SANITARY SEWER FEASIBILITY STUDY REPORT

Hamlet of Millwood, NY

709 Westchester Avenue | Suite L2
White Plains, New York 10604
800.807.4080

Woodard & Curran Engineering, P.A. P.C.

COMMITMENT & INTEGRITY DRIVE RESULTS

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1. INTRODUCTION AND EXISTING CONDITIONS

1.1 Project Background

Woodard & Curran (W&C) was retained by the Town of New Castle (Town) to prepare a feasibility study to investigate options available to the Town for implementation of a sanitary sewer collection system for the Hamlet of Millwood. The Millwood area has been identified by the Town of New Castle as needing sanitary sewers to support the wastewater disposal needs of its existing residential, business and industrial parcels, as well as for potential redevelopment opportunities. According to the Town, the installation of a sewer collection system in Millwood would yield significant benefits, including the elimination of negative impacts of possible failing septic systems and the reduction in residents' and business owners' ongoing wastewater infrastructure maintenance, repair and replacement costs. The Town also anticipates that providing sewer service to Millwood will enable further commercial and mixed-use development, which would help meet the social and economic needs of the community. This study evaluates the physical and economic factors that are essential for the Town to provide sanitary sewer service to the Millwood Sanitary Sewer District (MSSD). The limits of the MSSD study area are shown in Figure 1, in Appendix A.

In the Town's Request for Proposal for the Millwood sewer study, two sewer connection options were provided by the Town for evaluation. Both options were based on installation of a new gravity sewer line and pump station within the study area, with differing means of conveying wastewater flow along Route 100 to existing sewers located in adjacent towns that flow to the Yonkers Wastewater Treatment Plant, located approximately 20 miles south of Millwood. The first option would require connection to an existing sewer in the neighboring Town of Ossining. The second option would require new sewer lines to be constructed along the Saw Mill River Parkway, where it would connect to the existing Westchester County Trunk sewer. Both options would be comprised of gravity sewer, force main and a pump station.

During meetings held at the beginning of this study between the Town and W&C a third option was discussed, that being a connection from Millwood to a currently planned sewer system for the nearby Random Farms development. It was determined during these discussions that evaluating this third option would instead become the basis for the Millwood sanitary sewer feasibility study since there would be significant cost advantages to connecting to the Random Farms sewer system, which ultimately must be constructed to comply with a New York State Department of Environmental Conservation (NYSDEC) consent order. This report evaluates the feasibility of constructing a sanitary sewer collection system in Millwood and discusses existing conditions, design parameters, project costs, regulatory and permitting issues and recommendations for further evaluation.

1.2 Existing Conditions

The Hamlet of Millwood is located within the Town of New Castle, in Westchester County, New York. The Town of New Castle has a population of 17,600 as of the 2010 census. Millwood is approximately 0.4 square miles, and consists of a mix of residential, business and industrial zoning districts. Millwood does not currently have a sanitary sewer collection system, relying solely on individual onsite septic systems for wastewater disposal. Due to limited available undeveloped land area, growth within Millwood is limited and the lack of a sewer system is hindering its opportunities for increased commercial vitality, primarily through redevelopment.

1.3 Proposed Random Farms Sewer Project

The nearby residential development at Random Farms is currently under a consent order by the NYSDEC to address a failing onsite community wastewater disposal system. The Random Farms development is located approximately 1.5 miles to the north of Millwood along Random Farms Drive and is within the New Croton Watershed which supplies drinking water to New York City.

The Town provided drawings of the proposed Random Farms Sewer and Riverwoods/Yeshiva Sewer Trunk Connection Project to W&C (which is currently undergoing regulatory approval) proposing construction of a sanitary sewer extension from the existing Westchester County trunk sewer, located in the Village of Briarcliff Manor, to Random

Farms to serve the wastewater disposal needs of this development. The proposed collection system, including gravity sewer, force main and pump stations, would pass through the western edge of Millwood on Route 100 and Route 133, with a sewage pump station proposed at the southwest corner of Route 100 and Campfire Road. The drawings were evaluated to determine the feasibility of incorporating the connection of a future sewer collection system in Millwood to the sewer infrastructure that will be in place as part of the Random Farms sewer project.

1.4 Pheasant Run Condominium Development

The Pheasant Run condominium development is a residential community immediately west of Route 100 adjacent to the study area. The development includes 84 single family residential units that are located in building clusters along Pheasant Run, Touchstone Way and Fawn Ridge. The development is not currently included within the Millwood Sanitary Sewer District Study Area, however, Town staff have requested that these 84 units be included in the sewer study.

According to a utility site plan for the Pheasant Run development from 1984 prepared by Harold F. Campbell Civil Engineers & Surveyors, wastewater is treated and disposed of on the property by a community septic system with septic tanks and three large subsurface effluent leaching areas. The drawings show that the site utility design included installation of reserve force main pipes and a discharge manhole at the entrance to the development (at the intersection of Route 100 and Route 133) to redirect wastewater discharges in the future from the leaching areas to a new sanitary sewer connection in Route 100. Since connection of a future sewer collection system in Millwood would require a new gravity sewer line in Route 100 to pass by Pheasant Run and the Pheasant Run community septic system of over 30 years old, it is prudent to consider a sewer connection to the Millwood sewer system as part of the MSSD feasibility study.

2. EXISTING WASTEWATER FLOW ANALYSIS

A wastewater flow analysis was conducted based on municipal water usage data provided to W&C by the Town. The data included parcel Tax Identification Number, parcel address, owner, zoning district, and historical water usage (refer to Appendix B for tabulated data). For residential properties, bedroom count and bathroom count were also provided. The following report sections describe the various analyses completed for the properties within the study area. Design wastewater flow rates for the proposed sanitary sewer collection system were developed based on the current and preliminary estimated use of each property within the proposed Millwood Sanitary Sewer District.

The study area consists of a mix of existing zoning classifications, including residential, industrial, and business/commercial. By providing sanitary sewers to unsewered parcels, there becomes a high likelihood of future redevelopment consisting of higher density uses and along with this, redevelopment zoning must be considered. Accordingly, the existing Millwood parcels were analyzed based on their current use, not their current zone. For example, there are multiple single or multi-family homes located within the Retail Business (B-R) and General Industrial (I-G) zone, yet these properties are under residential use.

Parcels within the study area are shown in Appendix A, Figures 1 through 4. Figure 1 shows the uses including those labeled undevelopable, which are currently owned by government or utility agencies, such as the Town of New Castle, New York City Department of Environmental Protection (NYCDEP), or Consolidated Edison. Figures 2, 3 and 4 show parcels separately by residential, commercial and industrial uses, respectively. Future development in the study area is likely to occur in the vacant, privately-owned parcels or through redevelopment of existing privately-owned parcels. A change of use or ownership is not anticipated in the undevelopable parcels.

2.1 Residential Parcels

From review of the Town's GIS parcel data, it was determined that 28 properties in Millwood are currently used for residential purposes. Of these 28 properties, 12 are currently zoned within a residential zoning district. The remaining parcels are zoned within varying districts, which include retail business and general industrial. The daily water usage rates provided by the Town established a total daily wastewater flow for residential properties. The average daily flow was adjusted by a peaking factor of 4.2 per *Ten State Standards*[1] to develop an estimated peak flow as shown in Table 1.

Table 1: Millwood Area Estimated Existing Residential Wastewater Flow

Condition	Flow
Average Daily Flow	5,900 gpd
Peak Hourly Flow	24,780 gpd

2.2 Commercial Parcels

From review of the Town's GIS parcel data it was determined that 14 properties currently serve commercial uses and are zoned accordingly. The average daily flow, calculated from water usage data, is adjusted by a peaking factor of 4.2 per *Ten State Standards* to develop an estimated peak flow as shown in Table 2.

Table 2: Millwood Area Estimated Existing Commercial Wastewater Flow

Condition	Flow
Average Daily Flow	8,000 gpd
Peak Hourly Flow	33,600 gpd

[1] Ten State Standards, Recommended Standards for Wastewater Facilities, 2014 Edition.

2.3 Industrial Parcels

From review of the Town's GIS parcel data it was determined that 8 properties currently serve industrial uses and are zoned accordingly. The average daily flow, calculated from water usage data, is adjusted by a peaking factor of 4.2 per *Ten State Standards* to develop an estimated peak flow as shown in Table 3.

Table 3: Millwood Area Estimated Existing Industrial Wastewater Flow

Condition	Flow
Average Daily Flow	2,800 gpd
Peak Hourly Flow	11,760 gpd

2.4 Pheasant Run Condominiums

From review of utility site plans it was determined that there are 84 single family residential units in the Pheasant Run condominium development. Based on current water usage data, the Pheasant Run condominiums use an average of approximately 8,000 gallons per day from 84 individual units as well as a community bath house at the pool. The average daily flow, calculated from water usage data, is adjusted by a peaking factor of 4.2 per *Ten State Standards* to develop an estimated peak flow as shown in Table 4.

Table 4: Pheasant Run Estimated Existing Residential Wastewater Flow

Condition	Flow
Average Daily Flow	9,800 gpd
Peak Hourly Flow	41,160 gpd

3. SANITARY SEWER DESIGN AND PERMITTING

3.1 Millwood Sewer Collection System Layout

Woodard & Curran has evaluated the existing conditions in the Millwood study area and identified the potential sanitary sewer layout to serve the current and future wastewater disposal needs of the Millwood Sanitary Sewer District. The Millwood sewer project is estimated to consist of approximately 9,100 linear feet of gravity sewer main. Locations of proposed gravity sewers include Henry Place, Millwood Road, Schuman Road, Station Road, and Somerstown Road. Based on a preliminary analysis, it was determined that an 8-inch diameter sewer main pipe would provide sufficient capacity for this area, with pipe material to be polyethylene wrapped ductile iron pipe in accordance with Town sewer design standards. The minimum slope of the sewer will be 0.4%, to ensure that a minimum flow velocity of 2 feet/second is maintained for self-cleaning. This minimum slope is in accordance with Ten State Standards and, based on a Manning's Roughness Coefficient of 0.013 and flowing at 70% of pipe area (recommended design criteria for new sanitary sewers) this results in a capacity of 415,000 gallons per day, which exceeds the estimated peak hourly sewage flow of approximately 111,300 gallons per day.

	Avg. Daily Flow	Peak Hourly Flow
Existing Average Daily Flow – Millwood Study Area	16,700 gal/day	70,140 gal/day
Existing Average Daily Flow – Pheasant Run Condos	9,800 gal/day	41,160 gal/day
TOTAL	**26,500 gal/day**	**111,300 gal/day**
Capacity in 8-inch DI Pipe @ 0.4%	415,000 gal/day	

The project will include approximately 42 sewer manholes, based on manhole spacing of approximately 250 feet, or wherever a shift in sewer alignment occurs and at the end of sewer lines. Manholes will be precast concrete manholes, with cast iron frames and manhole covers. Manhole diameters will be at least 48 inches, with a minimum access diameter of 24 inches. A majority of the manholes will be less than 10 feet deep, though there will be some that will require deeper excavations due to existing topography and necessary minimum slope for gravity sewers. Residential property sewer laterals and commercial property laterals will be 6-inch diameter polyethylene wrapped ductile iron pipe. Lateral diameter size for future development will be determined based on type of development.

The Random Farms project includes a pump station within the project area, therefore no additional pump station will be required for the Millwood Project area. A preliminary sewer collection system layout for the Millwood Sanitary Sewer District is included in Appendix C.

