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July 28, 2016

Mr. Stephen Muollo, P.E.
Municipal Facilities Section – 2nd Floor; Bureau of Water Protection and Land Use
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106

Subject: New Hartford WPCA - *Line Extension and Repair Evaluation* and Sewer Service Area Map

Dear Mr. Muollo,

On behalf of the Town of New Hartford, CT Water Pollution Control Authority (WPCA), we are pleased to submit the enclosed *Sewer Line Extension and Repair Evaluation* report. This report, now dated July 2016, has been reviewed with the WPCA over the past several months and was approved by the WPCA at their meeting on July 21, 2016. This Report presents an evaluation of the WPCA's relevant existing facilities, as well as potential sewer extensions in the Cottage Street and Pine Meadow areas.

Also included in the Report submission is the Town's Proposed Sewer Service Area Map. This map was also approved and adopted by the WPCA, and was the subject of a public hearing on July 7, 2016. However, it is currently considered to be in draft form (most recently dated January 2016) until approval by DEEP. Please note that Section 2.2 of the Report includes specific discussion on the map as it relates to the Town's *2015 Plan of Conservation and Development*, as well as the State Office of Policy and Management's (OPM) *Conservation & Development Policies: The Plan for Connecticut*. Additionally, the map currently depicts OPM Priority Funding Areas as well as New Hartford commercial zoning via color-coding and hatching on the map. The report discussion and map illustrations are intended to help facilitate your review.

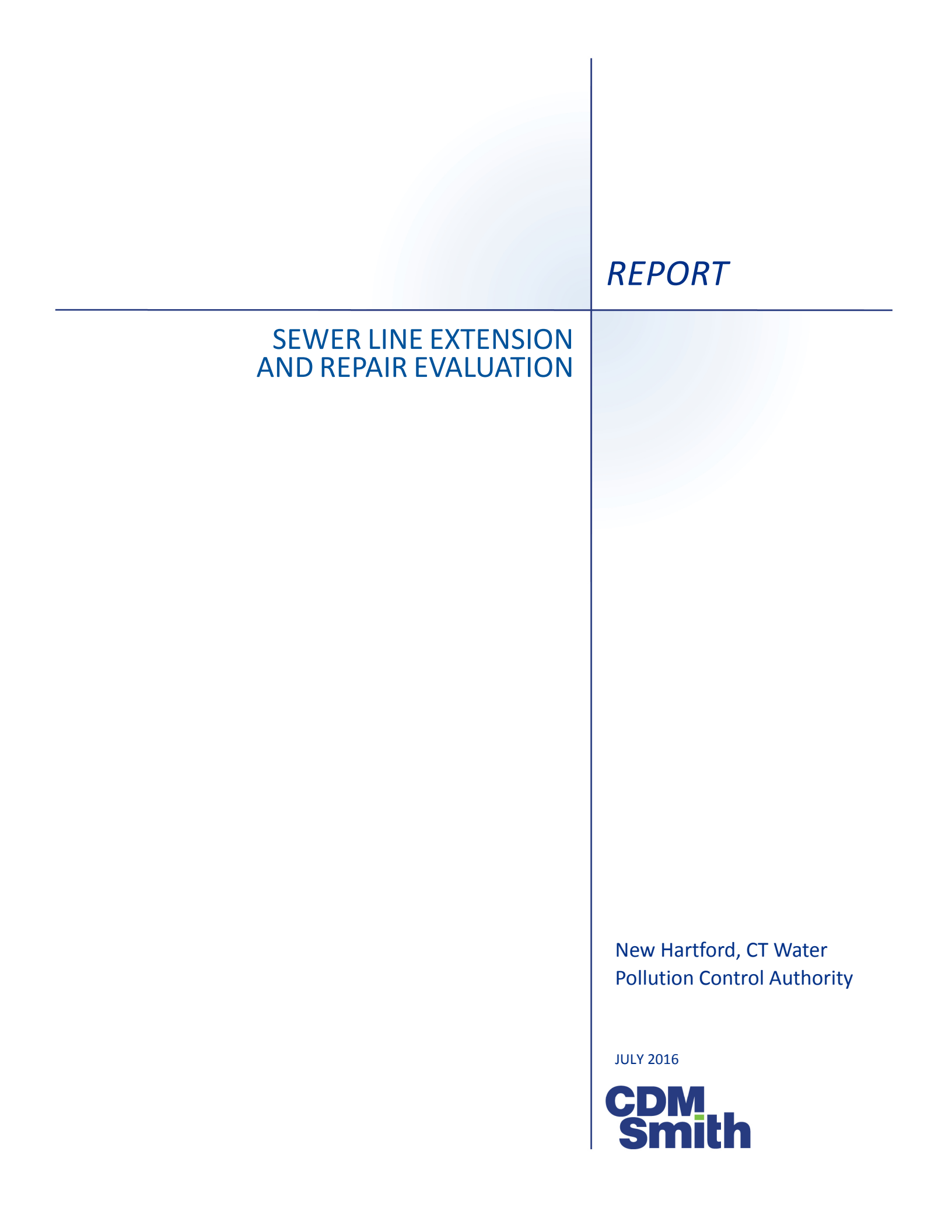
We would be pleased to meet with you to discuss the proposed Sewer Service Area Map and any other portions of the Report. I can be reached by e-mail at WagnerKG@cdmsmith.com or at (860) 808-2278.

Very truly yours,

Kristie G. Wagner, P.E., BCEE
Project Manager
CDM Smith Inc.

cc: Mr. Denton Butler, WPCA Chair





REPORT

SEWER LINE EXTENSION
AND REPAIR EVALUATION

New Hartford, CT Water
Pollution Control Authority

JULY 2016

CDM
Smith

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WPCA Endorsement and Recommendations

Section 1

Introduction

1.1 Project Background and Goals

The Town of New Hartford, located in northwestern CT in Litchfield County, has a population of approximately 7,190 people in 2016, estimated by the CT Data Collaborative. There are approximately 2,923 housing units in 2016 per the Town Clerk's office. The Town has a wastewater collection system including gravity sewers, three pumping stations, and a wastewater treatment plant designed for 400,000 gallons per day (gpd).

Portions of the wastewater collection system are nearly 50 years old, dating back to the late 1960s. The sewer system has approximately 215 connected users, representing less than 10 percent of the Town's housing units; some connections are also commercial and industrial in nature. The wastewater treatment plant currently treats an average daily flow of approximately 60,000 gpd; the plant upgrade to 400,000 gpd capacity in 2010 was designed to allow for future expansion of the sewer service area.

In 2015, the volunteer Water Pollution Control Authority (WPCA) completed a Line Extension Analysis report which outlined environmental and economic drivers for increasing the number of sewer system users, and decreasing septic systems in relatively densely developed areas, particularly those in proximity to the Federally-designated "Wild & Scenic" Farmington River and in the Town's Aquifer Protection Zone.

The goal of this report is to evaluate needs and options for protection of infrastructure, public health, and the environment as well as maximize economic benefit to the Town by evaluating feasibility and necessity of sewer extensions.

1.2 Summary of Report

The remainder of this report consists of the following Sections:

- Section 2, Existing Conditions and Needs Assessment – Describes existing treatment facility and collection system. Presents proposed Sewer Service Area Map and areas evaluated for sewer extensions in the short-term.
- Section 3, Alternatives Evaluation – Assesses options for protection of existing sewers and pumping stations, and expansion of sewers into the Cottage Street and Pine Meadow areas. Discusses flood protection requirements for new infrastructure.
- Section 4, Projected Costs and Revenue Distribution – Presents recommended sewer extension options, potential funding sources, and cost/revenue projections related to the sewer extensions

Section 2

Existing Conditions and Needs Assessment

2.1 Existing Facilities

2.1.1 Wastewater Treatment Plant

The New Hartford Wastewater Treatment Plant (WWTP) was constructed in 1969 and underwent a substantial upgrade in 2010. The upgrades modified the biological treatment system to a Sequencing Batch Reactor (SBR) treatment process with a total average daily capacity of 400,000 gallons per day (gpd). The improvements at the facility included three new SBR tanks, new interplant piping, replacement of the headworks equipment (automated screens and grit chamber), new disk filters and ultraviolet (UV) disinfection equipment. The WWTP also includes a generator sized for the whole plant, with a diesel belly fuel tank.

The WWTP is currently operated by Water Planet, a contract operations firm. They are responsible for all regular operations and maintenance, as well as unplanned/emergency maintenance of the WWTP and collection system. Sludge is hauled off-site for disposal by Veolia Water. According to plant operations staff, the majority of equipment is in good working condition. The effluent flow meter was replaced in 2015 due to a history of sensitivity to power surges and outages. The influent weir arrangement is not ideal and the influent meter has been calibrated several times, but it does provide adequate flow measurement for process control. The headworks screen includes a screw auger with spray wash system. During winter conditions, water from the spray wash can cause ice buildup on the equipment. This is typical of outdoor installations in New England. The most effective fix is to build an enclosure to control the temperature of the equipment, but this would be costly, and operations staff have indicated the current arrangement is manageable. The issues noted herein are manageable in nature and no significant improvements are needed at the WWTP in the near future.

A summary of monthly operations data for 3 years (September 2012 through August 2015) is presented in Table 2.1 at the end of this section. As noted in Section 1, the average daily flow is approximately 60,000 gpd. The facility generally has a good track record of permit compliance, with some exceedances noted in effluent BOD (3 occurrences), effluent suspended solids (2 occurrences), UV intensity (numerous occurrences), effluent e. Coli (3 occurrences), and effluent total nitrogen (1 occurrence). All reports are sent to the Connecticut Department of Energy and Environmental Protection (DEEP) monthly and no action has been taken by DEEP regarding these exceedances. It is noted that the NPDES permit includes a seasonal (April-October) load cap of 10.92 lbs/day of Phosphorus, implemented as part of DEEP's Phosphorus Reduction Strategy. Records indicate that the current treatment process have kept levels well below that cap, typically less than 3 lbs/day. It is noted that some unusually high peak flows (in excess of 700,000 gpd) were reported in 2012 and 2013. It is possible that the reported problems with the effluent flow meter before its replacement in 2015 resulted in inaccurate peak flow measurement.

