Nassau County
Stormwater Management Program

WHITE'S CREEK SUBWATERSHED
Stormwater Runoff Impact Analysis AND CANDIDATE SITE ASSESSMENT REPORT

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CASHIN ASSOCIATES, P.C.
Engineering • Planning • Construction Management

Cashin Associates, P.C.

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1. INTRODUCTION

The White's Creek Stormwater Runoff Impact Analysis (Analysis Report) has been prepared in accordance with the Nassau County Stormwater Management Program *Stormwater Runoff Impact Analysis Procedures Manual*. The Procedures Manual provides a methodology to assess and score all of the subwatersheds in the County in accordance with a standardized procedure. The Analysis Report contains a summary of all of the assessment data collected and developed regarding the subwatershed condition and also identifies potential water quality improvements.

The goals and objectives of the Stormwater Runoff Impact Analysis are to:

- Assess the condition of the existing subwatershed;
- Map the drainage infrastructure;
- Identify pollutants of concern; and
- Develop candidate projects and sites for mitigation of pollutant loading and improvement of water quality within the stream to the greatest extent possible.

The Analysis Report is organized into two main sections as follows:

- subwatershed assessment; and
- Stormwater management practice (SMP) candidate site assessment and recommendations.

The subwatershed assessment section describes the drainage infrastructure mapping, vulnerability analysis and stream assessment which were conducted in accordance with the methodology outlined in the *Stormwater Runoff Impact Analysis Procedures Manual*. The SMP candidate site assessment and recommendations section analyzes the collected data and identifies potential locations to site SMP's and also provides an analysis of potential pollutant load reduction and water quality improvement.

The data developed in this report can be entered into a comparative analysis sheet that will allow the County to track existing conditions and anticipated improvements for each subwatershed in the County.

2. SUBWATERSHED ASSESSMENT

The Center for Watershed Protection (CWP) classifies watersheds into five watershed management units. These include catchment area, subwatershed, watershed, subbasin, and basin. According to the CWP, the subwatershed-scale is preferred for assessment studies and is therefore the scale is used for this analysis. The drainage basins for water in Nassau County are the South Shore Estuary on the south shore and the Long Island Sound on the north shore. Nassau County has defined the watersheds based on the bay or inlet to which tributaries drain. The Oyster Bay Harbor/Mill Neck Creek watershed is located between Locust Valley and Oyster Bay Cove on the north shore. Subwatersheds are the tributaries that drain to the watersheds. For Oyster Bay Harbor and Mill Neck Creek the tributaries include Tiffany Creek, Whites Creek and Mill River which drain directly into the harbor and Francis Ponds/Beaver Brook, Kentuck Brook and Bailey Arboretum Brook which drain into Mill Neck Creek.

The subwatershed assessment included review of available subwatershed data including Nassau County Geographic Information System (NCGIS) mapping, other available municipal mapping, Nassau County record documents and other available municipal record documents. After available records wee reviewed, the land use data was utilized to estimate existing impervious cover, water quality storm volumes and pollutant loads. The stream assessment was conducted to verify mapping, assess field conditions and examine drainage infrastructure systems. The compiled information was analyzed to identify locations where stormwater runoff is impacting the stream either via inputs (i.e., outfalls, illicit discharges or lack of buffers) or through effects on the stream corridor (erosion, channelization or stream crossings). This data is used to identify potential candidate site locations for recommended stormwater management practices.

2.1. DRAINAGE INFRASTRUCTURE MAPPING

All sources of potentially available drainage data were reviewed and the information collected on a new layer in the GIS system. Prior to completing the stream assessment, areas where drainage infrastructure appeared to be lacking were noted and highlighted for review in the field. Drainage infrastructure data collected during the stream assessment was added to the drainage infrastructure maps.

2.1.1. MAP DEVELOPMENT

The Nassau County Geographic Information System (NCGIS) files for the subwatershed were requested and received from the Nassau County Department of Information Technology. The NCGIS data served as the base map on which newly identified information could be added.

At the offices of the NCDPW Engineering Department, a list of drainage maps for road projects and subdivision developments within the subject subwatershed was compiled from the County "drainage books" (a series of three sets of documents). A Freedom of Information Law (FOIL) request including the list of drainage maps necessary for the subject infrastructure review was prepared. Table 2-1 shows the list of documents requested via the FOIL. Review of the Nassau County as-built records identified 67 documents that pertained to work conducted in the White's Creek subwatershed. The maps were provided to a printing sub-consultant for scanning into Tagged Image File (TIFF) formatted documents. The documents were returned to the NCDPW Engineering Department along with a CD copy of the scanned documents. The drainage information from the scanned documents was transferred to a new GIS layer in accordance with Nassau County mapping protocols.

A FOIL request for available record documents for road projects within the subwatershed was made to New York State Department of Transportation. Paper copies of record documents were received. The drainage information that pertained to

the subwatershed was mapped in AutoCAD and transferred to GIS format on the same layer as the scanned data from Nassau County record documents.

The final layer combining the data from all sources is titled "Final GIS Layers" and includes identification of the source of the data in the "Origin" database column. The data identified in the field using GPS is included on the "Final GIS Layers" and is identified as "Cashin Associates GPS".

2.1.2. FIELD DATA COLLECTION

Using the mapping developed in Section 2.1.1, areas with incomplete drainage mapping were identified. A field survey of the drainage infrastructure in those locations was conducted. This task was performed in conjunction with the Stream Assessment described in Section 2.3. During the assessment, the stream corridor was walked to verify the mapped outfalls and to identify other locations where storm runoff appeared to be directly entering the stream. The drainage infrastructure upstream of each outfall was then field verified to identify the extent of the drainage infrastructure contributing to each outfall. The drainage infrastructure of the White's Creek subwatershed is shown on Map 2-1.

2.2. SUBWATERSHED VULNERABILITY ANALYSIS

The subwatershed Vulnerability Analysis consists of three components as follows:

- subwatershed characterization;
- impervious cover assessment; and
- pollutant load analysis.

The subwatershed characterization includes a description of the subwatershed's size, land uses, boundary, and length of waterbody. The impervious cover assessment calculates the amount of impervious area in the subwatershed based on: 1) NCGIS data for parking lots,

roads, building footprints; and 2) area calculations for sidewalks and driveways. The pollutant load calculation uses NCGIS data for land use in conjunction with standard coefficients for runoff pollutant levels, resulting in an estimate of pollutant loads for the subwatershed.

2.2.1. SUBWATERSHED CHARACTERIZATION

The White's Creek subwatershed is located within the Town of Oyster Bay in the northeastern portion of Nassau County. Presently, White's Creek comprises a short section of tidal creek and a narrow segment of freshwater. The tidal creek receives drainage from stormwater outfalls located at the northerly end of South Street. Runoff from the majority of the subwatershed, carried in street gutters and a network of underground piping, discharges at these outfalls. The freshwater segment is a channelized stream located between South Street and White Street that carries runoff from the drainage infrastructure in municipal parking lots and surrounding roadways.

The current White's Creek subwatershed encompasses 289 acres that contribute runoff that eventually enters White's Creek. The original subwatershed has been reduced significantly in size by the installation of recharge basins and other drainage infrastructure that contain storm runoff volume from roads, subdivision developments, and commercial and industrial sites. When an area contains storm runoff in on-site drainage infrastructure, that area is described as self-contained. For the subject analysis, those areas determined to be self-contained have been removed from the subwatershed area.

The geographic limits of the White's Creek subwatershed were defined through review of topographic maps, plans of existing municipal drainage infrastructure, and field assessment. Map 2-2 shows subwatershed topography along with existing drainage infrastructure.

The White's Creek subwatershed is centered along NYS Route 106/South Street. This is a New York State road (NYS Route 106) within the southern segment of the subwatershed and a Nassau County road (South Street) within the northern segment. Land use within the subwatershed is comprised of urban commercial downtown in the north and along Route 106 with high density residential surrounding most of the area. The subwatershed is approximately 21% commercial/industrial and 48% residential. The remaining land uses include roads, parks, and municipal land uses. Of the 629 residences in the subwatershed, 531 or 84% are smaller than one-quarter acre in size. There are few undeveloped municipal lots and little open space remaining within the subwatershed.

2.2.2. IMPERVIOUS COVER ASSESSMENT

Percentage of impervious cover has been determined to be an indicator of subwatershed health. Lower percentages of impervious cover in a subwatershed generally indicate that water quality is less impacted by pollutants than in subwatersheds with higher impervious cover percentages. The Center for Watershed Protection (CWP) has established subwatershed classification based on percentage of impervious cover ranging from sensitive streams (0-10% impervious) to urban drainage stream (>60% impervious). The impervious cover assessment uses methodology included in the NC Procedures Manual. The methodology is based on CWP procedures that use GIS data to estimate impervious cover. The impervious cover within the subwatershed was calculated from the NCGIS data and standardized tables developed by the CWP. The NCGIS data necessary to calculate impervious cover is presented in Table 2-2 GIS Data Chart.

The following sources or methods were used to calculate the impervious cover in the White's Creek subwatershed:

- NCGIS data allowed the actual footprint of all building areas and parking lot areas within each land use to be calculated.