3.2 Connection to Random Farms Sewer Project

The Town of New Castle has requested that Woodard & Curran explore the opportunity of connecting a future sewer collection system constructed in Millwood to the Random Farms sewer collection system project. The Random Farms project has been distributed into five separate contracts, that have not yet been bid for construction. Contract 1 of 5 includes installation of gravity sewer main and force main from the Millwood area, approximately 2 miles south along Route 100 to the existing Westchester County trunk line sewer, on Route 100 at Chappaqua Road. Contract 1 includes the installation of a sewage pump station, which is to be located adjacent to the Millwood study area. The proposed Random Farms contract drawings, specifically Contract 1, were evaluated by W&C to determine if the discharge of wastewater flows from a Millwood sewer extension to the Random Farms sewer system is feasible. The total estimated cost for Contract 1 provided by the Town is approximately $7.1 million.

Based on W&C's preliminary evaluation of the Random Farms sewer system design drawings, including the review of existing topography and location of the proposed Random Farm's pump stations, it is W&C's opinion that it is feasible for a future sewer collection system in Millwood to be designed to connect to the Random Farms sewer project at a location close to the proposed pump station for Contract 1 (near the intersection of Route 100 and Campfire Road). Further evaluation is needed including coordination with Random Farms sewer design engineers to determine if modifications to the current sewer system design for the Random Farms project would need to be made to accommodate the additional flow from Millwood. Pump station sizing including wet well size and pump size would need

to be confirmed, in addition to the force main and gravity sewer pipe sizes. Modifications may be necessary to the Random Farms sewer collection system to ensure the project's pump station, force main and gravity sewer main included in Contract 1 will provide the necessary capacity for both existing and future development in Millwood. The Pheasant Run development has the potential to connect to the Random Farms sewer system as well, by way of connection to the Millwood sewer system, as its connection point to the Millwood system would be upstream of the pump station. If the Random Farms sewer project is not constructed as planned, then its infrastructure would still need to be constructed as part of the Millwood sewer project for wastewater flows to be transmitted from Millwood to the County trunk line sewer, resulting in an additional $7.1 million cost to the Millwood sewer project.

3.3 Permitting

Construction of sewers in Millwood will require applications for various permits. W&C evaluated the potential need for the following permits: NYSDOT Highway Work Permit, NYSDEC (Freshwater Wetlands Permit & Stormwater Pollution Prevention Plan), Town of New Castle Permits, Westchester County Department of Health Permits (WCDOH), and Westchester County Department of Public Works (DPW) Permits (Highway Work Permit).

Based on the Millwood sewer project consisting of construction of sewers in the Millwood area with connection to the Random Farms sewer project, it is anticipated that the Millwood project would need permitting from the Town of New Castle, WCDOH and Westchester County DPW (for sewage discharge to the wastewater treatment plant in Yonkers). The project would also need New York City Department of Environmental (NYCDEP's) review and approval, as the project area is within NYCDEP's drinking watershed and the Random Farms sewer project, which the Millwood sewer system would connect to, is a project funded by NYCDEP East of Hudson watershed funds. Furthermore, the project would need NYSDEC permits, as a designated freshwater wetland is located within the project area (per the National Wetlands Inventory), as well as a NYSDOT highway work permit for work within the state right of way.

Table 3 includes a summary of costs which have been estimated by Woodard & Curran for anticipated permitting related to construction of a sanitary sewer collection system in Millwood. The total cost estimate for permitting including application fees and application preparation services is approximately $27,500.

Table 5: Permitting Cost Estimate

Permit Type	Application Fee	Estimated Application Preparation Services Cost
Town of New Castle[1]	$0	$0
WCDOH[2]	$700	$7,200
WCDEF[3]	$0	$1,200
NYCDEP[4]	$0	$8,400
NYSDOT[5]	$1,300	$8,400
Total	**$2,150**	**$25,200**

1. The Town of New Castle Application Fee is related to a street opening permit. The Town is expected to waive permitting fees for work done by the Town. No application preparation fees are included since the Contractor would be responsible for applying for this permit under the construction contract work.
2. WCDOH application fee is $700 for review of plans for a sanitary sewer extension. Estimated cost for application preparation services is based on one review meeting with WCDOH, as well as time to prepare the application and address any comments.
3. WCDEF approves connection to the County sewer, but does not charge an application fee. Estimated cost for application preparation services is based on preparation of the application and correspondence with WCDEF.
4. NYCDEP require an application fee, but will review the plans and issue approval. Estimated cost for application preparation services is based on two meetings with DEP during the application process, as well as time to prepare the application and address any comments.
5. NYSDOT application fee is estimated based on duration of work within the State right-of-way. Estimated cost for application preparation services is based on two review meetings with DOT, as well as time to prepare the application and address any comments.

4. EQUIVALENT DWELLING UNITS ANALYSIS & PROJECT COST

The Town is anticipating using funds generated by benefit assessment fees as a primary means of funding the design and construction of a sanitary sewer collection system for Millwood. A benefit assessment is a special property tax that is assessed to properties that have been "benefited" by the construction of, and connection to, a sewer collection system. A property that has been "benefited" is more economically viable than it was prior to completion of the project. A benefit assessment is determined on an analysis of overall project costs, including design, permitting, construction, legal and administrative. The Town must ultimately determine the equitable cost of a benefit assessment to charge property owners that are served by the sewer based on overall project cost, existing sewage flows from properties and estimated future sewage flows from growth and redevelopment.

4.1 Equivalent Dwelling Unit Calculation

The common method for assessing project costs through benefit assessments is by performing an analysis of Equivalent Dwelling Units (EDUs) for all parcels within the project area. The goal of an EDU analysis is to provide an equitable distribution of sewer project costs to be assessed to individual properties by the Town through benefit assessment fees. An equivalent dwelling unit (EDU) is what a single-family dwelling unit (or single-family residence) would be assessed as a benefit assessment, per an assigned wastewater flow rate. The EDUs for non-residential parcels (commercial, industrial and governmental) are then determined based on the volume of sewage flow relative to each parcel as compared to the sewage flow for a single-family dwelling unit (1 EDU).

The average daily flow of an existing residential property within the MSSD was determined to be approximately 200 gallons per day, based on water usage data provided by the Town. This flow value can be used to form the basis for a single EDU. By dividing the current average daily flow for the study area of 16,700 gallons per day (gpd) by the single EDU flow of 200 gpd, the result is 84 total EDUs for the current sewage flow conditions in Millwood (excluding Pheasant Run condominiums). By dividing the average daily flow for the study area of 16,700 gallons per day (gpd) plus the average daily flow for the Pheasant Run condominiums of 9,800 gpd, by the single EDU flow of 200 gpd, the result is 133 total EDUs for the current sewage flow conditions in Millwood including a sewer connection to Pheasant Run condominiums. It should be noted that the total increase in EDUs due to the addition of Pheasant Run would be approximately 50, which is less than the total residential units (84) in the condominium community. Based on water usage data these condominiums use less water than the single-family residences in the MSSD, and accordingly, they should be assessed less of the project cost.

4.2 Engineer's Estimate of Probable Project Costs

The project cost is a key component in determining the benefit fee for the property owners within the project area, since all project costs including construction, engineering (during design and construction phases) and legal/administrative costs associated with planning and implementing the project must be paid for by the existing and future sewer users. The Engineer's Estimate of Probable Project Costs included in Table 6 is based on a conceptual sewer collection system layout with preliminary planning level assumptions and does not include additional costs related to sewer connection and sewage treatment fees associated with discharge to the Westchester County trunk sewer. A more detailed and comprehensive design phase project cost estimate can be prepared if the Town wishes to pursue a detailed design for this project. The project cost would be refined as additional information is gathered within the project area, such as identifying subsurface geotechnical conditions through completion of soil borings to locate areas where bedrock or unsuitable soils may intersect the sewer pipe trench. The estimated project cost as shown in Table 6 is approximately $7.5 million, which includes a budget of 25% for design and construction phase engineering, 5% for legal and administrative costs and 20% contingency.

Table 6: Engineer's Estimate of Probable Project Costs

Description	Quantity	Units	Unit Cost	Cost
Mobilization/Demobilization	1	LS	$300,000	$300,000
Maintenance and Protection of Traffic	90	days	$1,000	$90,000
8-inch DIP	9,100	LF	$300	$2,730,000
Laterals (Existing Residential & Commercial)	50	Each	$2,500	$125,000
Random Farms Pump Station Upgrades	1	LS	$100,000	$100,000
Rock Removal	6,100	CY	$150	$915,000
Sanitary Sewer Manholes < 10 ft.	35	Each	$10,000	$350,000
Sanitary Sewer Manholes > 10 ft.	7	Each	$15,000	$105,000
Permanent Bituminous Asphalt Pavement	2,300	Ton	$150	$345,000
Test Pits	3	Each	$2,500	$7,500
Clearing/Grubbing/Removal of Trees	1	LS	$25,000	$25,000
Estimated Total Construction Cost				$5,100,000
Design and Construction Admin (25%)				$1,275,000
Legal & Admin (5%)				$250,000
Project Contingency (20%)				$1,000,000
Estimated Project Total				**$7,625,000**

4.3 Benefit Assessment Analysis

To determine the benefit fees for each property that will be served by the sewer system, the total project cost is distributed among the total project EDUs. Based on a project cost of approximately $7.625 million distributed amongst the existing 133 EDUs within the study area including Pheasant Run condominiums (without capacity for future development) a single benefit fee would be approximately $57,000. This is the amount that a single-family home could expect to pay for their share of the sewer construction costs (excluding ongoing user fees), with commercial users paying benefit fees proportional to their average daily sewage flow.

Benefit fees for projects of similar size typically range in cost from $30,000 - $40,000 per EDU. A benefit fee of over $40,000 per EDU is not typically feasible, as it places too high of a financial burden on an individual residential customer who could possibly pay less to repair or replace the septic system on their own property without need for a sewer connection. To achieve a more acceptable cost per EDU, the total EDUs in the study area would need to be between approximately 190 – 254 EDUs, at $30,000 - $40,000 per EDU, accordingly. Based on existing Millwood sewage flows comprising 84 EDUs, a range of 190 – 254 total EDUs for the project would result in approximately 106 – 170 EDUs that will available for future development and would not be assessed to sewer users at the completion of sewer construction. This means that between 55 - 65% of the project cost (±$4.2 – $5.1 million) would need to be funded either by the Town itself or by other funding sources until a future point in time when benefit fees for these additional EDUs could be assessed to new developments.

Pheasant Run, if included in the sewer district, would include an additional 49 EDUs to the 84 existing EDUs for Millwood and would result in a negligible increase in total overall project cost due to the very minimal public sewer infrastructure required to connect this property to the Millwood sewer system. Based on existing combined Millwood and Pheasant Run sewage flows comprising 133 EDUs, a range of 190 – 254 total EDUs for the project, at $30,000 - $40,000 per EDU, would result in approximately 57 – 121 EDUs that will available for future development and would not be assessed to sewer users at the completion of sewer construction. This means that between 30-45% of the project cost (±$2.3 – $3.6 million) would need to be funded either by the Town itself or by other funding sources until a future point in time when benefit fees for these additional EDUs could be assessed to new developments. These 57 – 121 EDUs would provide approximately 11,400 – 24,200 gpd for reserve benefit assessments for future development in the MSSD. The residential and commercial development scenarios discussed in Section 5.1 provide insight on the

magnitude of types of future development that can be supported by a sewer system in Millwood. Ultimately, the cost of this project will rely on how much redevelopment and what type of redevelopment will occur within the project area.

