

Bernardsville Borough

Introduction

Located in Somerset County in New Jersey, Bernardsville Borough covers approximately 12.9 square miles. With a population of 7,893 (2020 United States Census), Bernardsville Borough consists of 45.1% of urban land uses by area. Of that urban land use, approximately 62.1% is comprised of rural residential properties (NJDEP Open Data). In addition to residential development, urban land use also includes land used for commercial, industrial, recreational, and transportation purposes. Natural lands (forests, wetlands, and water) make up approximately 48.4% of Bernardsville Borough.

Bernardsville Borough contains portions of seven subwatersheds (Table 1). There are approximately 38.2 miles of rivers and streams within the municipality; these include tributaries to Harrisons Brook, Indian Grove Brook and its tributaries, McVikers Brook, Mine Brook and its tributaries, North Branch Raritan River and its tributaries, Passaic River and its tributaries, tributaries to Penns Brook, and several uncoded tributaries. Bernardsville Borough is within the New Jersey Department of Environmental Protection (NJDEP) Watershed Management Areas (WMA) 6 (Upper Passaic, Whippany, and Rockaway) and 8 (North and South Branch Raritan).

Table 1: Subwatersheds of Bernardsville Borough

Subwatershed	HUC14
Passaic River Upper (above Osborn Mills)	02030103010010
Passaic River Upper (Dead River to Osborn Mills)	02030103010070
Dead River (above Harrisons Brook)	02030103010080
Harrisons Brook	02030103010090
Raritan River North Branch (including McVickers to Indian Brook)	02030105060030
Raritan River North Branch (Peapack Brook to McVickers Brook)	02030105060040
Raritan River North Branch (including Mine Brook to Peapack Brook)	02030105060070

The purpose of this report is to provide a comprehensive understanding of key, defining features within the subwatersheds throughout Bernardsville Borough. This involves gathering, organizing, and presenting information about existing conditions and infrastructure within each subwatershed. It aims to serve as a tool for informed decision-making, planning, and

implementation of sustainable watershed management strategies aimed to protect and enhance the health of the watershed, its associated ecosystems, and the surrounding communities.

A geographic information system (GIS) was used to visualize data pertaining to the existing stormwater infrastructure, land cover, watershed delineation, and water quality classification and impairments within separate layers. Datasets from the New Jersey Department of Environmental Protection's (NJDEP's) GIS database was used to populate the watershed inventory map, from which the relevant data were isolated. Datasets representing Bernardsville Borough's existing stormwater infrastructure were provided by the municipality and were manipulated, if necessary, for the specific purposes of this report.

Analysis by Municipality

An analysis was completed by municipality. Figure 1 shows Bernardsville Borough in relation to the study area. Figure 2 shows the portions of the seven HUC14s in Bernardsville Borough and highlights the HUC14s that are contained within the study area. Figure 3 illustrates the land use in Bernardsville Borough. A detailed land use analysis and nonpoint source loading analysis was completed for each HUC14 in Bernardsville Borough and is presented in Table 2. Figure 4 shows the impervious cover in Bernardsville Borough based upon NJDEP's 2015 impervious cover layer. An impervious cover analysis was completed for each HUC14 in Bernardsville Borough and is presented in Table 3.

For the area of the municipality in the study area, a stormwater facilities analysis was completed (see Figure 5). Two sources were used to identify stormwater facilities. The first data source was the New Jersey Hydrologic Modeling Database (SCS, 2024) that was prepared by the Soil Conservation Districts (SCD) and Rutgers University. The second data source was the NJDEP 2020 land use/land cover GIS Layer. Land use data uses a land use code (1499) to identify stormwater basins. Each stormwater basin was inspected (see Table 4). The detention basins in Table 4 (identified as type "D") could benefit from naturalization (i.e., conversion from a detention basin to a bioretention basin). Detention basins that are already naturalized are identified as type "N". The retention basins in Table 4 (identified as type "R") could benefit from the addition of vegetative shoreline buffers. Retention basins that already have a vegetative shoreline buffer are listed as type "RB". No naturalized detention basins nor retention basins with vegetative shoreline buffers were identified in Bernardsville Borough within the study area.

The Q-Farms in Bernardsville Borough have been identified (see Figure 6). Table 5 presents the data available for each Q-Farm parcel. Q-Farms are the parcels that have been qualified for farmland tax assessment. The Q-Farms in the study area of Bernardsville Borough have been identified (see Figure 7 and Table 6). It is important to note that the land use on a Q-Farm is often not all agriculture. Figure 8 illustrates the land use on the Q-Farms, which is summarized in Table 7. There are 524.7 acres of agricultural land use in Bernardsville Borough, of which, 458.8 acres lie within the study area for this Watershed Restoration and Protection Plan. There are 39 Q-Farms in the study area portion of Bernardsville Borough, totaling 551.4 acres. Within the 39 Q-Farms, there are approximately 256.2 acres of agricultural land use. Aerial photography (see Figure 9) was used to identify areas where riparian buffers may be able to be enhanced to further protect the waterways from agricultural impacts. Based upon the aerial photograph and site visits, recommendations for the agricultural lands in the study area in Bernardsville Borough are presented in Table 8.

The impervious cover analysis was used to calculate targets for areas of rooftops to be treated with rain gardens and length of roadways to be managed with bioswales. Three HUC14s are included in the study area (02030105060030, 02030105060040, 02030105060070). Within these three HUC14s, there are 132.2 acres of buildings and 174.94 acres of roadway. The Watershed Restoration and Protection Plan recommends managing stormwater runoff from ¼ of 25% of the building rooftops. For the study area within Bernardsville Borough, approximately 8.3 acres of rooftop runoff would be managed with 1.65 acres of rain gardens. The plan also calls for the management of 10% of the roadways with bioswales. For the study area within Bernardsville Borough, approximately 17.5 acres of roadway would be managed, or 4.8 miles of roadway.

Finally, the parcel data was used to identify parcels that are classified as Property Class 15. Property Class 15 parcels are tax-exempt, and include six subcategories:

15A – Public School Property

15B- Other School Property

15C- Public Property

15D- Church and Charitable Property

15E- Cemeteries and Graveyards

15F- Other Exempt

The Property Class 15 parcels for Bernardsville Borough are shown in Figure 10 and presented in Table 9. When the municipality develops their Watershed Improvement Plan to satisfy their Municipal Separate Storm Sewer System (MS4) permit, these are the first sites that are assessed for opportunities to install watershed improvement projects. This assessment was completed for the Property Class 15 parcels in the study area (see Figure 11). Available information for each parcel in the study area is presented in Table 10. Class 15E parcels were excluded from the assessment. Ten of these properties offer opportunities to be retrofitted with green infrastructure to help reduce pollutant loads. These properties are identified in Table 10 and represent watershed improvement projects that can be included in the municipality's Watershed Improvement Plan. Figure 12 shows parcels within the entire municipality that offer opportunities to be retrofitted with green infrastructure. These sites are included in the Impervious Cover Reduction Action Plan that was completed by the RCE Water Resources Program for the municipality.

Water Quality Classification

The New Jersey Department of Environmental Protection (NJDEP) Surface Water Quality Standards (SWQS) are regulations that govern the water quality goals and pollution limitations for surface waters in New Jersey. Surface waters are classified based on their designated uses, such as drinking water supply, aquatic life habitat, recreation, or shellfish harvesting. The SQWS are used to protect those uses and guide permitting, monitoring, and water quality restoration efforts.

Under the SWQS, freshwaters are classified as Fresh Water 1 (FW1), Fresh Water 2 (FW2), or Pinelands (PL). FW1 waters are nondegradation waters with unique ecological significance, in which man-made wastewater discharges are not permitted. FW2 waters are all other freshwaters

except for Pinelands waters. FW2 waters are further classified based on their ability to support trout. Trout Production waters (TP) are designated for use by trout for spawning or nursery purposes during their first summer. Trout Maintenance waters (TM) are designated for the support of trout throughout the year. Nontrout waters (NT) are generally unsuitable for trout due to their physical, chemical, or biological characteristics. Pinelands waters – which may be either fresh or saline waters – are surface waters within the Pinelands Protection and Preservation areas.

Saline waters that are not PL are classified under the SWQS as either Saline Estuarine (SE) or Saline Coastal (SC). SE waters are further classified based on their ability to support recreation, shellfish harvesting, and warm water fish species. SE1 waters have the highest protection within the SE category, and must support the maintenance, migration, and propagation of fish and aquatic life, as well as shellfish harvesting. SE2 waters must support the maintenance, migration, and propagation of fish and aquatic life but do not need to support shellfish harvesting. SE3 waters must support the migration of fish but do not need to support permanent aquatic biota populations or shellfish harvesting. Some coastal waters have dual classifications where the waters change from freshwater to saltwater as they drain into the estuary or ocean.

Finally, there are three antidegradation classifications assigned to all New Jersey surface waters. Outstanding National Resource Waters (ONRW) is the most protective classification and applies to all F1 and PL waters. No degradation is permitted in ONRW waters. Category One waters (C1) are protected from any measurable change to existing water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources. Category Two waters (C2) permit some measurable degradation in water quality, but the changes must be limited and justified. C2 is the default classification for all surface waters that are not categorized as F1, PL, or C1.

There are five classifications that apply to the streams in Bernardsville Borough. Figure 13 depicts the water quality classifications of surface waters throughout Bernardsville Borough and Table 11 summarizes the total miles and percentage of each surface water quality classification in the municipality.

Areas Prone to Flooding

Administrators from Bernardsville Borough have identified several locations throughout the municipality that are particularly susceptible to flooding during heavy rainfall or storm events. Mine Brook at Route 202 and at Meeker Road have been noted as sites that frequently experience flooding, posing risks to nearby infrastructure and public safety. At Mine Brook by Route 202, there is an undersized culvert that runs underneath the roadway and adjacent train tracks that may be a contributing factor to the frequent flooding observed at this location. Figure 14 shows the locations of the aforementioned areas of concern.

