RUTGERS
New Jersey Agricultural
Experiment Station

Impervious Cover Reduction Action Plan
for
Berlin Township, Camden County, New Jersey

Prepared for Berlin Township by the
Rutgers Cooperative Extension Water Resources Program

August 10, 2016

WILLIAM PENN
FOUNDATION

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Introduction

Located in Camden County in northern New Jersey, Berlin Township covers approximately 3.3 square miles. Figures 1 and 2 illustrate that Berlin Township is dominated by urban land uses. A total of 68.2% of the municipality's land use is classified as urban. Of the urban land in Berlin Township, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2012 land use/land cover geographical information system (GIS) data layer categorizes Berlin Township 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 Berlin Township. Based upon the 2012 NJDEP land use/land cover data, approximately 27.4% of Berlin Township has impervious cover. This level of impervious cover suggests that the streams in Berlin Township are likely non-supporting streams. [1]

Methodology

Berlin Township contains portions of five subwatersheds (Figure 4). For this impervious cover reduction action plan, projects have been identified in each of these watersheds. Initially, aerial imagery was used to identify potential project sites that contain extensive impervious cover. Field visits were then conducted at each of these potential project sites to determine if a viable option exists to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the site visit, appropriate green infrastructure practices for the site were determined. Sites that already had stormwater management practices in place were not considered.

[1] Caraco, D., R. Claytor, P. Hinkle, H. Kwon, T. Schueler, C. Swann, S. Vysotsky, and J. Zielinski. 1998. Rapid Watershed Planning Handbook. A Comprehensive Guide for Managing Urbanizing Watersheds. Prepared by Center For Watershed Protection, Ellicott City, MD. Prepared for U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Region V. October 1998

