RUTGERS
New Jersey Agricultural
Experiment Station

Impervious Cover Reduction Action Plan
for
Belvidere, Warren County, New Jersey

Prepared for Belvidere by the
Rutgers Cooperative Extension Water Resources Program

August 24, 2021

ACKNOWLEDGEMENTS:

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RUTGERS
New Jersey Agricultural Experiment Station

NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

Table of Contents

Introduction

Located in Warren County, New Jersey, the Town of Belvidere covers approximately 1.43 square miles. Figures 1 and 2 illustrate that Belvidere is dominated by urban land uses. A total of 62.9% of the municipality's land use is classified as urban. Of the urban land in Belvidere, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2015 land use/land cover geographical information system (GIS) data layer categorizes Belvidere into many unique land use areas, assigning a percent impervious cover for each delineated area. These impervious cover values were used to estimate the impervious coverage for Belvidere. Based upon the 2015 NJDEP land use/land cover data, approximately 27.1% of Belvidere has impervious cover. This level of impervious cover suggests that the streams in Belvidere are likely non-supporting streams. [1]

Methodology

Belvidere contains portions of three subwatersheds (Figure 4). For this impervious cover reduction action plan (RAP), projects have been identified in one subwatershed. Aerial imagery initially was studied to identify potential project sites that contain extensive impervious cover. Field inspections were conducted to determine if viable options exist at the sites to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the field inspections, appropriate green infrastructure practices for the sites were recommended. Sites that already had green infrastructure stormwater management practices in place were not considered.

[1] Schuler, T.R., L. Fraley-McNeal, and K. Cappiella. 2009. Is Impervious Cover Still Important? Review of Recent Research. *Journal of Hydrologic Engineering* 14 (4): 309-315.

