TASK II: EVALUATION OF EXPANSIONS AND IMPROVEMENTS TO VILLAGE OF MILLBROOK SEWER AND WATER SYSTEMS

PREPARED FOR:

VILLAGE OF MILLBROOK, NY

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This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

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Introduction

Task II of the Local Government Efficiency Grant Program, provided by the New York State Department of State is to develop engineering, capital and operating budgets and procurement documents for the potential extension of water and sewer service to the following areas:

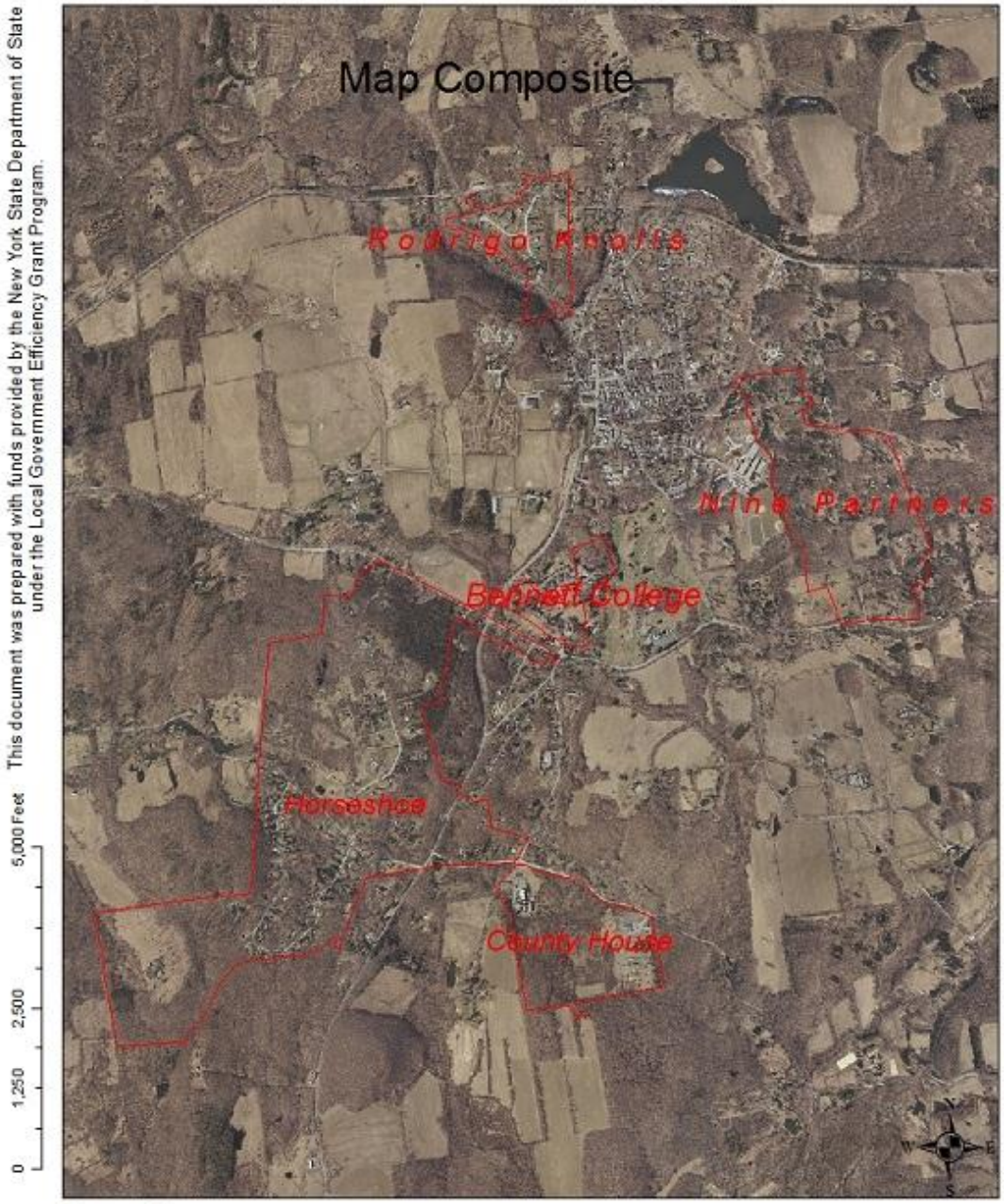
- Nine Partners Lane: Water and Sewer
- Former Bennett College Site: Water and Sewer
- Rodrigo Knolls: Water and Sewer
- Horseshoe: Water and Sewer
- Former County Infirmary Site: Water and Sewer

These areas are shown on the composite map located on page 4 of this document.

The work performed to establish the basis for the following reports are further developed and specified in the preliminary design and procurement documents that have been submitted under separate cover.

Expansion Area	Estimated Total Demand (GPD)	Estimated Maximum Probable Capital Cost
Nine Partners Lane Area: Water	13,650	$1,215,000
Nine Partners Lane Area: Sewer	11,550	$790,000
Former Bennett College Site: Water	30,000	$0
Former Bennett College Site: Sewer	30,000	$1,080,000
Rodrigo Knolls Area: Water	10,850	$648,000
Rodrigo Knolls Area: Sewer	8,050	$675,250
Horseshoe Road Area: Water	48,600	$2,706,000
Horseshoe Road Area: Sewer	25,200	$2,353,400
Former County Infirmary Site: Water	800	$0
Former County Infirmary Site: Sewer	800	$135,000

Composite Map



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Legend

Service Areas

2/24/11
VRI Environmental Services

Nine Partners Lane: Water

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to extension of water service to residents in the Nine Partners Lane area that are currently un-served. This report also provides a summary of the basis of design for the extension of water service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The proposed Nine Partners Lane area to be served covers approximately one hundred and forty nine (149) acres and is located entirely within the Village of Millbrook. The service area is comprised of thirty (39) residential parcels along Nine Partners Lane, Linden Lane, and Linden Court.

The area is currently served by individual water wells and sub-surface sewage disposal systems and therefore these residents currently pay no Village of Millbrook water consumption charge.

The service area is located at an elevation which is unable to be provided adequate pressure from the existing system and is therefore proposed to be served by a boosted pressure zone connected to the existing water main located on Nine Partners Lane.

1.2 Project Description

The existing storage and supply capacity of the Village of Millbrook water system is adequate to provide for the water demands and storage capacity required to serve the Nine Partners Lane area.

The proposed distribution system consists of an in-line booster pump station, approximately 6,100 linear feet of 8 inch cement lined ductile iron (CLDI) water main, and 39 new residential services (see Figure 2). The distribution system will be connected to the existing Village of Millbrook distribution system which terminates on Nine Partners Lane.

2.0 WATER SYSTEM FACILITIES

2.1 Projected Water Demands

The quantity of water required to meet existing and future domestic water usage is based on the following assumed design multipliers:

Individual houses (3-4 bedroom) = 350 gallons per day (gpd)

The projected average day water demand for the 39 residential properties within the proposed are to be served is as follows:

Projected Single-Family home water demand = 13,650 gpd

The projected maximum day water demand is established at 27,300 gpd using a peaking factor of 2.

2.2 Water Supply and Storage Facilities

The Village of Millbrook's existing water supply and storage facilities have been identified as being adequate to supply the proposed extension area. The Village's permitted water supply is 374,400 gpd. Based on historical usage, the systems average daily usage is 186,000 gpd and the calculated peak usage is 287,500 gpd. The Village's peaking factor between peak usage and average usage is calculated to be 1.5. Using this peaking factor to be applied to the expanded system results in a calculated peak usage of (186,000+13,650)*1.5 = 299,475 gpd which is approximately 75,000 gpd less than the permitted water supply.

To provide water storage capacity equal to the average daily consumption of the proposed Water System, approximately 199,650 gallons of storage capacity is needed. While the existing Village Storage Tank is reported to be a 500,000 gallons storage tank, it is estimated that only 50% of the capacity of the storage tank is usable for operating purposes to provide a minimum of 20 psi under all operating conditions. Therefore the 250,000 gallons of storage capacity exceeds average day demand.

2.3 Water Distribution System

The distribution system consists of approximately 6,100 linear feet of 8 inch cement lined ductile iron water main, with approximately 39 new services. Installation of the water mains will involve standard earthwork, piping, and construction techniques. As part of the water system construction, individual service taps consisting of a minimum ¾ inch curb stop and curb box will be installed and the services will be dead ends at the approximate parcel property line. From there, individual property water service lines are to be installed by the property owner in conformance with the Village of Millbrook requirements.

Throughout the distribution system, hydrants are shown on detail plan sheets at intervals not exceeding 600 feet and at all high points. Valves are shown on plan sheets at intervals not exceeding 800 feet and at all water main intersections. The hydrants will be utilized to periodically flush the water distribution system, and the valves will be used to isolate portions of the system for flushing and maintenance. Based on the available fire flow storage capacity the hydrants within the extension area are anticipated to be fire flow rated. The local Fire Department will be made aware of the available fire flow.

2.4 Water System Booster Pumps

Dual in-line booster pumps will be installed on Nine Partners Lane. The booster pumps have been sized to provide for the design pumping rates at the calculated Total Dynamic Head (TDH) for the pumps. The design pumping rate of 60 gpm for each pump was calculated as meeting the peak demand for the 39 residents in the Nine Partners Lane area that are at an elevation above 675 feet. The Total Head (225 feet) was derived as providing a minimum of 35 psi (80 feet) to the highest house served (elevation 900 feet) and then subtracting the elevation of the storage tank (elevation 760 feet). The appropriate pump curves were then entered for capacity vs. TDH for selection of the appropriate pumps. The pump selected will provide a minimum of 35 psi to the highest house served.

3.0 PROPOSED METHOD OF OPERATION

Operation of the water system facilities described above will involve the distribution of potable water from the Village Water System, individually metered to each user included in the extension area. Required minimum and maximum distribution system operating pressures will be maintained. Water samples will be collected and analyzed, and operating reports will be prepared by the Village Water System operator as required by Part 5 of the New York Codes, Rules and Regulations, New York State and Dutchess County Health Department requirements or other applicable standards and regulations.

4.0 OPINION OF MAXIMUM PROBABLE COST TO CONSTRUCT THE PROPOSED WATER SYSTEM EXTENSION

4.1 Opinion of Maximum Probable Costs

The cost to construct the proposed Water System extension will include costs related to the following: installation of new water mains in newly served areas of the Village; installation of a dual in-line booster pump station, installation of approximately 39 service connections; engineering, survey, legal and financial services. The evaluation of costs is based on the conceptual water main layout that has been developed prior to any regulatory review. The conceptual layout shows the water mains to be within Village Road R.O.W., requiring no easements. These costs are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	6100	$ 457,500.00
Rock Contingency on Distribution	%		40%	$ 183,200.00
Booster Pump	Each	$ 120,000.00	1	$ 120,000.00
Hydrants	Each	$ 2,500.00	12	$ 30,000.00
Valves	Each	$ 1,000.00	11	$ 11,000.00
Laterals	Each	$ 1,000.00	39	$ 39,000.00
Asphalt	L.F.	$ 50.00	750	$ 37,500.00
Subtotal				**$ 878,200.00**
Construction Contingency	%		15%	$ 133,800.00
Construction Total				**$ 1,012,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 1,012,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 152,000.00
Legal & Financial	%		5%	$ 51,000.00
Maximum Amount to be bonded				**$ 1,215,000.00**

4.2 Maximum Probable Cost To Be Bonded

With the above opinion of probable cost, the maximum probable cost to be funded will be $1,215,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 CONSUMPTION CHARGE

The current Village of Millbrook water consumption charge is $2.99 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly water consumption bill of $94.49, which would equate to $381.97 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for water estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.0, the cost for the use is calculated to be $381.97 per year.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service connection to be installed by the Village at their property line. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a ¾ inch meter, yoke and double check valve, and of installation of ¾ inch K-copper water service line from the property line to the house. The opinion of probable cost for purchase of the meter is $250, and for installation of the service line is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS

To extend service, the Village will require the following approvals from the noted agencies:

