



CITY OF POQUOSON, VIRGINIA

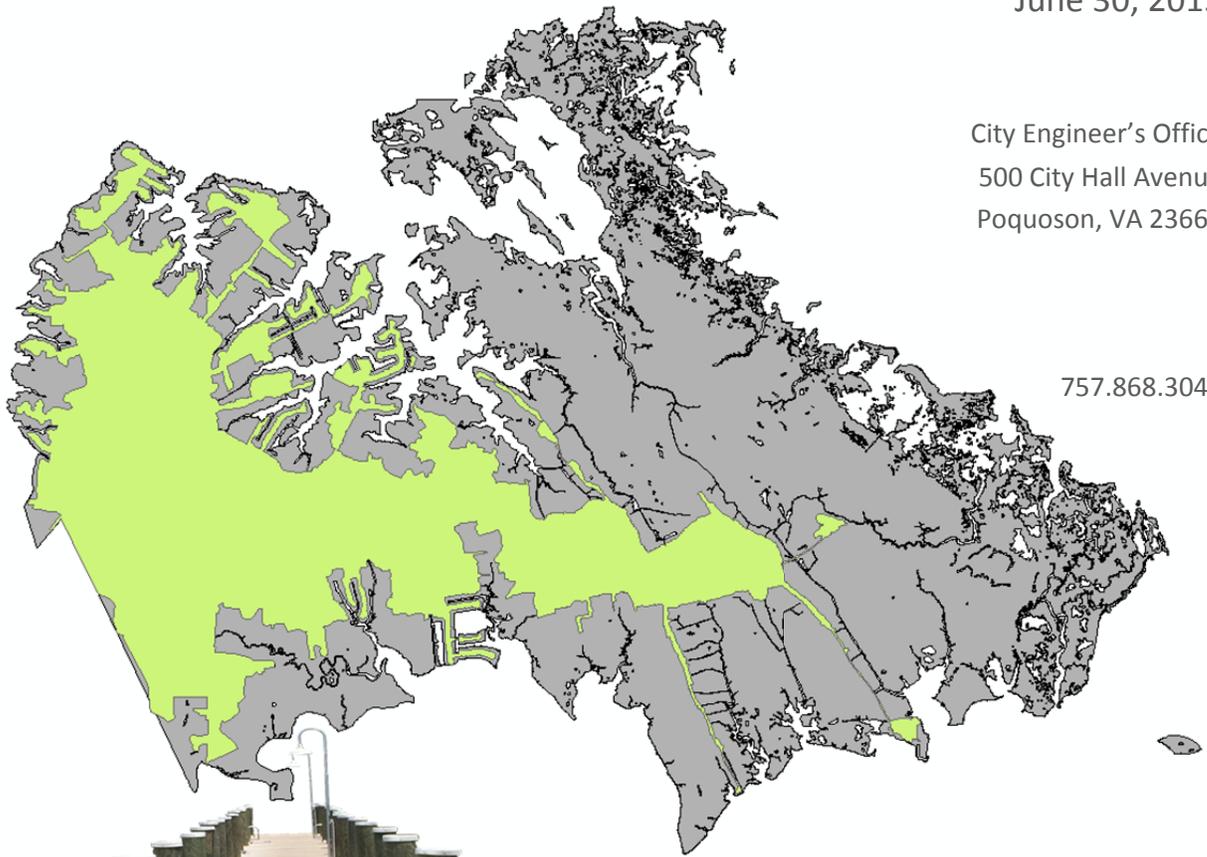
CHESAPEAKE BAY TMDL ACTION PLAN

VPDES PERMIT No. VAR040024

June 30, 2015

City Engineer's Office
500 City Hall Avenue
Poquoson, VA 23662

757.868.3040



CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name Title Date

DRAFT



CHESAPEAKE BAY TMDL ACTION PLAN (5 PERCENT COMPLIANCE)

VPDES PERMIT NUMBER VAR040024

June 30, 2015

Prepared by City staff and

AECOM No. 60393499

City Engineer's Office
500 City Hall Avenue, Poquoson, VA 22662
757-868-3040

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DEFINITIONS & ACRONYMS

The following definitions shall apply to this Chesapeake Bay TMDL Action Plan:

Action Plan – unless specifically stated otherwise, the Chesapeake Bay TMDL Action Plan

Permit – unless specifically stated otherwise, the City’s current MS4 permit valid from 2013 to 2018

The following acronyms are used in this Chesapeake Bay TMDL Action Plan:

City – unless specifically stated otherwise, the City of Poquoson

DEQ – Virginia Department of Environmental Quality

EOS – Edge of Stream

EPA – The U.S. Environmental Protection Agency

MS4 – Municipal Separate Storm Sewer System

MTD – Manufactured Treatment Devices

NAVD88 – North American Vertical Datum of 1988

POCs – Pollutants of Concern (Specifically Nitrogen, Phosphorus, and Total Suspended Solids)

RMA – Resource Management Area

SLAF – Stormwater Local Assistance Fund (administered by DEQ)

TMDL – Total Maximum Daily Load

RPA – Resource Protection Area

VAMSA – Virginia Municipal Stormwater Association

VSMP – Virginia Stormwater Management Program

CHESAPEAKE BAY TMDL ACTION PLAN (5 PERCENT COMPLIANCE)

VPDES PERMIT NUMBER VAR040024
JUNE 30, 2015

A. EXECUTIVE SUMMARY

The City of Poquoson is submitting this Chesapeake Bay Action Plan in compliance with Section I.C., “Special Condition for the Chesapeake Bay TMDL” found in its General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems, No. VAR040024 issued in 2013. This Action Plan details the City’s estimation of its existing source loads of POCs as of June 30, 2009 based on the Chesapeake Bay Program’s Phase 5.3.2 watershed model and the required reductions in POCs by the end of this permit cycle using Table 3d in the permit. Also, the means and methods by which the required reductions will be met, and an estimate of the costs to the City to meet the required reductions is addressed.

To determine the POC loads from existing sources, the City delineated Poquoson’s MS4 boundary carefully using guidance from the Virginia Municipal Stormwater Association and definitions from DEQ. The City’s GIS data and aerial imagery from 2009 were used to delineate the MS4 area. Contour information, storm system pipe and structure data, as well as infrared LiDAR data obtained from NASA, were used to determine drainage patterns during the delineation process. The City’s MS4 service area is shown in Figure 1.

Land cover within the MS4 as of June 30, 2009 was also determined using the City’s aerial imagery and parcel development data. The types of land cover identified within the City’s MS4 area were regulated urban pervious, regulated urban impervious and forested land. Forested land was only included if it was a contiguous area over one-half acre. Tidal marsh areas within the MS4 were included as forested land. Table 1 lists the land cover within the City’s MS4, as indicated in Figure 2. Table 2 lists the annual pollutant loads generated by existing sources as of June 30, 2009.

Based on a total of 636.28 acres of regulated urban impervious land, and 1,642.35 acres of regulated pervious land within the City's MS4 service area, the estimated annual pollutant loads from existing sources are 17,215.18 pounds of nitrogen, 1,798.38 pounds of phosphorus, and 409,285.41 pounds of total suspended solids.

The 5% required nutrient reduction for the first permit cycle, was calculated based on the land cover acreage within the MS4 and the required reduction in loading rates from Table 3d in the City's MS4 permit. Table 3 lists the total reductions required for the first permit cycle. The City's MS4 area in this Action Plan includes the City's 2010 Census urbanized area, and that land is included in the calculations of the reduction requirements for the first permit cycle. The total annual reductions required during the first permit cycle are 51.94 pounds of nitrogen, 9.65 pounds of phosphorus and 3,452.44 pounds of suspended solids.

To satisfy the first permit cycle requirements, Poquoson has identified seven specific projects, one of which is already completed, two of which are under design and are funded through a SLAF grant, and four additional projects that must be completed by June 30, 2018. The project locations are shown in Figure 3, with individual project sites shown in Figures 4 through 7. Table 4 documents the pollutant reductions for these projects, as summarized in Table 5. Table 6 presents the implementation schedule.

The two projects currently under design are a proposed wet pond and created wetland. Land use conversion for the property at 127 Ridge Road has been completed. The four remaining projects include three vegetated filter strips at different locations within the MS4 area and a wet swale. The City is also taking credit for an annual reduction of nitrogen of approximately 124.2 lbs./yr., for taking seven septic tanks offline and connecting those parcels to the City's sanitary sewer system.

The total annual reductions of POCs, through the implementation of this Action Plan, are approximately 201.86 pounds of nitrogen, 10.39 pounds of phosphorus, and 3,607.88 pounds of total suspended solids. The total implementation cost of the four additional projects is estimated at \$238,831. Table 7 lists the individual cost opinions for the four projects.

Due to the high cost to the City of meeting the required reductions, the City reserves the right to make adjustments to this plan, and to substitute any projects that can achieve the required pollutant reductions at less total cost. If DEQ approves more cost-effective BMP types for credit under the Chesapeake Bay TMDL, the City will modify its Action Plan to meet the nutrient reduction requirements during this permit cycle as well as future permit cycles.