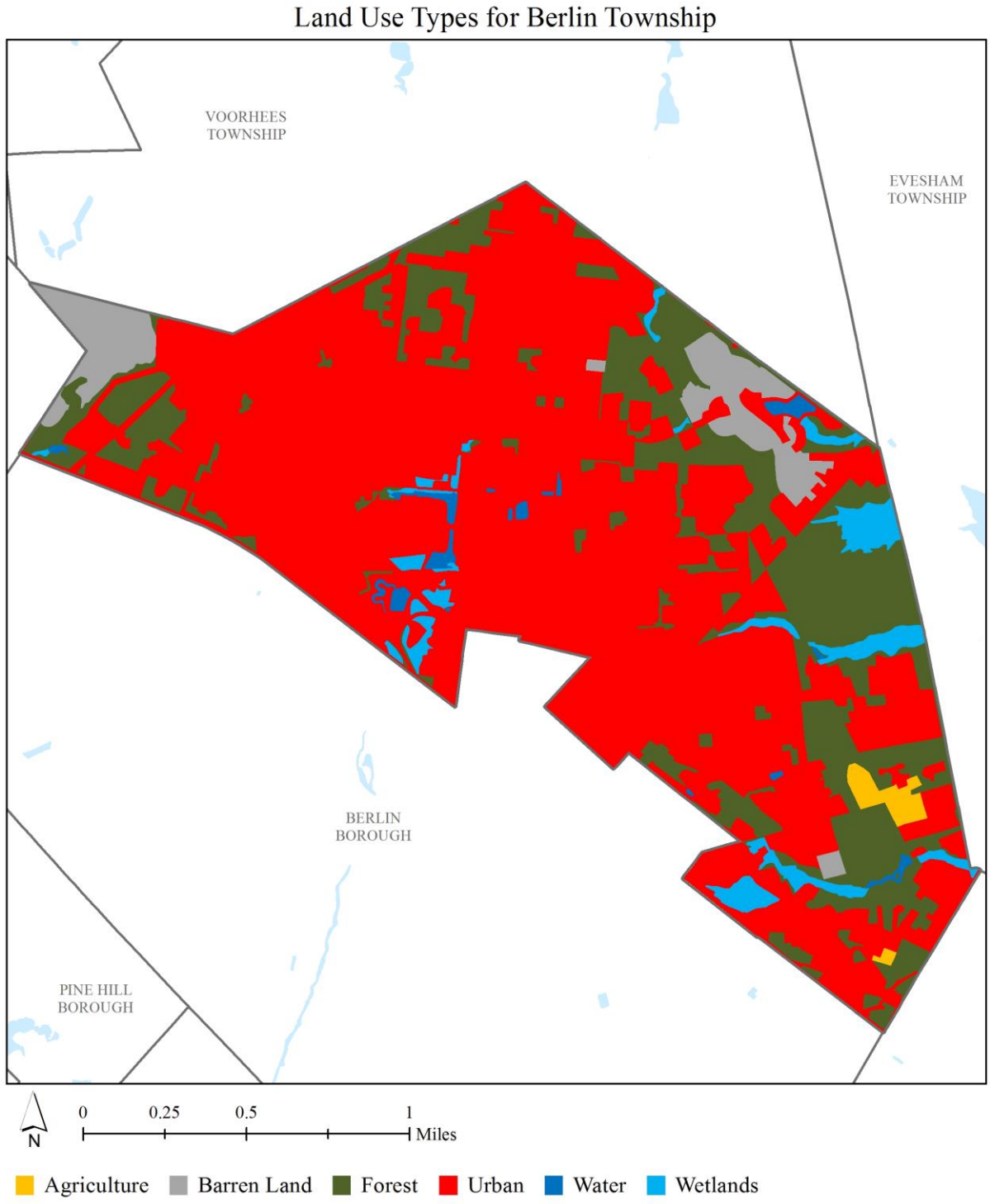


Figure 1: Map illustrating the land use in Berlin Township

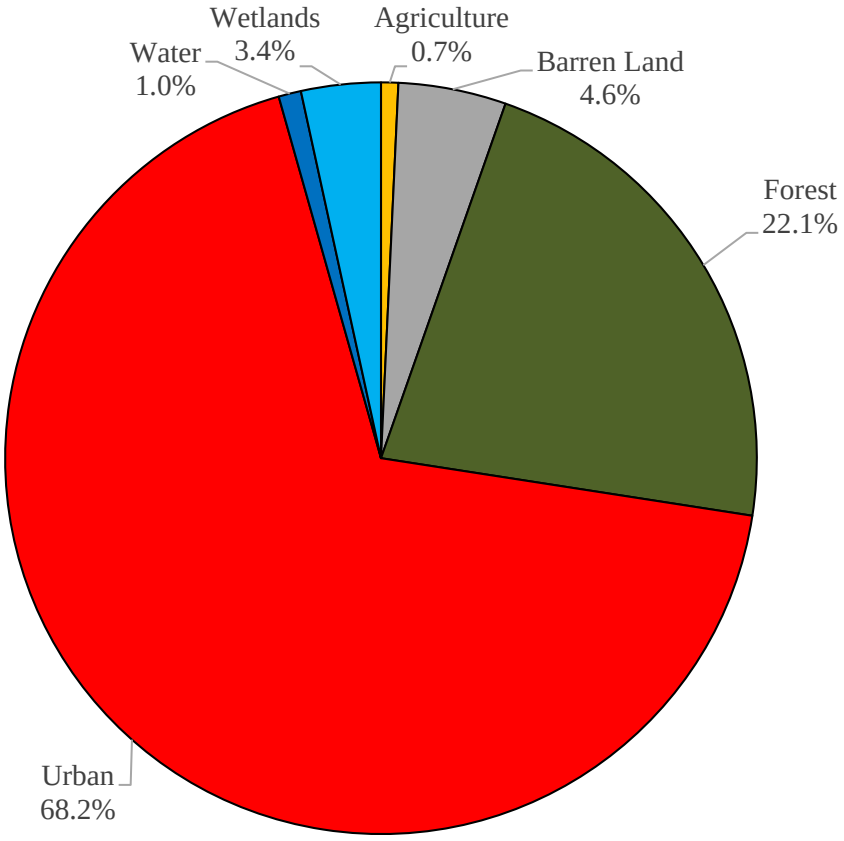


Figure 2: Pie chart illustrating the land use in Berlin Township

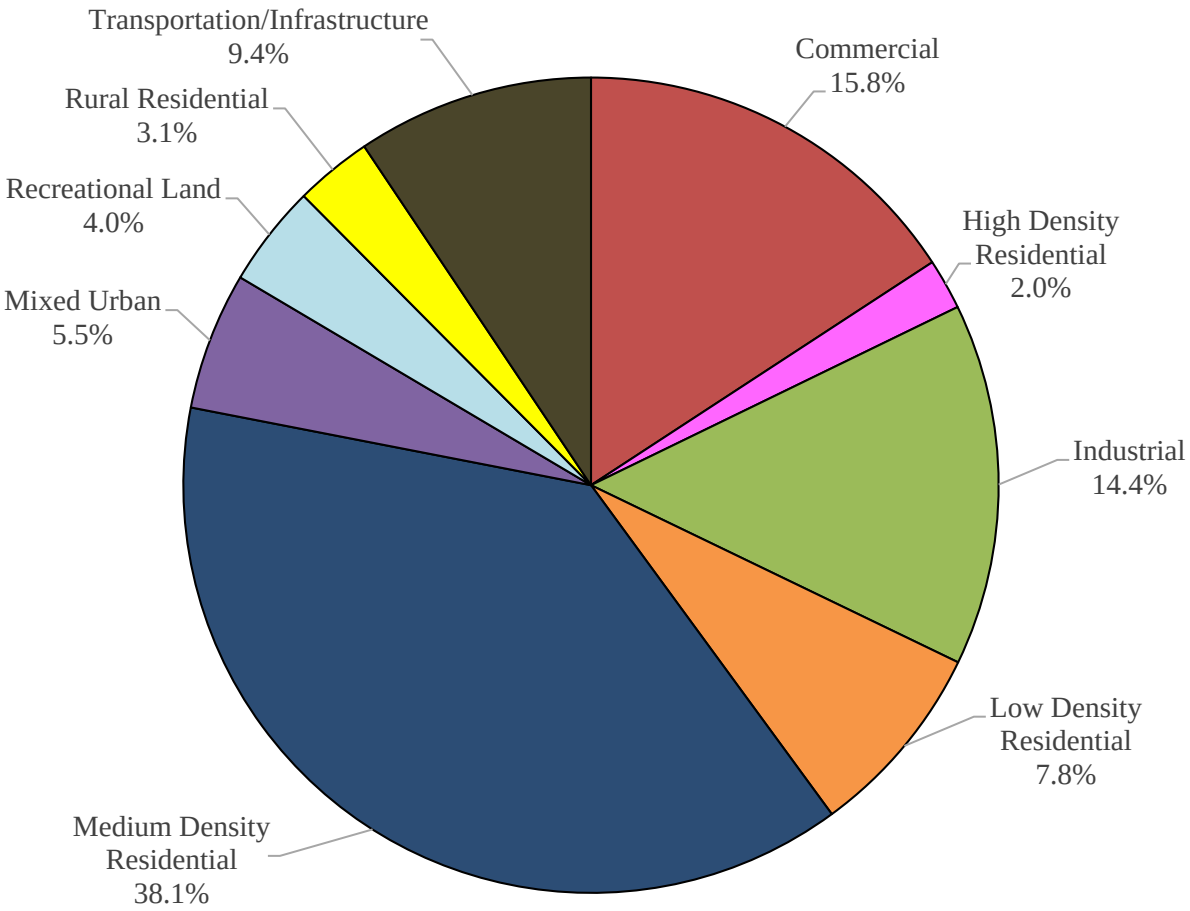


Figure 3: Pie chart illustrating the various types of urban land use in Berlin Township

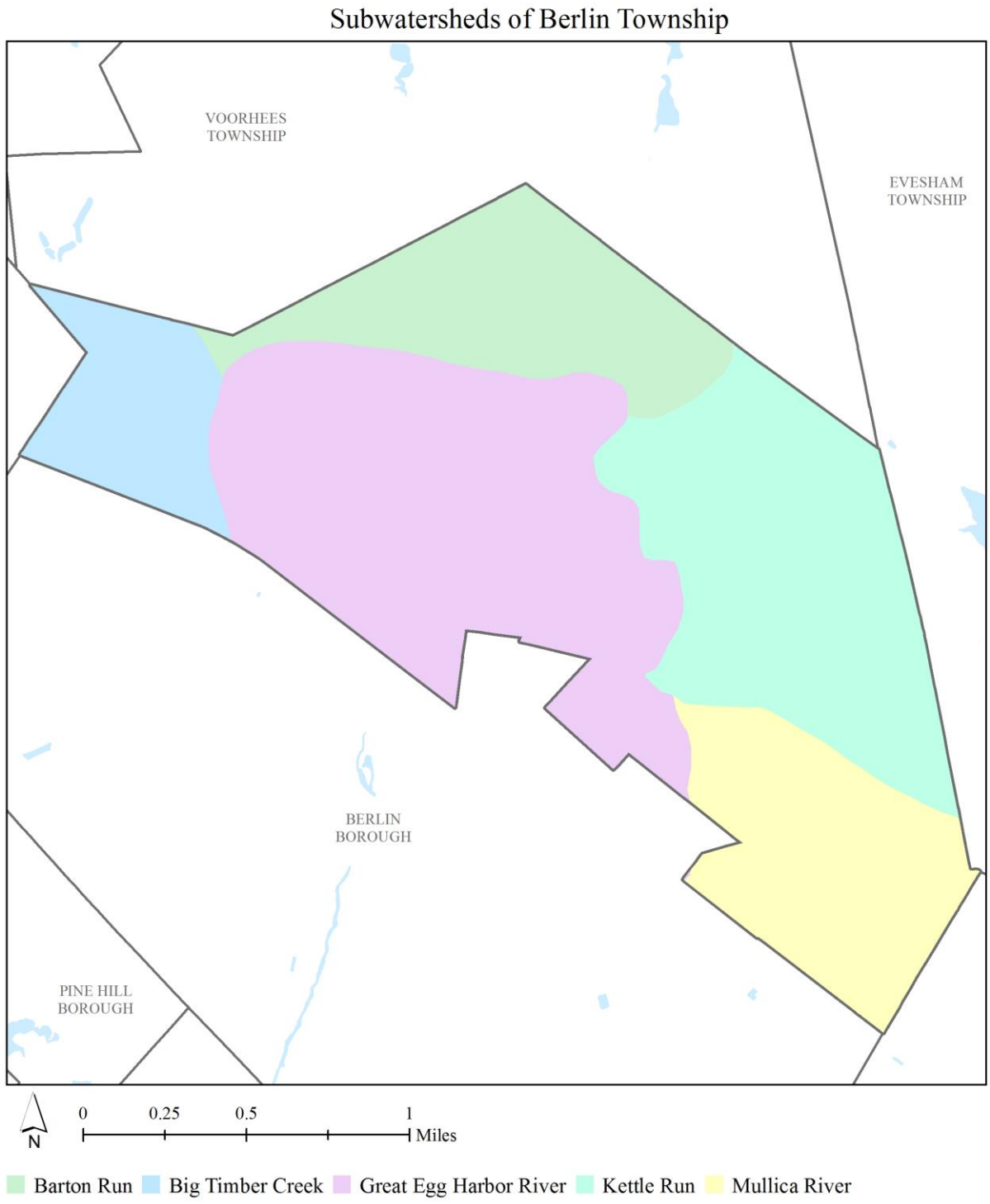


Figure 4: Map of the subwatersheds in Berlin Township

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 2012 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the water quality design storm (1.25 inches of rain over two-hours) and for the annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Berlin Township 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, enabling these practices to capture 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, 2004.

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 principal, 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 produce 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 Berlin Township. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, prevented 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 have an underlying stone layer to store stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA), 2013. Watershed Assessment, Tracking, and Environmental Results, New Jersey Water Quality Assessment Report. http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ

Bioretention systems/rain gardens

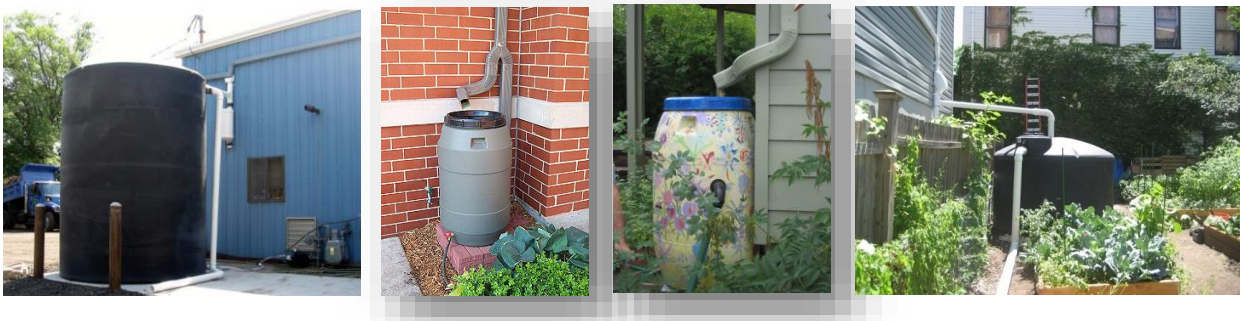
These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils that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

Downspout planter boxes

These are wooden boxes with plants installed at the base of a downspout that provide an opportunity to beneficially reuse rooftop runoff.

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.

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. They 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

Attachment 1 contains information on potential project sites where green infrastructure practices could be installed. The recommended green infrastructure practices and the drainage area that the green infrastructure practice can treat are identified for each potential project site. For each practice, the recharge potential, TSS removal potential, maximum volume reduction potential per storm, and the peak reduction potential are provided. This information is also provided so that proposed development projects that cannot satisfy the New Jersey stormwater management requirements for major development can use one of the identified projects to offset a stormwater management deficit. [4]

[4] New Jersey Administrative Code, N.J.A.C. 7:8, Stormwater Management, Statutory Authority: N.J.S.A. 12:5-3, 13:1D-1 et seq., 13:9A-1 et seq., 13:19-1 et seq., 40:55D-93 to 99, 58:4-1 et seq., 58:10A-1 et seq., 58:11A-1 et seq. and 58:16A-50 et seq., *Date last amended: April 19, 2010*.

