



**SEWER AREA RANKING PLAN  
FINAL REPORT**

**STOUGHTON, MASSACHUSETTS  
KLEINFELDER PROJECT #20153855.001A**

**NOVEMBER 2015**

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**SEWER AREA RANKING PLAN  
FINAL REPORT**

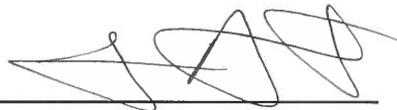
**STOUGHTON, MASSACHUSETTS**

Kleinfelder Project Number: 20153855.001A

Prepared by:

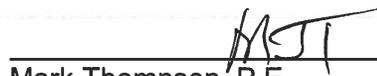


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**SEWER AREA RANKING PLAN - FINAL REPORT  
STOUGHTON, MASSACHUSETTS  
NOVEMBER 2015**

**EXECUTIVE SUMMARY**

The Town of Stoughton, Massachusetts retained the services of Kleinfelder to prepare an assessment of targeted areas of the Town that are presently unsewered and to recommend whether or not sewer is warranted. The areas recommended to be sewered are ranked on the basis of need for environmental and public health protection as well as potential economic benefit to the Town created by providing municipal sewer.

This study incorporated feedback from an assembled Steering Committee comprised of Town employees, residents and business owners representing a broad perspective on the subject of extending sewers. The Steering Committee Members are identified below.

	<b>First Name</b>	<b>Last Name</b>	<b>Title</b>
1	John	Batchelder	Public Works Superintendent
2	Scott	Carrara	Contractor
3	Bill	McNamara	Resident
4	Joseph	Nocera	Business Owner
5	Noreen	O'Toole	Town Planner
6	Andrew	Tibbs	Board of Health
7	Marc	Tisdelle	Town Engineer
8	Peter	Ventresca	Resident
9	Cynthia	Walsh	Board of Selectmen/ Resident

This study specifically seeks to complete the following objectives:

1. Review recent Health Department data, soils information, and land use information to determine where on-site wastewater disposal using septic systems may be problematic.
2. Recommend sewer extensions to those unsewered areas of greatest need and potential for economic benefit.
3. Prepare a ranking of the areas recommended to be sewered on the basis of public health and environmental protection, as well as potential for economic benefit.
4. Estimate the magnitude of new wastewater flows anticipated from each area recommended to be sewered.

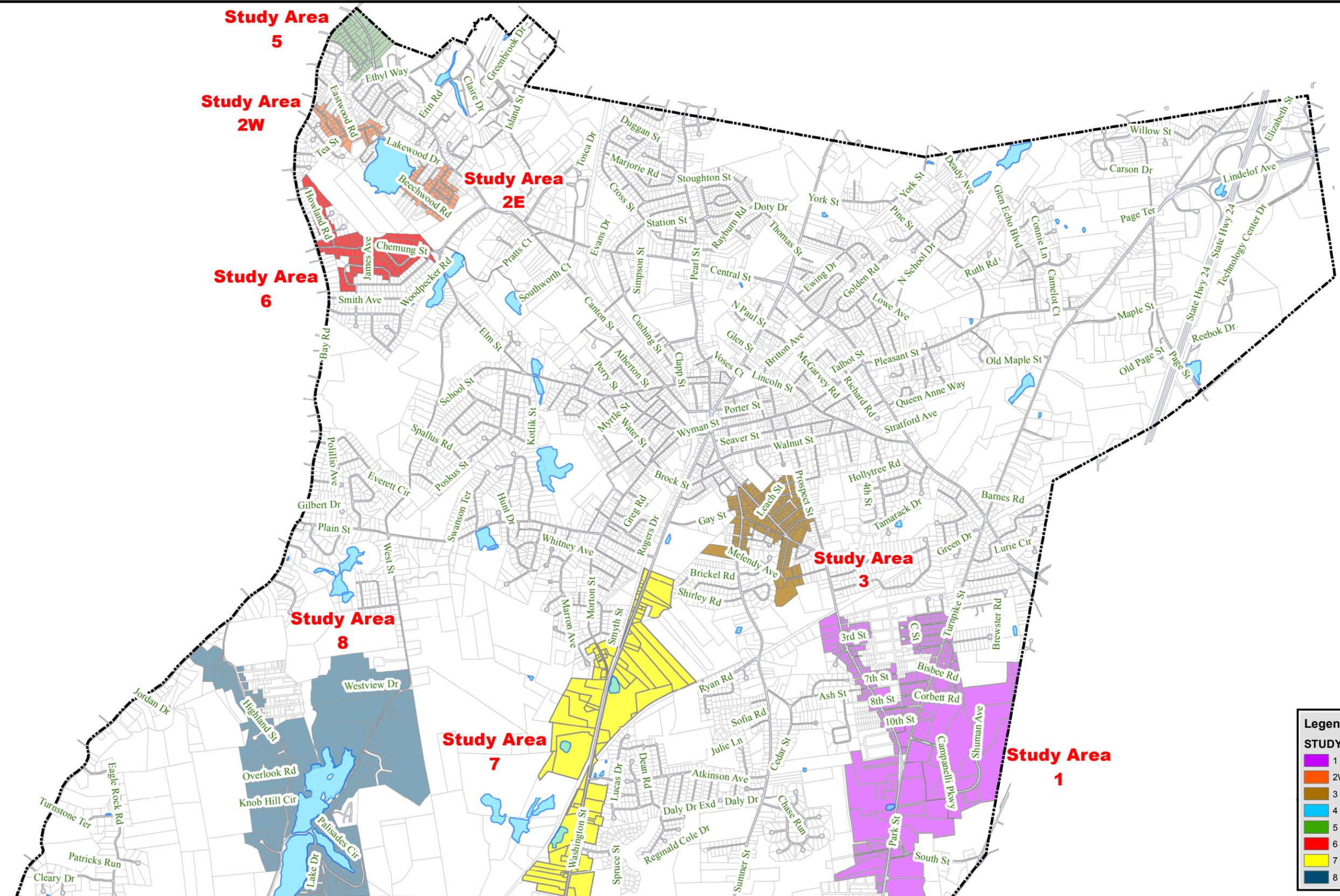
5. Provide preliminary layouts of new sewer and pump stations within those areas recommended to be sewer.
6. Evaluate the capacity of the existing wastewater collection system along key interceptors and determine if there is sufficient available capacity to accept additional wastewater flows from areas recommended to be sewer.
7. Determine if the Massachusetts Water Resources Authority (MWRA) has sufficient capacity within its interceptor to accept the additional flow from Stoughton.
8. Review the viability of working with Brockton to accept some of the new wastewater flows.
9. Identify if there are any Massachusetts Environmental Policy Act (MEPA) environmental triggers exceeded which might require an Environmental Notification Form (ENF) or Environmental Impact Report (EIR) to be prepared.
10. Develop planning level opinions of possible construction cost for each of the study areas recommended for sewer extensions.

## **STUDY AREAS**

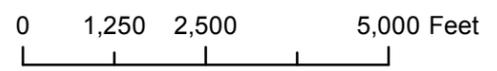
The Town identified nine (9) specific areas of Stoughton to include in this study. However, after an initial review of prior documentation Study Area 4, near Muddy Pond, was eliminated from consideration. This area, located on the western edge of Stoughton bordering Sharon, was eliminated due to a low need for sewer as documented in the 1980 sewer master plan by Maguire & Associates. Moreover, the two streets within this study area that were the greatest concern (Poskus Street and Kweder Avenue) have already been sewer further reducing the need for sewer in Study Area 4.

The remaining eight (8) study areas included are tabulated and shown in the figure below:

<b>Area Designation</b>	<b>General Area</b>	<b>Primary Roads</b>
1	Park Street & Campanelli Industrial Park	Park St., Campanelli Pkwy., Turnpike St.
2E	Pinewood Lake – East	Beechwood Rd., Springwood Ave., Pinewood Ave.
2W	Pinewood Lake – West	Cedarwood Rd., Lakewood Dr., Tea St.
3	Park Street Area - North	Park St., Sumner St., Birch St.
5	Northwestern area of Stoughton	Central St., Sharon St.
6	Pinewood Lake	Howland Rd., Mahoney Ave., Chemung St.
7	Washington Street (Rte 138)	Washington St.
8	Ames Pond	Highland St., West St., Palisades Cir.



Legend	
STUDY AREAS	
<span style="color: purple;">■</span>	1
<span style="color: orange;">■</span>	2W/2E
<span style="color: brown;">■</span>	3
<span style="color: lightblue;">■</span>	4
<span style="color: green;">■</span>	5
<span style="color: red;">■</span>	6
<span style="color: yellow;">■</span>	7
<span style="color: darkblue;">■</span>	8



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**STUDY AREAS ANALYZED FOR SEWER NEEDS**

**SEWER NEEDS ANALYSIS TOWN OF STOUGHTON, MASSACHUSETTS**

**FIGURE**

## STUDY AREA RANKING METHODOLOGY

The approach to ranking the recommended sewer areas was developed through the Steering Committee process. The primary determinant for recommending sewer was based on the environmental assessment; however, the potential for economic benefit was also considered in the overall ranking. The sewer area ranking rubric, below, illustrates the conceptual approach to ranking the study areas. Environmental need was rated on a scale from 1 to 5, with 5 being the highest need. The potential for economic benefit was identified on a highest to lowest economic order using letter grades for relative scoring. The highest grade would imply the area has great potential for economic benefit, while the lowest grade would imply there is no potential for economic benefit.

### SEWER AREA RANKING RUBRIC

		ECONOMIC BENEFIT GRADE					
		HIGHEST  LOWEST					
		A	B	C	D	E	F
ENVIRONMENTAL NEED	5						
	4.5						
	4	HIGH NEED FOR SEWER			MODERATE NEED FOR SEWER		
	3.5						
	3						
	2.5						
	2	LOW NEED FOR SEWER			SEWER NOT RECOMMENDED		
	1.5						
	1						
	0.5						
0							

## **ENVIRONMENTAL NEEDS ASSESSMENT**

The environmental needs ranking is based on weighted scores calculated by evaluating eight (8) different criteria. The individual scores are totalized and then normalized to a 5-point scale. The individual scores, normalized total score and environmental ranking for each study area, are summarized in the two tables below.

### **ENVIRONMENTAL NEEDS SCORING ANALYSIS**

<b>Study Area</b>	<b>Permeability</b>	<b>Env. Area</b>	<b>Depth to GW Table</b>	<b>No. of Pump outs</b>	<b>Title 5 Inspections</b>	<b>Local Upgrade Approvals</b>	<b>Development Density</b>	<b>Private Wells</b>
1	3.00	1.33	0.69	5.00	3.37	1.82	5.00	2
2W	1.07	0	3.00	0	3.03	0	5.00	4
2E	0.90	4.00	0.21	0	0	0	5.00	4
3	0.65	0	0.74	4.48	3.70	2.00	5.00	2
5	1.38	0	0	0	0	0	5.00	2
6	0.36	0	0.02	0	1.47	0	5.00	2
7	1.26	2.67	1.33	0	4.00	0	3.33	4
8	0.77	1.33	0.54	0	2.32	0.84	1.67	0

### **ENVIRONMENTAL NEEDS RANKING & NORMALIZED SCORE**

<b>Study Area</b>	<b>Rank</b>	<b>Score</b>
1	1	5.0
3	2	4.2
7	3	3.7
2W	4	3.6
2E	5	3.2
6	6	2.0
5	7	1.9
8	8	1.7

## **ECONOMIC BENEFIT ASSESSMENT**

This study relied on an economic benefit assessment methodology previously established by the Town's Director of Assessing, Mr. Joseph Gibbons. In a memorandum to the Town Manager, Mr. Michael Hartman dated February 4, 2013, Mr. Gibbons described the estimated tax levy increase that could be anticipated by sewerage the Park Street sewer area. The increased tax levy was conservatively estimated as a 1.5% increase within the decade following construction, a value of approximately \$786,000 annually. Further, Mr. Gibbons stated the actual increase could be greater than \$1,000,000 annually.