Village of Millbrook Board of Trustees:

- State Environmental Quality Review
- Borrowing Resolution to construct water system extension
- If required, acquisition of easements through private lands by agreements or eminent domain for distribution system

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

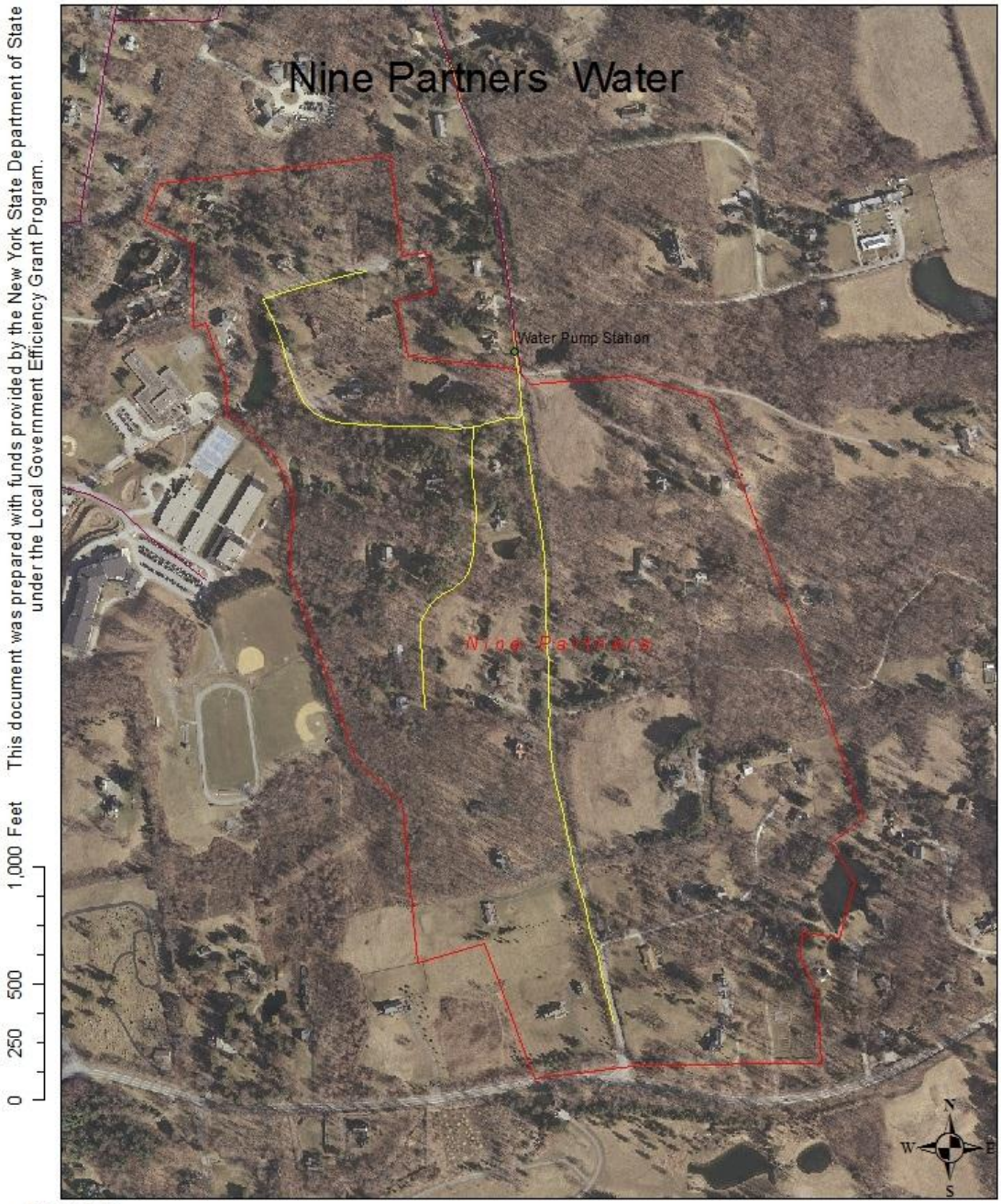
New York State Department of Environmental Conservation (NYSDEC):

- Storm Water Quality

Office of the State Comptroller:

- Financial Approval of Borrowing

Nine Partners Water Service Area



This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

0 250 500 1,000 Feet

Legend

- Water Pump Station
- Water Sub Station
- Wells
- Storage
- Pump House
- Water Loop
- Water Pipes
- 6 to 8 Inch Transite Line
- Water Line Expansion
- 10 Inch Water Line
- 2 Inch Water Line
- 4 Inch Water Line
- 6 Inch Water Line
- 8 Inch Water Line
- 8 or 10 Inch Connector
- Water Tower

2/24/11
VRI Environmental Services

Nine Partners Lane: Sewer

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to extension of sewer service to residents in the Nine Partners Lane area that are currently un-served. This report also provides a summary of the basis of design for the extension of sewer service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The proposed Nine Partners Lane area to be served covers approximately one hundred and thirty (130) acres and is located entirely within the Village of Millbrook. The service area is comprised of thirty (33) residential parcels along Nine Partners Lane, Linden Lane, and Linden Court.

The area is currently served by individual wells and sub-surface sewage disposal systems and therefore these residents pay only a partial Village of Millbrook Sewer Capital Assessment.

The service area is located at an elevation which is able to be served by gravity flow to existing sewer collection system located on Linden Lane.

1.2 Project Description

The existing sewer collection and treatment capacity of the Village of Millbrook sewer system is adequate to provide for the sewer demands required to serve the Nine Partners Lane area.

The proposed collection system consists of approximately 5,200 linear feet of 8 inch SDR 35 sewer main, 16 manholes and 33 new residential services (see Figure 2). The collection system will be connected to the existing Village of Millbrook collection system which terminates on Nine Partners Lane.

2.0 SEWER SYSTEM FACILITIES

2.1 Projected Sewer Demands

The quantity of processing capacity required to meet existing and future domestic sewer usage is based on the following assumed design multipliers:

Individual houses (3-4 bedroom) = 350 gallons per day (gpd)

The projected average day sewer demand for the 33 residential properties within the proposed area to be served is as follows:

Projected Single-Family home sewer demand = 11,550 gpd

2.2 Sewer Treatment Facilities

The Village of Millbrook's existing sewer treatment facilities have been identified as being adequate to supply the proposed extension area. The Village's permitted sewer discharge is 250,000 gpd. Based on historical usage, the systems average daily discharge is 196,000 gpd. Systems with an average daily flow in excess of 90% of permitted discharge (225,000 gpd for Millbrook) is required to consider an increased discharge limit. With the extension of service to the Nine Partners' area, the average daily discharge would be expected to be (196,000 + 11,550 = 207,550) less than 225,000 gpd. While the Village on occasion exceeded this average daily discharge on a monthly basis, this has been primarily due to Inflow and Infiltration (I&I) to the system which is unrelated to sewer discharges from individuals. The Village has made numerous repairs and other efforts to reduce I&I in the system such that the additional flow anticipated from the extension of the service area would not be expected to impact compliance with their discharge limit.

2.3 Sewer Collection System

The collection system consists of approximately 5,200 linear feet of 8 SDR 35 sewer main, with approximately 16 manholes and 33 new services. Installation of the sewer mains will involve standard earthwork, piping, and construction techniques. As part of the sewer system construction, individual lateral consisting of minimum 4 inch SDR 35 stubs will be installed and the services will be dead ended at the approximate edge of ROW. From there, individual property sewer service lines are to be installed by the property owner in conformance with the Village of Millbrook requirements.

3.0 PROPOSED METHOD OF OPERATION

Operation of the sewer system facilities described above will involve the collection and treatment of sewer by the Village Sewer System. Sewer use will be based on individually metered water connections in the extension area. Effluent samples from the wastewater treatment plant will be collected and analyzed, and operating reports will be prepared by the Village Sewer System operator as required by the Village's New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) permit.

4.0 OPINION OF MAXIMUM PROBABLE COST TO CONSTRUCT THE PROPOSED SEWER SYSTEM EXTENSION

4.1 Opinion of Maximum Probable Costs

The cost to construct the proposed Sewer Collection System extension will include costs related to the following: installation of new sewer mains in newly served areas of the Village; installation of manholes, installation of approximately 33 service connections; engineering, survey, legal and financial services. The evaluation of costs is based on the conceptual sewer main layout that has been developed prior to any regulatory review. The conceptual layout shows the sewer mains to be within Village Road R.O.W., requiring no easements. The Engineer's opinion of probable maximum cost of $790,000 is detailed further in the following table.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	5200	$ 312,000.00
Manholes	Each	$ 2,500.00	16	$ 40,000.00
Rock Contingency	%		45%	$ 158,000.00
Lift Station Upgrades	Each	$ 20,000.00	0	$ -
Laterals	Each	$ 1,000.00	33	$ 33,000.00
Asphalt	L.F.	$ 50.00	600	$ 30,000.00
Subtotal				**$ 573,000.00**
Construction Contingency	%		15%	$ 86,000.00
Construction Total				**$ 659,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 659,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 98,000.00
Legal & Financial	%		5%	$ 33,000.00
Maximum Amount to be bonded				**$ 790,000.00**

4.2 Maximum Probable Cost To Be Bonded

With the above opinion of probable cost, the maximum probable cost to be bonded will be $790,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY

5.1 BONDING COST AND CAPITAL DEBT SERVICE

The Village of Millbrook is investigation various methods of funding which are described in a separate document.

6.0 CONSUMPTION CHARGE

The Village of Millbrook has a consumption charge of $6.18 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly sewer consumption charge of $194.04, which would equate to $789.50 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of benefit assessment plus the cost for sewer estimated to be used in a year. A single family house is the typical benefited property in the Village.

In Section 6.0, the cost for the use is calculated to be $789.50 per year. Therefore, it is estimated that the total yearly cost for an average single family house in the Village Sewer System will be approximately $881.91 per year.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service lateral to be installed by the Village to the edge of ROW. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a 4 inch sewer lateral from the edge of ROW to the house. The opinion of probable cost for installation of the service lateral is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS

To extend service, the Village will require the following approvals from the noted agencies:

Village of Millbrook Board of Trustees:

- State Environmental Quality Review
- Borrowing Resolution to construct sewer system extension
- If required, acquisition of easements through private lands by agreements or eminent domain for collection system

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

New York State Department of Environmental Conservation (NYSDEC):

- Modified SPDES Discharge Permit
- Storm Sewer Quality

Office of the State Comptroller:

- Financial Approval of Borrowing

Nine Partners Sewer Area

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0 250 500 1,000 Feet

Legend

- Sewer Pump Station
- Force Main Sewer
- Sewer Line
- Residential Force Main
- Sewer Line Expansion
- Service Area

2/24/11
VRI Environmental Services

Former Bennett College Site: Water

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to extension of water service to a potential 95 unit residential development project with in the Former Bennett College Site. This report also provides a summary of the basis of design for the extension of water service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The Former Bennett College Site covers approximately twenty seven (27) acres and is located entirely within the Village of Millbrook. The service area is for a potential ninety five (95) residential unit development (a mix of duplexes and single family homes).

The area is currently an unoccupied former college campus within the Village of Millbrook.

The service area is located at an elevation which is able to be provided adequate pressure from the existing system.

1.2 Project Description

The existing storage and supply capacity of the Village of Millbrook water system is adequate to provide for the water demands and storage capacity required to serve the Former Bennett College Site.

There is an existing water main that runs in an easement across the Former Bennett College property which could be the connection location. It would be the developers responsibility for the construction of the distribution system required to serve the development although this distribution system may be dedicated to the Village for long term maintenance.

WATER SYSTEM FACILITIES

2.1 Projected Water Demands

The quantity of water required to meet existing and future domestic water usage is based on the following assumed design multipliers:

Individual Resident (2-4 bedroom) = 315 gallons per day (gpd)

The projected average day water demand for the 95 residential properties within the proposed area to be served is as follows:

Projected Units water use = 30,000 gpd

The projected maximum day water demand is established at 60,000 gpd using a peaking factor of 2.