- Area of roads was calculated from the NCGIS data.
- Total average driveway area was estimated by tallying the number of residences in each of five size categories, ranging from less than 1/8 acre to greater than one acre and applying impervious driveway factors from CWP as developed by Cappiella and Brown , 2001.
- Sidewalks were estimated by viewing aerial photography of the site and estimating the percentage of the subwatershed roads with sidewalks. In the case of White's Creek, 90% of the streets are estimated to have 4' wide sidewalks on both sides.

The impervious cover data was entered into the standard table from the Procedures Manual. The data table and results of calculations are shown on Table 2-3. The impervious area of the White's Creek subwatershed is 105 acres of the 289 total subwatershed acres. This represents 36% of the subwatershed. Based on the 36% impervious figure, White's Creek receives a subwatershed classification of non-supporting stream.

Non-supporting streams are dominated by urban stormwater runoff and increased flooding. The streams are generally channels for the conveyance of stormwater runoff and can no longer support the biological community. The stream channel becomes highly unstable, and many stream reaches experience severe widening, down cutting, and streambank erosion. Pool and riffle structure needed to sustain fish is diminished or eliminated and the substrate can no longer provide habitat for aquatic insects or spawning areas for fish. Water quality is consistently rated as fair to poor, and water recreation is no longer possible due to the presence of high bacterial levels. Streams generally display increases in nutrient loads to downstream receiving waters, even if effective urban BMPs are installed and maintained. The biological quality of non-supporting streams is generally considered poor, and is dominated by pollution-tolerant insects and fish. Although these streams may have potential for partial repair,

pre-development biological conditions cannot be achieved. These streams should be managed to prevent bank erosion, improve the stream corridor and improve water quality. The non-supporting subwatershed management goals are to minimize the downstream pollutant levels, alleviate flooding conditions, and improve the aesthetics of the corridor. All of these goals pertain to White's Creek.

2.2.3. STORM POLLUTANT LOAD CALCULATION

Nassau County has identified a number of pollutants associated with stormwater runoff to be of concern for the County's subwatersheds. Impervious surfaces act as a "trap and conveyance" mechanism for the pollutants, ultimately resulting in deposition of the pollutants into nearby waterbodies. These pollutants negatively affect the surface water quality. The pollutants identified by the County are carried in large quantities in storm runoff from roads and paved surfaces.

Total Suspended Solids – Total Suspended Solids (TSS), which includes silts and sediments, constitute the largest mass of pollutant loadings to surface waters. This pollutant is exported in greatest quantities from construction sites. In addition, TSS is generated from lands with insufficient vegetative cover, stream channel erosion, street sanding operations, and vehicle tires. NYSDEC has identified TSS as a pollutant of concern for New York State waters and requires that 80% of TSS be removed from runoff from new construction. The subwatershed's extensive road system and parking lots, compacted soils on small, older lots, and tight construction site conditions all have the potential to contribute to TSS in White's Creek.

Phosphorus and Nitrogen – Total Phosphorus (TP) and Total Nitrogen (TN) are two nutrients necessary for plant growth. Nonpoint sources of TP and TN are recognized causes of water quality degradation in many water bodies. These nutrients, washed into waterbodies via stormwater runoff, typically originate in lawn fertilizers and animal wastes from pets, waterfowl, small mammals and livestock. NYSDEC has

identified TP as a pollutant of concern for New York State waters and requires that 40% of TP be removed from runoff from new construction. Residences with small yards that drain to the street and pet wastes contribute TP and TN to White's Creek.

Fecal Coliform and Other Pathogens – Pathogens include bacteria, viruses and other microorganisms that can cause human illnesses such as hepatitis A. The suspected causes of this impairment originate in the feces of pets, livestock and waterfowl that are carried into waterbodies by stormwater runoff. Pet and waterfowl wastes contribute to high fecal coliform levels in White's Creek.

Hydrocarbons (Oils and Grease, Petroleum Compounds) – Oils and grease contain an array of hydrocarbon compounds, some of which can be toxic to aquatic life even at low concentrations. The major source of hydrocarbons in urban runoff is through the leakage of crankcase oil and other lubricating agents from motor vehicles and from facilities that service motor vehicles (e.g., repair shops and gasoline stations). Hydrocarbon concentrations are typically highest in runoff from parking lots, roadways, and service stations, areas which are significantly represented within the White's Creek subwatershed. Illegal disposal of waste oil onto streets and into storm sewers can also contribute to this problem.

Floatable Debris – Besides the obvious negative aesthetic effects, trash can impact aquatic life through either ingestion or entanglement. The urban nature of the White's Creek subwatershed contributes to increased levels of floatable debris or trash that collects in the stream and is carried to downstream waterbodies. The commercial areas and roads within the White's Creek subwatershed contribute a large floatable debris load to White's Creek. In addition, dumping of large debris was also observed in the White's Creek corridor.

The pollutant loads were calculated in accordance with the Nassau County Procedures Manual using the "Simple Method" for all pollutants with the exception of Floatable Debris. The Simple Method uses the land uses and CWP pollutant coefficients to calculate the pollutant loads. Land use was separated into the five categories of residential, commercial, industrial, roads and other. Pollutant load coefficients were assigned based on the land use. The "other" category includes parks, municipal properties and any other uses not included in the categories mentioned. Existing land uses within the subwatershed are presented on Map 2-4. The NCGIS land use data necessary to calculate pollutant loads is presented in Table 2-2 GIS Data Chart. Nassau County development criteria have long mandated that commercial and industrial properties contain their storm runoff on site. Those land uses can be excluded from the calculation if the field assessment confirms that these land uses are self-contained and do not contribute runoff to the waterbodies. For floatable debris, coefficients based on land use were developed for the categories of residential, commercial, industrial, roads and other. The coefficients are applied to each land use area to estimate floatable debris generation with the subwatershed.

The data was entered into the Water Quality Volume and Pollutant Load Calculation Table provided in the Procedures Manual. The resulting pollutant loads are shown on Table 2-4. The pollutant loads for each pollutant were assigned severity points based on the least, 1 point, to the most, 6 points, severe pollutant threat in the watershed. The pollutant loads are multiplied by the assigned severity points and the total is divided by 100 and entered into the pollutant severity score row on the Comparative Analysis Table. The pollutant loads are also used to assess potential SMP improvements to each individual subwatershed.

2.3. STREAM ASSESSMENT

The stream assessment was conducted in accordance with the NC Procedures Manual. In addition, the CWP *Unified Stream Assessment: A User's Manual* was reviewed prior to the field effort. The assessment was conducted during the winter months when the lack of

vegetation improved access to and provided visibility of the outfalls and stream corridor condition. White's Creek was assessed by traveling upstream from the mouth of the river at Oyster Bay Harbor. On the data sheets, the banks are described as left (west) and right (east) looking downstream.

The stream assessment for White's Creek was conducted on December 19, 2006. The equipment used by survey personnel to conduct the assessment included data assessment sheets, GPS unit, dry erase board and markers, digital camera, clipboard with a water resistant storage compartment, tape measure and waders. For this subwatershed, aerial photos and property line maps were used to record field data. In the event that property owners had concerns regarding the work, the survey team carried a contact list of the governing authority to provide to the residents. Each stream assessed was assigned an identification number starting with 100. White's Creek was the first stream assessed by this methodology and was assigned identification number 100.

During the stream assessment, the stream corridor was photographed at regular intervals and at specific locations. The interval photographs record the stream surroundings and any immediately identified points of interest. When a data assessment sheet was completed, a photograph of the specific location was taken. For each outfall and throughout each Reach photographs were taken to document the conditions. All photographs were immediately logged on the Photo Log sheet. The photographic log and photographs are included in Appendix A.

The data sheets were completed in either the field at each location or, when field conditions did not allow the immediate completion, immediately after returning from the field. Data Sheets are included in Appendix A. The data sheets are organized by reach in number order. In each reach section, the reach data sheets (RCH) are first followed by the outfall data sheets (OT), then the other data sheets.

When it was necessary to cross private property to reach the stream corridor, the assessment team would explain the purpose of the assessment and ask the property owner for permission to cross the property.

Reach boundaries were determined during the field assessment. The reach limits are selected based on one or more of the following criteria: change in surrounding land use; change in stream conditions; or a dividing characteristic such as a stream crossing or long culvert. White's Creek was assigned two reaches based on tidal influence and a long culvert. Reach 100-1 is the tidal segment and Reach 100-2 is the freshwater segment. The reaches were assigned identification numbers starting with xxx-1 at the subwatersheds downstream end. If branches had been encountered, the major branch reaches would have been completed and numbered first. The secondary branches subsequently would have been completed heading downstream from the point of confluence with the main branch.

The following paragraphs are a summary of the data collected on the assessment sheets. White's Creek, located at the northern end of the subwatershed, is less than a ¼ mile long with no branches. White's Creek flows north into Oyster Bay Harbor. The creek is dominated by stormwater runoff from the extensive upgradient drainage infrastructure. Reach 1 is tidal and receives all of the runoff from large piped outfalls (OT-1, OT-2, OT-3) and overland flow when the system exceeds capacity. A concrete bulkhead is located along the northern segment of the eastern bank of the creek. The western shoreline is separated from adjacent residences by a vegetated parcel owned by Commander Oil Company which also the developed shoreline along the western bank. The western parcel NC Tax Lot # 27-34-215) is undeveloped and provides an adequate buffer. Commander Oil Company also owns the parking lot north of Elsie Avenue. It appears that the drainage infrastructure may be in an easement through the grassed southwestern corner of that parcel (NC Tax Lot #27-034-72). In several locations it appears that the residences have expanded their yard space into the vegetated parcels. Existing outfalls have been undermined and appear to be in poor condition.

