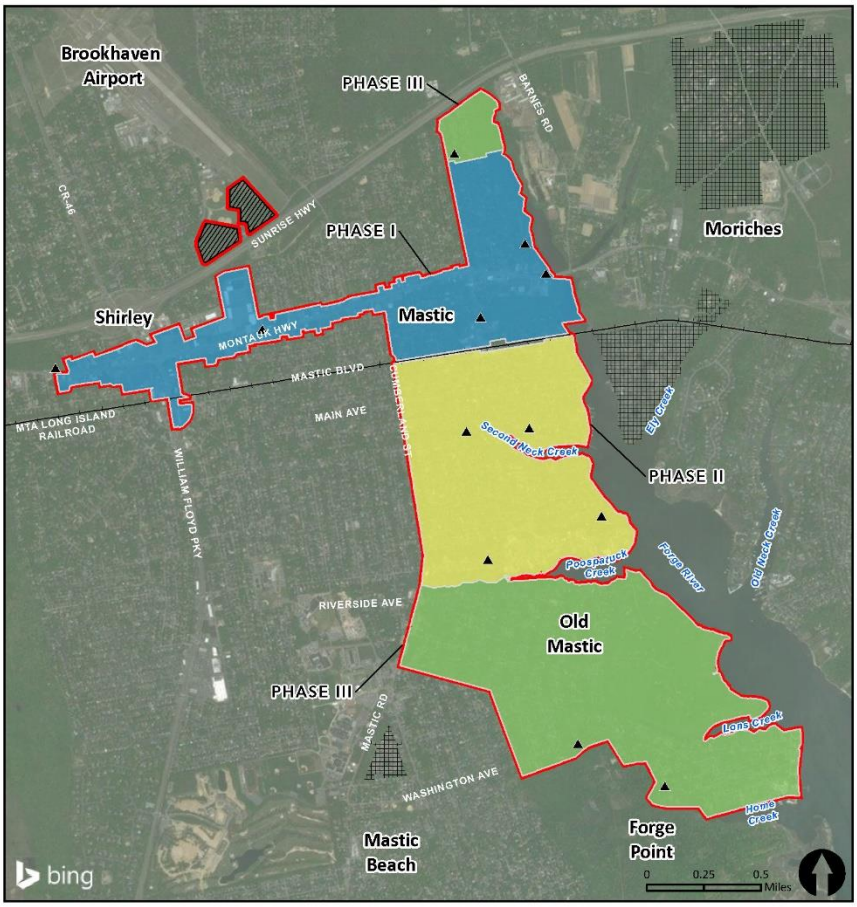


Forge River Watershed Sewer Project
Final Environmental Impact Statement
Appendix B, Part 3 of 3
Town of Brookhaven, Suffolk County, New York

June 2018

Prepared pursuant to the New York State Environmental Quality Review Act

SEQRA Lead Agency:
NY Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004

This page intentionally left blank.

APPENDIX B.3: ALTERNATIVES SCREENING REPORT

This page intentionally left blank.

Appendix B.3:

ALTERNATIVES SCREENING REPORT

Forge River Watershed Sewer Project

Mastic-Shirley Proposed Sewer District

Town of Brookhaven, New York

FEMA-DR-4085-NY HMGP

Sixth Revision: November 28, 2016

This page intentionally left blank.

EXECUTIVE SUMMARY

The Forge River Watershed Sewer Project proposes decommissioning on-site wastewater treatment and disposal systems (OSWS) in the project area and connecting the parcels to a new sewer collection system that would flow to a new advanced wastewater treatment facility (AWTF). The project area consists of three areas identified as Phases I to III, which contain 3,662 parcels in total. This report identifies and screens several alternatives for improving wastewater treatment in the project area to determine a reasonable range of alternatives warranting more detailed analysis in the draft environmental assessment (EA)/environmental impact statement (EIS).

Existing Conditions

Forge River is located in the hamlets of Mastic and Shirley in the Town of Brookhaven. The OSWS providing sanitary wastewater disposal in the project area are partially outdated and failing. Failing OSWS cause untreated effluent to be released into the surrounding soil. These failures can be caused by hydraulic overloading and flooding. Many of the OSWS in the project area failed during Hurricane Sandy and will continue to be subject to failures during future storm events. Failing systems result in impacts on human health during floods and contribute to high nutrient loading to Forge River and Great South Bay.

Screening Approach

A screening approach was developed to evaluate a range of alternatives for improving wastewater treatment in the project area and to identify those alternatives that are feasible and meet the purpose and need of the project. Section 404 of the Robert T. Stafford Relief and Emergency Assistance Act of 1974 (42 United States Code 5170c), as amended, authorizes the Federal Emergency Management Agency (FEMA) to provide funding to eligible grant applicants for activities that reduce or eliminate risks to life and property from hazards and their effects. The primary purpose of the proposed action is to mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures in the Forge River watershed in Suffolk County, New York, caused by natural hazards. The secondary purpose is to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge. Five criteria were used during screening:

- *Treatment performance (removal of total nitrogen):* This criterion relates to the mitigation of OSWS failure-related nitrogen impacts on surface waters and coastal wetlands and the resultant impact on their storm surge coastal flood risk protection capacity. The target for groundwater nitrogen concentrations for Suffolk County Groundwater Management Zone VI is 6 milligrams per liter (mg/L). The improvement in water quality provides long-term benefits through improved wetland health that contributes to a reduction in coastal flood risk.
- *Performance during flood events:* This criterion relates to the ability of an alternative to reduce or avoid short-term, repetitive, adverse impacts on human life and property associated with OSWS failures during and after flood events. Alternatives that perform best are those that are able to remain fully functional during and after flood events without a loss of treatment performance and avoid impacts on human health from flooded treatment systems.

- *Performance under projected sea level rise and climate change conditions:* This criterion evaluates the ability of an alternative to maintain full performance in the face of sea level rise and other climatic changes.
- *Acquisition of land (with appropriate dimensions and compatible land use):* For an alternative to be feasible, it must be constructible within a reasonable footprint on a site and within an area that is compatible with the use of the property for the proposed type of wastewater treatment.
- *Costs:* This criterion estimates order-of-magnitude costs for construction as well as for operation and maintenance (O&M) and the feasibility of an alternative in light of cost considerations for various industry practices.

Screening Summary and Recommendations

The screening approach was applied to five action alternatives. Following is summary of the evaluation for each alternative:

- *Action Alternative A (Replacing existing OSWS with Innovative/Alternative [I/A] OSWS):* This alternative generally would not mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards such as rising groundwater levels and overland flooding that result from precipitation and/or tidal and surge conditions (i.e., the alternative generally would not meet the primary purpose of the project). A rising sea level would further reduce the performance of I/A OSWS and increase the human health risk because more OSWS would leak during flood events. However, newer systems assessed during the County's ongoing demonstration project may include I/A OSWS set up above ground with less risk of flooding. Action Alternative A would achieve an effluent quality of at least 19 mg/L for total nitrogen, which would be an improvement from existing conditions (conventional OSWS achieve only about 40 mg/L). The target of a nitrogen concentration in the groundwater of 6 mg/L would be achieved in parts of the project area, and the nitrogen loading of Forge River would be substantially reduced (improved) from current conditions. Therefore, this alternative would meet the secondary purpose of the project, but not to the same extent as other action alternatives discussed below. In addition, the nitrogen reduction performance of these systems would be affected by flood events and sea level rise. I/A OSWS can operate effectively with reduced separation to groundwater, but the system still requires an unsaturated zone of soil to hydraulically function. A flood event would increase the elevation of the groundwater table and could cause flowing floodwaters, both of which would impact the functionality of OSWS. Compared to a centralized treatment system, construction costs would be substantially lower than the costs for a centralized system (less than half), while O&M costs would be in the same range. Therefore, Action Alternative A is recommended for further analysis in the draft EA/EIS, although this alternative does not achieve the same level of nitrogen reduction as centralized treatment system alternatives. The analysis shall be based on the latest available I/A OSWS technology, which may also meet part of the primary purpose of the project.
- *Action Alternative B (Low pressure and gravity sewer collection system with membrane bioreactor [MBR] or Sequencing Batch Reactor [SBR] facility):* This alternative would mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards such as rising groundwater levels and overland

flooding that result from precipitation and/or tidal and surge conditions (i.e., the alternative would meet the primary purpose of the project). Potential impacts on human health as a result of surcharged failed leaching fields would largely be eliminated with a centralized treatment facility. Rising sea levels would not reduce the performance of the AWTF because the proposed location of the AWTF is at a sufficiently high surface elevation, and National Oceanic and Atmospheric Administration (NOAA) sea level rise projections (NOAA, 2016) do not indicate inundation of the site. The facility would be protected from stormwater flooding by appropriate site drainage systems. Under rising sea levels, this alternative would therefore continue to eliminate the existing human health risk as a result of OSWS that leak during flood events. This alternative would provide the highest level of nitrogen removal from the effluent, expected to result in groundwater nitrogen concentrations below the target of 6 mg/L throughout large portions of the project area (i.e., the alternative would also meet the secondary purpose of the project). Construction costs for any centralized facility would be substantially higher than for I/A OSWS (Action Alternative A), but O&M costs would be similar. Action Alternative B is recommended for further analysis in the draft EA/EIS.

- *Action Alternative C (Different wastewater treatment technology):* The modified Ludzack-Ettinger (MLE) is a different form of treatment processes. Other than the treatment technology and cost, Action Alternative C is identical to Action Alternative B. Action Alternative C performs the same as Alternative B in terms of mitigating human health and property impacts and the effects of sea level rise. Thus, Action Alternative C would meet the primary purpose of the project. However, under this alternative, the nitrogen concentration in the effluent would be 100–233 percent higher than for the MBR or SBR processes. Thus, the alternative would not meet the secondary purpose of the project to the same extent as Action Alternative B. Total construction costs for a centralized system with MLE processes would be slightly lower (less than 3 percent) than for a system with the MBR or SBR process (Action Alternative B). In summary, Action Alternative C would result in lower benefits at similar costs compared to Action Alternative B. Therefore, Action Alternative C is not recommended for further analysis in the draft EA/EIS.
- *Action Alternative D (Different collection system infrastructure):* This action alternative is similar to Action Alternative B and would perform the same as Action Alternative B in terms of mitigating human health, property impacts, the effects of sea level rise, and effluent quality. Thus, the alternative would meet the primary and secondary purposes of the project similar to Action Alternative B. However, vacuum sewers can be operationally challenging to maintain and prone to vacuum leaks or blockage from grease build-up; these challenges could occasionally affect the secondary purpose of the project. O&M costs for this alternative would be slightly higher than for the combination of gravity and low pressure sewers under Action Alternative B. While Action Alternative D would generally meet the purpose and need to a similar extent as Action Alternative B, the alternative would not result in greater benefits and would result in less reliable operations at slightly greater cost. Therefore, Action Alternative D is not recommended for further analysis in the draft EA/EIS.
- *Action Alternative E (Alternative location[s] for AWTF):* Nine different sites were identified and evaluated for a wastewater treatment facility as part of various feasibility studies between 1999 and 2014. Review of the studies indicated that the Brookhaven

Calabro Airport site is the only feasible location for the AWTF. This site is part of Action Alternatives A to D. The site is close to the project area, thereby enabling efficient connectivity to the sewer network. The site acreage is adequate to accommodate the treatment facility and associated treatment area for all four phases of the sewer network. The site's depth to the groundwater table of 30 to 40 feet provides the necessary distance for feasible operation of the AWTF. Other sites considered during the various feasibility studies were screened out because they either had insufficient depths to the groundwater table, were located too close to residential neighborhoods, had unsuitable site dimensions, or were located too far from the area to be sewered.

In summary, Action Alternative A (replacing existing OSWS with I/A OSWS) and Action Alternative B (low pressure and gravity sewer collection system with MBR or SBR facility) are recommended as the appropriate alternatives for analysis in the draft EA/EIS.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

2.0 SCREENING APPROACH 8

2.1 Purpose and Need 8
2.2 Criteria 8
2.3 Screened Alternatives 10

3.0 SCREENING ANALYSIS 11

3.1 Action Alterative A: On-site Treatment and Disposal – Replacing Existing OSWS with I/A OSWS 11

3.1.1 Technical Aspects 11
3.1.2 Screening Results – Phase I/II Area 11
3.1.3 Screening Results – Phase III Area 13

3.2 Action Alterative B: Centralized Treatment – Low Pressure and Gravity Sewer Collection System with Membrane Bioreactor or Sequencing Batch Reactor Facility 18

3.2.1 Technical Aspects 18
3.2.2 Screening Results – Phase I/II Area 19
3.2.3 Screening Results – Phase III Area 21

3.3 Action Alterative C: Centralized Treatment – Different Wastewater Treatment Technology 22

3.3.1 Technical Aspects 22
3.3.2 Screening Results – Phase I/II Area 22
3.3.3 Screening Results – Phase III Area 24

3.4 Action Alterative D: Centralized Treatment – Different Collection System Infrastructure 24

3.4.1 Technical Aspects 24
3.4.2 Screening Results – Phase I/II Area 25
3.4.3 Screening Results – Phase III Area 26

3.5 Action Alterative E: Centralized Treatment – Alternative Location(s) for AWTF 26

4.0 SUMMARY AND RECOMMENDATIONS 29

5.0 REFERENCES 32

ATTACHMENT 1: ALTERNATIVES SCREENING MATRIX 35

ATTACHMENT 2: CONSIDERATIONS FOR WASTEWATER TREATMENT FOR PHASE IV 39

ATTACHMENT 3: ALTERNATIVE ON-SITE SEWAGE DISPOSAL SYSTEMS, TASK IX - SUMMARY REPORT 45

LIST OF TABLES

Table 3-1. Unit Costs for Construction and Installation of Conventional OSWS and two Examples of I/A OSWS in Residential Applications 16

Table 3-2. Costs for Construction and Annual Operation and Maintenance of Alternatives *(Order-of-magnitude Analysis)* 17

LIST OF FIGURES

Figure 1-1. Forge River Watershed Sewer Project Area 2

Figure 1-2. Coastal Inundation Risk Assessment Zone (Preliminary) 3

Figure 1-3. Septic Systems and Subwatersheds within the Forge River Watershed 4

Figure 1-4. Depth to Groundwater 5

Figure 1-5. Modeled Total Nitrogen Concentrations in Shallow Groundwater under Existing Conditions for the Phase I/II and III Areas 7

Figure 2-1. Past and Projected Changes in Sea Level 9

Figure 3-1. Shoreline with Projected Sea Level Rise 14

Figure 3-2. Projected Increase in the Groundwater Table between 2014 and 2100 as a Result of a 2.8-foot Sea Level Rise 15

Figure 3-3. Modeled Total Nitrogen Concentrations in Shallow Groundwater after Implementing Action Alternative B with MBR for the Phase I/II and III Areas 20

ABBREVIATIONS AND ACRONYMS

AWTF	Advanced Wastewater Treatment Facility
CR	County Road
EA	environmental assessment
EIS	environmental impact statement
FAST	Fixed Activated Sludge Treatment
FEMA	Federal Emergency Management Agency
gpd	gallon(s) per day
HMGP	Hazard Mitigation Grant Program
I/A	innovative/alternative
lbs/day	pound(s) per day
MBR	membrane bioreactor (a wastewater treatment process)
MGD	million gallons per day
mg/L	milligram(s) per liter
MLE	modified Ludzack-Ettinger (a wastewater treatment process)
MSL	mean sea level
NCA	National Climate Assessment
NOAA	National Oceanic and Atmospheric Administration
O&M	operation and maintenance
OSWS	on-site wastewater treatment and disposal system(s)
Project	Forge River Watershed Sewer Project
SBR	sequencing batch reactor (a wastewater treatment process)
SCDHS	Suffolk County Department of Health Services
SCDPW	Suffolk County Department of Public Works
SEQRA	State Environmental Quality Review Act
SFE	single family equivalent
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
yr	year

This page intentionally left blank.

1.0 INTRODUCTION

1.1 Background

The Forge River Watershed Sewer Project proposes decommissioning on-site wastewater treatment and disposal systems (OSWS) in the project area and connecting the parcels to a new sewer collection system that would flow to a new advanced wastewater treatment facility (AWTF). The project area was initially identified as "Phase I/II" (2,094 parcels) and included properties on the north and south sides of County Road (CR) 80 (Montauk Highway) between William Floyd Parkway and Forge River (**Figure 1-1**). This portion of the project is funded and is undergoing design. This alternatives screening report also includes "Phase III" (1,568 parcels), which consists primarily of residential areas along Forge River to the south of the Phase I/II area. Unless a particular phase is specified, the term "project area" applies to the combined Phase I to III area.

This report identifies and screens several alternatives for improving wastewater treatment in the project area to determine a reasonable range of alternatives warranting more detailed analysis in the draft EA/EIS; screening results are summarized in a matrix (**Attachment 1**). Phases I/II and III are screened separately, because Phases I/II are anticipated to be implemented before Phase III. The screening process concludes with a recommendation regarding which alternatives to advance for further analysis in the draft EA/EIS.

Public comments were received during scoping for a potential future phase of the overall project ("Phase IV"). This phase will be considered in the assessment of cumulative impacts in the draft EA/EIS. Phase IV includes the Village of Mastic Beach (south of Neighborhood Road) and Smith Point in the Hamlet of Shirley. This phase is discussed briefly in **Attachment 2**.

1.2 Existing Conditions

The project area is affected by heavy storms that can lead to flooding and inundation from surging ocean water (**Figure 1-2**). About 90 percent of the Phase I/II area is located within the Forge River watershed, and the remaining 10 percent of the area is located within the Carmans River watershed to the west. The entire Phase III area is located within the Forge River watershed.

The density of OSWS in the project area is high compared to many other parts of the Forge River watershed (**Figure 1-3**). About 96 percent of the current total nitrogen load from effluent discharged to the groundwater in the Phase I/II area is contributed by residential sources, with the remainder contributed by commercial and institutional sources (CDM Smith, 2015). The relative contribution from residential sources is likely even higher in the Phase III area. Ground surface elevations in the project area range from about 50 feet to 0 feet above mean sea level (MSL). Depth to groundwater ranges from 40 feet to less than 5 feet below the land surface (USGS, 2016) (**Figure 1-4**). Groundwater in much of the Phase I/II and III areas takes two years or less to flow to Forge River (CDM Smith, 2014).

Fore

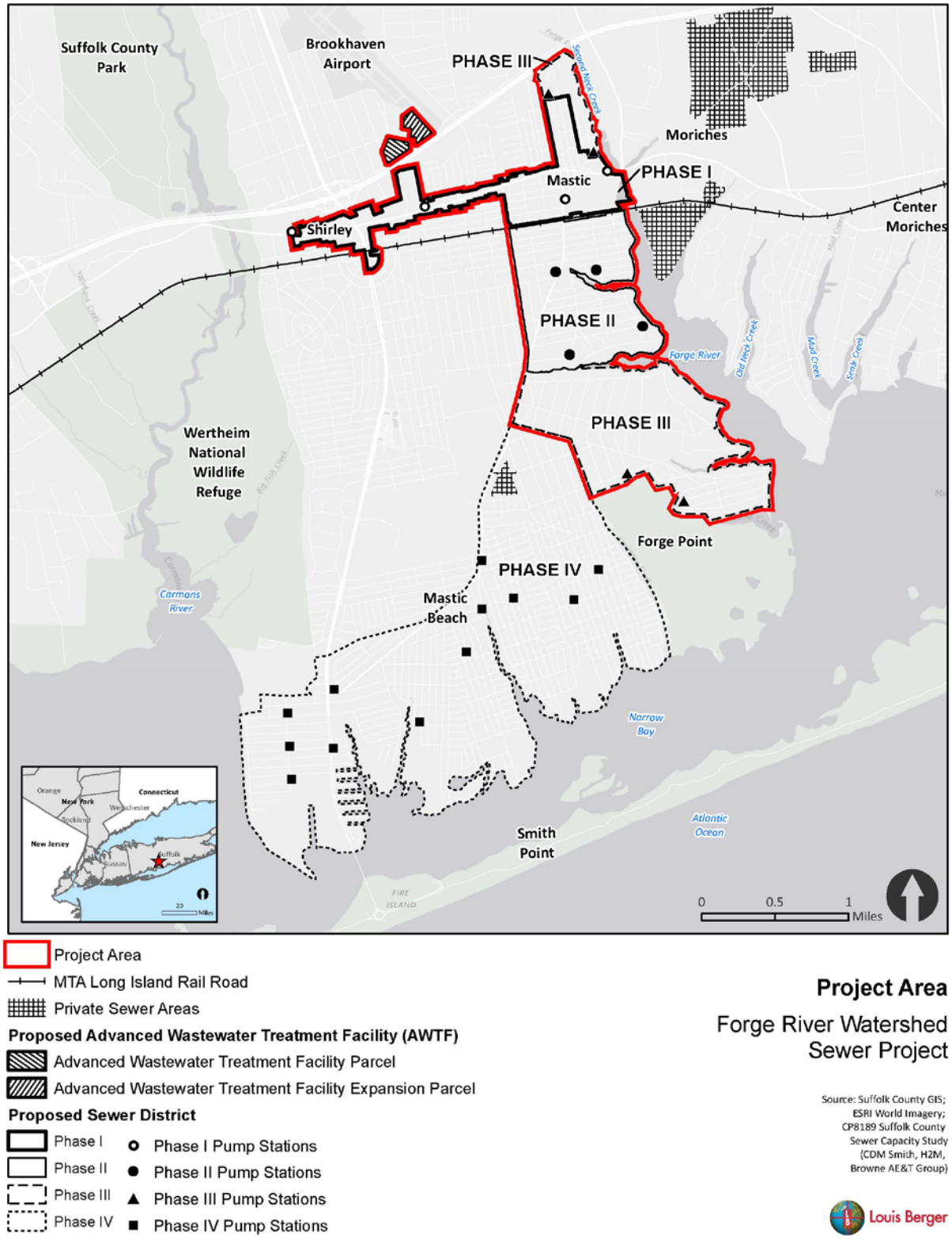
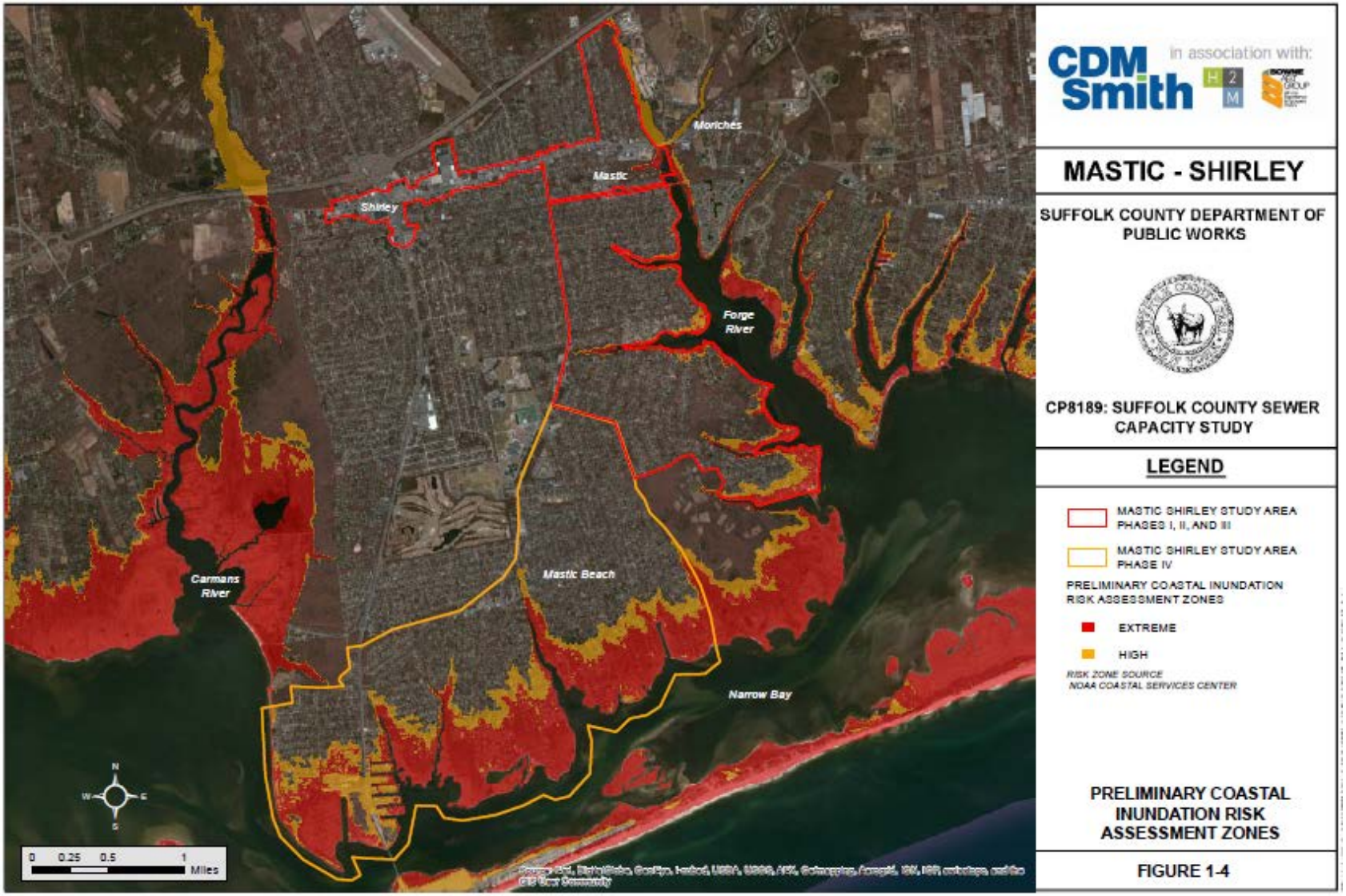


Figure 1-1. Forge River Watershed Sewer Project Area



Source: CDM Smith, 2014

Figure 1-2. Coastal Inundation Risk Assessment Zone (Preliminary)

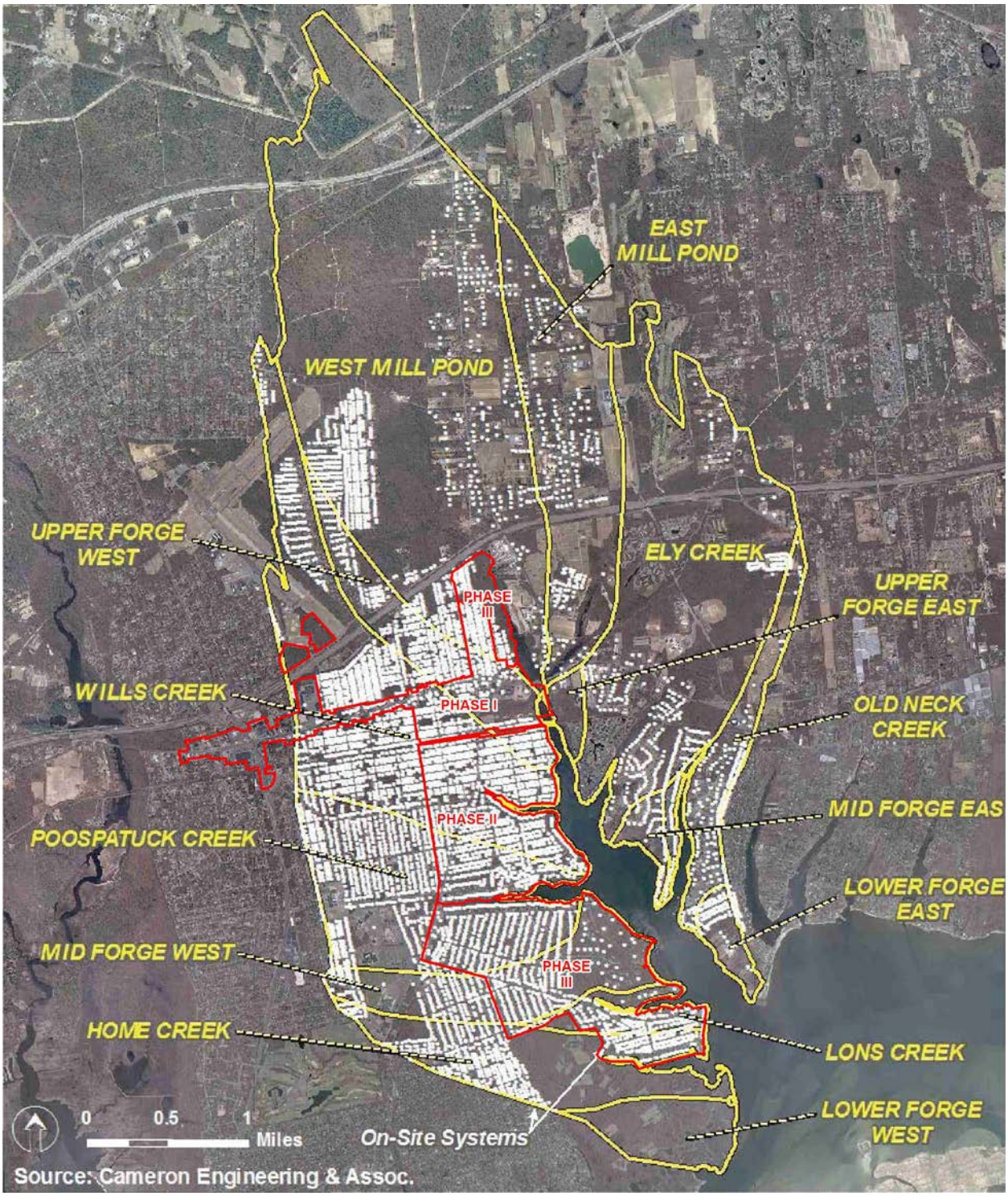
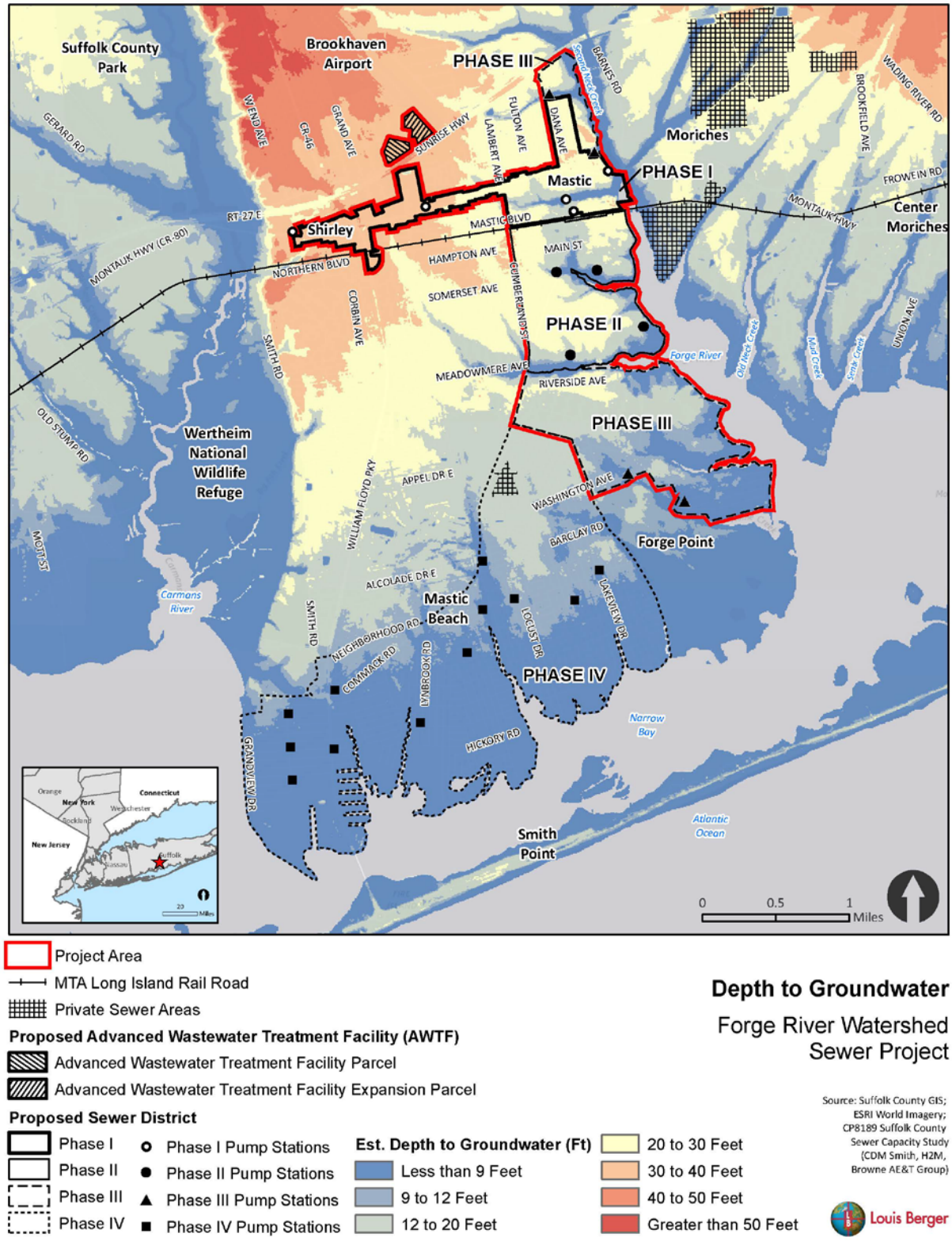


Figure 1-3. Septic Systems and Subwatersheds within the Forge River Watershed



Project Area
MTA Long Island Rail Road
Private Sewer Areas

Proposed Advanced Wastewater Treatment Facility (AWTF)

Advanced Wastewater Treatment Facility Parcel
Advanced Wastewater Treatment Facility Expansion Parcel

Proposed Sewer District

Phase I
Phase II
Phase III
Phase IV

Phase I Pump Stations
Phase II Pump Stations
Phase III Pump Stations
Phase IV Pump Stations

Est. Depth to Groundwater (Ft)

Less than 9 Feet
9 to 12 Feet
12 to 20 Feet
20 to 30 Feet
30 to 40 Feet
40 to 50 Feet
Greater than 50 Feet

Depth to Groundwater

Forge River Watershed Sewer Project

Source: Suffolk County GIS; ESRI World Imagery; CP8189 Suffolk County Sewer Capacity Study (CDM Smith, H2M, Browne AE&T Group)

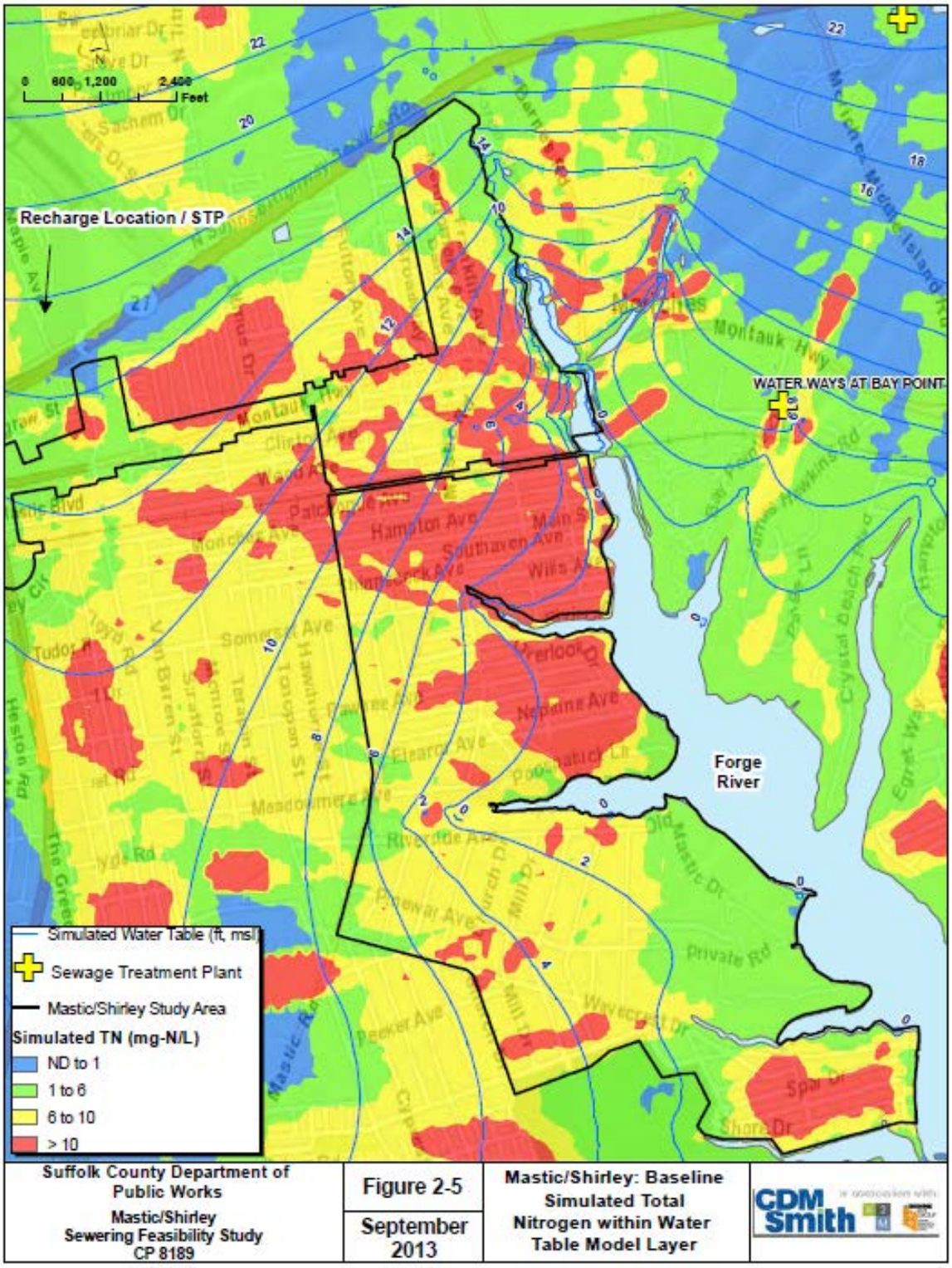
Louis Berger

Figure 1-4. Depth to Groundwater

OSWS failures occur when systems are flooded by heavy rainfall or are submerged in shallow groundwater that rises during storm events and reduces system capacity and/or inhibits or eliminates system treatment or disposal capability, as described below:

- *Capacity failure* occurs when tidal inundation of the land surface saturates soils above and around the systems causing water to enter the systems or when groundwater rises into the cesspool or leaching pools, reducing system hydraulic capacity. Capacity failure manifests itself by slow-draining domestic plumbing or backup of wastewater into the homes or basements of buildings served by the systems.
- *Treatment and disposal failure* occurs when groundwater or flood waters inundate the systems or soils immediately beneath the systems, disrupting the biological treatment activity in the systems. A 2-foot vertical separation between the bottom of the cesspool or leaching pool and the water table is necessary for decomposition of organic compounds, biodegradation of detergents, and die-off of bacteria and viruses. For an extended period of months to years following system failures caused by inundation, nutrients (e.g., nitrogen) and pathogens are discharged unabated to groundwater and potentially to nearby surface waterbodies (i.e., Forge River and Great South Bay). Rising groundwater tables and floodwaters can also result in flotation of tanks unless they are properly anchored in the ground.

OSWS are a significant source of nitrogen loading in Forge River because nitrogen leaches out of the OSWS into groundwater and the nitrogen-rich groundwater then flows subsurface toward these estuaries. Total nitrogen concentrations in the groundwater are currently higher than 10 milligrams per liter (mg/L) in a large portion of the project area (**Figure 1-5**) and do not meet Suffolk County's target for the area of 6 mg/L.



Source: CDM Smith, 2014.

Figure 1-5. Modeled Total Nitrogen Concentrations in Shallow Groundwater under Existing Conditions for the Phase I/II and III Areas

2.0 SCREENING APPROACH

A screening approach was developed to evaluate a range of alternatives for improving wastewater treatment in the project area and to identify those alternatives that are feasible and meet the purpose and need of the project.

2.1 Purpose and Need

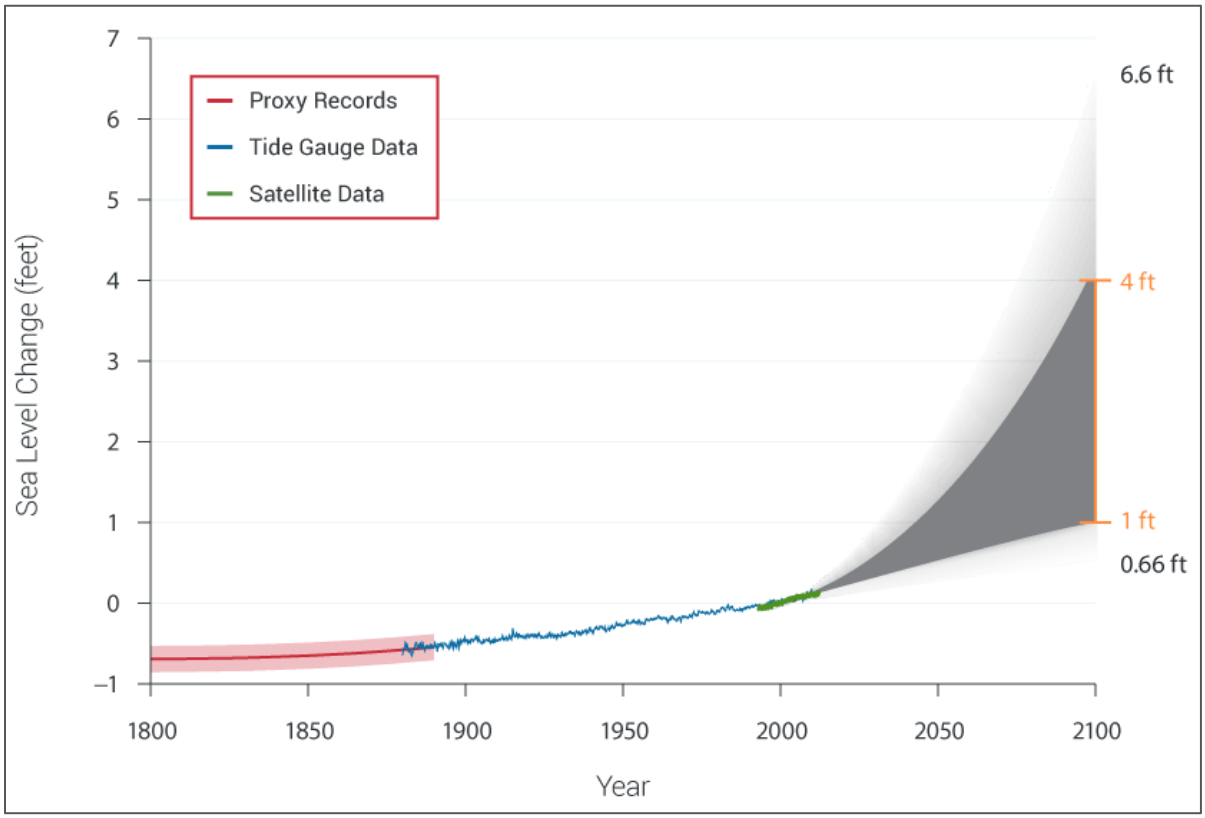
Section 404 of the Robert T. Stafford Relief and Emergency Assistance Act of 1974 (42 USC 5170c), as amended, authorizes FEMA to provide funding to eligible grant applicants for activities that reduce or eliminate risks to life and property from hazards and their effects. The primary purpose of the proposed action is to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures in the Forge River watershed in Suffolk County, New York, caused by natural hazards. The secondary purpose is to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge. The project is needed because OSWS in the project area are susceptible to both capacity failure and treatment and disposal failure during floods and heavy rain events.

2.2 Criteria

Based on the purpose and need for the project, the following five screening criteria were identified:

- *Treatment performance (removal of total nitrogen):* This criterion relates to the mitigation of OSWS failure-related nitrogen impacts on surface waters and coastal wetlands and the resultant impact on their storm surge coastal flood risk protection capacity. In the 1970s, Suffolk County studied the effect of buildings on the groundwater (Suffolk County, 2015). To limit nitrogen concentrations in the groundwater, groundwater management zones were established, based on differences in hydrogeology and groundwater quality. In 1981, these zones were added under Article 6 to the Suffolk County Sanitary Code. The Mastic-Shirley project area is located within Groundwater Management Zone VI (CDM Smith, 2014). The targeted nitrogen concentration in the groundwater within this zone is 6 mg/L, as stated above (Suffolk County, 2015). Therefore, this criterion evaluates the performance of alternatives relative to this target. Alternatives that perform best are those that meet or exceed this target, i.e., that result in the lowest total nitrogen discharge to groundwater (in mg/L). Alternatives with the lowest nitrogen discharge to groundwater provide the highest benefit to water quality in Forge River. The improvement in water quality provides long-term benefits through improved wetland health that contributes to a reduction in coastal flood risk.
- *Performance during flood events:* This criterion relates to the ability of an alternative to reduce or avoid short-term and repetitive, adverse impacts on human life and property associated with OSWS failures during and after flood events. Alternatives that perform best are those that are able to remain fully functional during and after flood events without a loss of treatment performance and avoid impacts to human health from flooded treatment systems.
- *Performance under projected sea level rise and climate change conditions:* Projections for sea level rise vary. The National Climate Assessment (NCA) projects a rise in sea level of 1 to 4 feet by 2100 (**Figure 2-1**) (NCA, 2014). NCA (2014) also provides a wider range of

0.66 foot to 6.6 feet that incorporates uncertainty about how glaciers and ice sheets would react to the warming ocean, the warming atmosphere, and changing winds and currents. Sea level rise inundates low-lying properties more frequently and raises the groundwater table in coastal areas permanently. In addition, more extreme storm events may occur as a result of climate change, resulting in more frequent and intense coastal surges and precipitation events (NCA, 2014). With the increase in groundwater levels, both on an event basis and on a permanent basis, OSWS are expected to fail more frequently. This criterion evaluates the ability of an alternative to maintain full performance in the face of these future conditions. Alternatives that perform best are those that are able to remain fully functional as groundwater levels rise both permanently and during and after a storm event in a future increasingly affected by climate change and sea level rise. The draft EA/EIS will assume a project life of up to 60 years (i.e., up to year 2082 with a start date of 2022). The expected sea level rise by 2080 would range between about 0.8 and 3 feet.



Source: NCA, 2014

Figure 2-1. Past and Projected Changes in Sea Level

- *Acquisition of land (with appropriate dimensions and compatible land use):* For an alternative to be feasible, it must be constructible within a reasonable footprint on a site and within an area that is compatible with the use of the property for the proposed type of wastewater treatment. Alternatives that require acquisition of an unusually large land area

or are not compatible with site or area land uses are considered poorly performing or infeasible.

- *Costs:* This criterion estimates order-of-magnitude costs for construction as well as for operation and maintenance (O&M) and the feasibility of an alternative in light of cost considerations for various industry practices. The criterion is applied to ascertain whether any alternatives would result in disproportionally or unusually high costs that would render the alternative infeasible. Costs for the 2,094 parcels within the Phase I/II area were calculated using 2,893 "single family equivalent (SFE) parcels." The use of SFEs accounts for more densely populated parcels and commercial lots and is consistent with the approach used by CDM Smith (2014; 2015). For the Phase III area, SFEs were not available; the number of parcels (i.e., 1,568) was used for calculations because this area contains few commercial properties (approximately 1 percent). Cost estimates were not adjusted for inflation for this screening analysis.

2.3 Screened Alternatives

Over the past decades, a wide range of alternatives has been evaluated to address the issues associated with the impacts of OSWS in Suffolk County and in the project area in particular. These alternatives include technology alternatives, variations and options thereof that were previously evaluated with similar project conditions, and alternatives suggested during the public scoping period for the draft EA/EIS.

The screening criteria above were applied to the following alternatives:

- **On-site Wastewater Treatment and Disposal Systems**
  - Action Alternative A: Replacing existing OSWS with innovative/alternative (I/A) OSWS
- **Centralized Treatment**
  - Action Alternative B: Low pressure and gravity sewer collection system with membrane bioreactor (MBR) or sequencing batch reactor (SBR) facility
  - Action Alternative C: Different wastewater treatment technology: Modified Ludzack-Ettinger (MLE) process
  - Action Alternative D: Different collection system infrastructure
  - Action Alternative E: Alternative location(s) for AWTF

These alternatives are discussed in Section 3. There are no environmental constraints that would render any of these alternatives entirely impracticable.

3.0 SCREENING ANALYSIS

This section describes the alternatives considered to meet the purpose and need of the project. This screening level of analysis allows alternatives to be compared to determine the action alternatives to be assessed in the draft EA/EIS. The analyses of potential long-term impacts will evaluate conditions with and without the proposed action and alternatives during the foreseeable design life of the proposed action and alternatives. As stated above, results of the screening analysis are summarized in a matrix (**Attachment 1**).

3.1 Action Alterative A: On-site Treatment and Disposal – Replacing Existing OSWS with I/A OSWS

This alternative would replace failing cesspools and septic systems in the project area with modern I/A OSWS. In 2014, Suffolk County began a demonstration project for I/A OSWS and, by fall 2016, plans to implement a program permitting the use of I/A OSWS (SCDPW, personal communication, 2016). Several systems are currently being tested. The effluent from these systems shall contain no more than 19 mg/L total nitrogen (Suffolk County, 2014) because this is the limit for effluent from residential dwellings in Massachusetts where the system was originally tested and which serves as a reference for efficacy (H2M, 2013).

3.1.1 Technical Aspects

As examples for this screening analysis, two I/A OSWS studied by H2M (2013) would achieve the desired nitrogen treatment based on effluent concentrations in Suffolk County—the BioMicrobics MicroFAST® system and Lombardo Associates Nitrex™ system (see **Attachment 3** for technical details of these systems). The Nitrex™ system is comparatively expensive for practical implementation. Therefore, the remaining discussion focuses primarily on the MicroFAST® treatment system.

The MicroFAST® system is a fixed activated sludge treatment, an aerobic method that injects air into wastewater to sustain suspended and attached microbial populations. Biological organisms allow nitrification to take place; an anoxic chamber allows for subsequent denitrification (USEPA, 2004). Flow through the system depends on gravity. Effluent from the house enters a septic tank where solids settle before the liquid flows into the second chamber where air is continuously blown into the module through an external blower. Some of the liquid is then airlifted back to the original anoxic tank where denitrification takes place. Treated effluent is released to a soil absorption system/leaching field (or drain field) (USEPA, 2004).

Before preparing the draft EA/EIS, the status of the ongoing demonstration program will be reviewed with the Suffolk County Department of Public Works (SCDPW) to integrate the latest findings in the analysis. As appropriate, that review will include “closed water systems,” recommended for consideration during the project’s public scoping meeting on January 26, 2016.

3.1.2 Screening Results – Phase I/II Area

Applying the screening criteria to Action Alternative A yields the following for the Phase I/II area:

- *Treatment performance:* For the H2M (2013) study, effluent samples were taken from MicroFAST® systems installed at two residential properties in Massachusetts. The technology was pre-engineered to meet the design requirement of at least 19 mg/L total nitrogen, the limit for effluent from residential dwellings in Massachusetts (H2M, 2013).

Sampling indicated the system met the design requirements; effluent consistently tested at less than 19 mg/L. Based on these results and additional manufacturer information, the system could be capable of meeting the limit of 19 mg/L required by the Suffolk County Department of Health Services (SCDHS) for the I/A OSWS demonstration project. If I/A OSWS are adequately adapted to conditions in Suffolk County, they would provide a significant improvement in treatment performance compared to a conventional OSWS, removing potentially at least 75 percent of the total nitrogen in the effluent (based on an effluent nitrogen concentration of 19 mg/L). However, effective oversight of O&M for I/A OSWS would be essential to ensure that treatment goals are met. I/A OSWS that are not regularly inspected and only occasionally monitored would not achieve treatment objectives (Heufelder et al., 2008). System reliability also is subject to availability of electrical power, and sustained power outages could adversely affect the system operation.

Extrapolated from data in CDM Smith (2014), an effluent nitrogen concentration of 19 mg/L from installed I/A OSWS would discharge a total load of approximately 138 pounds per day (lbs/day) to the groundwater from all the parcels in the Phase I/II area. Model data are not available to determine the resulting total nitrogen concentrations in the groundwater resulting from this nitrogen load. The discharged nitrogen load would mix with the groundwater that slowly migrates from high elevations on Long Island toward the coast. Groundwater is largely recharged by precipitation (rain and melting snow), which contains very low nitrogen concentrations. After mixing of the effluent discharge from I/A OSWS with the groundwater, the resulting total nitrogen concentration in the groundwater would be lower than under existing conditions with conventional OSWS; however, parts of the Phase I/II area would not be expected to meet the target of 6 mg/L.

- *Performance during flood events:* Although I/A OSWS such as the MicroFAST® system can generally operate in areas with shallower groundwater tables compared to conventional OSWS, I/A OSWS also face risks from floods because of similar or more complex components (e.g., control and electrical panels and external blowers that could be damaged during a flood). The capacity of the drain field would be diminished under mounded water table conditions, and the effluent would flood at the surface, creating human health and environmental concerns, similar to conventional OSWS. Inundation flooding can damage septic systems that are not properly designed to prevent flotation. Erosive velocities during storm events also can expose portions of the I/A OSWS. In addition, I/A OSWS require operation of aerators and/or pumps to provide treatment. Electrical power may need to be switched off during flood events to prevent electrical shock, thereby preventing a portion of the system from functioning and achieving its intended effectiveness.
- *Performance during sea level rise and climate change conditions:* **Figure 3-1** shows the effect of sea level rise on the position of the shoreline with sea level rise of up to 4 feet. Loss of land in the Phase I/II area would be comparatively limited. **Figure 3-2** shows that a rise in sea level by 2.8 feet between 2014 and 2100 (NCA, 2014) would cause the groundwater table to rise by up to 3 feet. A higher groundwater table would decrease the thickness of unsaturated soil below any OSWS, decreasing the extent of nitrogen reduction by soil bacteria or roots before nitrogen is released into the estuary. Therefore, similar to conventional OSWS, an I/A OSWS like the MicroFAST® system would also be susceptible to sea level rise. However, I/A OSWS would still provide effective nitrogen removal under increased water table conditions because the primary nitrogen removal

mechanism is within the treatment train with less reliance on the bacterial layer at the base of the disposal field for nitrogen reduction. Therefore, I/A OSWS would perform better than the conventional OSWS.

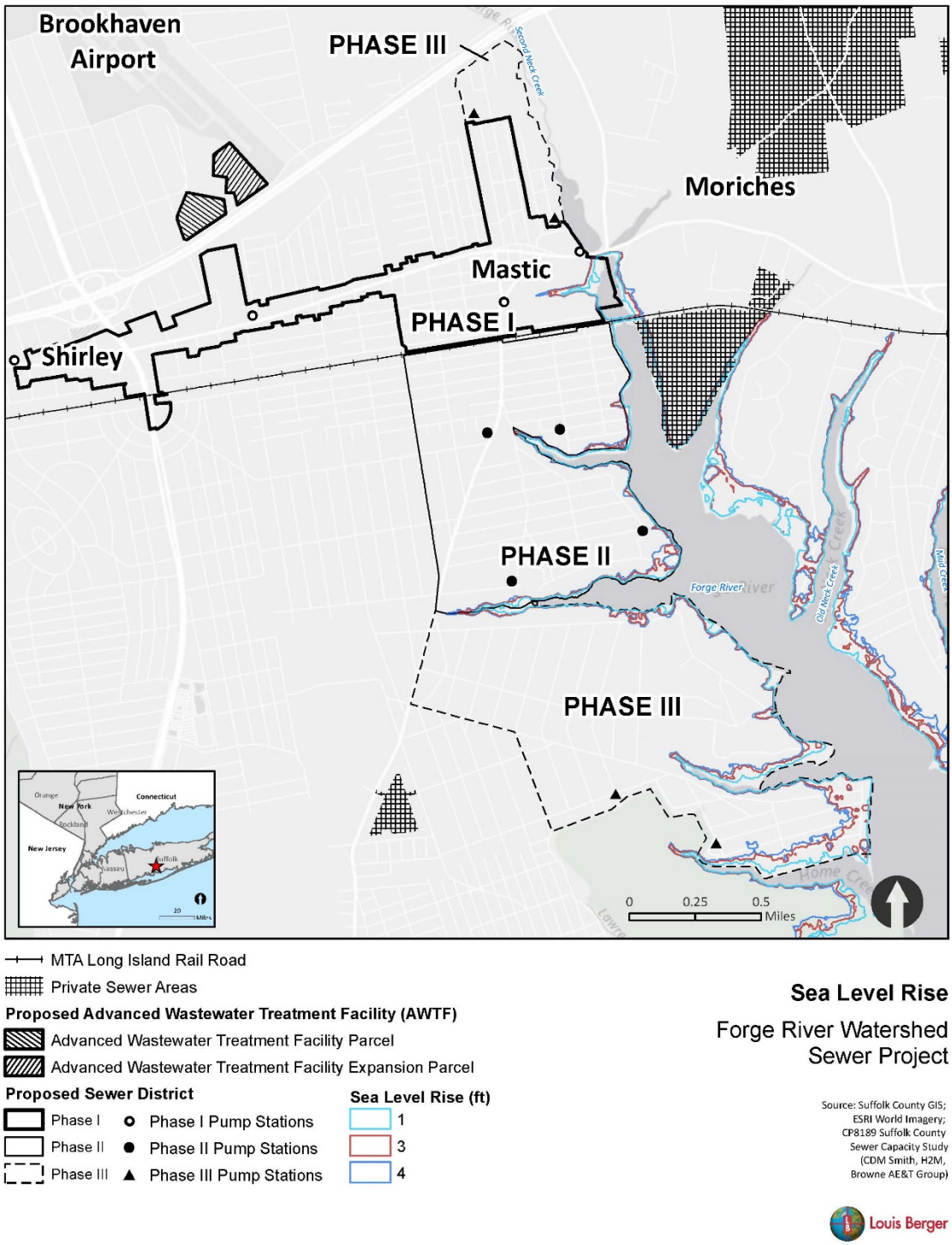
- *Acquisition of land:* OSWS design standards set by SCDHS require systems to be located on the same parcel as the building to be serviced and owned by the individual applicants (SCDHS, 1995; 2009). Thus, no public lands would need to be acquired under Action Alternative A.
- *Costs:* Because of the complexity of the technology involved, capital costs for I/A OSWS are generally much higher than a conventional OSWS. For example, capital costs for the MicroFAST® system would be $25,000; costs for the Nitrex™ system would be $41,500 (H2M, 2013) (**Table 3-1**). Using the costs for the MicroFAST® system as an example, replacement of all conventional OSWS in the Phase I/II area (using SFE) with I/A OSWS would require approximately $72 million (**Table 3-2**).

  O&M costs for I/A OSWS also would be higher than for conventional OSWS given the larger number of components of I/A OSWS. Based on data from other jurisdictions with a developed market of advanced treatment systems, annual O&M costs for typical I/A OSWS are between $200 and $500 (SCDPW, personal communication, 2016) (**Table 3-1**). Accordingly, annual O&M for the Phase I/II area would require $500,000 to $1.4 million (**Table 3-2**).

3.1.3 Screening Results – Phase III Area

Applying the screening criteria to Action Alternative A yields the following for the Phase III area:

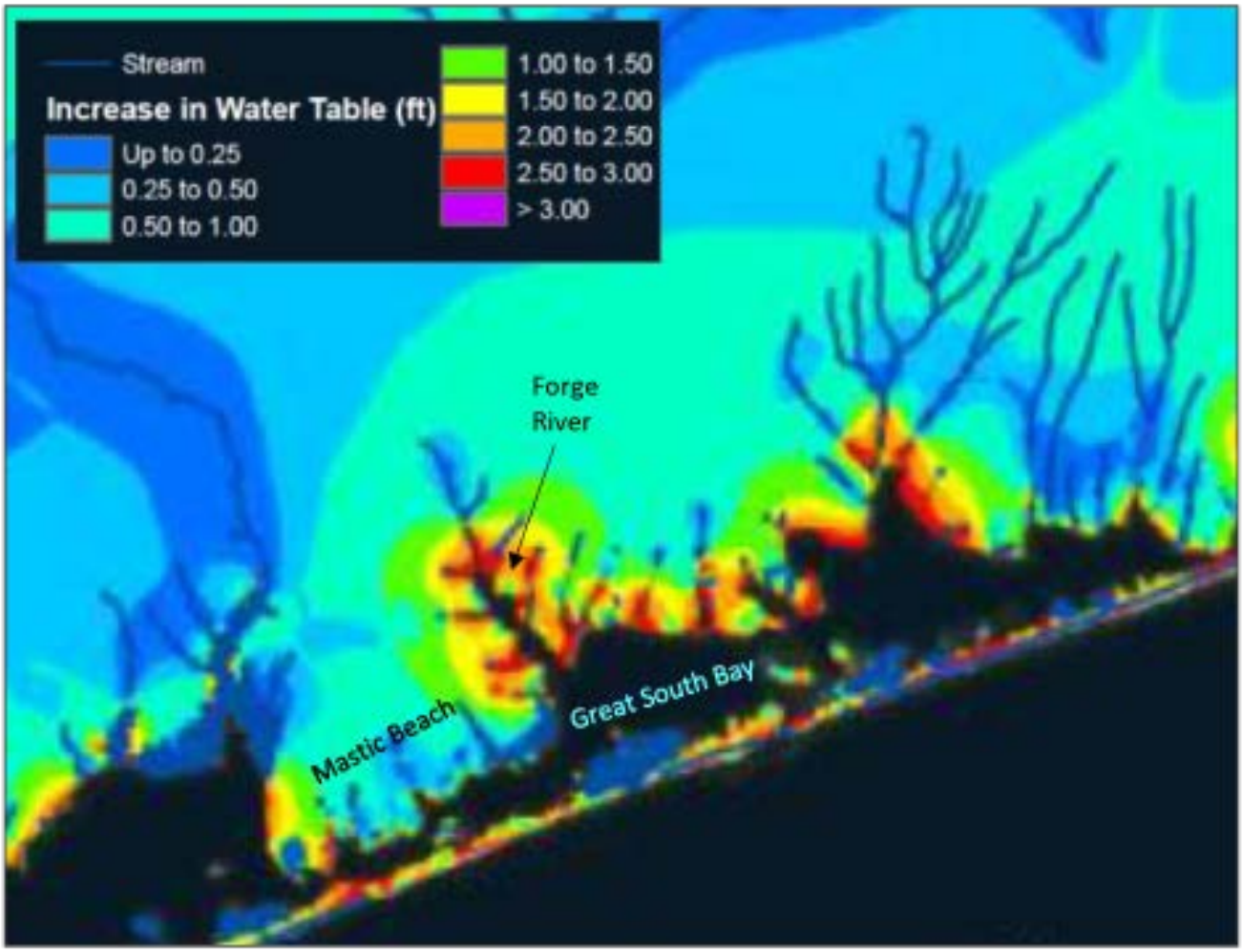
- *Treatment performance:* An effluent nitrogen concentration of 19 mg/L from installed I/A OSWS would discharge a load of approximately 84 lbs/day to the groundwater from all the parcels in the Phase III area (extrapolated from data in CDM Smith, 2014). After mixing of the effluent discharge from I/A OSWS with the groundwater, the resulting total nitrogen concentration in the groundwater would be lower than under existing conditions with conventional OSWS, and a larger portion of the Phase III area than is the case presently would meet the target of 6 mg/L. The densely populated southeastern corner of the Phase III area, however, likely would not meet the target.
- *Performance during flood events:* Performance in the Phase III area would be slightly worse than in the Phase I/II area because a larger proportion of the Phase III area has shallow depths to groundwater (**Figure 1-4**) and is thus more susceptible to flooding impacts (particularly in the southeastern corner of the area).
- *Performance during sea level rise conditions:* Performance during sea level rise conditions also would be slightly worse than in the Phase I/II area because of the overall shallower depths to groundwater.
- *Acquisition of land:* No land acquisition would be required.
- *Costs:* Using a cost of $25,000 per I/A OSWS for each of the 1,568 parcels, replacement of all conventional systems with I/A OSWS would require approximately $39 million (**Table 3-2**). Annual O&M would require between $300,000 and $800,000.



Source: NOAA, 2016.

Note, the 3-foot contour is shown in red for easier comparison of this figure with Figure 3-2.

Figure 3-1. Shoreline with Projected Sea Level Rise



Source: CDM Smith, as published in Suffolk County, 2015

Figure 3-2. Projected Increase in the Groundwater Table between 2014 and 2100 as a Result of a 2.8-foot Sea Level Rise

Table 3-1. Unit Costs for Construction and Installation of Conventional OSWS and two Examples of I/A OSWS in Residential Applications

		I/A OSWS (per unit)	I/A OSWS (per unit)
Cost Component	**Conventional Septic System (per unit)**	**BioMicrobics MicroFAST®**	**Lombardo Associates, Inc. – Nitrex™**
Permitting and regulatory requirements	$650	$5,000	$7,500
Treatment components (including ancillary equipment and contractor markup)	$3,700	$7,000	$19,500
Construction and installation	$730	$13,000	$14,500
TOTAL	$5,080	$25,000	$41,500
Annual O&M costs	$160	Typical I/A OSWS based on data from other jurisdictions with a developed market of I/A OSWS, O&M costs for typical I/A OSWS are between $200 and $500, including electrical costs (SCDPW, personal communication, 2016).	Typical I/A OSWS based on data from other jurisdictions with a developed market of I/A OSWS, O&M costs for typical I/A OSWS are between $200 and $500, including electrical costs (SCDPW, personal communication, 2016).

Source: SCDHS, 2013

Table 3-2. Costs for Construction and Annual Operation and Maintenance of Alternatives *(Order-of-magnitude Analysis)*

Alternatives[1]	Capital Costs* Phase I/II [2]	Capital Costs* Phase III	Capital Costs* Total	Annual O&M Costs* Phase I/II	Annual O&M Costs* Phase III	Annual O&M Costs* Total
Action Alternative A: Replacing all existing OSWS in project area with I/A OSWS[2,3]	$72	$39	**$111**	$0.5–$1.4	$0.3–$0.8	**$0.8–$2.2**
Action Alternative B: Low pressure and gravity sewer collection system with MBR facility[5]	$188	$106	**$294**	$1.1	$0.6	**$1.7**
Action Alternative B: Low pressure and gravity sewer collection system with SBR facility[6]	$185	$104	**$289**	$1.1	$0.6	**$1.7**
Action Alternative C: Different wastewater treatment technology using MLE process[6]	$183	$103	**$286**	$1.1	$0.6	**$1.7**
Action Alternative D: Different collection system infrastructure using vacuum sewers[7]	$188	$106	**$294**	$1.1	$0.66	**$1.76**

* in millions, estimate

[1] Action Alternative E (different locations for AWTF) was not considered because it only addresses one component of a complete centralized treatment system.

[2] Costs for the 2,094 parcels are applied to 2,893 SFE parcels in the Phase I/II area; for the Phase III area, the actual number of parcels was used.

[3] Capital costs: Assumes a one-time replacement of all conventional OSWS with an I/A OSWS costing $25,000. O&M: Assumes annual costs of $200 to $500 for typical I/A OSWS based on data from other jurisdictions with developed markets (SCDPW, personal communication, 2016), and includes electrical costs.

[5] Sources: Capital costs: Phase I/II, CDM Smith, 2015; Phase III, CDM Smith, 2013. O&M: See text for method of calculation.

[6] Capital costs: See text for method of calculation for Phase I/II. For Phase III, the percent difference between MBR and MLE (2.5%) and MBR and SBR (1.5%) was used for estimation. O&M: Costs were based on $1.71 per gallon per day (gpd) (CDM Smith, 2014). Thus, the costs for each phase were calculated based on applying the following factors: $1.71/gpd, 225 gpd per parcel, and number of parcels. O&M costs are anticipated to be the same as for Alternative B.

[7] Construction costs of vacuum sewers are expected to be approximately 10 to 15 percent higher than costs of low pressure sewers. Costs for low pressure sewers represent a relatively small percentage of the overall construction costs. Therefore, the overall capital costs for Action Alternative D are considered similar to Action Alternative B.

3.2 Action Alterative B: Centralized Treatment – Low Pressure and Gravity Sewer Collection System with Membrane Bioreactor or Sequencing Batch Reactor Facility

3.2.1 Technical Aspects

Action Alternative B would include a collection system with a combination of gravity sewers and low pressure sewers, a conveyance system consisting of multiple pump stations, and an AWTF. The wastewater or sanitary flow from the entire project area is projected to be approximately 3.2 million gallons per day (MGD) for the complete project area (CDM Smith, 2013; 2014). This flow includes approximately 1.0 MGD from the Phase I/II area and 0.4 MGD from the Phase III area. Following is a description of each component, based on information provided by CDM Smith (2014; 2015):

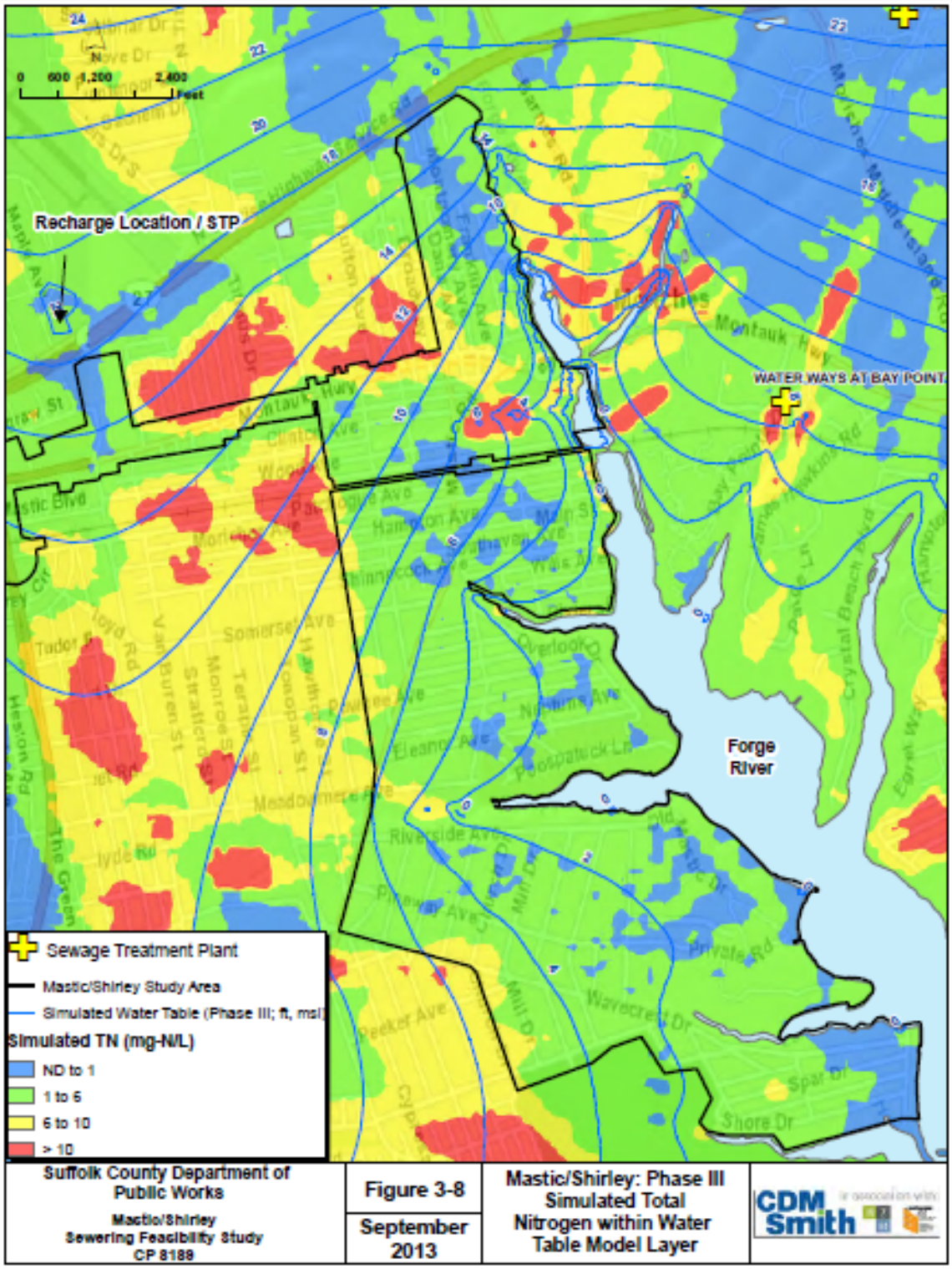
- *Collection – Gravity sewers:* Gravity sewers would be used in areas where the pipe installation can follow the natural inclines of the terrain to allow for natural flow to a pump station or treatment facility. The gradient must be steep enough to allow for self-cleaning flow inside the pipes. The main gravity sewer line usually runs the length of a street with lateral connections to adjacent properties.
- *Collection – Low pressure sewers:* Low pressure sewers would be used in relatively flat areas where the groundwater table is shallow, generally at a depth of 10 feet or less along Forge River and its tributaries, and along Great South Bay (see **Figure 1-4**). Therefore, low pressure sewers would be used in a small portion in the Phase I/II area and in the eastern half of the Phase III area. Each property in the collection area would be required to operate and maintain an on-site grinder pump.
- *Conveyance – Pump stations:* A total of 12 pump stations would be located throughout the project area, including eight pumps in the Phase I/II area and four pumps in the Phase III area. One of the pump stations would serve as an influent pump station to the AWTF.
- *Treatment – Advanced Wastewater Treatment Facility:* The sewer network would be connected to the AWTF via an influent pump station. Wastewater would be processed at the AWTF using either the MBR process or the SBR process, and effluent would be disposed after treatment through subsurface leaching pools.
    - *MBR Process:* Flow from pump stations would be discharged directly to influent screening equipment at the headworks, which would remove grit, large solids, and debris. Thereafter, wastewater would flow through various tanks and basins for treatment. Finally, effluent would enter parallel downstream membrane reactors to remove solids remaining in the process before being discharged to the leaching pools.
    - *SBR Process:* The SBR process is a suspended growth type activated sludge treatment process. The SBR process would involve pre-anoxic denitrification and combine anoxic conditions, aeration, and clarification within one common basin, eliminating the need to recycle process flow between tanks and optimizing the overall nitrogen removal efficiency (CDM Smith, 2014). The entire biological process would occur in one tank.

Removed solids would either be returned to the biological process or be pumped to a sludge holding tank for thickening before disposal at the Bergen Point Water Control Facility. A site under consideration for the AWTF is located at the Brookhaven Calabro Airport.

3.2.2 Screening Results – Phase I/II Area

Applying the screening criteria to Action Alternative B yields the following for the Phase I/II area:

- *Treatment performance:* The MBR process would produce a total nitrogen concentration in the effluent of between 3 and 5 mg/L, commonly described as the "limit of technology" for nitrogen removal. Assuming the selection of MBR technology, this alternative would reduce the nitrogen load discharged to the groundwater from the Phase I/II area from 166 lbs/day (currently) to 36 lbs/day (using an MBR effluent concentration of 5 mg/L during modeling) (CDM Smith, 2014). Total nitrogen concentrations in groundwater would decrease from currently greater than 10 mg/L in large parts of the Phase I/II area (**Figure 1-5**) to below the target of 6 mg/L in most of the area (**Figure 3-3**). Model results show that only a few small areas in mostly the northeastern part of the Phase I/II area would have groundwater nitrogen concentrations that would continue to exceed 6 mg/L; this may be due to the higher nutrient loading from OSWS located to the northwest of the Phase I/II area. The SBR process has been documented to achieve the limit of technology. Model data for the resulting total nitrogen concentration in groundwater do not exist. However, considering the modeling results for the MBR and SBR process, most of the Phase I/II area also would achieve the nitrogen concentration target of 6 mg/L in the groundwater.
- *Performance during flood events:* The AWTF would be located 60 feet above MSL, which is outside the flood zone for the Mastic-Shirley area (CDM Smith, 2014). A substantial portion of the proposed sewer collection infrastructure would be located within the floodplain. Pump stations located in the floodplain are expected to be constructed of flood-resistant building materials equipped with submersible pumps to minimize damage and disruption of service during flood events. Flooding could have a temporary impact on the sanitary collection system. Gravity sewers within flooded areas would likely surcharge, and grinder pumps within low pressure collection areas would be impacted by power outages. These operational impacts should be short-term, unless a storm event caused structural damage to roadways.
- *Performance during sea level rise and climate change conditions:* The system would be designed to withstand the forecasted sea level rise. As noted above, because the AWTF would be located at an elevation of 60 feet above MSL, it should be protected from sea level rise projected for 2100 (**Figure 2-1**). On-site grinder pumps would be located on or near the right-of-way for each parcel. Each grinder pump would be sealed in a watertight pit so it could be submerged. All electrical and vent pipes associated with the grinder pumps would be installed at a height higher than the base flood elevation (100-year storm elevation plus 5 feet, Hurricane Sandy inundation plus 4 feet, or 500-year storm elevation, whichever is the most restrictive).



Source: CDM Smith, 2014

Figure 3-3. Modeled Total Nitrogen Concentrations in Shallow Groundwater after Implementing Action Alternative B with MBR for the Phase I/II and III Areas

- *Acquisition of land:* Public land would be used for the AWTF and the eight pump stations. The area under consideration for the AWTF comprises approximately 30.7 acres of non-contiguous vacant/undeveloped land southwest of the Brookhaven Calabro Airport. Based on preliminary engineering of an AWTF with MBR treatment, the facility for treating Phase I/II wastewater volumes could be accommodated in the western parcel (13.7 acres), which would include buildings, road access, and leaching pools. Each of the proposed eight pump station sites throughout the Phase I/II area would occupy approximately 2,500 square feet (for a total of approximately 0.5 acre). Thus, the total area of land that would need to be acquired for centralized wastewater treatment of the Phase I/II area under Action Alternative B would be approximately 14.2 acres. The primary advantage of the SBR process is that multiple treatment processes take place in a single tank. AWTFs with SBR have a larger footprint compared to MBR facilities (USEPA, 2007a), but the overall footprint is estimated to be less than 1 percent larger than the footprint for an AWTF with MBR treatment; thus, the SBR treatment option would be expected to fit in the 13.7-acre parcel for the AWTF.

- *Costs:* Total estimated capital cost to establish the sewer district would be $188 million (**Table 3-2**). This includes $177 million for construction/engineering costs for the collection, conveyance, and treatment system and $11 million for grinder stations, abandonment of existing systems, and connection to the new system. The unit cost for a residential grinder pump station would be $4,500; the unit cost for a commercial grinder pump station would be $9,000. Costs for abandoning existing septic systems and connecting to the new conveyance system would be $2,500 for residential properties connecting to gravity sewers, $6,000 for residential properties connecting to low pressure sewers, and $9,000 for a commercial property connecting to the central system (CDM Smith, 2015). The total estimated construction costs for a centralized wastewater treatment system with SBR technology are estimated to be only approximately 1.5 percent lower than a system with MBR technology (i.e., $185 million).

  O&M include utility and chemical costs and staff salaries. Based on other sewer district operations, the annual cost would be approximately $1.71 per gallon per day (gpd). Annual costs incurred by residential properties would range from $385 for a single-family residence to $1,200 for a three-family residence. Annual costs for commercial properties would range from $2,000 to $11,000 depending on the type of retail facility. Properties serviced by low pressure sewers would have to pay for O&M of grinder pump stations that would range from an annual cost of $275 for residential properties to $1,700 for commercial properties (CDM Smith, 2015). For the entire Phase I/II area, estimated annual O&M would require $1.1 million (**Table 3-2**). The SBR process is operationally less intensive than the MBR process, but the SBR treatment process would include the same associated system costs for staff salaries, electricity, chemicals, and sludge disposal. Therefore, it is reasonable to assume that the margin of difference would be comparatively small with respect to total O&M costs.

3.2.3 Screening Results – Phase III Area

Applying the screening criteria to Action Alternative B yields the following for the Phase III area:

- *Treatment performance:* If the MBR treatment option is selected, the nitrogen load from the Phase III area would be reduced from about 78 lbs/day to 22 lbs/day (based on an

effluent concentration of 5 mg/L and extrapolating data from CDM Smith, 2014). Total nitrogen concentrations in the groundwater would decrease from the current concentration of 6 mg/L or more in over two thirds of the Phase III area (**Figure 1-5**) to below the target of 6 mg/L in nearly the entire area (**Figure 3-3**). If the SBR treatment option is selected, a lower nitrogen load would be discharged to the groundwater compared to existing conditions.

- *Performance during flood events:* Performance during flood events would be limited to a short-term temporary impact on the sanitary collection system, similar to the Phase I/II area.
- *Performance during sea level rise and climate change conditions:* Impacts are generally not expected, similar to the Phase I/II area. Service could be disrupted in areas served by low pressure sewers if there was a loss of power.
- *Acquisition of land:* The land needed for leaching the additional effluent volume of 0.4 MGD could be accommodated within the 17-acre expansion area for the AWTF, roughly estimated to require 20 percent of that additional land. In addition, land would be required for two pumping stations in the Phase III area.
- *Costs:* CDM Smith (2013) estimated costs for Phase III as $106 million (including costs for abandoning existing septic systems and connecting to the new conveyance system). Constructing the sewer network and pump stations in the Phase III area and expanding the AWTF to accommodate the additional wastewater would cost approximately the same regardless of selection of either the MBR or SBR process. Annual O&M for the entire Phase III area are estimated to be $600,000.

3.3 Action Alterative C: Centralized Treatment – Different Wastewater Treatment Technology

Action Alternative C would employ a different suspended growth type activated sludge process for nitrogen removal at a potentially lower cost. The MLE process was considered.

3.3.1 Technical Aspects

The Modified Ludzack-Ettinger (MLE) process would treat the same volume of sanitary wastewater but may result in higher total effluent nitrogen concentrations. The MLE process is a suspended growth type activated sludge treatment process used for nitrogen removal. This process requires an oxygen-deficient pre-anoxic zone for denitrification followed by an oxygen-rich aeration zone for nitrification and a secondary clarifier for sludge removal. Flow into the pre-anoxic zone comprises screened treatment plant influent and recycled process flow from the downstream aeration zone and secondary clarifier (CDM Smith, 2014). According to CDM Smith (2013), the primary advantage of this equipment is the operational energy savings realized over time.

3.3.2 Screening Results – Phase I/II Area

Applying the screening criteria to Action Alternative C yields the following for the Phase I/II area:

- *Treatment performance:* The MLE process would treat the same volume of sanitary wastewater as described under Action Alternative B, but would result in higher total nitrogen concentrations in the effluent: 10 mg/L (CDM Smith, 2014). Using mean values

for the MLE process, this implies that the total nitrogen loads discharged to the groundwater would be 100–233 percent higher for the MLE process compared to the MBR or SBR processes. Specifically, the total nitrogen load discharged to the groundwater would be 72 lbs/day for the MLE process, compared to the 22 to 36 lbs/day for the MBR process or 29 to 43 lbs/day for the SBR process (based on data extrapolated from CDM Smith [2014]). Model data for the resulting total nitrogen concentration in groundwater do not exist. However, considering the modeling results for the MBR process (**Figure 3-3**, which is based on a total nitrogen concentration in the effluent of 5 mg/L), the portion of Phase I/II area that would achieve the target of 6 mg/L nitrogen in the groundwater with an MLE process would be smaller. In summary, the MLE process does not perform as well as the MBR or SBR processes.

- *Performance during flood events:* Performance during flood events would be the same as described for Action Alternative B.
- *Performance during sea level rise and climate change conditions:* Performance during sea level rise and climate change conditions would be the same as described for Action Alternative B.
- *Acquisition of land:* The footprint for an MLE facility would be larger than for both MBR and SBR facilities, given that secondary clarification would be required, and the fact that an MLE process typically operates at lower mixed liquor suspended solids concentrations than an MBR process, necessitating the use of larger tanks. The increase in additional footprint is limited only to the area specific to secondary treatment. The areas required for site access, preliminary treatment, administration, and subsurface disposal remain constant for all three technologies. The basis of design for the subsurface leaching area is the hydraulic capacity of the treatment facility and infiltration capacity of the soils. Overall, the footprint for Action Alternative C is estimated to be less than 1 percent larger than the footprint for Action Alternative B; thus, Action Alternative C would be expected to fit in the 13.7-acre parcel for the AWTF.
- *Costs:* USEPA (2007b) compared costs for small new biological nutrient removal treatment facilities that treated up to 100,000 gpd. The construction cost of an MLE facility was $1.16 million. Based on cost information provided in USEPA (2007a), MLE facility costs would be up to approximately 25 percent lower than MBR or SBR facility costs. Considering the different components of these facilities (tanks, building, electrical, plumbing, piping, valves, instrumentation and controls, subsurface disposal pools), the total costs for a centralized system with MLE technology are estimated to be only approximately up to 2.5 percent lower than for an MBR or SBR technology (i.e., $183 million) (**Table 3-2**).

  With regard to O&M costs, all three wastewater treatment processes include the same associated system costs for staff salaries, electricity, chemicals, and sludge disposal. Therefore, it is reasonable to assume that the margin of difference would be comparatively small with respect to total O&M costs for any centralized treatment alternative (**Table 3-2**).

3.3.3 Screening Results – Phase III Area

Applying the screening criteria to Action Alternative C yields the following for the Phase III area:

- *Treatment performance:* As for the Phase I/II area, an MLE facility would lower the nitrogen load discharged to the groundwater compared to existing conditions. However, an MLE facility is not as effective as MBR or SBR facilities in removing nitrogen from wastewater prior to discharge to the groundwater.
- *Performance during flood events:* Performance during flood events would be the same as described for Action Alternative B.
- *Performance during sea level rise and climate change conditions:* Performance during sea level rise and climate change conditions would be the same as described for Action Alternative B.
- *Acquisition of land:* Acquisition of land would be the same as described for Action Alternative B.
- *Costs:* Costs for construction would be up to 2.5lower for an MLE compared to an MBR or SBR facility, using the approach described under Phase I/II above. Although the technologies are somewhat less expensive to install, constructing the sewer network and pump stations in the Phase III area and expanding the AWTF to accommodate the additional wastewater would cost approximately the same as under Action Alternative B. O&M costs would also be in the same range as those described for Action Alternative B.

3.4 Action Alterative D: Centralized Treatment – Different Collection System Infrastructure

Rather than the combination of gravity and low pressure sewers considered for Action Alternative B, this alternative would construct another type of collection system infrastructure throughout the same project area, which would consist of a combination of gravity and vacuum sewers. Action Alternative D would service the same number of parcels as Action Alternative B.

3.4.1 Technical Aspects

Vacuum sewers are another type of collection system that may be used in areas where gravity sewers are not an option. As such, they can be considered an alternative to the low pressure sewers described in Action Alternative B.

Vacuum sewers were assessed by CDM Smith (2014) and subsequently dismissed due to relatively high O&M costs and a lack of local operator experience. It is acknowledged that vacuum sewers were recommended for high water table areas in the Proposed Mastic-Shirley Sewer District (Henderson and Bodwell, 1999). However, Henderson and Bodwell (1999) did not provide an explanation why vacuum sewers, rather than low pressure sewers, were considered. The findings of the study were not implemented.

Vacuum sewers rely on a pressure differential to convey wastewater from individual properties to the treatment facility. The pressure differential is created by a vacuum pump located at a centralized pump station. The pump is connected to an enclosed collection tank that is directly connected to the collection system pipes. Wastewater from individual properties first flows into an on-site storage tank. Once it reaches a particular level in the tank, a pneumatic valve opens, and the induced vacuum suction causes wastewater to flow into the collection system piping and to the

enclosed collection tank at the pump station. It is then conveyed to the treatment facility via dry pit sewage pumps and force mains (CDM Smith, 2014).

Vacuum sewers would only be considered as a potential replacement of the collection system in areas proposed for the low pressure sewers. They would not replace the gravity sewers and/or the larger pump stations. Vacuum sewers are only effective in relatively flat areas with less than 10 feet of static head. The technology has not experienced widespread use; therefore, it is generally unknown to both utility contractors and operators. The applications to date have been for generally smaller service areas in newer developments.

There are a few local vacuum sewer installations in New England (Plum Island and Provincetown, Massachusetts). The system in Plum Island has experienced significant operational issues because of frozen valve chambers and air vents (Cape Cod Times, 2009; Newburyport DPS, 2015). Vacuum sewers also are more susceptible to blockages from overloading of the system with solids and/or grease.

3.4.2 Screening Results – Phase I/II Area

Applying the screening criteria to Action Alternative D yields the following for the Phase I/II area:

- *Treatment performance:* The type of collection system would not affect the treatment performance; thus, the performance would be the same as described for Action Alternative B.
- *Performance during flood events:* Assuming proper installation, including backup power generation, the effects would be the same as described for Action Alternative B.
- *Performance during sea level rise and climate change conditions:* Performance during sea level rise and climate change would be the same as described for Action Alternative B.
- *Acquisition of land:* Similar to Action Alternative B, the combination of gravity and vacuum sewers would require open-cut excavation for the entire length of roads where the pipe installation would occur. However, the small grinder pump stations at individual properties connected to the low pressure system would be replaced with fewer, but slightly larger, centralized pump stations for every cluster of houses connected to the vacuum pump system. These pump stations would have to be located on land available for public use. Overall, the land requirement would not be significantly different to that of Action Alternative B. Compared with low pressure sewers, Action Alternative D would rely less on locating equipment on individual parcels. However, easements may be required because of the challenges in siting a number of valve chambers within a utility right-of-way.
- *Costs:* The capital cost of a vacuum system would be higher than for a low pressure system. The higher capital costs are associated with the vacuum pumps, associated piping, and system controls and the need for an enclosed collection tank (CDM Smith, 2014). Construction costs of vacuum sewers are expected to be approximately 10 to 15 percent higher than costs of low pressure sewers. However, costs for low pressure sewers in the Phase I/II area represent a relatively small percentage of the overall construction costs. Therefore, the overall capital costs for Action Alternative D are considered similar to Action Alternative B (**Table 3-2**).

  The primary disadvantage of the technology is its long-term operational costs and substantial operational challenges. Higher O&M costs would result from the vacuum

equipment necessary to operate the collection system and address grease build-up within the individual on-site storage tanks. Grease could impede the proper operation of the pneumatic valves and cause potential blockage. In addition, vacuum leaks could directly result in failure of the collection system to convey wastewater to the central vacuum station (CDM Smith, 2014). O&M costs for a centralized system with vacuum sewers are not available, although the long-term O&M costs are expected to approach a 15 to 20 percent premium for this type of technology. However, given the comparatively small portion of the Phase I/II area that would require vacuum sewers, overall O&M costs for Action Alternative D are considered similar to Action Alternative B (**Table 3-2**).

3.4.3 Screening Results – Phase III Area

The screening criteria for Action Alternative D apply for Phase III in the same way they do for Phase I/II. The only exception is O&M costs. Vacuum sewers are required for a larger portion of the Phase III area than for the Phase I/II area. Therefore, overall O&M costs for Action Alternative D for the Phase III area are roughly estimated to be 10 percent higher than for Action Alternative B (**Table 3-2**).

3.5 Action Alterative E: Centralized Treatment – Alternative Location(s) for AWTF

This alternative would use the same MBR process as described under Action Alternative B but would use an alternative site to locate the AWTF and leaching area. Several screening analyses have been performed since 1999 that investigated a sewer district for the Mastic-Shirley area. While each of these studies had differing project objectives with varying study areas, they do reflect siting criteria associated with selection of a feasible site for an AWTF. The feasibility of an AWTF location is directly related to the proximity to the area being sewered. Locating an AWTF farther from the service area increases the cost of construction, energy cost of pumping, and land disturbance. Also, availability and active site development is dynamic, causing formerly available/feasible sites to be no longer available and/or feasible. A summary of past AWTF site location screening studies is provided below.

- **Henderson and Bodwell (1999):** This site screening analysis was performed as part of a feasibility study to create the Mastic-Shirley Sewer District in connection with the redevelopment of downtown Mastic. The study investigated six sites and reached the following conclusions:

  a) *William Floyd Estate:* The site is located in Mastic Beach, south of Washington Avenue. The groundwater table was considered to be too close to the surface for leaching fields and the site is owned by the U.S. Government (National Park Service).

  b) *Golf course complex (east/south of William Floyd Parkway):* The site was considered too close to newly installed public water wells and too close to existing residential homes. (Depth to groundwater at the site is less than 12 feet, also limiting its feasibility for subsurface leaching.)

  c) *Brookhaven Calabro Airport - Site 1 (South of ballfield):* At the time, the site was the future site for a planned development (Brookhaven Trans-Tech facility).

  d) *Brookhaven Calabro Airport - Site 2 (Intersection east and south of the two runways):* This site was considered too close to a concentration of existing homes and therefore was eliminated from further consideration for a wastewater treatment plant.

e) *Brookhaven Calabro Airport - Site 3 (Moriches Middle Island Road northeast of airport):* This site was considered relatively removed from existing developments that could be affected by a treatment facility and proximate to potential future developments in the area around the airport.

f) *New York DOT (southwest corner of Sunrise Highway and Titmus Drive):* The site, located at the southwestern corner of Sunrise Highway and Titmus Drive, was considered too small (long and narrow) and too close to existing homes and therefore was eliminated from further consideration.

The Henderson and Bodwell (1999) report selected alternative (e), Moriches Middle Island Road northeast of airport (airport site 3), for locating a wastewater treatment facility. Airport site 1 (alternative c) was considered for future development at the time and therefore was excluded in that study.

- **Henderson and Bodwell (2004) and SCDPW (2009):** The 2004 study conducted an additional site screening analysis for a wastewater treatment facility. The study was prepared in support of a proposed new sewer district for the CR 80 Shirley-Mastic corridor (including an area to the west of Carmans River), the Brookhaven Calabro Airport, and a proposed retirement community development on approximately 150 acres (NPV, 2009). SCDPW's selection process (2009), directed by Suffolk County resolution 1439-2008, started with six different locations for a wastewater treatment facility. Evaluation criteria included a candidate site's vicinity to residential communities, depth to groundwater, public well locations, soil recharge capabilities, site availability, accessibility, future use of adjacent properties, ability to accommodate expansion, and topography. After evaluating the initial list of six sites, three sites were assessed further:
    - *AVR Site*: This site was located near the Long Island Expressway and was primarily dismissed because of the distance (4 miles) from the master pump station. The long distance would require a long force main and result in higher construction costs and higher energy operating costs.
    - *Miles Development:* This site was located to the north of Sunrise Highway and west of Weeks Avenue. It was dismissed because of on-going development and proximity to new residential homes. As part of the Miles Development project, a 50-acre parcel was deeded to the town for the purposes of conservation. Parcel usage for a treatment plant would require a revision to the deed restriction. The site was dismissed because the parcel was considered too narrow (width of approximately 600 feet) for siting the disposal field and incompatible for use as a treatment plant.
    - *Brookhaven Airport, south of ballfield:* This site was recommended because of its proximity to the master pump station. It would be the least expensive to operate, but would be far enough from homeowners that it would not be a potential nuisance.
- **CDM Smith (2014):** After the initial evaluation, two potential locations for a wastewater treatment facility were considered more closely: an area at the Brookhaven Calabro Airport and an area on the "Links at Shirley Golf Course." The resolution from 2009 was used as a basis of the selection process. However, because the study area and design flow in the 2014 feasibility study had progressed since the 1999 study, sites too remote from the

treatment location were eliminated from further consideration. Characteristics of the sites that were advanced in the 2014 study for further consideration are as follows:

- *Links at Shirley Golf Course:* The golf course site is located in the southern part of Shirley to the east of the William Floyd Parkway. The site was eventually eliminated as an alternative because of much higher costs associated with constructing a force main from the master pump station. At the end of 2009, the Links at Shirley Golf Course was sold for private residential development. After the property was rezoned and subdivided, the developer dedicated 98 acres of the property as open space to the Town of Brookhaven for active recreational purposes (CDM Smith, 2014). Furthermore, the site has a comparatively shallow depth of only 12 feet to groundwater, which limits its treatment potential (**Figure 1-4**). In addition, the site is located outside of the Forge River watershed; groundwater would flow either to Great South Bay in the south and/or to Carmans River in the west (through the Wertheim National Wildlife Refuge).
- *Brookhaven Airport, south of ballfield:* Unlike the golf course site discussed above, the airport site is located close to the master pump station and would require a relatively short force main, resulting in lower construction costs. Furthermore, the area available at the site was determined to provide adequate space to accommodate wastewater from the Phase I to IV areas, including space for the treatment plant tanks and equipment, subsurface leaching pools, and buffers between adjacent properties as required by SCDPW and SCDHS. The airport site is located at approximately 60 feet above MSL, which is located outside of the future flood zone projected for the Mastic-Shirley area. The depth to groundwater at the site is between 30 and 40 feet (**Figure 1-4**).

In summary, several sites previously screened in various studies were deemed not feasible because of significant concerns related to site size, depth to groundwater, proximity to homes, availability, and distance to public drinking wells. Two other screened sites could be feasible, but are located at a considerable distance from the current project area, which is now focused much farther to the south without any other contributing areas in the north. These two sites are the AVR site, located approximately 4 miles to the north of the current project area, and the Moriches Middle Island Road site, located approximately 2 miles to the north of the current project area. The remaining site, located at the southern end of the Brookhaven Calabro Airport, south of ballfield, is located close to the current project area (less than 0.5 mile) and is considered the only feasible site for the treatment plant.