For this study, once again, Mr. Gibbons applied this methodology to estimate the economic benefit of sewerage Study Areas 1, 5 and 7. These areas were chosen because greater than 10% of the land area in these study areas are zoned either commercial or industrial.

In brief, Mr. Gibbons estimated that Study Areas 1 and 7 have the potential for increasing the tax levy by 2% (greater than \$1.1 million), and 0.09% (approximately \$50,000), respectively. Further, sewerage Study Area 5 is estimated to have little to no benefit to the tax levy.

## **SEWER AREA RANKING**

The final ranking is shown in the Sewer Area Ranking Results figure below. This ranking was determined by the environmental and economic analysis described above. Study Area 1 has both the highest environmental need and the greatest economic benefit, and therefore, is the highest ranked area. Due to a combination of environmental need and some economic benefit, Study Area 7 is also ranked highly. Study Areas 3, 2E and 2W were identified to have an environmental need, but little to no economic benefit, and therefore, are identified as having a moderate need for sewer. Ultimately, the Steering Committee recommended not sewerage Study areas 2E and 2W, so these areas were removed from the final recommendations. Finally, all other study areas are not recommended to be sewerage.

### SEWER AREA RANKING RESULTS

		ECONOMIC BENEFIT GRADE					
		HIGHEST  LOWEST					
		A	B	C	D	E	F
<b>ENVIRONMENTAL NEED</b>	5	4.5	<b>1</b>				
							<b>3</b>
	4	3.5			<b>7</b>		
							<b>2W</b> <b>2E</b>
	3	2.5					
	2	1.5					<b>6</b> <b>8</b>
						<b>5</b>	
	1	0.5					
	0						

HIGH NEED  
FOR SEWER

MODERATE  
NEED FOR  
SEWER

LOW NEED  
FOR SEWER

SEWER NOT  
RECOMMENDED

## **RECOMMENDATIONS**

This study recommends sewerage Study Areas 1, 3 and 7. Budget level opinions of probable construction costs for designing and constructing sewers in each of the Study Areas are provided. At this early planning stage, there are many unknowns with respect to subsurface conditions, utility conflicts, groundwater conditions, etc., which have a direct bearing on the cost of construction. Therefore, the costs presented in the table, below, are subject to refinement as more information becomes available. To account for these unknowns, each budget carries a 25% contingency factor.

### **PROBABLE CONSTRUCTION COSTS**

*(July 2015 ENR 20-CITY CCI: 10,037)*

Cost Category	Study Area		
	1	3	7
Construction Costs	\$9,300,000	\$3,708,000	\$3,537,000
Construction Contingency (25%)	\$2,330,000	\$927,000	\$884,000
<b>Construction Total</b>	<b>\$11,630,000</b>	<b>\$4,635,000</b>	<b>\$4,421,000</b>
Engineering Design	\$930,000	\$464,000	\$442,000
Engineering Support During Construction	\$500,000	\$275,000	\$275,000
Resident Project Representative	\$450,000	\$250,000	\$250,000
<b>Contract Total</b>	<b>\$13,510,000</b>	<b>\$5,624,000</b>	<b>\$5,388,000</b>

This study also enumerates additional considerations related to implementing this project. These are listed below:

1. The Town should review and consolidate its sewer policies, betterments and construction standards in order for property owners, designers and contractors to have a unified, clear understanding of what the Town requires for sewer policy, betterments and construction.
2. The Town should review the performance of the existing wastewater collection system to ensure that there is sufficient capacity available to accept future additional flows from the three recommended extension areas.
3. The Town should contact the Massachusetts Water Resources Authority (MWRA) to determine the level of permitting required to complete the recommended sewer extensions. Kleinfelder made initial contact with the MWRA as part of this study.
4. The Town should confirm Kleinfelder's opinion that this project will require an Environmental Notification Form (ENF) as stipulated by the Massachusetts Environmental Policy Act (MEPA).

**SEWER AREA RANKING PLAN - FINAL REPORT  
STOUGHTON, MASSACHUSETTS  
NOVEMBER 2015**

**1 BACKGROUND**

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The Town of Stoughton, Massachusetts has retained the services of Kleinfelder to prepare an assessment of targeted areas of the Town that are presently unsewered and recommend whether or not sewer is warranted. The areas recommended to be sewered are ranked on the basis of need for environmental and public health protection as well as potential economic benefit to the Town created by providing municipal sewer. This study also provides budgetary level opinions of possible construction costs for the purposes of establishing design and construction budgets.

An important element of this study was the public engagement process. The Town assembled a Steering Committee comprised of Town employees, residents and business owners representing a broad perspective on the subject of extending sewers. A summary of the public engagement process is provided in Section 6.1.

**1.1 PURPOSE AND OBJECTIVES**

The purpose of this study is to recommend whether or not to extend public sewer service to areas of Stoughton that are presently unsewered. This study is intended to update prior sewerage master plans completed in 1963 and 1980 (both by Maguire & Associates). The determination of need for sewer service is based on protecting public health and the environment. In addition, this study recognizes that sewerage some areas will benefit the Town economically by increasing property values and associated property taxes. Using these two evaluation approaches, this study ranks the areas in order of greatest benefit to the public, environment and the Town.

This study specifically seeks to complete the following objectives:

1. Review recent Health Department data, soils information, and land use information to determine where on-site wastewater disposal using septic systems may be problematic.

2. Recommend sewer extensions to those unsewered areas of greatest need and potential for economic benefit. [Section 3.1 and Section 3.2]
3. Prepare a ranking of the areas recommended to be sewered on the basis of public health and environmental protection, as well as potential for economic benefit. [Section 3.3]
4. Provide preliminary layouts of new sewer and pump stations within those areas recommended to be sewered. [Section 4.1]
5. Estimate the magnitude of new wastewater flows anticipated from each area recommended to be sewered. [Section 4.2]
6. Evaluate the capacity of the existing wastewater collection system along key interceptors and determine if there is sufficient available capacity to accept additional wastewater flows from areas recommended to be sewered. [Section 4.3]
7. Develop planning level opinions of possible construction cost for each of the study areas recommended for sewer extensions. [Section 5.3]
8. Determine if the Massachusetts Water Resources Authority (MWRA) has sufficient capacity within its interceptor to accept the additional flow from Stoughton. [Section 5.4]
9. Review the viability of working with Brockton to accept some of the new wastewater flows.
10. Identify if there are any Massachusetts Environmental Policy Act (MEPA) environmental triggers exceeded which might require an Environmental Notification Form (ENF) or Environmental Impact Report (EIR) to be prepared. [Section 5.4]

## 1.2 PRIOR STUDIES

A significant volume of prior work has already been completed by others when studying the need for sewer within the Town of Stoughton. Two sewer master plans were completed in 1963 and 1980. Together, these two plans describe local geology, soil and groundwater conditions, septic system performance, and possible threats to public health and environmental receptors. The 1980 study presents a ranking for sewer extensions.

### Significant Findings from 1963 Study

This study (Maguire & Associates, 1963) included a comprehensive evaluation of Stoughton's geology, soil characteristics and groundwater conditions as a means to assess the ability of the land to support on-site wastewater disposal. Areas of bedrock, marsh and other low-laying wetlands were also identified. This study included information from 40 subsurface borings which profiled underground conditions throughout the Town.

### Significant Findings from 1980 Study

This study (Maguire & Associates, 1980) reviewed several sources of data in order to prioritize particular areas for sewerage. Data reviewed included (1) U.S. Soil Conservation Service (SCS) soil limitations mapping, (2) septic system pump out records, (3) groundwater elevation data, (4) proximity to wetlands, (5) the effects of zoning and development, and (6) the effects to water quality and public health. This study also included a resident engagement survey to collect data on septic system performance and the public's interest in municipal sewer.

The 1980 study concluded by identifying the top ten highest need areas for sewer as well as a second tier of other need areas. Many of the areas recommended by the 1980 study to be sewerage have since been sewerage. However, several of these areas remain unsewerage today, and are part of Kleinfelder's study.

While much time has passed since these two reports were prepared much of their contents remain true today as subsurface conditions (geology, soils, groundwater characteristics, ledge, etc.) are generally unchanged. What has changed since 1978, however, is the implementation of Title 5 regulations for septic system design and performance and the degree of land development within unsewerage areas of Stoughton. This study supplements the two master plans by reviewing Health Department data to assess the performance of septic systems with respect to Title 5 and Massachusetts Department of Environmental Protection (MassDEP) guidelines.

### Additional Studies

In addition to the two master plans from 1963 and 1980, two studies released in 2012 reviewed the wastewater infrastructure needs of Stoughton. One study (Old Colony Planning Council, 2012) reviewed infrastructure needs along Route 27 (Park Street). This study supported the installation of sewer along Route 27 to support economic development. This study recommended conveying flows to the City of Brockton as an alternative to the MWRA. The second study (CDM Smith / Weston & Sampson, 2012) evaluated wastewater infrastructure needs for upper Taunton River basin, within which approximately half of Stoughton resides. This study made specific reference to the 1980 sewerage master plan (Maguire, 1980) indicating that not all recommended areas have been sewerage. Also, CDM Smith / Weston & Sampson identified Park Street as a specific concern. In addition, sewerage Washington Street near Kelsey Drive was recommended. Finally, this study also recommended reviewing Brockton as an alternative to the MWRA for conveying sewage flows.

These prior studies were reviewed by Kleinfelder as part of developing a baseline understanding of the historic context of sewer use in Stoughton. A list of all prior studies reviewed is included in Section 7.