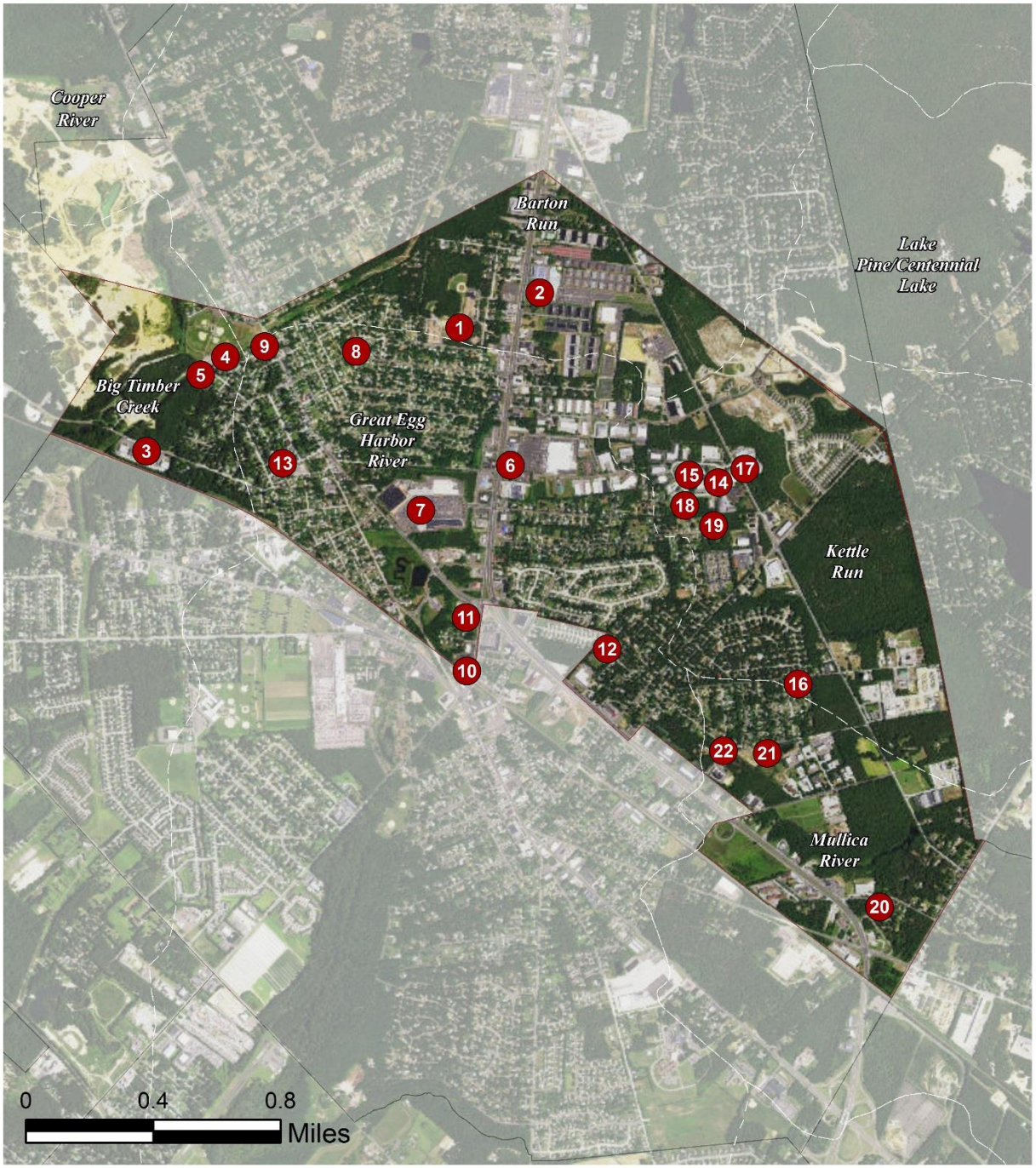
Conclusion

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 by a wide variety of people such as boy scouts, girl scouts, school groups, faith-based groups, social groups, watershed groups, and other community groups.

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 impervious cover reduction action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

a. Green Infrastructure Sites

BERLIN TOWNSHIP: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE BARTON RUN SUBWATERSHED:

1. Dwight D. Eisenhower Middle School
2. Sahara Sam's Oasis

SITES WITHIN THE BIG TIMBER CREEK SUBWATERSHED:

3. MedPlast
4. Senior Center & Luke Avenue Sports Complex
5. South Jersey FOP Lodge

SITES WITHIN THE GREAT EGG HARBOR RIVER SUBWATERSHED:

6. AtlantiCare Urgent Care Center
7. Berlin Circle Plaza
8. Berlin Township Library
9. Brew and Chew Coffee Shop
10. Filomena Cucina Rustica
11. Palace Diner
12. Robert T. Clyde Memorial Recreational Complex
13. Wesley United Methodist Church

SITES WITHIN THE KETTLE RUN SUBWATERSHED:

14. Duesmann and Hansel Recycling
15. Fred R Morgan & Sons Inc.
16. Greater Mount Carmel Church of God in Christ
17. Longrun Press Inc.
18. Novaflex
19. St. John's United Methodist Church

SITES WITHIN THE MULICA RIVER SUBWATERSHED:

20. East Berlin Community Church
21. Greengrove Baptist Church
22. Pilgrims Rest Disciple-Christ

b. Proposed Green Infrastructure Concepts

Dwight D. Eisenhower Middle School

Subwatershed: Barton Run

Site Area: 1,578,723 sq. ft.

Address: 235 Grove Avenue
West Berlin, NJ 08091

Block and Lot: Block 902, Lot 1

Pavement located on the southern end of the building can be replaced with porous asphalt to capture and infiltrate stormwater from the adjacent rooftops. Bioretention systems can be implemented along the northern and east side of the building to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
19	301,012	14.5	152.0	1,382.1	0.235	8.26

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	0.274	46	20,091	0.76	2,630	$13,150
Pervious pavement	0.341	57	25,013	0.94	2,390	$65,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Dwight D. Eisenhower Middle School

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

0 50' 100'

Sahara Sam's Oasis

Subwatershed: **Barton Run**

Site Area: **504,435 sq. ft.**

Address: **535 New Jersey 73**
West Berlin, NJ 08091

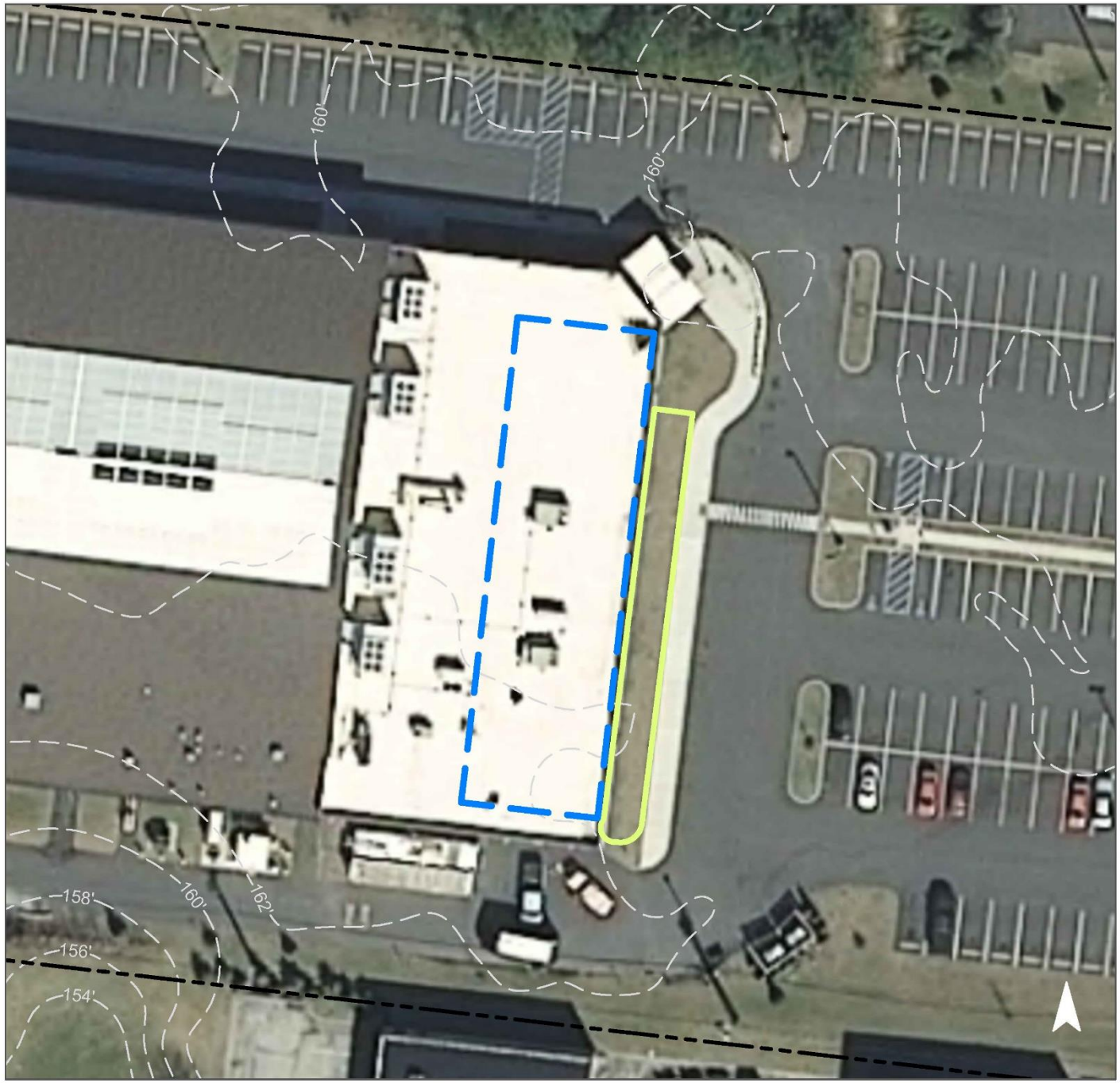
Block and Lot: **Block 1101, Lot 16**

A bioretention system can be implemented alongside the back of the building to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
9	45,197	2.2	22.8	207.5	0.035	1.24

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 system	0.188	31	3,763	0.52	1,800	$9,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sahara Sam's Oasis

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

0 25' 50'

MedPlast

Subwatershed: Big Timber Creek

Site Area: 380,298 sq. ft.