2.1.2 Wastewater Collection System

2.1.2.1 Collector Sewers

The New Hartford wastewater collection system includes over 14,600 linear feet of sewer pipe of various ages, materials, and conditions. The oldest sewers were installed in 1968, and pipe materials include cast iron, concrete, asbestos, clay and PVC. Limited repair and replacement projects have been completed since 2012, including portions of Brook Street, Bridge Street, and Main Street/Route 44. The majority of the collection system has not been inspected/televised in recent years.

2.1.2.2 Jones Mountain Trunk Sewer

The Jones Mountain Trunk Sewer is approximately 7,500 linear feet in length and is the main sewer line from the center of New Hartford to the WWTP. It is largely located in a wooded easement to the west of Route 44 in a former railroad bed, and is at a higher elevation than most of Route 44. The Town contracted New England Pipe Cleaning Company (NEPCCO) to perform a closed-circuit television (CCTV) inspection of the Jones Mountain Trunk Sewer in December 2015. From the CCTV footage, it appears that the pipe is concrete (likely asbestos cement, AC, based on its date of installation circa 1968). The Jones Mountain Trunk Sewer inspection included 29 pipe segments totaling 7304 feet of pipe inspected.

CDM Smith subsequently reviewed inspected footage and categorized defects (both structural and operational) per the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP). Observed defects are summarized in Tables 2.2 and 2.3. Per PACP, each defect is assigned a number between one and five to represent its significance, in both operational and structural categories. Ratings of one and two are minor defects such as fine roots and cracks that do not pose an imminent threat to the pipe. A three rating may include defects such as medium roots and grease, fractures, and offset joints. Broken/collapsed pipe and root balls would get a four or five rating since they pose a threat to the pipe and its functionality. The PACP Quick Rating is a way to rapidly evaluate the status of an inspected pipe. The first and third digits are the two highest defect ratings of the pipe. The second and fourth digits are the number of occurrences of those corresponding two highest ratings. This is a fast way to prioritize the attention given to pipes based on how severe the damage is to the pipe along with how often the damage occurs. However, the ratings are a simplified tool and not a substitute for engineering judgment.

About half of the pipe segments are clear of O&M defects and two thirds are clear of structural defects. Observed defects included operational issues such as debris, roots, grease, infiltration, and defective/intruding taps. Structural defects noted included offset joints, surface damage/spalling, and cracks, fractures, and minor breaks. The broken sections were coded as such because they represent slight intrusions from the outside. Given the widely scattered presence of these defects, it is possible that they may have occurred during construction and have been present for decades. In general, the pipe and operational ability have not been significantly compromised. Rehabilitation work does not appear necessary in the immediate future, but the Town should plan for periodic CCTV inspection of this line in future years. Additionally, if any change in use of the easement, such as construction of a potential Rails to Trails project, is planned, inspection should be performed at that time. It would be advisable to consider a

structural lining/rehabilitation of the pipe before heavy equipment is allowed to work in the easement, should it be selected for a Rails to Trails project.

2.1.2.3 Pumping Stations

New Hartford's collection system currently includes three pumping stations, located (1) Route 219 between the Farmington River and Route 44, (2) at the northern end of Prospect Street, and (3) on Greenwoods Road.

The Route 219 station is the oldest and largest capacity. It is a 1969 era station that was reportedly upgraded in the late 1980s. It has a steel wet well with two submersible pumps (one approximately 210 gpm capacity, the other reportedly slightly larger). One pump was replaced in 1987 and one was replaced in 2011. CDM Smith observed some rust on the steel wet well. It is recommended that the WPCA plan for a condition assessment of the steel wet well, including ultrasonic thickness testing, to confirm the structural soundness of this critical structure. Given that most of the equipment was last upgraded nearly 30 years ago, an assessment of the pumps and controls is also recommended.

The Prospect Street station is a newer pumping station that was built in 1997. The pump impellers were replaced in the last few years. Other than ongoing equipment maintenance, there are no significant needs at this station.

The Greenwoods Road pump station reportedly serves only a few houses, is relatively new, and no condition or operational issues were conveyed by operations staff.

2.2 Sewer Service Area Map

The Town of New Hartford does not have a current accurate Sewer Service Area (SSA) Map. As part of this Study, the Town's current and future sewer service needs were reviewed. Ultimately, a draft SSA Map was created and is appended to this Section. The map includes areas served by existing sewers, areas proposed for potential sewer extensions in the near future, and areas that the Town may wish to sewer in the long-term.

The SSA map has been reviewed for consistency with both the Town's *2015 Plan of Conservation and Development* (prepared by the Planning & Zoning Commission, effective October 15, 2015), and the State Office of Policy And Management's *Conservation & Development Policies: The Plan For Connecticut*, for 2013-2018 (C&S Plan). There are no apparent conflicts with the Town's Plan, which encourages development within the sewer service area to be connected to sewers, including line extensions where appropriate. The proposed SSA map is also consistent with the State's C&D Plan. The proposed SSA aligns with the State's designated "Priority Funding Areas" and "Balanced Priority Funding Areas". There are no mapped "Conservation Areas" included in the proposed SSA, with the exception of the east side of Holcolmb Hill Road and a parcel on Main Street just north of Town Hall. In the case of Holcolmb Hill Road, there are existing residential parcels on the east side that the Town would like to serve if a sewer extension is ever brought up the street to serve a new development on the west side. Since these are existing homes, sewer service should be allowable per the C&D Plan. The parcel on Main Street north of Town Hall is a designated protected space, but there are existing sewers in the vicinity. This parcel is not intended to be developed, but it may ultimately become a Town open space, recreational, or

parking lot with bathroom facilities. These uses appear permissible and are not “growth-related projects” under the C&D plan; as such, the parcel is included in the SSA.

The map appended to this Section is dated January 2016, and is in “Final Draft” form. It has been reviewed and accepted by the WPCA. The map will be submitted to DEEP for review along with this Report.

2.3 Potential Sewer Extension Areas

The *Line Extension Analysis* prepared by the WPCA in 2015 identified several potential sewer extension areas, with a goal of protecting the environment in existing developed neighborhoods in close proximity to the Farmington River. Additionally, sewer extensions would increase operating revenue to support the operation and maintenance of the collection system and WPCF. This report focuses on the Cottage Street Area and the Pine Meadow Area. Both are primarily residential neighborhoods, adjacent to main roads with sewer service.

Farmington River

Both the Cottage Street Area and the Pine Meadow Area are located in proximity to the Farmington River. The Farmington River has been designated a Federal “Wild and Scenic” River through the entire Town of New Hartford since 1994, due to its outstanding resources. Ultimately the Town adopted a “Farmington River Protection Overlay” District within its zoning regulations. This District is defined as the area within 100 feet of the edges of the riverbed, The District includes some specific restrictions designed to protect the river’s natural state, and the need to prevent water pollution is called out as an explicit goal.

2.3.1 Cottage Street Area

Cottage Street is located off of Reservoir Road (Route 219), northeast of the Farmington River. Properties on the south side of Cottage Street abut the River directly. Given the proximity to the Farmington River, proper management of wastewater must be a priority to prevent pollution of this valuable resource, which is also near a premier trout management area.

There are approximately 56 parcels in the Cottage Street area. Most are single-family residential, but there are also several two- and multi-family units, and a condominium development located at 130 Reservoir Road. Accounting for these multi-unit properties, it is estimated that there are approximately 79 Equivalent Dwelling Units (EDUs) in the Cottage Street area. Note that this is based on approximately 0.5 EDU per unit at 130 Reservoir Road, in accordance with water usage data from those units compared to the town average.

Using the Town’s average population density of 2.55 people per household (retrieved from www.census.gov/quickfacts/table/PST045215/0900551350) and Technical Report No. 16 (TR-16), *Guides for the Design of Wastewater Treatment Works* (published by the New England Interstate Water Pollution Control Commission, 2011 Edition) recommended planning value of 70 gallons per capita per day of wastewater flow, each EDU is estimated to contribute approximately 179 gallons per day. The estimated average daily wastewater flow from this area is approximately 14,200 gallons per day (gpd), with potential peak hourly flows of approximately 85,000 gpd. During design, additional allowances for infiltration and inflow will have to be added.

Many properties are less than 0.4 acres in size, though some larger parcels are intermixed.

The health district records contained information on 38 properties from the Cottage St area. The records list 13 septic repairs/replacements in the Cottage St neighborhood. The need for attention mostly stemmed from tank failures, though some were replaced from the homeowner looking to upgrade due to property expansion or transfer. According to WPCA billing records, 45 properties in the Cottage Street area are served with public water; the remaining receive their drinking water from private wells. If properties rely on wells for water, they are surrounded by possible contamination sources from neighboring septic tanks, particularly if separation distances between wells and septic tanks are not consistently kept. It would only take one failed septic tank to pollute that water source. Connecting to the sewer would largely eliminate this public health risk. Additionally, even where public water is used, protection of groundwater is a primary concern. Nutrient loading from septic tanks in densely developed areas can adversely affect groundwater quality. Further, well-designed septic systems should include adequate reserve area for potential future repairs; this can be difficult to attain on small lots.

Since detailed data for each property was not available in the health district records, soil mapping for the Cottage Street area is also referenced and shown on the figure entitled “Soil Potential Ratings for Subsurface Sewage Disposal Systems” at the end of this Section. For this map, data published by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) was referenced. *(data obtained in GIS format from http://cteco.uconn.edu/metadata/dep/document/SOILS_POLY_FGDC_Plus.htm, May 2016).* The data indicates that the soil in the Cottage Street area varies from “high potential” for septic absorption fields to “low” and “very low” potential (as well as a portion that is not rated). The presence of some low-potential soils coupled with relatively small lot sizes and proximity to the Farmington River make this area a logical candidate for a sewer extension.