2.2 Water Supply and Storage Facilities

The Village of Millbrook's existing water supply and storage facilities have been identified as being adequate to supply the proposed extension area. The Village's permitted water supply is 374,400 gpd. Based on historical usage, the systems average daily usage is 186,000 gpd and the calculated peak usage is 287,500 gpd.The Village's peaking factor between peak usage and average usage is calculated to be 1.5. Using this peaking factor to be applied to the expanded system results in a calculated peak usage of (186,000+30,000)*1.5 = 324,000 gpd which is approximately 50,000 gpd less than the permitted water supply.

To provide water storage capacity equal to the average daily consumption of the proposed Water System, approximately 216,000 gallons of storage capacity is needed. While the existing Village Storage Tank is reported to be a 500,000 gallons storage tank, it is estimated that only 50% of the capacity of the storage tank is usable for operating purposes to provide a minimum of 20 psi under all operating conditions. Therefore the 250,000 gallons of storage capacity exceeds average day demand.

The current site developer has drilled wells on the site, but the water quality may require further evaluation regarding the concept of co-mingling sources. The current developer has proposed to provide 60,000 gallons of additional storage and pumping facilities to deliver this supply source to the Village's distribution system. Discussions with any future developer of supply and storage by the developer or funded by the developer may need further study in order to address the long term needs of the Village's water system and water source quality.

2.3 Water Distribution System

The developer is responsible for connecting to the existing distribution system. No other improvements are anticipated.

2.0 PROPOSED METHOD OF OPERATION

Operation of the water system facilities described above will involve the distribution of potable water from the Village Water System, individually metered to each user included in the extension area. Required minimum and maximum distribution system operating pressures will be maintained. Water samples will be collected and analyzed, and operating reports will be prepared by the Village Water System operator as required by Part 5 of the New York Codes, Rules and Regulations, New York State and Dutchess County Health Department requirements or other applicable standards and regulations.

4.0 CONSUMPTION CHARGE

The Village of Millbrook has a water consumption charge of $2.99 per 1,000 gallons.
Based on NYSDEC design usage multipliers, the typical unit is conservatively estimated to use 315 gallons per day, which is equal to 28,744 gallons per quarter, or 114,975 gallons per year. This would result in a quarterly water consumption charge of $85.94, which would equate to $343.78 per year.

Any future developer will be subject to a one-time cost for connecting the proposed building to the Villages water distribution system located on the property.

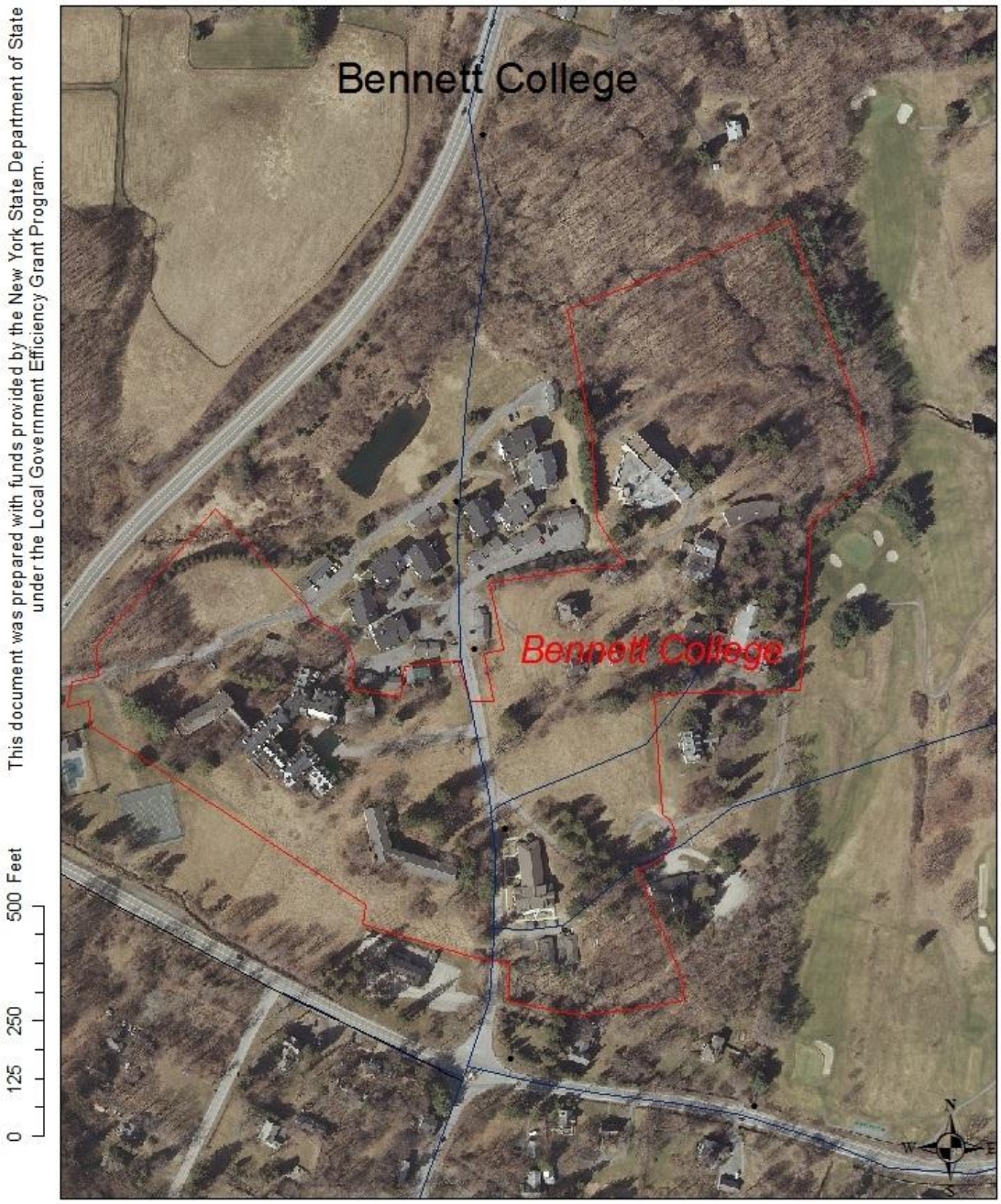
5.0 REQUIRED APPROVALS AND OTHER ACTIONS

To extend service, the Village will require the following approvals from the noted agencies:

Village of Millbrook Board of Trustees:

- State Environmental Quality Review
- If required, acceptance of easements to be dedicated by the developer.

Former Bennett College Site Service Area



This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

Legend

Service Area

Hydrants

Water Lines

2/24/11
VRI Environmental Services

Former Bennett College Site: Sewer

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to extension of sewer service to a potential 95 unit residential development project with in the Former Bennett College Site. This report also provides a summary of the basis of design for the extension of sewer service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The Former Bennett College Site covers approximately twenty seven (27) acres and is located entirely within the Village of Millbrook. The service area is for a potential ninety five (95) residential unit development (a mix of duplexes and single family homes).

The area is currently an unoccupied former college campus within the Village of Millbrook.

The service area is located at an elevation which is able to be served by gravity flow to an existing sewer collection system which flows to an existing sewer lift station.

1.2 Project Description

The existing sewer collection and treatment capacity of the Village of Millbrook sewer system is capable of being modified to provide for the sewer demands required to serve the Former Bennett College Site.

Any proposed development will be responsible for connecting to the Village's existing collection system which crosses through the property and flows by gravity to an existing sewer lift station. To accommodate the additional flow, the existing sewer lift station will need to be modified and additional treatment capacity will need to be developed at the Village's wastewater treatment plant.

2.0 SEWER SYSTEM FACILITIES

2.1 Projected Sewer Demands

The quantity of sewer required to meet existing and future domestic sewer usage is based on assumed design multipliers:

Individual Resident (2-4 bedroom) = 315 gallons per day (gpd)

The projected average day sewer demand for the 95 residential properties within the proposed area to be served is as follows:

Projected Units sewer demand = 30,000 gpd

2.2 Sewer Treatment Facilities

The Village of Millbrook's existing sewer treatment facilities have been identified as capable of being modified to treat wastewater from the proposed extension area.
The Village's permitted sewer discharge is 250,000 gpd. Based on historical usage, the systems average daily discharge is 196,000 gpd. Systems with an average daily flow in excess of 90% of permitted discharge (225,000 gpd for Millbrook) are required to consider an increased discharge limit. With the extension of service to the Former Bennett College Site, the average daily discharge would be expected to be (196,000 + 30,000 = 226,000) gpd. While the Village on occasion exceeded this average daily discharge on a monthly basis, this has been primarily due to Inflow and Infiltration (I&I) to the system which is unrelated to sewer discharges from individuals. The Village has made numerous repairs and other efforts to reduce I&I in the system such that the additional flow anticipated from the extension of the service area could be accommodated following some improvements in the treatment capacity.

2.3 Sewer Collection System

The collection system improvements consist of modifications to the existing sewer lift station and modifications to the wastewater treatment plant to accommodate the additional flow.

3.0 PROPOSED METHOD OF OPERATION

Operation of the sewer system facilities described above will involve the collection and treatment of sewer by the Village Sewer System. Sewer use will be based on individually metered water connections in the extension area. Effluent samples from the wastewater treatment plant will be collected and analyzed, and operating reports will be prepared by the Village Sewer System operator as required by the Village's New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) permit.

4.0 OPINION OF MAXIMUM PROBABLE COST TO CONSTRUCT THE PROPOSED SEWER SYSTEM EXTENSION

4.1 Opinion of Maximum Probable Costs

The cost to construct the proposed Sewer System extension will include costs related to the following: modifications to the existing sewer lift station and modifications to the existing wastewater treatment plant.

While the Village has some available capacity, it is anticipated that any future project developer would fund required capacity improvements to the existing Millbrook Wastewater Treatment Plant including engineering, survey, legal and financial services. The capacity improvements to be made will depend on the ultimate capacity requirements and could range from simply providing additional equalization storage; to expanding the current treatment technology; to replacing the existing extended aeration with a membrane bioreactor (MBR). These costs are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	0	$ -
Manholes	Each	$ 2,500.00	0	$ -
Rock Contingency	%		0%	$ -
Lift Station Upgrades	Each	$ 50,000.00	1	$ 50,000.00
Laterals	Each	$ 1,000.00	0	$ -
Develop Additional Sewer Capicity	GPD	$ 25.00	30000	$ 750,000.00
Subtotal				**$ 800,000.00**
Construction Contingency	%		15%	$ 120,000.00
Construction Total				**$ 920,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 920,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 120,000.00
Legal & Financial	%		5%	$ 40,000.00
Maximum Amount to be bonded				**$ 1,080,000.00**

4.2 Maximum Probable Cost To Be Funded

With the above opinion of probable cost, the maximum probable cost to be funded will be $1,080,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 CONSUMPTION CHARGE

The Village of Millbrook has a consumption charge of $6.18 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 315 gallons per day, which is equal to 28,744 gallons per quarter, or 114,975 gallons per year. This would result in a quarterly sewer consumption charge of $177.64, which would equate to $710.55 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for sewer estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.0, the cost for the use is calculated to be $789.50 per year.