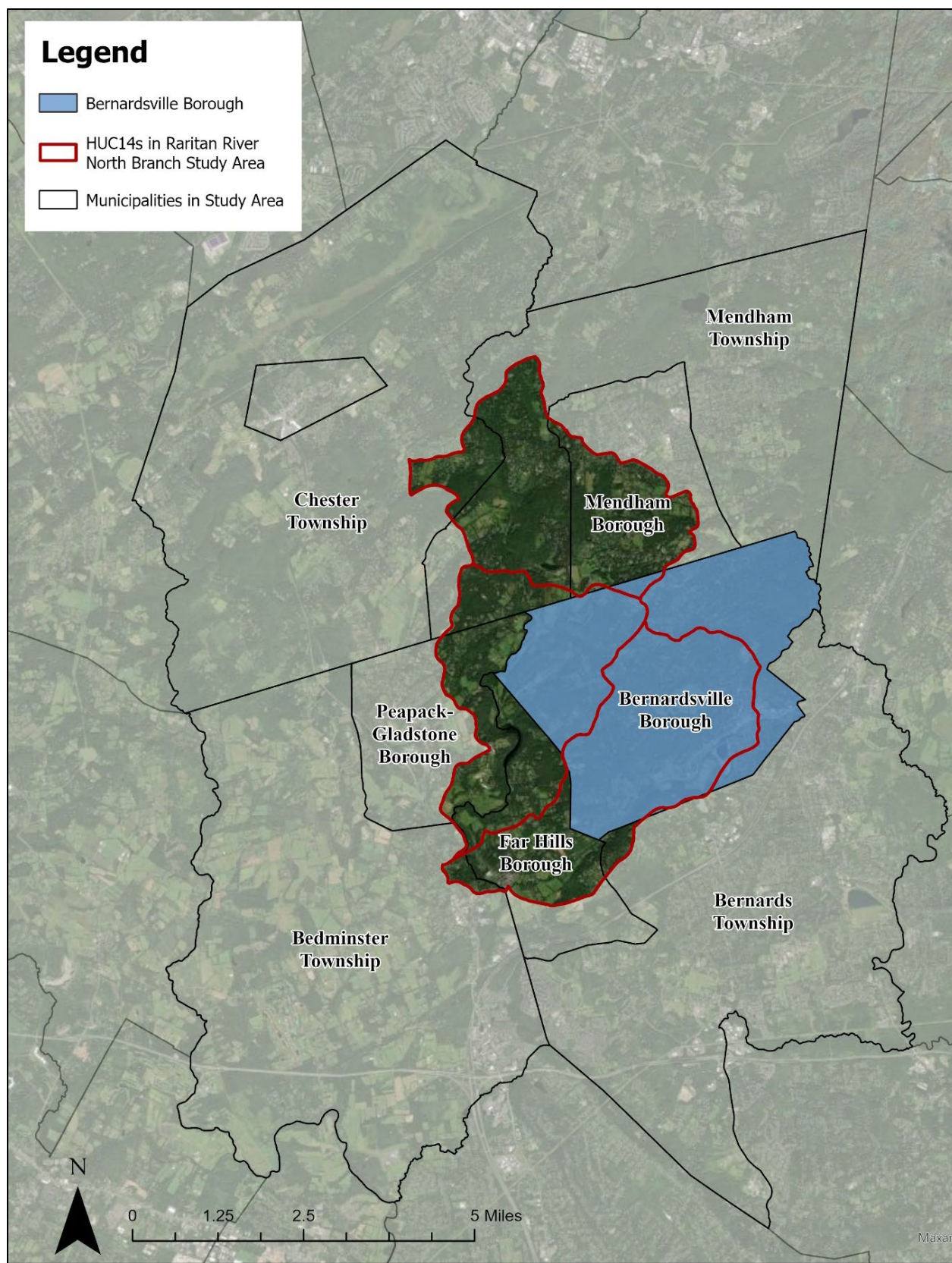


Figure 1: Municipalities in the Study Area

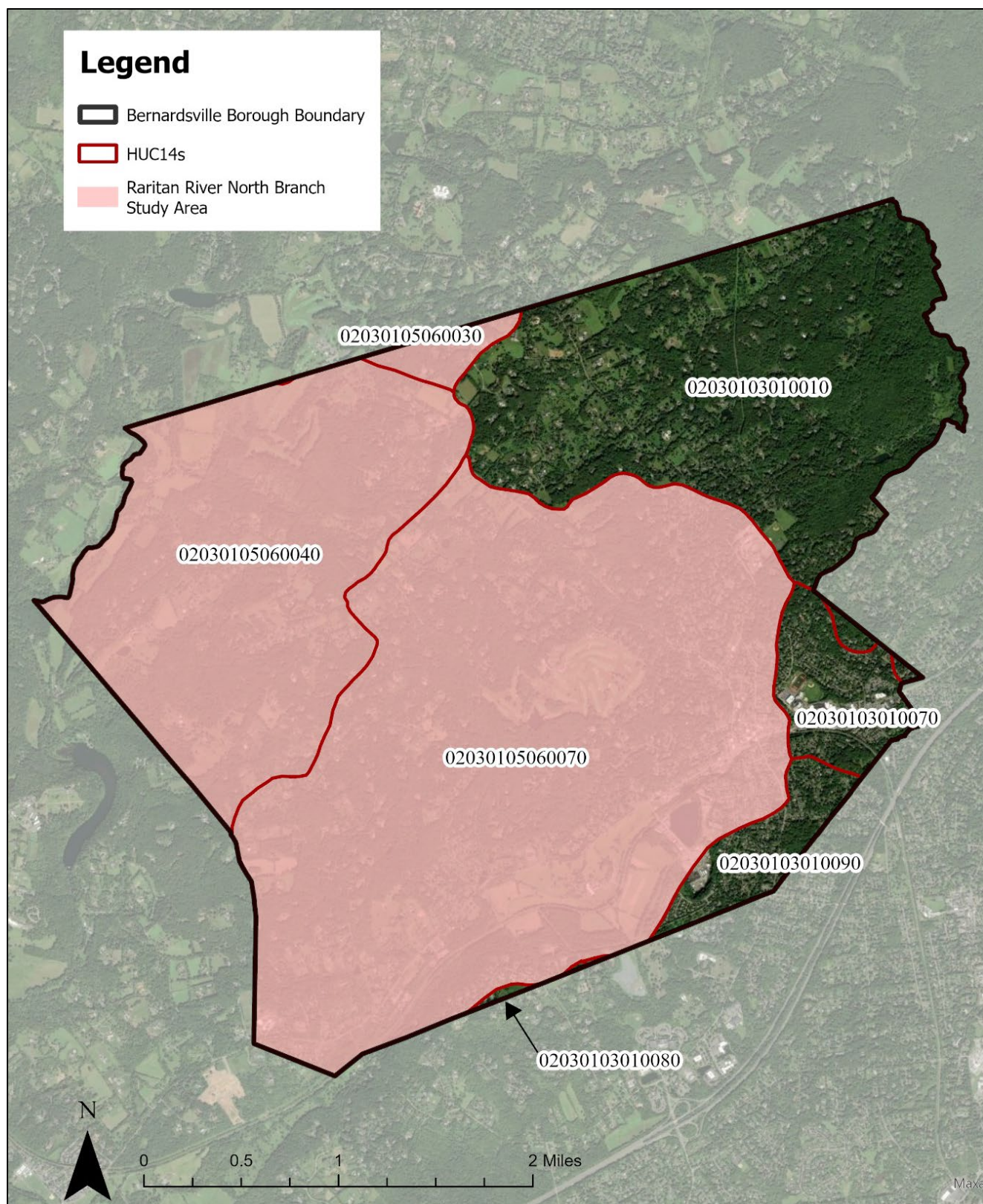


Figure 2: Portions of seven HUC14s are in Bernardsville Borough

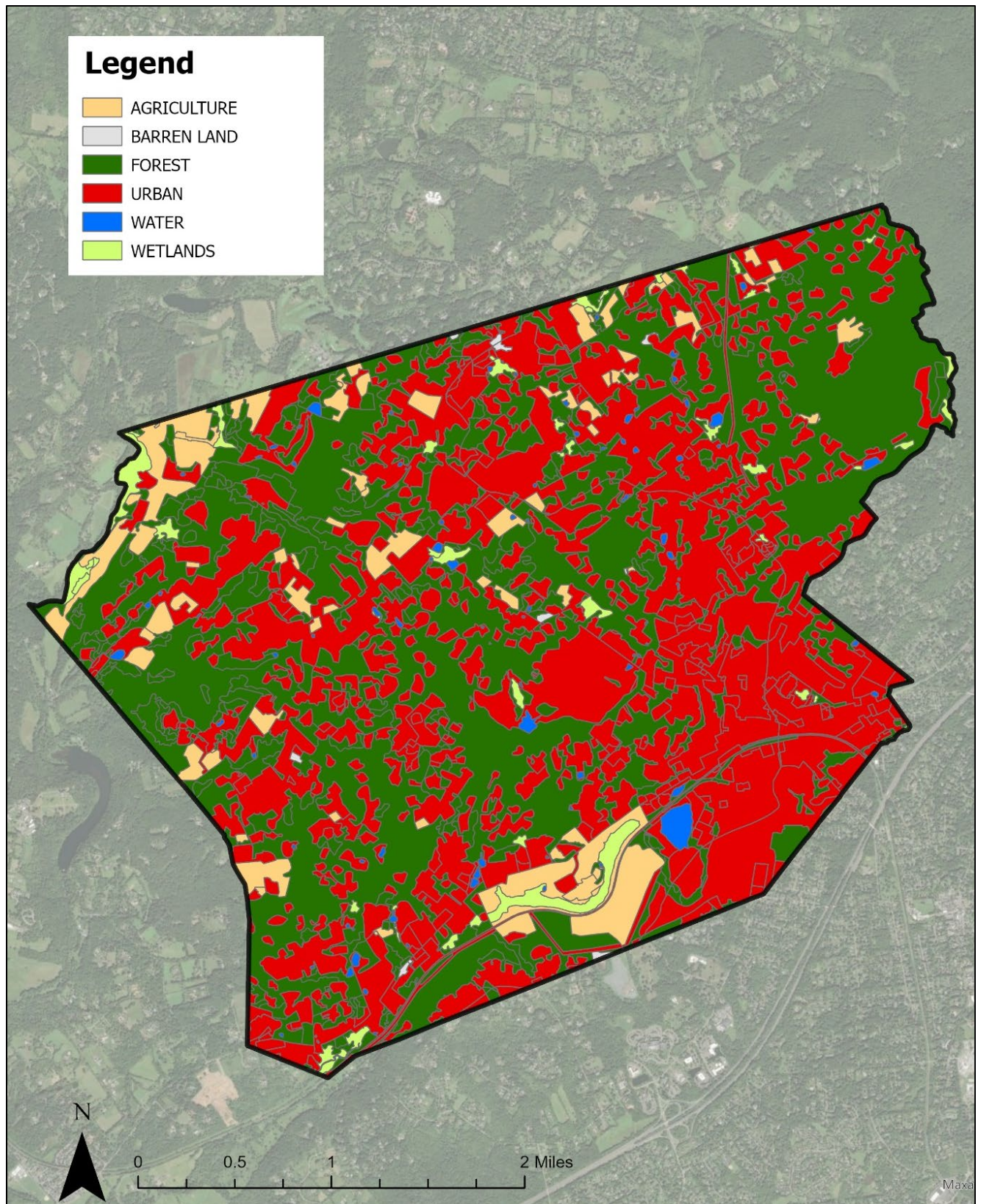


Figure 3: Land Use in Bernardsville Borough

**Table 2: Land Use Analysis and Nonpoint Source Loading Analysis by HUC14 for
Bernardsville Borough**

Land Use Type	Area (acres)	TP Load (lbs/yr)	TN Load (lbs/yr)	TSS Load (lbs/yr)
02030103010010				
Agriculture	65.9	85.6	658.6	19,758.6
Barren Land	3.0	1.5	15.0	179.7
Forest	1,068.5	106.9	3,205.6	42,741.3
Urban	817.7	1,144.8	12,266.2	114,484.9
Water	16.3	1.6	48.8	650.5
Wetlands	33.6	3.4	100.9	1,345.5
TOTAL =	2,005.0	1,343.8	16,295.1	179,160.6
02030103010070				
Agriculture	0.0	0.0	0.0	0.0
Barren Land	0.0	0.0	0.0	0.0
Forest	31.6	3.2	94.9	1,265.6
Urban	245.0	343.0	3,674.6	34,296.0
Water	0.5	0.0	1.4	19.2
Wetlands	3.1	0.3	9.2	122.4
TOTAL =	280.2	346.5	3,780.1	35,703.3
02030103010080				
Agriculture	0.0	0.0	0.0	0.0
Barren Land	0.0	0.0	0.0	0.0
Forest	3.1	0.3	9.2	122.8
Urban	7.7	10.7	115.1	1,073.9
Water	0.0	0.0	0.0	0.0
Wetlands	0.0	0.0	0.0	0.0
TOTAL =	10.7	11.0	124.3	1,196.7
02030103010090				
Agriculture	0.0	0.0	0.0	0.0
Barren Land	0.3	0.2	1.6	19.5
Forest	40.5	4.0	121.5	1,619.4
Urban	175.9	246.2	2,638.2	24,622.8
Water	0.0	0.0	0.0	0.0
Wetlands	0.0	0.0	0.0	0.0
TOTAL =	216.7	250.4	2,761.2	26,261.7
02030105060030				
Agriculture	0.5	0.7	5.1	152.3
Barren Land	2.2	1.1	11.0	132.4
Forest	44.7	4.5	134.2	1,789.0
Urban	38.3	53.7	575.1	5,367.5
Water	0.0	0.0	0.0	0.0
Wetlands	0.0	0.0	0.0	0.0

TOTAL =	85.8	59.9	725.4	7,441.3
02030105060040				
Agriculture	229.1	297.8	2,291.1	68,733.0
Barren Land	1.4	0.7	6.8	81.7
Forest	994.3	99.4	2,982.9	39,771.9
Urban	582.3	815.3	8,735.0	81,526.6
Water	12.0	1.2	36.1	481.6
Wetlands	45.0	4.5	134.9	1,798.9
TOTAL =	1,864.1	1,218.9	14,186.8	192,393.7
02030105060070				
Agriculture	229.2	297.9	2,291.8	68,752.7
Barren Land	5.7	2.8	28.4	340.6
Forest	1,581.1	158.1	4,743.2	63,242.1
Urban	1,863.9	2,609.4	27,958.2	260,943.1
Water	44.0	4.4	131.9	1,758.7
Wetlands	78.4	7.8	235.1	3,134.4
TOTAL =	3,802.1	3,080.5	35,388.5	398,171.5
All HUCs				
Agriculture	524.7	682.1	5,246.6	157,396.5
Barren Land	12.6	6.3	62.8	754.0
Forest	3,763.8	376.4	11,291.4	150,552.2
Urban	3,730.8	5,223.1	55,962.3	522,314.8
Water	72.8	7.3	218.3	2,910.1
Wetlands	160.0	16.0	480.1	6,401.2
TOTAL =	8,264.6	6,311.1	73,261.4	840,328.8

Impervious Cover Analysis

NJDEP's Open Data impervious surface GIS data layer depicts surfaces throughout Bernardsville Borough that have been covered with materials that are highly resistant to infiltration by water, rendering them impervious. These surfaces include rooftops, roadways, sidewalks, and other paved areas. These impervious cover values were used to estimate the impervious coverage for Bernardsville Borough. Based upon the NJDEP impervious surface data, Bernardsville Borough has impervious cover totaling 12.2%. Table 3 shows impervious cover for each HUC14. The extent of the impervious cover in Bernardsville Borough is shown in Figure 4. The literature suggests a link between impervious cover and stream ecosystem impairment (Schueler, 1994; Arnold and Gibbons, 1996; May et al., 1997). Impervious cover may be linked to the quality of lakes, reservoirs, estuaries, and aquifers (Caraco et al., 1998), and the amount of impervious cover in a watershed can be used to project the current and future quality of streams. Based on scientific literature, Caraco et al. (1998) classified urbanizing streams into the following three categories: sensitive streams, impacted streams, and non-supporting streams.

Schueler (1994, 2004) developed an impervious cover model that classified "sensitive streams" as typically having a watershed impervious surface cover from 0-10%. "Impacted streams" have

a watershed impervious cover ranging from 11-25% and typically show clear signs of degradation from urbanization. “Non-supporting streams” have a watershed impervious cover of greater than 25%; at this high level of impervious cover, streams are simply conduits for stormwater flow and no longer support a diverse stream community.

Schueler et al. (2009) reformulated the impervious cover model based upon new research that had been conducted. This analysis determined that stream degradation was first detected at 2 to 15% impervious cover. The updated impervious cover model recognizes the wide variability of stream degradation at impervious cover below 10%. The updated model also moves away from having a fixed line between stream quality classifications. For example, 5 to 10% impervious cover is included for the transition from sensitive to impacted, 20 to 25% impervious cover for the transition between impacted and non-supporting, and 60 to 70% impervious cover for the transition from non-supporting to urban drainage.

Based upon this information, Bernardsville Borough’s impervious cover percentage would suggest that its waterways are primarily impacted and most likely contributing to not meeting the state’s surface water quality standards.

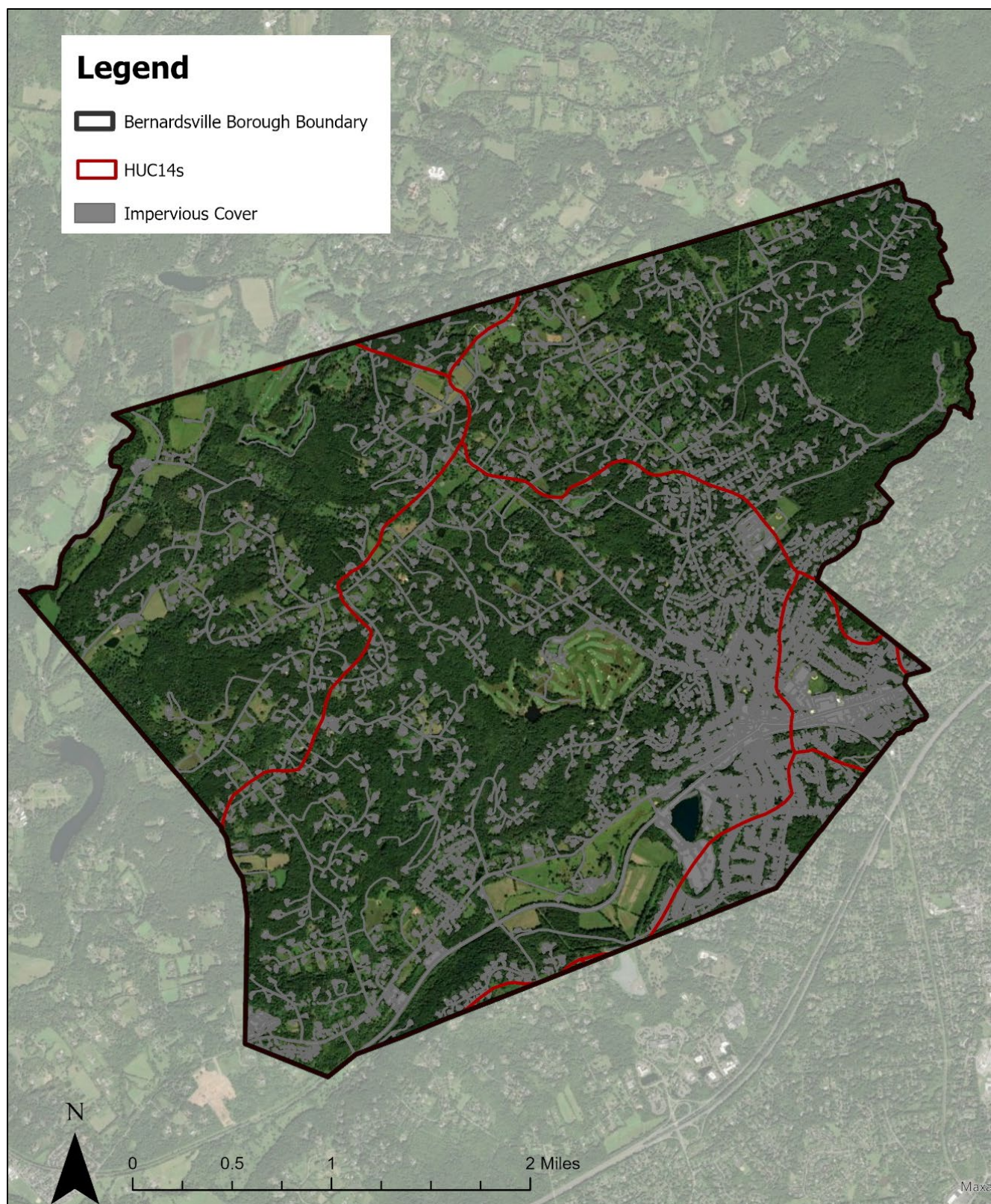


Figure 4: Impervious Cover in Bernardsville Borough

Table 3: Impervious Cover Analysis by HUC14 for Bernardsville Borough

Class	Area (acres)	HUC Impervious Cover (%)
02030103010010		
Building	32.82	
Other	89.44	
Road	44.61	
TOTAL =	166.9	8.3%
02030103010070		
Building	27.40	
Other	57.90	
Road	23.98	
TOTAL =	109.3	39.0%
02030103010080		
Building	0.42	
Other	0.41	
Road	0.00	
TOTAL =	0.8	7.7%
02030103010090		
Building	15.34	
Other	34.92	
Road	20.04	
TOTAL =	70.3	32.4%
02030105060030		
Building	2.21	
Other	4.80	
Road	1.76	
TOTAL =	8.8	10.2%
02030105060040		
Building	21.91	
Other	58.26	
Road	30.69	
TOTAL =	110.9	5.9%
02030105060070		
Building	108.07	
Other	288.04	
Road	142.49	
TOTAL =	538.6	14.2%
All HUCs		
Building	208.16	
Other	533.77	
Road	263.56	
TOTAL =	1,005.5	12.2%

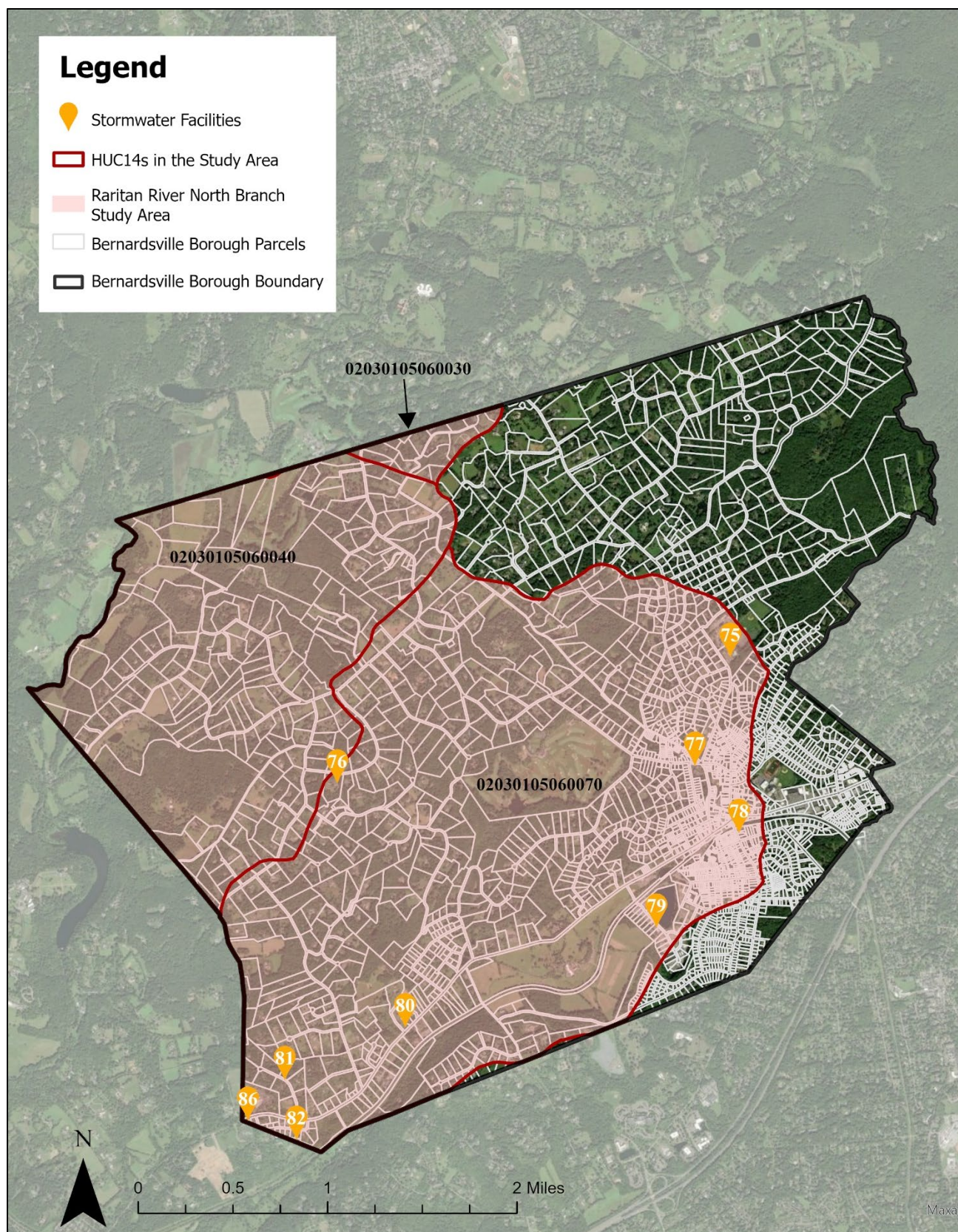


Figure 5: Stormwater Facilities in the Study Area of Bernardsville Borough

Table 4: Location of Stormwater Facilities in the Study Area of Bernardsville Borough