2.3.2 Pine Meadow Area

The Pine Meadow neighborhood is located off of Route 44 (Main Street) just south of Route 219 and west of the Farmington River. In addition to Main Street, it includes Church Street, Wickett Street, Ten Street, and a portion of Black Bridge Road. Some properties on Main, Wickett, and Ten Streets abut the River directly. As with the Cottage Street area, given the proximity to the Farmington River, proper management of wastewater must be a priority to prevent pollution of this valuable resource. It is also noted that the Satan’s Kingdom State Recreation Area is located downstream from this neighborhood and recreational use of the water is prevalent.

There are approximately 101 parcels in the Pine Meadow area. Most are single-family residential, but there are also several two- and multi-family units and several non-residential parcels. There are approximately 106 Equivalent Dwelling Units (EDUs) in the Pine Meadow area. It is noted that business water usage may correspond to more than 1 EDU, but they are counted singly herein for preliminary planning purposes. The estimated average daily wastewater flow from this area is approximately 19,000 gallons per day (gpd), with potential peak hourly flows of approximately 114,000 gpd.

Similar to Cottage Street, many properties are less than 0.4 acres, though some larger parcels are intermixed.

The health district records contained 68 records in the Pine Meadow area. The records list 26 septic repairs/replacements in the Pine Meadow neighborhood. The need for attention mostly stemmed from tank failures, though some were replaced from the homeowner looking to upgrade for property expansion or transfer. According to WPCA billing records and Health District records, the majority of properties in the Pine Meadow area are served with public water. Some residences along Main Street and Church Street are currently connected to the sewer, including some via individual grinder pumps to the Jones Mountain trunk sewer. Currently there are two properties connected via grinder pumps and one additional property is approved and intending to connect in the near future. There are approximately 13 additional residences that the WPCA anticipates ordering to connect in the near future that are anticipated to require grinder pumps.

As discussed above, even where public water is used, protection of groundwater is a primary concern. Nutrient loading from septic tanks in densely developed areas can adversely affect groundwater quality. Further, well-designed septic systems should include adequate reserve area for potential future repairs; this can be difficult to attain on small lots.

As with Cottage Street, since detailed data for each property was not available in the health district records, soil mapping for the Pine Meadow area is also referenced and shown on the figure entitled “Soil Potential Ratings for Subsurface Sewage Disposal Systems” at the end of this Section. The data indicates that the soil in the Pine Meadow area varies from “high potential” for septic absorption fields to “low” and “very low” potential (as well as a small portion that is not rated). The prevalence of low-potential soils coupled with relatively small lot sizes and proximity to the Farmington River make this area a logical candidate for a sewer extension.

It is important to note that the Pine Meadow neighborhood is located in a designated Aquifer Protection Area, meaning that it is within the area of contribution to a public water supply well. It is vital to protect groundwater quality within Aquifer Protection Areas due to the ultimate human consumption use of the groundwater.

2.3.3 Lower Priority Areas

The WPCA performed a line extension analysis in early 2015. Most of the analysis consisted of showing viable options for expanding the sewer into the Cottage Street and Pine Meadow areas. There were two options that were addressed but deemed to be lower priority due to being less advantageous financially, and having fewer environmental and health risks. A sewer extension in the Johnny Cake Lane and Highland Avenue area would connect approximately 44 residencies to the sewer.

Additionally, Greenwoods Road and Hillside Ave is an area that is not high priority but can be implemented at the discretion of a potential future developer. While currently there are only 9 possible connections in the area, it has potential for expansion that can lead to a large increase in revenue with minimal cost to the Town. The area has potential for up to 125 future connections via a developer-constructed sewer to be connected to the existing WPCA sewer line.

We agree with the conclusions that these extensions are not necessary at this time and can be considered an option for future expansion. These areas were not examined further as part of this study.

Table 2.1 WWTP MOR Summary Table

	Daily Flow (Effluent)			BOD (5-day)	Suspended Solids	UV Intensity		E. Coli	Total N	pH	Total P
	Max.	Min.	Total	Final Eff.	Final Eff.	High	Low		Eff. (12 month)	Eff.	Eff.
Permit Limit				7	7	6.1 min	6.1 min	126	13.3	6-9	N/A
Units	mgd			mg/l	mg/l	mW/cm2		#/100 ml	lb/d	S.U.	lb/d
Month											
Sep 12	0.566	0.006	0.076	4.0	2.8	N/A	N/A	N/A	N/A	6.7	N/A
Oct 12	0.532	0.005	0.072	<4.0	1.0	6.7	4.6	<10	2.5	6.7	3.2
Nov 12	0.900	0.007	0.056	1.9	3.3	N/A	N/A	N/A	2.7	6.9	N/A
Dec 12	0.910	0.007	0.058	2.2	2.1	N/A	N/A	N/A	2.5	6.7	N/A
Jan 13	0.909	0.006	0.053	4.3	2.8	N/A	N/A	N/A	2.5	6.6	N/A
Feb 13	0.897	0.003	0.059	3.6	1.6	N/A	N/A	N/A	2.4	6.6	N/A
Mar 13	0.866	0.000	0.074	3.4	3.4	N/A	N/A	N/A	2.4	6.5	N/A
Apr 13	0.723	0.000	0.079	1.9	6.5	7.6	3.4	3.2	3.0	6.8	1.0
May 13	0.729	0.001	0.086	<4.0	3.6	7.1	3.6	2.2	3.0	6.8	3.0
Jun 13	0.709	0.000	0.116	1.4	5.2	6.2	3.5	2.9	3.0	6.9	1.8
Jul 13	0.768	0.001	0.097	1.1	2.1	9.7	6.0	4.3	3.2	6.8	1.7
Aug 13	0.752	0.000	0.086	0.9	3.1	9.1	5.3	3.6	3.2	6.9	2.1
Sept 13	0.758	0.000	0.084	<5.0	1.3	9.6	4.8	1.8	3.2	6.9	2.1
Oct 13	0.813	0.000	0.074	2.8	3.3	9.0	4.8	0.0	3.1	6.9	1.6
Nov 13	0.893	0.003	0.069	1.9	6.6	N/A	N/A	N/A	3.1	6.9	N/A
Dec 13	0.871	0.018	0.056	7.3	7.4	N/A	N/A	N/A	3.2	6.9	N/A
Jan 14	0.690	0.018	0.051	2.7	3.2	N/A	N/A	N/A	3.3	6.9	N/A
Feb 14	0.688	0.018	0.049	3.4	3.7	N/A	N/A	N/A	3.5	6.9	N/A
Mar 14	N/A	N/A	0.058	1.6	2.9	N/A	N/A	N/A	1.3	6.3	N/A
Apr 14	N/A	N/A	0.079	5.0	4.3	2.1	N/A	150.0	N/A	6.3	0.4
May 14	N/A	N/A	0.092	5.2	6.1	2.2	N/A	120.0	14.5	6.1	1.2
Jun 14	N/A	N/A	0.075	6.0	6.5	1.9	N/A	0.0	6.3	6.1	1.8
Jul 14	N/A	N/A	0.051	1.0	2.4	N/A	1.5	0.0	3.6	6.8	1.8
Aug 14	0.477	0.018	0.047	4.1	4.5	6.3	1.8	21.3	1.5	6.6	N/A
Sept 14	0.447	0.018	0.040	<4.0	2.2	3.6	1.8	28.0	1.5	6.7	1.5
Oct 14	0.413	0.018	0.041	<4.0	2.6	3.8	1.5	140.0	1.4	6.6	2.3
Nov 14	0.568	0.018	0.031	N/A	N/A	N/A	N/A	N/A	N/A	6.4	N/A

	Daily Flow (Effluent)			BOD (5-day)	Suspended Solids	UV Intensity		E. Coli	Total N	pH	Total P
	Max.	Min.	Total	Final Eff.	Final Eff.	High	Low		Eff. (12 month)	Eff.	Eff.
Permit Limit				7	7	6.1 min	6.1 min	126	13.3	6-9	N/A
Units	mgd			mg/l	mg/l	mW/cm2		#/100 ml	lb/d	S.U.	lb/d
Month											
Dec 14	0.695	0.018	0.036	4.1	2.2	N/A	N/A	N/A	N/A	6.3	N/A
Jan 15	0.632	0.019	0.029	13.6	7.3	N/A	N/A	N/A	N/A	6.3	N/A
Feb 15	0.604	0.020	0.029	12.3	4.5	N/A	N/A	N/A	N/A	6.2	N/A
Mar 15	0.633	0.019	0.056	6.3	2.3	N/A	N/A	N/A	2.5	6.3	N/A
Apr 15	0.483	0.018	0.050	4.6	2.6	6.5	3.9	246.0	N/A	6.4	1.2
May 15	0.330	0.018	0.046	6.3	4.7	1.7	0.7	17.5	N/A	6.7	1.2
Jun 15	0.453	0.018	0.065	<4.0	3.5	8.4	3.6	12.5	N/A	6.6	N/A
Jul 15	0.398	0.018	0.040	<4.0	2.6	9.8	3.5	10.0	N/A	6.8	N/A
Aug 15	0.443	0.018	0.043	4.0	2.6	9.9	3.0	10.0	N/A	6.7	N/A