B. BACKGROUND INFORMATION

The City of Poquoson encompasses an area of less than 16 square miles, near the mouth of the Chesapeake Bay. The City drains to three water bodies; the Poquoson River, Back River, and the Chesapeake Bay itself, but is considered to be part of the York River watershed in the current Bay

model, and for purposes of developing this Action Plan to comply with the Chesapeake Bay TMDL requirements in its permit. The City has noted on many occasions that it does not drain to the York River, and feels that its POC reduction requirements are unrealistically high to make up for contributions of POCs by entities far upstream in the York River watershed.

With a 2010 population of approximately 12,500 residents, Poquoson is one of the smallest regulated MS4s in the state of Virginia. However, the City strives to protect the Chesapeake Bay through its local program, which it continues to update since the implementation of its 1999 comprehensive Chesapeake Bay Preservation Ordinance. The City of Poquoson's history is directly linked to the Chesapeake Bay. Historically, Poquoson was a fishing village, with generations of families making their living fishing in the Bay and many of Poquoson's residents still depend on the waters around Poquoson for their livelihood.

The land cover in the current Phase 5.3 Chesapeake Bay Watershed Model is highly inaccurate and in Poquoson's case is a poor representation of the actual land cover in the City's MS4 service area. The City has approximately 5,089 acres of tidal wetlands within its boundary, which are not regulated under the City's permit. The majority of those tidal wetlands are contained within the 3,276-acre Plum Tree Island National Wildlife Refuge. The remaining 1,800 acres of tidal wetlands surround the shoreline of the City's tidal creeks. In addition, there are approximately 1,575 acres of land that are not part of the MS4 service area because stormwater runs off directly to tidal waters, or stormwater is conveyed from City owned ditches or pipes through private property which is not maintained by the City. During the development of this Action Plan, the City spent considerable time and effort to delineate its MS4 service area and determine the total acres of regulated urban pervious and urban impervious land within that service area.

Poquoson, like other Hampton Roads localities, has flat, low-lying topography, high water tables, and soils that are not conducive to infiltration. As of spring 2015, there are not many Clearinghouse-approved BMPs that can be used in a cost-effective manner in the City. Many low impact development (LID) practices such as rooftop disconnection and vegetated roofs are acceptable as BMPs for individual parcel development but are not practical as retrofits for localities to implement on a large scale. The flat topography and high water tables in Poquoson preclude many of the BMPs with the highest nutrient removal efficiencies. Infiltration basins make ideal BMPs to treat impervious areas such as parking lots, but cannot be used in areas with high water tables. The primary BMPs considered by the City for the Action Plan were wet ponds, created wetlands, wet swales, vegetated filter strips, permeable asphalt, manufactured treatment devices and land conversions.

During the preparation of this Action Plan, DEQ made two revisions to its draft guidance memorandum (No. 14-2012) issued on August 18, 2014. The first revision was issued for public comment on March 19, 2015. The final guidance memorandum (No. 15-2005) was issued on May 18th, 2015—less than six weeks before this Action Plan was due to be implemented. Two revisions made in the final guidance memo impact the City's Action Plan. The first revision—reverting back to the Chesapeake Bay Program's size requirement for forested lands of 30m x 30m—reversed a

change in the March 19th guidance memo, stating that forested lands must be at least one-half acre in size. While this change resulted in a very slight decrease in the City's pollutant load, it did not affect the City's Action Plan. The second revision, which corrected an issue with rounding the required reduction in loading rates, found in Table 3d of the permit, does affect the City's POC reduction requirements, which are increased for nitrogen and phosphorus. Due to the delay in issuing the final guidance document, the City was not able to update the means and methods to achieve the first permit cycle reductions to account for the additional nutrient reductions required by the Corrected Reductions in Loading Rates listed in the final guidance memo. While the final guidance memo states that either set of load reduction numbers given in the memo may be used for the Action Plan, additional nutrient reductions will be required during the second permit cycle to make up for the difference.

During the development of its Action Plan, the City identified projects to help it meet the required POC reductions for both the first and second permit cycles. The projects the City proposes for meeting its 5% reductions during this permit cycle are described in detail in the Action Plan. However, due to the high cost to the City of meeting those reductions, the City plans to replace any of the proposed projects with more cost-effective BMPs, when and if they become approved by DEQ, to meet the nutrient reduction requirements.

C. REQUIRED COMPONENTS OF THE CHESAPEAKE BAY TMDL ACTION PLAN

The following sections of the Action Plan are required components, described in Section I.C.2.a of the City's MS4 Permit. The "Permit Requirements" described below are taken verbatim from Section I.C.2.a of the City's MS4 Permit.

1. REVIEW OF CURRENT MS4 PROGRAM

Permit Requirement: A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition.

The City of Poquoson has obtained coverage under 9VAC25-890-40, the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4's), with authorization to discharge under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act. This state permit authorizes operators of small municipal separate storm sewer systems to discharge to surface waters within the boundaries of the Commonwealth of Virginia, except those waters specifically named in State Water Control Board regulations, which prohibit such discharges. This permit is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of 5.0% of L2 as specified in the 2010 Phase I WIP.

The City maintains an MS4 program plan, which was updated according to the schedule found in Table 1 of the permit, and submitted to DEQ on September 30, 2014 along with its Permit Year 1 Annual Report. In accordance with the permit requirements, Poquoson has developed and shall submit to the department for its review and acceptance, an approvable Chesapeake Bay TMDL Action Plan on or before October 1, 2015. Unless specifically denied in writing by the department, this plan becomes effective and enforceable 90 days after the date received by the department.

The City implements its MS4 program through legal authorities found in Section 34 of the City Code. The City's Erosion and Sediment Control, Wetlands, and Stormwater Management Ordinances; Articles III, IV, and V of Chapter 34 respectively, are the primary legal authorities governing land development, water quality, and environmental protection. In addition to its environmental ordinances, the City has taken other steps to preserve the environment and protect water quality. In 1991, areas equal to approximately 16% of the City of the City's total land mass were designated as RPAs. All upland areas outside the RPAs were designated as RMAs. As a result, every construction project within the City is reviewed for compliance with the Chesapeake Bay Act.

Actions undertaken to implement the Chesapeake Bay TMDL Special Condition shall be undertaken on City-owned lands, using General Funds, in accordance with all applicable state laws and regulations.

2. IDENTIFICATION OF NEW OR MODIFIED LEGAL AUTHORITIES

Permit Requirement: The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition.

The only new legal authorities required for plan implementation will be site-specific permits related to construction activity. These include coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities; Poquoson Land Disturbance Permits; Poquoson Right-of-Way Permits; and Wetlands permits obtained on an as-needed basis. All other local and state construction and procurement laws are sufficient to implement the plan.

3. MEANS AND METHODS TO ADDRESS DISCHARGES INTO THE MS4 FROM NEW SOURCES

Permit Requirement: The means and methods that will be utilized to address discharges into the MS4 from new sources.

The City of Poquoson requires that stormwater discharges from any new development adhere to the criteria outlined in the VSMP regulations for both water quality and quantity. Post-development stormwater management facilities and structures must meet the design standards and specifications of the Virginia Stormwater BMP Clearinghouse, and plans for proposed post-

development stormwater management facilities must be reviewed and approved by the City. In addition, all construction activities must follow the minimum standards and requirements outlined in Virginia's Erosion and Sediment Control Law as well as the City's Erosion and Sediment Control ordinance, to prevent sediment laden stormwater from being discharged in to the MS4.

Also, the City restricts all development in its RPAs in accordance with the Chesapeake Bay Preservation Act. In an effort to protect water quality, all City upland areas outside the RPAs were designated as RMAs in 1991. This designation exceeds the Chesapeake Bay Act's minimum technical requirements for RMA designation. The City's Environmental Management Area Overlay District ordinance allows the City to request that a Water Quality Impact Assessment be performed for any proposed land disturbance, development, or redevelopment activity within an RMA, when the City deems it necessary due to unique site conditions, or the intensity of the proposed use, development or redevelopment.

4. ESTIMATE OF ANNUAL POC LOADS DISCHARGED FROM EXISTING SOURCES AS OF JUNE 30, 2009

Permit Requirement: An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables 2 a-d in this section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate.

To determine the POC loads from existing sources, the City delineated Poquoson's MS4 boundary carefully using guidance from the VAMSA and definitions from DEQ. The City's GIS data and aerial imagery from 2009 were used to delineate the MS4 area. Contour information, storm system pipe and structure data, as well as infrared LiDAR data obtained from NASA, were used to determine drainage patterns during the delineation process. Drainage ditches through private property were not included as part of the City's MS4 area, except for those ditches that the City identified as being maintained by City personnel. The majority of the City's outfall ditches are tidal at some point, and interstate waters and wetlands are outside of the City's MS4 jurisdiction. The MS4 area was terminated where outfall ditches reached "vegetated wetlands." Virginia's definition of vegetated wetlands is those lands between mean low water and an elevation above mean low water equal to 1.5 times the mean tide range. Using the Sewell's Point tidal recording station, this elevation is approximately equal to 2.16 on the NAVD88 datum. Figure 1 maps the resulting MS4 service area.