4.0 SUMMARY AND RECOMMENDATIONS

The primary purpose of the project is to mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards. The secondary purpose is to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge. Following is summary of the evaluation for each alternative:

- *Action Alternative A (Replacing existing OSWS with Innovative/Alternative [I/A] OSWS):* This alternative generally would not mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards such as rising groundwater levels and overland flooding that result from precipitation and/or tidal and surge conditions (i.e., the alternative generally would not meet the primary purpose of the project). A rising sea level would further reduce the performance of I/A OSWS and increase the human health risk because more OSWS would leak during flood events. However, newer systems assessed during the County's ongoing demonstration project may include I/A OSWS set up above ground with less risk of flooding. Action Alternative A would achieve an effluent quality of at least 19 mg/L for total nitrogen, which would be an improvement from existing conditions (conventional OSWS achieve only about 40 mg/L). The target of a nitrogen concentration in the groundwater of 6 mg/L would be achieved in parts of the project area, and the nitrogen loading of Forge River would be substantially reduced (improved) from current conditions. Therefore, this alternative would meet the secondary purpose of the project, but not to the same extent as other action alternatives discussed below. In addition, the nitrogen reduction performance of these systems would be affected by flood events and sea level rise. I/A OSWS can operate effectively with reduced separation to groundwater, but the system still requires an unsaturated zone of soil to hydraulically function. A flood event would increase the elevation of the groundwater table and could cause flowing floodwaters, both of which would impact the functionality of OSWS. Compared to a centralized treatment system, construction costs would be substantially lower than the costs for a centralized system (less than half), while O&M costs would be in the same range. Therefore, Action Alternative A is recommended for further analysis in the draft EA/EIS, although this alternative does not achieve the same level of nitrogen reduction as centralized treatment system alternatives. The analysis shall be based on the latest available I/A OSWS technology, which may also meet part of the primary purpose of the project.
- *Action Alternative B (Low pressure and gravity sewer collection system with membrane bioreactor [MBR] or sequencing batch reactor [SBR] facility):* This alternative would mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards such as rising groundwater levels and overland flooding that result from precipitation and/or tidal and surge conditions (i.e., the alternative would meet the primary purpose of the project). Potential impacts on human health as a result of surcharged failed leaching fields would largely be eliminated with a centralized treatment facility. Rising sea levels would not reduce the performance of the AWTF because the proposed location of the AWTF is at a sufficiently high surface elevation, and National Oceanic and Atmospheric Administration (NOAA) sea level rise projections (NOAA, 2016) do not indicate inundation of the site. The facility would be protected from

stormwater flooding by appropriate site drainage systems. Under rising sea levels, this alternative would therefore continue to eliminate the existing human health risk as a result of OSWS that leak during flood events. This alternative would provide the highest level of nitrogen removal from the effluent, expected to result in groundwater nitrogen concentrations below the target of 6 mg/L throughout large portions of the project area (i.e., the alternative would also meet the secondary purpose of the project). Construction costs for any centralized facility would be substantially higher than for I/A OSWS (Action Alternative A), but O&M costs would be similar. Action Alternative B is recommended for further analysis in the draft EA/EIS.

- *Action Alternative C (Different wastewater treatment technology):* The modified Ludzack-Ettinger (MLE) is a different form of treatment process. Other than the treatment technology and cost, Action Alternative C is identical to Action Alternative B. Action Alternative C performs the same as Alternative B in terms of mitigating human health and property impacts and the effects of sea level rise. Thus, Action Alternative C would meet the primary purpose of the project. However, under this alternative, the nitrogen concentration in the effluent would be 100–233 percent higher than for the MBR or SBR processes. Thus, the alternative would not meet the secondary purpose of the project to the same extent as Action Alternative B. Total construction costs for a centralized system with MLE processes would be slightly lower (less than 3 percent) than for a system with the MBR or SBR process (Action Alternative B). In summary, Action Alternative C would result in lower benefits at similar costs compared to Action Alternative B. Therefore, Action Alternative C is not recommended for further analysis in the draft EA/EIS.
- *Action Alternative D (Different collection system infrastructure):* This action alternative is similar to Action Alternative B and would perform the same as Action Alternative B in terms of mitigating human health, property impacts, the effects of sea level rise, and effluent quality. Thus, the alternative would meet the primary and secondary purposes of the project similar to Action Alternative B. However, vacuum sewers can be operationally challenging to maintain and prone to vacuum leaks or blockage from grease build-up; these challenges could occasionally affect the secondary purpose of the project. O&M costs for this alternative would be slightly higher than for the combination of gravity and low pressure sewers under Action Alternative B. While Action Alternative D would generally meet the purpose and need to a similar extent as Action Alternative B, the alternative would not result in greater benefits and would result in less reliable operations at slightly greater cost. Therefore, Action Alternative D is not recommended for further analysis in the draft EA/EIS.
- *Action Alternative E (Alternative location[s] for AWTF):* Nine different sites were identified and evaluated for a wastewater treatment facility as part of various feasibility studies between 1999 and 2014. Review of the studies indicated that the Brookhaven Calabro Airport site is the only feasible location for the AWTF. This site is part of Action Alternatives A to D. The site is close to the project area, thereby enabling efficient connectivity to the sewer network. The site acreage is adequate to accommodate the treatment facility and associated treatment area for all four phases of the sewer network. The site's depth to the groundwater table of 30 to 40 feet provides the necessary distance for feasible operation of the AWTF. Other sites considered during the various feasibility studies were screened out because they either had insufficient depths to the groundwater

table, were located too close to residential neighborhoods, had unsuitable site dimensions, or were located too far from the area to be sewered.

In summary, Action Alternative A (replacing existing OSWS with I/A OSWS) and Action Alternative B (low pressure and gravity sewer collection system with MBR or SBR facility) are recommended as the appropriate alternatives for analysis in the draft EA/EIS.

5.0 REFERENCES

Cameron Engineering (Cameron Engineering & Associates LLP). 2012. Forge River Watershed Management Plan. Prepared for the Town of Brookhaven, in association with CH2M Hill. March 12. Available at: http://www.cameronengineering.com/forgeriver/pdf/Forge-River-Management-Plan-Final-lores.pdf

Cape Cod Times. 2009. $20 million sewer question for Provincetown. Posted October 15, 2009.

CDM Smith. 2013. Draft Mastic Shirley Feasibility Study, Map & Plan for: Mastic/Shirley. Prepared in association with H2M and Bowne AE&T Group. Prepared for Suffolk County. September 2013.

CDM Smith. 2014. Mastic Shirley Feasibility Study, Map & Plan for: Mastic/Shirley. Prepared in association with H2M and Bowne AE&T Group. Prepared for Suffolk County. March 2014.

CDM Smith. 2015. Forge River Nitrogen Reduction Report, Sewering of Mastic/Shirley, EFC Report C1-5140-01-00. Prepared in association with H2M and Bowne AE&T Group. Prepared for Suffolk County. August 2014; amended June 2015.

H2M (Holzmacher, McLendon & Murrell). 2013. Alternative On-Site Wastewater Treatment Systems; Task 9 - Summary Report. H2M Project No. SCHS 09-01. February 2013.

Henderson and Bodwell. 1999. Study for the Proposed Mastic/Shirley Sewer District. Prepared for the Town of Brookhaven. July 15, 1999.

Henderson and Bodwell. 2004. Engineering analysis for a Wastewater Treatment Plant and Collection System to Service Mastic/Shirley Business Improvement District. November 8, 2006.

Heufelder, G., S. Rask, and C. Burt. 2008. Performance of Innovative Alternative Onsite Septic Systems for the Removal of Nitrogen in Barnstable County, Massachusetts, 1999-2007. Barnstable County Department of Health and Environment, Barnstable, MA.

NCA (National Climate Assessment). 2014. Climate Change Impacts in the United States. Available at: http://nca2014.globalchange.gov/report

Newburyport DPS (City of Newburyport Department of Public Services). 2015. Summary of Plum Island Vacuum Sewer System Issues, Winter 2015. Memo to Mayor D.D. Holaday from J. Tuccolo, Sewer Superintendent. March 23, 2015.

NOAA (National Oceanic and Atmospheric Administration). 2016. Sea Level Rise and Coastal Flooding Impacts. Accessed on March 15, 2016 at: https://coast.noaa.gov/slr/

NPV (Nelson, Pope & Voorhis, LLC). 2009. Town of Brookhaven Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II. Prepared for the Town of Brookhaven. Final Draft. December 2009.

SCDHS (Suffolk County Department of Health Services). 1995. Standards for Approval of Plans and Construction for Sewage Disposal Systems for Single-Family Residences. November 1995.

SCDHS. 2009. Standards for Approval of Plans and Construction for Sewage Disposal Systems for Other than Single-Family Residences. December 2009.

SCDHS. 2013. Alternative On-Site Sewage Disposal Systems Task IX Summary Report. February 2013.

SCDPW (Suffolk County Department of Public Works). 2009. Mastic-Shirley Sewer District Map and Plan. December 2, 2009.

SCDPW. 2016. Personal correspondence between B. Rukovets and B. Wright (both from Suffolk County) and B. Hay and C. Feeney (both from Louis Berger) regarding I/A OSWS. February 26, 2016.

Suffolk County. 2014. Request for Expressed Interest: A Demonstration of Innovative Alternative Onsite Wastewater Treatment Systems in Suffolk County. Issued April 14, 2014, with Addendum from May 9, 2014.

Suffolk County. 2015. Suffolk County Comprehensive Water Resources Management Plan.

USEPA. 2004. Onsite Wastewater Technology Testing Report. MicroFAST®. August 2004.

USEPA. 2007a. Wastewater Technology Factsheet; Membrane Bioreactors. Washington DC. September 2007.

USEPA. 2007b. Biological Removal Processes and Costs. Available at: http://www.epa.gov/sites/production/files/documents/criteria_nutrient_bioremoval.pdf

USGS (United States Geological Survey). 2016. Long Island Sound Depth to Water Viewer. Accessed on January 5, 2016. Available at: http://ny.water.usgs.gov/maps/li-dtw/

This page intentionally left blank.

ATTACHMENT 1: ALTERNATIVES SCREENING MATRIX

This page intentionally left blank.

Forge River Watershed Sewer Project: Alternatives Screening Matrix for Phases I to III Areas

Screening Criteria	Action Alternative A: Replacing Existing OSWS with I/A OSWS	Action Alternative B: Low Pressure and Gravity Sewer Collection System with (a) MBR Facility	Action Alternative B: Low Pressure and Gravity Sewer Collection System with (b) SBR Facility	Action Alternative C: Different Wastewater Treatment Technology: Ludzack-Ettinger (MLE) Process	Action Alternative D: Different Collection System Infrastructure: Vacuum Sewers in same Project Area [1]
Report Section	4.2	4.3	4.4	4.4	4.5
Treatment performance	Effluent TN of at least 19 mg/L using I/A OSWS. Groundwater TN concentration target of 6 mg/L expected to be met in parts of the project area.	Effluent TN of 3-5 mg/L (limit of technology). Groundwater TN concentration target of 6 mg/L met in almost entire project area.	Effluent TN of 3-5 mg/L (limit of technology). Goundwater TN concentration target of 6 mg/L met in almost entire project area.	Effluent TN of 10 mg/L. Groundwater TN concentration target of 6 mg/L expected to be met in parts of the project area.	Effluent TN of 3-5 mg/L (limit of technology). Groundwater TN concentration target of 6 mg/L met in almost entire project area.
Performance during flood events	IA OSWS would hydraulically fail in flooded areas due to elevated water table. Risks to human health remain.	AWTF located above flood zone. Pump stations designed to withstand floods. Risks to human health could occur during events with power failure.	AWTF located above flood zone. Pump stations designed to withstand floods. Risks to human health could occur during events with power failure.	AWTF located above flood zone. Pump stations designed to withstand floods. Risks to human health could occur during events with power failure.	AWTF located above flood zone. Pump stations designed to withstand floods. Risks to human health could occur during events with power failure.
Performance under projected sea level rise and climate change conditions	Increased rate of failure as separation to water table decreases with rising sea levels.	Treatment system and AWTF can be designed to operate under projected sea level rise.	Treatment system and AWTF can be designed to operate under projected sea level rise.	Treatment system and AWTF can be designed to operate under projected sea level rise.	Treatment system and AWTF can be designed to operate under projected sea level rise.
Acquisition of land	None needed. Installation limited to individual parcels.	Public land for AWTF and pump stations. Some parcels require grinder pumps.	Public land for AWTF and pump stations. Slightly (<5%) more space needed due to larger AWTF. Some parcels require grinder pumps.	Public land for AWTF and pump stations. Slightly (<5%) more space needed due to larger AWTF. Some parcels require grinder pumps.	Those parcels in the project area serviced by vacuum sewers require storage tanks. Also, potentially more space would be needed for pump stations.
Costs *(Phases I-III) (order-of-magnitude estimates)* a. Capital costs	I/A OSWS cost for project area: $111 million	Total costs for system: $294 million	Total costs for system: $289 million	Total costs for system: $286 million	Total costs for system: $294 million
Costs *(Phases I-III) (order-of-magnitude estimates)* b. O&M costs	$0.8 - $2.2 million/yr (based on $200 to $500/yr per system)	$1.7 million/yr	Expected to be similar to MBR system ($1.7 million/yr)	Expected to be similar to MBR system ($1.7 million/yr)	$1.76 million/yr; higher costs due to operational challenges of vacuum systems.

[1] Other components of the system are the same as under Action Alternative B.

Note: Action Alternative E (Alternative Location[s] for AWTF) is not included in this matrix because the only feasible site is the Brookhaven Calabro airport site which is included in Action Alternatives B to D.

Key:

	1 - Meets screening criterion best
	2
	3
	4 - Meets screening criterion least

This page intentionally left blank.

ATTACHMENT 2: CONSIDERATIONS FOR WASTEWATER TREATMENT FOR PHASE IV

This page intentionally left blank.

Attachment 2:

CONSIDERATIONS FOR WASTEWATER TREATMENT FOR PHASE IV

In consideration of the extensive damage caused by Hurricane Sandy in the Village of Mastic Beach and at Smith Point in the Hamlet of Shirley, and stakeholder input received during the New York Rising Community Reconstruction planning process, the project area (i.e., Phases I, II and III) was considered for expansion in March 2014. Specifically, the expanded area (referred to as Phase IV) would include the densely developed residential area south of Neighborhood Road from the Carmans River on the west, and the area south and east of Commack and Mastic Roads to Great South Bay on the south (see **Figure 1-1** for the location of the Phase IV area). The draft Environmental Assessment and Environmental Impact Statement (EA/EIS) provides a detailed analysis of Phases I, II and III identified in the Draft Mastic-Shirley Feasibility Study (CDM Smith, 2013[1]) and utilizes the considerable amount of information developed for those phases. Phase IV has not yet been analyzed to a similar level of detail and definition of Phase IV has not yet advanced to a degree that a detailed analysis can be conducted. In consideration of this, Phase IV is considered only in the cumulative impact analysis of the draft EA/EIS. If warranted, a separate environmental review may be conducted in the future when the specifics of Phase IV would become defined in greater detail.

Following is a summary of baseline information and aspects associated with the Phase IV area as relevant for future wastewater treatment in this area.

- *Area description:* The Phase IV area covers approximately 1,900 acres and contains approximately 6,000 parcels (CDM Smith, 2014). Greater than 60 percent of the Phase IV area is residential and greater than 35 percent of the area is currently recreation, open space or vacant. Only 1 percent of the area land use is commercial.
- *Watershed:* The Phase IV area is located mostly in the watershed of Narrow Bay to the south of Mastic Beach and Bellport Bay to the west. Both bays are hydrologically connected and part of Great South Bay. Only the northeastern corner of the Phase IV area is part of the Forge River watershed.
- *Flooding:* Topographic elevations of much of the Phase IV area are less than 20 feet above sea level; elevations in the southern portion of the Phase IV area are less than 10 feet. As a result, the area has a high risk of inundation from coastal surges. Figure 1-3 shows that the southern portion of the Phase IV area would be flooded during a high-risk event (i.e., major coastal storm or hurricane).
- *Depth to groundwater:* Due to the low topographic elevations of the area and proximity to the bay, depths to groundwater are less than 9 feet in a large portion of the Phase IV area (see **Figure 1-4**).
- *Sea level rise:* Rising sea levels of 3 or 4 feet by year 2100 would result in a loss of approximately the southern one third of the Phase 4 area (see **Figure 3-1**).

[1] References listed in Attachment 1 are included in Section 5 (References) of the main report.

- *Wetlands:* The Phase IV area has a broad band of coastal wetlands bordering Narrow Bay, including New York State Department of Environmental Conservation and National Wetlands Inventory wetlands.

A number of issues should be considered in a future assessment for wastewater treatment of the Phase IV area. It is important to note that the list is based on an initial assessment.

- *Engineering analysis:* Although the Phase IV area was included in the *Feasibility Study Map and Plan for Mastic Shirley* by CDM Smith (2014), the primary focus of the feasibility study were the Phases I - III areas. For example, modeled information on the total nitrogen concentrations in the groundwater after implementing wastewater treatment are available for the Phases I - III areas, but not for the Phase IV area. The subsequent "*Forge River Nitrogen Reduction Report"* by CDM Smith (2015) focused on the Phase I/II area only.
- *Environmental baseline information:* The watershed management plan by Cameron Engineering (2012) entitled *Forge River Watershed Management Plan* provides extensive background information on the natural and socioeconomic environment that is relevant as a background document for the draft EA/EIS for Phases I - III. A similar assessment has not been performed for the Phase IV area.
- *Watershed discharge*: Groundwater in the Phase IV area discharges to Narrow Bay. Should wastewater be collected from the approximately 6,000 parcels within the Phase IV area and treated at the Advanced Wastewater Treatment Facility (AWTF) proposed to be sited at the Brookhaven Calabro Airport, the treated effluent would be released into the Forge River watershed via groundwater discharge. Currently, the total nitrogen load from wastewater treatment by conventional onsite wastewater treatment systems (OSWS) entering the groundwater in the Phases I - III areas is 244 pounds/day (lbs/day) (CDM Smith, 2014). After implementing centralized wastewater treatment for the Phases I - III area, the total nitrogen load entering the groundwater would be 58 lbs/day (based on the membrane bioreactor [MBR] process, and an effluent concentration of 5 mg/L total nitrogen). If the treated wastewater effluent from the Phase IV area was added, the total nitrogen concentration in the treated effluent would be 134 lbs/day, still considerably less than the current discharge but more than doubling the load from the Phases I - III areas only. This added load would decrease the environmental benefit to Forge River achieved through a centralized treatment system for the Phases I - III areas and would be evaluated to determine if this outcome would be environmentally desirable, considering that Forge River has been identified as the "most eutrophic estuary in the county" in the *"Comprehensive Watershed Management Plan"* (Suffolk County, 2015). As noted above, a hybrid approach whereby only a portion of the Phase IV area would be connected to the AWTF and the remainder of the Phase IV area would be serviced by OSWS would reduce the contribution of the Phase IV area to the Forge River watershed. The effects of nitrogen loading from the Phase IV area on the Great South Bay (to which both Forge River and Narrow Bay connect) may vary accordingly.
- *Climate change considerations:* A large portion of the Phase IV area is at risk for inundation from flood surges. Sea level rise could permanently flood a portion of the Phase IV area. The State of New York is offering a program to purchase homes damaged by Hurricane Sandy under the premise that they will be demolished and the vacant properties then would be restored to their natural state, including wetlands. The increase of

ecologically healthy wetland systems along Narrow Bay will contribute to the reduction of flooding and erosion impacts resulting from storm surges. A wider coastal wetland zone will also improve the gradual adjustment of ecosystems in the coastal area to the effects of sea level rise. Considering these factors, and considering the high cost of implementing a centralized treatment network and other related facilities, a combination of centralized treatment and innovative/alternative (I/A) OSWS (or other alternative technologies) in selected areas might be a more cost-effective and environmentally preferable approach than centralized sewer service only.

In summary, while it is very likely that improved wastewater treatment in Phase IV would have important benefits to the water quality of Great South Bay, the specific approach to be chosen for the Phase IV area will require additional analysis and evaluation in preparation for eventual implementation.

This page intentionally left blank.

ATTACHMENT 3:
ALTERNATIVE ON-SITE SEWAGE DISPOSAL SYSTEMS, TASK IX - SUMMARY REPORT

Prepared for Suffolk County, New York, Department of Health Services,

Office of Wastewater Management

Prepared by H2M, February 2013

This page intentionally left blank.

APPENDIX B.4: PUBLIC SCOPING DOCUMENT

This page intentionally left blank.

Forge River Watershed Sewer Project
Town of Brookhaven, Suffolk County, New York

FEMA-DR-4085-NY

November 2016

SEQRA Lead Agency:
NY Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 10004

NEPA Lead Agency:
U.S. Department of Homeland Security
Federal Emergency Management Agency, Region II
26 Federal Plaza, NY, NY 10278

This page left intentionally blank.

TABLE OF CONTENTS

TABLE OF CONTENTS i

LIST OF FIGURES ii

1.0 INTRODUCTION 1

1.1 Suffolk County Coastal Resiliency Initiative 1

1.2 Forge River Watershed Sewer Project 3

2.0 PURPOSE AND NEED 3

3.0 PROJECT LOCATION AND BACKGROUND 4

4.0 ENVIRONMENTAL ANALYSIS FRAMEWORK 7

4.1 Scoping 7

4.1.1 Summary of Scoping Process 7

4.1.2 Summary of Scoping Comments 8

4.2 NEPA Draft EA and SEQRA Draft EIS 12

4.3 Environmental Impact Analysis 13

5.0 CONTENTS OF DRAFT EA/EIS DOCUMENTS 14

5.1 Proposed Action and Alternatives 15

5.1.1 Alternative 1: No-action 15

5.1.2 Alternative 2: Proposed Action Alternative 15

5.1.3 Alternative 3: Replacing On-site Wastewater Treatment and Disposal Systems with Innovative/Alternative Systems 16

5.2 Affected Environment and Potential Impacts 16

5.2.1 Geology, Topography and Soils 17

5.2.2 Air Quality 17

5.2.3 Water Quality 18

5.2.4 Wetlands and Coastal Resources 20

5.2.5 Floodplains 21

5.2.6 Vegetation 25

5.2.7 Wildlife and Fish 25

5.2.8 Threatened and Endangered Species and Critical Habitat 26

5.2.9 Cultural Resources 26

5.2.10 Land Use and Planning 27

5.2.11 Socioeconomics 28
5.2.12 Environmental Justice 30
5.2.13 Community Facilities and Services 31
5.2.14 Noise 31
5.2.15 Transportation 32
5.2.16 Public Services and Utilities 33
5.2.17 Public Health and Safety 33
5.2.18 Climate Change 34
5.3 Cumulative Impacts 36
5.4 Irreversible and Irretrievable Commitment of Resources 37
5.5 Permits and Project Conditions 37
5.6 Agency Coordination and Public Involvement 38
5.7 Other Sections 38
5.8 Suggested Appendices 38
5.9 Scoping Document References 39

LIST OF FIGURES

Figure 1. Suffolk County Coastal Resiliency Initiative 2
Figure 2. Forge River Watershed Sewer Project Area 6
Figure 3. Wetlands 22
Figure 4. Coastal Zone Boundary 23
Figure 5. Floodplains 24
Figure 6. Land Use 29
Figure 7. Projected Sea Level Rise 35

1.0 INTRODUCTION

On October 29, 2012, Hurricane Sandy caused storm damage to several areas across the state of New York. President Barack Obama declared Hurricane Sandy a major disaster on October 30, 2012. The declaration authorized the Department of Homeland Security-Federal Emergency Management Agency (FEMA) to provide assistance to New York State per federal disaster declaration DR-4085-NY and in accordance with Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974 (42 United States Code [USC] 5170c), as amended; the Sandy Recovery Improvement Act of 2013; and the accompanying Disaster Relief Appropriations Act of 2013. Suffolk County (the subgrantee) has applied to the FEMA Hazard Mitigation Grant Program (HMGP) for funding of the Suffolk County Coastal Resiliency Initiative (the Initiative). The New York State Division of Homeland Security and Emergency Services (DSHES) is the grantee partner.

1.1 Suffolk County Coastal Resiliency Initiative

The Initiative seeks to mitigate impacts on human life and property, surface waters, and coastal wetlands associated with on-site wastewater treatment and disposal system (OSWS) failures caused by natural hazards. The natural hazards include rain events, storm surge, and coastal flooding, particularly as they contribute to rising groundwater elevations and septic or cesspool failures for up to 74 percent of homes in Suffolk County that rely on OSWS. The Initiative would be accomplished through five projects in areas that are particularly prone to these conditions: Southwest Sewer District No. 3 (SSD #3), and the Carlls, Connetquot, Forge, and Patchogue River watersheds, as follows (see **Figure 1**).

- *SSD #3*: SSD #3 is south and west of the Southern State Parkway from the Nassau County line to the hamlet of East Islip, in the townships of Babylon and Islip. This project proposes to install service laterals connecting 2,232 residential parcels in SSD #3 to existing collection and conveyance systems terminating at Suffolk County's Bergen Point Wastewater Treatment Plant.
- *Carlls River Watershed*: The Carlls River is located in Babylon, flowing into the Great South Bay on the mainland side of Long Island just north of the Fire Island Inlet. This project comprises three sub-areas: North Babylon, West Babylon, and Wyandanch, and proposes to construct a new collection system to connect 2,601 parcels to existing conveyance and treatment systems.
- *Connetquot River Watershed*: The Connetquot River is located on the south shore of Long Island in Great River and flows into the Great South Bay. This project proposes to construct a new collection system to connect 500 parcels to existing conveyance and treatment systems.
- *Patchogue River Watershed*: The Patchogue River is located off of Patchogue Bay on Long Island's south shore, about 17 miles east of the Fire Island Inlet and 14 miles west of the Moriches Bay Inlet. This project proposes to construct a new collection system to connect 648 parcels to existing conveyance and treatment systems.

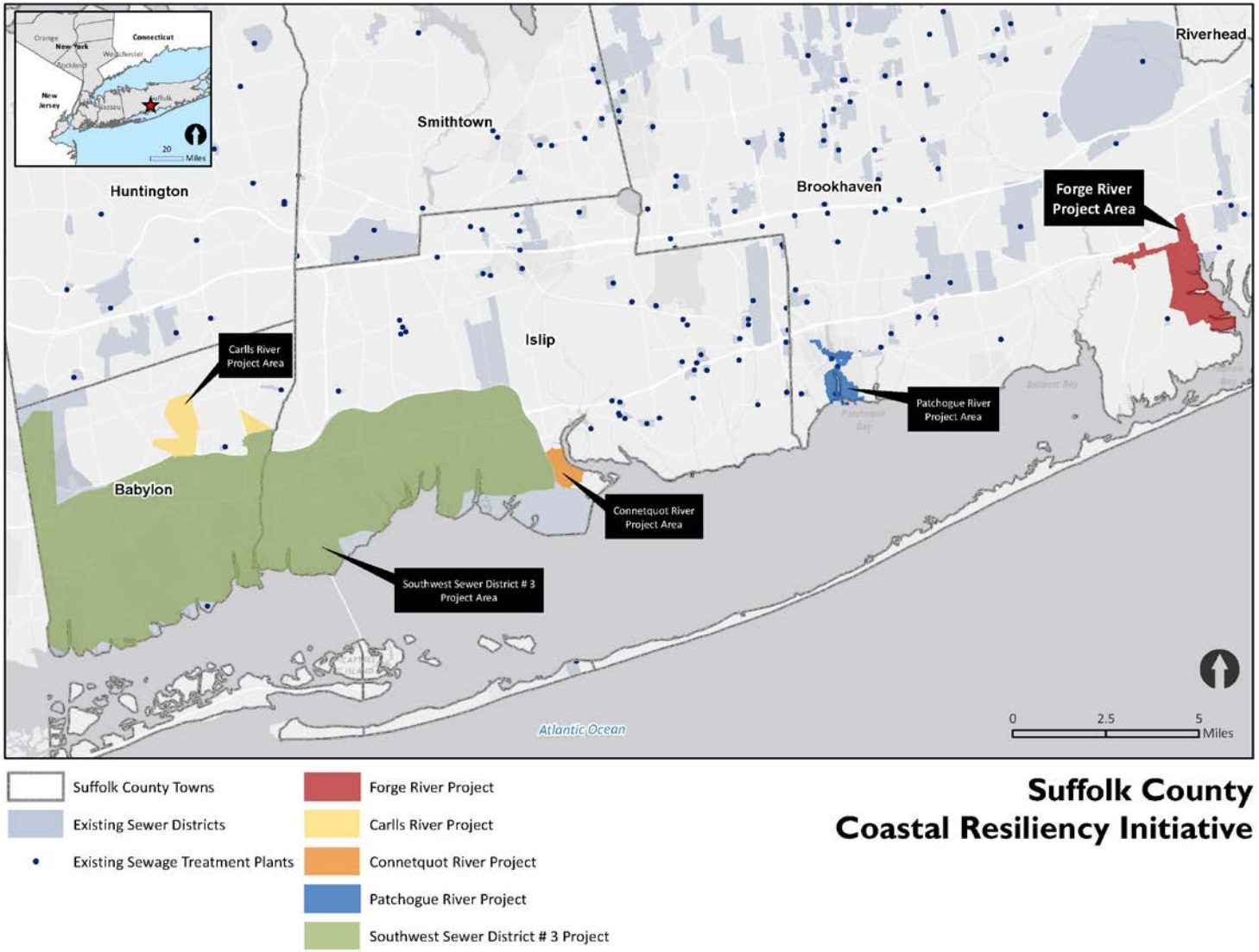


Figure 1. Suffolk County Coastal Resiliency Initiative

- *Forge River Watershed*: Forge River, the most eutrophic waterbody in Suffolk County, is located within the hamlets of Mastic and Shirley in the Town of Brookhaven (Suffolk County, 2015). This project proposes to construct new sewer collection and conveyance infrastructure, and an advanced wastewater treatment facility (AWTF). Phases I and II, which are currently proposed for funding, would sewer 2,094 parcels. Phase III, which is planned but not currently included in the application for FEMA HMGP funding, would sewer 1,568 parcels. Calabro Airport in the Town of Brookhaven is one potential site considered for the AWTF.

This document addresses the Forge River Watershed Sewer Project (the proposed action) as described below. The proposed action is functionally, geographically, hydrologically, and hydraulically separate from the four remaining projects discussed above as part of the Initiative and has both independent utility and a distinct schedule for implementation. Therefore, a permissibly separate environmental review process for this project will be completed with a rigorous assessment of cumulative impacts to ensure that the review will be no less protective of the environment.

1.2 Forge River Watershed Sewer Project

FEMA will be the lead agency under the National Environmental Policy Act (NEPA) and related laws for the environmental review of the proposed action. The Governor's Office of Storm Recovery (GOSR) will be the lead agency pursuant to the State Environmental Quality Review Act (SEQRA) and related laws for the environmental review of the proposed action.

To satisfy environmental review requirements concurrently under NEPA and SEQRA, a coordinated NEPA draft environmental assessment (EA) and SEQRA draft environmental impact statement (EIS) will be prepared that comprehensively addresses the requirements of both laws and regulations, in accordance with both NEPA (42 United States Code [USC] 4321–4370h) and SEQRA (Environmental Conservation Law [ECL] Sections 3-0301(1)(b), 3-0301(2)(m), and 8-0113 with promulgating regulations found at 6 New York Codes, Rules and Regulations [NYCRR] Part 617). These coordinated NEPA/SEQRA documents will evaluate the proposed action and alternatives for the Forge River Watershed Sewer Project.

2.0 PURPOSE AND NEED

Section 404 of the Robert T. Stafford Relief and Emergency Assistance Act of 1974 (42 USC 5170c), as amended, authorizes FEMA to provide funding to eligible grant applicants for activities that have the purpose of reducing or eliminating risks to life and property from hazards and their effects. The primary purpose of the proposed action is to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures in the Forge River Watershed in Suffolk County, New York, caused by natural hazards. The secondary purpose is to mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge.

The project is needed because OSWS in the project area are susceptible to both capacity and treatment or disposal failures during flood and heavy rain events. Many systems in the project area failed during Hurricane Sandy.

3.0 PROJECT LOCATION AND BACKGROUND

Forge River, the most eutrophic[1] waterbody in Suffolk County, is located within the hamlets of Mastic and Shirley in the Town of Brookhaven (Suffolk County, 2015). The proposed project area encompasses approximately 1,400 acres in the densely developed residential and commercial area located south of the Sunrise Highway (CDM Smith, 2014). The project area further includes two parcels with a combined area of 30.7 acres located on the Brookhaven Calabro Airport north of Sunrise Highway (New York State Route 27) (see **Figure 2**).

In addition to the proposed site for the AWTF, the project area was initially identified as "Phase I/II" and included 2,094 parcels located on the north and south sides of County Road (CR) 80 (Montauk Highway) between William Floyd Parkway and Forge River. In response to public scoping comments, this project area was expanded to include "Phase III," which consists of 1,568 primarily residential parcels located along Forge River to the south of the Phase I/II area. As a result, the project area for this draft EA/EIS encompasses Phases I, II, and III. It should be noted that only Phases I and II are currently proposed for funding. Phase III, which is planned but not currently included in the application for FEMA HMGP funding, is included in this review so that it could be constructed if funding becomes available.

The project area is affected by heavy storms that can lead to flooding with varying intensity and frequency. For example, intense flooding occurred during Hurricane Sandy in 2012; Hurricane Irene in 2011; and other unnamed seasonal storms, nor'easters, and hurricanes. Flooding can occur as a result of intense precipitation events (e.g., Hurricane Irene) or coastal surges (e.g., Hurricane Sandy), or a combination of both. Such flooding may increase as a result of climate change accompanied by rising sea levels and increasing frequency and severity of storms.

Approximately 90 percent of the Phase I/II area is located within the Forge River Watershed, and the remaining 10 percent of the area is located within the Carmans River Watershed to the west. The entire Phase III area is located within the Forge River Watershed. Forge River is an estuary along Moriches Bay; Carmans Rivers is an estuary along Bellsouth Bay. Both bays are connected by another bay (Narrow Bay), and all three bays are part of Great South Bay.

The OSWS providing sanitary wastewater disposal in the project area are partially outdated and failing. Failing OSWS cause untreated effluent to be released into the surrounding soil (Suffolk County, 2015). Failure can be caused by hydraulic overloading and flooding. Aged systems are at a higher risk for failing as a result of improper maintenance over time, leading to frequent sewage overflows and sewage backups resulting from clogged systems. While the exact number of system failures cannot be quantified, many of the OSWS in the project area failed during Hurricane Sandy and will continue to be subject to failures during future storm events.

The density of OSWS in the project area is high compared to many other parts of the Forge River Watershed. Approximately 96 percent of the current total nitrogen load from effluent discharged to the groundwater in the Phase I/II area is contributed by residential sources, with the remainder contributed by commercial and institutional sources (CDM Smith, 2015). The relative contribution from residential sources is likely even higher in the Phase III area. OSWS failures result when

[1] Eutrophic conditions (or eutrophication) consist of an abundant accumulation of nutrients that support a dense growth of algae and other organisms. The decay of these algae depletes shallow waterbodies of oxygen in summer. According to the *Suffolk County Comprehensive Water Resources Master Plan*, Forge River is considered the most eutrophic water body in Suffolk County (Suffolk County, 2015).

systems are flooded by heavy rainfall or submerged in shallow groundwater that rises during storm events, reducing system capacity and/or inhibiting or eliminating system treatment or disposal capability, as described below.

- *Capacity failure* occurs when tidal inundation of the land surface saturates soils above and around the systems causing water to enter the systems or when groundwater rises into the cesspool or leaching pools, reducing system hydraulic capacity. Capacity failure manifests itself by slow draining domestic plumbing or backup of wastewater into the home or basement of buildings served by the systems. In cases of limited capacity that can linger for weeks or months, the systems are used only for essential wastewater disposal; usually excrement disposal and bathing. Other uses, including dishwashing and laundry wastewater disposal, must be curtailed.
- *Treatment and disposal failure* occurs when groundwater or flood waters inundate the systems or soils immediately beneath the systems, disrupting the biologic treatment activity in the systems. A 2-foot vertical separation between the bottom of the cesspool or leaching pool and the water table is necessary for decomposition of organic compounds, biodegradation of detergents, and die off of bacteria and viruses. For an extended period of months to years following system failures caused by inundation, nutrients (e.g., nitrogen), and pathogens are discharged unabated to groundwater and potentially to nearby surface waterbodies, including the Forge River and Great South Bay.

The failure of OSWS causes public health risks associated with uncontrolled sewage discharges during and after storm events that create pathways for human exposure to harmful pathogens, increase risk to human life and property, and degrade ecosystems that protect Long Island's south shore against storm surge.

Risks to human life and property include raw (untreated) sewage backups into buildings or yards and overflows onto the land or into surface waters; health/safety hazards and costs associated with the cleanup of raw sewage backups; loss of wastewater treatment; and beach closures as a result of non-point source pollution. Nitrogen and pathogen contamination of underlying groundwater and the downgradient surface waters contributes to the deterioration of ecosystem functions in the Great South Bay, including the decline in fisheries and associated job loss. The loss or degradation of coastal wetlands decreases their protective functions of reducing wave energy and amplitude, slowing water velocity, reducing flood height and storm surge, and stabilizing the shoreline through sediment deposition. These effects of capacity failures on human health and coastal wetlands can persist for extended periods of time following flood events.

Suffolk County worked with local community representatives on the Suffolk County Sewer District/Wastewater Treatment Task Force (Task Force) to delineate areas where investment in sanitary sewer and wastewater infrastructure could provide environmental, economic, and/or social benefits, and identify critical need areas where the implementation of sewerage infrastructure may be warranted and should be assessed. The Task Force identified the connection of parcels in the Forge River Watershed as a priority. In 2013, a feasibility study was prepared for the Forge River Watershed to document the sewage collection and treatment/effluent discharge requirements, associated capital and operation costs, and environmental and economic benefits. The feasibility study was followed by the Forge River Nitrogen Reduction Report in 2014 (amended 2015), which evaluates engineering alternatives for sewering the Mastic-Shirley Sewer District.

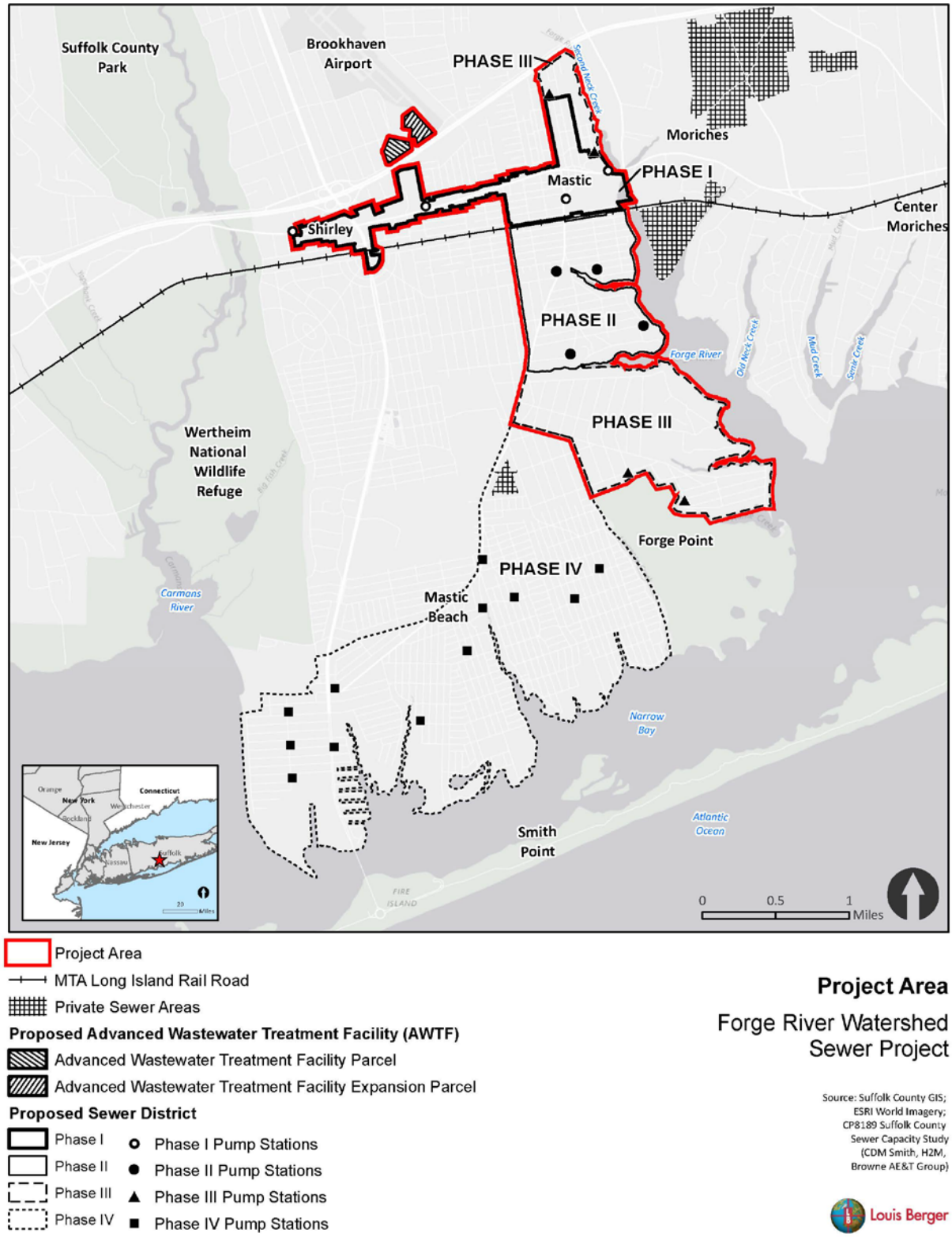


Figure 2. Forge River Watershed Sewer Project Area

Subsequently, the 2015 Suffolk County *Comprehensive Water Resources Management Plan* recommended the connection of parcels in SSD #3, and the Carlls, Connetquot, Forge, and Patchogue River watersheds as key measures to address several water quality and environmental quality issues.

4.0 ENVIRONMENTAL ANALYSIS FRAMEWORK

4.1 Scoping

4.1.1 Summary of Scoping Process

The process of determining the scope, focus, and content of an environmental document is known as "scoping." Scoping is a useful opportunity to obtain information from the public and governmental agencies. In particular, the scoping process asks agencies and interested parties to provide input on the proposed alternatives, the purpose and need for the project, the proposed topics of evaluation, and potential impacts and mitigation measures to be considered. The scoping process also allowed FEMA and GOSR to coordinate with other cooperating (NEPA) or involved/interested (SEQRA) agencies to reach agreement on relevant issues to minimize the inclusion of unnecessary issues.

In accordance with SEQRA and its implementing regulations under 6 NYCRR Part 617, GOSR transmitted a letter to all interested and involved agencies expressing interest in serving as the lead agency under SEQRA. Receiving no objections from interested and involved agencies, GOSR assumed lead agency status and classified the proposed project as a Type I Action under 6 NYCRR 617.4. GOSR initiated coordinated review of the proposed action by circulating a full Environmental Assessment Form (EAF) Part 1 for review and comment to interested and involved agencies. GOSR evaluated the criteria found under 6 NYCRR 617.7(c) and completed Parts 2 and 3 of the EAF, determining that the proposed action may result in one or more significant environmental impacts and will therefore require the preparation of a SEQRA EIS.

As SEQRA lead agency, GOSR has fulfilled the scoping requirements under 6 NYCRR 617.8. On December 23, 2015, GOSR issued a notice of SEQRA positive declaration, public scoping meeting, and public comment period, which lasted until February 16, 2016. With this notice, GOSR submitted a draft scope to all involved agencies and made the draft scope available to the public. The draft scope was available for public viewing in hard copy at the offices of GOSR, the Town of Brookhaven Clerk, Suffolk County Division of Planning & Economic Development, and Brookhaven Free Library; and digitally via the GOSR and Suffolk County websites. A public scoping meeting was held on January 26, 2016, from 6:00 pm to 8:00 pm at William Paca Middle School, 338 Blanco Drive, Mastic Beach, NY 11951.

All interested parties were provided opportunities to submit written comments at the public scoping meeting; to submit comments in writing via email, fax, or letter; and to provide verbal comments at the public scoping meeting that was recorded by a court reporter. Two SEQRA-involved agencies provided written comments, including the New York State Department of Environmental Conservation (NYSDEC) and the Town of Brookhaven.

This final written scope will be provided to all involved agencies and any individual that has expressed an interest in writing. The final scope will also be made available to the public via the GOSR and Suffolk County websites.

4.1.2 Summary of Scoping Comments

In total, 14 public comment letters, emails, and comment cards; 2 agency comment letters, emails, and comment cards; and 19 oral comments (heard during the public hearing) were received by the close of the public comment period. Each letter, email, and comment card discussed multiple topics. Comments received after the conclusion of the official comment period were (and will continue to be) reviewed but may not be included in the official record for the scoping period. Comments are still being solicited via the project website. This final scoping document has been revised to reflect public comments and the potential for impacts raised by the public (Section 5.0, *Contents of Draft EA/EIS Documents*).

The comments fit into five topic categories: project purpose and need, costs of the project, environmental impacts, miscellaneous, and new alternatives. The follow sections summarize the public comments received during the scoping period based on the environmental resource categories that will be discussed in the draft EA/EIS.

Public Comments Related to Purpose and Need

Many comments that were submitted related to the purpose and need and scope of the project. Commenters questioned whether the sewer project was necessary for the area, if other wastewater systems should be considered, and if this was an actual coastal resiliency project.

Response:

- *The project is needed because the project area is subject to heavy rainfall events that lead to elevated groundwater and regular flooding, which can cause failures of OSWS. When OSWS fail, untreated sewage is discharged into the environment, resulting in immediate hazards to human health and damages to property, as well as long-term degradation of coastal wetlands. The proposed project seeks to mitigate short-term, repetitive, adverse impacts on human life and property associated with OSWS failures in the Forge River Watershed in Suffolk County, New York, caused by natural hazards, as well as mitigate long-term, adverse impacts associated with such failures on surface waters and coastal wetlands that reduce the ability of these waters and wetlands to provide natural protection against storm surge.*
- *The draft EA will evaluate a third action alternative that considers innovative/alternative (I/A) wastewater treatment systems. This alternative would repair and/or replace existing OSWS with upgraded OSWS to achieve an effluent quality of up to 19 mg/L for total nitrogen.*
- *The proposed project is a coastal resiliency project because it would mitigate short- and long-term impacts associated with OSWS failures in the Forge River Watershed and with failures on surface waters and coastal wetlands. In doing so, it would contribute significantly to the Suffolk County Coastal Resiliency Initiative's goal of mitigating impacts on human life and property, surface waters, and coastal wetlands associated with OSWS failures caused by natural hazards (rain events, storm surge, and coastal flooding).*
- *Mastic-Shirley is one of the seven currently unsewered areas that the Suffolk County Sewer District/Wastewater Treatment Task Force identified as a critical area of need for centralized sewer service. The Draft Mastic-Shirley Feasibility Study (CDM Smith, 2014) and Forge River Nitrogen Reduction Report, Sewering of Mastic/Shirley, EFC Report*

C1-5140-01-00 (CDM Smith, 2015) documented the needs of the proposed district, including sewage collection and treatment/effluent discharge requirements and various benefits.

Many commenters indicated that they felt the purpose of the project is economic development, rather than mitigation or water quality, which they felt should be the main purpose. One commenter spoke in contradiction of this point, stating that economic development might be necessary considering the business closures and need in the community for an economic catalyst.

Response:

- *As noted in the purpose and need of the Scoping Document, the purpose of this project is not economic development, but rather, to mitigate short- and long-term adverse impacts associated with OSWS failures in the Forge River Watershed and with failures on surface waters and coastal wetlands, respectively. For the purpose of the land use and socioeconomic analyses in the draft EA/EIS, the no-action alternative will include increased development according to the Montauk Highway Corridor Study and Land Use Plan and as permitted by zoning. With the exception of development according to the Montauk Highway Corridor Study and Land Use Plan and as permitted by the zoning, it is assumed that currently vacant parcels will not be developed. However, the analyses in the draft EA/EIS will assess the potential for induced growth and indirect effects on population, employment, housing units, property values, and net fiscal flow based on this existing zoning.*

Public Comments Related to the Scope of the Environmental Analysis

One commenter indicated that the former duck farm along the Upper Forge River was historically the major cause of the nitrogen pollution, rather than failing OSWS. Some commenters spoke specifically to types of analyses that should be conducted, discussing the need for cumulative, indirect, and secondary impact analyses; a build-out analysis of what the district needs; mitigation plans; and an analysis of impacts on new single-family residences in the project area. Other commenters suggested the need for mitigation plans and due process for complying with Suffolk County laws for dealing with tidal wetlands, freshwater wetlands, and State Pollution Discharge Elimination System (SPDES) permits as well as cultural resources.

One commenter outlined certain projects in the project area that should be considered under the cumulative impacts analysis, including: The Town of Brookhaven Multifamily Housing Code, the Advanced OSWS Demonstration in Suffolk County, the Town of Brookhaven (Airport) Perimeter Road Project (OTRPRP), and The Town of Brookhaven's proposal to require decreased nitrogen outflow within 500 feet of the shoreline. The OTRPRP, specifically, was mentioned as a possible project that could result in adverse impacts on visual resources and neighborhood aesthetics/character, which should be addressed in the analysis.

Response:

- *As required by the implementing regulations of SEQRA, the impact analysis will evaluate the direct and indirect (including secondary) effects of all alternatives, as well as the contribution of the action alternatives to cumulative impacts when combined with other past, present, and reasonably foreseeable projects in the area.*

- *The draft EA/EIS will outline the proposed mitigation measures for each resource topic, and required mitigation will be discussed in the permits and project conditions chapter.*
- *The draft EA/EIS will evaluate the impacts on single-family residences under the socioeconomics resource topic.*
- *The proposed project will require several approvals, permits, and consultations that will be discussed in the permits and project conditions chapter.*
- *The analysis of water quality in the draft EA/EIS will consider other sources of nitrogen loading beyond failing OSWS, such as agricultural practices.*

Other public comments related to the environmental analysis dealt mostly with contamination, socioeconomics, and impacts on coastal resources and wetlands. The comments entailed inquiries from the public such as how the project would impact estuaries and wetlands, what remediation plans are in place if the sewer backup plan fails, and how neighbors would be compensated for their losses. One commenter further inquired as to what provisions have been made to hide the plant from view on the west side and how the plant would impact the nearby playground and ballfields.

Other commenters indicated that the project would saturate their land and pollute their soil without any benefit. Commenters reiterated the lack of benefit they perceived from this project and said the project would cost them money because it would pollute their soils. One commenter felt the project may impact home prices.

Response:

- *The draft EA will include detailed analyses of all possible adverse as well as beneficial impacts on the human and natural environment where potential impacts have been identified, as discussed in Section 5.0, Contents of Draft EA/EIS Documents.*

Public Comments Related to the Project Area

Many commenters suggested the project area, sewer line location, and sewage plant location should be changed to have more beneficial effects on the community. Commenters mentioned the project area should include Mastic Beach, Montauk Corridor, the Lower Peninsula, and the East River. Commenters also suggested the treatment plant should be located on the northwest portion of its current site, within the project area that is being sewered, or away from residences. One commenter asked why so much of the project area was located outside of the Forge River Watershed.

Response:

- *During the public scoping meeting, FEMA and GOSR indicated that the draft EA/EIS will provide a detailed analysis of the project area, defined as Phases I and II of the project area identified in the Draft Mastic-Shirley Feasibility Study. In response to public comments received during scoping, Phase III will also be included in the project area for detailed analysis. Phase IV will be evaluated as a reasonably foreseeable future project in the assessment of cumulative impacts.*
- *Several studies considered alternative locations for the AWTF outlined in an Alternatives Screening Report prepared by GOSR. The alternative locations for locating the AWTF facility included the Brookhaven Calabro Airport and the "Links at Shirley Golf Course."*

The golf course site was eventually eliminated as an alternative site because of the much higher costs associated with constructing a force main from the master pump station. As a result, the airport site was chosen for the AWTF because it was much closer to the master pump station, would require a shorter force main, and would be less costly. Moreover, at the end of 2009, the Links at Shirley Golf Course was sold for private residential development. After the property was rezoned and subdivided, the developer dedicated 98 acres of the property as open space to the Town of Brookhaven for active recreational purposes (CDM Smith, 2014). Furthermore, the site has a comparatively shallow depth of only 12 feet to groundwater, which limits its treatment potential. In addition, the site is located outside of the Forge River watershed; groundwater would flow either to Great South Bay in the south and/or to Carmans River in the west (through the Wertheim National Wildlife Refuge).

- *Approximately 90 percent of the Phase I/II area is located within the Forge River Watershed; the remaining 10 percent of the area is located within the Carmans River Watershed to the west. The entire Phase III area is located within the Forge River Watershed. The Phase IV area is located in the watershed of Narrow Bay to the south and Bellport Bay in the west—both bays are part of Great South Bay. For Phases I to IV, 46 percent of the project area is located in the Forge River Watershed, 2 percent is located in the Carmans River Watershed, and 52 percent is located in the Great South Bay Watershed.*

Other concerns expressed by commenters included:

- The sewer district should not be located near the airport where there are numerous plane crashes yearly.
- The Brookhaven lab had contaminated groundwater and should be addressed.
- The project should build 3.5 miles of pipeline down Neighborhood Road and up Mastic Road to be ready to connect when the project is completed because the county cannot afford to wait 15 to 20 years.

Response:

- *Because the Brookhaven Calabro Airport is one potential site under consideration for the location of the wastewater treatment plant, the draft EA/EIS will evaluate the proposed actions under NEPA and applicable "special purpose laws" pursuant to the Federal Aviation Administration (FAA) order 5050.4b, NEPA Implementing Instructions for Airport Actions, and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures. While none of the project alternatives are anticipated to interfere with aviation navigation, potential construction impacts related to aviation navigation will be evaluated in the draft EA/EIS. In addition, FAA is a cooperating agency for the review of this project under NEPA, and FEMA is coordinating with both FAA and the Town of Brookhaven.*
- *The draft EA/EIS will discuss existing groundwater contamination and the potential for nearby contaminated sites under both the water quality resource topic and the geology, topography, and soils resource topic.*

- *The project area to be evaluated in the draft EA/EIS will include Phase III, while the Phase IV area will be evaluated in the analysis of cumulative effects. Together, Phases III and IV encompass the area of Neighborhood Road and Mastic Road.*

Public Comments Related to Alternatives

Many commenters inadvertently expressed support for the No-action Alternative by either voicing opposition to the project or suggesting it was not necessary. One commenter opposed the project and indicated that sewering had failed the community in many categories, including creating untenable costs and drinking water drawdown. Other commenters were in support of sewering, and therefore the action alternatives, expressing that the current infrastructure was antiquated and long overdue for improvements and updates.

Response:

- *The draft EA/EIS will evaluate the potential costs of the project alternatives to residential and commercial property owners under the socioeconomics resource topic.*
- *The draft EA/EIS will evaluate the potential impacts of the project alternatives to drinking water supply and quality under the water quality resource topic.*

One commenter suggested additional alternatives should be considered that abandon the idea of sewering and focus instead on implementing waterless, closed, on-site wastewater systems that would avoid contamination or pollution and reuse waste as a fertilizer.

Response:

- *The use of a bathroom-only solution addresses only part of the pollution problem; the majority of the household volume of water is grey and must be conveyed for treatment. Kitchen waste would have to be brought to the bathroom for disposal. Although minor, there would also be homeowner attention (fan, pump, and a liquid cartridge) and compost usage. Local regulations would require revision related to "fertilizer" use.*

Public Comments Related to Costs

Commenters who discussed the costs of the project asked how this would affect local taxes and suggested that the Sandy Relief Fund be used to build the sewer. One commenter requested a full cost analysis of the project, including the costs of the construction or retrofit, costs of deteriorating infrastructure, a full analysis for storm scenarios, and the long-term maintenance costs.

Response:

- *While a full benefit-cost analysis is beyond the analysis required by NEPA/SEQRA to evaluate the potential for significant impacts related to the project alternatives, the draft EA/EIS will consider costs in the socioeconomics resource topic. In addition, a benefit-cost analysis was prepared as part of the Hazard Mitigation Grant Application to FEMA.*

4.2 NEPA Draft EA and SEQRA Draft EIS

FEMA and GOSR will work together to prepare a NEPA draft EA and SEQRA draft EIS, respectively, addressing the various items identified in this scoping document. The two documents will be separate but coordinated. The EA will comply with Section 102 of NEPA, as amended. The federal Council on Environmental Quality (CEQ) Regulations for Implementation of NEPA

(40 CFR 1500–1508), FEMA NEPA Desk Reference, and FAA Environmental Desk Reference for Airport Actions also will be consulted in preparation of the draft EA. The draft EIS will comply with the SEQRA regulations (6 NYCRR Part 617), and the SEQR Handbook will be consulted for guidance regarding required content and methodology.

In accordance with the aforementioned regulations and FEMA regulations for NEPA compliance (44 CFR Part 10), FEMA is required during decision making to fully evaluate and consider the environmental consequences of major federal actions it funds or undertakes. Likewise, SEQRA requires all state and local government agencies to consider environmental impacts equally with social and economic factors during discretionary decision making; assess the environmental significance of all actions they have discretion to approve, fund, or directly undertake; and balance the environmental impacts with social and economic factors when deciding to approve or undertake an action. The draft EA/EIS documents will assemble relevant and material facts to analyze the potential environmental impacts of the proposed action and reasonable alternatives, including a No-action Alternative.

The NEPA/SEQRA environmental review documents will be clearly and concisely written in plain language that can be easily read and understood by the public. Unless otherwise specified, all measurement units in the draft EA/EIS documents shall be English units (e.g., feet, acres, miles). The draft EA/EIS documents will be written in the third person without use of the terms I, we, or our. Narrative discussions will be accompanied to the greatest extent possible by illustrative tables and graphics. All graphics will clearly identify the project area. The documents shall contain, as appendices, all plans, reports, and studies; and prevailing federal, state, and town regulations and standards with respect to all disciplines of study. Highly technical material will be summarized and, if included in its entirety, it will be referenced in the draft EA/EIS documents and included as an appendix. In addition, all project correspondence from involved and interested agencies will be included in an appendix to the draft EA/EIS documents. Required appendices are provided at the conclusion of this scoping document.

Hard copies of the draft EA/EIS documents will be provided to allow for public review during normal business hours. Digital copies of the draft EA/EIS documents will be posted online for public review, in accordance with 2005 amendments to SEQRA. A public hearing also will be held to receive comments from agencies and the public on the draft EA/EIS documents.

4.3 Environmental Impact Analysis

The customary approach to presenting an impact analysis under NEPA and SEQRA is to start with a baseline of existing conditions in the relevant study areas for each resource topic and then forecast those conditions forward to a time in the future that is appropriate for assessing project impacts.

The draft EA/EIS documents will develop a construction scenario to assist in the analysis of potential short-term impacts. The construction scenario will:

- Identify and describe construction techniques required for installation of sewage conveyance, including equipment requirements. Identify construction techniques associated with the construction of the new AWTF and pump stations.
- Identify the proposed construction schedule and hours of construction.

- Identify the year of highest construction intensity (i.e., "worst-case" construction scenario) for the analysis of construction impacts.
- Calculate and map linear extent of excavation for project activities.
- Identify staging and laydown areas for construction equipment and materials (if available).

The analyses of potential long-term impacts will evaluate conditions with and without the proposed action and alternatives during the foreseeable design life of the proposed action and alternatives. Future year conditions with and without the proposed action and alternatives will be compared as a basis for presenting incremental change and identifying impacts. The reference point of conditions without the project is established by adjusting existing conditions to account for other known developments, policy initiatives, and trends that are expected to influence future conditions in the project area. This future condition without the proposed action and alternatives is then modified by overlaying the development and activity expected from the proposal under review to form a depiction of future conditions with the project in place. This comparison of future conditions with and without the project identifies the project impacts and the need, if any, for mitigation. The proposed action and alternatives will be addressed for each resource/area of concern, as discussed in Section 5.2, *Affected Environment and Potential Impacts*.

The draft EA/EIS will group the analysis of each resource topic into existing conditions, potential impacts, and mitigation for the proposed action and alternatives. Impacts will be classified as not measurable, adverse, and beneficial. The analysis for each resource topic will first identify whether there are adverse impacts. If adverse impacts are present, any avoidance or mitigation measures that should be applied to minimize those adverse effects will be discussed. The significance of the remaining effects will be determined. Where impacts cannot be mitigated, they will be described as unavoidable adverse impacts.

5.0 CONTENTS OF DRAFT EA/EIS DOCUMENTS

The coordinated draft EA/EIS documents will contain:

- A cover page, table of contents, and list of acronyms
- An executive summary
- An introduction and discussion of the purpose and need for the project
- A description of the project location and background
- A discussion of the proposed action and alternatives to the proposed action
- A description of the affected environment and assessment of the environmental impacts of the proposed action, including its short and long-term effects, and typical associated environmental effects; the assessment of short-term environmental impacts will include potential impacts of the project's construction activities, focusing on pedestrian and vehicular access and circulation, air quality, noise and vibration
- An identification of potential indirect and cumulative effects of the proposed action with other relevant projects
- A description of mitigation measures identified to minimize adverse environmental impacts for the proposed action

- An identification of any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented
- A conclusion with a summary table of impacts and identification of any adverse environmental effects that cannot be avoided if the proposed action is implemented
- A discussion of agency coordination, permits required for project implementation, and public involvement
- A list of preparers, references, and appendices

Specific tasks are described below.

5.1 Proposed Action and Alternatives

This section of each document will begin with a discussion of the alternatives screening process. A wide range of alternatives was identified for consideration in the draft EA/EIS and narrowed to a reasonable range of alternative through a screening process, as discussed in Alternative 3 below. All alternatives carried forward for evaluation will be analyzed at an equivalent level of detail to enable a comparative assessment. The draft EA/EIS will assume a project life span of up to 60 years (i.e., up to year 2082, with a start date of 2022). The alternatives analysis will be performed to satisfy NEPA and related laws in the EA, SEQRA and related laws in the EIS, and permitting requirements in both documents. This section will conclude with the reasons for determining the preferred alternative.

5.1.1 Alternative 1: No-action

Under the No-action Alternative, no new sewer district would be established and no additional sewer infrastructure or wastewater treatment facilities would be constructed to provide sanitary sewer service to presently unsewered parcels. The unsewered parcels in the project area would continue to use OSWS.

5.1.2 Alternative 2: Proposed Action Alternative

The Proposed Action Alternative would establish a county sewer district that would decommission the OSWS of 2,094 parcels for Phase I/II and 1,568 parcels for Phase III, connecting the parcels to a new sewer collection system that would flow to a proposed AWTF. These parcels would be primarily residential, with fewer commercial and non-residential parcels, and there would be no intent to sewer undevelopable lots, including presently vacant parcels within the proposed Mastic-Shirley Conservation Area. The total wastewater or sanitary flow from Phase I/II is projected to be approximately 1 million gallons per day (MGD), with a total estimated sanitary flow of 1.4 MGD for Phase I/II and III. The proposed action includes the following components:

- *Collection System.* A combination of gravity sewers and low-pressure sewers would be constructed. Gravity sewers are recommended for areas such as the Montauk Highway corridor and residential areas where the depth to groundwater is generally greater than 10 feet. Low-pressure sewers would be constructed in those areas where U.S. Geological Survey data estimate that the groundwater is less than 10 feet below grade; such areas primarily include residential properties near the Forge River and its tributaries. In addition, low-pressure sewers would serve properties located on the Poospatuck Reservation because of its proximity to the Forge River, anticipated shallow groundwater conditions, and build-out conditions that do not conform to current building code standards. A grinder

pump station would be located on each property served by the low-pressure collection system. These stations would be buried near the existing on-site septic systems or cesspools. Pump stations also would be required to convey sewage out of low-lying areas.

- *Wastewater Treatment.* Sanitary wastewater from the proposed sewer district would be conveyed to a new AWTF. The proposed site would be a 13.7-acre parcel located at Brookhaven Calabro Airport. The AWTF would comprise either a Membrane Bioreactor (MBR) facility to provide the best available technology for nitrogen removal (i.e., effluent discharge would be between 3 and 5 milligrams per liter [mg/L]) or Sequencing Batch Reactor (SBR) facility. The proposed action also includes the request for the release of land for an approximate 17.0-acre parcel adjacent to the eastern end of the proposed AWTF location and within the Brookhaven Calabro Airport property boundary to be reserved for future expansion and/or an additional recharge area. The process for disposing of treated effluent and potential impacts also would be described.

If approved, the sewer project could be completed within approximately six years, with the majority of new facilities operational in 2022. A discussion of long-term ownership and maintenance of the proposed sewer infrastructure also would be included.

5.1.3 Alternative 3: Replacing On-site Wastewater Treatment and Disposal Systems with Innovative/Alternative Systems

FEMA and NEPA cooperating agencies, as well as GOSR and SEQRA cooperating agencies, identified "other action alternatives" during a rigorous alternatives screening process. Screening criteria were established, including: treatment performance, performance during flood events, performance under projected sea level rise and climate change conditions, acquisition of land, and costs. The range of alternatives were screened against these criteria, and the resulting screening process narrowed the wide range of alternatives down to a reasonable range that will be carried through for analysis in the draft EA/EIS. An alternatives screening report will be provided as an appendix to the draft EA/EIS that discusses the identified alternatives, screening process, and results, including which alternatives were screened out and why, and which alternative is maintained for analysis in the draft EA/EIS and why.

This alternative would replace failing cesspools and septic systems with I/A OSWS for the same number of parcels as Alternative 2. In 2014, Suffolk County began a demonstration project for I/A OSWS. Several systems are currently being tested. In fall 2016, SCDHS approved two of the systems, both of which employ extended aeration activated sludge treatment, for provisional use. The County plans to have all pilot systems installed by the end of 2016, and the County anticipates that several more systems could be eligible for provisional use by September 2017. Systems that perform properly under provisional use could then be certified for general use approval as long as there are no significant environmental or public health concerns. The effluent from these systems shall contain no more than 19 mg/L total nitrogen (Suffolk County, 2014) because this is the limit for effluent from residential dwellings in Massachusetts where the system was originally tested and which serves as a reference for efficacy (H2M, 2013). This alternative will be further developed and described in detail in the draft EA/EIS.

5.2 Affected Environment and Potential Impacts

This section will provide a description of the physical setting and information on the existing environment or baseline conditions for those resources/areas of concern that may be affected by

the proposed action or alternatives. For each resource/area of concern that is discussed, the draft EA/EIS will provide the following:

- Description of the general setting and character of the existing proposed action site relevant to the resource/area of concern being discussed.
- Summary of the relevant law(s), executive order(s), or other requirement(s) that may be triggered because of potential impacts to that resource/area of concern.
- Description of the short-term (i.e., construction) and long-term (i.e., facility operation) impacts, both positive and negative, on the resource/area of concern for each alternative.
- Identification of mitigation measures or best management practices (BMPs) that would be implemented to reduce or avoid impacts for each alternative.

5.2.1 Geology, Topography and Soils

This section will document surficial geology, bedrock geology, and the presence of contaminated soil within the project area. Long Island is generally composed of glacial moraine and outwash areas of primarily deposits of rocks, pebbles, till, and sand. Regional, state, and national resources will be used to research the geology of the project area (New York State Geological Survey Regional Bedrock Map and Regional Surficial Geology Map). Current topographic conditions of the project area will be described using existing topographic maps from local, regional, statewide, and/or national resources.

A custom soil resource report for the project area will be obtained from the U.S. Department of Agriculture-Natural Resources Conservation Services, detailing soil types (e.g., percentage of acreage of watershed, composition, properties), soil characteristics (e.g., depth to groundwater, local profiles [if needed]), and soil history (e.g., depositional period, type, class, changes over time).

A limited geotechnical investigation will be performed for the project area during the design process in excavation areas to determine stability and strength of underlying soils and bedrock. The purpose of this investigation is to evaluate the ability of the local geology to support overlying foundations and/or proposed structures such as the AWTF. This investigation will be guided and informed by any existing geotechnical information. In terms of contaminated soil, characterization investigations will be performed in excavation areas to determine whether or not the material is contaminated and must be disposed of, or if it can be beneficially re-used. This investigation will be guided and informed by any existing contamination information. The investigation(s) conducted will be described.

Potential impacts on soil and bedrock as a result of implementation of the proposed action and alternatives will be assessed. Resources to be included in this assessment include those used to evaluate site geological conditions, any results from previously performed geotechnical investigations, and the results of the geotechnical investigation. If potentially significant impacts on site soil and bedrock as a result of project implementation are identified, mitigation activities to minimize or eliminate those potential impacts also will be identified.

5.2.2 Air Quality

Existing regional ambient air quality conditions will be described based on the most recent three years of data available through U.S. Environmental Protection Agency's (EPA) AirData website.

The ambient concentrations of the criteria pollutants will be compared to the National Ambient Air Quality Standards. General background information on local meteorological patterns will be provided using available airport or other available weather stations.

The attainment status of Suffolk County will be described based on the EPA *Greenbook of Nonattainment Areas*. Suffolk County is a nonattainment area for the 1997 and 2008, 8-hour ozone standards, and a maintenance area (former nonattainment area) for fine particulate matter ($PM_{2.5}$ [particulate matter less than 2.5 micrometers in diameter]). Federal actions in nonattainment and maintenance areas are subject to conformity requirements under the Clean Air Act; these requirements will be explained in a section regarding the regulatory framework for air quality.

A mobile source air quality impact analysis for the direct impacts of the proposed action and alternatives is not expected to be necessary because the provision of sewer infrastructure would have negligible long-term effects on the trip generation or traffic patterns. The number of truck and employee trips expected at the new AWTF will be examined. Temporary direct emissions from construction activity will be estimated, including fugitive dust and on-site diesel equipment. Potential effects from increases in mobile source emissions of trucks and worker vehicles at nearby sensitive receptors and congested locations and from potential traffic diversions also will be discussed. Potential long-term indirect effects on air quality resulting from induced growth will be examined, based on the analysis of induced growth discussed in the land use and socioeconomic resources sections. Because one potential site for the location of the AWTF is the Brookhaven Calabro Airport, the FAA *Aviation Emissions and Air Quality Handbook* (Version 3 Update 1) will be consulted for the air quality impact analysis.

The proposed AWTF and pump stations have the potential to generate odors. Operational impacts could predominantly entail odors created by the bacterial breakdown of sewage in wastewater. The magnitude of air impacts depends on several factors, including the length of wastewater transport time, level of treatment, design of the water reclamation facility, and proximity of receptors; conversely, available resources to respond and experience of operations staff could minimize impacts. Odors could occur at all locations where the wastewater system vents to open air. Odor emissions are most likely during warm weather and at points of turbulence within the collection and treatment processes. The odor impact analysis will include a review of the odor control measures incorporated into the design of the proposed AWTF and pump stations (including the enclosure of the plant and pump stations), the distance of the nearest sensitive receptors, and the available literature on the odor impacts of wastewater treatment systems similar to the proposed action. The odor impacts will be assessed in comparison to the New York City Department of Environmental Protection screening threshold of a 1 parts per billion increase in hydrogen sulfide concentration because no similar local odor regulations exist in the project area.

5.2.3 Water Quality

Congress enacted the Federal Water Pollution Control Act in 1948, which was later reorganized and expanded in 1972 and became known as the Clean Water Act (CWA) in 1977. The CWA regulates discharge of pollutants into waters under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and EPA. Section 404 of the CWA establishes USACE permit requirements for discharging dredged or fill materials into waters of the United States and traditional navigable waterways. USACE regulation of activities within navigable waters also is authorized under the 1899 Rivers and Harbors Act. Section 402 of the CWA requires the National Pollution Discharge Elimination System (NPDES) permits for activities that disturb 1 acre of ground or more. Under

NPDES, EPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. EPA has authorized New York State Department of Environmental Conservation (NYSDEC) to administer the NPDES program, referred to in the state as the State Pollution Discharge Elimination System (SPDES). The document *Technical and Operational Guidance (TOG) 1.1.6, Interpretation Guidance for Marine Dissolved Oxygen (DO) Standard* released by NYSDEC in 2008 provides water quality standards for the classifications assigned to various bodies of water, which will be discussed. In addition, a list of regulations pertaining to water quality for the area will be provided.

SPDES permits for wastewater discharges to groundwater in Suffolk County currently limit effluent nitrogen to less than 10 mg/L, and Suffolk County has recognized that reduction of effluent nitrogen to the lowest levels that can be practically achieved by the current limits of technology is appropriate for the project area. Target effluent concentrations will be identified, treatment technologies and processes for the proposed action and alternatives will be explained, and a discussion will be provided of how each alternative would meet the target effluent concentrations.

The Forge River has been identified as an impaired waterbody and is included in the NYSDEC 303(d) list for pathogens, nitrogen, and dissolved oxygen/oxygen demand. The most significant source of nitrogen loading to the Forge River and its tributaries, according to the *Forge River Watershed Management Plan*, is nitrogen loading from the residential areas that were developed prior to the establishment of Suffolk County Sanitary Code Article 6 density limitations. Construction and operation of the Mastic-Shirley Sewer District is intended to protect and improve groundwater quality and surface water quality by treating sanitary wastewater to reduce the concentrations of contaminants, such as nitrate, before they are introduced into the environment. The analysis of water quality in the draft EA/EIS will consider other sources of nitrogen loading beyond failing OSWS, such as agricultural practices.

Currently, nitrogen discharge from OSWS is regulated by lot size through the implementation of the Suffolk County Sanitary Code Article 6, which limits the development density for these zones to prevent excessive nitrogen loads from reaching the groundwater supply—a sole source aquifer that is the only source of potable water for the roughly 1.5 million residents. To supplement the goal of the density requirements of Article 6, sanitary wastewater must be collected and treated prior to being discharged into waterbodies. However, much of the project area was developed prior to implementation of Article 6, and existing development patterns exceed the density established for Groundwater Management Zone VI. Impacts of the proposed action and its consistency with the Suffolk County *Comprehensive Water Resources Management Plan* will be assessed.

Drinking water in this area is provided by underlying groundwater aquifers, which are the sole source of potable water for Nassau and Suffolk counties. The entire project area is within the Nassau-Suffolk Sole Source Aquifer System, designated by EPA as a sole source aquifer on June 21, 1978 (43 CFR Part 26611). Accordingly, EPA will review this project in accordance with Section 1424(e) of the Safe Drinking Water Act. A sole source aquifer screening checklist and supporting documentation will be completed for the proposed action and provided as an appendix. Based on the preliminary information provided, it is anticipated that this project would not create a significant hazard to public health or groundwater resources, and therefore would satisfy the requirements of Section 1424(e) of the Safe Drinking Water Act.

Community groundwater wells and registered private wells in the area will be identified, and a groundwater model will be used to determine if the wells would be influenced by the effluent from

the leaching fields. Based on the modeling results, if the wells are affected by the leaching field, the potential impacts of each alternative on drinking water supply will be assessed. Estimated nitrogen concentrations in shallow groundwater in the study area under existing conditions with wastewater disposal conducted via on-site septic systems will be documented for the project area using the groundwater quality modeling results provided in the *Draft Feasibility Study Map & Plan for Mastic/Shirley* (CDM Smith, 2014).

The nature of groundwater in the Forge River area, including hydraulics, aquifer characteristics, and elevation, will be identified using national, regional, and local resources. Because groundwater is a dynamic resource, the area studied will include any streams, creeks, or other waterbodies hydraulically connected to the aquifers. The legal framework and programs established by Suffolk County to protect the aquifer system from contaminants will be discussed. Potential impacts of the proposed action and alternatives on groundwater recharge and elevations will be quantified and discussed. The depth of excavation and corresponding relationship to the water table will be established. If any excavation depths are below the water table, dewatering and water management will be described. Potential operational issues (e.g., piping breaks or leakage) also will be included. Water conservation measures or other sustainability considerations will be described. A discussion of BMPs will be provided with regard to mitigating impacts on groundwater during construction within the water table and during repairs. The reduction in nitrogen loading to the surface water will also be assessed and water quality benefits of nitrogen removal will be explained in detail.

5.2.4 Wetlands and Coastal Resources

Wetlands within New York are identified and mapped by NYSDEC as state regulated wetlands, and by the U.S. Fish and Wildlife Service (USFWS) as part of the National Wetland Inventory (see **Figure 3**). While useful, these tools do not replace the need for field evaluations and on-site inspection to delineate the actual limits of regulated wetlands during baseline surveys. A field delineation of wetlands in accordance with the USACE 1987 Wetland Delineation Method, the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), and the New York State Freshwater Wetlands 1995 Delineation Manual will be conducted to establish wetland regulatory limits within the project area. Confirmation of wetland and regulatory limits will require coordination with USACE and NYSDEC. The NYSDEC Environmental Resource Mapper identifies state-regulated freshwater and tidal wetlands within the vicinity of the project area. These maps only show the approximate location of the actual wetland boundary. One USFWS National Wetland Inventory wetland is mapped in the northeast portion of the project area, in association with Mill Pond. Small portions of state regulated wetlands associated with the Forge River and Poospatuck Creek are mapped within the project area, and the areas surrounding those wetlands and Mill Pond are within Wetland Checkzones, or areas around a mapped wetland in which the actual wetland may occur. Additional freshwater and/or tidal wetlands associated with the Mill Pond, Poospatuck Creek, and the Forge River may be present within the project area. Surface waters along the eastern boundary of the project area consist of the Forge River and its tributary, Mill Pond, and the southern boundary is Poospatuck Creek. No designated wild or scenic river corridors are located within the project area. Adverse impacts on wetlands and surface waters are not expected; however, any potential for adverse impacts on wetlands and surface waters as a result of the project will be evaluated. If

potential impacts are identified, mitigation measures to avoid, minimize, and compensate for impacts will be developed.

The Coastal Zone Management Act is administered by states with shorelines in coastal zones to have a Coastal Zone Management Plan to manage coastal development. Because the project area is partially located within a designated coastal zone (see **Figure 4**), the proposed action and alternatives will be evaluated to ensure they are consistent with the substantive policies of the New York State Department of State (NYSDOS) and NYSDEC. A NYSDOS Federal Consistency Assessment Form will be prepared for the proposed action and provided as an appendix.

Consistency with the policies of the New York State coastal zone management program will be qualitatively assessed for the proposed action and each alternative. The project area is located partially within the "Coastal Zone Area South," a critical environmental area designated by the Town of Brookhaven. A discussion of existing coastal resources and the relationship of nitrogen pollution to long-term coastal wetland impacts will be provided, based on a review of available literature. Potential impacts on coastal resources from the proposed action and alternatives will be assessed qualitatively in terms of nitrogen and pathogen pollution, resulting effects on aquatic vegetation and wetlands in the Great South Bay, and the related ability of wetlands to protect the project area from storm surges and floods. Potential impacts on the use of coastal resources for recreational and commercial activities also will be discussed.

The project area is not located within a unit of the coastal barrier resource system; therefore, an assessment of impacts on coastal barrier resources will not be included in the draft EA/EIS.

5.2.1 Floodplains

According to available mapping of FEMA special flood hazard areas, parts of the project area are located in the 100- and 500-year floodplain (see **Figure 5**). Watersheds, and waterbodies where the proposed action and alternatives will drain will be identified. Existing runoff patterns, streams and drainage patterns in the project area will be described.

Potential impacts of the project on stormwater runoff during operation will be quantified and discussed. The increase in impervious surfaces resulting from the AWTF and pump stations will be quantified. The stormwater management system, drainage facilities, and detention areas also will be described. This analysis will discuss measures to ensure that stormwater from construction activities and under post-development conditions does not adversely affect downstream properties as required by, and according to, the NYSDEC 2010 Stormwater Management Design Manual. An eight-step floodplain review (i.e., Floodplain Management Plan) will be prepared in accordance with Executive Order 11988 and provided as an appendix. The design engineer will conduct an engineering analysis to determine if the project will increase flood heights, and prepare a No-rise Certification supported by technical data for review and approval by the local Floodplain Manager.

The Town of Brookhaven Town Code Chapter 33, Flood Damage Prevention, regulates construction and other development within special flood hazard areas of the Town of Brookhaven to protect human health and safety; minimize damage and loss of public and private property, infrastructure, and businesses; and reduce the necessity for flood-related rescue and relief efforts.

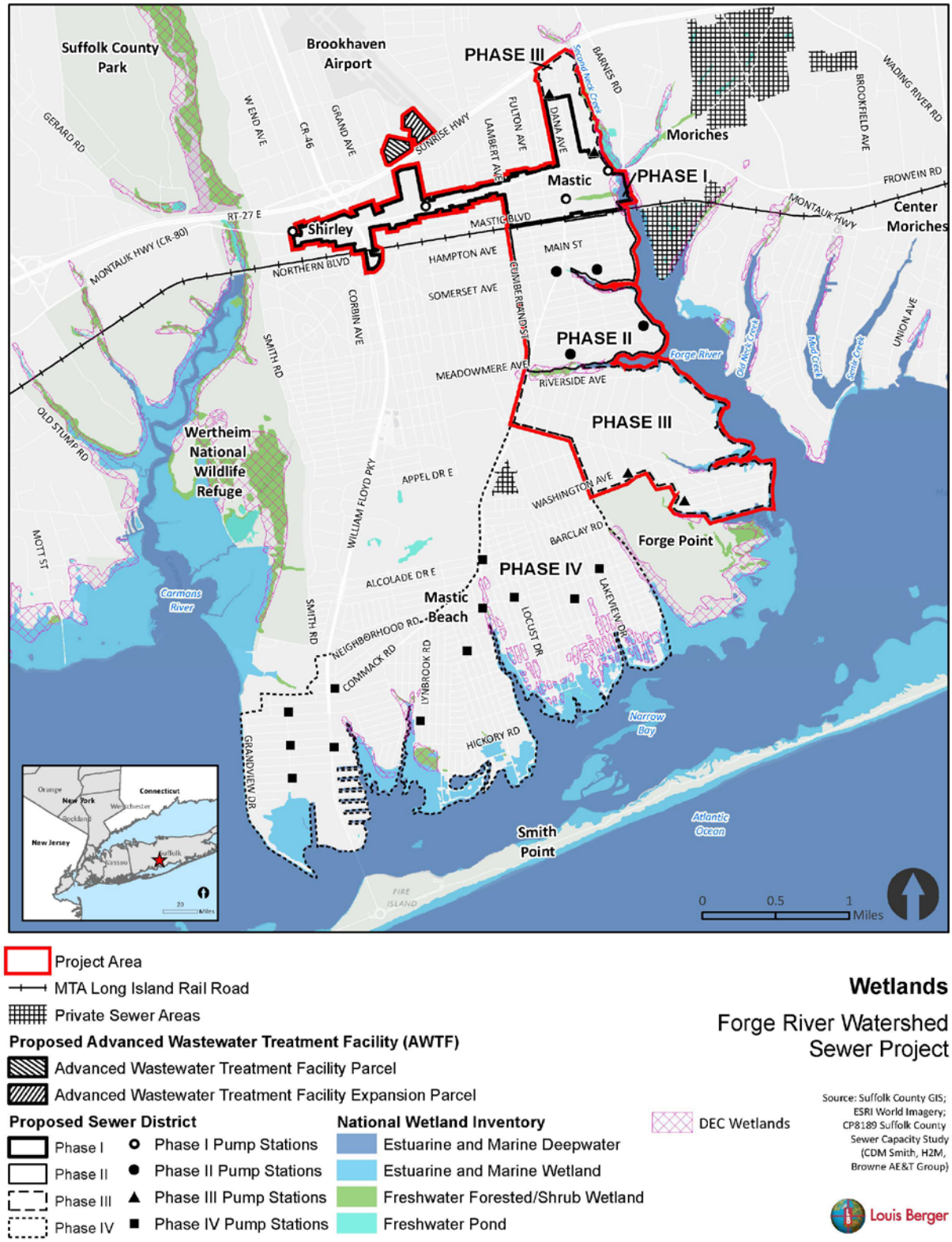


Figure 3. Wetlands

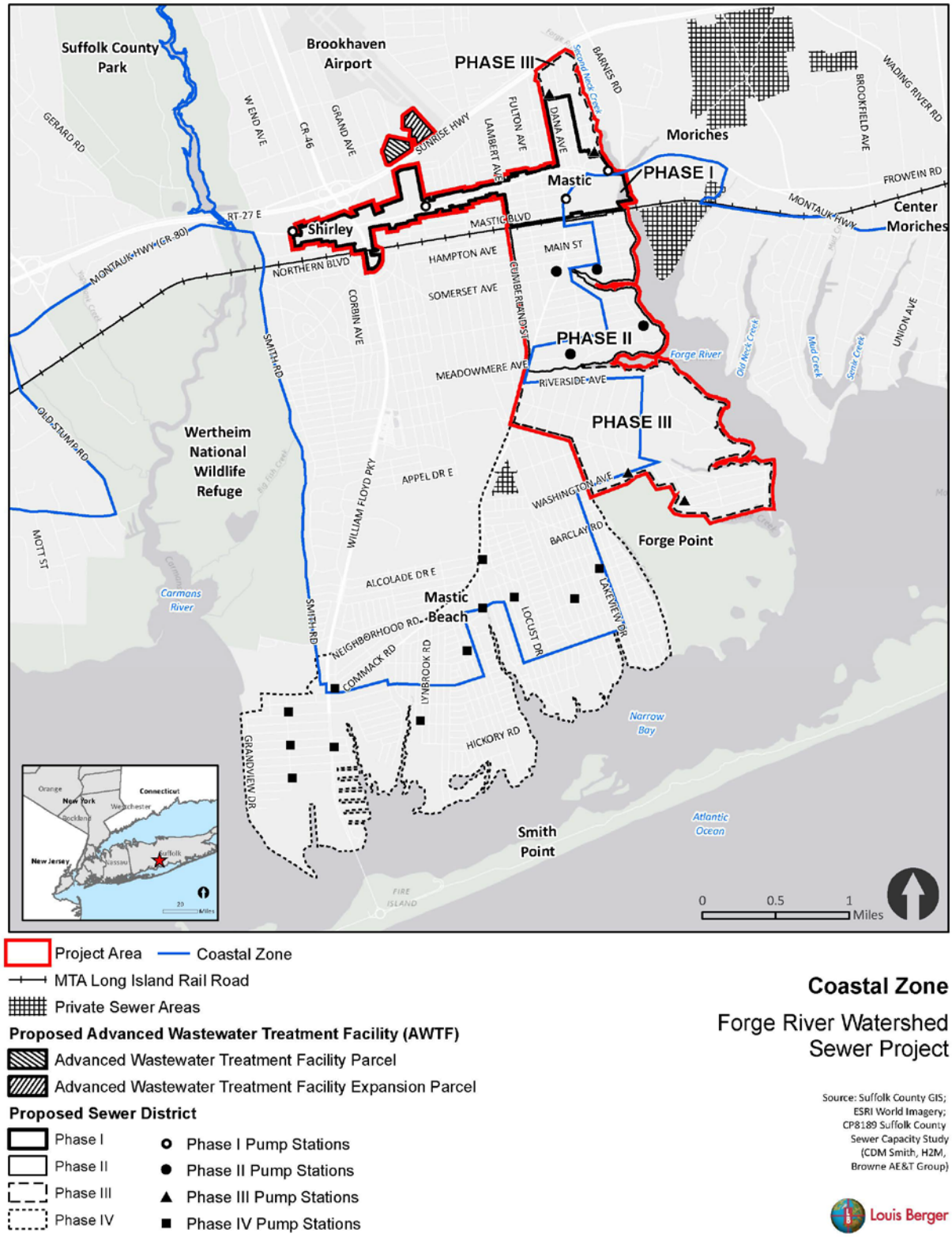


Figure 4. Coastal Zone Boundary

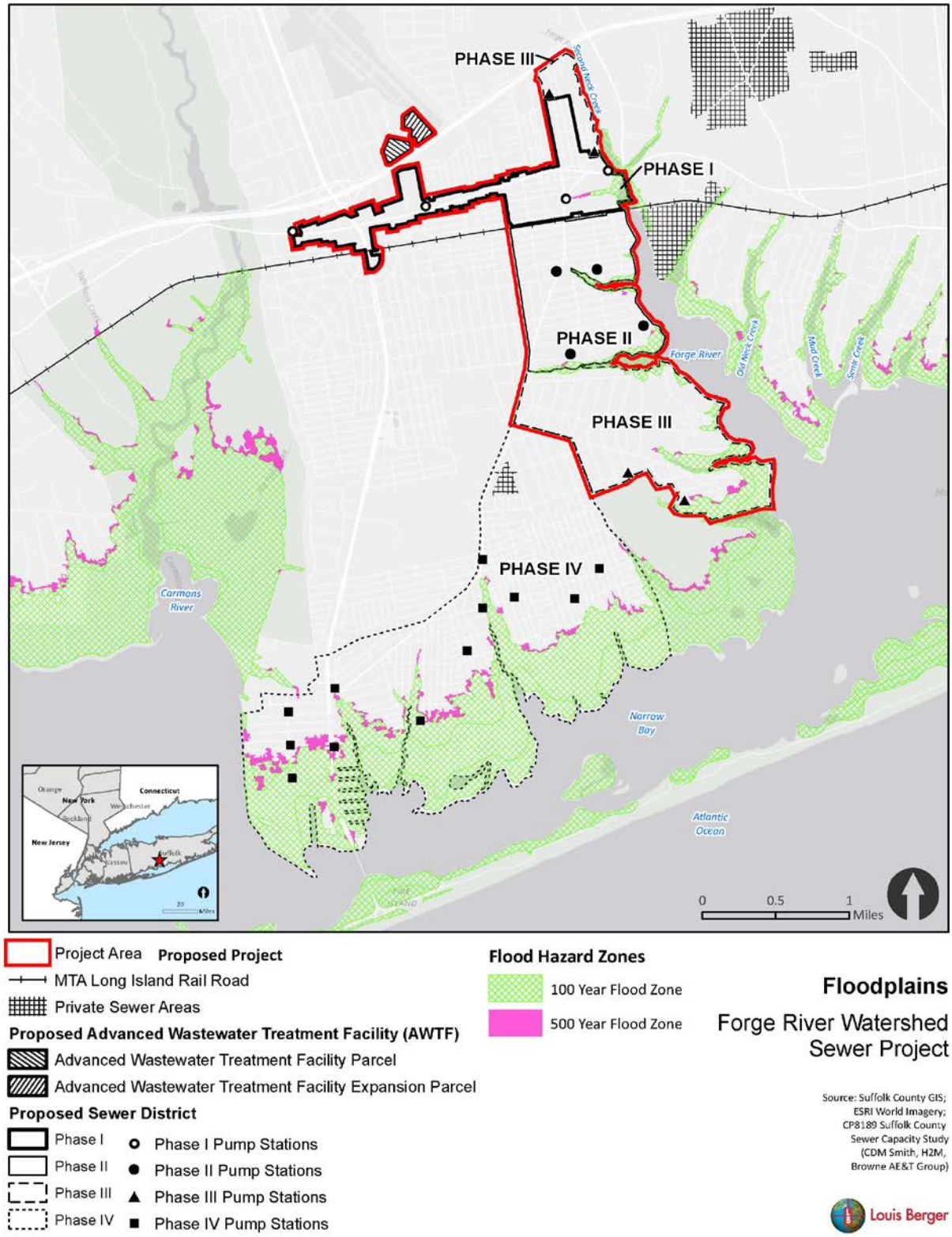


Figure 5. Floodplains

The use of green infrastructure may be necessary to offset any additional impermeable surfaces added as a result of the project. Should green infrastructure be employed, this section of the draft EA/EIS will evaluate potential impacts from proposed green infrastructure BMPs. Green infrastructure measures are not presently proposed as stormwater management practices for this project, but may be recommended as potential mitigation measures for potential groundwater impacts of sewer expansion. Increased use of green infrastructure design methods (e.g., bioswales, rain gardens, permeable pavements/pavers, wetland buffers or street tree trenches) would increase the amount of water being returned to the ground instead of having the runoff flow to drains or open waters.

5.2.1 Vegetation

A desktop review of available resource mapping, previous reports, and species inventories will be conducted to identify vegetation resources within the project area. Executive Order 13112, Invasive Species, requires federal agencies, to the extent practicable, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The presence of invasive plant species within the project area will be assessed, as well as the potential for opportunistic non-native invasive plant species to spread or become established following ground disturbances associated with construction. An on-site inspection will be conducted to confirm presence and approximate extent of plant species and ecological communities in the project area.

Vegetation within the Forge River and its tributaries would benefit from water quality improvements and positive changes to the benthic environment that may result from project implementation. Water quality improvements may lead to an increase in the distribution of seagrass beds and vegetated saltmarshes along the river. Potential adverse impacts may include disturbance to vegetation during construction, a decrease in size or type of the local plant community, and colonization of invasive plant species in disturbed areas following construction. Potential adverse impacts on plant communities attributable to the proposed action will be assessed. Efforts to reduce or minimize potential impacts on plant communities will be documented. If significant impacts remain, efforts to mitigate those impacts will be discussed.

5.2.2 Wildlife and Fish

Wildlife and fish, including benthic invertebrates and waterfowl that use the Forge River and its tributaries generally would be expected to benefit from water quality improvements and positive changes to the benthic environment that may result from project implementation. Potential adverse impacts may include disturbance to fish and wildlife during construction, a decrease in population size of local wildlife species, or a change in the type or amount of suitable habitat available to wildlife that currently use the project area. An on-site inspection will be conducted to confirm presence of and characterize species and suitable habitat in the project area. Potential impacts from the proposed action and alternatives on wildlife habitats will be assessed. Efforts to reduce or minimize potential impacts on wildlife will be documented. If significant impacts remain, efforts to mitigate those impacts will be discussed.

Because the Brookhaven Calabro Airport is the location under consideration for the proposed AWTF, conformity with stipulations established by the FAA Advisory Circular for *Hazardous Wildlife Attractants on or Near Airports* (FAA Advisory Circular No. 150/5200-33B dated August 28, 2007) is required. Land uses that may attract wildlife and therefore pose a concern for aviation safety include wastewater treatment facilities. The impact analysis will include a review of the

measures incorporated into the design of the proposed AWTF (including the enclosure of the plant and) that would reduce wildlife attraction. This section will assess the potential for the proposed action and alternatives to attract wildlife hazards and provide recommendations for reducing wildlife hazards to human health and safety.

5.2.3 Threatened and Endangered Species and Critical Habitat

Available resource mapping was accessed to make a preliminary determination as to whether threatened or endangered plant or animal species or critical habitat might be found within the project area. According to the NYSDEC Environmental Resource Mapper, no rare plants, animals, or significant natural communities exist in the project area. A review of USFWS list of federally endangered and threatened species indicates that the following species of plants and wildlife have been documented in Suffolk County: sandplain gerardia (*Agalinis acuta* – endangered); seabeach amaranth (*Amaranthus pumilus* – threatened); green turtle (*Chelonia mydas* – threatened); Hawksbill turtle (*Eretmochelys imbricate* – endangered); leatherback turtle (*Dermochelys coriacea* – endangered); piping plover (*Charadrius melodus* – threatened); roseate tern (*Sterna dougallii dougallii* – endangered); red knot (*Calidrus canatus rufa* – threatened); and northern long-eared bat (*Myotis septentrionalis* – threatened). Based on these species' habitat requirements, it is expected that only the northern long-eared bat may occur within the project area.

The NYSDEC Natural Heritage Program (NHP) and USFWS will be consulted for more specific information regarding the potential for threatened and endangered plant and wildlife species to occur within the project area and the potential presence of suitable habitat to support these species. The USFWS, Long Island Ecological Services Office, will be contacted through the Information, Planning, and Conservation System (IPaC) regarding the potential presence of wildlife species under the jurisdiction of USFWS within the vicinity of the project area, and an official species list will be requested. The NYSDEC NHP will be contacted requesting information regarding records of any federal and/or state special status species or habitats of special concern documented within the vicinity of the project area. Agency responses will be reviewed, and the potential that each species may occur within the project area will be assessed based on a review of species' life history and habitat preferences. Based on this review and agency consultation, biological field surveys may be needed to verify the presence of threatened and endangered species or their habitat. Species specific surveys, if necessary, would be conducted based on seasonal requirements and may be delayed until late summer for some species. Potential adverse impacts may include disturbance of endangered, threatened, or rare plant species or the diminishment of their habitat. The draft EA/EIS will assess the potential for impacts on the northern long-eared bat (*M. septentrionalis*) as well as other special status species if deemed necessary.

5.2.4 Cultural Resources

The Forge River project area is generally characterized by post-World War II housing with some modern commercial buildings along the Montauk Highway. A preliminary review of the New York Office of Parks, Recreation and Historic Preservation (OPRHP) Cultural Resource Information System (CRIS) database was conducted to ascertain the extent to which architectural resources in the project area had been identified and evaluated with respect to National Register of Historic Places (National Register) criteria and the presence of archaeological sites within or adjacent to the project area. No previously surveyed properties are located in the project area, according to the information collected from the database. Several areas of archaeological sensitivity are located on the north side of the Montauk Highway as well as the west and east ends

of the project area. A cultural resource reconnaissance survey was conducted along New York State Route 27 north of the project area (Survey No. 10SR60344).

A Phase IA Cultural Resources Survey will be conducted for the project area. The area of potential effect (APE) will likely include the public rights-of-way where sewer mains are proposed to be constructed, as well as residential and commercial parcels where lateral sewer connections and on-site grinder stations are proposed. FEMA/GOSR will consult with OPRHP in delineating the APE for the proposed action. While installation of the sewer system likely would not have a direct effect on architectural resources in the area with the exception of installation of grinder pump stations, its construction may affect significant landscaping and site features that would contribute to any potential historic districts.

Upon completion of the survey and review and concurrence of the results by OPRHP, an assessment of effect will be completed to ascertain what effects, if any, the proposed action and alternatives will have on historic resources. Of particular concern would be direct effects of construction on archaeological resources.

5.2.5 Land Use and Planning

This section will evaluate and provide a description of existing land use and development patterns within the project area. The Montauk Highway corridor portion of the project area is occupied by a mix of uses, including commercial and retail storefronts, offices, and restaurants. The remainder of the project area is predominantly residential (see **Figure 6**). A land use analysis will characterize the use and development trends within the project area that may be affected by the proposed action and its alternatives and to determine if they are compatible or would be affected by the proposed action and its alternatives. The analysis will also consider existing uses and zoning designations in the study area, the policies and regulations mentioned above that affect the area, and any changes anticipated to occur by the time the proposed action or its alternatives would be constructed.