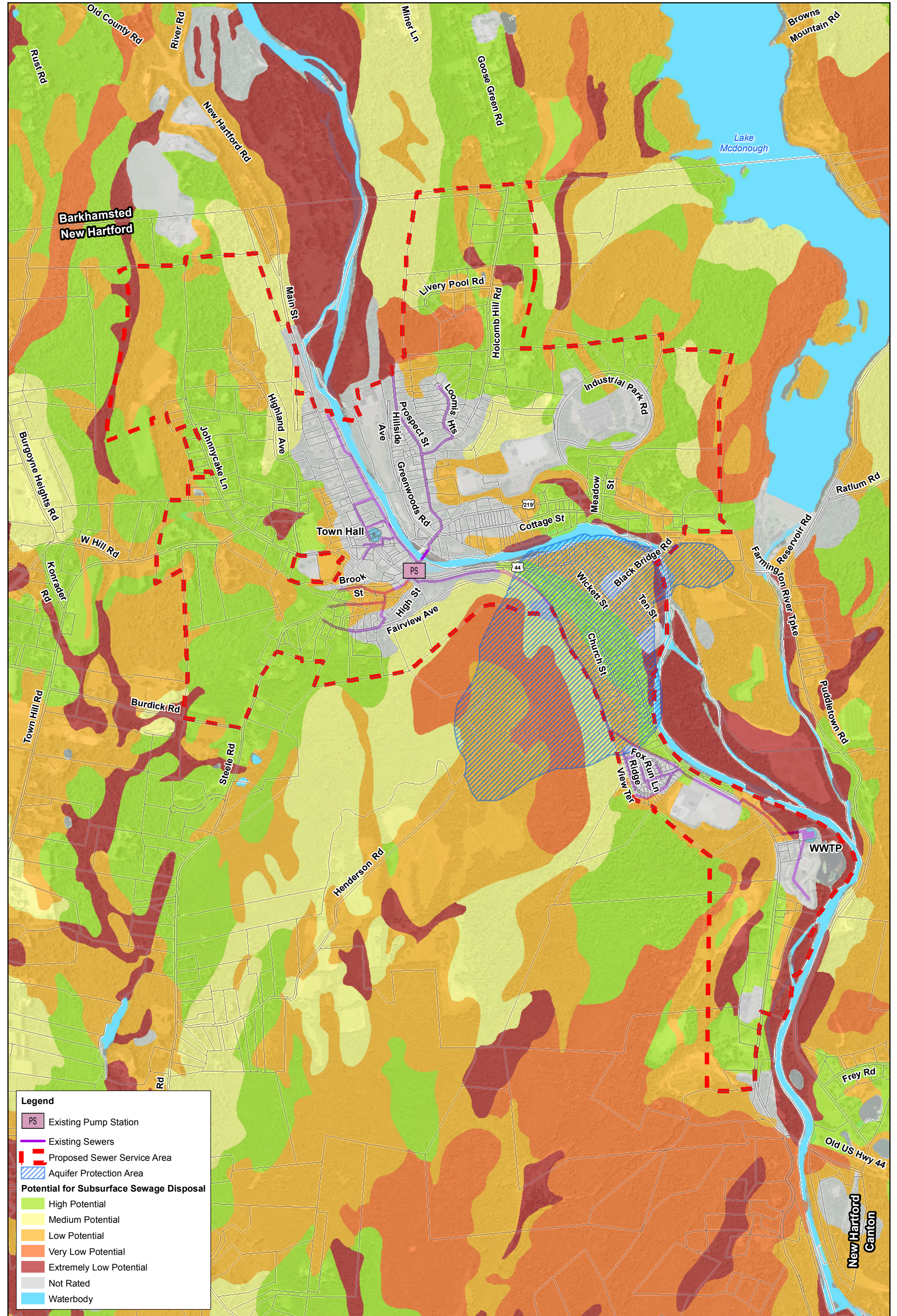
Table 2.1 WWTP MOR Summary - Cont'd

Table 2.2 Jones Mountain Trunk Observed Structural Defects (PACP Code 1-5 In Parenthesis)

Downstream MH	Upstream MH	Broken *	Fracture	Joint Offset/ Separated	Surface Damage	Crack	Structural PACP Quick Rating	Comments
JM-2	JM-1						0000	
JM-3	JM-2						0000	
JM-4	JM-3						0000	
JM-5	JM-4	Y (4)		Y (3)	Y (2)	Y (1)	4132	Slight broken pipe at 300.5 ft.
JM-6	JM-5						0000	
JM-7	JM-6						0000	
JM-8	JM-7			Y (3)	Y (2)		3121	
JM-9	JM-8	Y (4)			Y (2)		4121	Slight broken pipe at 280.4 ft.
JM-10	JM-9						0000	
JM-11	JM-10						0000	
JM-12	JM-11						0000	
JM-13	JM-12						0000	
JM-14	JM-13						0000	
JM-15	JM-14						0000	
JM-16	JM-15	Y (4)					4100	Slight broken pipe at 192.8 ft.
JM-17	JM-16						0000	
JM-18	JM-17						0000	
JM-19	JM-18						4100	Slight broken pipe at 74.2 ft
JM-20	JM-19	Y (4)	Y (3)		Y (n/a)		4132	Slight broken pipe at 179.8 ft.
JM-21	JM-20				Y (n/a)		0000	
JM-22	JM-21				Y (2,4)		4122	Reinforcement visible at 140.3 ft.
JM-23	JM-22						0000	
JM-24	JM-23						0000	
JM-25	JM-24	Y (4)	Y (2)		Y (2)		4122	Slight broken pipe at 185 ft.
JM-26	JM-25					Y (2)	2100	
JM-27	JM-26						0000	
JM-28	JM-27						0000	
JM-29	JM-28						0000	
JM-30	JM-29						0000	
*All instances of broken pipe are minor; they are classified as breaks due to slight intrusions from the pipe circumference.								

Table 2.3 Jones Mountain Trunk Observed Operational and Maintenance Defects (PACP Code 1-5 In Parenthesis)

Downstream MH	Upstream MH	Deposits (Mineral)	Deposits (Gravel)	Deposits (Grease)	Roots	Infiltration	Tap Break in Defective	Tap Break In Intruding	O&M PACP Quick Rating	Comments
JM-2	JM-1								0000	
JM-3	JM-2		Y (2)						2E00	Rating occurrence is high due to long continuous defect
JM-4	JM-3		Y (2)						2700	
JM-5	JM-4		Y (3)			Y (2)			3121	
JM-6	JM-5				Y (1)				1100	
JM-7	JM-6				Y (3)				3100	
JM-8	JM-7								0000	
JM-9	JM-8						Y (3)		3100	
JM-10	JM-9								0000	
JM-11	JM-10								0000	
JM-12	JM-11								0000	
JM-13	JM-12				Y (3)				3100	
JM-14	JM-13								0000	
JM-15	JM-14								0000	
JM-16	JM-15				Y (2)				2100	
JM-17	JM-16								0000	
JM-18	JM-17								0000	
JM-19	JM-18								0000	
JM-20	JM-19				Y (3)				3200	
JM-21	JM-20								0000	
JM-22	JM-21								0000	
JM-23	JM-22				Y (3)				3100	
JM-24	JM-23						Y (3)		3100	
JM-25	JM-24					Y (3)			3100	
JM-26	JM-25								0000	
JM-27	JM-26	Y (2)						Y (3,4)	4231	Intruding tap at 98 and 247 ft.
JM-28	JM-27							Y (2)	2100	
JM-29	JM-28				Y (3,1)				3112	
JM-30	JM-29			Y (4,2)					4121	Grease build up at 84.8 ft.



Legend

PS

Existing Pump Station

Existing Sewers

Proposed Sewer Service Area

Aquifer Protection Area

Potential for Subsurface Sewage Disposal

High Potential

Medium Potential

Low Potential

Very Low Potential

Extremely Low Potential

Not Rated

Waterbody

Section 3

Alternatives Evaluation

This Section discusses options for maintenance of the Jones Mountain Trunk Sewer, and alternatives for sewer extensions to the Cottage Street and Pine Meadow areas.

3.1 Jones Mountain Trunk Sewer

As discussed in Section 2, the Jones Mountain Trunk Sewer recently underwent a CCTV inspection in order to assess its condition. The inspection revealed that the sewer is generally in favorable shape. The condition of the pipe overall does not warrant immediate repairs or replacement, but the pipe should be re-inspected in several years to confirm any apparent deterioration. At this time, a proactive program of cleaning and root removal is recommended, due to evidence of prior root intrusion, along with television inspection every 3-5 years.

If additional deterioration or cracking is observed in future inspections, the pipe could be rehabilitated with cured-in-place pipe (CIPP). Alternatively, specific locations of broken or deteriorated pipe, if encountered, could be repaired by excavating and replacing short segments of pipe, but this is disruptive and may not be cost-effective. CIPP is a comprehensive rehabilitation for entire manhole-to-manhole segments with minimal excavation and access required, except in the case of collapsed pipe. It is estimated that cured-in-place lining of the entire 7,500 linear feet of the 12-inch diameter Jones Mountain Trunk sewer would cost on the order of \$65-\$75/linear foot including contingencies and some allowances for land clearing and rehabilitation of manholes. In today's dollars that would be a construction cost of approximately \$490,000 to \$570,000. Including allowances for engineering and implementation, a budgetary figure for this project is approximately \$750,000. At this time, this work is not recommended in the near future.

It is noted that the capacity of the 12-inch Jones Mountain Trunk Sewer is approximately 1.4 million gallons per day (mgd). Current flows average approximately 60,000 gallons per day (gpd) (0.06 mgd) and peak hourly flows are approximately 0.9 mgd. Addition of the Cottage Street and Pine Meadow area flows are estimated to add approximately 33,000 gpd (0.033 mgd) of average daily flow with peak flows of up to 0.2 mgd. This would result in a new peak flow of 1.1 mgd, which is within the capacity of the existing pipe.

It is also noted that evaluation of the remainder of the Town's collector sewers was not included in the scope of this report; CCTV inspection of the system every 5-10 years is advisable.

3.2 Sewer Extension Areas

3.2.1 Cottage Street

Multiple sewer options were considered for the Cottage Street area, including gravity sewers, pumping stations and individual grinder pumps. Ultimately, two viable alternatives for sewerage the Cottage Street area are presented on figures at the end of this Section (Options C-1 and C-2).