Land cover within the MS4 as of June 30, 2009 was also determined using the City's aerial imagery and parcel development data. The types of land cover identified within the City's MS4 area were regulated urban pervious, regulated urban impervious and forested land. Forested land was only included if it was a contiguous area over one-half acre. Forested areas on the edge of the MS4 boundary were included if they were under one-half acre but were part of a contiguous area greater than one-half acre. Originally, forested areas were included if they met the minimum area requirement of 30 meters square used in the Chesapeake Bay Watershed Model. After DEQ's

revised guidance memo was issued in March of 2015, the forested areas were revised, and only those forested areas that were a minimum of one-half acre were classified as forested land. The May 18, 2015 final guidance memo eliminates the half-acre requirement and goes back to the 30-meters-square requirement. Approximately 11.3 acres of regulated urban pervious land can revert to “forested land,” and not be included in the pollutant load calculations. The net result is a very small decrease in required pollutant reductions for the first two permit cycles. For the first permit cycle, the required nutrient reductions are reduced by 0.23 pounds of nitrogen, .02 pounds of phosphorus, and 3.62 pounds of suspended solids. The second permit cycle reductions are reduced by 1.58, 0.23, and 25.33 pounds of nitrogen, phosphorus and suspended solids respectively. These reductions do not have any impact on the means and methods for meeting the nutrient reduction requirements for the first two permit cycles. Due to the late date, and the amount of work required to update and recalculate land use, pollutant load, and BMP tables, with no impact to the Action Plan recommendations, the forest area changes in the May 18, 2015 guidance memo are not incorporated into the Action Plan. Tidal marsh areas within the MS4 are included as forested land. Land cover within the City’s MS4 is listed in Table 1 and shown in Figure 2. Table 2 lists the annual pollutant loads generated by existing sources as of June 30, 2009.

5. DETERMINATION OF TOTAL POLLUTANT LOAD REDUCTIONS

Permit Requirement: determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables 3 a-d in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.

The 5% required nutrient reductions for the first permit cycle are calculated based on the land cover acreages within the MS4 and the required reduction in loading rates from Table 3d in the City’s MS4 permit. Table 3 lists the total reductions required for the first permit cycle. It should be noted that the City’s MS4 area in this Action Plan includes the City’s 2010 Census urbanized area, and that land was included in the calculations of the reduction requirements for the first permit cycle.

As previously mentioned, DEQ’s May 18, 2015 final guidance memo recognized that the required reductions in loading rates found in Table 3d of the City’s MS4 permit contain problematic rounding of significant digits. Full reduction requirements are listed in the final guidance memo. According to the memo, either set of numbers may be used for this permit term. Elements in this Action Plan are based on the load reductions as they are listed in the City’s MS4 permit. The City’s nutrient reduction requirements increase for nitrogen and phosphorus when using the full load reductions as listed in the May 18, 2015 guidance memo. For the first permit cycle, the required reductions increase by 6.68 pounds for nitrogen and 1.07 pounds for phosphorus.

6. MEANS AND METHODS TO MEET THE REQUIRED REDUCTIONS WITH SCHEDULE

Permit Requirement: The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions.

To satisfy the first permit cycle requirements, Poquoson has identified seven specific projects, one of which is already completed, two of which are under design and are funded through a SLAF grant, and four additional projects that must be completed by June 30, 2018. The project locations are shown in Figure 3, with individual project sites shown in Figures 4 -7. Table 4 documents the pollutant reductions for these projects, and Table 5 summarizes the projects. Table 6 presents the implementation schedule is presented in.

Pollutant removals for the proposed wet pond and created wetland currently under design were calculated along with the land use conversion for the property at 127 Ridge Road to determine the remainder of the first permit cycle reductions. Because the created wetland does not meet the water quality volume under the Virginia BMP Clearinghouse specifications for a level 1 design, the Bay Program retrofit curves were used to determine the pollutant removal efficiencies. With a treatment depth of only 0.23 inches over the impervious area treated, the removal rates are approximately half of those for a level 1 design.

The vegetated filter strips along Victory Boulevard, at the Elementary School, and the end of Messick Road will meet the Clearinghouse specifications for sheet flow to a vegetated filter strip and soil compost amendments and will involve tilling the soil in the area of the filter strips, incorporating compost to amend the soil, and planting turf grass. These BMPs have minimal design requirements, do not require major construction efforts, and alter the land very little as turf grass can be planted back over the area where the compost was incorporated. The filter strips along Victory Boulevard and at Messick Point are an important part of the first permit cycle Action Plan, because they provide approximately 73% of the required nitrogen reduction and 25% of the required phosphorus reduction. Also, they are very cost effective, with the greatest costs being the compost itself and labor to till it into the soil. The filter strip along Victory Boulevard will require compost to be incorporated into the soil to a depth of approximately ten inches. Only the shallowest utilities will be in conflict, and because the area between the roadway and the ditch to the north is approximately 50 feet in most places, and the filter strip is 35 feet wide, the area tilled can vary to avoid utilities if necessary. The filter strips will not prevent redevelopment in the future. The strip along Victory Boulevard will treat the existing westbound lane and shoulder. If the road is widened in the future, the new asphalt and existing pavement will still require treatment by an alternative BMP for water quality.

The wet swale behind the Public Works yard primarily requires ditch grading and construction of one or two small weirs to detain stormwater runoff. Some clearing of trees will also be required.

This project could be replaced if other, more cost-effective BMPs, such as nutrient credits, oyster aquaculture or Phragmites harvesting, become available before the end of the permit cycle.

Also to the BMP construction projects listed above, the City will take nitrogen reduction credit for recent disconnections of household septic tanks and the conversions of the lots to sanitary sewer hookups. During the mid-2000s, the City spent millions of dollars to install new sanitary sewer lines and make pump station upgrades. Currently, it is estimated that more than 95% of the City's parcels are connected to the sanitary sewer system. With less than thirty parcels remaining with septic tanks, the City is working towards a 100% connection rate to its sanitary sewer system.

The City is applying the nitrogen reduction credits for those disconnections towards their TMDL requirements for several reasons. First, the City has been paying for the infrastructure improvements that allow the septic tank disconnections. Secondly, the septic systems the City has taken off-line were contributing to the nitrogen load in the Bay that ultimately has led to the development of the TMDL, and since the sewer line construction and upgrades, with most residential lots now connected to sanitary sewer, water quality has improved in the City's tidal creeks. Thirdly, the Chesapeake Bay TMDL reductions being enforced through its MS4 permit unfairly penalize the City by averaging nitrogen loads over the York River watershed, and Poquoson is being forced to make up for nutrient loads by upstream contributors. While the septic disconnects do not provide any reductions for phosphorus or suspended solid loads, the City has a substantial nitrogen reduction requirement, and will take credit for any actions that reduce nutrient inputs into the Bay.

In a June 17, 2015 conference call with the Hampton Roads Regional Stormwater Work Group, DEQ decided that localities could take nitrogen reduction credits for sanitary sewer connections equal to 3.6 lbs. N/capita/year. The number of people can be based on an average household per capita for the locality, an average for the neighborhood, or 1.5 people per bedroom. Credit can be taken for any septic tank/sewer connection from 2006 onward.

Since July 1, 2009, the City has disconnected seven septic tanks and connected those parcels to the sanitary sewer system. The houses on those seven parcels have a total of 23 bedrooms. The City estimated the per capita number using 1.5 people per bedroom for a total of 34.5 people and a total nitrogen reduction for the seven septic disconnects of 124.2 lbs/yr. As previously stated, there are no reductions for phosphorus and suspended solids, and the nitrogen reductions for septic disconnects do not eliminate any of the projects required for the first permit cycle reductions. However, they will count towards the total nitrogen reduction requirement (100%) at the end of the third permit cycle, and may be used to offset more expensive BMPs in the future.

The City will reserve the right to make adjustments to this plan, and to substitute any projects that can achieve the required pollutant reductions at less total cost. Alternative BMPs and nutrient credit trading opportunities that are not available in 2015 could become available in time to be implemented by June 30, 2018.

7. MEANS AND METHODS TO OFFSET INCREASED LOADS FROM CONSTRUCTION BETWEEN JULY 1, 2009 AND JUNE 30, 2014

Permit Requirement: The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.

Poquoson has consistently used an average land cover condition of 16% impervious cover for the design of post-development stormwater management facilities. The City therefore does not have to identify any means and methods to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2014—as addressed in Phase II General Permit Section I.C.2.a.(7).

8. MEANS AND METHODS TO OFFSET INCREASED LOADS FROM GRANDFATHERED PROJECTS

Permit Requirement: The means and methods to offset the increased loads from projects as grandfathered in accordance with 4VAC50-60-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids.

Poquoson does not have any grandfathered projects that began construction after July 1, 2014—as addressed in Phase II General Permit Section I.C.2.a.(8). Therefore, there are no required means and methods to offset increased loads from grandfathered projects.

9. ANY MODIFICATION TO THE TMDL OR WATERSHED IMPLEMENTATION PLAN

Permit Requirement: The operator shall address any modification to the TMDL or watershed implementation plan that occurs during the term of this state permit as part of its permit reapplication and not during the term of this state permit.

The City of Poquoson reserves the right to substitute locations, sizes and types of treatment practices if more cost effective measures are approved by the Bay Program or if site conditions warrant. Modifications to the TMDL plan shall be addressed during the permit reapplication.

10. FUTURE PROJECTS AND ASSOCIATED ACREAGE THAT QUALIFY AS GRANDFATHERED

Permit Requirement: A list of future projects and associated acreage that qualify as grandfathered in accordance with 4VAC50-60-48.