### 1.3 TOWN-SOURCED INFORMATION

In addition to researching prior studies, by others, Kleinfelder obtained a large degree of information from Town personnel in order to complete this study. The following information was obtained from the Town:

- Health Department information including,
  - Septic system pumping records (2010 to present)
  - Title 5 septic system inspections (2008 to present)
  - Septic system permits issues (calendar year 2014)
  - Septic system replacement list (2007 through 2013)
  - List of permitted septic system installers (as of 12/2/2014)
  - List of Local Upgrade Approvals (LUAs) (2012 through 2014)
- Geographic Information System (GIS) datalayers
  - Town base map
  - Town sewer datalayers
- Engineering Department Data
  - Town water account inventory
  - Memorandum entitled “Municipal Sewer Program Master Plan,” June 27, 2013, by Ben Feehan (former Town Engineer)
  - Sheets #1 and #2 entitled “Sewer Master Plan,” June 27, 2013, depicting preliminary sewer layouts
- Town zoning bylaws and Table of Dimensional and Density Regulations
- Town Assessor’s Office information from Mr. Joseph Gibbons – Director of Assessing
  - Memorandum entitled “Proposed Park Street Sewer Project,” February 4, 2013
  - Memorandum entitled “Sewer Priority Plan – Economic Analysis”, July 22, 2015

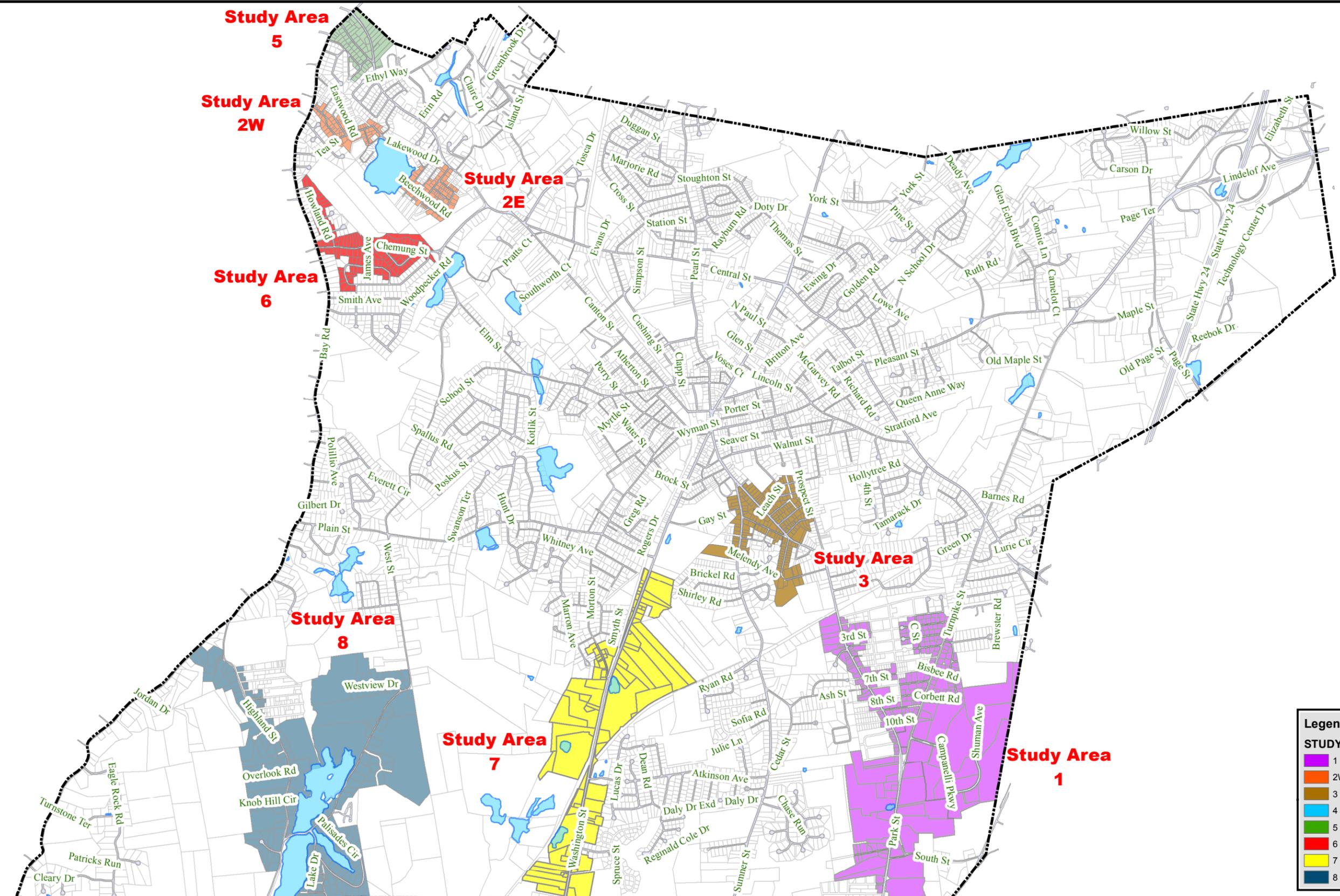
## 2 METHODOLOGY

### 2.1 IDENTIFY STUDY AREAS

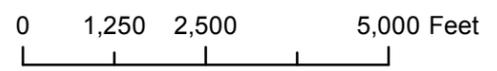
The Town identified nine (9) specific areas of Stoughton to include in this study. However, after an initial review of prior documentation one study area, near Muddy Pond, was eliminated from consideration. This area, located on the western edge of Stoughton bordering Sharon, was eliminated due to a relatively low immediate sewer needs assessment from the 1980 study. Moreover, the two streets within this study area that were the greatest concern (Poskus Street and Kweder Avenue) have been sewered.

The remaining eight (8) study areas included are tabulated and shown in the figure below:

Area Designation	General Area	Primary Roads
1	Park Street & Campanelli Industrial Park	Park Street, Campanelli Parkway, Turnpike Street
2E	Pinewood Lake – East	Beechwood Road, Springwood Avenue, Pinewood Avenue
2W	Pinewood Lake – West	Cedarwood Road, Lakewood Drive, Tea Street
3	Park Street Area - North	Park Street, Sumner Street, Birch Street
5	Northwestern area of Stoughton	Central Street, Sharon Street,
6	Pinewood Lake	Howland Road, Mahoney Avenue, Chemung Street
7	Washington Street (Rte 138)	Washington Street
8	Ames Pond	Highland Street, West Street, Palisades Circle



Legend	
STUDY AREAS	
<span style="color: purple;">■</span>	1
<span style="color: orange;">■</span>	2W/2E
<span style="color: brown;">■</span>	3
<span style="color: lightblue;">■</span>	4
<span style="color: green;">■</span>	5
<span style="color: red;">■</span>	6
<span style="color: yellow;">■</span>	7
<span style="color: darkblue;">■</span>	8



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**STUDY AREAS ANALYZED  
FOR SEWER NEEDS**

**SEWER NEEDS ANALYSIS  
TOWN OF STOUGHTON,  
MASSACHUSETTS**

**FIGURE**

**1**

## 2.2 DEVELOP SEWER AREA RANKING APPROACH

The approach to ranking the recommended sewer areas was developed through the Steering Committee process. The recommendation whether or not to sewer a particular study area was made on the basis of the environmental assessment; however, the potential for economic benefit was also considered into the overall ranking. The sewer area ranking rubric, below, illustrates the conceptual approach to ranking the study areas. Environmental need was rated on a scale from 1 to 5, with 5 being the highest need. The potential for economic benefit was identified on a highest to lowest economic order. The highest grade would imply the area has great potential for economic benefit, while the lowest grade would imply there is no potential for economic benefit.

**FIGURE 2  
SEWER AREA RANKING RUBRIC**

		ECONOMIC BENEFIT GRADE					
		HIGHEST  LOWEST					
		A	B	C	D	E	F
<b>ENVIRONMENTAL NEED</b>	5	<b>HIGH NEED FOR SEWER</b>			<b>MODERATE NEED FOR SEWER</b>		
	4.5						
	4	<b>HIGH NEED FOR SEWER</b>			<b>MODERATE NEED FOR SEWER</b>		
	3.5						
	3						
	2.5						
	2	<b>LOW NEED FOR SEWER</b>			<b>SEWER NOT RECOMMENDED</b>		
	1.5						
	1						
	0.5						
0							

## 2.3 ENVIRONMENTAL NEEDS ASSESSMENT

The need for public sewers to protect public health and the environment was considered as part of the environmental needs assessment. This assessment considered many of the same factors reviewed by Maguire & Associates in their 1963 and 1980 master plans; however, more recent Health Department data was introduced to make the evaluation current. A scoring system was created to rate the environmental need of each study area. The criteria utilized in this scoring system are listed below:

- **Number of Pump Outs:** The Stoughton Board of Health provided septic system pump out data for 2011 through 2014. MassDEP recommends at least one septic system pump out every 3 years; however, annual pump outs are considered good practice. Parcel data obtained from GIS were analyzed for the average number of annual septic system pump outs to determine the study area with existing on-site wastewater disposal issues.
- **Title 5 Inspections:** Existing on-site wastewater disposal systems are regulated under Title 5 of the Massachusetts State Environmental Code. The number of failed Title 5 inspections reported to the local Board of Health or MassDEP of existing subsurface sewage disposal systems was analyzed to identify study areas with existing non-conforming systems.
- **Local Upgrade Approvals:** Local Upgrade Approvals are variations to the Title 5 regulations that allow system owners to upgrade a nonconforming system to the maximum extent feasible ([310 CMR 15.401-405](#)). Local Upgrade Approvals are normally issued by the local Board of Health. The number of Local Upgrade Approvals in a study area identified the need for upgrades to existing non-conforming systems in order to meet Title 5 regulations.
- **Soil Permeability at 48”+ depth (inch/hr.):** National Resources Conservation Service (NRCS) soil survey data identifies the hydraulic conductivity of soils for the Town of Stoughton. Saturated hydraulic conductivity is defined by the NRCS as a quantitative measure of a soil’s ability to transmit water when subject to a hydraulic gradient. Hydraulic conductivity was converted to permeability for this analysis. This criterion identified the rate at which the soil can allow fluids to pass.
- **Depth to Groundwater:** Depth to ground water table in feet is an environmental concern to avoid sewer contamination of the existing groundwater prior to sufficient treatment of the septic system discharge.

- **Development Density:** This criterion analyzed the percentage of properties less than 20,000 square feet within a study area. The analysis addressed three issues for existing septic systems noted below:
  - Performance of septic system in a densely developed area
  - Setback distances for existing septic systems are required by the Local Board of Health and MassDEP
  - Potential contamination of private well water
- **Private Wells:** This criterion addressed the setback distance required between private wells and septic systems. Densely developed study areas with private wells would have a greater chance of water degradation and therefore are considered a greater risk for septic system operation.
- **Environmental Receptors (“ENV” Area):** The environmental area included areas limited to construction due to the existing environmental conditions. These conditions include areas within a wetland, 100-year flood zone, Title 5 buffer, IWPA, Zone 1, and/or open water.

A scoring rubric was created and reviewed through the Steering Committee process. Once the rubric was agreed to the data for each study area was analyzed and the scores were calculated. The scoring rubric is presented below:

**TABLE 1**  
**CRITERIA FOR SEWER NEED – ENVIRONMENTAL**

Criteria	Weighting	SCORE			
		0	1	2	3
# of Pump Outs (2012 – 2014 data)	5	1 or fewer per year average	>1 per year average	> 2 per year average	>3 per year average
Title 5 Inspections	4	0 failed inspections	1 failed inspection	2-4 failed inspections	>4 failed inspections
Local Upgrade Approvals	2	0 LUAs	1 LUA	2-4 LUAs	>4 LUAs
Soil Permeability at 48”+ depth (inch/hr.)	3	>6 in/hr.	2 – 6 in/hr.	1 – 2 in/hr.	<1 in/hr.
Depth to GW	3	>6 feet	4-6 feet	3-4 feet	<3 feet
Development Density (“DD”) (1), (2)	5	0% - 9% “small” lots	10% - 32% “small” lots	33% - 50% “small” lots	>50% “small” lots

Criteria	Weighting	SCORE			
		0	1	2	3
Private Wells	4	"DD" = 0 or 1	"DD" = 2 or 3, AND No Public Water on 0-32% of land	"DD" = 2 or 3, AND No Public Water on 33-50% of land	"DD" = 2 or 3, AND No Public Water on >50% of land
<b>ENV AREA</b> Wetlands / Open Water / 100-Yr Flood Zone / Title 5 Buffer / IWPA / Zone I <sup>(3), (4)</sup>	4	0-9% of land within ENV zone	10-32% of land within ENV zone	33-50% of land within ENV zone	>50% of land within ENV zone

**Notes:**

(1) Development Density is predicated on the prevalence of small lots within each study area, as defined below:

"Small" Lots → <20,000 s.f.