A discussion of future plans for development of the AWTF and pump station sites will be included. The proposed action's compliance with applicable town, county, and state planning documents and policies will be evaluated. Existing plans that will be reviewed to determine land use effects include, but are not limited to:

- *Town of Brookhaven, Comprehensive Land Use Plan (1996)*
- *Town of Brookhaven, Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley: Phases I and II (2004, 2009)*
- *Generic Environmental Impact Statement for the Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II as a supplement to the Generic Environmental Impact Statement for the Montauk Highway Corridor and Land Use Plan for Mastic and Shirley, NY (2010)*
- *Cleaner Greener Long Island Regional Sustainability Plan* (2013)
- *Suffolk County Comprehensive Water Resources Management Plan* (2015)
- *Mastic Beach and Smith Point of Shirley – New York Rising Community Reconstruction Plan* (2014)

The proposed provision of wastewater services would facilitate the implementation of the Town's 2004 vision of the neighborhood town centers along the Montauk Highway corridor. The No-

action Alternative will include increased development according to the Montauk Highway Corridor Study and Land Use Plan and as permitted by zoning. The analyses in the draft EA/EIS will assess the potential for induced growth and indirect effects on land use because the proposed sewer mains would pass vacant parcels and could potentially sewer vacant, in-fill parcels in developed areas.

Known projects or planned developments and initiatives located within the project area that are scheduled, funded, approved via permits, or otherwise committed will be reviewed for inclusion in the future No-action Alternative analysis and for consideration in the cumulative effects assessment. The agencies and organizations that will be contacted to obtain this information may include: the Town of Brookhaven Division of Planning, Suffolk County Department of Planning, Suffolk County Department of Public Works, and New York State Department of Transportation (NYSDOT).

The establishment of sanitary sewer service increases the development potential of an area and provides opportunities for more compact development. Residential cesspools, which are currently used by 74 percent of Suffolk County residents, prohibit density and multifamily development and often create problems for restaurants and other establishments with relatively large quantities of wastewater. The proposed sewer establishment project would provide the foundation for compact, mixed use development. The potential for project-related induced growth will be assessed through a geographic information systems (GIS) analysis, in consultation with local planners in the Town of Brookhaven, Village of Mastic Beach, and Suffolk County. It will begin with a GIS analysis that will assess the potential for development and redevelopment on both non-vacant and vacant parcels, as well as potential constraints to development, such as zoning and wetland hydrology. Consultation with local planners will refine the findings of this GIS analysis for inclusion in the draft EA/EIS. Indirect effects on population, employment, housing units, property values, and net fiscal flow will be discussed qualitatively based on existing zoning.

5.2.1 Socioeconomics

This section will provide an overview of the socioeconomic conditions of Suffolk County, the Town of Brookhaven, the Village of Mastic Beach, and the immediate affected area consisting of the parcels that will be newly connected to the sewer system.

The socioeconomic profile will be based on different data sources including the U.S. Bureau of Census (i.e., 2010 Census, 2008–2012 American Community Survey and the Longitudinal Employer-Household Dynamics Program), the U.S. Bureau of Labor Statistics, New York Office of the State Comptroller, and private data sources such as ESRI Community Analyst. Beyond available data sources, the Suffolk County Planning Department, Long Island Regional Economic Development Council, New York Metropolitan Transportation Council, Long Island Index, and other relevant state and local governmental bodies and research groups will be contacted to acquire other sources of existing research and data for the socioeconomic analysis. The socioeconomic profile will include but will not be limited to: population size, population growth, racial composition, age structure, educational attainment, employment status, journey to work, number of households, average household size, household income, housing tenure and occupancy, housing units by type, housing value, monthly rent, housing affordability, number of businesses, number of employees, and local government expenditures and revenues.

Figure 6. Land Use

Impacts of the proposed action and alternatives on the study areas (Suffolk County, Brookhaven, Mastic Beach, and immediate surrounding area) in terms of population and employment levels, property values, and fiscal revenues and expenditures will be assessed. The impact assessment will include short-term effects, which will occur during the construction period as well as permanent effects, which will occur once the project is completed. The short-term effects analyzed will include the creation of construction jobs and other potential construction impacts, such as the disruption of local businesses near the construction site. The direct permanent socioeconomic effects of the proposed action and alternatives are expected to be minimal; however, the proposed action and alternatives may have substantial indirect effects on the local study areas. The following conditions will be assessed:

- *Population:* Available population projections for the county and other study areas will be provided. Potential impacts on population growth will be assessed.
- *Employment:* Available employment projections for the county will be provided. The assessment will quantify the short-term job creation impact for the proposed action and each alternative using an economic input/output modeling system. Using the input/output modeling system, jobs in the construction industry and related industries and jobs at other local businesses that are triggered by construction vendor purchases and construction worker household spending (i.e., multiplier effects) will be estimated. The assessment also will include an estimate of the number of permanent jobs that will be created to maintain the sewer extension.
- *Property Values:* A literature review will be conducted to determine if the proposed action or alternatives are expected to affect property values, and a qualitative assessment will be presented.
- *Fiscal Flows:* The section will assess how the proposed action and alternatives will affect local government expenditures and revenues using available information on the costs of constructing, operating, and maintaining the sewer infrastructure and the potential revenues that would be generated (e.g., user fees) by the extension. If the assessment reflects local government expenditures exceeding local government revenues, the housing affordability and displacement effect of increased local property tax on the local community will also be assessed.

The proposed sewer establishment project would provide the foundation for economic growth related to increased development. Potential growth-inducing or indirect socioeconomic impacts include changes in population and employment levels, types of housing, types of businesses, property values, net fiscal flow (i.e., revenue minus expenditures), as well as residential and business displacement. Indirect effects on population, employment, housing units, property values, and net fiscal flow will be discussed using the results of the induced growth analysis, as discussed in Section 5.2.10, *Land Use and Planning*.

5.2.2 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of federal laws, regulations, policies, programs, and projects. Executive Order 12898, Environmental Justice, seeks to avoid environmental discrimination, so that, to the greatest extent

practicable and permitted by law, all populations are provided an opportunity to comment before decisions are rendered on proposed federal actions.

The environmental justice assessment in this section will present census data and use the EPA Environmental Justice Assessment Tool to identify environmental justice communities within the project area. Using data from the 2010 Census and the 2009–2013 American Community Survey at the census tract or block group level, the racial and income characteristics of the project area will be developed. The environmental justice population will be determined by comparing the census tract or block-group level race and income characteristics to those of a larger reference region. All census tracts or block groups that have proportionally more minorities or low-income persons are identified as environmental justice communities. The environmental justice analysis will consider the adverse effects and potential benefits of the proposed action and alternatives on the identified environmental justice communities.

Both temporary construction impacts and long-term operational impacts will be considered. If adverse effects are identified, the analysis will consider whether the effects on environmental justice populations would be disproportionately high or would be borne predominantly by the environmental justice population. The assessment also will consider the benefits to the environmental justice population, including access to the sewer system, avoidance of septic system costs, construction and sewer maintenance jobs, and any indirect effects, which may include improved access to jobs and affordable housing and property value increases. Mitigation, enhancement, and avoidance strategies as well as project benefits will be considered.

5.2.3 Community Facilities and Services

This section will evaluate the need for community services likely to result from the proposed action and alternatives; however, the project is not anticipated to impact the level of public safety services required by these providers because parcels to be connected to the new sewer system are already developed.

For the purposes of this assessment, community facilities and services include public or publicly funded schools, libraries, child care centers, health care facilities, fire and police protection, open space, and recreational facilities. A description of existing community facilities and services in the project area will be provided.

Because demand for community services generally results from the introduction of new residents, the community facilities assessment will use residential population projections from the socioeconomic resources assessment to determine the types of community facilities that may be affected by the proposed action and alternatives, and the need for any specific, detailed impact analyses.

In the long term, the potential project-induced increase in project area population may increase demand for existing services and facilities, with potential to result in indirect effects on service delivery. Thus the impact assessment will address the potential incremental increase in demand for public services likely to result from induced growth, based on the analysis in socioeconomic resources.

5.2.4 Noise

This section of the draft EA/EIS will identify and map noise-sensitive receptors (including residential areas, places of worship, schools, libraries, and parks) in the vicinity of any noise-

producing elements of the project. Existing condition noise levels will be monitored at sensitive noise receptors at two representative locations, where the project's operational noise would be most prevalent: one near the proposed AWTF at the ball fields at Ziegler Park, and another near a proposed pump station in a residential neighborhood, at the intersection on Jay Street near Willis Avenue. Noise monitoring will (1) use a sound level meter that meets or exceeds the requirements set forth in the American National Standards Institute (ANSI) S1.4-1983 Standards for Type 1 and 2 quality and accuracy, and (2) consist of 20-minute measurements conducted at peak morning and peak afternoon traffic hours. Traffic counts will identify the number of passenger cars, light trucks, heavy trucks, and buses on the adjacent roadway during construction and operation of the proposed action and alternatives.

Post construction, the flow in any installed sewer lines would be inaudible. Grinders are not expected to increase noise levels because the units would be buried. There may be a small amount of noise associated with the operation of pump stations; however, the proposed design would enclose all pump stations within buildings, with sound attenuating enclosures surrounding emergency generators. Increased noise levels near the proposed AWTF may occur; however, the proposed design would enclose all facilities at the AWTF.

Noise levels projected to occur during construction will be estimated using the Federal Highway Administration's roadway construction noise model. Manufacturer's specifications and other information regarding noise levels from wastewater treatment facilities and pump stations will be obtained, and using these data, noise levels at sensitive receptors near the proposed AWTF during operation will be projected and compared with existing noise levels to determine any impacts. Noise generated by the pump stations will be compared to estimated ambient noise levels, depending on the location of each station.

The draft EA/EIS will use noise impact criteria found in NYSDEC's *Assessing and Mitigating Noise Impacts* (2001). If impacts are identified, mitigation measures will be provided. Because a potential site under consideration for the location of the proposed AWTF is Brookhaven Calabro Airport, FAA airport noise regulations, guidance, and policies will be consulted. Potential long-term, indirect effects on noise resulting from induced growth will be discussed, based on the hypothetical scenarios for induced growth discussed in the section on socioeconomic resources.

5.2.5 Transportation

This section of the draft EA/EIS will evaluate potential impacts on traffic during construction and operation of the proposed action and alternatives. Traffic impacts during construction and operation are not anticipated to impede access for emergency response vehicles. Potential impacts during operation of the alternatives are not anticipated because there would be few employees at the AWTF and minimal truck trips associated with AWTF operations. Such operational impacts will be described qualitatively.

A transportation study area will be defined to evaluate the transportation network and the specific time periods and locations that could be affected by construction activity and detour routing. Traffic data will be obtained by conducting vehicle turning movement counts at up to 5 intersections during the weekday AM and PM peak periods, automatic traffic recorder (ATR) counts at up to 3 locations, and intersection inventories and signal operations at up to 5 intersections. The construction condition will be analyzed for traffic operations that reflect any detour routing; construction vehicles arriving to and departing from the construction area; and conceptual-level plan for control, maintenance, and protection of traffic. The construction traffic

analysis will be conducted at up to five intersections during the weekday AM and PM peak periods for the existing condition, and for conditions under the No-action Alternative, and construction of the Proposed Action. Construction traffic analysis results will include levels of service, volume/capacity (V/C) ratios, and stopped delay values for intersection analyses are computed in accordance with the standard procedure prescribed in the Transportation Research Board's 2010 Highway Capacity Manual. Mitigation measures will be applied where significant impacts are identified as part of the analyses.

Lastly, given that one potential site under consideration for the location of the AWTF is the Brookhaven Calabro Airport, the transportation chapter will consider short- and long-term impacts related to air navigation in the vicinity of the airport, such as possible constraints to air navigation as a result of cranes or other construction equipment.

5.2.6 Public Services and Utilities

Wastewater

Potential impacts on wastewater will be addressed in the water quality section. This section will describe the existing OSWS and potential impacts on wastewater treatment from the proposed action and alternatives.

Water Supply

Potential impacts on water supply also will be addressed in the water quality section. This section will describe the existing water supply wells and potential impacts on the water quality and quantity of the potable supply from the proposed action and alternatives.

Energy

This section will describe the electrical and natural gas energy capacity of existing supply network in the project area and identify elements of the proposed action and alternatives that will require energy to operate, including pump stations, grinders, and the new AWTF. An estimate of the energy required to operate these project elements will be provided. Energy conservation measures, renewable energy, or other sustainability considerations related to energy efficiency will be described. The existing capacity will be compared to the project's energy requirements to determine if capacity exists to supply the additional demands.

5.2.7 Public Health and Safety

This section will discuss the public health concerns related to nitrogen and pathogen pollution associated with failure of OSWS and qualitatively assess the impacts of the proposed action and alternatives on these public health hazards. It will specifically assess the potential for the proposed action and alternatives to have a disproportionate effect on children's environmental health or safety in accordance with Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. Because the proposed action and alternatives seek to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures in the Forge River Watershed, it is expected that the project would result in beneficial impacts on public health and safety.

5.2.8 Climate Change

As recommended by federal CEQ guidance for considering climate change in environmental review, the draft EA/EIS will consider the following when addressing climate change: (1) the potential effects of a proposed action on climate change as indicated by its greenhouse gas emissions; and (2) the implications of climate change on a proposed action.

Gravity and low-pressure sewer mains would not result in long-term greenhouse gas emissions. The only stationary air emission source associated with the proposed action and alternatives is the new AWTF. Wastewater treatment processes can produce greenhouse gas emissions in the form of methane and nitrous oxide. For the proposed action, methane and nitrous oxide emissions from the AWTF will be estimated using the general equations for centrally treated aerobic systems from EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2012. The EPA methodology is not specific to the proposed MBR or SBR technologies, but provides a conservative order of magnitude emissions estimate. The analysis will distinguish between open aerobic systems in the EPA methodology because the proposed design would enclose all AWTF facilities. For the No-action alternative, the EPA equations for septic system emissions will be used to assess the incremental impact of areas currently using septic systems switching to the new central treatment plant. Emissions associated with the ultimate disposal of sludge will be discussed.

Greenhouse emissions associated with electricity consumption by the AWTF will be quantified consistent with the methodology recommended by NYSDEC in the document *Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements*. The methodology is based on the annual electricity consumption of the facility and the average carbon dioxide-equivalent emissions factor for the applicable utility provider.

A review of relevant climate projections will be provided from scientific sources, including the Intergovernmental Panel on Climate Change, National Climate Assessment (NCA), NYSDEC, and NOAA. Projections for sea level rise vary. The NCA projects a rise in sea level rise of 1 to 4 feet by 2100 (NCA, 2014). Sea level rise inundates low-lying properties more frequently and raises the groundwater table in coastal areas permanently. In addition, more extreme storm events may occur as a result of climate change, resulting in more frequent and intense coastal surges and precipitation events (NCA, 2014).

The anticipated effects of climate change on the region will be discussed, such as sea level rise (see **Figure 7**), rising groundwater elevations, or increased precipitation. The potential for these effects to impact the facilities proposed under the proposed action and alternatives will be assessed. This section will evaluate the ability of the proposed action and alternatives to maintain full performance under projected future climate change through 2080, as the draft EA/EIS will assume a design life of up to 50 years (i.e., up to year 2072 with a start date of 2022), and 2080 climate change projections provide a conservative approximation of changes by 2072 (40 CFR 35(E), Appendix A(6)(g)). Alternatives that perform best would be those that are able to remain fully functional as groundwater levels rise both permanently and during and after a storm event in a future increasingly affected by climate change and sea level rise.

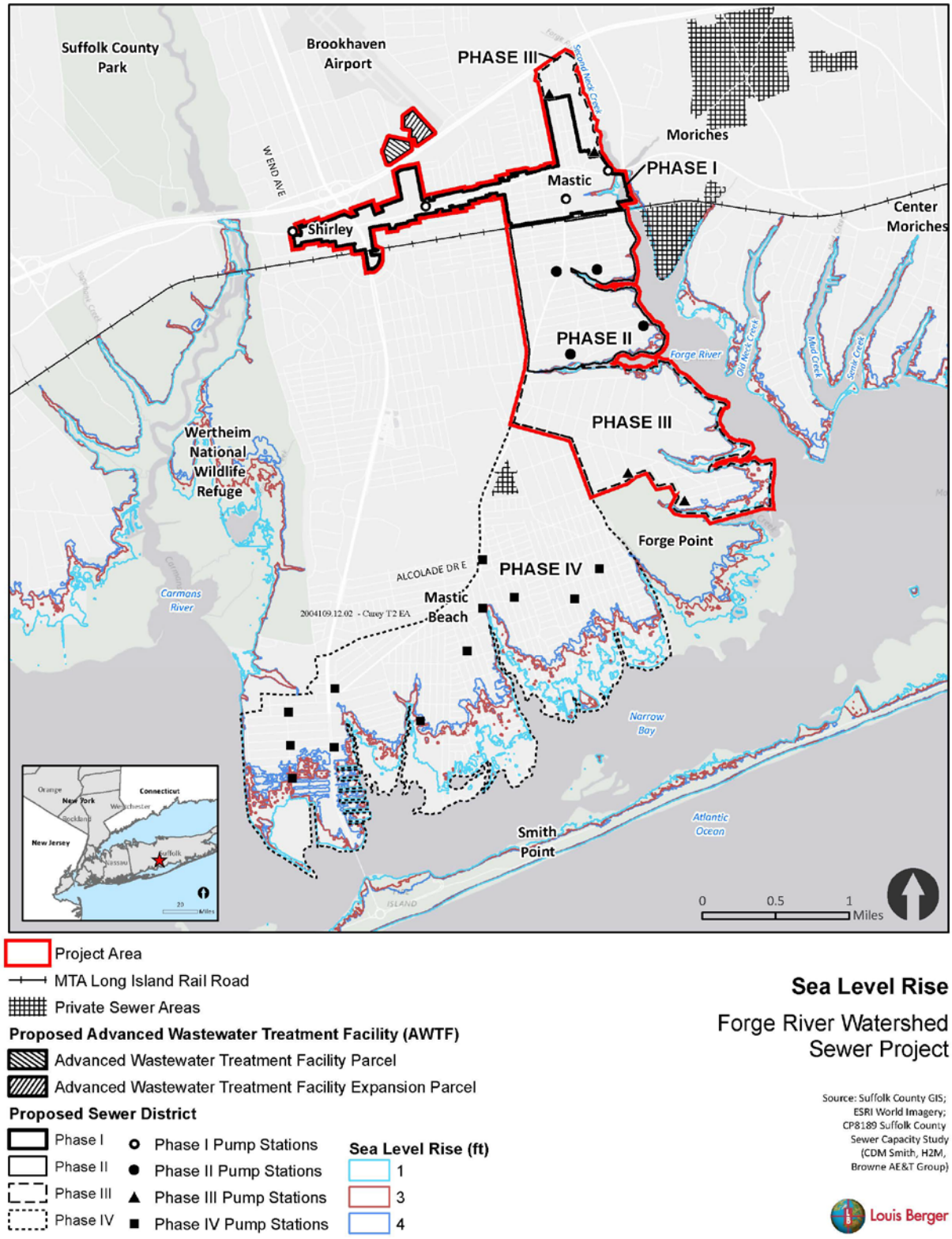


Figure 7. Projected Sea Level Rise

5.3 Cumulative Impacts

In this section, the contribution of the proposed action and alternatives to cumulative impacts will be considered. The primary study area for cumulative impacts is contained within the boundaries of the Forge River project area. Actions beyond the project area that may result in cumulative impacts will also be considered. This secondary study area includes the hamlets of Mastic and Shirley, the Town of Brookhaven, and the neighboring Village of Mastic Beach, as well as the Great South Bay. The temporal scale for the cumulative impacts analysis includes past actions since Hurricane Sandy through reasonably foreseeable future actions.

A discussion of past, present, and reasonably foreseeable projects will be provided. Such projects include the following; however, other reasonably foreseeable projects may be identified during the draft EA/EIS process.

- Phase IV of Forge River Watershed Sewer Project[2]
- Suffolk County Coastal Resiliency Initiative projects, including SSD #3 and Carlls, Connetquot, and Patchogue River watersheds
- Suffolk County Reclaim Our Water Initiative: Mastic Beach Septic Demonstration Program for Single Family Homeowners
- Greater Moriches Comprehensive Zoning Re-evaluation Study of the Montauk Highway Corridor for the Moriches, Center Moriches, East Moriches and Eastport
- Brookhaven Calabro Municipal Airport Obstruction Tree Removal and Perimeter Road Project and Associated Clearing/Planting, Security Fencing and Drainage Structure Installation
- Solar photovoltaic panel project(s) at Calabro Airport
- Mastic Beach and Smith Point of Shirley Stormwater Management Plan

The assessment of cumulative impacts will consider the total of all impacts on a particular resource that have occurred, are occurring, and will likely occur as a result of the proposed action and these other identified projects. The cumulative impacts analysis for both action alternatives will be limited to cumulative impacts for the following resources: water quality, wetlands and coastal resources, floodplains, wildlife and fish, threatened and endangered species and critical habitat, land use and planning, and socioeconomic resources. Impacts on other resources from all sewerage improvement projects would be localized; hence, cumulative impacts are not anticipated.

The direct benefits of the sewer extension on water quality will be assessed, along with the negative effect of increased impervious surface cover that would result from potential new development facilitated by the sewer extension and other potential actions that would affect water quality. The assessment of cumulative impacts for water quality will specifically consider any impacts on

[2] Phase IV was proposed in March 2014 as a result of stakeholder input received during the New York Rising Community Reconstruction planning process. The Phase IV area would include the densely developed residential area south of Neighborhood Road from Carmans River on the west and the area south and east of Commack and Mastic Roads to Great South Bay on the south.

groundwater and surface waters related to the potential treatment of wastewater from areas within the Carmans River and Narrow Bay[3] watersheds and subsequent discharge into the Forge River Watershed.

5.4 Irreversible and Irretrievable Commitment of Resources

This chapter will discuss any irreversible or irretrievable commitment of resources as a result of the proposed action in terms of loss of environmental resources, both in the immediate future and in the long term. The extent to which the proposed action involves trade-offs between short-term environmental gains and long-term losses will be addressed. In addition, potential short-term losses will be compared with long-term benefits.

5.5 Permits and Project Conditions

This section will provide a description of permits, reviews, consultations, and approvals that would typically be required for the proposed action.

A majority of property owners within the project area will be required to approve the creation of a Mastic-Shirley Sewer District by public referendum. The final design contract will include modification of and/or development of a map and plan leading to the formation the proposed county sewer district according to Article 5-A, Section 256 of New York State County Law. Following acceptance of the map and plan, the project will be required to receive approval from the Suffolk County Department of Health Services, and obtain approval from the New York State Comptroller regarding the costs of improvements as they relate to the tax impacts on property owners within the district and the New York State Comptroller's predetermined threshold amount.

Other regulatory requirements for the Forge River Watershed Sewer Project would include compliance with Section 14.09, New York State Historic Preservation Act, and Section 106, National Historic Preservation Act/Tribal Consultation; Section 7, Threatened/Endangered Species Coordination; SPDES permit and compliance with and Suffolk County Article 6 and Article 7 requirements; SPDES General Permit for Stormwater Discharges from Construction Activity, including preparation of an SWPPP; approval from Suffolk County Department of Health Services, and compliance with Suffolk County Department of Health Services and Suffolk County Department of Public Works sewage treatment plant design and space requirements.

Because the Brookhaven Calabro Airport is the site under consideration for the location of the wastewater treatment plant, the draft EA/EIS will evaluate the proposed action and alternatives under NEPA and applicable "special purpose laws" pursuant to FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures.*

Other construction-related permits or approvals that the proposed action may require include the road opening permits and/or easements through NYSDOT and building permits from the Town of Brookhaven; a State Highway Access and/or State Highway Road Permit from NYSDOT; a Water Withdrawal Permit from NYSDEC for dewatering activities; and compliance with Suffolk County Sanitary Code Article 9 and Article 12 for use and storage of construction chemicals and petroleum products. Permits would be required from the Metropolitan Transit Authority Long Island Railroad in locations where sewer infrastructure would need to cross under railroad tracks. Because a

[3] Narrow Bay is a waterbody within Great South Bay, located south of Mastic Beach.

portion of the project area is located within the boundaries of the coastal zone, the proposed action requires a consistency assessment for compatibility with the State's Coastal Management Program and coastal policies. In addition, an inter-municipal agreement with the Town of Brookhaven would be required to site the AWTF at the airport.

5.6 Agency Coordination and Public Involvement

This section will provide an overview of efforts to ensure effective public participation and access to information, a description of any public involvement that occurred regarding the proposed action (i.e., newspaper notices and public meetings) and a list of federal, state, and local agencies and offices or other stakeholders that were contacted and asked to review the project.

Cooperating agencies identified under NEPA include FAA, EPA, and potentially others. The draft EA/EIS will be prepared to meet all environmental and other relevant regulatory requirements of these agencies. Involved agencies identified under SEQRA include the New York State Environmental Facilities Corporation; DSHES; New York State Office of State Comptroller, Division of Legal Services; NYSDEC – Region 1; New York Office of Parks, Recreation and Historic Preservation; New York State Department of State Division of Coastal Resources; NYSDOT; Metropolitan Transportation Authority – Long Island Rail Road; Suffolk County; Suffolk County Planning Commission; Town of Brookhaven, and Town of Brookhaven Planning Board. As such, this section would provide an overview of the various consultations required from these agencies and with tribal governments in and around the area pertaining to requirements under regulation such as Section 106 of the National Historic Preservation Act of 1966 or the Endangered Species Act of 1973.

5.7 Other Sections

An executive summary (draft EIS) or introduction (draft EA) and conclusion also will be provided. The summary will provide a description of the proposed action, the purpose and need for the proposed action, the required approvals, the project location, anticipated impacts, proposed mitigation measures, and alternatives. The executive summary will follow the general outline of the tasks outlined above, or those tasks deemed appropriate during the draft EA/EIS scoping process.

The conclusion will identify the preferred alternative and discuss why the preferred alternative is the best alternative to meet the project purpose and need, and summarize the potential impacts on the human environment in the vicinity of the project area. Impacts will be summarized as short-term and long-term by resource/area of concern, with a discussion of intensity for significant adverse or beneficial impacts. A summary table of impacts will be provided by resource/area of concern, as applicable

References will be provided at the conclusion of the draft EA/EIS in an accepted citation style and parenthetical citations will be used throughout draft EA/EIS.

A list of preparers will be provided following the conclusion of each document.

5.8 Suggested Appendices

Appendices to the draft EA/EIS may include, but are limited to the following documents:

- Alternatives Screening Report
- NEPA Public Scoping Report

- SEQRA documentation including Positive Declaration, Notice of Intent EIS and final scoping document
- New York State Department of State Coastal Zone Management Program federal consistency assessment form and supporting documentation
- Sole source aquifer screening and supporting documentation
- Eight-step floodplain and wetlands review process
- Phase IA Cultural Resources Surveys
- U.S. Department of House and Urban Development 24 CFR Part 58 environmental assessment checklist
- Correspondence with regulatory agencies

5.9 Scoping Document References

CDM Smith

2014 Mastic Shirley Feasibility Study, Map & Plan for: Mastic/Shirley. Prepared in association with H2M and Bowne AE&T Group. Prepared for Suffolk County. March 2014.

2015 Forge River Nitrogen Reduction Report, Sewering of Mastic/Shirley, EFC Report C1-5140-01-00. Prepared in association with H2M and Bowne AE&T Group. Prepared for Suffolk County. August 2014; amended June 2015.

CDM Smith in association with H2M and Bowne AE&T Group

2013 *Draft Mastic Shirley Feasibility Study, Map & Plan for: Mastic/Shirley.*

2014 *Mastic-Shirley Drainage Zones*.

2014 *Phase I and Phase II: Mastic-Shirley Proposed Sewer District*.

2014 *Suffolk County. Feasibility Study, Map and Plan for: Mastic/Shirley, Suffolk County Sewer District Capacity Study, CP 8189*. March.

2015 *Forge River Nitrogen Reduction Report, Sewering of Mastic/Shirley*, EFC Report C1-5140-01-00. Amended in June 2015.

Keystone Aerial Surveys

No date Geomaps 15-229-4_UCFp Aerial Survey.

NCA

2014 National Climate Assessment. Climate Change Impacts in the United States. Available at: http://nca2014.globalchange.gov/report.

Nelson, Pope & Voorhis, LLC

2009 Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II, Final Draft.

2010 Draft Generic Environmental Impact Statement for the Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II, April.

New York City Mayor's Office of Environmental Coordination

2014 New York City Environmental Quality Review [CEQR] Technical Manual - Chapter 7, Open Space, March 2014 Edition.

New York Office of Parks, Recreation and Historic Preservation

2015 New York State Cultural Resource Information System.

New York State Department of Environmental Conservation

2001 Assessing and Mitigating Noise Impacts, February.

2009 Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements. Accessed at: http://www.dec.ny.gov/docs/administration_pdf/eisghgpolicy.pdf

New York State Division of Homeland Security and Emergency Services

2015 Confidential. FEMA-DR-4085-NY HMGP Application State #2486. Sub-applicant: Suffolk County. Project Title: Suffolk County Coastal Resiliency Initiative. April.

New York State Governor's Office of Storm Recovery

2014 NY Rising Community Reconstruction Plan for Mastic Beach/Smith Point of Shirley, March.

NYS 2100 Commission

2013 Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure.

Suffolk County

2015 *Comprehensive Water Resources Management Plan*. April.

Suffolk County Department of Public Works

2015 Request for Proposal for planning and design assistance for Forge River Watershed Sewer Project (Parts 1-5, Addendum 1-2, Responses to Questions and Clarifications), July.

2016 Personal communication, February 26, 2016.

Town of Brookhaven

2012 *Forge River Watershed Management Plan*. Prepared by Cameron Engineering & Associates, LLP. March.

2013 *The Carmans River Conservation and Management Plan*. Town of Brookhaven, Long Island.

APPENDIX B.5: GROUNDWATER WELL MODELING

This page intentionally left blank.

Memorandum

To: *Jonathan Carey*

From: *CDM Smith*

Date: *July 17, 2017, Revised August 8, 2017*

Subject: *Groundwater Modeling Evaluation of the Proposed Forge River Watershed WWTP*

Introduction/Background

The Suffolk County groundwater model was used to evaluate the potential impacts of recharging treated effluent from the proposed Forge River Watershed Wastewater Treatment Plant (WWTP) on Suffolk County Water Authority (SCWA) supply wells S-71881, S-71882, S-96232, and S-112780 at the Lambert Avenue and Main Street wellfields, shown on Figure 1. Previous modeling evaluations based on advective transport have shown that the recharge area for the proposed Forge River Watershed WWTP lies primarily within the 25-year contributing area of the Forge River. The primary purpose of this modeling evaluation was to assess whether treated effluent recharged on the site could reach the SCWA wells as a result of either dispersion or increased water supply pumping.

Currently, Suffolk County is designing Phases I and II of the Forge River Watershed sewering project (shown on Figure 1). The groundwater model was used to evaluate whether recharge of 1.0 million gallons per day (MGD) of treated effluent in the southwest portion of the Forge River Watershed WWTP site could impact nearby SCWA wells under typical average annual pumping conditions at the wellfields. A second simulation was completed to evaluate whether recharged treated effluent would travel to the wells if the higher summer pumpage was sustained throughout the year in the future. In addition, the groundwater model was used to assess the potential impacts of recharging up to 3.2 MGD of treated effluent at the site, should the County obtain funding and implement potential Phases III and IV in the future.

Groundwater Model

The existing, calibrated Suffolk County Groundwater Model, based on the DYNSYSTEM set of codes provided the framework for this modeling assessment. DYNFLOW (DYNamic groundwater flow model) was used to simulate the flow field at and downgradient of the proposed recharge site and DYNTRACK (mass transport simulation code) used this flow field to simulate the migration of treated sanitary effluent as it migrated from the proposed Forge River Watershed WWTP recharge area.

DYNFLOW is a fully three-dimensional finite element groundwater flow simulation code that was developed at CDM Smith and has been used to simulate groundwater flow on Long Island for almost thirty years. DYNTRACK is the companion three-dimensional random walk based particle tracking and solute transport model code that is fully integrated with DYNFLOW. A

detailed review of the solution technique (the DYNFLOW model code) was conducted decades ago. At that time, the model codes were approved and validated by the International Groundwater Modeling Center at the Colorado School of Mines in Boulder Colorado (van der Heijde 1999). Subsequently, the USEPA approved use of the DYNFLOW (and the companion contaminant transport code, DYNTRACK) on Superfund sites. Since that time, the models have been successfully used for numerous projects in Suffolk and Nassau Counties, Queens and Brooklyn, throughout the United States, as well as in Europe and in the Middle East to support water resource management projects. More detail on the codes may be found at www.dynsystem.com.

The finite element Suffolk County Main Body Flow Model was originally developed and calibrated as a cooperative effort in 1996 and 1997. Cooperators included Suffolk County Department of Health Services (SCDHS), Suffolk County Department of Public Works (SCDPW) and SCWA, with guidance and input provided by New York State Department of Environmental Conservation (NYSDEC) and the Suffolk County Planning Department. The development and calibration of the Suffolk County Groundwater Flow Model was documented in the document entitled Suffolk County Groundwater Model (CDM October 2003). Model inputs, data sources, boundary conditions, and calibration are described in that document.

The Suffolk County groundwater model has been used as the basis for the New York State Department of Health Source Water Assessment Plan (SWAP), to assess the reduction in nitrogen loading that would result from sewering (documented in the Feasibility Study/Map & Plan for Mastic/Shirley), and to support development of the Forge River Total Maximum Daily Load (TMDL). Simulated water levels in the updated groundwater flow model used for this analysis were compared to average water level observations from 2000 to 2009 at groundwater wells in the area, to verify that the computer-simulated groundwater flow field continues to represent the observed flow field.

For this study, the computational grid was refined in the vicinity of the proposed Forge River Watershed WWTP recharge areas by reducing node spacing to between 100 and 200 feet to represent the spatial distribution of the effluent recharge application and the rate and direction of flow away from the recharge areas. The computational grid near the four SCWA supply wells was also refined to better match the locations of the wells.

Simulations

Average annual pumping for the ten-year period from 2000 to 2009 and average annual recharge over the ten-year period were applied throughout the model domain. The annual pumpage through the ten-year period for all four wells in the Lambert Avenue and Main Street wellfields is shown on Figure 2a. Figure 2b shows how pumpage in each individual well has varied through the period.

To represent the impacts of the proposed sewering program, sanitary wastewater that currently recharges the aquifer system via on-site wastewater disposal systems was removed from the flow model from the areas to be sewered; instead recharge of treated effluent was simulated at the proposed Forge River Watershed WWTP recharge areas. For summer pumping scenarios, average summer pumping for June, July and August from 2000 to 2009 at nearby SCWA wells

listed in Table 1 was applied continuously. This is a conservative assumption. Annual average pumping at these four wells over the 10-year period was 2.38 MGD. For the months of June, July and August, the average pumping was 58% higher at 3.76 MGD.

Table 1: Average Annual and Summer Pumping Rates (MGD) at SCWA Wells at the Lambert Avenue and Main Street wellfields

Well	Annual Average Pumping for 2000 to 2009 (MGD)	Summer Pumping for June, July and August for 2000 to 2009 (MGD)
S-71881	0.50	0.89
S-71882	0.52	0.93
S-96232	0.63	0.95
S-112780	0.73	0.99
Total	2.38	3.76

Groundwater flow was simulated for three sets of recharge configurations for both the average and summer pumping discussed above. Model simulated return flow from septic systems was removed from the delineated areas shown in Figure 1 for the appropriate Sewering Phase and effluent recharge was applied at the recharge areas shown in Figure 3. The three simulated recharge configurations include:

- Sewering Phases I and II: No recharge from on-site wastewater disposal systems/septic system was simulated in the Phase I and Phase II sewer areas. A total of 1 MGD was recharged in the area designated as Recharge Area 1 on Figure 3, as defined by preliminary design documents.

- Sewering Phases I, II and III: No recharge from on-site wastewater disposal systems/septic systems was simulated in the Phase I, II and III sewer areas. A total of 1.4 MGD was recharged with 1 MGD to Recharge Area 1 and 0.4 MGD to the area designated as Recharge Area 2 on Figure 3.

- Sewering Phases I, II, III, and IV: No recharge from on-site wastewater disposal systems/septic systems was simulated in the Phase I, II, III and IV sewer areas. A total of 3.2 MGD was recharged on the proposed wastewater treatment plant site, with 1 MGD to Recharge Area 1, and 0.6 MGD each to the areas designated as Recharge Areas 2 and 3 and 1 MGD to the area designated as Recharge Area 4. Areas 2, 3 and 4 are presumed locations of recharge for Phases III and IV based on direction from Louis Berger, as no preliminary designs have been completed.

Combinations of the two pumping scenarios and three recharge scenarios were simulated as summarized in Table 2.

Table 2: Model Simulations

Simulation	Flow Field	Effluent Recharge (MGD)			
		Recharge Area 1	Recharge Area 2	Recharge Area 3	Recharge Area 4
Phases I and II	Annual Average Pumpage	1	0	0	0
Phases I and II	Summer Pumpage	1	0	0	0
Phases I, II and III	Annual Average Pumpage	1	0.4	0	0
Phases I, II and III	Summer Pumpage	1	0.4	0	0
Phases I, II, III and IV	Annual Average Pumpage	1	0.6	0.6	1
Phases I, II, III and IV	Summer Pumpage	1	0.6	0.6	1

Three-dimensional advection-dispersion transport simulations were performed to project the migration of recharged treated effluent from the recharge facilities for each phase of sewering for each of the two water supply pumping scenarios. A continuous "source" of effluent was applied at the recharge areas for a period of 100 years. The transport simulations were based on effective porosity values ranging from 0.1 to 0.24 depending on the aquifer layer and longitudinal and transverse dispersivities of 30 feet and 3 feet transverse respectively, with an anisotropy factor of 0.1 applied to vertical dispersivity. These transport parameters are consistent with those used in previous modeling assessments of the area.

Results

Under recent average annual conditions of recharge and water supply pumping and recharge of 1.0 MGD (Phases I and II) of treated effluent from the Forge River Watershed WWTP, the treated effluent is simulated to migrate towards and discharge to the Forge River, as shown by Figure 4, with no impacts to the nearby SCWA wellfields. Figure 4 shows a plan view with points representing the migration of the simulated effluent recharge after 100 years. In the plan view, particles are present near wells S-96232 and S-112760; however, the cross-sectional view on Figure 4 shows that recharged effluent at these locations is in the shallow aquifer, approximately 100 feet above the wells screens.

The effluent recharge flows predominately through the shallow Upper Glacial aquifer and is only pulled down to the SCWA well screens under high pumping and high recharge conditions. If SCWA pumping was to increase such that the higher summertime pumping rates were

sustained throughout the year, treated effluent could reach Well S-71881 in the Lambert Avenue wellfield within approximately 6 years. The treated effluent would comprise less than 5 percent of the supply well discharge. For the purposes of this evaluation, a supply well is assumed to be potentially impacted if the effluent is simulated to comprise at least 1 percent of the supply well discharge.

Under recent average annual conditions of recharge and water supply pumping and potential future recharge of 1.4 MGD (Phases I, II and III) of treated effluent from the Forge River Watershed WWTP, the treated effluent is simulated to migrate to discharge to the Forge River, with no impacts to the nearby SCWA wellfields. If the SCWA wells were pumped at the higher summer pumping rates throughout the year, treated effluent could reach Well S-71881 (Lambert Avenue wellfield) and S-96232 (Main Street wellfield) within approximately 4 and 25 years, respectively. The treated effluent would be less than 5 percent of the supply well discharge in S-96232 and between 10 and 15 percent of the supply well discharge in S-71881.

Should Phases I, II, III and IV of the sewering program be implemented in the future, and all 3.2 MGD is discharged at the Forge River Watershed WWTP site, most of the treated effluent will continue to discharge to the Forge River under average annual conditions of recharge and pumping as shown on Figure 5. However, under these conditions, some of the treated discharge would migrate towards the southwest to discharge to the Carmans River and some would be captured by wells S-71881, S-96232 and S-112780, as shown on Figure 5. The treated effluent would be less than 5 percent of the supply well discharge in wells S-96232 and S-112780 and between 45 and 50 percent of the supply well discharge in S-71881. If average annual water supply pumping was increased to summer pumping rates, both wellfields would be impacted. Wells S-71881 and S-71882 would begin to capture treated effluent within two and seven years respectively and treated effluent would reach the Main Street wellfield within 18 years. The treated effluent would be less than 5 percent of the supply well discharge in well S-71882, between 5 and 10 percent of the supply well discharge in wells S-96232 and S-112780 and between 45 and 50 percent of the supply well discharge in well S-71881.

Summary

Under current average annual pumping conditions, the model results indicate that treated effluent recharged as part of sewering Phases I and II and future potential Phase III will not impact the nearby SCWA wells.

If pumping rates at the nearby wellfields are increased significantly, or if additional recharge from sewering future potential Phase IV is added at the site, this could result in impact to both SCWA well S-71881 at the Lambert Avenue wellfield and to the Main Street wellfield (wells S-96232 and S-112780). Recharge from all four currently proposed and future potential sewering phases and significantly higher sustained water supply pumping is projected to result in impacts to all four wells.

References

CDM 2003. Suffolk County Groundwater Model. CDM. October 2003.

CDM Smith, in association with H2M Engineers and Architects and Bowne AE&T Group. Draft Feasibility Study/Map & Plan for Mastic Shirley. September 2013.

van der Heijde, Paul K.M. (1999). "DYNFLOW Version 5.18: Testing and Evaluation of Code Performance." Heath Hydrology, Boulder Colorado. August 1999.

Figure Redacted

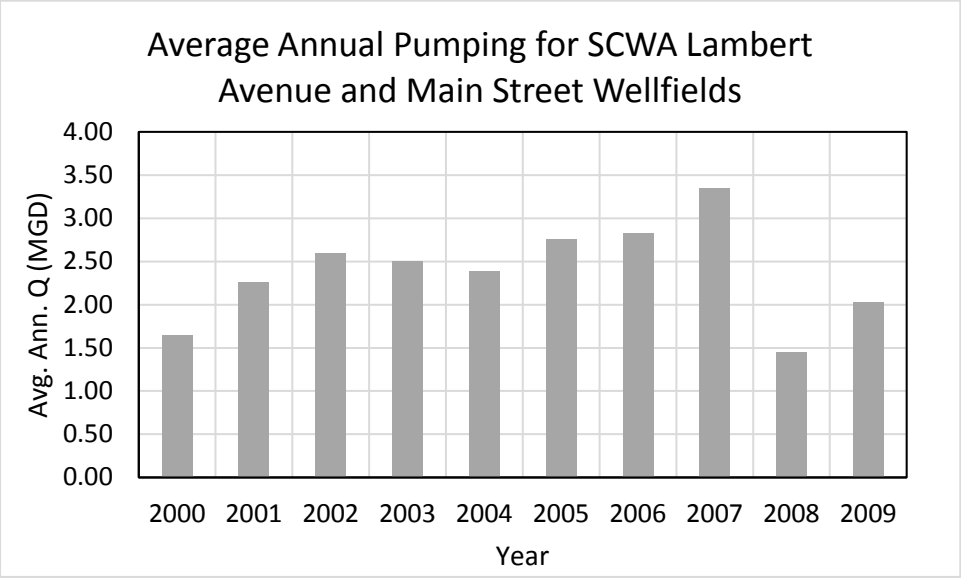


Figure 2a: Annual Pumping from 2000 to 2009 for SCWA Lambert Avenue and Main Street Wellfields

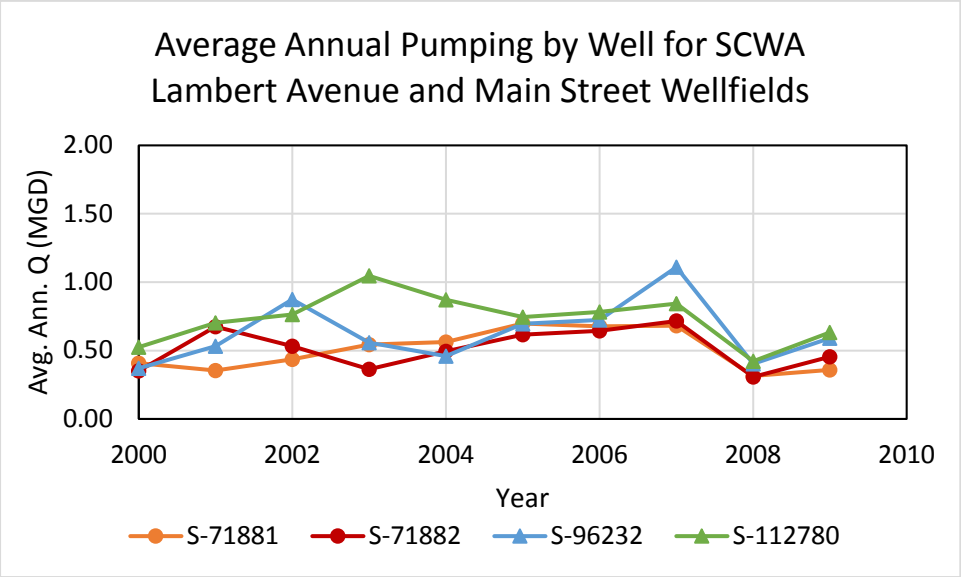
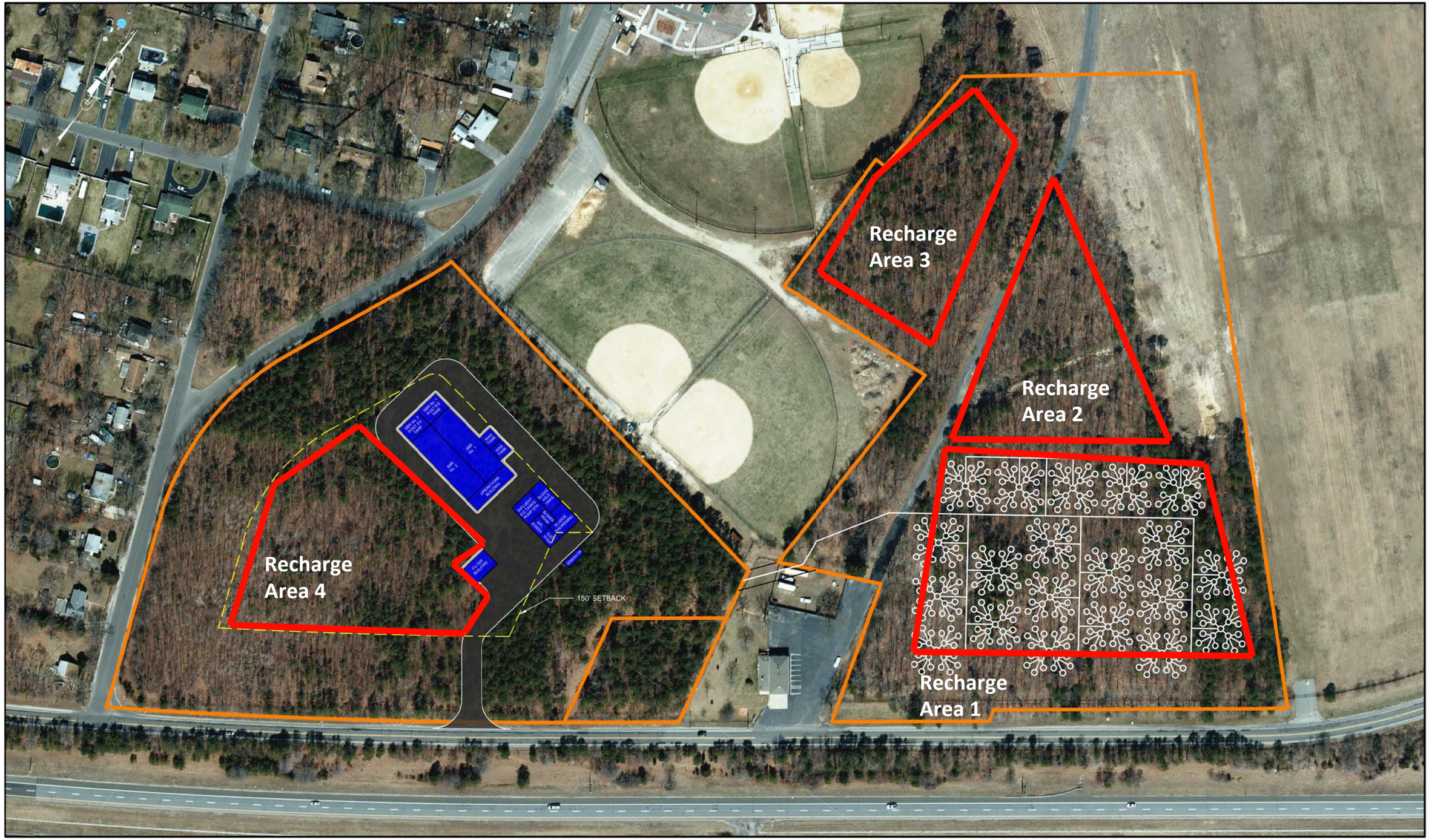


Figure 2b: Annual Pumping by Well from 2000 to 2009 for SCWA Lambert Avenue and Main Street Wellfields



Gannett Fleming

SUFFOLK COUNTY DEPARTMENT OF PUBLIC WORKS
FORGE RIVER WATERSHED SEWER PROJECT

AWTF PRELIMINARY SITE LAYOUT
1 MGD RECHARGE CAPACITY ALTERNATIVE No. 2

0 40 160
SCALE: 1 : 80

FIGURE 3

01/26/17 12:58pm FILE= R:\PROJECTS\62000\62100 SCDPW Forge River\5.00 Wrkg Files - On Shared Drive\CADD\Base Files\11x17 Fig-Bdr.dwg by MDOHERTY XREF FILE = NONE

Figure Redacted

Figure Redacted

This page intentionally left blank.

APPENDIX B.6: NOISE MONITORING TECHNICAL MEMORANDUM

This page intentionally left blank.

Paul Carpenter Associates, Inc.
7 Columbia Turnpike, Suite 101, Florham Park, NJ 07932 TEL: (973) 822-8221
pcairnoise.com

TECHNICAL MEMORANDUM

TO: Ms. Jennifer Gonzalez

OF: **Louis Berger**

FROM: Sharon Paul Carpenter

DATE: June 1, 2016

RE: **Forge River Watershed Sewer Project EIS**

As part of a subconsultant agreement, Paul Carpenter Associates, Inc. (PCA) was retained by Louis Berger (LB) to provide background noise monitoring data in order to assist with environmental studies related to the Forge River Watershed Sewer Environmental Impact Statement (EIS) document. Background noise monitoring study details are provided within, and all raw noise monitoring data files as well as graphed 24-hour weekday and weekend data was submitted to LB electronically (Microsoft Excel format) via email on June 1, 2016.

Background Noise Levels

PCA monitored and compiled long-term background noise level data within the study area in order to identify existing ambient noise levels during both weekday and weekend periods. Several metrics were documented, including the L_{eq} (energy noise level average), L_{max} (maximum noise level), L_{min} (minimum noise level) and L_{90} (noise levels exceeded 90% of the time) and logged every 10 minutes. PCA utilized Larson Davis Model 831 (Type 1) and Rion NL-52 (Type 1) sound level meters to perform the existing noise monitoring study. Field calibration was performed utilizing a Larson Davis Model CAL200 calibrator. All monitoring equipment was laboratory calibrated within the previous year, traceable to the National Institute of Standards and Technology. Appendix A includes all monitoring equipment calibration certificates. Monitoring commenced on Friday, May 20, 2016 and ended on Friday, May 27, 2016. Through communication with LB and approval by the client, noise monitoring locations were selected, and noise levels were documented in two (2) locations detailed within Figure 1. A photo and description of each monitoring site is included within.

Monitoring location # 1 (Ziegler Field Complex) is located at 146 Dawn Drive in Shirley, New York. The athletic complex is bordered by the Sunrise Highway to the south and the Brookhaven Airport to the north. The athletic complex, also known as Airport Field, includes a playground and eight (8) baseball/softball fields. This monitoring location is the closest noise sensitive receiver to proposed treatment process and equipment buildings associated with the proposed sewer plant.

Photo # 1 – Noise Level Meter Along Eastern Fence Line of Ziegler Field Complex

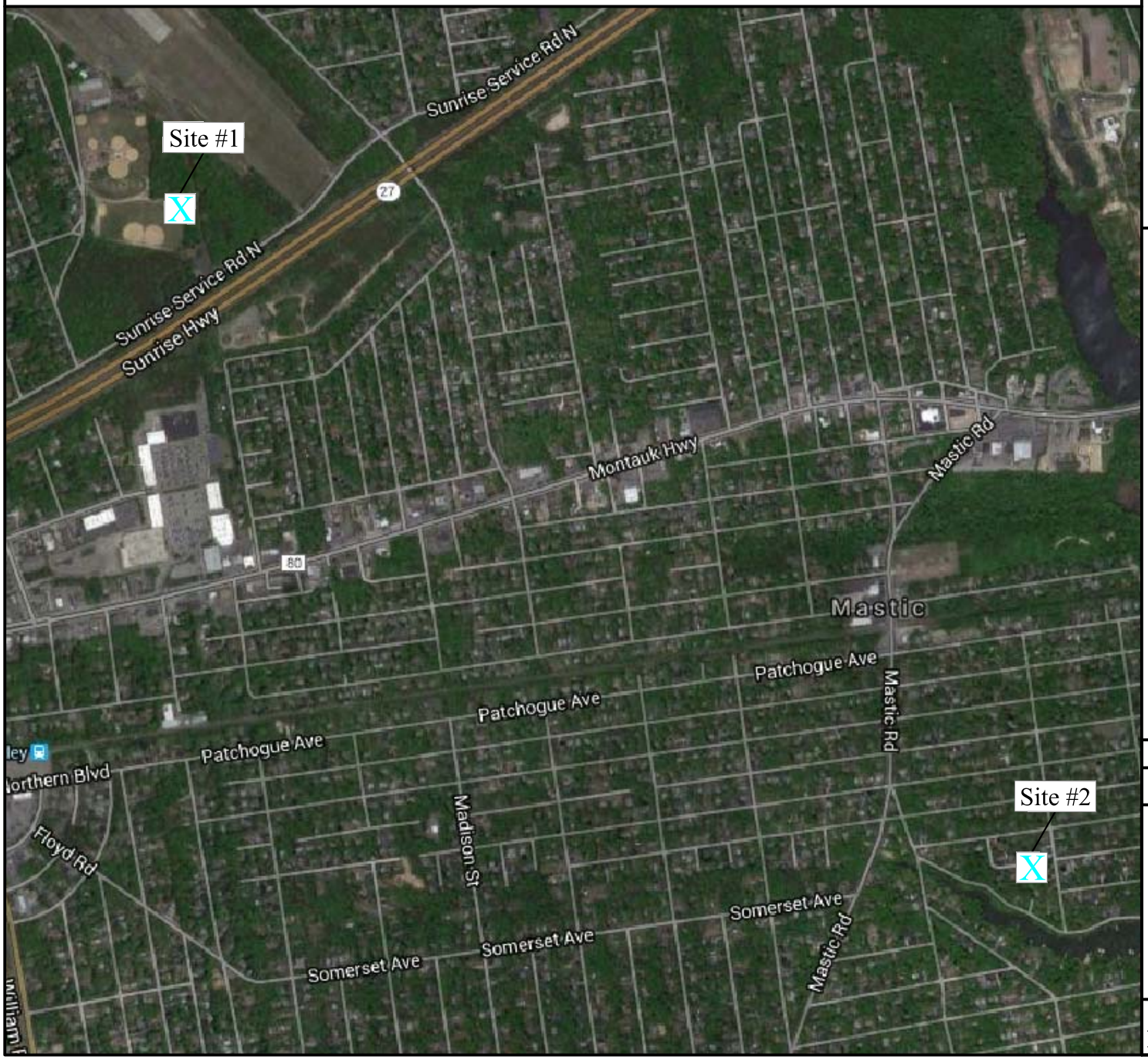
Monitoring location # 2 (Jay Street Vacant Lot) is located on a wooded empty lot at the east end of the Jay Street cul-de-sac, adjacent to backyards along Babylon Street. This site is representative of single-family residential dwellings and the proposed location of a Phase II pump station, just north of Second Neck Creek. The site is also adjacent to the Native American Reservation area.

Photo # 2 – Jay Street Vacant Lot

Weather conditions play an important role in documenting accurate background noise levels. Noise level data documented during periods of high wind, high relative humidity or precipitation was filtered from the data set. The nearest National Oceanic and Atmospheric Administration (NOAA) weather station was located at the Long Island Mac Arthur Airport. Meteorological data during the monitoring period is included within Appendix B.

Twenty-four (24) hour raw and filtered weekday and weekend data was graphed for LB's review for all aforementioned metrics (L_{eq}, L_{max}, L_{min}, and L_{90}) and included within the electronic data.

AERIAL MAPPING PROVIDED BY USGS



PROJECT NORTH

X Location of Noise Monitor

\# Noise Monitoring Site Number

0 600 1200 2400 FEET

Date	June 1, 2016

Suffolk County Department of Public Works

Forge River Watershed Sewer Project

Figure 1

Noise Monitoring Locations

Drawn by: G. Druckenmiller Checked by: S.P. Carpenter

Paul Carpenter Associates, Inc.

APPENDIX A
CALIBRATION CERTIFICATES

Calibration Certificate

Certificate Number 2015010793

Customer:
Paul Carpenter Associates
23 Vreeland Road
Florham Park, NJ 07932, United States

Model Number	831		***Procedure Number***	D0001.8384	
Serial Number	0004053		***Technician***	Ron Harris	
Test Results	**Pass**		***Calibration Date***	5 Nov 2015	
Initial Condition	As Manufactured		***Calibration Due***		
			Temperature	22.97 °C	± 0.01 °C
Description	Larson Davis Model 831		***Humidity***	51.1 %RH	± 0.5 %RH
			Static Pressure	86.62 kPa	± 0.03 kPa

Evaluation Method ***Tested with:***
PRM831. S/N 036902
377B02. S/N 154240

Data reported in dB re 20 µPa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
SRS DS360 Ultra Low Distortion Generator	06/24/2015	06/24/2016	006311
Hart Scientific 2626-H Temperature Probe	06/17/2015	06/17/2016	006798
Larson Davis CAL200 Acoustic Calibrator	08/12/2015	08/12/2016	007027
Larson Davis Model 831	03/05/2015	03/05/2016	007182
1/2 inch Microphone - P - 0V	03/11/2015	03/11/2016	007185
Larson Davis CAL291 Residual Intensity Calibrator	09/24/2015	09/24/2016	007287

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA
ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.00	113.80	114.20	0.14	Pass

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using S-time-weighted sound level

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	-0.16	-0.20	-1.20	0.80	0.21	Pass
1000	0.20	0.00	-0.70	0.70	0.21	Pass
8000	-2.46	-3.00	-5.50	-1.50	0.21	Pass

-- End of measurement results--

Self-generated Noise

Measured according to IEC 61672-3:2013 11.1 and ANSI S1.4-2014 Part 3: 11.1

Measurement	Test Result [dB]
Low Range, 20 dB gain	64.22

-- End of measurement results--

-- End of Report--

Signatory: *Ron Harris*

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA
ACCREDITED
Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®

NVLAP Lab Code: 200625-0

Calibration Certificate No.33333

Instrument:	**Sound Level Meter**	*Date Calibrated:* **2/25/2015**	*Cal Due:* **2/25/2016**
Model:	**NL52**	*Status:*	**Received** / **Sent**
Manufacturer:	**Rion**	*In tolerance:*	**X** / **X**
Serial number:	**01032443**	*Out of tolerance:*	
Tested with:	**Microphone UC-59 s/n 05827**	*See comments:*	
	Preamplifier NH25 s/n 32471	*Contains non-accredited tests:* __Yes _X_ No	
Type (class):	**1**	*Calibration service:* __ Basic _X_ Standard	
Customer:	**Paul Carpenter Associates, Inc.**	*Address:*	**23 Vreeland Road, Suite 204, Florham Park, NJ 07932**
Tel/Fax:	**973-822-8221 x11 / 973-833-9221**		

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	31052	Oct 7, 2014	Scantek, Inc./ NVLAP	Oct 7, 2015
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Oct 1, 2014	ACR Env. / A2LA	Oct 1, 2015
HM30-Thommen	Meteo Station	1040170/39633	Oct 3, 2014	ACR Env./ A2LA	Oct 3, 2015
PC Program 1019 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 10, 2014	Scantek, Inc./ NVLAP	Nov 10, 2015

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.7	99.75	35.5

Calibrated by:	Lydon Dawkins	**Authorized signatory:**	Mariana Buzduga
Signature	Lydon Dawkins	Signature	[illegible]
Date	2/25/2015	Date	2/26/2015

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored Z:\Calibration Lab\SLM 2015\RIONL52_01032443_M1.doc

Results summary: Device complies with following clauses of mentioned specifications:

CLAUSES[1] FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT[2,3]	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
INDICATION AT THE CALIBRATION CHECK FREQUENCY - ANSI S1.4 CLAUSE 3.2	Passed	0.15
LEVEL LINEARITY TEST - ANSI S1.4-1983, CLAUSE 6.9 & 6.10	Passed	0.25
WEIGHTING NETWORK TEST: A NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: C NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: LINEAR NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
OVERLOAD DETECTOR TEST: A-NETWORK - ANSI S1.4-1983 CLAUSE 8.3.1	Passed	0.25
F/S/I/PEAK TEST: STEADY STATE RESPONSE - ANSI S1.4 1983 CLAUSE 6.4	Passed	0.25
FAST-SLOW TEST: OVERSHOOT TEST - ANSI S1.4 1983 CLAUSE 8.4.1	Passed	0.25
SINGLE SINE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.1 & 8.4.3	Passed	0.25
PEAK DETECTOR TEST, SINGLE SQUARE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.4	Passed	0.25
RMS DETECTOR TEST: CREST FACTOR TEST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
RMS DETECTOR TEST: CONTINUOUS SINE WAVE BURST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
TIME AVERAGING TEST: AVERAGING FUNCTIONS - ANSI S1.43 CLAUSE 9.3.2	Passed	0.25
LINEARITY TEST - ANSI S1.43 CLAUSE 9.3.3	Passed	0.15
SUMMATION OF ACOUSTIC TESTS - ANSI S1.4 CLAUSE 5 USING ACTUATOR	Passed	0.2-0.5

[1] The results of this calibration apply only to the instrument type with serial number identified in this report.

[2] Parameters are certified at actual environmental conditions.

[3] The tests marked with (*) are not covered by the current NVLAP accreditation.

Comments: The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.
Compliance with any standard cannot be claimed based solely on the periodic tests.

Tests made with the following attachments to the instrument:

Microphone: Rion UC-59 s/n 05827 for acoustical test
Preamplifier: Rion NH25 s/n 32471 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests
Accompanying acoustical calibrator: none
Windscreen: none

Measured Data: in Test Report # 33333 of 9 + 1 pages.

Place of Calibration: Scantek, Inc.
6430 Dobbin Road, Suite C
Columbia, MD 21045 USA

Ph/Fax: 410-290-7726/ -9167
callab@scantekinc.com

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Summary of Test Report No.:33333

Rion Type: NL52 Serial no: 01032443

Customer:	**Paul Carpenter Associates, Inc.**
Address:	**23 Vreeland Road, Suite 204, Florham Park, NJ 07932**
Contact Person:	**Sharon Paul Carpenter**
Phone No.:	**973-822-8221 x11**
Fax No.:	**973-833-9221**

Instrument software version: NL-52, NX-42EX

Microphone:	Rion	Type: UC-59	Serial no: 05827	Sens:-26.01dB
Preamplifier	Rion	Type: NH25	Serial no: 32471	

Measurement Results:

Indication at the calibration check frequency - ANSI S1.4 Clause 3.2	Passed
Level Linearity Test - ANSI S1.4-1983, Clause 6.9 & 6.10	Passed
Weighting Network Test: A Network - ANSI S1.4-1983 Clause 8.2.1	Passed
Weighting Network Test: C Network - ANSI S1.4-1983 Clause 8.2.1	Passed
Weighting Network Test: Linear Network - ANSI S1.4-1983 Clause 8.2.1	Passed
Overload Detector Test: A-Network - ANSI S1.4-1983 Clause 8.3.1	Passed
F/S/I/Peak Test: Steady State Response - ANSI S1.4 1983 Clause 6.4	Passed
Fast-Slow Test: Overshoot test - ANSI S1.4 1983 Clause 8.4.1	Passed
Single Sine Wave Burst - ANSI S1.4 1983 Clause 8.4.1 & 8.4.3	Passed
Peak Detector Test, single square wave burst - ANSI S1.4 1983 Clause 8.4.4	Passed
RMS Detector Test: Crest Factor Test - ANSI S1.4-1983 Clause 8.4.2	Passed
RMS Detector Test: Continuous Sine Wave Burst - ANSI S1.4-1983 Clause 8.4.2	Passed
Time Averaging Test: Averaging Functions - ANSI S1.43 Clause 9.3.2	Passed
Linearity Test - ANSI S1.43 Clause 9.3.3	Passed
Summation of acoustic tests - ANSI S1.4 Clause 5 using Actuator	Passed

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
99.75	23.7	35.5

Date of calibration: 2/25/2015
Date of issue: 2/25/2015
Supervisor: Mariana Buzduga
Measurements performed by:

LD

Lydon Dawkins

Software version: 6.1 T

Scantek, Inc.
6430 Dobbin Rd., Suite C, Columbia, MD 21045
Ph: 410-290-7726 eMail: callab@scantekinc.com

Test Report No.:33333

Manufacturer:	Rion
Instrument type:	NL52
Serial no:	01032443
Customer:	Paul Carpenter Associates, Inc.
Department:	
Order No:	
Contact Person:	Sharon Paul Carpenter
Address:	23 Vreeland Road, Suite 204, Florham Park, NJ 07932

Environmental conditions:

Pressure:	99.75
Temperature:	23.7
Relative humidity:	35.5

Supervisor	Mariana Buzduga
Engineer	Lydon Dawkins
Date:	2/25/2015

Measurement Results:

Indication at the calibration check frequency - ANSI S1.4 Clause 3.2

```
Reference Calibrator: WSC4 - NOR1251-30878
Reference calibrator level: 114.02
Before calibration:
  Environmental corrections: 0.00
  Other corrections: -0.02
  Notional level: 114.00
Reference calibrator level before calibration: 114.4
After calibration:
  Environmental corrections: 0.00
  Other corrections: -0.02
  Notional level: 114.00
Reference calibrator level after calibration: 114.0
Associated Calibrator:  -  -
Associated calibrator level: Not calibrated
Test Passed
```

Level Linearity Test - ANSI S1.4-1983, Clause 6.9 & 6.10

The SLM is set to the reference range and the signal generator is adjusted to give a reading equal to the reference level (Normally 94dB.) The test signal is increased to give a reading equal to FSD. The generator is lowered in 1 dB step until the lower limit of the reference range is reached. The Fast SPL value is measured. The error is measured relative to 94 dB, in the last one dB step and the max error in a floating 10 dB window.

Nom. Value (dB)	Meas. Value (dB)	Tolerance limits (dB)	Error in the last 1dB (dB)		Max Error in the last 10dB (dB)		Error Rel. to ref. level (dB)	
Measured at 31.5 Hz								
94.0	93.9	0.2/0.4/0.7	0.0	P	0.0	P	-0.1	P
95.0	94.9	0.2/0.4/0.7	0.0	P	0.0	P	-0.1	P
100.0	99.8	0.2/0.4/0.7	-0.1	P	0.1	P	-0.2	P
105.0	104.9	0.2/0.4/0.7	0.1	P	0.1	P	-0.1	P
110.0	109.8	0.2/0.4/0.7	-0.1	P	0.1	P	-0.2	P
115.0	114.8	0.2/0.4/0.7	0.0	P	0.1	P	-0.2	P
120.0	119.8	0.2/0.4/0.7	0.0	P	0.0	P	-0.2	P
125.0	124.9	0.3/1.0/1.0	0.1	P	0.1	P	-0.1	P
130.0	129.8	0.3/1.0/1.0	-0.1	P	0.1	P	-0.2	P
134.0	133.8	0.3/1.0/1.0	0.0	P	0.1	P	-0.2	P
135.0	134.9	0.3/1.0/1.0	0.1	P	0.1	P	-0.1	P
136.0	135.9	0.3/1.0/1.0	0.0	P	0.1	P	-0.1	P
137.0	136.9	0.3/1.0/1.0	0.0	P	0.1	P	-0.1	P
94.0	93.9	0.2/0.4/0.7	0.0	P	0.1	P	-0.1	P
90.0	90.0	0.2/0.4/0.7	0.1	P	0.1	P	0.0	P
85.0	85.0	0.2/0.4/0.7	0.0	P	0.1	P	0.0	P
80.0	80.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
75.0	75.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
70.0	70.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
65.0	65.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P

Level Linearity Test - ANSI S1.4-1983, Clause 6.9 & 6.10

Nom. Value (dB)	Meas. Value (dB)	Tolerance limits (dB)	Error in the last 1dB (dB)		Max Error in the last 10dB (dB)		Error Rel. to ref. level (dB)	
60.0	60.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
55.0	54.9	0.2/0.4/0.7	-0.1	P	0.1	P	-0.1	P
50.0	49.9	0.2/0.4/0.7	0.0	P	0.1	P	-0.1	P
45.0	45.0	0.2/0.4/0.7	0.1	P	0.1	P	0.0	P
42.0	42.0	0.2/0.4/0.7	0.0	P	0.1	P	0.0	P
41.0	40.9	0.2/0.4/0.7	-0.1	P	0.1	P	-0.1	P
40.0	39.9	0.2/0.4/0.7	0.0	P	0.1	P	-0.1	P
39.0	39.0	0.3/1.0/1.0	0.1	P	0.1	P	0.0	P
Measured at 1000 Hz								
94.0	94.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
95.0	95.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
100.0	100.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
105.0	105.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
110.0	110.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
115.0	115.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
120.0	120.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
125.0	125.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
130.0	130.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
134.0	134.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
135.0	135.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
136.0	136.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
137.0	137.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
94.0	94.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
90.0	90.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
85.0	85.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
80.0	80.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
75.0	75.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
70.0	70.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
65.0	65.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
60.0	60.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
55.0	55.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
50.0	50.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
45.0	45.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
42.0	42.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
41.0	41.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
40.0	39.9	0.2/0.4/0.7	-0.1	P	0.1	P	-0.1	P
39.0	38.9	0.3/1.0/1.0	0.0	P	0.1	P	-0.1	P
Measured at 8000 Hz								
94.0	94.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
95.0	95.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
100.0	100.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
105.0	105.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
110.0	110.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
115.0	115.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
120.0	120.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
125.0	125.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
130.0	130.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
134.0	134.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
135.0	135.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
136.0	136.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
137.0	137.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P
94.0	94.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
90.0	90.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
85.0	85.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
80.0	80.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P

Level Linearity Test - ANSI S1.4-1983, Clause 6.9 & 6.10

Nom. Value (dB)	Meas. Value (dB)	Tolerance limits (dB)	Error in the last 1dB (dB)		Max Error in the last 10dB (dB)		Error Rel. to ref. level (dB)	
75.0	75.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
70.0	70.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
65.0	65.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
60.0	60.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
55.0	55.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
50.0	50.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
45.0	45.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
42.0	42.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
41.0	41.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
40.0	40.0	0.2/0.4/0.7	0.0	P	0.0	P	0.0	P
39.0	39.0	0.3/1.0/1.0	0.0	P	0.0	P	0.0	P

Test Passed

Weighting Network Test: A Network - ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq (Hz)	Ref. (dB)	Measured value (dB)	Tolerance norm Upp. (dB)	Tolerance norm Low. (dB)	Error Value (dB)	Result
31.6	88.6	88.3	1.5	-1.5	-0.3	P
63.1	101.8	101.8	1.0	-1.0	0.0	P
125.9	111.9	111.9	1.0	-1.0	0.0	P
251.2	119.4	119.3	1.0	-1.0	-0.1	P
501.2	124.8	124.7	1.0	-1.0	-0.1	P
1000.0	128.0	128.0	1.0	-1.0	0.0	P
1995.3	129.2	129.2	1.0	-1.0	0.0	P
3981.1	129.0	129.0	1.0	-1.0	0.0	P
7943.3	126.9	127.0	1.5	-3.0	0.1	P
12589.3	123.7	123.4	3.0	-6.0	-0.3	P

Test Passed

Weighting Network Test: C Network - ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq (Hz)	Ref. (dB)	Measured value (dB)	Tolerance norm Upp. (dB)	Tolerance norm Low. (dB)	Error Value (dB)	Result
31.6	125.0	124.8	1.5	-1.5	-0.2	P
63.1	127.2	127.2	1.0	-1.0	0.0	P
125.9	127.8	127.8	1.0	-1.0	0.0	P
251.2	128.0	128.0	1.0	-1.0	0.0	P

Weighting Network Test: C Network - ANSI S1.4-1983 Clause 8.2.1

Freq (Hz)	Ref. (dB)	Measured value (dB)	Tolerance norm Upp. (dB)	Tolerance norm Low. (dB)	Error Value (dB)	Result
501.2	128.0	128.0	1.0	-1.0	0.0	P
1000.0	128.0	128.0	1.0	-1.0	0.0	P
1995.3	127.8	127.8	1.0	-1.0	0.0	P
3981.1	127.2	127.2	1.0	-1.0	0.0	P
7943.3	125.0	125.1	1.5	-3.0	0.1	P
12589.3	121.8	121.5	3.0	-6.0	-0.3	P

Test Passed

Weighting Network Test: Linear Network - ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq (Hz)	Ref. (dB)	Measured value (dB)	Tolerance norm Upp. (dB)	Tolerance norm Low. (dB)	Error Value (dB)	Result
31.6	128.0	127.8	1.5	-1.5	-0.2	P
63.1	128.0	127.9	1.0	-1.0	-0.1	P
125.9	128.0	128.0	1.0	-1.0	0.0	P
251.2	128.0	127.9	1.0	-1.0	-0.1	P
501.2	128.0	128.0	1.0	-1.0	0.0	P
1000.0	128.0	128.0	1.0	-1.0	0.0	P
1995.3	128.0	128.0	1.0	-1.0	0.0	P
3981.1	128.0	128.0	1.0	-1.0	0.0	P
7943.3	128.0	128.0	1.5	-3.0	0.0	P
12589.3	128.0	128.0	3.0	-6.0	0.0	P

Test Passed

Overload Detector Test: A-Network - ANSI S1.4-1983 Clause 8.3.1

The SLM is set to A-weighted and the least sensitive range setting. A sine wave of 1000 Hz is applied to the SLM with an amplitude that gives a reading 5 dB less than the maximum level the SLM is designed to measure. The test signal is lowered in 1/3 octave frequency steps until 20 Hz is reached. The amplitude of the test signal is simultaneously increased corresponding to the inverse of the A-weighting curve. The overload indication shall be turned on before the measured Slow SPL value is deviating more than one dB from the initial value measured at 1000 Hz.

Freq. (Hz)	Level Increase (dB)	Meas. Value (dB)	Tol. Upp. (dB)	Tol. Low. (dB)	Error Value (dB)		Error Code
The Reference range is used for this test because of expected high signal amplitude.							
1000.0	0.0	125.0	-1.0	1.0	0.0	P	No overload
794.3	0.8	125.0	-1.0	1.0	0.0	P	No overload
631.0	1.9	125.0	-1.0	1.0	0.0	P	No overload
501.2	3.2	125.0	-1.0	1.0	0.0	P	No overload
398.1	4.8	125.0	-1.0	1.0	0.0	P	No overload
316.2	6.6	125.0	-1.0	1.0	0.0	P	No overload
251.2	8.6	124.9	-1.0	1.0	-0.1	P	No overload

Overload Detector Test: A-Network - ANSI S1.4-1983 Clause 8.3.1

Freq. (Hz)	Level Increase (dB)	Meas. Value (dB)	Tol. Upp. (dB)	Tol. Low. (dB)	Error Value (dB)		Error Code
199.5	10.9	125.0	-1.0	1.0	0.0	P	No overload
158.5	13.4	125.1	-1.0	1.0	0.1	P	Overload

Test Passed

F/S/I/Peak Test: Steady State Response - ANSI S1.4 1983 Clause 6.4

A continuous sine wave is applied and adjusted to give an indication of 94.0 dB with time constant F(ast). The instrument is set to S(low) and I(mpulse), if applicable. The indication shall not differ more than 0.1 dB for type 0,1,2 instruments and 0.2 for type 3 instruments.

Time Const.	Norm Value (dB)	Measured Value (dB)	Tol. limit (dB)	Error Value (dB)	
Fast	94.0	94.0	0.1	0.0	P
Slow	94.0	94.0	0.1	0.0	P

Test Passed

Fast-Slow Test: Overshoot test - ANSI S1.4 1983 Clause 8.4.1

The overshoot is tested by applying a sine wave that step (sudden increase) in amplitude by 20 dB. The steady end response shall give a signal 4 dB below the upper limit of primary indicator range. The difference between the maximum value and the end value tells the overshoot. Both F(ast) and S(low) time constants are tested.

Time Const.	Ref.- Value (dB)	Measured Value (dB)	Tolerance norm (dB)	Overshoot (dB)	Error
Fast	117.0	117.0	1.1	0.0	P
Slow	117.0	116.9	1.6	-0.1	P
Fast	87.0	87.0	1.1	0.0	P
Slow	87.0	86.9	1.6	-0.1	P

Test Passed

Single Sine Wave Burst - ANSI S1.4 1983 Clause 8.4.1 & 8.4.3

A continuous sine wave is applied to the SLM and adjusted to give an indication 4 dB below upper limit of the primary indicator range. Then onset transient characteristics are tested using a single sine wave burst with an amplitude equal to the continuous signal and a duration of T(ms). The test is repeated at a level 24 dB below the upper limit of the primary indicator range.

Time Constant	Burst Duration (ms)	Ref. Value (dB)	Measured Value (dB)	Tolerance Value (dB)		Error Value (dB)	
Fast	200.0	116.0	116.0	1.0	-1.0	0.0	P
Slow	500.0	112.9	112.9	1.0	-1.0	0.0	P
Fast	200.0	86.0	86.0	1.0	-1.0	0.0	P
Slow	500.0	82.9	82.9	1.0	-1.0	0.0	P

Test Passed

Single Sine Wave Burst - ANSI S1.4 1983 Clause 8.4.1 & 8.4.3

Time Constant	Burst Duration (ms)	Ref. Value (dB)	Measured Value (dB)	Tolerance Value (dB)	Error Value (dB)

Peak Detector Test, single square wave burst - ANSI S1.4 1983 Clause 8.4.4

Pulse Duration	Pulse Polarity	Ref. Value (dB)	Measured Value (dB)	Tolerance Value (dB)	Error (dB)	
10ms	+	120.0	120.8	2.0	0.8	P
0.1ms	+	120.0	119.9	2.0	-0.1	P
10ms	-	120.0	120.8	2.0	0.8	P
0.1ms	-	120.0	119.8	2.0	-0.2	P

The results have been compensated for the impulse response of the C-weighting network.
Test Passed

RMS Detector Test: Crest Factor Test - ANSI S1.4-1983 Clause 8.4.2

The SLM is set to reference range. A continuous square wave with CF=1 is applied and adjusted to give an indication 2 dB below upper limit of primary indicator range. The duration of the square wave pulses is kept constant at 200 µs and rise time less than 10µs. The RMS value of the signal is kept constant while the crest factor (CF) is increased from 1 to 10. The test is performed both for positive and negative going test signals.

Crest Factor	Ref. Value (dB)	Meas. Value (dB)	Tol. norm (dB)	Error Value (dB)	
Positive Pulses					
3.0	119.0	118.8	0.5	-0.2	P
5.0	119.0	118.8	1.5	-0.2	P
10.0	119.0	118.8	1.5	-0.2	P
Negative Pulses					
3.0	119.0	118.8	0.5	-0.2	P
5.0	119.0	118.8	1.5	-0.2	P
10.0	119.0	118.8	1.5	-0.2	P
Positive Pulses					
3.0	89.0	88.9	0.5	-0.1	P
5.0	89.0	89.0	1.5	0.0	P
10.0	89.0	89.2	1.5	0.2	P
Negative Pulses					
3.0	89.0	88.9	0.5	-0.1	P
5.0	89.0	88.9	1.5	-0.1	P
10.0	89.0	89.2	1.5	0.2	P

Test Passed

RMS Detector Test: Continuous Sine Wave Burst - ANSI S1.4-1983 Clause 8.4.2

The instrument is set to time constant Slow. A continuous sine wave (2kHz) is applied to the SLM and adjusted to give an indication 2 dB below upper limit of the primary indicator range. The signal is replaced by a sequence of tone bursts with a repetition rate of 40Hz. The RMS level of the signal is kept constant while the crest factor is increased from 1 to 10.
Test signal: Continuous sine wave burst with repetition rate of 40Hz

Crest Factor	Ref. Value (dB)	Meas. Value (dB)	Tolerance norm (dB)	Error Value (dB)	
3	119.0	119.0	0.5	0.0	P
5	119.0	119.0	1.5	0.0	P
10	119.0	119.0	1.5	0.0	P
3	89.0	89.0	0.5	0.0	P
5	89.0	88.9	1.5	-0.1	P
10	89.0	88.9	1.5	-0.1	P

Test Passed

Time Averaging Test: Averaging Functions - ANSI S1.43 Clause 9.3.2

The SLM is set to the reference range. The signal generator is adjusted to give a 4 kHz sine wave with an rms level equal to 20dB above the bottom end of the Linearity range. The sine wave is replaced by a sequence of tone burst with the same frequency. The burst duty factor (the distance between each burst) is increased, while the amplitude is increased to keep the same equivalent rms level. The measurement time is 100 sec for type 0 (and manually controlled) instruments and 10 sec for all other instruments.

Burst Duration (ms)	Ref. Value (dB)	Tolerance norm (dB)	Value (LeqA) (dB)	Error Value (dB)		Value (SEL) (dB)	Error Value (dB)	
1000.0	60.0	0.5	60.0	0.0	P	70.0	0.0	P
100.0	60.0	0.5	60.1	0.1	P	70.1	0.1	P
10.0	60.0	1.0	60.1	0.1	P	70.1	0.1	P
1.0	60.0	1.0	60.0	0.0	P	70.0	0.0	P
1min	60.0	1.0	60.0	0.0	P	77.8	0.0	P

Test Passed

Linearity Test - ANSI S1.43 Clause 9.3.3

Int. Time (sec.)	Ref. Value (dB)	Meas. Value (dB)	Tolerance norm (dB)	Error Value (dB)		Meas. Value (dB)	Tolerance norm (dB)	Error Value (dB)	
10	94.0	94.0	0.4	0.0	P	104.0	0.4	0.0	P
10	138.0	138.0	0.7	0.0	P	148.0	0.7	0.0	P
10	39.0	38.9	0.7	-0.1	P	48.9	0.7	-0.1	P

Test Passed

Summation of acoustic tests - ANSI S1.4 Clause 5 using Actuator

The microphone data are measured using electrostatic actuator.

SLM: A-Weighted results

Freq. (Hz)	SLM (dB)	Mic. (dB)	CR. (dB)	WS. (dB)	Tol. (dB)	Dev. (dB)
31.5	-39.7				+-1.5	-0.3
63	-26.2				+-1.5	0.0
125	-16.1				+-1.0	0.0
250	-8.7				+-1.0	-0.1
500	-3.3				+-1.0	-0.1
1 k	0.0				+-1.0	0.0
2 k	1.2				+-1.0	0.0
4 k	1.0				+-1.0	0.0
8 k	-1.0				+1.5,-3	0.1
12.5 k	-4.6				+3,-6	-0.3

SLM: C-Weighted results

Freq. (Hz)	SLM (dB)	Mic. (dB)	CR. (dB)	WS. (dB)	Tol. (dB)	Dev. (dB)
31.5	-3.2				+-1.5	-0.2
63	-0.8				+-1.5	0.0
125	-0.2				+-1.0	0.0
250	0.0				+-1.0	0.0
500	0.0				+-1.0	0.0
1 k	0.0				+-1.0	0.0
2 k	-0.2				+-1.0	0.0
4 k	-0.8				+-1.0	0.0
8 k	-2.9				+1.5,-3	0.1
12.5 k	-6.5				+3,-6	-0.3

SLM: Lin results

Freq. (Hz)	SLM (dB)	Mic. (dB)	CR. (dB)	WS. (dB)	Tol. (dB)	Dev. (dB)
31.5	-0.2				+-1.5	-0.2
63	-0.1				+-1.5	-0.1
125	0.0				+-1.0	0.0
250	-0.1				+-1.0	-0.1
500	0.0				+-1.0	0.0
1 k	0.0				+-1.0	0.0
2 k	0.0				+-1.0	0.0
4 k	0.0				+-1.0	0.0
8 k	0.0				+1.5,-3	0.0
12.5 k	0.0				+3,-6	0.0

Test Passed

The overall free field response of the sound level meter and microphone has shown to conform with the requirements in §6 of the ANSI S1.4 for a type 1 sound level meter. LD

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®

NVLAP Lab Code: 200625-0

Calibration Certificate No.35964

Instrument:	**Acoustical Calibrator**	*Date Calibrated:* **4/5/2016** *Cal Due:* **4/05/2017**		
Model:	**CAL200**	*Status:*	**Received**	**Sent**
Manufacturer:	**Larson Davis**	*In tolerance:*	**X**	**X**
Serial number:	**11126**	*Out of tolerance:*		
Class (IEC 60942):	**1**	*See comments:*	**X**	**X**
Barometer type:		*Contains non-accredited tests:* __Yes _X_ No		
Barometer s/n:				

Customer: **Paul Carpenter Associates, Inc.** *Address:* **23 Vreeland Road, Suite 204, Florham Park, NJ 07932**
Tel/Fax: **973-822-8221 x21 / 973-833-9221**

Tested in accordance with the following procedures and standards:
Calibration of Acoustical Calibrators, Scantek Inc., Rev. 1/16/2015

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	31061	Jul 20, 2015	Scantek, Inc./ NVLAP	Jul 20, 2016
DS-360-SRS	Function Generator	88077	Sep 9, 2014	ACR Env./ A2LA	Sep 9, 2016
34401A-Agilent Technologies	Digital Voltmeter	MY47011118	Sep 24, 2015	ACR Env./ A2LA	Sep 24, 2016
HM30-Thommen	Meteo Station	1040170/39633	Oct 23, 2015	ACR Env./ A2LA	Oct 23, 2016
140-Norsonic	Real Time Analyzer	1403978	Mar 17, 2016	Scantek, Inc. / NVLAP	Mar 17, 2017
PC Program 1018 Norsonic	Calibration software	v.6.1T	Validated Nov 2014	Scantek, Inc.	-
4192-Brüel&Kjær	Microphone	2854675	Nov 11, 2015	Scantek, Inc. / NVLAP	Nov 11, 2016
1203-Norsonic	Preamplifier	92268	Oct 14, 2015	Scantek, Inc./ NVLAP	Oct 14, 2016

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)

Calibrated by:	Jeremy Gotwalt	**Authorized signatory:**	Valentin Buzduga
Signature		Signature	
Date	4/5/16	Date	4/06/2016

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored as: Z:\Calibration Lab\Cal 2016\LDCAL200_11126_M3.doc

Results summary: Device was tested and complies with following clauses of mentioned specifications:

CLAUSES[1] FROM STANDARDS REFERENCED IN PROCEDURES:	MET[2]	NOT MET	COMMENTS
Manufacturer specifications			
Manufacturer specifications: Sound pressure level	X		
Manufacturer specifications: Frequency	X		
Manufacturer specifications: Total harmonic distortion	X		
Current standards			
ANSI S1.40:2006 B.3 / IEC 60942: 2003 B.2 - Preliminary inspection	X		
ANSI S1.40:2006 B.4.4 / IEC 60942: 2003 B.3.4 - Sound pressure level	X		
ANSI S1.40:2006 A.5.4 / IEC 60942: 2003 A.4.4 - Sound pressure level stability	X		
ANSI S1.40:2006 B.4.5 / IEC 60942: 2003 B.3.5 - Frequency	X		
ANSI S1.40:2006 B.4.6 / IEC 60942: 2003 B.3.6 - Total harmonic distortion	X		

[1] The results of this calibration apply only to the instrument type with serial number identified in this report.

[2] The tests marked with (*) are not covered by the current NVLAP accreditation.

Main measured parameters [3]:

Measured[4]/Acceptable[5] Tone frequency (Hz):	Measured[4]/Acceptable[5] Total Harmonic Distortion (%):	Measured [4]/Acceptable Level[5] (dB):
1000.40 ± 1.0/1000.0 ± 10.0	0.31 ± 0.10/ < 3	94.05 ± 0.12/94.0 ± 0.4
1000.41 ± 1.0/1000.0 ± 10.0	0.36 ± 0.10/ < 3	114.02 ± 0.12/114.0 ± 0.4

[3] The stated level is valid at measurement conditions.

[4] The above expanded uncertainties for frequency and distortion are calculated with a coverage factor k=2; for level k=2.00

[5] Acceptable parameters values are from the current standards

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.5 ± 1.7	101.13 ± 0.016	32.4 ± 5.0

Tests made with following attachments to instrument:

Calibrator ½" Adaptor Type:
Other:

Adjustments: Unit was adjusted for level.

Comments: As received, the instrument produced sound pressure levels near the lower limit of the admissible range. The level was adjusted close to the nominal value. After adjustment, the instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.
Compliance with any standard cannot be claimed based solely on the periodic tests.

Measured Data: in Acoustical Calibrator Test Report # 35964 of four pages.

Place of Calibration: Scantek, Inc.
6430 Dobbin Road, Suite C
Columbia, MD 21045 USA
Ph/Fax: 410-290-7726/ -9167
callab@scantekinc.com

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Test Report No.:35964

Manufacturer: Larson Davis
Type: CAL200
Serial no: 11126

Customer: Paul Carpenter Associates, Inc.
Department:
Address: 23 Vreeland Road, Suite 204, Florham Park, NJ 07932
Order No:
Contact Person: Bryan Fuerte, Sharon Paul Carpenter
Phone No.: 973-822-8221 x21
Fax No.: 973-833-9221

Measurement Results:

	Level: (dB)	P. Stab : (dB)	Frequency: (Hz)	F. Stab : (%)	Distortion: (% TD)
1:	94.05	0.03	1000.39	0.00	0.31
2:	94.06	0.01	1000.41	0.01	0.31
3:	94.05	0.01	1000.41	0.01	0.31
Result (Average):	**94.05**	**0.02**	**1000.40**	**0.01**	**0.31**
Expanded Uncertainty:	0.12	0.03	1.00	0.01	0.10
Degree of Freedom:	>100	21	>100	18	>100
Coverage Factor:	2.00	2.13	2.00	2.28	2.00

The stated levels are relative to 20µPa.

The stated level is valid at measurement conditions.
Reference microphone: 4192-2854675. Volume correction: 0.126 dB
Records:Z:\Calibration Lab\Cal 2016\LDCAL200_11126_M3.nmf

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

After adjustment data.

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
101.128 ± 0.016 kPa	24.5 ± 1.7 °C	32.4 ± 5.0 %RH

Date of calibration: 4/5/2016
Date of issue: 4/5/2016

Supervisor : Valentin Buzduga
Measurements performed by:

Jeremy Gotwalt
Software version: 6.1T

Scantek, Inc.
6430 Dobbin Rd., Suite C, Columbia, MD 21045
Ph: 410-290-7726 eMail: callab@scantekinc.com

Test Report No.:35964

Manufacturer: Larson Davis
Type: CAL200
Serial no: 11126

Customer: Paul Carpenter Associates, Inc.
Department:
Address: 23 Vreeland Road, Suite 204, Florham Park, NJ 07932
Order No:
Contact Person: Bryan Fuerte, Sharon Paul Carpenter
Phone No.: 973-822-8221 x21
Fax No.: 973-833-9221

Measurement Results:

	Level: (dB)	P. Stab : (dB)	Frequency: (Hz)	F. Stab : (%)	Distortion: (% TD)
1:	114.01	0.01	1000.41	0.00	0.36
2:	114.04	0.01	1000.41	0.00	0.36
3:	114.01	0.01	1000.41	0.00	0.36
Result (Average):	**114.02**	**0.01**	**1000.41**	**0.00**	**0.36**
Expanded Uncertainty:	0.12	0.02	1.00	0.01	0.10
Degree of Freedom:	>100	>100	>100	>100	>100
Coverage Factor:	2.00	2.00	2.00	2.00	2.00

The stated levels are relative to 20µPa.

The stated level is valid at measurement conditions.
Reference microphone: 4192-2854675. Volume correction: 0.126 dB
Records:Z:\Calibration Lab\Cal 2016\LDCAL200_11126_M4.nmf

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

After adjustment data.

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
101.150 ± 0.001 kPa	23.4 ± 1.0 °C	36.9 ± 2.0 %RH

Date of calibration: 4/5/2016
Date of issue: 4/5/2016

Supervisor : Valentin Buzduga
Measurements performed by:

Jeremy Gotwalt
Software version: 6.1T

Scantek, Inc.
6430 Dobbin Rd., Suite C, Columbia, MD 21045
Ph: 410-290-7726 eMail: callab@scantekinc.com

Test Report No.:35964

Manufacturer: Larson Davis
Type: CAL200
Serial no: 11126

Customer:	**Paul Carpenter Associates, Inc.**
Department:	
Address:	**23 Vreeland Road, Suite 204, Florham Park, NJ 07932**
Order No:	
Contact Person:	**Bryan Fuerte, Sharon Paul Carpenter**
Phone No.:	**973-822-8221 x21**
Fax No.:	**973-833-9221**

Measurement Results:

	Level: (dB)	P. Stab : (dB)	Frequency: (Hz)	F. Stab : (%)	Distortion: (% TD)
1:	93.74	0.01	1000.43	0.02	0.31
2:	93.75	0.01	1000.40	0.01	0.31
3:	93.75	0.01	1000.36	0.02	0.31
Result (Average):	**93.75**	**0.01**	**1000.40**	**0.02**	**0.31**
Expanded Uncertainty:	0.12	0.02	1.00	0.01	0.10
Degree of Freedom:	>100	>100	>100	4	>100
Coverage Factor:	2.00	2.00	2.00	2.87	2.00

The stated levels are relative to 20µPa.

The stated level is valid at measurement conditions.
Reference microphone: 4192-2854675. Volume correction: 0.126 dB
Records:Z:\Calibration Lab\Cal 2016\LDCAL200_11126_M1.nmf

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

As received data.

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
99.180 ± 0.001 kPa	23.6 ± 1.0 °C	43.1 ± 2.0 %RH

Date of calibration: 4/4/2016
Date of issue: 4/5/2016

Supervisor : Valentin Buzduga
Measurements performed by:

Jeremy Gotwalt
Software version: 6.1T

Scantek, Inc.
6430 Dobbin Rd., Suite C, Columbia, MD 21045
Ph: 410-290-7726 eMail: callab@scantekinc.com

Test Report No.:35964

Manufacturer: Larson Davis
Type: CAL200
Serial no: 11126

Customer:	**Paul Carpenter Associates, Inc.**
Department:	
Address:	**23 Vreeland Road, Suite 204, Florham Park, NJ 07932**
Order No:	
Contact Person:	**Bryan Fuerte, Sharon Paul Carpenter**
Phone No.:	**973-822-8221 x21**
Fax No.:	**973-833-9221**

Measurement Results:

	Level: (dB)	P. Stab : (dB)	Frequency: (Hz)	F. Stab : (%)	Distortion: (% TD)
1:	113.72	0.01	1000.42	0.00	0.36
2:	113.73	0.02	1000.42	0.00	0.36
3:	113.73	0.01	1000.42	0.00	0.36
Result (Average):	**113.73**	**0.01**	**1000.42**	**0.00**	**0.36**
Expanded Uncertainty:	0.12	0.02	1.00	0.01	0.10
Degree of Freedom:	>100	>100	>100	>100	>100
Coverage Factor:	2.00	2.00	2.00	2.00	2.00

The stated levels are relative to 20µPa.