As previously discussed, if the Random Farms sewer project is not constructed separately, then its infrastructure would need to be constructed as part of the Millwood sewer design project for wastewater flows to be transmitted from Millwood to the County trunk sewer line. This would result in an estimated $7.1 million in additional cost to the Millwood sewer users, for a total estimated Millwood sewer project cost of approximately $14.725 million, resulting in double the cost per EDU to the sewer users and making the project economically infeasible.

4.4 Annual Costs

Annual costs for connected properties will be based on a combination of debt service to repay the benefit fee as well as ongoing operation and maintenance fees. The Town may choose to bond the total project cost up front, with each property then paying back the costs on an EDU basis. For a typical single-family home (one EDU), a benefit fee may be $40,000 over a 30-year bond term at 3%. This bond would result in a monthly payment of $169 per month, or $2,028 per year.

The New York State Comptroller's Office reviews and approves sanitary sewer districts with annual costs that exceed the average. The Comptroller published an update in December 2016 that included an average for Town sanitary districts of $909 per year. Based on the bond repayment alone, the Millwood sewer district would exceed the average and would require Comptroller review and approval.

In addition to the debt service, annual costs would be incurred to operate and maintain the pump stations and collection system. These annual costs would also be paid per property through sewer usage fees based on established rates, typically on a quarterly basis. Further analysis will be required to determine the ongoing usage fees for the MSSD.

5. WASTEWATER FLOW BY USE

5.1 Future Flow Analyses

The New York State Department of Environmental Conservation (NYSDEC) has established sewage flow rate estimates for various residential and commercial property types. Table 4 below provides estimated NYSDEC design sewage flow rates for types of uses that may be contemplated for future developments in Millwood, along with planning level unit estimates for each use. The purpose of this table is to provide an **example** composition of additional future development that could utilize the excess pipe capacity in a sewer collection system for Millwood and is not a recommended scenario for Millwood itself.

Table 7: Wastewater Flow and EDU Equivalent Based on Use

NYSDEC Sewage Design Flow Estimates			Flow Estimates for Potential Future Development Uses in Millwood		
Type of Use	**Unit**	**Per Unit Flow Rate (gal/day)**	**Number of Units**	**Average Daily Flow (gal/day)**	**EDUs**
Dentist	Per chair	250	4 Chairs	1,000	5
Day Care	Per child	20	25	500	3
Health Club	Per patron	20	100	2,000	10
Shopping Center	Per square feet	0.1 + 15 gpd/employee/shift	45,000 ft^2 + 25 employees	5,000	25
Restaurant	Per seat	35	50	1,750	9
Banquet Hall	Per seat	75	100	4,500	23
Apartment	Per bedroom	110	70	7,700	39
			TOTAL	22,450	114

EXAMPLE

6. FUNDING

As part of this study, Woodard & Curran has reviewed more than 20 state and federal grant and loan opportunities to identify potential funding opportunities which may assist in providing sanitary sewer service to the Millwood Sanitary Sewer District. This funding review is based on Woodard & Curran's knowledge of grants and loans secured for projects of similar scope and geographic location. The funding opportunities presented below are specific to installation of a sewer collection system. The ability to document water quality problems that the sewer project will resolve, such as chronic septic failure and nutrient loading through specific surveys/studies, will improve grant competitiveness. Additional funding programs also may be available if the sewer project is completed as part of an overall revitalization program that includes other elements identified in the Town Plan and Strategy documents (e.g., streetscaping, recreational trail linkage, green infrastructure).

Woodard & Curran's funding assessment reviewed local, state, and federal programs including, but not limited to the U.S. Environmental Protection Agency (USEPA), U.S. Department of Agriculture (USDA), New York State Department of State (NYS DOS), New York State Department of Environmental Conservation (NYS DEC), and the New York State Environmental Facilities Corporation (NYS EFC). State and federal funding opportunities including New York State Grants Gateway and Grants.gov were also reviewed.

Of approximately 20 opportunities evaluated, 5 were identified as potential funding sources based on project details and grant information as of the date of this report. The potential funding sources identified will require further refinement as additional project information becomes available and grant application windows change over time.

If a sewer project is to proceed for the Millwood area, Woodard & Curran recommends that the Town consider the following funding programs:

- NYS Environmental Facilities Corporation Clean Water Grant (WIIA)
- NYS Department of Environmental Conservation Water Quality Improvement Project Grant (WQIP)
- Community Development Block Grant Fund (Grant)
- NYS Department of State Local Government Efficiency Grant (LGE)
- Clean Water State Revolving Loan Fund

Other funding opportunities that were assessed but not retained as opportunities for this project include (1) USDA Rural Development's Water and Waste Disposal Loan and Grant Program (New Castle population exceeds the threshold); (2) NYS EFC Wastewater Infrastructure Engineering Planning Grant (New Castle exceeds the Median Household Income eligibility threshold of $85,000); (3) USEPA Water Infrastructure Finance and Innovation Act (WIFIA) (projects must be of national or regional significance).

NYS Clean Water Grant (WIIA)

Under the Water Infrastructure Improvement Act, the NYS Environmental Facilities Corporation provides grants for water quality infrastructure projects at municipally owned sewage treatment works and those that address CSOs and SSOs; eligible projects also include replacement of on-site septic systems with sewers. For 2017, $112.5 million is available in this program. Criteria for evaluation include water quality improvement or reduction in risk to public health, financial need, readiness to advance to construction, and level of demonstrated community support. Applicants must submit a grant application, engineering report, environmental review documents, a certified bond and/or board resolution, smart growth assessment and proof of district formation if required; additional supporting documents also may be necessary. Up to 25% of total net project costs are eligible for grant funding not to exceed $5 million. No single project or municipality may receive more than $5 million over a 5-year period. Engineering Planning grants, Green Innovation Grants, Storm Mitigation Loans, and Inter-Municipal Water Infrastructure Grants are excluded from this cap.

NYS DEC Water Quality Improvement Grant Program (WQIP)

The Water Quality Improvement Project program is a competitive, statewide reimbursement grant program open to local governments and not-for-profit corporations to implement projects that directly address documented water quality impairments or protect a drinking water source. The program requires recipients to provide 15% of the award amount for high priority wastewater treatment improvement projects; 25% of the award amount for non-agricultural non-point source abatement and control and MS4 projects; and 60% of the award amount for general wastewater infrastructure improvement projects. Communities with inadequate on-site septic systems are specifically eligible and will be given highest priority if they have a completed sanitary survey conducted by the Department of Health and/or impact a waterbody listed as impaired on the State Priority Waterbody List. Applications that do not address water quality impairment or protect a drinking water source are ineligible. The New Castle project may meet both criteria though the portion of Millwood Center that drains to the Croton Reservoir is limited and it is not clear whether documentation of failing septic systems is available. The maximum grant amount under this program is $5 million.

Community Block Development Grant Program

The New York State Office of Community Renewal administers the federally funded Community Development Block Grant (CDBG) Program to provide financial assistance to eligible cities, towns, and villages with a population less than 50,000 and counties with unincorporated population less than 200,000. The CDBG Program list of eligible communities includes the Town of New Castle. Approximately $20 million is available in 2017. The program goals are to develop viable communities by providing decent housing, suitable living environments and expanded economic opportunities principally for persons of low and moderate income (LMI). No less than 70% of NYS CDBG funds must be used for activities that benefit LMI persons; LMI is defined as 80% of the median income of the Metropolitan Statistical Area (MSA). Eligible projects must benefit 51% or more of LMI persons as demonstrated by a household survey of properties within the project benefit area. 2017 CDBG funding activities include (1) Public Infrastructure (water source development, storage; sanitary sewage collection and treatment; and flood control and stormwater drainage; (2) Public Facilities and Other Public Works (structures to house or serve special needs populations); and (3) Community Planning (costs associated with planning projects including Community Needs Assessment or preliminary engineering for water or sewer). Funding limits for water/sewer/stormwater public infrastructure are $750,000 per project; joint applications are eligible to receive $900,000. CDBG scoring considers need, impact, financial capacity, administrative capacity, and the Regional Economic Development Council score.

Local Government Efficiency Grant (LGE)

The NYS Department of State Local Government Efficiency Grant Program is designed to assist local leaders in identifying best practices and taking actions to reduce municipal expenditures, limit growth in property taxes and increase efficiencies in service delivery. Typical projects include government reorganization, functional or service delivery consolidation, city/county charter revisions that include functional consolidation, cooperative service agreements, and establishment of regional service delivery mechanisms. Generally, local governments must apply cooperatively for an LGE grant; however, in certain instances the program can provide direct assistance to fiscally stressed local governments to implement internal reorganizations or service delivery modifications. Local governments may apply for either implementation planning or implementation projects. Maximum funding for planning is $12,500 for each local government involved in the project, not to exceed $100,000. The total maximum cumulative funding for a project is $200,000 for each local government involved in the project not to exceed $1,000,000. For planning grants, matching funds equal to at least 50% of the total project cost are required; upon implementation, the original matching funds will be refunded up to 90% of the eligible costs. For implementation projects, matching funds of at least 10% of the total project cost are required. All grants are reimbursement grants. To receive full funding, awardees must demonstrate that the project has received all appropriate public consideration, referenda where required.

Clean Water State Revolving Loan Fund

The Clean Water State Revolving Fund (CWSRF) is jointly administered by the Environmental Facilities Commission (EFC) and the New York State Department of Environmental Conservation (DEC). The CWSRF provides low-interest

rate financing to municipalities to construct water quality protection projects such as sewers and wastewater treatment facilities. For communities with demonstrated financial hardship, interest rates can be reduced to as low as zero percent. To apply for financing, it is necessary to submit a Project Listing through the Project Listing and Update System (PLUS) that will be scored, ranked, and listed in the Intended Use Plan (IUP). Project Listings can be submitted at any time but must be submitted by May 1 to have projects listed in the Draft IUP, and by the end of the public comment period for the Draft IUP to be listed in the Final IUP. After a project is listed in the IUP, a complete CWSRF Financing Package application can be submitted and are typically due March 1 of each year. If the project is delayed until the 2018 cycle, IUP listing and CWSRF loans can be pursued.

If the Town moves ahead with the strategies identified in the MRS, additional grant programs that might apply include the Climate Smart Communities Grant, Empire State Development Grant, Green Innovation Grant, and OPRHP Environmental Protection Fund Grant.

7. FINDINGS & RECOMMENDATIONS

7.1 Summary of Findings

The Town of New Castle has identified the Hamlet of Millwood as a priority area for the construction of sanitary sewers to replace existing capacity limited and failing septic systems to encourage economic growth in the Hamlet. A sanitary sewer extension from the County trunk sewer in the Village of Briarcliff Manor is currently proposed under a separate project to address a New York State Department of Environmental Conservation consent order to provide sewer connection to the development at Random Farms, and would run directly through the Millwood Sanitary Sewer District. This sanitary sewer extension project would provide an ideal connection point for a sanitary sewer collection system in Millwood. In addition, the Town is considering including a sewer connection from the Pheasant Run condominium development, which includes 84 single family residential units, into the Millwood sewer collection system. Based on construction of a sewer collection system in Millwood with connections to the Pheasant Run development and to the Random Farms sewer system, the total estimated project cost for the Millwood sewer project is approximately $7.6 million (excluding connection or discharge fees to the County trunk sewer).