(2) Assessment of Development Density includes parcels that might fall within the ENV Area

(3) Using GIS, dissolve these layers into a singular ENV layer

(4) Zone II not included in ENV area. This was agreed to through the steering process.

**2.4 ECONOMIC BENEFIT**

This study accounts for potential economic benefit by sewerage some of the study areas analyzed. Kleinfelder worked with the Town's Director of Assessing, Mr. Joseph Gibbons, to analyze the potential for economic benefit. The theory for economic benefit is based on the fact that property values of sewerage properties are generally higher than unsewerage properties – particularly for commercial or industrial zoned parcels. Therefore, by extending sewers to commercial or industrial zoned parcels, the land value and associated tax levy will increase, affording greater revenue to the Town of Stoughton. This theory was applied to the Park Street area in a report, by Connery Associates, dated March 1, 2012. This report, prepared for Park Street Sewer LLC, concluded the Park Street sewer project could be funded through betterment fees, annual user fees and the increase to the underlying land value without incurring long term municipal costs. A similar analysis was later completed by Mr. Gibbons, in a Memorandum dated February 4, 2013, which projected an increase of approximately \$1,000,000 in the tax levy due to sewerage the Park Street area analyzed.

This approach for economic benefit assessment is, once again, applied in this study. Working with Mr. Gibbons, it was agreed that evaluating the potential for economic benefit was only viable if 10% or more of the land area of a particular study area was zoned with either commercial or industrial zoning types. The Town of Stoughton Zoning table summarizes the percentage of land area, by zone type, for each of the study areas:

**TABLE 2  
TOWN OF STOUGHTON ZONING**

<b>Zoning by % Area</b>			
<b>Study Area</b>	<b>Zone Label</b>	<b>Zone Type</b>	<b>% Area of Zoning</b>
Study Area 1	GB	General Business	8%
	I	Industrial	12%
	NB	Neighborhood Business	3%
	RA	Residential-Suburban A	12%
	RB	Residential-Suburban B	64%
Study Area 2E	RC	Residential-Suburban C	100%
Study Area 2W	RC	Residential-Suburban C	100%
Study Area 3	I	Industrial	70%
	NB	Neighborhood Business	2%
	RB	Residential-Suburban B	28%
Study Area 5	GB	General Business	20%
	RC	Residential-Suburban C	80%
Study Area 6	RC	Residential-Suburban C	100%
Study Area 7	GB	General Business	48%
	I	Industrial	25%
	RA	Residential-Suburban A	14%
	RC	Residential-Suburban C	11%
	RU	Residential-Urban	1%
Study Area 8	RA	Residential-Suburban A	100%

Based on this table, study areas 1, 5 and 7 have more than 10% of commercial or industrial land area, and therefore, were analyzed by Mr. Gibbons using the approach above.

### 3 FINDINGS AND SEWER AREA RANKING

#### 3.1 ENVIRONMENTAL NEEDS

The environmental needs ranking is based on the scoring system defined in Section 2.3 Environmental Needs Assessment. The weighted scores for each environmental needs criteria is identified in Environmental Score Table below. These scores were totalized and normalized to a 5 point scale to obtain the final sewer needs ranking shown in the tables below.

**TABLE 3  
ENVIRONMENTAL NEEDS SCORING ANALYSIS**

Study Area	Permeability	Env. Area	Depth to GW Table	No. of Pump outs	Title 5 Inspections	Local Upgrade Approvals	Development Density	Private Wells
1	3.00	1.33	0.69	5.00	3.37	1.82	5.00	2
2W	1.07	0	3.00	0	3.03	0	5.00	4
2E	0.90	4.00	0.21	0	0	0	5.00	4
3	0.65	0	0.74	4.48	3.70	2.00	5.00	2
5	1.38	0	0	0	0	0	5.00	2
6	0.36	0	0.02	0	1.47	0	5.00	2
7	1.26	2.67	1.33	0	4.00	0	3.33	4
8	0.77	1.33	0.54	0	2.32	0.84	1.67	0

**TABLE 4  
ENVIRONMENTAL NEEDS RANKING & NORMALIZED SCORE**

Study Area	Rank	Score
1	1	5.0
3	2	4.2
7	3	3.7
2W	4	3.6
2E	5	3.2
6	6	2.0
5	7	1.9
8	8	1.7

### 3.2 ECONOMIC BENEFIT

Mr. Gibbons' findings were summarized in a Memorandum to Marc Tisdelle, Town Engineer, dated July 22, 2015. This Memorandum is attached to Appendix A, Sewer Priority Plan – Economic Analysis. In brief, Mr. Gibbons estimated that study areas 1 and 7 have potential for varying degrees of economic benefit, and study area 5 has little to no potential for economic benefit.

Study area 1 (Park Street and Campanelli Industrial Park) has the greatest potential for economic benefit. According to Mr. Gibbons, sewerage for this area of the Stoughton will increase the tax levy by approximately 2% within the decade following construction of the sewer improvements. The increase in property values would be primarily concentrated at Campanelli Industrial Park rather than along Park Street. A 2% increase in tax levy would yield greater than \$1 million of additional revenue, annually, for the Town, with the potential for revenue to increase by as much as \$1.5 million within ten years after construction.

Study area 7 (Washington Street) had a modest potential for economic benefit. According to Mr. Gibbons, sewerage for this area of Stoughton will increase the tax levy by approximately 0.09%, or approximately \$50,000 annually. As such, this area has approximately 1/20<sup>th</sup> the economic benefit potential of study area 1.

### 3.3 SEWER AREA RANKING

The final ranking is shown in the Sewer Area Ranking Results figure below. This ranking was determined by the environmental and economic analysis identified in 3.1 and 3.2 of this report. This figure shows Study Areas 1 and 7 are the two highest ranked areas for sewer and Study Areas 3, 2E and 2W are identified as having a moderate need for sewer. Note that while Study Areas 2E and 2W are ranked with a moderate need for sewer, the Steering Committee concluded that areas should not be sewerage. This conclusion is further explained in Section 6.1. All other study areas are not recommended to be sewerage.

**FIGURE 3  
SEWER AREA RANKING RESULTS**

		ECONOMIC BENEFIT GRADE					
		HIGHEST  LOWEST					
		A	B	C	D	E	F
<b>ENVIRONMENTAL NEED</b>	5	4.5	<b>1</b>				
							<b>3</b>
	4	3.5		<b>7</b>			<b>2W</b>
							<b>2E</b>
	3	2.5					
	2	1.5				<b>5</b>	<b>6</b>
							<b>8</b>
	1	0.5					
	0						

HIGH NEED  
FOR SEWER

MODERATE  
NEED FOR  
SEWER

LOW NEED  
FOR SEWER

SEWER NOT  
RECOMMENDED

## 4 EVALUATION OF SEWERING OPTIONS

### 4.1 DESCRIPTION OF SEWER EXTENSIONS

#### 4.1.1 BROCKTON ALTERNATIVE

Kleinfelder reviewed and evaluated the potential for conveying sewage flows from Study Area 1 to the City of Brockton as a part of the Steering Committee Process. This alternative was recommended in prior studies, as previously described. Based on this evaluation, this alternative was eliminated from consideration. Section 6.1 discusses this alternatives in further detail.

#### 4.1.2 SEWER EXTENSION RECOMMENDATIONS

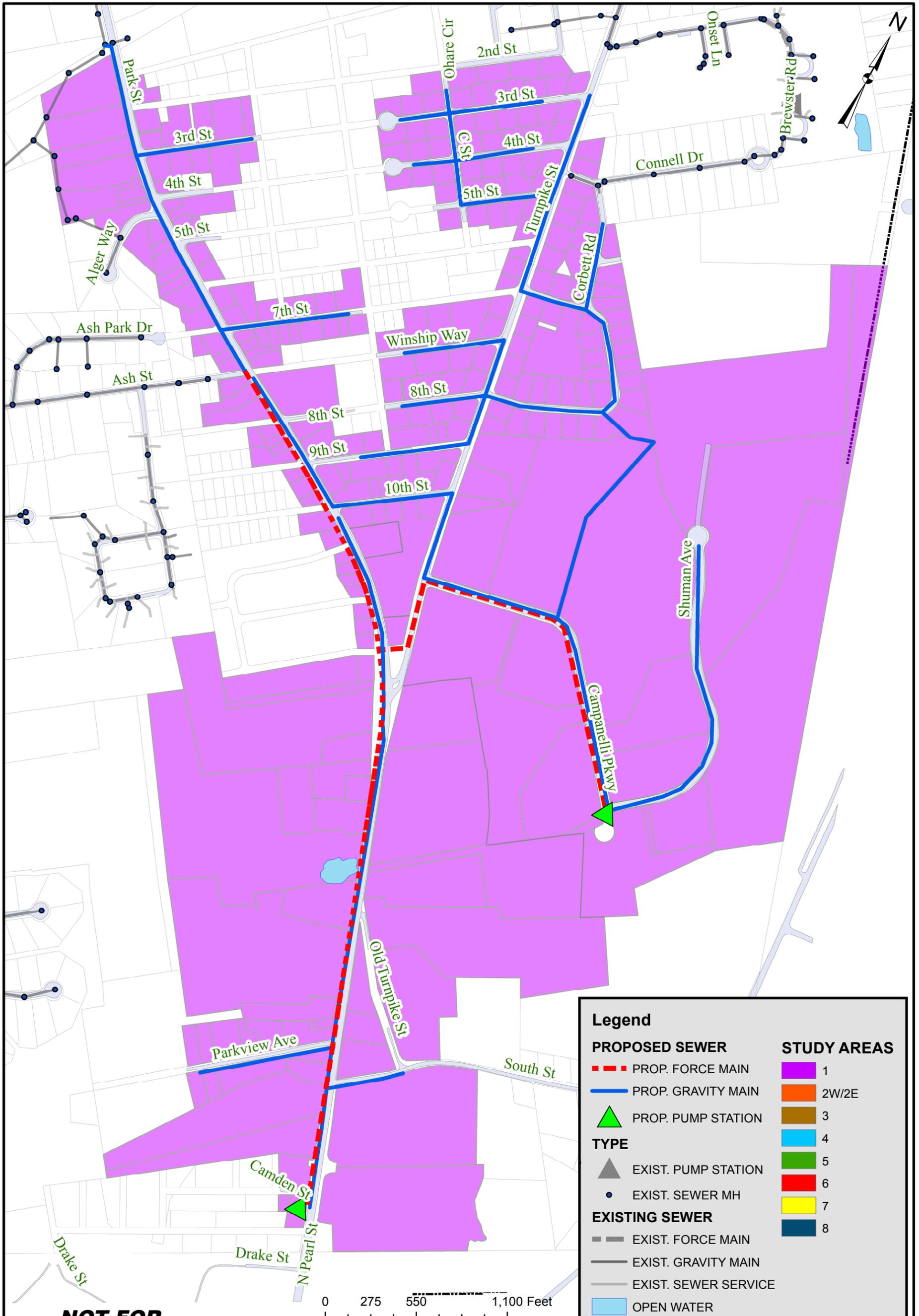
Study Area 1, 3 and 7 are recommended for sewer extensions based on the environmental analysis and economic analysis (Section 3). While Study Areas 2W and 2E occupy the top-right quadrant of Figure 3, the Steering Committee concluded that areas should not be sewered. This conclusion is further explained in Section 6.1.