Address: 225 Old Egg Harbor Road
West Berlin, NJ 08091

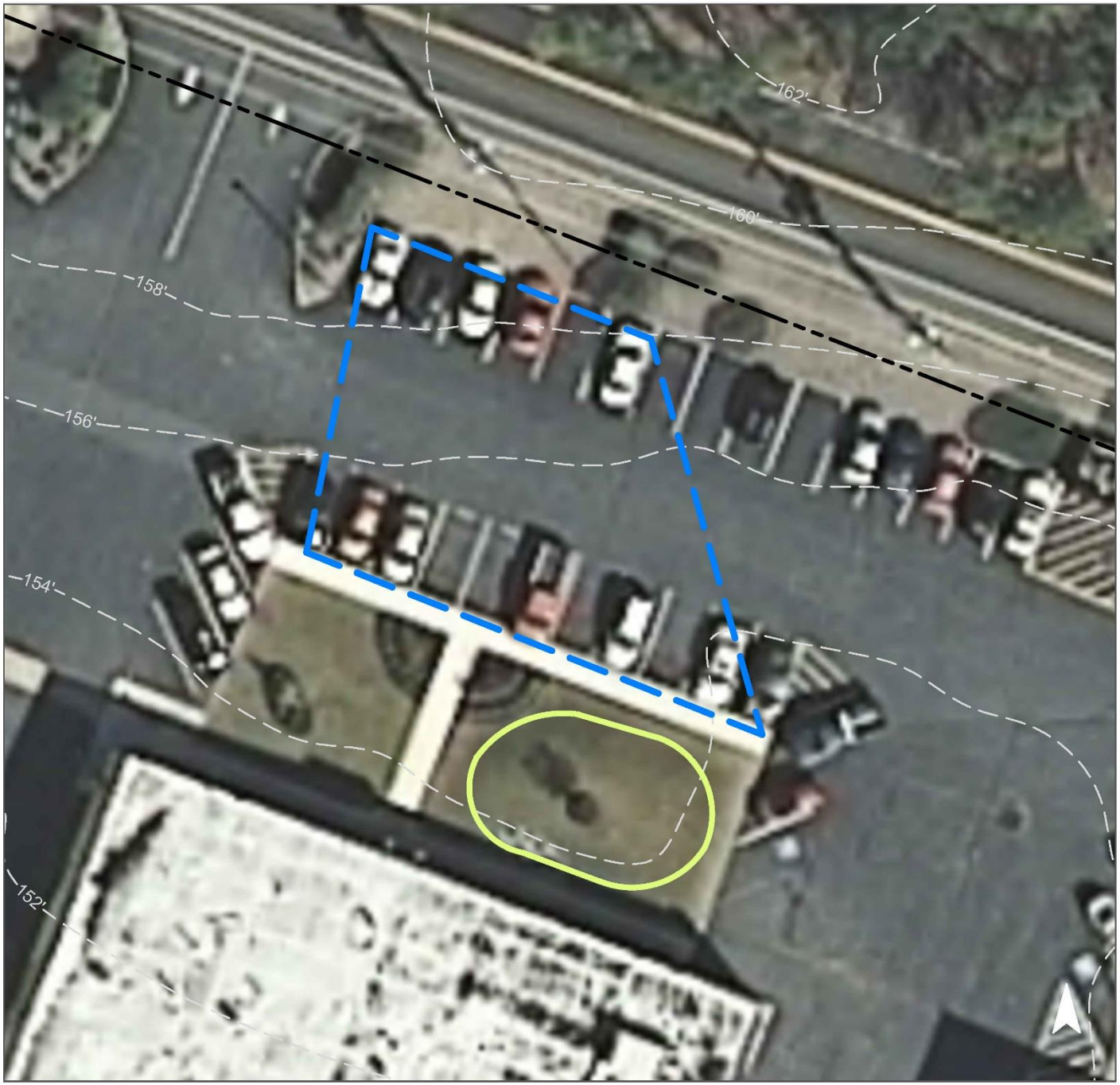
Block and Lot: Block 304, Lot 1.05

A bioretention system can be implemented in front of the building to manage stormwater from the parking lot. A trench drain can be used to direct the runoff into the bioretention system. 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"
75	284,868	13.7	143.9	1,307.9	0.222	7.81

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	0.129	22	9,500	0.36	1,245	$6,225

GREEN INFRASTRUCTURE RECOMMENDATIONS



MedPlast

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

0 15' 30'

Senior Center & Luke Avenue Sports Complex

Subwatershed: Big Timber Creek

Site Area: 913,730 sq. ft.

Address: 235 Pine Avenue
West Berlin, NJ 08091

Block and Lot: Block 527, Lot 6

The parking spaces located in both parking lots and the basketball courts can be replaced with porous asphalt to capture and infiltrate stormwater. A bioretention system can be implemented behind the senior center to manage stormwater from the 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"
11	96,805	4.7	48.9	444.5	0.075	2.66

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	0.069	12	5,049	0.19	660	$3,300
Pervious pavement	1.917	321	140,631	5.29	25,360	$634,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Senior Center & Luke Avenue Sports Complex

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

0 75' 150'

South Jersey FOP Lodge

Subwatershed: Big Timber Creek

Site Area: 39,072 sq. ft.

Address: 235 Pine Avenue
West Berlin, NJ 08091

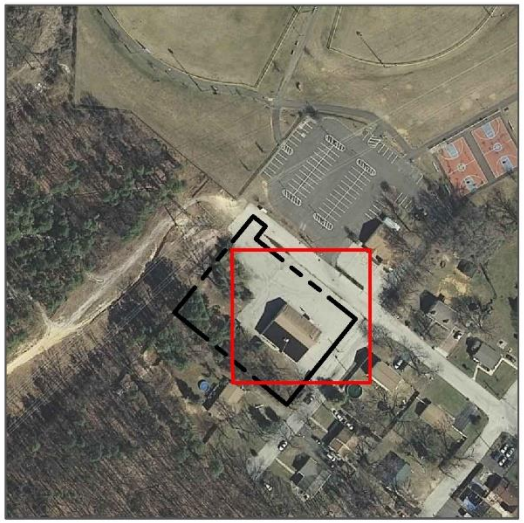
Block and Lot: Block 511, Lot 1.01

A bioretention system can be implemented at the south corner of the building to capture runoff from the rooftop by directing downspouts into it. The parking spaces in front of the building can be replaced with porous pavement to capture runoff from the rooftop. This site also has an excessive amount of pavement that is in disuse that could be depaved and replaced by garden or lawn space. 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"
72	28,315	1.4	14.3	130.0	0.022	0.78

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	0.036	6	2,678	0.10	350	$1,750
Pervious pavement	0.069	12	5,086	0.19	475	$11,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



South Jersey FOP Lodge

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

0 15' 30'

AtlantiCare Urgent Care Center

Subwatershed: Great Egg Harbor River

Site Area: 53,110 sq. ft.

Address: 255 NJ-73
West Berlin, NJ 08091

Block and Lot: Block 1203, Lot 3

The parking spaces along the west end can be replaced with porous asphalt to capture and infiltrate stormwater before it reaches the basin. A bioretention system can be implemented in the island to manage more of the parking lot's stormwater by using curb cuts to allow water to flow into it. Another rain garden can be implemented alongside the back of the building to manage rooftop runoff. 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"
75	39,872	1.9	20.1	183.1	0.031	1.09

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	0.166	28	12,215	0.46	1,600	$8,000
Pervious pavement	0.214	36	15,678	0.59	1,680	$42,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

AtlantiCare Urgent Care Center

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

0 20' 40'

Berlin Circle Plaza

Subwatershed: Great Egg Harbor River

Site Area: 1,922,070 sq. ft.

Address: 116 Walker Avenue
West Berlin, NJ 08091

Block and Lot: Block 703, Lot 1

The large paved area alongside the Staples can be depaved or replaced with porous pavement. This area can potentially be used to manage additional runoff from the rooftop or 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"
63	1,208,292	58.3	610.2	5,547.7	0.941	33.14

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	0.498	83	36,517	1.37	19,100	$477,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Berlin Circle Plaza

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

0 30 60'

Berlin Township Library

Subwatershed: Great Egg Harbor River

Site Area: 34,253 sq. ft.

Address: 201 Veterans Avenue
West Berlin, NJ 08091

Block and Lot: Block 619, Lot 1.01

A bioretention system can be implemented in front of the building to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. Porous pavement can be implemented at the back of the building by directing downspouts into it to capture the remaining rooftop runoff. 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"
28	9,487	0.5	4.8	43.6	0.007	0.26

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	0.022	4	1,638	0.06	215	$1,075
Pervious pavement	0.044	7	3,224	0.12	650	$16,250

GREEN INFRASTRUCTURE RECOMMENDATIONS

Berlin Township Library

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

0 15' 30'

Brew and Chew Coffee Shop

Subwatershed: Great Egg Harbor River

Site Area: 14,503 sq. ft.