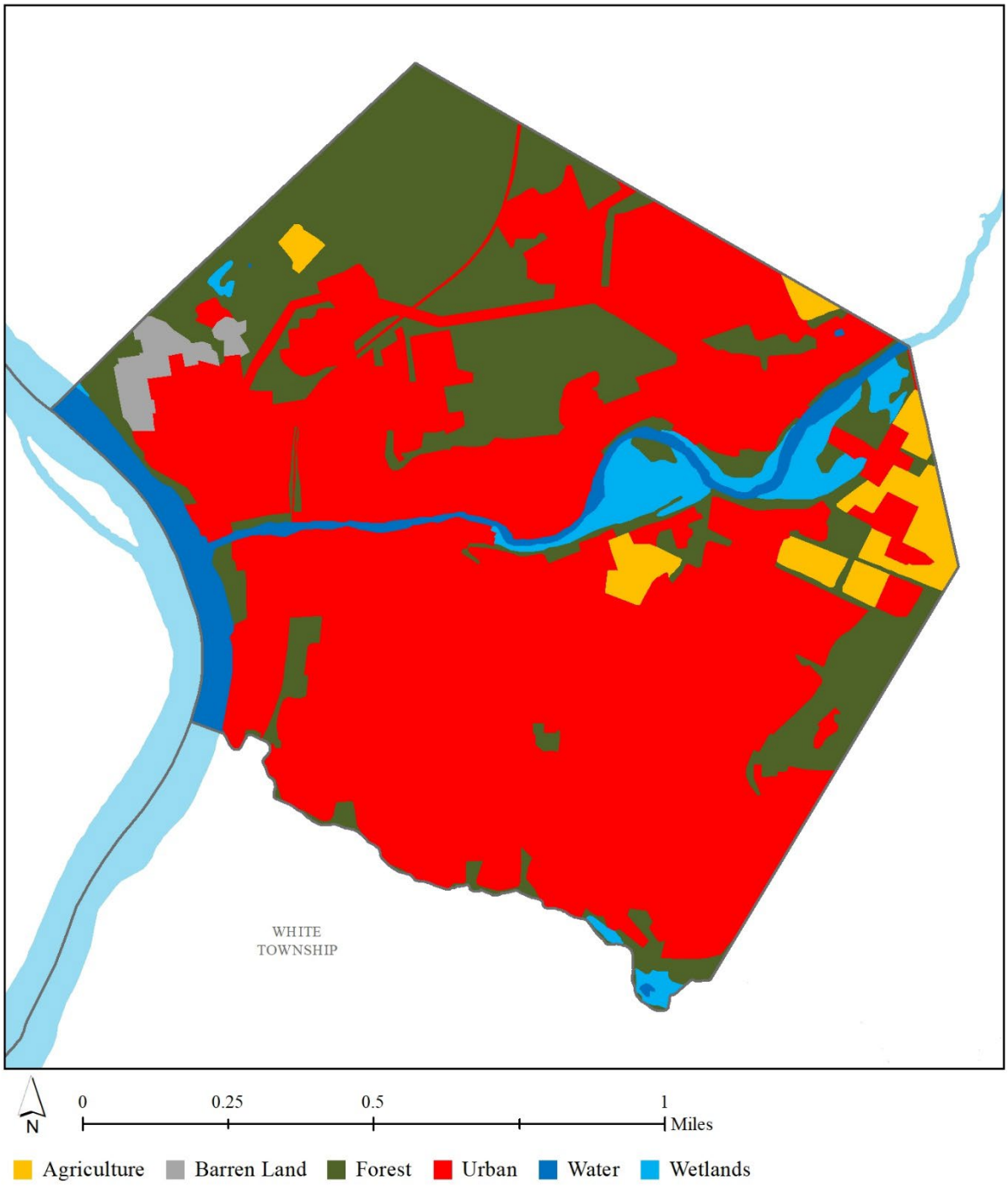


Figure 1: Map of land use in Belvidere

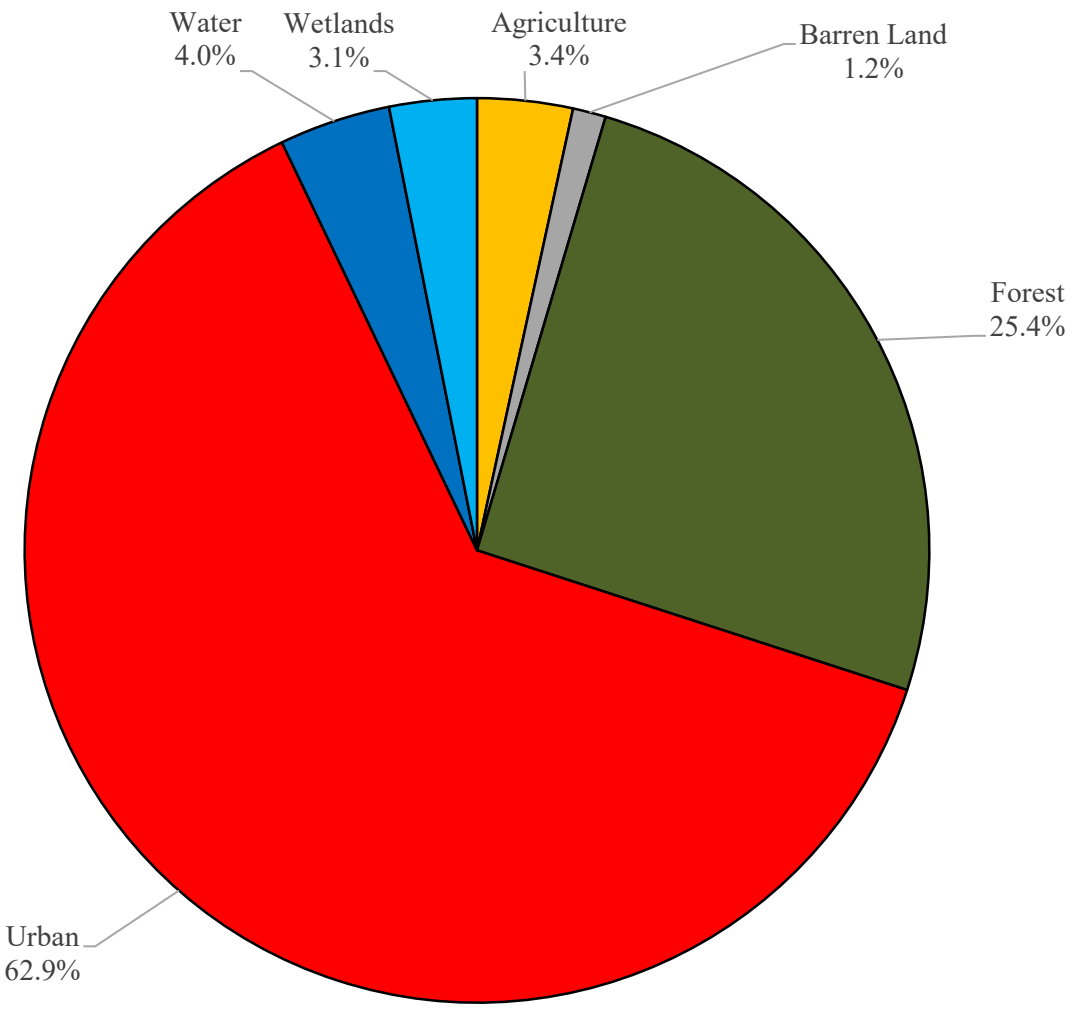


Figure 2: Pie chart illustrating the land use in Belvidere

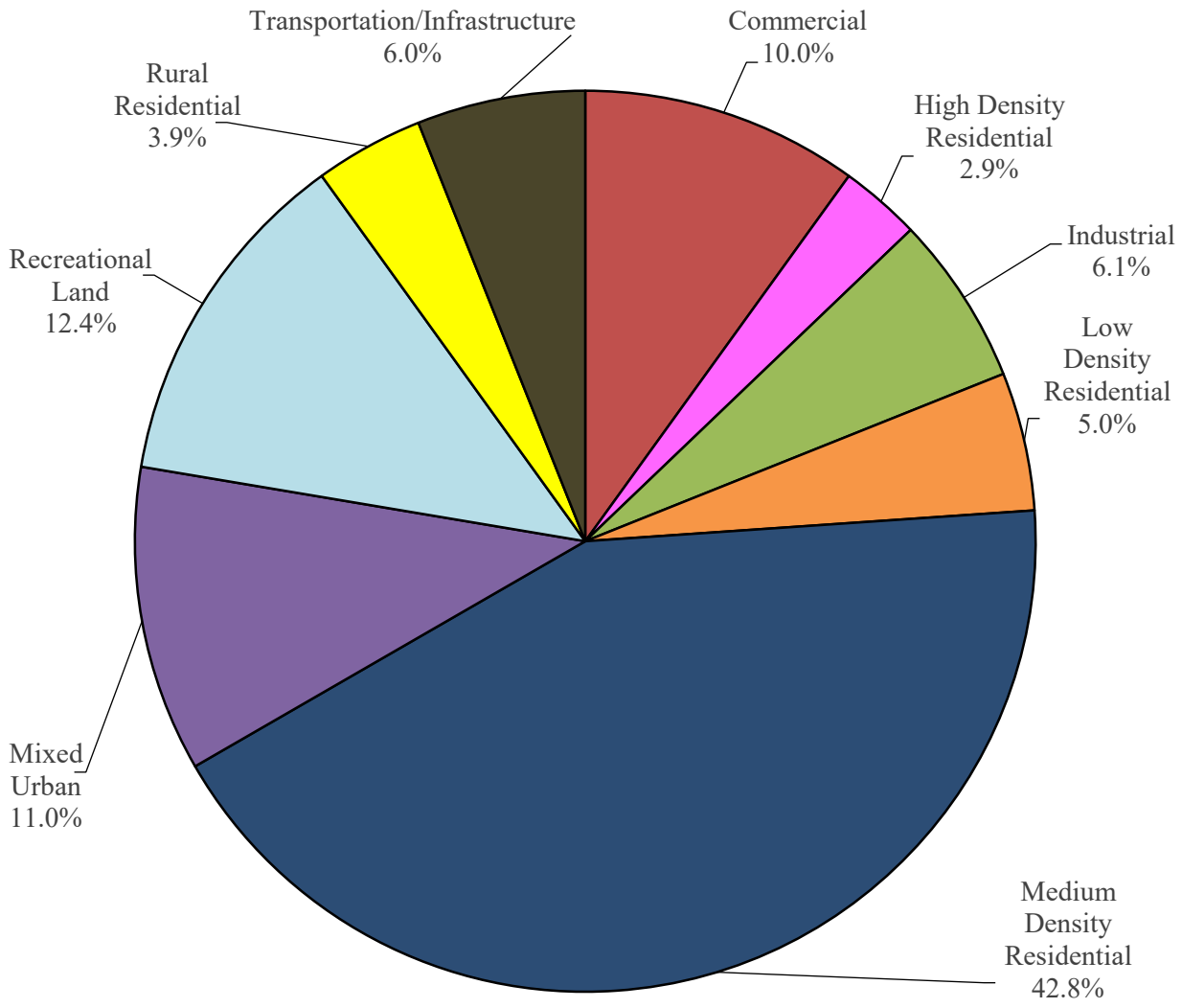


Figure 3: Pie chart illustrating the various types of urban land use in Belvidere