Woodard & Curran has determined that a gravity sewer collection system constructed to industry standards for minimum sewer main pipe size and slope would provide sufficient capacity for the current estimated sewage flows in Millwood, as well as potential sewage flows from future development in the Hamlet. A preliminary benefit fee evaluation including equivalent dwelling unit (EDU) analysis was conducted by Woodard & Curran identifying 84 existing EDUs for the MSSD, as well as potential capacity for an additional 49 EDUs for the Pheasant Run condominium development, for a total of 133 EDUs that will be served by existing development in the project area. With at target benefit fee of $30,000 - $40,000 per EDU and an estimated project cost of $7.5 million, the total project EDUs would be in the range of 190 – 254 EDUs which would result in approximately 57 – 121 EDUs that will available for future development. These future benefit fees amounting to 30 - 45% of the project cost (±$2.3 – $3.6 million) will need to be funded either by the Town itself or by other funding sources until a future point in time when benefit fees for these additional EDUs could be assessed to new developments. These 57 – 121 EDUs would provide approximately 11,400 – 24,200 gpd in reserve benefit assessments for future development in the MSSD. There are various sewer infrastructure funding opportunities that exist that could be applied towards the capital cost for project, which would effectively reduce the short and long-term benefit fee burdens on the sewer users and the Town. It should be noted that additional design capacity is available within the proposed sewer infrastructure to accommodate additional EDUs beyond the estimated maximum of 254; however, further evaluation will be required to establish a detailed financial model that is compliant with state statutes for assessment of sanitary sewer infrastructure costs.

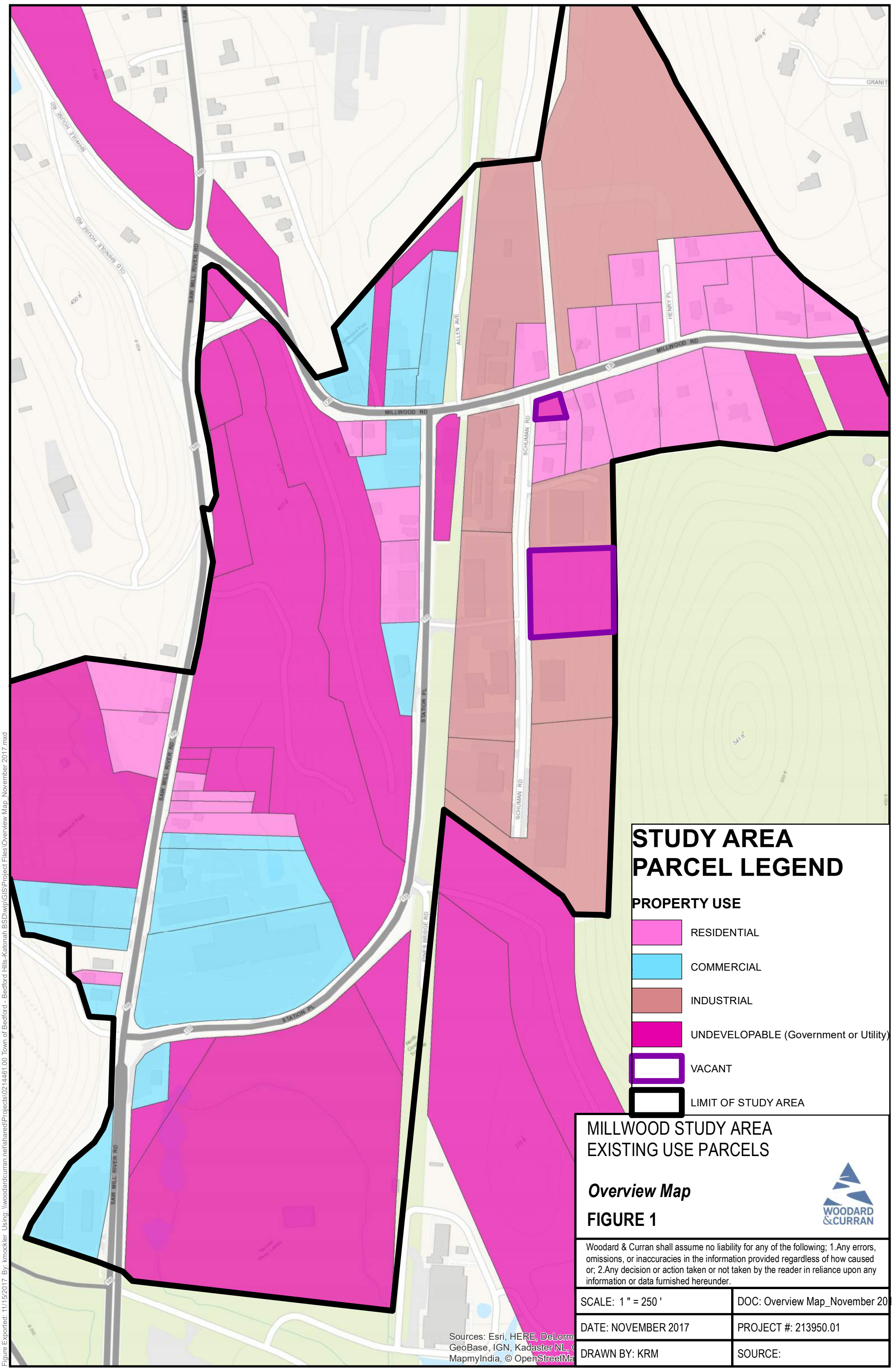
7.2 Recommendations

Woodard & Curran recommends that the Town of New Castle evaluate the project costs presented in this Report, to both the potential sewer users and the Town itself, to determine if the magnitude of these costs are practicable to proceed further with evaluation and planning for the Millwood Sanitary Sewer District project.

If the project costs alone do not create a significant roadblock to the project, then some recommended next steps for the Town include:

- Continued community outreach and public interaction to understand the level of public support for a sanitary sewer system in Millwood;
- Further assessment of potential development opportunities in Millwood;
- Evaluation of project financing opportunities, including low interest loan and grant opportunities,
- Further evaluation of project costs and potential benefit assessment structure based on funding opportunities and Town's input on project needs;
- Further coordination with the proposed Random Farms Sewer and Riverwoods/Yeshiva Sewer Trunk Connection Project to ensure available capacity for projected sewage flows from Millwood.