The stated level is valid at measurement conditions.
Reference microphone: 4192-2854675. Volume correction: 0.126 dB
Records:Z:\Calibration Lab\Cal 2016\LDCAL200_11126_M2.nmf

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

As received data

Environmental conditions:

Pressure:	Temperature:	Relative humidity:
99.180 ± 0.001 kPa	23.6 ± 1.0 °C	43.1 ± 2.0 %RH

Date of calibration: 4/4/2016
Date of issue: 4/5/2016

Supervisor : Valentin Buzduga
Measurements performed by:

Jeremy Gotwalt
Software version: 6.1T

Scantek, Inc.
6430 Dobbin Rd., Suite C, Columbia, MD 21045
Ph: 410-290-7726 eMail: callab@scantekinc.com

APPENDIX B
METEOROLOGICAL DATA

Hourly Obs

Month/Year: 05/2016
Station Location: LONG ISLAND MAC ARTHUR AIRPORT (04781)
Lat: 40.793
Lon: -73.101
Elev: 84 ft. above sea level

WBAN	Date	Time	StationTyp	SkyCondition	Sky Condition Flag	Visibility	DryBulb Farenheit	DryBulb Celsius	RelativeHuidity	Wind Speed	Wind Direction	Hourly Precip	Altimeter Flag	FilterOut?
4781	5/20/2016	0:56	12	CLR		9	48	8.9	86	0	0			
4781	5/20/2016	1:56	12	CLR		10	47	8.3	89	0	0			
4781	5/20/2016	2:56	12	CLR		9	47	8.3	89	0	0			
4781	5/20/2016	3:56	12	CLR		9	46	7.8	89	0	0			
4781	5/20/2016	4:56	12	FEW250		10	50	10	90	8	350			
4781	5/20/2016	5:56	12	BKN250		10	52	11.1	90	8	350			
4781	5/20/2016	6:56	12	BKN250		10	56	13.3	83	7	340			
4781	5/20/2016	7:56	12	BKN250		10	61	16.1	60	11	340			
4781	5/20/2016	8:56	12	BKN250		10	65	18.3	47	10	350			
4781	5/20/2016	9:56	12	BKN250		10	69	20.6	39	11	350			
4781	5/20/2016	10:56	12	FEW065 SCT250		10	70	21.1	36	7	340			
4781	5/20/2016	11:56	12	FEW065 FEW250		10	72	22.2	31	8	40			
4781	5/20/2016	12:56	12	FEW065 SCT250		10	74	23.3	31	0	0			
4781	5/20/2016	13:56	12	FEW065 BKN250		10	71	21.7	38	*18*	190			Y
4781	5/20/2016	14:56	12	FEW065 BKN250		10	71	21.7	34	13	210			
4781	5/20/2016	15:56	12	FEW070 BKN250		10	68	20	44	10	180			
4781	5/20/2016	16:56	12	FEW070 FEW210 BKI		10	66	18.9	45	9	190			
4781	5/20/2016	17:56	12	SCT220 BKN270		10	64	17.8	48	10	170			
4781	5/20/2016	18:56	12	FEW220 BKN280		10	61	16.1	56	7	180			
4781	5/20/2016	19:56	12	FEW220 BKN270		10	59	15	65	10	220			
4781	5/20/2016	20:56	12	BKN270		10	57	13.9	69	8	220			
4781	5/20/2016	21:56	12	SCT280		10	55	12.8	72	3	230			
4781	5/20/2016	22:56	12	BKN270		10	55	12.8	75	3	220			
4781	5/20/2016	23:56	12	CLR		10	55	12.8	75	0	0			
4781	5/21/2016	0:56	12	CLR		10	55	12.8	75	5	190			
4781	5/21/2016	1:56	12	CLR		10	52	11.1	80	0	0			
4781	5/21/2016	2:56	12	CLR		10	49	9.4	83	0	0			
4781	5/21/2016	3:56	12	CLR		10	48	8.9	86	3	360			
4781	5/21/2016	4:56	12	FEW170 BKN250		10	49	9.4	89	0	0			
4781	5/21/2016	5:56	12	SCT170 BKN250		10	54	12.2	86	0	0			
4781	5/21/2016	6:56	12	SCT160 BKN250		10	60	15.6	72	3	100			
4781	5/21/2016	7:56	12	BKN140 BKN250		10	62	16.7	63	3	130			
4781	5/21/2016	8:56	12	BKN130 OVC250		10	65	18.3	47	5	130			
4781	5/21/2016	9:56	12	BKN130 OVC250		10	62	16.7	65	8	120			
4781	5/21/2016	10:56	12	BKN120 OVC250		10	61	16.1	67	6	130			
4781	5/21/2016	11:56	12	BKN120 OVC250		10	60	15.6	62	13	130			
4781	5/21/2016	12:56	12	BKN120 OVC200		10	59	15	62	11	140			
4781	5/21/2016	13:56	12	BKN110 OVC200		10	61	16.1	50	10	130			
4781	5/21/2016	14:56	12	FEW065 BKN085 OV(		10	60	15.6	58	9	110			
4781	5/21/2016	15:56	12	FEW065 BKN085 OV(		10	57	13.9	78	6	110	*0.02*		Y
4781	5/21/2016	16:56	12	BKN070 OVC080		10	57	13.9	83	6	80 *T*			Y
4781	5/21/2016	17:56	12	BKN065 OVC080		10	58	14.4	84	6	80			
4781	5/21/2016	18:56	12	FEW040 BKN060 OV(		10	58	14.4	84	7	50			
4781	5/21/2016	19:54	12	FEW009 BKN028 OV(		10	57	14	90	9	40			
4781	5/21/2016	19:56	12	FEW009 BKN028 OV(		10	57	13.9	87	9	30			
4781	5/21/2016	20:17	12	BKN008 BKN028 OV(		7	57	13.9	87	8	50			
4781	5/21/2016	20:56	12	OVC008		8	56	13.3	87	8	30 *T*			Y
4781	5/21/2016	21:56	12	OVC008		8	56	13.3	90	8	20 *T*			Y
4781	5/21/2016	22:52	12	SCT008 BKN035 OV(		10	55	13	*96*	9	30			Y
4781	5/21/2016	22:56	12	SCT008 BKN035 OV(		10	56	13.3	90	8	40	*0.01*		Y
4781	5/21/2016	23:13	12	BKN012 OVC036		10	56	13.3	90	7	20			
4781	5/21/2016	23:33	12	FEW006 BKN012 OV(		10	56	13.3	90	7	30			
4781	5/21/2016	23:41	12	FEW010 BKN027 OV(		10	56	13.3	90	9	20			
4781	5/21/2016	23:52	12	FEW012 BKN032 OV(		10	55	13	90	9	20			
4781	5/21/2016	23:56	12	FEW011 BKN065 OV(		10	55	12.8	90	9	20			
4781	5/22/2016	0:04	12	SCT009 BKN060 OV(		10	55	12.8	90	10	20			
4781	5/22/2016	0:56	12	SCT008 BKN020 OV(		10	55	12.8	90	10	40			
4781	5/22/2016	1:03	12	BKN007 BKN020 OV(		10	55	12.8	90	13	30			
4781	5/22/2016	1:56	12	OVC006		10	55	12.8	90	13	30			
4781	5/22/2016	2:21	12	SCT006 OVC049		10	55	12.8	90	10	40			
4781	5/22/2016	2:56	12	BKN047 OVC070		10	55	12.8	90	8	360			
4781	5/22/2016	3:15	12	BKN010 OVC046		10	55	12.8	90	8	10			
4781	5/22/2016	3:56	12	BKN012 OVC039		10	55	12.8	83	10	360			
4781	5/22/2016	4:15	12	SCT012 BKN022 OV(		10	55	12.8	80	11	360			
4781	5/22/2016	4:33	12	FEW016 BKN030 OV(		10	55	12.8	77	8	360			
4781	5/22/2016	4:48	12	FEW018 BKN028 OV(		10	55	12.8	75	11	360			
4781	5/22/2016	4:56	12	SCT018 BKN028 OV(		10	55	12.8	77	10	10			
4781	5/22/2016	5:56	12	FEW018 SCT026 OV(		8	54	12.2	77	9	10 *T*			Y
4781	5/22/2016	6:51	12	SCT017 BKN027 OV(		6	54	12	80	8	350			
4781	5/22/2016	6:56	12	SCT017 BKN027 OV(		6	53	11.7	86	6	10	*0.03*		Y
4781	5/22/2016	7:56	12	OVC022		7	53	11.7	86	8	360	*0.04*		Y
4781	5/22/2016	8:51	12	BKN036 OVC049		8	54	12	86	7	20			
4781	5/22/2016	8:56	12	BKN036 OVC049		8	54	12.2	86	6	10	*0.01*		Y
4781	5/22/2016	9:56	12	BKN036 OVC055		10	58	14.4	81	6	30 *T*			Y
4781	5/22/2016	10:56	12	FEW015 BKN055 OV(		10	63	17.2	70	7	30			
4781	5/22/2016	11:56	12	SCT025 BKN055 BKN		10	66	18.9	61	11	20			
4781	5/22/2016	12:56	12	SCT030 BKN055 BKN		10	68	20	55	9	30			
4781	5/22/2016	13:56	12	SCT030 BKN055 BKN		10	69	20.6	49	9	80			
4781	5/22/2016	14:56	12	SCT049 BKN065 BKN		10	65	18.3	65	9	180			
4781	5/22/2016	15:56	12	FEW050 SCT070 BKN		10	63	17.2	70	7	190			
4781	5/22/2016	16:56	12	FEW050 BKN110 BKN		10	65	18.3	65	5	240			
4781	5/22/2016	17:56	12	FEW055 FEW110 SC		10	64	17.8	68	7	170			
4781	5/22/2016	18:56	12	FEW055 SCT120 BKN		10	60	15.6	75	8	170			
4781	5/22/2016	19:56	12	FEW060 BKN100 BKN		10	58	14.4	81	3	200			
4781	5/22/2016	20:56	12	FEW070 BKN100 BKN		10	58	14.4	81	7	180			
4781	5/22/2016	21:56	12	FEW110 BKN240		10	56	13.3	83	3	250			
4781	5/22/2016	22:56	12	FEW110 BKN220		10	54	12.2	86	0	0			
4781	5/22/2016	23:56	12	CLR		10	52	11.1	90	0	0			

Hourly Obs

Month/Year: 05/2016
Station Location: LONG ISLAND MAC ARTHUR AIRPORT (04781)
Lat: 40.793
Lon: -73.101
Elev: 84 ft. above sea level

WBAN	Date	Time	StationTyp	SkyCondition	Sky Condition Flag	Visibility	DryBulb Farenheit	DryBulb Celsius	RelativeHuidity	Wind Speed	Wind Direction	Hourly Precip	Altimeter Flag	FilterOut?
4781	5/23/2016	0:56	12	FEW065		10	51	10.6	93	0	0			
4781	5/23/2016	1:56	12	CLR		10	52	11.1	93	3	330			
4781	5/23/2016	2:56	12	CLR		10	51	10.6	93	0	0			
4781	5/23/2016	3:56	12	CLR		10	50	10	90	0	0			
4781	5/23/2016	4:56	12	FEW100 SCT250		10	52	11.1	90	8	350			
4781	5/23/2016	5:56	12	FEW090 BKN140		10	56	13.3	90	6	360			
4781	5/23/2016	6:56	12	FEW130 SCT250		10	58	14.4	84	6	140			
4781	5/23/2016	7:56	12	SCT150		10	64	17.8	70	3	330			
4781	5/23/2016	8:56	12	FEW045 FEW250		10	68	20	59	0	0			
4781	5/23/2016	9:56	12	FEW037 FEW250		10	69	20.6	57	5	VR			
4781	5/23/2016	10:56	12	FEW046 SCT250		10	69	20.6	51	11	170			
4781	5/23/2016	11:56	12	FEW050 SCT250		10	70	21.1	49	7	140			
4781	5/23/2016	12:56	12	FEW055 SCT250		10	71	21.7	46	8	180			
4781	5/23/2016	13:56	12	FEW055 FEW150 SC		10	70	21.1	46	9	180			
4781	5/23/2016	14:56	12	FEW055 FEW150 BK		10	70	21.1	42	11	160			
4781	5/23/2016	15:56	12	FEW055 SCT150 BK		10	68	20	41	14	150			
4781	5/23/2016	16:56	12	FEW055 SCT150 BK		10	68	20	44	8	160			
4781	5/23/2016	17:56	12	FEW055 FEW150 BK		10	67	19.4	44	8	140			
4781	5/23/2016	18:56	12	FEW050 BKN110 BK		10	65	18.3	47	5	210			
4781	5/23/2016	19:56	12	FEW050 BKN100 BK		10	64	17.8	52	3	200			
4781	5/23/2016	20:56	12	FEW050 BKN085 OV		10	64	17.8	50	6	180 T			Y
4781	5/23/2016	21:56	12	FEW050 BKN085 OV		10	62	16.7	63	5	110 T			Y
4781	5/23/2016	22:56	12	FEW050 OVC080		7	58	14.4	78	8	280	0.04		Y
4781	5/23/2016	23:56	12	OVC070		5	56	13.3	87	10	290	0.1		Y
4781	5/24/2016	0:56	12	OVC060		9	56	13.3	87	8	310	0.07		Y
4781	5/24/2016	1:56	12	OVC042		10	56	13.3	87	8	290	0.14		Y
4781	5/24/2016	2:56	12	OVC045		10	56	13.3	90	0	0 T			Y
4781	5/24/2016	3:56	12	BKN039 OVC050		10	57	13.9	90	10	330			
4781	5/24/2016	4:56	12	SCT049 BKN065 BKN		8	57	13.9	90	5	320	0.01		Y
4781	5/24/2016	5:54	12	BKN016 BKN029 OVC		10	57	14	90	6	360			
4781	5/24/2016	5:56	12	BKN016 BKN029 OVC		10	58	14.4	87	6	350	0.01		Y
4781	5/24/2016	6:54	12	FEW016 SCT024 OVC		7	57	14	93	7	310			
4781	5/24/2016	6:56	12	FEW016 SCT024 OVC		7	58	14.4	90	7	320 T			Y
4781	5/24/2016	7:41	12	SCT008 BKN031 OVC		5	58	14.4	90	7	340			
4781	5/24/2016	7:54	12	BKN007 OVC032		3	57	14	93	8	340			
4781	5/24/2016	7:56	12	BKN007 OVC032		3	58	14.4	93	8	340	0.02		Y
4781	5/24/2016	8:33	12	FEW005 OVC017		10	58	14.4	93	7	330			
4781	5/24/2016	8:56	12	FEW005 OVC020		10	59	15	90	7	310	0.02		Y
4781	5/24/2016	9:56	12	FEW005 OVC020		10	61	16.1	87	7	310			
4781	5/24/2016	10:36	12	FEW015 BKN030 BK		10	64	17.8	78	10	320			
4781	5/24/2016	10:56	12	FEW015 BKN030 BK		10	66	18.9	73	15	330			
4781	5/24/2016	11:56	12	SCT032 BKN070 BKN		10	65	18.3	70	9	320			
4781	5/24/2016	12:54	12	FEW015 BKN026 OVC		10	68	20	63	6	300			
4781	5/24/2016	12:56	12	FEW015 BKN026 OVC		10	68	20	66	10	300			
4781	5/24/2016	13:56	12	FEW015 BKN028 OVC		10	68	20	66	7	350 T			Y
4781	5/24/2016	14:16	12	FEW015 BKN027CB C		3	63	17.2	81	9	10			
4781	5/24/2016	14:39	12	SCT027CB BKN055 C		7	63	17.2	84	6	340			
4781	5/24/2016	14:56	12	FEW027 BKN055 BK		10	64	17.8	84	7	340	0.15		Y
4781	5/24/2016	15:56	12	FEW008 SCT027 OVC		4	63	17.2	84	10	360	0.01		Y
4781	5/24/2016	16:56	12	FEW005 FEW035 SC		10	64	17.8	84	5	10	0.07		Y
4781	5/24/2016	17:56	12	FEW009 SCT050 BK		10	64	17.8	87	0	0 T			Y
4781	5/24/2016	18:56	12	FEW009 SCT055 BK		10	63	17.2	87	5	260 T			Y
4781	5/24/2016	19:56	12	BKN065 OVC100		7	63	17.2	90	0	0	0.01		Y
4781	5/24/2016	20:56	12	SCT047 BKN075 OVC		9	62	16.7	90	3	VR	0.02		Y
4781	5/24/2016	21:56	12	SCT100 BKN120		10	61	16.1	90	0	0	0.01		Y
4781	5/24/2016	22:56	12	BKN110		8	59	15	97	0	0			Y
4781	5/24/2016	23:56	12	BKN100		10	59	15	93	5	250			
4781	5/25/2016	0:56	12	SCT120		7	58	14.4	97	0	0			Y
4781	5/25/2016	1:56	12	FEW120		4	57	13.9	96	0	0			Y
4781	5/25/2016	2:07	12	CLR		1.75	57	13.9	96	0	0			Y
4781	5/25/2016	2:17	12	BKN110		0.5	57	13.9	96	0	0			Y
4781	5/25/2016	2:27	12	BKN110		2	56	13.3	100	3	350			Y
4781	5/25/2016	2:34	12	BKN110		5	57	13.9	96	0	0			Y
4781	5/25/2016	2:56	12	CLR		3	57	13.9	96	0	0			Y
4781	5/25/2016	3:04	12	CLR		2.5	57	13.9	96	0	0			Y
4781	5/25/2016	3:21	12	CLR		0.75	56	13.3	96	0	0			Y
4781	5/25/2016	3:35	12	VV002		0.5	55	12.8	96	0	0			Y
4781	5/25/2016	3:56	12	VV002		0.75	54	12.2	100	0	0			Y
4781	5/25/2016	3:59	12	FEW002		1.25	55	12.8	96	0	0			Y
4781	5/25/2016	4:12	12	CLR		3	55	12.8	96	0	0			Y
4781	5/25/2016	4:41	12	CLR		2.5	54	12.2	100	0	0			Y
4781	5/25/2016	4:54	12	FEW100 FEW250		8	54	12	100	0	0			Y
4781	5/25/2016	4:56	12	FEW100 FEW250		7	54	12.2	96	0	0			Y
4781	5/25/2016	5:56	12	FEW250		7	59	15	93	3	250			
4781	5/25/2016	6:56	12	FEW250		10	63	17.2	81	6	240			
4781	5/25/2016	7:56	12	FEW250		10	70	21.1	64	6	260			
4781	5/25/2016	8:56	12	FEW250		10	76	24.4	42	9	300			
4781	5/25/2016	9:56	12	FEW250		10	80	26.7	37	5	300			
4781	5/25/2016	10:56	12	FEW250		10	84	28.9	31	8	280			
4781	5/25/2016	11:56	12	FEW250		10	82	27.8	38	11	200			
4781	5/25/2016	12:56	12	SCT250		10	84	28.9	34	13	220			
4781	5/25/2016	13:56	12	FEW250		10	85	29.4	32	10	260			
4781	5/25/2016	14:56	12	FEW250		10	84	28.9	32	15	230			
4781	5/25/2016	15:56	12	SCT250		10	83	28.3	31	14	220			
4781	5/25/2016	16:56	12	SCT250		10	78	25.6	39	11	230			
4781	5/25/2016	17:56	12	SCT250		10	76	24.4	42	11	220			
4781	5/25/2016	18:56	12	SCT250		10	73	22.8	43	10	220			
4781	5/25/2016	19:56	12	SCT250		10	69	20.6	55	5	230			

Hourly Obs

Month/Year: 05/2016
Station Location: LONG ISLAND MAC ARTHUR AIRPORT (04781)
Lat: 40.793
Lon: -73.101
Elev: 84 ft. above sea level

WBAN	Date	Time	StationTyp	SkyCondition	Sky Condition Flag	Visibility	DryBulb Farenheit	DryBulb Celsius	RelativeHuidity	Wind Speed	Wind Direction	Hourly Precip	Altimeter Flag	FilterOut?
4781	5/25/2016	20:56	12	FEW250		10	65	18.3	68	5	240			
4781	5/25/2016	21:56	12	FEW250		10	65	18.3	70	0	0			
4781	5/25/2016	22:56	12	FEW250		10	64	17.8	73	5	240			
4781	5/25/2016	23:56	12	CLR		10	65	18.3	70	0	0			
4781	5/26/2016	0:56	12	CLR		10	63	17.2	75	0	0			
4781	5/26/2016	1:56	12	CLR		10	63	17.2	73	3	230			
4781	5/26/2016	2:56	12	CLR		10	59	15	84	0	0			
4781	5/26/2016	3:56	12	CLR		10	60	15.6	81	0	0			
4781	5/26/2016	4:56	12	BKN250		10	61	16.1	78	0	0			
4781	5/26/2016	5:56	12	BKN250		10	64	17.8	81	0	0			
4781	5/26/2016	6:56	12	BKN250		10	71	21.7	64	5	230			
4781	5/26/2016	7:56	12	SCT250		10	76	24.4	50	0	0			
4781	5/26/2016	8:56	12	BKN250		10	80	26.7	49	5	160			
4781	5/26/2016	9:56	12	BKN250		10	81	27.2	41	6	VR			
4781	5/26/2016	10:56	12	FEW200 BKN250		10	82	27.8	38	10	190			
4781	5/26/2016	11:56	12	FEW150 FEW200 BKI		10	83	28.3	38	10	190			
4781	5/26/2016	12:56	12	FEW050 FEW150 FEV		10	83	28.3	38	10	180			
4781	5/26/2016	13:56	12	FEW060 FEW150 FEV		10	83	28.3	40	15	210			
4781	5/26/2016	14:56	12	FEW150 FEW200 OV		10	83	28.3	34	15	200			
4781	5/26/2016	15:56	12	FEW150 SCT200 OVC		10	81	27.2	37	14	200			
4781	5/26/2016	16:56	12	BKN250		10	78	25.6	40	13	230			
4781	5/26/2016	17:56	12	FEW150 BKN250		10	76	24.4	43	7	210			
4781	5/26/2016	18:56	12	FEW150 BKN250		10	73	22.8	50	8	210			
4781	5/26/2016	19:56	12	FEW140 BKN250		10	69	20.6	63	6	170			
4781	5/26/2016	20:56	12	BKN250		10	67	19.4	68	6	180			
4781	5/26/2016	21:56	12	SCT250		10	66	18.9	73	6	180			
4781	5/26/2016	22:56	12	SCT250		10	65	18.3	75	5	180			
4781	5/26/2016	23:56	12	CLR		8	64	17.8	81	6	180			
4781	5/27/2016	0:56	12	CLR		8	64	17.8	84	6	170			
4781	5/27/2016	1:56	12	CLR		9	63	17.2	87	5	170			
4781	5/27/2016	2:56	12	CLR		9	63	17.2	87	3	170			
4781	5/27/2016	3:56	12	CLR		8	61	16.1	90	3	110			
4781	5/27/2016	4:56	12	SCT150 SCT250		7	63	17.2	90	5	160			
4781	5/27/2016	5:56	12	FEW070 SCT150 SCT		8	65	18.3	87	6	160			
4781	5/27/2016	6:56	12	FEW065 BKN170 BKN		10	68	20	81	6	170			
4781	5/27/2016	7:56	12	FEW080 BKN170		10	71	21.7	73	7	160			
4781	5/27/2016	8:56	12	SCT120 BKN250		10	73	22.8	71	9	170			
4781	5/27/2016	9:56	12	FEW150 BKN250		10	76	24.4	67	9	190			
4781	5/27/2016	10:56	12	FEW100 FEW150 BKI		10	74	23.3	69	10	170			
4781	5/27/2016	11:56	12	FEW120 BKN250		10	73	22.8	71	9	170			
4781	5/27/2016	12:56	12	FEW050 FEW120 SCT		10	73	22.8	71	11	180			
4781	5/27/2016	13:56	12	FEW250		10	72	22.2	71	13	190			
4781	5/27/2016	14:56	12	FEW080 SCT250		10	71	21.7	71	14	180			

This page intentionally left blank.

APPENDIX B.7: NOISE TECHNICAL ANALYSIS

This page intentionally left blank.

Analysis of Construction Noise

The noise technical report provides the data and analyses used to determine the existing noise environment and conditions expected during construction of the Proposed Action and its alternatives.

Codes and Guidance

Code of the Town of Brookhaven

The Code of the Town of Brookhaven, Chapter 50 Noise Control, outlines maximum permissible sound levels by receiving property category, including residential, commercial, and industrial. These limits, discussed below, pertain to the levels at the lot line of the receiving property. Noise from construction activity is exempt from the above requirements, but is limited to the hours of 7:00 a.m. to 6:00 p.m. on weekdays.

Federal Highway Administration Transit Noise and Vibration Impact Assessment (May 2006) Guidance Document.

The Federal Transportation Administration's *Transit Noise and Vibration Impact Assessment* (May 2006) provides guidelines for the evaluation of noise from construction. While it is not the purpose of the FTA manual to specify standardized criteria for construction noise impact, the following guidelines can be considered reasonable criteria for assessment. If these criteria are exceeded, there may be adverse community reaction.

Study Area

The study area for the analysis of construction noise impacts encompasses the project area, including the residential areas through which the collection and conveyance systems would extend, the areas surrounding the pump stations and the area surrounding the Advanced Wastewater Treatment Facility (AWTF). Figure 1, included in the Attachments, depicts the study area for the Proposed Action, the location of the AWTF and pump station, and the two locations where monitoring was conducted to establish existing noise conditions.

Assumptions and Assessment Methodology

Noise Descriptors and Thresholds

Noise is typically defined as unwanted or undesirable sound. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time.

Sound pressure level (SPL) is used to measure the magnitude of sound and is expressed in decibels (dB or dBA), with the threshold of human hearing defined as 0 dBA. The SPL increases logarithmically, so that when the intensity of a sound is increased by a factor of 10, its SPL rises by 10 dB, while a 100-fold increase in the intensity of a sound increases the SPL by 20 dB.

Equivalent noise level (Leq) is the average of sound energy over time, so that one sound occurring for 2 minutes would have the same Leq of a sound twice as loud occurring for 1 minute. Maximum noise level (Lmax) is a measure of the maximum SPL.

The day night noise level (Ldn) is based on the Leq, and is used to measure the average sound impacts for the purpose of guidance for compatible land use. It weights the impact of sound as it is perceived at night against the impact of the same sound heard during the day. This is done by

adding 10 dBA to all noise levels measured between 10:00 pm and 7:00 am. For instance, the sound of a car on a rural highway may have an SPL of 50 dBA when *measured* from the front porch of a house. If the measurement were taken at night, a value of 60 dBA would be recorded and incorporated into the 24-hour Ldn.

Leq and Ldn are useful measures when used to determine levels of constant or regular sounds (such as road traffic or noise from a ventilation system). However, neither represents the sound level as it is perceived during discrete events, such as fire sirens and other impulse noises. They are averages that express the equivalent SPL over a given period of time. Because the decibel scale is logarithmic, louder sounds (higher SPL) are weighted more heavily; however, loud infrequent noises (such as fire sirens) with short durations would not significantly increase Leq or Ldn over the course of a day.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies, from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the "A-weighting system" is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called A-weighted sound levels, and are expressed in decibel notation as dBA. Throughout this section, all sound levels are expressed with dBA weighting. Examples of A-weighted sound pressure levels are presented in Table 1.

Table 1 Examples of Common Sounds: A-weighted Sound Level in Decibels (dBA)

A-weighted	Overall Level	Noise Environment
120	Uncomfortably loud (32 times as loud as 70 dBA)	Military jet airplane takeoff at 50 feet.
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet. Locomotive pass-by at 100 feet.
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet. Diesel truck 40 mph at 50 feet.
70	Moderately loud	Freeway at 50 feet from pavement edge at 10 a.m. Vacuum cleaner (indoor).
60	Relatively quiet (1/2 as loud as 70 dBA)	Air condition unit at 100 feet. Dish washer at 10 feet (indoor).
50	Quiet (1/4 as loud as 70 dBA)	Large transformers. Small private office (indoor).
40	Very quiet (1/8 as loud as 70 dBA)	Birds calls. Lowest limit of urban ambient sound.
10	Extremely quiet	Just audible (1/64 as loud as 70 dBA)
0		Threshold of hearing.

Source: Federal Agency Review of Selected Airport Noise Analysis Issues, 1992.

The noise impact criteria for construction of the project are based on the Federal Highway Administration (FTA's) *Transit Noise and Vibration Impact Assessment* (May 2006) guidance document. The noise limits established by the Town of Brookhaven Noise Code would be

applicable for assessing the operational effects of the proposed action and its alternatives. Because the Noise Code does not provide quantitative construction noise thresholds, FTA guidelines would be applicable for the evaluation of construction noise impacts. The FTA's *Transit Noise and Vibration Impact Assessment* (May 2006) provides guidelines for the evaluation of noise from construction.

Local Noise Code

The Town of Brookhaven Noise Code noise thresholds are provided in Table 2.

Table 2: Town of Brookhaven Noise Code Criteria

Sound Source Property Category	Residential Receiving Property* 7:00 a.m. to 10:00 p.m. (Lmax dBA)	Residential Receiving Property* 10:00 p.m. to 7:00 a.m. (Lmax dBA)	Commercial Receiving Property* All Times (Lmax dBA)	Industrial Receiving Property* All Times (Lmax dBA)
Residential	55	50	65	75
Commercial, Public Lands or Rights-of-Way	65	50	65	75
Industrial	65	50	65	75

Source: Town of Brookhaven, NY. Chapter 50: Noise Control. http://ecode360.com/8593708. Accessed February 2016.
*Noise level at the lot line of receiving property.

Construction Impact Criteria

To account for a worst case condition, for the evaluation of construction-related noise impacts it is assumed that the modeled noise levels over the 8-hour work day (8-hour Leq dBA) are the same as the peak noise identified in Tables 3 and 4, below. For such a condition, FTA suggests that for residential receptors (and receptors of similar sensitivity), an 8-hour Leq dBA exceeding 80 may be considered an adverse impact.

Construction Noise Methodology

Typical noise emission levels from construction equipment were derived from the FHWA Roadway Construction Noise Model (RCNM), and construction noise levels were modeled with the RCNM. The model calculates noise by using empirical data for noise generated by construction equipment, mathematical formulae relating noise attenuation with distance and information regarding the percentage of time that a certain piece of equipment is expected to be operated at maximum power while on site during construction – the Acoustical Usage Factor. The results of the noise model were used as a basis to evaluate potential construction-related noise impacts at receptor locations in the vicinity of the proposed action and its alternatives.

Existing Noise Levels

Existing noise levels were established by monitoring noise levels at two representative locations as shown in Figure 1 (see Attachments). Monitoring Location 1 (ML 1) is near the proposed AWTF, within park land uses and near residential land uses. Monitoring Location 2 (ML 2) is located near a residential area typical of the location of the pump stations, on a vacant and wooded

lot at the east end of the Jay Street cul-de-sac, adjacent to backyards along Babylon Street. This site is representative of single-family residential dwellings and the proposed location of a Phase II pump station, just north of Second Neck Creek. The site is also adjacent to the Poospatuck Reservation.

Long-term background noise level data within the study area were compiled to identify existing ambient noise levels during both weekday and weekend periods. Several metrics were documented, including the Leq (energy noise level average), Lmax (maximum noise level), Lmin (minimum noise level) and L90 (noise levels exceeded 90% of the time) and logged every 10 minutes. Monitoring equipment included Larson Davis Model 831 (Type 1) and Rion NL-52 (Type 1) sound level meters. Field calibration was performed utilizing a Larson Davis Model CAL200 calibrator. **Appendix A.6** includes all monitoring data and equipment calibration certificates. Monitoring commenced on Friday, May 20, 2016, and ended on Friday, May 27, 2016.

Sensitive noise receptors that could be affected by the proposed action and its alternatives include residences, parks, and places of worship, schools and libraries, among others. Sensitive receptors in the vicinity of the AWTF include residences north of Sunrise Highway and west of Pinelawn Avenue, residences north of the highway and east of Winters Drive, and users of Ziegler Park (see Figure 1). Pump stations would be developed at 12 locations throughout the project area, including those located in residential neighborhoods. Figure 1 illustrates the locations of the AWTF, the pump stations and the sensitive land uses in the study area.

The existing noise environment at ML-1, in the vicinity of the proposed AWTF, is characterized by highway noise from the adjacent Sunrise Highway and the service road to the highway. The existing noise environment at ML-2 is typical of a quiet residential neighborhood with slow and infrequent traffic on residential streets. The results of the existing conditions noise monitoring are compared with noise levels permitted by the Town of Brookhaven Noise Code are presented in Table 3 and Table 4. At ML 1, existing noise levels exceed the levels permitted by the Noise Code during the daytime and nighttime on weekdays, and exceed slightly daytime levels no the weekend. At ML 2, noise levels are within permitted levels.

Table 3: Existing Weekday Noise Levels

Monitoring Location	Daytime Noise Level Leq(h) (dBA)	Nighttime Noise Level Leq(h) (dBA)	Daytime/Nighttime Permitted Residential Noise Levels – Leq(h) (dBA)
ML 1	58.2	54.5	55/50
ML 2	50.5	45.5	55/50

Table 4: Existing Weekend Noise Levels

Monitoring Location	Daytime Noise Level Leq(h) (dBA)	Nighttime Noise Level Leq(h) (dBA)	Daytime/Nighttime Permitted Residential Noise Levels – Leq(h) (dBA)
ML 1	56.4	48.8	55/50
ML 2	49.5	40.3	55/50

Potential Impacts and Proposed Mitigation

No Action Condition

The no-action alternative would not involve construction; therefore, there would be no short-term impacts from noise. In addition, pump stations and a waste water treatment plant would not be operated; therefore, there would be no long-term impacts from noise.

Alternative 2: Proposed Action: Centralized Treatment – Low Pressure and Gravity Sewer Collection System with Membrane Bioreactor (MBR) or Sequencing Batch Reactor (SBR) Facility

The Proposed Action would involve construction activity, the operation of construction equipment, delivery of excavate and construction materials using trucks, and transportation of workers, all of which could contribute to an increase in noise levels.

For each of the project components (collection and conveyance systems, pump stations, and AWTF and leaching pools), the assessment is divided into the evaluation of stationary source construction impacts and mobile source construction impacts.

Construction Conditions – Stationary Source Emissions

Expected noise levels generated by construction activities were evaluated for different construction tasks. The construction tasks evaluated included the following:

- excavation for collection and conveyance systems,
- installation of collection and conveyance systems,
- excavation for the pump stations,
- pump station foundation and concrete work,
- pump station structures and equipment installation,
- AWTF and leaching pool excavation,
- AWTF foundations and concrete work,
- AWTF structures and equipment installation.

Construction equipment required for these tasks, and noise levels for each piece of equipment at a distance of 50 feet, is provided in Table 5, below.

Table 5: Construction Equipment Noise Levels

Construction Equipment	Noise Level at 50 feet (dBA)	Construction Equipment	Noise Level at 50 feet (dBA)
Excavator	80.7	Front End Loader	79.1
Backhoe	77.6	Lift	74.7
Compressors	77.7	Roller	80.0
Jackhammers	88.9	Flat Bed Truck	74.3
Cherry Picker*	81.0	Concrete Truck	78.8
Concrete Pumper	81.4	Grader	85.0
Bulldozer	81.7	Mobile Crane	80.6
Dump Truck	76.5	Generator	80.6

Source: FHWA Roadway Construction Noise Model, except
*: U.S. Department of Energy, Waste Isolation Pilot Plant, DEIS

For each of these tasks, equipment expected for the construction activity was placed around the construction site at a distance from a receptor representing a reasonable worst case condition. For each of the construction tasks identified above, the following sections describe the modeling scenario, including the equipment used in the task and the distance from a representative receptor. The modeled noise level is indicated in the last row of the table. In some cases, trees, vegetation and topography may reduce the noise levels indicated below. However, in order to consider the reasonable worst case, no credit for these noise mitigating features was applied to the model regarding the construction of the collection and conveyance systems and the pump stations.

Collection and Conveyance Systems

These systems would be installed along roadways in the study area, adjacent to residences and receptors with similar sensitivity to noise impacts. The RCNM noise model was populated with equipment at a distance from receptors as indicated in Table 6, below. The total noise level at the receptor closest to the construction activity, considering all construction equipment operating at the construction site, is indicated in the table. (Attachment 1 provides the results of the RCNM.)

For the collection and conveyance systems, it is expected that work would proceed at a rate of one block every two weeks, at a minimum. For the modeling effort, one week was allocated for excavation and one week for sewer pipeline installation.

Table 6: Conveyance System Construction Noise Levels

Week One: Excavation		Week Two: Installation	
Equipment Type	Distance to Receptor	Equipment Type	Distance to Receptor
Excavator	50 feet	2 Front End Loaders	50 & 100 feet
Backhoe	60 feet	2 Backhoes	60 & 120 feet
2 Compressors	60 & 120 feet	2 Forklifts	50 & 100 feet
2 Jackhammers	60 & 120 feet	2 Compressors	60 & 120 feet
		1 Roller	75 feet
		2 Flatbed Trucks	70 & 130 feet
Noise Level at Closest Receptor (Excavation)	83.4 dBA	Noise Level at Closest Receptor (Installation)	80.2 dBA

Collection and Conveyance Systems Impacts

Noise generated during certain periods of construction of the collection and conveyance systems would be greater than existing ambient levels. Using the measurements of ambient noise levels at ML 2 as representative of levels in the residential neighborhoods south of Montauk Highway, the difference between existing conditions at the receptors closest to the construction activity and the worst case construction conditions would range between 32.9 dBA during excavation for the collection and conveyance systems and 29.6 dBA for construction of the systems (Table 7).

Table 7: Collection and Conveyance System Construction Noise Impacts

	Construction Noise Levels	Monitored Ambient	Increase over Existing	Increase over FTA Construction Criteria
Excavation	**83.4 dBA**	**50.5 dBA**	**32.9 dBA**	**3.4 dBA**
Construction	**80.1 dBA**	**50.5 dBA**	**29.6 dBA**	**0.1 dBA**

Although noise levels would be substantially higher than ambient conditions during excavation and construction of the collection and conveyance systems, the levels would be only slightly over the FTA suggested impact criteria. Additionally, the work on these systems would take a maximum of two weeks per block, and construction activity in front of any one house (or other receptor) would be far shorter than two weeks. No nighttime construction would occur.

Pump Stations

Pump stations would be constructed along Montauk Highway and in the residential neighborhoods west of Forge River. Noise receptors in these areas are similar to those found in the vicinity of the proposed collection and conveyance systems – residential receptors and receptors similarly sensitive to noise.

For the purposes of noise modeling, construction of each pump station was divided into three stages: excavation, concrete foundation work, and facility construction. For each stage, the RCNM noise model was populated with equipment at a distance from receptors as indicated in Table 8, below. The total noise level at the receptor closest to the construction activity, considering all construction equipment operating at the construction site, is indicated in the table.

For the pump stations, it is expected that excavation work would occur for approximately one week, followed by concrete foundation work, and facility construction and equipment installation. Construction of each pump station, including installation of equipment, would take approximately one month. For the modeling effort, all equipment expected to be on the construction site was in operation, resulting in noise levels identified in Table 8. Because it is unlikely that all the construction equipment listed below would be in operation concurrently, actual noise levels would likely be lower.

Table 8: Pump Station Construction Noise Levels

Excavation		Concrete Foundations		Facility Construction	
Equipment Type	Distance to Receptor	Equipment Type	Distance to Receptor	Equipment Type	Distance to Receptor
Excavator	50 feet	2 Cherry Pickers	60 and 80 feet	Front End Loader	50 feet
2 Backhoes	60 and 90 feet	Concrete Truck	70 feet	Backhoe	60 feet
Jackhammer	50 feet	2 Compressors	50 and 80 feet	Lift	50 feet
2 Compressors	50 and 80 feet	Front End Loader	50 feet	2 Compressors	60 and 80 feet
Front End Loader	70 feet	Backhoe	70 feet	Grader	75 feet
				Flatbed Truck	75 feet
				Roller	50 feet
				Cherry Picker	80 feet
Noise Level at Closest Receptor (Excavation)	84.1 dBA	Noise Level at Closest Receptor (Concrete)	79.9 dBA	Noise Level at Closest Receptor (Facility Construction)	82.2 dBA

Pump Station Impacts

As shown above and in Table 9, noise generated during certain periods of construction of the pump stations would be substantially greater than existing ambient levels and slightly higher than FTA impact criteria. Using the measurements of ambient noise levels at ML 2 as representative of levels in the residential neighborhoods south of Montauk Highway, the difference between existing conditions at the receptors closest to the construction activity and the worst case construction conditions would range between 29.4 dBA during concrete foundation work and 33.6 dBA during excavation for the stations. However, noise levels generated during excavation would only occur for approximately one week, while noise levels during the remaining construction duration would be somewhat lower.

Table 9: Pump Station Construction Noise Impacts

	Construction Noise Levels	Monitored Ambient	Increase Over Existing	Increase over FTA Construction Criteria
Excavation	**84.1 dBA**	**50.5 dBA**	**33.6 dBA**	**4.1 dBA**
Concrete	**79.9 dBA**	**50.5 dBA**	**29.4 dBA**	**-**
Facility construction	**82.2 dBA**	**50.5 dBA**	**31.7 dBA**	**2.2 dBA**

AWTF and Leaching Pool Development

The AWTF and the leaching pools would be constructed north of Sunrise Highway and east of Maple Avenue. Receptors in the vicinity include the residential neighborhoods west of Maple Avenue and the recreational fields directly north of the construction site. Noise receptors in these areas are similar to those found in the vicinity of the collection and conveyance systems and pump stations – residential receptors and receptors similarly sensitive to noise.

For the purposes of noise modeling, construction of the AWTF and leaching pools was divided into three stages: excavation, concrete foundation work, and facility construction. For each stage, the RCNM noise model was populated with equipment at a distance from receptors as indicated in the table below. The total noise level at the receptor closest to the construction activity, considering all construction equipment operating at the construction site, is indicated in the table.

For the AWTF and leaching pools, it is expected that excavation work would occur for approximately one year, followed by concrete foundation work and construction of the facility, with a duration of two years for Phases I and II and one additional year for Phase III. For the modeling effort, all equipment expected to be on the construction site was in operation, resulting in noise levels identified in Table 10. A buffer of trees and vegetation lies between the construction site and the residential and recreational receptors. According to the Federal Highways Administration, an approximately 100-foot-wide vegetated buffer including trees can reduce noise levels by 5 dB. For the modeling of noise generated by the AWTF and leaching pool construction, it was assumed that the construction site would extend from approximately 150 feet to approximately 1,000 feet east of the residences on Maple Avenue, and from approximately 150 feet to 500 feet south of the recreational fields. A 5 dB reduction in construction noise levels was applied to the model to account for the vegetated buffer.

Table 10: AWTF Construction Noise Levels

Excavation		Concrete Foundations		Facility Construction	
Equipment Type	Distance to Receptor	Equipment Type	Distance to Receptor	Equipment Type	Distance to Receptor
2 Excavators	180 and 300 feet	2 Cherry Pickers	200 and 220 feet	2 Front End Loader	200 and 220 feet
2 Dozers	180 and 300 feet	4 Compressors	180, 200, 250 and 300 feet	2 Backhoes	180 and 300 feet
2 Front End Loaders	180 and 300 feet	2 Front End Loaders	200 and 220 feet	Lift	200 feet
2 Dump Trucks	180 and 300 feet	2 Backhoes	180 and 300 feet	4 Compressors	180, 200, 250 and 300 feet
2 Compressors	200 and 220 feet	2 Concrete Trucks	180 and 300 feet	Grader	200 feet
2 Jackhammers	200 and 220 feet	2 Concrete Pump Trucks	180 and 300 feet	Flatbed Truck	
Scraper	180 feet			Roller	220 feet
Roller	220 feet			2 Cherry Pickers	220 and 300 feet
				Crane	180 feet
Noise Level at Closest Receptor (Excavation)	71.5 dBA	Noise Level at Closest Receptor (Concrete)	68.7 dBA	Noise Level at Closest Receptor (Facility Construction)	69.2 dBA

AWTF and Leach Field Construction Impacts

As shown above and in Table 11, noise generated during certain periods of construction of the AWTF and leaching pools would be greater than existing ambient levels. Using the measurements of ambient noise levels at ML 1 as representative of levels in the residential neighborhoods west of Maple Avenue, the difference between existing conditions at the receptors closest to the construction activity and the worst case construction conditions would range between 13.3 dBA

for excavation of the AWTF and leaching pools, and 10.5 dBA during concrete pours for the facility.

During periods when excavation for the AWTF and leaching pools would occur near the western and northern edges of the construction site, noise levels would exceed ambient levels by up to 13.3 dBA. While excavation of the entire site would take approximately one year, excavation close to the receptors west of Maple Avenue and excavation in the vicinity of the recreational fields would only take a fraction of that time.

Table 11: AWTF and Leach Field Construction Noise Impacts

	Construction Noise Levels	Monitored Ambient	Increase over Existing	Increase over FTA Construction Criteria
Excavation	**71.5 dBA**	**58.2 dBA**	**13.3 dBA**	**-**
Concrete	**68.7 dBA**	**58.2 dBA**	**10.5 dBA**	**-**
Facility construction	**69.2 dBA**	**58.2 dBA**	**11.0 dBA**	**-**

For construction of the collection and conveyance systems, pump stations, AWTF, and leaching pools, construction noise was calculated for a worst case condition—when all construction equipment on the site would be operating concurrently. The amount of time under this worst case condition would be much shorter than the total construction duration. Furthermore, construction work would be conducted between the hours 7:00 a.m. and 6:00 p.m., when the municipal noise code exempts construction from prohibited activities.

Construction Conditions – Mobile Source Emissions

A significant increase in traffic due to construction activities could increase noise experienced at receptors proximate to the highways where construction activity occurs, or on highways where construction materials deliveries trucks travel.

According to the Federal Highways Administration, provided the vehicle mix remains constant, a doubling of traffic would increase traffic noise by approximately 3 dB, a barely perceptible change in relative loudness. A screening of the increase of traffic due to project construction was conducted to identify locations where such an increase would generate perceptible increases in noise levels.

To account for conditions where the vehicle mix would change, as expected in the case of the proposed project, the City Environmental Quality Review Technical Manual suggests the use of “noise passenger car equivalents”, where the noise generated by a medium truck is equivalent to the noise generated by 13 cars, the noise generated by a bus is equivalent to the noise generated by 18 cars, and the noise generated by a heavy truck is equivalent to the noise generated by 47 cars.

Collection and Conveyance Systems

Materials delivery for construction of the collection and conveyance systems would require delivery of sand to line the trench in which the sewer pipeline would be placed, and delivery of the sewer pipes, fittings and other supplies. For construction of the collection and conveyance

systems, the locations with the least existing traffic were assumed to be the most susceptible to an increase in construction-related traffic noise. For example, Southhaven Avenue west of Mastic Road would exemplify a neighborhood in the study area with low traffic volumes. According to traffic counts conducted for the proposed project, a.m. traffic volumes on a Tuesday in June 2016 identified 90 passenger car equivalents over the three hours starting at 6:30. For the three hours from 4:00 p.m. to 7:00 p.m., 92 noise passenger car equivalents (noise PCEs) were identified. (Worksheets providing traffic data are provided in Attachment 1.)

It is assumed that teams of five workers would be required for construction of the conveyance systems. It is further assumed that one sand delivery truck trip would occur in the morning and one in the afternoon each day (approximately 10 truck trips would be required to deliver sand over the course of 2 weeks), and delivery of pipe and other supplies would amount to 2 truck trips per day – one in the morning and one in the evening. This would amount to 65 PCEs in the morning and 65 PCEs in the afternoon (five worker trips, one sand delivery with a heavy truck, and one medium truck delivery of materials). As such, material delivery trips and worker trips would not double noise PCEs or result in 3 dBA or greater increase in traffic noise over existing conditions on the least traveled roadways in the study area during the peak traffic period. During off-peak traffic periods, the addition of project-related construction traffic may result in a doubling of noise PCEs, and thus elevate ambient noise levels by 3 dBA or more.

Pump Stations

For construction of the pump stations, the locations with the least existing traffic were assumed to be the most susceptible to an increase in construction-related traffic noise. For example, Southhaven Avenue west of Mastic Road would exemplify a neighborhood in the study area with low traffic volumes. According to traffic counts conducted for the proposed project, a.m. traffic volumes on a Tuesday in June 2016 identified 90 noise PCEs over the three hours starting at 6:30. For the three hours from 4:00 p.m. to 7:00 p.m., 92 noise PCEs were identified.

It is assumed that teams of five workers would be required for construction of each pump station. During excavation for the pump stations, there would be a brief period where several dump truck trips would be required for the removal of excavate. This would be followed by trips for delivery of concrete and construction supplies. It is expected that workers would arrive at the construction site prior to the beginning of the shift and leave at the end of the shift, and therefore, worker trips and delivery trips would not occur at the same time. For the worst case condition, it is assumed that three heavy trucks would be travel this segment of the roadway during the peak of excavation, and three cement mixer trucks would travel this segment during the peak concrete foundation work. This would result in 154 noise PCEs for construction activity and 246 noise PCEs when added to the existing traffic – more than doubling peak hour traffic. This condition would only occur for a couple of days, during peak excavation and peak concrete foundation work. At other times, worker trips and materials delivery trips are not expected to double existing noise PCEs during the peak traffic period.

AWTF and Leaching Pools

The AWTF and leaching pools would be constructed north of Sunrise Highway and east of Maple Avenue. Trucks hauling excavate and delivering concrete and supplies would likely travel along Sunrise Highway, exit at William Floyd Parkway and reach the site via Sunrise Service Road North. It is expected that the greatest trucking activity would occur during excavation for the

AWTF and leach pools, and during concrete pours for the AWTF buildings. In both cases, it is further expected that workers would arrive before the start of the 7:00 a.m. work shift, and leave after the shift. The worker trips, therefore, would not coincide with excavate and construction materials deliveries.

During excavation, it is estimated that 36 truck trips (one way) would travel the route in the a.m. peak (7:00 to 8:00 a.m.). During concrete pours for the AWTF, it is estimated that 75 one-way truck trips would travel the route in the a.m. peak.

During the peak excavate hauling hour (7:00 to 8:00 a.m.) traffic counts along Sunrise Service Road North west of Maple Avenue indicate 930 noise PCEs. The addition of 36 dump truck trips, in terms of PCEs, would generate 1,692 noise PCEs.

During the peak period of concrete work, when large amounts of concrete must be supplied continuously, it is estimated that approximately 38 concrete trucks would enter the site, resulting in 76 truck trips (one trip in, one trip out). The addition of 76 truck trips would generate 3,572 PCEs. However, due to the nature of this type of construction, long periods of construction involving the preparation of concrete forms, installation of reinforcement bars and other preparation activities are required prior to pouring the concrete. When this has been accomplished, concrete is delivered and pumped into the forms. As such, the increase in traffic due to concrete deliver would only occur for 8 or 10 days, followed by another period of preparation work.

Mitigation

Mitigation measures to reduce noise impacts, in addition to applicable local regulations, have been identified for implementation at the treatment plant sites.

The following measures would be implemented for construction of the collection conveyance systems, pump stations and AWTF.

- All construction equipment would be required to be equipped with well-maintained mufflers and other sound control devices equal to or better performing than those originally supplied by the manufacturer.
- Noisy portable equipment, such as generators and compressors, would be located as far away from residential receptors as practical and muffled within enclosures.
- Equipment would not be allowed to idle for long periods of time; equipment not being used would be shut off.
- Construction haul routes would be designated to minimize impacts on residential receptors.
- Specific noise level limits would be specified in construction contract documents for certain construction equipment, such as internal combustion engine-powered generators, compressors, excavators, loaders, and graders.
- Any construction activities required outside of exempt daytime hours can only be conducted under an exemption permit or variance. If an exemption permit or variance is granted for night-time construction activities, the noise level limits for residential land use during night-time hours will be applied.

Alternative 3: On-site Treatment and Disposal – Replacing Existing On-Site Wastewater Treatment and Disposal Systems (OSWS) with Innovative/Advanced On-Site Wastewater Treatment and Disposal Systems (I/A OSWS)

Under Alternative 3, no noise due to the proposed project would be experienced by the residential receptors west of Maple Avenue and north of Sunrise Highway, and users of recreational facilties southeast of the airport and north of Sunrise Highway. Alternative 3 would not generate noise associated with the installation of sewage lines, including construction equipment and materials deliveries, along roadways in the neighborhoods south of Sunrise Highway.

However, noise generated during the removal of old OSWS, and excavation and installation of new I/A OSWS at each of the approximately 3,500 parcels in the project area would impact the property subject to the I/A OSWS installation (subject property), and properties in the vicinity.

Stationary Construction Impacts

For the evaluation of noise for Alternative 3, several assumptions were made:

- equipment required would include a heavy truck (for disposal of the old OSWS and any excavate, and later, to deliver the new I/A OSWS), a backhoe, and other construction equipment:
- the I/A OSWS would be installed on the subject property, approximately 15 feet from the residence or structure;
- construction at each property would take approximately two weeks;
- ambient noise at each property is represented by the monitored noise levels at ML 2 (50.4 dBA).

For the subject property, the RCNM was populated with the indicated equipment at a distance ranging from 15 feet to 20 feet. For the adjoining properties, equipment was placed at a distance ranging from 30 to 50 feet, and for properties further from the subject property, equipment was placed at a distance ranging from 100 to 120 feet.

Results of the RCNM indicate noise levels presented in Table 12.

Table 12: I/A OSWS Construction Noise Impacts

	Construction Noise Levels	Monitored Ambient	Increase over Existing	Increase over FTA Construction Criteria
Subject Property	92.4 dBA	50.4 dBA	42.0 dBA	2.4 dBA
Property Adjacent	85.0 dBA	50.4 dBA	34.6 dBA	-
Further Properties	75.8 dBA	50.4 dBA	25.4 dBA	-

As shown in the table, significant noise impacts would be expected during construction work for the I/A OSWS installation. At times during the two-week construction period at any one property, noise levels could reach 92 dBA or higher. Properties in the vicinity could reach 84 dBA.

Mobile Impacts

As noted earlier, a doubling of traffic, in terms of noise PCEs, would generate an approximately 3 dBA increase in traffic noise. Due to the expected project generated traffic is expected to consist of two or four heavy truck trips over the course of the two week construction duration at each property, and the addition of several daily worker trips, traffic, in terms of noise PCEs, is not expected to double.

Alternative 3 Impacts

Implementation of Alternative 3 would generate Moderate Adverse noise impacts to receptors on approximately 3,600 properties within the study area. Although the impact experienced at the subject property and the adjacent property would, at times, exceed the FTA 8-hour Leq (dBA) impact criteria, the construction duration is relatively short – approximately two weeks. These impacts would be short-term and temporary.

This page intentionally left blank.

APPENDIX B.8: AMBIENT AIR QUALITY STANDARDS

This page intentionally left blank.

The Clean Air Act (CAA) and its amendments led to the creation of National Ambient Air Quality Standards (NAAQS) by the U.S. Environmental Protection Agency (EPA) for six criteria air pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), and lead. There are two types of NAAQS—primary standards and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.[1] Table 1 summarizes the primary and secondary NAAQS for the criteria pollutants. The six criteria pollutants are briefly described below, including a brief discussion of the relevance of each pollutant to the emissions sources involved with the Proposed Project.

Carbon monoxide. CO is a colorless, odorless gas emitted from combustion processes, including engine exhaust. Elevated CO concentrations can cause adverse health impacts by reducing oxygen delivery to vital organs. Very high concentrations can cause death.[2] CO is primarily a consideration in the vicinity of congested intersections with very high traffic volumes.

Lead. Lead is a toxic heavy metal that can have numerous adverse health impacts, including neurological damage to children and cardiovascular effects in adults.[3] Lead emissions can contribute to exposure through the air directly or indirectly by causing soil/water contamination. Prior to the phase out of leaded gasoline, automobiles were a source of lead emissions. According to the EPA, the major sources of lead emissions to the air today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline.[4] The Proposed Project does not involve lead emissions.

Nitrogen dioxide. NO_2 is one of a group of reactive gases called nitrogen oxides or NO_x. NO_2 forms small particles that penetrate deep in the lungs, and can cause or worsen existing respiratory system problems such as asthma, emphysema, or bronchitis. NO_2 emission sources associated with the Proposed Project include autos and trucks, construction equipment, and natural gas boilers, among others. NO_x are also a precursor to the formation of ozone.[5]

Ozone. Ground-level O_3 is an important component of smog and is formed through reactions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. Sources of NO_x and VOC emissions include both mobile and stationary sources. Health effects of O_3 exposure include respiratory irritation, reduced lung function, worsening of diseases such as asthma. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to O_3. Elevated O_3 can also impact sensitive vegetation.[6] O_3 formation is a regional air quality concern; therefore the potential impacts in terms of O_3 formation are addressed by quantifying the contribution of the Project to precursor emissions rather than predicting project-specific O_3 concentrations.

Particulate matter. PM is a broad class of air pollutants that exist as liquid droplets or solids, with a wide range of size and chemical composition. Smaller particulates that are smaller than or equal to 10 and 2.5 microns in size (PM_{10} and $PM_{2.5}$) are of particular health concern because they can get deep into the lungs and affect respiratory and heart function. Particulates can also impact visibility; damage soil, plants, and water quality; and stain stone

materials.[7] PM emissions are primarily a concern for heavy-duty trucks and other equipment with diesel engines, although PM emissions also occur from gasoline and natural gas combustion.

Sulfur dioxide. SO_2 is part of a group of reactive gases called oxides of sulfur. Health effects of SO_2 exposure include adverse respiratory effects, such as increased asthma symptoms.[8] The largest sources of SO_2 emissions nationally are from fossil fuel combustion at power plants/industrial facilities, electrical utilities, and residential/commercial boilers. Mobile sources are not a significant source of SO_2 emissions.[9]

Table 1. National Ambient Air Quality Standards[10]

Pollutant	Primary / Secondary		Averaging Time	Level	Form
Carbon Monoxide	primary		8-hour	9 ppm	not to be exceeded more than once per year
			1-hour	35 ppm	
Lead	primary and secondary		Rolling 3-month average	0.15 μg/m³	not to be exceeded
Nitrogen Dioxide	primary		1-hour	100 ppb	98th percentile, averaged over 3 years
	primary and secondary		Annual	53 ppb	annual mean
Ozone	primary and secondary		8-hour	0.070 ppm	annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate matter	$PM_{2.5}$	primary	Annual	12 μg/m³	annual mean, averaged over 3 years
		secondary	Annual	15 μg/m³	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 μg/m³	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 μg/m³	not to be exceeded more than once per year on average over 3 years
Sulfur dioxide	primary		1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary		3-hour	0.5 ppm	not to be exceeded more than once per year

The NAAQS for CO, annual NO2, and SO2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only.

Federal ambient air quality standards do not exist for HAP's; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain non-criteria compounds, including non-methane hydrocarbons, fluorides, beryllium, and hydrogen sulfide. The Project would not involve industrial operations or other potential sources of fluoride or beryllium emissions. Hydrogen sulfide emissions are a consideration in the odor assessment of the AWTF. The NYSDEC 1-hr hydrogen sulfide standard is 0.01 ppm (14 μg/m3) (6 CRR-NY 257-10.3).

Non-methane hydrocarbons are a concern in terms of contributing to O3 formation at a regional level and not localized concentrations at sensitive receptors in the vicinity of the Project Site. Therefore, non-methane hydrocarbons are addressed for this DEIS by quantifying the total project-related emissions of hydrocarbon ozone precursors (VOC).

NYSDEC has also developed short-term and annual guideline concentrations (SGCs and AGCs) for numerous non-criteria pollutants.[11] The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure.

---

[1] National Ambient Air Quality Standards (NAAQS). Accessed online at: http://www.epa.gov/air/criteria.html.

[2] Carbon Monoxide, Health. Accessed online at: http://www.epa.gov/airquality/carbonmonoxide/health.html.

[3] http://www.epa.gov/airquality/lead/health.html.

[4] http://www.epa.gov/airquality/lead/.

[5] http://www.epa.gov/airquality/nitrogenoxides/health.html.

[6] http://www.epa.gov/airquality/ozonepollution/basic.html.

[7] Particulate Matter (PM), Health. Accessed online at: http://www.epa.gov/airquality/particlepollution/health.html.

[8] http://www.epa.gov/airquality/sulfurdioxide/health.html.

[9] http://www.epa.gov/ttnchie1/net/2008report.pdf.

[10] National Ambient Air Quality Standards: http://www.epa.gov/air/criteria.html.

[11] http://www.dec.ny.gov/docs/air_pdf/agcsgc14.pdf

APPENDIX B.9: AIR QUALITY TECHNICAL ANALYSIS

This page intentionally left blank.

Construction Emissions

Forge River EA/EIS

2018 Peak Construction Year Emissions Summary (tons)

	NOx (tons)	VOC (tons)	PM2.5 (tons)	CO2 (metric tons)
Off-Road Heavy Equipment	4.5	0.7	0.3	1,665.41
On-Road Haul Trucks and Worker Commutes	19.8	1.0	0.9	3,605.43
Fugitive Dust	NA	NA	5.6	NA
Total	**24.3**	**1.7**	**6.8**	**5,270.83**
de minimis threshold	***100.0***	***50.0***	***100.0***	

Assume 1/2 emissions of peak year in off-peak years	*2,635.42*
Off-peak emissions for three years	*7,906.25*
Total Construction period CO2 emissions	*13,177.08*

Off-Road Equipment	Total Operating Hours	HP	Load Factor	Type	Emission Factors (g/hp-hr)			
					3	87	90	110
					Nox	VOC	CO2	PM2.5
Excavator	6,264	233	0.59	Diesel	0.831719	0.162977	536.387370	0.033521
Bulldozer	4,176	236	0.59	Diesel	1.036710	0.170611	536.363838	0.053225
Front-End Loader	3,654	230	0.59	Diesel	1.360376	0.183676	536.324874	0.082537
Backhoe	4,176	87	0.21	Diesel	3.625299	0.772333	693.785179	0.621971
Air Compressors	12,528	84	0.43	Diesel	2.284888	0.257385	589.648237	0.192590
Grader	1,566	231	0.59	Diesel	1.005164	0.169356	536.368081	0.050422
Roller	2,088	132	0.59	Diesel	1.480944	0.193993	536.295010	0.143015
Generator	2,088	33	0.43	Diesel	4.269649	0.381068	589.265346	0.255931
				Total Emissions (grams)	**4,126,907.62**	**616,533.16**	**1,665,405,830.96**	**300,261.77**
				Total Emissions (tons)	**4.55**	**0.68**	**1,835.80**	**0.33**

Load Factor Source:

Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10081RV.pdf

Horsepower Source

Nonroad Engine Population Estimates- selected typical HP based on population by HP information
https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10081T6.pdf

On-Road Trucks		3	87	90	1.1	116	117
		NOx	VOC	CO2	PM2.5 Exhaust	PM2.5 Brakewear	PM2.5 Tirewear
Haul Truck	grams/VMT	9.381818	0.406907	1718.79	0.3918263	0.0128008	0.004825
Auto	grams/VMT	0.253459	0.101402	288.536	0.0082704	0.00197862	0.001324
	Total Grams	**17,955,273**	**896,737**	**3,605,426,501**	**746,870**	**26,629**	**10,792**
	Total Tons	**19.79229**	**0.98848**	**3,974.30127**	**0.82328**	**0.02935**	**0.01190**

Peak Annual Haul Truck Trips (Roundtrips)	37,572	See construction trips calculation sheet assumption
Ave. Roundtrip Distance (miles)	50	
Peak Annual Haul Truck VMT	1,878,581	
Peak Annual Employee Commutes (Roundtrips)	26,100	100 employees over 261 days with no carpooling assumption
Ave. Roundtrip Distance (miles)	50	
Peak Annual Employee Commute VMT	1,305,000	

Fugitive Dust

AP 42 13.2.4 Loading and Unloading Material into trucks

$$E = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (pound [lb]/ton)}$$

Assumptions

	K	
	PM10	**PM25**
	0.35	0.053
Wind Speed (mph)	5	
Moisture Content	12.00%	
Silt Content	8.50%	

grams/lb
453.592

Truck Loading

	Emission Factor in lbs/ton
PM10	0.0575183
PM2.5	0.0087099

where:

E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s) (miles per hour [mph])
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 µm taken from Reference 14.

Annual Truck Trips	37571.629	
Cubic Yards per Truck	12.5	
Soil tons	469,645	assuming 1 ton of soil per cubic yard
PM2.5 lbs - Loading	4090.5729	
PM2.5 lbs - Loading and Unloading	8181.1458	
PM2.5 Tons- Uncontrolled	4.0905729	

Fugitive Dust

AP 42 11.9

Topsoil removal by scraper	0.058	lbs of TSP/ton	
Total quantity of soil moved	1995986.893	cubic yards	
		assuming 1 cubic yard	
lbs of TSP	115767.2398	of soil weighs 1 ton	
Tons of TSP	57.88361989		
Tons of PM2.5	6.077780089	0.105	PM2.5 scaling factor
Wind erosion of exposed areas	0.38	TSP tons/acre per year	
	105.790404	total project acres	
	26.44760101	25% exposed at one time	
Tons of TSP	10.05008838		
Tons of PM2.5	1.05525928	0.105	

Total PM2.5 from fugitive dust-uncontrolled	**11.22361227**
With 50% Reduction for Dust BMPs	**5.611806136**

Emergency Generator Emissions

900 kw AWTF emergency backup generator- emissions estimate

Horsepower 500

1207	Pollutant	Emission Factor (grams/hp-hr)	Source	Emissions @500 hrs/year (lbs)	Annual Emissions in Tons
	NOx	0.0108027	CAT 32 Spec sheet, converted to lbs	6519.42945	3.26
	VOC	0.0025141	AP-42 Table 3.3-1 (TOC- exhaust plus crankcase)	1517.25935	0.76
	SOx	0.0025	AP-42 Table 3.3-1	1508.75	0.75
	PM	0.0022	AP-42 Table 3.3-1	1327.7	0.66
	CO2	1.15	AP-42 Table 3.3-1	694025	347.01

2000

300 kw Pump Station diesel emergency backup generator

Horsepower 500

402	Pollutant	Emission Factor (lbs/hp-hr)	Source	Emissions @500 hrs/year (lbs)	Annual Emissions in Tons	12 pump stations
	NOx	0.00881849	CAT C9 spec sheet, conveted to lbs	1772.51649	0.89	10.64
	VOC	0.0025141	AP-42 Table 3.3-1 (TOC- exhaust plus crankcase)	505.3341	0.25	3.03
	SOx	0.0025	AP-42 Table 3.3-1	505.3341	0.25	3.03
	PM	0.0022	AP-42 Table 3.3-1	442.2	0.22	2.65
	CO2	1.15	AP-42 Table 3.3-1	231150	115.58	1386.90

Total Emissions- AWTF generator plus pump	
NOx	13.89
VOC	3.79
SOx	3.79
PM	3.32
CO2	1733.91

Metric Tons 1572.976693

Wastewater Treatment CH4 Emissions

Total Emissions 2012 (Domestic) in Tg of CO2e			Per Capita Tg	Per Capita Metric Tons	
CH4					46957
	Centralized	2.8	1.10063E-08	0.011006289	516.8223
			0		
CH4	Septic	5.1	8.01887E-08	0.080188679	3765.42

Percent Reduction-
Septic to Centralized **-86.27%** **-3248.6**

	2012 U.S. Pop
Total	318,000,000
Central Treatment	254,400,000
Septic Treatment	63600000

Wastewater Treatment (Methane)	-3,248.6
Fuel Consumption (Backup Generators)	1,572.0
Electricity Consumption	7,492.4
Net Change	5,815.8

APPENDIX B.10: 8-STEP FLOODPLAIN REVIEW PROCESS

This page intentionally left blank.

FLOODPLAIN AND WETLANDS 8-STEP PROCESS IN ACCORDANCE WITH EXECUTIVE ORDER 11988: FLOODPLAIN MANAGEMENT AND EXECUTIVE ORDER 11990: WETLANDS

New York Governor's Office of Storm Recovery

Forge River Watershed Sewer Project

Thomas J. King, Certifying Environmental Officer

April 26, 2018

Suffolk County, (subgrantee), has applied to the FEMA HMGP for funding from the Initiative. The New York State Division of Homeland Security and Emergency Services is the grantee partner. The Forge River Watershed Sewer Project (proposed action), located in the Town of Brookhaven, Suffolk County, New York, is one project included in the Initiative, (Figure 3-1).

The Proposed Action Alternative would involve establishing a county sewer district that would decommission the OSWS of approximately 3,400 parcels in the project area and connect the parcels to a new sewer collection system that would flow to a proposed AWTF. These parcels would be primarily residential, with fewer commercial and non-residential parcels, and there would be no intent to sewer undevelopable lots, including presently vacant parcels within the proposed Mastic-Shirley Conservation Area. The total wastewater or sanitary flow from the project area is projected to be approximately 1.4 million gallons per day (MGD). The proposed action includes the following components:

- *Collection and Conveyance System.* A combination of gravity sewers and low-pressure sewers would be constructed as part of the collection system. Gravity sewers are recommended for areas such as the Montauk Highway corridor and residential areas where the depth to groundwater is generally greater than 10 feet. Low-pressure sewers would be constructed in those areas where U.S. Geological Survey data estimate that the groundwater is less than 10 feet below grade; such areas primarily include residential properties near the Forge River and its tributaries. In addition, low-pressure sewers would serve properties located on the Poospatuck Reservation because of its proximity to the Forge River, anticipated shallow groundwater conditions, and build-out conditions that do not conform to current building code standards. A grinder pump station including pump and storage tank with level-sensing equipment would be located on each property served by the low-pressure collection system. These grinder pumps would be buried near the existing on-site septic systems or cesspools or placed inside the basement of the building it serves. Additionally, twelve pumping stations also would be required to convey sewage out of low-lying areas. Or, an exclusively low-pressure sewer system would be built.
- *Wastewater Treatment.* Sanitary wastewater from the proposed sewer district would be conveyed to a new AWTF. The proposed site would be a 13.7-acre parcel located at Brookhaven Calabro Airport. A Membrane Bioreactor (MBR) or Sequencing Batch Reactor (SBR) facility is proposed for the AWTF that would provide the best available technology for nitrogen removal (i.e., effluent discharge would be between 3 and 5 milligrams per liter [mg/L]). The proposed action also includes the request for the release of land for an approximate 17.0-acre parcel adjacent to the eastern end of the proposed

AWTF location and within the Brookhaven Calabro Airport property boundary to be reserved for future expansion and/or an additional recharge area.

If approved, the sewer project could be completed within approximately six years, with the majority of new facilities operational in 2022.

This project must be conducted in accordance with conditions for federal actions in the floodplain as set forth in Presidential Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), and the implementing regulation found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands. These regulations apply to all Agency actions which have the potential to affect floodplains or wetlands or their occupants, or which are subject to potential harm by location in floodplains or wetlands.

Additionally, all HMGP grant-funded projects carried out in the floodplain or affecting the floodplain must be coordinated with the local floodplain administrator for floodplain development permit and the action must be undertaken in compliance with all relevant, applicable, and required local codes and standards and thereby will reduce the risk of future flood loss, minimize the impacts of floods on safety, health, and welfare, and preserve and possibly restore beneficial floodplain values as required by EO 11988.

Step ONE: Determine whether the action is located in a 100-year floodplain (or a 500-year floodplain for critical actions) or wetland.

According to FEMA, Flood Insurance Rate Map (FIRM) panels 36103C0717H, 36103C0736H, 36103C0737H, 36103C0738H, 36103C0739H, and 36103C0730H (effective September 25, 2009) indicate that the site contains both 100-year (i.e. Zones A, AE, and VE) and 500-year (i.e., Zone X [shaded]) floodplains adjacent to the Forge River and associated tributaries (FEMA 2009a, b, c, d, e, f). Figure 5.6-1 shows the project area and floodplains.

- Zone A indicates areas with a 1 percent or greater chance of flooding; however, no base flood elevations are determined. The project area contains approximately 0.8 acres (0.05 percent of the total project area) of Zone A floodplain.
- Zone AE indicates areas with a 1 percent or greater chance of flooding and is considered the base flood zone. The project area contains approximately 147.9 acres (9 percent of the total project area) of Zone AE, with base flood elevations ranging from 7 to 9 feet North American Vertical Datum of 1988 (NAVD88).
- Zone VE indicates coastal areas with a 1 percent or greater chance of flooding and an additional velocity hazard associated with storm waves. The project area contains approximately 18.91 acres (1 percent of the total project area) of Zone VE, with base flood elevations ranging from 9 to 10 feet NAVD88.
- Minimal scattered areas of Flood Zone X [shaded], or areas with a 0.2 percent chance of flooding, are located landward of the 100-year floodplain along each of the five tributaries to the Forge River within the project area. There are approximately 8.7 acres of 500-year floodplain within the project area.

This project is (a) new construction and (b) does not meet any of the exemptions in 24 CFR 55.12, therefore, EO 19988 applies. An evaluation of direct and indirect impacts associated with construction within a floodplain is required. This analysis considers the natural functions of

floodplains as well as the impacts on flood levels, flood risk, or the flow of flood waters in the project area or to surrounding areas.

The project is located adjacent to, but not within, wetlands.

Step TWO: Notify the public for early review of the proposal and involve the affected and interested public in the decision making process.

Because a portion of the proposed action would be located in the floodplain, GOSR must publish an early notice that allows the public an opportunity to provide input into the decision to provide funding for the project activities in this area.

Public involvement occurred during the scoping process and would occur during the 30-day public review of the Draft EA. Additionally following completion of the detailed design process, GOSR would provide a copy of the Draft EA to FEMA and notify this regulatory agency of GOSR's intent to modify land located in a 100-year or 500-year floodplain.

After the early public notice and comment period is complete, GOSR will assess, consider, and respond to the comments received individually and collectively for the project, then proceed to Step Three.

Step THREE: Identify and evaluate practicable alternatives.

The alternative actions considered are as follows: No Action, Mastic-Shirley Sewer District Establishment, and On-Site Treatment and Disposal (Replacing Existing On-Site Wastewater Treatment and Disposal Systems (OSWS) with Innovative/Advanced On-Site Wastewater Treatment and Disposal Systems (I/A OWTS)).

Alternative 1: No Action

Under the No Action alternative, the project area would continue to use the existing sub-performing and non-performing conventional OSWS. Surface water and groundwater flooding would continue to result in OSWS failures and untreated wastewater entering local waterbodies. Additionally, there would be no reduction in nitrogen and pathogen pollution in the regional waters. The untreated wastewater and high levels of nitrogen and pathogens would reduce the ability of the floodplains within the project area and the Great South Bay to reduce flood height and provide natural protection against storm surge. This alternative does not satisfy the Purpose and Need of the proposed action.

Alternative 2: Proposed Action Alternative: Mastic-Shirley Sewer District Establishment

The proposed alternative would establish a Mastic-Shirley Sewer District (MSSD) and construct and operate a collection system with either a combination of gravity sewers and low-pressure sewers, or exclusively low-pressure sewers, a conveyance system consisting of multiple pump stations and force mains, and an AWTF. The collection system would include 12 Drainage Zones that would direct wastewater to a series of pump stations. Each pump station would direct flow through the conveyance system via force mains to the AWTF. Gravity sewers would be installed where depth to groundwater is greater than 10 feet whereas low pressure sewers would be installed in areas of shallow groundwater of 10 feet or less. Properties connected to low pressure sewer mains would operate and maintain an on-site storage tank and a grinder pump. The proposed

AWTF would treat wastewater using either a membrane bioreactor (MBR) or sequencing batch reactor (SBR).

Alternative 3: On-site Treatment and Disposal – Replacing Existing On-Site Wastewater Treatment and Disposal Systems (OSWS) with Innovative/Advanced On-Site Wastewater Treatment and Disposal Systems (I/A OWTS)

An alternative that would provide on-site treatment and disposal by replacing and upgrading the existing on-site cesspools and conventional OSWS in Phases I through III with innovative/advanced on-site wastewater treatment and disposal systems (I/A OWTS) was evaluated. Several types of I/A OWTS would be available for installation with all using a variation of typical wastewater treatment processes found in large scale treatment plants such as attached-growth processes, suspended-growth processes, or a combination of both. Although upgrades to I/A OWTS would likely alleviate some of the long-term degradation of coastal floodplains and their functions in the region due to contamination from nitrogen and pathogens, it would not accomplish the primary purpose of the proposed action, which is to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards. The I/A OWTS would provide effective nitrogen removal under shallower water table conditions. However, most of the I/A OWTS types available would still be susceptible to failure from inundation from rising groundwater, storm or tidal surges, or sea level rise because they would be installed underground and require the use of leaching pools. The system failures would result in biological and nutrient contamination of groundwater, and potentially surface water, localized flooding, and sustained flood risks to human life and property.

Step FOUR: Identify Potential Direct and Indirect Impacts Associated with Floodplain Development.

GOSR has evaluated the alternatives to the proposed project activities in the floodplain, and has determined that the proposed activities must take place in the floodplain.

Under the proposed action, there would be direct and indirect impacts to floodplains during construction and operation of the proposed project.

The AWTF construction site is located approximately one mile from any surrounding floodplains. Therefore, the AWTF would be constructed outside the floodplain and would not result in any impacts to the floodplain.

Construction of the gravity and low-pressure sewer collection system, including mains, laterals, and on-site storage tanks and grinder pump stations, and the conveyance system force mains and wet wells would disturb ground surface. Segments of the proposed force and low-pressure sewer mains would be constructed in floodplains. Portions of the proposed low-pressure main would be constructed in the 100-year floodplains associated with the Forge River, Second Neck Creek, Poospatuck Creek, and Home Creek, while other portions would be constructed in the 500-year floodplain associated with Second Neck Creek, Poospatuck Creek, Lons Creek, and Home Creek. A very small segment of proposed force main would be constructed in 500-year floodplain associated with Second Neck Creek. These segments of the sewer collection and conveyance system must be constructed in the floodplain because some of the properties that need to be connected are located in the floodplain. Specifically, the mains and laterals would be buried underground or located within existing areas of impervious surface such as roadways. Each grinder pump would be installed inside the basement of the building it serves or buried outside in a

watertight pit. Much of the gravity, low-pressure, and conveyance system would be constructed within the previously disturbed existing rights-of-way and would not affect floodplain functions. None of these sewer elements would not contribute additional impervious surface because they would either be buried underground or located within existing areas of impervious surface. The 12 pump stations associated with the conveyance system would disturb approximately 0.1 acre of ground surface and contribute to increased impervious surface. Because the majority of the study area is located outside of the floodplain, adverse impacts from the construction activities are anticipated to be minor, if any.

Construction activities would comply with permitting and regulatory requirements and the use of best management practices, stormwater management techniques, and sediment and erosion control plans, which would minimize the temporary adverse impacts to floodplains and associated flood risks. In accordance with permit requirements, temporarily disturbed floodplain areas on-site or off-site would be filled and revegetated or paved over, depending on the location, to restore original conditions upon completion of construction to avoid long-term impacts.

Construction of the sewer mains (e.g., open cut excavation and/or directional drilling) and the use of construction staging areas within floodplains would result in short-term, adverse impacts from soil compaction, vegetation and soil disturbance, and degradation of floodplain functions. Ground disturbance associated with the construction would temporarily alter the existing stormwater runoff and drainage patterns and potentially degrade the quality of stormwater runoff in the specific part of the system being constructed. These temporary changes and interruptions to existing stormwater drainage and water quality would result in short-term, adverse impacts.

During operation of the Proposed Action, the presence of new permanent structures could affect the floodplain and stormwater. The construction of 12 pump stations and an AWTF would result in new impervious surface in the study area. The pump stations and AWTF would be constructed outside the floodplain and would not result in any direct impacts on the floodplain. Increased impervious surface outside of the floodplain from the pump stations and AWTF could result in indirect impacts on floodplains from increased stormwater runoff. Potential indirect, long term, impacts on floodplains from increased impervious surface associated with the AWTF and pump stations would be minimized through compliance with New York State stormwater control guidelines and stormwater management measures to ensure that the post-development conditions do not adversely impact downstream areas. Such measures would include installation of bioswales or stormwater retention basins, permeable paving, or other features. Because of these mitigation measures, no direct, long-term effects on floodplains or changes in the potential flood risk from stormwater flooding are expected.

Removing existing failing OSWS would benefit floodplains and decrease flood risks and hazards to the local communities. Eliminating leaking OSWS would reduce the amount of water recharging the localized water table, which could temporarily result in less groundwater flooding. In the long term, the water table would adjust to generally current conditions as the treated effluent released into the groundwater at the AWTF site would migrate toward the Forge River. Additionally, removing failing OSWS would decrease the discharge of pollutants that degrade the floodplains and tidal wetlands in the region. Reducing regional floodplain and wetland degradation would allow these resources to better dissipate wave energy and mitigate flooding associated with tidal surge, which in turn would reduce hazards to human health caused by flooding and storm-related failure of OSWS. Overall, indirect, long-term effects on floodplains would be beneficial from the

reduced degradation caused by pollutants and the decrease in the risk of flood loss and impacts of floods on human life and property.

Flooding within the project area would not affect the operation of the pump stations because they would be constructed of flood-resistant building materials and equipped with submersible pumps to minimize damage and disruption of service during flood events. However, flood events could have a temporary impact on the collection system. During flooding, there is the potential for gravity sewers to surcharge and power outages to affect the grinder pumps associated with the low-pressure sewers. Therefore, the adverse impacts of flooding on the operation of the sewer system would be short term, unless a storm event caused structural damage to roadways.

Additionally, there are 87 vacant lots (approximately 2 percent of the total lots) located within 100-year and 500-year floodplains within Phases I-III. The proposed project would not encourage development in the floodplain because there is no intention for vacant parcels to be connected in the sewer district. However, any future development on vacant parcels within the floodplain, would be required to complete a separate floodplain impact analysis and follow all applicable state and federal regulations for construction in a floodplain. Indirect, long-term impacts on floodplains would be negligible.

Step FIVE: Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the floodplain and to restore, and preserve the values of the floodplain.

Implementation of the proposed action outside of the floodplain would not meet the primary purpose of the project because the properties in the floodplain are at risk of OSWS failure during floods and storm events, which result in nutrient and pathogen discharges and would lead to human health impacts. The proposed project is intended to enhance the coastal resiliency of the Forge River watershed, and therefore provision of benefits to the coast and associated floodplains would require proposed actions that impact those same coastal areas. Several properties that are located in the floodplain need to be connected to the proposed sewer system. Therefore, temporary adverse impacts associated with construction activities would need to occur within the floodplain. Although some temporary disturbance would occur within the floodplain during installation of the low pressure and gravity sewers, construction methods and mitigation measures would be selected to minimize floodplain impacts.

Mitigation measures and practices for floodplains and stormwater would reduce or offset potential adverse impacts from construction of the proposed sewer system. Construction must comply with New York State Standards and Specifications for Erosion and Sediment Control and local soil erosion and sediment control guidance. Construction of the new sewer system would temporarily disturb more than one acre of soil. Therefore, the actions would require coverage under the New York State General Permit for Stormwater Discharges from Construction Activities as well as preparation of a SWPPP. The SWPPP would highlight techniques to prevent discharge of construction-related pollutants to waters of the state. The specific information and contents of a SWPPP will be determined during the engineering design process; however, the general requirements include descriptions of stormwater and erosion and sediment control practices during construction, any required post-construction stormwater management including a stormwater modeling and analysis report, identification of any potential pollution sources, pollution prevention measures for construction chemicals, and soil stabilization measures. The erosion and sediment control practices must comply with the technical standard, New York State Standards and

Specifications for Erosion and Sediment Control. The standard erosion and sediment control BMPs include silt fences, brush mattresses, check dams, debris and sediment basins and traps, grading and seeding/revegetation, swales, and storm drain inlet protections (NYSDEC 2005). Best management practices to control stormwater runoff quantity and quality include detention and wet ponds, constructed wetlands, infiltration trenches and basins, filtration practices such as bioretention and sand filters, swales, and underground storage (NYSDEC 2015). In addition to reducing the amount of stormwater runoff, these BMPs could also indirectly provide floodplain functions, such as slowing and capturing runoff flows, promoting infiltration, improving water quality, and reducing downstream flooding and property damage.

After construction, impervious surface in the project area would increase; however, this impervious surface would be located outside of the floodplain. Stormwater runoff from the new AWTF would be contained through on-site stormwater management facilities; the specific management practices would be determined in the detailed site design process, as would any additional measures to minimize the effect of the new impervious surface. Stormwater BMPs use natural processes, such as infiltration, evaporation, and transpiration, to retain and store runoff.

Step SIX: Re-evaluate the Proposed Action.

Although the proposed project is located in a floodplain, the project would be designed to minimize effects on floodplains and floodplain values and would seek to provide coastal resiliency and flood mitigation benefits to the human community. The replacement of OSWS with sewer systems would reduce OSWS failures during storm events benefiting the community and reducing localized flood damages associated with OSWS. Additionally, improving the health and associated natural functions of floodplains and tidal wetlands in the Forge River watershed and Great South Bay would enhance coastal resiliency and flood mitigation benefits.

GOSR has reevaluated the proposed action and determined that the Forge River Watershed Sewer Project is still practicable in light of its exposure to flood hazards in the floodplain. The project activities located within the floodplain are the installation of subsurface force mains and laterals through trenching or directional drilling. The disturbed areas would be restored to prior vegetated or impervious conditions resulting in no long-term adverse impacts. Temporary construction impacts to floodplains and floodplain values would be mitigated through implementation of best management practices and other techniques described in Step Five. Therefore, the project would not aggravate current hazards to the floodplain, nor would the project disrupt floodplain values.

GOSR has also reconsidered the alternatives discussed in Step Three and determined the best practicable alternative is the proposed action. The No Action alternative is not practicable because it would not prevent or minimize temporary adverse impacts on human life and property and long-term degradation of floodplain and wetlands from OSWS failures, the discharge of untreated wastewater into local waterbodies, or localized flooding. Although upgrades to I/A OWTS would likely provide benefits by alleviating some of the long-term degradation of coastal floodplains and their functions in the region resulting from contamination, they would not accomplish the primary purpose of the proposed action, which is to mitigate short-term and repetitive, adverse impacts on human life and property associated with OSWS failures caused by natural hazards. The installation of I/A OWTS is not preferred or practical because it would provide a proportionally less beneficial impacts on floodplain health and flood mitigation than the proposed project.

This section may be modified following public comment on the Draft EA and this 8-step evaluation if substantive comments are received regarding floodplain impacts.

Step SEVEN: Issue Findings and a Public Explanation.

Step 7 requires that the public be provided with an explanation of any final decisions that the proposed action in a floodplain is the only practicable alternative, potential impacts of the proposed action on floodplains, and associated mitigation measures. In accordance with 44 CFR 9.12, this notice is provided with the notice of availability of the Draft EA for public review and comment.

The public would be provided a "Notice for Final Public Review of a Proposed Activity in a 100-Year Floodplain" either through the Notice of Availability of the Draft EA or a standalone notice. Under each option, the public would have the opportunity to review and comment on the determination that the proposed action is practicable, and the potential impacts and mitigation measures.

Step EIGHT: Implement the Proposed Action.

FEMA will ensure that this plan, as modified and described above, is executed and that necessary language is included in all agreements with participating parties. Further, FEMA will see that all mitigation measures described in Step 5 of this 8-step review and in the draft EA will be implemented. The proposed action will be conducted in accordance with applicable floodplain management requirements.

APPENDIX B.11: SOIL CHARACTERISTICS

This page intentionally left blank.

Properties of Soils Characterization

Common properties used to characterize soil include land classification, soil erosion, hydraulic conductivity, the amount of water available (in profile), and the depth to the water table.

Land Classification

Land classifications are defined as land use and management groupings that are assigned to soil areas where the soil combination demonstrates similar behavior for the specified practice. Most of these classifications are based on the individual properties of each soil, as well as other factors that influence the particular use of a soil. Example classifications include ecological site classification, farmland classification, irrigated and non-irrigated land capability classification, and hydric rating. The factors of interest for this assessment include:

Farmland classification: Categorizes soils in terms of farmland type, if applicable. Farmland types include prime farmland, farmland of statewide importance, farmland of local importance, and unique farmland. Soils that are not considered farmland are not assigned a category (NRCS, 2017).

Hydric rating: A value based on soil properties associated with formation under saturated conditions. When combined with microbial activity, saturation results in the depletion of oxygen (i.e., anaerobic conditions). Prolonged anaerobic conditions promote certain processes that result in the accumulation of iron and affect the characteristics of other soil elements like manganese and sulfur. These changes in a soil's makeup are reflected by particular colorations, like reddish, bluish or greenish gray. Another indicator of hydric soils is a "rotten egg" smell produced by changes in the soil's sulfur compounds (NRCS, 2016, 2017).

Soil Erosion

Soil erosion factors are used to evaluate potential erosion. Example soil erosion factors include a K factor that quantifies the relative vulnerability of the soil to water erosion and a T factor that represents the maximum amount of annual erosion that permits the indefinite maintenance of the fertility and productive capacity of a soil (NRCS, 2011). The project would primarily affect soils through excavation in the overburden; therefore, the factor of interest would be the K factor. In general, the higher the K value is, the more susceptible a soil is to erosion by water.

Hydraulic Connectivity

Hydraulic conductivity, in this case, is defined as the rate at which water will move through the soil. It depends on two primary factors: (1) the natural ability of a soil to hold water, and (2) the amount of water contained in the soil (i.e., the level of soil saturation). All hydraulic conductivity values presented in this section are representative of the ability of water to move through a soil that is holding as much water as its natural capacity will allow (i.e., completely saturated). In general, the higher the hydraulic conductivity, the faster water will move through a completely saturated soil (Fetter, 1994).

Amount of Water Available

The amount of water available in a soil profile also depends on the natural capacity of a soil to hold water. Other factors that influence this value are the amount of recharge received (i.e., the amount of water available to move into the soil profile) and the infiltration rate (i.e., how fast water

moves downward from the surface into the profile). Similar to hydraulic conductivity, the greater the height of the water within the profile, the more water is available.

Depth to the Water Table

The depth to the water table is a universal criteria that is represented by the distance from the ground's surface to the top of the water table. This measurement can vary based on both the soil and aquifer characteristics of a particular area.

Soils in the Study Area

Soils in the study area are presented in the table below, followed by a description of the characteristics of each soil type.

Map Unit Symbol	Map Unit Name	Acres in Area of Interest	Percent of Area of Interest	Erosion hazard (K factor)	Hydric Rating	Farmland Classification
At	Atsion sand	0	0.0%	Not rated or not available	65	Not prime farmland
CpA	Carver and Plymouth sands, 0 to 3 percent slopes	129.4	7.90%	Not rated or not available	0	Not prime farmland
CpC	Carver and Plymouth sands, 3 to 15 percent slopes	157.9	9.60%	Not rated or not available	0	Not prime farmland
CpE	Carver and Plymouth sands, 15 to 35 percent slopes	38.1	2.30%	Not rated or not available	0	Not prime farmland
CuB	Cut and fill land, gently sloping	81.5	5.00%	Not rated or not available	0	Not prime farmland
De	Deerfield sand	22.7	1.40%	Not rated or not available	5	Farmland of statewide importance
Fd	Fiil land, dredged material	2.8	0.2%	Not rated or not available	0	Not prime farmland
Mu	Swansea muck, 0 to 1 percent slopes, coastal lowland	7.4	0.50%	Not rated or not available	100	Not prime farmland
PlA	Plymouth loamy sand, 0 to 3 percent slopes	284.9	17.40%	0.10	0	Farmland of statewide importance
PlB	Plymouth loamy sand, 3 to 8 percent slopes	29.9	1.80%	0.10	0	Farmland of statewide importance
Rc	Recharge basin	0.1	0.0%	Not rated or not available	0	Not prime farmland
RdA	Riverhead sandy loam, 0 to 3 percent slopes	769.2	46.90%	0.15	0	All areas are prime farmland
RdB	Riverhead sandy loam, 3 to 8 percent slopes	39.2	2.40%	0.15	0	All areas are prime farmland
RhB	Riverhead and Haven soils, graded, 0 to 8 percent slopes	1.5	0.1%	0.17	0	Not prime farmland
Su	Sudbury sandy loam	9.6	0.6%	Not rated or not available	0	All areas are prime farmland
Tm	Tidal marsh	4	0.2%	Not rated or not available	95	Not prime farmland

Map Unit Symbol	Map Unit Name	Acres in Area of Interest	Percent of Area of Interest	Erosion hazard (K factor)	Hydric Rating	Farmland Classification
Ur	Urban land	13.9	0.80%	Not rated or not available	0	Not prime farmland
W	Water	11.4	0.70%	Not rated or not available	0	Not prime farmland
We	Wareham loamy sand	37.2	2.30%	Not rated or not available	60	Farmland of statewide importance

Atsion Sand

Atsion sand (At) is present in the study area at slopes ranging from 0 to 2 percent. The two primary components of this formation are both Atsion sands, but with different natural drainage classes: a poorly drained Atsion sand composes 50 percent of the material present and a somewhat poorly drained Atsion sand composes 30 percent of the material present. The remaining 20 percent comprises minor components. Atsion sand is not considered prime farmland, has a hydric rating of 65, and represents < 0.1 percent of the land in the study area.

Both Atsion sand components have, for the most part, the same characteristics. Both are derived from sandy marine deposits and currently take the form of depressions in the land surface. The typical profile has six horizons. The first two are characterized by highly decomposed plant material and extend from 0 to 2 and 2 to 4 inches bgs. These horizon are abbreviated Oi and Oa, respectively. The next four horizons—A, Bh, Bs, and C—extend from 4 to 14 inches, 14 to 19 inches, 19 to 31, and 31 to 60 inches bgs, respectively. All of these horizons comprise sand, with the only variation present in the Bh horizon, which is characterized as loamy sand. Both Atsion sand components also have a minimum hydraulic conductivity of 0.20 to 5.95 inches/hour, which is considered moderately high to high. The sands have a moderate capacity for water storage (7.1 inches). The only difference between these two Atsion sands is the depth to the water table. This depth ranges from 0 to 12 inches in the poorly drained material, and from 6 to 18 inches in the somewhat poorly drained material.

The minor components of the Atsion sand do not vary between the two drainage classifications and include:

- Wareham (10 percent)
- Berryland (5 percent)
- Deefield (5 percent)

Carver and Plymouth Sands

Carver and Plymouth sands are present in the study area in three slope ranges: 0 to 3 percent (CpA), 3 to 15 percent (CpC), and 15 to 35 percent (CpC). The sands at all of these slope ranges comprise 40 percent Plymouth sand and similar soils and 40 percent Carver and similar soils, with the remaining 20 percent of the sands comprising minor components. These minor components vary between the slope ranges. Neither the Carver nor the Plymouth sand are considered prime farmland and all have a hydric rating of 0. The Carver and Plymouth sands collectively represent 19.8 percent of the land in the study area in the following distribution:

- CpA: 7.9 percent
- CpC: 9.6 percent
- CpE: 2.3 percent

The Carver sand is derived from coarse sand and glaciofluvial deposits and currently takes the form of outwash plains and moraines. The typical profile of Carver material has four horizons. The first is characterized by highly-decomposed plant material, which extends from 0 to 1 inches below the ground surface (bgs). This layer is abbreviated as Oa. The remaining three horizons—H1, H2, and H3—extend from 1 to 9 inches, 9 to 23 inches, and 23 to 60 inches bgs, respectively. All of these horizons comprise coarse sand. Carver sand is naturally excessively-drained, with a minimum hydraulic conductivity of 0.20 to 5.95 inches/hour, which is considered moderately high to high. The depth to the water table in this unit is more than 80 inches, and the sand has a low capacity for water storage (3.6 inches).

The Plymouth sand is derived from sandy glaciofluvial or deltaic deposits that are acidic in nature, and, like the Carver sand, currently takes the form of outwash plains and moraines. The typical profile of Plymouth material has three horizons. The first two, H1 and H2, extend from 0 to 4 inches and 4 to 27 inches bgs, respectively, and comprise sand. The third layer, H3, is present at a depth of 27 to 60 inches and is characterized as gravelly coarse sand. Plymouth sand is naturally excessively-drained, with a minimum hydraulic conductivity of 5.95 to 19.98 inches/hour, which is considered high to very high. The depth to the water table in this unit is more than 80 inches, and the sands have a very low capacity for water storage (2.4 inches).

The minor components of the Plymouth and Carver sands vary with the slope of the material. Sands with 0 to 3 percent slopes (CpA) include:

- Haven (5 percent)
- Riverhead (5 percent)
- Plymouth loamy sand (5 percent)
- Carver dark subsoil (5 percent)

Sands with 3 to 15 percent slopes (CpC) include:

- Haven (5 percent)
- Riverhead (5 percent)
- Plymouth loamy sand (5 percent)
- Carver dark subsoil (3 percent)
- Unnamed silty soils (2 percent)

Sands with 3 to 15 percent slopes (CpE) include:

- Haven (5 percent)
- Montauk, sandy variant (5 percent)
- Riverhead (5 percent)
- Carver dark subsoil (5 percent)

Cut and Fill Land, Gently Sloping

Cut and fill land (CuB) composes 80 percent of this formation, and minor components compose the remaining 20 percent. This type of land is generally defined as a miscellaneous land type comprising areas that have been altered to such a degree that any native soil characteristics have been eliminated. Slopes in cut and fill land can range from 0 to 50 percent; the slopes in the study area are characterized as "gentle." Cut and fill land is not considered prime farmland, and it has a hydric rating of 0. This land type composes 5 percent of the study area. Minor components of the CuB include:

- Haven (5 percent)
- Plymouth (5 percent)
- Riverhead (5 percent)
- Carver (5 percent)

Deerfield Sand

Deerfield sand (De) is present in the study area at slopes ranging from 0 to 2 percent. The formation comprises 85 percent Deerfield sand and similar soils and 15 minor components. The Deerfield sand is considered farmland of statewide importance, has a hydric rating of 5, and represents 1.4 percent of the land in the study area.

Deerfield sand is derived from sandy glaciofluvial or deltaic deposits mainly born of granite, gneiss, or sandstone, and currently takes the form of outwash plains and terraces. The typical profile of Deerfield material has four horizons. The first is characterized by highly-decomposed plant material, which extends from 0 to 3 inches bgs. As is the case with previously-described, similar horizons, this layer is abbreviated as Oa. The remaing three horizons—H1, H2, and H3—extend from 3 to 9 inches, 9 to 28 inches, and 28 to 60 inches bgs, respectively. All of these horizons comprise sand. Deerfield sand is naturally moderately-well drained, with a minimum hydraulic conductivity of 0.20 to 5.95 inches/hour, which is considered moderately high to high. The depth to the water table ranges from about 18 to 36 inches and the sands have a low capacity for water storage (4.8 inches).

The minor components of the Deerfield sand include:

- Carver (5 percent)
- Atsion (5 percent)
- Carver wet substratum (5 percent)

Fill Land, Dredged Material

Fill land, dredged material (Fd) composes 95 percent of this formation, and minor components compose the remaining 5 percent. As with cut and fill land, this type of land is generally defined as a miscellaneous land type comprising areas that have been altered to such a degree that any native soil characteristics have been eliminated. In this case, however, it is known that the fill material originated as dredged material. Fill land, dredged material is not considered prime farmland, and does not have a hydric rating. This land type composes 0.2 percent of the study area. The minor component of the Fd is:

- Dune land (5 percent)

Swansea Muck

Swansea muck (Mu) is present in the study area coastal lowlands at slopes ranging from 0 to 1 percent. The formation comprises 85 percent Swansea and similar soils, with the remaining 15 percent comprising minor components. Swansea muck is not considered prime farmland, has a hydric rating of 100, and represents 0.5 percent of the land in the study area.

Swansea muck is derived from highly-decomposed organic material over loose sand and gravelly glaciofluvial deposits and currently takes the form of bogs, marshes, and swamps. The typical profile of Swansea material has two horizons: the first is characterized by muck and extends from 0 to 36 inches bgs, while the second comprises coarse sand and is present from 36 to 79 inches bgs. As is the case with previously-described formations, the first layer is abbreviated as Oa; the second is abbreviated Cg. Swansea muck is naturally very poorly drained, with a minimum hydraulic conductivity of 0.14 to 14.17 inches/hour, which is considered moderately low to high. The depth to the water table ranges from about 0 to 6 inches and the sands have a very high capacity for water storage (17.3 inches).