The first option, C-1, includes gravity sewers along Cottage Street, Reservoir Road and Black Bridge Road. The topography of the neighborhood does not allow connecting to the existing Reservoir Road sewer by gravity, so pumping is required. Option C-1 shows gravity sewers flowing towards a pump station preliminarily located on an undeveloped parcel at 115 Cottage Street. The pump station would discharge to a force main flowing west on Cottage Street to the existing sewer at the intersection of Reservoir Road and Cottage Street, and ultimately to the Route 219 pumping station.

As noted in Section 2, an analysis of the Route 219 pumping station is recommended due to the age of the station and its equipment. One of the existing pumps has a reported capacity of 210 gpm (approximately 302,000 gpd) and the other pump is slightly larger. Based on reported peak flows at the WPCF, it is likely that both pumps operate at times; the station requires further analysis to confirm capacity. If the pumping station is not adequately sized to handle the additional peak flows, two options to consider would be increasing the pump station capacity or extending the force main directly to the Jones Mountain Trunk Sewer.

It is noted that it is also possible to route the force main from the Cottage Street pump station to the east to Reservoir Road and Black Bridge Road, ultimately discharging to the Pine Meadow sewers (if constructed, discussed below). Though this would require a shorter length of force main piping (2000' vs 2700'), it would include piping in otherwise undisturbed roadway on a portion of Black Bridge Road (whereas the Cottage Street force main option could include both gravity sewer and force main in the same trench), and crossing the river via the Black Bridge Road bridge. It would also increase the size of the pump station needed for the Pine Meadow area discussed below. For these reasons, this configuration is not presented on the figures, but may still be evaluated during preliminary design.

The second option, C-2, includes servicing the area with individual residential grinder pumps and low-pressure sewers in lieu of traditional gravity sewers and a community pumping station. For this option, each home would have a grinder pump which moves wastewater into a low-pressure force main located in the road. Wastewater from each home flows by gravity into the pump chamber where the pump starts once the volume reaches a specific capacity, and the wastewater is conveyed out to a small-diameter (likely 1.5- to 2-inch) pipeline installed approximately 5 feet deep. Rather than manholes, air release valves and flow isolation valves are installed within the main pipe. Either homeowners or the municipality would be responsible for the long-term maintenance of the grinder pump. Monthly power usage is typically the responsibility of the property owner, as a well pump would be. Low-pressure sewers have some advantages including lower capital cost for the pipeline installation due to smaller-diameter pipes at shallower depths compared to traditional gravity sewers. However, disadvantages include having numerous mechanical components (pumps) throughout the system, which require regular maintenance by either the homeowner or the municipality. With grinder pump systems, extended power outages have the potential to cause sewer backups unless provisions for connection to individual generators are incorporated into the design of each homeowner's system. Thus, having grinder pumps on each property can lead to negative public perception of the project. Nonetheless, this is a technically feasible option for the Cottage Street area.

For either option, C-1 or C-2, an additional variation includes further expansions to include more connections on surrounding roadways – Reservoir Road from Prospect Street to the east, Reservoir Road from Cottage Street to the west, Meadow Street (towards the Industrial Park), and Carter Street. These variations are shown as additional optional sewers on both figures.

One additional alternative that was considered would involve putting a siphon under the Farmington River and connecting to the Pine Meadow sewers discussed below. This may eliminate the need for pumping from Cottage Street, but it would likely be difficult to obtain permits to construct a pipe under the Farmington River in this recreational area, given that other options are feasible. Additionally, siphons are difficult to maintain, particularly in areas with relatively low flow and potential for sedimentation. As such, this option is not recommended.

Cottage Street potential project costs are summarized in **Table 3-1** below.

Table 3-1: Cottage Street Sewer Extension Options – Project Costs

Cottage Street			
	Option C-1	Option C-2	Additional Extensions
Anticipated Construction Cost	\$1,900,000	\$1,600,000	\$400,000
Engineering and Implementation (17% of Construction)	\$320,000	\$270,000	\$70,000
Project Contingency (10%)	\$220,000	\$190,000	\$47,000
Total Estimated Project Cost (Rounded)	\$2,400,000	\$2,100,000	\$500,000

Note: Construction cost estimates assume minimal rock and groundwater, and no contaminated soils. Escalation to mid-2018 construction is included.

3.2.2 Pine Meadow Area

Similar to Cottage Street, multiple configurations were considered for the Pine Meadow area, including gravity sewers, pumping stations and individual grinder pumps. Ultimately, three viable alternatives for sewerage the Pine Meadow area are presented on figures at the end of this Section (Options P-1, P-2 and P-3).

For Pine Meadow, the possibility of a completely gravity-driven sewer was considered. This would be the lowest-cost option, with no long-term maintenance of pumping facilities required. However, due to the relatively flat topography of the area and the shallow depth of the Jones Mountain Trunk Sewer, gravity sewers with minimum recommended slopes of 0.4% cannot be constructed in the Pine Meadow neighborhood at elevations low enough to connect to the existing Jones Mountain Trunk Sewer by gravity. Thus, it appears that pumping will be required to convey wastewater from the Pine Meadow neighborhood to the existing Jones Mountain sewer.

Options P-1 and P-2 both include gravity sewers along Wickett Street, Ten Street, Black Bridge Road, Church Street and Main Street, converging at a pumping station preliminarily located at the rear of an industrial parcel located at 8 Wickett Street. The pumping station would discharge to a force main flowing down Main Street and Church Street, ultimately flowing to the Jones Mountain trunk sewer. It is noted that the Main Street (Route 44, a State road) sewer may be located in the

road shoulder rather than travel lane to keep construction disruption and pavement restoration costs down.

The second option P-2 is similar to P-1 except that a portion of the pipe is relocated from Main St to an abandoned canal bed located along the eastern edge of the properties on Main Street and the western edge of the properties on Wickett Street. This canal bed is reportedly owned by one property owner, though the GIS does not currently show it as a single parcel. This option has the benefit of reducing construction in Main Street/Route 44, and construction would also be at a shallower depth, but it comes with the disadvantage of additional private property disruption. As shown on the figure, a sewer would still be required on Wickett Street to serve the homes there. Most residents located on the west side of Main Street and Church Street would need to connect directly to the Jones Mt. Trunk. In order to do this, approximately 14 new grinder pumps would be installed since the trunk is uphill from the properties. Currently, adjacent properties that are connected to the sewer have grinder pumps that are owned by the residents. As discussed above in the Cottage Street option, this may not be perceived well by the homeowners due to the added responsibility, but this option minimizes construction of new piping in Main Street/Route 44.

The final option, P-3, includes servicing the area with individual residential grinder pumps and low-pressure sewers in lieu of traditional gravity sewers and a community pumping station. As described under Cottage Street above, for this option, each home would have a grinder pump which moves wastewater into a low-pressure force main located in the road or easement. Advantages and disadvantages are described above under Cottage Street; this is a technically feasible option for the Pine Meadow area.

As discussed in Section 2, the WPCA may issue orders to approximately 13 property owners on Church Street to connect to the Jones Mountain trunk sewer via grinder pumps. Additionally, there are a few parcels on Church Street that do not have frontage on Main Street or directly on the Jones Mountain trunk sewer, but easements may be negotiated to connect to one of these sewers in lieu of a sewer on Church Street. The figures and cost estimates currently include a conservative layout, with a sewer on Church Street, for planning purposes. However, the results of these negotiations may reduce the extent of sewer required on Church Street, which would result in cost savings for the Pine Meadow Area sewer extension for any of the options.

Pine Meadow potential project costs are summarized in **Table 3-2** below.

Table 3-2: Pine Meadow Sewer Extension Options – Project Costs

	Option P-1	Option P-2	Option P-3
Anticipated Construction Cost	\$2,600,000	\$2,500,000	\$2,400,000
Engineering and Implementation (17 % of Construction)	\$440,000	\$430,000	\$410,000
Project Contingency (10%)	\$300,000	\$290,000	\$280,000
Total Estimated Project Cost (Rounded)	\$3,300,000	\$3,200,000	\$3,100,000

Note: Construction cost estimates assume minimal rock and groundwater, and no contaminated soils. Escalation to mid-2018 construction is included.

3.3 Protection of Wastewater Infrastructure in Floodplains

Portions of Cottage Street are within the 100-year flood plain (according to the most recent FEMA Flood Insurance Rate Maps dated February 1982), but the potential pump station site appears to be just outside of the floodplain. For Pine Meadow, the majority of the area east of Main Street, including the potential pump station site, is located within the 100-year floodplain.

In general, minimizing the presence of wastewater-containing structures (septic tanks and grinder pumps) is preferable within floodplains. The potential exists for floodwater intrusion into septic tanks, resulting in wastewater mixing with floodwaters. Regarding grinder pumps, the same potential for wastewater contamination exists for any pump chambers that are not properly covered, and any household flooding could damage electrical and control components of the pumps. This is a factor weighing against individual grinder pumps in both neighborhoods, but does not preclude the option of continuing with some grinder pumps along Church Street and the Jones Mountain trunk sewer which is outside of the floodplain.