The Proposed Sewer Extension table below approximates the number of pump stations, length of gravity sewer, and force main for each study area ranking shown from highest to lowest order of immediate need for sewer extensions.

**TABLE 5  
PROPOSED SEWER EXTENSIONS**

Study Area	Gravity Sewer (ft.)	Force Main (ft.)	Pump Stations (Each)
1	26,000	7,900	2
3	10,400	1,000	1
7	9,900	1,700	1
<b>Total (feet)</b>	<b>46,300</b>	<b>10,600</b>	-
<b>Total (miles)</b>	<b>8.8</b>	<b>2.0</b>	-

The following figures provide the layout of conceptual gravity sewer, force main, and pump stations for study areas 1, 3 and 7.



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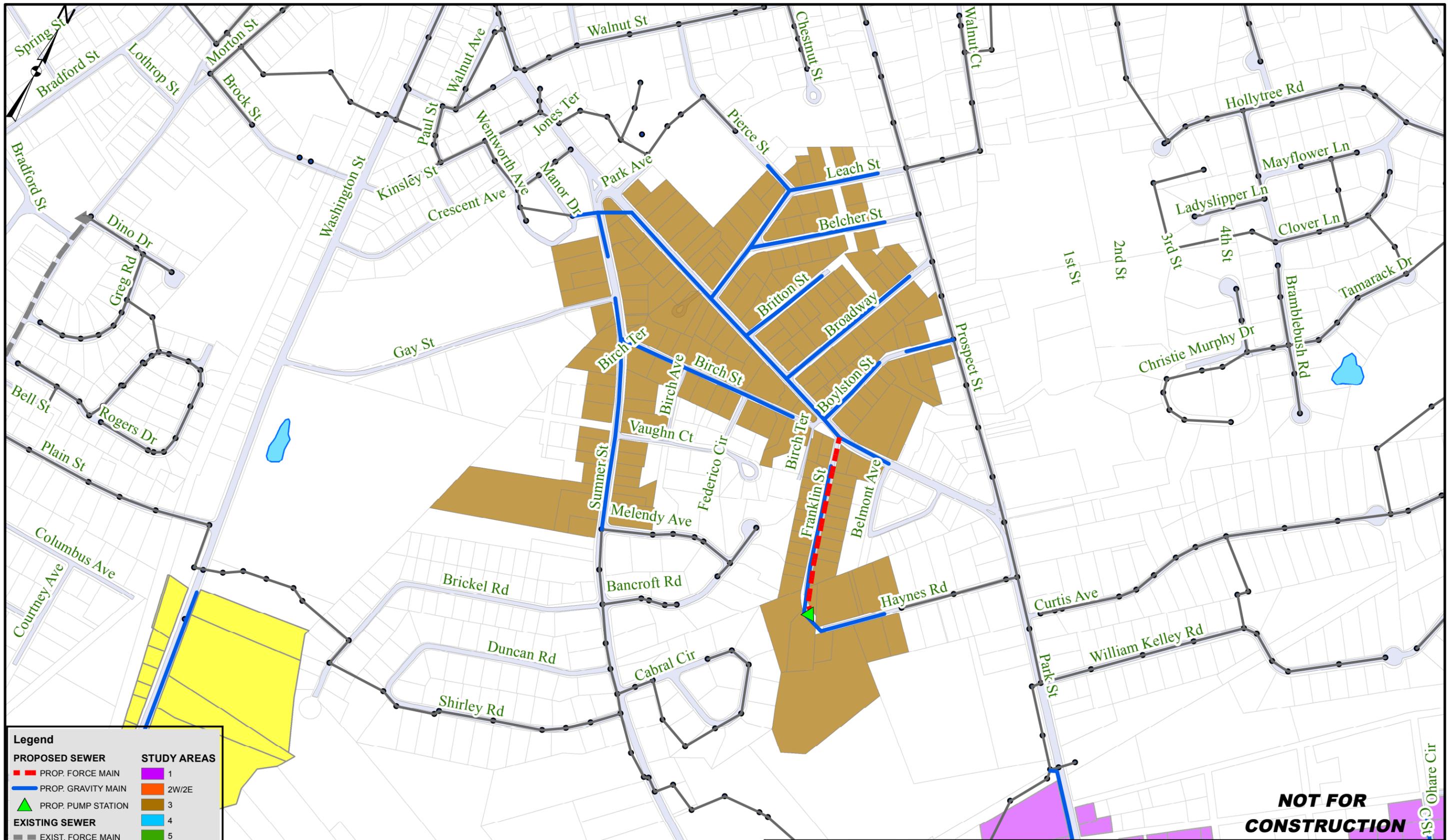
PROJECT NO. 20153855  
 DRAWN: OCTOBER 2015  
 DRAWN BY: JAA  
 CHECKED BY: DTP  
 FILE NAME: PROPOSED SEWER REPORT FIGURES 2

**STUDY AREA 1  
CONCEPTUAL LAYOUT**

**SEWER NEEDS ANALYSIS  
TOWN OF STOUGHTON,  
MASSACHUSETTS**

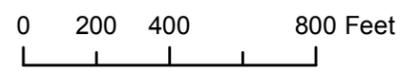
**FIGURE  
4**

Legend	
<b>PROPOSED SEWER</b>	<b>STUDY AREAS</b>
PROP. FORCE MAIN	1
PROP. GRAVITY MAIN	2W/2E
PROP. PUMP STATION	3
<b>TYPE</b>	4
EXIST. PUMP STATION	5
EXIST. SEWER MH	6
<b>EXISTING SEWER</b>	7
EXIST. FORCE MAIN	8
EXIST. GRAVITY MAIN	
EXIST. SEWER SERVICE	
OPEN WATER	



**Legend**

<b>PROPOSED SEWER</b>	<b>STUDY AREAS</b>
— PRO. FORCE MAIN	1
— PRO. GRAVITY MAIN	2W/2E
▲ PRO. PUMP STATION	3
— EXISTING SEWER	4
— EXIST. FORCE MAIN	5
— EXIST. GRAVITY MAIN	6
— EXIST. SEWER SERVICE	7
<b>TYPE</b>	8
▲ EXIST. PUMP STATION	
● EXIST. SEWER MH	
■ OPEN WATER	



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FILE NAME:	PROPOSED SEWER REPORT FIGURES.MXD

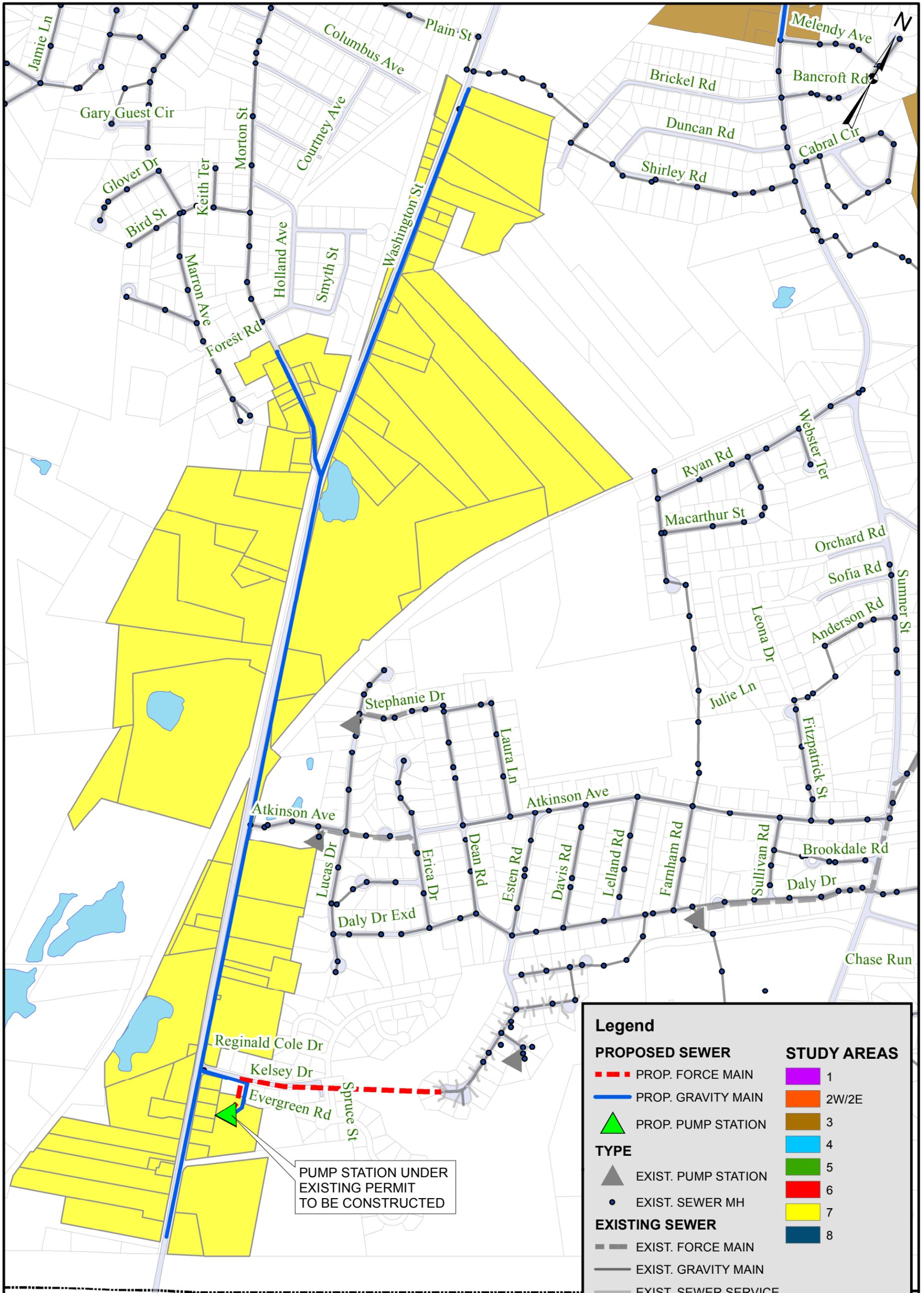
**STUDY AREA 3  
CONCEPTUAL LAYOUT**

**SEWER NEEDS ANALYSIS  
TOWN OF STOUGHTON,  
MASSACHUSETTS**

**FIGURE  
5**

**NOT FOR  
CONSTRUCTION**

Ohare Cir



PUMP STATION UNDER EXISTING PERMIT TO BE CONSTRUCTED

Legend	
<b>PROPOSED SEWER</b>	<b>STUDY AREAS</b>
PROP. FORCE MAIN	1
PROP. GRAVITY MAIN	2W/2E
PROP. PUMP STATION	3
<b>TYPE</b>	4
EXIST. PUMP STATION	5
EXIST. SEWER MH	6
<b>EXISTING SEWER</b>	7
EXIST. FORCE MAIN	8
EXIST. GRAVITY MAIN	
EXIST. SEWER SERVICE	
OPEN WATER	

0 325 650 1,300 Feet

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PROJECT NO. 20153855  
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 FILE NAME: PROPOSED SEWER REPORT FIGURES 2

**STUDY AREA 7  
 CONCEPTUAL LAYOUT**  
**SEWER NEEDS ANALYSIS  
 TOWN OF STOUGHTON,  
 MASSACHUSETTS**

**FIGURE  
 6**

## 4.2 STUDY AREA FLOWS

Study area wastewater flows were estimated for residential and commercial/industrial zoned parcels. The wastewater flows for each study area were estimated by totaling the wastewater flow rate for each parcel.