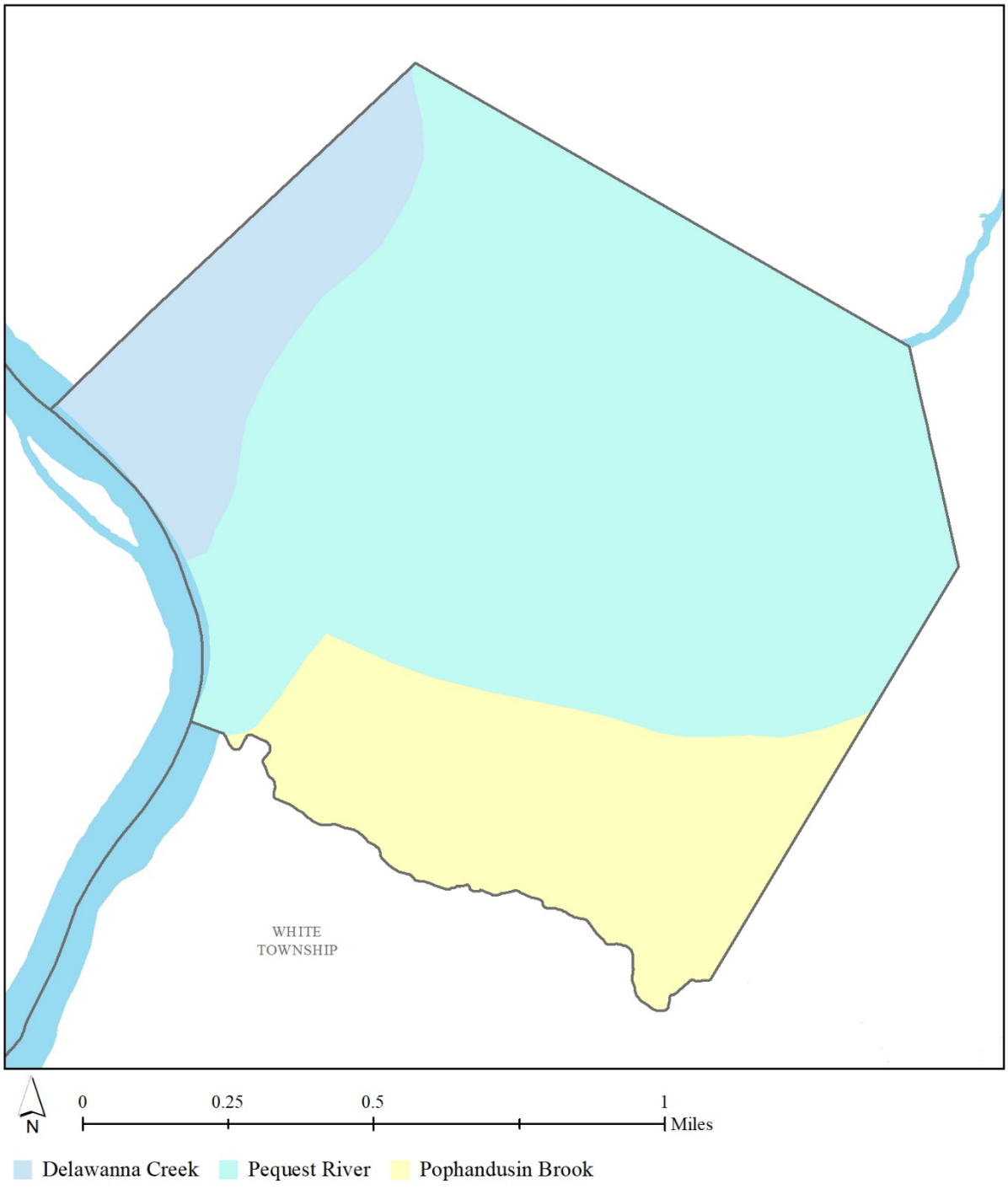


Figure 4: Map of the subwatersheds in Belvidere

For each potential project site, specific aerial loading coefficients for commercial land use were used to determine the annual runoff loads for total phosphorus (TP), total nitrogen (TN), and total suspended solids (TSS) from impervious surfaces (Table 1). These are the same aerial loading coefficients that NJDEP uses in developing total maximum daily loads (TMDLs) for impaired waterways of the state. The percentage of impervious cover for each site was extracted from the 2015 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the New Jersey water quality design storm (1.25 inches of rain over two hours) and for the average annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Belvidere using the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, which utilizes regional and statewide soil data to predict soil types in an area. Several key soil parameters were examined (e.g., natural drainage class, saturated hydraulic conductivity of the most limiting soil layer (K_{sat}), depth to water table, and hydrologic soil group) to evaluate the suitability of each site's soil for green infrastructure practices. In cases where multiple soil types were encountered, the key soil parameters were examined for each soil type expected at a site.

For each potential project site, drainage areas were determined for each of the green infrastructure practices proposed at the site. These green infrastructure practices were designed to manage the 2-year design storm, allowing for the capture of 95% of the annual rainfall. Runoff volumes were calculated for each proposed green infrastructure practice. The reduction in TSS loading was calculated for each drainage area for each proposed green infrastructure practice using the aerial loading coefficients in Table 1. The maximum volume reduction in stormwater runoff for each green infrastructure practice for a storm was determined by calculating the volume of runoff captured from the 2-year design storm. For each green infrastructure practice, peak discharge reduction potential was determined through hydrologic modeling in HydroCAD. For each green infrastructure practice, a cost estimate is provided. These costs are based upon the square footage of the green infrastructure practice and the real cost of green infrastructure practice implementation in New Jersey.

Table 1: Aerial Loading Coefficients[2]

Land Cover	TP load (lbs/acre/yr)	TN load (lbs/acre/yr)	TSS load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agriculture	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

[2] New Jersey Department of Environmental Protection (NJDEP), Stormwater Best Management Practice Manual, February 2004, Page 3-11.

Green Infrastructure Practices

Green infrastructure is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly. Green infrastructure projects capture, filter, absorb, and reuse stormwater to maintain or mimic natural systems and to treat runoff as a resource. As a general principle, green infrastructure practices use soil and vegetation to recycle stormwater runoff through infiltration and evapotranspiration. When used as components of a stormwater management system, green infrastructure practices such as bioretention, green roofs, porous pavement, rain gardens, and vegetated swales can yield a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these practices can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits[3]. A wide range of green infrastructure practices have been evaluated for the potential project sites in Belvidere. The practices are discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected from draining directly to the roadway or storm sewer system, and directed to discharge water to a pervious area (i.e., lawn).

Pervious pavements

There are several types of permeable pavement systems including porous asphalt, pervious concrete, permeable pavers, and grass pavers. These surfaces are hard and support vehicle traffic but also allow water to infiltrate through the surface. They are designed with an underlying stone layer to retain stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA). 2015. Benefits of Green Infrastructure. http://www.epa.gov/greeninfrastructure/benefits-green-infrastructure

Bioretention systems/rain gardens

These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils that do not quickly infiltrate by incorporating an underdrain into the system.

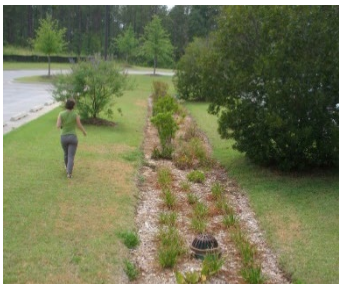
Downspout planter boxes

These are large wooden boxes that house a variety of water-retaining and/or filtering plants. When installed at the base of a downspout, water is captured by the plants which reduces stormwater runoff volume, provides a water source for the vegetation, and provides a small patch of habitat and food sources for birds and insects.

Rainwater harvesting systems (cistern or rain barrel)

These systems capture rainwater, mainly from rooftops, in cisterns or rain barrels. The water can then be used for watering gardens, washing vehicles, or for other non-potable uses.

Bioswale



Bioswales are landscape features that convey stormwater from one location to another while removing pollutants and providing water an opportunity to infiltrate. Bioswales are often designed for larger scale sites where water needs time to move and slowly infiltrate into the groundwater. Much like rain garden systems, bioswales can also be designed with an underdrain pipe that allows excess water to discharge to the nearest catch basin or existing stormwater system.

Stormwater planters

Stormwater planters are vegetated structures that are built into the sidewalk to intercept stormwater runoff from the roadway or sidewalk. Many of these planters are designed to allow the water to infiltrate into the ground while others are designed simply to filter the water and convey it back into the stormwater sewer system.

Tree filter boxes

These are pre-manufactured concrete boxes that contain a special soil mix and are planted with a tree or shrub. Tree filter boxes filter stormwater runoff but provide little storage capacity. They are typically designed to quickly filter stormwater and then discharge it to the local sewer system.

Potential Project Sites

Appendix A contains information on potential project sites where green infrastructure practices could be installed with a focus on existing site conditions. The recommended green infrastructure practices and the drainage area that the green infrastructure practices can treat are identified for each potential project site. For each practice, recharge potential, TSS removal potential, maximum volume reduction potential per storm, peak reduction potential, and estimated project costs are provided. This information will be especially useful in instances where proposed development projects cannot satisfy the New Jersey stormwater management requirements (N.J.A.C. 7:8).