There are no future projects and associated acreage within the City that qualify as grandfathered in accordance with 4VAC50-60-48.

11. ESTIMATE OF EXPECTED COSTS

Permit Requirement: An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle.

The total implementation cost of the four additional projects is estimated at \$238,831. Individual cost opinions for the four projects are found in Table 7.

12. PUBLIC COMMENT

Permit Requirement: An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.

The City of Poquoson Chesapeake Bay TMDL Action Plan was discussed at a televised City Council Work Session on June 22, 2015, and made available on line on the City website, and at City Hall on Friday, June 26, 2015. Public Comments were received from June 26, 2015 to July 27, 2015.

Table 1. City of Poquoson Regulated MS4 Area

MS4 Land Use	Area (ac)
Regulated Impervious	636.28
Regulated Pervious	1,642.35
Forest*	817.02
Open Water*	15.94
Total Area	3,111.59

* Excluded land

Table 2. Existing Pollutant Loads (As of June 30, 2009)

Pollutant	Subsource	2009 EOS Loading Rate for the York River Basin (lbs/ac) ¹	Total Existing Acres Served by MS4 (6/30/09)	Estimated Load (lbs)	Estimated Total POC Load Based on 2009 Progress Run (lbs)
Nitrogen	Regulated Impervious	7.31	636.28	4,651.21	17,215.18
	Regulated Pervious	7.65	1,642.35	12,563.98	
Phosphorus	Regulated Impervious	1.51	636.28	960.78	1,798.38
	Regulated Pervious	0.51	1,642.35	837.60	
TSS	Regulated Impervious	456.68	636.28	290,576.35	409,285.41
	Regulated Pervious	72.28	1,642.35	118,709.06	

1. Existing Source Loads for the York River Basin taken from Table 2d of the City's MS4 General Permit.

Table 3. Reductions Required During First Permit Cycle (5% of the Level 2 Scoping Run)

No offsets are required for "New Sources" as of 06/30/2009. An average land cover of 16% imperviousness was used by the City for the design of post-development stormwater management facilities for development that occurred between June 30, 2009 and June 30, 2014.

Pollutant	Subsource	First Permit Cycle Required Reduction in Loading Rate (lbs/ac)	Total Existing Acres Served by MS4 (6/30/09)	Reduction Required (lbs)	Total Reduction Required During First Permit Cycle (lbs)
Nitrogen	Regulated Impervious	0.03	636.28	19.09	51.94
	Regulated Pervious	0.02	1,642.35	32.85	
Phosphorus	Regulated Impervious	0.01	636.28	6.36	9.65
	Regulated Pervious	0.002	1,642.35	3.28	
TSS	Regulated Impervious	4.60	636.28	2,926.89	3,452.44
	Regulated Pervious	0.32	1,642.35	525.55	

Table 4. Computation of Proposed Credits for First Permit Cycle (5% of the Level 2 Scoping Run)

SUMMARY — BMPs Required for First Permit Cycle Reductions, 5% of the Level 2 Scoping Run				
		TN	TP	TSS
5% Required Annual Reductions - (1st Permit Cycle)		51.94	9.65	3,452.44
Total Annual Reductions (lbs/yr) from BMPs		201.86	10.39	3,607.88
Pounds in Excess of Requirements:	✓ 149.92	⚠ 0.74	✓ 155.44	
(carried forward to 2nd permit cycle)				

1-1. Proposed Created Wetland (In Progress)

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	7.42	2.13	0.07	27.61	15.80	0.52	204.87
Reg. Pervious	4.14	7.65	0.51	72.28	31.67	2.11	299.24
Reg. Impervious	8.88	7.31	1.51	456.68	64.91	13.41	4,055.32
Total (lbs/yr)		112.39	16.04	4,559.42			
Removal Efficiency		15%	24%	30%			
Annual Reduction (lbs/yr)		16.86	3.85	1,367.83			

1-2. Proposed Wet Pond (In Progress)

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	1.86	2.13	0.07	27.61	3.96	0.13	51.35
Reg. Pervious	1.84	7.65	0.51	72.28	14.08	0.94	133.00
Reg. Impervious	3.41	7.31	1.51	456.68	24.93	5.15	1,557.28
Total (lbs/yr)		42.96	6.22	1741.63			
Removal Efficiency		20%	45%	60%			
Annual Reduction (lbs/yr)		8.59	2.80	1044.98			

1-3. Land Use Change - 127 Ridge Rd. (Completed)

Area Converted	Acres	Load Reductions (lbs/ac/yr)			Total Reductions (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Impervious to Grass	0.08	6.06	1.17	430.00	0.48	0.09	34.40
Pervious to Grass	0.21	4.41	0.08	-	0.93	0.02	-
Total Reduction for Land Conversion (lbs/yr)		1.41	0.11	34.40			

Table 4. Computation of Proposed Credits for First Permit Cycle (5% of the Level 2 Scoping Run)

1-4. Victory Boulevard Vegetated Filter Strip

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	-	2.13	0.07	27.61	-	-	-
Reg. Pervious	0.86	7.65	0.51	72.28	6.58	0.44	62.16
Reg. Impervious	0.72	7.31	1.51	456.68	5.26	1.09	328.81
Total (lbs/yr)					11.84	1.53	390.97
Removal Efficiency					50%	50%	50%
Annual Reduction (lbs/yr)					5.92	0.76	195.49
Additional Reduction for Land Use Change (Pervious to Grass)							
Area Converted	Acres	Load Reductions (lbs/ac/yr)			Total Reductions (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Pervious to Grass	1.95	4.41	0.08	-	8.60	0.16	-
Total Reduction for Land Conversion (lbs/yr)					8.60	0.16	-
Total Annual Reduction (lbs/yr) (Efficiency + Land Conversion)					14.52	0.92	195.49

1-5. Elementary School Vegetated Filter Strip

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	-	2.13	0.07	27.61	-	-	-
Reg. Pervious	0.91	7.65	0.51	72.28	6.96	0.46	65.77
Reg. Impervious	-	7.31	1.51	456.68	-	-	-
Total (lbs/yr)					6.96	0.46	65.77
Removal Efficiency					50%	50%	50%
Annual Reduction (lbs/yr)					3.48	0.23	32.89
Additional Reduction for Land Use Change (Pervious to Grass)							
Area Converted	Acres	Load Reductions (lbs/ac/yr)			Total Reductions (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Pervious to Grass	0.40	4.41	0.08	-	1.76	0.03	-
Total Reduction for Land Conversion (lbs/yr)					1.76	0.03	-
Total Annual Reduction (lbs/yr) (Efficiency + Land Conversion)					5.24	0.26	32.89

Table 4. Computation of Proposed Credits for First Permit Cycle (5% of the Level 2 Scoping Run)

1-6. Wet Swale Near Municipal Works Lot and Pool

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	-	2.13	0.07	27.61	-	-	-
Reg. Pervious	1.37	7.65	0.51	72.28	10.48	0.70	99.02
Reg. Impervious	2.73	7.31	1.51	456.68	19.96	4.12	1,246.74
Total (lbs/yr)				30.44	4.82	1,345.76	
Removal Efficiency				25%	20%	50%	¹
Annual Reduction (lbs/yr)				7.61	0.96	672.88	

1- 50% value from Bay Program for Vegetated Open Channels (C/D soils)

1-7. End of Messick Road Vegetated Filter Strip

Land Use	Acres	Loading Rates (lbs/ac/yr)			Pollutant Loads (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Forest	-	2.13	0.07	27.61	-	-	-
Reg. Pervious	3.64	7.65	0.51	72.28	27.85	1.86	263.10
Reg. Impervious	0.56	7.31	1.51	456.68	4.09	0.85	255.74
Total (lbs/yr)				31.94	2.70	518.84	
Removal Efficiency				50%	50%	50%	
Annual Reduction (lbs/yr)				15.97	1.35	259.42	

Additional Reduction for Land Use Change (Pervious to Grass)

Area Converted	Acres	Load Reductions (lbs/ac/yr)			Total Reductions (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Pervious to Grass	1.69	4.41	0.08	-	7.45	0.14	-
Total Reduction for Land Conversion (lbs/yr)				7.45	0.14	-	

Total Annual Reduction (lbs/yr) (Efficiency + Land Conversion)

23.42	1.49	259.42
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1-8. Septic Tank Disconnects/Connections to Sanitary Sewer

Conversion	Number of People Served	Load Reductions (lbs/capita/yr)			Total Reductions (lbs/yr)		
		TN	TP	TSS	TN	TP	TSS
Septic to Sanitary Sewer	34.5	3.60	-	-	124.20	-	-
Total Reduction for Land Conversion (lbs/yr)				124.20	-	-	

See the summary at the beginning of this table for cumulative totals.