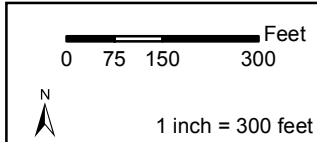
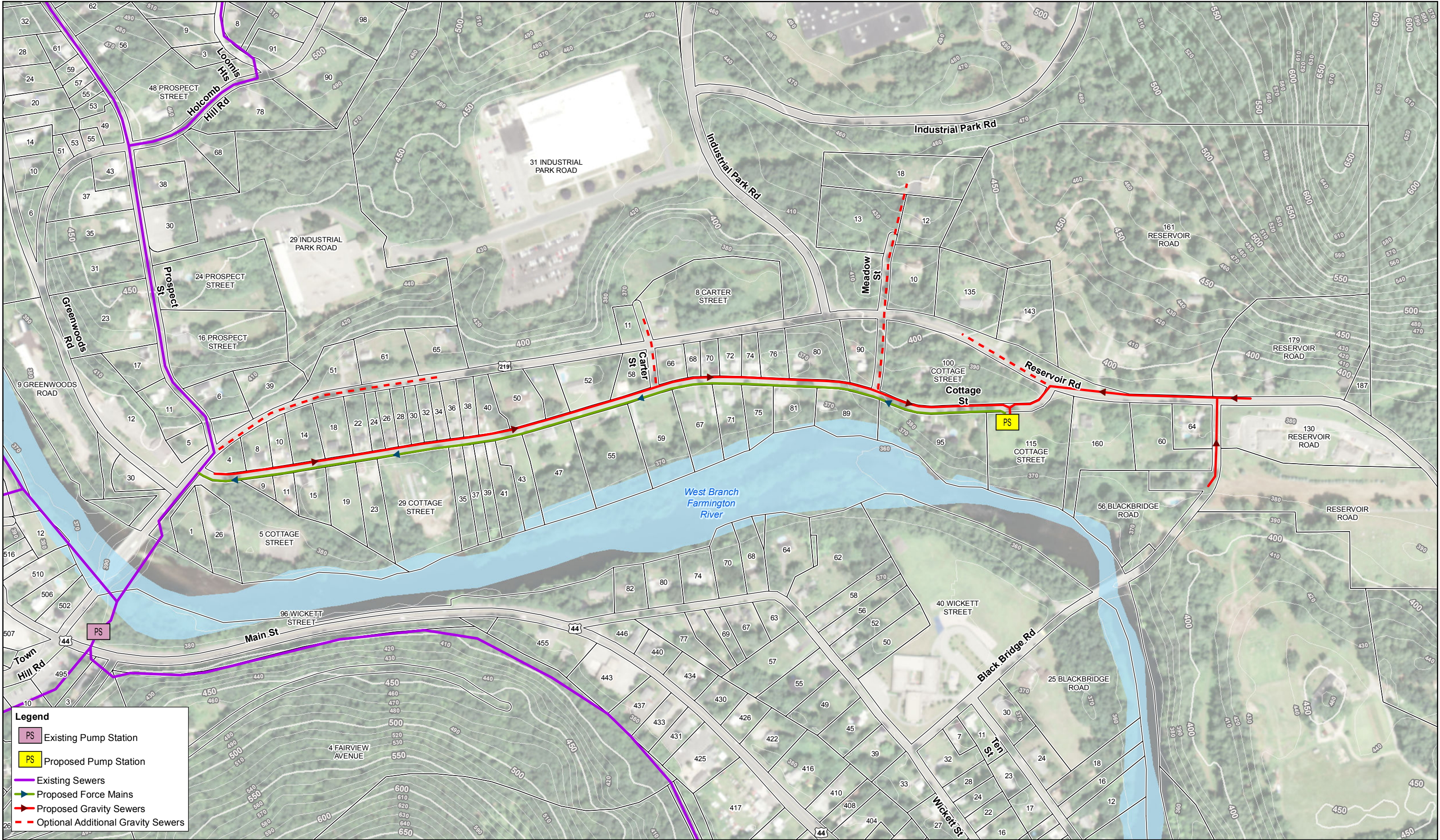
It is not unusual to have wastewater collection systems and associated infrastructure located within floodplains. There are unique challenges associated with designing infrastructure in these areas, but protection in the form of watertight manhole covers and backwater valves for homes minimizes risk of damage to private property from wastewater during a flooding event.

A consideration for pumping station design is protection of the facility during a flood. Per TR-16 guidelines, any pumping stations located below the 100-year flood elevation must be protected from damage during a 100-year flood. In fact, regulatory trends may require protection up to an additional 3 feet above the 100-year flood elevation defined by the Federal Emergency Management Agency (FEMA). Even though facilities (and surrounding homes on the sewer system) may be inaccessible during a flood, the intent of regulations and guidelines on this topic is to minimize equipment loss in the event of a catastrophic flood event, and allow facilities to be returned to service in the shortest time possible. Facilities must also be fully accessible and operational during a 25-year flood.

Detailed floodproofing measures will be evaluated during design but will likely include floodproof hatches on below-grade chambers, and elevating the floor and doorways of any utility buildings. It also may be possible to protect the facility with a protective barrier. It is understood that the Town desires to maintain the residential character of these neighborhoods, so architectural style and appeal should also be considered during the floodproofing design of pumping station structures.

Emergency power (generator) should be provided at all pumping facilities, and also must be elevated to protect from flood. During design, DEEP Flood Management Certification must also be obtained for new facilities to be located within floodplains, to ensure that the new construction does not have an adverse impact on flooding potential of nearby or upstream parcels.

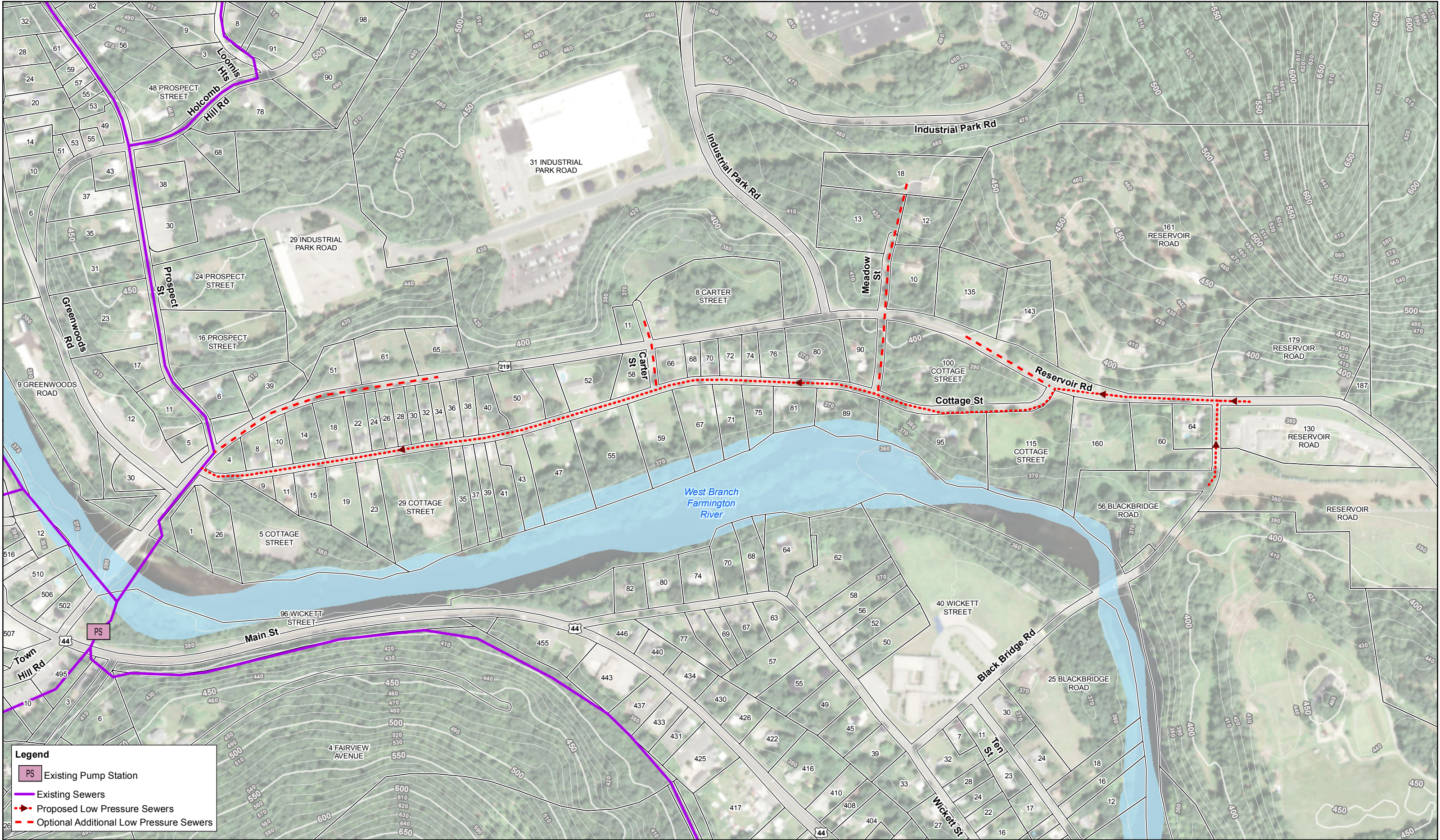
It is also noted that the Town's Route 219 pumping station is located within the 100-year floodplain. Protection of the infrastructure, including consideration for a protective barrier, should be included as part of an evaluation of that Station.



New Hartford, CT

Cottage Street Residential Area

Option C-1 Gravity Sewers with Pump Station







Legend

- PS Proposed Pump Station
- Existing Sewers
- Proposed Force Mains
- Proposed Gravity Sewers
- Existing Sewer Connection



Section 4

Projected Costs and Revenue Distribution

This Section presents a summary of project costs, funding sources, and revenues projected for each of the sewer extension areas, Cottage Street and Pine Meadow.

4.1 Recommended Sewer Extension Options

Alternatives for sewer extensions in Cottage Street and Pine Meadow are presented in Section 3. Ultimately, the recommended option may not necessarily be the absolute lowest cost option, but must be a cost-effective option that will provide health and environmental protection with the greatest security and lowest long-term maintenance for the Town. Ultimately the WPCA and Town officials will determine the preferred options. For purposes of this draft report, the preliminarily recommended options are:

- Cottage Street – Option C-1, Gravity sewers with pumping station, without additional extensions on Reservoir Road, Carter Street and Meadow Street shown on the Option C-1 figure. This Option does include the Canterbury Village apartment complex (approximately 24 units) at 130 Reservoir Road. Total Project Cost of \$2,400,000.
- Pine Meadow – Option P-1, Gravity sewers in streets with pumping station. Total project cost of \$3,300,000.