Conclusion

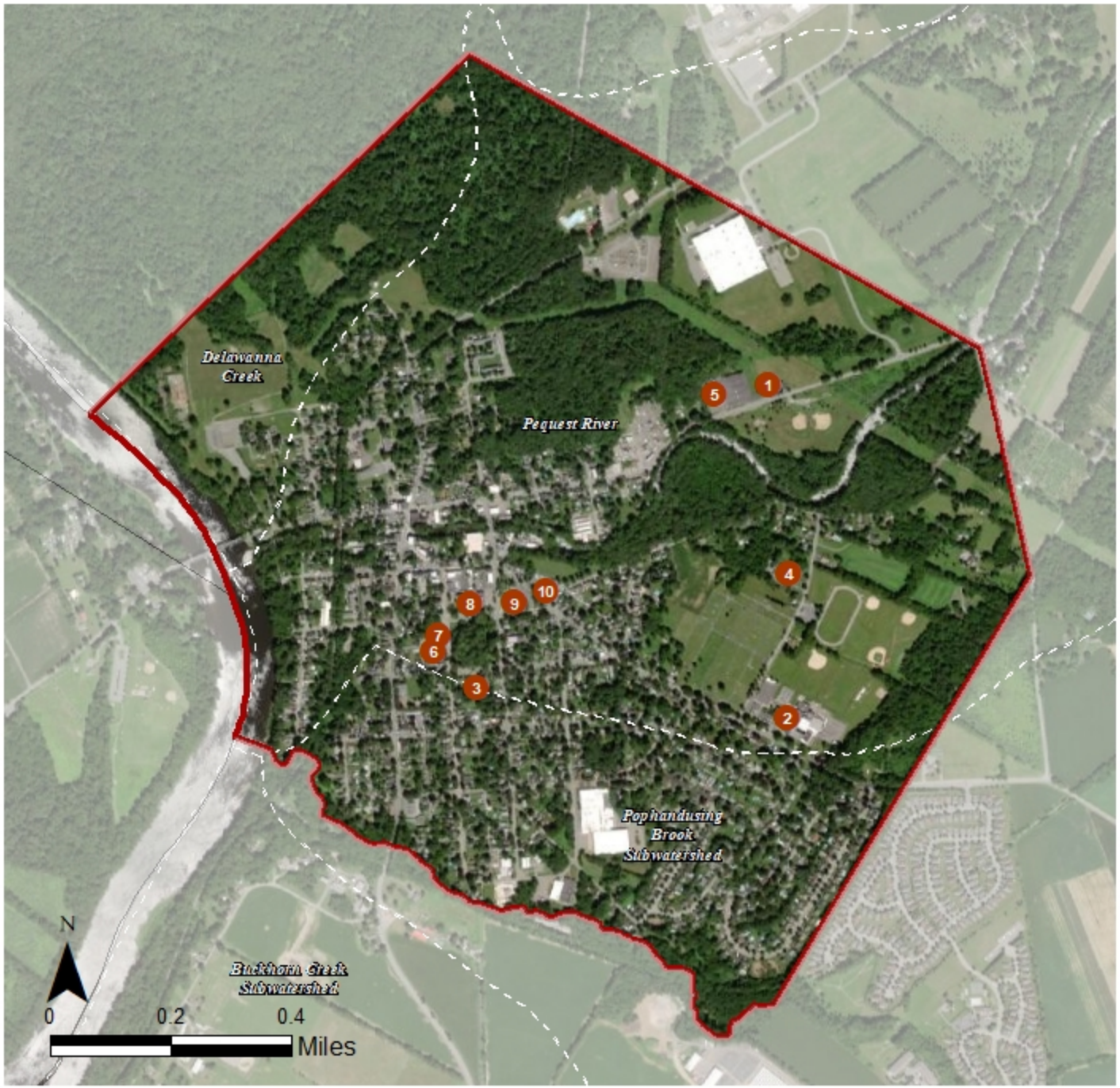
This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented through a wide variety of volunteer groups, such as Boy Scouts, Girl Scouts, Municipal Green Teams, corporate volunteerism, faith-based groups, school groups, watershed groups, and other active community organizations.

Additionally, development projects that are in need of providing off-site compensation for stormwater impacts can use the projects in this plan as a starting point. The municipality can quickly convert this green infrastructure action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

Appendix A: Climate Resilient Green Infrastructure

a. Green Infrastructure Sites

BELVIDERE: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE PEQUEST RIVER SUBWATERSHED

1. Belvidere Municipal Court
2. Belvidere Elementary School
3. Episcopal Church of Saint Luke & Saint Mary
4. First Baptist Church
5. Good Will Fire Company
6. United Presbyterian Church
7. Warren County Board of Elections
8. Warren County Courthouse
9. Warren County Prosecutor's Office
10. Warren County Superintendent

b. Proposed Green Infrastructure Concepts

BELVIDERE MUNICIPAL COURT

Subwatershed: Pequest River

Site Area: 36,530 sq. ft.

Address: 691 Water Street
Belvidere, NJ 07823

Block and Lot: Block 2, Lot 1.02

Downspout planter boxes can be installed south of the building between the sidewalk and the building to capture, treat, and infiltrate stormwater runoff from the roof. Parking spaces on the south side of the parking lot can be converted to pervious pavement to capture and infiltrate stormwater runoff from the parking lot. 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"
69	25,120	1.2	12.7	115.3	0.020	0.69

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	0.204	34	14,990	0.56	1,400	$35,000
Planter boxes	n/a	3	n/a	n/a	4 (boxes)	$4,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Belvidere Municipal Court

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

0 20' 40'

BELVIDERE ELEMENTARY SCHOOL

Subwatershed: Pequest River

Site Area: 700,965 sq. ft.