The RCH 100-1 data sheet includes a sketch of the reach which describes field conditions and identifies locations for which other data sheets were completed. In Reach 100-1, four outfalls were identified. The assessment identified a specific area of concern at the OT-2 and OT-3 concrete headwall. These outfalls carry the flow from Reach 2. The bottom of the headwall is severely eroded. Photographs 3 and 4 document this condition. A second area of concern is the buffer along the left bank of the creek. This condition is assessed on data sheet IB-1. The parking lot and buildings of the industrial facility, which appears to be for fuel oil storage, is immediately adjacent to the waterbody. The northern end of the site has a concrete bulkhead. The buffer area and riparian zone are extremely narrow. The buffer conditions are shown in photos #7, #10, #13 and #20. Along the western shoreline the commercial property is a fuel company. Access to the site was allowed, but required that the plant manager provide a security escort to accompany the assessment personnel as they reviewed the buffer area and shoreline. For security reasons, the plant manager requested that the site buildings not be photographed. Some debris, mostly concrete and asphalt, was noted along both banks. The overall stream condition was assessed to be in the suboptimal range, with the east bank ranking higher because of the vegetated, stable bank and buffer width. The west bank was rated lower because of channelization and lack of vegetation. The overall buffer and floodplain condition was assessed to be in the marginal to suboptimal range because of the lack of buffer zone and floodplain encroachment along the west bank. It should be noted that although the open water segment of White's Creek is limited, an extensive upgradient drainage infrastructure system outfalls through OT-1. The system has been determined to be undersized for the flow, creating an upstream flooding condition during rainfalls events. Prior studies have been conducted to identify measures to mitigate the flooding conditions, but no solution has been implemented to date. Additional studies may be necessary to develop a solution to the flooding. These studies may simultaneously be able to address some of the water quality issues at this location. Little open space to site SMP practices was identified, but a retrofit or restoration action such as a water quality inlet may be feasible in the road right-

of-way immediately prior to the stream outfall. OT-2 and OT-3 carry runoff and flow from Reach 2 into Reach 1.

Reach 100-2 is a small segment of the creek that extends south along the west side of White Street. The creek has been channelized through this section and carries storm flows from upgradient drainage infrastructure. There does not appear to be any aquatic habitat remaining in this reach. In several locations the shoreline has been hardened by the installation of granite blocks. The reach has a commercial parking lot on the east side. On the west side, the northern segment is adjacent to a small open grass lot and the southern segment runs behind several residences.

The RCH 100- 2 data sheet includes a sketch of the reach which describes field conditions and identifies locations for which other data sheets were completed. In RCH 100-2, two outfalls (OT-1, OT-2) were identified. OT-2 outfalls storm runoff from an upgradient drainage infrastructure system that extends through several municipal parking lots. There are two paved stream crossings, one at a private driveway (SC-2) and the other at Elsie Avenue (SC-3). SC-3 and SC-4, which is through a grassed area, are each a 50' length box culvert. TR-1 identifies a location at the southern end of the stream with discarded wood pallets and yard waste as shown in Photo #33. The overall stream condition was assessed to be in the suboptimal to marginal range because of disruption in vegetation and an area of bank erosion caused by high flows. The overall buffer and floodplain condition was assessed to be in the marginal to poor range because of the lack of buffer zone and floodplain encroachment. As discussed for Reach 100-1, studies may be necessary to develop a solution to the upgradient flooding condition. Solutions to the flooding problems may simultaneously address some of the water quality issues in Reach 100-2. The small open lawn area along the east side of Reach 2 may provide an opportunity to site a SMP. The space's limited size may restrict the size and capacity of any identified SMP practice.

Table 2-5 Subwatershed Comparative Analysis tabulates the information collected during the field assessment, along with the impervious cover results and pollutant severity score to produce a subwatershed total score. While the subwatershed total score can be subjective due to the many additional factors involved in assessing the subwatershed condition and the feasibility of SMP's, the general subwatershed score categories are as follows:

- 0-15 Optimal/Sensitive
- 16-30 Suboptimal/Impacted
- 31-45 Marginal/Non-supporting
- 46+ Poor/Urban

White's Creek was scored a 24 placing the creek in the suboptimal/impacted condition. Suboptimal/Impacted streams are estimated to have mid-range levels of impervious cover and pollutant loads. The subwatershed score can also be used to assess the conditions of a specific subwatershed in relation to other subwatersheds in the County or other jurisdiction. For example a watershed with a score of 48 would be identified as poor/urban and would face greater impacts that a watershed with a score of 11. However, even watersheds with low score may have segments that can be improved by specific stormwater management practices.

In fact, White's Creek and has been extensively impacted by the surrounding land use and extensive stormwater drainage systems and is more consistent with a poor/urban stream. The score of 24 is reflective of the limited length of the creek. The existing reaches of the creek have inadequate buffers, high storm flows, and flood plain encroachment. In addition, the surrounding urban character reduces the locations where structural SMP's can be located.

3. SMP CANDIDATE SITE ASSESSMENT AND RECOMMENDATIONS

3.1. WATER QUALITY CLASSIFICATIONS/DESIGNATED USES

Table 3.1 summarizes the NYSDEC general water quality classifications in terms of their best usage. The watersheds that were analyzed for this report include the freshwater sections of the creek tributaries which fall within the Class 'C" waters.

Table 3.1 NYSDEC Water Quality Classifications (6NYCRR Part 885 and Part 701)**.**

Waterbody	Water Classification	Best Usage
River /Creek - freshwater	C	The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
River/Creek - tidal	SC	The best usage of Class SC waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
Oyster Bay Harbor	SA	The best usages of Class SA waters are shell fishing for market purposes, primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

The NYSDEC has designated Oyster Bay Harbor a priority waterbody with known aquatic life impairment. A priority waterbody is a waterbody determined by NYSDEC staff, with public input, having uses precluded, impaired, stressed or threatened and, in some cases, requiring establishment of a TMDL. The causes of the impairments have been identified as pathogens from urban/storm runoff and municipal sources. The southern portion of Oyster Bay Harbor is a NYSDEC uncertified shellfishing area. Uncertified shellfishing areas are lands where the NYSDEC has prohibited shellfish harvesting for food uses in accordance with NYSDEC regulation 6NYCRR Part 41.

Pathogen TMDL's for shellfishing waters in Oyster Bay Harbor have been completed. There are set target percent reductions for pathogens levels.

Table 3.1 identifies "best usages". The actual usage of the waters is dependent upon the impairments to the quality of the waters. The numerous parameters that commonly characterize water quality include taste, color, suspended solids, oils, refuse, thermal discharges, phosphorus, nitrogen, pathogens and dissolved solids. A common example of this is Class "B" waters that have a best usage for primary recreational contact (swimming) but are closed due to impacts to the water quality as a result of high bacteria levels. Town and County beaches are often closed after a rainfall that causes high bacteria levels in those waters.

Two major water quality parameters for Class "C" waters are dissolved oxygen (DO) and coliform bacteria concentrations. Adequate DO is essential to the growth and reproduction of finfish and shellfish. DO is also important for the natural decomposition of organic wastes. Current public health standards call for low coliform bacteria concentrations as the presence of such bacteria is regarded to be an indication of potentially pathogenic contamination from human or animal wastes. The actual water quality may not be suitable for the best usage based on these water quality parameters.

3.2. SITE ASSESSMENT/SMP SELECTION

The White's Creek subwatershed is dominated by urban commercial and high density residential land use with limited open space for siting SMP's. The impervious cover assessment of the of White's Creek subwatershed determined that the area is 36% impervious and that White's Creek is a non-supporting stream dominated by urban storm runoff and increased flooding. White's Creek has a limited length of open water and an extensive drainage infrastructure system. The densely developed area has severely limited or no buffer width.

Numerous potential 'hot spots', locations with a higher than average probability of generating pollutants, were identified in this subwatershed. Potential 'hot spot' locations include:

- a petroleum bulk station (left bank of RCH 100-1) (Transport Related industry type);
- railroad car terminal/storage yard (Transport Related industry type);
- multiple auto repair and service stations (Commercial industry type);
- boat storage and repair shops (Industrial industry type);
- gas stations (Commercial industry type); and
- parking lots (Commercial industry type).

'Hot spots' are land uses that are known to have high levels of various materials including oil/grease containers, auto and marine parts, dumpsters, gas tanks, and other hazardous materials. If the storm runoff from these land uses is not contained on-site, they can easily be carried into the road drainage systems and into waterbodies.

The pollutants that can be expected to dominate this urban commercial watershed include silts and sediments, oil and grease, petroleum products, trash and bacteria from pet wastes.

White's Creek has an extensive drainage infrastructure system that extends south from the outfall along Route 106/Pine Hollow Road/South Street and discharges into the tidal reach of the creek. A smaller freshwater reach carries drainage from the commercial area south of Audrey Avenue and White Street. The drainage infrastructure and area topography are shown on Map 2-2. Storm flow from the surrounding residential street surfaces flow to the drainage infrastructure systems. The existing systems are severely undersized and flooding along South Street is typical during moderate to severe rain events. Several studies to evaluate and identify drainage improvements on Berry Hill Road have been undertaken but, to date, none of the recommendations resulting from the studies have been implemented. Route 106/South Street is dominated by commercial land use that has a

significant number of automotive repair shops and service stations. Not all of these locations appear to contain their storm runoff on-site due to the lack of area to infiltrate runoff on most of the urban commercial properties located along the northern section of South Street. It is also suspected that roof drains may connect into the drainage system through either surface flow or piped systems.