Raritan River North Branch Study Area		
<u>ID</u>	<u>Address</u>	<u>Type</u>
75	115 Seney Dr	R
76	37 Boulderwood Dr	D
77	80 Claremont Rd	I
78	22 Mount Airy Rd	I
79	15 Old Quarry Rd	D
80	475 Mine Brook Rd	D
81	681 Mine Brook Rd	D
82	689 Mine Brook Rd	D
86	5 Castle Court	I

“D” = Detention, “R” = Retention, “I” = Infiltration

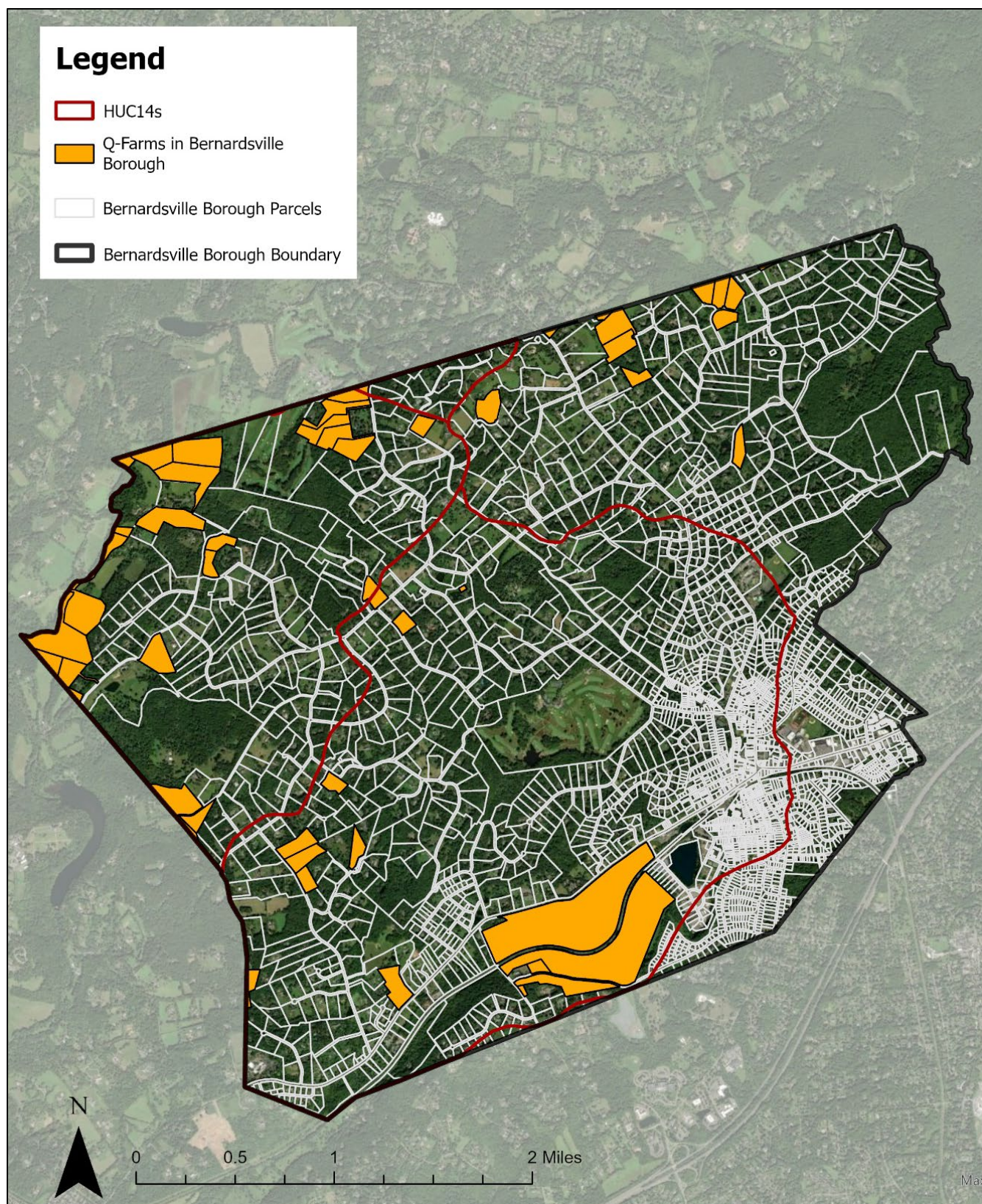


Figure 6: Q-Farm Parcels in Bernardsville Borough

Table 5: Q-Farm Parcels in Bernardsville Borough

Block	Lot	Q-Code	Prop Class	Location
1	1	Q0001	3B	51 Stevens Lane
2	1	Q0001	3B	41 Stevens Lane
2	2	Q0001	3B	Stevens Lane
2	11	Q0001	3B	51 Stevens Lane
1	5	Q0002	3B	141 Stevens Lane
9	15.02	Q0002	3B	212 Stevens Lane
2	48.02	Q0006	3B	40 Campbell Rd.
2	48.03	Q0006	3B	171 Clark Rd.
2	43	Q0008	3B	71 Mountain Top Rd.
7	23.09	Q0010	3B	3 Donner Road
7	24	Q0012	3B	Mendham Rd.
9	15.01	Q0013	3B	214 Stevens Lane
10	2	Q0014	3B	160 Campbell Rd.
12	5	Q0015		Ravine Lake Road
16	5	Q0017		Mountain Top Rd & Post Ln
23	4.01	Q0018	3B	141 Lloyd Rd.
28	8	Q0021	3B	350 Mt. Harmony Rd.
28	60.05	Q0023	3B	211 Douglass Rd.
96	2	Q0027	3B	Mine Brook Rd.
100	1	Q0027	3B	Pill Hill Rd.
100	1.02	Q0027	3B	241 Pill Hill Rd.
101	2	Q0027	3B	78 Meeker Rd
101	3	Q0027	3B	280 Meeker Rd.
27	14	Q0028	3B	Mitchel Rd.
15	14	Q0029		Overleigh Rd
7	23	Q0030	3B	1 Donner Rd.
28	48	Q0031	3B	487 Mine Brook Rd.
1	4	Q0032	3B	131 Stevens Lane
9	3	Q0035	3B	30 Stevens Lane
28	61	Q0037	3B	227 Douglass Ave.
2	7.02	Q0046	3B	170-4 Dryden Rd
2	7.03	Q0046	3B	170-7 Dryden Rd
2	7.04	Q0046	3B	170-5 Dryden Rd
2	7.05	Q0046	3B	170-3 Dryden Rd
2	7.06	Q0046	3B	170-1 Dryden Rd
28	59.02	Q0047	3B	191 Douglass Ave.
10	26	Q0051	3B	211 Ravine Lake Rd.
12	4	Q0051		Ravine Lake Rd
5	8	Q0056	3B	41 Chapin Rd.
5	2.01	Q0057	3B	1-6 Chapin Rd.
8	2	Q0059	3B	Hardscrabble Rd.

9	14	Q0064	3B	231 Campbell Rd.
9	16	Q0064	3B	Campbell Rd.
28	60.04	Q0070	3B	69 Charles Rd.
7	1.01	Q0077	3B	Mendham Rd.
7	4.05	Q0078	3B	1 Rose Hill Ct.
7	4.04	Q0081	3B	3 Rose Hill Ct.
7	4.06	Q0082	3B	8 Preserve Lane
7	4.08	Q0083	3B	3 Preserve Lane
9	17	Q0084	3B	Campbell Road
7	20.02	Q0091	3B	331-1 Mendham Rd.

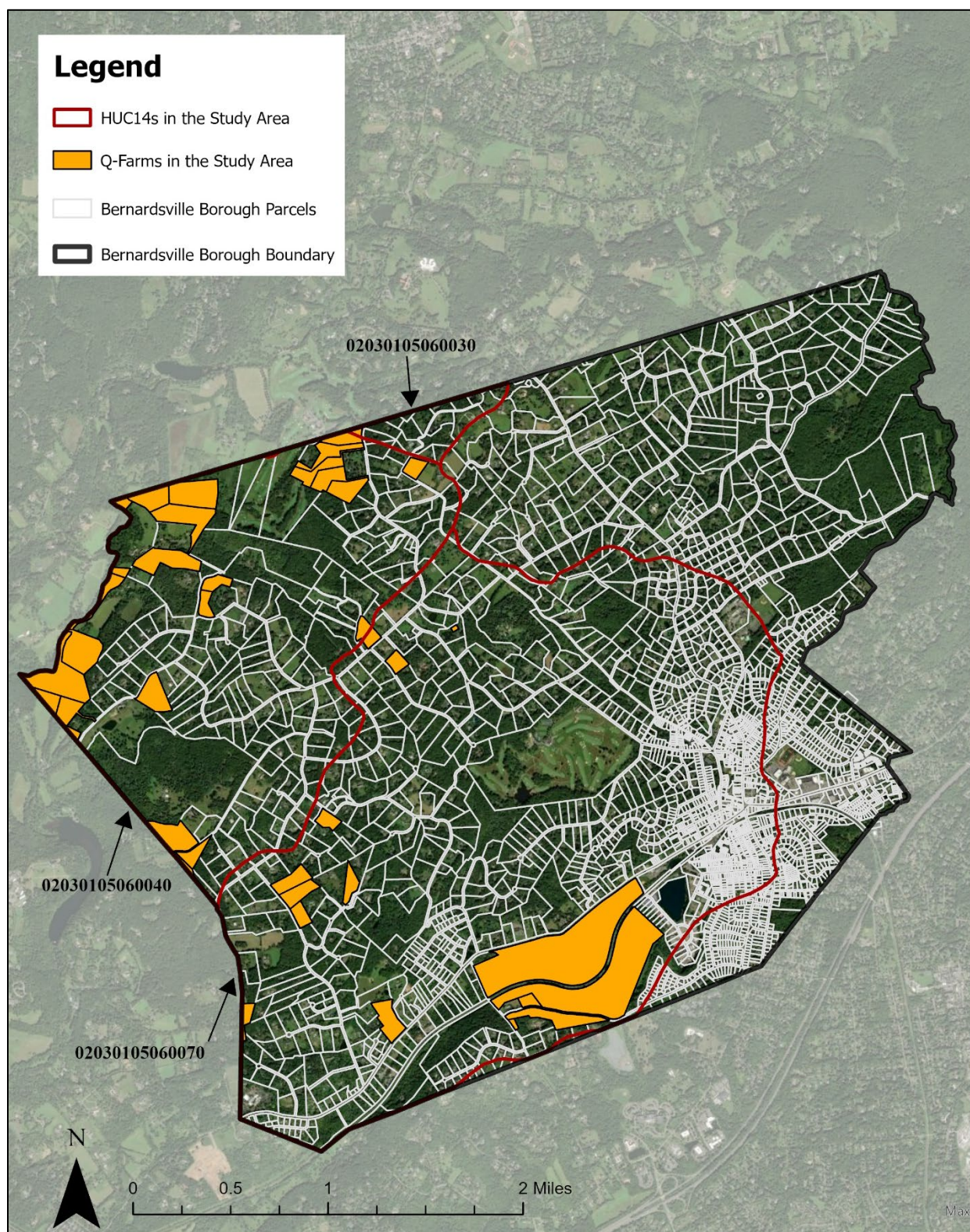


Figure 7: Q-Farm Parcels in the Study Area of Bernardsville Borough

Table 6: Q-Farm Parcels in the Study Area of Bernardsville Borough

Block	Lot	Q-Code	Prop Class	Location
1	1	Q0001	3B	51 Stevens Lane
2	1	Q0001	3B	41 Stevens Lane
2	2	Q0001	3B	Stevens Lane
2	11	Q0001	3B	51 Stevens Lane
1	5	Q0002	3B	141 Stevens Lane
9	15.02	Q0002	3B	212 Stevens Lane
2	48.02	Q0006	3B	40 Campbell Rd.
2	48.03	Q0006	3B	171 Clark Rd.
2	43	Q0008	3B	71 Mountain Top Rd.
9	15.01	Q0013	3B	214 Stevens Lane
10	2	Q0014	3B	160 Campbell Rd.
12	5	Q0015		Ravine Lake Road
16	5	Q0017		Mountain Top Rd & Post Ln
28	8	Q0021	3B	350 Mt. Harmony Rd.
28	60.05	Q0023	3B	211 Douglass Rd.
96	2	Q0027	3B	Mine Brook Rd.
100	1	Q0027	3B	Pill Hill Rd.
100	1.02	Q0027	3B	241 Pill Hill Rd.
101	2	Q0027	3B	78 Meeker Rd
101	3	Q0027	3B	280 Meeker Rd.
27	14	Q0028	3B	Mitchel Rd.
15	14	Q0029		Overleigh Rd
28	48	Q0031	3B	487 Mine Brook Rd.
1	4	Q0032	3B	131 Stevens Lane
9	3	Q0035	3B	30 Stevens Lane
28	61	Q0037	3B	227 Douglass Ave.
2	7.02	Q0046	3B	170-4 Dryden Rd
2	7.03	Q0046	3B	170-7 Dryden Rd
2	7.04	Q0046	3B	170-5 Dryden Rd
2	7.05	Q0046	3B	170-3 Dryden Rd
2	7.06	Q0046	3B	170-1 Dryden Rd
28	59.02	Q0047	3B	191 Douglass Ave.
10	26	Q0051	3B	211 Ravine Lake Rd.
12	4	Q0051		Ravine Lake Rd
5	8	Q0056	3B	41 Chapin Rd.
9	14	Q0064	3B	231 Campbell Rd.
9	16	Q0064	3B	Campbell Rd.
28	60.04	Q0070	3B	69 Charles Rd.
9	17	Q0084	3B	Campbell Road

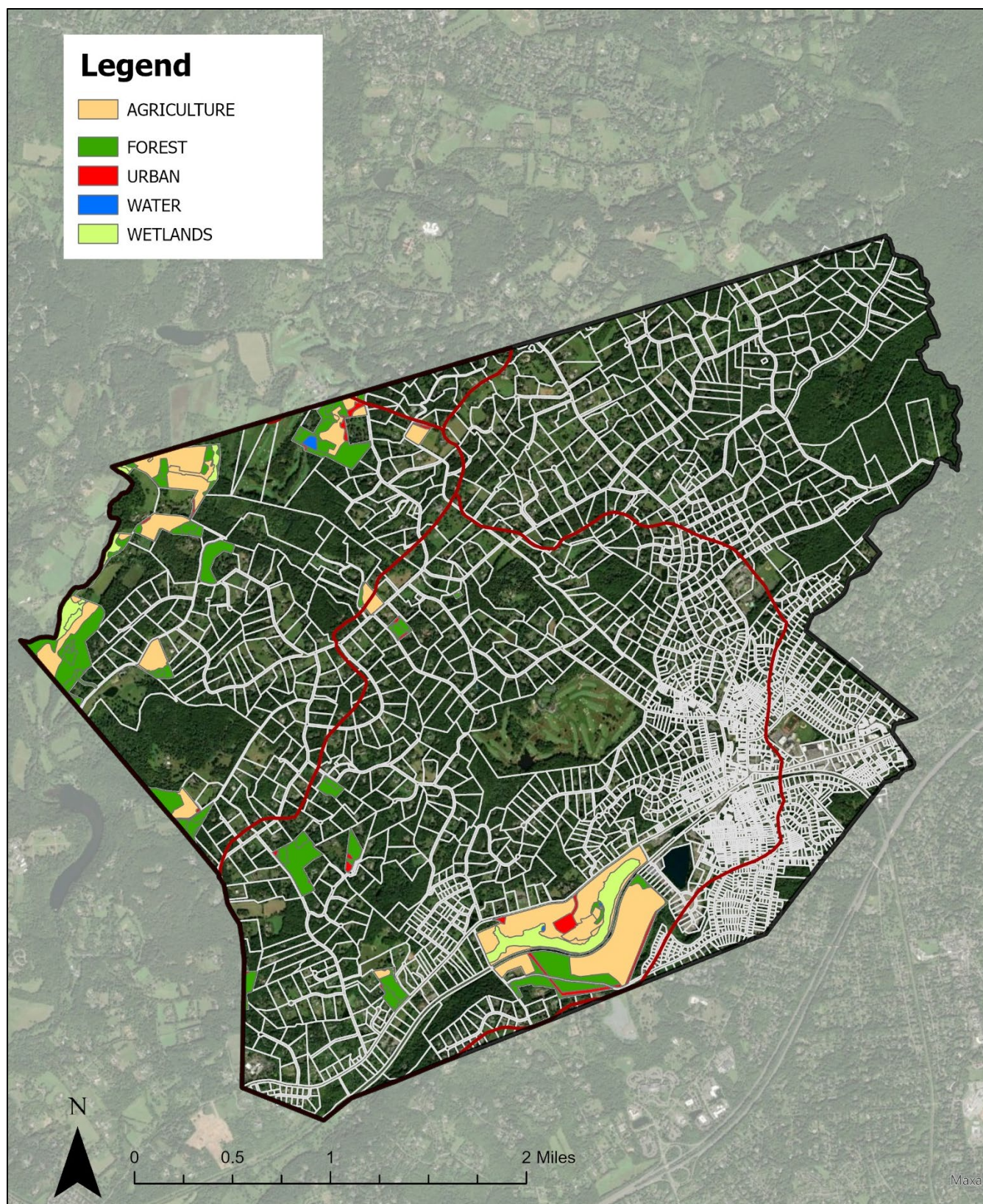


Figure 8: Land Use on Q-Farm Parcels in the Study Area of Bernardsville Borough

Table 7: Land Use on Q-Farms in the Study Area of Bernardsville Borough

Land Use	Area (acres)
Agriculture	256.2
Barren Land	0.0
Forest	205.3
Urban	23.3
Water	5.1
Wetlands	61.3
Total:	551.4