The minor components of Swansea muck include:

- Freetown (10 percent)
- Rainberry (5 percent)

Plymouth Loamy Sand

Plymouth loamy sand is present in the study area in two slope ranges: 0 to 3 percent (PlA) and 3 to 8 percent (PlB). The composition of the sand in the two slope ranges is slightly different; sand present in the 0 to 3 percent slope range comprises 85 percent Plymouth and similar soils and 15 percent minor components, while that characterized by the 3 to 8 percent slope range comprises 80 percent Plymouth and similar soils and 20 percent minor components. The minor components also vary between the slope ranges. Plymouth loamy sand is considered farmland of statewide importance, has a hydric rating of 0, and has an erosion hazard of 0.1. The two slope ranges of Plymouth loamy sand collectively represent 19.2 percent of the land in the study area in the following distribution:

- PlA: 17.4 percent
- PlB: 1.8 percent

The Plymouth loamy sand is derived from sandy glaciofluvial or deltaic deposits that are acidic in nature, and, like the Plymouth sand described above, currently takes the form of outwash plains and moraines. The typical profile of Plymouth loamy material has three horizons. The first two, H1 and H2, extend from 0 to 4 inches and 4 to 27 inches bgs, respectively, and comprise loamy sand. The third layer, H3, is present at a depth of 27 to 60 inches and is characterized as gravelly coarse sand. Plymouth loamy sand is naturally excessively-drained, with a minimum hydraulic conductivity of 5.95 to 19.98 inches/hour, which is considered high to very high. The depth to the water table in this unit is more than 80 inches and the sands have a very low capacity for water storage (2.4 inches).

The minor components of Plymouth loamy sand varies with the slope of the material. Sand with 0 to 3 percent slopes (PlA) includes:

- Carver (5 percent)

- Montauk sandy variant (5 percent)
- Riverhead (5 percent)

Sand with 3 to 8 percent slopes (PlB) includes:

- Carver (5 percent)
- Montauk sandy variant (5 percent)
- Riverhead (5 percent)
- Plymouth gravelly (5 percent)

Riverhead Sandy Loam

Riverhead sandy loam is present in the study area in two slope ranges: 0 to 3 percent (RdA) and 3 to 8 percent (RdB). The sands at both of these slope ranges comprise 80 percent Riverhead and similar soils and 20 percent minor components. These minor components vary between the slope ranges. Riverhead sandy loam is considered prime farmland, has a hydric rating of 0, and has an erosion hazard of 0.15. The two slope ranges of Riverhead sandy loam collectively represent 49.3 percent of the land in the study area in the following distribution:

- RdA: 46.9 percent
- RdB: 2.4 percent

Riverhead sandy loam is derived loamy glaciofluvial deposits overlying stratified sand and gravel and take the form of outwash plains and moraines. The typical profile of Riverhead material has four horizons. The first two (H1 and H2) are characterized by sandy loam and extend 0 to 12 inches and 12 to 27 inches bgs, respectively. The third horizon, H3, is present between 27 and 35 inches bgs and comprises gravelly sandy loam, while the fourth (H4) stretches from 35 to 65 inches bgs and comprises stratified coarse sand to gravelly sand. Riverhead sandy loam is naturally well-drained, with a minimum hydraulic conductivity of 1.98 to 5.95 inches/hour, which is considered high. The depth to the water table in this unit is more than 80 inches, and the sands have a low capacity for water storage (5.1 inches).

The minor components of the Riverhead sandy loam varies with the slope of the material. Material with 0 to 3 percent slopes (RdA) include:

- Haven (5 percent)
- Plymouth (5 percent)
- Sudbury (5 percent)
- Montauk Sandy Variant (3 percent)
- Riverhead Silty Loam (2 percent)

Material with 3 to 8 percent slopes (RdB) include:

- Haven (5 percent)
- Plymouth (5 percent)
- Bridgehampton (5 percent)
- Montauk Sandy Variant (3 percent)

- Riverhead Silty Loam (2 percent)

Riverhead and Haven Soils

Riverhead and Haven soils (RhB) are present in the study area at slopes ranging from 0 to 8 percent. The formation comprises 45 percent Riverhead, graded and similar soils, 35 percent Haven, graded, and similar soils, and 20 percent of the material comprising minor components. Neither the Riverhead nor the Haven soils are considered prime farmland and both have a hydric rating of 0. The rosion hazard for these soils is 0.17. The Riverhead and Haven soils collectively represent 0.1 percent of the land in the study area.

Riverhead soil is derived from loamy glaciofluvial deposits overlying stratified sand and gravel and currently takes the form of outwash plains and moraines. The typical profile of Riverhead material has four horizons. The first two are characterized by sandy loam and extend from 0 to 12 inches and 12 to 27 inches. These layers are abbreviated as H1 and H2, respectively. The remaing two horizons—H3, and H4—extend from 27 to 35 inches (H3) and 35 to 65 inches (H4). H3 consists of gravelly sandy loam, while H4 is characterized by stratified coarse sand to gravelly sand. Riverhead soil is naturally well-drained, with a minimum hydraulic conductivity of 1.98 to 5.95 inches/hour, which is considered moderately high. The depth to the water table in this unit is more than 80 inches, and the sand has a low capacity for water storage (5.1 inches).

Haven soil is derived from loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, and, similar to the Riverhead soil, currently takes the form of outwash plains. The typical profile of Haven material has four horizons. The first two, H1 and H2, extend from 0 to 12 inches and 12 to 19 inches bgs, respectively, and comprise loam. The third layer, BC, is present at a depth of 19 to 28 inches bgs and is characterized as gravelly loam. The fourth layer comprises stratified gravelly sand, and extends from 28 to 60 inches bgs. This layer is abbreviated as C. Haven soil is naturally well-drained, with a minimum hydraulic conductivity of 0.57 to 1.98 inches/hour, which is considered moderately high to high. The depth to the water table in this unit is more than 80 inches, and the sands have a very low capacity for water storage (4.6 inches).

The minor components of the Riverhead and Haven soils include:

- Unnamed soils, loamy surface (10 percent)
- Cut and fill (5 percent)
- Montauk, graded (5 percent)

Sudbury Sandy Loam

Sudbury sandy loam (Su) is present in the study area at slopes ranging from 0 to 3 percent. The formation comprises 85 percent Sudbury sandy loam and similar soils, with the remaining 15 percent comprising minor components. Sudbury sandy loam is considered prime farmland, has a hydric rating of 0, and represents 0.6 percent of the land in the study area.

Sudbury sandy loam is derived from sandy and gravelly glaciofluvial deposits originating mainly with crystalline rock and currently takes the form of outwash plains. The typical profile of Sudbury material has five horizons. The first is characterized by highly-decomposed plant material and extends from 0 to 1 inches bgs. As is the case with previously-described formations, the first layer is abbreviated as Oa. The second and third horizons, H1 and H2, extend from 1 to 2 inches and 2 to 25 inches bgs, respectively. These layers are composed of sandy loam. The third layer, H3, comprises loamy sand and is present between 25 and 37 inches. The fourth horizon extends from

37 to 60 inches bgs and comprises stratified gravelly sand. This layer is abbreviated as H4. Sudbury sandy loam is naturally moderately well-drained, with a minimum hydraulic conductivity of 0.20 to 5.95 inches/hour, which is considered moderately high to high. The depth to the water table is greater than 80 inches and the material has a low capacity for water storage (5.5 inches).

The minor components of Sudbury sandy loam include:

- Riverhead (5 percent)
- Walpole (5 percent)
- Sudbury, gently sloping (5 percent)

Tidal Marsh

Tidal marshes (Tm) are present in the study area at slopes ranging from 0 to 1 percent. The formation consists of 95 percent Tidal marsh, with the remaining 5 percent comprising minor components. Tidal marshes are not considered prime farmland, have a hydric rating of 95, and represent 0.2 percent of the land in the study area.

Tidal marshes are derived from organic material, and do not have a profile. These features are naturally poorly drained and are characterized by the presence of water at the surface.

The minor component of Tidal marshes includes:

- Dune land (5 percent)

Urban Land

Urban land (Ur) comprises 100 percent of this formation. This type of land is generally defined as land which is found in watersheds that provide drinking water, food, waste utilization, and natural resources in communities. Urban land is also located within cities in park areas, recreation areas, community gardens, green belts, lawns, septic absorption fields, sediment basins, and other uses. Urban land is not considered prime farmland, and has a hydric rating of 0. This land type and composes 0.8 percent of the study area. Urban land has no minor components.

Wareham Loamy Sand

Wareham loamy sand (We) is present in the study area at slopes ranging from 0 to 3 percent. The two primary components of this formation are both Wareham loamy sands, but with different natural drainage classes. The first, a poorly drained Wareham loamy sand, composes 50 percent of the material present, while the second, a somewhat poorly drained Wareham loamy sand, composes 35 percent of the material present. The remaining 15 percent comprises minor components. Wareham loamy sand is considered farmland of statewide importance, has a hydric rating of 60, and represents 2.3 percent of the land in the study area.

Both Wareham loamy sand components have, for the most part, the same characteristics. Both are derived from sandy glaciofluvial or deltaic deposits and currently take the form of depressions in the land surface. The typical profile has four horizons. The first is characterized by highly-decomposed plant material, which extends from 0 to 3 inches bgs. As is the case with previously-described, similar horizons, this layer is abbreviated as Oa. The next three horizons—H1, H2, and H3—extend from 3 to 7 inches, 7 to 9 inches, and 9 to 36 inches bgs, respectively. All of these horizons comprise loamy sand. The final layer, H4, is present at 32 to 60 inches bgs and is characterized by stratified very gravelly coarse sand. Both Wareham loamy sand components also

have a minimum hydraulic conductivity of 0.20 to 5.95 inches/hour, which is considered moderately high to high. The sands have a low capacity for water storage (5.4 inches). The only difference between these two Wareham loamy sands is the depth to the water table. This depth ranges from 6 to 12 inches in the poorly drained material, and from 6 to 18 inches in the somewhat poorly drained material.

The minor components of the Wareham loamy sand do not vary between the two drainage classifications. These include:

- Atsion (5 percent)
- Berryland (5 percent)
- Walpole (5 percent)

Recharge Basin and Water

Two additional "soil types" identified in the study area include Recharge basin (Rc) zones and areas of water (W). Based on the NRCS characterization, Recharge basin-classified land makes up less than 0.01 percent of the study area, while water makes up 0.7 percent.

References

NCRCD. 2017. Cut and Fill Land. Available online: http://www.ncrcd.org/files/5714/0968/2785/CUT_and_FILL_LAND.pdf. Accessed January 19, 2017.

NRCS. 2017. Custom Soil Resource Report for Suffolk County, NY. Dated January 2017

NRCS. 2017. Urban Soils. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/urban/. Accessed January 19, 2017.

NRCS. 2017. Web Soil Survey. Available online: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed January 18, 2017.

APPENDIX B.12: TRANSPORTATION TECHNICAL ANALYSIS

This page intentionally left blank.

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

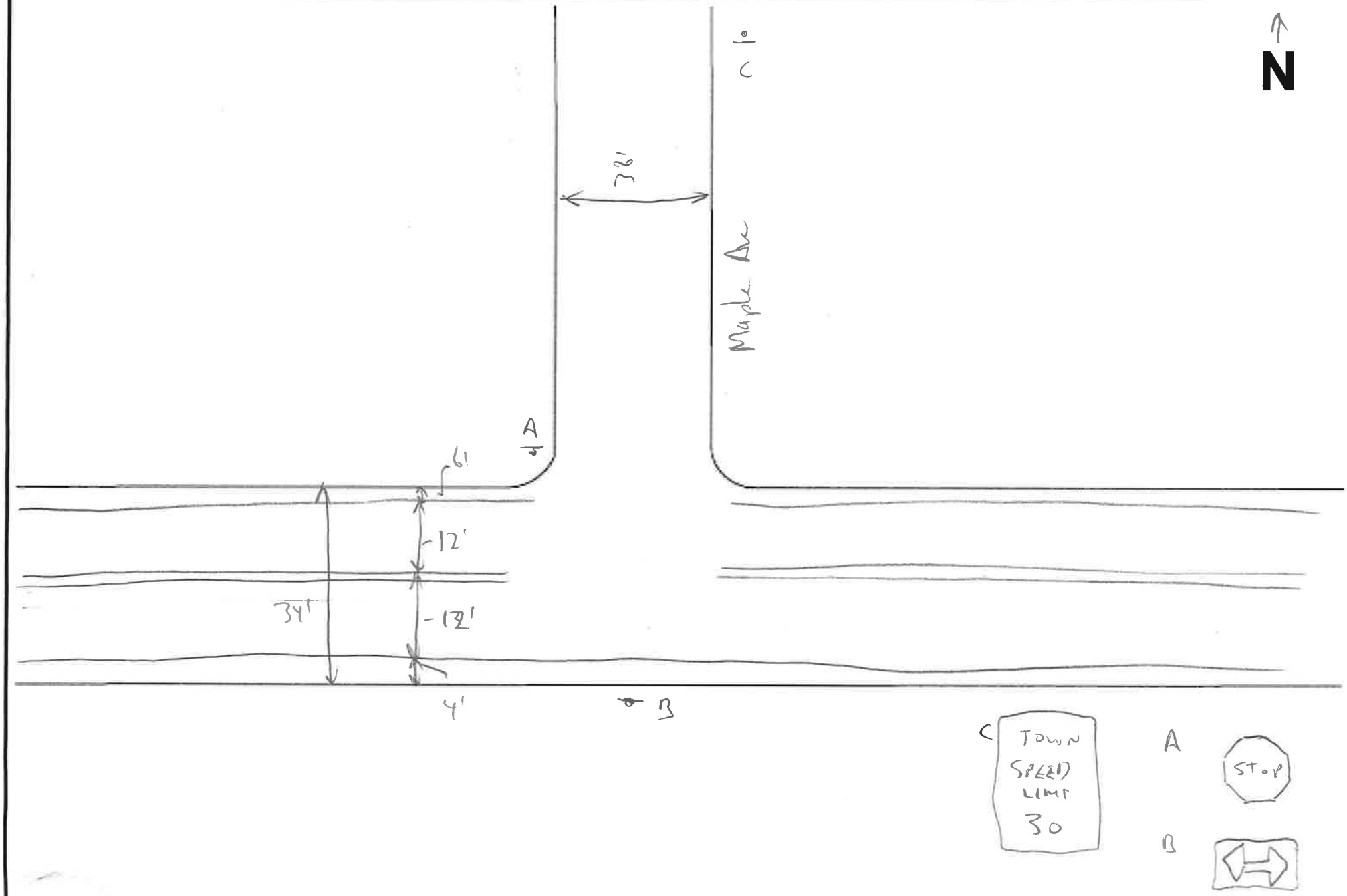
APPENDIX A

INTERSECTION INVENTORY

Project _____ Date: 12/7/16

Observations

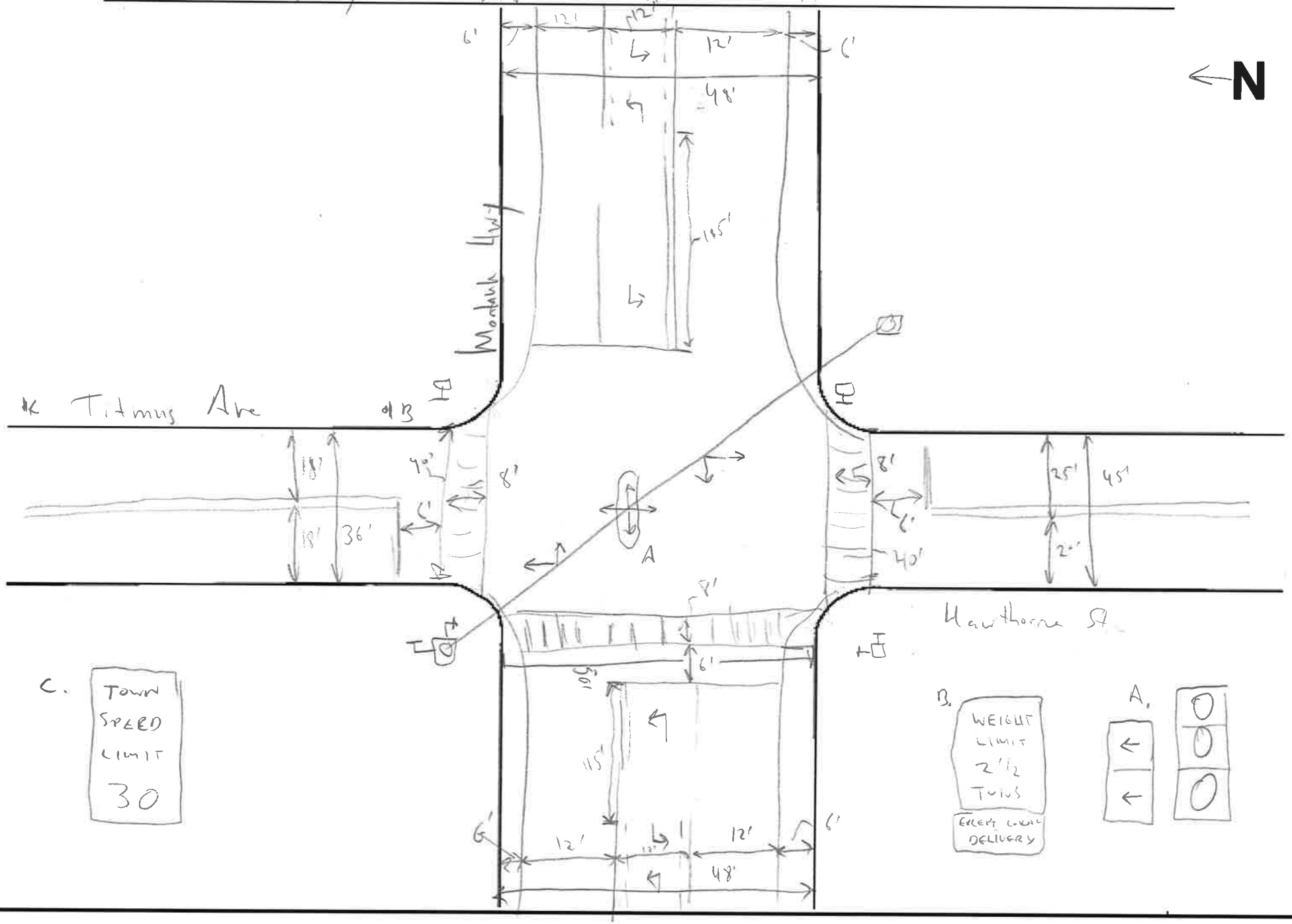
Intersection Sunrise Service Road North @ Maple Ave



Project _____ Date: 12/12/16

Observation

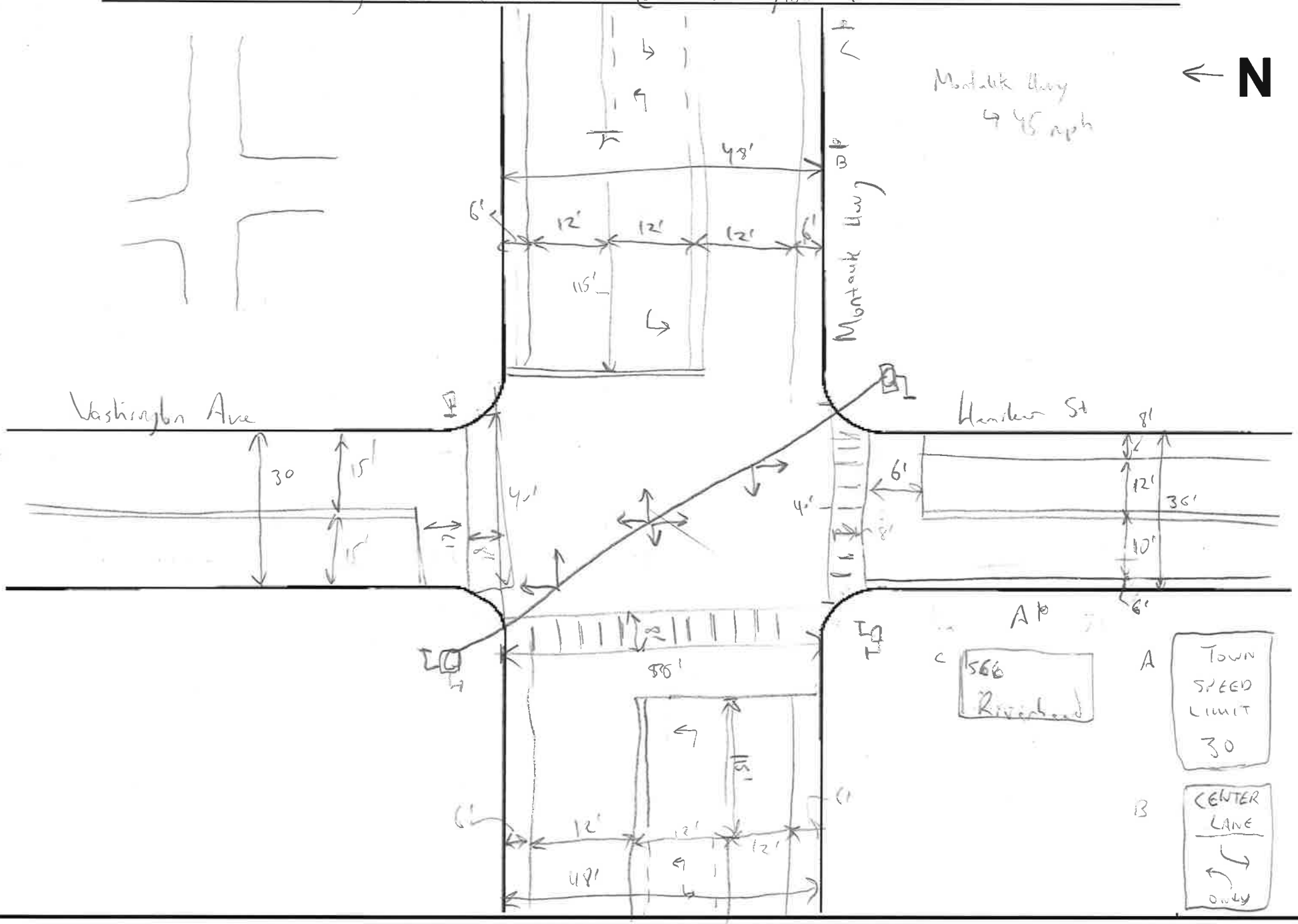
Intersection Montauk Highway @ Titmus Ave @ Hawthorne St



Observations

Project _____ Date: 12/7/16

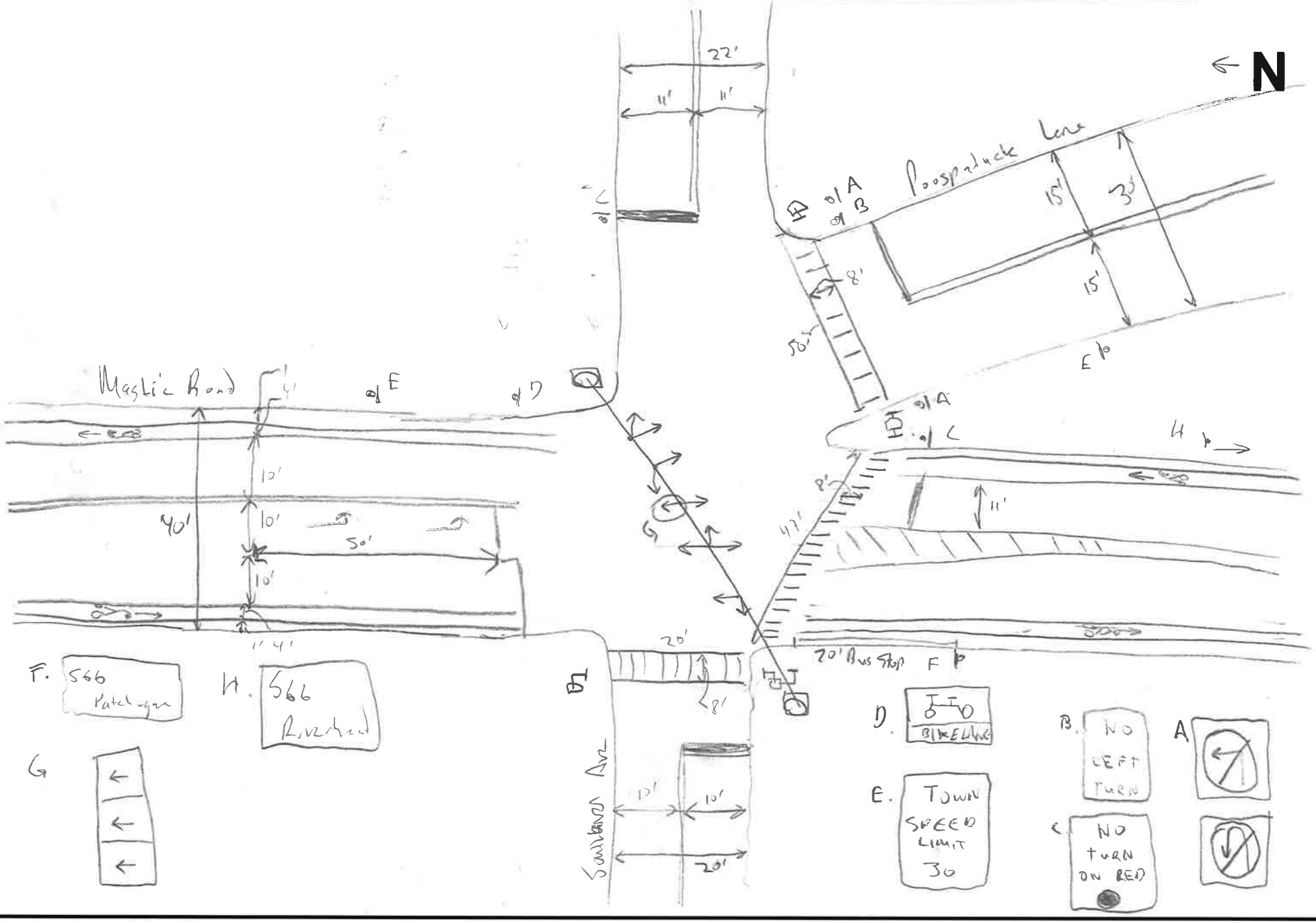
Intersection Montauk Hwy @ Hamilton St @ Washington Ave



Project _____ Date: 12/7/16

Observations

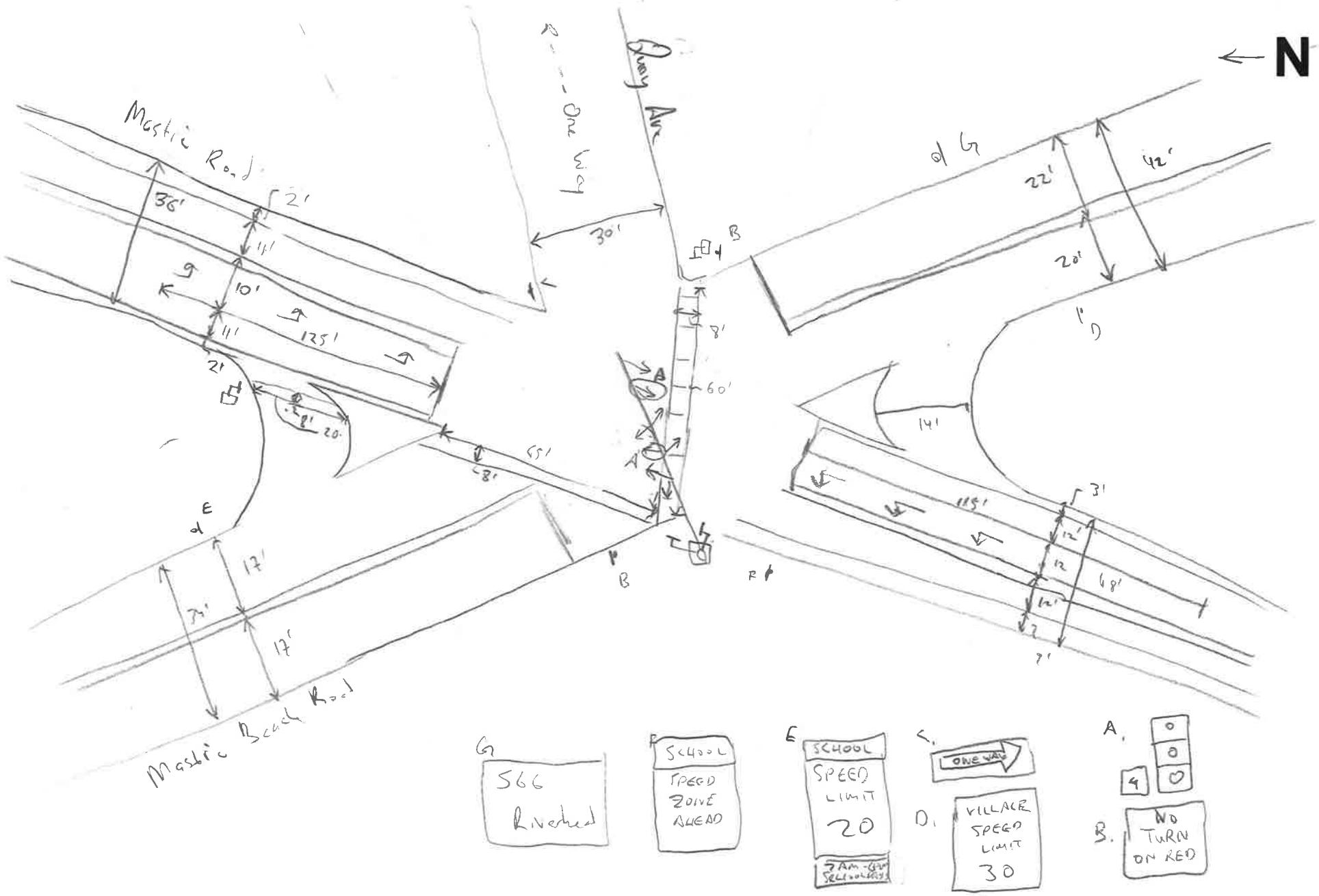
Intersection Mastic Road @ Southaven Ave @ Poospatuck Lane



Observations

Project _____ Date: 12/7/16

Intersection Mastic Road @ Mastic Beach Rd @ Quay Ave



FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

APPENDIX B

SUFFOLK COUNTY AND FIELD SIGNAL TIMINGS

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Phase Timings 1-16 [1.1.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk		7		7		7		7								
Ped Clearance		10		10		10		10								
Min Green	3	30		6	3	30		6								
Passage	2	5		2	2	5		2								
Max1	10	60		25	10	60		25								
Max2																
Yellow	3.2	4.3	3	3.5	3.2	4.3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red	2	2.3	1.5	2	2	2.3	1.5	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Red Revert	2	2	2	2	2	2	2	2								
Added Initial																
Max Initial																
Time Before Reduce		40				40										
Cars Before Reduce																
Time To Reduce		40				40										
Reduce By																
Min Gap	2	3		2	2	3		2								
Dynamic Max Limit	20	100		40	20	100		40								
Dynamic Max Step	5	10		5	5	10		5								
Auto Exit		ON				ON										
Rest In Walk																

Phase Option [1.1.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable	ON	ON		ON	ON	ON		ON								
Auto Entry		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall		ON				ON			ON	ON	ON	ON	ON	ON	ON	ON
Max Recall																
Ped Recall									ON	ON	ON	ON	ON	ON	ON	ON
Soft Recall																
Dual Entry				ON				ON								
Sim Gap Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Guar Passage																
Cond Service																
Add Init Calc																

Phase Option+ [1.1.3]/[1.1.5]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Reservice																
Walk Yellow																
Skip Red																
Red Rest																
Max 2																
Max Inhibit																
Ped Delay																
Red Rest On Gap																
Conf Phs1																
Green Ped Delay Time																
Omit Yel																
Ped Out																
Start Yel																
Inhibit P1																
Inhibit P2																
Inhibit P3																
Inhibit P4																
Inhibit P5																
Inhibit P6																
Inhibit P7																
Inhibit P8																
Call Phs1																
Call Phs2																
Call Phs3																
Call Phs4																
From Phs1																
To Phs1																
From Phs2																
To Phs2																
From Phs3																
To Phs3																
From Phs4																
To Phs4																

Prepared By	Date Implemented	Reviewed By	Traffic Engineer

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Coordination, Splits [2.7.1]

Split Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	12	56		22	12	56		22								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	12	56		22	12	56		22								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	13	52		25	13	52		25								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX 1	FIXED

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active
FRC	TIMED	TIMED	NO RECYCLE	ON	OFF	ON	OFF	OFF	0	+	ON

Coordination, Pattern 1-16 [2.4]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time	90	90	90													
Offset Time	40	45	58													
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Coordination, Pattern+ 1-16 [2.5][2.6]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Short	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12
Long	25	25	25	25	22	22	22	22	22	22	22	22	22	22	22	22
Dwell																
No Short P 1																
No Short P 2																
No Short P 3																
No Short P 4																
Early Yield																
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn
CNA	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Max 2	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Float	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Min Veh Perm	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
Min Ped Perm	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
Ret Hold	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
CIC Plan																
Ph Opt Table																
Ph Time Table																
Det Grp																
Call Inh																
Inh Perm Phs 1	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 2	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 3	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 4	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 5	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 6	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 7	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 8	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Dia Mode	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft

Channels/SDLC, Assign to Phases [1.3.1](v61) or [1.8.1](v65, v76)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #	1	2		4	5	6		8	2		6	8					1	3	5	7				
Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	PED	PED	PED	PED	OLP	OLP	OLP	OLP	PED	PED	PED	PED	VEH	VEH	VEH	VEH
Flash	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Detector, Vehicle Parameters & Options [5.1][5.2]

1-16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase	1	5	4	8	2	6										
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

17-32

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time	2	2														

33-48

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time																

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

49-64

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time																

Detector, Vehicle Parameters+ [5.3]

1-16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

17-32

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

33-48

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

49-64

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

Detector, Ped Detectors 1-16 [5.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	2	6	8													
No Activity																
Max Presence	15	15	15	15	15	15	15	15								
Erratic Cnt																

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
OFF	OFF	OFF	ON	

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1		4															NORMAL		3.5	1.5
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6																	NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5
Overlap 9																	NORMAL		3.5	1.5
Overlap 10																	NORMAL		3.5	1.5
Overlap 11																	NORMAL		3.5	1.5
Overlap 12																	NORMAL		3.5	1.5
Overlap 13																	NORMAL		3.5	1.5
Overlap 14																	NORMAL		3.5	1.5
Overlap 15																	NORMAL		3.5	1.5
Overlap 16																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds									
Overlap 1																										
Overlap 2																										
Overlap 3																										
Overlap 4																										
Overlap 5																										
Overlap 6																										
Overlap 7																										
Overlap 8																										
Overlap 9																										
Overlap 10																										
Overlap 11																										
Overlap 12																										
Overlap 13																										
Overlap 14																										
Overlap 15																										
Overlap 16																										

Flash Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
45	20	PH OVER	D-CONN

Flash, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Aux Switch Function	Local Flash Start	Console Timeout	Yellow 3 Second Disable	Tone Disable	Omit Yellow Enable	MCE Timeout	Enable Run	Start Red Time	Phase Mode	Disable Init Ped	Diamond Mode	TOD Dim Enable	Extra Maps Enable	D Connector Enable	SDLC Retry Time	TS2 Det Faults	Stop Time Over Preempt
	OFF	900	3	STOPTM	RED	20	OFF	OFF	OFF		ON		STD8	OFF	4PH	OFF	DEFAULT	NONE		ON	OFF

Ring Sequence 1 [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

Phase Startup, Concur [1.1.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Startup	RED	GREEN	RED	RED	RED	GREEN	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED
Ring	1	1	1	1	2	2	2	2								
Concur 1	5	5	7	7	1	1	3	3								
Concur 2	6	6	8	8	2	2	4	4								
Concur 3																
Concur 4																
Concur 5																
Concur 6																
Concur 7																
Concur 8																

Comm, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	Port	System-Up	Sys-Down	PC/Print	Aux 232
505								

Suffolk County

Timing Sheet

12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	ON
10	
11	
12	ON
13	
14	ON
15	
16	
17	ON
18	ON
19	ON
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	ON
29	ON
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	ON
44	ON
45	
46	
47	
48	ON
49	ON
50	ON
51	ON
52	ON
53	ON
54	ON
55	ON
56	ON
57	ON
58	ON
59	
60	
61	ON
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	
14	ON
15	
16	
17	
18	
19	
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
OFF	OFF

74		74	
75		75	
76		76	
77		77	
78		78	
79		79	
80		80	
81		81	
82		82	
83		83	
84		84	
85		85	
86		86	
87		87	
88		88	
89		89	
90		90	
91		91	
92		92	
93		93	
94		94	
95		95	
96		96	
97		97	
98		98	
99		99	
100		100	
101		101	
102		102	
103		103	
104		104	
105		105	
106		106	
107		107	
108		108	
109		109	
110		110	
111		111	
112		112	
113		113	
114		114	
115		115	
116		116	
117		117	
118		118	
119		119	
120		120	
121		121	
122		122	
123		123	
124		124	
125		125	
126		126	
127		127	
128		128	

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15	15	15
Min Green	6	6	6	6	6	6
Min Walk	1	1	1	1	1	1
Ped Clear	1	1	1	1	1	1
Track Green						
Min Dwell	2	2	2	2	2	2
Max Presence	120	120	120	120	120	120
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1	2	4	1	2	3	4
Dwell P2	6	8	6	5	8	7
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1	2	2	2	2	2	2
Exit R2	6	6	6	6	6	6
Exit R3						
Exit R4						

Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable	ON	ON	ON	ON	ON	ON
Type	EMERG	EMERG	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt		ON	ON	ON	ON	ON
Max2						
Return Max/Min	MAX	MAX	MAX	MAX	MAX	MAX
Extend Dwell						
Pattern						
Output Mode	TS2	TS2	TS2	TS2	TS2	TS2
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Max Green						

Low Priority Preempt [3]

Preempt	7	8	9	10
Min				
Max				
Type				
Lockout Mode	MAX	MAX	MAX	MAX
Coord in Preempt				
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Priority P5				
Priority P6				
Priority P7				
Priority P8				
Priority P9				
Priority P10				
Priority P11				
Priority P12				
Max Lockout				

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

TB Coor, Advanced Scheduler [4.3]

	Month												Day of Week							Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3																																																				1
4																																																				1
5																																																				1
6																																																				1
7																																																				1
8																																																				1
9																																																				1
10																																																				1
11																																																				1
12																																																				1
13																																																				1
14																																																				1
15																																																				1
16																																																				1
17																																																				1
18																																																				1
19																																																				1
20																																																				1
21																																																				1
22																																																				1
23																																																				1
24																																																				1
25																																																				1
26																																																				1
27																																																				1
28																																																				1
29																																																				1
30																																																				1
31																																																				1
32																																																				1

TB Coor, Day Plan [4.4]

Day Plan Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		6	9	14	19											
Minute			30		30											
Action	99	99	99	99	99											

Day Plan Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		10	18													
Minute																
Action	99	99	99	99												

Day Plan Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Day Plan Table 7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 13	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 14	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 15	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day plan Link 1-16 [4.3]

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Link																

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1				0	0						
2	2				0	0						
3	3				0	0						
4	4				0	0						
5	5				0	0						
6	6				0	0						
7	7				0	0						
8	8				0	0						
9	9				0	0						
10	10				0	0						
11	11				0	0						
12	12				0	0						
13	13				0	0						
14	14				0	0						
15	15				0	0						
16	16				0	0						
17	17				0	0						
18	18				0	0						
19	19				0	0						
20	20				0	0						
21	21				0	0						
22	22				0	0						
23	23				0	0						
24	24				0	0						
25					0	0						
26					0	0						
27					0	0						
28					0	0						
29					0	0						
30					0	0						
31					0	0						
32					0	0						
33					0	0						
34					0	0						
35					0	0						
36					0	0						
37					0	0						
38					0	0						
39					0	0						
40					0	0						
41					0	0						
42					0	0						
43					0	0						
44					0	0						
45					0	0						
46					0	0						
47					0	0						
48					0	0						
49					0	0						
50					0	0						
51					0	0						
52					0	0						
53					0	0						
54					0	0						
55					0	0						
56					0	0						
57					0	0						
58					0	0						
59					0	0						
60					0	0						
61					0	0						
62					0	0						
63					0	0						
64					0	0						
65					0	0						
66					0	0						
67					0	0						
68					0	0						
69					0	0						
70					0	0						
71					0	0						
72					0	0						
73					0	0						

74					0	0						
75					0	0						
76					0	0						
77					0	0						
78					0	0						
79					0	0						
80					0	0						
81					0	0						
82					0	0						
83					0	0						
84					0	0						
85					0	0						
86					0	0						
87					0	0						
88					0	0						
89					0	0						
90					0	0						
91					0	0						
92					0	0						
93					0	0						
94					0	0						
95					0	0						
96					0	0						
97					0	0						
98					0	0						
99	254				0	0						
100	255				0	0						

Channels/SDLC+, IO Logic [1.8.7]

	1	2	3	4	5	6	7	8	9	10
Result										
Operator 1 Function	----	----	----	----	----	----	----	----	----	----
Operator 1 Result	I	I	I	I	I	I	I	I	I	I
Operator 1 IO	I	I	I	I	I	I	I	I	I	I
Operator 1 Invert	-	-	-	-	-	-	-	-	-	-
Operand 1										
Operator 2 Function	----	----	----	----	----	----	----	----	----	----
Operator 2 IO	I	I	I	I	I	I	I	I	I	I
Operator 2 Invert	-	-	-	-	-	-	-	-	-	-
Operand 2										
Operator 3 Function	----	----	----	----	----	----	----	----	----	----
Operator 3 IO	I	I	I	I	I	I	I	I	I	I
Operator 3 Invert	-	-	-	-	-	-	-	-	-	-
Operand 3										
Time Operator	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY
Time										

User Input map [1.8.9.1]

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Pin 1	1	9	189	189	202	189	189	189
Pin 2	2	10	189	189	203	189	189	189
Pin 3	3	129	202	189	200	189	189	189
Pin 4	4	130	203	189	201	189	189	189
Pin 5	5	131	200	181	189	189	189	189
Pin 6	6	132	201	178	189	189	189	189
Pin 7	7	189	198	228	189	189	189	189
Pin 8	8	189	199	229	189	189	189	189

User Output map [1.8.9.2]

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Pin 1	1	4	7	10	28	115	115	115
Pin 2	49	52	55	58	34	115	115	115
Pin 3	2	5	8	11	25	13	115	115
Pin 4	26	29	32	35	31	37	115	115
Pin 5	50	53	56	59	115	61	115	115
Pin 6	3	6	9	12	115	14	115	115
Pin 7	27	30	33	36	115	38	115	115
Pin 8	51	54	57	60	114	62	115	115

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Miscellaneous Data

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 3, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 1, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RIW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Alternate Phase Program 2, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RIW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Alternate Phase Program 3, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RIW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Extend																
Queue																
Call Phase																
Switch Phase																
Delay Time																
No Activity																
Max Presence																
Erratic Cnt																
Fail Time																

Detector Alternate Program 1, Vehicle Options [5.5.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Added Initial																
Call																
Extend Time																
Queue Limit																

Detector Alternate Program 1, Ped Parameters [5.5.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase																
No Activity																
Max Presence																
Erratic Cnt																

Channel/SDLC +, Assign to Phases [1.8.4]

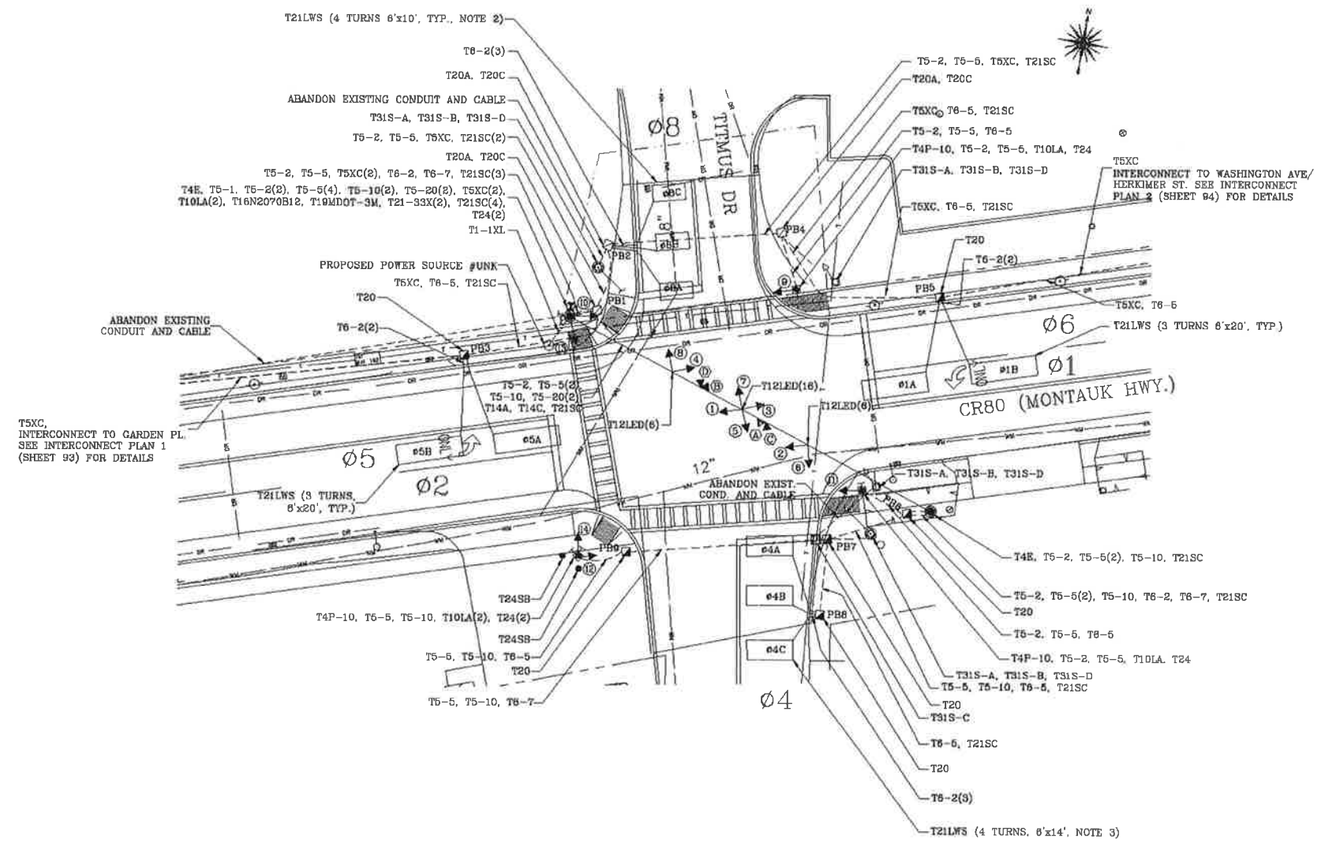
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	10	21	22	23	24
PH/OLP #	1	2		4	5	6		8	2		6	8					1	3	5	7				
Flash Red+																								
Flash Yel+																								
Flash Grn+																								
Flash Inh Red+																								

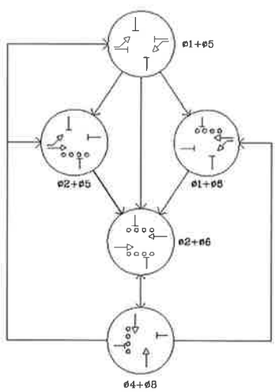
Suffolk County Timing Sheet 12/27/2016 1:09:27 PM

Station : 505 - CR 80 @ TITMUS DR-HAWTHORNE ST (Standard File)

Communication, IP Parameters [6.5]

	Octet 1	Octet 2	Octet 3	Octet 4
IP Address 1				
IP Address 2				
IP Address 3				
IP Address 4				
IP Mask 1				
IP Mask 2				
IP Mask 3				
IP Mask 4				
IP Broadcast 1				
IP Broadcast 2				
IP Broadcast 3				
IP Broadcast 4				
IP Gateway 1				
IP Gateway 2				
IP Gateway 3				
IP Gateway 4				
IP Port				





PHASING DIAGRAM

PHASE \ SIGNAL	1	2	3	4	5-8	9-10	11-12	13,14
	12"	12"	12"	12"	12"	16"x18"	16"x18"	16"x18"
	R Y G	R Y G	R Y G	R Y G	R Y G			
ø1+ø5	~~G~~ / R	R	~~G~~ / R	R	R	STEADY	STEADY	STEADY
ø1+ø6	R	R	~~G~~ / G	G	R	*	STEADY	STEADY
ø2+ø5	~~G~~ / G	G	R	R	R	STEADY	*	STEADY
ø2+ø6	G	G	G	G	R	*	*	STEADY
ø4+ø8	R	R	R	R	G	STEADY	STEADY	*
FLASH	Y	Y	Y	Y	R	DARK	DARK	DARK

* indication should remain in steady "DON'T WALK" unless the pushbutton is activated.

SIGNAL SEQUENCE TABLE

CHANNEL	A	B	C	D
PHASE	ø2+ø5	ø1+ø6	ø4+ø8	
RETURN	ø2+ø8			

PREEMPTION TABLE

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QTY
T1-1XL	AERIAL SERVICE DROP CABLE, 2 COND., #4 AWG	L.F.	20
T4E	STEEL POLE 30 FOOT HEAVY DUTY	EA.	2
T4P-10	SIGNAL POLE - 10 FOOT	EA.	3
T5-1	SIGNAL CABLE, 2 COND. #8 AWG	L.F.	40
T5-2	SIGNAL CABLE, 2 COND. #14 AWG	L.F.	385
T5-5	SIGNAL CABLE, 5 COND. #14 AWG	L.F.	750
T5-10	SIGNAL CABLE, 10 COND. #14 AWG	L.F.	370
T5-20	SIGNAL CABLE, 20 COND. #14 AWG	L.F.	350
T5XC	SHIELDED COMMUNICATION CABLE, 6 PR #19 AWG	L.F.	255
T6-2	STEEL CONDUIT, 1" DIA.	L.F.	35
T6-5	STEEL CONDUIT, 2" DIA.	L.F.	190
T6-7	STEEL CONDUIT, 3" DIA.	L.F.	75
T10LA	PEDESTRIAN SIGNAL, LED, 16"x18"	EA.	6
T12LED	LED SIGNAL SECTION 8" OR 12"	EA.	28
T14A	SPAN WIRE ASSEMBLY - 1/4"	EA.	1
T14C	SPAN WIRE ASSEMBLY - 7/16"	EA.	1
T16N2070B12	2070 TRAFFIC SIGNAL CONTR. W/ 336S CAB., 12 POS.	EA.	1
T19MDOT-3M	OPTICOM SYSTEM, NYS 179/2070	INT.	1
T20	PULLBOX	EA.	6
T20A	ADJUST TO GRADE PULLBOX COVER	EA.	3
T20C	CLEAN EXISTING PULLBOX	EA.	3
T21-33X	2 CHANNEL INDUCTANCE LOOP SENSOR FOR 33X CAB.	EA.	2
T21LWS	ROADWAY LOOP, SPECIAL	L.F.	500
T21SC	SHIELDED LEAD-IN CABLE	L.F.	500
T24	PEDESTRIAN PUSHBUTTON ASSEMBLY	EA.	6
T24SB	STEEL BOLLARD, 5" DIA.	EA.	2
T30S	MAINT. TRAFFIC SIGNAL EQUIP.	MONTH	18
T31S-A	REMOVE POLE OR CONTROLLER FOUNDATIONS	EA.	4
T31S-B	REMOVE TRAFFIC SIGNAL POLE	EA.	4
T31S-C	REMOVE TRAFFIC SIGNAL PULLBOX	EA.	1
T31S-D	REMOVE TRAFFIC SIGNAL EQUIPMENT	EA. INT.	1

NOTES:

1. Signal heads, poles, posts, cabinets, and controllers removed under any T31S-_ item shall be returned to the SCDPW Yaphank yard or disposed of A.O.B.E. Contractor shall provide 48 hours notice of delivery of these items. The existing span wire as well as other miscellaneous related items shall be removed and disposed of A.O.B.E. For clarity, the existing signal heads are not shown on the plan.
2. For the Ø8 loops, wire Ø8A, Ø8B and ø8C in parallel into one shielded lead-in cable.
3. For the Ø4 loops, wire Ø4A, Ø4B and ø4C in parallel into one shielded lead-in cable.
4. All loops shall be centered in their lanes and spaced 10' apart.

0 20 40
SCALE

SYMBOL	DESCRIPTION	APPROVED	DATE
	REVISIONS		

COUNTY OF SUFFOLK
DEPARTMENT OF PUBLIC WORKS
YAPHANK, NEW YORK

GILBERT ANDERSON, P.E. - COMMISSIONER

PLAN FOR THE RECONSTRUCTION OF
C.R. 80 MONTAUK HIGHWAY

TRAFFIC SIGNAL PLAN

C.R. 80-MONTAUK HWY.
AT TITMUS DRIVE

PROJECT NO.	DATE	SHEET NO. 90 OF 109
5516	10-17-08	

DESIGNED BY: Engineers Name CHECKED BY: ENGINEER NAME DRAWN BY: Drafters Name COMPARED BY: Engineers Name

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Phase Timings 1-16 [1.1.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk		7		7		7		7								
Ped Clearance		10		10		10		10								
Min Green		20		6		20		6								
Passage				4				2								
Max1		55		35		55		35								
Max2																
Yellow	3	4.7	3	3.5	3	4.7	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red	1.5	2.3	1.5	2.3	1.5	2.3	1.5	2.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Red Revert	2	2	2	2	2	2	2	2								
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap				2				2								
Dynamic Max Limit																
Dynamic Max Step																
Auto Exit		ON				ON										
Rest In Walk		ON				ON										

Phase Option [1.1.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable		ON		ON		ON		ON								
Auto Entry		ON				ON										
Non Act1																
Non Act2																
Lock Call									ON	ON	ON	ON	ON	ON	ON	ON
Min Recall		ON				ON			ON	ON	ON	ON	ON	ON	ON	ON
Max Recall																
Ped Recall		ON				ON			ON	ON	ON	ON	ON	ON	ON	ON
Soft Recall																
Dual Entry				ON				ON								
Sim Gap Enable	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Guar Passage																
Cond Service																
Add Init Calc																

Phase Option+ [1.1.3]/[1.1.5]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Reservice																
Walk Yellow																
Skip Red																
Red Rest																
Max 2																
Max Inhibit																
Ped Delay																
Red Rest On Gap																
Conf Phs1																
Green Ped Delay Time																
Omit Yel																
Ped Out																
Start Yel																
Inhibit P1																
Inhibit P2																
Inhibit P3																
Inhibit P4																
Inhibit P5																
Inhibit P6																
Inhibit P7																
Inhibit P8																
Call Phs1																
Call Phs2																
Call Phs3																
Call Phs4																
From Phs1																
To Phs1																
From Phs2																
To Phs2																
From Phs3																
To Phs3																
From Phs4																
To Phs4																

Prepared By	Date Implemented	Reviewed By	Traffic Engineer

1 of 14

Suffolk County | Timing Sheet | 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Coordination, Splits [2.7.1]

Split Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time		39		36		39		36								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time		39		36		39		36								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time		50		40		50		40								
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON														

Split Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time	9	23	12	16	9	23	12	16								
Mode	NON	MAX	NON	NON	NON	MAX	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph		ON				ON										

Split Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Split Table 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time																
Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
Coord-Ph																

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Coordination, Modes,+ [2.1]

Modes

Operational	Correct	Maximum	Force-Off
	SHRT/LNG	MAX 1	FIXED

Modes+

Mode	Leave Before	Leave After	Recycle	Stop In Walk	External	Auto Reset	Latch Sec Foff	Coord Easy Float	Yield Value	Coord NTCIP Yield Sign	Closed Loop Active
FRC	TIMED	TIMED	P3478 INH	ON	OFF	ON	OFF	OFF	0	+	ON

Coordination, Pattern 1-16 [2.4]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle Time	75	75	90													
Offset Time																
Split Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Seq Number	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Coordination, Pattern+ 1-16 [2.5][2.6]

Pattern	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Short	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12
Long	25	25	25	25	22	22	22	22	22	22	22	22	22	22	22	22
Dwell																
No Short P 1																
No Short P 2																
No Short P 3																
No Short P 4																
Early Yield																
Offset	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn	endgrn
CNA	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Max 2	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Float	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Min Veh Perm	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
Min Ped Perm	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
Ret Hold	on	on	on	on	off	off	off	off	off	off	off	off	off	off	off	off
CIC Plan																
Ph Opt Table																
Ph Time Table																
Det Grp																
Calf Inh																
Inh Perm Phs 1	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 2	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 3	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 4	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 5	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 6	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 7	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Inh Perm Phs 8	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off	off
Dia Mode	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft	dft

Channels/SDLC, Assign to Phases [1.3.1](v61) or [1.8.1](v65, v76)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PH/OLP #		2		4		6		8	2		6	8					1	3	5	7				
Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	PED	PED	PED	PED	OLP	OLP	OLP	OLP	PED	PED	PED	PED	VEH	VEH	VEH	VEH
Flash	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz																								
Dimming Green																								
Dimming Yellow																								
Dimming Red																								
Alt Cyc	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Detector, Vehicle Parameters & Options [5.1][5.2]

1-16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase	4	8														
Switch Phase																
Delay Time	3	3														
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time			2	2	2	2	2	2	2	2	2	2	2	2	2	2

17-32

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time	2	2														

33-48

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time																

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

49-64

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Extend	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Added Initial	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Queue																
Call	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Call Phase																
Switch Phase																
Delay Time																
Extend Time																
Queue Limit																
No Activity																
Max Presence	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Erratic Counts	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Fail Time																

Detector, Vehicle Parameters+ [5.3]

1-16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

17-32

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

33-48

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

49-64

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Green Occupancy																
Yellow Occupancy																
Red Occupancy																
External Mode	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM	NORM
Delay Phase 1																
Delay Phase 2																
Source																

Detector, Ped Detectors 1-16 [5.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase	2	6	8													
No Activity																
Max Presence	15	15	15	15	15	15	15	15								
Erratic Cnt																

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Overlap General Parameters [1.5.1]

Conflict Lock	Lock Inhibit	Program Card	Use Parent	Canadian Fast Flash
OFF	OFF	OFF	ON	

Overlap Program Parameters [1.5.2.1]

Overlap	Included Phases								Modifer Phases								Type	Green	Yellow	Red
Overlap 1	5																NORMAL		3.5	1.5
Overlap 2																	NORMAL		3.5	1.5
Overlap 3																	NORMAL		3.5	1.5
Overlap 4																	NORMAL		3.5	1.5
Overlap 5																	NORMAL		3.5	1.5
Overlap 6																	NORMAL		3.5	1.5
Overlap 7																	NORMAL		3.5	1.5
Overlap 8																	NORMAL		3.5	1.5
Overlap 9																	NORMAL		3.5	1.5
Overlap 10																	NORMAL		3.5	1.5
Overlap 11																	NORMAL		3.5	1.5
Overlap 12																	NORMAL		3.5	1.5
Overlap 13																	NORMAL		3.5	1.5
Overlap 14																	NORMAL		3.5	1.5
Overlap 15																	NORMAL		3.5	1.5
Overlap 16																	NORMAL		3.5	1.5

Overlap Conflict Parameters+ [1.5.2.2]

Overlap	Conflicting Phases								Conflicting Overlaps								Conflicting Peds									
Overlap 1																										
Overlap 2																										
Overlap 3																										
Overlap 4																										
Overlap 5																										
Overlap 6																										
Overlap 7																										
Overlap 8																										
Overlap 9																										
Overlap 10																										
Overlap 11																										
Overlap 12																										
Overlap 13																										
Overlap 14																										
Overlap 15																										
Overlap 16																										

Flash Parameters [1.4.1]

Auto Flash Parameter

Yellow	Red	Mode	Source
45	20	PH OVER	D-CONN

Flash, Phases/Overlaps [1.4.2]

Auto Flash	1	2	3	4	5	6	7	8	9	10	11	12
Phases												
Overlaps												

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Unit Parameters [1.2.1]

StartUp Flash	Auto Ped Clear	Backup Time	Red Revert	Aux Switch Function	Local Flash Start	Console Timeout	Yellow 3 Second Disable	Tone Disable	Omit Yellow Enable	MCE Timeout	Enable Run	Start Red Time	Phase Mode	Disable Init Ped	Diamond Mode	TOD Dim Enable	Extra Maps Enable	D Connector Enable	SDLC Retry Time	TS2 Det Faults	Stop Time Over Preempt
	OFF	900	3	STOPTM	RED	20	OFF	OFF	OFF		ON		STD8	OFF	4PH	OFF	DEFAULT	NONE		ON	OFF

Ring Sequence 1 [1.2.4]

Ring	P1	P2	P3	P4	P5	P6	P7	P8
Ring 1	1	2	3	4				
Ring 2	5	6	7	8				
Ring 3								
Ring 4								

Phase Startup, Concur [1.1.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Startup	RED	GREEN	RED	RED	RED	GREEN	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED
Ring	1	1	1	1	2	2	2	2								
Concur 1	5	5	7	7	1	1	3	3								
Concur 2	6	6	8	8	2	2	4	4								
Concur 3																
Concur 4																
Concur 5																
Concur 6																
Concur 7																
Concur 8																

Comm, General Comm Parameters [6.1]

Station ID	Master Station ID	Fallback time	Allow Pencil	Port	System-Up	Sys-Down	PC/Print	Aux 232
506	8506							

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Alarms, Enable Events [1.6.1]

Event#	Event Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	ON
10	
11	
12	ON
13	
14	ON
15	
16	
17	ON
18	ON
19	ON
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	ON
29	ON
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	ON
44	ON
45	
46	
47	
48	ON
49	ON
50	ON
51	ON
52	ON
53	ON
54	ON
55	ON
56	ON
57	ON
58	ON
59	
60	
61	ON
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	

Alarms, Enable Alarms [1.6.4]

Alarm#	Alarm Enable
1	ON
2	ON
3	
4	ON
5	ON
6	ON
7	
8	
9	
10	
11	
12	ON
13	
14	ON
15	
16	
17	
18	
19	
20	ON
21	
22	
23	
24	
25	ON
26	
27	ON
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	

Alarms, Parameters [1.6.7]

Preempt Event Enabled	Pattern Event Enabled
OFF	OFF

74		74	
75		75	
76		76	
77		77	
78		78	
79		79	
80		80	
81		81	
82		82	
83		83	
84		84	
85		85	
86		86	
87		87	
88		88	
89		89	
90		90	
91		91	
92		92	
93		93	
94		94	
95		95	
96		96	
97		97	
98		98	
99		99	
100		100	
101		101	
102		102	
103		103	
104		104	
105		105	
106		106	
107		107	
108		108	
109		109	
110		110	
111		111	
112		112	
113		113	
114		114	
115		115	
116		116	
117		117	
118		118	
119		119	
120		120	
121		121	
122		122	
123		123	
124		124	
125		125	
126		126	
127		127	
128		128	

Suffolk County | Timing Sheet | 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Preemption Times[3.1]/Phases[3.2]/Options[3.3]

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash	ON	ON	ON	ON	ON	ON
Override Higher	ON	ON	ON	ON	ON	ON
Flash Dwell						
Link						
Delay						
Min Duration	15	15	15	15	15	15
Min Green	6	6	6	6	6	6
Min Walk	1	1	1	1	1	1
Ped Clear	1	1	1	1	1	1
Track Green						
Min Dwell	2	2	2	2	2	2
Max Presence	120	120	120	120	120	120
Track R1						
Track R2						
Track R3						
Track R4						
Dwell P1	2	4	1	2	3	4
Dwell P2	6	8	6	5	8	7
Dwell P3						
Dwell P4						
Dwell P5						
Dwell P6						
Dwell P7						
Dwell P8						
Dwell P9						
Dwell P10						
Dwell P11						
Dwell P12						
Dwell Ped1						
Dwell Ped2						
Dwell Ped3						
Dwell Ped4						
Dwell Ped5						
Dwell Ped6						
Dwell Ped7						
Dwell Ped8						
Exit R1	2	2	2	2	2	2
Exit R2	6	6	6	6	6	6
Exit R3						
Exit R4						

Preemption Times+[3.4]/Overlaps+[3.5]/Options+[3.6]

Preempt	1	2	3	4	5	6
Enable	ON	ON	ON	ON	ON	ON
Type	EMERG	EMERG	EMERG	EMERG	EMERG	EMERG
Skip Track						
Volt Mon Flash						
Coord in Preempt		ON	ON	ON	ON	ON
Max2						
Return Max/Min	MAX	MAX	MAX	MAX	MAX	MAX
Extend Dwell						
Pattern						
Output Mode	TS2	TS2	TS2	TS2	TS2	TS2
Track Over 1						
Track Over 2						
Track Over 3						
Track Over 4						
Track Over 5						
Track Over 6						
Track Over 7						
Track Over 8						
Track Over 9						
Track Over 10						
Track Over 11						
Track Over 12						
Dwell Over 1						
Dwell Over 2						
Dwell Over 3						
Dwell Over 4						
Dwell Over 5						
Dwell Over 6						
Dwell Over 7						
Dwell Over 8						
Dwell Over 9						
Dwell Over 10						
Dwell Over 11						
Dwell Over 12						
Ped Clear						
Yellow						
Red						
Max Green						

Low Priority Preempt [3]

Preempt	7	8	9	10
Min				
Max				
Type				
Lockout Mode	MAX	MAX	MAX	MAX
Coord in Preempt				
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Priority P5				
Priority P6				
Priority P7				
Priority P8				
Priority P9				
Priority P10				
Priority P11				
Priority P12				
Max Lockout				

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

TB Coor, Advanced Scheduler [4.3]

	Month												Day of Week						Day of Month									1									2									3		
Plan	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	Day Plan
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3																																																				1
4																																																				1
5																																																				1
6																																																				1
7																																																				1
8																																																				1
9																																																				1
10																																																				1
11																																																				1
12																																																				1
13																																																				1
14																																																				1
15																																																				1
16																																																				1
17																																																				1
18																																																				1
19																																																				1
20																																																				1
21																																																				1
22																																																				1
23																																																				1
24																																																				1
25																																																				1
26																																																				1
27																																																				1
28																																																				1
29																																																				1
30																																																				1
31																																																				1
32																																																				1

TB Coor, Day Plan [4.4]

Day Plan Table 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		6	9	14	19											
Minute			30		30											
Action	2	1	2	3	2											

Day Plan Table 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		10	18													
Minute																
Action	2	3	2													

Day Plan Table 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour		11	20													
Minute																
Action	4	2	4													

Day Plan Table 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Day Plan Table 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hour																
Minute																
Action																

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Day Plan Table 7	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 8	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 9	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 10	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 11	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 12	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 13	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 14	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day Plan Table 15	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Hour																
Minute																
Action																

Day plan Link 1-16 [4.3]

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Link																

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

TB Coor, Action Table [4.5]

Action	Pattern	Aux 1	Aux 2	Aux 3	Special 1	Special 2	Special 3	Special 4	Special 5	Special 6	Special 7	Special 8
1	1				0	0						
2	2				0	0						
3	3				0	0						
4	4				0	0						
5	5				0	0						
6	6				0	0						
7	7				0	0						
8	8				0	0						
9	9				0	0						
10	10				0	0						
11	11				0	0						
12	12				0	0						
13	13				0	0						
14	14				0	0						
15	15				0	0						
16	16				0	0						
17	17				0	0						
18	18				0	0						
19	19				0	0						
20	20				0	0						
21	21				0	0						
22	22				0	0						
23	23				0	0						
24	24				0	0						
25					0	0						
26					0	0						
27					0	0						
28					0	0						
29					0	0						
30					0	0						
31					0	0						
32					0	0						
33					0	0						
34					0	0						
35					0	0						
36					0	0						
37					0	0						
38					0	0						
39					0	0						
40					0	0						
41					0	0						
42					0	0						
43					0	0						
44					0	0						
45					0	0						
46					0	0						
47					0	0						
48					0	0						
49					0	0						
50					0	0						
51					0	0						
52					0	0						
53					0	0						
54					0	0						
55					0	0						
56					0	0						
57					0	0						
58					0	0						
59					0	0						
60					0	0						
61					0	0						
62					0	0						
63					0	0						
64					0	0						
65					0	0						
66					0	0						
67					0	0						
68					0	0						
69					0	0						
70					0	0						
71					0	0						
72					0	0						
73					0	0						

74					0	0						
75					0	0						
76					0	0						
77					0	0						
78					0	0						
79					0	0						
80					0	0						
81					0	0						
82					0	0						
83					0	0						
84					0	0						
85					0	0						
86					0	0						
87					0	0						
88					0	0						
89					0	0						
90					0	0						
91					0	0						
92					0	0						
93					0	0						
94					0	0						
95					0	0						
96					0	0						
97					0	0						
98					0	0						
99	254				0	0						
100	255				0	0						

Channels/SDLC+, IO Logic [1.8.7]

	1	2	3	4	5	6	7	8	9	10
Result										
Operator 1 Function	----	----	----	----	----	----	----	----	----	----
Operator 1 Result	I	I	I	I	I	I	I	I	I	I
Operator 1 IO	I	I	I	I	I	I	I	I	I	I
Operator 1 Invert	-	-	-	-	-	-	-	-	-	-
Operand 1										
Operator 2 Function	----	----	----	----	----	----	----	----	----	----
Operator 2 IO	I	I	I	I	I	I	I	I	I	I
Operator 2 Invert	-	-	-	-	-	-	-	-	-	-
Operand 2										
Operator 3 Function	----	----	----	----	----	----	----	----	----	----
Operator 3 IO	I	I	I	I	I	I	I	I	I	I
Operator 3 Invert	-	-	-	-	-	-	-	-	-	-
Operand 3										
Time Operator	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY	DLY
Time										

User Input map [1.8.9.1]

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Pin 1	1	9	189	189	202	189	189	189
Pin 2	2	10	189	189	203	189	189	189
Pin 3	3	129	202	189	200	189	189	189
Pin 4	4	130	203	189	201	189	189	189
Pin 5	5	131	200	181	189	189	189	189
Pin 6	6	132	201	178	189	189	189	189
Pin 7	7	189	198	228	189	189	189	189
Pin 8	8	189	199	229	189	189	189	189

User Output map [1.8.9.2]

	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Pin 1	1	4	7	10	28	115	115	115
Pin 2	49	52	55	58	34	115	115	115
Pin 3	2	5	8	11	25	13	115	115
Pin 4	26	29	32	35	31	37	115	115
Pin 5	50	53	56	59	115	61	115	115
Pin 6	3	6	9	12	115	14	115	115
Pin 7	27	30	33	36	115	38	115	115
Pin 8	51	54	57	60	114	62	115	115

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Miscellaneous Data

Alternate Phase Program 1, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 2, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 3, Interval Times [1.1.6.1]

Phase	Walk	Ped Clear	Min Green	Passage	Max1	Max2	Yellow	Red Clear	Assign Ph	Bike Clear
1										
2										
3										
4										
5										
6										
7										
8										

Alternate Phase Program 1, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RTW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Alternate Phase Program 2, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RTW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Alternate Phase Program 3, Phase Options [1.1.6.2]

Column	Non Act1	Lock Call	Soft Recall	Dual Entry	Sim Gap Enb	Guar Pass	RTW	Cond Service	Reservice	Red Rest	Max 2	Ped Delay	Conf Phs1	Conf Phs1	Assign Phase
1	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
3	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
4	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
5	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
6	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
7	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			
8	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF			

Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Alternate Phase Program 1, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Alternate Phase Program 2, Calls and Redirection [1.1.6.3]

Entry	Call Phases				From	To	From	To	From	To	From	To	Assigned Ph
1													
2													
3													
4													
5													
6													
7													
8													

Detector Alternate Program 1, Vehicle Parameters [5.5.1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Extend																
Queue																
Call Phase																
Switch Phase																
Delay Time																
No Activity																
Max Presence																
Erratic Cnt																
Fail Time																

Detector Alternate Program 1, Vehicle Options [5.5.2]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Volume																
Occupancy																
Yellow Lock																
Red Lock																
Added Initial																
Call																
Extend Time																
Queue Limit																

Detector Alternate Program 1, Ped Parameters [5.5.4]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Call Phase																
No Activity																
Max Presence																
Erratic Cnt																

Channel/SDLC +, Assign to Phases [1.8.4]

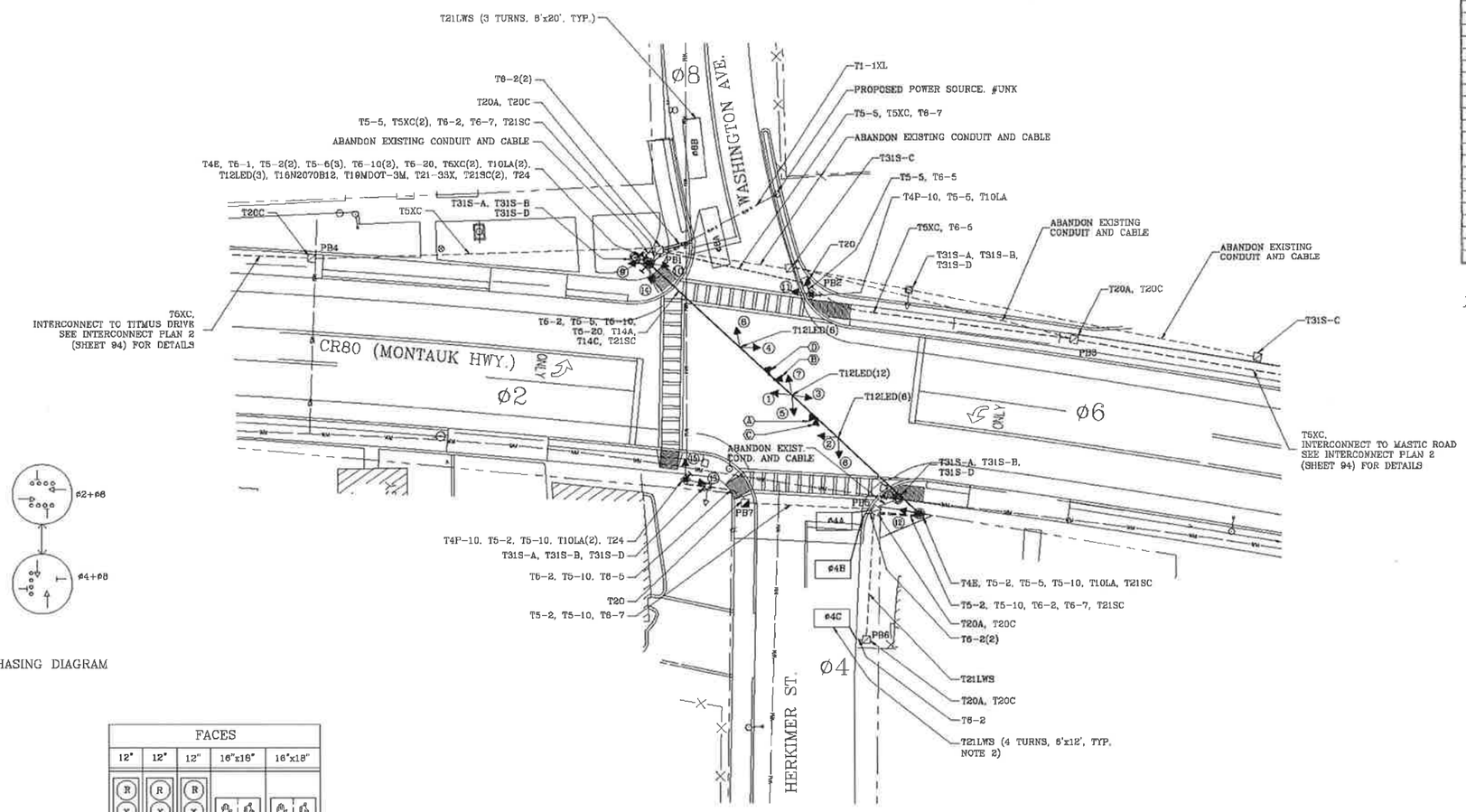
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	10	21	22	23	24
PH/OLP #		2		4		6		8	2		6	8					1	3	5	7				
Flash Red+																								
Flash Yel+																								
Flash Grn+																								
Flash Inh Red+																								

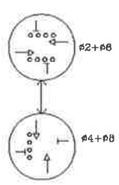
Suffolk County Timing Sheet 12/27/2016 1:24:48 PM

Station : 506 - CR 80 @ WASHINGTON AVE-HERKIMER ST (M) (Standard File)

Communication, IP Parameters [6.5]

	Octet 1	Octet 2	Octet 3	Octet 4
IP Address 1				
IP Address 2				
IP Address 3				
IP Address 4				
IP Mask 1				
IP Mask 2				
IP Mask 3				
IP Mask 4				
IP Broadcast 1				
IP Broadcast 2				
IP Broadcast 3				
IP Broadcast 4				
IP Gateway 1				
IP Gateway 2				
IP Gateway 3				
IP Gateway 4				
IP Port				





PHASING DIAGRAM

PHASE \ SIGNAL	FACES 12" (R Y G)	12" (R Y G)	12" (R Y G)	16"x16"	16"x18"
	1-4	5-8	9	10-13	14,15
Ø2+Ø6	G	R	G	✋**	STEADY
Ø4+Ø8	R	G	R	STEADY	✋*
FLASH	Y	R	Y	DARK	DARK

* indication should remain in steady "DON'T WALK" unless the pushbutton is activated.
** Ped signals 10 thru 13 will be controlled using "Ped recycle" during Ø2 and Ø6.

SIGNAL SEQUENCE TABLE

CHANNEL	A	B	C	D
PHASE	Ø2+Ø6		Ø4+Ø8	
RETURN	Ø4+Ø8			

PREEMPTION TABLE

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QTY
T1-1XL	AERIAL SERVICE DROP CABLE, 2 COND., #4 AWG	L.F.	52
T4E	STEEL POLE 30 FOOT HEAVY DUTY	EA.	2
T4P-10	SIGNAL POLE - 10 FOOT	EA.	2
T5-1	SIGNAL CABLE, 2 COND. #6 AWG	L.F.	40
T5-2	SIGNAL CABLE, 2 COND. #14 AWG	L.F.	335
T5-5	SIGNAL CABLE, 5 COND. #14 AWG	L.F.	365
T5-10	SIGNAL CABLE, 10 COND. #14 AWG	L.F.	335
T5-20	SIGNAL CABLE, 20 COND. #14 AWG	L.F.	165
T5XC	SHIELDED COMMUNICATION CABLE, 6PR., #19AWG	L.F.	400
T6-2	STEEL CONDUIT, 1" DIA.	L.F.	30
T6-5	STEEL CONDUIT, 2" DIA.	L.F.	130
T6-7	STEEL CONDUIT, 3" DIA.	L.F.	65
T10LA	PEDESTRIAN SIGNAL, LED, 16"X18"	EA.	6
T12LED	LED SIGNAL SECTION 8" OR 12"	EA.	27
T14A	SPAN WIRE ASSEMBLY - 1/4"	EA.	1
T14C	SPAN WIRE ASSEMBLY - 7/16"	EA.	1
T16N2070B12	2070 TRAFFIC SIGNAL CONTR. W/ 3363 CAB., 12 POS.	EA.	1
T19MDOT-3M	OPTICOM SYSTEM, NYS 170/2070	INT.	1
T20	PULLBOX	EA.	2
T20A	ADJUST TO GRADE PULLBOX COVER	EA.	4
T20C	CLEAN EXISTING PULLBOX	EA.	5
T21-33X	2 CHANNEL INDUCTANCE LOOP SENSOR FOR 33X CAB.	EA.	1
T21LWS	ROADWAY LOOP, SPECIAL	L.F.	325
T21SC	SHIELDED LEAD-IN CABLE	L.F.	230
T24	PEDESTRIAN PUSHBUTTON ASSEMBLY	EA.	2
T30S	MAINT. TRAFFIC SIGNAL EQUIP	MONTH	18
T31S-A	REMOVE POLE OR CONTROLLER FOUNDATIONS	EA.	4
T31S-B	REMOVE TRAFFIC SIGNAL POLE	EA.	4
T31S-C	REMOVE PULLBOX	EA.	2
T31S-D	REMOVE TRAFFIC SIGNAL EQUIPMENT	EA. INT.	1

NOTES:

1. Signal heads, poles, posts, cabinets, and controllers removed under any T31S-_ item shall be returned to the SCDPW Yaphank yard or disposed of A.O.B.E. Contractor shall provide 48 hours notice of delivery of these items. The existing span wire as well as other miscellaneous related items shall be removed and disposed of A.O.B.E. For clarity, the existing signal heads are not shown on the plan.
2. For the Ø4 loops, wire Ø4A, Ø4B and Ø4C in parallel into one shielded lead-in cable.
3. All loops shall be centered in their lanes and spaced 10' apart.

0 20 40
SCALE

SYMBOL	DESCRIPTION	APPROVED	DATE
	REVISIONS		

COUNTY OF SUFFOLK
DEPARTMENT OF PUBLIC WORKS
YAPHANK, NEW YORK

GILBERT ANDERSON, P.E. - COMMISSIONER

PLAN FOR THE RECONSTRUCTION OF C.R. 80 MONTAUK HIGHWAY

TRAFFIC SIGNAL PLAN

C.R. 80-MONTAUK HWY. AT WASHINGTON AVENUE

PROJECT NO.	DATE	SHEET NO. 91 OF 109
5516	10-17-08	

DESIGNED BY: Engineers Name
CHECKED BY: ENGINEER NAME
DRAWN BY: Drafters Name
COMPARED BY: Engineers Name

Manual Traffic Signal Timing
Mastic Road (NB/SB) at Mastic Beach Road (EB/WB)
AM Peak 15 Minute Period: 8:00 - 8:15 AM

	Phase 1 (SB)		Phase 2 (NB)		Phase 3 (EB/WB)	
G & Y	34		34		22	
R	56		56		68	
Cycle	Total	90	Total	90	Total	90
G & Y	34		34		22	
R	56		56		68	
Cycle	Total	90	Total	90	Total	90
G & Y	34		34		22	
R	56		56		68	
Cycle	Total	90	Total	90	Total	90
G & Y	34		34		22	
R	56		56		68	
Cycle	Total	90	Total	90	Total	90

Yellow Time from Field

3.5	3.5	3

Red Clearance from Field

2	2	2

PM Peak 15 Minute Period: 5:45 - 6:00 PM

	Phase 1 (SB)		Phase 2 (NB)		Phase 3 (EB/WB)	
G & Y	30		18		36	
R	54		58		40	
Cycle	Total	84	Total	76	Total	76
G & Y	22		18		36	
R	54		66		60	
Cycle	Total	76	Total	84	Total	96
G & Y	30		30		34	
R	64		66		50	
Cycle	Total	94	Total	96	Total	84
G & Y	32		18		32	
R	54		70		80	
Cycle	Total	86	Total	88	Total	112
%G & Y	34%		24%		38%	
%R	66%		76%		63%	
Cycle	Total	100%	Total	100%	Total	100%

Average Cycle Length 90

G & Y	30		23		37	
R	60		67		53	
Cycle	Total	90	Total	90	Total	90

Yellow Time from Field

3.5	3.5	3

Red Clearance from Field

2	2	2

Manual Traffic Signal Timing
Mastic Road (NB/SB) at Southaven Ave (EB/WB)/Poospatuck Ln (NWB)
AM Peak 15 Minute Period: 8:15 - 8:30 AM

	Phase 1 (SB)		Phase 2 (NB/SB)		Phase 3 (SB/NWB)		Phase 4 (EB/WB)	
G & Y	10		116		20		10	
R	134		30		130		140	
Cycle	Total	144	Total	146	Total	150	Total	150
G & Y	12		112		20		10	
R	140		32		130		140	
Cycle	Total	152	Total	144	Total	150	Total	150
G & Y	16		118		20		10	
R	132		38		130		140	
Cycle	Total	148	Total	156	Total	150	Total	150
G & Y	12		114		14		10	
R	138		42		136		140	
Cycle	Total	150	Total	156	Total	150	Total	150
%G & Y	8%		76%		12%		7%	
%R	92%		24%		88%		93%	
Cycle	Total	100%	Total	100%	Total	100%	Total	100%

Average Cycle Length 150

G & Y	12		108		20		10	
R	138		42		130		140	
Cycle	Total	150	Total	150	Total	150	Total	150

Yellow Time from Field

3	3.5	3.5	3

Red Clearance from Field

2	2	2	2

PM Peak 15 Minute Period: 5:45 - 6:00 PM

	Phase 1 (NB/SB)		Phase 2 (SB/NWB)		Phase 3 (EB/WB)		Phase 4 (SB)	
G & Y	12		124		14		10	
R	138		32		132		140	
Cycle	Total	150	Total	156	Total	146	Total	150
G & Y	18		114		18		10	
R	132		36		134		140	
Cycle	Total	150	Total	150	Total	152	Total	150
G & Y	18		116		12		10	
R	140		42		136		140	
Cycle	Total	158	Total	158	Total	148	Total	150
G & Y	18		106		18		10	
R	124		36		132		140	
Cycle	Total	142	Total	142	Total	150	Total	150
%G & Y	11%		76%		10%		7%	
%R	89%		24%		90%		93%	
Cycle	Total	100%	Total	100%	Total	100%	Total	100%

Average Cycle Length 150

G & Y	18		104		18		10	
R	132		46		132		140	
Cycle	Total	150	Total	150	Total	150	Total	150

Yellow Time from Field

3	3.5	3.5	3

Red Clearance from Field

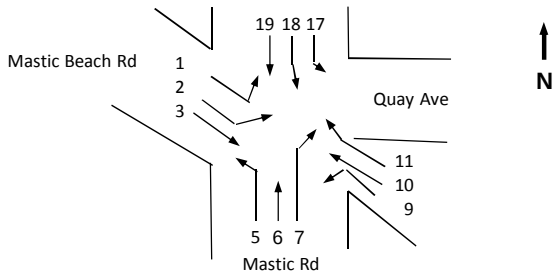
2	2	2	2

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

APPENDIX C

TURNING MOVEMENT COUNTS (TMCs)

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Mastic Road @ Mastic Beach Road**

Day, Date: **Tuesday, 6/7/16**

Time	Mastic Beach Road (EB)												Mastic Beach Road (WB)											
	Left (1)				Slight Left (2)				Thru (3)				Left (9)				Thru (10)				Slight Right (11)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	1	0	0	**1**	0	0	0	**0**	6	1	0	**7**	0	0	0	**0**	30	0	0	**30**	36	0	0	**36**
6:45 - 7:00	0	0	0	**0**	0	0	0	**0**	7	0	1	**8**	2	0	0	**2**	37	0	0	**37**	34	3	0	**37**
7:00 - 7:15	5	0	0	**5**	1	0	0	**1**	7	0	2	**9**	1	0	0	**1**	37	0	1	**38**	36	0	1	**37**
7:15 - 7:30	0	0	0	**0**	1	0	0	**1**	21	1	0	**22**	1	0	0	**1**	40	0	0	**40**	35	4	1	**40**
7:30 - 7:45	0	0	0	**0**	0	0	0	**0**	13	0	1	**14**	0	0	0	**0**	43	0	1	**44**	36	0	1	**37**
7:45 - 8:00	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	3	0	1	**4**	36	0	0	**36**	23	0	0	**23**
8:00 - 8:15	1	0	0	**1**	1	0	0	**1**	26	1	0	**27**	2	0	0	**2**	33	0	0	**33**	26	1	1	**28**
8:15 - 8:30	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	2	0	0	**2**	29	0	0	**29**	32	2	0	**34**
8:30 - 8:45	0	0	0	**0**	0	0	0	**0**	16	1	0	**17**	0	0	0	**0**	32	0	1	**33**	35	4	0	**39**
8:45 - 9:00	1	0	0	**1**	0	0	0	**0**	22	0	0	**22**	3	0	2	**5**	30	0	0	**30**	30	0	1	**31**
9:00 - 9:15	0	0	0	**0**	0	0	0	**0**	15	0	2	**17**	2	0	0	**2**	31	0	0	**31**	24	0	1	**25**
9:15 - 9:30	0	0	0	**0**	0	0	0	**0**	13	0	0	**13**	1	0	0	**1**	26	0	0	**26**	34	1	1	**36**

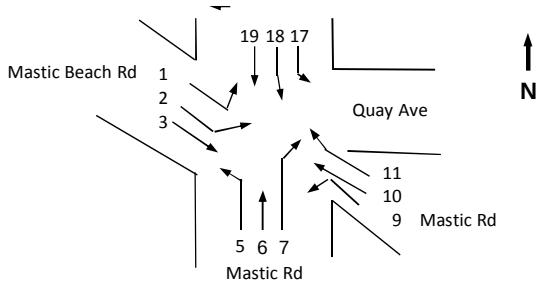
Time	Mastic Road (NB)												Mastic Road (SB)											
	Left (5)				Thru (6)				Slight Right (7)				Left (17)				Slight Left (18)				Thru (19)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	13	0	0	**13**	44	0	0	**44**	0	0	0	**0**	0	0	0	**0**	12	0	3	**15**	20	2	10	**32**
6:45 - 7:00	21	0	2	**23**	50	0	0	**50**	0	0	0	**0**	0	0	0	**0**	10	1	1	**12**	16	0	10	**26**
7:00 - 7:15	42	0	3	**45**	46	3	6	**55**	1	0	0	**1**	1	0	0	**1**	19	3	2	**24**	49	2	10	**61**
7:15 - 7:30	34	2	1	**37**	37	0	16	**53**	1	0	0	**1**	0	0	0	**0**	7	0	1	**8**	48	0	2	**50**
7:30 - 7:45	20	0	0	**20**	48	6	0	**54**	3	0	0	**3**	0	0	0	**0**	20	1	1	**22**	28	4	0	**32**
7:45 - 8:00	28	2	0	**30**	51	2	0	**53**	2	0	0	**2**	1	0	0	**1**	16	0	1	**17**	57	2	5	**64**
8:00 - 8:15	50	0	0	**50**	65	0	16	**81**	5	0	1	**6**	0	0	0	**0**	16	3	4	**23**	39	2	0	**41**
8:15 - 8:30	20	0	0	**20**	60	5	0	**65**	2	0	0	**2**	0	0	0	**0**	24	3	4	**31**	46	0	7	**53**
8:30 - 8:45	38	0	1	**39**	62	2	2	**66**	3	0	0	**3**	0	0	0	**0**	20	3	3	**26**	46	1	1	**48**
8:45 - 9:00	35	0	2	**37**	54	7	2	**63**	6	0	0	**6**	1	0	0	**1**	14	0	0	**14**	64	1	6	**71**
9:00 - 9:15	32	1	2	**35**	84	3	6	**93**	3	0	0	**3**	1	0	0	**1**	21	0	2	**23**	57	2	2	**61**
9:15 - 9:30	29	0	0	**29**	51	1	1	**53**	4	0	0	**4**	0	0	0	**0**	11	2	1	**14**	45	4	1	**50**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	LT(2)	TH(3)	LT(9)	TH(10)	RT(11)	LT(5)	TH(6)	RT(7)	LT(17)	LT(18)	TH(19)
8:00 - 9:00 AM	Volumes	2	1	76	9	125	132	146	275	17	1	94	213
	P.H.F.	0.50	0.25	0.70	0.45	0.95	0.85	0.73	0.85	0.71	0.25	0.76	0.75
	% of HV	0%	0%	3%	22%	1%	7%	2%	12%	6%	0%	21%	8%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.97	0.03	0.00	1.00
WB	0.95	0.03	0.02	1.00
NB	0.91	0.03	0.05	1.00
SB	0.88	0.04	0.08	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Mastic Road @ Mastic Beach Road**

Day, Date: **Tuesday, 6/7/16**

Time	Mastic Beach Road (EB)												Mastic Beach Road (WB)											
	Left (1)				Slight Left (2)				Thru (3)				Left (9)				Thru (10)				Slight Right (11)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	3	0	0	**3**	0	0	0	**0**	41	0	0	**41**	2	0	0	**2**	19	0	0	**19**	26	1	2	**29**
16:15 - 16:30	0	0	0	**0**	2	0	0	**2**	45	0	1	**46**	1	0	0	**1**	24	0	0	**24**	27	0	1	**28**
16:30 - 16:45	0	0	0	**0**	1	0	0	**1**	32	0	0	**32**	3	0	0	**3**	20	1	0	**21**	28	0	1	**29**
16:45 - 17:00	2	0	0	**2**	0	0	0	**0**	55	0	0	**55**	1	0	0	**1**	24	0	0	**24**	27	1	0	**28**
17:00 - 17:15	1	0	0	**1**	0	0	0	**0**	40	1	0	**41**	2	0	0	**2**	26	0	0	**26**	27	0	0	**27**
17:15 - 17:30	1	0	0	**1**	0	0	0	**0**	53	0	1	**54**	1	0	0	**1**	37	1	0	**38**	24	1	3	**28**
17:30 - 17:45	1	0	0	**1**	0	0	0	**0**	53	0	0	**53**	1	0	0	**1**	22	0	0	**22**	14	1	0	**15**
17:45 - 18:00	1	0	0	**1**	0	0	0	**0**	64	0	0	**64**	2	0	0	**2**	25	0	0	**25**	36	0	0	**36**
18:00 - 18:15	0	0	0	**0**	0	0	0	**0**	48	0	0	**48**	2	0	0	**2**	30	1	0	**31**	37	3	0	**40**
18:15 - 18:30	0	0	0	**0**	0	0	0	**0**	52	0	0	**52**	0	0	0	**0**	24	0	0	**24**	29	0	1	**30**
18:30 - 18:45	0	0	0	**0**	0	0	0	**0**	60	0	0	**60**	2	0	0	**2**	22	0	0	**22**	33	0	0	**33**
18:45 - 19:00	1	0	0	**1**	3	0	0	**3**	59	1	0	**60**	1	0	0	**1**	23	0	0	**23**	24	0	0	**24**

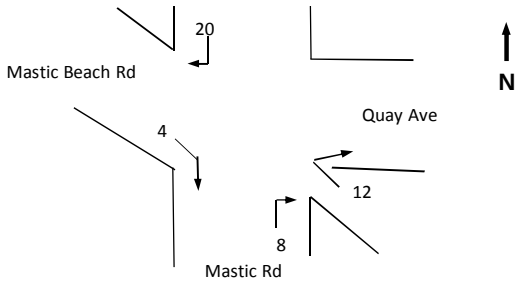
Time	Mastic Road (NB)												Mastic Road (SB)											
	Left (5)				Thru (6)				Slight Right (7)				Left (17)				Slight Left (18)				Thru (19)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	17	0	0	**17**	53	1	5	**59**	0	0	1	**1**	0	0	0	**0**	40	3	1	**44**	67	0	4	**71**
16:15 - 16:30	17	0	0	**17**	42	0	2	**44**	4	0	0	**4**	2	0	0	**2**	70	1	0	**71**	82	2	1	**85**
16:30 - 16:45	12	0	0	**12**	56	3	0	**59**	2	0	0	**2**	0	0	0	**0**	42	1	1	**44**	60	1	2	**63**
16:45 - 17:00	22	0	0	**22**	52	0	0	**52**	3	0	1	**4**	1	0	0	**1**	52	3	1	**56**	95	1	2	**98**
17:00 - 17:15	23	0	0	**23**	52	2	1	**55**	4	0	0	**4**	4	0	0	**4**	35	0	0	**35**	81	2	0	**83**
17:15 - 17:30	9	0	1	**10**	52	0	1	**53**	3	0	0	**3**	0	0	0	**0**	45	1	0	**46**	61	2	0	**63**
17:30 - 17:45	12	1	0	**13**	69	1	1	**71**	3	0	0	**3**	1	0	0	**1**	49	0	1	**50**	80	0	0	**80**
17:45 - 18:00	9	0	0	**9**	56	0	0	**56**	3	0	0	**3**	0	0	0	**0**	41	1	1	**43**	72	1	0	**73**
18:00 - 18:15	17	0	0	**17**	50	0	0	**50**	4	0	0	**4**	1	0	0	**1**	51	2	0	**53**	84	1	0	**85**
18:15 - 18:30	16	0	0	**16**	49	0	0	**49**	4	0	0	**4**	1	0	0	**1**	48	0	0	**48**	97	0	0	**97**
18:30 - 18:45	23	0	0	**23**	63	1	0	**64**	4	0	0	**4**	1	0	0	**1**	66	0	1	**67**	71	0	0	**71**
18:45 - 19:00	11	0	0	**11**	34	0	0	**34**	1	0	0	**1**	1	0	0	**1**	39	0	0	**39**	70	3	0	**73**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	LT(2)	TH(3)	LT(9)	TH(10)	RT(11)	LT(5)	TH(6)	RT(7)	LT(17)	LT(18)	TH(19)
17:00 - 18:00 PM	Volumes	4	0	212	6	111	106	55	235	13	5	174	299
	P.H.F.	1.00	0.00	0.83	0.75	0.73	0.74	0.60	0.83	0.81	0.31	0.87	0.90
	% of HV	0%	0%	1%	0%	1%	5%	4%	3%	0%	0%	2%	2%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.99	0.00	0.00	1.00
WB	0.97	0.01	0.01	1.00
NB	0.97	0.01	0.01	1.00
SB	0.98	0.01	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Mastic Road @ Mastic Beach Road**

Day, Date: **Tuesday, 6/7/16**

Time	Mastic Beach Road (EB)												Mastic Beach Road (WB)											
									Right (4)												Right (12)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
6:30 - 6:45									4	0	0	**4**									0	0	0	**0**
6:45 - 7:00									12	1	0	**13**									0	0	0	**0**
7:00 - 7:15									20	1	1	**22**									2	0	0	**2**
7:15 - 7:30									37	0	5	**42**									1	0	0	**1**
7:30 - 7:45									28	0	1	**29**									1	0	0	**1**
7:45 - 8:00									27	0	2	**29**									0	0	0	**0**
8:00 - 8:15									16	0	0	**16**									1	0	0	**1**
8:15 - 8:30									22	1	0	**23**									6	0	0	**6**
8:30 - 8:45									22	0	1	**23**									0	0	0	**0**
8:45 - 9:00									19	0	0	**19**									0	0	1	**1**
9:00 - 9:15									38	0	0	**38**									0	0	0	**0**
9:15 - 9:30									14	0	0	**14**									1	0	0	**1**