SMP's that can treat pollutants in heavy urban runoff flow and can also be located within the limited space available in the urban environment include infiltration practices such as drywells and ultra urban retrofits such as catch basin filters, water quality inlets, hydrodynamic structures and underground dry detention facilities.

3.3. SMP IMPLEMENTATION CANDIDATE SITES

The White's Creek drainage area is fully developed and largely impervious with no large undeveloped land parcels available. It is not economically feasible to acquire large developed parcels to site SMP's. The report prepared by the Town of Oyster Bay entitled ***Whites Creek Watershed Analysis & Stormwater Mitigation Plan*** (dated March 1998) (*1998 Whites Creek Plan*) identified a series of SMP's to reduce the pollutant loads entering Oyster Bay Harbor via Whites Creek. These recommendations have been reviewed and are expected to provide mitigation potential for this urban watershed. It should be noted that the *1998 Whites Creek Plan* used a water quality storm volume of 1". The current NYSDEC Design Manual for new development uses a 90% rainfall event for the average annual stormwater runoff volume, which equals a 1.2" rainfall on Long Island. The *1998 Whites Creek Plan* calculations removed the areas of developed sites that were identified to have self-contained drainage systems. The *1998 Whites Creek Plan* recommendations are summarized below.

The small recharge basin located on the west side of Pine Hollow Road/Route 106 is NYSDOT recharge basin (RB) #15. This basin was constructed in 1959 with an original design capacity of 75,882 CF. Lack of maintenance of the basin has resulted in sediment

build-up and reduced infiltration. The sediment build-up has reduced the basin capacity to below the capacity necessary for the contributing 53.5 acres of drainage area. The *1998 Whites Creek Plan* recommends excavation of NYSDOT RB# 15 and installation of a bypass system to ensure that the water quality storm runoff and the associated pollutants are contained in RB #15. This recommendation appears to provide adequate recharge basin storage potential for the water quality storm event volume from the 53.5 acres sub-drainage area and will capture TSS, hydrocarbons, bacteria and trash. As the water quality volume is stored and infiltrated to groundwater, small amounts of total nitrogen and total phosphorus will also be removed from runoff entering Whites Creek. This system is under NYSDOT jurisdiction. This location has been identified as Candidate Site 3 on Map 3-1.

The *1998 White's Creek Plan* second mitigation measure recommendation is for two pipe outfalls identified as 100-1 OT-2 and OT-3 herein. The upgradient drainage system extends along White Street and East Main Street and through a municipal parking lot to Summit Street. The drainage area is 14.9 acres and the water quality treatment volume was estimated at 41,480 CF. The piping system is adequate for the estimated peak flow but does not have a component to remove pollutants from the flow. The *1998 Whites Creek Plan* recommended mitigation measure is the installation of a water quality inlet immediately prior to the outflow. The location may be in either Elsie Avenue or, if an easement allows, in the existing grassed corner of parcel #27-34-215 which is owned by the Commander Oil Company. The municipal drainage infrastructure currently extends through this area, so an easement may already be in place. The WQI would be sized for an 11 CFS flow and a bypass piping system installed for larger storm events. The proposed SMP will capture TSS, hydrocarbons and trash. It will not capture bacteria. Bacteria levels may be low from this sub-drainage area due to the high commercial use. The non structural SMP's listed at the end of Section 3.3 can be used to reduce bacteria levels in this sub-drainage area. Nitrogen and phosphorus levels are expected to be low because of the existing commercial land use. This location has been identified as Candidate Site 2 on Map 3-1.

The third mitigation measure discussed in the *1998 White's Creek Plan* is for the 36" outfall identified as 100-1 OT-1 herein. This outfall is located at the northern terminus of South Street. The upgradient drainage system extends south along South Street and collects runoff from all of the surrounding street surfaces including Berry Hill Road. In addition, overflow from RB #15 also can enter the system immediately north of RB #15. The existing drainage infrastructure is severely undersized for the 47.37 CFS peak discharge from the sub-drainage area. When the flow exceeds the piping capacity, the runoff surface flows along South Street to Whites Creek. Several mitigation measures for the peak flows in this location have been studied and are discussed in the *1998 Whites Creek Plan*. For this report, the flow in the pipe system was used to identify and size the SMP. The maximum capacity of this piped system is the flow from a ¾" storm event or 40 CFS. Based on the existing drainage system, the *1998 Whites Creek Plan* recommended mitigation measure is the installation of a water quality inlet immediately prior to the outflall. The WQI would be located at the northern limit of South Street. The WQI would be sized for a flow of 40 CFS with no bypass piping required. The proposed SMP will capture TSS, hydrocarbons and trash. It will not capture bacteria, nitrogen or phosphorus. The non structural SMP's listed at the end of Section 3.3 can be used to reduce bacteria, nitrogen and phosphorus levels in this sub-drainage area. This system is under the jurisdiction of NCDPW. This location has been identified as Candidate Site 1 on Map 3-1.

Non-structural SMP's that can aid in reducing the pollutants that enter the Whites Creek include:

- increased street sweeping;
- enforcement of existing Town or County regulations for dog walking;
- enforcement of existing Town or County regulations for erosion and sedimentation control during and following construction;
- program to identify stormwater 'hotspots' and implement on-site infiltration systems; and

- public education on fertilizer and chemical use reduction and materials disposal and on trash disposal.

3.4. POLLUTANT LOAD REDUCTION ANALYSIS

As discussed earlier, the proposed SMP's treat less than the NYSDEC required water quality volume for new development, but due to the urban land use of the area and lack of available open space, potential SMP's are limited.

To estimate the pollutant load reductions achieved by implementation of the proposed SMP's, the outfall drainage areas that contribute to each identified SMP were estimated and the outfall drainage area pollutant loads were calculated during the preparation of *1998 White's Creek Plan.* The data from those calculations are included in Table 3-3 for each candidate site. (Tables 3-1 and 3-2 were not used to complete this report as the data was provided in the *1998 White's Creek Plan.)* Table 3-4 - Pollutant Reduction Analysis was completed by inserting the pollutant load total for each pollutant of concern from Table 2-5 and from Table 3-3 for each outfall into the appropriate columns and rows on Table 3-4. The SMP % Pollutant Reduction was adjusted to reflect the lower volume of the design storm.

The Candidate Site Assessment identified a total of three outfalls for potential SMP's at three candidate sites. Proposed SMP's include water quality inlets and recharge basin redevelopment. The outfall locations include three pipe outfalls. Where outfalls are located in close proximity and carry flow from similar areas, two SMP's are proposed but identified as a single candidate site. For example, the road drainage from Reach 100-2 is carried to outfalls OT- 2 and OT- 3 which are located immediately adjacent to each other.

If the proposed SMPs are implemented, and perform as anticipated, it is estimated that the pollutant loads from outfall drainage areas of White's Creek can be reduced by the following quantities and percentages:

Pollutant	Load Removal	Percent Removal
Total Nitrogen (TN)	140 lbs	7 %
Total Suspended Solids (TSS)	47,178 lbs	60 %
Total Phosphorus (TP)	27 lbs	9 %
Fecal Coliform (F Coli)	0.34 billion colonies	21 %
Trash (Floatable Debris)	685 lbs	41 %
Oil & Grease (Hydrocarbons)	1,358 lbs	33 %

Siting of SMP's that will reduce nitrogen, phosphorus and fecal coliform from runoff is limited by the ability to identify land where appropriate SMP's can be located. Generally, these SMP's require longer detention time and, subsequently, larger land areas. If land to site SMP's such as wetlands, infiltration or filtering practices or bioretention basins can be identified, it is recommended that these SMP's be pursued to further reduce pollutant load levels to White's Creek.