Residential wastewater flows were estimated by using per capita residential water consumption data and multiplying by the average household size. Water consumption data was obtained from Annual Statistical Reports between the years 2009-2014. Typical household size was taken from the 2010 U.S. Census. Residential wastewater rates were then estimated by multiplying water consumption by 90% to account for water used, but not returned to the sewer system (e.g. irrigation, car washing, etc). Using this approach a typical residential property in Stoughton is estimated to produce 140 gallons per day average daily flow.

Wastewater flows from commercial and industrial parcels were estimated by referencing Title 5. Per Title 5 peak design flows from commercial and industrial parcels is 75 gallons per day per 1,000 square feet of land. Kleinfelder assumed a typical peaking factor of 2.5, and therefore, utilized 30 gallons per day per 1,000 square feet of land to estimate wastewater produced on commercial and industrial parcels.

In addition to wastewater generated from each parcel, it was assumed that the new sewers would have a modest amount of infiltration and inflow. Using TR-16 guidelines, it was assumed there would be 250 gallons per day per inch-mile of new sewer.

The results of the calculated average daily flow and peak flows for each study area can be found in the Study Area Flow Calculation Table below.

**TABLE 6  
STUDY AREA FLOW CALCULATION**

Study Area	Estimated Flow (gpd)	
	Average Daily Flow	Peak Flow
1	345,900	1,009,900
3	38,300	106,300
7	146,300	428,300
<b>Total Flow (gpd)</b>	<b>530,500</b>	<b>1,544,500</b>

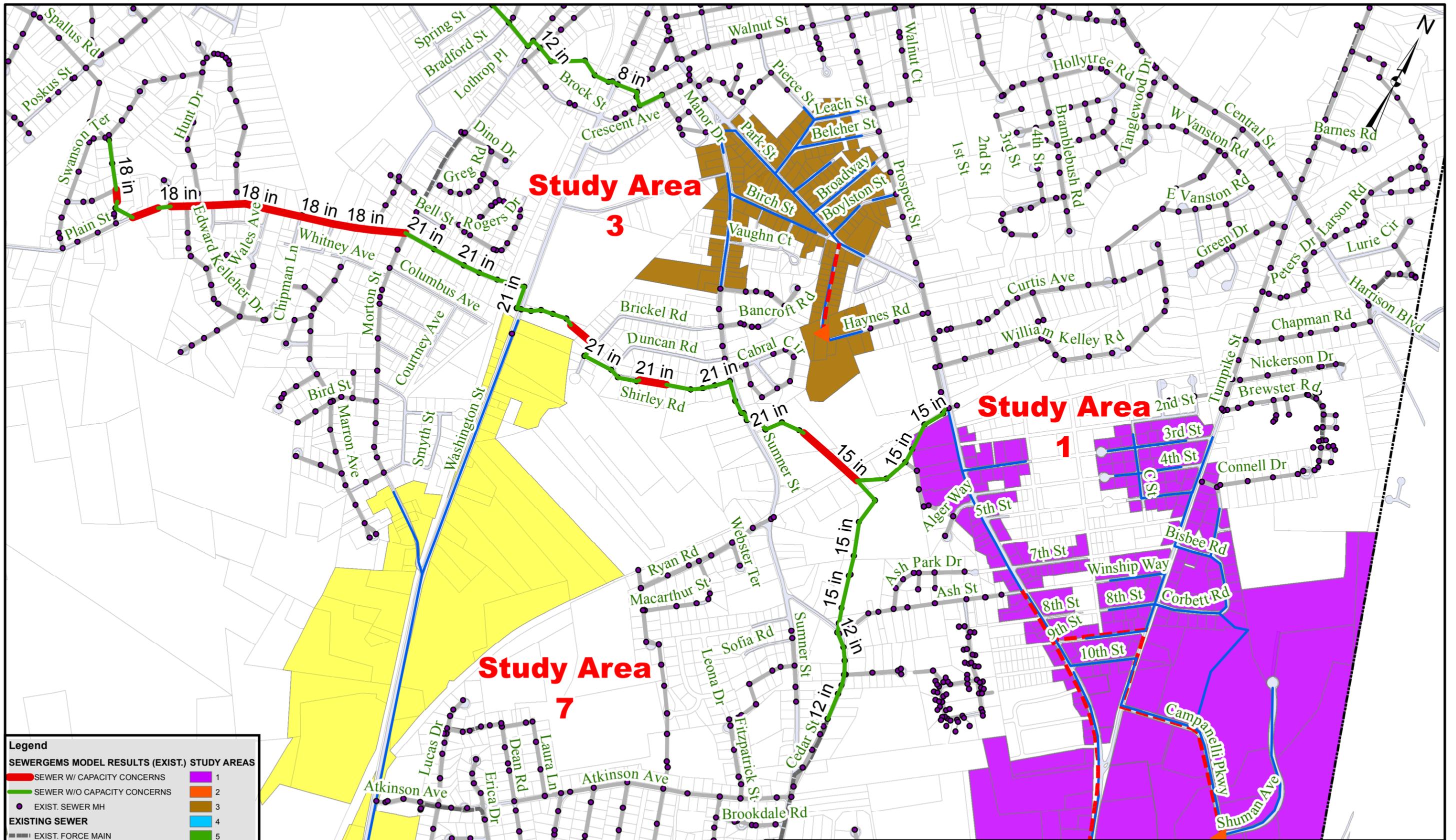
#### 4.3 EXISTING HYDRAULICS

Kleinfelder modeled the Town’s existing sewer system in order to assess the hydraulic impact of the proposed sewer flows on the existing collection system during peak flow conditions. Kleinfelder’s model was based on the Town’s existing XP-SWMM model, created by Weston and Sampson in 2008. The Weston and Sampson model utilized groundwater, rainfall, and flow monitoring data to create and calibrate the model. Weston and Sampson created the following three scenarios:

- Scenario 1: Average daily dry weather flow,
- Scenario 2: Average daily dry weather flow plus peak design storm inflow, and
- Scenario 3: Peak sanitary wastewater plus peak design storm inflow plus peak infiltration.

Kleinfelder re-created Weston and Sampson’s Scenario 3 model results utilizing SewerGems modeling software, the input flow data used by Weston and Sampson, and the Town’s sewer system layout, diameter, slope and materials information from its GIS. The results from running the Scenario 3 model in SewerGems roughly matched Weston and Sampson’s results found from its XP-SWMM model.

The model results did not suggest hydraulic restrictions within Study Area 3 would be anticipated. However, the model suggested that the proposed flows from Study Areas 1 and 7 would enter the collection system near the same location (a cross country sewer between Sumner Street and Prospect Street) and occupy capacity within an existing sewer interceptor that is hydraulically limited under current peak flow conditions. Two specific locations along this interceptor are depicted in the following figure that are currently limited in capacity per the results of the Weston and Sampson model.



**Legend**

**SEWERGEMS MODEL RESULTS (EXIST.) STUDY AREAS**

- SEWER W/ CAPACITY CONCERNS
- SEWER W/O CAPACITY CONCERNS
- EXIST. SEWER MH

**EXISTING SEWER**

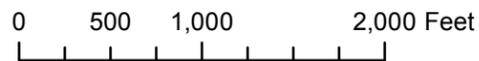
- EXIST. FORCE MAIN
- EXIST. GRAVITY MAIN
- EXIST. SEWER SERVICE

**PROPOSED SEWER**

- PROP. FORCE MAIN
- PROP. GRAVITY MAIN
- ▲ PROP. PUMP STATION

**STUDY AREAS**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8



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**ALL STUDY AREA FLOWS  
SEWERGEMS MODEL  
RESULTS  
SEWER NEEDS ANALYSIS  
TOWN OF STOUGHTON,  
MASSACHUSETTS**

**FIGURE  
7**

While Scenario 3 identifies capacity issues at two locations, it is too preliminary to recommend improving the capacity in either location at this time for the following reasons:

1. The Town has no reported chronic basement backups or sanitary sewer overflows in this part of the collection system.
2. Scenario 3 is a very conservative hydraulic scenario that does not represent typical conditions. Weston and Sampson utilized conservative peaking factors generally between 4 and 6 to establish peak flows. These peaking factors are somewhat more conservative than what would be recommended by TR-16.
3. Since 2008, when the Weston and Sampson modeled was completed, the Town has performed sewer system rehabilitation in this part of Town to remove infiltration and inflow. Weston and Sampson will be updating the Town-wide hydraulic model in the coming year which will quantify the current hydraulic conditions of the two areas identified as a possible concerns.

Kleinfelder recommends that the updated Town model provide a particular focus on the existing collection system downstream of Study Areas 1 and 7 in order to better define what existing hydraulic issues exist, if any.

## **5 RECOMMENDATIONS**

### **5.1 SEWER POLICIES, BETTERMENTS & CONSTRUCTION STANDARDS**

This study did not review or make any recommendations to modify the current Town policies for payment for sewer extensions (betterments and fees) or policy with regard to sewer connections. Kleinfelder understands that this review is presently being undertaken by the Town. Also, this study did not review or make any recommendations for adopting standard construction details for new sewer extensions.

During the Steering Committee process, there was strong consensus that the Town's sewer policies and construction standards should be updated and consolidated into a clear policy document.

Kleinfelder understands that there are at least two important elements of an updated betterment policy that the Town intends to complete prior to constructing these recommended sewer extensions. First, an updated betterment policy that fairly balances the cost burden to bettered property owners with the benefit of the sewer extension is important to garner broad support for the proposed sewer extensions. Second, a sewer policy that mandates abutters to connect to the new sewer will help the Town collect sewer use and connection fees, enhance property value, and discontinue reliance upon septic systems.

The Town would benefit from adopting consistent construction standards for sewer installation and connections to properties. Based on the Steering Committee process it was apparent that different construction standards have been used throughout the Town during the developing of the sewer system which resulted in inconsistencies between workmanship and the availability of a stub to connect to. A set of construction standards would facilitate consistent sewer installation going forward.

### **5.2 UPGRADES TO EXISTING SYSTEM**

Based on the hydraulic model output information presented by Weston and Sampson in 2008, Kleinfelder identified a possible hydraulic restrictions during peak flow rates along Plain Street, Shirley Road and a cross country sewer that runs parallel to Sumner Street and Prospect Street. This area would receive additional wastewater flows from both Study Area 1 and Study Area 7. Kleinfelder does not recommend improvements to the collection system in this area until further study can be completed to validate the findings

of the 2008 hydraulic model. In fact, according to the Town, Weston and Sampson will be updating the 2008 hydraulic model to reflect many of the I/I removal efforts completed by the Town. Once the hydraulic model is updated, Kleinfelder recommends the hydraulics through the area of concern, identified above, be re-checked to confirm whether or not any capital investment is warranted to improve hydraulics.

### 5.3 BUDGETING FOR DESIGN AND CONSTRUCTION

Kleinfelder has prepared budget level opinions of probable construction costs for designing and constructing sewers in each of the Study Areas recommended for sewer. At this early planning stage, there are many unknowns with respect to subsurface conditions, utility conflicts, groundwater conditions, etc., which have a direct bearing on the cost of construction. Therefore, the costs presented in the table, below, are subject to refinement as more information becomes available. To account for these unknowns, each budget carries a 25% contingency factor.