Address: 229 Haddon Avenue
West Berlin, NJ 08091

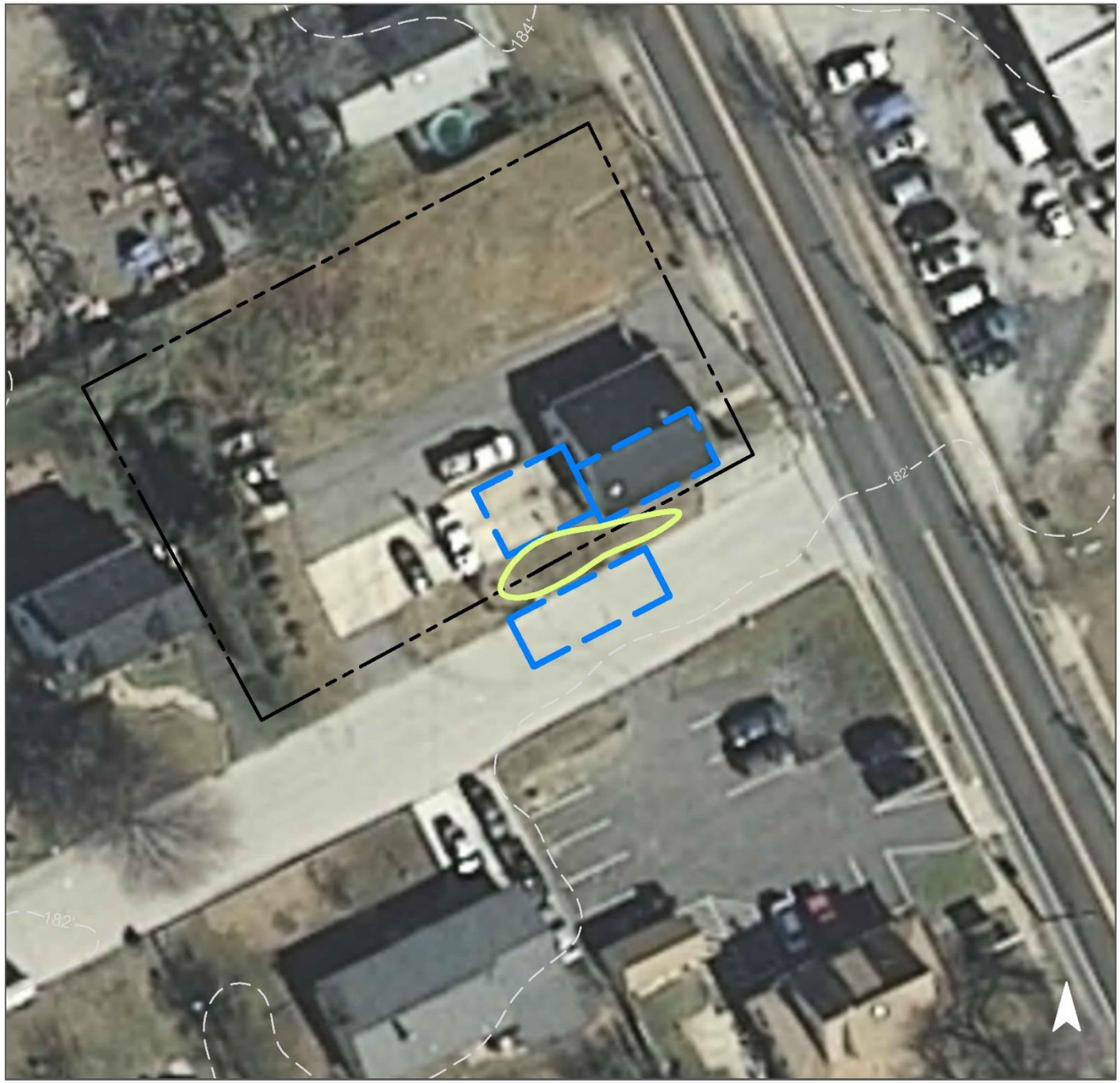
Block and Lot: Block 527, Lot 3

A bioretention system can be implemented in the turfgrass area adjacent to Lester Avenue to manage stormwater from the street, rooftop, and parking area. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
25	3,626	0.2	1.8	16.6	0.003	0.10

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	0.042	7	3,059	0.11	400	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Brew and Chew Coffee Shop

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

0 20' 40'

Filomena Cucina Rustica

Subwatershed: Great Egg Harbor River

Site Area: 125,467 sq. ft.

Address: 13 Cross Keys Road
West Berlin, NJ 08091

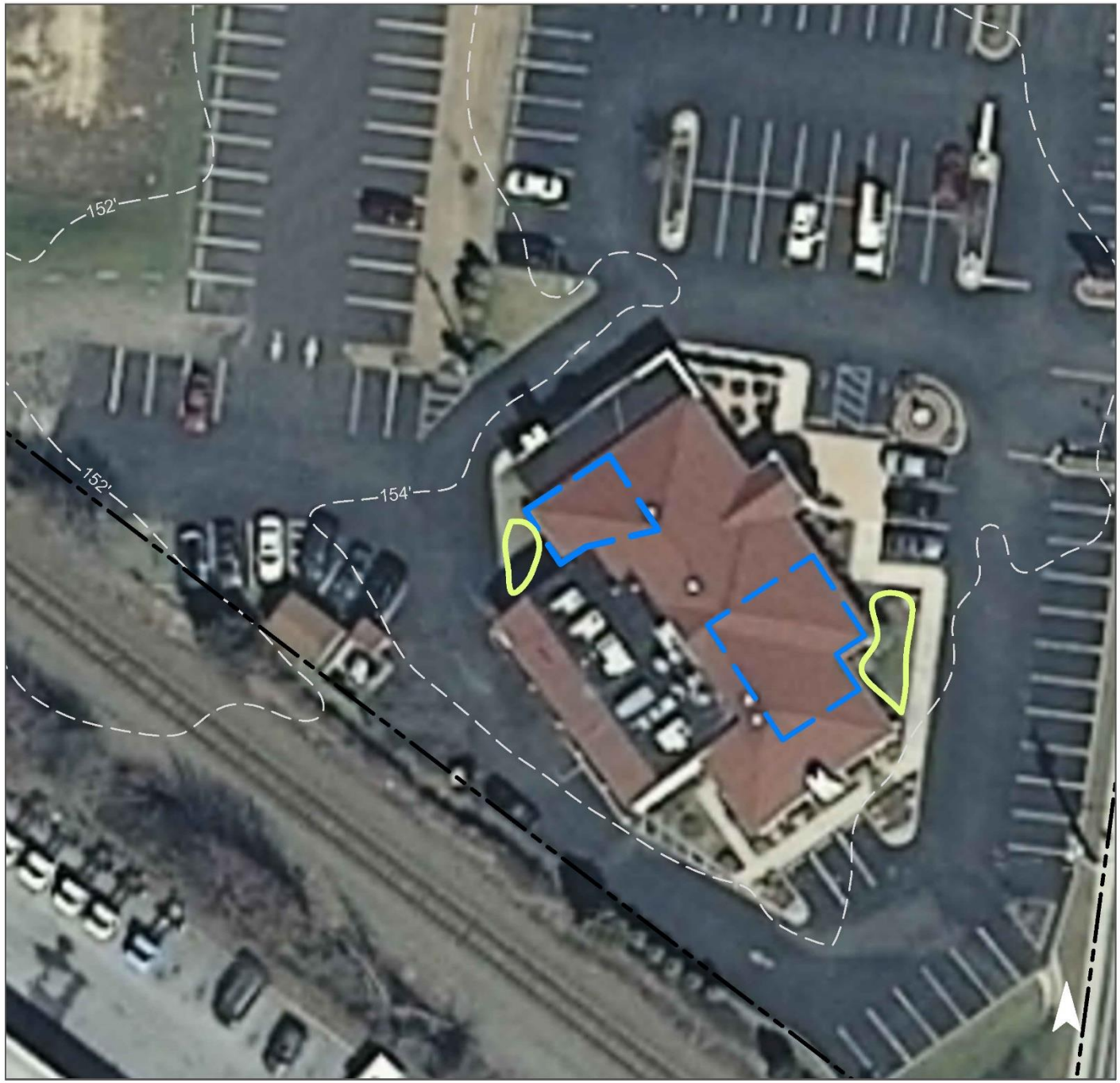
Block and Lot: Block 101, Lot 1

Bioretention systems can be implemented in the turfgrass areas in front and behind the building to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
47	58,406	2.8	29.5	268.2	0.046	1.60

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	0.039	7	2,865	0.11	375	$1,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Filomena Cucina Rustica

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

0 20' 40'

Palace Diner

Subwatershed: Great Egg Harbor River

Site Area: 183,385 sq. ft.

Address: 100 NJ-73
Berlin, NJ 08009

Block and Lot: Block 102, Lot 10

The parking spaces in the northern end of the parking lot can be replaced with porous asphalt to capture and infiltrate stormwater. Due to the slope of the lot, the parking spaces can collect stormwater from other sections of the lot as well. A preliminary soil assessment suggests that soil testing is needed to determine if the site has 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"
45	82,964	4.0	41.9	380.9	0.065	2.28

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	0.467	78	34,251	1.29	3,250	$81,250

GREEN INFRASTRUCTURE RECOMMENDATIONS

Palace Diner

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

0 25' 50'

Robert T. Clyde Memorial Recreational Complex

Subwatershed: Great Egg Harbor River

Site Area: 237,393 sq. ft.

Address: 206 Day Avenue
West Berlin, NJ 08091

Block and Lot: Block 1406, Lot 1

The paved sport areas can be replaced with porous asphalt to capture and infiltrate stormwater. A bioretention system can be implemented in the turfgrass depression next to the building. The bioretention system would be designed to capture, retain, and infiltrate stormwater from the building's 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"
38	91,105	4.4	46.0	418.3	0.071	2.50

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	1,758	0.07	230	$1,150
Pervious pavement	0.652	109	47,842	1.80	25,025	$625,625

GREEN INFRASTRUCTURE RECOMMENDATIONS

Robert T. Clyde Memorial Recreational Complex

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

0 35' 70'

Wesley United Methodist Church

Subwatershed: Great Egg Harbor River

Site Area: 68,583 sq. ft.