Nassau County Stormwater Management Program
Stormwater Runoff Impact Analysis
NCDPW Engineering Department
Map File List of Requested Plans
Table 2-1

Whites Creek (ID No. 100)					
COUNTY FILE # (BROWN / BLACK BOOK)		**OLD COUNTY FILE #** (BLUE BOOK)		**MUNICIPALITY FILE #** (RED BOOK)	
1943-1		2168-6		185-6	
494-4		1753-5		1934-9	
523-10		332-10		ENV.25-1065	
218-1		4113-1		1639-2	
4386-1		135-2		1599-2	
3356-2		55-4		1735-5	
123-581		139-6		183-1	
3302-4		19-2		180-8	
627-1		1580-2		46-8	
558-9		1510-2		133-1	
L3-16-4		135-37		133-2	
3144-8		2194-4		1592-4	
464-2		1935-3		1422-7	
3269-9		1651-4		2194-1	
3264-3		1397-7		225-2	
331		1651-1		1417-1	
1834-7		1638-3		3185-1	
3224-7		1001-3		1397-4	
1216-1		4245-7		4389-3	
2365-2				4397-2	
1367-1					
1387-1					
7005-1					
1943-2					
38-Y-4					
2103-10					
2514-3					
1619-4					
2157-4					

Nassau County Stormwater Management Program
Stormwater Runoff Impact Analysis
GIS Data
Table 2-2

Name of Subwatershed: **Whites Creek (ID No. 100)**

Tributary to:	**Oyster Bay Harbor**
Adjacent Land Use:	**High Density Commercial**

Impervious Information

	Area		Building Area		Parking Lot Area		Length of Roads		Number of Residences
Residential	139	Acres	23	Acres					629
Commercial	56	Acres	13	Acres	16	Acres			
Industrial	6	Acres	3	Acres	1	Acres			
Roadway (Pavement)	26	Acres							
Other (Parks, Municipal, (ROW-Pvmt), Etc.)	62	Acres	2	Acres	10	Acres			
Total Subwatershed	289	Acres	41	Acres	27	Acres	36,049	LF	

Residential Lots	Quantity in Subwatershed
43,561 +	16
21,781 - 43,560 SF	6
10,891 - 21,780 SF	76
5,446 - 10,890 SF	373
0 - 5,445 SF	158
Total Number	629

Assumed Percentage of Roadway With Sidewalks (%)	90
Sidewalk Width (FT)	4
Assumed Sides of Roadway With Sidewalk	2

*** Source NCGIS Database Dated July 24, 2006**

Nassau County Stormwater Management Program
Stormwater Runoff Impact Analysis
Impervious Cover Calculations
Table 2-3

Impervious Driveway Factors		
Residential Lot Area (AC)	**Average Driveway Area (SF)**	**NC criteria**
2	3,212	1-2+ AC
1	2,073	1/2-1 AC
1/2	1,152	1/4-1/2 AC
1/4	652	1/8 - 1/4 AC
1/8	432	0-1/8 AC
Source : Cappiella and Brown, 2001		
WVA Table 4: Average Driveway Areas in the Chesapeake Bay Region		

Average Residential Driveway Area Calculation				
Subwatershed	**Whites Creek (ID No. 100)**			
Tributary to	Oyster Bay Harbor			
Residential > 1 acre - 3212 SF	Units	16	Acres	0.2
Residential > 1/2 acre to ≤ 1 acre - 2,073 SF	Units	6	Acres	0.1
Residential > 1/4 acre to ≤ 1/2 acre - 1,152 SF	Units	76	Acres	0.8
Residential > 1/8 acre to ≤ 1/4 acre - 652 SF	Units	373	Acres	3.7
Residential ≤ 1/8 acre - 432 SF	Units	158	Acres	1.6
Total Acres Driveways Impervious	Units	629	Acres	6

Sidewalk Area Calculation	
Subwatershed	**Whites Creek (ID No. 100)**
Tributary to	Oyster Bay Harbor
Linear feet of road	36049
Assumed percentage with Sidewalks	90
Sidewalk Width	4
Sides Sidewalk	2
Total Acres Sidewalk	6
Calculation : LF of road x % with sidewalks x 4 ft w x 2 sides	

Impervious Area Calculation		
SubWatershed	**Whites Creek (ID No. 100)**	
Tributary to	Oyster Bay Harbor	
Adjacent Land Use	High Density Commercial	
Total Subwatershed Area	Acres	289
Impervious areas		
Buildings Area	Acres	41
Roads Area	Acres	26
Parking Lot Area	Acres	27
Sidewalks Area - See Table	Acres	6
Driveway Area Total - See Table	Acres	6
TOTAL IMPERVIOUS AREA	Acres	**105**
TOTAL % IMPERVIOUS	%	**36%**
Classification	**4**	

Impervious Area Notes
1. GIS Data Table is source for areas of buildings, roads and parking lots.
2. Sidewalk area calculations are based on percentage of sidewalk area estimated by preparer
3. Impervious Driveways Factors Table - Average Driveway Areas Souce: WVA Table 4, Cappiella and Brown

Initial Subwatershed Classification			
	8	Sensitive Stream	0-10% impervious
	6	Impacted Stream	>10%- to 25% impervious
	4	Non-Supporting Stream	> 25%- 60% impervious
	2	Urban Drainage Stream	> 60% impervious
Source: WVA Figure 4 and Table 2			

Nassau County Stormwater Management Program
Stormwater Runoff Impact Analysis
Water Quality Storm Event (WQSE) Volume and Pollutant Load Estimates
Table 2-4

Subwatershed		**Whites Creek (ID No. 100)**							
Tributary To		Oyster Bay Harbor							
Land Use		**Residential**	**Commercial**	**Industrial**	**Roadway**	**Other**	**TOTAL**		
Contributory Area	Acres	139.0	56.0	6.4	25.8	61.8	**289.0**		
Impervious Area	Acres	22.6	29.3	3.9	25.8	11.6	**93.2**		
Impervious Area	%	16.2	52.3	61.3	100.0	18.8	32.2		
Water Quality Storm Event Volume	WQv-acre-feet	2.7	2.9	0.4	2.5	1.4	9.8		
Water Quality Storm Event Volume	WQv-Cubic Feet	118,716.2	126,992.6	16,803.3	106,806.9	58,849.6	428,168.7		
Annual Rainfall	inches	42.0	42.0	42.0	42.0	42.0	42.0		
Annual Runoff	inches	7.4	19.7	22.7	35.9	8.3	12.9		
Total Nitrogen (TN)	coefficient mg/l	2.2	2.0	2.5	3.0	2.0		SEVERITY PTS.*	TOTALS
	lbs	512.2	498.1	82.4	628.4	230.8	**1,951.9**	3.0	5,855.8
Total Suspended Solids (TSS)	coefficient mg/l	100.0	75.0	150.0	120.0	54.5			
	lbs	23,282.1	18,678.9	4,943.1	25,135.8	6,290.0	**78,330.0**	4.0	313,319.9
Total Phosphorus (TP)	coefficient mg/l	0.4	0.2	0.4	0.5	0.3			
	lbs	93.1	49.8	13.2	104.7	30.0	**290.9**	2.0	581.7
Fecal Coliform (F Coli)	coefficient mpn/100 ml	7,750.0	3,000.0	2,400.0	1,700.0	5,000.0			
	billion colonies	0.8	0.3	0.0	0.2	0.3	**1.6**	6.0	9.7
Floatable Debris	coefficient CF/AC	5.0	8.0	5.0	8.0	5.0			
	CF	695.0	448.2	32.1	206.5	308.8	**1,690.5**	1.0	1,690.5
Oil and Grease	coefficient mg/l	3.3	5.0	4.0	8.0	3.0			
	lbs	768.3	1,245.3	131.8	1,675.7	346.2	**4,167.3**	5.0	20,836.7
							86,432.3		**342,294.4**
								SCORE	**1,184.4**

SOURCE:
"C" Valve Source; See Table
Impervious Area is based on NCGIS Impervious Area Data from building areas, parking areas, and road areas
* The pollutant loads for each pollutant were assigned severity points based on the least, 1 point, to the most, 6 points, severe pollutant threat in the watershed. The pollutant loads are multiplied by the assigned severity points and the total is divided by 100

Nassau County Stormwater Management Program
Stormwater Runoff Impact Analysis
Subwatershed Comparative Analysis
Table 2-5

	Unit Criteria	Scoring Criteria	Whites Creek (ID No. 100)			
			100-1		100-2	
Stream Assessment Quantification	**Unit**	**Points**	**Qty**	**Qty x Pts**	**Qty**	**Qty x Pts**
Outfall	per outfall	2	4	8	4	8
Suspected Illicit Discharge or Hot Spot Locations	per location	8	0	0	0	0
WQ Retrofit/Restoration Candidates	per location	1	1	1	1	1
Infrastructure Investigations Required	per location	1	0	0	0	0
Severe Bank Erosion	per location	1	1	1	1	1
Inadequate Buffers	per 5% of reach	5	10	50	20	100
Road Crossings	per location	1	0	0	4	4
Channelized Segments	per 5% of reach	1	2	2	2	2
Public Ownership of the Stream Corridor	per 10% of reach	1	0	0	0	0
Livestock Encroachment or High Waterfowl Populations	per location	5	0	0	0	0
Threatened Infrastructure	per location	3	1	3	1	3
Trash Accumulation In Stream	per location	5	0	0	1	5
Stream Condition Subtotal (RCH)	from RCH sheet.	80	51	-6	41	-5
Buffer/Floodplain Condition Subtotal (RCH)	from RCH sheet.	80	34	-4	9	-1
Reach Total	**No. of Reaches**	2	**54**		**118**	
Subwatershed Total			**172**			
Impervious Cover Classification	Sensitive, Impacted, Non supporting, Urban	8,6,4,2	**4**			
Pollutant Load			**12**			
Total Score			**24**			
RANK						

Nassau County Stormwater Management Program
Candidate Site Assessment
Water Quality Storm Event (WQSE) Volume and Pollutant Load Estimates
Table 3-3