**TABLE 7**  
**PROBABLE CONSTRUCTION COSTS**

*(July 2015 ENR 20-CITY CCI: 10,037)*

Cost Category	Study Area		
	1	3	7
Construction Costs	\$9,300,000	\$3,708,000	\$3,537,000
Construction Contingency (25%)	\$2,330,000	\$927,000	\$884,000
<b>Construction Total</b>	<b>\$11,630,000</b>	<b>\$4,635,000</b>	<b>\$4,421,000</b>
Engineering Design	\$930,000	\$464,000	\$442,000
Engineering Support During Construction	\$500,000	\$275,000	\$275,000
Resident Project Representative	\$450,000	\$250,000	\$250,000
<b>Contract Total</b>	<b>\$13,510,000</b>	<b>\$5,624,000</b>	<b>\$5,388,000</b>

Details of the estimates above are included in Appendix B – Sewer Priority Plan – Budgetary Cost Estimates.

### 5.4 PERMITTING CONSIDERATIONS

Kleinfelder anticipates, at a minimum, the following permits would be necessary for the recommended sewer extensions to Study Areas 1, 3, and 7:

- NPDES General Construction Permit & SWPPP,
- Notice of Intent to the local Conservation Commission,
- Massachusetts Department of Transportation (MassDOT) access permit,
- Local Board of Health permit,
- MWRA Municipal permit, and
- Submission of a MEPA Environmental Notification Form (ENF)

Other additional permits may be necessary as more specifics from each study area become better defined during design. These may include, but not be limited to, permits related to the U.S. Army Corps of Engineering; National Historic Preservation Act; Endangered Species Act; and Massachusetts Article 97. It is noted here that in 2014 MassDEP no longer issues permits for sewer extensions of the nature recommended by the study.

Kleinfelder specifically researched permitting needs associated with the MWRA and MEPA that are required for extending sewer to Study Areas 1, 3 and 7. A brief summary of this research is summarized below.

#### 5.4.1 MWRA Permitting Considerations

Kleinfelder contacted MWRA representatives from the planning department, operations and maintenance department, and industrial coordinators department to inquire about MWRA's requirements and permitting for a MWRA community to extend sewer. Kleinfelder communicated Stoughton's intent to extend sewer to Study areas 1, 3, and 7, which will increase sanitary sewer flows sent to MWRA facilities for treatment. The following summarizes MWRA permitting and requirements gathered from Kleinfelder's discussions with the MWRA.

##### i. Annual Municipality Permit

This permit application is sent to a MWRA community annually. The application consists of reporting existing conditions of the MWRA community that includes a report of new businesses, occupancy approvals, etc. and to report any blockages, root control and I&I. Peter Yarossi, the regional manager and head of the industrial coordinators department, reviews these permits, is the contact to assist with filling out this permit when the project is underway and after the project's completion.

ii. MWRA Facility Capacity Check

Kleinfelder estimated the projected wastewater flows for each Study Area which can be found in Section 4.2 of this report. The average daily flow and peak flow scenarios were presented to MWRA representatives to inquire about any capacity issues for the MWRA Deer Island Wastewater Treatment Plant. Kleinfelder reached out to the Operations and Maintenance Director at the MWRA, Steve Cullen, to discuss any capacity issues. Mr. Cullen confirmed that the Deer Island Wastewater Treatment Plant will have no capacity issues with the additional flows produced by extending sewer to Study Areas 1, 3 and 7. Further, Mr. Cullen indicated that Stoughton is already permitted to accept sewage as planned for complete buildout, and therefore the reserve capacity is already available to the Town. Therefore, there is no other MWRA permitting required for sewer extensions. Mr. Cullen further recommended the Town follow up with the MWRA planning department in regards to the project. The planning department would be able to verify that the proposed flow request from this study will not exceed the reserved capacity available to Stoughton with the MWRA system.

iii. Direct Connect Permit

The MWRA requires a direct connect permit for Towns who are adding a new connection to the existing MWRA system. Flows generated from the proposed sewer extensions in this study will utilize the Town's existing interceptors and MWRA connection, so this permit does not apply.

5.4.2 MEPA Threshold Exceedances

MEPA is not technically a permitting process; however, it is a necessary process to undergo for projects that have the potential to exceed certain environmental triggers and require a land transfer, state-sourced financial assistance, or permit from a State agency. The MEPA regulation is 301 CMR 11.00.

Sewer extensions for Study Areas 1, 3 and 7 include work within MassDOT owned roadways requiring the Town of Stoughton to obtain a state permit. This makes the project potentially subject to MEPA review, should any MEPA environmental thresholds be exceeded. Depending on the degree of exceedance, the project

could be subject to two tiers of MEPA review, including (1) an Environmental Notification Form (ENF) or 2) an ENF and Environmental Impact Report (EIR).

Kleinfelder reviewed the specific MEPA environmental triggers and formed the opinion that this project is likely subject to submission of an ENF. Further, additional MEPA review may be necessary should the Secretary so require it. The specific MEPA environmental threshold items this project potentially exceed in Section 5 of the MEPA regulation include the following:

- **Item 11.03(5)(b).3b:** “Construction of one or more New sewer mains five or more miles in length,” and
- **Item 11.03(5)(b).4a:** “New discharge or Expansion in discharge to a sewer system of 100,000 or more gpd of sewage, industrial wastewater or untreated stormwater.”

## 5.5 SCHEDULE

This study does not provide a specific schedule for implementation of the design and construction of each study area. It is Kleinfelder’s understanding that the recommendations of this study will undergo a public education and approval process before design and construction can begin.

The Steering Committee identified the need to coordinate planned sewer extensions with MassDOT for those study areas that have sewer planned within state-owned roadways. In most cases, MassDOT will maintain a utility work moratorium for a period of time following paving of the roadway.

## 6 PUBLIC PROCESS

### 6.1 STEERING COMMITTEE PROCESS

This study was guided by an assembly of interested citizens, town personnel and local business owners as part of a formal Steering Committee process. The purpose of the Steering Committee was to comment on the direction of the study, the methodology of the evaluation and its preliminary findings and recommendations. The Steering Committee members served in an advisory capacity, and therefore, no voting took place during the Steering Committee meetings.

A total of four (4) Steering Committee meetings occurred at the following project milestones:

Meeting #	Date	Project Milestone	Meeting Objectives
1	2/5/15	Kick-off	<ul style="list-style-type: none"> <li>• Review study purpose</li> <li>• Define role of Steering Process</li> <li>• Select Study Area</li> </ul>
2	3/5/15	Develop Evaluation Approach	<ul style="list-style-type: none"> <li>• Develop environmental ranking criteria</li> <li>• Develop economic ranking criteria</li> </ul>
3	7/23/15	Review Ranking Results	<ul style="list-style-type: none"> <li>• Review and comment on study areas recommended to be sewered</li> <li>• Review and comment on preliminary ranking</li> </ul>
4	10/1/15	Steering Closeout	<ul style="list-style-type: none"> <li>• Review construction costs</li> <li>• Review final recommendations of study</li> </ul>

Members of the Steering Committee are listed below:

	<b>First Name</b>	<b>Last Name</b>	<b>Title</b>
1	John	Batchelder	Public Works Superintendent
2	Scott	Carrara	Contractor
3	Bill	McNamara	Resident
4	Joseph	Nocera	Business Owner
5	Noreen	O'Toole	Town Planner
6	Andrew	Tibbs	Board of Health
7	Marc	Tisdelle	Town Engineer
8	Peter	Ventresca	Resident
9	Cynthia	Walsh	Board of Selectmen/ Resident

The major contributions of the Steering Committee process included the following:

- **Study Area Delineation** – The committee process helped to define the locations and extend of the study areas included in this study. There remain several isolated areas of the Town not included in this study; however, the committee determined these areas are too small to evaluate and could go through a petition process to obtain public sewer.
- **Evaluation Methodology** – The committee process informed and modified the approach to evaluating and ranking the environmental need and economic benefit to extending sewers to a given study area.
- **Presentation of Ranking** – The committee developed the tabular illustration of the results of this evaluation. In particular, the use of letter grades to describe economic benefit was developed by the committee.
- **Evaluation of Brockton** – The committee reviewed the plausibility of conveying new sewage flows (particularly from Study Area 1) to Brockton instead of using the Town’s existing MWRA connection. The committee determined this alternative was not desirable due to the following reasons:
  - Stoughton would need to enter negotiations with Brockton to develop the terms of conveying sewage to Brockton. In contrast, the Town is already permitted to convey sewage to the MWRA.
  - Based on similar negotiations with Brockton, other towns have been required to pay substantial entry fees to utilize Brockton’s wastewater treatment plant.

- Although Brockton has recently improved its wastewater treatment plant, the EPA has not authorized Brockton to increase its wastewater flows above 18 MGD. Further, Brockton's draft NPDES permit is requiring additional costly capital improvements to further reduce effluent nitrogen and phosphorous.
- The City of Brockton's wastewater collection system would need to be improved in order to accept flows from Stoughton in order to increase available capacity.
- **Study Areas 2W and 2E** –The Steering Committee did not support sewerage either of these two study areas. As part of the steering process the committee cited minimal public interest and no known existing public health issues within Study Areas 2W and 2E as reasons for this recommendation.

## 7 REFERENCES

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Maguire & Associates, "Report on Sewerage Facilities for Stoughton, MA," January 1963

Maguire & Associates, "Sewer Needs Survey," March 1980

Old Colony Planning Council, "Stoughton Route 27 Infrastructure Needs Assessment," June 2012.

CDM Smith / Weston & Sampson, "Upper Taunton River Regional Wastewater Evaluation," October 2012.

Massachusetts DEP Annual Statistical Reports, 2009 through 2014

Title 5 Regulations – 310 CMR 15.00

Weston & Sampson, Final Report: Sewer System Flow Model, December 2009

MWRA, Annual Infiltration and Inflow (I/I) Reduction Report for Fiscal Year 2014, August 22, 2014.

Massachusetts DEP, Source Water Assessment and Protection (SWAP) Report, August 2003).

Additional sources may be referenced separately in the report text.

**APPENDIX A: SEWER AREA RANKING PLAN - ECONOMIC ANALYSIS**

# Town of Stoughton

10 Pearl Street • Stoughton, MA 02072 • (781) 341-1300 • FAX (781) 344-5048

To: Marc Tisdelle, Town Engineer

From: Joseph Gibbons, Director of Assessing *JAG*

Date: July 22, 2015

Re: **Sewer Priority Plan – Economic Analysis**  
Proposed Sewer Projects: 1A, 1B, 5 & 7

## Area 1A & 1B:

After a brief macro analysis, my appraisal staff and I analyzed areas 1A, 1B, 5 and 7. Areas 1A & 1B are more desirable from an economic growth perspective than areas 5 or 7 due to larger lot sizes, zoning and the presence of existing underutilized commercial and industrial buildings. 1A & 1B should add approximately 2.00% to the property tax levy within a decade following construction. With major emphasis placed on the forty-four (44) commercial and industrial parcels (please see the attached addendum), I would estimate an increase in total assessed value of a minimum of 50% in the Campanelli Industrial Park and less along Park Street. This increase would arise from lower vacancy rates due to better tenancies, and improvements to existing industrial properties.