Address: 809 Oxford Street
Belvidere, NJ 07823

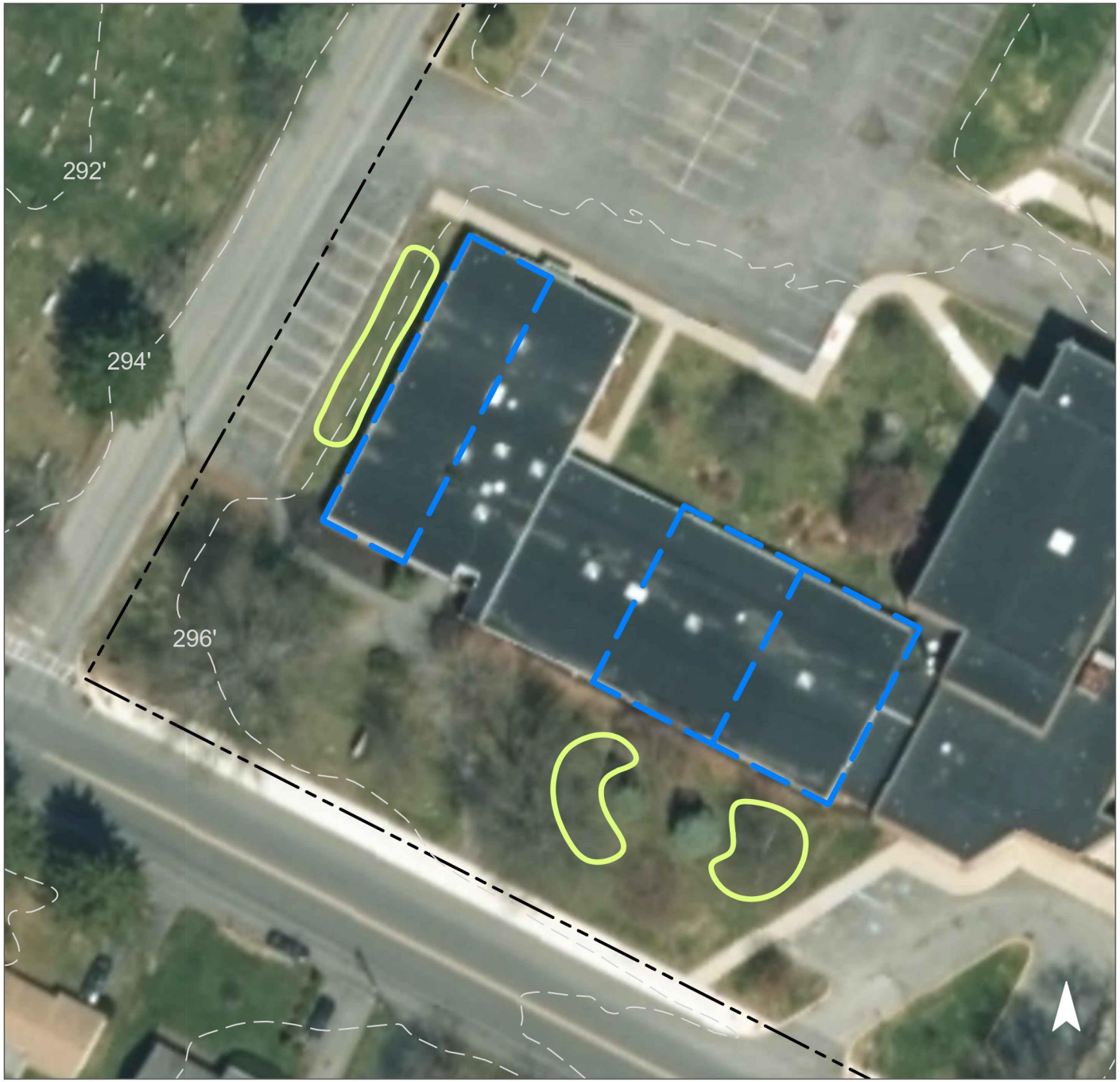
Block and Lot: Block 31, Lots 10 & 11

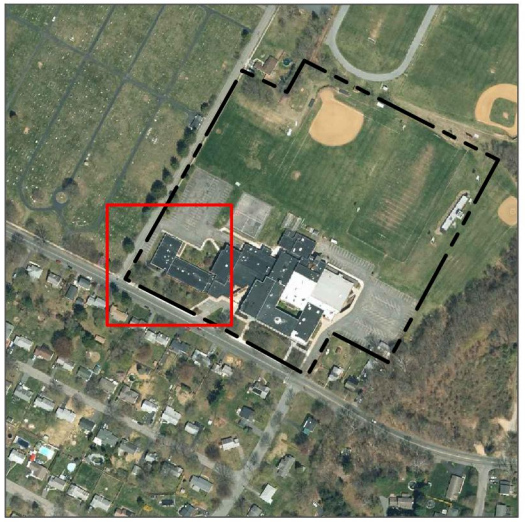
Bioretention systems can be installed south and west of the building to allow for the capture, treatment, and infiltration of stormwater runoff from the rooftop. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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	297,515	14.3	150.3	1,366.0	0.232	8.16

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	0.229	38	16,840	0.63	2,205	$11,025

GREEN INFRASTRUCTURE RECOMMENDATIONS





Belvidere Elementary School

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

0 25' 50'

EPISCOPAL CHURCH OF SAINT LUKE & SAINT MARY

Subwatershed: Pequest River

Site Area: 28,520 sq. ft.

Address: 408 3rd Street
Belvidere, NJ 07823

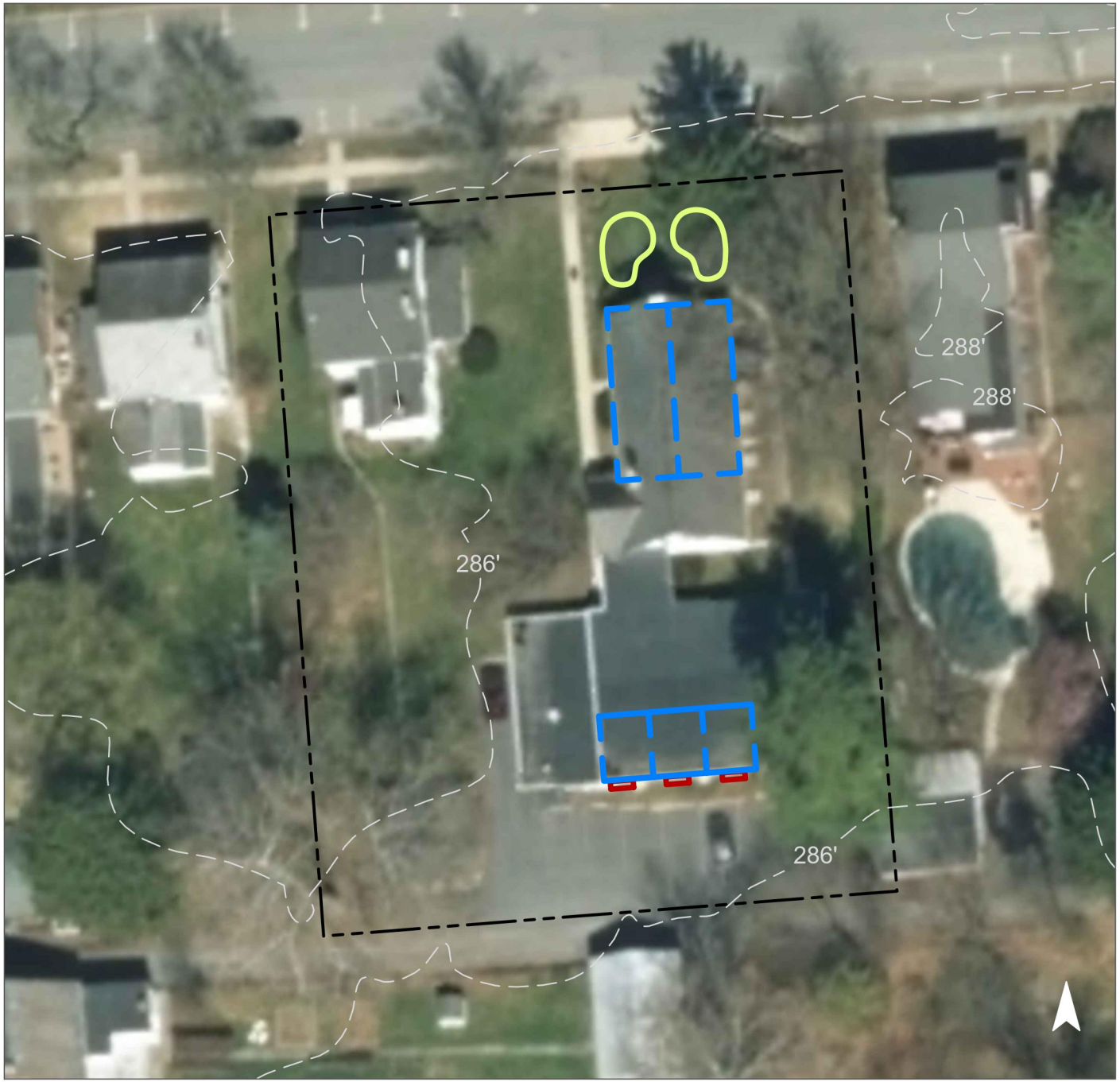
Block and Lot: Block 27, Lot 3

Two bioretention systems can be installed north of the building to capture, treat, and infiltrate stormwater runoff from the roof. Downspout planter boxes can be installed on the south end of the building to capture rooftop runoff to reduce stormwater flow onto the pavement. 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"
46	13,180	0.6	6.7	60.5	0.010	0.36

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	0.038	6	2,750	0.10	360	$1,800
Planter boxes	n/a	2	n/a	n/a	3 (boxes)	$3,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Episcopal Church of Saint Luke & Saint Mary

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

0 20' 40'

FIRST BAPTIST CHURCH

Subwatershed: Pequest River

Site Area: 140,880 sq. ft.