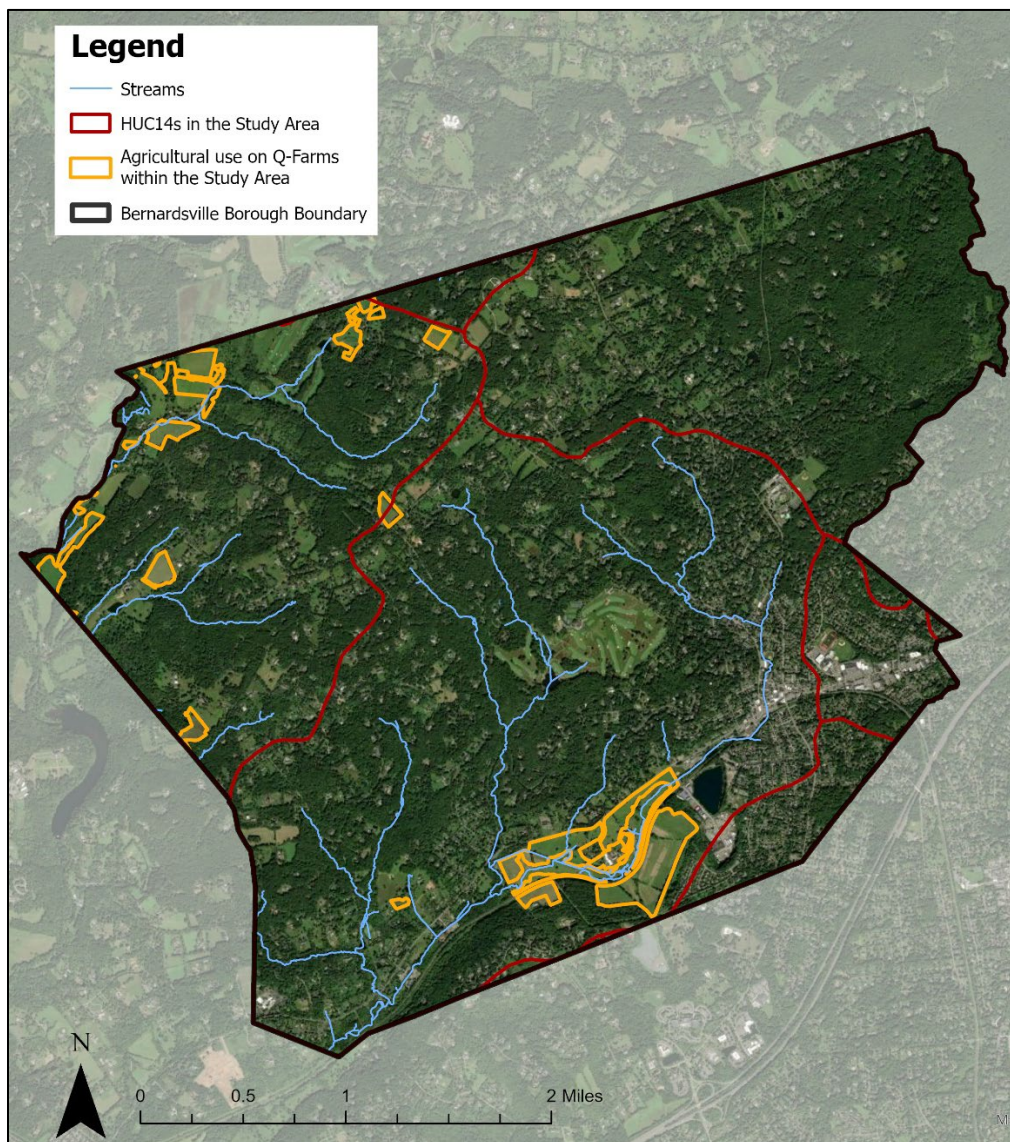


Figure 9: Aerial View of Agricultural Use on Q-Farm Parcels within the Study Area of Bernardsville Borough

Table 8: Recommendations for Specific Farms in the Study Area of Bernardsville Borough

North Branch Raritan River Study Area								
Block	Lot	Q-Farm Code	Cover Crop	Enhanced Stream Buffer	Impervious Cover Mgt.	Rainwater Harvesting	Livestock Exclusion	Manure Mgt.
2	11	Q0001						X
10	2	Q0014	X					
1	4	Q0032						X

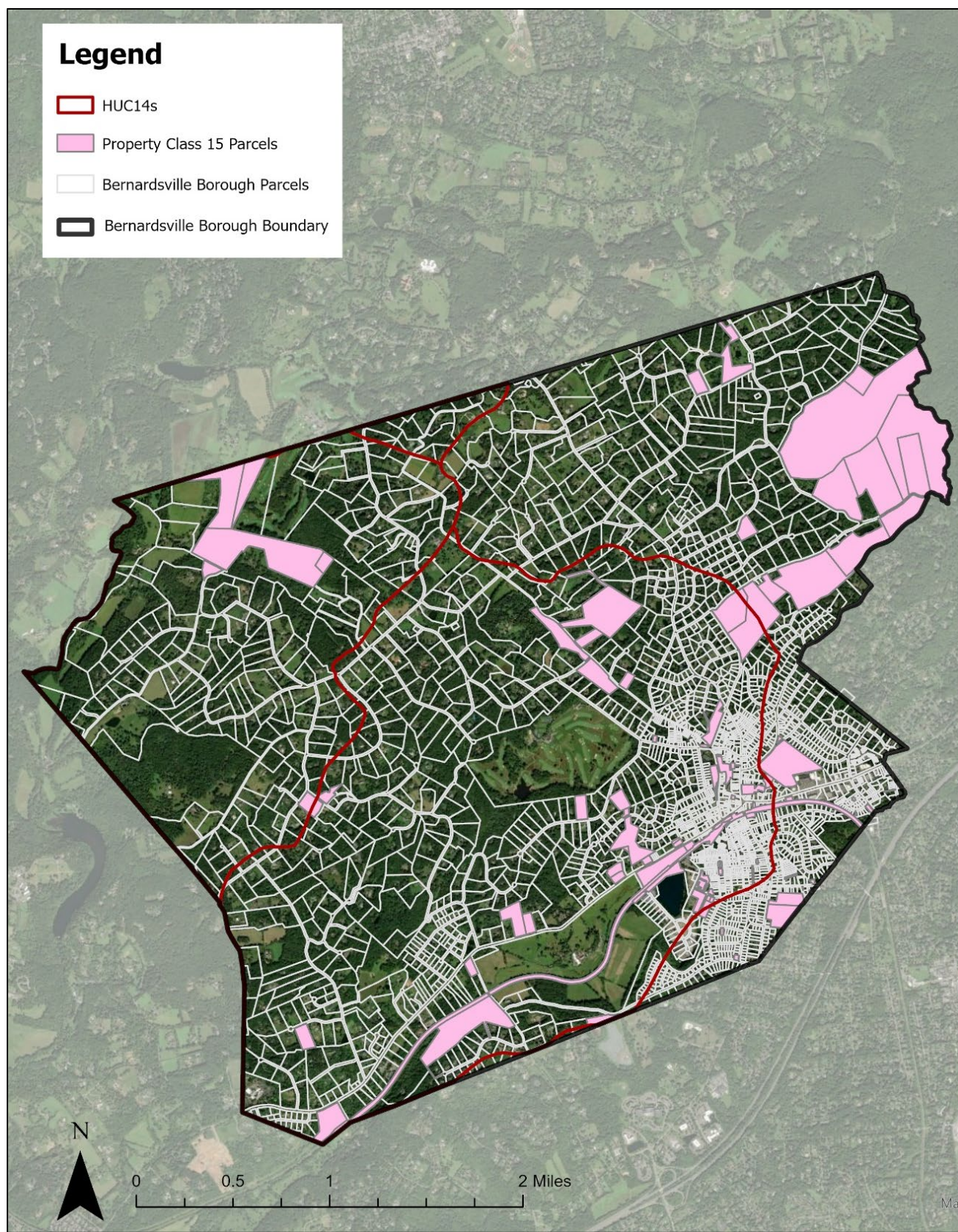


Figure 10: Property Class 15 Parcels in Bernardsville Borough

Table 9: Property Class 15 Parcels in Bernardsville Borough

Block	Lot	Prop Class	Location	Facility Type
35	1	15A	141 Seney Dr.	Schools
58	1	15A	2 Childsworth Ave.	Vacant Land
64	1	15A	25 Olcott Ave.	Schools
2	3	15C	Stevens Lane	Park
2	4	15C	Stevens Lane	Park
2	12	15C	21 Stevens Lane	Park
2	13	15C	Stevens Lane	Park
9	4.01	15C	11 Campbell Rd.	Park
17	30	15C	277 Claremont Rd.	Park
17	43	15C	122 Mendham Rd.	Roads
35	2	15C	121 Seney Dr.	Swimming Pool
35	6	15C	115 Chestnut Ave.	Recreation
36	5.01	15C	Olcott Lane	Road
38	13	15C	Windwood Road	Vacant Land
66	22	15C	1-7 Anderson Hill Road	Common Elements
68	4	15C	60 Claremont Rd.	Kuser Park
69	8	15C	79 Claremont Rd.	Playground
69	9	15C	Claremont Rd.	Claremont Field
69	28	15C	30 Anderson Hill Rd.	Land
69	29	15C	14 Park Lane	Recreation Bldg.
70	4	15C	35 Quimby Lane	Parking Lot
75	5	15C	40 Claremont Rd.	Kuser Park
80	14.07	15C	off Spring House Rd.	Vacant Land
80	15	15C	Round Top Rd.	Vacant Land
80	15.07	15C	Laurelwood Dr.	Vacant Land
80	15.38	15C	Mine Brook Rd.	Vacant Land
80	18	15C	76 Round Top Rd.	Water Supply
80	58	15C	4 Chilton St.	Vacant Land
93	10	15C	622 Mine Brook Rd.	Vacant Land
95	4.22	15C	Meeker Rd.	Vacant Land
97	1	15C	166 Mine Brook Rd.	Municipal Bldg.
98	1	15C	Mine Brook Rd.	Parking Area
100	2.23	15C	1 Old Quarry Road	Vacant Land
100	2.49	15C	2 Old Quarry Road	Pistol Range
100	4	15C	Clinton St	Storage Bldg.
101	5	15C	150 Pill Hill Rd.	Sewer Disposal
102	3	15C	Mine Ave.	Vacant Land
111	4	15C	Center St. Ext.	Right Of Way
111	18	15C	Crescent Rd.	Vacant Land
114	1	15C	70 Bernards Ave.	Common Elements Coa
114	1.01	15C	1 Pine St.	Open Space
115	1	15C	47-3 Maple St.	Vacant Land
115	2	15C	47-4 Maple St.	Vacant Land
115	7	15C	Liberty Rd.	Park
123	13	15C	33 Ann St.	Pump House
124	1	15C	18 Mount Airy Rd.	Vacant Land

125	13	15C	65 Morristown Rd.	Commercial Building
125	27.29	15C	202 North Finley	Water Basin
125	27.3	15C	12 Fox Hollow Trail	Pumphouse
129	22	15C	14 Morrison Avenue	Pump House
131	11.01	15C	108 Mount Airy Rd.	Vacant Land
131	12	15C	120 Mount Airy Rd.	Vacant Land
135	1	15C	2 Conkling Ave.	Vacant Land
135	6	15C	Pennington Ave.	Vacant Land
142	11.02	15C	Brookside Ave.	Right Of Way
144	1	15C	50 Mine Brook Rd.	Railroad Station
14	21	15D	379 Mt. Harmony Rd.	St. Johns Chapel
28	7	15D	370 Mt. Harmony Rd.	Church Parking
37	18.01	15D	108 Claremont Rd.	Vacant Land
39	6	15D	111 Claremont Rd.	R.C. Church
65	10	15D	22 Church St.	Methodist Church
81	3	15D	321 Mine Brook Rd.	Church
81	4.01	15D	315 Mine Brook Rd.	Rectory
94	19	15D	11 Meeker Rd.	Church
105	1	15D	49 Bernards Ave.	Chapel
105	12	15D	47 Bernards Ave.	Parking Area
113	1	15D	50 Bernards Ave.	Parking Area
7	4.01	15F	2 Preserve Lane	Disabled Veteran
7	4.07	15F	200 Washington Corner Rd	Land & Water Presrvt
16	6.03	15F	300 Claremont Rd.	Water Shed
17	17	15F	181 Claremont Rd.	Disabled Adults
17	28	15F	251 Claremont Rd.	Vacant House
21	1	15F	61 Jockey Hollow Rd.	National Park
21	2	15F	121 Jockey Hollow Rd.	National Park
21	12	15F	131 Hardscrabble Rd.	Park
21	13	15F	51 Hardscrabble Rd.	Bird Sanctuary
21	14	15F	21 Hardscrabble Rd.	Bird Sanctuary
21	14.02	15F	11 Hardscrabble Rd.	Bird Sanctuary
23	5.01	15F	83 Stone Fence Rd.	Disable Veteran
27	18	15F	Mitchell Road	Vacant Land
30	33	15F	121 Round Top Rd.	Disabled Veteran
31	1	15F	240 Claremont Rd.	Water Shed
35	8	15F	161 Chestnut Ave.	Bird Sanctuary
35	13	15F	64 Hardscrabble Rd.	Vacant Land
36	24.02	15F	93 Mine Mount Rd.	Disable Vet
62	4.27B	15F	7b Somerset Hills Court	Disabled Veteran
80	14	15F	189 Mine Brook Rd.	Vacant Land
80	14.01	15F	4 Spring House Rd.	Vacant House
80	59	15F	117 Mine Brook Rd.	Fire House
89	3	15F	50 Pickle Brook Rd	Disable Veteran
97	2	15F	118 Mine Brook Rd.	Fire House
110	16	15F	11 Bernards Ave	Disable Veteran
120	4	15F	16 Sunnybrook Rd.	Disabled Vet
125	4	15F	11 Morristown Rd.	Congdon Lodge
125	27.13	15F	5 Blazure Dr.	Disable Veteran

129	31.01	15F	24 Burrows Ave.	Disabled Vet
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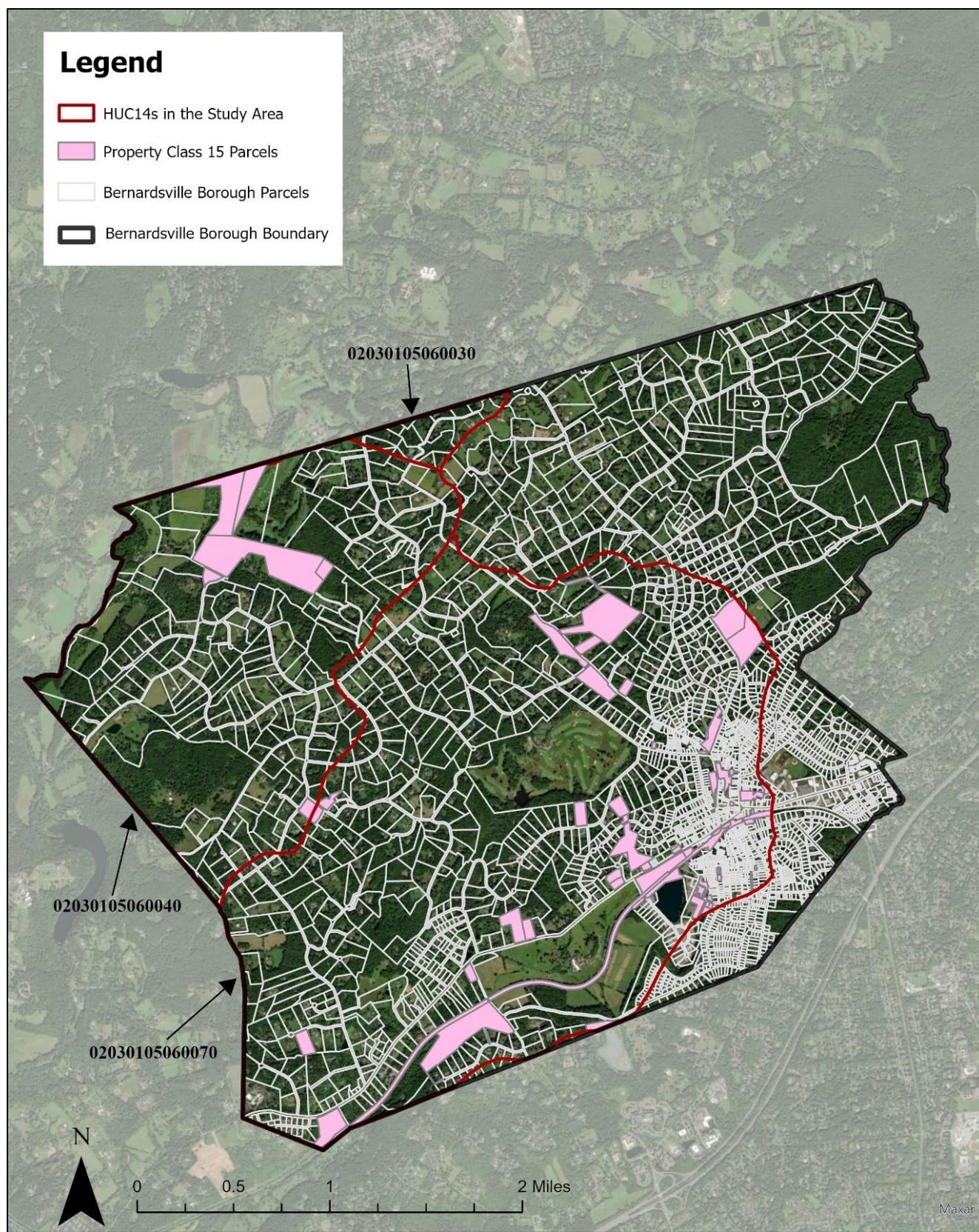