These are conservative recommended options for cost-benefit discussions. They also minimize the use of individual residential grinder pumps, which has a long-term maintenance benefit to the Town and homeowners. These figures do not include improvements to the Route 219 pumping station, should they be deemed necessary.

4.2 Grant and Loan Funding Sources

To minimize the financial impact to the Town but still satisfy the water quality needs in these sewer extension areas, available grant funding alternatives must be explored.

This project would be eligible for grant funding in the amount of 25% through the small communities set-aside program through the Connecticut DEEP, Clean Water Fund. A low-interest, 20-year loan may be borrowed for the balance.

Additional grant funding may be available through the USDA Rural Development (RD) Water and Waste Disposal program. Typically, towns with populations less than 10,000 are eligible for assistance, depending on median household income. Eligible project costs include funds for engineering, construction, legal costs, land and easement takings, and interim financing of interest. The potential for RD funding should be explored during the design phase of any sewer extension project. One benefit to RD funding is that they offer up to a 40-year financing term for some loans. According to Ms. Noreen Laurinaitis at the local RD office, the current rate New Hartford would qualify for is approximately 2.25% for up to 40 years, depending on the life of the

infrastructure being constructed. The rate is adjusted quarterly. There is sometimes a grant subsidy, but that is determined based on yearly budget requests and available funding.

Finally, grant funding may be available for the project from the Office of Policy and Management (OPM) Small Town Economic Assistance Program (STEAP) grant. This program can provide up to \$500,000 per year to each eligible Town. New Hartford is an eligible Town and has received STEAP grants in the past, including two for sewer repair projects near New Hartford's downtown center between 2011 and 2013. For these projects, the initial \$250,000 allotment (STEAP FY 2010) was not fully expended, and the balance was carried forward and supplemented with an additional \$150,000 (STEAP FY 2011) to do additional sewer restoration work, which was completed in 2013. These funds may be used to offset construction costs, or possibly to assist homeowners with costs associated with lateral connections to hook up to the sewer.

4.3 Cost Recovery and Revenues

Project costs for the Cottage Street and Pine Meadow Sewer Extensions are presented in Section 3, and the total project costs for the preliminarily recommended options are noted in Paragraph 4.1 above. There are numerous alternatives by which the Town can recover the capital cost of the wastewater system construction. These range from cost sharing by the users of the system, cost recovery through debt service on the town-wide tax rate, and assessment of betterments. A brief description of the most commonly used revenue sources follows.

4.3.1 Benefit Assessments and Connection Fees

Connecticut law (CGS 103: 7-249) allows communities to charge a one-time "betterment" fee or "Benefit Assessment" for the construction of a sewer system. These fees can be paid by the owner of the bettered property as either a one-time payment, or may be amortized over 20-30 years, typically at the same borrowing rate that the Town uses to finance the construction. All property owners who receive sewer service, whether they connect to the sewer system or not, can be assessed betterments. In order to assess betterments, municipalities must determine the approximate dollar value by which each property is increasing with the addition of the sewer service. This can be difficult in areas with varying property values, but the process can begin with hiring an appraiser to provide an average dollar value or percent increase for each neighborhood or street. The betterment fee by law is capped at the appraised value increase, and some towns choose to cap it at a slightly lower value than that. If the betterments do not produce enough revenue to fully pay for the construction of the project, the remainder typically must be shared by the other taxpayers in town.

As such, some communities support all or part of the construction and operation of its sewer system through the general tax rate. Under either of these circumstances, sewer related expenses become an expense to the general fund, and are paid through the proceeds of local property taxes. The use of tax levy support is often justified on the basis that these investments provide benefit to the Town as a whole, as well as to individual properties serviced by the facilities. This is currently the case in New Hartford.

As part of this study, information was gathered on Benefit Assessments established by other towns. Many towns do not publish this data or do not have an established formula for assessment

of them, particularly if they have not undertaken any sewer extension projects in recent years. Available data indicates that Benefit Assessments vary widely in both methodology and amount.

Some examples from other municipalities (all less than 900 users) include:

- Brookfield - 1.95% to 8.93% of grand list value
- Coventry – recently revised to \$12,000 per single-family home
- Newtown – conducts pre- and post- sewer appraisals for each extension
- Point-of-Woods (subdivision in South Lyme) - \$19,600
- Tolland - \$8,000
- Brooklyn, East Haddam, and Harwinton do not have established Betterment Assessments

New Hartford currently does not have an established Benefit Assessment but needs to determine the most appropriate methodology before embarking on the sewer extension projects. For preliminary planning purposes, a range of 5-8% of appraised value may be appropriate for residential properties. This must be ultimately determined by the WPCA and other Town leaders. According to the Town's Assessor data, the residential properties in both the Cottage Street and Pine Meadow area have an average appraised value of approximately \$170,000. This 5-8% range would result in a Benefit Assessment between \$8,500 and \$13,600 per property. Preliminary discussions with the WPCA indicate that the upper end of that range is likely too high to be widely supported at this time.

For the initial draft analyses presented below, a range of Benefit Assessments of \$5,000 to \$10,000 per connection was assumed for simplicity. It is noted that multi-family units are counted as separate individual connections in the financial analysis presented below; the large complex at 130 Reservoir Road is counted as 0.5 EDU per unit as noted in Section 2. This value may be higher than appropriate for some of the multi-family units; however, some higher-value properties including commercial lots may equalize this assumed cost.

One option for Benefit Assessments for duplexes and small multi-unit properties is to charge a fixed value for each lot, plus an additional fee for each dwelling unit on that lot. For example, in Coventry, the WPCA recently adopted a Benefit Assessment of \$3,100 per lot, plus \$8,900 for each EDU; a duplex would be charged \$3,100 plus 2 * \$8,900, for a total of \$20,900. A separate formula would need to be established for large apartment complexes and commercial properties, and would often be based on estimated flow and EDUs.

It is noted that a new septic system, when needed, may cost homeowners between \$5,000 and \$20,000, or more, depending on site conditions, and it is possible that substantial repairs may be needed more than once during a homeowner's time owning a residence. This may be a useful discussion point relative to the one-time Betterment Assessments that will be levied.

In addition to Benefit Assessments, most municipalities charge a one-time fee at the time of hookup – a "Connection Fee" intended to recover some of the implementation costs associated with new users. These values also vary widely, often between \$1,000 and \$3,000 per hookup

based on data from several towns that have less than 500 system users. At present, New Hartford has an established connection fee of \$250 per single-family residential unit, \$300 per two-family unit, and the ability to charge proportionately more for larger or commercial developments. For purposes of the initial draft analyses presented below, a range of \$1,000 to \$6,000 per EDU is used.

It is noted that homeowner costs related to on-lot work for sewer connections (lateral connections and decommissioning of septic tanks) are not included in the project costs. A range of costs for this work is \$5,000 to \$15,000, dependent on lot-specific conditions such as topography and distance from home to road.

4.3.2. Annual Sewer User Fees

DEEP's Clean Water Fund Regulations require that a user charge system must be adopted and designed to produce adequate revenues required for the operation, maintenance, and replacement of the wastewater facilities. Each user that discharges wastewater to the system is required to pay a share of the cost. In addition, the user charge may also include the cost to recover part or all of the debt associated with the construction of the wastewater facilities. The user charge system must be adopted through the municipal legislative process and all funds generated must be segregated from the general tax revenue and utilized for the sole purpose of wastewater collection and treatment. Charges are usually based on water use, which is a reasonable estimate of sewage generation, or an average flat fee for those customers not on metered public water.

As with Benefit Assessments, there is a wide range of annual sewer user rates throughout the state. Rates for numerous municipalities with user bases less than 500 customers were examined, and many have average annual fees that are less than \$500 per user. However, some towns including East Haddam, Goshen and Redding have annual fees greater than \$900. New Hartford's annual user fees are based on water consumption and average approximately \$1400 per year.

The WPCA may consider small rate increases in future years, but there is evidence that users are exercising water conservation measures to limit their bills (based on 2015 and 2014 revenue collection data); as such, for this study it is assumed that the average fee of approximately \$1400 per user will remain static for the near future.

4.3.3 Cost and Revenue Projections

The tables below present project costs as well as revenue projections associated with the proposed sewer extensions. It is noted that for this analysis, it was assumed that all users will be required to connect and the WPCA will collect all appropriate revenues.

Tables 4-1 and 4-2 present the project costs and debt service for the proposed sewer extensions, isolated from other WPCA budget items. **Bold values in the table** indicate those used in Table 4-3 which presents WPCA budget scenarios.