Address: 155 Pequest Road
Belvidere, NJ 07823

Block and Lot: Block 30, Lot 7

Two bioretention systems can be installed to the north and west of the building to capture, treat, and infiltrate stormwater runoff from the roof using the disconnected downspouts. 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"
26	36,140	1.7	18.3	165.9	0.02	0.99

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	6,110	0.23	800	$4,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

First Baptist Church

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

0 25' 50'

GOOD WILL FIRE COMPANY

Subwatershed: Pequest River

Site Area: 225,305 sq. ft.

Address: 689 Water Street
Belvidere, NJ 07823

Block and Lot: Block 2, Lot 1.01

Pervious pavement can be installed west of the building on the southernmost parking strip to capture, treat, and infiltrate stormwater runoff from the parking lot. Bioretention systems can be installed in the turfgrass area between the parking lot and sidewalks to intercept stormwater before it enters the catch basin storm drains. 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"
54	122,180	5.9	61.7	561.0	0.095	3.35

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	0.163	27	11,940	0.45	1,565	$7,825
Pervious pavement	0.350	59	25,690	0.97	2,400	$60,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Good Will Fire Company

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

0 30' 60'

UNITED PRESBYTERIAN CHURCH

Subwatershed: Pequest River

Site Area: 28,100 sq. ft.

Address: 224 Mansfield Street
Belvidere, NJ 07823

Block and Lot: Block 23, Lot 2

Bioretention systems can be installed north and south of the church building to capture, treat, and infiltrate stormwater runoff from the rooftop. 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"
62	17,525	0.8	8.9	80.5	0.014	0.48

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	6,430	0.24	845	$4,225

GREEN INFRASTRUCTURE RECOMMENDATIONS

United Presbyterian Church

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

0 15' 30'

WARREN COUNTY BOARD OF ELECTIONS

Subwatershed: Pequest River

Site Area: 33,635 sq. ft.

Address: 202 Mansfield Street
Belvidere, NJ 07823

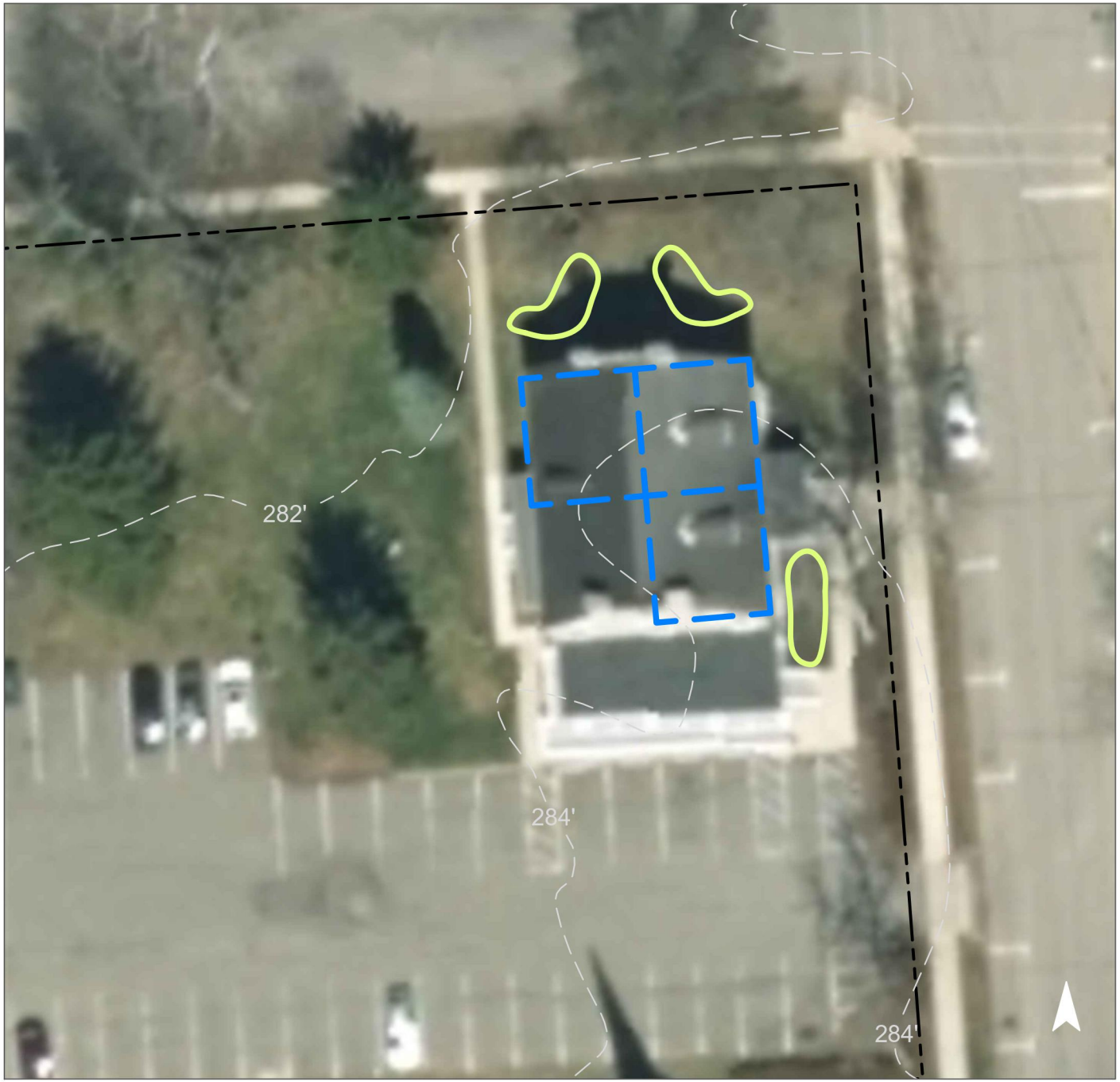
Block and Lot: Block 23, Lot 1

Bioretention systems can be installed around the corners of the building to capture, treat, and infiltrate stormwater runoff from the rooftop. 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"
75	25,090	1.2	12.7	115.2	0.020	0.69

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	0.044	7	3,210	0.12	420	$2,100

GREEN INFRASTRUCTURE RECOMMENDATIONS



Warren County Board of Elections

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

0 15' 30'

WARREN COUNTY COURTHOUSE

Subwatershed: Pequest River

Site Area: 75,445 sq. ft.