APPENDIX A: MILLWOOD SEWER STUDY AREA MAPS


SAW MILL RIVER RD
SHINGLE HOUSE RD
OLD SHINGLE HOUSE RD
MILLWOOD RD
ALLEN AVE
HENRY PL
SCHUMAN RD
STATION PL
DINES BRIDGE RD
GRANIT
STUDY AREA
PARCEL LEGEND
PROPERTY USE
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
UNDEVELOPABLE (Government or Utility)
VACANT
LIMIT OF STUDY AREA
MILLWOOD STUDY AREA
EXISTING USE PARCELS
Overview Map
FIGURE 1
WOODARD &CURRAN
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DOC: Overview Map_November 2017.mx
DATE: NOVEMBER 2017
PROJECT #: 213950.01
DRAWN BY: KRM
SOURCE:
Sources: Esri, HERE, DeLorm
GeoBase, IGN, Kadaster NL,
MapmyIndia, © OpenStreetMa
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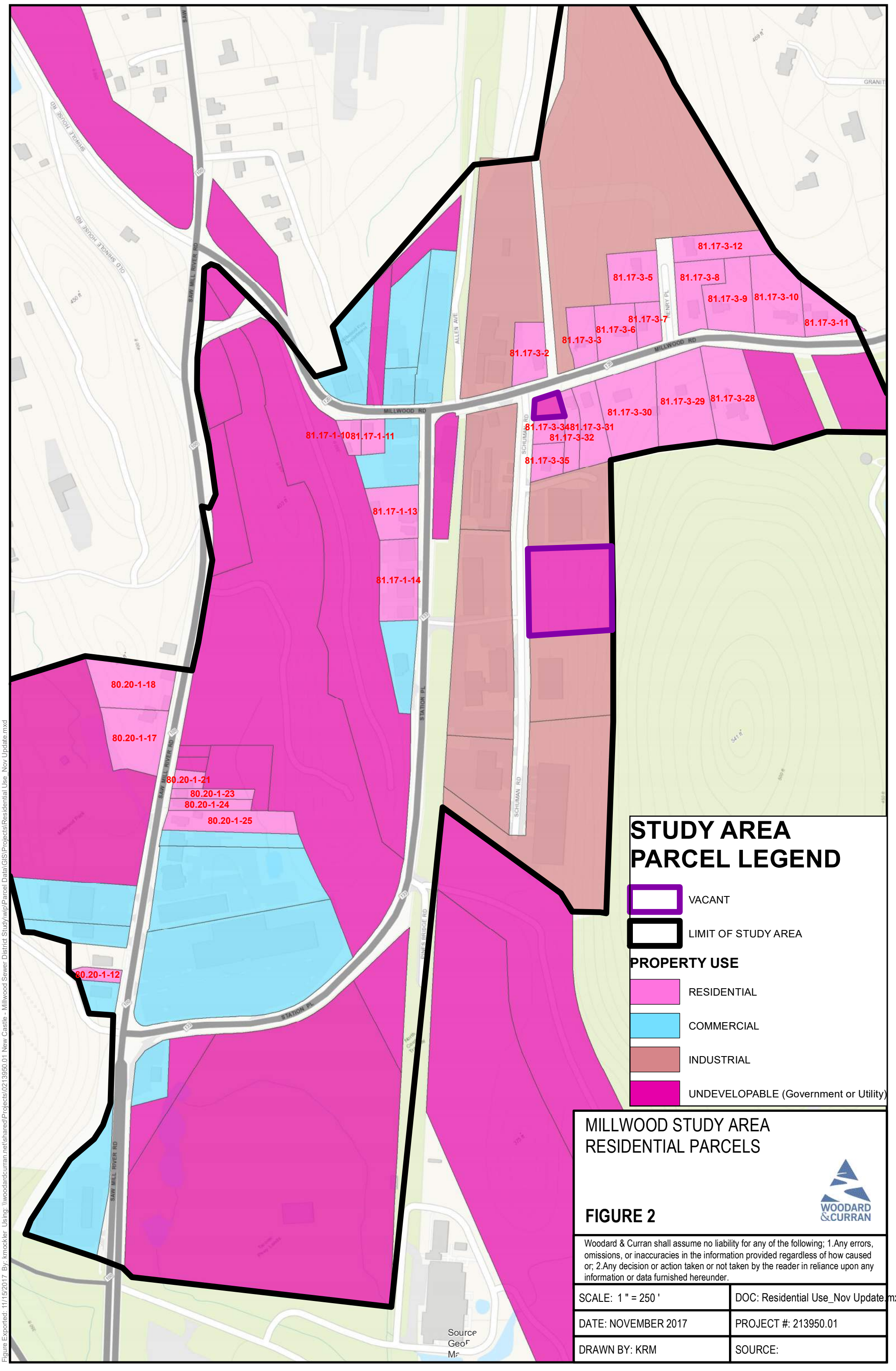
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81.17-3-5
81.17-3-8
81.17-3-9
81.17-3-10
81.17-3-7
81.17-3-6
81.17-3-11
81.17-3-3
81.17-3-2
MILLWOOD RD
81.17-3-29
81.17-3-28
81.17-3-30
81.17-3-34
81.17-3-31
81.17-3-32
81.17-3-35
81.17-1-10
81.17-1-11
81.17-1-13
81.17-1-14
80.20-1-18
80.20-1-17
80.20-1-21
80.20-1-23
80.20-1-24
80.20-1-25
80.20-1-12
SAW MILL RIVER RD
ALLEN AVE
SCHUMAN RD
STATION PL
OLD SHINGLE HOUSE RD
STUDY AREA
PARCEL LEGEND
VACANT
LIMIT OF STUDY AREA
PROPERTY USE
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
UNDEVELOPABLE (Government or Utility)
MILLWOOD STUDY AREA
RESIDENTIAL PARCELS
FIGURE 2
WOODARD &CURRAN
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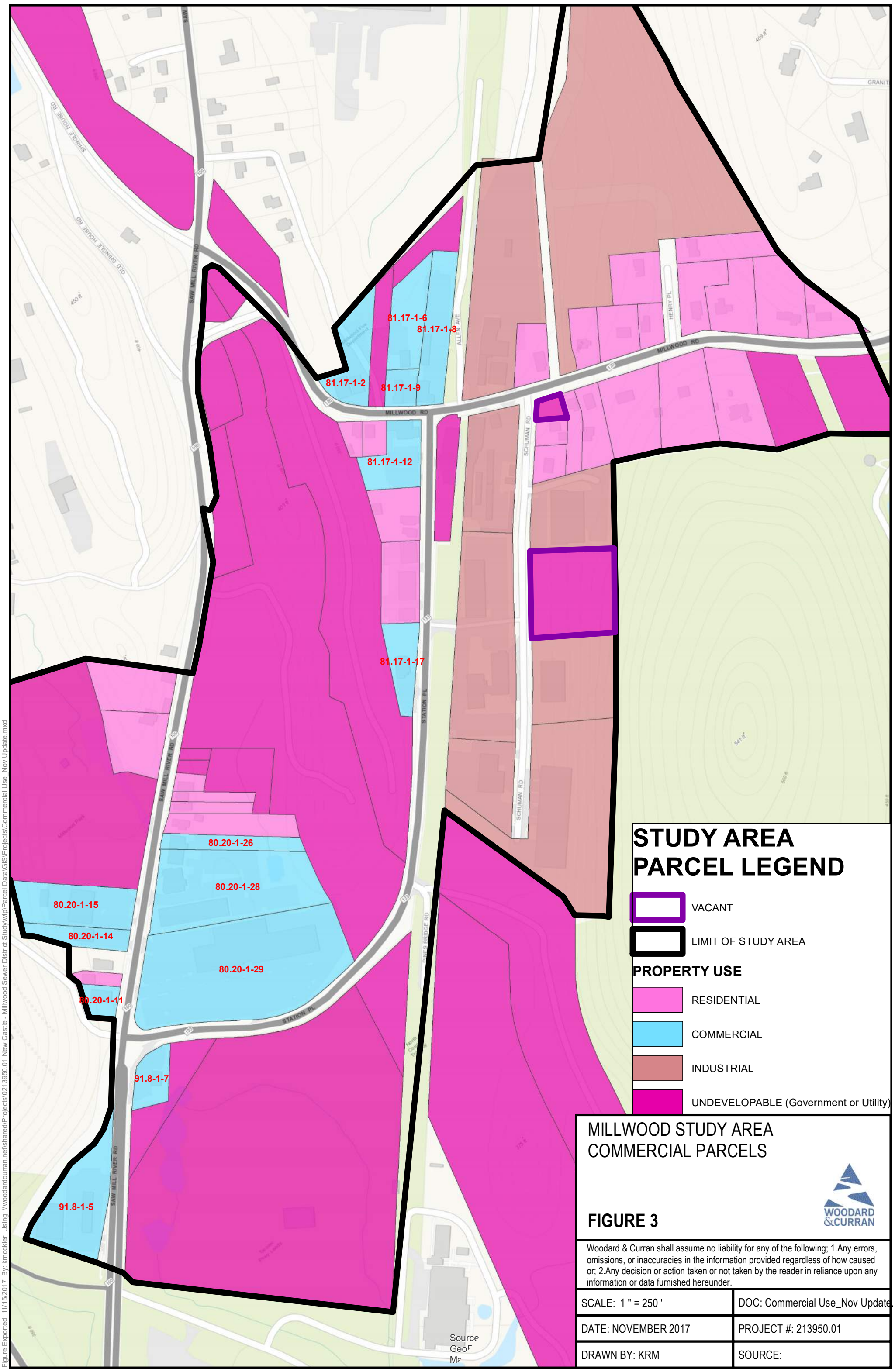
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81.17-1-2
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81.17-1-12
81.17-1-17
80.20-1-26
80.20-1-28
80.20-1-15
80.20-1-14
80.20-1-29
80.20-1-11
91.8-1-7
91.8-1-5
SAW MILL RIVER RD
MILLWOOD RD
STATION PL
SCHUMAN RD
ALLEN AVE
HENRY PL
SHINGLE HOUSE RD
OLD SHINGLE HOUSE RD
STATIONS BRIDGE RD
STUDY AREA
PARCEL LEGEND
VACANT
LIMIT OF STUDY AREA
PROPERTY USE
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
UNDEVELOPABLE (Government or Utility)
MILLWOOD STUDY AREA
COMMERCIAL PARCELS
FIGURE 3
WOODARD &CURRAN
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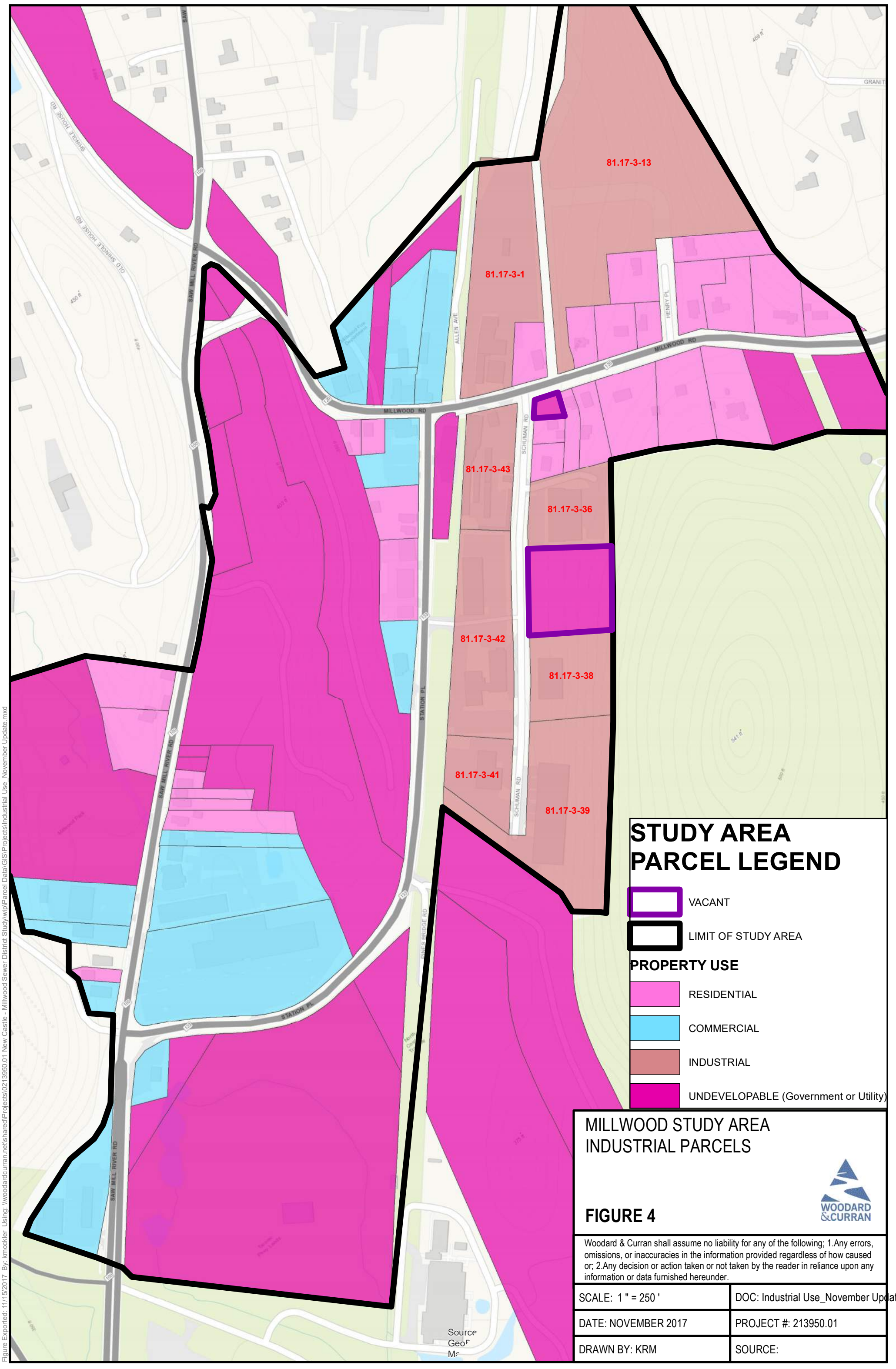
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81.17-3-1
81.17-3-43
81.17-3-36
81.17-3-42
81.17-3-38
81.17-3-41
81.17-3-39
SAW MILL RIVER RD
MILLWOOD RD
ALLEN AVE
SCHUMAN RD
HENRY PL
STATION PL
OLD SHINGLE HOUSE RD
SHINGLE HOUSE RD
GRANIT
STATION PL
STEVENS BRIDGE RD
STEVENS BRIDGE RD
STUDY AREA
PARCEL LEGEND
VACANT
LIMIT OF STUDY AREA
PROPERTY USE
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
UNDEVELOPABLE (Government or Utility)
MILLWOOD STUDY AREA
INDUSTRIAL PARCELS
FIGURE 4
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SCALE: 1 " = 250 '
DOC: Industrial Use_November Update.r
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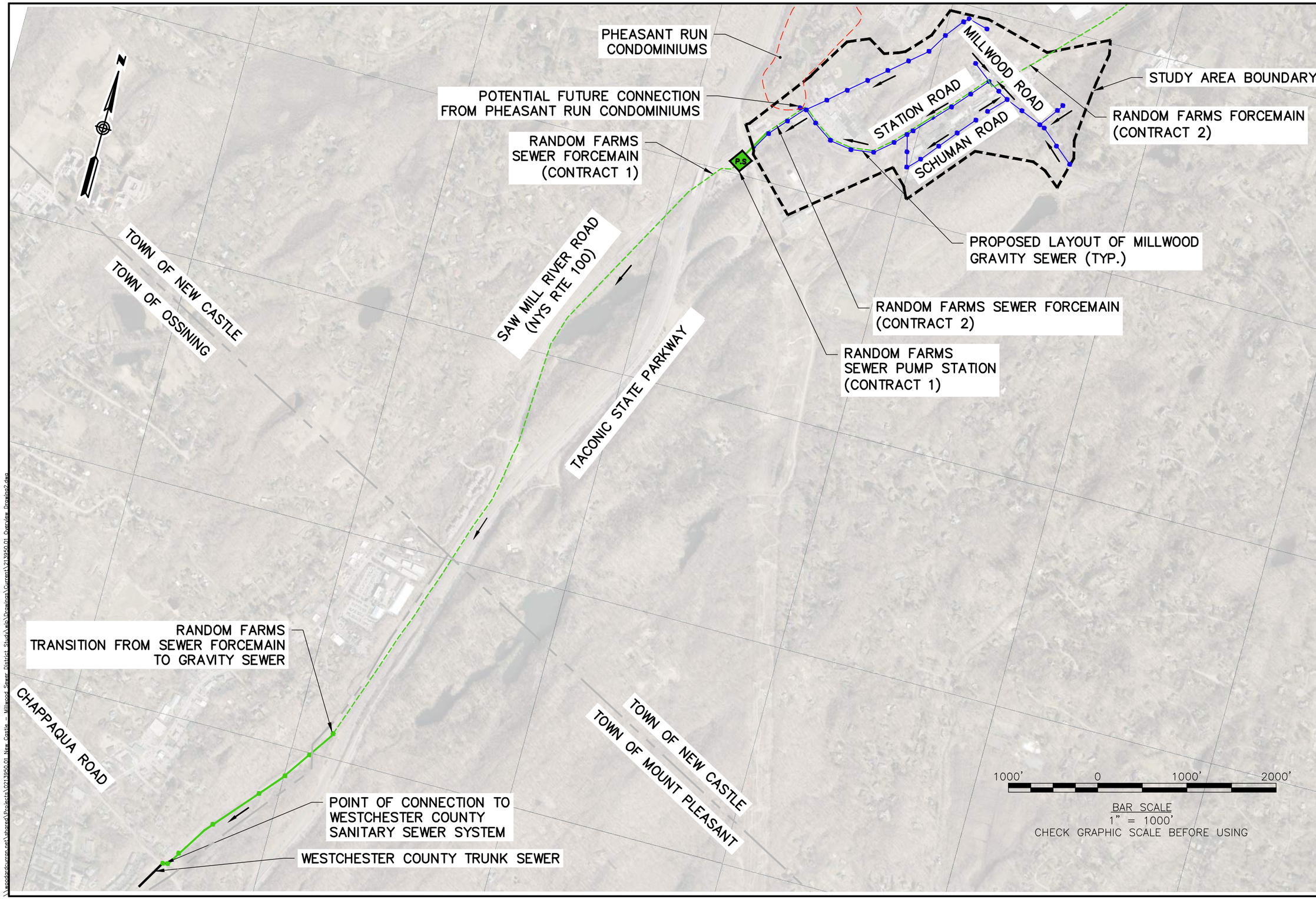