In addition to the above described costs for capital and usage, the developer will be subject to a one-time cost for connecting the proposed building to the Village's sewer collection system located on the property.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS

To extend service, the Village will require the following approvals from the noted agencies:

Village of Millbrook Board of Trustees:

- State Environmental Quality Review
- Borrowing Resolution to construct sewer system extension
- If required, acquisition of easements through private lands by agreements or eminent domain for collection system

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

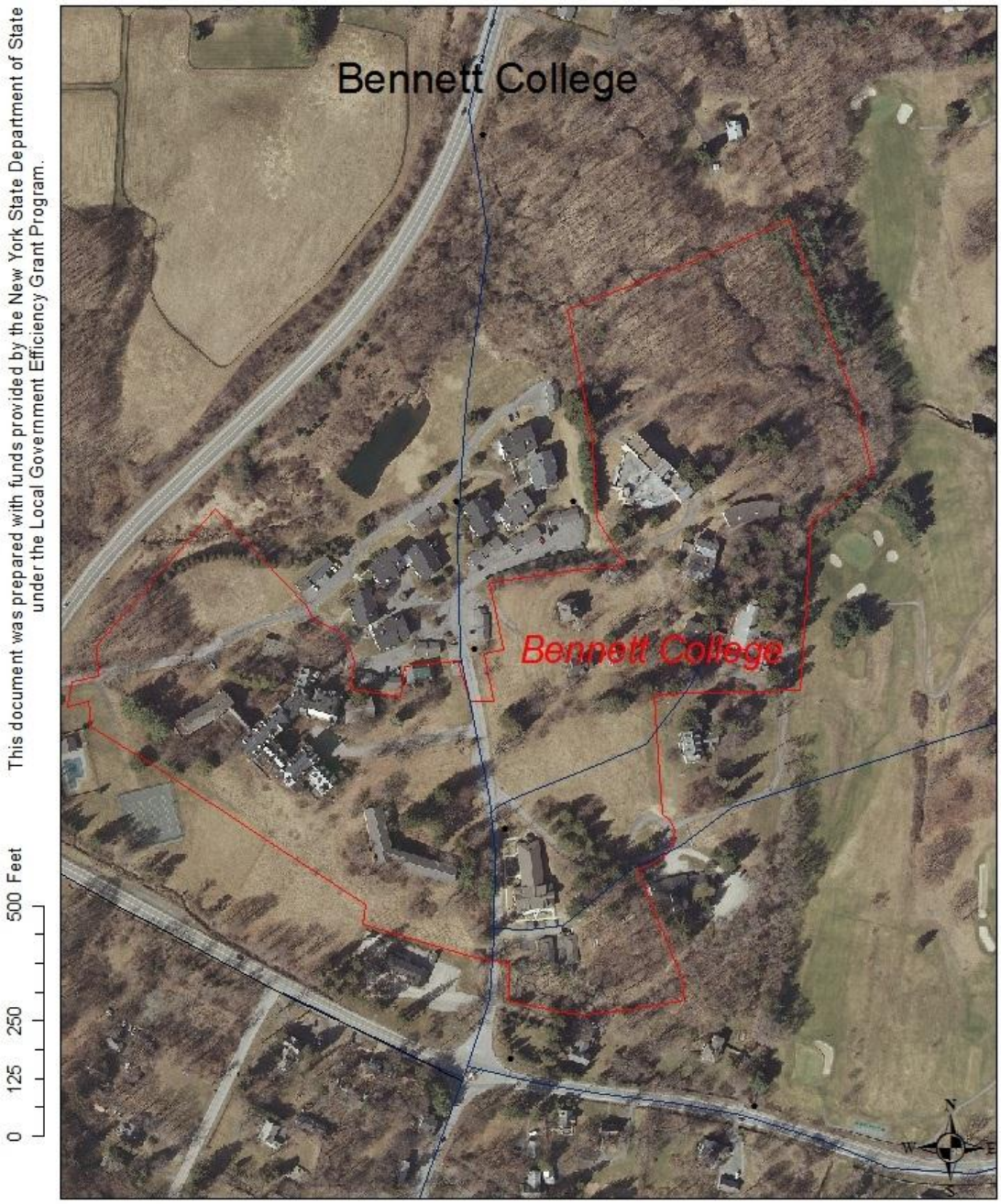
New York State Department of Environmental Conservation (NYSDEC):

- Modified SPDES Discharge Permit
- Storm Sewer Quality

Office of the State Comptroller:

- Financial Approval of Borrowing

Former Bennett College Site Service Area



This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

0 125 250 500 Feet

Legend

Service Area

Hydrants

Water Lines

2/24/11
VRI Environmental Services

Rodrigo Knolls: Water

1.0 INTRODUCTION

Due to subsurface conditions in the area of Rodrigo Knoll, water quantity and quality issues have become more critical causing the need to evaluate the feasibility of establishing a water service area as described in this report.

The purpose of this report is to present findings and engineering data pertinent to establishment of a water service area in order to service residents in the un-served neighborhood on Rodrigo Knolls and Rodrigo Court adjacent to the Village of Millbrook in the Town of Washington.

1.1 Background

The Village of Millbrook received funding through the New York State Department of State under the Local Government Efficiency Grant Program to evaluate the extension of water service to the residents on Rodrigo Knolls and Rodrigo Court due to water quantity and quality concerns related to their individual residential wells. In response to the concerns the following MP&R has been prepared.

2.0 RODRIGO KNOLL WATER SERVICE AREA PROJECTED WATER SERVICE AREA DEMANDS

2.1 Proposed Service Area and Need

Enclosed is a map indicating the extent of the service area for the proposed Rodrigo Knoll Water Service Area. The total acreage of the proposed Service Area is approximately 50 acres.

The proposed service area includes: residents along Rodrigo Knolls, Rodrigo Court, Stanford Road, and Sharon Turnpike.

2.2 Projected Water Demands

The quantity of water required for domestic usage is based on the following assumed design multipliers used to estimate existing and future water demands:

Individual houses = 350 gallons per day (gpd)

2.2.1 Water Demand

The projected average day water demand for the properties within the proposed Service Area is summarized below:

Projected Single-Family home water demand = 10,850 gpd

3.0 RODRIGO KNOLLS WATER SERVICE AREA FACILITIES ANALYSIS

3.1 Formation Process

It is proposed that a Service Area be established to provide facilities and service benefiting the residential properties shown on Exhibit 2, Map of proposed Rodrigo Knolls Water Service Area.

3.2 Proposed Sources

The Village of Millbrook's existing water supply has been identified as being adequate to supply the proposed extension area. The Village's permitted water supply is 374,400 gpd. Based on historical usage, the systems average daily usage is 186,000 gpd and the calculated peak usage is 287,500 gpd. The Village's peaking factor between peak usage and average usage is calculated to be 1.5. Using this peaking factor to be applied to the expanded system results in a calculated peak usage of (186,000+10,850)*1.5 = 295,275 gpd which is approximately 80,000 gpd less than the permitted water supply. The location of the proposed groundwater source is in the Town of Washington, east of the Village of Millbrook.

3.3 Water Storage

To provide water storage capacity equal to the average daily consumption of the proposed Water System, approximately 196,850 gallons of storage capacity is needed. While the existing Village Storage Tank is reported to be a 500,000 gallons storage tank, it is estimated that only 50% of the capacity of the storage tank is usable for operating purposes to provide a minimum of 20 psi under all operating conditions. Therefore the 250,000 gallons of storage capacity exceeds average day demand.

3.4 Proposed Routing of Water Distribution System

The enclosed map shows the extent of the proposed water main routings and approximate location of the tie-ins for the proposed Rodrigo Knolls Water Service Area.

The proposed distribution system will consist of installing approximately 3,900 linear feet of 8 inch cement lined ductile iron water main. Installation of the water mains are shown to be within the R.O.W. of Town or State Roads so it is unlikely that land acquisition or easement will be required. However, in the event easements are required, acquisition of easements will be by agreement or eminent domain. Detailed layout of the distribution water mains will be completed during the design phase of the project. Installation of the water mains will involve standard earthwork, piping, and construction techniques.

The distribution system will include one State Road crossing on Sharon Turnpike. There will also be a bored crossing under the East Branch of the Wappinger Creek. The Rodrigo Knolls Water Service Area distribution system is proposed to be interconnected with The Village of Millbrook system as shown on the map. A relationship is proposed with the Village of Millbrook for the shared use of facilities.

Rodrigo Knoll Water Service Area users will purchase water from The Village of Millbrook based on the quantities measured by individual meters.

Throughout the distribution system, hydrants will be installed at an interval not to exceed 600 feet, hydrants will be installed at all high points, and valves will be installed at all water main intersections or intervals not more than 800 feet. The hydrants will be utilized to periodically flush the water distribution system, and the valves will be used to isolate portions of the system for flushing and maintenance. Fire flow rating will not be provided anywhere in the system. The local Fire Department will be made aware of this.

3.6 Proposed Method of Operation

Operation of the Rodrigo Knolls Water Service Area's facilities described above will involve the purchase of metered water meeting New York State drinking water standards from The Village of Millbrook. Purchased potable water from the Village of Millbrook will be distributed and individually metered to each user included in the Rodrigo Knolls Water Service Area. Required minimum and maximum distribution system operating pressures will be maintained. Water samples will be collected and analyzed, and operating reports will be prepared by the Village of Millbrook operator as required by Part 5 of the New York Codes, Rules and Regulations, New York State and Dutchess County Health Department requirements or other applicable standards and regulations.

4.0 OPINION OF MAXIMUM PROBABLE COST TO ESTABLISH AND CONSTRUCT THE PROPOSED RODRIGO KNOLLS WATER SERVICE AREA

4.1 Opinion of Maximum Probable Costs

The cost to establish and construct the proposed Rodrigo Knolls Water Service Area will include costs related to the following: installation of new water mains in newly served areas of the Service Area; installation of approximately 31 service connections; installation of the tie-in connection across Sharon Turnpike; bore crossing under Creek; and engineering, survey, legal and financial services. The evaluation of costs is based on the conceptual water main layout that has been developed prior to any regulatory review. The conceptual layout shows the water mains to be within Town and State Road R.O.W., requiring no easements. These costs are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	3,900	$ 292,500.00
Rock Contingency on Distribution	%		15%	$ 43,350.00
Bore Under Sharon Turnpike	Each	$ 30,000.00	1	$ 30,000.00
Bore Under Creek	Each	$ 30,000.00	1	$ 30,000.00
Hydrants	Each	$ 2,500.00	8	$ 20,000.00
Valves	Each	$ 1,000.00	9	$ 9,000.00
Laterals	Each	$ 1,000.00	31	$ 31,000.00
Asphalt	L.F.	$ 50.00	250	$ 12,500.00
Subtotal				**$ 468,350.00**
Construction Contingency	%		15%	$ 70,650.00
Construction Total				**$ 539,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 539,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 82,000.00
Legal & Financial	%		5%	$ 27,000.00
Maximum Amount to be Bonded				**$ 648,000.00**

4.2 Maximum Probable Cost To Be Bonded

With the Village of Millbrook being the source for the proposed Rodrigo Knolls Water Service Area, the maximum probable cost to be bonded will be $648,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY OF THE WATER SERVICE AREA

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 WATER PURCHASE COSTS

Water purchase costs from the Village of Millbrook will be paid from money generated by water use. All users will be metered and the purchase costs will be billed to users based on meter readings. The water purchase cost will be based on the O&M cost for the Village of Millbrook and proposed Rodrigo Knolls Water Service Area. O&M cost will include labor, equipment, power, replacement parts, and any other one time or recurring costs included within the annual budget for the Service Area as deemed appropriate by the Village of Millbrook. This budget amount will be divided into the estimated usage to establish an O&M water rate. Water purchase costs will be billed by the Village of Millbrook on a quarterly basis.