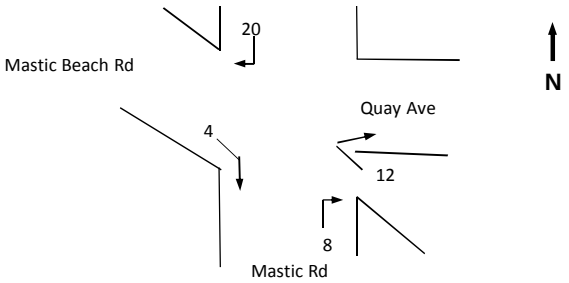
Time	Mastic Road (NB)												Mastic Road (SB)											
									Right (8)												Right (20)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
6:30 - 6:45									1	0	0	**1**									0	0	0	**0**
6:45 - 7:00									0	0	0	**0**									0	0	0	**0**
7:00 - 7:15									0	0	0	**0**									0	0	0	**0**
7:15 - 7:30									0	0	0	**0**									2	0	0	**2**
7:30 - 7:45									0	0	0	**0**									0	0	0	**0**
7:45 - 8:00									0	0	0	**0**									0	0	0	**0**
8:00 - 8:15									0	0	0	**0**									2	0	0	**2**
8:15 - 8:30									0	0	0	**0**									0	0	0	**0**
8:30 - 8:45									0	0	0	**0**									0	0	0	**0**
8:45 - 9:00									0	0	0	**0**									0	0	0	**0**
9:00 - 9:15									0	0	0	**0**									0	0	0	**0**
9:15 - 9:30									0	0	0	**0**									2	0	0	**2**

Peak Hour	Approach	EB	WB	NB	SB
8:00 - 9:00 AM	Movements	RT(4)	RT(12)	RT(8)	RT(20)
	Volumes	81	8	0	2
	P.H.F.	0.88	0.33	0.00	0.25
	% of HV	2%	13%	0%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.98	0.01	0.01	1.00
WB	0.88	0.00	0.13	1.00
NB	0.00	0.00	0.00	
SB	1.00	0.00	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Mastic Road @ Mastic Beach Road**

Day, Date: **Tuesday, 6/7/16**

Time	Mastic Beach Road (EB)												Mastic Beach Road (WB)											
									Right (4)												Right (12)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
16:00 - 16:15									22	0	0	**22**									2	0	0	**2**
16:15 - 16:30									17	0	0	**17**									0	0	0	**0**
16:30 - 16:45									17	0	0	**17**									2	0	0	**2**
16:45 - 17:00									21	0	0	**21**									8	0	0	**8**
17:00 - 17:15									20	0	0	**20**									0	0	0	**0**
17:15 - 17:30									35	0	0	**35**									1	0	0	**1**
17:30 - 17:45									21	0	1	**22**									0	0	0	**0**
17:45 - 18:00									37	0	0	**37**									0	0	0	**0**
18:00 - 18:15									28	0	0	**28**									2	0	0	**2**
18:15 - 18:30									13	0	0	**13**									1	0	0	**1**
18:30 - 18:45									18	0	0	**18**									1	0	0	**1**
18:45 - 19:00									13	0	0	**13**									2	0	0	**2**

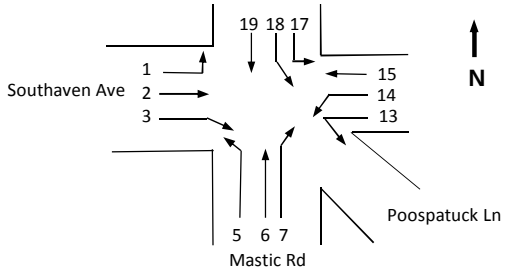
Time	Mastic Road (NB)												Mastic Road (SB)											
									Right (8)												Right (20)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
16:00 - 16:15									2	0	0	**2**									0	0	0	**0**
16:15 - 16:30									3	0	0	**3**									1	0	0	**1**
16:30 - 16:45									1	0	0	**1**									0	0	0	**0**
16:45 - 17:00									4	0	0	**4**									1	0	0	**1**
17:00 - 17:15									2	0	0	**2**									0	0	0	**0**
17:15 - 17:30									0	0	0	**0**									0	0	0	**0**
17:30 - 17:45									3	0	0	**3**									1	0	0	**1**
17:45 - 18:00									0	0	0	**0**									1	0	0	**1**
18:00 - 18:15									3	0	0	**3**									1	0	0	**1**
18:15 - 18:30									1	0	0	**1**									1	0	0	**1**
18:30 - 18:45									0	0	0	**0**									0	0	0	**0**
18:45 - 19:00									2	0	0	**2**									0	0	0	**0**

Peak Hour	Approach	EB	WB	NB	SB
17:00 - 18:00 PM	Movements	RT(4)	RT(12)	RT(8)	RT(20)
	Volumes	114	1	5	2
	P.H.F.	0.77	0.25	0.42	0.50
	% of HV	1%	0%	0%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.99	0.00	0.01	1.00
WB	1.00	0.00	0.00	1.00
NB	1.00	0.00	0.00	1.00
SB	1.00	0.00	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Southaven Avenue (EB)												Southaven Avenue (WB)											
	Left (1)				Thru (2)				Slight Right (3)				Sharp Left (13)				Left (14)				Thru (15)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**
6:45 - 7:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	1	**1**	0	0	0	**0**
7:00 - 7:15	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
7:15 - 7:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
7:30 - 7:45	4	0	1	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
7:45 - 8:00	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	2	0	1	**3**	0	0	0	**0**
8:00 - 8:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
8:15 - 8:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
8:30 - 8:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
8:45 - 9:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
9:00 - 9:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
9:15 - 9:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**

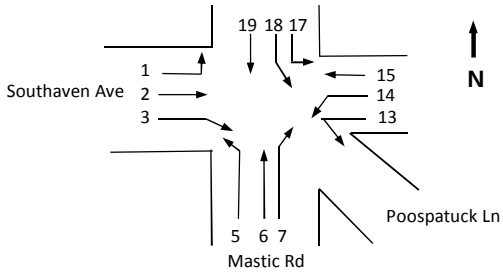
Time	Mastic Road (NB)												Mastic Road (SB)											
	Left (5)				Thru (5)				Right (6)				Left (17)				Slight Left (18)				Thru (19)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	1	0	0	**1**	158	3	0	**161**	0	0	0	**0**	0	0	0	**0**	1	0	1	**2**	43	3	12	**58**
6:45 - 7:00	0	0	0	**0**	133	4	0	**137**	0	0	0	**0**	0	0	0	**0**	4	0	2	**6**	54	2	15	**71**
7:00 - 7:15	1	0	0	**1**	150	2	4	**156**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	105	5	9	**119**
7:15 - 7:30	2	0	0	**2**	142	5	10	**157**	2	0	0	**2**	0	0	0	**0**	3	1	1	**5**	65	4	4	**73**
7:30 - 7:45	2	0	0	**2**	119	4	9	**132**	1	0	0	**1**	1	0	0	**1**	3	0	0	**3**	62	3	4	**69**
7:45 - 8:00	2	0	0	**2**	115	5	2	**122**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	79	2	1	**82**
8:00 - 8:15	0	0	0	**0**	125	0	8	**133**	0	0	0	**0**	1	0	0	**1**	9	0	1	**10**	79	10	17	**106**
8:15 - 8:30	1	0	0	**1**	135	3	2	**140**	1	0	0	**1**	0	0	0	**0**	13	1	0	**14**	118	8	6	**132**
8:30 - 8:45	0	0	0	**0**	143	3	0	**146**	1	0	0	**1**	0	0	0	**0**	9	0	0	**9**	83	3	5	**91**
8:45 - 9:00	0	0	0	**0**	143	7	1	**151**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	99	2	0	**101**
9:00 - 9:15	0	0	0	**0**	106	7	8	**121**	1	0	0	**1**	0	0	0	**0**	10	1	0	**11**	74	1	1	**76**
9:15 - 9:30	0	0	0	**0**	109	2	9	**120**	0	0	0	**0**	0	0	0	**0**	19	1	0	**20**	105	5	1	**111**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(13)	LT(14)	TH(15)	LT(5)	TH(5)	RT(6)	LT(17)	LT(18)	TH(19)
8:00 - 9:00 AM	Volumes	2	0	0	0	6	0	1	570	2	1	39	430
	P.H.F.	0.50	0.00	0.00	0.00	0.50	0.00	0.25	0.94	0.50	0.25	0.70	0.81
	% of HV	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	5%	12%

Classification

Approach	Cars	Trucks	Buses	Total
EB	1.00	0.00	0.00	1.00
WB	1.00	0.00	0.00	1.00
NB	0.96	0.02	0.02	1.00
SB	0.89	0.05	0.06	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Southaven Avenue (EB)												Southaven Avenue (WB)											
	Left (1)				Thru (2)				Slight Right (3)				Sharp Left (13)				Left (14)				Thru (15)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**
16:15 - 16:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**
16:30 - 16:45	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	1	**4**	0	0	0	**0**
16:45 - 17:00	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**
17:00 - 17:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
17:15 - 17:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**
17:30 - 17:45	2	0	0	**2**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**
17:45 - 18:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
18:00 - 18:15	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
18:15 - 18:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	1	0	0	**1**
18:30 - 18:45	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
18:45 - 19:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**

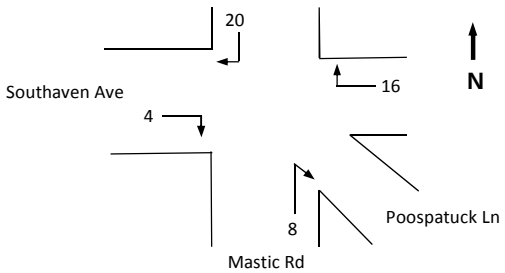
Time	Mastic Road (NB)												Mastic Road (SB)											
	Left (5)				Thru (5)				Right (6)				Left (17)				Slight Left (18)				Thru (19)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	0	0	0	**0**	126	3	9	**138**	0	0	0	**0**	0	0	0	**0**	30	0	0	**30**	192	2	1	**195**
16:15 - 16:30	3	0	0	**3**	116	4	6	**126**	1	0	0	**1**	2	0	0	**2**	21	0	0	**21**	184	1	1	**186**
16:30 - 16:45	0	0	0	**0**	97	0	3	**100**	1	0	0	**1**	1	0	0	**1**	25	0	0	**25**	150	4	1	**155**
16:45 - 17:00	0	0	0	**0**	109	2	0	**111**	0	0	0	**0**	1	0	0	**1**	16	0	0	**16**	191	4	2	**197**
17:00 - 17:15	0	0	0	**0**	112	1	1	**114**	0	0	0	**0**	1	0	0	**1**	18	1	0	**19**	184	7	1	**192**
17:15 - 17:30	1	0	0	**1**	121	1	8	**130**	1	0	0	**1**	1	0	0	**1**	21	0	0	**21**	183	1	1	**185**
17:30 - 17:45	1	0	0	**1**	121	2	1	**124**	1	0	0	**1**	3	0	0	**3**	20	0	0	**20**	182	2	2	**186**
17:45 - 18:00	1	0	0	**1**	141	1	1	**143**	3	0	0	**3**	0	0	0	**0**	22	0	0	**22**	184	2	0	**186**
18:00 - 18:15	1	0	0	**1**	121	2	0	**123**	0	0	0	**0**	0	0	0	**0**	19	0	0	**19**	197	2	1	**200**
18:15 - 18:30	0	0	0	**0**	120	1	1	**122**	0	0	0	**0**	1	0	0	**1**	29	0	0	**29**	201	1	0	**202**
18:30 - 18:45	1	0	0	**1**	143	1	0	**144**	0	0	0	**0**	1	0	0	**1**	27	0	0	**27**	179	2	1	**182**
18:45 - 19:00	1	0	0	**1**	116	3	0	**119**	0	0	0	**0**	1	0	0	**1**	17	0	0	**17**	172	4	0	**176**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(13)	LT(14)	TH(15)	LT(5)	TH(5)	RT(6)	LT(17)	LT(18)	TH(19)
17:00 - 18:00 PM	Volumes	4	1	2	0	5	1	3	511	5	5	82	749
	P.H.F.	0.50	0.25	0.25	0.00	0.31	0.25	0.75	0.89	0.42	0.42	0.93	0.98
	% of HV	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	2%

Classification

Approach	Cars	Trucks	Buses	Total
EB	1.00	0.00	0.00	1.00
WB	1.00	0.00	0.00	1.00
NB	0.97	0.01	0.02	1.00
SB	0.98	0.02	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Southaven Avenue (EB)												Southaven Avenue (WB)											
									Right (4)												Right (16)			
									Auto	Truck	Bus	Total									0	0	0	Total
6:30 - 6:45									0	0	0	**0**									0	0	0	**0**
6:45 - 7:00									0	0	0	**0**									1	0	0	**1**
7:00 - 7:15									0	0	0	**0**									1	1	0	**2**
7:15 - 7:30									1	0	0	**1**									1	1	0	**2**
7:30 - 7:45									0	0	1	**1**									0	0	0	**0**
7:45 - 8:00									0	0	0	**0**									0	2	1	**3**
8:00 - 8:15									0	0	0	**0**									0	0	0	**0**
8:15 - 8:30									1	0	0	**1**									1	0	0	**1**
8:30 - 8:45									0	0	0	**0**									3	0	0	**3**
8:45 - 9:00									0	0	0	**0**									1	0	0	**1**
9:00 - 9:15									0	0	0	**0**									1	0	0	**1**
9:15 - 9:30									0	0	0	**0**									1	0	0	**1**

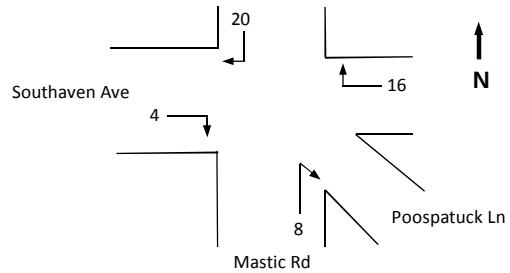
Time	Mastic Road (NB)												Mastic Road (SB)											
									Sharp Right (8)												Right (20)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
6:30 - 6:45									0	0	0	**0**									1	0	0	**1**
6:45 - 7:00									0	0	0	**0**									0	0	1	**1**
7:00 - 7:15									0	0	0	**0**									0	0	0	**0**
7:15 - 7:30									0	0	0	**0**									0	0	0	**0**
7:30 - 7:45									0	0	0	**0**									3	0	0	**3**
7:45 - 8:00									0	0	0	**0**									1	0	0	**1**
8:00 - 8:15									0	0	0	**0**									3	0	0	**3**
8:15 - 8:30									0	0	0	**0**									0	0	0	**0**
8:30 - 8:45									0	0	0	**0**									1	0	0	**1**
8:45 - 9:00									0	0	0	**0**									0	0	0	**0**
9:00 - 9:15									0	0	0	**0**									1	0	0	**1**
9:15 - 9:30									0	0	0	**0**									1	0	0	**1**

Peak Hour	Approach	EB	WB	NB	SB
	Movements	RT(4)	RT(16)	RT(8)	RT(20)
8:00 - 9:00 AM	Volumes	1	5	0	4
	P.H.F.	0.25	0.42	0.00	0.33
	% of HV	0%	0%	0%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	1.00	0.00	0.00	1.00
WB	1.00	0.00	0.00	1.00
NB	0.00	0.00	0.00	
SB	1.00	0.00	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Southaven Avenue (EB)												Southaven Avenue (WB)											
									Right (4)												Right (16)			
									Auto	Truck	Bus	Total									0	0	0	Total
16:00 - 16:15									0	0	0	**0**									0	0	0	**0**
16:15 - 16:30									0	0	0	**0**									2	0	0	**2**
16:30 - 16:45									0	0	0	**0**									0	0	0	**0**
16:45 - 17:00									0	0	0	**0**									1	0	0	**1**
17:00 - 17:15									1	0	0	**1**									0	0	0	**0**
17:15 - 17:30									0	0	0	**0**									2	0	0	**2**
17:30 - 17:45									0	0	0	**0**									1	0	0	**1**
17:45 - 18:00									1	0	0	**1**									0	0	0	**0**
18:00 - 18:15									0	0	0	**0**									0	0	0	**0**
18:15 - 18:30									1	1	0	**2**									1	0	0	**1**
18:30 - 18:45									0	0	0	**0**									1	0	0	**1**
18:45 - 19:00									0	0	0	**0**									1	0	0	**1**

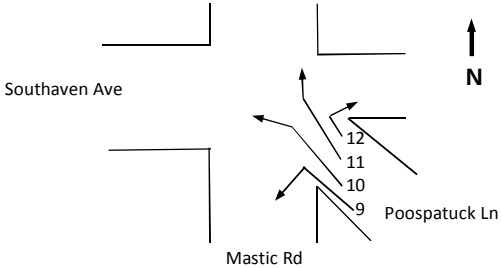
Time	Mastic Road (NB)												Mastic Road (SB)											
									Sharp Right (8)												Right (20)			
									Auto	Truck	Bus	Total									Auto	Truck	Bus	Total
16:00 - 16:15									0	0	0	**0**									1	0	0	**1**
16:15 - 16:30									0	0	0	**0**									3	0	0	**3**
16:30 - 16:45									0	0	0	**0**									2	0	0	**2**
16:45 - 17:00									0	0	0	**0**									5	0	0	**5**
17:00 - 17:15									0	0	0	**0**									2	0	0	**2**
17:15 - 17:30									0	0	0	**0**									4	1	0	**5**
17:30 - 17:45									0	0	0	**0**									2	0	0	**2**
17:45 - 18:00									0	0	0	**0**									3	0	0	**3**
18:00 - 18:15									0	0	0	**0**									3	0	0	**3**
18:15 - 18:30									0	0	0	**0**									0	0	0	**0**
18:30 - 18:45									0	0	0	**0**									5	0	0	**5**
18:45 - 19:00									0	0	0	**0**									0	0	0	**0**

Peak Hour	Approach	EB	WB	NB	SB
	Movements	RT(4)	RT(16)	RT(8)	RT(20)
17:00 - 18:00 PM	Volumes	2	3	0	8
	P.H.F.	0.25	0.75	0.00	0.40
	% of HV	50%	0%	0%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.50	0.50	0.00	1.00
WB	1.00	0.00	0.00	1.00
NB	0.00	0.00	0.00	
SB	1.00	0.00	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time									**Poospatuck Lane (NWB)**															
									Sharp Left (9)				Slight Left (10)				Slight Right (11)				Sharp Right (12)			
									Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45									0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**
6:45 - 7:00									0	0	0	**0**	0	0	0	**0**	4	0	1	**5**	0	0	0	**0**
7:00 - 7:15									0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**
7:15 - 7:30									0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
7:30 - 7:45									0	0	0	**0**	0	0	0	**0**	11	0	1	**12**	0	0	0	**0**
7:45 - 8:00									0	0	0	**0**	0	0	0	**0**	8	0	1	**9**	1	0	0	**1**
8:00 - 8:15									0	0	0	**0**	0	0	0	**0**	9	0	0	**9**	0	0	0	**0**
8:15 - 8:30									0	0	0	**0**	0	0	0	**0**	14	1	2	**17**	0	0	0	**0**
8:30 - 8:45									0	0	0	**0**	0	0	0	**0**	14	0	0	**14**	0	0	0	**0**
8:45 - 9:00									0	0	0	**0**	0	0	0	**0**	21	1	0	**22**	0	0	0	**0**
9:00 - 9:15									0	0	0	**0**	0	0	0	**0**	14	0	0	**14**	0	0	0	**0**
9:15 - 9:30									0	0	0	**0**	0	0	0	**0**	17	1	1	**19**	0	0	0	**0**

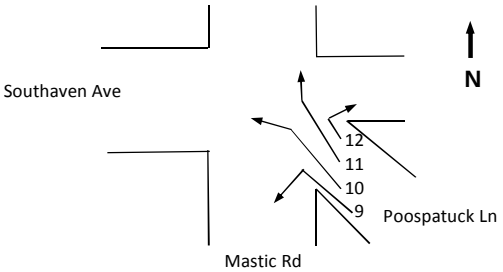
Time																								
6:30 - 6:45																								
6:45 - 7:00																								
7:00 - 7:15																								
7:15 - 7:30																								
7:30 - 7:45																								
7:45 - 8:00																								
8:00 - 8:15																								
8:15 - 8:30																								
8:30 - 8:45																								
8:45 - 9:00																								
9:00 - 9:15																								
9:15 - 9:30																								

Peak Hour	Approach						
8:00 - 9:00 AM	Movements	LT(9)	LT(10)	RT(11)	RT(12)		
	Volumes	0	0	62	0		
	P.H.F.	0.00	0.00	0.70	0.00		
	% of HV	0%	0%	6%	0%		

Classification

Approach	Cars	Trucks	Buses	Total

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Mastic Road @ Southaven Road**

Day, Date: **Tuesday, 6/7/2016**

Time									Poospatuck Lane (NWB)															
									Sharp Left (9)				Slight Left (10)				Slight Right (11)				Sharp Right (12)			
									Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15									0	0	0	**0**	0	0	0	**0**	25	0	0	**25**	0	0	0	**0**
16:15 - 16:30									0	0	0	**0**	1	0	0	**1**	19	1	1	**21**	3	0	0	**3**
16:30 - 16:45									0	0	0	**0**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**
16:45 - 17:00									0	0	0	**0**	1	0	0	**1**	12	0	0	**12**	0	0	0	**0**
17:00 - 17:15									0	0	0	**0**	0	0	0	**0**	23	0	0	**23**	0	0	0	**0**
17:15 - 17:30									0	0	0	**0**	0	0	0	**0**	17	0	0	**17**	0	0	0	**0**
17:30 - 17:45									0	0	0	**0**	0	0	0	**0**	18	0	0	**18**	0	0	0	**0**
17:45 - 18:00									0	0	0	**0**	0	0	0	**0**	25	0	0	**25**	0	0	0	**0**
18:00 - 18:15									0	0	0	**0**	0	0	0	**0**	24	0	1	**25**	0	0	0	**0**
18:15 - 18:30									0	0	0	**0**	0	0	0	**0**	15	0	0	**15**	1	0	0	**1**
18:30 - 18:45									0	0	0	**0**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**
18:45 - 19:00									0	0	0	**0**	0	0	0	**0**	26	0	0	**26**	0	0	0	**0**

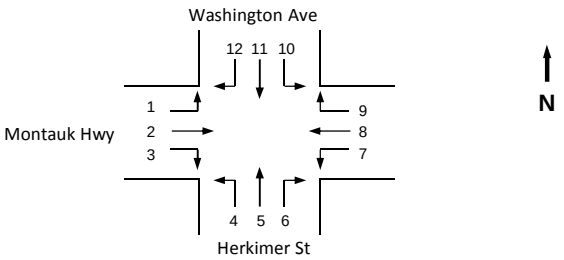
Time																								
16:00 - 16:15																								
16:15 - 16:30																								
16:30 - 16:45																								
16:45 - 17:00																								
17:00 - 17:15																								
17:15 - 17:30																								
17:30 - 17:45																								
17:45 - 18:00																								
18:00 - 18:15																								
18:15 - 18:30																								
18:30 - 18:45																								
18:45 - 19:00																								

Peak Hour	Approach						
	Movements	LT(9)	LT(10)	RT(11)	RT(12)		
17:00 - 18:00 PM	Volumes	0	0	83	0		
	P.H.F.	0.00	0.00	0.83	0.00		
	% of HV	0%	0%	0%	0%		

Classification

Approach	Cars	Trucks	Buses	Total

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Montauk Highway @ Washington Avenue**

Day, Date: **Tuesday, 6/7/2016**

Time	Montauk Highway (EB)												Montauk Highway (WB)											
	Left (1)				Thru (2)				Right (3)				Left (7)				Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	0	0	0	**0**	64	3	0	**67**	11	0	0	**11**	0	0	1	**1**	61	7	10	**78**	0	0	1	**1**
6:45 - 7:00	0	0	0	**0**	63	8	0	**71**	13	0	1	**14**	5	0	0	**5**	71	4	2	**77**	0	0	0	**0**
7:00 - 7:15	1	0	0	**1**	61	1	1	**63**	19	2	1	**22**	1	0	0	**1**	84	3	2	**89**	2	0	0	**2**
7:15 - 7:30	1	2	0	**3**	75	5	0	**80**	15	1	1	**17**	2	0	1	**3**	88	11	2	**101**	1	1	0	**2**
7:30 - 7:45	1	0	0	**1**	110	11	3	**124**	20	1	1	**22**	1	0	0	**1**	80	15	5	**100**	1	0	0	**1**
7:45 - 8:00	0	0	0	**0**	104	8	10	**122**	15	4	0	**19**	3	0	0	**3**	74	3	2	**79**	2	0	0	**2**
8:00 - 8:15	1	1	0	**2**	86	10	3	**99**	32	1	1	**34**	4	0	0	**4**	126	8	2	**136**	2	0	0	**2**
8:15 - 8:30	0	0	0	**0**	102	7	0	**109**	39	6	0	**45**	5	0	1	**6**	101	13	0	**114**	1	3	0	**4**
8:30 - 8:45	1	0	0	**1**	98	8	3	**109**	18	4	0	**22**	1	0	0	**1**	112	6	1	**119**	1	1	0	**2**
8:45 - 9:00	2	0	0	**2**	90	7	0	**97**	25	3	0	**28**	2	0	0	**2**	87	2	0	**89**	1	0	0	**1**
9:00 - 9:15	2	0	0	**2**	77	8	0	**85**	25	0	0	**25**	2	0	0	**2**	111	6	1	**118**	1	0	0	**1**
9:15 - 9:30	1	0	0	**1**	101	9	2	**112**	45	2	0	**47**	3	0	1	**4**	101	5	0	**106**	1	0	0	**1**

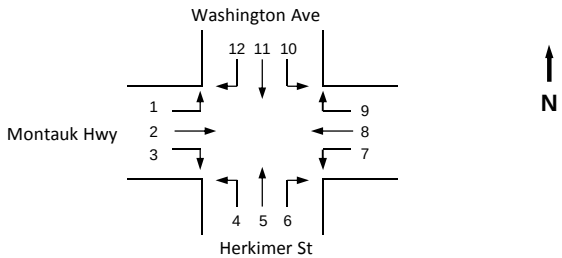
Time	Herkimer Street (NB)												Washington Avenue (SB)											
	Left (4)				Thru (5)				Right (6)				Left (10)				Thru (11)				Right (12)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	47	1	0	**48**	2	0	0	**2**	1	0	0	**1**	5	0	0	**5**	0	0	0	**0**	6	0	0	**6**
6:45 - 7:00	38	1	0	**39**	2	0	0	**2**	4	1	0	**5**	5	1	0	**6**	1	0	1	**2**	3	0	0	**3**
7:00 - 7:15	45	3	1	**49**	1	0	0	**1**	0	0	0	**0**	6	0	0	**6**	7	0	1	**8**	3	0	0	**3**
7:15 - 7:30	34	1	3	**38**	0	0	0	**0**	2	0	1	**3**	6	2	0	**8**	0	1	0	**1**	6	0	0	**6**
7:30 - 7:45	35	0	4	**39**	1	0	0	**1**	6	0	2	**8**	5	3	1	**9**	1	1	0	**2**	9	3	0	**12**
7:45 - 8:00	46	0	0	**46**	1	0	0	**1**	7	0	0	**7**	8	3	1	**12**	0	0	0	**0**	3	0	0	**3**
8:00 - 8:15	38	0	1	**39**	1	0	0	**1**	3	0	0	**3**	4	2	0	**6**	4	0	0	**4**	3	2	0	**5**
8:15 - 8:30	45	0	1	**46**	1	0	0	**1**	1	0	1	**2**	9	1	0	**10**	4	0	0	**4**	4	0	0	**4**
8:30 - 8:45	62	1	0	**63**	1	0	0	**1**	3	0	0	**3**	6	0	0	**6**	3	1	0	**4**	4	1	0	**5**
8:45 - 9:00	50	3	0	**53**	1	1	0	**2**	1	0	0	**1**	6	0	0	**6**	4	0	0	**4**	1	0	0	**1**
9:00 - 9:15	49	3	0	**52**	0	0	0	**0**	1	0	1	**2**	4	1	0	**5**	0	0	0	**0**	4	0	0	**4**
9:15 - 9:30	45	2	4	**51**	0	0	0	**0**	4	0	0	**4**	3	1	0	**4**	3	0	0	**3**	2	0	0	**2**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(7)	TH(8)	RT(9)	LT(4)	TH(5)	RT(6)	LT(10)	TH(11)	RT(12)
8:00 - 9:00 AM	Volumes	5	414	129	13	458	9	201	5	9	28	16	15
	P.H.F.	0.63	0.95	0.72	0.54	0.84	0.56	0.80	0.63	0.75	0.70	1.00	0.75
	% of HV	20%	9%	12%	8%	7%	44%	3%	20%	11%	11%	6%	20%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.90	0.09	0.01	1.00
WB	0.92	0.07	0.01	1.00
NB	0.96	0.02	0.01	1.00
SB	0.88	0.12	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Montauk Highway @ Washington Avenue**

Day, Date: **Tuesday, 6/7/2016**

Time	Montauk Highway (EB)												Montauk Highway (WB)											
	Left (1)				Thru (2)				Right (3)				Left (7)				Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	2	0	0	**2**	116	3	0	**119**	48	1	1	**50**	5	0	0	**5**	142	3	0	**145**	1	0	0	**1**
16:15 - 16:30	1	0	0	**1**	106	2	1	**109**	41	0	1	**42**	2	0	1	**3**	150	5	0	**155**	3	0	0	**3**
16:30 - 16:45	4	0	0	**4**	128	2	1	**131**	35	0	1	**36**	14	0	0	**14**	139	4	0	**143**	2	1	0	**3**
16:45 - 17:00	4	0	0	**4**	118	3	1	**122**	42	2	0	**44**	10	1	0	**11**	165	6	0	**171**	6	0	0	**6**
17:00 - 17:15	3	0	0	**3**	119	1	0	**120**	48	1	0	**49**	16	0	0	**16**	141	1	1	**143**	2	0	0	**2**
17:15 - 17:30	1	0	0	**1**	142	1	1	**144**	48	1	0	**49**	6	0	0	**6**	135	1	1	**137**	3	0	0	**3**
17:30 - 17:45	5	0	0	**5**	115	1	2	**118**	54	2	0	**56**	9	0	1	**10**	161	1	0	**162**	0	0	0	**0**
17:45 - 18:00	3	0	0	**3**	107	1	0	**108**	39	1	0	**40**	8	0	0	**8**	141	3	0	**144**	5	0	0	**5**
18:00 - 18:15	1	0	0	**1**	108	3	0	**111**	44	1	0	**45**	3	0	0	**3**	147	2	0	**149**	2	0	0	**2**
18:15 - 18:30	4	0	0	**4**	114	3	0	**117**	48	2	0	**50**	5	0	0	**5**	116	0	0	**116**	3	0	0	**3**
18:30 - 18:45	3	0	0	**3**	102	4	0	**106**	40	1	0	**41**	1	0	1	**2**	112	3	0	**115**	0	0	0	**0**
18:45 - 19:00	4	0	0	**4**	103	2	0	**105**	62	0	0	**62**	6	0	1	**7**	101	3	0	**104**	0	0	0	**0**

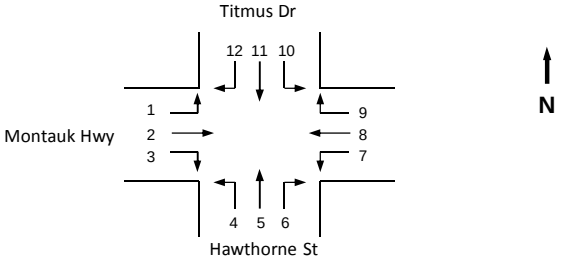
Time	Herkimer Street (NB)												Washington Avenue (SB)											
	(NB)				Thru (5)				Right (6)				(SB)				Thru (11)				Right (12)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	63	4	0	**67**	2	0	0	**2**	4	1	1	**6**	3	0	0	**3**	8	0	0	**8**	6	0	0	**6**
16:15 - 16:30	53	1	0	**54**	3	0	0	**3**	1	0	1	**2**	2	0	0	**2**	4	0	0	**4**	4	0	0	**4**
16:30 - 16:45	53	1	1	**55**	2	0	0	**2**	3	1	1	**5**	3	0	0	**3**	7	0	1	**8**	2	0	0	**2**
16:45 - 17:00	40	0	0	**40**	2	0	0	**2**	4	0	0	**4**	5	0	0	**5**	2	0	0	**2**	8	1	0	**9**
17:00 - 17:15	59	0	0	**59**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	4	0	0	**4**	5	0	0	**5**
17:15 - 17:30	48	0	0	**48**	4	0	0	**4**	3	0	0	**3**	5	0	1	**6**	1	0	0	**1**	6	0	0	**6**
17:30 - 17:45	74	0	0	**74**	1	0	0	**1**	3	0	2	**5**	3	0	0	**3**	1	0	0	**1**	7	0	0	**7**
17:45 - 18:00	62	0	0	**62**	3	0	0	**3**	7	0	0	**7**	4	0	0	**4**	7	0	0	**7**	7	0	0	**7**
18:00 - 18:15	54	1	1	**56**	3	0	0	**3**	9	0	0	**9**	6	0	0	**6**	4	0	0	**4**	8	0	0	**8**
18:15 - 18:30	56	1	0	**57**	3	0	0	**3**	3	0	1	**4**	2	0	0	**2**	3	0	0	**3**	9	0	0	**9**
18:30 - 18:45	57	0	0	**57**	3	0	0	**3**	5	0	0	**5**	4	0	0	**4**	5	0	0	**5**	2	0	0	**2**
18:45 - 19:00	57	1	0	**58**	2	0	0	**2**	2	0	0	**2**	5	1	0	**6**	6	0	0	**6**	4	0	0	**4**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(7)	TH(8)	RT(9)	(NB)	TH(5)	RT(6)	(SB)	TH(11)	RT(12)
17:00 - 18:00 PM	Volumes	12	490	194	40	586	10	243	10	15	17	13	25
	P.H.F.	0.60	0.85	0.87	0.63	0.90	0.50	0.82	0.63	0.54	0.71	0.46	0.89
	% of HV	0%	1%	3%	3%	1%	0%	0%	0%	13%	6%	0%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.98	0.01	0.00	1.00
WB	0.99	0.01	0.00	1.00
NB	0.99	0.00	0.01	1.00
SB	0.98	0.00	0.02	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Montauk Highway @ Titmus Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Montauk Highway (EB)												Montauk Highway (WB)											
	Left (1)				Thru (2)				Right (3)				Left (7)				Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	8	0	0	**8**	66	1	1	**68**	3	0	0	**3**	0	0	0	**0**	133	6	4	**143**	15	1	0	**16**
6:45 - 7:00	2	1	0	**3**	68	8	1	**77**	4	0	0	**4**	1	0	0	**1**	114	7	3	**124**	10	1	0	**11**
7:00 - 7:15	5	1	0	**6**	62	4	0	**66**	6	0	0	**6**	6	0	0	**6**	130	5	1	**136**	6	1	1	**8**
7:15 - 7:30	7	0	0	**7**	66	14	1	**81**	1	0	0	**1**	1	0	0	**1**	147	7	2	**156**	10	1	1	**12**
7:30 - 7:45	2	0	0	**2**	96	18	3	**117**	1	0	0	**1**	0	0	0	**0**	123	9	1	**133**	12	0	2	**14**
7:45 - 8:00	9	0	0	**9**	103	11	1	**115**	6	0	0	**6**	0	0	0	**0**	115	4	1	**120**	14	0	0	**14**
8:00 - 8:15	7	1	0	**8**	87	11	1	**99**	5	0	0	**5**	3	1	1	**5**	151	4	1	**156**	10	2	0	**12**
8:15 - 8:30	3	0	0	**3**	118	12	0	**130**	5	0	0	**5**	1	0	0	**1**	152	12	1	**165**	14	1	0	**15**
8:30 - 8:45	8	1	1	**10**	101	14	1	**116**	1	0	0	**1**	2	0	0	**2**	168	9	2	**179**	17	0	0	**17**
8:45 - 9:00	8	0	0	**8**	94	6	1	**101**	5	0	0	**5**	1	0	0	**1**	126	7	0	**133**	11	1	0	**12**
9:00 - 9:15	6	0	0	**6**	101	11	0	**112**	8	0	0	**8**	2	0	0	**2**	145	8	0	**153**	9	0	0	**9**
9:15 - 9:30	10	1	0	**11**	134	9	0	**143**	9	0	0	**9**	3	0	0	**3**	138	9	0	**147**	11	0	2	**13**

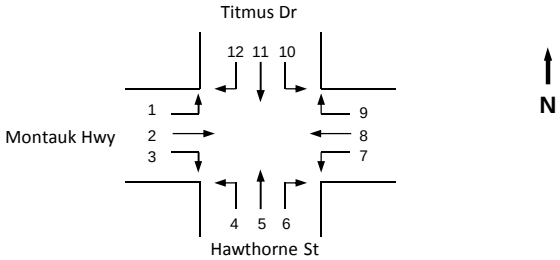
Time	Hawthorne Street (NB)												Titmus Drive (SB)											
	Left (4)				Thru (5)				Right (6)				Left (10)				Thru (11)				Right (12)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	4	0	0	**4**	8	0	0	**8**	1	0	0	**1**	5	0	0	**5**	3	0	0	**3**	5	1	0	**6**
6:45 - 7:00	15	0	0	**15**	7	0	0	**7**	2	0	0	**2**	11	0	1	**12**	6	0	2	**8**	7	1	0	**8**
7:00 - 7:15	9	0	0	**9**	12	0	0	**12**	5	0	0	**5**	14	1	0	**15**	11	0	0	**11**	7	0	0	**7**
7:15 - 7:30	13	0	0	**13**	9	1	1	**11**	1	0	1	**2**	9	0	0	**9**	8	0	0	**8**	9	3	0	**12**
7:30 - 7:45	8	1	0	**9**	18	0	0	**18**	3	0	0	**3**	14	2	1	**17**	5	0	1	**6**	9	0	0	**9**
7:45 - 8:00	10	0	0	**10**	6	0	1	**7**	4	0	2	**6**	14	6	3	**23**	2	0	0	**2**	8	2	0	**10**
8:00 - 8:15	10	0	0	**10**	7	0	0	**7**	6	0	0	**6**	12	0	1	**13**	6	0	0	**6**	9	0	0	**9**
8:15 - 8:30	15	0	0	**15**	4	0	0	**4**	1	0	0	**1**	13	3	0	**16**	4	0	0	**4**	7	1	0	**8**
8:30 - 8:45	12	0	0	**12**	6	1	0	**7**	4	0	0	**4**	13	0	1	**14**	6	2	1	**9**	10	1	1	**12**
8:45 - 9:00	9	0	0	**9**	10	0	0	**10**	1	0	0	**1**	12	1	0	**13**	5	0	0	**5**	12	0	0	**12**
9:00 - 9:15	6	0	0	**6**	5	0	0	**5**	1	0	1	**2**	16	0	0	**16**	3	2	0	**5**	8	0	0	**8**
9:15 - 9:30	7	0	0	**7**	4	0	0	**4**	1	0	0	**1**	16	0	0	**16**	5	1	0	**6**	10	0	0	**10**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(7)	TH(8)	RT(9)	LT(4)	TH(5)	RT(6)	LT(10)	TH(11)	RT(12)
8:00 - 9:00 AM	Volumes	29	446	16	9	633	56	46	28	12	56	24	41
	P.H.F.	0.73	0.86	0.80	0.45	0.88	0.82	0.77	0.70	0.50	0.88	0.67	0.85
	% of HV	10%	10%	0%	22%	6%	7%	0%	4%	0%	11%	13%	7%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.90	0.09	0.01	1.00
WB	0.94	0.05	0.01	1.00
NB	0.99	0.01	0.00	1.00
SB	0.90	0.07	0.03	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Montauk Highway @ Titmus Road**

Day, Date: **Tuesday, 6/7/2016**

Time	Montauk Highway (EB)												Montauk Highway (WB)											
	Left (1)				Thru (2)				Right (3)				Left (7)				Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	21	1	0	**22**	165	5	1	**171**	14	1	0	**15**	3	0	0	**3**	183	6	0	**189**	13	0	0	**13**
16:15 - 16:30	12	0	0	**12**	165	4	0	**169**	18	0	0	**18**	1	0	0	**1**	197	5	0	**202**	18	1	0	**19**
16:30 - 16:45	17	0	0	**17**	175	1	0	**176**	9	0	0	**9**	2	0	0	**2**	159	6	0	**165**	9	0	1	**10**
16:45 - 17:00	18	0	0	**18**	166	5	0	**171**	14	0	0	**14**	4	1	0	**5**	191	5	0	**196**	15	0	0	**15**
17:00 - 17:15	17	0	0	**17**	182	0	0	**182**	16	1	0	**17**	1	0	0	**1**	165	3	0	**168**	23	0	0	**23**
17:15 - 17:30	18	0	0	**18**	195	2	1	**198**	15	0	0	**15**	2	0	0	**2**	157	1	0	**158**	18	1	0	**19**
17:30 - 17:45	20	0	0	**20**	193	1	1	**195**	17	0	0	**17**	1	0	0	**1**	189	2	0	**191**	28	0	0	**28**
17:45 - 18:00	16	1	0	**17**	149	4	0	**153**	11	0	0	**11**	2	0	0	**2**	183	2	0	**185**	20	0	0	**20**
18:00 - 18:15	20	0	0	**20**	177	2	0	**179**	8	0	0	**8**	2	0	0	**2**	162	2	0	**164**	18	0	1	**19**
18:15 - 18:30	19	1	0	**20**	172	4	0	**176**	13	0	0	**13**	2	0	0	**2**	168	1	0	**169**	24	0	0	**24**
18:30 - 18:45	14	0	0	**14**	175	4	0	**179**	13	0	0	**13**	3	0	0	**3**	156	2	0	**158**	16	1	0	**17**
18:45 - 19:00	12	0	0	**12**	184	2	0	**186**	12	0	0	**12**	0	0	0	**0**	166	2	0	**168**	11	0	0	**11**

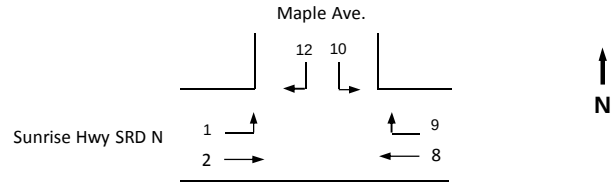
Time	Hawthorne Street (NB)												Titmus Drive (SB)											
	(NB)				Thru (5)				Right (6)				(SB)				Thru (11)				Right (12)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	10	0	0	**10**	12	0	0	**12**	1	0	0	**1**	30	0	1	**31**	22	0	0	**22**	15	0	0	**15**
16:15 - 16:30	5	0	0	**5**	9	0	0	**9**	1	0	0	**1**	24	0	0	**24**	13	0	0	**13**	17	1	0	**18**
16:30 - 16:45	10	0	1	**11**	11	0	0	**11**	4	0	0	**4**	30	1	2	**33**	25	0	0	**25**	22	0	0	**22**
16:45 - 17:00	12	0	0	**12**	9	0	0	**9**	2	0	0	**2**	19	0	0	**19**	29	0	0	**29**	22	0	0	**22**
17:00 - 17:15	11	0	0	**11**	10	0	1	**11**	1	0	0	**1**	26	1	0	**27**	31	0	0	**31**	16	1	0	**17**
17:15 - 17:30	13	0	0	**13**	16	0	0	**16**	2	0	2	**4**	37	0	0	**37**	20	1	0	**21**	20	0	0	**20**
17:30 - 17:45	13	0	0	**13**	11	0	1	**12**	1	0	0	**1**	17	1	0	**18**	24	0	0	**24**	27	0	0	**27**
17:45 - 18:00	11	0	0	**11**	8	0	0	**8**	0	0	0	**0**	29	1	0	**30**	33	0	0	**33**	23	0	0	**23**
18:00 - 18:15	8	0	0	**8**	9	0	0	**9**	2	0	0	**2**	22	1	0	**23**	35	0	0	**35**	26	1	0	**27**
18:15 - 18:30	9	0	0	**9**	7	0	0	**7**	0	0	0	**0**	22	1	0	**23**	17	0	0	**17**	17	0	0	**17**
18:30 - 18:45	10	0	0	**10**	9	0	0	**9**	0	2	0	**2**	21	1	0	**22**	19	0	0	**19**	20	0	0	**20**
18:45 - 19:00	3	0	0	**3**	9	0	0	**9**	2	0	0	**2**	22	0	0	**22**	22	0	0	**22**	20	0	0	**20**

Peak Hour	Approach	EB			WB			NB			SB		
	Movements	LT(1)	TH(2)	RT(3)	LT(7)	TH(8)	RT(9)	(NB)	TH(5)	RT(6)	(SB)	TH(11)	RT(12)
17:00 - 18:00 PM	Volumes	72	728	60	6	702	90	48	47	6	112	109	87
	P.H.F.	0.90	0.92	0.88	0.75	0.92	0.80	0.92	0.73	0.38	0.76	0.83	0.81
	% of HV	1%	1%	2%	0%	1%	1%	0%	4%	33%	3%	1%	1%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.99	0.01	0.00	1.00
WB	0.99	0.01	0.00	1.00
NB	0.96	0.00	0.04	1.00
SB	0.98	0.02	0.00	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY AM PEAK PERIOD



Intersection: **Sunrise Highway Service Road North @ Maple Avenue**

Day, Date: **Tuesday, 6/7/2016**

Time	Sunrise Highway Service Road North (EB)												Sunrise Highway Service Road North (WB)											
	Left (1)				Thru (2)												Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total									Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
6:30 - 6:45	1	0	0	**1**	30	0	1	**31**									91	1	3	**95**	0	0	0	**0**
6:45 - 7:00	6	0	0	**6**	32	0	1	**33**									76	2	1	**79**	6	0	0	**6**
7:00 - 7:15	2	0	0	**2**	16	2	1	**19**									90	2	2	**94**	1	0	0	**1**
7:15 - 7:30	1	0	0	**1**	18	2	0	**20**									77	3	4	**84**	4	0	0	**4**
7:30 - 7:45	5	1	0	**6**	30	0	0	**30**									87	3	2	**92**	2	0	0	**2**
7:45 - 8:00	6	0	0	**6**	30	2	0	**32**									87	3	1	**91**	1	0	0	**1**
8:00 - 8:15	7	0	0	**7**	32	4	0	**36**									81	5	3	**89**	2	0	1	**3**
8:15 - 8:30	4	0	0	**4**	25	0	1	**26**									86	1	1	**88**	1	1	0	**2**
8:30 - 8:45	5	0	0	**5**	24	0	0	**24**									73	2	3	**78**	0	0	0	**0**
8:45 - 9:00	4	0	0	**4**	19	2	0	**21**									69	1	0	**70**	2	0	0	**2**
9:00 - 9:15	0	0	0	**0**	32	3	0	**35**									53	2	0	**55**	2	0	0	**2**
9:15 - 9:30	0	2	0	**2**	31	1	1	**33**									44	2	3	**49**	0	0	0	**0**

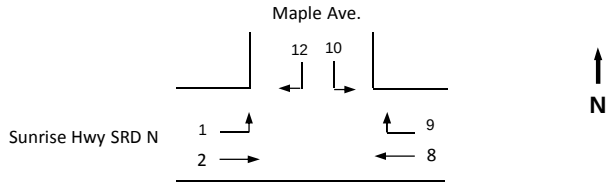
Time													Maple Avenue (SB)											
													Left (10)								Right (12)			
													Auto	Truck	Bus	Total					Auto	Truck	Bus	Total
6:30 - 6:45													3	0	0	**3**					6	0	1	**7**
6:45 - 7:00													1	0	0	**1**					2	0	0	**2**
7:00 - 7:15													8	1	0	**9**					3	0	1	**4**
7:15 - 7:30													1	1	1	**3**					6	2	0	**8**
7:30 - 7:45													1	0	0	**1**					8	0	0	**8**
7:45 - 8:00													0	0	0	**0**					6	0	0	**6**
8:00 - 8:15													2	0	1	**3**					6	0	1	**7**
8:15 - 8:30													1	1	1	**3**					4	1	0	**5**
8:30 - 8:45													1	1	0	**2**					5	1	0	**6**
8:45 - 9:00													4	1	1	**6**					2	0	0	**2**
9:00 - 9:15													1	0	0	**1**					5	0	0	**5**
9:15 - 9:30													2	0	0	**2**					2	0	0	**2**

Peak Hour	Approach	EB		WB			SB	
	Movements	LT(1)	TH(2)	TH(8)	RT(9)		LT(10)	RT(12)
8:00 - 9:00 AM	Volumes	20	107	325	7		14	20
	P.H.F.	0.71	0.74	0.91	0.58		0.58	0.71
	% of HV	0%	7%	5%	29%		43%	15%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.94	0.05	0.01	1.00
WB	0.95	0.03	0.02	1.00
SB	0.74	0.15	0.12	1.00

GOSR Forge River EA-EIS
INTERSECTION FULL TURNING MOVEMENT COUNT SUMMARY
WEEKDAY PM PEAK PERIOD



Intersection: **Sunrise Highway Service Road North @ Maple Avenue**

Day, Date: **Tuesday, 6/7/2016**

Time	Sunrise Highway Service Road North (EB)												Sunrise Highway Service Road North (WB)											
	Left (1)				Thru (2)												Thru (8)				Right (9)			
	Auto	Truck	Bus	Total	Auto	Truck	Bus	Total									Auto	Truck	Bus	Total	Auto	Truck	Bus	Total
16:00 - 16:15	8	0	0	**8**	92	2	3	**97**									48	2	1	**51**	3	0	0	**3**
16:15 - 16:30	7	0	0	**7**	100	1	2	**103**									58	2	1	**61**	4	0	0	**4**
16:30 - 16:45	3	0	0	**3**	100	1	0	**101**									54	2	0	**56**	5	0	0	**5**
16:45 - 17:00	4	0	0	**4**	104	1	0	**105**									61	5	0	**66**	4	0	0	**4**
17:00 - 17:15	12	0	0	**12**	112	0	0	**112**									65	0	0	**65**	14	0	0	**14**
17:15 - 17:30	22	0	0	**22**	100	3	1	**104**									50	1	0	**51**	21	0	0	**21**
17:30 - 17:45	32	2	0	**34**	110	2	0	**112**									52	1	0	**53**	34	0	0	**34**
17:45 - 18:00	31	0	0	**31**	90	1	0	**91**									55	1	0	**56**	24	0	0	**24**
18:00 - 18:15	19	0	0	**19**	90	2	0	**92**									55	0	0	**55**	8	0	0	**8**
18:15 - 18:30	15	0	0	**15**	84	1	0	**85**									52	0	0	**52**	9	1	0	**10**
18:30 - 18:45	9	0	0	**9**	80	3	0	**83**									59	2	0	**61**	11	0	0	**11**
18:45 - 19:00	6	1	0	**7**	84	3	0	**87**									60	3	0	**63**	9	0	0	**9**

Time													Maple Avenue (SB)											
													Left (10)								Right (12)			
													Auto	Truck	Bus	Total					Auto	Truck	Bus	Total
16:00 - 16:15													3	0	1	**4**					2	0	0	**2**
16:15 - 16:30													2	0	0	**2**					2	0	0	**2**
16:30 - 16:45													8	0	0	**8**					6	0	0	**6**
16:45 - 17:00													3	0	0	**3**					7	0	0	**7**
17:00 - 17:15													1	0	0	**1**					6	0	0	**6**
17:15 - 17:30													4	0	0	**4**					11	0	0	**11**
17:30 - 17:45													4	0	0	**4**					6	0	0	**6**
17:45 - 18:00													6	0	0	**6**					11	0	0	**11**
18:00 - 18:15													4	0	1	**5**					8	0	0	**8**
18:15 - 18:30													5	0	0	**5**					11	0	0	**11**
18:30 - 18:45													4	0	0	**4**					6	0	0	**6**
18:45 - 19:00													2	0	0	**2**					8	0	0	**8**

Peak Hour	Approach	EB		WB			SB	
	Movements	LT(1)	TH(2)	TH(8)	RT(9)		LT(10)	RT(12)
17:00 - 18:00 PM	Volumes	50	347	231	38		16	33
	P.H.F.	0.66	0.94	0.92	0.86		0.80	0.75
	% of HV	2%	3%	2%	3%		6%	0%

Classification

Approach	Cars	Trucks	Buses	Total
EB	0.97	0.03	0.00	1.00
WB	0.98	0.02	0.00	1.00
SB	0.98	0.00	0.02	1.00

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

APPENDIX D

AUTOMATIC TRAFFIC RECORDER (ATRs)

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **Sunrise Service Road North**	FROM: **Maple Avenue**	TO: **Titmus Drive**	COUNTY:	**Kings**
DIRECTION:	Eastbound	FACTOR GROUP:	REC. SERIAL #:	FUNC. CLASS:	CITY:	**New York**
STATE DIR CODE:	1	WK OF YR: 23	PLACEMENT: Sunrise Service Road North	NHS:	BIN:	
DATE OF COUNT:	06/03/2016		@ REF MARKER:	JURIS: City	RR CROSSING:	
NOTES LANE 0:			ADDL DATA:	CC Stn:	HPMS SAMPLE:	
			COUNT TYPE: Axle Paired	BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)		PROCESSED BY: SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F													**216**	**244**	**296**	**384**	**517**	**531**	**476**	**289**	**293**	**220**	**176**	**124**			
4	S	**83**	**42**	**12**	**18**	**18**	**17**	**65**	**127**	**150**	**252**	**239**	**265**	**344**	**333**	**296**	**321**	**355**	**294**	**266**	**233**	**222**	**202**	**128**	**114**	4396	355	16
5	S	**60**	**67**	**40**	**21**	**16**	**12**	**37**	**61**	**71**	**150**	**194**	**245**	**299**	**288**	**246**	**243**	**258**	**232**	**208**	**199**	**164**	**100**	**89**	**70**	3370	299	12
6	M	**32**	**12**	**10**	**15**	**17**	**37**	**93**	**163**	**161**	**160**	**180**	**182**	**225**	**238**	**277**	**417**	**562**	**545**	**433**	**335**	**267**	**212**	**129**	**67**	4769	562	16
7	T	**46**	**20**	**13**	**10**	**13**	**39**	**100**	**155**	**140**	**173**	**175**	**208**	**226**	**250**	**302**	**382**	**484**	**540**	**485**	**354**	**247**	**167**	**96**	**102**	4727	540	17
8	W	**51**	**21**	**19**	**6**	**17**	**29**	**100**	**153**	**181**	**152**	**190**	**211**	**227**	**212**	**300**	**377**	**458**	**547**	**442**	**341**	**239**	**181**	**104**	**71**	4629	547	17
9	T	**42**	**24**	**17**	**8**	**14**	**37**	**100**	**160**	**182**	**159**	**177**	**213**	**239**	**239**	**296**	**410**	**489**	**558**	**455**	**349**	**262**	**188**	**120**	**73**	4811	558	17
10	F	**61**	**29**	**20**	**8**	**12**	**42**	**112**	**167**	**185**	**156**	**177**	**203**	**249**	**251**	**307**	**416**	**496**	**593**	**485**	**362**	**292**	**204**	**140**	**106**	5073	593	17
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY)

12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	AWDT
46	**22**	**16**	**8**	**15**	**35**	**100**	**156**	**168**	**161**	**181**	**211**	**231**	**234**	**299**	**390**	**477**	**548**	**461**	**348**	**249**	**179**	**107**	**82**	**4724**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	ESTIMATED (one way)
7	**168**	**3**	**72**				**1.077**	**AADT 4386**

ROAD:		ROAD NAME: **Sunrise Service Road North**	FROM: **Maple Avenue**	TO: **Titmus Drive**	COUNTY:	**Kings**
STATION:	**000001**	STATE DIR CODE: **1**	PLACEMENT: **Sunrise Service Road North**		**DATE OF COUNT:**	**06/03/2016**

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **4th Avenue**	FROM: **43rd Street**	TO: **42nd Street**	COUNTY:	**Kings**
DIRECTION:	Westbound	FACTOR GROUP:	REC. SERIAL #:	FUNC. CLASS:	CITY:	**New York**
STATE DIR CODE:	2	WK OF YR: 23	PLACEMENT: 4th Avenue	NHS:	BIN:	
DATE OF COUNT:	06/03/2016		@ REF MARKER:	JURIS: City	RR CROSSING:	
NOTES LANE 0:			ADDL DATA:	CC Stn:	HPMS SAMPLE:	
			COUNT TYPE: Axle Paired	BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)		PROCESSED BY: SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F														**230**	**282**	**282**	**290**	**268**	**321**	**245**	**176**	**125**	**86**	**59**			
4	S	**42**	**18**	**10**	**8**	**19**	**61**	**111**	**197**	**227**	**260**	**290**	**318**	**345**	**308**	**265**	**269**	**256**	**259**	**268**	**186**	**144**	**121**	**79**	**72**	4133	345	12
5	S	**40**	**24**	**21**	**14**	**6**	**25**	**25**	**78**	**122**	**176**	**232**	**315**	**280**	**269**	**241**	**237**	**208**	**168**	**155**	**154**	**115**	**79**	**65**	**35**	3084	315	11
6	M	**21**	**9**	**12**	**16**	**45**	**119**	**273**	**381**	**310**	**242**	**210**	**237**	**203**	**224**	**274**	**249**	**282**	**309**	**249**	**203**	**133**	**105**	**61**	**51**	4218	381	7
7	T	**20**	**13**	**12**	**11**	**45**	**119**	**294**	**382**	**341**	**229**	**201**	**209**	**208**	**223**	**273**	**270**	**256**	**322**	**272**	**182**	**132**	**99**	**62**	**27**	4202	382	7
8	W	**24**	**8**	**14**	**16**	**39**	**135**	**300**	**351**	**342**	**249**	**201**	**207**	**211**	**213**	**271**	**275**	**237**	**210**	**188**	**172**	**123**	**95**	**63**	**38**	3982	351	7
9	T	**13**	**4**	**12**	**14**	**42**	**132**	**304**	**379**	**332**	**251**	**183**	**206**	**214**	**216**	**273**	**263**	**280**	**297**	**272**	**220**	**141**	**133**	**92**	**46**	4319	379	7
10	F	**18**	**11**	**13**	**14**	**52**	**113**	**273**	**347**	**329**	**309**	**248**	**231**	**235**	**240**	**327**	**288**	**288**	**340**	**301**	**241**	**181**	**157**					
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY)

12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	**AWDT**
19	**8**	**13**	**14**	**42**	**129**	**299**	**371**	**338**	**243**	**195**	**207**	**211**	**217**	**272**	**269**	**258**	**276**	**244**	**191**	**132**	**109**	**72**	**37**	**4166**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	**ESTIMATED (one way)**
7	**168**	**3**	**72**				**1.077**	**AADT** **3868**

ROAD:		ROAD NAME: **4th Avenue**	FROM: **43rd Street**	TO: **42nd Street**	COUNTY:	**Kings**
STATION:	**000001**	STATE DIR CODE: **2**	PLACEMENT: **4th Avenue**		**DATE OF COUNT:**	**06/03/2016**

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **Mastic Road**		FROM: **Moriches Avenue**		TO: **Patchogue Avenue**		COUNTY: **Kings**
DIRECTION:	Northbound	FACTOR GROUP:		REC. SERIAL #:		FUNC. CLASS:		CITY: **New York**
STATE DIR CODE:	1	WK OF YR:	23	PLACEMENT: Mastic Road		NHS:		BIN:
DATE OF COUNT:	06/03/2016			@ REF MARKER:		JURIS: City		RR CROSSING:
NOTES LANE 0:				ADDL DATA:		CC Stn:		HPMS SAMPLE:
				COUNT TYPE: Axle Paired		BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)			PROCESSED BY:	SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F														**618**	**619**	**555**	**675**	**626**	**700**	**626**	**522**	**381**	**240**	**176**			
4	S	**118**	**66**	**63**	**41**	**59**	**188**	**380**	**557**	**609**	**693**	**744**	**783**	**778**	**769**	**788**	**759**	**702**	**715**	**679**	**640**	**501**	**335**	**301**	**184**	11452	788	14
5	S	**142**	**80**	**71**	**38**	**44**	**77**	**182**	**263**	**456**	**587**	**736**	**770**	**769**	**648**	**679**	**606**	**622**	**481**	**488**	**453**	**346**	**229**	**177**	**110**	9054	770	11
6	M	**72**	**32**	**36**	**39**	**126**	**406**	**675**	**680**	**668**	**600**	**572**	**618**	**637**	**591**	**684**	**630**	**660**	**595**	**563**	**554**	**486**	**303**	**210**	**108**	10545	684	14
7	T	**96**	**42**	**37**	**49**	**120**	**414**	**655**	**687**	**695**	**602**	**524**	**584**	**563**	**591**	**680**	**629**	**572**	**623**	**622**	**553**	**425**	**301**	**186**	**123**	10373	695	8
8	W	**76**	**38**	**33**	**44**	**107**	**426**	**678**	**659**	**726**	**615**	**622**	**618**	**621**	**628**	**622**	**540**	**557**	**497**	**585**	**555**	**399**	**292**	**158**	**99**	10195	726	8
9	T	**64**	**44**	**43**	**38**	**126**	**424**	**652**	**693**	**639**	**634**	**547**	**574**	**611**	**601**	**661**	**609**	**645**	**605**	**630**	**641**	**474**	**403**	**212**	**113**	10683	693	7
10	F	**82**	**37**	**36**	**53**	**127**	**413**	**650**	**713**	**691**	**636**	**675**	**661**	**634**	**666**	**638**	**558**	**642**										
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											
		79	**41**	**38**	**44**	**118**	**421**	**662**	**680**	**687**	**617**	**564**	**592**	**598**	**607**	**654**	**593**	**591**	**575**	**612**	**583**	**433**	**332**	**185**	**112**	**10418**		

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY) — **AWDT**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	**ESTIMATED (one way)**
7	**168**	**3**	**72**				**1.077**	**AADT 9673**

ROAD:		ROAD NAME: **Mastic Road**	FROM: **Moriches Avenue**	TO: **Patchogue Avenue**	COUNTY: **Kings**
STATION:	**000001**	STATE DIR CODE: **1**	PLACEMENT: **Mastic Road**		**DATE OF COUNT: 06/03/2016**

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **Mastic Road**	FROM: **Patchogue Avenue**	TO: **Moriches Avenue**	COUNTY:	**Kings**
DIRECTION:	Southbound	FACTOR GROUP:	REC. SERIAL #:	FUNC. CLASS:	CITY:	**New York**
STATE DIR CODE:	2	WK OF YR: 23	PLACEMENT: Mastic Road	NHS:	BIN:	
DATE OF COUNT:	06/03/2016		@ REF MARKER:	JURIS: City	RR CROSSING:	
NOTES LANE 0:			ADDL DATA:	CC Stn:	HPMS SAMPLE:	
			COUNT TYPE: Axle Paired	BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)		PROCESSED BY: SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F														**743**	**771**	**871**	**929**	**989**	**982**	**886**	**743**	**581**	**460**	**313**			
4	S	**209**	**134**	**80**	**38**	**45**	**59**	**133**	**342**	**431**	**557**	**728**	**815**	**894**	**905**	**886**	**891**	**903**	**925**	**783**	**738**	**639**	**522**	**420**	**296**	12373	925	17
5	S	**247**	**157**	**84**	**56**	**38**	**47**	**77**	**221**	**362**	**452**	**611**	**713**	**808**	**762**	**730**	**735**	**705**	**627**	**601**	**528**	**497**	**356**	**243**	**179**	9836	808	12
6	M	**81**	**52**	**25**	**28**	**26**	**78**	**232**	**412**	**498**	**521**	**569**	**677**	**638**	**724**	**765**	**881**	**954**	**964**	**928**	**799**	**687**	**485**	**313**	**224**	11561	964	17
7	T	**181**	**63**	**49**	**33**	**34**	**71**	**238**	**392**	**516**	**499**	**529**	**623**	**588**	**722**	**790**	**828**	**949**	**1008**	**973**	**858**	**627**	**504**	**328**	**199**	11602	1008	17
8	W	**114**	**56**	**37**	**18**	**24**	**70**	**244**	**422**	**561**	**522**	**584**	**621**	**661**	**688**	**762**	**868**	**899**	**950**	**813**	**699**	**607**	**519**	**317**	**192**	11248	950	17
9	T	**124**	**69**	**41**	**18**	**29**	**73**	**216**																				
10	F																											
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY)

12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	**AWDT**
140	**63**	**42**	**23**	**29**	**71**	**233**	**407**	**539**	**511**	**557**	**622**	**625**	**705**	**776**	**848**	**924**	**979**	**893**	**779**	**617**	**512**	**323**	**196**	**11414**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	**ESTIMATED (one way)**
6	**144**	**2**	**48**				**1.077**	**AADT** **10598**

ROAD:		ROAD NAME: **Mastic Road**	FROM: **Patchogue Avenue**	TO: **Moriches Avenue**	COUNTY:	**Kings**
STATION:	**000001**	STATE DIR CODE: **2**	PLACEMENT: **Mastic Road**		**DATE OF COUNT:**	**06/03/2016**

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **Babylon Street**	FROM: **Ditmas Avenue**	TO: **Wills Avenue**	COUNTY:	**Kings**
DIRECTION:	Northbound	FACTOR GROUP:	REC. SERIAL #:	FUNC. CLASS:	CITY:	**New York**
STATE DIR CODE:	1	WK OF YR: 23	PLACEMENT: Babylon Street	NHS:	BIN:	
DATE OF COUNT:	06/03/2016		@ REF MARKER:	JURIS: City	RR CROSSING:	
NOTES LANE 0:			ADDL DATA:	CC Stn:	HPMS SAMPLE:	
			COUNT TYPE: Axle Paired	BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)		PROCESSED BY: SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F													**1**	**27**	**30**	**25**	**28**	**21**	**26**	**22**	**11**	**13**	**9**	**7**			
4	S	**5**	**3**	**4**		**2**	**4**	**5**	**9**	**16**	**15**	**18**	**20**	**28**	**15**	**22**	**23**	**9**	**19**	**28**	**14**	**18**	**11**	**5**	**9**	302	28	12
5	S	**10**	**5**	**4**	**1**	**1**	**2**	**3**	**6**	**5**	**8**	**11**	**16**	**15**	**10**	**9**	**17**	**12**	**17**	**11**	**13**	**12**	**8**	**7**	**2**	205	17	15
6	M	**3**	**5**			**3**	**1**	**10**	**12**	**14**	**10**	**17**	**17**	**19**	**10**	**27**	**24**	**31**	**22**	**28**	**24**	**20**	**16**	**10**	**5**	328	31	16
7	T	**1**	**2**	**3**		**4**	**1**	**12**	**19**	**15**	**7**	**11**	**13**	**17**	**23**	**29**	**19**	**25**	**29**	**27**	**8**	**16**	**9**	**3**	**7**	300	29	14
8	W	**2**	**1**	**1**	**1**	**3**	**2**	**13**	**15**	**11**	**7**	**18**	**18**	**15**	**9**	**25**	**18**	**18**	**25**	**16**	**19**	**15**	**14**	**8**	**6**	280	25	14
9	T	**3**	**1**	**3**		**4**		**5**	**11**	**15**	**11**	**12**	**10**	**18**	**25**	**19**	**17**	**26**	**20**	**21**	**19**	**17**	**9**	**9**	**4**	279	26	16
10	F	**3**	**1**	**3**		**2**	**1**	**3**	**18**	**19**	**23**	**15**	**15**	**27**	**25**	**33**	**34**	**28**	**16**	**16**	**19**							
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											
		2	**1**	**2**	**1**	**4**	**2**	**10**	**15**	**14**	**8**	**14**	**14**	**17**	**19**	**24**	**18**	**23**	**25**	**21**	**15**	**16**	**11**	**7**	**6**	**289**		

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY) — **AWDT**

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	**ESTIMATED (one way)**
7	**168**	**3**	**72**				**1.077**	**AADT 268**

ROAD:		ROAD NAME: **Babylon Street**	FROM: **Ditmas Avenue**	TO: **Wills Avenue**	COUNTY:	**Kings**
STATION:	**000001**	STATE DIR CODE: **1**	PLACEMENT: **Babylon Street**		**DATE OF COUNT:**	**06/03/2016**

16.451 - GOSR Forge River EA-EIS

Traffic Count Hourly Report

ROAD:		ROAD NAME: **Babylon Street**	FROM: **Wills Avenue**	TO: **Ditmas Avenue**	COUNTY:	**Kings**
DIRECTION:	Southbound	FACTOR GROUP:	REC. SERIAL #:	FUNC. CLASS:	CITY:	**New York**
STATE DIR CODE:	2	WK OF YR: 23	PLACEMENT: Babylon Street	NHS:	BIN:	
DATE OF COUNT:	06/03/2016		@ REF MARKER:	JURIS: City	RR CROSSING:	
NOTES LANE 0:			ADDL DATA:	CC Stn:	HPMS SAMPLE:	
			COUNT TYPE: Axle Paired	BATCH ID:		
COUNT TAKEN BY:	Traffic Data Survey (ATR Tube)		PROCESSED BY: SIMCO Engineering, P.C.			

DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
		AM												PM														
3	F													**2**	**16**	**6**	**7**	**3**	**7**	**12**	**4**	**7**	**6**	**2**	**3**			
4	S		**1**	**2**			**2**	**5**	**7**	**13**	**15**	**8**	**10**	**9**	**16**	**13**	**20**	**14**	**11**	**13**	**4**	**6**	**2**	**4**	**2**			
5	S	**6**	**2**	**1**	**1**	**1**	**2**	**1**	**5**	**8**	**11**	**12**	**8**	**10**	**8**	**10**	**11**	**11**	**6**	**9**	**5**	**8**	**4**	**5**	**2**	147	12	10
6	M		**3**		**1**	**2**	**8**	**14**	**20**	**16**	**10**	**7**	**6**	**8**	**8**	**25**	**12**	**14**	**18**	**17**	**11**	**8**	**4**	**3**	**1**			
7	T	**2**		**1**	**1**	**4**	**4**	**10**	**19**	**7**	**6**	**7**	**5**	**4**	**14**	**16**	**12**	**13**	**17**	**6**	**6**	**8**	**6**	**1**	**3**	172	19	7
8	W	**1**			**1**	**3**	**9**	**6**	**18**	**13**	**8**	**6**	**6**	**5**	**9**	**14**	**7**	**13**	**8**	**11**	**7**	**6**	**6**	**10**	**2**	169	18	7
9	T	**1**		**1**	**3**	**2**	**6**	**8**	**19**	**16**	**9**	**7**	**8**	**10**	**12**	**13**	**12**	**11**	**14**	**11**	**9**	**9**	**7**	**8**	**4**	200	19	7
10	F	**2**		**1**	**1**	**3**	**7**	**13**	**18**	**13**	**6**	**10**	**8**	**7**	**7**	**13**	**12**	**13**	**14**	**8**	**5**							
11	S																											
12	S																											
13	M																											
14	T																											
15	W																											
16	T																											
17	F																											
18	S																											
19	S																											
20	M																											
21	T																											
22	W																											
23	T																											
24	F																											
25	S																											
26	S																											
27	M																											
28	T																											
29	W																											
30	T																											

AVERAGE MID-WEEKDAY (TUESDAY THRU THURSDAY)

1	#####	1	2	3	6	8	19	12	8	7	6	6	12	14	10	12	13	9	7	8	6	6	3

AWDT
#DIV/0!

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	**ESTIMATED (one way)**
5	**120**	**3**	**72**				**1.077**	**AADT** **#DIV/0!**

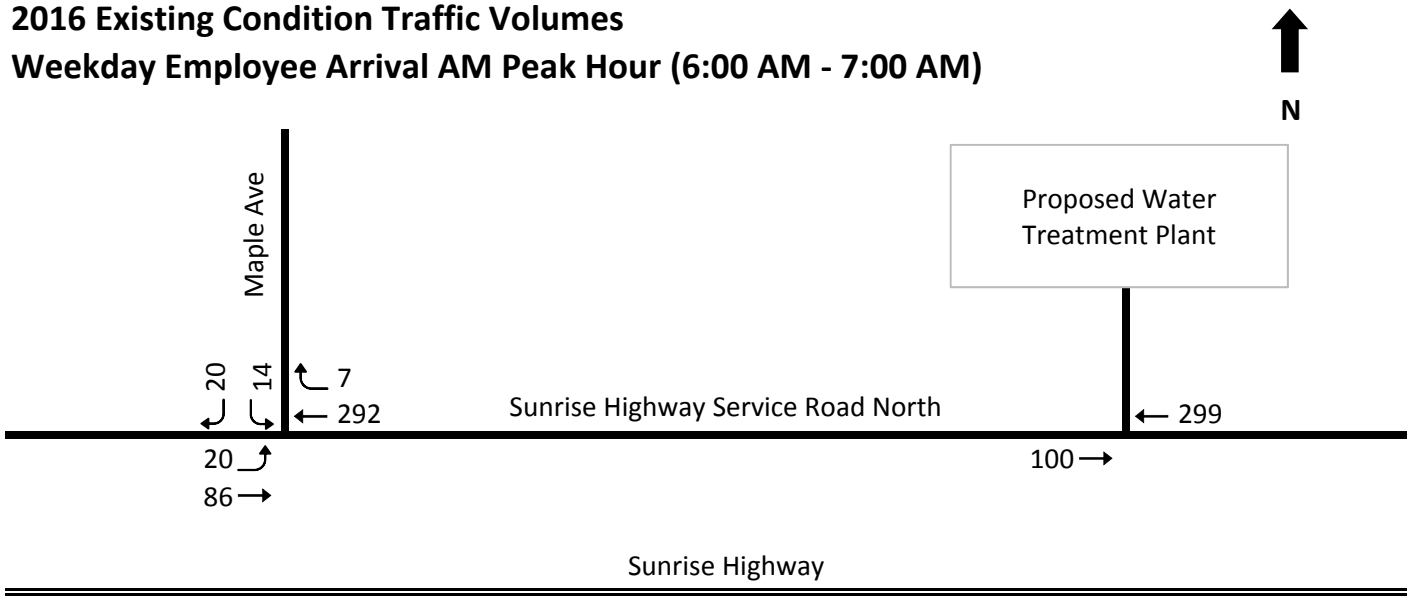
ROAD:		ROAD NAME: **Babylon Street**	FROM: **Wills Avenue**	TO: **Ditmas Avenue**	COUNTY:	**Kings**
STATION:	**000001**	STATE DIR CODE: **2**	PLACEMENT: **Babylon Street**		**DATE OF COUNT:**	**06/03/2016**

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

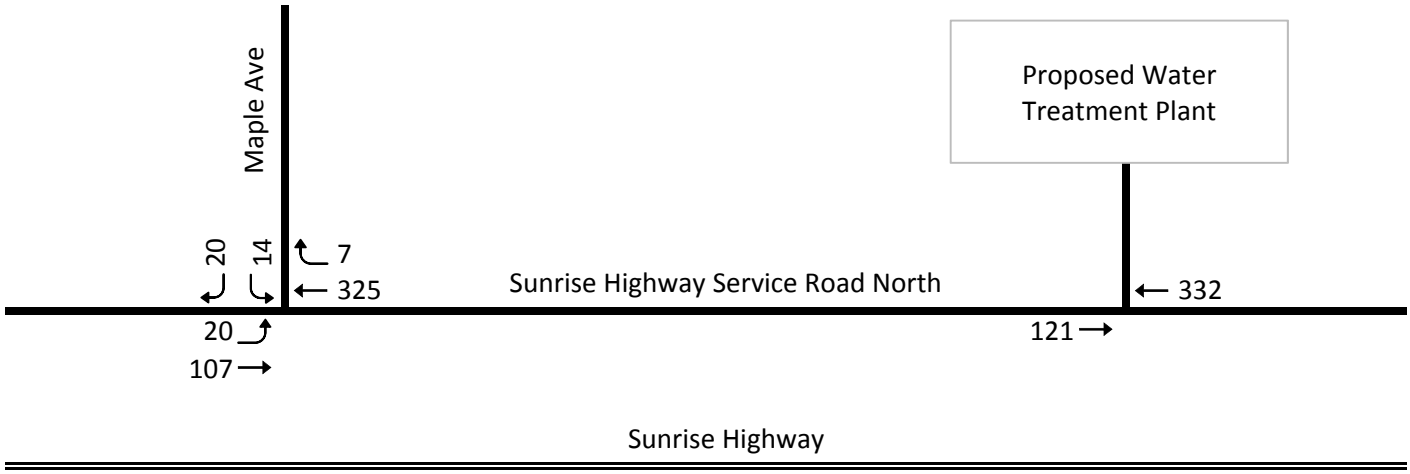
APPENDIX E

TRAFFIC FLOW DIAGRAMS

FORGE RIVER WATERSHED SEWER PROJECT
2016 Existing Condition Traffic Volumes
Weekday Employee Arrival AM Peak Hour (6:00 AM - 7:00 AM)



FORGE RIVER WATERSHED SEWER PROJECT
2016 Existing Condition Traffic Volumes
Weekday Adjacent Street AM Peak Hour (8:00 AM - 9:00 AM)

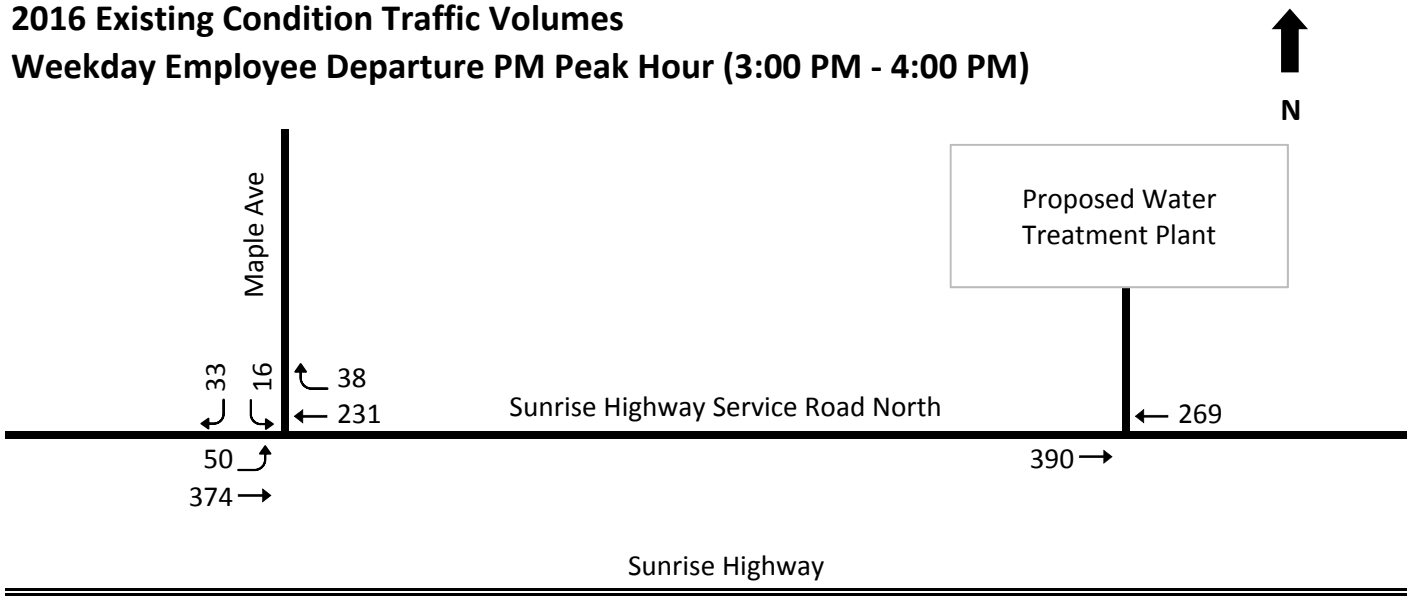


Legend

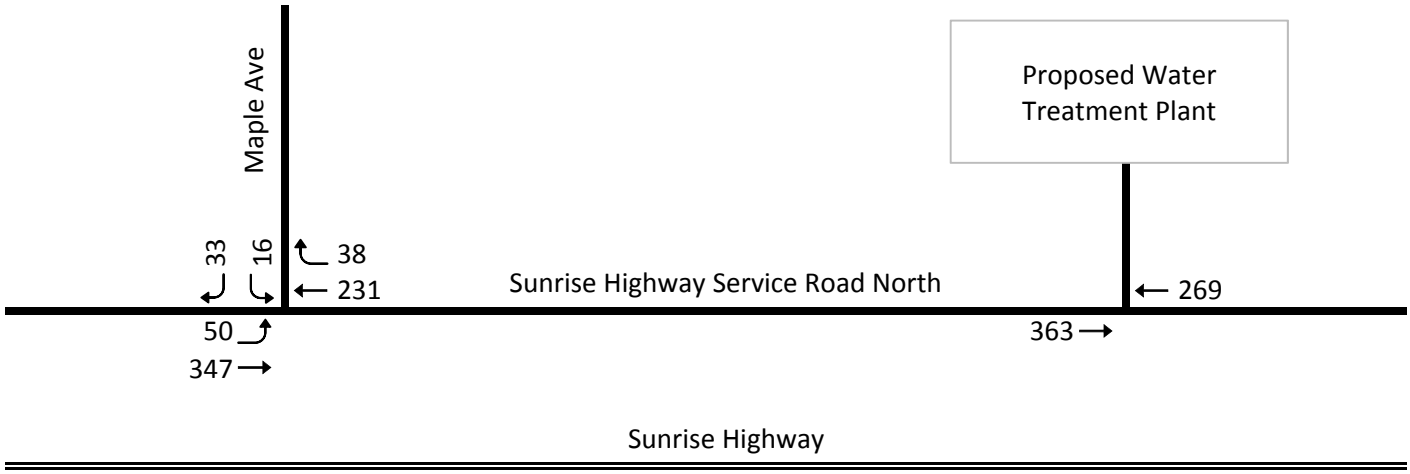
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
2016 Existing Condition Traffic Volumes
Weekday Employee Departure PM Peak Hour (3:00 PM - 4:00 PM)



FORGE RIVER WATERSHED SEWER PROJECT
2016 Existing Condition Traffic Volumes
Weekday Adjacent Street PM Peak Hour (5:00 PM - 6:00 PM)

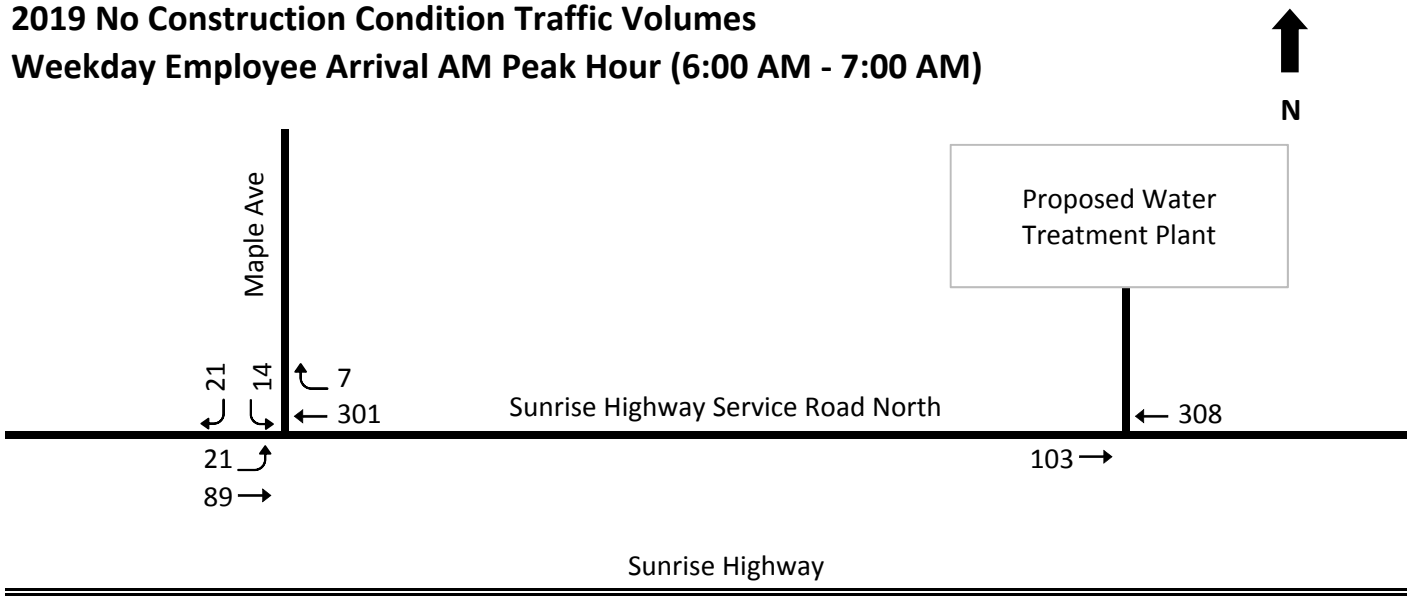


Legend

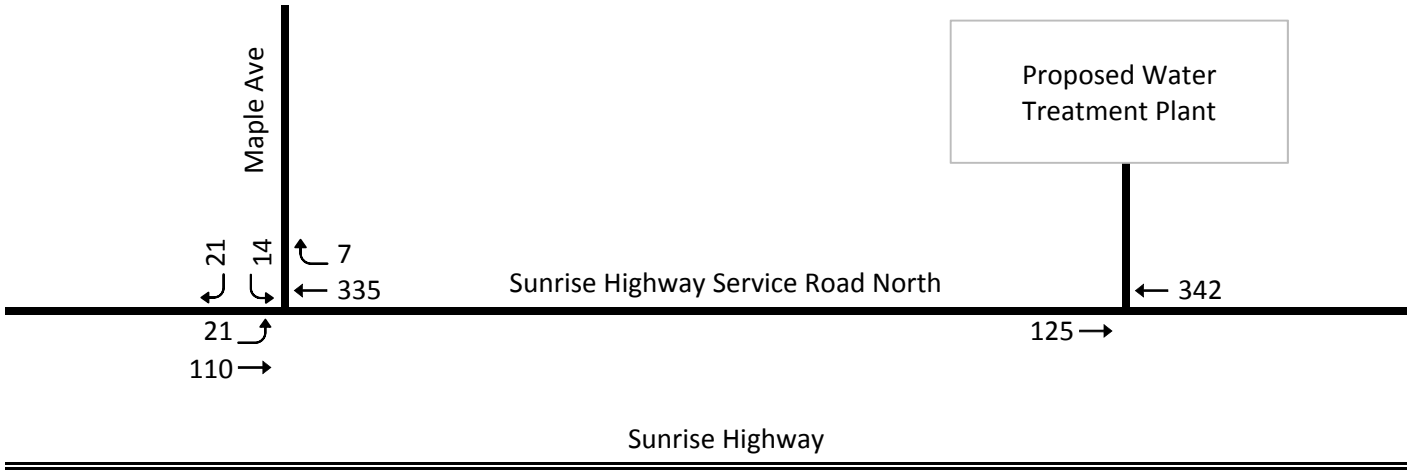
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
2019 No Construction Condition Traffic Volumes
Weekday Employee Arrival AM Peak Hour (6:00 AM - 7:00 AM)



FORGE RIVER WATERSHED SEWER PROJECT
2019 No Construction Condition Traffic Volumes
Weekday Adjacent Street AM Peak Hour (8:00 AM - 9:00 AM)

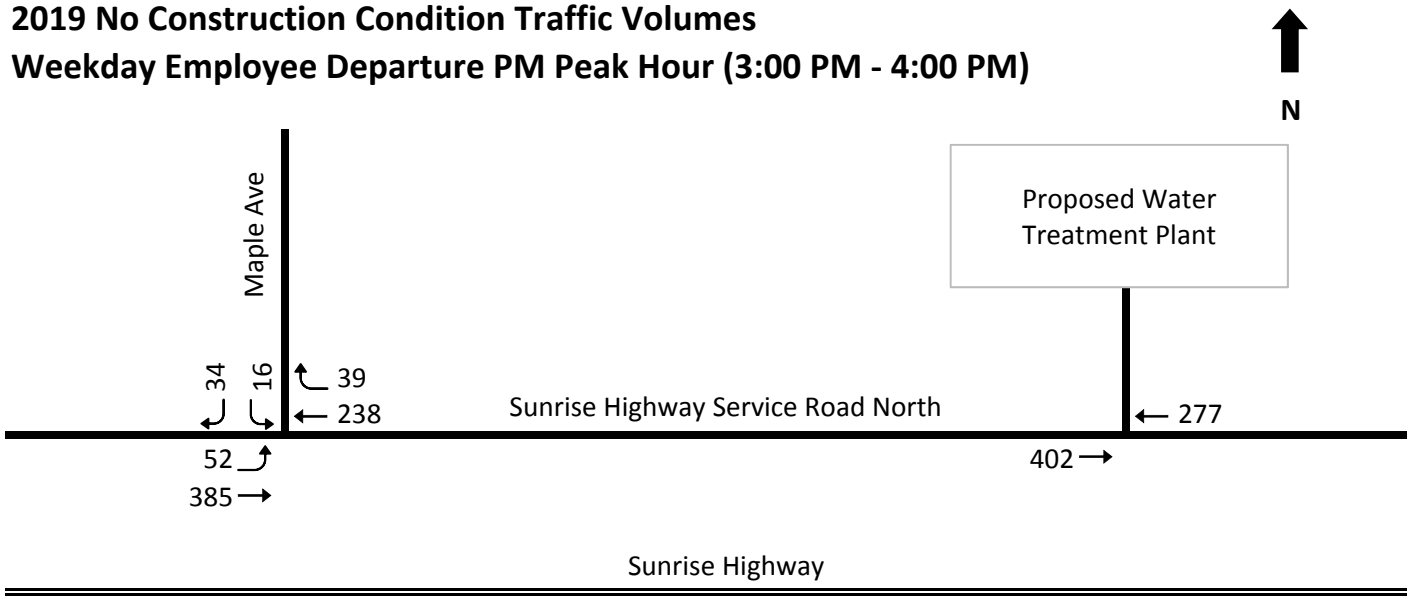


Legend

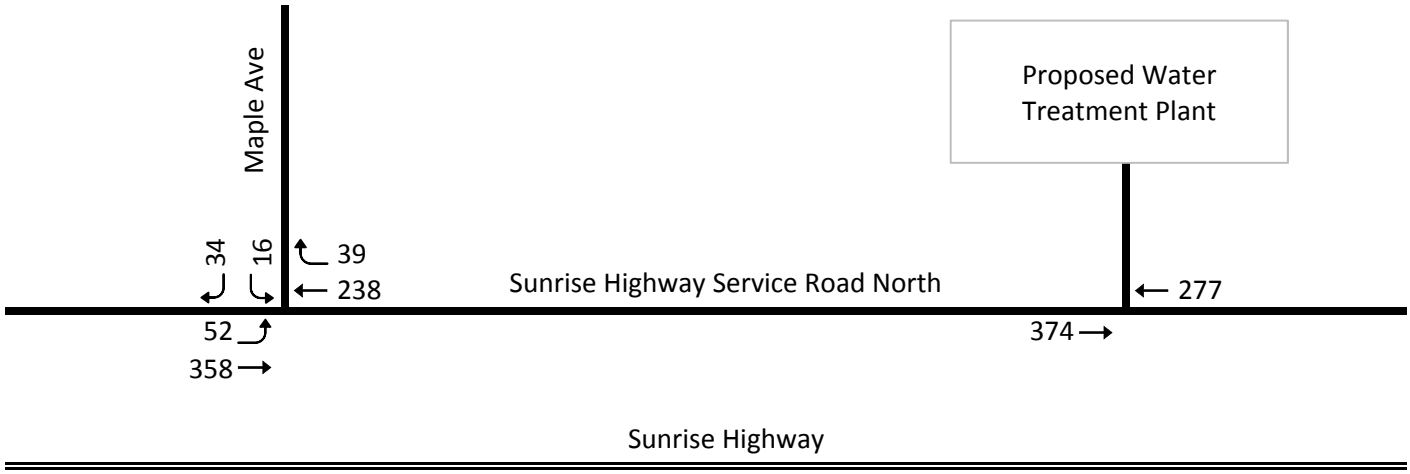
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
2019 No Construction Condition Traffic Volumes
Weekday Employee Departure PM Peak Hour (3:00 PM - 4:00 PM)



FORGE RIVER WATERSHED SEWER PROJECT
2019 No Construction Condition Traffic Volumes
Weekday Adjacent Street PM Peak Hour (5:00 PM - 6:00 PM)

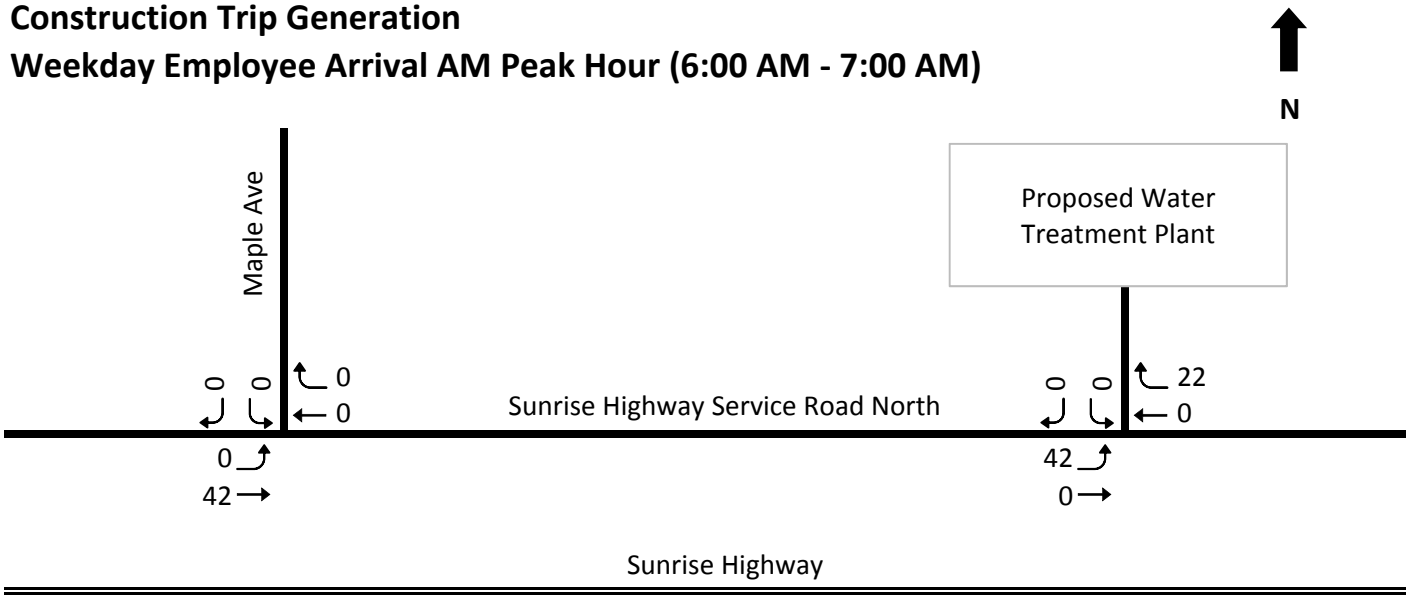


Legend

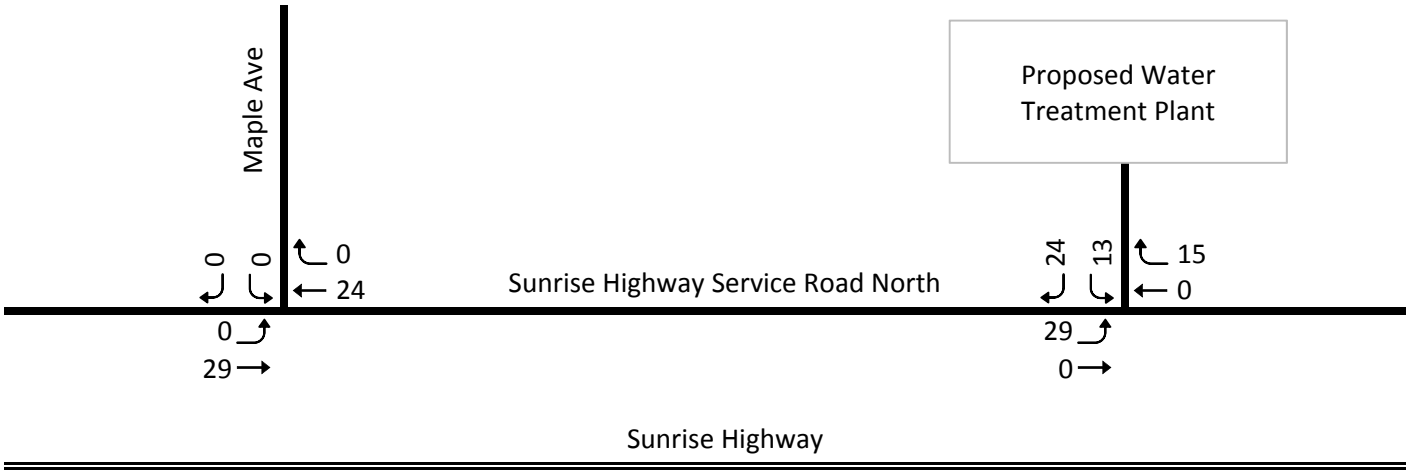
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
Construction Trip Generation
Weekday Employee Arrival AM Peak Hour (6:00 AM - 7:00 AM)



FORGE RIVER WATERSHED SEWER PROJECT
Construction Trip Generation
Weekday Adjacent Street AM Peak Hour (8:00 AM - 9:00 AM)