Woodard & Curran Engineering PA PC
709 Westchester Avenue, Suite L2
White Plains, New York 10604
800.807.4080 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

FIGURE 5: CONCEPTUAL SEWER LAYOUT

DESIGNED BY: EB
DRAWN BY: KM
CHECKED BY: KK
213950.01 OVERVIEW DRAW*.dwg

TOWN OF NEW CASTLE

MILLWOOD SEWER FEASIBILITY

JOB NO: 213950.01
DATE: NOVEMBER 2017
SCALE: SCALE

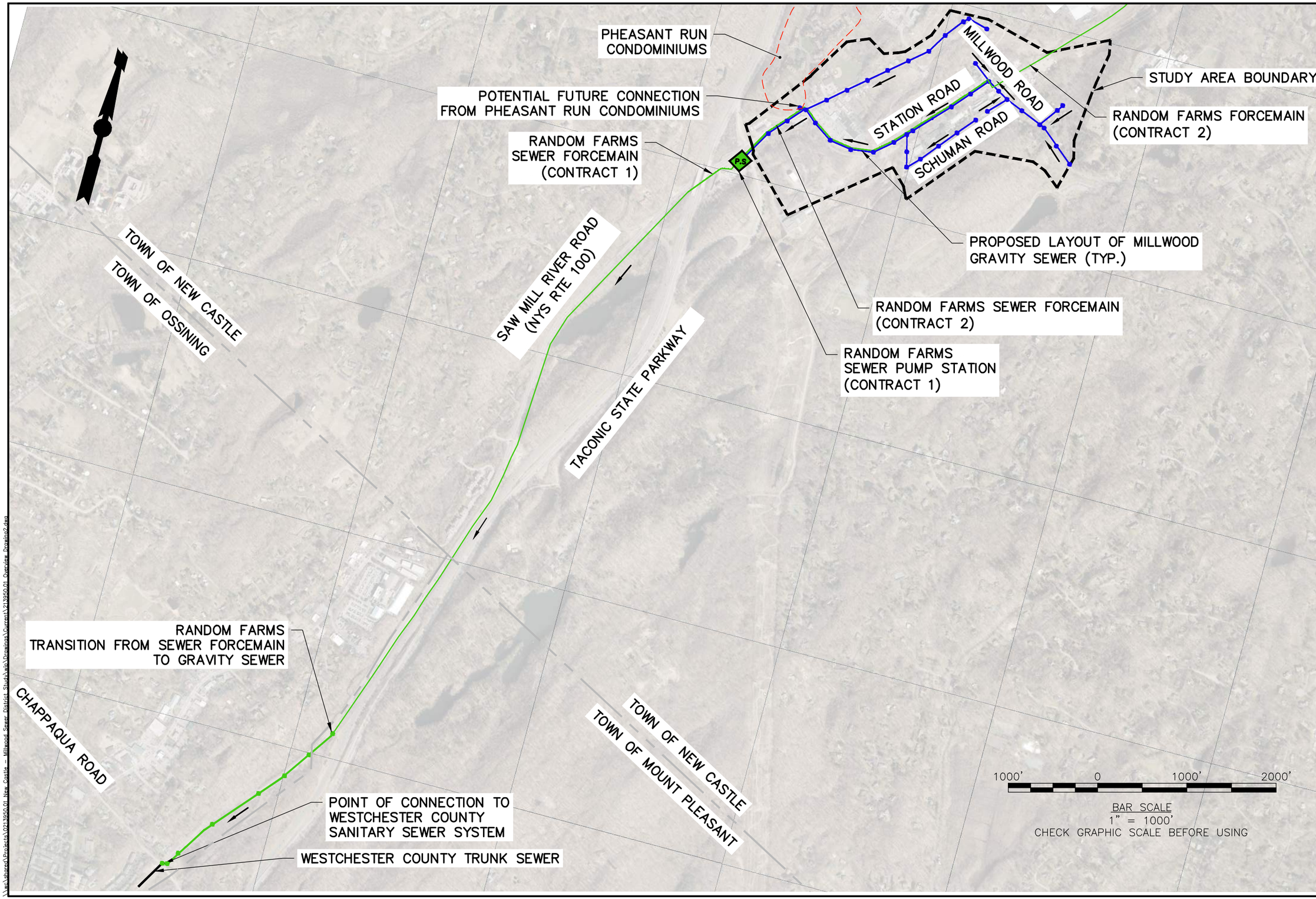
FIGURE 5

APPENDIX B: WATER USAGE DATA BY PARCEL

Parcels in Millwood Sewer District Study Area															
				91 DAYS	91 DAYS		89 DAYS	89 DAYS		95 DAYS	95 DAYS		92 DAYS	92 DAYS	
		QUARTERLY WATER	DAILY WATER	SUMMER WATER	SUMMER WATER	DAILY SUMMER WATER	FALL WATER	FALL WATER	DAILY FALL WATER	WINTER WATER	WINTER WATER	DAILY WINTER WATER	SPRING WATER	SPRING WATER	DAILY SPRING WATER
PARCEL ID	ADDRESS	USAGE (GALLONS)	USAGE (GALLONS)	USAGE (CUBIC FEET)	USAGE (GALLONS)	USAGE (GALLONS)	USAGE (CUBIC FEET)	USAGE (GALLONS)	USAGE (GALLONS)	USAGE (CUBIC FEET)	USAGE (GALLONS)	USAGE (GALLONS)	USAGE (CUBIC FEET)	USAGE (GALLONS)	USAGE (GALLONS)
80.20-1-11	219 SAW MILL RIVER RD	748	6.79	100	748	8.21978022	100	748	8.404494382	100	748	7.873684211	100	748	8.130434783
80.20-1-12	223 SAW MILL RIVER RD	7854	70.13	900	6732	73.97802198	0	0	0	1800	13464	141.7263158	1500	11220	121.9565217
80.20-1-13	227 SAW MILL RIVER RD	20196	180.32	3900	29172	320.5714286	1400	10472	117.6629213	2500	18700	196.8421053	3000	22440	243.9130435
80.20-1-14	231 SAW MILL RIVER RD	17578	156.95	2500	18700	205.4945055	2300	17204	193.3033708	2600	19448	204.7157895	2000	14960	162.6086957
80.20-1-15	235 SAW MILL RIVER RD	ROCKY'S MILLWOOD DELI INC : 955	ROCKY'S MILLWOOD DELI INC : 853	13700	102476	1126.10989	13200	98736	1109.393258	14600	109208	1149.557895	14700	109956	1195.173913
80.20-1-16	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-17	251 SAW MILL RIVER RD	7891.4	70.46	1100	8228	90.41758242	1400	10472	117.6629213	720	5385.6	56.69052632	1000	7480	81.30434783
80.20-1-18	257 SAW MILL RIVER RD	17952	160.29	2300	17204	189.0549451	1500	11220	126.0674157	2900	21692	228.3368421	2900	21692	235.7826087
80.20-1-19	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-20	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-21	266 SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-22	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-23	262 SAW MILL RIVER RD	8415	75.13	1200	8976	98.63736264	1100	8228	92.4494382	1100	8228	86.61052632	1100	8228	89.43478261
80.20-1-24	258 SAW MILL RIVER RD	10898.36	97.31	14	104.72	1.150769231	1914	14316.72	160.8620225	0	0	0	100	748	8.130434783
80.20-1-25	254 SAW MILL RIVER RD	31977	285.51	4800	35904	394.5494505	4300	32164	361.3932584	4400	32912	346.4421053	3600	26928	292.6956522
80.20-1-26	248 SAW MILL RIVER RD	UNIT 1 : 5984 UNIT 2 : 11033 UN	UNIT 1 : 53.43 UNIT 2 : 98.51 UN	6300	47124	517.8461538	6100	45628	512.6741573	7800	58344	614.1473684	7300	54604	593.5217391
80.20-1-28	238 SAW MILL RIVER RD	0	0	9500	71060	780.8791209	5500	41140	462.247191	4800	35904	377.9368421	6000	44880	487.826087
80.20-1-29	230 SAW MILL RIVER RD	286577.5	2558.73	35667	266789.16	2931.749011	51583	385840.84	4335.290337	33000	246840	2598.315789	33000	246840	2683.043478
80.20-2-3	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-2-4	1 MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-2-5	SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-1-2	60 MILLWOOD RD	374	3.34	0	0	0	100	748	8.404494382	0	0	0	100	748	8.130434783
81.17-1-5	SAND STREET	67694	604.41	17700	132396	1454.901099	10800	80784	907.6853933	3400	25432	267.7052632	4300	32164	349.6086957
81.17-1-6	70 MILLWOOD RD	27489	245.44	4100	30668	337.010989	3600	26928	302.5617978	3500	26180	275.5789474	3500	26180	284.5652174
81.17-1-7	STATION PL	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-1-8	84 MILLWOOD RD	38148	340.61	5400	40392	443.8681319	5500	41140	462.247191	4700	35156	370.0631579	4800	35904	390.2608696
81.17-1-9	76 MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-1-10	75 MILLWOOD RD	56287	502.56	14400	107712	1183.648352	9600	71808	806.8314607	1500	11220	118.1052632	4600	34408	374
81.17-1-11	79 MILLWOOD RD	78914	704.59	14000	104720	1150.769231	9600	71808	806.8314607	11200	83776	881.8526316	7400	55352	601.6521739
81.17-1-12	83 MILLWOOD RD	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81.17-1-13	13 STATION PL	3553	31.72	3600	26928	295.9120879	3133	23434.84	263.312809	2600	19448	204.7157895	3200	23936	260.173913
81.17-1-14	11 STATION PL	102850	918.3	24000	179520	1972.747253	11000	82280	924.494382	6000	44880	472.4210526	22000	164560	1788.695652
81.17-1-17	5 STATION PL	935	8.35	2000	14960	164.3956044	2100	15708	176.494382	3000	22440	236.2105263	2600	19448	211.3913043
81.17-2-1	14 STATION PL	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-1	86 MILLWOOD RD	13277	118.54	2200	16456	180.8351648	1600	11968	134.4719101	1700	12716	133.8526316	1600	11968	130.0869565
81.17-3-2	90 MILLWOOD RD	19448	173.64	3700	27676	304.1318681	1900	14212	159.6853933	2700	20196	212.5894737	2100	15708	170.7391304
81.17-3-3	108 MILLWOOD RD	24497	218.72	4800	35904	394.5494505	2900	21692	243.7303371	2600	19448	204.7157895	2800	20944	227.6521739
81.17-3-5	7 HENRY PL	12342	110.1	1700	12716	139.7362637	1400	10472	117.6629213	2000	14960	157.4736842	1500	11220	121.9565217
81.17-3-6	112 MILLWOOD RD	24684	220.39	3400	25432	279.4725275	3300	24684	277.3483146	2800	20944	220.4631579	3700	27676	300.826087
81.17-3-7	116 MILLWOOD RD	7106	63.45	1000	7480	82.1978022	900	6732	75.64044944	1000	7480	78.73684211	900	6732	73.17391304
81.17-3-8	4 HENRY PL	7854	70.13	1200	8976	98.63736264	800	5984	67.23595506	1200	8976	94.48421053	1000	7480	81.30434783
81.17-3-9	128 MILLWOOD RD	24310	217.05	5400	40392	443.8681319	3800	28424	319.3707865	2100	15708	165.3473684	1700	12716	138.2173913
81.17-3-10	140 MILLWOOD RD	9911	88.49	1200	8976	98.63736264	1400	10472	117.6629213	1200	8976	94.48421053	1500	11220	121.9565217
81.17-3-11	158 MILLWOOD RD	16082	143.59	2500	18700	205.4945055	1800	13464	151.2808989	2100	15708	165.3473684	2200	16456	178.8695652