6.1 Consumption Charge

The Village of Millbrook consumption charge for the proposed Rodrigo Knoll Water Service Area will be $5.98 per 1,000 gallons to operate and maintain the supply, storage and distribution facilities. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly water consumption charge of $190.99, which would equate to $763.95 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for water estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.1, the cost for the use of 127,750 gallons in a year was calculated to cost $763.95 based on the water consumption charge of $5.98 per 1,000 gallons.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service connection to be installed by the Service Area at their property line. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a ¾ inch meter, yoke and double check valve, and of installation of ¾ inch K-copper water service line from the property line to the house. The opinion of probable cost for purchase of the meter is $250, and for installation of the service line is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS FOR WATER SERVICE AREA

The Rodrigo Knolls Water Service Area will require the following approvals from the noted agencies:

Town of Washington Board:

- Highway Work Permit for work in Town Road

Village of Millbrook:

- State Environmental Quality Review
- Agreement for water source
- If required, acquisition of easements through private lands by agreements or eminent domain for distribution system

Dutchess County Department of Health:

- Approval of Service Area (Water Supply Application)
- Approval of Engineering Plans and Specifications for Facilities

New York State Department of Transportation:

- Highway Work Permit for work on Sharon Turnpike

New York State Department of Environmental Conservation (NYSDEC):

- Water Quality Certification
- Storm Water Quality
- Approval of Service Area (Water Supply Application)

New York State Departments of Health:

- Approval of Service Area (Water Supply Application)
- Approval of Engineering Plans and Specifications for Facilities

Office of the State Comptroller:

- Financial Approval of Service Area

Army Corps of Engineers (ACOE):

- Storm Water Quality

Rodrigo Knolls Water Service Area

This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

0 250 500 1,000 Feet

Legend

- Water Pump Station
- Water Sub Station
- Wells
- Storage
- Pump House
- Water Loop
- Water Pipes
- 8,000 Foot Loop
- Water Line Expansion
- 2 Inch Water Line
- 4 Inch Water Line
- 6 Inch Water Line
- 6 to 8 Inch Transite Line
- 8 Inch Water Line
- 10 Inch Water Line
- Service Area
- 8 or 10 Inch Connector
- Water Tower

2/24/11
VRI Environmental Services

Rodrigo Knolls: Sewer

1.0 INTRODUCTION

Due to subsurface conditions in the area of Rodrigo Knolls, sewer subsurface disposal system issues have become more critical causing the need to evaluate the feasibility of establishing a sewer service area as described in this report.

The purpose of this report is to present findings and engineering data pertinent to establishment of a sewer service area in order to service residents in the un-served neighborhood on Rodrigo Knolls and Rodrigo Court adjacent to the Village of Millbrook in the Town of Washington.

1.1 Background

The Village of Millbrook received funding through the New York State Department of State under the Local Government Efficiency Grant Program to evaluate the extension of Sewer service to the residents on Rodrigo Knolls and Rodrigo Court due to Sewer subsurface disposal system concerns related to their individual residential wells. In response to the concerns the following MP&R has been prepared.

2.0 RODRIGO KNOLLS SEWER SERVICE AREA PROJECTED SEWER SERVICE AREA DEMANDS

2.1 Proposed Service Area and Need

Enclosed is a map indicating the extent of the proposed service area for the proposed Rodrigo Knolls Sewer Service Area. The total acreage of the proposed Service Area is approximately 37 acres.

The proposed service area includes: residents along Rodrigo Knolls, Rodrigo Court, and Stanford Road.

2.2 Projected Sewer Demands

The quantity of sewer capacity required for domestic demands is based on the following assumed design multipliers used to estimate existing and future sewer demands:

Individual houses = 350 gallons per day (gpd)

2.2.1 Sewer Demand

The projected average day sewer demand for the properties within the proposed Service Area is summarized below:

Projected Single-Family home sewer demand = 8,050 gpd

3.0 RODRIGO KNOLLS SEWER SERVICE AREA FACILITIES ANALYSIS

3.1 Formation Process

It is proposed that a Sewer Service Area be established to provide facilities and service benefiting the residential properties shown on Exhibit 2, Map of proposed Rodrigo Knolls Sewer Service Area.

3.2 Proposed Sources

The Village of Millbrook has been identified as the only sewer treatment facilities for the proposed Rodrigo Knolls Sewer Service Area. The Village of Millbrook collection and treatment system has been identified as having the potential to be upgraded to meet the additional anticipated demands of the proposed Service Area. The location of the sewer treatment plant is along the East Branch of the Wappinger Creek in the western portion of the Village of Millbrook.

3.3 Proposed Routing of Sewer Collection System

The map shows the extent of the proposed sewer main routings and approximate location of the tie-ins for the proposed Rodrigo Knolls Sewer Service Area.

The proposed collection system will consist of installing approximately 3,000 linear feet of 8 inch SDR 35 Sewer main and 13 manholes. Installation of the sewer mains are shown to be within the R.O.W. of Town Roads so it is unlikely that land acquisition or easement will be required. However, in the event easements are required, acquisition of easements will be by agreement or eminent domain. Detailed layout of the collection Sewer mains will be completed during the design phase of the project. Installation of the Sewer mains will involve standard earthwork, piping, and construction techniques.

The collection system will include suspending the sewer main along the bridge over the East Branch of the Wappinger Creek. The Rodrigo Knolls Sewer Service Area collection system is proposed to be connected at the existing sewer lift station located at the Village of Millbrook sewer plant as shown on the enclosed map. The existing lift station will be required to be upgraded to meet the increased flows. A relationship is proposed with the Village of Millbrook for the shared use of facilities. Rodrigo Knolls Sewer Service Area users will pay for sewer treatment by The Village of Millbrook based on the quantity of water use measured by individual meters.

3.5 Proposed Method of Operation

Operation of the sewer system facilities described above will involve the collection and treatment of sewer by the Village Sewer System. Sewer use will be based on individually metered water connections in the extension area. Effluent samples from the wastewater treatment

plant will be collected and analyzed, and operating reports will be prepared by the Village Sewer System operator as required by the Village's New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) permit.

4.0 OPINION OF MAXIMUM PROBABLE COST TO ESTABLISH AND CONSTRUCT THE PROPOSED RODRIGO KNOLLS SEWER SERVICE AREA

4.1 Opinion of Maximum Probable Costs

The cost to establish and construct the proposed Rodrigo Knolls Sewer Service Area will include costs related to the following: installation of new Sewer mains in newly served areas; installation of 13 manholes and approximately 23 service connections; suspending the sewer main along the bridge over the East Branch of the Wappinger Creek; upgrading the existing sewer lift station; development of additional sewer treatment capacity; and engineering, survey, and legal services.

While the Village has some available capacity, it is anticipated that the Rodrigo Knolls Sewer Service Area would fund required capacity improvements to the existing Millbrook Wastewater Treatment Plant based on a pro-rated share of the increased capacity. The capacity improvements to be made will depend on the ultimate capacity requirements and could range from simply providing additional equalization storage; to expanding the current treatment technology; to replacing the existing extended aeration with a membrane bioreactor (MBR).

The evaluation of costs is based on the conceptual sewer main layout that has been developed prior to any regulatory review. The conceptual layout shows the sewer mains to be within Town and State Road R.O.W., requiring no easements. All of the costs identified above are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Sewer Collectin System	L.F.	$ 60.00	3,000	$ 180,000.00
Manholes	Each	$ 2,500.00	13	$ 32,500.00
Rock Contengency	%		20%	$ 43,500.00
Lift Station Upgrades	Each	$ 20,000.00	1	$ 20,000.00
Attach sewer lines to bridge	Each	$ 20,000.00	1	$ 20,000.00
Laterals	Each	$ 1,000.00	23	$ 23,000.00
Asphalt	L.F.	$ 50.00	500	$ 25,000.00
Subtotal				**$ 344,000.00**
Construction Contingency	%		15%	$ 51,000.00
Construction Total				**$ 395,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 395,000.00**
Develop Additional Sewer Capacity	GPD	$ 25.00	8,050	$ 201,250.00
Egineer Design, Approval &				
Construction Support	%		15%	$ 59,000.00
Legal & Financial	%		5%	$ 20,000.00
Maximum Amount to be bonded				**$ 675,250.00**

4.2 Maximum Probable Cost To Be Funded

With the Village of Millbrook being the treatment resource for the proposed Rodrigo Knolls Sewer Service Area, the maximum probable cost to be funded will be $675,250.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY OF THE SEWER SERVICE AREA

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 SEWER PURCHASE COSTS

Sewer treatment costs for the Village of Millbrook will be paid from money generated by Sewer use. All users will be charged for treatment based on metered water use. The sewer purchase cost will be based on the O&M cost for the Village of Millbrook and proposed Rodrigo Knolls Sewer Service Area. O&M cost will include labor, equipment, power, replacement parts, and any other one time or recurring costs included within the annual budget for the Service Area as deemed appropriate by the Village of Millbrook. This budget amount will be divided into the estimated usage to establish an O&M Sewer rate. Sewer purchase costs will be billed by the Village of Millbrook on a quarterly basis.

6.1 Consumption Charge

The Village of Millbrook has a consumption charge of $6.18 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly sewer consumption charge of $194.04, which would equate to $789.50 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for sewer estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.0, the consumption charge is calculated to be $789.50 per year.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service lateral to be installed by the Village to the edge of ROW. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a 4 inch sewer

lateral from the edge of ROW to the house. The opinion of probable cost for installation of the service lateral is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS FOR SEWER SERVICE AREA

The Rodrigo Knolls Sewer Service Area will require the following approvals from the noted agencies:

Town of Washington Board:

- Highway Work Permit for work in Town Road

Village of Millbrook:

- State Environmental Quality Review
- Agreement for Sewer source
- If required, acquisition of easements through private lands by agreements or eminent domain for collection system

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

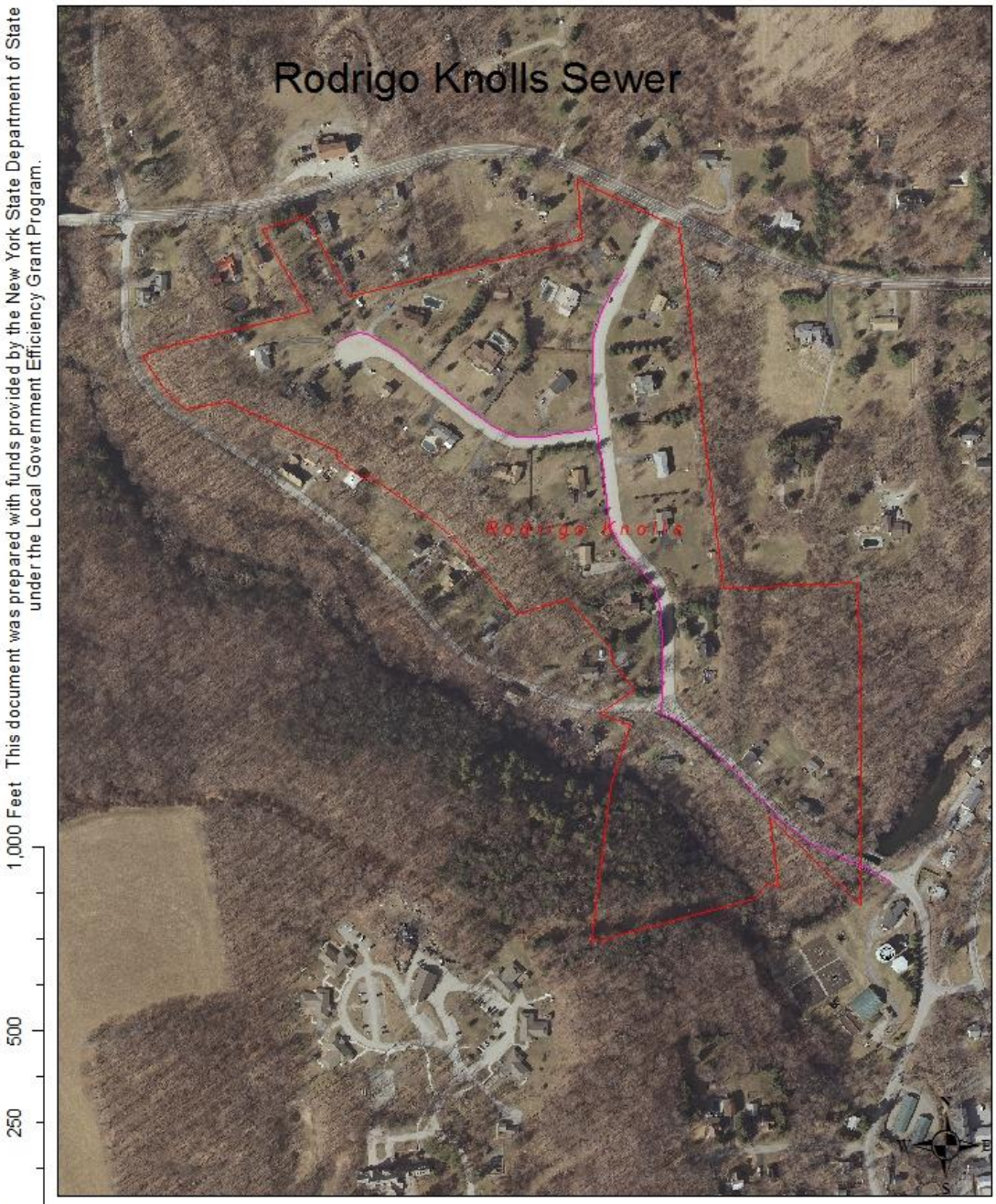
New York State Department of Environmental Conservation (NYSDEC):

- Modified SPDES Discharge Permit
- Storm Sewer Quality

Office of the State Comptroller:

- Financial Approval of Borrowing

Rodrigo Knolls Sewer Service Area



This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

Legend

- Sewer Pump Station
- Force Main Sewer
- Sewer Line
- Residential Force Main
- Sewer Line Expansion
- Service Area

2/24/11
VRI Environmental Services

Horseshoe Road: Water

1.0 INTRODUCTION

Due to subsurface conditions in the area of Horseshoe Road, water quantity and quality issues have become more critical causing the need to evaluate the feasibility of establishing a water service area as described in this report.