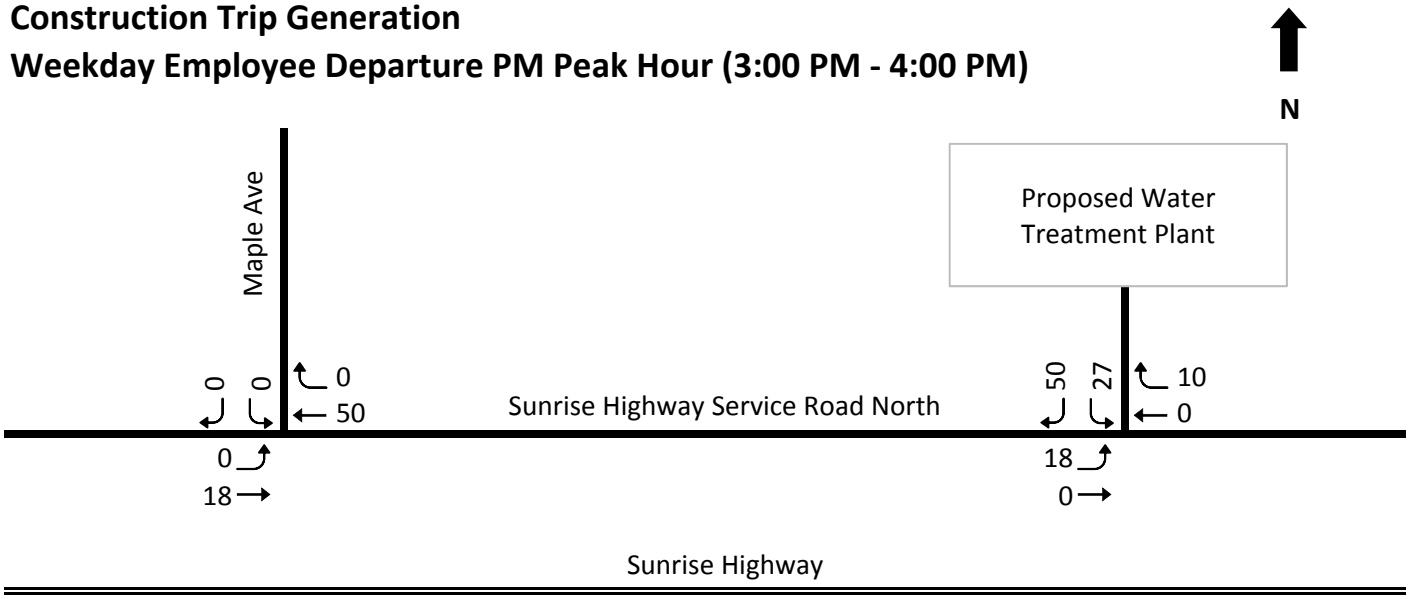


Legend

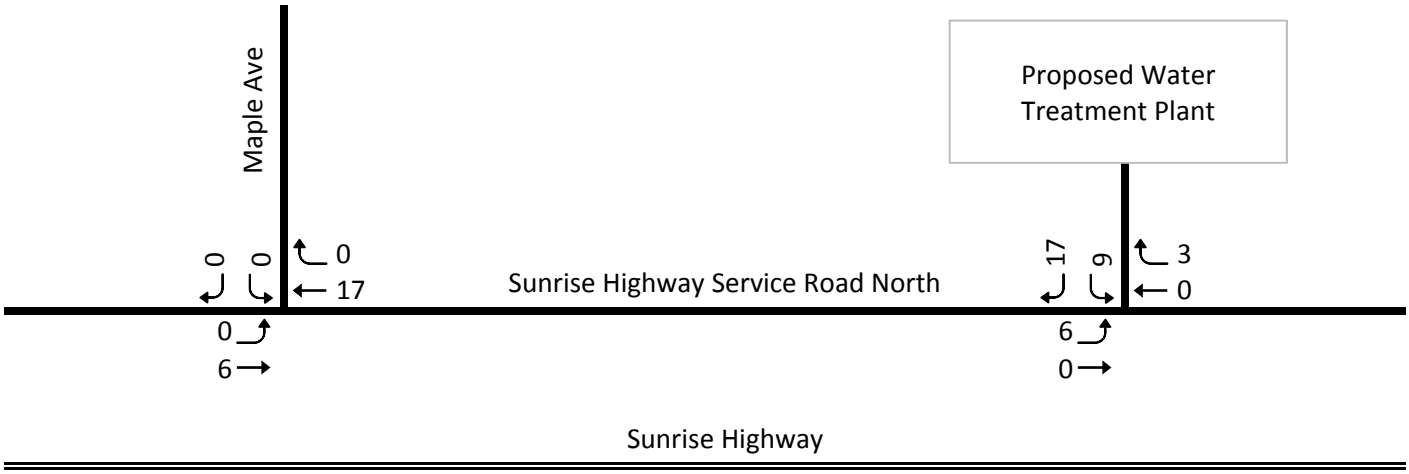
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
Construction Trip Generation
Weekday Employee Departure PM Peak Hour (3:00 PM - 4:00 PM)



FORGE RIVER WATERSHED SEWER PROJECT
Construction Trip Generation
Weekday Adjacent Street PM Peak Hour (5:00 PM - 6:00 PM)

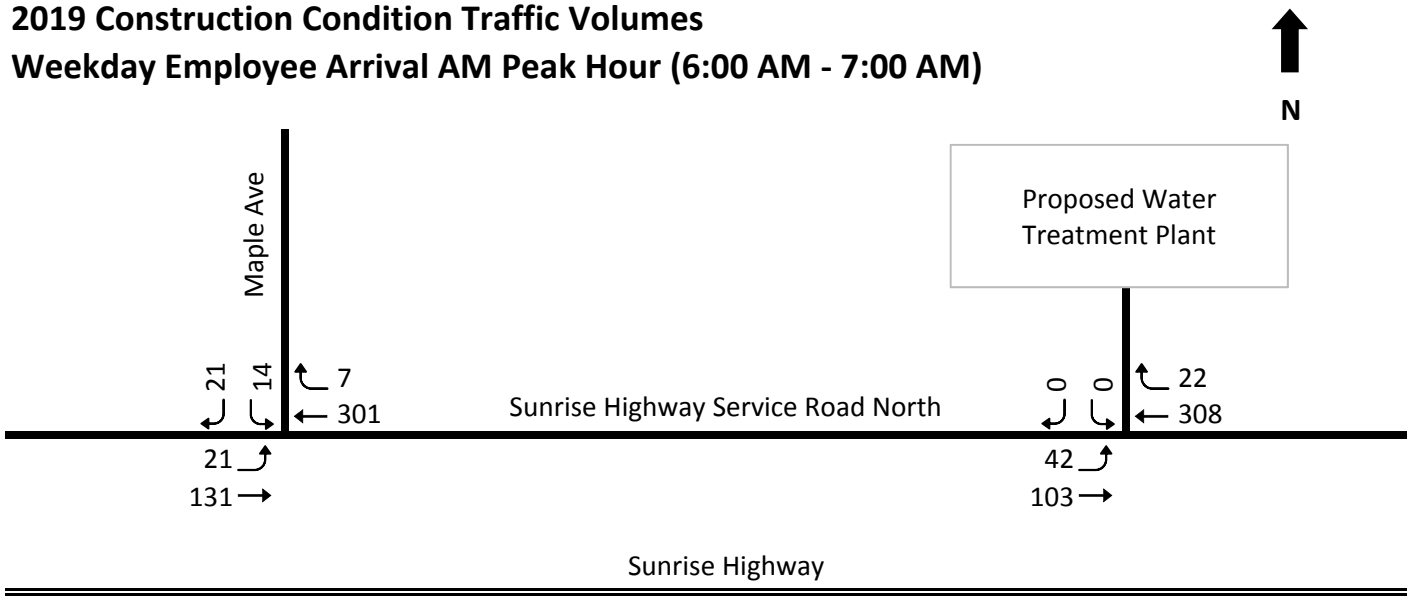


Legend

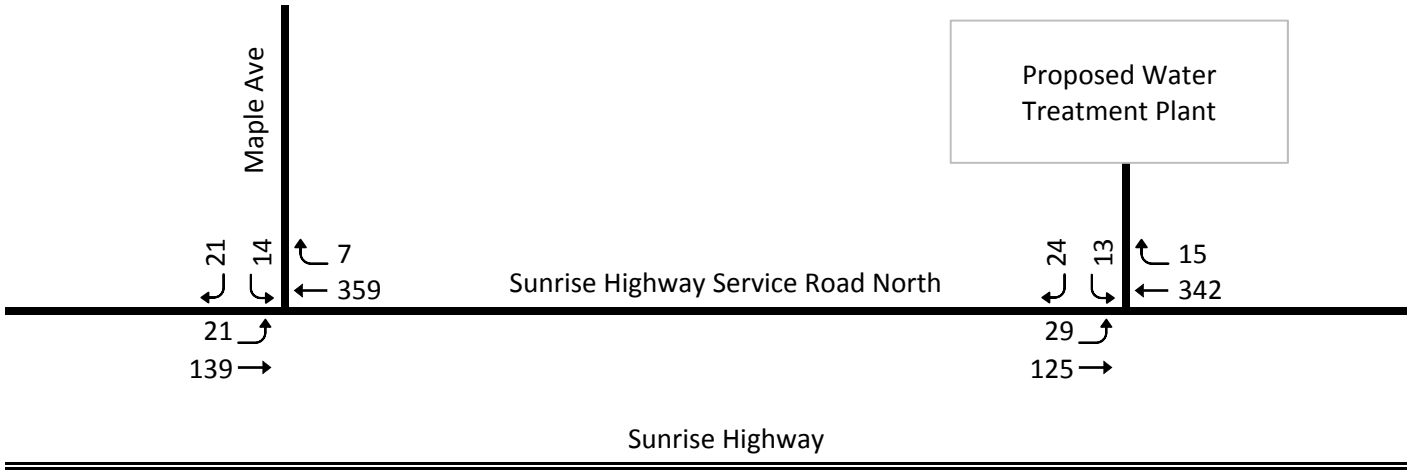
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
2019 Construction Condition Traffic Volumes
Weekday Employee Arrival AM Peak Hour (6:00 AM - 7:00 AM)



FORGE RIVER WATERSHED SEWER PROJECT
2019 Construction Condition Traffic Volumes
Weekday Adjacent Street AM Peak Hour (8:00 AM - 9:00 AM)

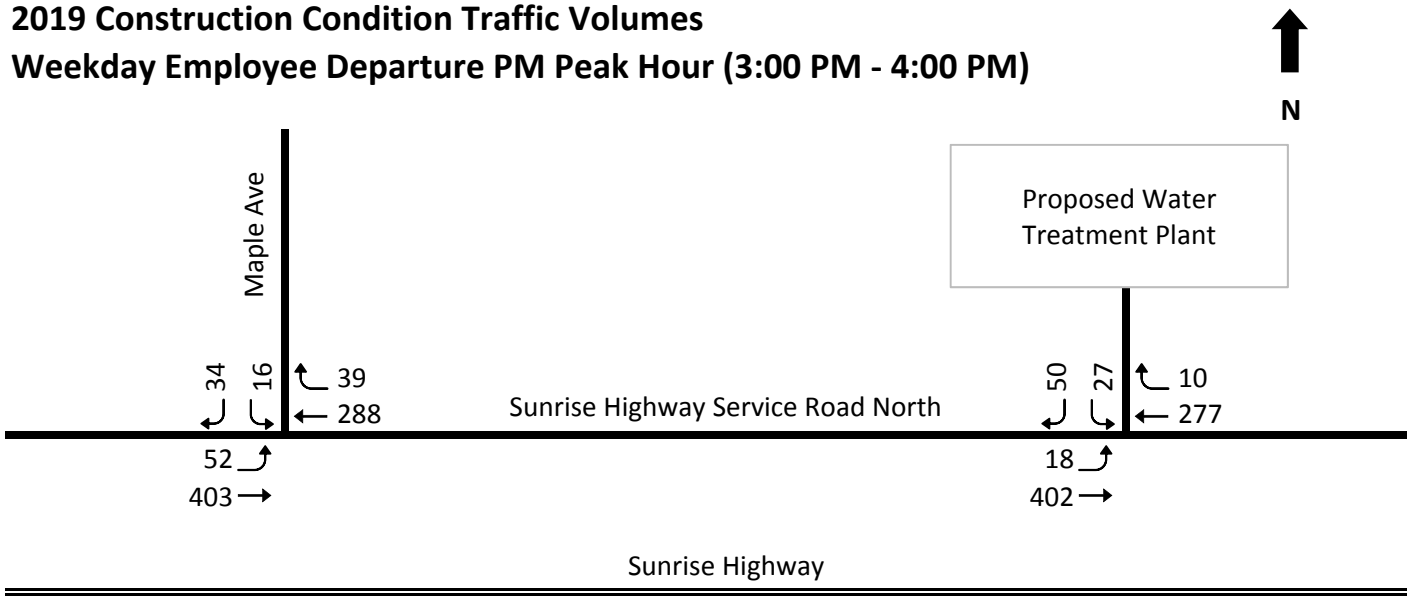


Legend

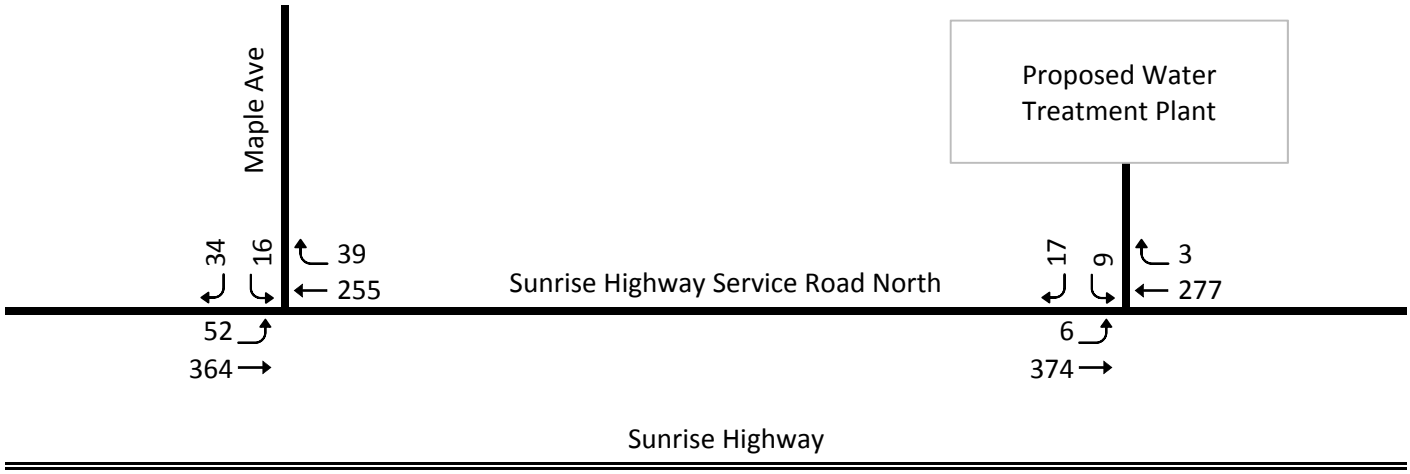
#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
2019 Construction Condition Traffic Volumes
Weekday Employee Departure PM Peak Hour (3:00 PM - 4:00 PM)



FORGE RIVER WATERSHED SEWER PROJECT
2019 Construction Condition Traffic Volumes
Weekday Adjacent Street PM Peak Hour (5:00 PM - 6:00 PM)



Legend

#,###	Traffic Volume
→	Traffic Direction/ Movement
▬	Roadway
═	Expressway

Not to Scale
SIMCO Engineering P.C.

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

APPENDIX F

INTERSECTION LEVEL OF SERVICE (LOS)

Forge River Watershed Sewer Project
INTERSECTION LEVELS OF SERVICE SUMMARY
Mastic-Shirley Proposed Sewer District, Town of Brookhaven, New York
Weekday Background AM Peak Hour (8:00 - 9:00 AM)

Intersection	Movement	Existing (2016)			No Construction (2019)			Construction (2019)		
		Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS
1. Mastic Beach Road and Mastic Road (S)										
Mastic Beach Road	EBLTR	36.1	0.59	D	36.5	0.60	D	36.5	0.60	D
	WBLT	76.6	0.96	E	84.5	0.99	F	84.5	0.99	F
Mastic Road	NBL	23.8	0.32	C	23.9	0.33	C	--	--	--
	NBTR	29.1	0.65	C	29.7	0.66	C	--	--	--
	NBLTR	--	--	--	--	--	--	68.8	1.00	E
	SBL	23.1	0.25	C	23.2	0.26	C	--	--	--
	SBTR	24.9	0.44	C	25.0	0.45	C	--	--	--
	SBLTR	--	--	--	--	--	--	30.1	0.68	C
	Overall	38.3		D	40.2		D	57.2		E
2. Southaven Avenue and Mastic Road/Poospatuck Lane (S)										
Southaven Avenue	EBLTR	70.9	0.07	E	70.9	0.07	E	70.9	0.07	E
	WBLTR	73.8	0.27	E	73.8	0.27	E	73.8	0.27	E
Poospatuck Lane	NWBTR	69.0	0.39	E	64.7	0.41	E	64.7	0.41	E
Mastic Road	NBLTR	11.6	0.50	B	11.8	0.52	B	11.8	0.52	B
	SBL	90.6	0.67	F	85.9	0.64	F	--	--	--
	SBTR	1.3	0.38	A	1.3	0.39	A	--	--	--
	SBLTR	--	--	--	--	--	--	1.4	0.42	A
	Overall			A			A			A
3. Montauk Highway and Washington Avenue/Hemiker Street (S)										
Montauk Highway	EBL	12.6	0.03	B	12.6	0.03	B	--	--	--
	EBTR	28.4	0.84	C	30.8	0.87	C	--	--	--
	EBLTR	--	--	--	--	--	--	31.9	0.88	C
	WBL	13.0	0.09	B	13.1	0.09	B	--	--	--
	WBTR	22.0	0.74	C	22.9	0.76	C	--	--	--
	WBLTR	--	--	--	--	--	--	25.2	0.80	C
Washington Avenue	NBLTR	18.1	0.53	B	18.4	0.55	B	18.4	0.55	B
Hemiker Street	SBLTR	14.2	0.12	B	14.2	0.12	B	14.2	0.12	B
	Overall	23.3		C	24.7		C	26.2		C
4. Montauk Highway and Hawthrone Street/Titmus Drive (S)										
Montauk Highway	EBL	6.1	0.12	A	5.1	0.12	A	--	--	--
	EBTR	6.9	0.46	A	7.0	0.47	A	--	--	--
	EBLTR	--	--	--	--	--	--	7.8	0.55	A
	WBL	4.6	0.02	A	4.6	0.03	A	--	--	--
	WBTR	9.5	0.65	A	9.9	0.67	A	--	--	--
	WBLTR	--	--	--	--	--	--	10.3	0.69	B
Hawthrone Street	NBLTR	33.0	0.37	C	33.2	0.39	C	33.2	0.39	C
Titmus Drive	SBLTR	34.6	0.51	C	34.9	0.52	C	34.9	0.52	C
	Overall	12.2		B	12.5		B	13.1		B
5. Sunrise Highway Service Road North and Maple Avenue (U)										
Sunrise Highway Service Road North	EBLT	8.0	0.02	A	8.1	0.02	A	8.2	0.02	A
Maple Avenue	SBLR	12.2	0.08	B	12.4	0.08	B	12.9	0.09	B
6. Sunrise Highway Service Road North and Site Driveway (U)										
Sunrise Highway Service Road North	EBLT	--	--	--	--	--	--	9.0	0.04	A
Site Driveway	SBLR	--	--	--	--	--	--	14.0	0.10	B

Notes: S - Signalized Intersection;
U - Unsignalized Intersection.

Forge River Watershed Sewer Project
INTERSECTION LEVELS OF SERVICE SUMMARY
Mastic-Shirley Proposed Sewer District, Town of Brookhaven, New York
Weekday Background PM Peak Hour (5:00 - 6:00 PM)

Intersection	Movement	Existing (2016)			No Construction (2019)			Construction (2019)		
		Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS
1. Mastic Beach Road and Mastic Road (S)										
Mastic Beach Road	EBLTR	26.0	0.63	C	24.7	0.56	C	24.7	0.57	C
	WBLT	22.9	0.46	C	22.3	0.40	C	22.3	0.41	C
Mastic Road	NBL	30.6	0.20	C	30.5	0.19	C	--	--	--
	NBTR	51.2	0.84	D	45.0	0.86	D	--	--	--
	NBLTR	--	--	--	--	--	--	71.7	0.96	F
	SBL	27.5	0.42	C	27.4	0.40	C	--	--	--
	SBTR	30.1	0.59	C	30.2	0.59	C	--	--	--
	SBLTR	--	--	--	--	--	--	63.3	0.97	E
	Overall	31.5		C	30.0		C	48.9		D
2. Southaven Avenue and Mastic Road/Poospatuck Lane (S)										
Southaven Avenue	EBLTR	73.2	0.23	E	73.2	0.23	E	73.2	0.23	E
	WBLTR	73.1	0.23	E	73.1	0.23	E	73.1	0.23	E
Poospatuck Lane	NWBTR	77.3	0.55	E	78.4	0.57	E	78.4	0.57	E
Mastic Road	NBLTR	13.3	0.50	B	13.5	0.51	B	13.5	0.51	B
	SBL	75.0	0.63	E	72.7	0.61	E	--	--	--
	SBTR	1.6	0.50	A	1.7	0.51	A	--	--	--
	SBLTR	--	--	--	--	--	--	2.1	0.57	A
	Overall			A	11.8		B			A
3. Montauk Highway and Washington Avenue/Hemiker Street (S)										
Montauk Highway	EBL	13.5	0.08	B	13.7	0.08	B	--	--	--
	EBTR	47.8	0.97	D	45.4	0.96	D	--	--	--
	EBLTR	--	--	--	--	--	--	52.3	0.99	D
	WBL	46.7	0.61	D	48.1	0.62	D	--	--	--
	WBTR	24.4	0.74	C	25.4	0.76	C	--	--	--
	WBLTR	--	--	--	--	--	--	41.3	0.93	D
Washington Avenue	NBLTR	26.2	0.66	C	27.0	0.68	C	27.0	0.68	C
Hemiker Street	SBLTR	18.1	0.10	B	18.1	0.11	B	18.1	0.11	B
	Overall	35.0		C	34.2		C	42.8		D
4. Montauk Highway and Hawthrone Street/Titmus Drive (S)										
Montauk Highway	EBL	8.1	0.35	A	8.7	0.39	A	--	--	--
	EBTR	12.3	0.71	B	13.0	0.73	B	--	--	--
	EBLTR	--	--	--	--	--	--	28.1	0.93	C
	WBL	5.7	0.03	A	5.7	0.03	A	--	--	--
	WBTR	12.9	0.73	B	13.6	0.75	B	--	--	--
	WBLTR	--	--	--	--	--	--	14.0	0.76	B
Hawthrone Street	NBLTR	31.3	0.41	C	31.5	0.43	C	31.5	0.43	C
Titmus Drive	SBLTR	88.5	1.02	F	98.8	1.06	F	98.8	1.06	F
	Overall	25.8		C	28.0		C	34.5		C
5. Sunrise Highway Service Road North and Maple Avenue (U)										
Sunrise Highway Service Road North	EBLT	8.0	0.05	A	8.0	0.05	A	8.2	0.05	A
Maple Avenue	SBLR	12.3	0.11	B	12.4	0.11	B	13.4	0.12	B
6. Sunrise Highway Service Road North and Site Driveway (U)										
Sunrise Highway Service Road North	EBLT	--	--	--	--	--	--	8.5	0.01	A
Site Driveway	SBLR	--	--	--	--	--	--	12.3	0.05	B

Notes: S - Signalized Intersection;
U - Unsignalized Intersection.

Forge River Watershed Sewer Project
INTERSECTION LEVELS OF SERVICE SUMMARY
Mastic-Shirley Proposed Sewer District, Town of Brookhaven, New York
Weekday Construction Worker AM Peak Hour (6:00 - 7:00 AM)

Intersection	Movement	Existing (2016)			No Construction (2019)			Construction (2019)		
		Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS
5. Sunrise Highway Service Road North and Maple Avenue (U)										
Sunrise Highway Service Road North	EBLT	8.0	0.02	A	8.0	0.02	A	8.0	0.02	A
Maple Avenue	SBLR	11.7	0.07	B	11.8	0.08	B	12.1	0.08	B
6. Sunrise Highway Service Road North and Site Driveway (U)										
Sunrise Highway Service Road North	EBLT	--	--	--	--	--	--	8.1	0.04	A
Site Driveway	SBLR	--	--	--	--	--	--	--	--	--

Weekday Construction Worker PM Peak Hour (3:00 - 4:00 PM)

Intersection	Movement	Existing (2016)			No Construction (2019)			Construction (2019)		
		Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS
5. Sunrise Highway Service Road North and Maple Avenue (U)										
Sunrise Highway Service Road North	EBLT	8.0	0.05	A	8.0	0.05	A	8.2	0.05	A
Maple Avenue	SBLR	12.4	0.11	B	12.6	0.11	B	13.4	0.12	B
6. Sunrise Highway Service Road North and Site Driveway (U)										
Sunrise Highway Service Road North	EBLT	--	--	--	--	--	--	8.8	0.02	A
Site Driveway	SBLR	--	--	--	--	--	--	15.1	0.21	C

Notes: U - Unsignalized Intersection.

FORGE RIVER WATERSHED SEWER PROJECT
MASTIC-SHIRLEY PROPOSED SEWER DISTRICT
TOWN OF BROOKHAVEN, NY

APPENDIX G

HCS TRAFFIC ANALYSIS OUTPUTS

EXISTING (2016)
TRAFFIC LEVEL OF SERVICE

WEEKDAY AM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	17.0	0.0				28.5	28.5	0.0	
Yellow	3.0					3.5	3.5		
All Red	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	324	1716	0.59	0.19	36.1	D	36.1	D
Westbound								
LTR	314	1661	0.96	0.19	76.6	E	76.6	E
Northbound								
L	560	1770	0.32	0.32	23.8	C		
TR	534	1686	0.65	0.32	29.1	C	27.3	C
Southbound								
L	472	1492	0.25	0.32	23.1	C		
TR	612	1934	0.44	0.32	24.9	C	24.4	C

Intersection Delay = 38.3 (sec/veh) Intersection LOS = D

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	3	76	81	9	125	140	146	275	17	95	213	2
% Heavy Veh	0	3	2	22	1	7	2	12	6	21	8	0
PHF	0.80	0.80	0.88	0.80	0.95	0.88	0.80	0.85	0.80	0.80	0.80	0.80
PK 15 Vol	1	24	23	3	33	40	46	81	5	30	67	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol			0			0			0			0
Adj Flow		191			302		182	345		119	268	
%InSharedLn												
Prop LTs		0.021			0.036			0.000			0.000	
Prop RTs		0.482			0.526			0.061			0.007	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		10.0	10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A	A	A	
Right	A				Right	A	A	A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.0	0.0				7.0	103.0	15.0	0.0
Yellow	3.0					3.0	3.0	3.0	
All Red	2.0					2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	45	1341	0.07	0.03	70.9	E	70.9	E
Westbound								
LTR	48	1430	0.27	0.03	73.8	E	73.8	E
Northbound								
LTR	1212	1765	0.50	0.69	11.6	B	11.6	B
Southbound								
L	75	1604	0.67	0.05	90.6	F		
TR	1425	1583	0.38	0.90	1.3	A	8.9	A

Intersection Delay = 11.1 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	2	0	1	6	0	5	1	570	2	40	430	4
% Heavy Veh	0	0	0	0	0	0	0	4	0	5	12	0
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.94	0.80	0.80	0.81	0.80
PK 15 Vol	1	0	1	2	0	2	1	152	1	12	133	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		10.0	10.0	
RTOR Vol			0			0			0			0
Adj Flow		3			13			609		50	536	
%InSharedLn												
Prop LTs		0.667			0.538			0.002			0.000	
Prop RTs		0.333			0.462			0.003			0.009	
Peds Bikes		0			0			0			0	
Buses		0			0			0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0		0.0	0.0	
Arriv. Type		3			3			3		3	3	
Unit Ext.		3.0			3.0			3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0		2.0	2.0	
Ext of g		2.0			2.0			2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru	P				Thru			
Right	P				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	15.0	130.0	0.0					
Yellow	3.0	0.0						
All Red	2.0	0.0						

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	197	1972	0.39	0.10	69.0	E	69.0	E
Northbound								
Southbound								

Intersection Delay = 69.0 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					62	0						
% Heavy Veh					6	0						
PHF					0.80	0.80						
PK 15 Vol					19	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					77							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2016 Existing
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	32.0	0.0					30.2	0.0		
Yellow	4.7						3.5			
All Red	2.3						2.3			

Cycle Length: 75.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	190	446	0.03	0.43	12.6	B		
TR	708	1660	0.84	0.43	28.4	C	28.2	C
Westbound								
L	182	426	0.09	0.43	13.0	B		
TR	750	1758	0.74	0.43	22.0	C	21.7	C
Northbound								
LTR	505	1255	0.53	0.40	18.1	B	18.1	B
Southbound								
LTR	575	1429	0.12	0.40	14.2	B	14.2	B

Intersection Delay = 23.3 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	5	414	129	13	458	9	201	5	9	28	16	15
% Heavy Veh	20	9	12	8	7	44	3	20	11	11	6	20
PHF	0.80	0.95	0.80	0.80	0.84	0.80	0.80	0.80	0.80	0.80	1.00	0.80
PK 15 Vol	2	109	40	4	136	3	63	2	3	9	4	5
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow	6	597		16	556			268			70	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.937			0.500	
Prop RTs		0.270			0.020			0.041			0.271	
Peds Bikes	0			0			0			0		
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2016 Existing
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru	A	A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru	A	A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	6.8	49.4	0.0				16.5	0.0		
Yellow	3.2	4.3					3.5			
All Red	2.0	2.3					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	310	454	0.12	0.68	5.1	A		
TR	1175	1723	0.46	0.68	6.9	A	6.8	A
Westbound								
L	441	647	0.02	0.68	4.6	A		
TR	1206	1768	0.65	0.68	9.5	A	9.4	A
Northbound								
LTR	287	1567	0.37	0.18	33.0	C	33.0	C
Southbound								
LTR	281	1531	0.51	0.18	34.6	C	34.6	C

Intersection Delay = 12.2 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	29	446	16	9	633	56	46	28	12	56	24	41
% Heavy Veh	10	10	0	22	6	7	0	4	0	11	13	7
PHF	0.80	0.86	0.80	0.80	0.88	0.82	0.80	0.80	0.80	0.88	0.80	0.85
PK 15 Vol	9	130	5	3	180	17	14	9	4	16	7	12
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow	36	539		11	787			107			142	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.533			0.451	
Prop RTs		0.037			0.086			0.140			0.338	
Peds Bikes	0			0			0			0		
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	20	107			325	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	24	133			357	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		20
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		24
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	24						41	
C(m) (vph)	1205						538	
v/c	0.02						0.08	
95% queue length	0.06						0.25	
Control Delay	8.0						12.2	
LOS	A						B	
Approach Delay							12.2	
Approach LOS							B	

EXISTING (2016)
TRAFFIC LEVEL OF SERVICE

WEEKDAY PM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	0.0				24.5	17.5	0.0	
Yellow	3.0					3.5	3.5		
All Red	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	641	1804	0.63	0.36	26.0	C	26.0	C
Westbound								
LTR	613	1725	0.46	0.36	22.9	C	22.9	C
Northbound								
L	351	1805	0.20	0.19	30.6	C		
TR	362	1862	0.84	0.19	51.2	D	47.4	D
Southbound								
L	486	1787	0.42	0.27	27.5	C		
TR	563	2068	0.59	0.27	30.1	C	29.1	C

Intersection Delay = 31.5 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	212	114	6	111	107	55	235	18	179	299	2
% Heavy Veh	0	0	0	0	1	3	0	1	0	1	1	0
PHF	1.00	0.83	0.80	0.80	0.80	0.80	0.80	0.83	0.80	0.88	0.90	0.80
PK 15 Vol	1	64	36	2	35	33	17	71	6	51	83	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol			0			0			0			0
Adj Flow		401			280		69	305		203	334	
%InSharedLn												
Prop LTs		0.010			0.025			0.000			0.000	
Prop RTs		0.354			0.479			0.072			0.006	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		10.0	10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A	A	A	
Right	A				Right	A	A	A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.0	0.0				13.0	99.0	13.0	0.0
Yellow	3.0					3.0	3.0	3.0	
All Red	2.0					2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	47	1413	0.23	0.03	73.2	E	73.2	E
Westbound								
LTR	48	1439	0.23	0.03	73.1	E	73.1	E
Northbound								
LTR	1172	1775	0.50	0.66	13.3	B	13.3	B
Southbound								
L	145	1668	0.63	0.09	75.0	E		
TR	1561	1734	0.50	0.90	1.6	A	9.4	A

Intersection Delay = 11.9 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	1	4	5	1	3	3	511	5	87	749	8
% Heavy Veh	0	0	0	0	0	0	0	3	0	1	2	8
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.89	0.80	0.95	0.98	0.80
PK 15 Vol	1	1	1	2	1	1	1	144	2	23	191	2
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		10.0	10.0	
RTOR Vol			0			0			0			0
Adj Flow		11			11			584		92	774	
%InSharedLn												
Prop LTs		0.455			0.545			0.007			0.000	
Prop RTs	0.455			0.364			0.010			0.013		
Peds Bikes	0			0			0			0		
Buses		0			0			0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0		0.0	0.0	
Arriv. Type		3			3			3		3	3	
Unit Ext.		3.0			3.0			3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0		2.0	2.0	
Ext of g		2.0			2.0			2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2016 Existing
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru	P				Thru			
Right	P				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	13.0	132.0	0.0					
Yellow	3.0	0.0						
All Red	2.0	0.0						

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	181	2090	0.55	0.09	77.3	E	77.3	E
Northbound								
Southbound								

Intersection Delay = 77.3 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					83	0						
% Heavy Veh					0	0						
PHF					0.83	0.80						
PK 15 Vol					25	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					100							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2016 Existing
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
WB Left	P				SB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	43.0	0.0					34.2	0.0		
Yellow	4.7						3.5			
All Red	2.3						2.3			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	197	412	0.08	0.48	13.5	B		
TR	858	1796	0.97	0.48	47.8	D	47.2	D
Westbound								
L	82	172	0.61	0.48	46.7	D		
TR	896	1876	0.74	0.48	24.4	C	26.0	C
Northbound								
LTR	497	1309	0.66	0.38	26.2	C	26.2	C
Southbound								
LTR	631	1660	0.10	0.38	18.1	B	18.1	B

Intersection Delay = 35.0- (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	12	490	194	40	586	10	243	10	15	17	13	25
% Heavy Veh	0	1	3	3	1	0	0	0	13	6	0	0
PHF	0.80	0.80	0.87	0.80	0.90	0.80	0.82	0.80	0.80	0.80	0.80	0.89
PK 15 Vol	4	153	56	12	163	3	74	3	5	5	4	7
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes		1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L		TR	L		TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow	15	835		50	663			327			65	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.905			0.323	
Prop RTs		0.267			0.018			0.058			0.431	
Peds Bikes		0			0			0			0	
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2016 Existing
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru	A	A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru	A	A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	7.8	45.4					19.5			
Yellow	3.2	4.3					3.5			
All Red	2.0	2.3					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	228	351	0.35	0.65	8.1	A		
TR	1205	1857	0.71	0.65	12.3	B	12.0	B
Westbound								
L	242	373	0.03	0.65	5.7	A		
TR	1197	1845	0.73	0.65	12.9	B	12.8	B
Northbound								
LTR	285	1316	0.41	0.22	31.3	C	31.3	C
Southbound								
LTR	369	1703	1.02	0.22	88.5	F	88.5	F

Intersection Delay = 25.8 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	72	728	60	6	702	90	48	47	6	112	109	87
% Heavy Veh	1	1	2	0	1	1	0	4	33	3	1	1
PHF	0.90	0.92	0.88	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.83	0.81
PK 15 Vol	20	198	17	2	191	28	13	15	2	35	33	27
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow	80	859		7	875			118			378	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.441			0.370	
Prop RTs		0.079			0.128			0.059			0.283	
Peds Bikes	0			0			0			0		
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	50	347			231	38
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	62	369			251	44
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		33
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		41
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	62						60	
C(m) (vph)	1266						556	
v/c	0.05						0.11	
95% queue length	0.15						0.36	
Control Delay	8.0						12.3	
LOS	A						B	
Approach Delay							12.3	
Approach LOS							B	

NO CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY AM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left		A		
Thru	A					Thru		A		
Right	A					Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	17.0	0.0					28.5	28.5	0.0	
Yellow	3.0						3.5	3.5		
All Red	2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	324	1713	0.60	0.19	36.5	D	36.5	D
Westbound								
LTR	314	1662	0.99	0.19	84.5	F	84.5	F
Northbound								
L	560	1770	0.33	0.32	23.9	C		
TR	534	1686	0.66	0.32	29.7	C	27.7	C
Southbound								
L	472	1492	0.26	0.32	23.2	C		
TR	612	1934	0.45	0.32	25.0	C	24.5	C

Intersection Delay = 40.2 (sec/veh) Intersection LOS = D

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	3	78	83	9	129	144	150	283	18	98	219	2
% Heavy Veh	0	3	2	22	1	7	2	12	6	21	8	0
PHF	0.80	0.80	0.88	0.80	0.95	0.88	0.80	0.85	0.80	0.80	0.80	0.80
PK 15 Vol	1	24	24	3	34	41	47	83	6	31	68	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol			0			0			0			0
Adj Flow		195			311		187	355		122	276	
%InSharedLn												
Prop LTs		0.021			0.035			0.000			0.000	
Prop RTs		0.482			0.527			0.062			0.007	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		12.0	10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left		A		
Thru	A					Thru		A		
Right	A					Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A	A	A	
Right	A					Right	A	A	A	
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	5.0	0.0					7.0	103.0	15.0	0.0
Yellow	3.0						3.0	3.0	3.0	
All Red	2.0						2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	45	1341	0.07	0.03	70.9	E	70.9	E
Westbound								
LTR	48	1430	0.27	0.03	73.8	E	73.8	E
Northbound								
LTR	1212	1765	0.52	0.69	11.8	B	11.8	B
Southbound								
L	80	1719	0.64	0.05	85.9	F		
TR	1425	1583	0.39	0.90	1.3	A	8.5	A

Intersection Delay = 11.0 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	2	0	1	6	0	5	1	587	2	41	443	4
% Heavy Veh	0	0	0	0	0	0	0	4	0	5	12	0
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.94	0.80	0.80	0.81	0.80
PK 15 Vol	1	0	1	2	0	2	1	156	1	13	137	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		12.0	10.0	
RTOR Vol			0			0			0			0
Adj Flow		3			13			627		51	552	
%InSharedLn												
Prop LTs		0.667			0.538			0.002			0.000	
Prop RTs		0.333			0.462			0.003			0.009	
Peds Bikes		0			0			0			0	
Buses		0			0			0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0		0.0	0.0	
Arriv. Type		3			3			3		3	3	
Unit Ext.		3.0			3.0			3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0		2.0	2.0	
Ext of g		2.0			2.0			2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru	A				Thru			
Right	A				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	15.0	130.0	0.0					
Yellow	3.0	0.0						
All Red	2.0	0.0						

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	197	1972	0.41	0.10	64.7	E	64.7	E
Northbound								
Southbound								

Intersection Delay = 64.7 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					64	0						
% Heavy Veh					6	0						
PHF					0.80	0.80						
PK 15 Vol					20	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					80							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 No Construction
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	32.0	0.0					30.2	0.0		
Yellow	4.7						3.5			
All Red	2.3						2.3			

Cycle Length: 75.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	179	420	0.03	0.43	12.6	B		
TR	708	1660	0.87	0.43	30.8	C	30.6	C
Westbound								
L	169	396	0.09	0.43	13.1	B		
TR	751	1759	0.76	0.43	22.9	C	22.7	C
Northbound								
LTR	505	1254	0.55	0.40	18.4	B	18.4	B
Southbound								
LTR	571	1418	0.12	0.40	14.2	B	14.2	B

Intersection Delay = 24.7 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	5	427	133	13	472	9	207	5	9	29	16	15
% Heavy Veh	20	9	12	8	7	44	3	20	11	11	6	20
PHF	0.80	0.95	0.80	0.80	0.84	0.80	0.80	0.80	0.80	0.80	1.00	0.80
PK 15 Vol	2	112	42	4	140	3	65	2	3	9	4	5
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow	6	615		16	573			276			71	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.938			0.507	
Prop RTs		0.270			0.019			0.040			0.268	
Peds Bikes	0			0			0			0		
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 No Construction
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	61.4	0.0					16.5	0.0		
Yellow	4.3						3.5			
All Red	2.3						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	307	450	0.12	0.68	5.1	A		
TR	1176	1724	0.47	0.68	7.0	A	6.9	A
Westbound								
L	437	640	0.03	0.68	4.6	A		
TR	1205	1767	0.67	0.68	9.9	A	9.8	A
Northbound								
LTR	284	1548	0.39	0.18	33.2	C	33.2	C
Southbound								
LTR	280	1525	0.52	0.18	34.9	C	34.9	C

Intersection Delay = 12.5 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	30	460	16	9	652	58	47	29	12	58	25	42
% Heavy Veh	10	10	0	22	6	7	0	4	0	11	13	7
PHF	0.80	0.86	0.80	0.80	0.88	0.82	0.80	0.80	0.80	0.88	0.80	0.85
PK 15 Vol	9	134	5	3	185	18	15	9	4	16	8	12
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow	37	555		11	812			110			146	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.536			0.452	
Prop RTs		0.036			0.087			0.136			0.336	
Peds Bikes	0			0			0			0		
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	110			335	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	26	137			368	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		21
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		26
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	26						43	
C(m) (vph)	1194						531	
v/c	0.02						0.08	
95% queue length	0.07						0.26	
Control Delay	8.1						12.4	
LOS	A						B	
Approach Delay							12.4	
Approach LOS							B	

NO CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY PM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	0.0				24.5	17.5	0.0	
Yellow	3.0					3.5	3.5		
All Red	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	642	1806	0.57	0.36	24.7	C	24.7	C
Westbound								
LTR	613	1724	0.41	0.36	22.3	C	22.3	C
Northbound								
L	351	1805	0.18	0.19	30.5	C		
TR	362	1863	0.78	0.19	45.0	D	42.4	D
Southbound								
L	486	1787	0.41	0.27	27.4	C		
TR	563	2068	0.60	0.27	30.2	C	29.2	C

Intersection Delay = 30.0 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	218	117	6	114	110	57	242	18	184	308	2
% Heavy Veh	0	0	0	0	1	3	0	1	0	1	1	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PK 15 Vol	1	59	32	2	31	30	15	66	5	50	84	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		12.0			12.0		12.0	12.0		12.0	15.0	
RTOR Vol			0			0			0			0
Adj Flow		368			251		62	283		200	337	
%InSharedLn												
Prop LTs		0.011			0.028			0.000			0.000	
Prop RTs		0.345			0.478			0.071			0.006	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		12.0	10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A	A	A	
Right	A				Right	A	A	A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.0	0.0				13.0	99.0	13.0	0.0
Yellow	3.0					3.0	3.0	3.0	
All Red	2.0					2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	47	1413	0.23	0.03	73.2	E	73.2	E
Westbound								
LTR	48	1439	0.23	0.03	73.1	E	73.1	E
Northbound								
LTR	1172	1775	0.51	0.66	13.5	B	13.5	B
Southbound								
L	155	1787	0.61	0.09	72.7	E		
TR	1561	1734	0.51	0.90	1.7	A	9.2	A

Intersection Delay = 11.8 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	1	4	5	1	3	3	526	5	89	772	8
% Heavy Veh	0	0	0	0	0	0	0	3	0	1	2	8
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.89	0.80	0.95	0.98	0.80
PK 15 Vol	1	1	1	2	1	1	1	148	2	23	197	2
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	1	1	0
LGConfig		LTR			LTR			LTR		L	TR	
Lane Width		10.0			11.0			11.0		12.0	10.0	
RTOR Vol			0			0			0			0
Adj Flow		11			11			601		94	798	
%InSharedLn												
Prop LTs		0.455			0.545			0.007			0.000	
Prop RTs	0.455			0.364			0.010			0.013		
Peds Bikes	0			0			0			0		
Buses		0			0			0		0	0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0		0.0	0.0	
Arriv. Type		3			3			3		3	3	
Unit Ext.		3.0			3.0			3.0		3.0	3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0		2.0	2.0	
Ext of g		2.0			2.0			2.0		2.0	2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 No Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru		P			Thru			
Right		P			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		13.0	132.0	0.0				
Yellow		3.0	0.0					
All Red		2.0	0.0					

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	181	2090	0.57	0.09	78.4	E	78.4	E
Northbound								
Southbound								

Intersection Delay = 78.4 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					86	0						
% Heavy Veh					0	0						
PHF					0.83	0.80						
PK 15 Vol					26	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					104							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 No Construction
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
WB Left	P				SB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	43.0	0.0					34.2	0.0		
Yellow	4.7						3.5			
All Red	2.3						2.3			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	182	381	0.08	0.48	13.7	B		
TR	857	1793	0.96	0.48	45.4	D	44.8	D
Westbound								
L	82	172	0.62	0.48	48.1	D		
TR	897	1877	0.76	0.48	25.4	C	26.9	C
Northbound								
LTR	496	1306	0.68	0.38	27.0	C	27.0	C
Southbound								
LTR	626	1647	0.11	0.38	18.1	B	18.1	B

Intersection Delay = 34.2 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	12	505	200	41	604	10	250	10	15	18	13	26
% Heavy Veh	0	1	3	3	1	0	0	0	13	6	0	0
PHF	0.80	0.85	0.87	0.80	0.90	0.80	0.82	0.80	0.80	0.80	0.80	0.89
PK 15 Vol	4	149	57	13	168	3	76	3	5	6	4	7
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes		1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L		TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow	15	824		51	683			336			67	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.908			0.328	
Prop RTs		0.279			0.018			0.057			0.433	
Peds Bikes		0			0			0			0	
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 No Construction
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left	A			
Thru	A	A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A	A			SB Left	A			
Thru	A	A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	7.8	45.4				19.5			
Yellow	3.2	4.3				3.5			
All Red	2.0	2.3				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	208	320	0.39	0.65	8.7	A		
TR	1205	1857	0.73	0.65	13.0	B	12.6	B
Westbound								
L	223	343	0.03	0.65	5.7	A		
TR	1197	1845	0.75	0.65	13.6	B	13.6	B
Northbound								
LTR	281	1299	0.43	0.22	31.5	C	31.5	C
Southbound								
LTR	368	1700	1.06	0.22	98.8	F	98.8	F

Intersection Delay = 28.0 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	74	750	62	6	723	93	49	48	6	115	112	90
% Heavy Veh	1	1	2	0	1	1	0	4	33	3	1	1
PHF	0.90	0.92	0.88	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.83	0.81
PK 15 Vol	21	204	18	2	196	29	13	15	2	36	34	28
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat	1900	1900		1900	1900			1900			1900	
ParkExist												
NumPark												
No. Lanes		1	1	0	1	1	0	0	1	0	0	1	0
LGConfig	L		TR	L		TR			LTR			LTR	
Lane Width	12.0	12.0		12.0	12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow	82	885		7	902			120			390	
%InSharedLn												
Prop LTs	1.000	0.000		1.000	0.000			0.442			0.369	
Prop RTs		0.079			0.129			0.058			0.285	
Peds Bikes		0			0			0			0	
Buses	0	0		0	0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet	0.0	0.0		0.0	0.0			0.0			0.0	
Arriv. Type	3	3		3	3			3			3	
Unit Ext.	3.0	3.0		3.0	3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Ext of g	2.0	2.0		2.0	2.0			2.0			2.0	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	52	358			238	39
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	64	380			258	45
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		34
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		42
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	64						61	
C(m) (vph)	1258						547	
v/c	0.05						0.11	
95% queue length	0.16						0.37	
Control Delay	8.0						12.4	
LOS	A						B	
Approach Delay							12.4	
Approach LOS							B	

CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY AM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	17.0	0.0				28.5	28.5	0.0	
Yellow	3.0					3.5	3.5		
All Red	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	324	1713	0.60	0.19	36.5	D	36.5	D
Westbound								
LTR	314	1662	0.99	0.19	84.5	F	84.5	F
Northbound								
LTR	543	1715	1.00	0.32	68.8	E	68.8	E
Southbound								
LTR	582	1838	0.68	0.32	30.1	C	30.1	C

Intersection Delay = 57.2 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	3	78	83	9	129	144	150	283	18	98	219	2
% Heavy Veh	0	3	2	22	1	7	2	12	6	21	8	0
PHF	0.80	0.80	0.88	0.80	0.95	0.88	0.80	0.85	0.80	0.80	0.80	0.80
PK 15 Vol	1	24	24	3	34	41	47	83	6	31	68	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow		195			311			542			398	
%InSharedLn												
Prop LTs		0.021			0.035			0.345			0.307	
Prop RTs	0.482			0.527			0.041			0.005		
Peds Bikes	0			0			0			0		
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		10.0			11.0			11.0			10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A	A	A	
Right	A				Right	A	A	A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.0	0.0				7.0	103.0	15.0	0.0
Yellow	3.0					3.0	3.0	3.0	
All Red	2.0					2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	45	1341	0.07	0.03	70.9	E	70.9	E
Westbound								
LTR	48	1430	0.27	0.03	73.8	E	73.8	E
Northbound								
LTR	1212	1765	0.52	0.69	11.8	B	11.8	B
Southbound								
LTR	1426	1585	0.42	0.90	1.4	A	1.4	A

Intersection Delay = 7.6 (sec/veh) Intersection LOS = A

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	2	0	1	6	0	5	1	587	2	41	443	4
% Heavy Veh	0	0	0	0	0	0	0	4	0	5	12	0
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.94	0.80	0.80	0.81	0.80
PK 15 Vol	1	0	1	2	0	2	1	156	1	13	137	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		10.0			11.0			11.0			10.0	
RTOR Vol			0			0			0			0
Adj Flow		3			13			627			603	
%InSharedLn												
Prop LTs		0.667			0.538			0.002			0.085	
Prop RTs		0.333			0.462			0.003			0.008	
Peds Bikes		0			0			0			0	
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0			0.0	
Arriv. Type		3			3			3			3	
Unit Ext.		3.0			3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0			2.0	
Ext of g		2.0			2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru	A				Thru			
Right	A				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	15.0	130.0	0.0					
Yellow	3.0	0.0						
All Red	2.0	0.0						

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	197	1972	0.41	0.10	64.7	E	64.7	E
Northbound								
Southbound								

Intersection Delay = 64.7 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					64	0						
% Heavy Veh					6	0						
PHF					0.80	0.80						
PK 15 Vol					20	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					80							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 Construction
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	0.0				30.2	0.0		
Yellow	4.7					3.5			
All Red	2.3					2.3			

Cycle Length: 75.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	707	1656	0.88	0.43	31.9	C	31.9	C
Westbound								
LTR	733	1718	0.80	0.43	25.2	C	25.2	C
Northbound								
LTR	505	1254	0.55	0.40	18.4	B	18.4	B
Southbound								
LTR	571	1418	0.12	0.40	14.2	B	14.2	B

Intersection Delay = 26.2 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	5	427	133	13	472	9	207	5	9	29	16	15
% Heavy Veh	20	9	12	8	7	44	3	20	11	11	6	20
PHF	0.80	0.95	0.80	0.80	0.84	0.80	0.80	0.80	0.80	0.80	1.00	0.80
PK 15 Vol	2	112	42	4	140	3	65	2	3	9	4	5
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow		621			589			276			71	
%InSharedLn												
Prop LTs		0.010			0.027			0.938			0.507	
Prop RTs		0.267			0.019			0.040			0.268	
Peds Bikes		0			0			0			0	
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday AM (8:00 - 9:00 AM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 Construction
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	61.4	0.0				16.5	0.0		
Yellow	4.3					3.5			
All Red	2.3					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1084	1589	0.55	0.68	7.8	A	7.8	A
Westbound								
LTR	1195	1752	0.69	0.68	10.3	B	10.3	B
Northbound								
LTR	284	1548	0.39	0.18	33.2	C	33.2	C
Southbound								
LTR	280	1525	0.52	0.18	34.9	C	34.9	C

Intersection Delay = 13.1 (sec/veh) Intersection LOS = B

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	30	460	16	9	652	58	47	29	12	58	25	42
% Heavy Veh	10	10	0	22	6	7	0	4	0	11	13	7
PHF	0.80	0.86	0.80	0.80	0.88	0.82	0.80	0.80	0.80	0.88	0.80	0.85
PK 15 Vol	9	134	5	3	185	18	15	9	4	16	8	12
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow		592			823			110			146	
%InSharedLn												
Prop LTs		0.063			0.013			0.536			0.452	
Prop RTs	0.034			0.086			0.136			0.336		
Peds Bikes	0			0			0			0		
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	139			359	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	26	173			394	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		21
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		26
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	26						43	
C(m) (vph)	1168						498	
v/c	0.02						0.09	
95% queue length	0.07						0.28	
Control Delay	8.2						12.9	
LOS	A						B	
Approach Delay							12.9	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday AM (8:00 - 9:00 AM)
Intersection: Sunrise Hwy SR N @ Site Dway
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Site Driveway
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	29	125			342	15
Peak-Hour Factor, PHF	0.80	0.80			0.80	0.80
Hourly Flow Rate, HFR	36	156			427	18
Percent Heavy Vehicles	42	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				13		24
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				16		29
Percent Heavy Vehicles				50		50
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	36						45	
C(m) (vph)	933						446	
v/c	0.04						0.10	
95% queue length	0.12						0.33	
Control Delay	9.0						14.0	
LOS	A						B	
Approach Delay							14.0	
Approach LOS							B	

CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY PM PEAK HOUR

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road

Inter.: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	0.0				24.5	17.5	0.0	
Yellow	3.0					3.5	3.5		
All Red	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	642	1806	0.57	0.36	24.7	C	24.7	C
Westbound								
LTR	613	1724	0.41	0.36	22.3	C	22.3	C
Northbound								
LTR	361	1854	0.96	0.19	71.7	E	71.7	E
Southbound								
LTR	553	2031	0.97	0.27	63.3	E	63.3	E

Intersection Delay = 48.9 (sec/veh) Intersection LOS = D

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Mastic Beach Rd @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Mastic Beach Road N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	218	117	6	114	110	57	242	18	184	308	2
% Heavy Veh	0	0	0	0	1	3	0	1	0	1	1	0
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PK 15 Vol	1	59	32	2	31	30	15	66	5	50	84	1
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow		368			251			345			537	
%InSharedLn												
Prop LTs		0.011			0.028			0.180			0.372	
Prop RTs		0.345			0.478			0.058			0.004	
Peds Bikes		0			0			0			0	
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue

Inter.: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		10.0			11.0			11.0			10.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A	A	A	
Right	A				Right	A	A	A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.0	0.0				13.0	99.0	13.0	0.0
Yellow	3.0					3.0	3.0	3.0	
All Red	2.0					2.0	2.0	2.0	

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	47	1413	0.23	0.03	73.2	E	73.2	E
Westbound								
LTR	48	1439	0.23	0.03	73.1	E	73.1	E
Northbound								
LTR	1171	1774	0.51	0.66	13.5	B	13.5	B
Southbound								
LTR	1554	1727	0.57	0.90	2.1	A	2.1	A

Intersection Delay = 7.6 (sec/veh) Intersection LOS = A

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Southaven Ave @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Southaven Avenue N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	4	1	4	5	1	3	3	526	5	89	772	8
% Heavy Veh	0	0	0	0	0	0	0	3	0	1	2	8
PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.89	0.80	0.95	0.98	0.80
PK 15 Vol	1	1	1	2	1	1	1	148	2	23	197	2
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		10.0			11.0			11.0			10.0	
RTOR Vol			0			0			0			0
Adj Flow		11			11			601			892	
%InSharedLn												
Prop LTs		0.455			0.545			0.007			0.105	
Prop RTs	0.455			0.364			0.010			0.011		
Peds Bikes	0			0			0			0		
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0			0.0			0.0	
Arriv. Type		3			3			3			3	
Unit Ext.		3.0			3.0			3.0			3.0	
I Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0			2.0			2.0	
Ext of g		2.0			2.0			2.0			2.0	

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane

Inter.: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisd: Town of Brookhaven
Year : 2019 Construction
N/S St: Mastic Road

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left			
Thru					Thru			
Right					Right			
Peds					Peds			
WB Left					SB Left			
Thru		P			Thru			
Right		P			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		13.0	132.0	0.0				
Yellow		3.0	0.0					
All Red		2.0	0.0					

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
TR	181	2090	0.57	0.09	78.4	E	78.4	E
Northbound								
Southbound								

Intersection Delay = 78.4 (sec/veh) Intersection LOS = E

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Poospatuck Ln @ Mastic Rd
Area Type: All other areas
Jurisdiction: Town of Brookhaven
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Poospatuck Lane N/S St: Mastic Road

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume					86	0						
% Heavy Veh					0	0						
PHF					0.83	0.80						
PK 15 Vol					26	0						
Hi Ln Vol												
% Grade					0							
Ideal Sat					1900							
ParkExist												
NumPark												
No. Lanes	0	0	0	0	1	0	0	0	0	0	0	0
LGConfig					TR							
Lane Width					15.0							
RTOR Vol						0						
Adj Flow					104							
%InSharedLn												
Prop LTs					0.000							
Prop RTs				0.000								
Peds Bikes				0								
Buses					0							
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet					0.0							
Arriv. Type					3							
Unit Ext.					3.0							
I Factor					1.000							
Lost Time					2.0							
Ext of g					2.0							

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 Construction
N/S St: WashingtonAv(NB)/HemikerSt(SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
WB Left	P				SB	Left	A			
Thru	P					Thru	A			
Right	P					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	43.0	0.0					34.2	0.0		
Yellow	4.7						3.5			
All Red	2.3						2.3			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	846	1771	0.99	0.48	52.3	D	52.3	D
Westbound								
LTR	788	1650	0.93	0.48	41.3	D	41.3	D
Northbound								
LTR	496	1306	0.68	0.38	27.0	C	27.0	C
Southbound								
LTR	626	1647	0.11	0.38	18.1	B	18.1	B

Intersection Delay = 42.8 (sec/veh) Intersection LOS = D

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hemiker St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: WashingtonAv(NB)/HemikerSt(SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	12	505	200	41	604	10	250	10	15	18	13	26
% Heavy Veh	0	1	3	3	1	0	0	0	13	6	0	0
PHF	0.80	0.85	0.87	0.80	0.90	0.80	0.82	0.80	0.80	0.80	0.80	0.89
PK 15 Vol	4	149	57	13	168	3	76	3	5	6	4	7
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			12.0			15.0	
RTOR Vol			0			0			0			0
Adj Flow		839			734			336			67	
%InSharedLn												
Prop LTs		0.018			0.069			0.908			0.328	
Prop RTs		0.274			0.016			0.057			0.433	
Peds Bikes		0			0			0			0	
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Signalized Intersections Release 5.5

Analyst: SZ
Agency: SIMCO Engineering, P.C.
Date: 12/23/2016
Period: Weekday PM (5:00 - 6:00 PM)
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80)

Inter.: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisd: Suffolk County
Year : 2019 Construction
N/S St: HawthroneSt (NB)/TitmusDr (SB)

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			16.0			16.0	
RTOR Vol		0			0			0			0	

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	58.4					19.5			
Yellow	4.3					3.5			
All Red	2.3					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1040	1603	0.93	0.65	28.1	C	28.1	C
Westbound								
LTR	1191	1836	0.76	0.65	14.0	B	14.0	B
Northbound								
LTR	281	1299	0.43	0.22	31.5	C	31.5	C
Southbound								
LTR	368	1700	1.06	0.22	98.8	F	98.8	F

Intersection Delay = 34.5 (sec/veh) Intersection LOS = C

Phone: Fax:
E-Mail:

OPERATIONAL ANALYSIS

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Montauk Hwy @ Hawthrone St
Area Type: All other areas
Jurisdiction: Suffolk County
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
E/W St: Montauk Highway (CR 80) N/S St: HawthroneSt (NB)/TitmusDr (SB)

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	74	750	62	6	723	93	49	48	6	115	112	90
% Heavy Veh	1	1	2	0	1	1	0	4	33	3	1	1
PHF	0.90	0.92	0.88	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.83	0.81
PK 15 Vol	21	204	18	2	196	29	13	15	2	36	34	28
Hi Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900			1900			1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	0	1	0	0	1	0
LGConfig		LTR			LTR			LTR			LTR	
Lane Width		12.0			12.0			16.0			16.0	
RTOR Vol			0			0			0			0
Adj Flow		967			909			120			390	
%InSharedLn												
Prop LTs		0.085			0.008			0.442			0.369	
Prop RTs	0.072			0.128			0.058			0.285		
Peds Bikes	0			0			0			0		
Buses		0			0			0			0	
%InProtPhase												

Duration 0.25 Area Type: All other areas

OPERATING PARAMETERS

	Eastbound	Westbound	Northbound	Southbound
	L T R	L T R	L T R	L T R
Init Unmet	0.0	0.0	0.0	0.0
Arriv. Type	3	3	3	3
Unit Ext.	3.0	3.0	3.0	3.0
I Factor	1.000	1.000	1.000	1.000
Lost Time	2.0	2.0	2.0	2.0
Ext of g	2.0	2.0	2.0	2.0

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	52	403			288	39
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	64	428			313	45
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		34
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		42
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	64						61	
C(m) (vph)	1201						490	
v/c	0.05						0.12	
95% queue length	0.17						0.42	
Control Delay	8.2						13.4	
LOS	A						B	
Approach Delay							13.4	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Weekday PM (5:00 - 6:00 PM)
Intersection: Sunrise Hwy SR N @ Site Dway
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street:
North/South Street: Site Driveway
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	6	374			277	3
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	6	415			307	3
Percent Heavy Vehicles	50	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				9		17
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				10		18
Percent Heavy Vehicles				22		18
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	6						28	
C(m) (vph)	1022						520	
v/c	0.01						0.05	
95% queue length	0.02						0.17	
Control Delay	8.5						12.3	
LOS	A						B	
Approach Delay							12.3	
Approach LOS							B	

EXISTING (2016)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER AM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker AM (6:00 - 7:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	20	86			292	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	24	107			320	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		20
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		24
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	24						41	
C(m) (vph)	1243						576	
v/c	0.02						0.07	
95% queue length	0.06						0.23	
Control Delay	8.0						11.7	
LOS	A						B	
Approach Delay							11.7	
Approach LOS							B	

EXISTING (2016)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER PM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker PM (3:00 - 4:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2016 Existing
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	50	374			231	38
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	62	397			251	44
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		33
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		41
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	62						60	
C(m) (vph)	1266						546	
v/c	0.05						0.11	
95% queue length	0.15						0.37	
Control Delay	8.0						12.4	
LOS	A						B	
Approach Delay							12.4	
Approach LOS							B	

NO CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER AM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker AM (6:00 - 7:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	89			301	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	26	111			330	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		21
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		26
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	26						43	
C(m) (vph)	1232						569	
v/c	0.02						0.08	
95% queue length	0.06						0.24	
Control Delay	8.0						11.8	
LOS	A						B	
Approach Delay							11.8	
Approach LOS							B	

NO CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER PM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker PM (3:00 - 4:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 No Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	52	385			238	39
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	64	409			258	45
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		34
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		42
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	64						61	
C(m) (vph)	1258						537	
v/c	0.05						0.11	
95% queue length	0.16						0.38	
Control Delay	8.0						12.6	
LOS	A						B	
Approach Delay							12.6	
Approach LOS							B	

CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER AM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker AM (6:00 - 7:00 AM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	21	131			301	7
Peak-Hour Factor, PHF	0.80	0.80			0.91	0.80
Hourly Flow Rate, HFR	26	163			330	8
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				14		21
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				17		26
Percent Heavy Vehicles				43		15
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	26						43	
C(m) (vph)	1232						549	
v/c	0.02						0.08	
95% queue length	0.06						0.25	
Control Delay	8.0						12.1	
LOS	A						B	
Approach Delay							12.1	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker AM (6:00 - 7:00 AM)
Intersection: Sunrise Hwy SR N @ Site Dway
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street:
North/South Street: Site Driveway
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	42	103			308	22
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	46	114			342	24
Percent Heavy Vehicles	0	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		0
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				0		0
Percent Heavy Vehicles				0		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	46						0	
C(m) (vph)	1204							
v/c	0.04							
95% queue length	0.12							
Control Delay	8.1							
LOS	A							
Approach Delay								
Approach LOS								

CONSTRUCTION (2019)
TRAFFIC LEVEL OF SERVICE

WEEKDAY WORKER PM PEAK HOUR

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker PM (3:00 - 4:00 PM)
Intersection: Sunrise Hwy SR N @ Maple Ave
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street: Sunrise Highway SR North
North/South Street: Maple Avenue
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	52	403			288	39
Peak-Hour Factor, PHF	0.80	0.94			0.92	0.86
Hourly Flow Rate, HFR	64	428			313	45
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				16		34
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				19		42
Percent Heavy Vehicles				6		0
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	64						61	
C(m) (vph)	1201						490	
v/c	0.05						0.12	
95% queue length	0.17						0.42	
Control Delay	8.2						13.4	
LOS	A						B	
Approach Delay							13.4	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: SZ
Agency/Co.: SIMCO Engineering, P.C.
Date Performed: 12/23/2016
Analysis Time Period: Worker PM (3:00 - 4:00 PM)
Intersection: Sunrise Hwy SR N @ Site Dway
Jurisdiction: NYSDOT
Units: U. S. Customary
Analysis Year: 2019 Construction
Project ID: Forge River Watershed Sewer Project
East/West Street:
North/South Street: Site Driveway
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	18	402			277	10
Peak-Hour Factor, PHF	0.80	0.80			0.80	0.80
Hourly Flow Rate, HFR	22	502			346	12
Percent Heavy Vehicles	50	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				27		50
Peak Hour Factor, PHF				0.80		0.80
Hourly Flow Rate, HFR				33		62
Percent Heavy Vehicles				18		18
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/		No	/
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	22						95	
C(m) (vph)	978						450	
v/c	0.02						0.21	
95% queue length	0.07						0.79	
Control Delay	8.8						15.1	
LOS	A						C	
Approach Delay							15.1	
Approach LOS							C	

This page intentionally left blank.

APPENDIX B.13: UNBUILT FLOOR AREA ANALYSIS

This page intentionally left blank.

The Suffolk County Sanitary Code currently limits the developable floor area and number of residential units for lots that use septic systems. In some cases, these development limits are stricter than the limits under current zoning. Therefore, connection to a sewer system, as under the Proposed Action, would facilitate development because it would allow for development up to the density and intensity specified in the zoning code.

The growth-inducement analysis assumes that construction of the Proposed Action could gradually induce growth up to existing zoning limits on the following properties. Therefore, the unbuilt floor area was calculated for the following parcels, where development or redevelopment could increase land use intensity or density.

(1) Currently developed parcels along Montauk Highway that were rezoned in 2004 from J2 to J6. Under an "all commercial scenario, the net difference of maximum developable commercial floor area under each zoning was calculated. To account for residential unit development under J6, a "residential and commercial scenario" was calculated using minimum unit size and maximum residential density per acre, assuming all units would be above the first floor. It is recognized that existing and future development may not be developed to the full FAR, but this methodology was considered sufficient for providing an estimate of unbuilt floor area.

(2) Parcels along Montauk Highway located in the Transit Area Overlay District, which was established in 2010. Under an "all commercial scenario," the net developable square footage was taken from the Draft Generic Environmental Impact Statement for the Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II (2010). To account for residential unit development on these parcels, a "residential and commercial scenario" was calculated using minimum unit size and maximum residential density per acre, assuming all units would be above the first floor.

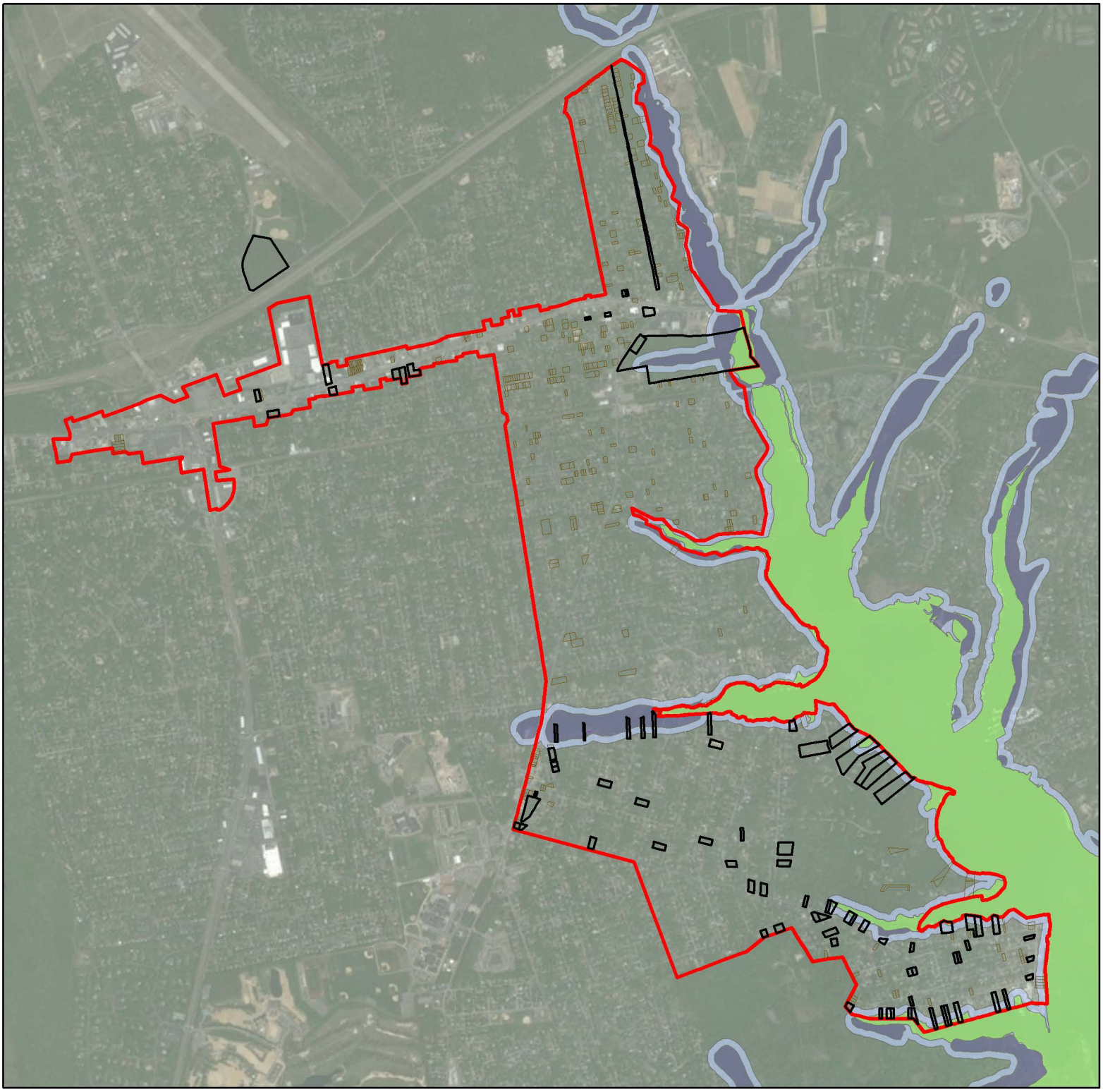
(3) Vacant parcels throughout the study area (see map). Vacant parcels in the J2 were assumed developed to the maximum allowable commercial density. Vacant parcels in the J6 zoning district were calculated under both an "all commercial scenario" and a "residential and commercial scenario." For other vacant parcels in the project area (away from Montauk Highway), residential development was assumed. Parcel areas were recalculated to remove areas within wetland or wetland adjacent areas, and the remaining lot area was divided by minimum lot size to roughly estimate the number of buildable units.

(Description of zoning districts in the project area and calculations are included as attachments)

Resulting totals shown in the table below.

Residential + Commercial Scenario		
residential	344	units
commercial	133,202	square feet
Maximum Commercial Scenario		
residential	122	units
commercial	386,515	square feet

The Proposed Action would not directly result in this new development. This growth would occur according to prevailing market conditions and development trends in the Shirley-Mastic and Mastic Beach areas of the Town of Brookhaven.



Project Area
Vacant Parcels Meet Minimum Floor Area for Development
Vacant Parcels Do Not Meet Minimum Floor Area for Development
Freshwater Wetland
Tidal Wetland
Wetland Adjacent Area

Project Area

Forge River Watershed
Sewer Project

Source: Suffolk County GIS;
ESRI World Imagery;
CP8189 Suffolk County
Sewer Capacity Study
(CDM Smith, H2M,
Browne AE&T Group)

0 1,000 2,000
Feet

Louis Berger

Attachment A: Description of Zoning Districts

Town Zoning

- A-1: Most of the study area is zoned A-1. The A-1 zone is for single-family residential use and requires minimum lot area of 40,000 square feet and maximum building size of 15,000 square feet. Maximum floor area ratios (FARs) within the residential zones depend on the number of stories as defined in the Town code.
- L-1 Industry (Light Industry): The L-1 zone is for industrial use and requires a minimum lot area of 40,000 square feet, with exceptions, and a maximum FAR of 35 percent. The height restriction is 3 stories or 50 feet; however, a chimney stack or vent may be in excess of 250 feet.
- J-2 Business (Neighborhood Business): The J-2 zone requires a minimum lot area of 15,000 square feet, with a maximum FAR of 35 percent. The height restriction is 2½ stories or 35 feet. Principally permitted uses include a variety of commercial uses, as well as single- and two-family dwellings by special permit.
- J-5 Business (High Intensity Business): The J-5 zone requires a minimum lot area of 20,000 square feet, with a maximum FAR of 25 percent. The height restriction is 2½ stories or 35 feet.
- J-6 Business (Main Street Business): The J-6 zone requires a minimum lot area of 4,000 square feet, with a maximum FAR of 60 percent. The height restriction is 2½ stories or 35 feet. This district encourages development and redevelopment of fully integrated mixed-use pedestrian-oriented main street centers, and thus provides for higher density and encourages mixed use buildings (allowing only residential and office use on second floor). It requires design elements such as sidewalk-oriented buildings with parking in the rear and building architecture that conforms to the design standards contained in the Main Street Business Design Manual. J-6 zoning is overall more intense than J-2 zoning because it allows for six units per acre and mixed use on the first and second floors, as well as alcohol-serving businesses, which are often more intense from the perspective of sanitary waste) (Town of Brookhaven 2016a).
    - According to the Town zoning code, the Town Planning Board is authorized, as part of its site plan review, to grant zoning incentives in this zone to encourage development that offers special identified public benefits. Incentives include increased FAR, reduced parking requirements, and the provision of additional sewer capacity, which is in excess of minimum, required on-site demand.
- K-Business: The K zone requires a minimum lot area of 15,000 square feet, with a maximum FAR of 20 percent. The height restriction is 2½ stories or 35 feet. Permitted uses are boathouses, open farming/agriculture, duck ranches, and other customary uses.
- PRC (Planned Retirement Community): The dimensional, density, and FAR requirements for senior citizen housing units within the PRC zone depend on the relationship of the housing units to major arterial and connector roadways. The minimum gross area within the PRC zone is 10 acres with a maximum density of 7 units per acre.

- Split zoned parcels: Approximately 16 parcels within the study area are split-zoned (J-2 and A-1). More than half of these parcels are at least 75 within the A-1 zones. As a result of this configuration, the parcels are effectively zoned A-1.

Village Zoning

- R1 Residence District: The R1 district is for single-family residential use, of no more than 30 feet or 2 stories in height, on lots having an area of 7,500 square feet or more, and a total building area that does not exceed 35 percent of the lot area.
- R2 Residence District: The R2 district is also for single-family residential use, of no more than 35 feet or 2 stories in height, on lots having an area of 80,000 square feet or more.
- B1 Business District: The B1 district is a commercial zone with a height restriction of 2½ stories or 35 feet, a minimum lot area of 10,000 square feet, and a total building area not to exceed 75 percent of the total lot area.
- B2 Business District: The B2 district is also a commercial zone with the same height restrictions as B1 and a minimum lot area of 20,000 square feet, as well as a total building area not to exceed 35 percent of the total lot area.
- R/B Residence/Business District: The R/B district allows for all permitted uses within the R1 district, as well as office and professional space, home based businesses, and bed and breakfasts as accessory uses. The B1 height restriction is the same as R1. The minimum lot size for B1 is 10,000 square feet, with the total building area not to exceed 35 percent of the total lot area.
- WD Waterfront District: The WD district exists to capture the relationship between waterfront and inland areas to create opportunities for pedestrian access to and along the waterfront.

Attachment B: Forge River Watershed Sewer District Project Growth-Inducing Impacts

Table 1: Project Combined with J-2 to J-6 2010 Upzoning

variable	value	unit	sources/notes
total induced growth	208,338	square feet	per GIS analysis, 1/13; removed vacant J6 parcels (covered in Table 3)
total area rezoned	28.38	acres	per GIS analysis, 1/13
minimum unit size	600	square feet	Brookhaven Zoning Code, §85-484
max residential density	6	units/acre	Brookhaven Zoning Code, §85-484
percent of floor area residential	67%	percent	Brookhaven Zoning Code, §85-484, up to 3 stories, top to residential
Residential + Commercial Scenario			
residential	138,892	square feet	assumes 2nd and 3rd stories are all residential (§85-482, §85-484)
residential	170	units	the lower of (a) allowed units per total acres, or (b) buildable sf / minimum unit size
commercial	69,446	square feet	
Maximize Commercial Scenario			
commercial	208,338	square feet	Assumes all commercial. Different building bulk (2.5-story limit, §85-482)

Table 2: Transit Area Overlay District (TAOD)

variable	value	unit	sources/notes
total induced growth	60,401	square feet	Draft Generic Environmental Impact Statement for the Montauk Highway Corridor Study & Land Use Plan for Mastic & Shirley Phase II (2010)
Residential + Commercial Scenario			
residential	30,201	square feet	assumes 2nd story all residential (§85-658(F))
residential	50	units	the lower of (a) allowed units per total acres, or (b) buildable sf / minimum unit size
commercial	30,201	square feet	assumes only 1st story commercial
Maximize Commercial Scenario			
commercial	60,401	square feet	Assumes all commercial. Different building bulk (2.5-story limit, §85-482)

Table 3: Project Combined with Vacant Parcels

variable	value	unit	sources/notes
Residential + Commercial Scenario			
residential	154	units	per GIS analysis, 1/27
commercial	33,556	square feet	per GIS analysis, 1/27
Maximize Commercial Scenario			
commercial	117,776	square feet	per GIS analysis 1/27

Table 4: Totals

variable	value	unit	sources/notes
Residential + Commercial Scenario			
residential	375	units	
commercial	133,202	square feet	
Maximize Commercial Scenario			
residential	154	**units**	
commercial	386,515	square feet	

APPENDIX B.14: SOCIOECONOMICS

This page intentionally left blank.

This appendix provides a description of the approach used in the socioeconomics section as well as a description of key socioeconomics characteristics.

1.1 Approach

The socioeconomic section provides an overview of the socioeconomic conditions of the study area and compares them to the conditions in Suffolk County, the Town of Brookhaven, Mastic, Shirley, and the Village of Mastic Beach. The socioeconomic profile is based on data from the U.S. Bureau of Census (i.e., 2010 Census, 2011–2015 American Community Survey, and the 2014 Longitudinal Employer-Household Dynamics Program), the New York Office of the State Comptroller, and the New York Metropolitan Transportation Council (NYMTC). The profile includes population size, population projections, race and ethnicity, population in poverty, number of households, average household size, household income, housing tenure and occupancy, housing value, monthly rent, housing affordability, number of employees, employment projections, and local government full valuation data.

The potential for project-related induced growth was assessed using GIS, in consultation with local planners in the Town of Brookhaven, Village of Mastic Beach, and Suffolk County. The GIS analysis was used to assess the potential for development and redevelopment on currently developed parcels. Suffolk County does not intend to connect vacant parcels to the sewer district, but the analysis conservatively assessed the potential growth related to such connections. Constraints on development, such as zoning and wetland hydrology, were included in this exercise. Consultation with local planners refined the findings of this GIS analysis.

Direct and indirect impacts of each alternative on the jurisdictions in the study area in terms of population and employment levels, property values, fiscal revenues and expenditures, avoided property losses, access to the proposed sewer system, and cost to residents and businesses were assessed. The short-term effects analyzed include the creation of construction jobs. The following conditions were assessed:

- **Access to centralized sewer infrastructure:** The Proposed Action would provide access to centralized sewer infrastructure to the occupants of properties that would be connected to the AWTF. The socioeconomic analysis quantified households that would gain access to sewer service. This condition would only occur under the Proposed Action, and as such is not evaluated under the other alternatives.
- **Cost to residents and local businesses:** Under the Proposed Action, local residents would pay a user fee and assessment for the AWTF but would no longer have OSWS costs. There would also be a one-time connection fee, which for Phase I/II projects would be mostly covered by the FEMA grant but which would be the responsibility of the property owner for Phase III properties. The socioeconomic analysis quantified these estimated costs and assessed the cost increase relative to existing housing costs and household income. Under the I/A OWTS Alternative, properties would incur a monthly cost for maintenance of the system and, after 5 years, owners would have to pay an annual maintenance service contract fee. Under the No Action Alternative, property owners would pay for the on-lot OSWS, which typically includes pumping every three to five years and reconstruction after 20 to 30 years

- **Avoided losses from flooding:** The alternatives were assessed for their potential to reduce the risk associated with flooding and flood related damages. These avoided losses were assessed qualitatively.
- **Employment:** The socioeconomic analysis quantified the short-term job creation effect for the alternatives using an economic input-output modeling system. Using the input/output modeling system, jobs in the construction industry and related industries and jobs at other local businesses that would be triggered by construction vendor purchases and construction worker household spending (i.e., multiplier effects) were estimated. The assessment also estimated of the number of permanent jobs that would be created to maintain the sewer district and the potential direct and indirect business displacement effects. Direct business displacement is the involuntary displacement of study area businesses that would occur if properties could no longer be used for business purposes because of the Proposed Action. Indirect business displacement is the involuntary displacement that would occur if the Proposed Action would change the local real estate market so that local businesses could no longer afford rent.
- **Property values:** Impacts on property values as a result of the alternatives were analyzed qualitatively.
- **Fiscal flows:** The socioeconomic analysis assessed how the alternatives would affect local government expenditures and revenues using available information on the costs of constructing, operating, and maintaining the sewer extension and the potential revenues that would be generated (e.g., user fees) by the extension. Potential direct or indirect displacement could lead to loss in property tax revenue. Increased property tax revenues associated with potentially increased property values in the study area were assessed. This analysis also assessed how local government expenditures compared to local government revenues to determine the housing affordability and displacement effects of local property tax fluctuation on the local community.
- **Population:** Potential impacts on population, including direct and indirect residential displacement, were assessed. Direct residential displacement is the involuntary displacement of residents that would occur if properties could no longer be used as residences because of the alternatives. Indirect residential displacement is the involuntary displacement that would occur if the alternative would change the local real estate market so that local residents could no longer afford residential properties.
- **Induced growth and other (re)development facilitated by the Proposed Action:** In 2004, the Town of Brookhaven adopted a resolution increasing the permitted density and mix of uses along Montauk Highway. In addition, in 2010 the Town of Brookhaven adopted a Transitional Area Overlay District that permits a higher density in the Montauk Highway corridor to help the community realize the vision of the *Montauk Highway Corridor Study and Land Use Plan for Mastic Shirley*. (To date, a limited number of properties have been redeveloped along the corridor.) To the extent that the Proposed Action would facilitate increased development intensity, the associated population, employment, housing units, and net fiscal flow were assessed qualitatively. Furthermore, as noted above, although Suffolk County does not intend to connect vacant parcels to the sewer system, this analysis conservatively assesses the growth-inducement effects of such connections. The resulting indirect effects on population, employment, housing units, and

net fiscal flow were assessed qualitatively. This indirect growth would only occur under the Proposed Action, and as such is not evaluated for the other alternatives.

1.2 Key Socioeconomics Characteristics

1.2.1 Population

The census block group level study area includes 46,597 residents (U.S. Census Bureau n.d.). Future population growth was examined using the 2050 NYMTC population projections, which are provided at a census tract level. Based on the NYMTC 2050 projections, no population growth is expected in the census tract study area between 2010 and 2020 (**Table 1**). In the next three decades, the population is expected to grow, albeit at a lower rate than the populations of Town of Brookhaven and Suffolk County as whole.

Table 1. Population Projections, 2010–2050

Population Level	Study Area	Town of Brookhaven	Suffolk County
2010	72,904	486,364	1,493,350
2020	72,708	494,445	1,513,038
2030	75,604	516,703	1,587,892
2040	79,061	541,256	1,665,742
2050	82,284	564,349	1,731,185
Population Change			
2010–2020	-0.3%	1.7%	1.3%
2020–2030	4.0%	4.5%	4.9%
2030–2040	4.6%	4.8%	4.9%
2040–2050	4.1%	4.3%	3.9%

Source: NYMTC (2016)

1.2.2 Race and Ethnicity

The majority of the census block group study area residents identify as non-Hispanic white (68.1 percent) (**Table 2**). Hispanics are the second largest population group accounting for 18.1 percent. The study area's racial and ethnic breakdown is similar to that of Suffolk County (U.S. Census Bureau n.d.).

Table 2. Race and Ethnicity

Geography	Population	Not Hispanic: White alone	Not Hispanic: - Black or African American alone	Not Hispanic: American Indian and Alaska Native alone	Not Hispanic: - Asian alone	Not Hispanic: Native Hawaiian, and other Pacific. Islander alone	Not Hispanic: - Some other race alone	Not Hispanic: Two or more races:	Hispanic:
Study Area	46,957	68.1%	6.9%	0.8%	3.4%	0.0%	0.0%	2.8%	18.1%
Suffolk County	1,501,373	69.6%	7.1%	0.1%	3.7%	0.0%	0.3%	1.3%	17.8%
Town of Brookhaven	488,930	73.8%	4.9%	0.1%	4.5%	0.0%	0.2%	1.4%	15.0%
Mastic CDP	16,084	66.2%	6.8%	0.1%	4.1%	0.0%	0.1%	1.3%	21.5%
Shirley CDP	25,691	65.8%	7.4%	0.2%	4.6%	0.0%	0.1%	3.0%	18.8%
Village of Mastic Beach	14,883	67.3%	9.7%	0.2%	1.7%	0.0%	0.0%	3.7%	17.5%

Source: U.S. Census Bureau (n.d.)
Notes: CDP – Census Designated Place

1.2.3 Household Size

Based on the 2011–2015 American Community Survey, 14,431 households reside in the study area. The study area's average household size is 2.97, which is larger than the average household size in the three other geographies (**Table 3**). Compared to the Town of Brookhaven and Suffolk County, the study area has relatively few one-person households and more large (five-person or more) households.

Table 3. Household Size

	Study Area	Suffolk County	Town of Brookhaven	Mastic CDP	Shirley CDP	Village of Mastic Beach
Total Households	14,431	493,849	161,116	4,750	7,568	4,881
One-person	16.2%	21.3%	21.4%	15%	15%	15.1%
Two-person	30.7%	29.8%	29.2%	26.0%	29.0%	32.4%
Three-person	19.3%	16.9%	17.3%	19.0%	20.0%	18.7%

	Study Area	Suffolk County	Town of Brookhaven	Mastic CDP	Shirley CDP	Village of Mastic Beach
Four-person	16.0%	18.2%	18.9%	19.0%	18.0%	19.7%
Five-person	11.4%	8.2%	8.7%	14.0%	11.0%	10.3%
Six-person	3.4%	3.2%	3.0%	4.0%	4.0%	2.9%
Seven-person	2.9%	2.4%	1.6%	3.0%	4.0%	0.8%
Average	2.97	2.81	2.80	N/A	N/A	2.89

Source: U.S. Census Bureau (n.d.)

1.2.4 Household Income and Poverty

Median household income in the census block group study area was $79,264 (in 2015 dollars) (**Table 4**). The study area has a higher median household income than that of both the Village of Mastic Beach and Mastic but lower than that of Suffolk County, the Town of Brookhaven, and Shirley. Similarly, compared to Suffolk County and the Town of Brookhaven, a higher proportion of study area families live in poverty (U.S. Census Bureau n.d.).

Table 4. Household Income and Poverty

Geography	Median Household Income	Percent Families with Incomes below Poverty Level
Study Area	$79,264	6.7
Suffolk County	$88,663	4.8
Town of Brookhaven	$87,040	5.2
Mastic	$71,789	10.1
Shirley	$83,569	6.8
Village of Mastic Beach	$62,602	13.0

Source: U.S. Census Bureau (n.d.)

1.2.5 Housing Characteristics

According to the 2011–2015 American Community Survey, the census block group study area includes 15,883 housing units (**Table 5**). The study area's vacancy rate of 9.1 percent was higher than that of Mastic (6.5 percent) and the Town of Brookhaven (7.5 percent) and lower than the vacancy rates in Suffolk County (13.4 percent), the Village of Mastic Beach (13.5 percent), and Shirley (10.4 percent). The study area's owner-occupancy rate (71.8 percent) was similar to that of the Town of Brookhaven (73.1 percent), Mastic (72.9 percent), and Shirley (73.7 percent) and exceeds the rates of Suffolk County (68.8 percent) and the Village of Mastic Beach (63.5 percent).

Table 5. Select Housing Characteristics, 2011–2015

Geography	Housing Units	Percent Vacant	Percent Owner Occupied	Percent Renter Occupied	Median Housing Value	Median Gross Rent	Average Monthly Owner Cost
Study Area	15,883	9.1%	71.8%	19.1%	$255,431	$1,236	$2,081
Suffolk County	570,194	13.4%	68.8%	17.8%	$375,100	$1,544	$2,377
Town of Brookhaven	174,853	7.9%	73.1%	19.0%	$327,300	$ 1,601	$2,278
Mastic CDP, New York	5,080	6.5%	73.7%	19.8%	$235,100	$ 1,005	$2,048
Shirley CDP, New York	8,451	10.4%	72.9%	16.7%	$253,700	$1,348	$2,070
Village of Mastic Beach	5,642	13.5%	63.5%	23.1%	$188,500	$1,622	$1,861

Source: U.S. Census Bureau (n.d.)

The median value of owner-occupied houses in the study area was $255,433, which is similar to those in Shirley and Mastic, lower than those in Suffolk County and the Town of Brookhaven but higher than that in the Village of Mastic Beach. Similarly, average monthly homeowner costs for housing in the study area ($2,081) were similar to those in Shirley and Mastic, lower than those in Suffolk County and the Town of Brookhaven, but higher than those in the Village of Mastic Beach. At $1,236, median gross rent was lower in the study area than it was in all other three geographies, with the exception of Mastic.

As expected, homeowners typically had a higher household income than renters. As shown in **Table 6**, median household income was $83,568 for homeowners and $50,244 for renters. For about half of homeowners (49 percent) and for 68 percent of renters, housing costs accounted for at least 30 percent of their income. Housing that costs up to 30 percent of income is considered affordable (HUD 2017). Households spending more than 30 percent of their income on housing are considered cost-burdened. Thus, an increase in household cost in the study area would make housing unaffordable for a large share of the households. The data was obtained from the 2011–2015 American Community Survey at the census tract level because this data was not available at the block group level.

Table 6. Housing Affordability, 2011–2015

	Homeowners	Renters
Median Household Income	$83,568	$50,244
Percent of Households for which Housing cost is 30 percent or more of household income	49%	68%

Source: U.S. Census Bureau (n.d.)

1.2.6 Employment

Based on data from the Longitudinal Employer-Household Dynamics Program from the U.S. Census Bureau, there were a total of 6,102 jobs in the block group study area: 3,939 jobs in Shirley, 759 in Mastic and 1,531 in Mastic Beach in 2014 (**Table 7**). The largest industries (in terms of employment) in the study area were retail, education, food services and accommodation, and health care and social assistance. In Shirley, retail trade, manufacturing, wholesale trade, and food services and accommodation were the largest industries. In Mastic, the largest industries were health care and social services, retail, and construction. In Mastic Beach, 74 percent of jobs were in education (U.S. Census Bureau 2014).

Table 7. Employment 2014

	Study Area	Shirley	Mastic	Mastic Beach
Total Jobs	6,102	3,939	759	1,531
Earnings				
$1,250 per month or less	32.3%	31.9%	36.0%	13.0%
$1,251 to $3,333 per month	34.6%	30.4%	43.3%	32.7%
More than $3,333 per month	33.2%	37.8%	20.7%	54.3%
Industry				
Agriculture, Forestry, Fishing and Hunting	0.2%	0.0%	0.9%	0.0%
Mining, Quarrying, and Oil and Gas Extraction	0.3%	0.0%	0.0%	0.0%
Utilities	0.0%	0.0%	0.0%	0.0%
Construction	8.0%	5.3%	13.6%	5.3%
Manufacturing	1.9%	17.4%	2.9%	0.1%
Wholesale Trade	2.4%	13.6%	1.4%	1.1%
Retail Trade	21.7%	28.3%	20.6%	3.9%
Transportation and Warehousing	1.0%	1.0%	2.8%	0.2%
Information	3.5%	5.1%	0.0%	0.2%
Finance and Insurance	2.3%	3.1%	0.9%	0.1%
Real Estate and Rental and Leasing	0.7%	0.3%	0.0%	0.0%
Professional, Scientific, and Technical Services	3.4%	2.6%	1.3%	1.0%
Management of Companies and Enterprises	0.3%	0.0%	0.3%	0.2%
Administration & Support, Waste Management and Remediation	4.0%	1.3%	2.4%	0.8%
Educational Services	19.1%	0.7%	0.8%	74.0%
Health Care and Social Assistance	11.5%	6.5%	24.9%	2.7%
Arts, Entertainment, and Recreation	0.7%	0.5%	0.4%	0.3%

	Study Area	Shirley	Mastic	Mastic Beach
Accommodation and Food Services	13.4%	10.2%	16.9%	3.7%
Other Services (excluding Public Administration)	4.6%	3.6%	10.0%	3.0%
Public Administration	0.8%	0.5%	0.0%	3.1%

Source: U.S. Census Bureau (2014)

Future employment growth was examined using the 2050 NYMTC employment projections, which are provided the census tract level. Based on these projections, 12,389 jobs existed in the census tract level study area in 2010 (**Table 8**). Retail employment accounted for 21 percent and office employment for 15.7 percent. The study area had proportionally more retail employment than the Town of Brookhaven and Suffolk County, but a similar proportion of office employment as the Town.

Table 8. Employment Census Tract Level Study Area, 2010

	Total	Retail	Office
Study Area	12,389	21.0%	15.7%
Town of Brookhaven	151,460	15.2%	15.6%
Suffolk County	619,947	12.6%	20.0%

Source: NYMTC (2016)

Between 2010 and 2020, employment in the study area is expected to grow by 9.3 percent, which would be faster than employment growth in the Town of Brookhaven and Suffolk County as whole (**Table 9**). In the next decade (2020 to 2030), employment growth is expected to slow down in all four geographies. With growth of 4.7 percent between 2020 and 2030, the study area would still outperform the Town of Brookhaven (4.4 percent) and Suffolk County (3.3 percent). Between 2010 and 2030, retail employment is expected to decline in the study area, Town of Brookhaven, and Suffolk County, while office employment is expected to increase in all three areas. The projected growth for office employment between 2010 and 2020 in the study area is almost twice that of Suffolk County.

Table 9. Employment Projections, 10-Year Growth, 2010–2050

	Total	Retail	Office
2010–2020			
Study Area	9.3%	-6.2%	14.9%
Town of Brookhaven	8.0%	-5.8%	12.4%
Suffolk County	6.2%	-6.0%	7.5%

	Total	Retail	Office
2020–2030			
Study Area	4.7%	-5.8%	9.5%
Town of Brookhaven	3.3%	-5.8%	6.7%
Suffolk County	4.4%	-5.8%	7.2%

Source: NYMTC (2016)

1.2.7 Local Government Taxes and Revenues

Based on data from the New York Office of the State Comptroller, the Town of Brookhaven's total property tax base (full value real property) was $48.2 billion in 2015. The per capita full value in the Town was $99,210. The total Town's property tax levy of $162 million includes the levy of the Town and the fire protection district and other dependent district levies. Town property tax revenues account for 50 percent of the Town's total revenue. Properties located in the Town are also subject to a Suffolk County tax and taxes for the fire district and other independent districts. Not including school district property taxes, the total property tax levy on properties located in the Town of Brookhaven was $463.9 million, which translates into a per capita property tax of $954. Within William Floyd School District, the full value of real property was $3.5 billion in 2015.

This page intentionally left blank.

APPENDIX B.15: WRITTEN CORRESPONDENCE

Forge River EIS - Public Comments

Albert

Michael Albert <malbertfrd@aol.com>

Thu 5/31/2018 7:36 PM

To:nyshcr.sm.nyscdbg.dr.er <nyscdbg_dr_er@nyshcr.org>;

Cc:MalbertFRD <malbertfrd@aol.com>;

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Written comments by emailing NYSCDBG_DR_ER@nyshcr.org:
FORGE RIVER WATERRSHED SEWAGE PROJECT
REGARDING ITEM 4.1.1 * The indications are for using a combination of low pressure system and/or force main system.

PHASE 1 -There is a decided liability in all commercial properties having to handle, at their own expense, their own hook ups, existing OWTS abandonments, installations of digesters, holding tanks, shut offs and annual maintenance, plus venting at 5' above 100 year storm elevation and the requisite emergency generators.

The EIS suggest that there will be about 300 of these Grinders, is that number inadequate and is it more likely double or triple for the commercial corridor?