Table 5. Projects for First Permit Cycle (5% of the Level 2 Scoping Run)

Project	Location(s)	2015 Estimated Cost	Notes
1-1. Proposed Created Wetland (In Progress)	Adjacent to Oxford Run Ditch just south of Victory Boulevard.	-	Project funded previously (SLAF grant).
1-2. Proposed Wet Pond (In Progress)	Adjacent to Oxford Run Ditch, west of the City Hall parking lot.	-	Project funded previously (SLAF grant).
1-3. Land Use Change - 127 Ridge Road (Completed)	127 Ridge Road.	-	Project completed previously.
1-4. Victory Boulevard Vegetated Filter Strip	North side of Victory Boulevard from the City line to Oxford Run Ditch	\$ 110,743	
1-5. Elementary School Vegetated Filter Strip	Along concrete swale to the west of the Elementary School Parking lot.	\$ 13,479	
1-6. Wet Swale Near Municipal Works Lot and Pool	Just south of the Municipal Works lot on Municipal Drive.	\$ 39,739	
1-7. End of Messick Road Vegetated Filter Strips	Around City lot at end of Messick Road (Messick Point).	\$ 74,870	
1-8. Septic Tank Disconnects/Connections to Sanitary Sewer	(See notes)	\$ -	Completed after July 1, 2009
		Total Cost: \$	238,831

Notes:

1. See Figure 3 for specified locations.
2. See Table 7 for computation and tabulation of Chesapeake Bay TMDL pollutant removal credits.
3. See Table 11 for cost opinions.
4. Projects may be abandoned in favor of more economical alternatives, depending upon future regulatory approval of innovative BMPs, or other alternatives that may become available.
5. The following parcels were connected to sanitary sewer: 220 Browns Neck Rd. (2BR), 2 Lyons Creek Dr.(3 BR), 3 Lyons Creek Dr. (5 BR), 4 Lyons Creek Dr. (4 BR), 5 Lyons Creek Dr. (3 BR), 6 Lyons Creek Dr. (3 BR), 201-A Odd Rd. (3 BR). The number of individuals served was calculated using DEQ's estimate of 1.5 individuals per bedroom, and a total number of bedrooms of 23. $23 \times 1.5 = 34.5$ individuals.

Table 6. Schedule for First Permit Cycle (5% of the Level 2 Scoping Run)

Project	DATES ²			Notes
	BMP Initiated ¹	BMP Construction to Begin	BMP Installation Completed	
1-1. Proposed Created Wetland (In Progress)	n/a	6/30/2015	3/31/2016	SLAF grant. In design as of April 2015.
1-2. Proposed Wet Pond (In Progress)	n/a	6/30/2015	3/31/2016	SLAF grant. In design as of April 2015.
1-3. Land Use Change - 127 Ridge Rd. (Completed)	n/a	-	Before 6/30/2014	Completed.
1-4. Victory Boulevard Vegetated Filter Strip	n/a	10/31/2016	6/30/2017	
1-5. Elementary School Vegetated Filter Strip	n/a	10/31/2016	6/30/2017	
1-6. Wet Swale Near Municipal Works Lot and Pool	n/a	10/31/2017	6/30/2018	
1-7. End of Messick Road Vegetated Filter Strip	n/a	10/31/2017	6/30/2018	
1-8. Septic Tank Disconnects/Connections to Sanitary Sewer	After 6/30/2009	-	-	Completed.

Notes:

1. This column is for non-structural BMPs.
2. This information is formatted as requested in DEQ Guidance Memo No. 15-2005 (Finalized 5/18/2015).
3. This schedule can be used as the annual benchmarks required by the Phase II General Permit.
4. Projects may be abandoned in favor of more economical alternatives, depending upon future regulatory approval of innovative BMPs, or other alternatives that may become available.

Table 7. Cost Opinions

1-4. Victory Boulevard Vegetated Filter Strip. (Approximately 35' x 2,427')

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$3,564	\$3,564
2	Soil Testing	17	EA	\$100	\$1,700
3	Compost (4.5" depth incorporated to a depth of 10")	1168	CY	\$20	\$23,360
4	Soil tilling and compost incorporation	1.95	AC	\$3,100	\$6,045
5	Seeding	1.95	AC	\$1,000	\$1,950
6	Erosion and Sediment Control	1	LS	\$11,500	\$11,500
Construction Sub-Total:					\$48,119
	Design and Permitting	1	LS	\$20,000	\$20,000
	Survey	1	LS	\$18,000	\$18,000
	Utility Location	1	LS	\$10,000	\$10,000
	Utility Relocation	1	LS	\$15,000	\$15,000
	Contingency	20	%	\$9,624	\$9,624
Design & Construction Subtotal:					\$110,743
Total Project Cost:					\$110,743

Cost Assumptions

1. Mobilization/Demobilization set at 8% of construction subtotal.
2. One soil test required per 5,000 s.f. of vegetated filter strip. Assumes 2 samples for each test location; one before and one after compost incorporation.
3. Compost depth and incorporation depth from BMP clearinghouse Design Guideline No. 4 for Soil Compost Amendments. Compost depth based on IC/SA ratio of 0.37 and hydrologic group C soils.
4. Turf seeding assumed to be applied at 100 lbs. per acre. Includes mechanical spreading.
5. E&S cost assumes approximately 2,800 l.f. of silt fence and 1.95 acres of erosion control mulch.

Table 7. Cost Opinions

1-5. Elementary School Vegetated Filter Strip. (Approximately 35' x 500')

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$659	\$659
2	Soil Testing	4	EA	\$100	\$400
3	Compost (3.5" depth incorporated to a depth of 9")	190	CY	\$20	\$3,800
4	Soil tilling and compost incorporation	0.4	AC	\$3,100	\$1,240
5	Seeding	0.4	AC	\$1,000	\$400
6	Erosion and Sediment Control	1	LS	\$2,400	\$2,400
Construction Sub-Total:					\$8,899
	Design and Permitting	1	LS	\$800	\$800
	Survey	1	LS	\$1,000	\$1,000
	Utility Location	1	LS	\$1,000	\$1,000
	Contingency	20	%	\$1,780	\$1,780
Design & Construction Subtotal:					\$13,479
Total Project Cost:					\$13,479

Cost Assumptions

1. Mobilization/Demobilization set at 8% of construction subtotal.
2. One soil test required per 5,000 s.f. of vegetated filter strip. Assumes 2 samples for each test location; one before and one after compost incorporation.
3. Compost depth and incorporation depth from BMP clearinghouse Design Guideline No. 4 for Soil Compost Amendments. Compost depth based on IC/SA ratio of 0.0 and hydrologic group C soils.
4. Turf seeding assumed to be applied at 100 lbs. per acre. Includes mechanical spreading.
5. E&S cost assumes approximately 600 l.f. of silt fence and 0.4 acres of erosion control mulch.

Table 7. Cost Opinions

1-6. Wet Swale Near Municipal Works Lot and Pool.

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$1,589	\$1,589
2	Clearing & Grubbing	0.4	AC	\$8,000	\$3,200
3	Regular Excavation	230	CY	\$22	\$5,060
4	V-Notched Weir Across Swale	2	EA	\$1,800	\$3,600
5	Erosion and Sediment Control	1	LS	\$8,000	\$8,000
Construction Sub-Total:					\$21,449
	Design and Permitting	1	LS	\$8,000	\$8,000
	Survey	1	LS	\$3,000	\$3,000
	Utility Location	1	LS	\$3,000	\$3,000
	Contingency	20	%	\$4,290	\$4,290
Design & Construction Subtotal:					\$39,739
Total Project Cost:					\$39,739

Cost Assumptions

1. Mobilization/Demobilization set at 8% of construction subtotal.
2. Excavation quantity based on a proposed swale with the following dimensions; bottom width = 8', depth = 3' side slopes = 1V:4H and an existing ditch with the following dimensions; bottom width = 3', depth = 3' side slopes = 1V:4H.
3. Cost for each v-notched weir assumes 2.41 CY of concrete for a weir 26' long x 3' high x 6" thick, with a 26' x 2' x 6" footing, and 3.8 tons of No. 57 stone for bedding.
4. Cost opinion assumes 2 weirs. Only 1 weir may be necessary depending on actual ditch slope.
5. E&S cost assumes approximately 1,150 SY of VDOT St'd EC-2 protective soil covering and 800 l.f. of silt fence. EC-2 covering includes 2" of topsoil and seed.

Table 7. Cost Opinions

1-7. End of Messick Road Vegetated Filter Strip. (Approximately 35' x 1,694' & 50' x 335')

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$4,128	\$4,128
2	Soil Testing	16	EA	\$100	\$1,600
3	Compost (9" depth incorporated to a depth of 18")	596	CY	\$20	\$11,920
4	Compost (3.5" depth incorporated to a depth of 9")	558	CY	\$20	\$11,160
5	Soil tilling and compost incorporation (18")	0.56	AC	\$5,000	\$2,800
6	Soil tilling and compost incorporation (9")	1.13	AC	\$3,100	\$3,503
7	Seeding	1.69	AC	\$1,000	\$1,690
8	Stone Level Spreaders	553	LF	\$16.50	\$9,125
9	Erosion and Sediment Control	1	LS	\$9,800	\$9,800
				Construction Sub-Total:	\$55,725
Design and Permitting		1	LS	\$5,000	\$5,000
Survey		1	LS	\$1,500	\$1,500
Utility Location		1	LS	\$1,500	\$1,500
Contingency		20	%	\$11,145	\$11,145
				Design & Construction Subtotal:	\$74,870
				Total Project Cost:	\$74,870

Cost Assumptions

- Mobilization/Demobilization set at 8% of construction subtotal.
- One soil test required per 5,000 s.f. of vegetated filter strip. Assumes 2 samples for each test location; one before and one after compost incorporation.
- Compost depth and incorporation depth from BMP clearinghouse Design Guideline No. 4 for Soil Compost Amendments. Compost depth of 9" based on IC/SA ratio of 1.0 and hydrologic group C soils. Compost depth of 3.5" based on IC/SA ratio of 0.0 and hydrologic group C soils.
- Compost depth of 9" for filter strip beside parking lot. Nutrient reduction credit only taken for impervious area equal to size of filter strips adjacent to parking lot (0.56 acres).
- Turf seeding assumed to be applied at 100 lbs. per acre. Includes mechanical spreading.
- LF cost of level spreaders includes 41 CY of No. 57 stone and 250 SY of geotextile fabric.
- E&S cost assumes approximately 2,400 l.f. of silt fence and 1.69 acres of erosion control mulch.