Figure 11: Property Class 15 Parcels in the Study Area of Bernardsville Borough

Table 10: Property Class 15 Parcels in the Study Area of Bernardsville Borough

Block	Lot	Prop Class	Location	Facility Type
*35¹	1	15A	141 Seney Dr.	Schools
64 ¹	1	15A	25 Olcott Ave.	Schools
2	3	15C	Stevens Lane	Park
2	4	15C	Stevens Lane	Park
2	12	15C	21 Stevens Lane	Park
2	13	15C	Stevens Lane	Park
9	4.01	15C	11 Campbell Rd.	Park
17	30	15C	277 Claremont Rd.	Park
17	43	15C	122 Mendham Rd.	Roads
*35¹	2	15C	121 Seney Dr.	Park
36	5.01	15C	Olcott Lane	Road
38	13	15C	Windwood Road	Vacant Land
*66	22	15C	1-7 Anderson Hill Road	Common Elements
68	4	15C	60 Claremont Rd.	Kuser Park
69	8	15C	79 Claremont Rd.	Playground
69	9	15C	Claremont Rd.	Claremont Field
69	28	15C	30 Anderson Hill Rd.	Land
69	29	15C	14 Park Lane	Recreation Bldg.
70	4	15C	35 Quimby Lane	Parking Lot
75	5	15C	40 Claremont Rd.	Kuser Park
80	14.07	15C	Off Spring House Rd.	Vacant Land
80	15	15C	Round Top Rd.	Vacant Land
80	15.07	15C	Laurelwood Dr.	Vacant Land
80	15.38	15C	Mine Brook Rd.	Vacant Land
80	18	15C	76 Round Top Rd.	Water Supply
80	58	15C	4 Chilton St.	Vacant Land
93	10	15C	622 Mine Brook Rd.	Vacant Land
95	4.22	15C	Meeker Rd.	Vacant Land
*97	1	15C	166 Mine Brook Rd.	Municipal Bldg.
98	1	15C	Mine Brook Rd.	Parking Area
100	2.23	15C	1 Old Quarry Road	Vacant Land
100	2.49	15C	2 Old Quarry Road	Pistol Range
100	4	15C	Clinton St	Storage Bldg.
101 ¹	5	15C	150 Pill Hill Rd.	Sewer Disposal
102	3	15C	Mine Ave.	Vacant Land
111	4	15C	Center St. Ext.	Right Of Way
111	18	15C	Crescent Rd.	Vacant Land
114	1	15C	70 Bernards Ave.	Common Elements Coa
114	1.01	15C	1 Pine St.	Open Space
115	1	15C	47-3 Maple St.	Vacant Land
115	2	15C	47-4 Maple St.	Vacant Land
115 ¹	7	15C	Liberty Rd.	Park
124	1	15C	18 Mount Airy Rd.	Vacant Land
144 ¹	1	15C	50 Mine Brook Rd.	Railroad Station
*14	21	15D	379 Mt. Harmony Rd.	St. Johns Chapel
28	7	15D	370 Mt. Harmony Rd.	Church Parking

37	18.01	15D	108 Claremont Rd.	Vacant Land
*39	6	15D	111 Claremont Rd.	R.C. Church
65 ¹	10	15D	22 Church St.	Methodist Church
*81	3	15D	321 Mine Brook Rd.	Church
81	4.01	15D	315 Mine Brook Rd.	Rectory
*94	19	15D	11 Meeker Rd.	Church
*105²	1	15D	49 Bernards Ave.	Chapel
*105²	12	15D	47 Bernards Ave.	Parking Area
113	1	15D	50 Bernards Ave.	Parking Area
16	6.03	15F	300 Claremont Rd.	Water Shed
17	17	15F	181 Claremont Rd.	Disabled Adults
17	28	15F	251 Claremont Rd.	Vacant House
27	18	15F	Mitchell Road	Vacant Land
30	33	15F	121 Round Top Rd.	Disabled Veteran
31	1	15F	240 Claremont Rd.	Water Shed
36	24.02	15F	93 Mine Mount Rd.	Disable Vet
80	14	15F	189 Mine Brook Rd.	Vacant Land
80	14.01	15F	4 Spring House Rd.	Vacant House
80	59	15F	117 Mine Brook Rd.	Fire House
89	3	15F	50 Pickle Brook Rd	Disable Veteran
*97	2	15F	118 Mine Brook Rd.	Fire House
110	16	15F	11 Bernards Ave	Disable Veteran
125	4	15F	11 Morristown Rd.	Congdon Lodge

*** Sites that can be retrofitted with green infrastructure**

¹ Only a portion of the parcel is within the study area

² Site includes two tax-exempt parcels

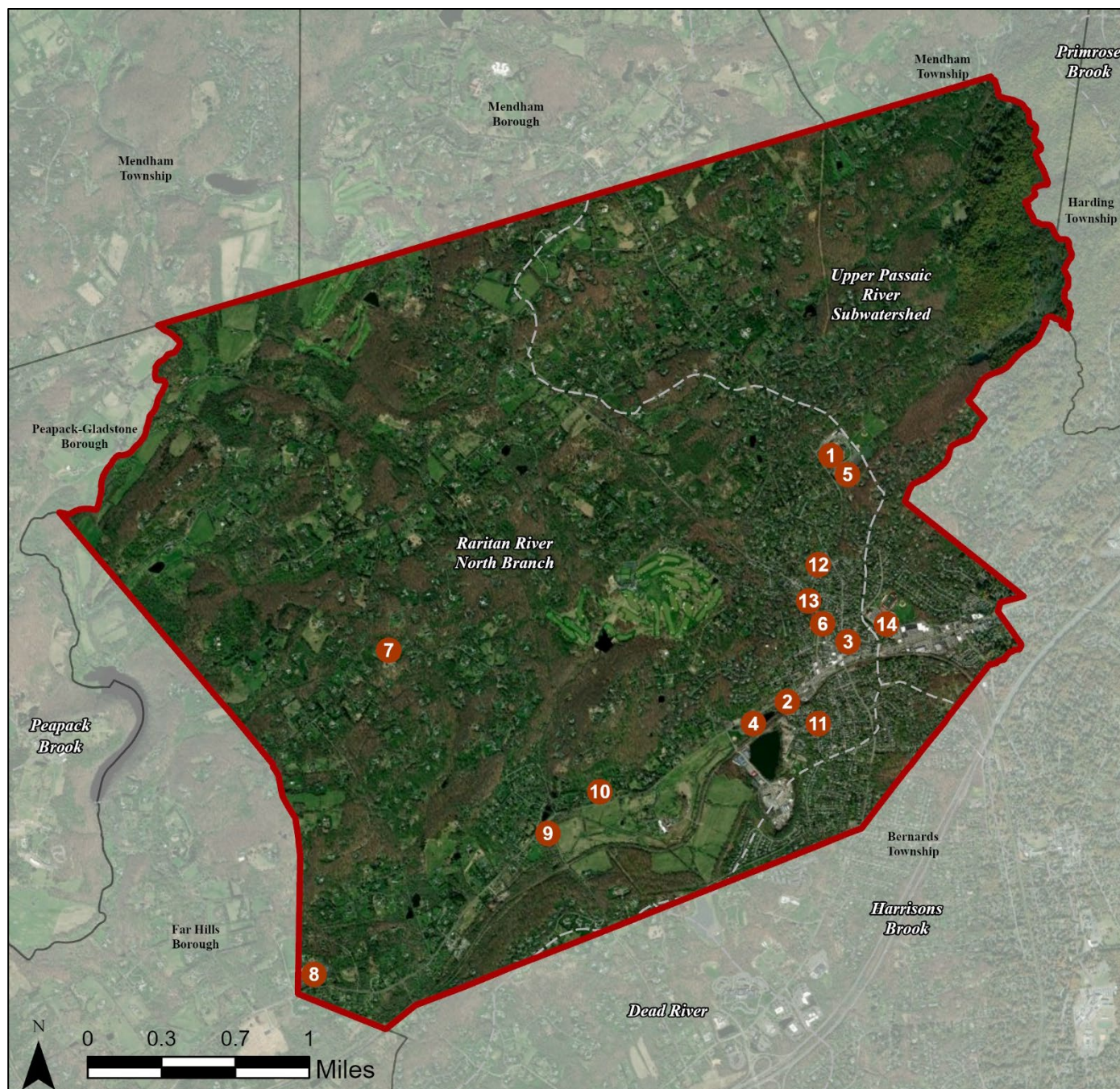


Figure 12: Sites with Green Infrastructure Opportunities in Bernardsville Borough

BEDWELL ELEMENTARY SCHOOL



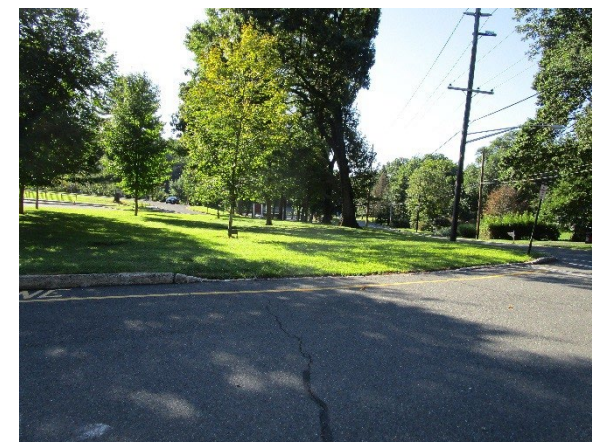
RAP ID: 1

Subwatershed: Raritan River North Branch

Site Area: 684,276 sq. ft.

Address: 141 Seney Drive
Bernardsville, NJ 07924

Block and Lot: Block 35, Lot 1

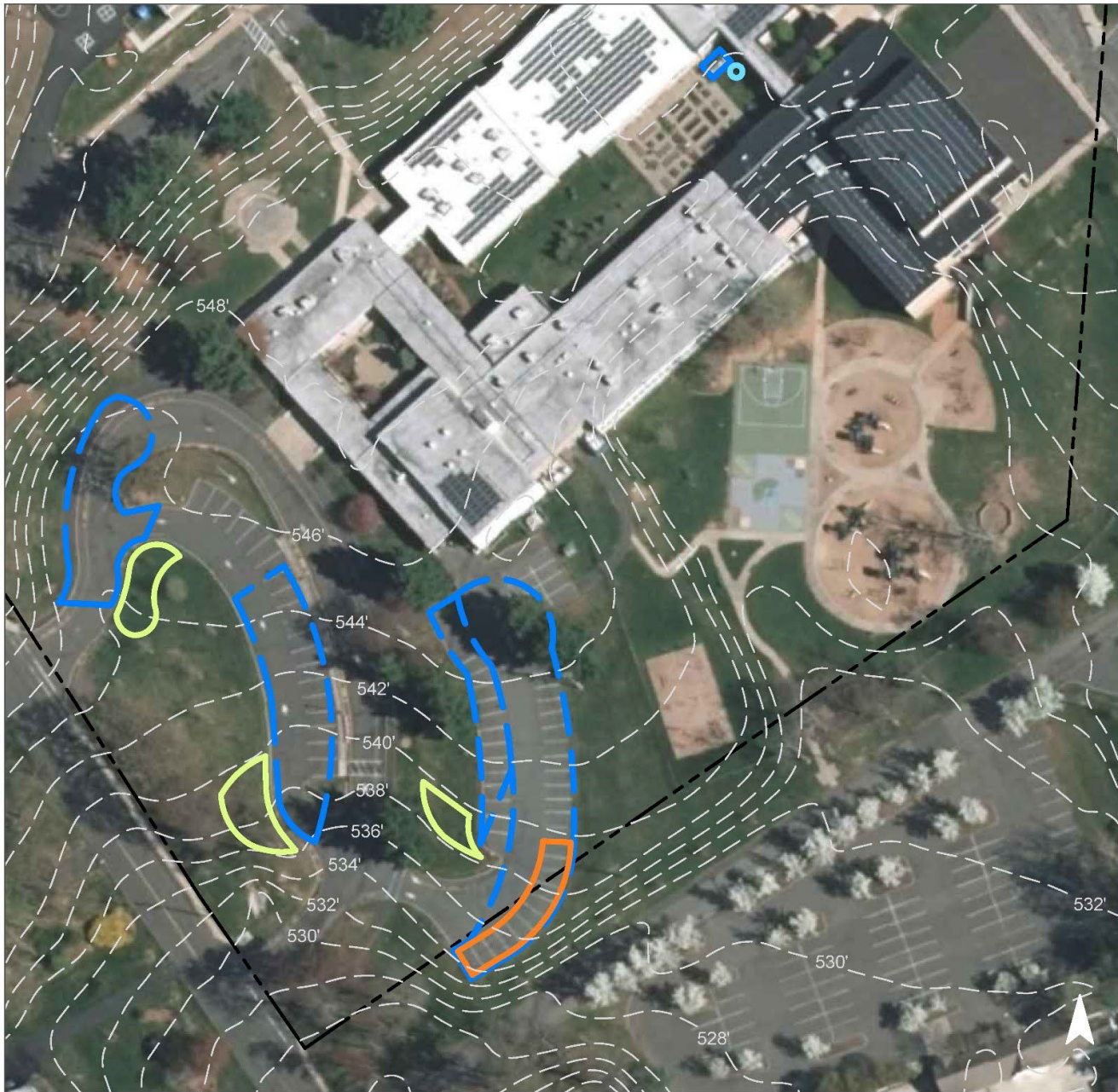


Rain gardens can be installed in parking lot islands to capture, treat, and infiltrate stormwater runoff from the parking lot. A section of parking spaces can be converted to porous asphalt to capture and infiltrate runoff from the parking lot as well. A rain barrel can be installed at the small greenhouse in the courtyard to capture runoff to be reused for watering the garden. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
52	357,822	17.3	180.7	1,642.9	0.279	9.81

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.351	59	25,750	0.97	3,370	\$16,850
Pervious pavement	0.278	47	20,420	0.77	1,925	\$48,125
Rainwater harvesting	0.004	1	115	0.00	115 (gal)	\$230

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bedwell Elementary School

-  bioretention system
-  pervious pavement
-  rainwater harvesting
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 50' 100'

BERNARDSVILLE FIRE COMPANY



RAP ID: 2

Subwatershed: Raritan River North Branch

Site Area: 46,026 sq. ft.