Outfall		**NYSDOT RB #15**					
Tributary To		Oyster Bay Harbor					
Land Use		**Residential**	**Commercial**	**Industrial**	**Roadway**	**Other**	**TOTAL**
Contributory Area	Acres	Calculations done on previous study.				54.0	**54.0**
Impervious Area	Acres					13.5	**13.5**
Impervious Area	%					25.0	25.0
Water Quality Storm Event Volume	WQv-acre-feet					1.5	1.5
Water Quality Storm Event Volume	WQv-Cubic Feet					64686.6	64686.6
Annual Rainfall	inches					42.0	42.0
Annual Runoff	inches					10.4	10.4
Total Nitrogen (TN)	coefficient mg/l					2.2	
	lbs					279.1	**279.1**
Total Suspended Solids (TSS)	coefficient mg/l					100.0	
	lbs					12686.1	**12686.1**
Total Phosphorus (TP)	coefficient mg/l					0.4	
	lbs					50.7	**50.7**
Fecal Coliform (F Coli)	coefficient mpn/100 ml					7750.0	
	billion colonies					0.4	**0.4**
Floatable Debris	coefficient CF/AC					5.0	
	CF					270.0	**270.0**
Oil and Grease	coefficient mg/l					3.3	
	lbs					418.6	**418.6**

SOURCE:
"C" Valve Source; See Table
Impervious Area is based on NCGIS Impervious Area Data from building areas, parking areas, and road areas

Nassau County Stormwater Management Program
Candidate Site Assessment
Water Quality Storm Event (WQSE) Volume and Pollutant Load Estimates
Table 3-3

Outfall		**OT-1**					
Tributary To		Oyster Bay Harbor					
Land Use		**Residential**	**Commercial**	**Industrial**	**Roadway**	**Other**	**TOTAL**
Contributory Area	Acres	Calculations derived from previous study.				169.0	**169.0**
Impervious Area	Acres					69.3	**69.3**
Impervious Area	%					41.0	41.0
Water Quality Storm Event Volume	WQv-acre-feet					7.1	7.1
Water Quality Storm Event Volume	WQv-Cubic Feet					308491.9	308491.9
Annual Rainfall	inches					42.0	42.0
Annual Runoff	inches					15.8	15.8
Total Nitrogen (TN)	coefficient mg/l					2.2	
	lbs					1331.0	**1331.0**
Total Suspended Solids (TSS)	coefficient mg/l					100.0	
	lbs					60500.1	**60500.1**
Total Phosphorus (TP)	coefficient mg/l					0.4	
	lbs					242.0	**242.0**
Fecal Coliform (F Coli)	coefficient mpn/100 ml					7750.0	
	billion colonies					2.1	**2.1**
Floatable Debris	coefficient CF/AC					5.0	
	CF					845.0	**845.0**
Oil and Grease	coefficient mg/l					3.3	
	lbs					1996.5	**1996.5**

SOURCE:
"C" Valve Source; See Table
Impervious Area is based on NCGIS Impervious Area Data from building areas, parking areas, and road areas

Nassau County Stormwater Management Program
Candidate Site Assessment
Water Quality Storm Event (WQSE) Volume and Pollutant Load Estimates
Table 3-3

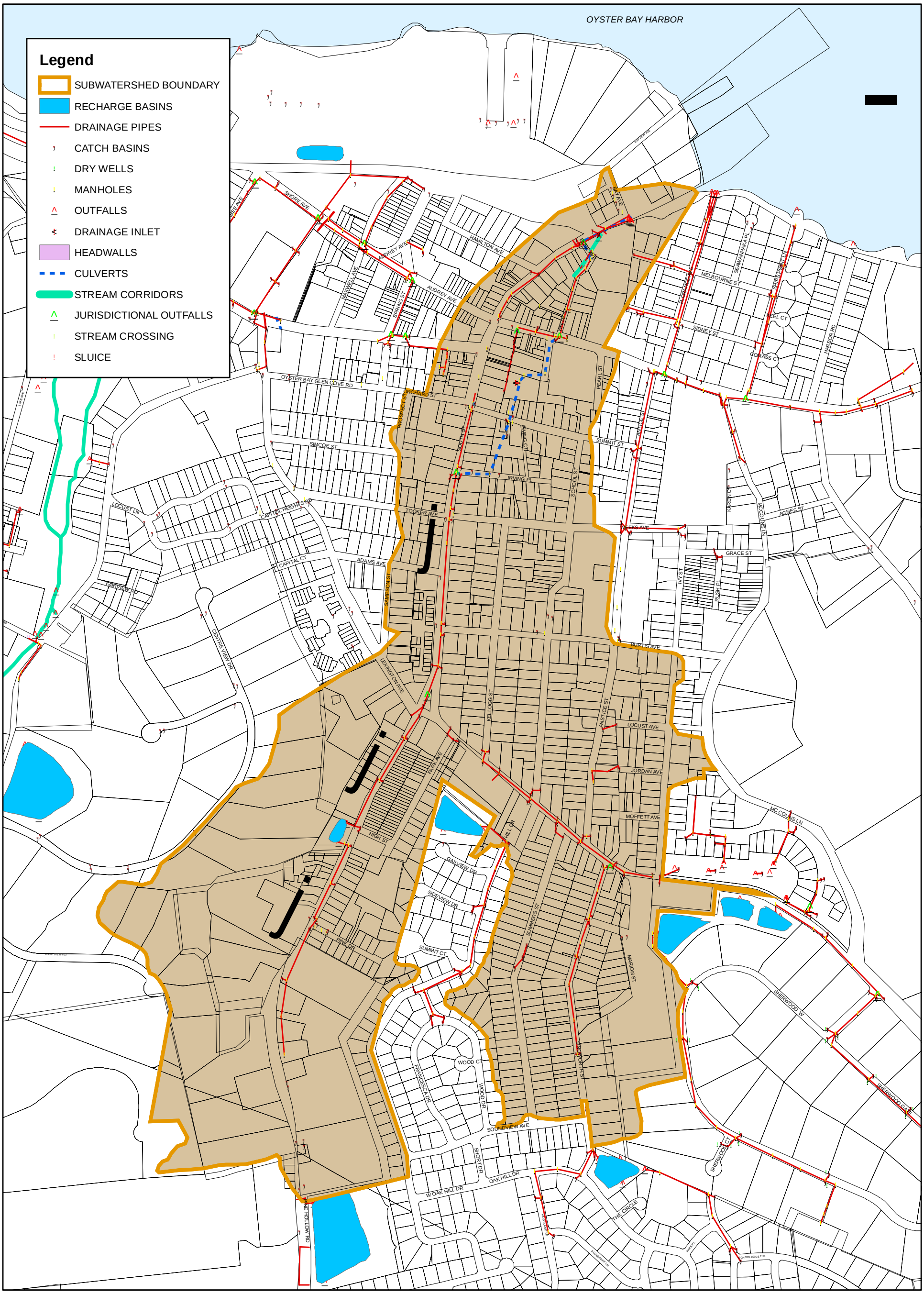
Outfall		**OT-2 & 3**					
Tributary To		Oyster Bay Harbor					
Land Use		**Residential**	**Commercial**	**Industrial**	**Roadway**	**Other**	**TOTAL**
Contributory Area	Acres	Calculations derived from previous study.				15.0	**15.0**
Impervious Area	Acres					12.0	**12.0**
Impervious Area	%					80.0	80.0
Water Quality Storm Event Volume	WQv-acre-feet					1.2	1.2
Water Quality Storm Event Volume	WQv-Cubic Feet					50311.8	50311.8
Annual Rainfall	inches					42.0	42.0
Annual Runoff	inches					29.1	29.1
Total Nitrogen (TN)	coefficient mg/l					2.2	
	lbs					217.1	**217.1**
Total Suspended Solids (TSS)	coefficient mg/l					100.0	
	lbs					9866.9	**9866.9**
Total Phosphorus (TP)	coefficient mg/l					0.4	
	lbs					39.5	**39.5**
Fecal Coliform (F Coli)	coefficient mpn/100 ml					7750.0	
	billion colonies					0.3	**0.3**
Floatable Debris	coefficient CF/AC					5.0	
	CF					75.0	**75.0**
Oil and Grease	coefficient mg/l					3.3	
	lbs					325.6	**325.6**

SOURCE:
"C" Valve Source; See Table
Impervious Area is based on NCGIS Impervious Area Data from building areas, parking areas, and road areas

Nassau County Stormwater Management Program
Canidate Site Assessment
Pollutant Reduction Analysis
Table 3-4