81.17-3-12	10 HENRY PL	10659	95.17	1700	12716	139.7362637	900	6732	75.64044944	1500	11220	118.1052632	1600	11968	130.0869565
81.17-3-13	100 MILLWOOD RD	46563	415.74	6300	47124	517.8461538	6100	45628	512.6741573	12400	92752	976.3368421	100	748	8.130434783
81.17-3-26	149 MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-27	MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-28	135 MILLWOOD RD	16643	148.6	2100	15708	172.6153846	2600	19448	218.5168539	2200	16456	173.2210526	2000	14960	162.6086957
81.17-3-29	129 MILLWOOD RD	13838	123.56	2000	14960	164.3956044	1100	8228	92.4494382	1700	12716	133.8526316	2600	19448	211.3913043
81.17-3-30	125 MILLWOOD RD	17391	155.28	2700	20196	221.9340659	2000	14960	168.0898876	2000	14960	157.4736842	2600	19448	211.3913043
81.17-3-31	105 MILLWOOD RD	187	1.67	0	0	0	0	0	0	0	0	0	100	748	8.130434783
81.17-3-32	101 MILLWOOD RD	8976	80.14	1000	7480	82.1978022	900	6732	75.64044944	1500	11220	118.1052632	1400	10472	113.826087
81.17-3-33	MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-34	1 SCHUMAN RD	12342	110.2	1600	11968	131.5164835	1800	13464	151.2808989	1700	12716	133.8526316	1500	11220	121.9565217
81.17-3-35	3 SCHUMAN RD	22440	200.36	2600	19448	213.7142857	2900	21692	243.7303371	3000	22440	236.2105263	3500	26180	284.5652174
81.17-3-36	5 SCHUMAN RD	39270	350.63	5000	37400	410.989011	5000	37400	420.2247191	6000	44880	472.4210526	5000	37400	406.5217391
81.17-3-37	SCHUMAN RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-38	11 SCHUMAN RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-39	15 SCHUMAN RD	117810	1051.88	13000	97240	1068.571429	25000	187000	2101.123596	10000	74800	787.3684211	15000	112200	1219.565217
81.17-3-41	16 SCHUMAN RD	22440	200.36	4000	29920	328.7912088	2000	14960	168.0898876	2000	14960	157.4736842	4000	29920	325.2173913
81.17-3-42	12 SCHUMAN RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
81.17-3-43	87 MILLWOOD RD	16456	146.93	1900	14212	156.1758242	1700	12716	142.8764045	2200	16456	173.2210526	3000	22440	243.9130435
91.8-1-5	201 SAW MILL RIVER RD	162690	1452.59	38000	284240	3123.516484	29000	216920	2437.303371	9000	67320	708.6315789	11000	82280	894.3478261
91.8-1-7	208 SAW MILL RIVER RD	16830	150.27	1600	11968	131.5164835	4400	32912	369.7977528	1500	11220	118.1052632	1500	11220	121.9565217
91.8-1-8	SOMERSTOWN RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-1-9	90 SAW MILL RIVER RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-3-1	15 MILLWOOD RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-3-1.-1	CAMPFIRE RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-4-1	125 CAMPFIRE RD	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-4-1.-1	CATSKILL AQUEDUCT LINE	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
91.8-4-1.-2		XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
80.20-1-10.-1	1 FAWN RIDGE	7293	65.12	900	6732	73.97802198	900	6732	75.64044944	1100	8228	86.61052632	1000	7480	81.30434783
80.20-1-10.-2	2 FAWN RIDGE	22814	203.7	2800	20944	230.1538462	3200	23936	268.9438202	3200	23936	251.9578947	3000	22440	243.9130435
80.20-1-10.-3	3 FAWN RIDGE	12342	110.2	1900	14212	156.1758242	1300	9724	109.258427	1900	14212	149.6	1500	11220	121.9565217
80.20-1-10.-4	4 FAWN RIDGE	12155	108.53	1600	11968	131.5164835	1300	9724	109.258427	1900	14212	149.6	1700	12716	138.2173913
80.20-1-10.-5	5 FAWN RIDGE	9537	85.15	1300	9724	106.8571429	1400	10472	117.6629213	1500	11220	118.1052632	900	6732	73.17391304
80.20-1-10.-6	6 FAWN RIDGE	5049	45.08	800	5984	65.75824176	800	5984	67.23595506	500	3740	39.36842105	600	4488	48.7826087
80.20-1-10.-7	7 FAWN RIDGE	3740	33.39	400	2992	32.87912088	500	3740	42.02247191	600	4488	47.24210526	500	3740	40.65217391
80.20-1-10.-8	8 FAWN RIDGE	3179	28.38	400	2992	32.87912088	300	2244	25.21348315	600	4488	47.24210526	400	2992	32.52173913
80.20-1-10.-9	9 FAWN RIDGE	2805	25.04	300	2244	24.65934066	400	2992	33.61797753	400	2992	31.49473684	400	2992	32.52173913
80.20-1-10.-10	10 FAWN RIDGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80.20-1-10.-11	11 FAWN RIDGE	7480	66.79	900	6732	73.97802198	800	5984	67.23595506	1200	8976	94.48421053	1100	8228	89.43478261
80.20-1-10.-12	12 FAWN RIDGE	1122	10.02	300	2244	24.65934066	100	748	8.404494382	100	748	7.873684211	100	748	8.130434783
80.20-1-10.-13	13 FAWN RIDGE	12716	113.54	1700	12716	139.7362637	1500	11220	126.0674157	2100	15708	165.3473684	1500	11220	121.9565217
80.20-1-10.-14	14 FAWN RIDGE	8228	73.46	1500	11220	123.2967033	1400	10472	117.6629213	700	5236	55.11578947	800	5984	65.04347826
80.20-1-10.-15	15 FAWN RIDGE	5423	48.42	700	5236	57.53846154	700	5236	58.83146067	800	5984	62.98947368	700	5236	56.91304348
80.20-1-10.-16	16 FAWN RIDGE	5610	50.09	700	5236	57.53846154	600	4488	50.42696629	900	6732	70.86315789	800	5984	65.04347826
80.20-1-10.-17	17 FAWN RIDGE	3927	35.06	700	5236	57.53846154	500	3740	42.02247191	500	3740	39.36842105	400	2992	32.52173913
80.20-1-10.-18	18 FAWN RIDGE	5049	45.08	500	3740	41.0989011	600	4488	50.42696629	800	5984	62.98947368	800	5984	65.04347826
80.20-1-10.-19	19 FAWN RIDGE	9350	83.48	1100	8228	90.41758242	900	6732	75.64044944	1300	9724	102.3578947	1700	12716	138.2173913
80.20-1-10.-20	20 FAWN RIDGE	9911	88.49	1300	9724	106.8571429	1300	9724	109.258427	1400	10472	110.2315789	1300	9724	105.6956522
80.20-1-10.-21	21 FAWN RIDGE	3553	31.72	500	3740	41.0989011	500	3740	42.02247191	400	2992	31.49473684	500	3740	40.65217391
80.20-1-10.-22	22 PHEASANT RUN	1496	13.36	200	1496	16.43956044	100	748	8.404494382	0	0	0	500	3740	40.65217391
80.20-1-10.-23	23 PHEASANT RUN	14773	131.9	500	3740	41.0989011	2355	17615.4	197.9258427	1000	7480	78.73684211	1000	7480	81.30434783
80.20-1-10.-24	24 PHEASANT RUN	41729.05	372.58	6645	49704.6	546.2043956	3470	25955.6	291.6359551	3600	26928	283.4526316	8600	64328	699.2173913
80.20-1-10.-25	25 PHEASANT RUN	18700	166.96	2100	15708	172.6153846	2600	19448	218.5168539	2700	20196	212.5894737	2600	19448	211.3913043
80.20-1-10.-26	26 PHEASANT RUN	3366	30.05	500	3740	41.0989011	500	3740	42.02247191	400	2992	31.49473684	400	2992	32.52173913
80.20-1-10.-27	27 PHEASANT RUN	5797	51.76	700	5236	57.53846154	700	5236	58.83146067	800	5984	62.98947368	900	6732	73.17391304