Table 4-1: Cottage Street Sewer Extension Options – Debt Service and Income

	Lowest to Highest Property Owner Costs (Connection Fees and Benefit Assessments)		
Number of New Connections (EDUs)	79	79	79
Project Cost Estimate	\$2,400,000	\$2,400,000	\$2,400,000
Town/WPCA Portion (Assuming 25% DEEP)	\$1,800,000	\$1,800,000	\$1,800,000
Connection Fee Recovery (First year) (\$1000; \$3000; \$6000 each)	\$79,000	\$237,000	\$474,000
Amount Financed by Town/WPCA	\$1,721,000	\$1,563,000	\$1,326,000
Annual Debt Payment (20 years, 2%)	\$105,000	\$96,000	\$81,000
Annual Debt Payment (30 years, 3%)	\$88,000	\$80,000	\$68,000
Annual Additional Income from Benefit Assessment Payments (\$5000; \$7500; \$10000; 20 years, 2%)	\$24,000	\$36,000	\$48,000
Annual Additional Income from Benefit Assessment Payments (\$5000; \$7500; \$10000; 30 years, 3%)	\$20,000	\$30,000	\$40,000
Annual Additional Income from New User Fees (Average \$1400/EDU)	\$110,600	\$110,600	\$110,600

Table 4-2: Pine Meadow Area Sewer Extension Options – Debt Service and Income

	Lowest to Highest Property Owner Costs (Connection Fees and Benefit Assessments)		
Number of New Connections (EDUs)	106	106	106
Project Cost Estimate	\$3,300,000	\$3,300,000	\$3,300,000
Town/WPCA Portion (Assuming 25% DEEP)	\$2,475,000	\$2,475,000	\$2,475,000
Connection Fee Recovery (First year) (\$1000; \$3000; \$6000 each)	\$106,000	\$318,000	\$636,000
Amount Financed by Town/WPCA	\$2,369,000	\$2,157,000	\$1,839,000
Annual Debt Payment (20 years, 2%)	\$145,000	\$132,000	\$112,000
Annual Debt Payment (30 years, 3%)	\$121,000	\$110,000	\$94,000
Annual Additional Income from Benefit Assessment Payments (\$5000; \$7500; \$10000; 20 years, 2%)	\$32,000	\$49,000	\$65,000
Annual Additional Income from Benefit Assessment Payments (\$5000; \$7500; \$10000; 30 years, 3%)	\$27,000	\$41,000	\$54,000
Annual Additional Income from New User Fees (Average \$1400/EDU)	\$148,400	\$148,400	\$148,400

As shown, the two projects collectively will result in additional debt service of approximately \$190,000 for a 30-year term at 3% interest (\$80,000 Cottage Street and \$110,000 Pine Meadow). However, additional revenues from Benefit Assessment payments and additional user fees are estimated at \$330,000. This is an apparent positive for the WPCA, but other impacts to the WPCA budget must be considered.

Table 4-3 below presents an abbreviated summary of the current WPCA sewer operations budget and sewer debt service. As shown, the current WPCA sewer revenues do not cover all operating and debt payment costs, and the WPCA budget is balanced by a surplus in water revenues.

For the future, post-sewer-extension construction budget scenario, some increase to operations costs are assumed. The new sewer extensions and pump stations are not anticipated to require substantial investment beyond the initial capital costs during the 30-year debt service period, but some increases to power consumption and general maintenance will be realized. However, notably, sludge disposal costs will increase generally proportionately with the increase in flow. Assumptions are listed in the notes below the table. The table also presents financial impacts of a developer-funded sewer extension on Greenwoods Road, mentioned in Section 2.

Table 4-3: Estimated Impact on Sewer Portion of WPCA Budget *All Expenditures and Shortfalls Noted with (Parenthesis)*

	Current Budget (Approximate)	Future Budget, Including Both Cottage St and Pine Meadow Sewer Extensions (7)	Future Budget, Also Including Developer-Funded Greenwoods Road Sewer Extension (8)
Routine Operations (1)	(\$197,000)	(\$217,000)	(\$217,000)
Non-Routine Operations, Generator, Fuel, Power, Rubbish (2)	(\$103,000)	(\$108,000)	(\$110,000)
Sludge Hauling (3)	(\$41,000)	(\$62,000)	(\$71,000)
Debt Service (4)	(\$84,000)	(\$274,000)	(\$274,000)
Total Annual Sewer Expenditures (5)	(\$425,000)	(\$661,000)	(\$672,000)
Total Annual Sewer Revenue (6)	\$342,000	\$672,000	\$770,000
Annual Surplus (or Shortfall) within Sewer Portion of WPCA Budget	(\$83,000)	\$11,000	\$98,000

(1) Current Routine based on estimated Water Planet Contract in '16-'17 budget as of April 2016; many costs are fixed; assume 10% increase due to sewer extensions

(2) Current Non-routine based on '16-'17 budget as of May 2016, including non-routine operator costs, fuel, electricity, phone, trash, misc; many costs are fixed; assume 5% increase due to sewer extensions

(3) Current Sludge based on Veolia '16-'17 budget as of April 2016; estimate 50% increase due to additional sludge production from sewer extensions

(4) Current Debt includes Total of '16-'17 budget line items: Plant (matures in 2041, see additional discussion below), 130K Loan (matures in 2024), and Prospect Street (matures in 2026); Sewer Extension Debt Payments based on 30 years, 3%.

(5) Excluding "General Account" Items in WPCA Budget

(6) Current revenue based on '16-'17 budget as of April 2016 (215 users including some large commercial). Expanded based on additional 185 users at \$1400 Average Sewer Bill, plus Benefit Assessment Payments enumerated above (30 years, same as Sewer Extension Debt terms).

(7) Budget does not include substantial improvements at Rte 219 pumping station

(8) Greenwoods Sewer Extension is based on 125 units at 1.5 persons per unit average; water usage equivalent to approximately 73 EDUs. Does not include substantial improvements at Rte 219 pumping station.

As noted in the last line of the table, the sewer portion of the current WPCA budget is subsidized by a surplus in the water portion of the WPCA budget. Based on the assumptions noted in the table and notes, the Cottage Street and Pine Meadow sewer extensions are estimated to improve the sewer budget by approximately \$94,000 per year, after accounting for the additional debt service and expenses associated with treatment and sludge hauling. The estimated sewer budget shows a small surplus without relying on the water funds to offset sewer expenses.

This table presents the financial picture **in current dollars** for the next several years and is based on a 30-year term for the new sewer extension debt as well as Benefit Assessment payments. However, it is noted that \$13,000 yearly debt service (\$130K loan on WPCA budget) will end in 2024 and an additional approximately \$4500 in annual debt service (Prospect Street loan on WPCA budget) will end in 2026.

Conversely, however, the Town is currently subsidizing the treatment plant loan payment by \$131,000 per year, leaving the WPCA with approximately \$66,000 per year of the \$197,000 loan payment (scheduled for maturity in 2041). The Town and WPCA may consider increasing the WPCA portion and decreasing the Town portion by approximately \$54,000 per year beginning in 2019. The anticipated revenues from these sewer extensions will offset that increased WPCA cost, and the increase in the WPCA portion of the debt appears to be accommodated within the sewer budget if the Greenwoods developer-built extension is constructed.

Finally, **Table 4-4** below presents a range of costs to be borne by property owners who are part of the new sewer extension projects. This table includes connection fees, benefit assessments, on-lot costs for lateral connections and septic tank abandonment, and annual user fees. For purposes of this table it is assumed that connection fees are paid up-front but Benefit Assessments and lateral connection/septic abandonment costs are financed for 30 years (same term as estimated for the WPCA sewer extension loans).

Table 4-4: Estimated Range of Property Owner Total Annual Costs

Item	Low End of Estimate	High End of Estimate
Connection Fee (up-front, not financed)	\$1,000	\$6,000
Benefit Assessment	\$5,000	\$10,000
Lateral Connection/Septic Abandonment	\$5,000	\$15,000
Total to Finance	\$10,000	\$25,000
Approximate Annual Payment (BA + Lateral, 30 years, 3%)	\$510	\$1,275
Approximate Annual Cost Including \$1400 User Fee	\$1910	\$2,675

4.4 Conclusion

As shown in the tables above, the Cottage Street and Pine Meadow area sewer extensions are anticipated to result in increased revenue for the WPCA, even when debt service and additional operational costs are considered. As discussed in Section 2, the density of development in these neighborhoods, in close proximity to the valuable Farmington River and the Town's aquifer, validate the concept of extending sewer service to these areas.

WPCA Line Extension Endorsement & Recommendations

The WPCA endorses the Sewer Line Extension & Repair Evaluation Report prepared by the professional engineering firm of CDM-Smith. The reviewed areas are specific to expansion of New Hartford's wastewater collection system to include the Cottage Street Section and Pine Meadow Section, options (C-1 & P-1) as shown in the accompanying Report, Section #3, Maps C-1 and P-1.

The WPCA, utilizing the Key Assumptions noted below, will begin the process of promoting public information sessions to inform and gain acceptance of these projects for town-wide approval. These Key Assumptions include:

(1) Total Project construction costs, including engineering fees for services will approximate \$5,700,000, with a Town/WPCA portion of \$4,275,000 and Clean Water Grant Funding of \$1,425,000.

(2) The current set-asides for grant and low interest loans in support of both projects will be available for these projects.

(3) Revenues, (rates, connection fees, & benefit assessments) as projected in the Report along with participation by all Town taxpayers will meet the requirements for operations, maintenance and debt service to cover the cost of both projects providing competitive rates for residential and commercial accounts.

(4) Benefit Assessments are pegged at a range from \$7,500-\$10,000 and Connection Fees at a range from (\$1,000-\$3,000-\$6,000) per household.

(5) Mandatory connection orders and payment of Betterment Assessment Fees begins within (90) days of construction completion.

(6) Outstanding abutters (previously not connected - estimated at 38 households) receive orders to connect and are given benefit assessments to reflect their participation in debt service payments for the WWTP.

(7) Low interest Benefit Assessment Lateral Connection Loans will exist through Town or third party sources, with terms acceptable to the Town and WPCA.

(8) The WPCA endorses the project without regard to the disposition of any Developer Project. The Greenwoods project is shown for illustration purposes as indicative of the contribution a developer funded construction project with 125 connections contributes to the potential revenue stream.

WPCA Line Extension Endorsement & Recommendations

Essential steps in the go forward process include:

- DEEP Submission & Acceptance Of The WPCA Approved Extension Plan Report
- Public Information Sessions P&Z 8-24 Approval
- Approval Referendum - (Design, Construction, Contingency)
- Design Essentials & Confirmation Of Funding
- Bidding
- Construction Start

It is the goal of the New Hartford WPCA to provide a quality constructed, reliable and cost effective wastewater infrastructure, (Plant & Collection System) that promotes environmental protection and insures public health & safety at competitive rates that stimulates commercial and industrial development, providing economic growth and rate stabilization for both residential users and commercial accounts alike.