Address: 413 2nd Street
Belvidere, NJ 07823

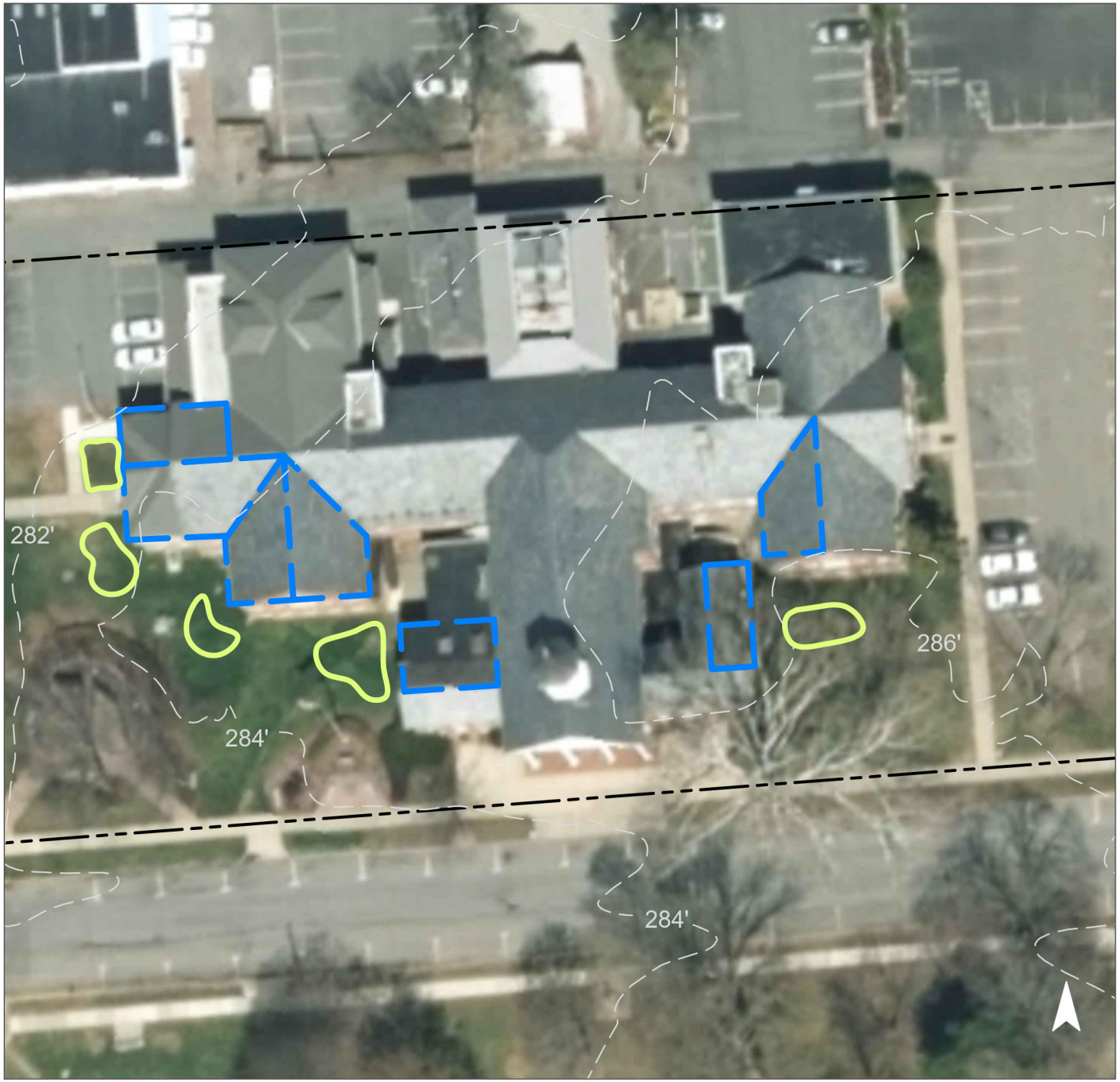
Block and Lot: Block 17, Lots 8-13

Bioretention systems can be installed around the building to capture, treat, and infiltrate stormwater runoff from the rooftop. 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"
80	60,230	2.9	30.4	276.5	0.047	1.65

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	0.132	22	9,690	0.36	1,270	$6,350

GREEN INFRASTRUCTURE RECOMMENDATIONS



Warren County Courthouse

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

0 25' 50'

WARREN COUNTY PROSECUTOR'S OFFICE

Subwatershed: Pequest River

Site Area: 67,275 sq. ft.

Address: 501 2nd Street
Belvidere, NJ 07823

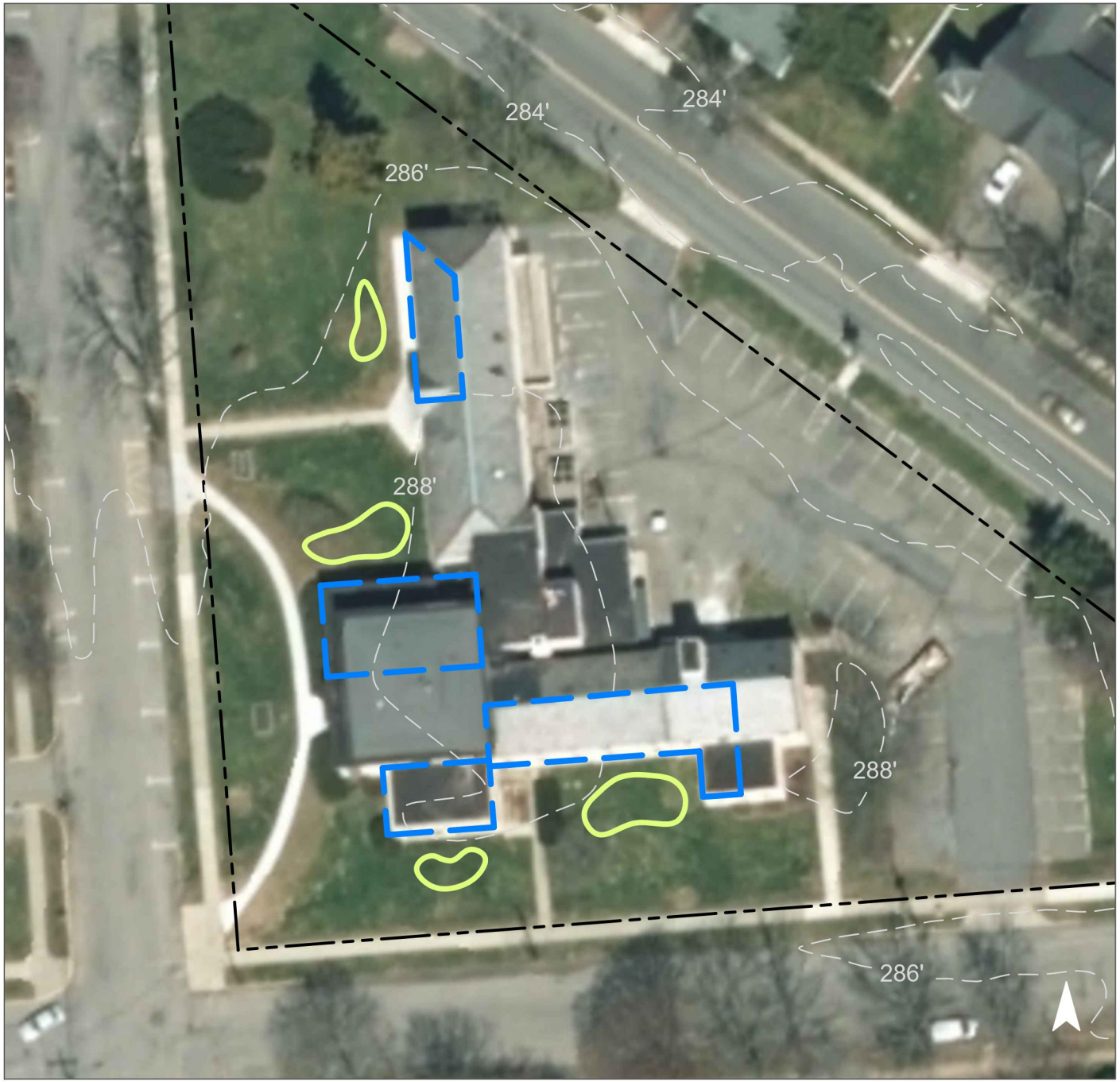
Block and Lot: Block 18, Lot 1

Bioretention systems can be installed around the building to capture, treat, and infiltrate stormwater runoff from the rooftop. 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"
80	53,710	2.6	27.1	246.6	0.042	1.47