UNLIKE homeowners having all facets of hooking up to the system paid for from within project funding, the commercial properties will have to bear that expense, further, the true costs of the sewer district maintaining these grinder station on residential properties, of which all equipment will be on private properties, is understated for the residential properties and further, undefined on commercial properties. 1

EXAMPLE- the calculation being used is 225 gallons for a single family dwelling. The Suffolk County Health department requires a calculation of 300 gallons for a three bedroom house. The idea could be that a 70 gallon containment for the Digester pump is totally inadequate. The notion that this is two to three days of storage capacity is not factual. And, in an emergency situations there is no way that the thousands of digester pumps can be serviced or kept operational. Where is there a provision for overflow and on site emergency dispositions of waste effluent in the event of individual emergencies, or multiple failures in a small area i.e. downed electric service for several blocks, or lastly, major catastrophes like total black out or major storm damage. A Municipal sewage system that is expected to be maintained by individual property owners is not a municipal system. 2

The Project is transferring installation costs, as well as maintenance costs, to the commercial properties in an attempt to reduce the cost to residential properties. And the residential properties annual costs are understated. The sewer districts operating costs are not validated. Further, Where do the commercial properties get the funding to hook up, and what happens if they do not? 3

FURTHER, where is there an existing municipality, of similar size, that has a duplicate system such as what is being proposed, where are the comparisons as to:

a) What cost issues did they run into that exceeded the budget?

b) What operational limitations did they run into?

c) What experience did they have in individual dwelling power loss?

d) What experience did they have in major power failure?

e) What experience did they have with emergency service calls?

f) What was the annual staffing required?

4

IT IS REASONABLE TO CONCLUDE THAT GRINDER PITS, ON PRIVATE PROPERTIES, CAN NOT BE COST EFFECTIVE TO INSTALL AND MAINTAIN ON THE COMMERCIAL CORRIDOR. FURTHER, ITEM 4.2 - IT IS NOT POSSIBLE GIVEN THE SIZE OF THE THE DISTRICT TO IDENTIFY THAT THE SYSTEM WOULD BE ALL LOW PRESSURE. - THIS FACT WOULD MAKE THE CURRENT CALCULATIONS OF BUDGETING AND FUNDING RIFE WITH POTENTIAL DEFICIENCIES WHICH WOULD POTENTIALLY OCCUR MID PROJECT, WORSE YET THERE WOULD BE SYSTEM FAILURES WITHIN THE EARLY LIFE OF THE DISTRICT IF THIS SYSTEM IS NOT CIRCUMSTANCE FUNCTIONAL.

5

REGARDING THE DISPOSITION OF SEWAGE SLUDGE and ITEM 4.3 - AWTF and MBR

ITEM 4.3 - There is no representation of the number of truckloads of sewage sludge that will be required for the district. The number of tons generated would require the trucking off the sewage sludge through neighborhood streets that may not be able to handle the additional traffic. Dry tonnage calculations and wet tons can be calculated and could be more than 100 trucks per month as well as all of the attendant trips relating to staff, equipment movement, headquarters and of course the construction period. Handling of the

6

GROUND WATER LOAD for the TREATMENT SITE 30.7 acres per ITEM 4.3 - AWTF and MBR indicate maximum gallonage with these provisions - SUBJECT PARCEL SITE IS MAXIMIZED FROM THE START? HOW MUCH OF THAT SEWAGE WILL BE STORED ON SITE FOR PICK UP AND CARTING AND ARE RECEIVING SITES EQUIPPED TO HANDLE THE DISTRICT GENERATED SLUDGE.

There are basic calculations of site load capacity for recharging of water water after treatment. There is an absence of data in the EIS that would support 1.3 million gallons per day of recharge. Hydrogeology currently demonstrate the lateral movement of water and the distances to surface water would require that the recharge area be calculated on the basis of supersaturation. TREATMENT PLANT LAND AREA might not be sufficient to handle 1.3 million gallons per day of recharge.

What superior holding capacity at the treatment plant site is in place to deal with a slowing up of recharge due to soil type and supersaturation? - IT IS REASONABLE TO ASK IF THE SITE IS TOO SMALL AND IS MAXED OUT AT INCEPTION. AND FURTHER, WHERE IS THE PROJECTED GROWTH GOING TO EXPAND INTO?

7

yours truly, Michael Albert
BOX 266, PORT JEFFERSON, NEW YORK 11777

Forge River Watershed Sewer Project

Aloia-Cortes

Michael Aloia-Cortes <mpacortes@gmail.com>

Sat 6/2/2018 8:41 AM

To: nyshcr.sm.nyscdbg.dr.er <nyscdbg_dr_er@nyshcr.org>;

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Good morning,

I am a resident of Mastic, NY. Currently the map titled Mastic/Shirley Study Area Phase I, II, III, IV shows the residential streets closest to the West Mill Pond as part of phase III. I believe it would be appropriate to consider including this area as part of phase I or II. 1

Thank you,
Michael Aloia-Cortes

Asaro

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the
Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Gerard Asaro
Organization/Affiliation: resident / concerned citizen
Street Address: 25 Coventry avenue
City: Mastic State: NY Zip Code: 11950
Email:

Comments:
This is a good idea, for the people of the tri-hamlet area, However Suffolk County pays very high Real estates in the State. I believe the County and Federal Government should put more Cresources Cmoney in to the system since this would put an addional tax burden on residents who already pay very high taxes residents should not have to pay a maintenance fee.

1

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

GOVERNOR'S OFFICE OF STORM RECOVERY

Fitzer

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the
Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Karen Fitzer

Organization/Affiliation: homeowner

Street Address: 68 Baybright Drive West

City: Shirley **State:** New York **Zip Code:** 11967

Email: Herbandkaren@optonline.net

Comments: See attached.

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

GOVERNOR'S OFFICE OF STORM RECOVERY

May 23, 2018

Forge River Watershed Sewer Project

My name is Karen Fitzer. I live at 68 Baybright Drive West, Shirley, New York. I recently attended two public information sessions regarding the Forge River Watershed Sewer Project held at the Mastic Fire Department. I would have gotten up to speak at the Environmental Hearing, May 22nd, but I'm not comfortable speaking in front of many people. A gentleman gave me this Comment Form so I'm writing to you.

I have lived in the area since 1976. I worked very closely with the Suffolk County Water Authority many years ago to bring water mains into our area after I learned I had free ammonia in my well water. I walked and talked to my neighbors, flyers in mailboxes, meetings at the library, etc., difficult at times, but in the end, 150 or so people, some with the help of a grant agreed to sign up. It was a great accomplishment, we now had Suffolk County Well Water. I was told by an employee, I live in a blighted area. I wasn't quite sure what that meant at the time.

My neighbors and I, both of whom were much older at the time, who have since passed away, helped greatly to secure Suffolk County Well Water and fought for street signs, one was involved in Neighborhood Watch. I know they would be involved in this project if they were here. I learned a lot from them.

I have worked at the William Floyd School District for 21 years and have since retired. I work with the town to help clean up the community, the Great Brookhaven Clean-up.

I am greatly concerned for our area, and have been for some time.

When I first moved to Shirley it was like a breath of fresh air. Now, I have to wonder, between, Brookhaven National Lab just north of me, and the Brookhaven Landfill. I learned everything in the ground water runs North to South, I'm south of Brookhaven National Lab. I've been drinking Poland Spring Water for many years. I've had kidney surgery and have to drink a good amount of water every day. It's a concern. 1

We live near a bridge, Smith Point, that everywhere else on Long Island, is beautifully maintained. Why is this area neglected?

All I can say is I pray the Forge River Watershed Sewer Project does go through. I love walking along the bay and riding my bike to the ocean. We must respect our waters, it should have never gone this far. My husband is a fisherman, we spent many years on the water fishing, boating, sailing, swimming, with our two sons. We look forward to enjoying these same recreational activities with our six grandchildren. I can't imagine nitrogen pollution from broken or poorly functioning septic systems, and cesspools, and agricultural uses, not being addressed. IT IS OF THE UTMOST IMPORTANCE that this Forge River Watershed Sewer Project become a reality. That the vote is a YES!

Sincerely,
Karen Fitzer

Hopkins

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 1
SUNY @ Stony Brook, 50 Circle Road, Stony Brook, NY 11790
P: (631) 444-0365 I F: (631) 444-0360
www.dec.ny.gov

May 30, 2018

Matt Accardi
Governor's Office of Storm Recovery
25 Beaver St., 5th Fl.
New York, NY 10004

Re: Application #1-4722-06562/00003
Proposed Shirley-Mastic Sewer District

Dear Mr. Accardi:

The Department of Environmental Conservation (DEC) has completed its review of the Draft Environmental Impact Statement (DEIS) for the referenced action, which involves the connection of approximately 3,400 parcels to a new advanced wastewater treatment facility (AWTF).

We have identified several topics or issues in the DEIS which require clarification, further explanation or the addition of details to ensure that the subsequent Final Environmental Impact Statement (FEIS) contains all the information and analysis necessary for the lead agency and the involved agencies to make the findings and determinations required of them at the conclusion of the process. Please see the following comments.

1. Section 5.4.3.2 discusses potential impacts to water quality. It is stated that a temporary lowering of the water table may occur in the study area. As adverse impacts are expected, DEC would like the FEIS to address how the lowering of the water table will be mitigated. Such mitigation may include the installation of bioswales or other forms of green infrastructure with the intent to recharge stormwater runoff to groundwater. These practices may mitigate for both the expected lowering of the water table and increase in impervious surfaces as a result of pump station construction. 1

2. Pump stations are proposed throughout the project area. It is preferred that these pump stations are located outside of both Article 24 and Article 25 wetlands and their regulated adjacent areas. 2

3. Tidal Wetland Land Use Regulations Development Restrictions (6 NYCRR Part 661.6) state that the minimum lot area for any principle building constructed within a regulated area is 40,000 square feet for an area not served by a public sewage system. This square footage decreases to 20,000 square feet for areas that are 3

connected to a sewer, which may allow for the subdivision of lots and a subsequent increase in development and population. DEC would like information regarding how many parcels will be subject to subdivision within regulated wetlands and their respective adjacent areas and the impact this may have to wetlands and water supply. 3 cont.

We are available to discuss these comments or answer any questions you may have. I can be reached at (631) 444-0364 or at elyssa.hopkins@dec.ny.gov. Thank you for the opportunity to comment.

Sincerely,

Elyssa Hopkins

Elyssa Hopkins
Environmental Analyst

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the
Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Donna L. Jimenez

Organization/Affiliation: Resident Phase II

Street Address: 124 Neptune Avenue

City: Mastic **State:** NY **Zip Code:** 11950

Email: jimenezdl@live.com

Comments: Long overdue project - much needed

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

NY RISING GOVERNOR'S OFFICE OF STORM RECOVERY

MANOR PARK CIVIC ASSOCIATION

P.O. BOX 504

MORICHES, NEW YORK 11955

VIA EMAIL:NYSCDBG_DR_ER@nyshcr.org Keenan

May 30, 2018

Governor's Office of Storm Recovery
24 Beaver St. - 5th Floor
New York, NY 10004

Re: Forge River Watershed Sewer Project
Draft Environmental Impact Statement (May 2, 2018)

I write on behalf of the Manor Park Civic Association regarding the above-referenced project. No homes or businesses in our area are included in any phase of the proposed sewer district. However, the advanced water treatment facility (AWTF) would be located on a site within the area represented by this Civic Association that is outside the boundaries of the project area.

Residential properties in close proximity to the AWTF will experience the negative impacts of this project without any of the benefits. According to DEIS Figure 5.14-1, the site of the proposed AWTF is located in an "EJ community" based on Income and Race/Ethnicity. Section 5.14.3.2 notes the probability of "adverse air quality impacts associated with emissions near the AWTF" once construction is complete.

In its discussion of environmental justice, the DEIS omits consideration of the unmitigated damage that will be suffered by the nearby residents of Maple Avenue, Winston Drive, Park Avenue and Dawn Drive in Shirley, NY (DEIS, Section 5.14). Contrary to the statement in Section 5.14.3.2, and unlike areas within the project area, this community would not "experience the same benefits from the Proposed Action as the general population." DEIS, pg. 124.

1

Other potential sites for the AWTF were rejected as being "too close to residential neighborhoods." DEIS, Sec. 6.3.3, pg. 189. Notably, none of the listed sites is located any closer to a residential neighborhood than the proposed Maple Avenue parcel. Alternative sites were also rejected on the basis of cost, although there is no documentation of these costs or the cost of including a relatively small number of AWTF neighbors within the project area. DEIS, Sec. 6.3.3. 2

Inclusion of these local EJ community parcels in Phase I of the project would mitigate some of the harm that will be accompany construction and continuous operation of a large-scale AWTF otherwise serving only distant neighborhoods. 3

Although the DEIS references the need for Federal Aviation Administration approval to site the AWTF at Brookhaven Airport, there is no indication that such approval is forthcoming. DEIS, Sec. 7.0, Table 7.1. The FAA has, in the past, declined to permit the construction of a sewer treatment plant at that location.

The DEIS also fails to address New York State's reversionary interest in the proposed AWTF site if it is not being used for Airport purposes. Alienation of this site, by sale or long-term lease, may trigger reversion of the original Airport property to the State. Similarly, there is no discussion of the required agreement with the Town of Brookhaven for use/lease/sale of the proposed Maple Avenue AWTF site, although the need for an "intermunicipal agreement" with the Town is noted. DEIS, Table 7.1., pg. 205. 4

While this Civic Association remains opposed to the current version of this project, environmental justice demands at a minimum that residents living in close proximity to the proposed AWTF be included in Phase I of the proposed sewer district. 5

Raymond G. Keenan

President, Manor Park Civic Association

Miller

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the
Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Arthur Miller

Organization/Affiliation:

Street Address:

City: **State:** **Zip Code:**

Email:

Comments: How are they going to treat the solids that are removed

1

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

GOVERNOR'S OFFICE OF STORM RECOVERY

Steinmacker

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: ED + DENISE STEINMACKER

Organization/Affiliation: RESIDENT

Street Address: 133 WINTERS DR

City: MASTIC **State:** NY **Zip Code:** 11950

Email: SSURFRATT@AOL.COM

Comments: 1- How is this project going to better my home VALUE, when I AM PAYING AND NOT USING THE SYSTEM - 1

2- I UNDERSTAND the South Neighborhoods BENIFIT FOR GROUND WATER AND CESSPOOLS, BUT THE NORTH Neighborhood ALONG SIDE AND NEAR THE FACILITY, "AIR QUALITY". Smell WILL BE A FACTOR FOR ME - LIVING EAST OF THE FACILITY ALONGSIDE THE AIRPORT - WINTERS DR. 2

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

NY RISING GOVERNOR'S OFFICE OF STORM RECOVERY

C. Taylor

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Chris Taylor

Organization/Affiliation: Resident

Street Address: 101 Hawthorne ST

City: Mastic State: NY Zip Code: 11950

Email:

Comments: It is my understanding that commercial properties are excluded from grant funding. This means they will probably continue to use their existing systems to flush waste away - places like restaurants with a very high volume of restroom waste - 1

What about schools? Churches? municipal bldgs? What about the Poosepatuck Indian Reservation? Will they be required to hookup? That area is densely populated. Extremely dense. Also they have gas stations in there I wonder about the safety of those gas tanks. 2

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

Additional comments may be recorded on the back of this page (or you may attach additional materials).

GOVERNOR'S OFFICE OF STORM RECOVERY

R. Taylor

COMMENT FORM
Forge River Watershed Sewer Project

Public Hearing on the Draft Environmental Impact Statement

May 22, 2018
Mastic Fire Department
1080 Mastic Road, Mastic, NY

Please use this comment form to let us know your thoughts.
These comments will become part of the official record.

Name *(required)*: Robert Taylor
Organization/Affiliation: Resident
Street Address: 101 Hawthorne ST
City: Mastic State: NY Zip Code: 11950
Email: ~~~~

Comments: The people of the Mastic Peninsula deserve the best quality treatment plant and one that can handle current and future needs. 1

At the meeting this subject was brought up. 2

Also in the event of a power failure what actually happens to the system, does it still work? 3

Is there any possibility of sewage lines contaminating the water lines? 4

Please leave this form with us today or submit any time during the comment period, which ends on **June 1, 2018**, to the contact noted below:

Matt Accardi
Bureau of Environmental Review and Assessment
Assistant General Counsel
New York State Governor's Office of Storm Recovery
25 Beaver Street, 5th Floor
New York, NY 11566

this is the zip code for Merrick NY ??

Additional comments may be recorded on the back of this page (or you may attach additional materials).

GOVERNOR'S OFFICE OF STORM RECOVERY

APPENDIX B.16: PUBLIC HEARING TRANSCRIPT

GOVERNOR'S OFFICE OF STORM RECOVERY

----------X

PUBLIC HEARING

RE: Forge River Watershed Sewer Project

----------X

May 22, 2018

7:03 p.m.

Mastic Fire Department

1080 Mastic Road

Mastic, New York 11950

B E F O R E:

MATT ACCARDI - The Chair

A P P E A R A N C E S:

GOVERNOR'S OFFICE OF STORM RECOVERY
25 Beaver Street, 5th Floor
New York, New York 10004
BY: MATT ACCARDI, Assistant General Counsel;
Deputy Director, Bureau of Environmental Review
and Assessment

ALSO PRESENT:

Other project participants

The Public

SPEAKERS:

NAME	PAGE
Legislator Rudy Sunderman.....	12-13
Ray Hallenbeck.....	14-15
Beth Wahl, President of Chamber of Commerce of Mastics and Shirley..	15-16
Arthur Henderson.....	16-18
Evelyn Green.....	18-19
Steven Carney.....	20-21
Maura Spery, Director of Mastic Beach Property Owners Association....	21-23
Raymond Keenan, President, Manor Park Civic Association.....	23-26
Kabir Javaid, Real Estate Agent and Landlord	26-30
Robert Manion.....	30
John Siebert.....	31-33
A Voice.....	33-36
Frank Fugarino, President Pattersquash Creek Civic Association.....	36-39
A Voice.....	39-40
Larry Tellefsen, Director of Mastic Beach Property Owners.....	40-43

05/22/2018 Forge River Scoping Meeting

THE CHAIR: All right. We'll get started now. We're going to come on the record, so that means that the court reporter will start transcribing everything that I'm saying and everything that any of the speakers are saying, so please -- please be mindful as she needs to hear it clearly, understand everything that everyone is saying. So if you're not actively making a comment, please keep your voice silent preferably, but definitely to a minimum.

Okay. Good evening and thank you for attending tonight's public hearing. My name is Matt Accardi. I am Assistant General Counsel and Certifying Environmental Officer for the New York State Governor's Office of Storm Recovery, also known as GOSR, G-O-S-R. GOSR is an Office of the New York State Homes and Community Renewals Housing Trust Fund Corporation, which is a benefit -- a public benefit corporation.

The purpose of this evening's hearing is to receive comments on the draft environmental impact statement prepared for the Forge River Watershed Sewer Project in the Town of Brook haven, Suffolk County, New York. Public

05/22/2018 Forge River Scoping Meeting comments will be received on the draft environmental impact statement for the project prepared -- which has been prepared and published pursuant to the State of New York Environmental Quality Review Act, also known as SEQRA, S-E-Q-R-A.

We are joined this evening by representatives from the Suffolk County Department of Public Works. Pursuant to SEQRA, comments will be responded to in writing in the final environmental impact statement. Neither GOSR, nor Suffolk County will respond to any comments, or take any action on the project or in tonight's public hearing. Before the hearing comments -- before hearing comments tonight, I will make a brief presentation on the environmental review process. I'll then provide an overview of the project and then set forth tonight's ground rules.

So the New York State Environmental Quality Review Act process. On May 2nd, 2018 GOSR completed and made available for public review and comment a draft environmental impact statement. They call it a DEIS, a draft

05/22/2018 Forge River Scoping Meeting

environmental impact statement. It evaluates the environmental impacts of the proposed Forge River Watershed Sewer Project. SEQRA requires that -- requires that the public be afforded 30 days to review the DEIS. The DEIS is available for download at GOSR's Website, which is www.stormrecovery.NY.GOV/environmental-docs, d-o-c-s. And hard copies of the DEIS are also available at local libraries, as well as various Town and County facilities. Project information sheets are available at the sign-in table for additional details on reviewing the DEIS and submitting written comments.

GOSR will accept and respond to any and all comments received on or before 5 p.m. on Friday June 1st, 2018. The close of comments is 5 p.m. on Friday, June 1st, 2018. After the close of the public comment period, again 5 p.m. on June 1st, 2018, GOSR will review any and all comments received, prepare responses to all comments and make any necessary revisions to the environmental impact statement. GOSR will then publish a final environmental impact statement, an FEIS, final environmental impact statement in

05/22/2018 Forge River Scoping Meeting

the New York State Department of Environmental Conservation's Environmental Notice Bulletin. The FEIS is expected to be completed by mid-June.

Finally, GOSR will issue a -- a statement of findings pursuant to SEQRA, which will be available on GOSR's website at www.stormrecovery.NY.gov/enviornmental-docs. Note that the Federal Emergency Management Agency FEMA is responsible -- is the responsible entity for the purpose of compliance with the National Environmental Policy Act, also known as NEPA, N-E-P-A, and related laws for the Federal Environmental Review of the proposed action. A -- a separate NEPA Environmental Assessment is under preparation for the Federal Environmental Review of the proposed action. And that will also be available for public review and -- and comment later this summer from FEMA.

I will now read a summary of the proposed action, the Forge River Watershed Sewer Project. The proposed action would establish a Mastic Shirley Sewer District and construct and operate a sewage collection system and an advanced wastewater treatment facility. The

05/22/2018 Forge River Scoping Meeting environmental analysis in the draft EIS, DEIS, addresses Phases I and II assuming connection of approximately 2,000 parcels in the new sewer district. The DEIS also addresses Phase III, which includes approximately 1,300 parcels and consists primarily of residential areas along the Forge River to the south of the Phase II area and some parcels to the north adjacent to the Phase I area.

The project area encompasses approximately 1,600 acres in a densely-developed residential and commercial area bounded by Sunrise Highway to the north, Home Creek (phonetic) to the south, William Floyd Parkway to the west, and Forge River and its tributaries to the east. The project area also includes a 13.7-acre undeveloped parcel and a 17-acre undeveloped parcel, both of which are located on the Brook haven Calabro Airport property, for the siting of an advanced wastewater treatment facility. The project area is subject to heavy rainfall events that lead to regular surface and groundwater flooding and a combination of both groundwater and surface water flooding with

varying intensity and frequency. The project area has experienced in intense flooding during events such as Hurricane Sandy in 2012, Hurricane Irene in 2011 and other unnamed seasonal storms, nor'easters and hurricanes.

The DEIS analyzes a collection system comprised of either gravity sewers or low pressure sewers with laterals to individual parcels. If gravity sewers were used, up to 12 separate pump stations would be located throughout the project area to convey wastewater to the advanced wastewater treatment facility.

AUDIENCE MEMBER: Excuse me? Can -- can something be done with the lighting, so it would make it easier to see.

AUDIENCE MEMBER: Turn the lights off.

THE CHAIR: We'll work on that and we'll take a quick pause.

AUDIENCE MEMBER: Sorry about that.

THE CHAIR: Good. Okay.

If exclusive -- if an exclusively low pressure sewer system was used, no such pump stations would -- would be required. For parcels connected to low pressure sewers, each property

05/22/2018 Forge River Scoping Meeting

would operate and maintain an on-site storage tank with level-sensing equipment and a grinder pump, which would be installed outside buildings to the extent practical. The advanced wastewater treatment facility would be located on two contiguous -- non-contiguous parcels totaling 30.7 acres on the southwest portion of the Brook haven Calabro Airport property. The treatment plant would have a hydraulic daily design flow capacity of 1.4 million gallons per day, which is equivalent to the projected average daily design flow of the collection and conveyance system. The treatment plant would have -- would use either a membrane bioreactor process or a sequencing batch reactor process. Treated effluent would flow to underground leaching structures on the Airport property.

All process tanks will be located inside a building designed with architectural features that blend into the surrounding. The building would be equipped with an odor-control system to minimize potential odors from migrating off site during normal operations.

So we'll now begin receiving comments

05/22/2018 Forge River Scoping Meeting

on the record. We will call speakers up three at a time, in order in which you signed up. The court reporter will transcribe your comments for the record in inclusion into the FEIS, final environmental impact statement. Each speaker will have three minutes. When you are finished speaking, please return to the audience.

If -- if you'd like to provide a comment tonight on the record, you may do so. Please fill out a speaker request card at the sign-in table. And again, GOSR will not -- or the County will not respond to any comments or questions on the project during the hearing tonight. All comments will be included and responded to in the final environmental impact statement.

Additional comments can be submitted in writing to GOSR at the Governor's Office of Storm Recovery, 25 Beaver Street, the 5th Floor, New York, New York 10004, or by e-mail at nyscdbg_dr_er@nyshcr.org. Both address I just mentioned are provided on -- at the project info table and they're also back on the projector now.

All right. As a courtesy, we will have

any Legislators or their representatives come up. To provide a first comment, Legislator Rudy Sunderman is here. He will have the floor first.

(Audience participation.)

LEGISLATOR SUNDERMAN: First, I'd like to thank everybody for coming out today. But first, I'd -- I'd like to say though this is an opportunity for this community I feel. Normally when you have a $200 million grant opportunity, that's a once in a lifetime opportunity for us. So I would tell you that in my point here is:

One it's going to be for our environment;

Two, it's going to be for economical development;

Three, it's going to be opportunities for jobs.

At the end of the day, it's going to be the voters and the residents of Phase I and Phase II that are going to have the opportunity to vote on -- on this opportunity. But I just wanted to stress how important it is for our community. With the funding that we have here available to us, I would hate to see the

opportunity lost. So again, it's going to be up to the voters to make that decision for us when -- when the opportunity comes.

We have a lot of personnel that's going to be able to stay here afterwards, 'cause as you heard, you're going to be able to spoke -- you're going to be able to speak on the record, but there's not going to be a reply from us. But later on, there's a lot of information left behind you. Everybody with a name tag on is going to be able to answer a question or two, if you did -- if you did have a question here after the public hearing's over.

So -- so I thank you for coming out today. There is some refreshments over there, if you want something. And thanks for giving time for tonight. Thanks to everyone.

(Audience participation.)

THE CHAIR: All right. Our first three speakers, if you could please line up near the microphone, this will just help us move through this in a timely manner. Ray Hallenbach -- I'm sorry, Ray Hallenbeck, Beth Wahl and Arthur.

(Stepping up.)

05/22/2018 Forge River Scoping Meeting

THE CHAIR: Before giving your comment, please state your full name, first and last name for the record so the court reporter can hear it. Jonathan, sitting to my left, will be taking time. Everyone will have three minutes. We'll give you a one-minute warning, and a 30-second warning and a stop.

(Laughter.)

THE CHAIR: So if you come up to the stop, please go and finish your thought on the comment cards that are in the back corner and submit them. That way you can finish your thought all in one shot, and have that on the record. We'll review it.

Okay. Thank you.

Ray. Hallenbeck

MR. HALLENBECK: Hi. My name is Raymond Hallenbeck.

AUDIENCE MEMBER: The mic's not on.

AUDIENCE MEMBER: It's not working.

MR. HALLENBECK: It's not working.

THE CHAIR: Okay. Why don't you take that?

MR. HALLENBECK: Okay. Hi. My name is

05/22/2018 Forge River Scoping Meeting

Raymond Hallenbeck. I live about two blocks away.

I just have a question. I see they're going to put pumps on all the people's property, that they're run by electric. What happens when lights go out? And what would cause that? Would an accident on a -- an accident, hitting a pole, a -- a snowstorm, whatever?

But what you would do when the pumps all stopped? How would you start them again? And how long would it take? Would you have to knock down the system and put the system up again? Would we have to wait days? What would it be, 'cause you're not going to run around with a, you know, a chart to do -- to do everybody's house?

1

That's the only question I have.

THE CHAIR: Okay. Thank you for your comment. It will be responded to.

MR. HALLENBECK: Okay.

THE CHAIR: Thank you.

Wahl

MS. WAHL: Good evening. My name is Beth Wahl. I'm President of the Chamber of Commerce of the Mastics and Shirley.

05/22/2018 Forge River Scoping Meeting

This project is imperative for our community, for the future of the tri-hamlet area. Our businesses cannot expand. Our homeowners are polluting our River with the cesspools. We have so many -- we're so overpopulated in this area, and we have to find a solution.

A prime example is we just have a new project that's brought to our attention. Somebody wants to put a catering hall on Montauk Highway. Guess what? He can't have an active kitchen, because we do not have sewers. Therefore, you have to cater in your food. It's absurd.

We need this desperately in our community. And I am begging everyone in Phase I and II to please vote yes.

Thank you.

MR. HENDERSON: Hello, good evening. My name is Arthur Henderson. I live down the block.

Henderson

I would like to thank everyone for coming out and to this meeting to be heard. I would like to address the issue of the Forge River Watershed Sewer Project. I have looked

05/22/2018 Forge River Scoping Meeting

over the DEIS most-recent report on May 2nd, 2018. I -- I feel, in my opinion, Suffolk County is selling out the people. They're selling the people out short on this project. The project deserves better. The people deserve better.

The project that I -- a project that will exceed one-quarter of a billion dollars to be completed Phase I, and Phase II and possibly Phase III. I believe we are better. I believe there are a better -- there is a better plan for the advanced sewer treatment system. The one that is being -- than what is being proposed.

The example of this treatment system that we are talking about is right -- the -- the -- okay, excuse me. The treat -- an example of a treatment system that is -- that is better than the treatment system that is being proposed is located here in Suffolk County. This system is located in the Village of Greenport. I witnessed a building of -- of this system, and it had got all the permits, and from the State, the County, the Town and the Village.

It takes care of all the Village needs. It is turning the waste into energy. And that's

1

what I believe is very good. That's what I believe is necessary, helping to pay for itself in fact. So I believe the proposed Forge River Watershed Sewer Project System is antiquated, okay. It has -- we have a potential of doing better than that. And because it is antiquated, there are many failures with these old systems.

It will -- it will take over five years plus, to hopefully get this system up. Forge River community deserves more than an antiquated treatment system.

1 cont.

Thank you.

MR. CAREY: Thank you.

MR. HENDERSON: You're welcome.

THE CHAIR: The next -- the next three speakers will be Evelyn Green, Steven Carney and Maura Spery.

(Stepping up.)

THE CHAIR: You all can please come up to the microphone.

Thank you.

MS. GREEN: Hello.

THE CHAIR: You just have to hold it really close.

05/22/2018 Forge River Scoping Meeting

MS. GREEN: Just --

MS. ZANAIB: You just have to hold it really close.

MS. GREEN: Hold it really close. Don't put it in your mouth.

Okay. My -- my name is Evelyn Green. Green

And the gentleman before me just brought something up, that is antiquated system that you're thinking of putting in. What I would like to see is I would like to see proposals for other systems, not just one system. I haven't seen -- and I've attended most of these meetings, and I have not seen anything else offered other than the one system that is now being offered. 1

So I do believe in the system. I do believe we definitely need sewers. But I would like to see something that is energy efficient and that is going to behoove the community more than just fixing the Forge River. I -- it needs to fix other things. It's -- it's a system that could be paying for itself.

Thank you.

THE CHAIR: Would you prefer this microphone?

05/22/2018 Forge River Scoping Meeting

MR. CARNEY: No, I think it's fine.

THE CHAIR: Oh, okay.

MR. CARNEY: My name's Steven Carney and my -- I have a couple questions here.

One question is, you know, your -- your business district on Phase I of the sewer plant is encompassing just the businesses. Why are you not at least encompassing up to the railroad tracks and incorporate that whole area, because it's a densely populated area?

And what -- and is this sewage treatment plant large enough to accept the future areas? Because I have a friend that's just retired from Nassau Sewage Plant, and he's saying the plant's not going to be big enough to sustain all that needs to be done for the whole area.

And the other question is what's going on with the other side of Forge River? That land, that water's polluted too, over there, you know. And if you're looking to bring it back to life, I would think you would have to bring back both sides of the River and not just one side, you know.

That's my questions.

Carney

1

2

3

THE CHAIR: Great. Thank you for your comment.

MR. CARNEY: Okay.

MS. SPERY: My name is Maura Spery. I'm a Director with the Mastic Beach Property Owners Association, as well as the former Mayor in Mastic Beach.

Spery

My comments are really for the people who are in Phase I who get to vote for this. For us on the peninsula, certainly for us down in Mastic Beach, this is a once in a lifetime opportunity. And we're depending on you guys to vote, so that we can get sewers.

And there's $189 million for this plant. And it -- it's got enough capacity to do the entire peninsula. And this chance is really not going to come again. And -- and I hear you, there are better systems. But it took seven years to be able to get this money and -- and five years on top of seven. So we're talking about 12 years to be where we are on the precipice of finally taking the peninsula and not being the place where everybody dumps all their crap.

The sewers is our ticket out. The sewers is going to let the 60,000 people on this peninsula not be abused and mistreated like we have been for so many years.

Sewers really are the answer. Is it the perfect system? God no. Are there better things? Yes. Can they hopefully integrate some of that? Yes. But already, they're threatening to take this money away, if you vote no and we don't start Phase I.

Look at, I think Mastic Beach should have been Phase I. But it doesn't matter. This is the chance now. I beg you behind me, please vote yes. We need this desperately to turn our community around.

And I'll tell you this, your septics might not be failing now. Our's are. It's going to smell up here. You're not going to be able to go to the beach.

You're not going to be able to fish. Suffolk County used to provide 50 percent of the nation's shell fish, 50 percent. We provide zero now, zero, because we have 360,000 septic systems, single and separate going into the

ground, into sand. It just goes through the sand into our aquifers, into our rivers, into the bays, into our Sound. It's insane.

We desperately need these sewers. Please -- please when it comes time, vote yes.

Thank you.

(Audience participation.)

THE CHAIR: Next is Raymond Keenan, Kabir Javaid and Robert Manion.

(Stepping up.)

MR. KEENAN: Good evening. Ray Keenan, President, Manor Park Civic Association.

Keenan

I've been ask to read a letter from the Mastic Park Civic Association. I write on -- and this has been submitted to the -- via website to you guys already.

I write on the behalf of the Mastic Park Civic Association regarding the above-referenced project. The area represented by the Civic Association founded over 30 years ago includes all residential parcels located in Phase I and II of the project. Based on comments by several local officials, we are deeply concerned that residents may be deprived of an

6

05/22/2018 Forge River Scoping Meeting

opportunity to participate in a public referendum to establish the Mastic Shirley Sewer District. Those comments include the potential use of a permissive referendum, or more problematically, the creation of a County sewer district without voter approval.

The DEIS explicitly states the, quote, the sewer program would be initiated by a creation of a Mastic Shirley Sewer District through public referendum. If approved by the voters, the system could be designed, and constructed and implemented within six years.

In light of the comments by local officials, we urge GOSR to reiterate in no uncertain terms, that this project will be subject to a public referendum. Area residents that will be affected by the proposed project deserve the opportunity to decide its fate. Anything less than mandatory public referendum is not acceptable to the community. That's number one.

Number two, and this is more from the Manor Park side. The -- the DEIS in Section 4.2 references removal of over 2 million cubic yards

6 cont.

7

05/22/2018 Forge River Scoping Meeting

of material for the purpose of constructing the sewer district. And then it goes on to say that 658,000 yards of material -- I should say that the 2 million was -- would be disturbed. 658,000 cubic yards will be removed.

It goes on in the next section, which deals with taking away the current septic systems or -- or in -- on the houses, that they will have to be backfilled. So that means that you will get rid 658,000 cubic yards of material. And -- and the homeowners then will have to go out and buy fill to put it -- to essentially fill in their old cesspools, et cetera. So it seems to me that something should be done there, that this -- this cubic yardage should somehow come back to the people who live here and not have to go out and -- and buy it.

7 cont.

The third has to do with -- do with issue number three has to do with the STP location. As the gentleman said back here, why the areas along Montauk Highway that are residential weren't included is beyond us. But specifically for the people who live right across the street from this STP, who are not in any

8

phase of this project, who will suffer the most from this project, have no benefit at all coming to them. And they should be included, those streets. Maple Avenue is -- is the prime example. Right across from the STP should be included in the district.

8 cont.

Thank you.

THE CHAIR: Thank you.

MR. JAVAID: Hi. My name is Kabir Javaid.

Javaid

AUDIENCE MEMBER: Can you turn the volume up a little bit more?

AUDIENCE MEMBER: Speak directly into the microphone.

MR. CAREY: Just give him that one.

THE CHAIR: Yeah. You don't mind just using this one.

MR. JAVAID: Thanks so much.

My name is Kabir Javaid. I am a local real estate agent and a landlord.

And first thing I --

AUDIENCE MEMBER: Speak up.

AUDIENCE MEMBER: We can't hear you.

(Audience participation.)

THE CHAIR: Let me just --

AUDIENCE MEMBER: Get rid of that mic..

AUDIENCE MEMBER: Take the bass down.

THE CHAIR: One second. Here I'll -- we'll -- we'll start your time over.

Okay. So I'm sorry, but it's actually not important for you all to hear, as long as the court reporter can hear and we get the record --

AUDIENCE MEMBER: It is important for us to hear.

THE CHAIR: -- on the record.

AUDIENCE MEMBER: We want to hear what he's saying.

THE CHAIR: So the record will contain everything.

AUDIENCE MEMBER: Let him speak.

THE CHAIR: Okay.

And if you can please give it your best shot.

Thank you.

MR. JAVAID: Hi. My name is Kabir Javaid. And -- and I'm a local real estate agent and also a landlord. I own a couple of properties within the sewer district for Phase I

05/22/2018 Forge River Scoping Meeting and Phase II.

First thing first, I -- I really -- I really want to thank New York State and everybody that is contributing funds for this project. This is definitely a very good thing to an area that definitely requires this.

It -- it -- what I've noticed wherever a sewer district comes to an area, it definitely economically improves that area. It -- it increases the home values. And also, it -- it brings in a lot of young people to that town.

One thing I would ask as a suggestion is that you should definitely study different sewer districts, and pick which sewer district and design your planning based on like the most successful one. And one of the sewer districts or one of the sections that I definitely recommend you guys looking into is the W Section of Coram, New York, C-o-r-a-m, New York. That got sewers a couple of decades ago, but I saw a very significant improvement to a residential neighborhood, not a commercial area, but a residential neighborhood. And it -- it brought tremendous amount of -- it -- it increases the

1

05/22/2018 Forge River Scoping Meeting

values of the homes tremendously by just putting in the sewer district. So I highly recommend you studying that area.

1 cont.

And another thing I want you keep in mind is I hope that everybody passes this referendum, because I -- I truly believe it's in everybody's best interest. But once you pass it, please keep in mind the small developers, because there is only 'X' amount of capacity that is available. And it's -- it's sad that, you know, none of the large developers are here. But once everything is approved, they show up and they gobble up most of the capacity.

2

And another thing is I -- I want you guys to be very transparent when it comes to the contracting of this sewer district. I -- I am -- I -- I do have my own construction crew. I -- I do work on my own projects. I would like to take part in -- in this project.

I would like to take a portion of the contracts, if it's possible. I know I'm not a multimillionaire developer, but I do have the capacity to handle certain parts of the -- the project. And yeah, do not give all the contracts

05/22/2018 Forge River Scoping Meeting

to just one contractor. Please --

THE CHAIR: Thank you.

MR. JAVAID: -- diversify.

THE CHAIR: Thank you.

(Audience participation.)

MR. MANION: Yes. My name is Robert Manion. I'm all for this project and I hope it goes through.

The only thing I worry about automatically, like a lot of other projects, are we were going to go over budget? Is it going to be a lot of issues with that? And I noticed how they have the layout with all the areas. And it's like is it like overlapping work? Are we always tearing up the streets, instead of doing everything in certain sections? It's like, you know, is it going to be tearing up the roads constantly? That's a little concern for me, but I am all for it and I hope it passes.

Thank you.

(Audience participation.)

THE CHAIR: Okay. Thank you.

Next is John Siebert, Michael Albert and Frank -- Frank Fugarino.

2 cont.

Manion

1

2

05/22/2018 Forge River Scoping Meeting

(Stepping up.)

MR. SIEBERT: How are you? John Siebert.

Siebert

I just want to thank GOSR for putting this project out. This is the single most important opportunity that this -- this area has. We have not had this opportunity forever.

A lot of people bash this area. We do -- we do. We do it to ourselves. But we do not have the opportunity to move the area ahead. This gives you the opportunity to move the area ahead.

We're sick of being a third-world nation; okay? We deserve sewage. We deserve economic development. We deserve resiliency towards the area. Yes, it's going to move down towards the Mastic Shirley Peninsula. And yes, some -- some of the -- the sewer systems, they can be different down -- down in Mastic Shirley area when we get to that. We need this to move ahead.

Phases I and II, people are worried about a couple hundred dollars a month. The costs have gone down --

AUDIENCE MEMBER: Yeah, tremendously.

MR. SIEBERT: -- from about $1,200 under 600 -- under about $600. I'm sorry, this is -- under $600 a year; okay? So the cost has gone down, half the amount.

This is going to add to your property values. We've seen it all across Long Island. If you look at -- at Huntington Station, Huntington area, Farmingdale, Patchogue. The -- what's the connecting factor? They have sewers; okay? We do not have sewers.

Look at Patchogue, you guys have been out to Patchogue 15 years ago. I remember going there as a kid, before the Lace Mill went down; you know? It looked like crap. Now it looks gorgeous. It's gorgeous. We all go to Patchogue.

I'd like to go out to eat out here.

(Audience participation.)

MR. SIEBERT: Okay. Don't mess up and you have that opportunity. You have the resiliency towards the area that can prevent against future storms. This is your opportunity.

I would love to see actual facts that

rebuke that -- actual facts, not alternative facts, actual -- actual facts, okay, that can say that it is not the best opportunity for the area. I would love to see that. Please let me know that.

I appreciate the opportunity. I'm so looking forward to sewers coming to this area finally.

Thank you.

AUDIENCE MEMBER: Well said.

(Audience participation.)

THE CHAIR: Michael Albert. Hopefully --

A VOICE: Good evening.

My questions are related to the environmental impact statement. And what I'd like to know is, where is the model of this system that we can go and find out that it's in place and in effect for a municipality of our size, that equals the same system that's being proposed? We don't know that this exists anywhere else.

My experience in these digesters is that they are much smaller applications. This is

Albert

8

05/22/2018 Forge River Scoping Meeting

quite a large application for a low-pressure digester system.

So if there is a -- a municipality of this size, I'd like for everybody to know about it, mostly because we can then find out:

What cost issues did they run into;

Whether they exceeded their budgets;

What operational limitations did they run into;

What experience did they have in individual dwelling power loss;

What experience did they have in major power failure;

What experience did they have with emergency service calls;

What was the annual staffing requirement;

What is the life span of the digester pump, and the associated monitoring and shut off equipment.

What provisions for on-site overflow -- and this is very important -- on-site overflow, is this container 75 gallons;

The Health Department standard for an

9

10

05/22/2018 Forge River Scoping Meeting individual zoning is 300 gallons, so you can see in a failure where's the effluent go, back into the house, onto the street;

What provisions are there going to be made for overflow;

10 cont.

Regarding the costs of the existing house abandonments for residential properties, it's covered for residential properties, but not commercial properties, neither is the installation of the digester pump, neither is the monitoring of all of this equipment. This is all falling on individuals.

So the digester pump, the containment tanks being paid for residential properties, but not commercial. The hookup costs are not for commercial. They're for residential only. All this bears a huge expense to property owners that are commercial in nature.

11

Our property, I expect it's going to cost a quarter of a million dollars. I have many more items of this magnitude, but I think the question of ground loading, where the sewer treatment plant is supposed to be at 1.3 million gallons a day, I question whether or not the

05/22/2018 Forge River Scoping Meeting

siting is large enough and the ground can take that number of gallons in leaching, clear leaching nonetheless.

11 cont.

Thank you.

THE CHAIR: Thank you.

(Audience participation.)

THE CHAIR: Okay.

MR. FUGARINO: Okay. I am Frank Fugarino. I'm the President of Pattersquash Creek Civic Association. And that is a Civic Association representing 130 residents in Mastic Beach.

Fugarino

We must not give away this once in a lifetime funding to Oakdale or any other place that's looking for this money. This opportunity is our's. It speaks to the future.

And I don't know if you understand this, after July 1, the septic cesspool laws that are now going to be in place, will cause any new construction or even our own residential cities to count on alternative sewer systems. Alternative sewer systems may not work on your block, because of the leach field. And without sewers, you wouldn't be in a position of having

to either elevate or -- thank you -- either elevate or perhaps build that concrete wall around septics. That goes for forty to eighty thousand dollars. When I built my home in 2007, it was twenty-four thousand.

This sewage treatment plant is so vital. Down in our Peninsula at Mastic Beach, we cannot use our cesspools after nor'easters. What are people about to do in that part of the world? You're not that far from that part of the world, if you live within three blocks or four blocks of any waterway. If you live four blocks within Forge River or -- or any of the waterways out here, groundwater is rising. When you talk to Charlie Flagg who's -- who's a professor at Stony Brook and you ask him what is going on, one of the first things he talks about is groundwater rising. There is nothing that any of you could do about groundwater rising, except sewers. It's the only way to have a cesspool that works, because the cesspools don't work any longer when groundwater rises. Do you follow?

This is a look to the future. It really is. It's -- it's for yourselves and it's

for your neighbors. There are people that cannot get through the winters any longer in Mastic Beach, because of the nor'easters and the groundwater rising. The cesspools, each and every one of us, mine was built by a fellow from preservation, I won't mention who, who was very proud about talking about putting the cesspools in the groundwater tables, so that when the tide goes out, it goes out with it.

Well, guess what? We killed ourselves. We ruined ourselves. All that ammonia went out and killed the shellfish, and so on and so on in the food chain. And so, you know, you have to understand the uses that this is looking to the future, it really is, for each and every one of us. Your cess -- cesspools will not work if ground water is rising as it is.

I've got 30 seconds. I want to give you a specific one. In 2000 and -- in two years time, groundwater rose in my area a foot-and-a-half. When I first came here as a summer resident, my groundwater was at 32 inches. When I built my house in 2005, groundwater was at 18 inches. It's coming to you and it's coming --

it's coming to us in the Peninsula of Mastic Beach. You have to understand this. It's a big -- it's a look to the future.

Thank you.

THE CHAIR: Thank you.

MR. CAREY: Thank you.

(Audience participation.)

THE CHAIR: Frank Mancini and Larry Tellefsen.

(Stepping up.)

A VOICE: Hello.

Mancini

I'm -- I'm just a local resident. But I'm also -- for the last 20 years, I have been working in the public water and wastewater business. I have a New York State Professional Geologist License. I have the highest water treatment license you can get in the State. And currently, I'm working on the second highest wastewater treatment license you can get in the State.

I don't really have a horse in this race, as far as working or designing it. But it's definitely something we desperately need and it's a once in a life time opportunity. And as

far as calling it antiquated technology, it's fairly proven technology. It's all based on your nitrogen loading and like your total nitrogen standard by the DEC. So those things are not really -- I -- I don't really understand the concern there. I'm just here to advocate for it.

And -- and like I -- I said, I'm not looking to gain. I have no way to gain from this. But if you want to talk to somebody who's completely removed from it, and just a local resident whose built a career on it and a formal education about it, I'm here and I'm willing to talk to you.

(Audience participation.)

THE CHAIR: Thank you.

(Audience participation.)

Tellefsen

MR. TELLEFSEN: My name is Larry Tellefsen and I live on Riverside Avenue. I'm -- I'm the Director of Mastic Beach Property Owners. I also was very instrumental with the then New York State Senator Lee Zeldin, when he had the Tri-Hamlet Project. I wrote my -- most of the infrastructure dealing with the sewage.

Now, I envisioned a multifaceted type

of system. One type would be regular sewers, some vacuums, some low pressures, some gravity. Every -- every one of them had to work off of pumps to get where they had to go to. But with this site -- this site is -- I think the site is -- addition or not, this is a single sludge. What happens is the effluent becomes clear and it goes -- goes to leach. They take out the -- the --

AUDIENCE MEMBER: Sludge.

MR. TELLEFSEN: -- the sludge as it thickens and they truck that away or it can be piped away. I don't know how they're going to deliver it yet, but it's got to be delivered.

1

The thing is multi-faceted means multi-faceted. This system, we need this system. You want business, you want to see Montauk Highway developed, you want to see your community thrive, you need sewers. It's not going to do it, without it.

In Downtown Mastic Beach, you want to see it thrive and come in -- come into being something, it needs sewers. It's not going to happen without them.

The thing is we have this onsite wastewater systems that's going on. Suffolk County came out with a grant, very good. Like I said, multi-faceted. This system can only handle so much of a load. If you have all these independent on-site wastewater systems operating -- now Legislators, I need you to hear this. Right now, if you have an on-site wastewater system and the sewer system comes in, you have to hook up. It's mandated by what's in the Health -- the approvals by the Health Department. Legislators, you've got to fix that.

If you have an operating on-site wastewater system that's functioning properly, why should you have to hookup to a sewer -- sewer system when you have one in your backyard that's working fine that's putting out all effluent? Now, that's some -- something that has to be corrected.

2

Now, the thing is, folks, you got to vote for this thing because you want to see Mastic, Mastic Beach, the whole Mastic neck thrive and become something that everybody keeps dreaming of.

Everyone tells me how great it used to be in the past. Well, that was the past and we are here today. We got to fix what we made -- what mistakes were made in the past, bring Mastic up to the 21st Century. Bring in this new technology, clean up our groundwater. Bring back our eel grass and fix our ecology.

Thank you very much.

(Audience participation.)

THE CHAIR: Thank you. That concludes the speakers that have signed up so far. If you're here and you would like to make an oral comment on the record, please go over to the sign-in table and complete a requester card.

As I said earlier, there are comment cards and papers available for you to work on. Write a comment and submit it to us tonight, and we'll take it with us and incorporate it into the record as well. Thank you.

AUDIENCE MEMBER: All right. Can I just --

THE CHAIR: It is now 10 minutes to 8, so we will come off the record until we have a group of people signed up to provide comment.

05/22/2018 Forge River Scoping Meeting

Okay, so we'll come off the record.

(Whereupon, a recess was taken at 7:50 p.m. and the Public Hearing continued at 8:45 p.m..)

THE CHAIR: Okay. So we'll say back on the record and it is 9 -- 8:45. There are no more public speakers. We have reached the end of the hearing.

As previously mentioned, you may also submit comments via mail or e-mail using the materials provided at the sign-in table.

This concludes this public hearing. Thank you for attending.

(Time Noted: 8:47 p.m..)

05/22/2018 Forge River Scoping Meeting

C E R T I F I C A T I O N

I, STEPHANIE J. VALDER, do hereby certify that the within transcript is a true, accurate and complete transcript of the proceedings which took place in the above matter.

Stephanie J. Valder

STEPHANIE J. VALDER

$

$1,200 (1)
32:3
$189 (1)
21:15
$200 (1)
12:10
$600 (2)
32:4,5

A

abandonments (1)
35:8
able (7)
13:6,7,8,12;21:20;
22:19,21
above (1)
45:8
above-referenced (1)
23:20
absurd (1)
16:14
abused (1)
22:4
ACCARDI (2)
1:20;4:14
accept (2)
6:15;20:13
acceptable (1)
24:21
accident (2)
15:8,8
accurate (1)
45:7
acres (2)
8:12;10:8
across (3)
25:24;26:6;32:8
Act (3)
5:6,22;7:12
action (5)
5:14;7:14,17,21,22
active (1)
16:12
actively (1)
4:9
actual (4)
32:25;33:2,3,3
actually (1)
27:7
add (1)
32:7
addition (1)
41:7
additional (2)
6:13;11:18
address (2)
11:22;16:24
addresses (2)
8:3,5
adjacent (1)
8:9
advanced (5)
7:25;8:21;9:13;
10:5;17:12
advocate (1)
40:7
affected (1)
24:18
afforded (1)
6:5
afterwards (1)
13:6
again (6)
6:19;11:12;13:2;
15:11,14;21:18
against (1)
32:24
Agency (1)
7:9
agent (2)
26:21;27:23
ago (3)
23:22;28:21;32:14
ahead (3)
31:11,13,22
Airport (3)
8:20;10:9,18
Albert (2)
30:24;33:13
along (2)
8:7;25:22
alternative (3)
33:2;36:22,23
always (1)
30:16
ammonia (1)
38:12
amount (3)
28:25;29:10;32:6
analysis (1)
8:2
analyzes (1)
9:7
annual (1)
34:17
antiquated (5)
18:5,7,11;19:9;40:2
application (1)
34:2
applications (1)
33:25
appreciate (1)
33:7
approval (1)
24:7
approvals (1)
42:12
approved (2)
24:11;29:13
approximately (3)
8:4,6,12
aquifers (1)
23:3
architectural (1)
10:20
area (31)
8:8,10,11,13,17,22;
9:3,12;16:3,6;20:10,
11,17;23:20;24:17;
28:6,9,10,23;29:4;
31:7,9,11,12,17,21;
32:10,23;33:4,8;
38:21
areas (4)
8:7;20:14;25:22;
30:14
around (3)
15:15;22:16;37:4
Arthur (2)
13:24;16:20
Assessment (1)
7:15
Assistant (1)
4:14
associated (1)
34:20
Association (7)
21:7;23:13,15,19,
21;36:11,12
assuming (1)
8:3
attended (1)
19:13
attending (2)
4:13;44:14
attention (1)
16:9
AUDIENCE (32)
9:14,17,20;11:8;
12:5;13:19;14:20,21;
23:8;26:12,14,23,24,
25;27:3,4,10,13,17;
30:6,22;32:2,20;
33:11,12;36:7;39:8;
40:15,17;41:11;
43:10,21
automatically (1)
30:11
available (9)
5:23;6:6,10,12;7:7,
18;12:25;29:11;43:17
Avenue (2)
26:5;40:19
average (1)
10:12
away (6)
15:3;22:10;25:8;
36:14;41:13,14

B

back (9)
11:24;14:12;20:21,
22;25:17,21;35:3;
43:7;44:6
backfilled (1)
25:10
backyard (1)
42:17
Based (3)
23:23;28:16;40:3
bash (1)
31:9
bass (1)
27:4
batch (1)
10:16
bays (1)
23:4
Beach (12)
21:6,8,12;22:12,20;
36:13;37:8;38:4;39:3;
40:20;41:22;42:23
bears (1)
35:18
Beaver (1)
11:20
become (1)
42:24
becomes (1)
41:8
beg (1)
22:14
begging (1)
16:16
begin (1)
10:25
behalf (1)
23:18
behind (2)
13:11;22:14
behoove (1)
19:19
benefit (3)
4:20,20;26:3
best (3)
27:19;29:8;33:4
Beth (2)
13:24;15:24
better (9)
17:6,6,10,11,11,17;
18:7;21:19;22:7
beyond (1)
25:23
big (2)
20:16;39:4
billion (1)
17:8
bioreactor (1)
10:15
bit (1)
26:13
blend (1)
10:21
block (2)
16:21;36:24
blocks (4)
15:2;37:12,12,13
both (4)
8:19,24;11:22;
20:23
bounded (1)
8:13
brief (1)
5:17
bring (5)
20:21,22;43:5,6,7
brings (1)
28:12
Brook (4)
4:25;8:20;10:9;
37:17
brought (3)
16:9;19:9;28:24
budget (1)
30:12
budgets (1)
34:8
build (1)
37:3
building (3)
10:20,22;17:21
buildings (1)
10:4
built (4)
37:5;38:6,24;40:12
Bulletin (1)
7:3
business (3)
20:7;39:16;41:18
businesses (2)
16:4;20:8
buy (2)
25:13,18

C

Calabro (2)
8:20;10:9
call (2)
5:25;11:2
calling (1)
40:2
calls (1)
34:16
came (2)
38:22;42:4
Can (23)
9:14,15;11:18;14:4,
13;18:20;21:14;22:8;
26:12;27:9,19;31:20;
32:23;33:3,19;34:6;
35:2;36:2;39:18,20;
41:13;42:5;43:21
capacity (5)
10:11;21:16;29:10,
14,24
card (2)
11:11;43:15
cards (2)
14:12;43:17

care (1)
17:24
career (1)
40:12
CAREY (3)
18:14;26:16;39:7
Carney (5)
18:17;20:2,4,4;21:4
cater (1)
16:13
catering (1)
16:10
cause (4)
13:6;15:7,15;36:20
Century (1)
43:6
certain (2)
29:24;30:17
certainly (1)
21:11
certify (1)
45:6
Certifying (1)
4:15
cess (1)
38:17
cesspool (2)
36:19;37:21
cesspools (7)
16:5;25:14;37:9,22;
38:5,8,17
cetera (1)
25:14
chain (1)
38:14
Chair (36)
1:20;4:2;9:18,21;
13:20;14:2,10,23;
15:19,22;18:16,20,24;
19:24;20:3;21:2;23:9;
26:9,17;27:2,5,12,15,
18;30:3,5,23;33:13;
36:6,8;39:6,9;40:16;
43:11,23;44:6
Chamber (1)
15:24
chance (2)
21:17;22:14
Charlie (1)
37:16
chart (1)
15:16
cities (1)
36:21
Civic (6)
23:13,15,19,21;
36:11,11
clean (1)
43:7
clear (2)
36:3;41:8
clearly (1)
4:8
close (5)
6:17,19;18:25;19:4,
5
collection (3)
7:24;9:7;10:13
combination (1)
8:24
coming (8)
12:7;13:15;16:23;
26:3;33:8;38:25,25;
39:2
comment (14)
4:10;5:24;6:19;
7:19;11:10;12:3;14:2,
12;15:20;21:3;43:14,
16,18,25
comments (21)
4:22;5:2,11,14,16,
16;6:14,16,17,21,22;
10:25;11:4,13,15,18;
21:9;23:23;24:4,14;
44:11
Commerce (1)
15:25
commercial (6)
8:13;28:23;35:10,
16,17,19
Community (10)
4:18;12:9,24;16:3,
16;18:11;19:19;
22:16;24:21;41:19
complete (2)
43:15;45:7
completed (3)
5:23;7:4;17:9
completely (1)
40:11
compliance (1)
7:11
comprised (1)
9:8
concern (2)
30:19;40:7
concerned (1)
23:25
concludes (2)
43:11;44:13
concrete (1)
37:3
connected (1)
9:25
connecting (1)
32:11
connection (1)
8:3
Conservation's (1)
7:3
consists (1)
8:7
constantly (1)
30:19
construct (1)
7:23
constructed (1)
24:13
constructing (1)
25:2
construction (2)
29:18;36:21
contain (1)
27:15
container (1)
34:24
containment (1)
35:14
contiguous (1)
10:7
continued (1)
44:4
contracting (1)
29:17
contractor (1)
30:2
contracts (2)
29:22,25
contributing (1)
28:5
convey (1)
9:12
conveyance (1)
10:14
copies (1)
6:9
Coram (1)
28:20
C-o-r-a-m (1)
28:20
corner (1)
14:12
Corporation (2)
4:19,20
corrected (1)
42:20
cost (3)
32:5;34:7;35:21
costs (3)
31:25;35:7,16
Counsel (1)
4:14
count (1)
36:22
County (11)
4:25;5:9,13;6:11;
11:13;17:3,19,23;
22:22;24:6;42:4
couple (4)
20:5;27:24;28:21;
31:24
court (4)
4:4;11:4;14:4;27:9
courtesy (1)
11:25
covered (1)
35:9
crap (2)
21:25;32:16
creation (2)
24:6,10
Creek (2)
8:14;36:11
crew (1)
29:18
cubic (4)
24:25;25:6,11,16
current (1)
25:8
currently (1)
39:19

D

daily (2)
10:10,13
day (3)
10:12;12:19;35:25
days (2)
6:5;15:14
dealing (1)
40:24
deals (1)
25:8
DEC (1)
40:5
decades (1)
28:21
decide (1)
24:19
decision (1)
13:3
deeply (1)
23:24
definitely (8)
4:11;19:17;28:6,7,
9,14,18;39:24
DEIS (11)
5:25;6:6,6,9,13;8:2,
5;9:7;17:2;24:8,24
deliver (1)
41:15
delivered (1)
41:15
densely (1)
20:11
densely-developed (1)
8:12
Department (5)
1:11;5:10;7:2;
34:25;42:13
depending (1)
21:13
deprived (1)
23:25
deserve (5)
17:6;24:19;31:15,
15,16
deserves (2)
17:6;18:11
design (3)
10:11,13;28:16
designed (2)
10:20;24:12
designing (1)
39:23
desperately (4)
16:15;22:15;23:5;
39:24
details (1)
6:13
developed (1)
41:19
developer (1)
29:23
developers (2)
29:9,12
development (2)
12:16;31:16
different (2)
28:14;31:20
digester (4)
34:3,19;35:11,14
digesters (1)
33:24
directly (1)
26:14
Director (2)
21:6;40:20
District (13)
7:23;8:5;20:7;24:3,
6,10;25:3;26:7;27:25;
28:9,15;29:3,17
districts (2)
28:15,17
disturbed (1)
25:5
diversify (1)
30:4
d-o-c-s (1)
6:9
dollars (4)
17:8;31:24;35:21;
37:5
done (3)
9:15;20:17;25:15
down (11)
15:13;16:20;21:11;
27:4;31:17,20,20,25;
32:6,15;37:8
download (1)
6:7
Downtown (1)
41:22
draft (5)
4:22;5:2,24,25;8:2
dreaming (1)
42:25
dumps (1)
21:24
during (3)
9:3;10:24;11:14
dwelling (1)
34:12

E

earlier (1) 43:16
easier (1) 9:16
east (1) 8:17
eat (1) 32:19
ecology (1) 43:8
economic (1) 31:16
economical (1) 12:15
economically (1) 28:10
education (1) 40:13
eel (1) 43:8
effect (1) 33:20
efficient (1) 19:18
effluent (4) 10:17;35:3;41:8; 42:18
eighty (1) 37:4
EIS (1) 8:2
either (4) 9:8;10:15;37:2,2
electric (1) 15:6
elevate (2) 37:2,3
else (2) 19:14;33:23
e-mail (2) 11:21;44:11
Emergency (2) 7:9;34:16
encompasses (1) 8:11
encompassing (2) 20:8,9
end (2) 12:19;44:8
energy (2) 17:25;19:18
enough (4) 20:13,16;21:16; 36:2
entire (1) 21:17
entity (1) 7:10
environment (1) 12:14
Environmental (23) 4:15,22;5:3,5,12,18, 21,24;6:2,3,23,24,25; 7:2,3,12,14,15,16;8:2; 11:6,16;33:17
envisioned (1) 40:25
equals (1) 33:21
equipment (3) 10:3;34:21;35:12
equipped (1) 10:22
equivalent (1) 10:12
essentially (1) 25:13
establish (2) 7:22;24:3
estate (2) 26:21;27:23
et (1) 25:14
evaluates (1) 6:2
Evelyn (2) 18:17;19:7
even (1) 36:21
evening (6) 4:12;5:8;15:23; 16:19;23:12;33:15
evening's (1) 4:21
events (2) 8:23;9:4
everybody (7) 12:7;13:11;21:24; 28:4;29:6;34:5;42:24
everybody's (2) 15:16;29:8
everyone (6) 4:9;13:18;14:6; 16:16,22;43:2
example (4) 16:8;17:14,16;26:6
exceed (1) 17:8
exceeded (1) 34:8
except (1) 37:20
exclusive (1) 9:22
exclusively (1) 9:22
Excuse (2) 9:14;17:16
existing (1) 35:7
exists (1) 33:22
expand (1) 16:4
expect (1) 35:20
expected (1) 7:4
expense (1) 35:18
experience (4) 33:24;34:11,13,15
experienced (1) 9:3
explicitly (1) 24:8
extent (1) 10:5

F

facilities (1) 6:11
facility (4) 7:25;8:22;9:13; 10:6
fact (1) 18:4
factor (1) 32:11
facts (4) 32:25;33:2,3,3
failing (1) 22:18
failure (2) 34:14;35:3
failures (1) 18:8
fairly (1) 40:3
falling (1) 35:13
far (4) 37:11;39:23;40:2; 43:12
Farmingdale (1) 32:10
fate (1) 24:19
features (1) 10:21
Federal (3) 7:9,13,16
feel (2) 12:9;17:3
FEIS (3) 6:25;7:4;11:5
fellow (1) 38:6
FEMA (2) 7:10,19
field (1) 36:24
fill (3) 11:11;25:13,13
final (5) 5:12;6:24,25;11:5, 16
Finally (3) 7:5;21:23;33:9
find (3) 16:7;33:19;34:6
findings (1) 7:6
fine (2) 20:2;42:18
finish (2) 14:11,13
finished (1) 11:7
Fire (1) 1:11
first (11) 12:3,4,6,8;13:20; 14:3;26:22;28:3,3; 37:18;38:22
fish (2) 22:21,23
five (2) 18:9;21:21
fix (4) 19:21;42:13;43:4,8
fixing (1) 19:20
Flagg (1) 37:16
flooding (3) 8:24,25;9:3
Floor (2) 11:20;12:4
flow (3) 10:11,13,17
Floyd (1) 8:15
folks (1) 42:21
follow (1) 37:23
food (2) 16:13;38:14
foot-and-a-half (1) 38:22
forever (1) 31:8
Forge (54) 1:6;4:1,23;5:1;6:1, 3;7:1,21;8:1,8,16;9:1; 10:1;11:1;12:1;13:1; 14:1;15:1;16:1,24; 17:1;18:1,4,10;19:1, 20;20:1,19;21:1;22:1; 23:1;24:1;25:1;26:1; 27:1;28:1;29:1;30:1; 31:1;32:1;33:1;34:1; 35:1;36:1;37:1,14; 38:1;39:1;40:1;41:1; 42:1;43:1;44:1;45:1
formal (1) 40:12
former (1) 21:7
forth (1) 5:19
forty (1) 37:4
forward (1) 33:8
founded (1) 23:21
four (2) 37:12,13
Frank (4) 30:25,25;36:9;39:9
frequency (1) 9:2
Friday (2) 6:17,18
friend (1) 20:14
Fugarino (3) 30:25;36:9,10
full (1) 14:3
functioning (1) 42:15
Fund (1) 4:19
funding (2) 12:24;36:15
funds (1) 28:5
future (7) 16:3;20:13;32:24; 36:17;37:24;38:16; 39:4

G

gain (2) 40:9,9
gallons (5) 10:11;34:24;35:2, 25;36:3
General (1) 4:14
gentleman (2) 19:8;25:21
Geologist (1) 39:17
gives (1) 31:12
giving (2) 13:17;14:2
gobble (1) 29:14
God (1) 22:7
goes (9) 23:2;25:3,7;30:9; 37:4;38:10,10;41:9,9
Good (9) 4:12;9:21;15:23;

16:19;18:2;23:12;28:6;33:15;42:4
gorgeous (2) 32:17,17
GOSR (12) 4:17,17;5:13,23;6:15,20,23;7:5;11:12,19;24:15;31:5
G-O-S-R (1) 4:17
GOSR's (2) 6:7;7:7
GOVERNOR'S (3) 1:2;4:16;11:19
grant (2) 12:10;42:4
grass (1) 43:8
gravity (3) 9:8,10;41:3
Great (2) 21:2;43:2
Green (5) 18:17,23;19:2,5,7
Greenport (1) 17:20
grinder (1) 10:3
ground (5) 5:20;23:2;35:23;36:2;38:18
groundwater (12) 8:24,25;37:15,18,20,23;38:5,9,21,23,24;43:7
group (1) 43:25
Guess (2) 16:11;38:11
guys (5) 21:13;23:17;28:19;29:16;32:13

H

half (1) 32:6
hall (1) 16:10
Hallenbach (1) 13:23
Hallenbeck (7) 13:24;14:18,19,22,25;15:2,21
handle (2) 29:24;42:6
happen (1) 41:25
happens (2) 15:6;41:8
hard (1) 6:9
hate (1) 12:25
haven (3) 4:25;8:20;10:9
Health (3) 34:25;42:12,12
hear (9) 4:8;14:4;21:18;26:24;27:8,9,11,13;42:8
heard (2) 13:7;16:23
HEARING (10) 1:4;4:13,21;5:15,15,16;11:14;44:4,9,13
hearing's (1) 13:14
heavy (1) 8:22
Hello (3) 16:19;18:23;39:12
help (1) 13:22
helping (1) 18:3
HENDERSON (3) 16:19,20;18:15
hereby (1) 45:5
Hi (4) 14:18,25;26:10;27:22
highest (2) 39:17,19
highly (1) 29:3
Highway (4) 8:14;16:11;25:22;41:19
hitting (1) 15:8
hold (3) 18:24;19:3,5
Home (3) 8:14;28:11;37:5
homeowners (2) 16:4;25:12
Homes (2) 4:18;29:2
hook (1) 42:11
hookup (2) 35:16;42:16
hope (3) 29:6;30:9,20
hopefully (3) 18:10;22:8;33:14
horse (1) 39:22
house (4) 15:17;35:4,8;38:24
houses (1) 25:9
Housing (1) 4:19
huge (1) 35:18
hundred (1) 31:24
Huntington (2) 32:9,10
Hurricane (2) 9:4,4
hurricanes (1) 9:6
hydraulic (1) 10:10

I

II (8) 8:3,8;12:21;16:17;17:9;23:23;28:2;31:23
III (2) 8:5;17:10
impact (11) 4:23;5:3,12,24;6:2,23,24,25;11:6,16;33:17
impacts (1) 6:3
imperative (1) 16:2
implemented (1) 24:13
important (5) 12:23;27:8,10;31:7;34:23
improvement (1) 28:22
improves (1) 28:10
inches (2) 38:23,25
include (1) 24:4
included (4) 11:15;25:23;26:4,7
includes (3) 8:6,17;23:22
inclusion (1) 11:5
incorporate (2) 20:10;43:19
increases (2) 28:11,25
independent (1) 42:7
individual (3) 9:9;34:12;35:2
individuals (1) 35:13
info (1) 11:23
information (2) 6:11;13:10
infrastructure (1) 40:24
initiated (1) 24:9
insane (1) 23:4
inside (1) 10:20
installation (1) 35:11
installed (1) 10:4
instead (1) 30:16
instrumental (1) 40:21
integrate (1) 22:8
intense (1) 9:3
intensity (1) 9:2
interest (1) 29:8
into (16) 10:21;11:5;17:25;22:25;23:2,3,3,3,4;26:14;28:19;34:7,10;35:3;41:23;43:19
Irene (1) 9:5
Island (1) 32:8
issue (3) 7:5;16:24;25:20
issues (2) 30:13;34:7
items (1) 35:22

J

Javaid (8) 23:10;26:10,11,19,20;27:22,23;30:4
jobs (1) 12:18
John (2) 30:24;31:3
joined (1) 5:8
Jonathan (1) 14:5
July (1) 36:19
June (3) 6:17,18,20

K

Kabir (4) 23:10;26:10,20;27:22
Keenan (3) 23:9,12,12
keep (3) 4:10;29:5,9
keeps (1) 42:24
kid (1) 32:15
killed (2) 38:11,13
kitchen (1) 16:12
knock (1) 15:13
known (3) 4:17;5:6;7:12

L

Lace (1) 32:15
land (1) 20:20
landlord (2) 26:21;27:24
large (4) 20:13;29:12;34:2;36:2
Larry (2) 39:10;40:18
last (2) 14:3;39:14
later (2) 7:19;13:10
laterals (1) 9:9
Laughter (1) 14:9
laws (2) 7:13;36:19
layout (1) 30:14
leach (2) 36:24;41:9
leaching (3) 10:18;36:3,4
lead (1) 8:23
least (1) 20:9
Lee (1) 40:22
left (2) 13:10;14:5
Legislator (2) 12:3,6
Legislators (3) 12:2;42:8,13
less (1) 24:20
letter (1) 23:14
level-sensing (1)

10:3
libraries (1)
6:10
License (3)
39:17,18,20
life (3)
20:22;34:19;39:25
lifetime (3)
12:11;21:12;36:15
light (1)
24:14
lighting (1)
9:15
lights (2)
9:17;15:7
limitations (1)
34:9
line (1)
13:21
little (2)
26:13;30:19
live (7)
15:2;16:20;25:17,24;37:12,13;40:19
load (1)
42:6
loading (2)
35:23;40:4
local (7)
6:10;23:24;24:14;26:20;27:23;39:13;40:11
located (7)
8:19;9:11;10:6,19;17:19,20;23:22
location (1)
25:21
long (3)
15:12;27:8;32:8
longer (2)
37:22;38:3
Look (5)
22:12;32:9,13;37:24;39:4
looked (2)
16:25;32:16
looking (6)
20:21;28:19;33:8;36:16;38:15;40:9
looks (1)
32:16
loss (1)
34:12
lost (1)
13:2
lot (6)
13:5,10;28:12;30:11,13;31:9
love (2)
32:25;33:5
low (4)
9:8,22,25;41:3
low-pressure (1)
34:2

M

magnitude (1)
35:22
mail (1)
44:11
maintain (1)
10:2
major (1)
34:13
making (1)
4:10
Management (1)
7:9
Mancini (1)
39:9
mandated (1)
42:11
mandatory (1)
24:20
Manion (3)
23:10;30:7,8
manner (1)
13:23
Manor (2)
23:13;24:24
many (4)
16:6;18:8;22:5;35:21
Maple (1)
26:5
Mastic (24)
1:11,12,13;7:23;21:6,8,12;22:12;23:15,18;24:3,10;31:18,20;36:13;37:8;38:3;39:3;40:20;41:22;42:23,23,23;43:5
Mastics (1)
15:25
material (3)
25:2,4,11
materials (1)
44:12
MATT (2)
1:20;4:14
matter (2)
22:13;45:9
Maura (2)
18:18;21:5
May (7)
1:8;5:22;11:10;17:2;23:25;36:23;44:10
Mayor (1)
21:7
means (3)
4:4;25:10;41:16
Meeting (43)
4:1;5:1;6:1;7:1;8:1;9:1;10:1;11:1;12:1;13:1;14:1;15:1;16:1,23;17:1;18:1;19:1;20:1;21:1;22:1;23:1;24:1;25:1;26:1;27:1;28:1;29:1;30:1;31:1;32:1;33:1;34:1;35:1;36:1;37:1;38:1;39:1;40:1;41:1;42:1;43:1;44:1;45:1
meetings (1)
19:13
MEMBER (18)
9:14,17,20;14:20,21;26:12,14,23,24;27:3,4,10,13,17;32:2;33:11;41:11;43:21
membrane (1)
10:15
mention (1)
38:7
mentioned (2)
11:23;44:10
mess (1)
32:21
mic (1)
27:3
Michael (2)
30:24;33:13
microphone (4)
13:22;18:21;19:25;26:15
mic's (1)
14:20
mid-June (1)
7:4
might (1)
22:18
migrating (1)
10:23
Mill (1)
32:15
million (7)
10:11;12:10;21:15;24:25;25:5;35:21,24
mind (3)
26:17;29:6,9
mindful (1)
4:7
mine (1)
38:6
minimize (1)
10:23
minimum (1)
4:11
minutes (3)
11:7;14:6;43:23
mistakes (1)
43:5
mistreated (1)
22:4
model (1)
33:18
money (3)
21:20;22:10;36:16
monitoring (2)
34:20;35:12
Montauk (3)
16:11;25:22;41:18
month (1)
31:24
more (7)
18:11;19:19;24:5,23;26:13;35:22;44:8
most (6)
19:13;26:2;28:16;29:14;31:6;40:23
mostly (1)
34:6
most-recent (1)
17:2
mouth (1)
19:6
move (5)
13:22;31:11,12,17,21
much (4)
26:19;33:25;42:6;43:9
multifaceted (1)
40:25
multi-faceted (3)
41:16,17;42:5
multimillionaire (1)
29:23
municipality (2)
33:20;34:4
must (1)
36:14

N

name (15)
4:13;13:11;14:3,3,18,25;15:23;16:20;19:7;21:5;26:10,20;27:22;30:7;40:18
name's (1)
20:4
Nassau (1)
20:15
nation (1)
31:15
National (1)
7:11
nation's (1)
22:23
nature (1)
35:19
near (1)
13:21
necessary (2)
6:22;18:3
neck (1)
42:23
need (9)
16:15;19:17;22:15;23:5;31:21;39:24;41:17,20;42:8
needs (5)
4:7;17:24;19:20;20:17;41:24
neighborhood (2)
28:23,24
neighbors (1)
38:2
Neither (3)
5:12;35:10,11
NEPA (2)
7:12,15
N-E-P-A (1)
7:13
New (18)
1:13;4:15,18,25;5:5,21;7:2;8:4;11:21,21;16:9;28:4,20,20;36:20;39:16;40:22;43:6
next (5)
18:16,16;23:9;25:7;30:24
nitrogen (2)
40:4,4
non-contiguous (1)
10:7
none (1)
29:12
nonetheless (1)
36:4
nor (1)
5:13
nor'easters (3)
9:6;37:9;38:4
normal (1)
10:24
Normally (1)
12:9
north (2)
8:9,14
Note (1)
7:9
Noted (1)
44:15
Notice (1)
7:3
noticed (2)
28:8;30:13
number (4)
24:21,23;25:20;36:3
nyscdbg_dr_er@nyshcrorg (1)
11:22

O

Oakdale (1)
36:15
odor-control (1)
10:22

odors (1)
10:23
off (6)
9:17;10:24;34:20;
41:4;43:24;44:2
offered (2)
19:14,15
OFFICE (4)
1:2;4:16,17;11:19
Officer (1)
4:15
officials (2)
23:24;24:15
old (2)
18:8;25:14
once (6)
12:11;21:12;29:8,
12;36:14;39:25
One (23)
12:13;14:14;17:12;
19:12,15;20:6,23;
24:22;26:16,18;27:5;
28:13,17,17,18;30:2;
37:17;38:6,16,20;
41:2,4;42:17
one-minute (1)
14:7
one-quarter (1)
17:8
only (6)
15:18;29:10;30:10;
35:17;37:21;42:5
onsite (1)
42:2
on-site (6)
10:2;34:22,23;42:7,
9,14
onto (1)
35:4
operate (2)
7:24;10:2
operating (2)
42:8,14
operational (1)
34:9
operations (1)
10:24
opinion (1)
17:3
opportunities (1)
12:17
opportunity (20)
12:9,10,11,21,22;
13:2,4;21:13;24:2,19;
31:7,8,11,12;32:22,
24;33:4,7;36:16;
39:25
oral (1)
43:13
order (1)
11:3
Our's (2)
22:18;36:17
ourselves (3)
31:10;38:11,12
out (23)
11:11;12:7;13:15;
15:7;16:23;17:4,5;
22:2;25:12,18;31:6;
32:14,19,19;33:19;
34:6;37:14;38:10,10,
12;41:9;42:4,18
outside (1)
10:4
over (10)
13:14,16;17:2;18:9;
20:20;23:21;24:25;
27:6;30:12;43:14
overflow (3)
34:22,23;35:6
overlapping (1)
30:15
overpopulated (1)
16:6
overview (1)
5:19
own (4)
27:24;29:18,19;
36:21
Owners (3)
21:7;35:18;40:20

P

paid (1)
35:15
papers (1)
43:17
parcel (2)
8:18,19
parcels (7)
8:4,6,9;9:10,24;
10:7;23:22
Park (4)
23:13,15,19;24:24
Parkway (1)
8:15
part (3)
29:20;37:10,11
participate (1)
24:2
participation (13)
12:5;13:19;23:8;
26:25;30:6,22;32:20;
33:12;36:7;39:8;
40:15,17;43:10
parts (1)
29:24
pass (1)
29:8
passes (2)
29:6;30:20
past (3)
43:3,3,5
Patchogue (4)
32:10,13,14,18
Pattersquash (1)
36:10
pause (1)
9:19
pay (1)
18:3
paying (1)
19:22
peninsula (7)
21:11,17,23;22:4;
31:18;37:8;39:2
people (13)
17:4,5,6;21:9;22:3;
25:17,24;28:12;31:9,
23;37:10;38:2;43:25
people's (1)
15:5
per (1)
10:11
percent (2)
22:22,23
perfect (1)
22:7
perhaps (1)
37:3
period (1)
6:19
permissive (1)
24:5
permits (1)
17:22
personnel (1)
13:5
Phase (17)
8:5,8,9;12:20,21;
16:16;17:9,9,10;20:7;
21:10;22:11,13;
23:23;26:2;27:25;
28:2
Phases (2)
8:3;31:23
phonetic (1)
8:15
pick (1)
28:15
piped (1)
41:14
place (5)
21:24;33:20;36:15,
20;45:8
plan (1)
17:11
planning (1)
28:16
plant (8)
10:10,14;20:7,13,
15;21:16;35:24;37:7
plant's (1)
20:16
please (18)
4:7,7,10;11:8,11;
13:21;14:3,11;16:17;
18:20;22:14;23:6,6;
27:19;29:9;30:2;33:5;
43:14
plus (1)
18:10
pm (7)
1:9;6:16,18,19;
44:4,5,15
point (1)
12:12
pole (1)
15:8
Policy (1)
7:12
polluted (1)
20:20
polluting (1)
16:5
populated (1)
20:11
portion (2)
10:8;29:21
position (1)
36:25
possible (1)
29:22
possibly (1)
17:9
potential (3)
10:23;18:6;24:4
power (2)
34:12,14
practical (1)
10:5
precipice (1)
21:23
prefer (1)
19:24
preferably (1)
4:11
preparation (1)
7:16
prepare (1)
6:21
prepared (3)
4:23;5:4,4
presentation (1)
5:17
preservation (1)
38:7
President (3)
15:24;23:13;36:10
pressure (3)
9:9,23,25
pressures (1)
41:3
prevent (1)
32:23
previously (1)
44:10
primarily (1)
8:7
prime (2)
16:8;26:5
problematically (1)
24:5
proceedings (1)
45:8
process (5)
5:18,22;10:16,16,
19
Professional (1)
39:16
professor (1)
37:16
program (1)
24:9
Project (35)
1:6;4:24;5:3,14,19;
6:4,11;7:22;8:11,17,
22;9:2,12;11:14,23;
16:2,9,25;17:5,5,7,7;
18:5;23:20,23;24:16,
18;26:2,3;28:5;29:20,
25;30:8;31:6;40:23
projected (1)
10:12
projector (1)
11:24
projects (2)
29:19;30:11
properly (1)
42:15
properties (5)
27:25;35:8,9,10,15
property (10)
8:20;9:25;10:9,18;
15:5;21:6;32:7;35:18,
20;40:20
proposals (1)
19:11
proposed (10)
6:3;7:14,17,21,22;
17:13,18;18:4;24:18;
33:22
proud (1)
38:8
proven (1)
40:3
provide (6)
5:18;11:9;12:3;
22:22,23;43:25
provided (2)
11:23;44:12
provisions (2)
34:22;35:5
PUBLIC (19)
1:4;4:13,20,25;
5:10,15,23;6:5,19;
7:18;13:14;24:2,11,
17,20;39:15;44:4,8,13
publish (1)
6:24
published (1)
5:4
pump (6)
9:11,23;10:4;34:20;

35:11,14
pumps (3)
15:5,10;41:5
purpose (3)
4:21;7:11;25:2
pursuant (3)
5:5,10;7:6
put (5)
15:5,13;16:10;19:6;
25:13
putting (5)
19:10;29:2;31:5;
38:8;42:18

Q

Quality (2)
5:6,22
quarter (1)
35:21
quick (1)
9:19
quite (1)
34:2
quote (1)
24:8

R

race (1)
39:23
railroad (1)
20:9
rainfall (1)
8:23
Ray (4)
13:23,24;14:17;
23:12
Raymond (3)
14:19;15:2;23:9
RE (1)
1:6
reached (1)
44:8
reactor (1)
10:16
read (2)
7:20;23:14
real (2)
26:21;27:23
really (13)
18:25;19:4,5;21:9,
17;22:6;28:3,4;37:25;
38:16;39:22;40:6,6
rebuke (1)
33:2
receive (1)
4:22
received (3)
5:2;6:16,21
receiving (1)
10:25
recess (1)
44:3
recommend (2)
28:19;29:3
record (15)
4:3;11:2,5,10;13:8;
14:4,15;27:9,12,15;
43:14,20,24;44:2,7
RECOVERY (3)
1:2;4:16;11:20
references (1)
24:25
referendum (6)
24:2,5,11,17,20;
29:7
refreshments (1)
13:16
regarding (2)
23:19;35:7
regular (2)
8:23;41:2
reiterate (1)
24:15
related (2)
7:13;33:16
remember (1)
32:14
removal (1)
24:25
removed (2)
25:6;40:11
Renewals (1)
4:18
reply (1)
13:9
report (1)
17:2
reporter (4)
4:4;11:4;14:4;27:9
representatives (2)
5:9;12:2
represented (1)
23:20
representing (1)
36:12
request (1)
11:11
requester (1)
43:15
required (1)
9:24
requirement (1)
34:18
requires (3)
6:4,5;28:7
resident (3)
38:23;39:13;40:12
residential (11)
8:7,13;23:22;25:23;
28:22,24;35:8,9,15,
17;36:21
residents (4)
12:20;23:25;24:17;
36:12
resiliency (2)
31:16;32:23
respond (3)
5:13;6:15;11:13
responded (3)
5:11;11:16;15:20
responses (1)
6:21
responsible (2)
7:10,10
retired (1)
20:15
return (1)
11:8
Review (10)
5:6,18,22,24;6:6,
20;7:14,17,18;14:15
reviewing (1)
6:13
revisions (1)
6:22
rid (2)
25:11;27:3
right (8)
4:2;11:25;13:20;
17:15;25:24;26:6;
42:9;43:21
rises (1)
37:23
rising (5)
37:15,19,20;38:5,
18
River (56)
1:6;4:1,23;5:1;6:1,
3;7:1,21;8:1,8,16;9:1;
10:1;11:1;12:1;13:1;
14:1;15:1;16:1,5,25;
17:1;18:1,4,11;19:1,
20;20:1,19,23;21:1;
22:1;23:1;24:1;25:1;
26:1;27:1;28:1;29:1;
30:1;31:1;32:1;33:1;
34:1;35:1;36:1;37:1,
14;38:1;39:1;40:1;
41:1;42:1;43:1;44:1;
45:1
rivers (1)
23:3
Riverside (1)
40:19
Road (1)
1:12
roads (1)
30:18
Robert (2)
23:10;30:8
rose (1)
38:21
Rudy (1)
12:3
ruined (1)
38:12
rules (1)
5:20
run (4)
15:6,15;34:7,10

S

sad (1)
29:11
same (1)
33:21
sand (2)
23:2,2
Sandy (1)
9:4
saw (1)
28:21
saying (5)
4:5,6,9;20:15;27:14
Scoping (42)
4:1;5:1;6:1;7:1;8:1;
9:1;10:1;11:1;12:1;
13:1;14:1;15:1;16:1;
17:1;18:1;19:1;20:1;
21:1;22:1;23:1;24:1;
25:1;26:1;27:1;28:1;
29:1;30:1;31:1;32:1;
33:1;34:1;35:1;36:1;
37:1;38:1;39:1;40:1;
41:1;42:1;43:1;44:1;
45:1
seasonal (1)
9:5
second (2)
27:5;39:19
seconds (1)
38:19
Section (3)
24:24;25:7;28:19
sections (2)
28:18;30:17
seems (1)
25:14
selling (2)
17:4,4
Senator (1)
40:22
separate (3)
7:15;9:11;22:25
septic (3)
22:24;25:8;36:19
septics (2)
22:17;37:4
SEQRA (4)
5:6,10;6:4;7:6
S-E-Q-R-A (1)
5:7
sequencing (1)
10:16
service (1)
34:16
set (1)
5:19
seven (2)
21:19,21
several (1)
23:24
sewage (6)
7:24;20:12,15;
31:15;37:7;40:24
Sewer (30)
1:6;4:24;6:4;7:21,
23;8:4;9:23;16:25;
17:12;18:5;20:7;24:3,
6,9,10;25:3;27:25;
28:9,15,15,17;29:3,
17;31:19;35:23;
36:22,23;42:10,16,16
sewers (20)
9:8,9,10,25;16:12;
19:17;21:14;22:2,3,6;
23:5;28:21;32:11,12;
33:8;36:25;37:20;
41:2,20,24
sheets (1)
6:12
shell (1)
22:23
shellfish (1)
38:13
Shirley (6)
7:23;15:25;24:3,10;
31:18,20
short (1)
17:5
shot (2)
14:14;27:20
show (1)
29:13
shut (1)
34:20
sick (1)
31:14
side (3)
20:19,23;24:24
sides (1)
20:23
Siebert (5)
30:24;31:3,4;32:3,
21
signed (3)
11:3;43:12,25
significant (1)
28:22
sign-in (4)
6:12;11:12;43:15;
44:12
silent (1)
4:10
single (3)
22:25;31:6;41:7
site (4)
10:24;41:6,6,6
siting (2)
8:21;36:2
sitting (1)
14:5

six (1)
24:13
size (2)
33:21;34:5
sludge (3)
41:7,11,12
small (1)
29:9
smaller (1)
33:25
smell (1)
22:19
snowstorm (1)
15:9
solution (1)
16:7
Somebody (2)
16:10;40:10
somehow (1)
25:16
Sorry (4)
9:20;13:24;27:7;
32:4
Sound (1)
23:4
south (2)
8:8,15
southwest (1)
10:8
span (1)
34:19
speak (4)
13:8;26:14,23;
27:17
speaker (2)
11:6,11
speakers (6)
4:6;11:2;13:21;
18:17;43:12;44:8
speaking (1)
11:8
speaks (1)
36:17
specific (1)
38:20
specifically (1)
25:24
Spery (3)
18:18;21:5,5
spoke (1)
13:7
staffing (1)
34:17
standard (2)
34:25;40:5
start (4)
4:4;15:11;22:11;
27:6
started (1)
4:3
State (12)
4:16,18;5:5,21;7:2;
14:3;17:22;28:4;
39:16,18,21;40:22
statement (12)
4:23;5:3,12,25;6:2,
23,24,25;7:6;11:6,17;
33:17
states (1)
24:8
Station (1)
32:9
stations (2)
9:11,24
stay (1)
13:6
STEPHANIE (2)
45:5,12
Stepping (5)
13:25;18:19;23:11;
31:2;39:11
Steven (2)
18:17;20:4
Stony (1)
37:16
stop (2)
14:8,11
stopped (1)
15:11
storage (1)
10:2
STORM (3)
1:2;4:16;11:20
storms (2)
9:5;32:24
STP (3)
25:20,25;26:6
Street (3)
11:20;25:25;35:4
streets (2)
26:5;30:16
stress (1)
12:23
structures (1)
10:18
study (1)
28:14
studying (1)
29:4
subject (2)
8:22;24:17
submit (3)
14:13;43:18;44:11
submitted (2)
11:18;23:16
submitting (1)
6:14
successful (1)
28:17
suffer (1)
26:2
Suffolk (7)
4:25;5:9,13;17:3,
19;22:22;42:3
suggestion (1)
28:13
summary (1)
7:20
summer (2)
7:19;38:23
Sunderman (2)
12:4,6
Sunrise (1)
8:14
supposed (1)
35:24
surface (2)
8:23,25
surrounding (1)
10:21
sustain (1)
20:16
system (34)
7:24;9:7,23;10:14,
23;15:13,13;17:12,14,
17,18,19,21;18:5,10,
12;19:9,12,15,16,21;
22:7;24:12;33:19,21;
34:3;41:2,17,17;42:5,
10,10,15,17
systems (10)
18:8;19:12;21:19;
22:25;25:8;31:19;
36:22,23;42:3,7

T

table (5)
6:12;11:12,24;
43:15;44:12
tables (1)
38:9
tag (1)
13:11
talk (3)
37:15;40:10,14
talking (3)
17:15;21:21;38:8
talks (1)
37:18
tank (1)
10:3
tanks (2)
10:19;35:15
tearing (2)
30:16,18
technology (3)
40:2,3;43:7
Tellefsen (4)
39:10;40:18,19;
41:12
tells (1)
43:2
terms (1)
24:16
thanks (3)
13:17,18;26:19
Therefore (1)
16:13
thickens (1)
41:13
thinking (1)
19:10
third (1)
25:19
third-world (1)
31:14
though (1)
12:8
thought (2)
14:11,14
thousand (2)
37:5,6
threatening (1)
22:9
three (8)
11:2,7;12:17;13:20;
14:6;18:16;25:20;
37:12
thrive (3)
41:20,23;42:24
throughout (1)
9:12
ticket (1)
22:2
tide (1)
38:9
timely (1)
13:23
today (3)
12:7;13:16;43:4
tonight (5)
5:16;11:10,15;
13:18;43:18
tonight's (3)
4:13;5:15,20
took (2)
21:19;45:8
top (1)
21:21
total (1)
40:4
totaling (1)
10:7
towards (3)
31:17,18;32:23
Town (4)
4:24;6:11;17:23;
28:12
tracks (1)
20:10
transcribe (1)
11:4
transcribing (1)
4:5
transcript (2)
45:6,7
transparent (1)
29:16
treat (1)
17:16
Treated (1)
10:17
treatment (16)
7:25;8:21;9:13;
10:6,10,14;17:12,14,
17,18;18:12;20:13;
35:24;37:7;39:18,20
tremendous (1)
28:25
tremendously (2)
29:2;32:2
tributaries (1)
8:16
tri-hamlet (2)
16:3;40:23
truck (1)
41:13
true (1)
45:7
truly (1)
29:7
Trust (1)
4:19
Turn (3)
9:17;22:15;26:12
turning (1)
17:25
twenty-four (1)
37:6
two (6)
10:6;12:15;13:12;
15:2;24:23;38:20
type (2)
40:25;41:2

U

uncertain (1)
24:16
under (4)
7:16;32:4,4,5
underground (1)
10:17
undeveloped (2)
8:18,19
unnamed (1)
9:5
up (30)
9:10;11:2,3;12:2;
13:3,21,25;14:10;
15:13;18:10,19,20;
19:9;20:9;22:19;
23:11;26:13,23;
29:13,14;30:16,18;
31:2;32:21;39:11;
42:11;43:6,7,12,25
urge (1)
24:15
use (3)
10:15;24:4;37:9
used (4)
9:10,23;22:22;43:2
uses (1)
38:15

using (2)
26:18;44:11

V

vacuums (1)
41:3
VALDER (2)
45:5,12
values (3)
28:11;29:2;32:8
various (1)
6:10
varying (1)
9:2
via (2)
23:16;44:11
Village (3)
17:20,23,24
vital (1)
37:8
voice (3)
4:10;33:15;39:12
volume (1)
26:13
vote (8)
12:22;16:17;21:10,14;22:10,15;23:6;42:22
voter (1)
24:7
voters (3)
12:20;13:3;24:12

W

Wahl (3)
13:24;15:23,24
wait (1)
15:14
wall (1)
37:3
wants (1)
16:10
warning (2)
14:7,8
waste (1)
17:25
wastewater (11)
7:25;8:21;9:12,13;10:5;39:15,20;42:3,7,10,15
water (4)
8:25;38:18;39:15,17
water's (1)
20:20
Watershed (6)
1:6;4:24;6:4;7:21;16:25;18:5
waterway (1)
37:13
waterways (1)
37:14
way (3)
14:13;37:21;40:9
Website (3)
6:7;7:7;23:16
welcome (1)
18:15
weren't (1)
25:23
west (1)
8:16
what's (3)
20:18;32:11;42:11
where's (1)
35:3
Whereupon (1)
44:3
wherever (1)
28:8
whole (3)
20:10,17;42:23
who's (3)
37:16,16;40:10
whose (1)
40:12
William (1)
8:15
willing (1)
40:13
winters (1)
38:3
within (5)
24:13;27:25;37:12,13;45:6
without (4)
24:6;36:24;41:21,25
witnessed (1)
17:21
work (8)
9:18;29:19;30:15;36:23;37:22;38:17;41:4;43:17
working (6)
14:21,22;39:15,19,23;42:18
Works (2)
5:10;37:21
world (2)
37:10,11
worried (1)
31:23
worry (1)
30:10
write (3)
23:15,18;43:18
writing (2)
5:11;11:19
written (1)
6:14
wrote (1)
40:23
wwwstormrecoveryNYgov/enviornmental-docs (1)
7:8
wwwstormrecoveryNYGOV/environmental-docs (1)
6:8

X

X' (1)
29:10

Y

yardage (1)
25:16
yards (4)
24:25;25:4,6,11
year (1)
32:5
years (10)
18:9;21:20,21,22;22:5;23:21;24:13;32:14;38:20;39:14
York (14)
1:13;4:15,18,25;5:5,21;7:2;11:21,21;28:4,20,20;39:16;40:22
young (1)
28:12

Z

ZANAIB (1)
19:3
Zeldin (1)
40:22
zero (2)
22:23,24
zoning (1)
35:2

0

05/22/2018 (42)
4:1;5:1;6:1;7:1;8:1;9:1;10:1;11:1;12:1;13:1;14:1;15:1;16:1;17:1;18:1;19:1;20:1;21:1;22:1;23:1;24:1;25:1;26:1;27:1;28:1;29:1;30:1;31:1;32:1;33:1;34:1;35:1;36:1;37:1;38:1;39:1;40:1;41:1;42:1;43:1;44:1;45:1

1

1 (1)
36:19
1,300 (1)
8:6
1,600 (1)
8:12
1.3 (1)
35:24
1.4 (1)
10:11
10 (1)
43:23
10004 (1)
11:21
1080 (1)
1:12
11950 (1)
1:13
12 (2)
9:10;21:22
13.7-acre (1)
8:18
130 (1)
36:12
15 (1)
32:14
17-acre (1)
8:18
18 (1)
38:25
1st (3)
6:17,18,20

2

2 (2)
24:25;25:5
2,000 (1)
8:4
20 (1)
39:14
2000 (1)
38:20
2005 (1)
38:24
2007 (1)
37:5
2011 (1)
9:5
2012 (1)
9:4
2018 (6)
1:8;5:22;6:17,18,20;17:3
21st (1)
43:6
22 (1)
1:8
25 (1)
11:20
2nd (2)
5:22;17:2

3

30 (3)
6:5;23:21;38:19
30.7 (1)
10:8
300 (1)
35:2
30-second (1)
14:7
32 (1)
38:23
360,000 (1)
22:24

4

4.2 (1)
24:24

5

5 (3)
6:16,18,19
50 (2)
22:22,23
5th (1)
11:20

6

60,000 (1)
22:3
600 (1)
32:4
658,000 (3)
25:4,5,11

7

7:03 (1)
1:9
7:50 (1)
44:4
75 (1)
34:24

8

8 (1)
43:23
8:45 (2)
44:5,7
8:47 (1)
44:15

9

9 (1)
44:7