Address: 118 Mine Brook Road
Bernardsville, NJ 07924

Block and Lot: Block 97, Lot 2

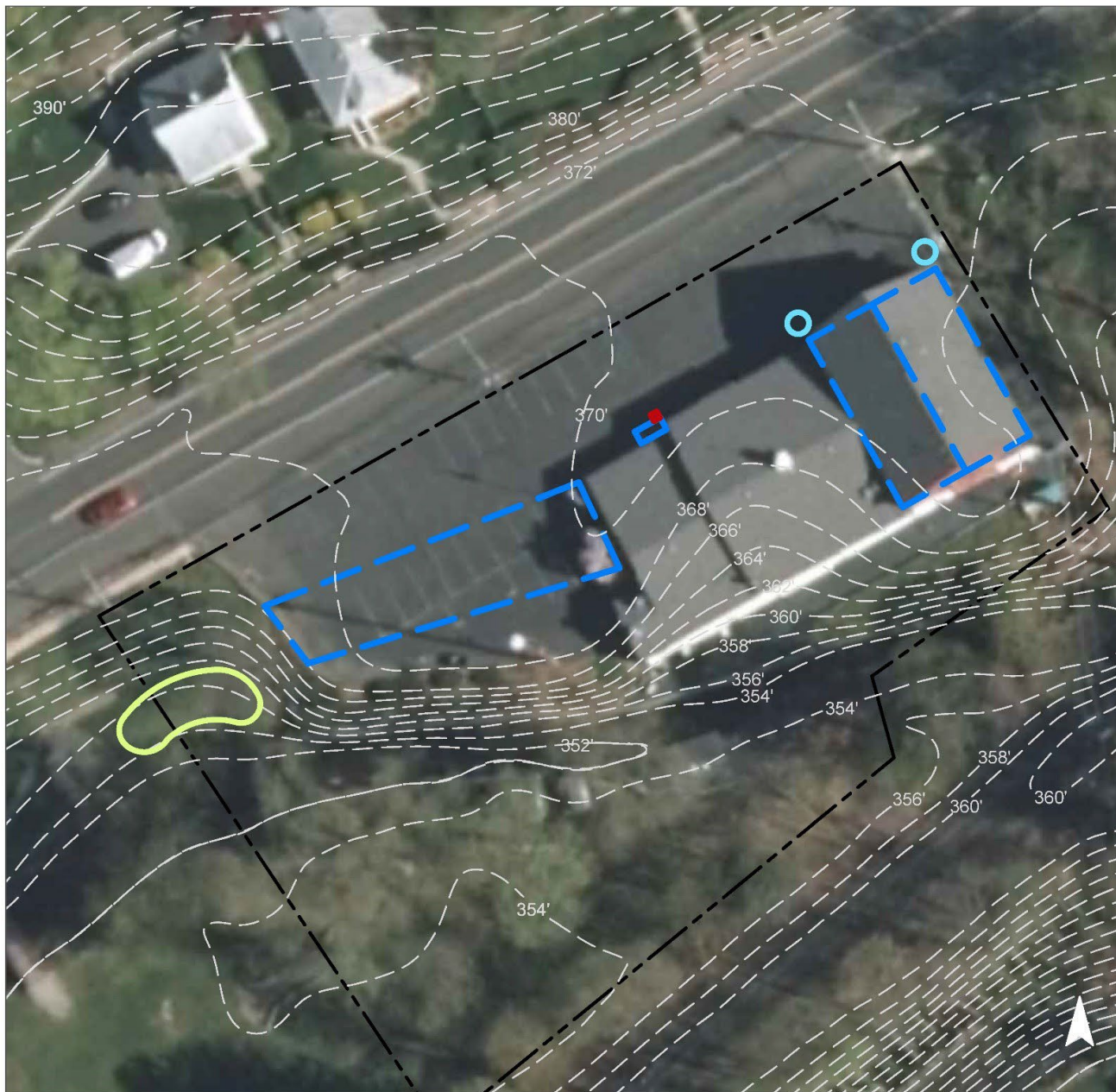


Cisterns can be installed at the northeast and west corners of the main building to capture and reuse stormwater. A downspout planter box can be installed next to the main entrance to capture and filter stormwater. A rain garden can be installed at the bottom of the hill to help manage stormwater causing erosion along the hill. Additional measures should be taken to stabilize the slope. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
60	27,463	1.3	13.9	126.1	0.021	0.75

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.073	12	5,360	0.20	700	\$3,500
Planter box	n/a	0.1	n/a	n/a	1 (box)	\$1,000
Rainwater harvesting	0.076	13	2,280	0.26	2,280 (gal)	\$4,560

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bernardsville Fire Company

-  bioretention system
-  planter box
-  rainwater harvesting
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 25' 50'

BERNARDSVILLE LIBRARY



RAP ID: 3

Subwatershed: Raritan River North Branch

Site Area: 131,851 sq. ft.

Address: 1 Anderson Hill Road
Bernardsville, NJ 07924

Block and Lot: Block 66, Lot 22

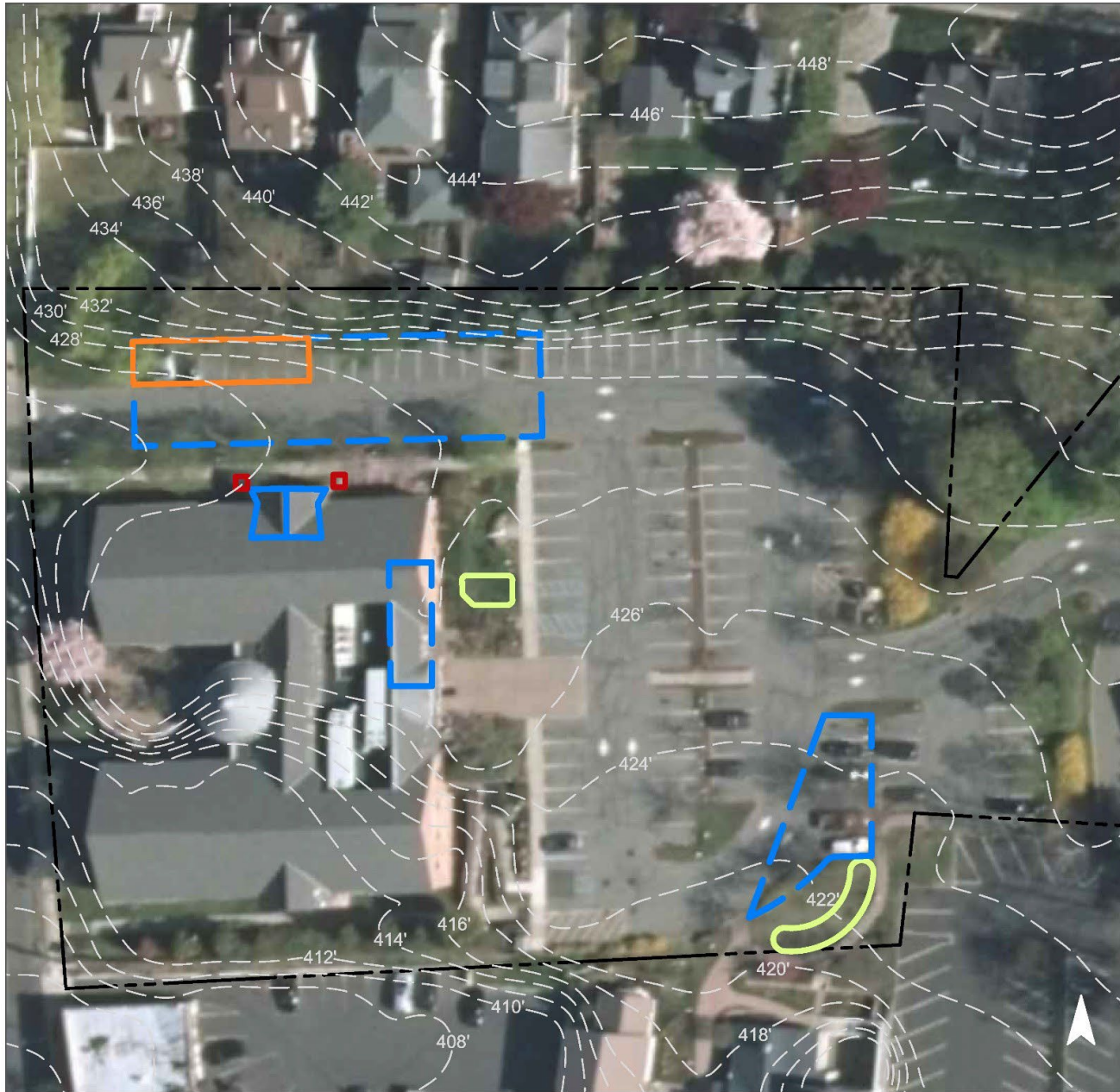


Downspout planter boxes can be installed alongside the northern side of the building to capture and filter stormwater. Pervious pavement can be installed in the parking spaces to the east to capture, treat, and infiltrate parking lot runoff. Rain gardens can be installed adjacent to parking spaces and downspouts to capture, treat, and infiltrate runoff from the parking lot and rooftop. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
81	106,775	5.1	53.9	490.2	0.083	2.93

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.066	11	4,810	0.18	680	\$3,400
Pervious pavement	0.167	28	12,240	0.46	1,145	\$28,625
Planter boxes	n/a	2	n/a	n/a	2 (boxes)	\$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bernardsville Library

- bioretention system
- pervious pavement
- planter box
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 30' 60'

BERNARDSVILLE MUNICIPAL COURT & NERVINE PARK



RAP ID: 4

Subwatershed: Raritan River North Branch

Site Area: 465,036 sq. ft.

Address: 166 Mine Brook Road
Bernardsville, NJ 07924

Block and Lot: Block 97, Lot 1



Pervious pavement can be installed in the parking lot to capture, treat, and infiltrate parking lot runoff. Two cisterns can be attached to the building to capture and filter stormwater runoff from the rooftop. Rain gardens can be installed adjacent to the roadways to capture, treat, and infiltrate runoff from the road. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
34	156,500	7.5	79.0	718.5	0.122	4.29

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.241	40	17,710	0.67	2,315	\$11,575
Pervious pavement	0.473	79	34,690	1.30	3,240	\$81,000
Rainwater harvesting	0.061	10	1,830	0.07	1,830 (gal)	\$3,660

GREEN INFRASTRUCTURE RECOMMENDATIONS

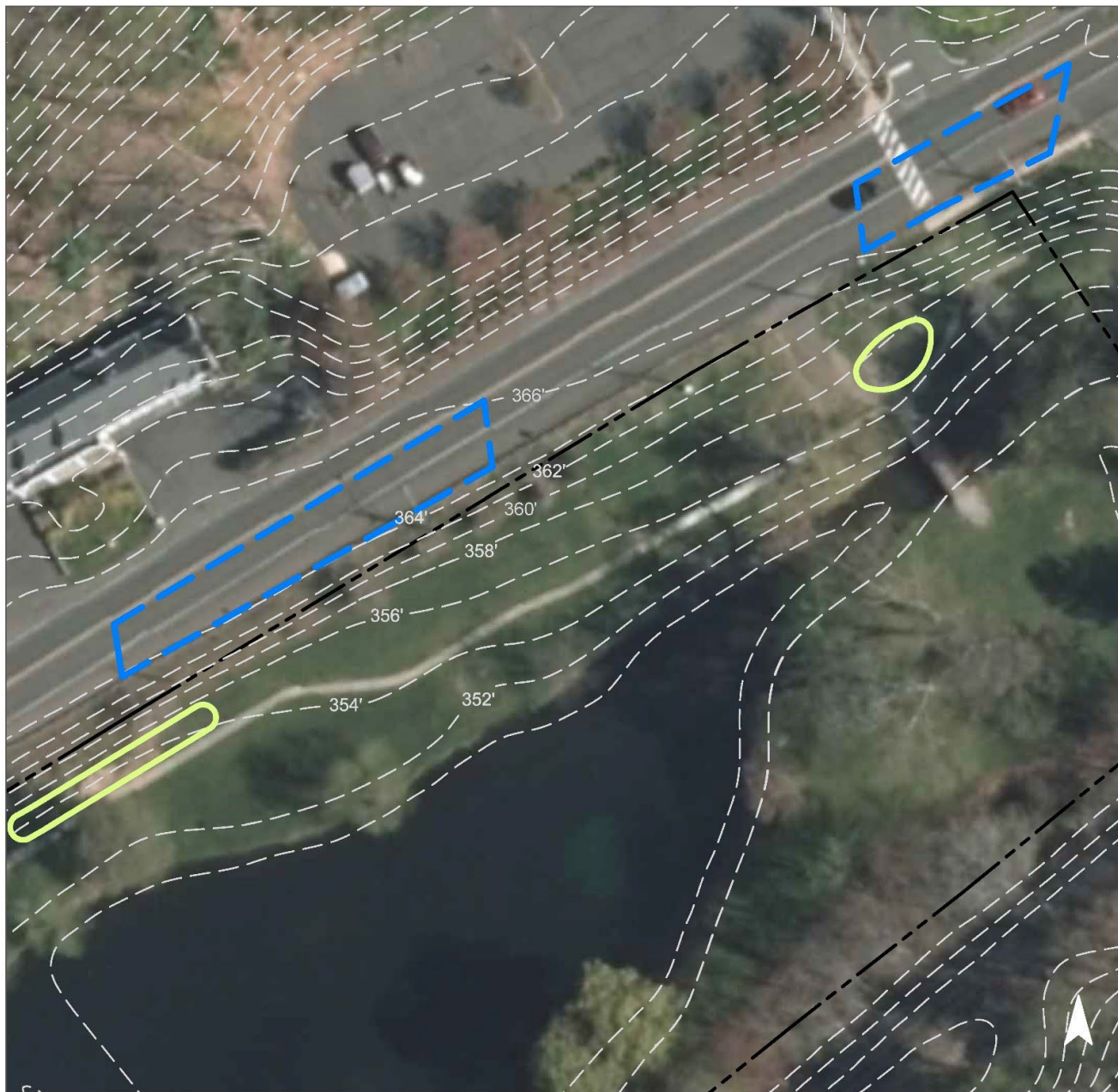


Bernardsville Municipal Court

-  bioretention system
-  pervious pavement
-  rainwater harvesting
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS



GREEN INFRASTRUCTURE RECOMMENDATIONS



Nervine Park

-  bioretention system
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 30' 60'

BERNARDSVILLE MUNICIPAL POOL



RAP ID: 5

Subwatershed: Raritan River North Branch

Site Area: 1,630,208 sq. ft.

Address: 141 Seney Drive
Bernardsville, NJ 07924

Block and Lot: Block 35, Lot 2, 6



Two sections of parking spaces can be converted to pervious pavement to capture and infiltrate parking lot runoff. Sections of turfgrass adjacent to the parking lot can be converted to rain gardens to capture, treat, and infiltrate parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
16	263,800	12.7	133.2	1,211.2	0.206	7.24

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.088	15	6,460	0.24	845	\$4,225
Pervious pavement	0.460	77	33,760	1.27	3,150	\$78,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bernardsville Municipal Pool

-  bioretention system
-  pervious pavement
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 50' 100'

BERNARDSVILLE SCHOOL OF MUSIC



RAP ID: 6

Subwatershed: Raritan River North Branch

Site Area: 36,235 sq. ft.

Address: 75 Claremont Road #101
Bernardsville, NJ 07924

Block and Lot: Block 69, Lot 5, 6, 7

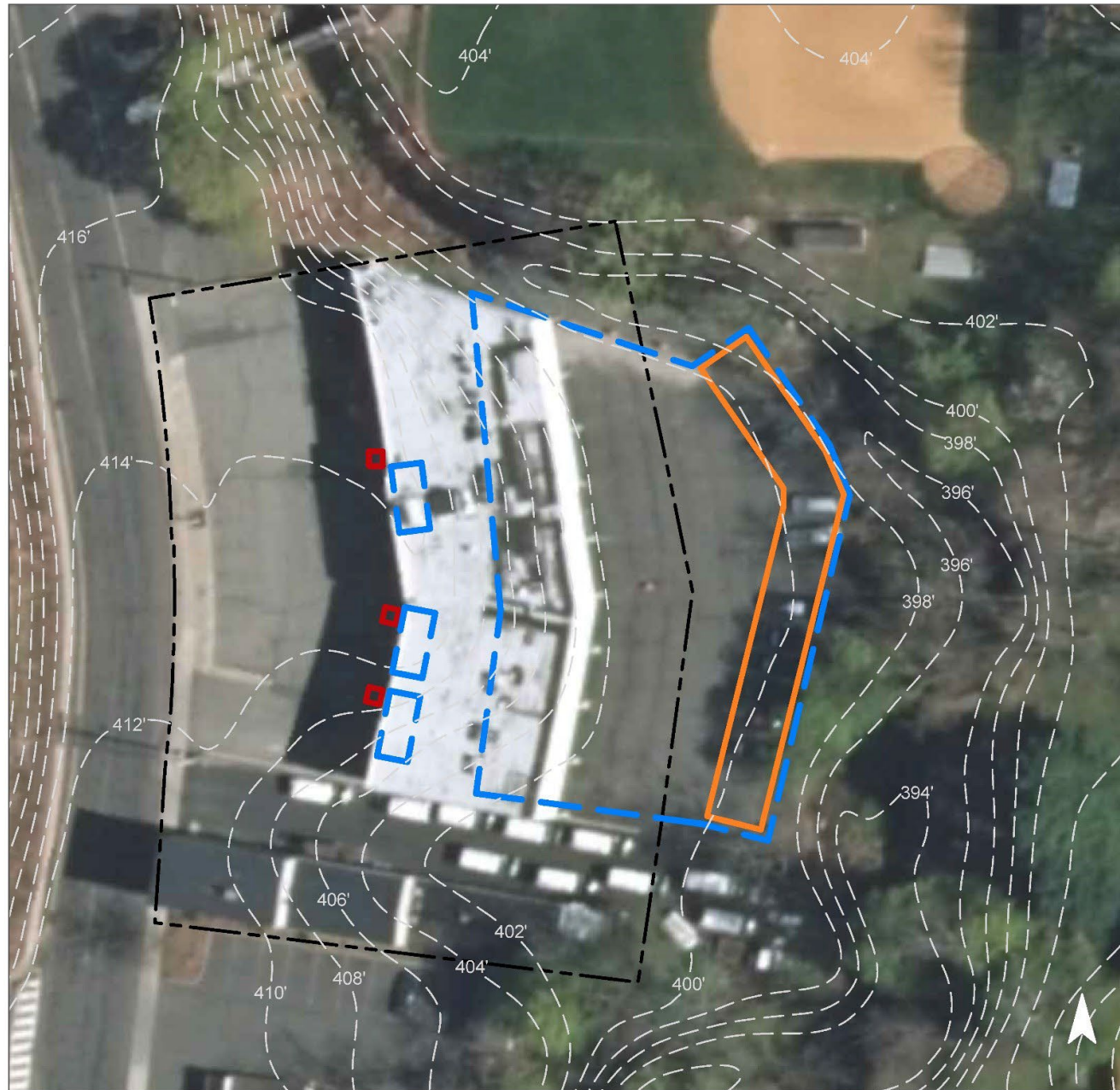


Pervious pavement can be installed in the back parking lot to capture, treat, and infiltrate parking lot runoff. Downspout planter boxes can be installed at the bases of the downspouts connected to the support beams at the southeast corner of the building to capture and filter stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
81	29,441	1.4	14.9	135.2	0.023	0.81

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavement	0.423	71	31,050	1.17	2,900	\$72,500
Planter boxes	n/a	2	n/a	n/a	3 (boxes)	\$3,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bernardsville School of Music

-  planter box
-  pervious pavement
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 25' 50'

CHURCH OF SAINT JOHN OF THE MOUNTAIN



RAP ID: 7

Subwatershed: Raritan River North
Branch

Site Area: 124,250 sq. ft.