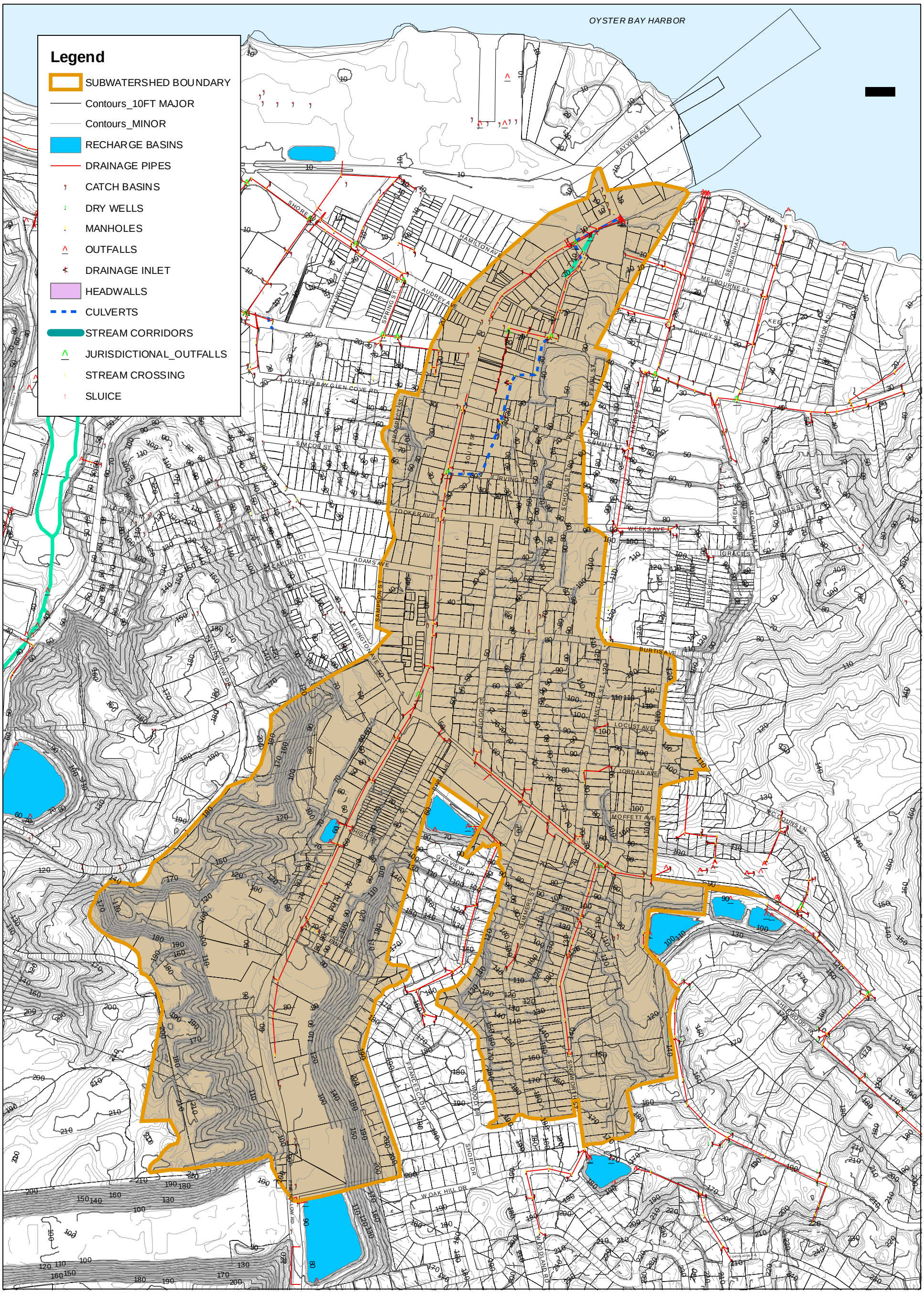
Tributary to		Oyster Bay Harbor						
Adjacent Land Use		High Density/Commercial						
Location		Subwatershed Area Pollutant Load* (Enter Data from Table 2-4)	Candidate Site 1	Candidate Site 2	Candidate Site 3	Candidate Sites Total Pollutant Load Reduction	Drainage Area Total Pollutant Load	Drainage Area Pollutant Reduction (%)
Outfall			OT 1	OT 2 & 3	NYSDOT RB #15			
Stormwater Management Practice			WQI*	WQI**	RB Rehab.**			
Total Nitrogen (TN)	pollutant load (lbs)	1952	1331.0	217.1	279.1	140	1,952	7%
	SMP Pollutant Reduction %		0%	0%	50%			
	Pollutant Reduction (lbs)		0.0	0.0	139.5			
Total Suspended Solids (TSS)	pollutant load (lbs)	78330	60500.1	9866.9	12686.1	47178	78,330	60%
	SMP Pollutant Reduction %		51%	69%	75%			
	Pollutant Reduction (lbs)		30855.1	6808.2	9514.5			
Total Phosphorus (TP)	pollutant load (lbs)	291	242.0	39.5	50.7	27	291	9%
	SMP Pollutant Reduction %		0%	0%	54%			
	Pollutant Reduction (lbs)		0.0	0.0	27.4			
Fecal Coliform (F Coli)	Pollutant load (billion colonies)	1.62	2.1	0.3	0.4	0.34	1.62	21%
	SMP Pollutant Reduction %		0%	0%	75%			
	Pollutant Reduction (bc)		0.0	0.0	0.3			
Floatable Debris (Trash)	pollutant load (CF)	1691	845.0	75.0	270.0	685	1,691	41%
	SMP Pollutant Reduction %		51%	69%	75%			
	Pollutant Reduction (CF)		431.0	51.8	202.5			
Oil and Grease (Hydrocarbons)	pollutant load (lbs)	4167	1996.5	325.6	418.6	1358	4,167	33%
	SMP Pollutant Reduction %		43%	57%	75%			
	Pollutant Reduction (lbs)		858.5	185.6	314.0			

* OT-1 WQI Sized for maximum 3/4" rainfall event. 0.75"/1.2" = 62.5% . TSS and Trash : 82% of 62.5 = 51%, Hydrocarbons: 85% of 51 = 43%, No N, P, or fc r
** OT-2 WQI sized for 1" rainfall event. 1.0"/1.2" = 83%. TSS and Trash: 83% of 83.0 = 69%, Hydrocarbons 85% of 69 = 57%,
RB #15 sized for 1" rainfall event 1.0"/1.2" = 83%. TSS,Trash, F coli, & hydrocarbons 90% of 83 = 75%, TN 60% of 83 = 50%, TP 65% of 83 = 54%



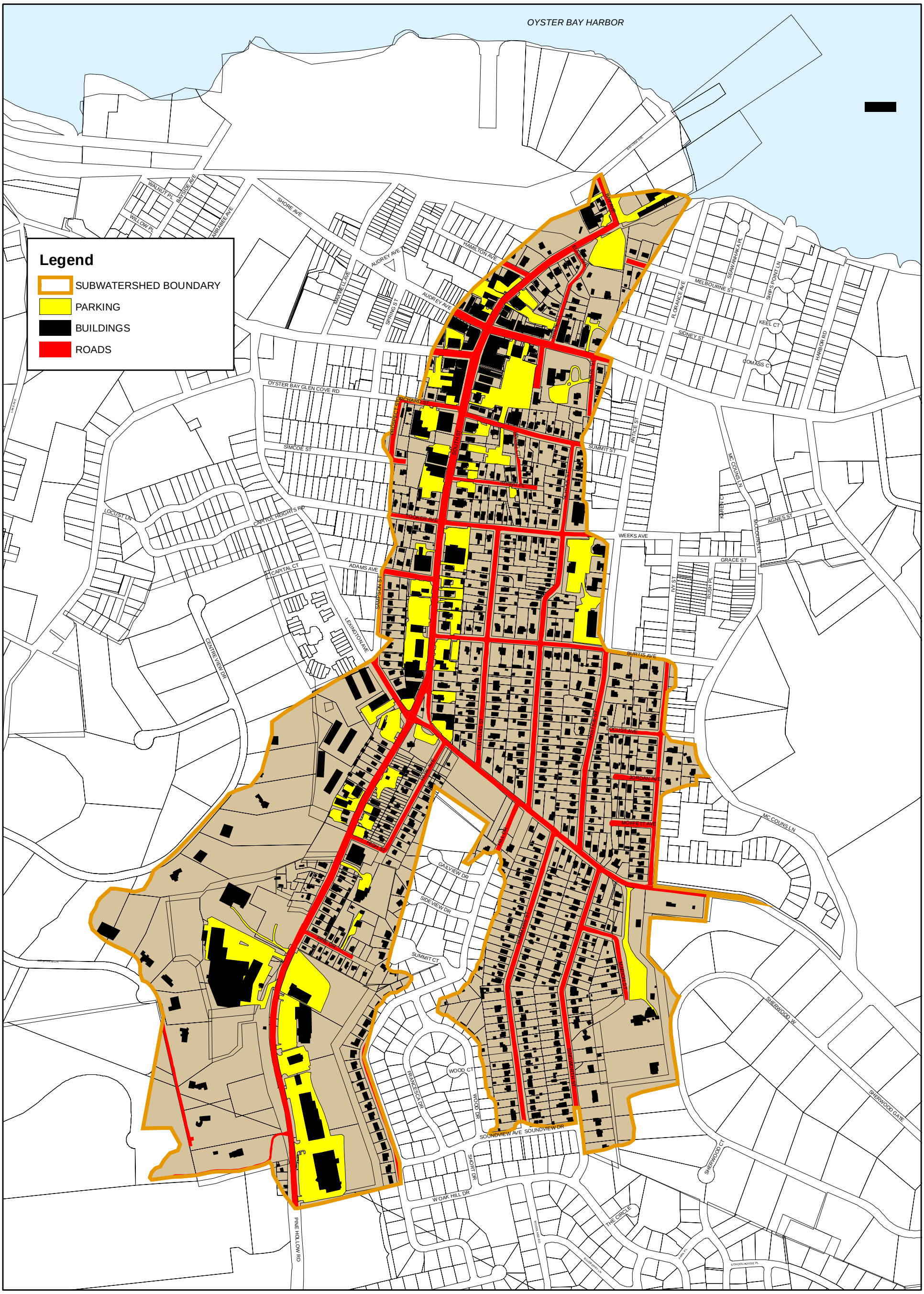
SOURCE: NCGIS AND CASHIN ASSOC. P.C.