The purpose of this report is to present findings and engineering data pertinent to establishment of a water service area in order to service residents in the un-served neighborhood on Horseshoe Road and College Lane adjacent to the Village of Millbrook in the Town of Washington.

1.1 Background

The Village of Millbrook received funding through the New York State Department of State under the Local Government Efficiency Grant Program to evaluate the extension of water service to the residents on Horseshoe Road due to water quantity and quality concerns related to their individual residential wells. In response to the concerns the following MP&R has been prepared.

2.0 HORSESHOE ROAD WATER SERVICE AREA PROJECTED WATER SERVICE AREA DEMANDS

2.1 Proposed Service Area and Need

Enclosed is a map indicating the extent of the proposed service area for the proposed Horseshoe Road Water Service Area. The total acreage of the proposed Service Area is approximately 452 acres.

The proposed service area includes: property owners along Horseshoe Road, College Lane, South Road, Oak Summit Road Route 82 and Route 343.

2.2 Projected Water Demands

The quantity of water required for domestic usage is based on the following assumed design multipliers used to estimate existing and future water demands:

Single Family Home = 350 gallons per day (gpd)

Non-Single Family Home Calculated flow from NYSDEC Design Standards for Wastewater Treatment Works, 1988 in gallons per day (gpd)

2.2.1 Water Demand

The projected average day water demand for the properties within the proposed Service Area is summarized below:

Projected Single-Family home water demand = 47,600 gpd

Projected Non-Single-Family home water demand = 1,000 gpd

3.0 HORSESHOE ROAD WATER SERVICE AREA FACILITIES ANALYSIS

3.1 Formation Process

It is proposed that a Service Area be established to provide facilities and service benefiting the residential properties shown on the enclosed map of proposed Horseshoe Road Water Service Area.

3.2 Proposed Sources

The Village of Millbrook's existing water supply has been identified as being adequate to supply the proposed extension area. The Village's permitted water supply is 374,400 gpd. Based on historical usage, the systems average daily usage is 186,000 gpd and the calculated peak usage is 287,500 gpd. The Village's peaking factor between peak usage and average usage is calculated to be 1.5. Using this peaking factor to be applied to the expanded system results in a calculated peak usage of (186,000+48,600)*1.5 = 351,900 gpd which is approximately 23,000 gpd less than the permitted water supply. The location of the proposed groundwater source is in the Town of Washington, east of the Village of Millbrook.

3.3 Water Storage

To provide water storage capacity equal to the average daily consumption of the proposed Water System, approximately 233,600 gallons of storage capacity is needed. While the existing Village Storage Tank is reported to be a 500,000 gallons storage tank, it is estimated that only 50% of the capacity of the storage tank is usable for operating purposes to provide a minimum of 20 psi under all operating conditions. Therefore the 250,000 gallons of storage capacity exceeds average day demand.

3.4 Proposed Routing of Water Distribution System

Exhibit 2 shows the extent of the proposed water main routings and approximate location of the tie-ins for the proposed Horseshoe Road Water Service Area. The proposed distribution system will consist of installing approximately 17,500 linear feet of 8 inch cement lined ductile iron water main, 1,200 linear feet of 4 inch cement lined ductile iron booster main, and pump station. Installation of the water mains are shown to be within the R.O.W. of Town or State Roads so it is unlikely that land acquisition or easement will be required. However, in the event easements are required, acquisition of easements will be by agreement or eminent domain. Detailed layout of the distribution water mains will be completed during the design phase of the project. Installation of the water mains will involve standard earthwork, piping, and construction techniques.

The distribution system will include two State Road crossing on Route 82. The Horseshoe Road Water Service Area distribution system is proposed to be interconnected with The Village of Millbrook system as shown on the enclosed map. A relationship is proposed with the Village of Millbrook for the shared use of facilities. Horseshoe Road Water Service Area users will purchase water from The Village of Millbrook based on the quantities measured by individual meters.

Throughout the distribution system, hydrants will be installed at an interval not to exceed 600 feet, hydrants will be installed at all high points, and valves will be installed at all water main intersections or intervals not more than 800 feet. The hydrants will be utilized to periodically flush the water distribution system, and the valves will be used to isolate portions of the system for flushing and maintenance. Fire flow rating will not be provided anywhere in the system. The local Fire Department will be made aware of this.

3.5 Water System Booster Pumps

Dual in-line booster pumps will be installed at the upper end of Horseshoe Road. The booster pumps have been sized to provide for the design pumping rates at the calculated Total Dynamic Head (TDH) for the pumps. The design pumping rate of 20 gpm for each pump was calculated as meeting the peak demand for the 12 residents in the Nine Partners Lane area that are at an elevation above 675 feet. The Total Head (60 feet) was derived as providing a minimum of 35 psi (80 feet) to the highest house served (elevation 820 feet) and then subtracting the elevation of the storage tank (elevation 760 feet). The appropriate pump curves were then entered for capacity vs. TDH for selection of the appropriate pumps. The pump selected will provide a minimum of 35 psi to the highest house served.

3.6 Proposed Method of Operation

Operation of the Horseshoe Road Water Service Area's facilities described above will involve the purchase of metered water meeting New York State drinking water standards from The Village of Millbrook. Purchased potable water from the Village of Millbrook will be distributed and individually metered to each user included in the Horseshoe Road Water Service Area. Required minimum and maximum distribution system operating pressures will be maintained. Water samples will be collected and analyzed, and operating reports will be prepared by the Village of Millbrook operator as required by Part 5 of the New York Codes, Rules and Regulations, New York State and Dutchess County Health Department requirements or other applicable standards and regulations.

4.0 OPINION OF MAXIMUM PROBABLE COST TO ESTABLISH AND CONSTRUCT THE PROPOSED HORSESHOE ROAD WATER SERVICE AREA

4.1 Opinion of Maximum Probable Costs

The cost to establish and construct the proposed Horseshoe Road Water Service Area will include costs related to the following: installation of new water mains in newly served areas of

the Service Area; installation of approximately 137 service connections; installation of the tie-in connection across Sharon Turnpike; bore crossing under Creek; and engineering, survey, and legal services. The evaluation of costs is based on the conceptual water main layout that has been developed prior to any regulatory review. The conceptual layout shows the water mains to be within Town and State Road R.O.W., requiring no easements. All of the costs identified above are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	17500	$ 1,312,500.00
Rock Contingency on Distribution	%		15%	$ 192,000.00
Booster Pressure Line	L.F.	$ 25.00	1200	$ 30,000.00
Bore Under Route 82	Each	$ 40,000.00	2	$ 80,000.00
Booster Pump	Each	$ 100,000.00	1	$ 100,000.00
Hydrants	Each	$ 2,500.00	27	$ 67,500.00
Valves	Each	$ 1,000.00	28	$ 28,000.00
Laterals	Each	$ 1,000.00	137	$ 137,000.00
Asphalt	L.F.	$ 50.00	400	$ 20,000.00
Subtotal				**$ 1,967,000.00**
Construction Contingency	%		15%	$ 294,000.00
Construction Total				**$ 2,261,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 2,261,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 335,000.00
Legal & Financial	%		5%	$ 110,000.00
Maximum Amount to be bonded				**$ 2,706,000.00**

4.2 Maximum Probable Cost To Be Funded

With the Village of Millbrook being the source for the proposed Horseshoe Road Water Service Area, the maximum probable cost to be funded will be $2,706,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY OF THE WATER SERVICE AREA

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 WATER PURCHASE COSTS

Water purchase costs from the Village of Millbrook will be paid from money generated by water use. All users will be metered and the purchase costs will be billed to users based on meter

readings. The water purchase cost will be based on the O&M cost for the Village of Millbrook and proposed Horseshoe Road Water Service Area. O&M cost will include labor, equipment, power, replacement parts, and any other one time or recurring costs included within the annual budget for the Service Area as deemed appropriate by the Village of Millbrook. This budget amount will be divided into the estimated usage to establish an O&M water rate. Water purchase costs will be billed by the Village of Millbrook on a quarterly basis.

6.1 Consumption Charge

Village of Millbrook consumption charge for the proposed Horseshoe Road Water Service Area will be $5.98 per 1,000 gallons to operate and maintain the supply, storage and distribution facilities. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly water consumption charge of $190.99, which would equate to $763.95 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for water estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.1, the cost for the consumption of 127,750 gallons in a year was calculated to cost $763.95 based on the water consumption charge of $5.98 per 1,000 gallons.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service connection to be installed by the Service Area at their property line. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a ¾ inch meter, yoke and double check valve, and of installation of ¾ inch K-copper water service line from the property line to the house. The opinion of probable cost for purchase of the meter is $250, and for installation of the service line is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS FOR WATER SERVICE AREA

The Horseshoe Road Water Service Area will require the following approvals from the noted agencies:

Town of Washington Board:

- Highway Work Permit for work in Town Road

Village of Millbrook:

- State Environmental Quality Review

- Agreement for water source
- If required, acquisition of easements through private lands by agreements or eminent domain for distribution system

Dutchess County Department of Health:

- Approval of Service Area (Water Supply Application)
- Approval of Engineering Plans and Specifications for Facilities

New York State Department of Transportation:

- Highway Work Permit for work on Route 82 and 343

New York State Department of Environmental Conservation (NYSDEC):

- Water Quality Certification
- Storm Water Quality
- Approval of Service Area (Water Supply Application)

New York State Departments of Health:

- Approval of Service Area (Water Supply Application)
- Approval of Engineering Plans and Specifications for Facilities