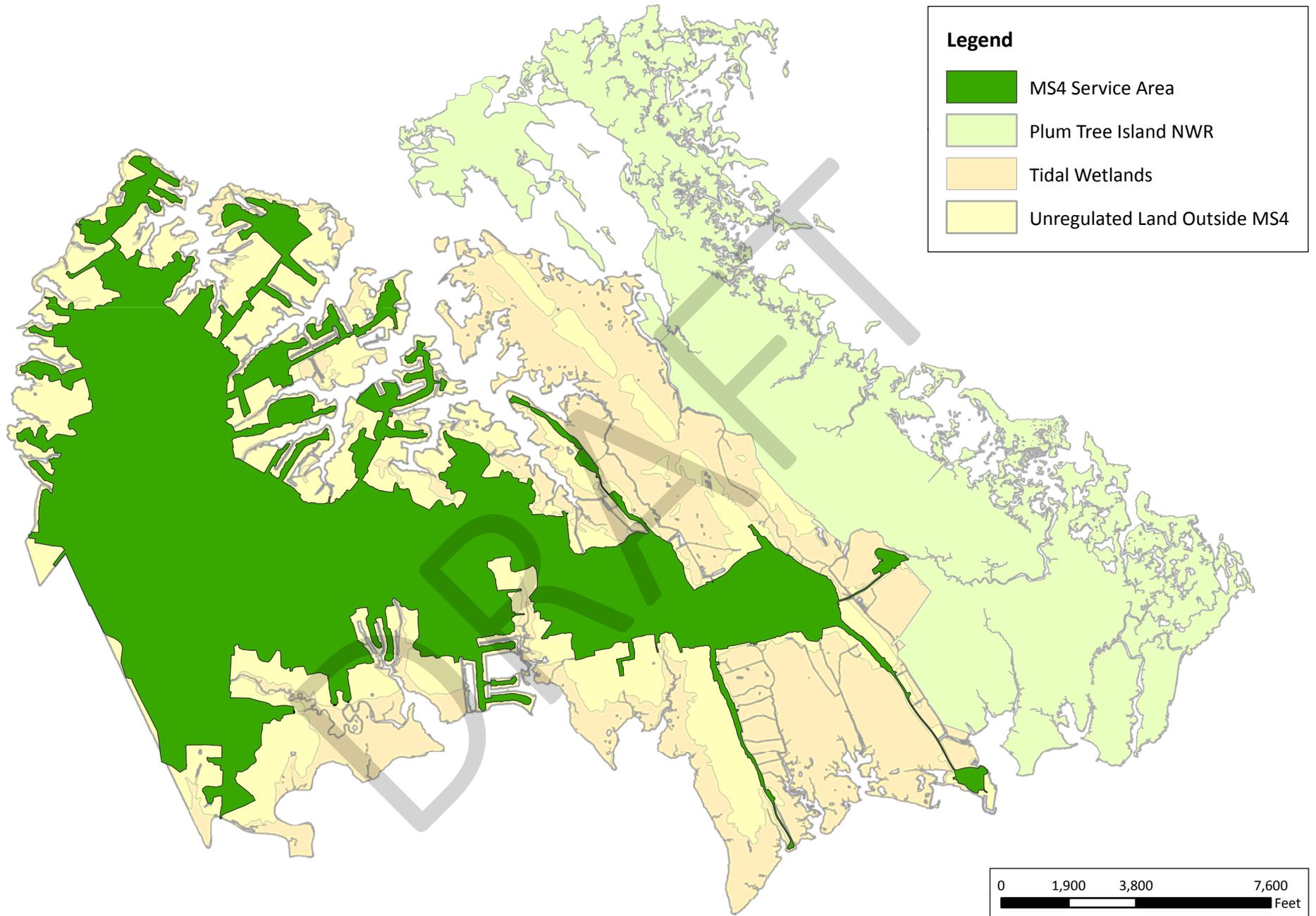


Figure 1. City of Poquoson's MS4 Service Area

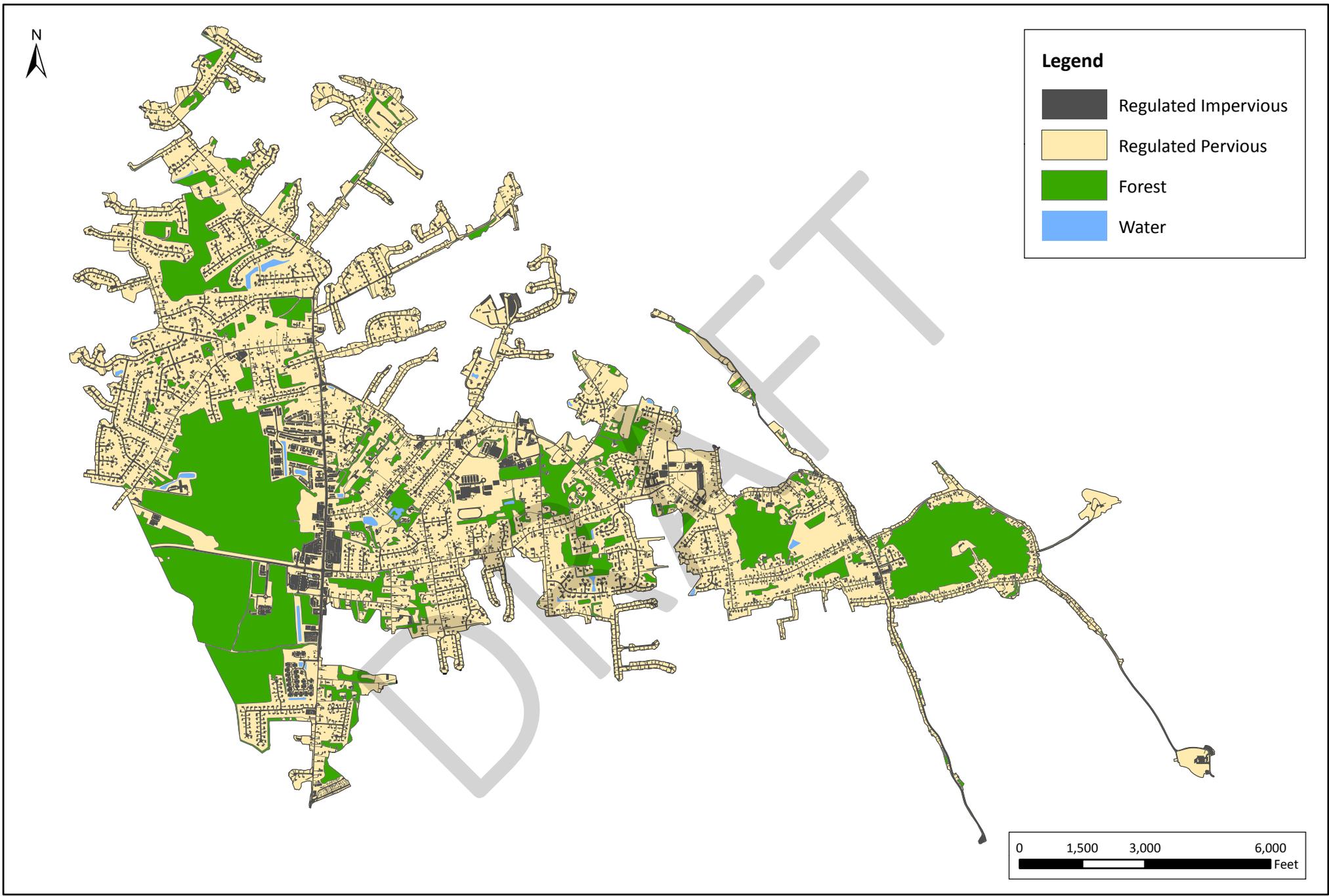


Figure 2. Land Use in the MS4 Service Area

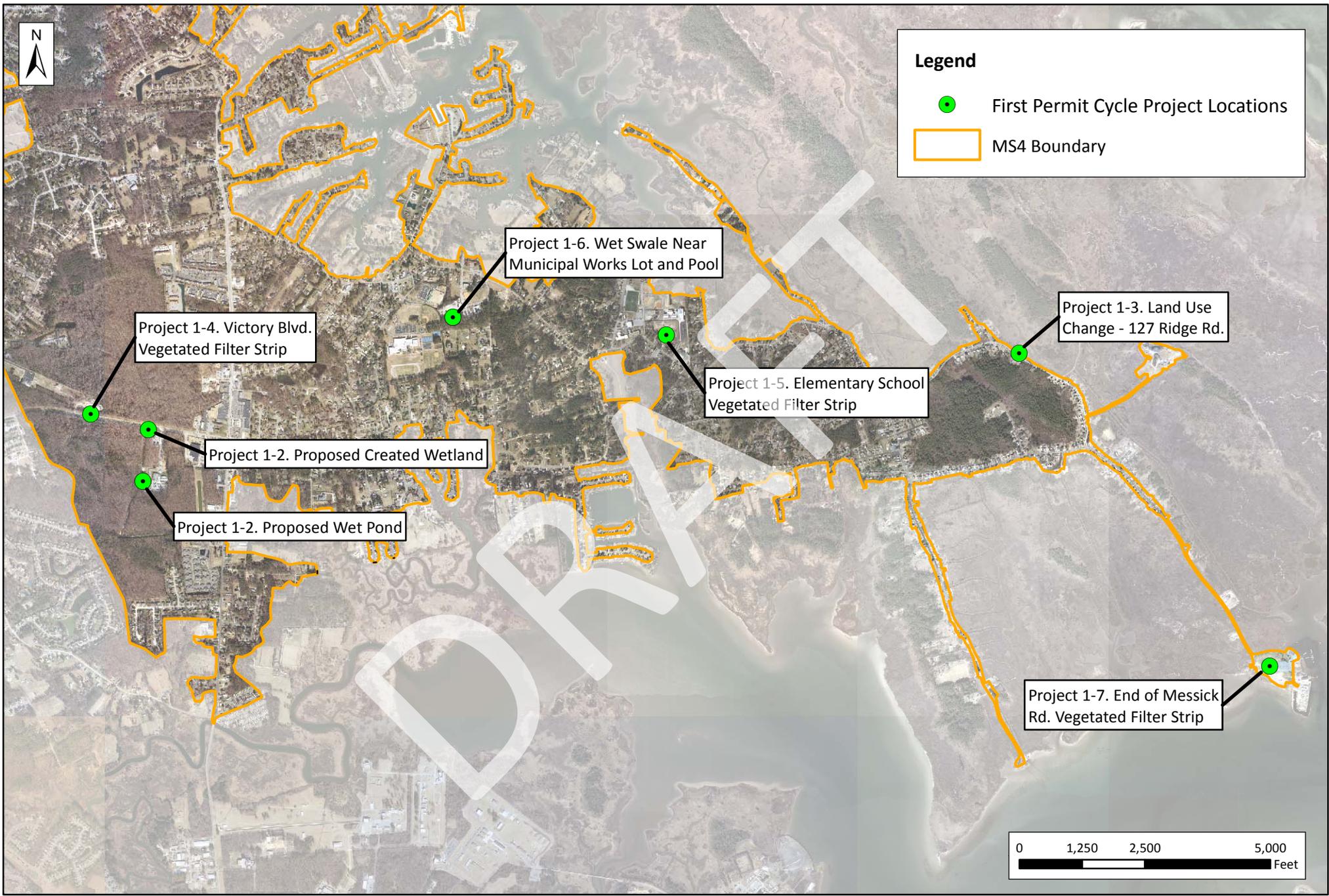


Figure 3. Project Locations for First Permit Cycle (5% of the Level 2 Scoping Run)