Address: 159 Bate Avenue
West Berlin, NJ 08091

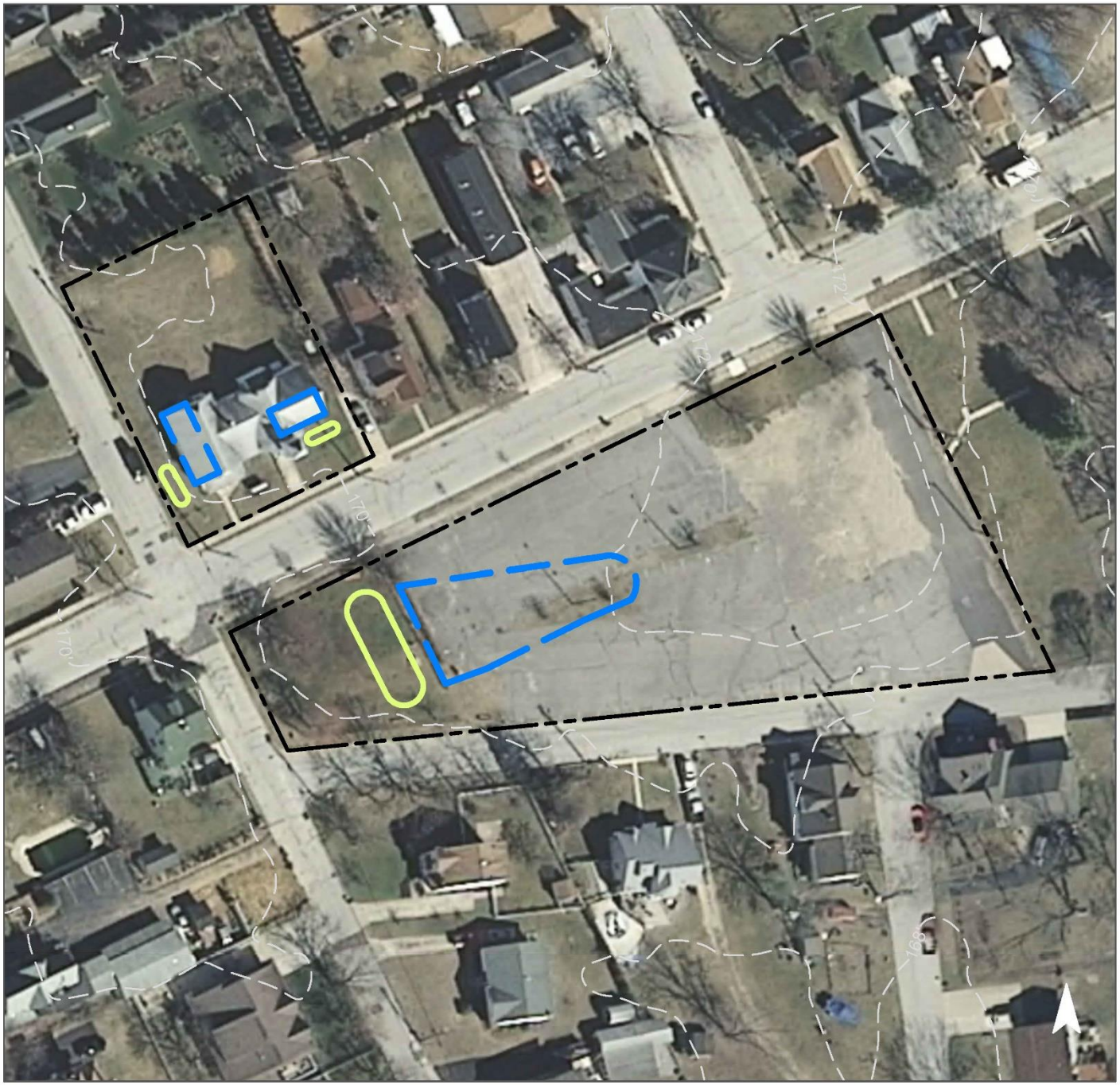
Block and Lot: Block 219, Lot 1

A large bioretention system can be implemented in the turfgrass area west of the parking lot. Two more rain garden can be implemented in front of the building to manage stormwater from the rooftops. 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"
78	53,407	2.6	27.0	245.2	0.042	1.46

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	0.143	24	10,502	0.39	1,375	$6,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Wesley United Methodist Church

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

0 40' 80'

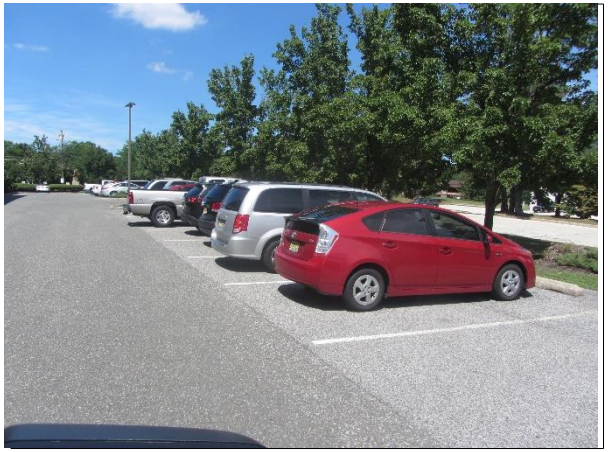
Duesmann and Hansel Recycling

Subwatershed: Kettle Run

Site Area: 82,038 sq. ft.

Address: 1003 Industrial Drive
West Berlin, NJ 08091

Block and Lot: Block 2303, Lot 1



Parking spaces located on the southern end of the parking lot can be replaced with porous asphalt to capture and infiltrate stormwater. The parking lot slopes towards this end which would allow these spaces to manage stormwater generated from a portion of 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"
75	61,529	3.0	31.1	282.5	0.048	1.69

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	0.500	84	36,704	1.38	3,430	$85,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Duesmann and Hansel Recycling

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

0 20' 40'

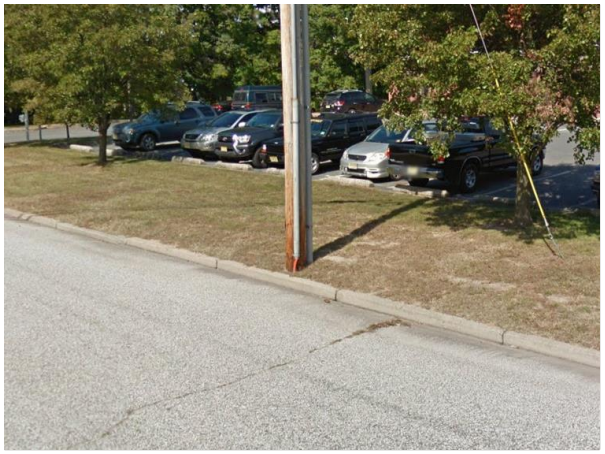
Fred R Morgan & Sons Inc.

Subwatershed: Kettle Run

Site Area: 72,090 sq. ft.

Address: 1019 Industrial Drive
West Berlin, NJ 08091

Block and Lot: Block 2303, Lot 2



Porous pavement can be implemented in the south row of parking spaces to capture runoff from the rooftop and parking lot. A bioretention system can be implemented in the turfgrass area located in-between the parking lot and Industrial Drive to capture any overflow from the porous pavement system. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
55	39,647	1.9	20.0	182.0	0.031	1.09

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	0.123	21	9,006	0.34	1,180	$5,900
Pervious pavement	0.289	48	21,206	0.80	1,980	$49,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Fred R Morgan & Sons Inc.

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

0 25' 50'

Greater Mount Carmel Church of God in Christ

Subwatershed: Kettle Run

Site Area: 40,670 sq. ft.

Address: 250 Chestnut Avenue
West Berlin, NJ 08091

Block and Lot: Block 1819, Lot 8

A rain garden can be implemented adjacent to the shed to the southeast by redirecting its downspouts into it to capture its runoff. A rainwater harvesting system can be implemented next to the southeastern corner of the building to manage even more stormwater from the 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"
62	25,220	1.2	12.7	115.8	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 system	0.026	4	1,915	0.07	250	$1,250
Rainwater harvesting	0.006	1	411	0.02	500 (gal)	$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Greater Mount Carmel
Church of God in Christ

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

0 20' 40'

Longrun Press Inc.

Subwatershed: Kettle Run

Site Area: 88,482 sq. ft.

Address: 1002 Industrial Drive
West Berlin, NJ 08091

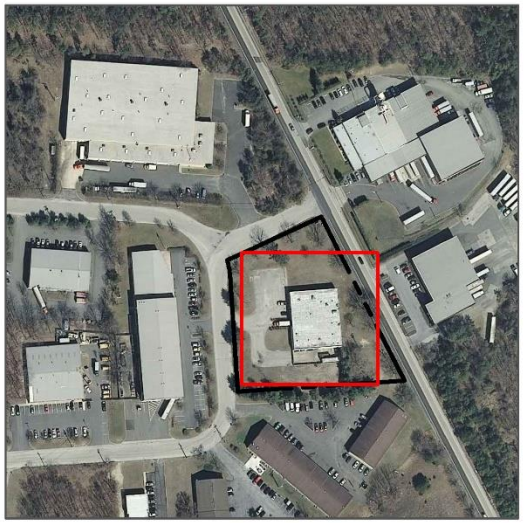
Block and Lot: Block 2301, Lot 1

A bioretention system can be implemented in the turfgrass area alongside the building to capture a portion of rooftop runoff. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
47	41,492	2.0	21.0	190.5	0.032	1.14

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	0.151	25	11,085	0.42	1,450	$7,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Longrun Press Inc.

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

0 20' 40'