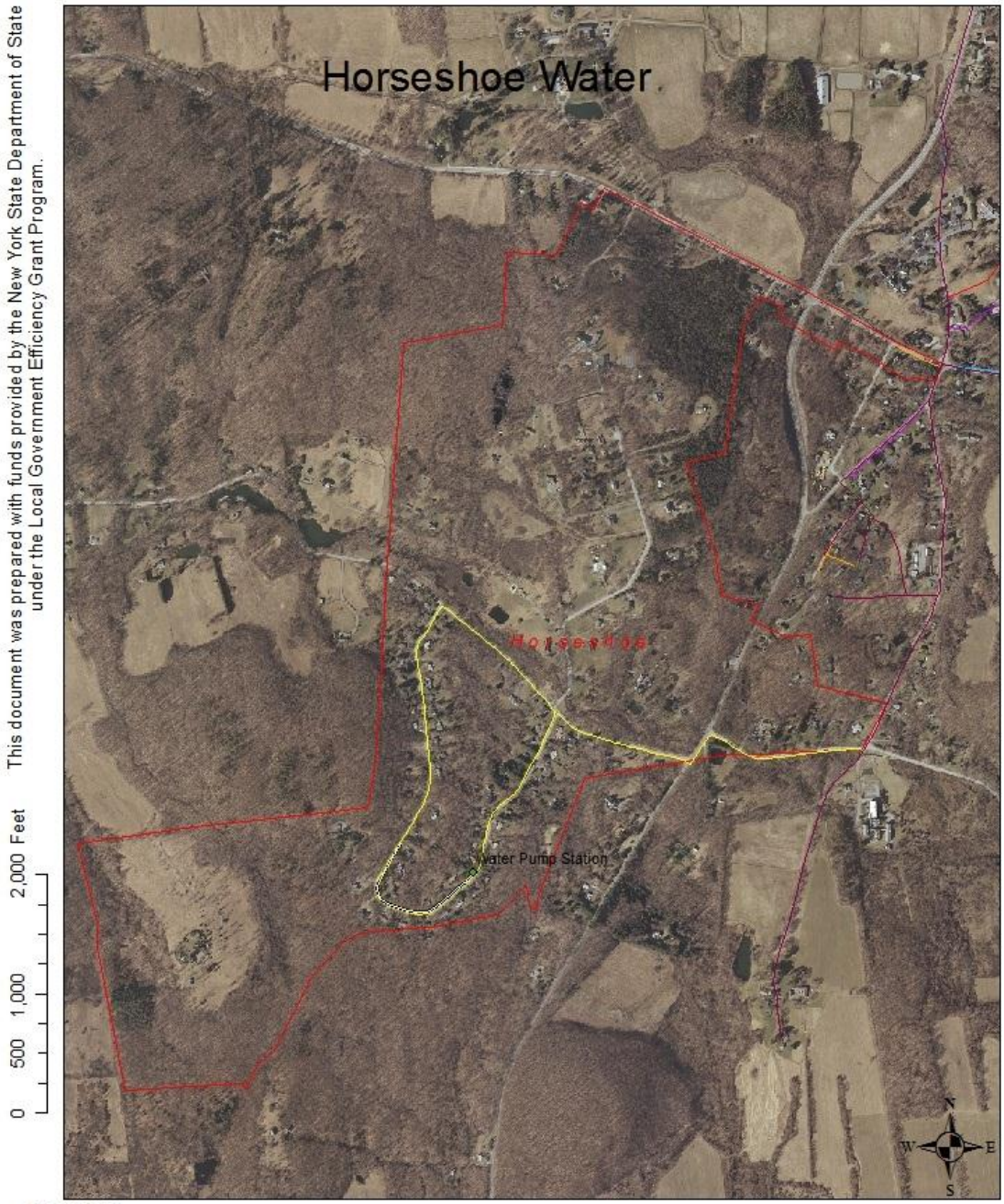
Office of the State Comptroller:

- Financial Approval of Service Area

Army Corps of Engineers (ACOE):

- Storm Water Quality

Horseshoe Water Service Area



This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

0 500 1,000 2,000 Feet

Legend

- Water Pump Station
- Water Sub Station
- Wells
- Storage
- Pump House
- Water Loop
- Water Pipes
- 6 to 8 Inch Transite Line
- Water Line Expansion
- 10 Inch Water Line
- 2 Inch Water Line
- 4 Inch Water Line
- 6 Inch Water Line
- 8 Inch Water Line
- 8 or 10 Inch Connector
- Water Tower

2/24/11
VRI Environmental Services

Horseshoe Road: Sewer

1.0 INTRODUCTION

Due to subsurface conditions in the area of Horseshoe Road, sewer subsurface disposal system issues have become more critical causing the need to evaluate the feasibility of establishing a sewer service area as described in this report.

The purpose of this report is to present findings and engineering data pertinent to establishment of a sewer service area in order to service residents in the un-served neighborhood on Horseshoe Road and South Road adjacent to the Village of Millbrook in the Town of Washington.

1.1 Background

The Village of Millbrook received funding through the New York State Department of State under the Local Government Efficiency Grant Program to evaluate sharing of sewer services with the Town of Washington through the extension of Sewer service to the residents on Horseshoe Road and South Road which are currently served by individual subsurface disposal system and individual residential wells. The following MP&R has been prepared to describe the proposed shared sewer service.

2.0 HORSESHOE ROAD SEWER SERVICE AREA PROJECTED SEWER SERVICE AREA DEMANDS

2.1 Proposed Service Area and Need

Enclosed is a map indicating the extent of the proposed service area for the proposed Horseshoe Road Sewer Service Area. The total acreage of the proposed Service Area is approximately 211 acres. The proposed service area includes: residents along Horseshoe Road and South Road.

2.2 Projected Sewer Demands

The quantity of sewer capacity required for domestic demands is based on the following assumed design multipliers used to estimate existing and future sewer demands:

Individual houses = 350 gallons per day (gpd)

2.2.1 Sewer Demand

The projected average day sewer demand for the properties within the proposed Service Area is summarized below:

Projected Single-Family home sewer demand = 25,200 gpd

3.0 HORSESHOE ROAD SEWER SERVICE AREA FACILITIES ANALYSIS

3.1 Formation Process

It is proposed that a Sewer Service Area be established to provide facilities and service benefiting the residential properties shown on the enclosed map of proposed Horseshoe Road Sewer Service Area.

3.2 Proposed Sources

The Village of Millbrook has been identified as the only sewer treatment facilities for the proposed Horseshoe Road Sewer Service Area. The Village of Millbrook collection and treatment system has been identified as having the potential to be upgraded to meet the additional anticipated demands of the proposed Service Area. The location of the sewer treatment plant is along the East Branch of the Wappinger Creek in the western portion of the Village of Millbrook.

3.3 Proposed Routing of Sewer Collection System

The enclosed map shows the extent of the proposed sewer main routings and approximate location of the tie-ins for the proposed Horseshoe Road Sewer Service Area.

The proposed collection system will consist of installing approximately 8,000 linear feet of 8 inch SDR 35 Sewer main, 20 manholes, lift station and 4,000 linear feet of 4 inch SDR 26 force main, and a bore under Route 82. Installation of the sewer main is shown to be within the R.O.W. of Town Roads so it is unlikely that land acquisition or easement will be required. However, in the event easements are required, acquisition of easements will be by agreement or eminent domain. Detailed layout of the collection Sewer mains will be completed during the design phase of the project. Installation of the Sewer mains will involve standard earthwork, piping, and construction techniques.

The Horseshoe Road Sewer Service Area collection system is proposed to be connected via a force main to the existing sewer collection system on County House Road as shown on enclosed map. A relationship is proposed with the Village of Millbrook for the shared use of facilities. Horseshoe Road Sewer Service Area users will pay for sewer treatment by The Village of Millbrook based on the quantity water use measured by individual meters.

3.5 Proposed Method of Operation

Operation of the sewer system facilities described above will involve the collection and treatment of sewer by the Village Sewer System. Sewer use will be based on individually metered water connections in the extension area. Effluent samples from the wastewater treatment plant will be collected and analyzed, and operating reports will be prepared by the Village Sewer System operator as required by the Village's New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) permit.

4.0 OPINION OF MAXIMUM PROBABLE COST TO ESTABLISH AND CONSTRUCT THE PROPOSED HORSESHOE ROAD SEWER SERVICE AREA

4.1 Opinion of Maximum Probable Costs

The cost to establish and construct the proposed Horseshoe Road Sewer Service Area will include costs related to the following: installation of new Sewer mains in newly served areas; installation of 20 manholes and approximately 72 service connections; installation of lift station and force main; bore under Route 82; development of additional sewer treatment capacity; and engineering, survey, and legal services.

While the Village has some available capacity, it is anticipated that the Horseshoe Road Sewer Service Area would fund required capacity improvements to the existing Millbrook Wastewater Treatment Plant based on a pro-rated share of the increased capacity. The capacity improvements to be made will depend on the ultimate capacity requirements and could range from simply providing additional equalization storage; to expanding the current treatment technology; to replacing the existing extended aeration with a membrane bioreactor (MBR).

The evaluation of costs is based on the conceptual sewer main layout that has been developed prior to any regulatory review. The conceptual layout shows the sewer mains to be within Town and State Road R.O.W., requiring no easements. All of the costs identified above are summarized and included in the following table.

Description	Units	$/Units	Quantity	Cost
Sewer Collectin System	L.F.	$ 60.00	6,600	$ 396,000.00
Forcemain	L.F.	$ 60.00	4000	$ 240,000.00
Manholes	Each	$ 2,500.00	20	$ 50,000.00
Rock Contengency	%		30%	$ 205,800.00
Forcemain in Common Trench	L.F.	$ 25.00	1,400	$ 35,000.00
Lift Station	Each	$ 120,000.00	1	$ 120,000.00
Bore Under Route 82	Each	$ 40,000.00	1	$ 40,000.00
Laterals	Each	$ 1,000.00	72	$ 72,000.00
Asphalt	L.F.	$ 50.00	1,800	$ 90,000.00
Subtotal				**$ 1,248,800.00**
Construction Contingency	%		15%	$ 187,000.00
Construction Total				**$ 1,435,800.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 1,435,800.00**
Develop Additional Sewer Capacity	GPD	$ 25.00	25,200	$ 630,000.00
Egineer Design, Approval &				
Construction Support	%		15%	$ 215,000.00
Legal & Financial	%		5%	$ 72,600.00
Maximum Amount to be bonded				**$ 2,353,400.00**

4.2 Maximum Probable Cost To Be Funded

With the Village of Millbrook being the treatment resource for the proposed Horseshoe Road Sewer Service Area, the maximum probable cost to be funded will be $2,353,400.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY OF THE SEWER SERVICE AREA

5.1 Funding Cost and Capital

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 SEWER TREATMENT COSTS

Sewer treatment costs for the Village of Millbrook will be paid from money generated by Sewer use. All users will be charged for treatment based on metered water use. The sewer purchase cost will be based on the O&M cost for the Village of Millbrook and proposed Horseshoe Road Sewer Service Area. O&M cost will include labor, equipment, power, replacement parts, and any other one time or recurring costs included within the annual budget for the Service Area as deemed appropriate by the Village of Millbrook. This budget amount will be divided into the estimated usage to establish an O&M Sewer rate. Sewer purchase costs will be billed by the Village of Millbrook on a quarterly basis.

6.1 Consumption Charge

The Village of Millbrook has a consumption charge of $6.18 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 350 gallons per day, which is equal to 31,938 gallons per quarter, or 127,750 gallons per year. This would result in a quarterly sewer consumption charge of $194.04, which would equate to $789.50 per year.

7.0 TOTAL COST TO AVERAGE SINGLE FAMILY HOUSE

The total yearly cost for an average single family will be equal to the yearly cost of the funding option selected by the Village plus the cost for sewer estimated to be used in a year. A single family house is the typical benefited property in the Village.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.0, the cost for the use is calculated to be $789.50 per year.