This overall increase of approximately \$1,135,572 to the tax levy, which does not include other additional benefits to the Town of Stoughton including but not limited to personal property taxes, increased/better uses in the Industrial Park, new growth from additions to existing commercial/industrial buildings and new commercial buildings primarily along Park Street, new homes, increased automobile excise taxes, permit fees and the annual 2.5% multiplier. Conservatively, one could be looking at well over \$1,500,000 within ten years after construction.

## Area 7:

Area 7 is somewhat desirable from an economic point of view due to the existence of thirty-seven (37) commercial/industrial properties, however these properties are smaller in size and in land area than those analyzed in areas 1A & 1B. Area 7 should add approximately, \$49,700 (0.09%) to the tax levy. Also, the average total assessment (land & building) for Areas 1A & 1B is 1,577,359 compared to 365,668 in area 7. This suggests an already existing willingness to improve the land in areas 1A & 1B and

considerably less so in Area 7. One might assume that the access to sewerage would further facilitate development of Areas 1A & 1B to maximum potential. These facts would limit the upside in Area 7 from an economic perspective compared to Areas 1A & 1B. . Many of these parcels are improved with automobile garages, repair shops etc. and contain or abut wetlands. Moreover, the proposed southeast corridor railroad expansion may affect the ability to develop this area.

**Area 5:**

Area 5 is the least desirable from an economic perspective due to paucity of commercial and industrial properties. This section has only ten commercial properties and no industrial properties. Area 5 is already improved with single family properties on relatively small lots and hardly any vacant developable parcels. From a purely economic perspective, this area is not desirable to sewer and we did not do extensive appraisal analysis.

**Summary:**

Areas 1A & 1B are ripe for expanded development given the existence of several large industrial buildings. The additional development of this area has been held back by the presence of outdated septic systems and the lack of town sewerage. In our opinion, Areas 1A & 1B are ripe for expanded development with large buildings already in place, whereas Area 7 would be limited by existing smaller lots and buildings. The expansion would be limited in Area 7 compared to Areas 1A & 1B.

The majority of this new growth from sewer expansion in Areas 1A & 1B would be on the CIP (Commercial/Industrial/Personal Property) side of the ledger, which would help keep the residential tax rate from increasing as much as it would without this growth. This project would address some of the concerns that the Assessors have raised at the last few Tax Classification Hearings, namely that the majority of the Town's new growth was residential. A balanced mixture of both residential and commercial growth is ideal for maintaining the current shift of the tax rate.

**APPENDIX B: SEWER AREA RANKING PLAN – BUDGETARY COST ESTIMATES**

**Study Area 1**  
**Engineer's Estimate of Probable Construction Costs - CONCEPT LEVEL FOR BUDGETING PURPOSES**  
**Sewer Priority Plan**  
**Stoughton, MA**

Date: October 7, 2015  
 ENR 20-City CCI Index: 10,037 (July 2015)

Item No.	Description	Unit Cost	Quantities	Units	Cost
1	5% Mobilization/Demobilization	\$ 443,100	1	%	\$443,100
2a	Pipe - PVC 8-inch diameter	\$ 125	17,922	LF	\$2,240,250
2b	Pipe - PVC 10-inch diameter	\$ 150	8,109	LF	\$1,216,350
3	Pipe - PVC 4-inch diameter - pressure sewer	\$ 50	7,922	LF	\$396,094
4	6" PVC sanitary sewer services	\$ 70	7330	LF	\$513,100
5	Manhole - Precast 4-Foot Diameter (every 250 feet)	\$ 500	840	VF	\$420,000
6a	Wastewater Pumping Station - small	\$ 300,000	2	LS	\$600,000
6b	Wastewater Pumping Station - large	\$ 600,000	0	LS	\$0
7	Exploratory Investigations	\$ 75	700	CY	\$52,500
8	Rock Excavation	\$ 100	6500	CY	\$650,000
9	Utility Support and Coordination	\$ 20,000	1	LS	\$20,000
10	Excavation of Unsuitable Material Below Grade	\$ 50	100	CY	\$5,000
11a	Trench Pavement (4.5-inch, Local Roads)	\$ 125	6510	TON	\$813,750
11b	Trench Pavement (7.5-inch, State Roads)	\$ 125	2330	TON	\$291,250
11c	Crown-to-Curb Pavement (2-inch)	\$ 125	7609	TON	\$951,105
12	Police Details	\$ 1,200	577	DAYS	\$692,400
XX					

Construction Costs	\$9,300,000
Construction Contingency (25%)	\$2,330,000
<b>Construction Total</b>	<b>\$11,630,000</b>
Engineering Design (8% of construction total)	\$930,000
Engineering Support During Construction (\$25,000/month, 20 months)	\$500,000
Resident Project Representative (\$25,000/month, 18 months)	\$450,000
<b>Contract Total</b>	<b>\$13,510,000</b>

**CONSTRUCTION COST PER FOOT ANALYSIS**

<b>Construction Total</b>	<b>\$9,300,000</b>
Subtract PS & FM	\$996,094
Subtotal	\$8,303,906
LF	26,031
\$ Per Foot (of subtotal)	\$319.00
\$ Per Parcel (of subtotal)	\$28,340.98

**Study Area 3**  
**Engineer's Estimate of Probable Construction Costs - CONCEPT LEVEL FOR BUDGETING PURPOSES**  
**Sewer Priority Plan**  
**Stoughton, MA**

Date: October 7, 2015  
 ENR 20-City CCI Index: 10,037 (July 2015)

Item No.	Description	Unit Cost	Quantities	Units	Cost
1	5% Mobilization/Demobilization	\$ 176,600	1	%	\$176,600
2a	Pipe - PVC 8-inch diameter	\$ 125	10,415	LF	\$1,301,875
2b	Pipe - PVC 10-inch diameter	\$ 150	0	LF	\$0
3	Pipe - PVC 4-inch diameter - pressure sewer	\$ 50	972	LF	\$48,600
4	6" PVC sanitary sewer services	\$ 70	5250	LF	\$367,500
5	Manhole - Precast 4-Foot Diameter (every 250 feet)	\$ 500	340	VF	\$170,000
6a	Wastewater Pumping Station - small	\$ 300,000	1	LS	\$300,000
6b	Wastewater Pumping Station - large	\$ 600,000	0	LS	\$0
7	Exploratory Investigations	\$ 75	300	CY	\$22,500
8	Rock Excavation	\$ 100	2800	CY	\$280,000
9	Utility Support and Coordination	\$ 20,000	1	LS	\$20,000
10	Excavation of Unsuitable Material Below Grade	\$ 50	100	CY	\$5,000
11a	Trench Pavement (4.5-inch, Local Roads)	\$ 125	2690	TON	\$336,250
11b	Trench Pavement (7.5-inch, State Roads)	\$ 125	720	TON	\$90,000
11c	Crown-to-Curb Pavement (2-inch)	\$ 125	2268	TON	\$283,538
12	Police Details	\$ 1,200	255	DAYS	\$306,000
XX					

Construction Costs	\$3,708,000
Construction Contingency (25%)	\$927,000
<b>Construction Total</b>	<b>\$4,635,000</b>
Engineering Design (10% of construction total)	\$464,000
Engineering Support During Construction (\$25,000/month, 11 months)	\$275,000
Resident Project Representative (\$25,000/month, 10 months)	\$250,000
<b>Contract Total</b>	<b>\$5,624,000</b>

**CONSTRUCTION COST PER FOOT ANALYSIS**

<b>Construction Total</b>	<b>\$3,708,000</b>
Subtract PS & FM	\$348,600
Subtotal	\$3,359,400
LF	10,415
\$ Per Foot (of subtotal)	\$322.55
\$ Per Parcel (of subtotal)	\$15,997.14

**Study Area 7**  
**Engineer's Estimate of Probable Construction Costs - CONCEPT LEVEL FOR BUDGETING PURPOSES**  
**Sewer Priority Plan**  
**Stoughton, MA**

Date: October 14, 2015  
 ENR 20-City CCI Index: 10,037 (July 2015)

Item No.	Description	Unit Cost	Quantities	Units	Cost
1	5% Mobilization/Demobilization	\$ 168,400	1	%	\$168,400
2a	Pipe - PVC 8-inch diameter	\$ 125	9,934	LF	\$1,241,750
2b	Pipe - PVC 10-inch diameter	\$ 150	0	LF	\$0
3	Pipe - PVC 4-inch diameter - pressure sewer	\$ 50	1,670	LF	\$83,500
4	6" PVC sanitary sewer services	\$ 70	2380	LF	\$166,600
5	Manhole - Precast 4-Foot Diameter (every 250 feet)	\$ 500	320	VF	\$160,000
6a	Wastewater Pumping Station - small	\$ 300,000	1	LS	\$300,000
6b	Wastewater Pumping Station - large	\$ 600,000	0	LS	\$0
7	Exploratory Investigations	\$ 75	200	CY	\$15,000
8	Rock Excavation	\$ 100	3000	CY	\$300,000
9	Utility Support and Coordination	\$ 20,000	1	LS	\$20,000
10	Excavation of Unsuitable Material Below Grade	\$ 50	100	CY	\$5,000
11a	Trench Pavement (4.5-inch, Local Roads)	\$ 125	970	TON	\$121,250
11b	Trench Pavement (7.5-inch, State Roads)	\$ 125	2850	TON	\$356,250
11c	Crown-to-Curb Pavement (2-inch)	\$ 125	2889	TON	\$361,175
12	Police Details	\$ 1,200	198	DAYS	\$237,600
XX					

Construction Costs	\$3,537,000
Construction Contingency (25%)	\$884,000
<b>Construction Total</b>	<b>\$4,421,000</b>
Engineering Design (10% of construction total)	\$442,000
Engineering Support During Construction (\$25,000/month, 11 months)	\$275,000
Resident Project Representative (\$25,000/month, 10 months)	\$250,000
<b>Contract Total</b>	<b>\$5,388,000</b>

**CONSTRUCTION COST PER FOOT ANALYSIS**

<b>Construction Total</b>	<b>\$3,537,000</b>
Subtract PS & FM	\$383,500
Subtotal	\$3,153,500
LF	9,934
\$ Per Foot (of subtotal)	\$317.45
\$ Per Parcel (of subtotal)	\$33,194.74

**UNIT PRICE ASSUMPTIONS****Engineer's Estimate of Probable Construction Costs - CONCEPT LEVEL FOR BUDGETING PURPOSES****Sewer Priority Plan****Stoughton, MA**

Item No.	Description	Unit Cost	Units
1	5% Mobilization/Demobilization	\$ -	-
2a	Pipe - PVC 8-inch diameter	\$ 125	LF
2b	Pipe - PVC 10-inch diameter	\$ 150	LF
3	Pipe - PVC 4-inch diameter - pressure sewer	\$ 50	LF
4	6" PVC sanitary sewer services	\$ 70	LF
5	Manhole - Precast 4-Foot Diameter (every 250 feet)	\$ 500	VF
6a	Wastewater Pumping Station - small	\$ 300,000	EA
6b	Wastewater Pumping Station - large	\$ 600,000	EA
7	Exploratory Investigations	\$ 75	CY
8	Rock Excavation	\$ 100	CY
9	Utility Support and Coordination	\$ 20,000	LS
10	Excavation of Unsuitable Material Below Grade	\$ 50	CY
11a	Trench Pavement (4.5-inch, Local Roads)	\$ 125	TON
11b	Trench Pavement (7.5-inch, State Roads)	\$ 125	TON
11c	Crown-to-Curb Pavement (2-inch)	\$ 125	TON
12	Police Details	\$ 1,200	DAY