Address: 370 Mount Harmony Road
Bernardsville, NJ 07924



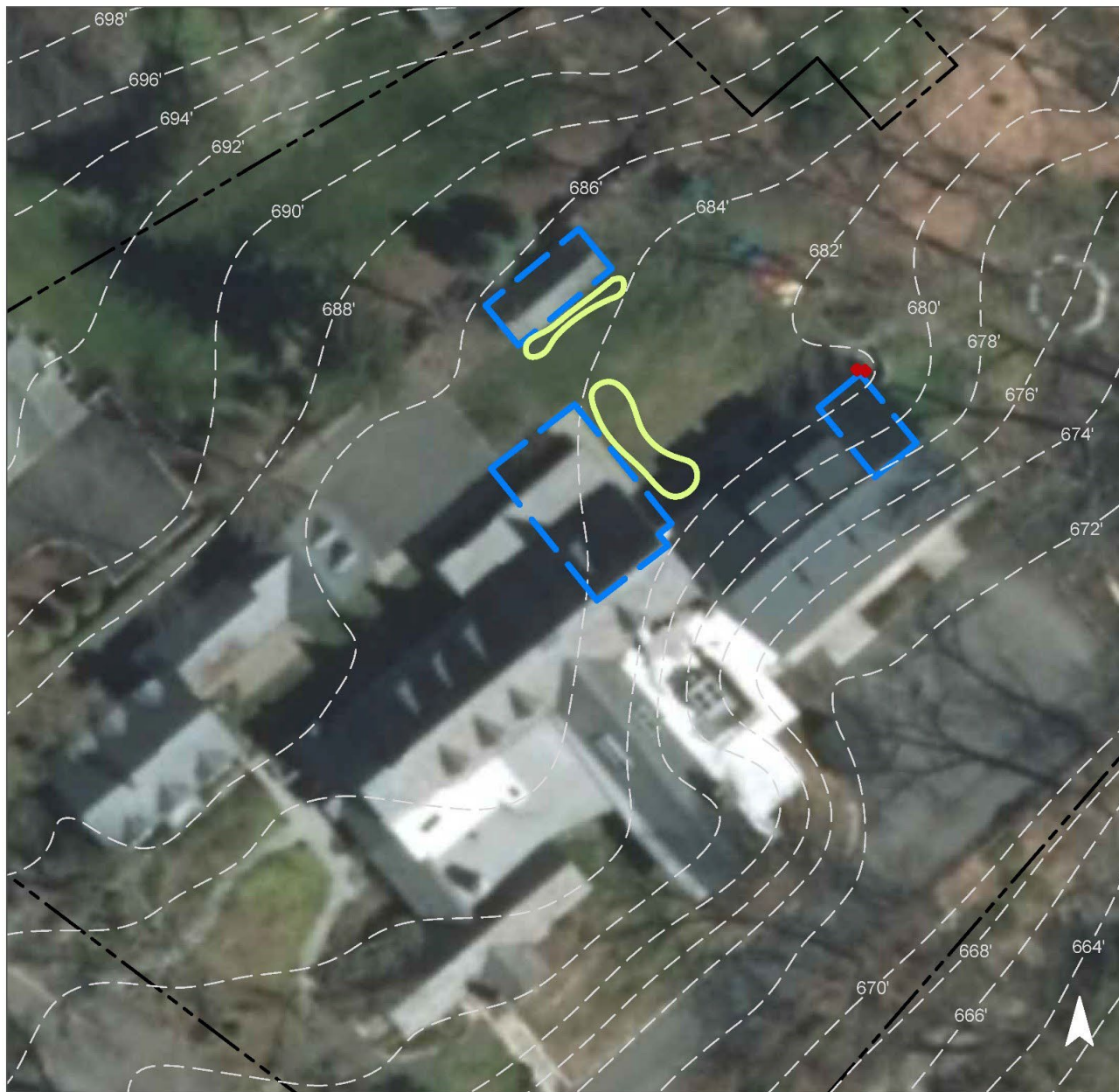
Block and Lot: Block 14, Lot 21

Rain gardens can be installed at the corner of the sidewalk and adjacent to the shed to the north of the church to capture, treat, and infiltrate rooftop runoff. Downspout planter boxes can be installed at the northeast corner of the building to capture and filter stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
27	33,683	1.6	17.0	154.7	0.026	0.92

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.042	7	3,100	0.14	405	\$2,025
Planter boxes	n/a	1	n/a	n/a	2 (boxes)	\$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Church of Saint John of the Mountain

-  bioretention system
-  planter box
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 20' 40'

FAR HILLS COUNTRY DAY SCHOOL



RAP ID: 8

Subwatershed: Raritan River North Branch

Site Area: 803,550 sq. ft.

Address: 697 US-202
Far Hills, NJ 07931

Block and Lot: Block 89, Lot 10



Rain gardens can be installed in the turfgrass to capture, treat, and infiltrate rooftop and parking lot runoff. Downspout planter boxes can be installed in the courtyard to capture and filter stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
44	350,940	16.9	177.2	1,611.3	0.273	9.63

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.229	38	16,820	0.63	2,200	\$11,000
Planter boxes	n/a	2	n/a	n/a	3 (boxes)	\$3,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Far Hills Country Day School

-  bioretention system
-  planter box
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 50' 100'

FIRST CHURCH OF CHRIST, SCIENTIST



RAP ID: 9

Subwatershed: Raritan River North Branch

Site Area: 101,910 sq. ft.

Address: 11 Meeker Road
Bernardsville, NJ 07924

Block and Lot: Block 94, Lot 19

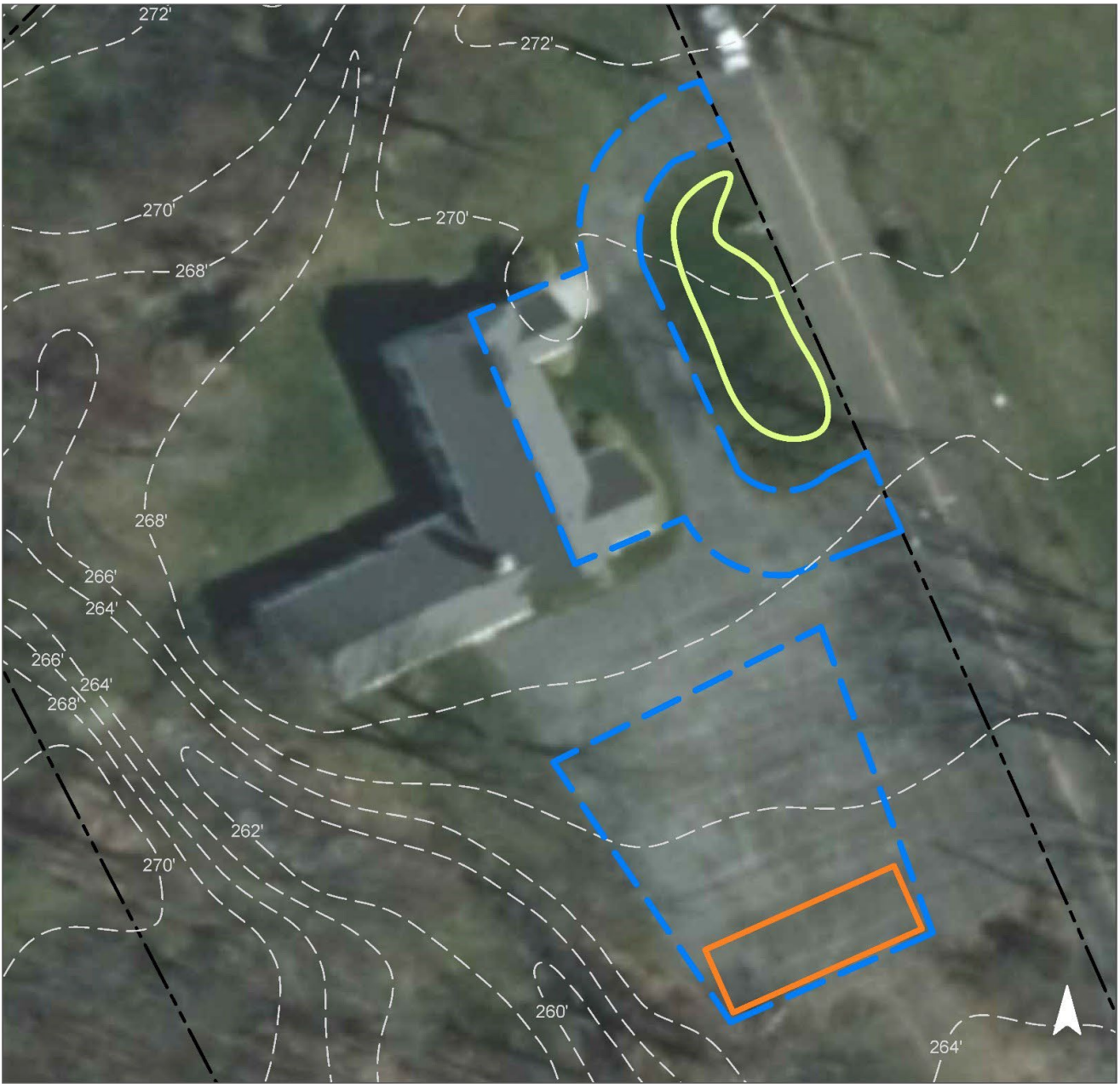


A rain garden can be installed in the turfgrass court to capture, treat, and infiltrate parking lot runoff. Pervious pavement can be installed in the parking spaces to capture, treat, and infiltrate parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
29	29,507	1.4	14.9	135.5	0.023	0.81

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.133	22	9,790	0.37	1,280	\$6,400
Pervious pavement	0.141	24	10,380	0.39	970	\$24,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



First Church of Christ, Scientist

-  bioretention system
-  pervious pavement
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS



GOOD SHEPHERD CHURCH



RAP ID: 10

Subwatershed: Raritan River North
Branch

Site Area: 372,570 sq. ft.

Address: 321 Mine Brook Road
Bernardsville, NJ 07924

Block and Lot: Block 81, Lot 3

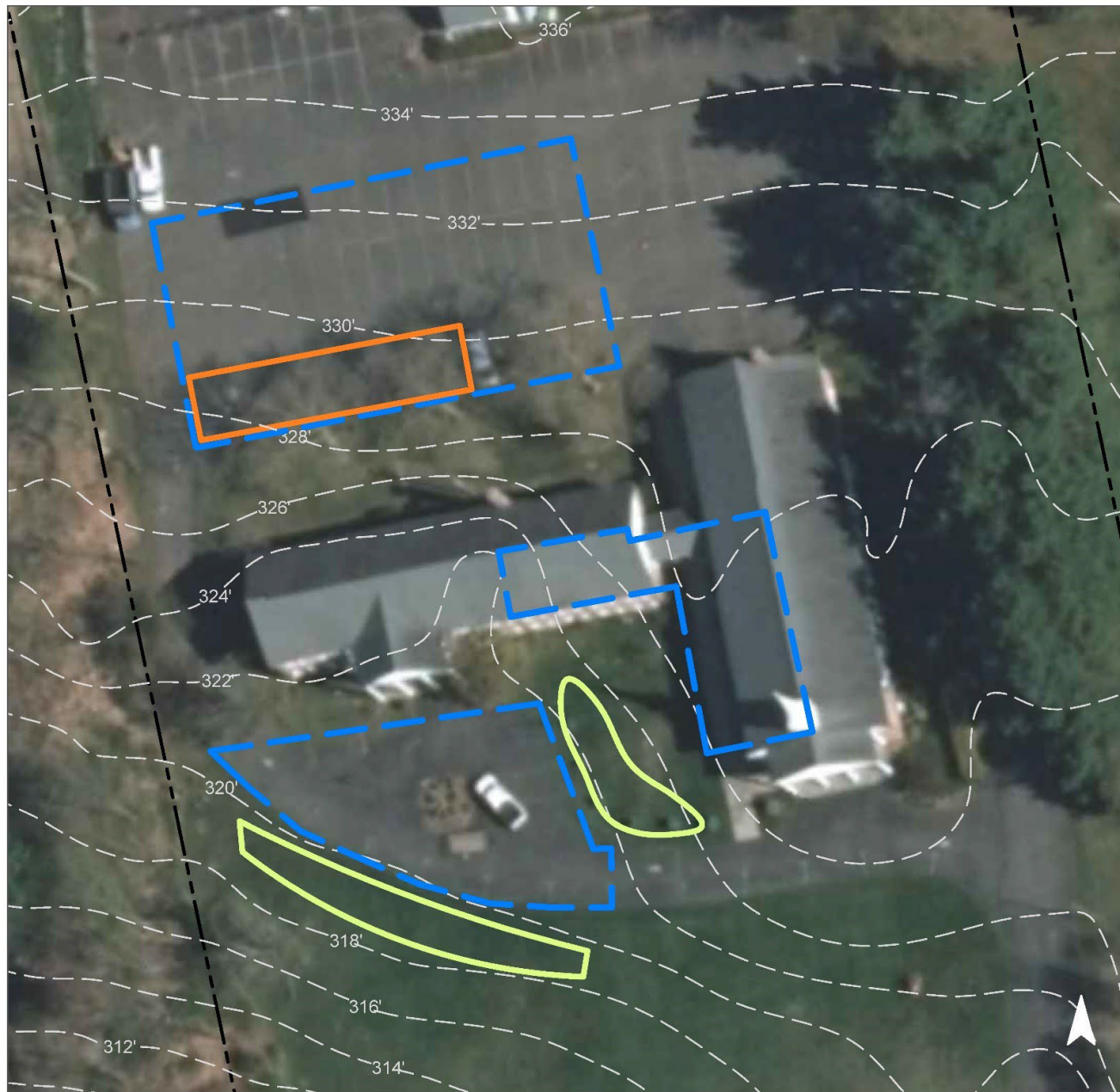


Rain gardens can be installed in the courtyard in the corner of the building and adjacent to the parking lot south of the building to capture, treat, and infiltrate rooftop and parking lot runoff. Pervious pavement can be installed in the small area of parking spaces in front and in the larger parking lot in the rear of the building to capture, treat, and infiltrate parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
19	71,293	3.4	36.0	327.3	0.056	1.96

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.231	39	16,920	0.64	2,215	\$11,075
Pervious pavement	0.270	45	19,810	0.74	1,850	\$46,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Good Shepherd Church

-  bioretention system
-  pervious pavement
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 25' 50'

SACRED HEART CHAPEL



RAP ID: 11

Subwatershed: Raritan River North
Branch

Site Area: 15,409 sq. ft.

Address: 47 Bernards Avenue
Bernardsville, NJ 07924

Block and Lot: Block 105, Lots 1,12

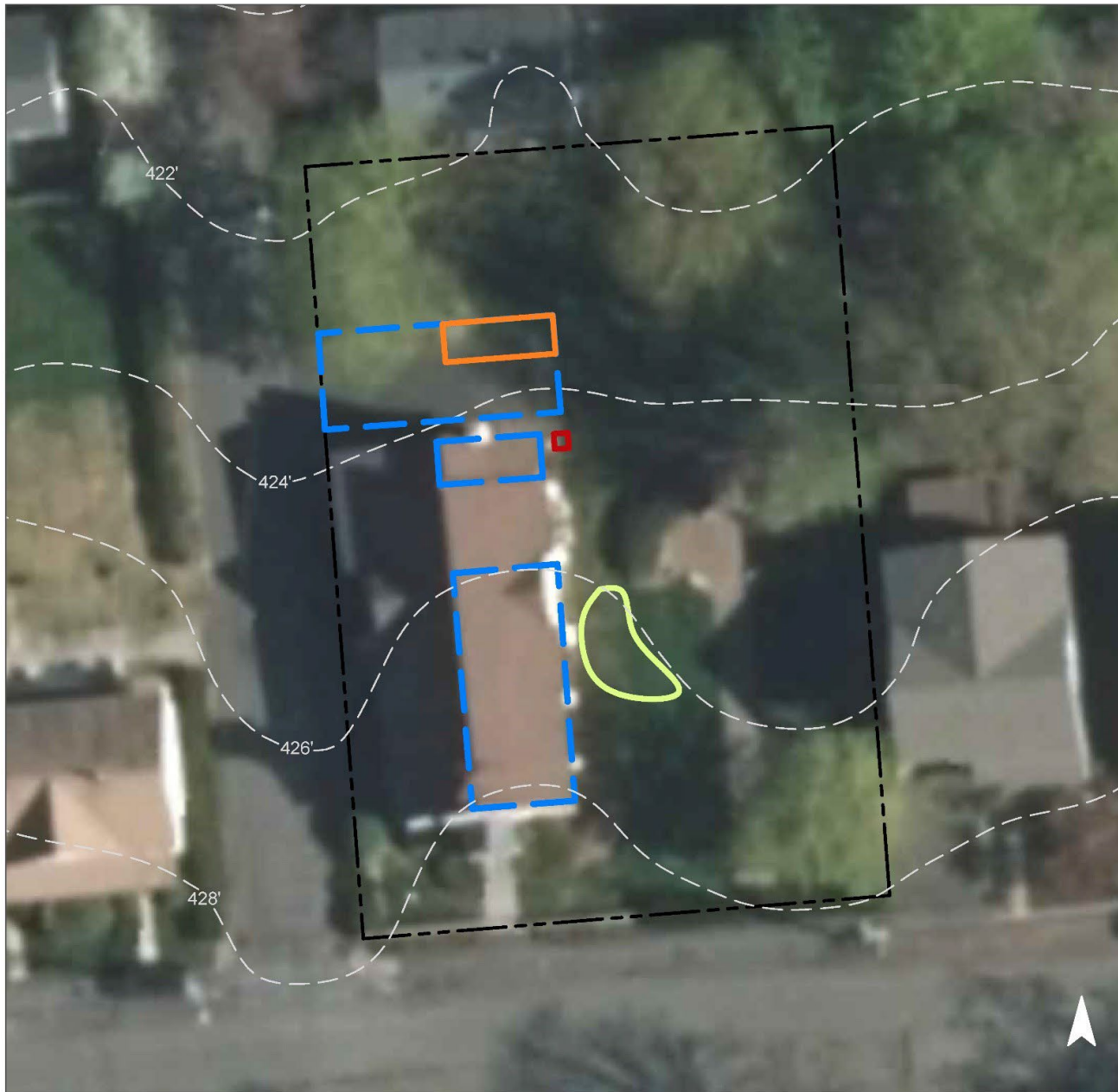


A rain garden can be installed on the eastern side of the church to capture, treat, and infiltrate rooftop runoff. A downspout planter box can be installed at the northeast corner of the church to capture and filter stormwater. Pervious pavement can be installed in the parking spaces north of the building to capture, treat, and infiltrate parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
50	7,656	0.4	3.9	35.2	0.006	0.21

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.024	4	1,770	0.07	230	\$1,150
Pervious pavement	0.022	4	1,650	0.06	160	\$4,000
Planter box	n/a	1	n/a	n/a	1 (box)	\$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sacred Heart Chapel

-  bioretention system
-  pervious pavement
-  planter box
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS



SCHOOL OF SAINT ELIZABETH



RAP ID: 12

Subwatershed: Raritan River North Branch

Site Area: 263,055 sq. ft.