In addition to the above described costs for capital and usage, each single family house will be subject to a one-time cost for connecting their home to the service lateral to be installed by the Village to the edge of ROW. This work is to be contracted directly by each parcel owner. The work for an average single family house will generally include installation of a 4 inch sewer

lateral from the edge of ROW to the house. The opinion of probable cost for installation of the service lateral is approximately $25 per linear foot.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS FOR SEWER SERVICE AREA

The Horseshoe Road Sewer Service Area will require the following approvals from the noted agencies:

Town of Washington Board:

- Highway Work Permit for work in Town Road

Village of Millbrook:

- State Environmental Quality Review
- Agreement for Sewer source
- If required, acquisition of easements through private lands by agreements or eminent domain for collection system

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

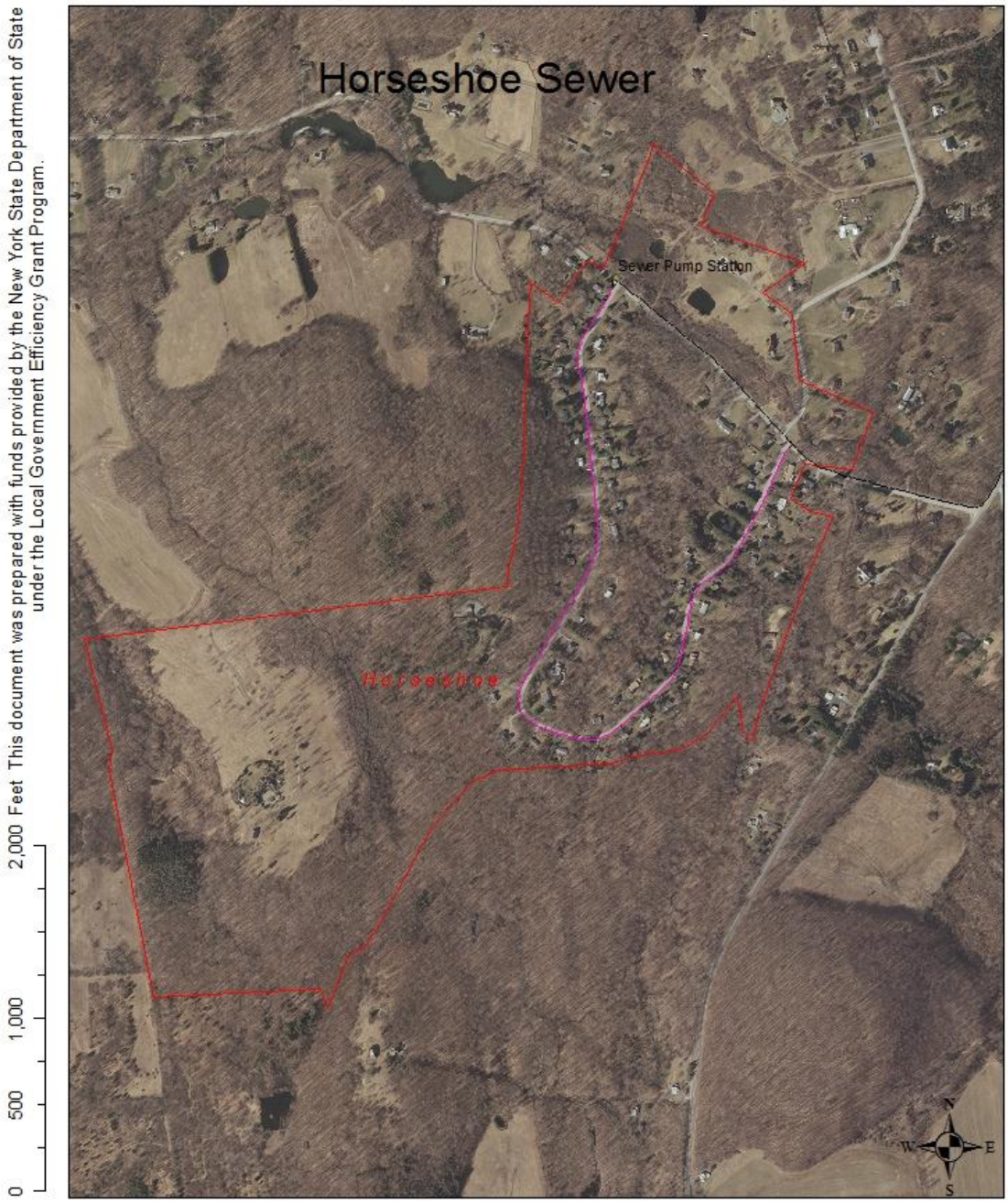
New York State Department of Environmental Conservation (NYSDEC):

- Modified SPDES Discharge Permit
- Storm Sewer Quality

Office of the State Comptroller:

- Financial Approval of Borrowing

Horseshoe Sewer Service Area



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0 500 1,000 2,000 Feet

Legend

- Sewer Pump Station
- Residential Force Main
- Force Main Sewer
- Sewer Line Expansion
- Sewer Line
- Service Areas

2/24/11

Former County Infirmary Site: Water

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to extension of water service to residents in the County House area that are currently un-served. This report also provides a summary of the basis of design for the extension of water service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The proposed County House area to be provided with additional service covers approximately ninety five (95) acres and is located in the Town of Washington and outside the Village of Millbrook. The County is proposing to expand the current building usage by 8,000 square feet of office space within the County House area.

The area is currently partially occupied.

The service area is located at an elevation which is able to be provided adequate pressure from the existing system.

1.2 Project Description

The existing storage and supply capacity of the Village of Millbrook water system is adequate to provide for the water demands and storage capacity required to serve the County House area.

There is an existing water main that serves the County House which is large enough to serve anticipated expansion. There is no additional work needed to be done by the County or the Village to provide the additional service.

2.0 WATER SYSTEM FACILITIES

2.1 Projected Water Demands

The quantity of water required to meet existing and future domestic water usage is based on the following assumed design multipliers, which can be found in the New
York State Department of Environmental Conservation 1988 as follows:

Office space = 0.1 gallons per day per square foot

The projected average day water demand for the 8,000 square foot of office space within the County House property area to be served is as follows:

Projected water use = 800 gpd

The projected maximum day water demand is established at 1,600 gpd using a peaking factor of 2.

2.2 Water Supply and Storage Facilities

The Village of Millbrook's existing water supply and storage facilities have been identified as being adequate to supply the proposed extension area. The Village's permitted water supply is 374,400 gpd. Based on historical usage, the systems average daily usage is 186,000 gpd and the calculated peak usage is 287,500 gpd.
The Village's peaking factor between peak usage and average usage is calculated to be 1.5. Using this peaking factor to be applied to the expanded system results in a calculated peak usage of (186,000+800)*1.5 = 280,200 gpd which is approximately 95,000 gpd less than the permitted water supply.

To provide water storage capacity equal to the average daily consumption of the proposed Water System, approximately 186,800 gallons of storage capacity is needed. While the existing Village Storage Tank is reported to be a 500,000 gallons storage tank, it is estimated that only 50% of the capacity of the storage tank is usable for operating purposes to provide a minimum of 20 psi under all operating conditions. Therefore the 250,000 gallons of storage capacity exceeds average day demand.

2.3 Water Distribution System

No work is required to increase the service to the County House.

3.0 PROPOSED METHOD OF OPERATION

Operation of the water system facilities described above will involve the distribution of potable water from the Village Water System, individually metered to each user included in the extension area. Required minimum and maximum distribution system operating pressures will be maintained. Water samples will be collected and analyzed, and operating reports will be prepared by the Village Water System operator as required by Part 5 of the New York Codes, Rules and Regulations, New York State and Dutchess County Health Department requirements or other applicable standards and regulations.

4.0 O&M FOR VILLAGE OF MILLBROOK SOURCE

The Village of Millbrook has a water rate calculated at $2.99 per 1,000 gallons. Based on proposed additional service of 800 gpd, 73,000 gallons would be used per quarter, or 292,000 gallons per year. This would result in a quarterly water usage bill of $218.27, which would equate to $873.08 per year.

5.0 REQUIRED APPROVALS AND OTHER ACTIONS

There are no anticipated approvals required to increase service to former County Infirmary.

Former County Infirmary Water Service Area

This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

0 250 500 1,000 Feet

Legend

Service Areas

2/24/11
VRI Environmental Services

Former County Infirmary Site: Sewer

1.0 INTRODUCTION

The purpose of this report is to present findings and engineering data pertinent to providing sewer service to the County House area that is currently a partially served site. This report also provides a summary of the basis of design for the extension of sewer service; technical specifications and preliminary design drawings have also been prepared and are presented separately.

1.1 Project Service Area

The proposed County House area to be provided with additional service covers approximately ninety five (95) acres and is located in the Town of Washington and outside the Village of Millbrook. The County is proposing to expand the current building usage by 8,000 square feet of office space within the County House area.

The area is currently partially occupied.

The service area is located at an elevation which is unable to be served by gravity flow to an existing pump station which serves the current demands at the County House.

1.2 Project Description

The existing sewer collection and treatment capacity of the Village of Millbrook sewer system is capable of being modified to provide for the sewer demands required to serve the County House area.

The County House is currently connected to the Villages existing collection system via an existing pump station on the County House property. This pump station is more than adequate to handle the additional flow but this should be evaluated. It may be warranted to modify the pump station to be more efficient as well as to include the addition of an emergency generator.

2.0 SEWER SYSTEM FACILITIES

2.1 Projected Sewer Demands

The quantity of sewer required to meet existing and future domestic sewer usage is based on assumed design multipliers, which can be found in the New York State Department of Environmental Conservation 1988 as follows:

Office space = 0.1 gallons per day per square foot

The projected average day sewer demand for the 8,000 square foot of office space within the County House property area to be served is as follows:
Projected water use = 800 gpd

2.2 Sewer Treatment Facilities

The Village of Millbrook's existing sewer treatment facilities have been identified as capable to treat wastewater from the proposed extension area. The Village's permitted sewer discharge is 250,000 gpd. Based on historical usage, the systems average daily discharge is 196,000 gpd. Systems with an average daily flow in excess of 90% of permitted discharge (225,000 gpd for Millbrook) are required to consider an increased discharge limit. With the extension of service to the County House area, the average daily discharge would be expected to be (196,000 + 800 = 196,800) gpd. While the Village on occasion exceeded this average daily discharge on a monthly basis, this has been primarily due to Inflow and Infiltration (I&I) to the system which is unrelated to sewer discharges from individuals. The Village has made numerous repairs and other efforts to reduce I&I in the system such that the additional flow anticipated from the extension of the service area could be accommodated.

2.3 Sewer Collection System

The collection system improvements consist of modifications to the existing sewer lift station.

3.0 PROPOSED METHOD OF OPERATION

Operation of the sewer system facilities described above will involve the collection and treatment of sewer by the Village Sewer System. Sewer use will be based on individually metered water connections in the extension area. Effluent samples from the wastewater treatment plant will be collected and analyzed, and operating reports will be prepared by the Village Sewer System operator as required by the Village's New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) permit.

4.0 OPINION OF MAXIMUM PROBABLE COST TO CONSTRUCT THE PROPOSED SEWER SYSTEM EXTENSION

4.1 Opinion of Maximum Probable Costs

The cost to construct the proposed Sewer System extension will include costs related to modifications to the existing sewer lift station for improved efficiency and reliability.
The Engineer's opinion of probable maximum cost of $135,000 as detailed in the following table.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	0	$ -
Manholes	Each	$ 2,500.00	0	$ -
Rock Contingency	%		0%	$ -
Lift Station Upgrades	Each	$ 25,000.00	1	$ 25,000.00
Generator	Each	$ 75,000.00	1	$ 75,000.00
Subtotal				**$ 100,000.00**
Construction Contingency	%		15%	$ 15,000.00
Construction Total				**$ 115,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 115,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 15,000.00
Legal & Financial	%		5%	$ 5,000.00
Maximum Amount to be bonded				**$ 135,000.00**

4.2 Maximum Probable Cost To Be Funded

With the above opinion of probable cost, the maximum probable cost to be funded will be $135,000.

5.0 PROJECTED REPAYMENT SCHEDULES AND FINANCIAL FEASIBILITY

5.1 FUNDING COST OF CAPITAL

The Village of Millbrook is investigating various methods of funding which are described in a separate document.

6.0 O&M FOR VILLAGE OF MILLBROOK TREATMENT

The Village of Millbrook has an operating costs calculated at $6.18 per 1,000 gallons. Based on NYSDEC design usage multipliers, an average single family house is conservatively estimated to use 800 gallons per day, which is equal to 73,000 gallons per quarter, or 292,000 gallons per year. This would result in a quarterly sewer usage bill of $451.14, which would equate to $1,804.56 per year.

7.0 TOTAL COST TO COUNTY HOUSE

The total yearly cost for the additional demand of the County House will be equal to the yearly cost of the funding option selected by the Village plus the cost for sewer estimated to be used in a year.

The funding cost to a typical single family residential parcel is described in a separate document. In Section 6.0, the cost for the use is calculated to be $1,804.56 per year.

8.0 REQUIRED APPROVALS AND OTHER ACTIONS

To extend service, the Village will require the following approvals from the noted agencies:

Village of Millbrook Board of Trustees:

- State Environmental Quality Review
- Borrowing Resolution to construct sewer system extension

Dutchess County Department of Health:

- Approval of Engineering Plans and Specifications for Facilities

Office of the State Comptroller:

- Financial Approval of Borrowing

Former County Infirmary Site Sewer Area

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0 250 500 1,000 Feet

Legend

Service Areas

2/24/11
VRI Environmental Services