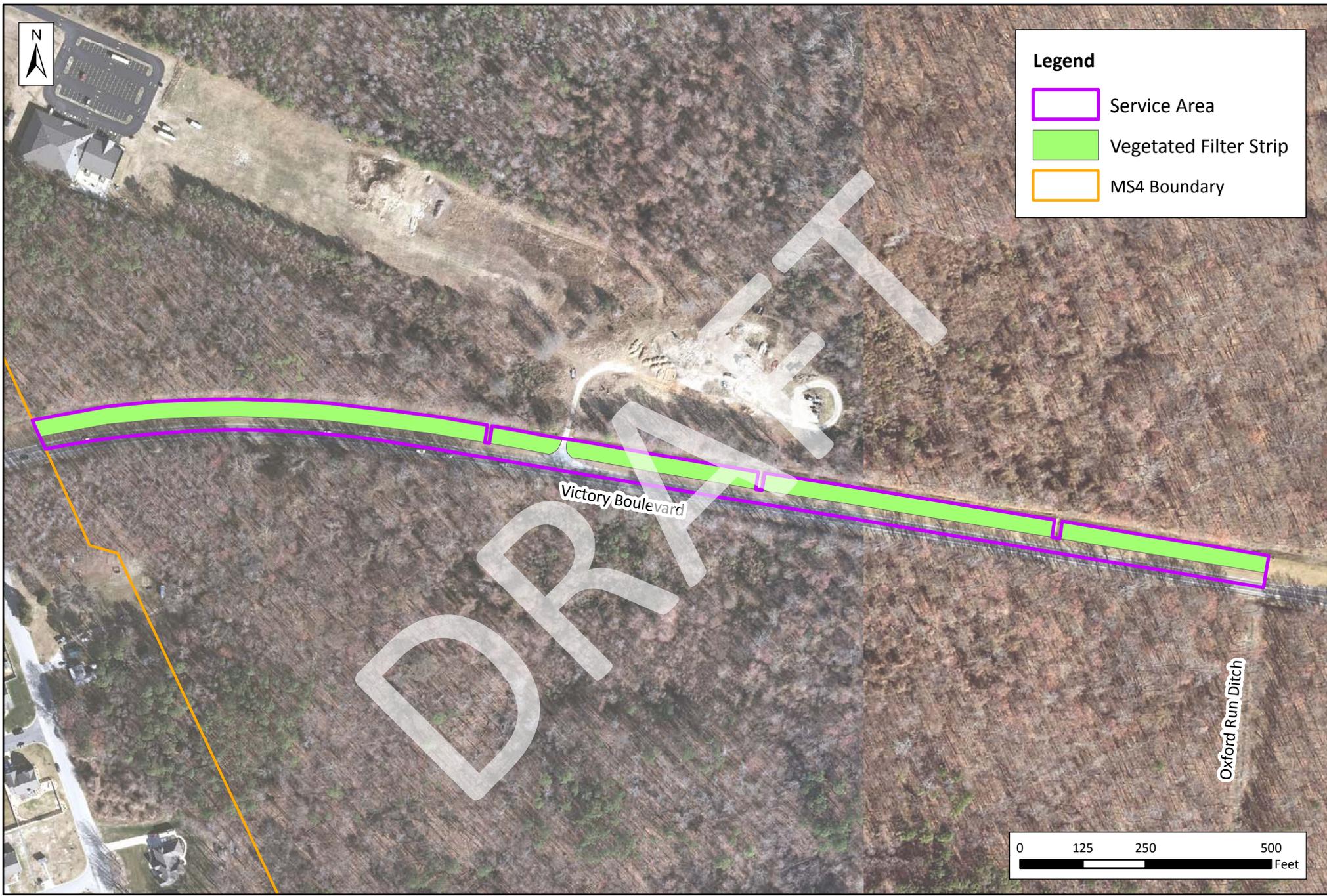


Figure 4. Project 1-4, Victory Boulevard Vegetated Filter Strip

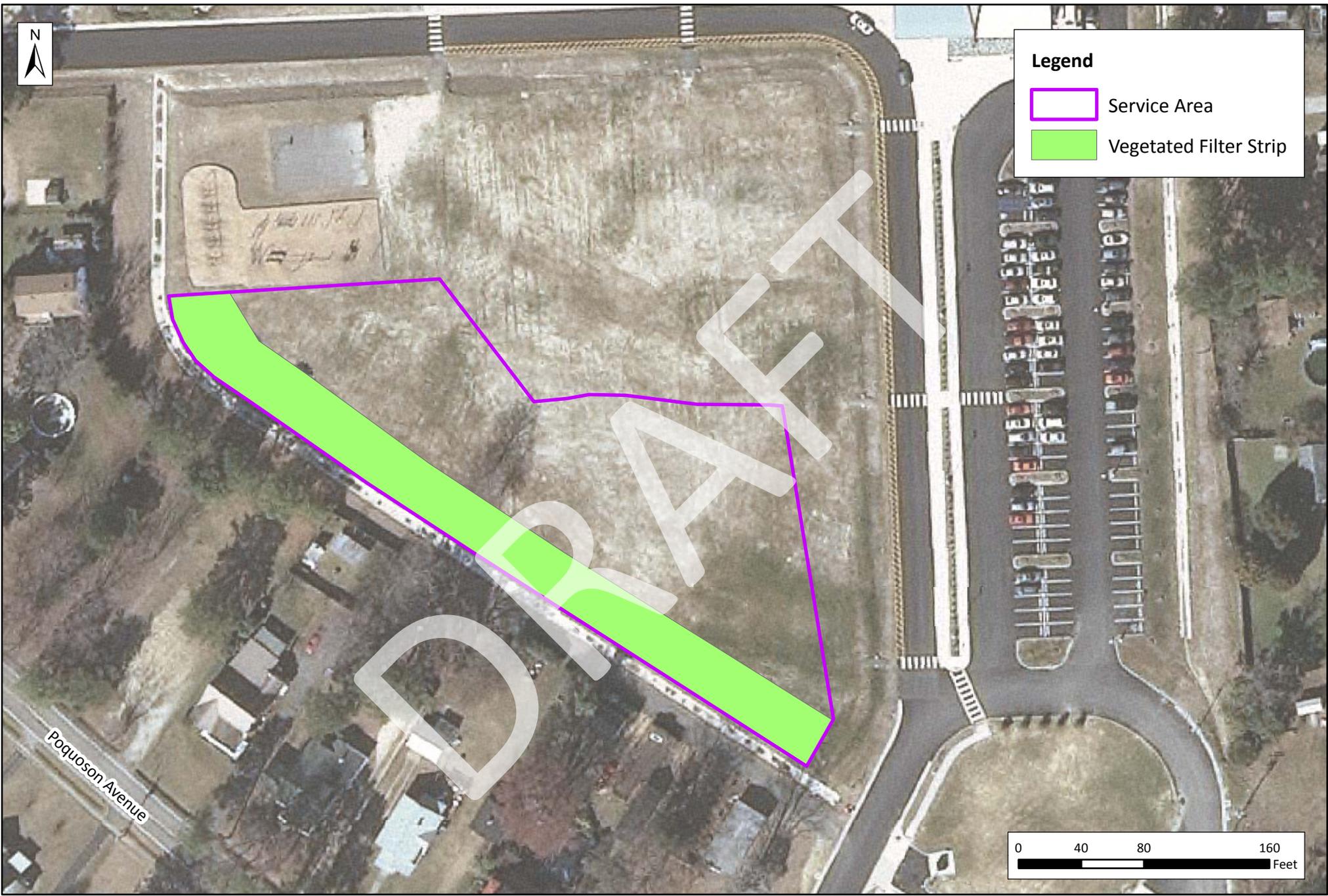


Figure 5. Project 1-5, Elementary School Vegetated Filter Strip