Address: 30 Seney Drive
Bernardsville, NJ 07924

Block and Lot: Block 39, Lot 6

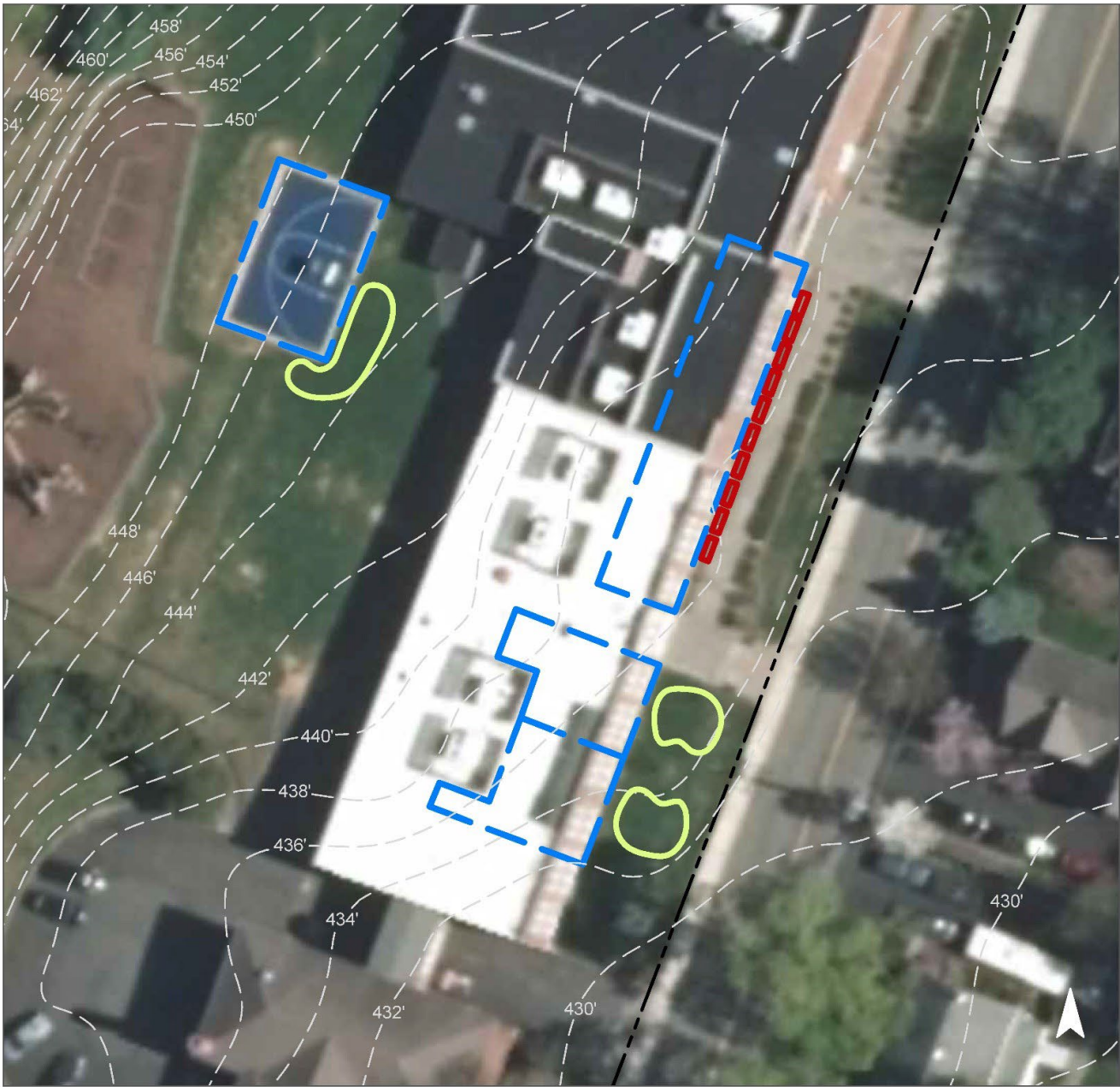


Rain gardens can be installed on either side of the red tree shown to the southeast of the school and along the southeast corner of the tennis court to capture, treat, and infiltrate rooftop and pavement runoff. Downspout planter boxes can be installed to the right of the main entrance to capture and filter stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
42	110,897	5.3	56.0	509.2	0.086	3.04

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.083	14	6,120	0.23	815	\$4,075
Planter boxes	n/a	8	n/a	n/a	10 (boxes)	\$10,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



School of Saint Elizabeth

-  bioretention system
-  planter box
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS



SAINT BERNARD'S CHURCH



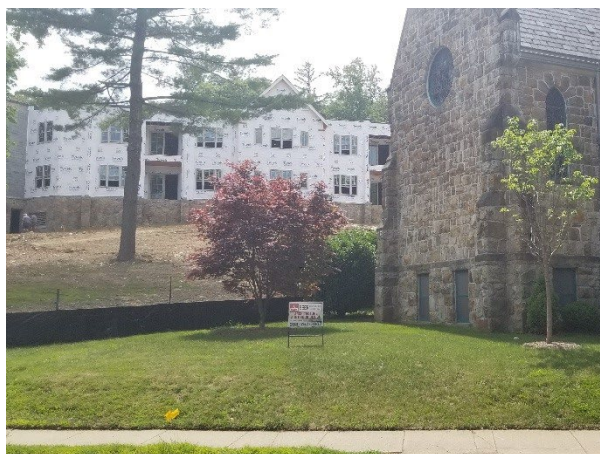
RAP ID: 13

Subwatershed: Raritan River North Branch

Site Area: 158,487 sq. ft.

Address: 88 Claremont Road
Bernardsville, NJ 07924

Block and Lot: Block 68, Lot 9

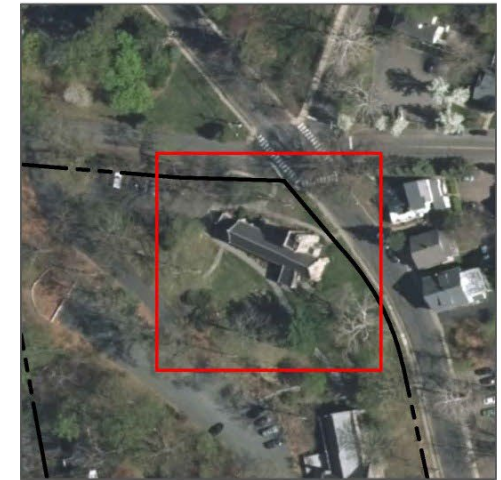


A rain garden can be installed along the southeast side of the church and at the bottom of a hill on the property to capture, treat, and infiltrate parking lot and rooftop runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
50	78,635	3.8	39.7	361.0	0.061	2.16

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.056	9	4,130	0.16	540	\$2,700

GREEN INFRASTRUCTURE RECOMMENDATIONS



Saint Bernard's Church

-  bioretention system
-  drainage area
-  property line
-  2015 Aerial: NJOIT, OGIS

0 25' 50'

BERNARDS HIGH SCHOOL

RAP ID: 14

Subwatershed: Upper Passaic River

HUC14 ID 02030103010070

Site Area: 1,172,134 sq. ft.

Address: 25 Olcott Avenue
Bernardsville, NJ 07924



Block and Lot: Block 64, Lot 1

Rain gardens can be installed in multiple grass areas around the property to capture, treat, and infiltrate the stormwater runoff from rooftops, walkways, road, and driveways. Some of these gardens require curb cuts and trench drains to intercept and redirect runoff to the gardens. Existing parking spaces in the northern and southern parking lots can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 49"
49	570,245	27.5	288.0	2,618.2	0.444	17.42

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	30,415	0.883	133	58,910	2.21	7,610	\$76,100
Pervious pavement	81,540	2.366	355	157,920	5.93	20,555	\$513,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bernards High School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS



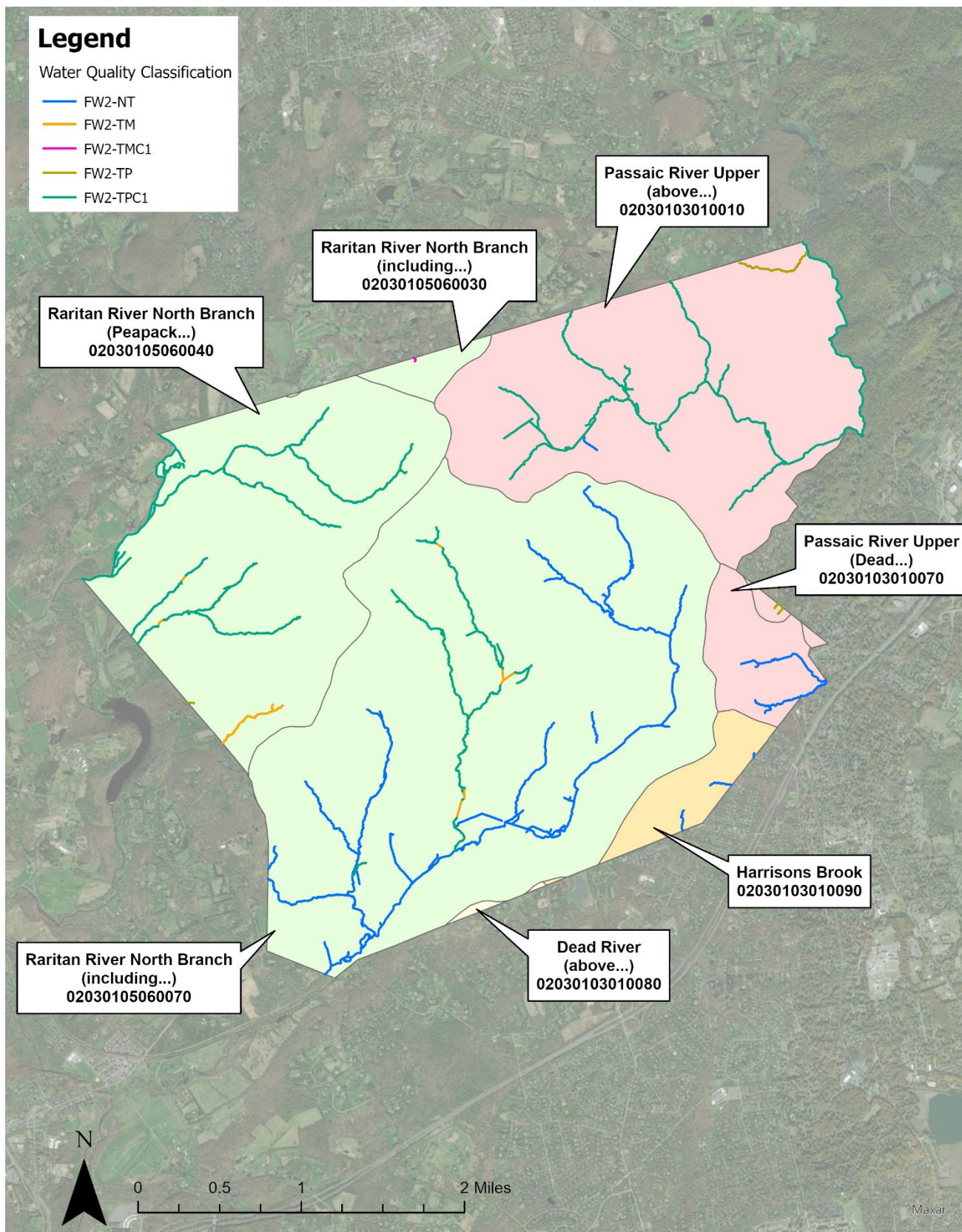


Figure 13. Water Quality Classification of Surface Waters in Bernardsville Borough

Table 11. Water Quality Classification of Surface Waters in Bernardsville Borough

Surface Water Quality Classification	Surface Water Quality Code	Miles	Percent of Municipal Streams
Freshwater 2, non-trout	FW2-NT	14.9	39.1%
Freshwater 2, trout production, Category One	FW2-TPC1	21.5	56.1%
Freshwater 2, trout maintenance	FW2-TM	1.1	3.0%
Freshwater 2, trout production	FW2-TP	0.7	1.7%
Freshwater 2, trout maintenance, Category One	FW2-TMC1	0.03	0.1%

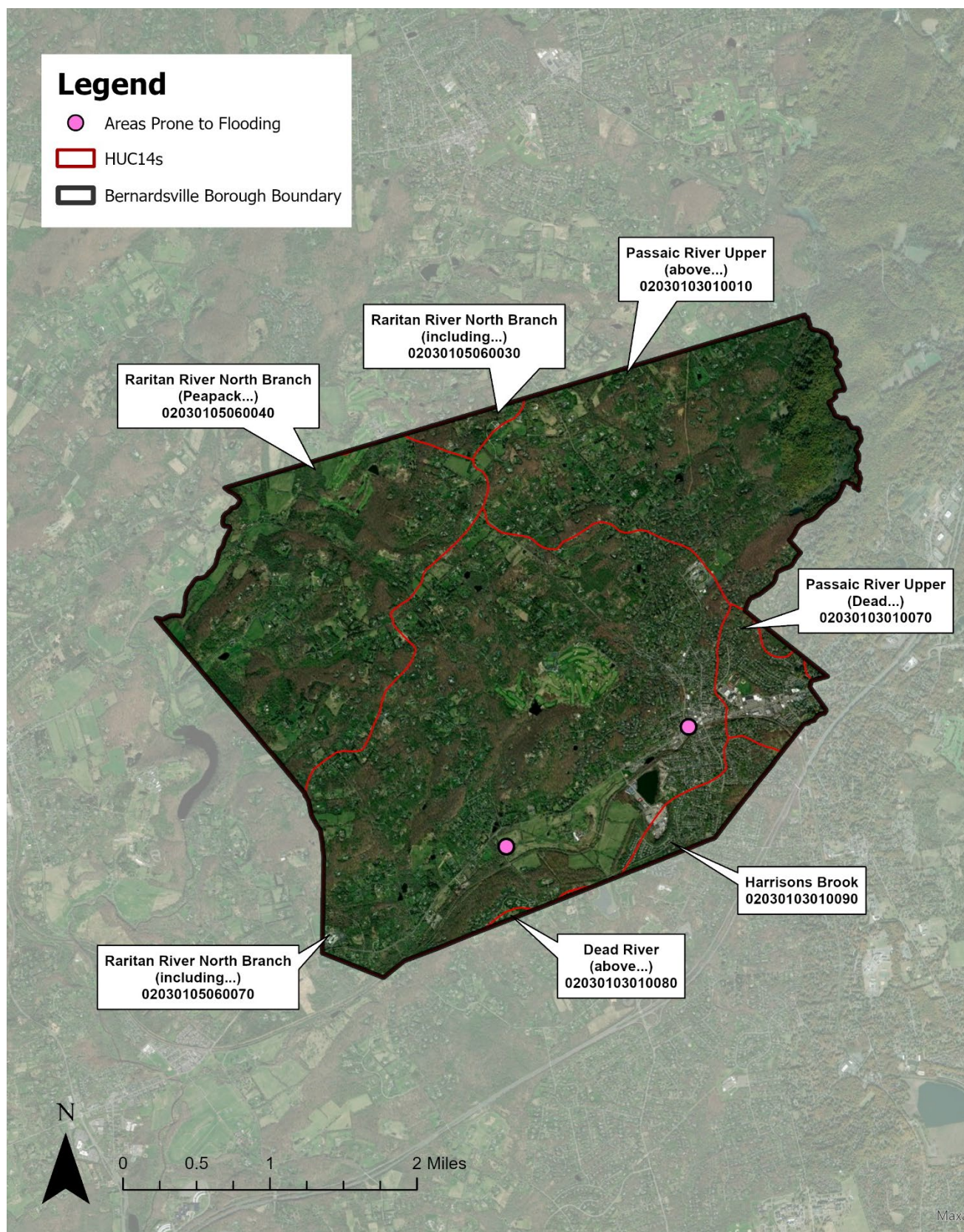


Figure 14. Areas Prone to Flooding in Bernardsville Borough