80.20-1-10.-28	28 FAWN RIDGE	4862	43.41	800	5984	65.75824176	800	5984	67.23595506	500	3740	39.36842105	500	3740	40.65217391
80.20-1-10.-29	29 FAWN RIDGE	8789	78.47	1200	8976	98.63736264	1200	8976	100.8539326	1200	8976	94.48421053	1100	8228	89.43478261
80.20-1-10.-30	30 FAWN RIDGE	12155	108.53	1500	11220	123.2967033	1600	11968	134.4719101	1500	11220	118.1052632	1900	14212	154.4782609
80.20-1-10.-31	31 FAWN RIDGE	26741	238.76	5800	43384	476.7472527	2400	17952	201.7078652	3200	23936	251.9578947	2900	21692	235.7826087
80.20-1-10.-32	32 FAWN RIDGE	2431	21.71	0	0	0	1300	9724	109.258427	1800	13464	141.7263158	1800	13464	146.3478261
80.20-1-10.-33	33 FAWN RIDGE	7667	68.46	400	2992	32.87912088	700	5236	58.83146067	2500	18700	196.8421053	500	3740	40.65217391
80.20-1-10.-34	34 FAWN RIDGE	11968	106.86	1500	11220	123.2967033	2200	16456	184.8988764	1500	11220	118.1052632	1200	8976	97.56521739
80.20-1-10.-35	35 FAWN RIDGE	27115	242.1	3500	26180	287.6923077	3500	26180	294.1573034	3700	27676	291.3263158	3800	28424	308.9565217
80.20-1-10.-36	36 FAWN RIDGE	10472	93.5	1500	11220	123.2967033	500	3740	42.02247191	1700	12716	133.8526316	1400	10472	113.826087
80.20-1-10.-37	37 FAWN RIDGE	14773	131.9	2100	15708	172.6153846	1700	12716	142.8764045	1800	13464	141.7263158	2300	17204	187
80.20-1-10.-38	38 FAWN RIDGE	3553	31.72	500	3740	41.0989011	500	3740	42.02247191	400	2992	31.49473684	500	3740	40.65217391
80.20-1-10.-39	39 FAWN RIDGE	8228	73.46	1100	8228	90.41758242	900	6732	75.64044944	1200	8976	94.48421053	1200	8976	97.56521739
80.20-1-10.-40	40 FAWN RIDGE	4675	41.74	600	4488	49.31868132	800	5984	67.23595506	500	3740	39.36842105	600	4488	48.7826087
80.20-1-10.-41	41 TOUCHSTONE WAY	14773	131.9	2400	17952	197.2747253	1700	12716	142.8764045	1600	11968	125.9789474	2200	16456	178.8695652
80.20-1-10.-42	42 TOUCHSTONE WAY	5797	51.76	800	5984	65.75824176	700	5236	58.83146067	800	5984	62.98947368	800	5984	65.04347826
80.20-1-10.-43	43 TOUCHSTONE WAY	11220	100.18	1500	11220	123.2967033	1600	11968	134.4719101	1500	11220	118.1052632	1400	10472	113.826087
80.20-1-10.-44	44 TOUCHSTONE WAY	12903	115.21	1700	12716	139.7362637	1800	13464	151.2808989	1700	12716	133.8526316	1700	12716	138.2173913
80.20-1-10.-45	45 TOUCHSTONE WAY	12155	108.53	1900	14212	156.1758242	1300	9724	109.258427	1400	10472	110.2315789	1900	14212	154.4782609
80.20-1-10.-46	46 TOUCHSTONE WAY	3179	28.38	400	2992	32.87912088	200	1496	16.80898876	600	4488	47.24210526	500	3740	40.65217391
80.20-1-10.-47	47 TOUCHSTONE WAY	6171	55.1	800	5984	65.75824176	800	5984	67.23595506	1000	7480	78.73684211	6000	44880	487.826087
80.20-1-10.-48	48 TOUCHSTONE WAY	11594	103.52	1200	8976	98.63736264	1300	9724	109.258427	1900	14212	149.6	1800	13464	146.3478261
80.20-1-10.-49	49 TOUCHSTONE WAY	7293	65.12	1000	7480	82.1978022	1000	7480	84.04494382	1000	7480	78.73684211	900	6732	73.17391304
80.20-1-10.-50	50 TOUCHSTONE WAY	27489	245.44	3600	26928	295.9120879	4500	33660	378.2022472	2200	16456	173.2210526	4400	32912	357.7391304
80.20-1-10.-51	51 TOUCHSTONE WAY	4114	36.73	700	5236	57.53846154	600	4488	50.42696629	400	2992	31.49473684	500	3740	40.65217391
80.20-1-10.-52	52 TOUCHSTONE WAY	9911	88.49	1200	8976	98.63736264	1300	9724	109.258427	1400	10472	110.2315789	1400	10472	113.826087
80.20-1-10.-53	53 TOUCHSTONE WAY	12155	108.53	1500	11220	123.2967033	1600	11968	134.4719101	1600	11968	125.9789474	1800	13464	146.3478261
80.20-1-10.-54	54 TOUCHSTONE WAY	12155	108.53	1000	7480	82.1978022	1500	11220	126.0674157	2500	18700	196.8421053	1500	11220	121.9565217
80.20-1-10.-55	55 TOUCHSTONE WAY	4675	41.74	600	4488	49.31868132	600	4488	50.42696629	700	5236	55.11578947	600	4488	48.7826087
80.20-1-10.-56	56 TOUCHSTONE WAY	5049	45.08	700	5236	57.53846154	700	5236	58.83146067	700	5236	55.11578947	600	4488	48.7826087
80.20-1-10.-57	57 TOUCHSTONE WAY	10659	95.17	1300	9724	106.8571429	1100	8228	92.4494382	1500	11220	118.1052632	1800	13464	146.3478261
80.20-1-10.-58	58 TOUCHSTONE WAY	6732	60.11	1000	7480	82.1978022	800	5984	67.23595506	1000	7480	78.73684211	800	5984	65.04347826
80.20-1-10.-59	59 TOUCHSTONE WAY	5610	50.09	700	5236	57.53846154	800	5984	67.23595506	800	5984	62.98947368	700	5236	56.91304348
80.20-1-10.-60	60 TOUCHSTONE WAY	30481	272.15	1400	10472	115.0769231	1200	8976	100.8539326	12800	95744	1007.831579	900	6732	73.17391304
80.20-1-10.-61	61 PHEASANT RUN	3740	33.39	500	3740	41.0989011	600	4488	50.42696629	400	2992	31.49473684	500	3740	40.65217391
80.20-1-10.-62	62 TOUCHSTONE WAY	10285	91.83	1100	8228	90.41758242	1400	10472	117.6629213	1600	11968	125.9789474	1400	10472	113.826087
80.20-1-10.-63	63 PHEASANT RUN	5797	51.76	800	5984	65.75824176	700	5236	58.83146067	800	5984	62.98947368	800	5984	65.04347826
80.20-1-10.-64	64 PHEASANT RUN	23936	213.71	3200	23936	263.032967	3400	25432	285.752809	3100	23188	244.0842105	3100	23188	252.0434783
80.20-1-10.-65	65 PHEASANT RUN	3553	31.72	500	3740	41.0989011	400	2992	33.61797753	500	3740	39.36842105	500	3740	40.65217391
80.20-1-10.-66	66 PHEASANT RUN	5236	46.75	600	4488	49.31868132	600	4488	50.42696629	800	5984	62.98947368	800	5984	65.04347826
80.20-1-10.-67	67 PHEASANT RUN	16269	145.26	2500	18700	205.4945055	2200	16456	184.8988764	1600	11968	125.9789474	2400	17952	195.1304348
80.20-1-10.-68	68 PHEASANT RUN	6919	61.78	900	6732	73.97802198	900	6732	75.64044944	800	5984	62.98947368	1100	8228	89.43478261
80.20-1-10.-69	69 PHEASANT RUN	12342	110.2	1700	12716	139.7362637	1600	11968	134.4719101	1700	12716	133.8526316	1600	11968	130.0869565
80.20-1-10.-70	70 PHEASANT RUN	12155	108.53	1700	12716	139.7362637	1200	8976	100.8539326	1800	13464	141.7263158	1800	13464	146.3478261
80.20-1-10.-71	71 PHEASANT RUN	10472	93.5	1400	10472	115.0769231	1500	11220	126.0674157	1000	7480	78.73684211	1700	12716	138.2173913
80.20-1-10.-72	72 PHEASANT RUN	25245	225.4	3100	23188	254.8131868	2100	15708	176.494382	4200	31416	330.6947368	4100	30668	333.3478261
80.20-1-10.-73	73 PHEASANT RUN	16643	148.6	2300	17204	189.0549451	2500	18700	210.1123596	1700	12716	133.8526316	2400	17952	195.1304348
80.20-1-10.-74	74 PHEASANT RUN	55352	494.21	7600	56848	624.7032967	9300	69564	781.6179775	7100	53108	559.0315789	5600	41888	455.3043478
80.20-1-10.-75	75 PHEASANT RUN	9163	81.81	1400	10472	115.0769231	1500	11220	126.0674157	900	6732	70.86315789	1100	8228	89.43478261
80.20-1-10.-76	76 PHEASANT RUN	8228	73.46	1200	8976	98.63736264	1000	7480	84.04494382	1200	8976	94.48421053	1000	7480	81.30434783
80.20-1-10.-77	77 PHEASANT RUN	24684	220.39	3300	24684	271.2527473	3200	23936	268.9438202	3300	24684	259.8315789	3400	25432	276.4347826
80.20-1-10.-78	78 PHEASANT RUN	2431	21.71	200	1496	16.43956044	200	1496	16.80898876	500	3740	39.36842105	400	2992	32.52173913
80.20-1-10.-79	79 PHEASANT RUN	9163	81.81	1200	8976	98.63736264	1200	8976	100.8539326	1300	9724	102.3578947	1200	8976	97.56521739
80.20-1-10.-80	80 PHEASANT RUN	1870	16.7	300	2244	24.65934066	200	1496	16.80898876	300	2244	23.62105263	200	1496	16.26086957
80.20-1-10.-81	81 PHEASANT RUN	11033	98.51	1400	10472	115.0769231	800	5984	67.23595506	2100	15708	165.3473684	1600	11968	130.0869565
80.20-1-10.-82	82 PHEASANT RUN	7667	68.46	1100	8228	90.41758242	1100	8228	92.4494382	1000	7480	78.73684211	900	6732	73.17391304
80.20-1-10.-83	83 PHEASANT RUN	12003.53	107.17	1500	11220	123.2967033	1700	12716	142.8764045	1319	9866.12	103.8538947	1900	14212	154.4782609
80.20-1-10.-84	84 PHEASANT RUN	6732	60.11	800	5984	65.75824176	800	5984	67.23595506	1100	8228	86.61052632	900	6732	73.17391304

APPENDIX C: MILLWOOD SEWER SYSTEM CONCEPTUAL LAYOUT



Woodard & Curran Engineering PA PC
709 Westchester Avenue, Suite L2
White Plains, New York 10604
800.807.4080 | www.woodardcurran.com

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FIGURE 5: CONCEPTUAL SEWER LAYOUT

DESIGNED BY: EB
DRAWN BY: KM
CHECKED BY: KK
213950.01 OVERVIEW DRAW*.dwg

TOWN OF NEW CASTLE

MILLWOOD SEWER FEASIBILITY

JOB NO: 213950.01
DATE: OCTOBER 2017
SCALE: SCALE

FIGURE 5

\\wc\sanect\Projects\024\213950.01 New Castle - Millwood Sewer District Study\mp\Drawings\Current\213950.01 Overview Drawing2.dwg

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