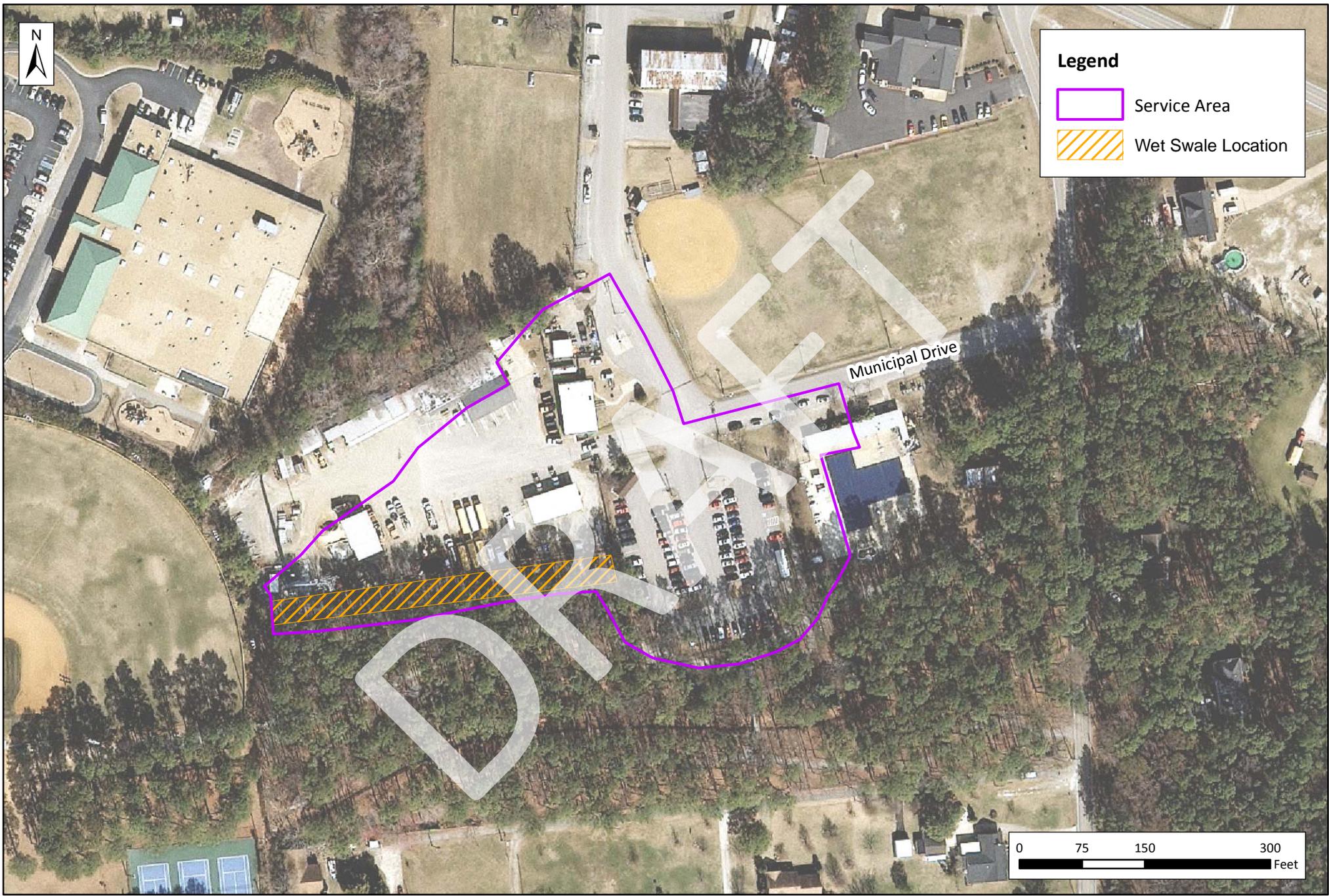


Figure 6. Project 1-6, Wet Swale Near Municipal Works Lot and Pool

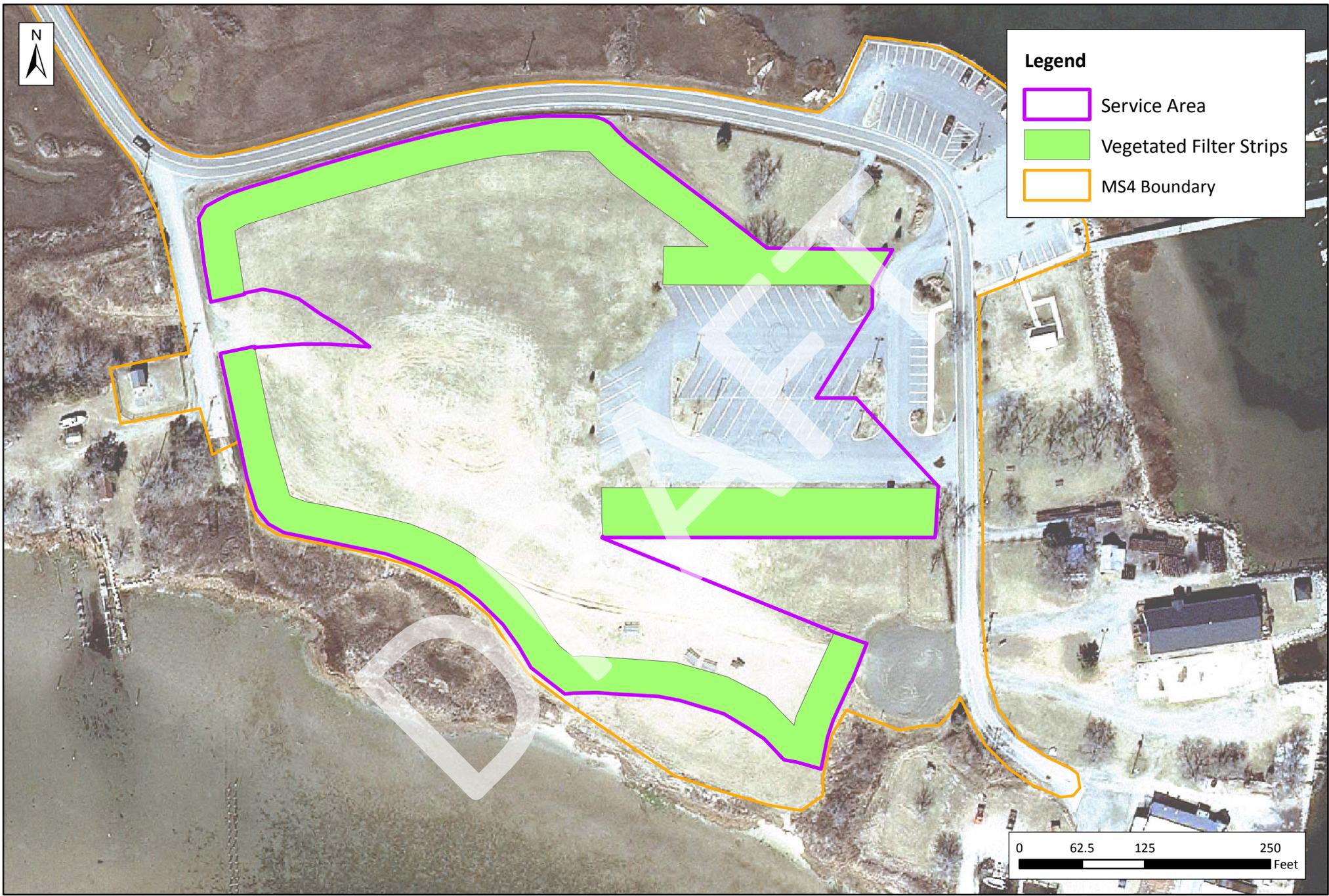


Figure 7. Project 1-7, End of Messick Road Vegetated Filter Strips