Novaflex

Subwatershed: **Kettle Run**

Site Area: **105,883 sq. ft.**

Address: **1024 Industrial Drive**
West Berlin, NJ 08091

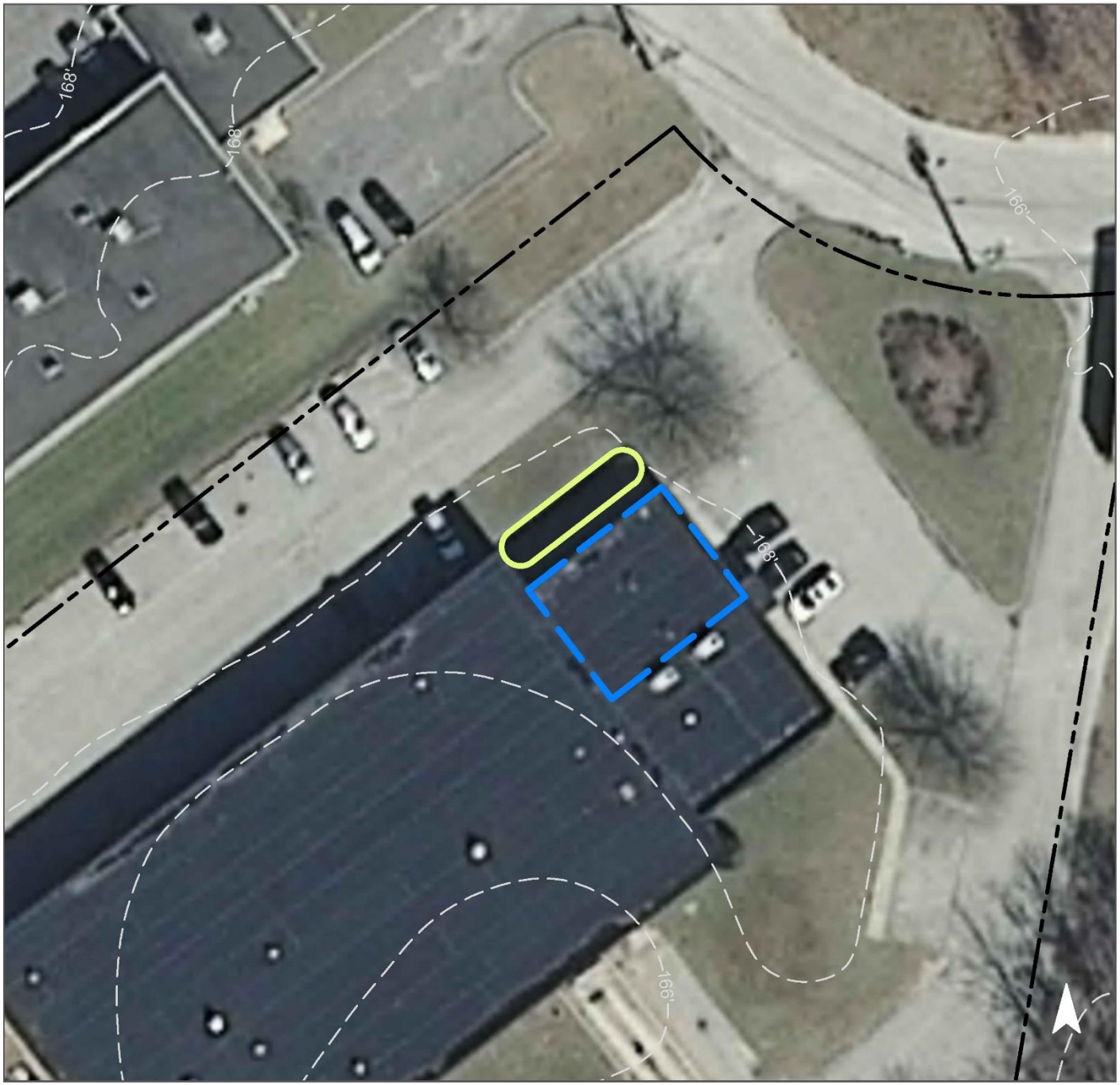
Block and Lot: **Block 2301, Lot 7**

A bioretention system can be implemented in the turfgrass area near the building's entrance to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
73	77,145	3.7	39.0	354.2	0.060	2.12

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	0.041	7	3,022	0.11	400	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Novaflex

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

0 20' 40'

St. John's United Methodist Church

Subwatershed: Kettle Run

Site Area: 77,543 sq. ft.

Address: 410 Fairview Avenue
West Berlin, NJ 08091

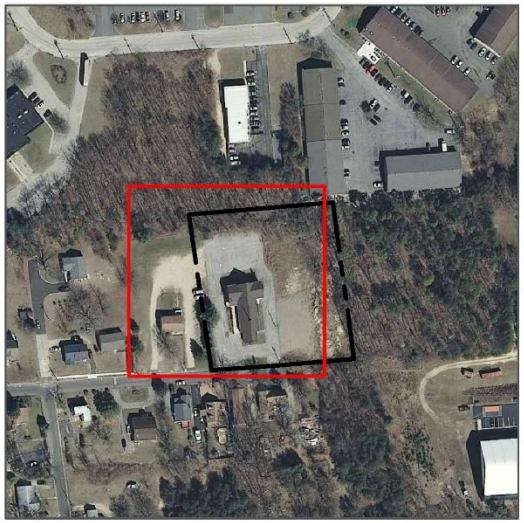
Block and Lot: Block 1905, Lot 2

Portions of the damaged parking lot can be replaced with porous asphalt to capture and infiltrate a large portion of stormwater generated by the rooftop and pavement on the site. A rain garden can also be implemented near the entrance of the church to capture additional runoff from the rooftop and add aesthetic value. 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"
38	29,657	1.4	15.0	136.2	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
Bioretention system	0.020	3	1,436	0.05	190	$950
Pervious pavement	0.500	84	36,704	1.38	3,430	$85,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



St John's United Methodist Church

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

0 25' 50'

East Berlin Community Church

Subwatershed: Mullica River

Site Area: 76,449 sq. ft.

Address: 115 Collings Avenue
West Berlin, NJ 08091

Block and Lot: Block 1606, Lot 5

A bioretention system can be implemented in the front lawn to manage stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
48	36,911	1.8	18.6	169.5	0.029	1.01

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	0.049	8	3,583	0.13	470	$2,350

GREEN INFRASTRUCTURE RECOMMENDATIONS

East Berlin Community Church

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

0 20' 40'

Greengrove Baptist Church

Subwatershed: Mullica River

Site Area: 105,097 sq. ft.

Address: 240 Cushman Avenue
Berlin Township, NJ 08091

Block and Lot: Block 1702, Lot 2

Sections of the parking lot can be replaced with porous asphalt to capture and infiltrate stormwater from the parking lot and rooftop. A long bioretention system can be implemented to the west of the building to manage additional stormwater from the rooftop. Bioretention systems are green infrastructure practices designed to capture, retain, and infiltrate stormwater. 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"
23	24,341	1.2	12.3	111.8	0.019	0.67

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	0.045	8	3,291	0.12	430	$2,150
Pervious pavement	0.180	32	13,845	0.52	2,980	$74,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Greengrove Baptist Church

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

0 20' 40'

Pilgrims Rest Disciple-Christ

Subwatershed: Mullica River

Site Area: 14,473 sq. ft.

Address: 125 Cushman Avenue
West Berlin, NJ 08091

Block and Lot: Block 1412, Lot 23

A rainwater harvesting system can be implemented to capture stormwater from the rooftop that can be used to water the existing landscaping. A rain garden can be implemented to the east of the building by redirecting downspouts into it to capture rooftop runoff. 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"
30	4,331	0.2	2.2	19.9	0.003	0.12

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	0.014	2	995	0.04	130	$650
Rainwater harvesting	0.007	1	494	0.02	500 (gal)	$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Pilgrims Rest Disciple-Christ

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

0 10' 20'

c. Summary of Existing Conditions

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
BARTON RUN SUBWATERSHED	**47.82**	**2,083,158**			**16.7**	**174.9**	**1,589.6**		**7.95**	**346,209**	**0.270**	**9.50**
Dwight D. Eisenhower Middle School												
Total Site Info	36.24	1,578,723	902	1	14.5	152.0	1,382.1	19	6.91	301,012	0.235	8.26
Sahara Sam's Oasis												
Total Site Info	11.58	504,435	1101	16	2.2	22.8	207.5	9	1.04	45,197	0.035	1.24
BIG TIMBER CREEK SUBWATERSHED	**30.60**	**1,333,100**			**19.8**	**207.1**	**1,882.4**		**9.41**	**409,988**	**0.319**	**11.24**
MedPlast												
Total Site Info	8.73	380,298	304	1.05	13.7	143.9	1,307.9	75	6.54	284,868	0.222	7.81
Senior Center & Luke Avenue Sports Complex												
Total Site Info	20.98	913,730	527	6	4.7	48.9	444.5	11	2.22	96,805	0.075	2.66
South Jersey FOP Lodge												
Total Site Info	0.90	39,072	511	1.01	1.4	14.3	130.0	72	0.65	28,315	0.022	0.78
GREAT EGG HARBOR RIVER SUBWATERSHED	**60.58**	**2,638,764**			**74.6**	**781.4**	**7,103.6**		**35.52**	**1,547,159**	**1.205**	**42.43**
AtlantiCare Urgent Care Center												
Total Site Info	1.22	53,110	1203	3	1.9	20.1	183.1	75	0.92	39,872	0.031	1.09
Berlin Circle Plaza												
Total Site Info	44.12	1,922,070	703	1	58.3	610.2	5,547.7	63	27.74	1,208,292	0.941	33.14
Berlin Township Library												
Total Site Info	0.79	34,253	619	1.01	0.5	4.8	43.6	28	0.22	9,487	0.007	0.26
Brew and Chew Coffee Shop												
Total Site Info	0.33	14,503	527	3	0.2	1.8	16.6	25	0.08	3,626	0.003	0.10
Filomena Cucina Rustica												
Total Site Info	2.88	125,467	101	1	2.8	29.5	268.2	47	1.34	58,406	0.046	1.60

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
Palace Diner												
Total Site Info	4.21	183,385	102	10	4.0	41.9	380.9	45	1.90	82,964	0.065	2.28
Robert T. Clyde Memorial Recreational Complex												
Total Site Info	5.45	237,393	1406	1	4.4	46.0	418.3	38	2.09	91,105	0.071	2.50
Wesley United Methodist Church												
Total Site Info	1.57	68,583	219	1	2.6	27.0	245.2	78	1.23	53,407	0.042	1.46
KETTLE RUN SUBWATERSHED	**58.54**	**2,549,863**			**29.9**	**313.6**	**2,850.8**		**14.25**	**620,899**	**0.484**	**17.03**
Duesmann and Hansel Recycling												
Total Site Info	1.88	82,038	2303	1	3.0	31.1	282.5	75	1.41	61,529	0.048	1.69
Fred R Morgan & Sons Inc.												
Total Site Info	1.65	72,090	2303	2	1.9	20.0	182.0	55	0.91	39,647	0.031	1.09
Greater Mount Carmel Church of God in Christ												
Total Site Info	0.93	40,670	1819	8	1.2	12.7	115.8	62	0.58	25,220	0.020	0.69
Longrun Press Inc.												
Total Site Info	2.03	88,482	2301	1	2.0	21.0	190.5	47	0.95	41,492	0.032	1.14
Novaflex												
Total Site Info	2.43	105,883	2301	7	3.7	39.0	354.2	73	1.77	77,145	0.060	2.12
St. John's United Methodist Church												
Total Site Info	1.78	77,543	1905	2	1.4	15.0	136.2	38	0.68	29,657	0.023	0.81
MULLICA RIVER SUBWATERSHED	**4.50**	**196,018**			**3.2**	**33.1**	**301.1**		**1.51**	**65,583**	**0.051**	**1.80**
East Berlin Community Church												
Total Site Info	1.76	76,449	1606	5	1.8	18.6	169.5	48	0.85	36,911	0.029	1.01