MAP 2-1
NASSAU COUNTY STORMWATER MANAGEMENT PROGRAM
STORMWATER RUNOFF IMPACT ANALYSIS
DRAINAGE INFRASTRUCTURE
WHITES CREEK SUBWATERSHED



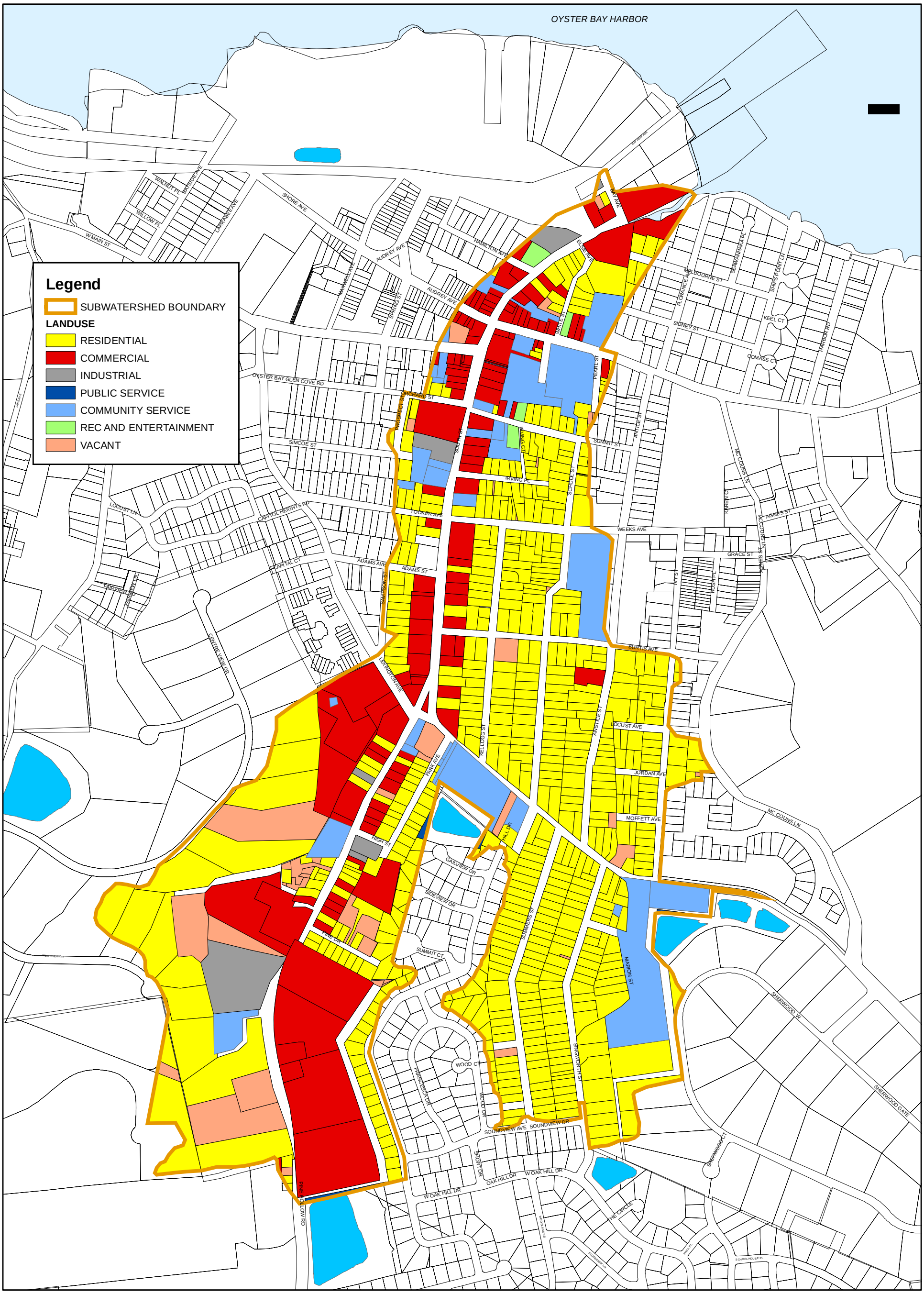
SOURCE: NCGIS AND CASHIN ASSOC. P.C.

MAP 2-2
NASSAU COUNTY STORMWATER MANAGEMENT PROGRAM
STORMWATER RUNOFF IMPACT ANALYSIS
CONTOURS
WHITES CREEK SUBWATERSHED



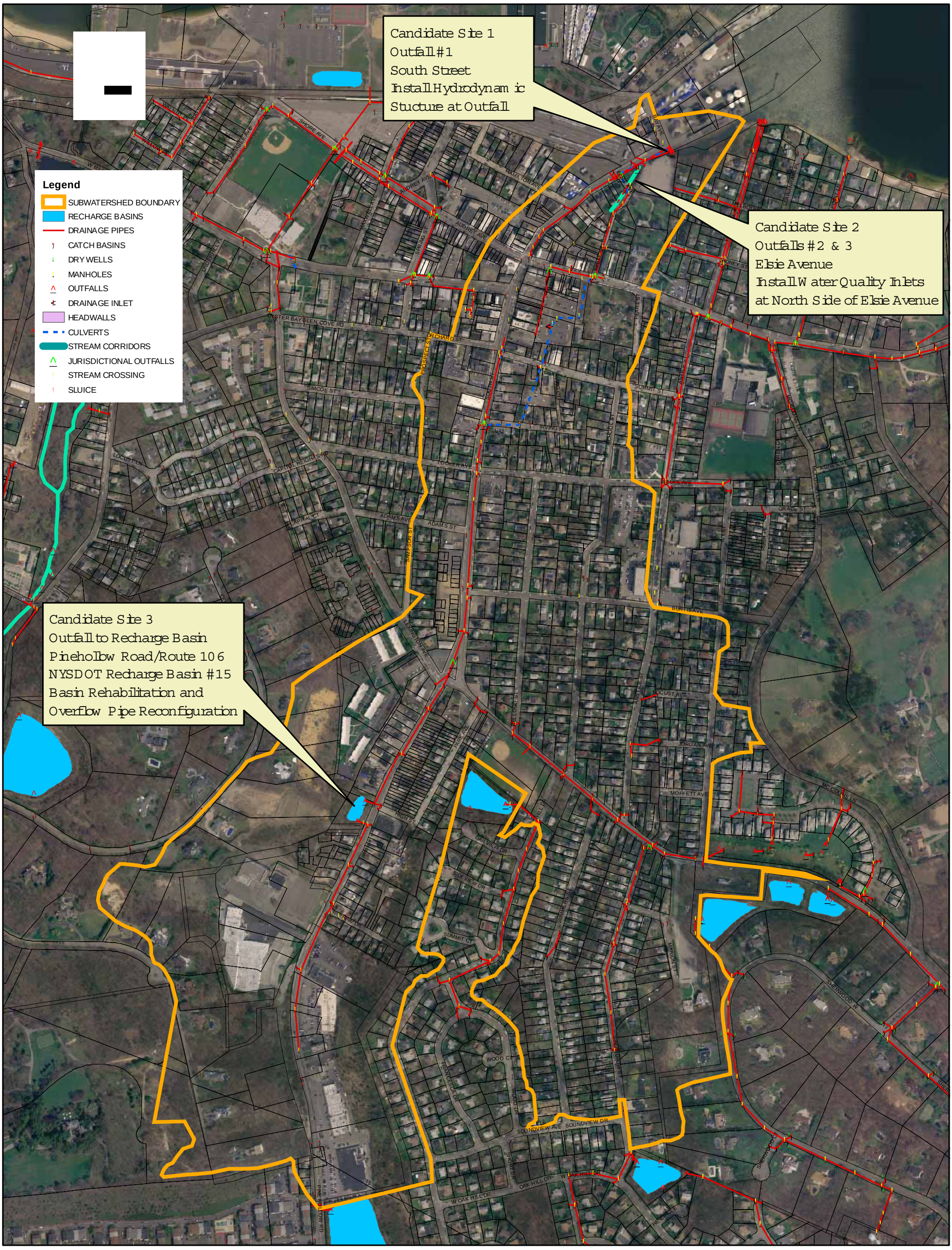
SOURCE: NCGIS AND CASHIN ASSOC. P.C.

MAP 2-3
NASSAU COUNTY STORMWATER MANAGEMENT PROGRAM
STORMWATER RUNOFF IMPACT ANALYSIS
IMPERVIOUS AREAS
WHITES CREEK SUBWATERSHED



SOURCE: NCGIS AND CASHIN ASSOC. P.C.

MAP 2-4
NASSAU COUNTY STORMWATER MANAGEMENT PROGRAM
STORMWATER RUNOFF IMPACT ANALYSIS
LAND USE
WHITES CREEK SUBWATERSHED



SOURCE: NCGIS AND CASHIN ASSOC. P.C.

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ENGINEERING · PLANNING · CONSTRUCTION MANAGEMENT

MAP 3-1
NASSAU COUNTY STORMWATER MANAGEMENT PROGRAM
STORMWATER RUNOFF IMPACT ANALYSIS
SMP CANDIDATE SITES MAP
WHITES CREEK SUBWATERSHED

Nassau County
Stormwater Management Program

WHITE'S CREEK SUBWATERSHED
Stormwater Runoff Impact Analysis AND CANDIDATE SITE ASSESSMENT REPORT

Appendix a – FIELD DATA

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