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	0.127	21	9,330	0.35	1,230	$6,150

GREEN INFRASTRUCTURE RECOMMENDATIONS



Warren County Prosecutors Office

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

0 25' 50'

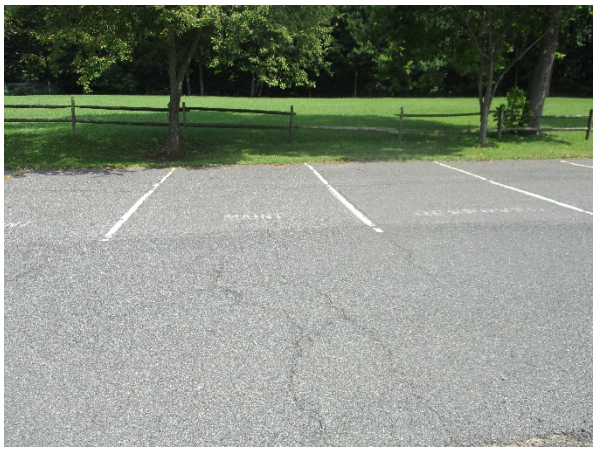
WARREN COUNTY SUPERINTENDENT

Subwatershed: Pequest River

Site Area: 21,520 sq. ft.

Address: 537 Oxford Street
Belvidere, NJ 07823

Block and Lot: Block 10, Lot 7



Bioretention systems can be installed northwest and southeast of the building to capture, treat, and infiltrate stormwater runoff from the rooftop. Pervious pavement can be installed in the northern section of the parking lot to capture, treat, and infiltrate stormwater runoff from the parking lot. 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"
78	16,785	0.8	8.5	77.1	0.013	0.46

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	0.024	4	1,760	0.07	230	$1,150
Pervious pavement	0.128	21	9,380	0.35	1,000	$25,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Warren County Superintendent

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

0 20' 40'

c. Summary of Existing Conditions

Summary of Existing Conditions

	Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Existing Annual Loads (Commercial)			Runoff Volumes from I.C.		Runoff Volumes from I.C.	
									TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (cu.ft.)	Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
	Pequest River SITES	**31.18**	**1,358,175**				**15.32**	**667,475**	**32.2**	**337.1**	**3064.6**	**69,529**	**2,447,408**	**0.5201**	**18.307**
1	**Belvidere Municipal Court**														
	Total Site Info	0.84	36,530	2	1.02	69	0.58	25,120	1.2	12.7	115.3	2,617	92,107	0.0196	0.689
2	**Belvidere Elementary School**														
	Total Site Info	16.09	700,965	31	10, 11	42	6.83	297,515	14.3	150.3	1366.0	30,991	1,090,888	0.2318	8.160
3	**Episcopal Church of Saint Luke & Saint Mary**														
	Total Site Info	0.65	28,520	27	3	46	0.30	13,180	0.6	6.7	60.5	1,373	48,327	0.0103	0.361
4	**First Baptist Church**														
	Total Site Info	3.23	140,880	30	7	26	0.83	36,140	1.7	18.3	165.9	3,765	132,513	0.0282	0.991
5	**Good Will Fire Company**														
	Total Site Info	5.17	225,305	2	1.01	54	2.80	122,180	5.9	61.7	561.0	12,727	447,993	0.0952	3.351
6	**United Presbyterian Church**														
	Total Site Info	0.65	28,100	23	2	62	0.40	17,525	0.8	8.9	80.5	1,826	64,258	0.0137	0.481
7	**Warren County Board of Elections**														
	Total Site Info	0.77	33,635	23	1	75	0.58	25,090	1.2	12.7	115.2	2,614	91,997	0.0195	0.688
8	**Warren County Courthouse**														
	Total Site Info	1.73	75,445	17	8-13	80	1.38	60,230	2.9	30.4	276.5	6,274	220,843	0.0469	1.652
9	**Warren County Prosecutor's Office**														
	Total Site Info	1.54	67,275	18	1	80	1.23	53,710	2.6	27.1	246.6	5,595	196,937	0.0418	1.473
10	**Warren County Superintendent**														
	Total Site Info	0.49	21,520	10	7	78	0.39	16,785	0.8	8.5	77.1	1,748	61,545	0.0131	0.460

d. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
	Pequest River SITES	**63,280**	**1.45**	**1.610**	**275**	**118,120**	**4.43**				**$171,625**	**9%**
1	**Belvidere Municipal Court**											
	Pervious pavement	7,840	0.18	0.204	34	14,990	0.56	1,400	25	SF	$35,000	31%
	Planter boxes	860	0.02	n/a	3	n/a	n/a	4	1000	box	$4,000	3%
	Total Site Info	**8,700**	**0.20**	**0.204**	**37**	**14,990**	**0.56**				**$39,000**	**35%**
2	**Belvidere Elementary School**											
	Bioretention systems	8,805	0.20	0.229	38	16,840	0.63	2,205	5	SF	$11,025	3%
	Total Site Info	**8,805**	**0.20**	**0.229**	**38**	**16,840**	**0.63**				**$11,025**	**3%**
3	**Episcopal Church of Saint Luke & Saint Mary**											
	Bioretention systems	1,440	0.03	0.038	6	2,750	0.10	360	5	SF	$1,800	11%
	Planter boxes	645	0.01	n/a	2	n/a	n/a	3	1000	box	$3,000	5%
	Total Site Info	**2,085**	**0.05**	**0.038**	**9**	**2,750**	**0.10**				**$4,800**	**16%**
4	**First Baptist Church**											
	Bioretention systems	3,195	0.07	0.083	14	6,110	0.23	800	5	SF	$4,000	9%
	Total Site Info	**3,195**	**0.07**	**0.083**	**14**	**6,110**	**0.23**				**$4,000**	**9%**
5	**Good Will Fire Company**											
	Bioretention systems	6,245	0.14	0.163	27	11,940	0.45	1,565	5	SF	$7,825	5%
	Pervious pavement	13,440	0.31	0.350	59	25,690	0.97	2,400	25	SF	$60,000	11%
	Total Site Info	**19,685**	**0.45**	**0.513**	**86**	**37,630**	**1.42**				**$67,825**	**16%**
6	**United Presbyterian Church**											
	Bioretention systems	3,360	0.08	0.088	15	6,430	0.24	845	5	SF	$4,225	19%
	Total Site Info	**3,360**	**0.08**	**0.088**	**15**	**6,430**	**0.24**				**$4,225**	**19%**
7	**Warren County Board of Elections**											
	Bioretention system	1,680	0.04	0.044	7	3,210	0.12	420	5	SF	$2,100	7%
	Total Site Info	**1,680**	**0.04**	**0.044**	**7**	**3,210**	**0.12**				**$2,100**	**7%**
8	**Warren County Courthouse**											
	Bioretention systems	5,065	0.12	0.132	22	9,690	0.36	1,270	5	SF	$6,350	8%
	Total Site Info	**5,065**	**0.12**	**0.132**	**22**	**9,690**	**0.36**				**$6,350**	**8%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
9	**Warren County Prosecutor's Office**											
	Bioretention systems	4,880	0.11	0.127	21	9,330	0.35	1,230	5	SF	$6,150	9%
	Total Site Info	**4,880**	**0.11**	**0.127**	**21**	**9,330**	**0.35**				**$6,150**	**9%**
10	**Warren County Superintendent**											
	Bioretention systems	920	0.02	0.024	4	1,760	0.07	230	5	SF	$1,150	5%