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
Greengrove Baptist Church												
Total Site Info	2.41	105,097	1702	2	1.2	12.3	111.8	23	0.56	24,341	0.019	0.67
Pilgrims Rest Disciple-Christ												
Total Site Info	0.33	14,473	1412	23	0.2	2.2	19.9	30	0.10	4,331	0.003	0.12

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 (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
	BARTON RUN SUBWATERSHED	**30,795**	**0.71**	**0.802**	**134**	**58,868**	**2.22**	**6,820**			**$87,900**	**8.9%**
1	**Dwight D. Eisenhower Middle School**											
	Bioretention systems	10,510	0.24	0.274	46	20,091	0.76	2,630	5	SF	$13,150	3.5%
	Pervious pavement	13,085	0.30	0.341	57	25,013	0.94	2,390	25	SF	$65,750	4.3%
	Total Site Info	**23,595**	**0.54**	**0.615**	**103**	**45,104**	**1.70**	**5,020**			**$78,900**	**7.8%**
2	**Sahara Sam's Oasis**											
	Bioretention system	7,200	0.17	0.188	31	13,763	0.52	1,800	5	SF	$9,000	15.9%
	Total Site Info	**7,200**	**0.17**	**0.188**	**31**	**13,763**	**0.52**	**1,800**			**$9,000**	**15.9%**
	BIG TIMBER CREEK SUBWATERSHED	**85,230**	**1.96**	**2.221**	**372**	**162,944**	**6.13**	**28,090**			**$657,150**	**20.8%**
3	**MedPlast**											
	Bioretention system	4,970	0.11	0.129	22	9,500	0.36	1,245	5	SF	$6,225	1.7%
	Total Site Info	**4,970**	**0.11**	**0.129**	**22**	**9,500**	**0.36**	**1,245**			**$6,225**	**1.7%**
4	**Senior Center & Luke Avenue Sports Complex**											
	Bioretention system	2,640	0.06	0.069	12	5,049	0.19	660	5	SF	$3,300	2.7%
	Pervious pavement	73,560	1.69	1.917	321	140,631	5.29	25,360	25	SF	$634,000	76.0%
	Total Site Info	**76,200**	**1.75**	**1.985**	**332**	**145,680**	**5.48**	**26,020**			**$637,300**	**78.7%**
5	**South Jersey FOP Lodge**											
	Bioretention system	1,400	0.03	0.036	6	2,678	0.10	350	5	SF	$1,750	4.9%
	Pervious pavement	2,660	0.06	0.069	12	5,086	0.19	475	25	SF	$11,875	9.4%
	Total Site Info	**4,060**	**0.09**	**0.106**	**18**	**7,764**	**0.29**	**825**			**$13,625**	**14.3%**
	GREAT EGG HARBOR RIVER SUBWATERSHED	**88,685**	**2.04**	**2.311**	**387**	**169,549**	**6.37**	**53,900**			**$1,263,600**	**5.7%**
6	**AtlantiCare Urgent Care Center**											
	Bioretention systems	6,390	0.15	0.166	28	12,215	0.46	1,600	5	SF	$8,000	16.0%
	Pervious pavement	8,200	0.19	0.214	36	15,678	0.59	1,680	25	SF	$42,000	20.6%
	Total Site Info	**14,590**	**0.33**	**0.380**	**64**	**27,893**	**1.05**	**3,280**			**$50,000**	**36.6%**

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 (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
7	**Berlin Circle Plaza**											
	Pervious pavement	19,100	0.44	0.498	83	36,517	1.37	19,100	25	SF	$477,500	1.6%
	Total Site Info	**19,100**	**0.44**	**0.498**	**83**	**36,517**	**1.37**	**19,100**			**$477,500**	**1.6%**
8	**Berlin Township Library**											
	Bioretention system	855	0.02	0.022	4	1,638	0.06	215	5	SF	$1,075	9.0%
	Pervious pavement	1,685	0.04	0.044	7	3,224	0.12	650	25	SF	$16,250	17.8%
	Total Site Info	**2,540**	**0.06**	**0.066**	**11**	**4,862**	**0.18**	**865**			**$17,325**	**26.8%**
9	**Brew and Chew Coffee Shop**											
	Bioretention system	1,600	0.04	0.042	7	3,059	0.11	400	5	SF	$2,000	44.1%
	Total Site Info	**1,600**	**0.04**	**0.042**	**7**	**3,059**	**0.11**	**400**			**$2,000**	**44.1%**
10	**Filomena Cucina Rustica**											
	Bioretention systems	1,500	0.03	0.039	7	2,865	0.11	375	5	SF	$1,875	2.6%
	Total Site Info	**1,500**	**0.03**	**0.039**	**7**	**2,865**	**0.11**	**375**			**$1,875**	**2.6%**
11	**Palace Diner**											
	Pervious pavement	17,915	0.41	0.467	78	34,251	1.29	3,250	25	SF	$81,250	21.6%
	Total Site Info	**17,915**	**0.41**	**0.467**	**78**	**34,251**	**1.29**	**3,250**			**$81,250**	**21.6%**
12	**Robert T. Clyde Memorial Recreational Complex**											
	Bioretention system	920	0.02	0.024	4	1,758	0.07	230	5	SF	$1,150	1.0%
	Pervious pavement	25,025	0.57	0.652	109	47,842	1.80	25,025	25	SF	$625,625	27.5%
	Total Site Info	**25,945**	**0.60**	**0.676**	**113**	**49,600**	**1.87**	**25,255**			**$626,775**	**28.5%**
13	**Wesley United Methodist Church**											
	Bioretention systems	5,495	0.13	0.143	24	10,502	0.39	1,375	5	SF	$6,875	10.3%
	Total Site Info	**5,495**	**0.13**	**0.143**	**24**	**10,502**	**0.39**	**1,375**			**$6,875**	**10.3%**
	KETTLE RUN SUBWATERSHED	**94,340**	**2.17**	**2.458**	**411**	**180,358**	**6.79**	**19,630**			**$327,250**	**15.2%**
14	**Duesmann and Hansel Recycling**											
	Pervious pavement	19,200	0.44	0.500	84	36,704	1.38	3,430	25	SF	$85,750	31.2%
	Total Site Info	**19,200**	**0.44**	**0.500**	**84**	**36,704**	**1.38**	**3,430**			**$85,750**	**31.2%**

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 (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
15	**Fred R Morgan & Sons Inc.**											
	Bioretention system	4,710	0.11	0.123	21	9,006	0.34	1,180	5	SF	$5,900	11.9%
	Pervious pavement	11,090	0.25	0.289	48	21,206	0.80	1,980	25	SF	$49,500	28.0%
	Total Site Info	**15,800**	**0.36**	**0.412**	**69**	**30,212**	**1.14**	**3,160**			**$55,400**	**39.9%**
16	**Greater Mount Carmel Church of God in Christ**											
	Bioretention system	1,000	0.02	0.026	4	1,915	0.07	250	5	SF	$1,250	4.0%
	Rainwater harvesting	215	0.00	0.006	1	411	0.02	500	2	gal	$1,000	0.9%
	Total Site Info	**1,215**	**0.03**	**0.032**	**5**	**2,326**	**0.09**	**750**			**$2,250**	**4.8%**
17	**Longrun Press Inc.**											
	Bioretention system	5,800	0.13	0.151	25	11,085	0.42	1,450	5	SF	$7,250	14.0%
	Total Site Info	**5,800**	**0.13**	**0.151**	**25**	**11,085**	**0.42**	**1,450**			**$7,250**	**14.0%**
18	**Novaflex**											
	Bioretention system	1,580	0.04	0.041	7	3,022	0.11	400	5	SF	$2,000	2.0%
	Total Site Info	**1,580**	**0.04**	**0.041**	**7**	**3,022**	**0.11**	**400**			**$2,000**	**2.0%**
19	**St. John's United Methodist Church**											
	Bioretention system	750	0.02	0.020	3	1,436	0.05	190	5	SF	$950	2.5%
	Pervious pavement	19,200	0.44	0.500	84	36,704	1.38	3,430	25	SF	$85,750	64.7%
	Total Site Info	**19,950**	**0.46**	**0.520**	**87**	**38,141**	**1.43**	**3,620**			**$86,700**	**67.3%**
	MULLICA RIVER SUBWATERSHED	**11,615**	**0.27**	**0.303**	**51**	**22,208**	**0.83**	**4,510**			**$80,650**	**17.7%**
20	**East Berlin Community Church**											
	Bioretention system	1,875	0.04	0.049	8	3,583	0.13	470	5	SF	$2,350	5.1%
	Total Site Info	**1,875**	**0.04**	**0.049**	**8**	**3,583**	**0.13**	**470**			**$2,350**	**5.1%**
21	**Greengrove Baptist Church**											
	Bioretention system	1,720	0.04	0.045	8	3,291	0.12	430	5	SF	$2,150	7.1%
	Pervious pavement	7,240	0.17	0.189	32	13,845	0.52	2,980	25	SF	$74,500	29.7%
	Total Site Info	**8,960**	**0.21**	**0.233**	**39**	**17,137**	**0.64**	**3,410**			**$76,650**	**36.8%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		Recharge	TSS Removal	Max Volume Reduction	Peak Discharge Reduction	Size of	Unit		Total	I.C.
		Area (SF)	Area (ac)	Potential (Mgal/yr)	Potential (lbs/yr)	Potential (gal/storm)	Potential (cfs)	BMP (SF)	Cost ($)	Unit	Cost ($)	Treated %
22	**Pilgrims Rest Disciple-Christ**											
	Bioretention system	520	0.01	0.014	2	995	0.04	130	5	SF	$650	12.0%
	Rainwater harvesting	260	0.01	0.007	1	494	0.02	500	2	gal	$1,000	6.0%
	Total Site Info	**780**	**0.02**	**0.020**	**3**	**1,489**	**0.06**	**630**			**$1,650**	**18.0%**