



Draft

**Impervious Cover Reduction Action Plan
for
Milltown Borough, Middlesex County, New Jersey**

*Prepared for Milltown Borough by the
Rutgers Cooperative Extension Water Resources Program*

September 5, 2015



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Introduction

Located in Middlesex County in central New Jersey, Milltown Borough covers approximately 1.6 square miles east of Raritan. Figures 1 and 2 illustrate that Milltown Borough is dominated by urban land uses. A total of 88.1% of the municipality's land use is classified as urban. Of the urban land in Milltown Borough, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Milltown Borough 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 Milltown Borough. Based upon the 2007 NJDEP land use/land cover data, approximately 40.9% of Milltown Borough has impervious cover. This level of impervious cover suggests that the streams in Milltown Borough are likely non-supporting streams.¹

Methodology

Milltown Borough contains one subwatershed (Figure 4). For this impervious cover reduction action plan, projects have been identified in the watershed. 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

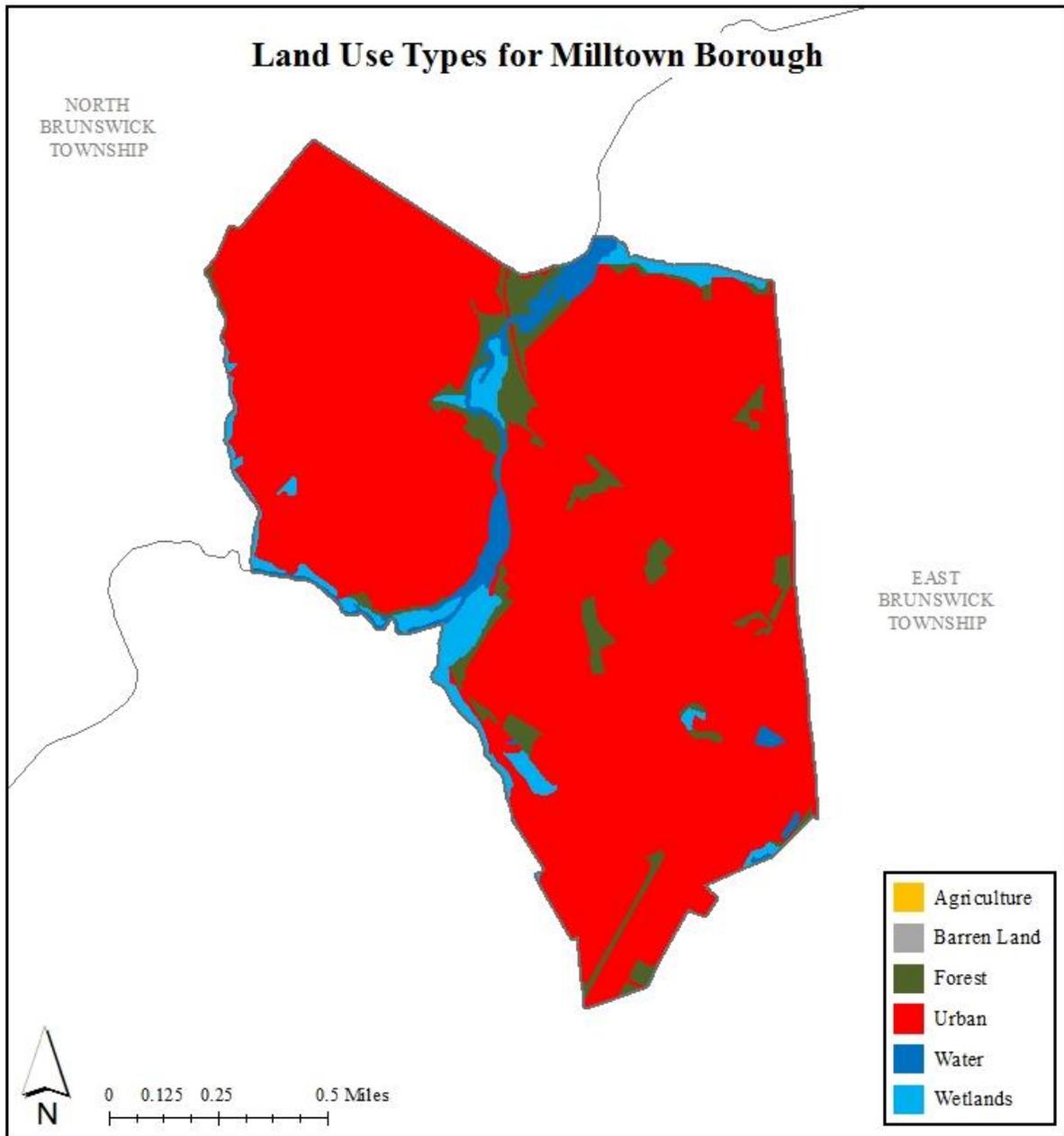


Figure 1: Map illustrating the land use in Milltown Borough

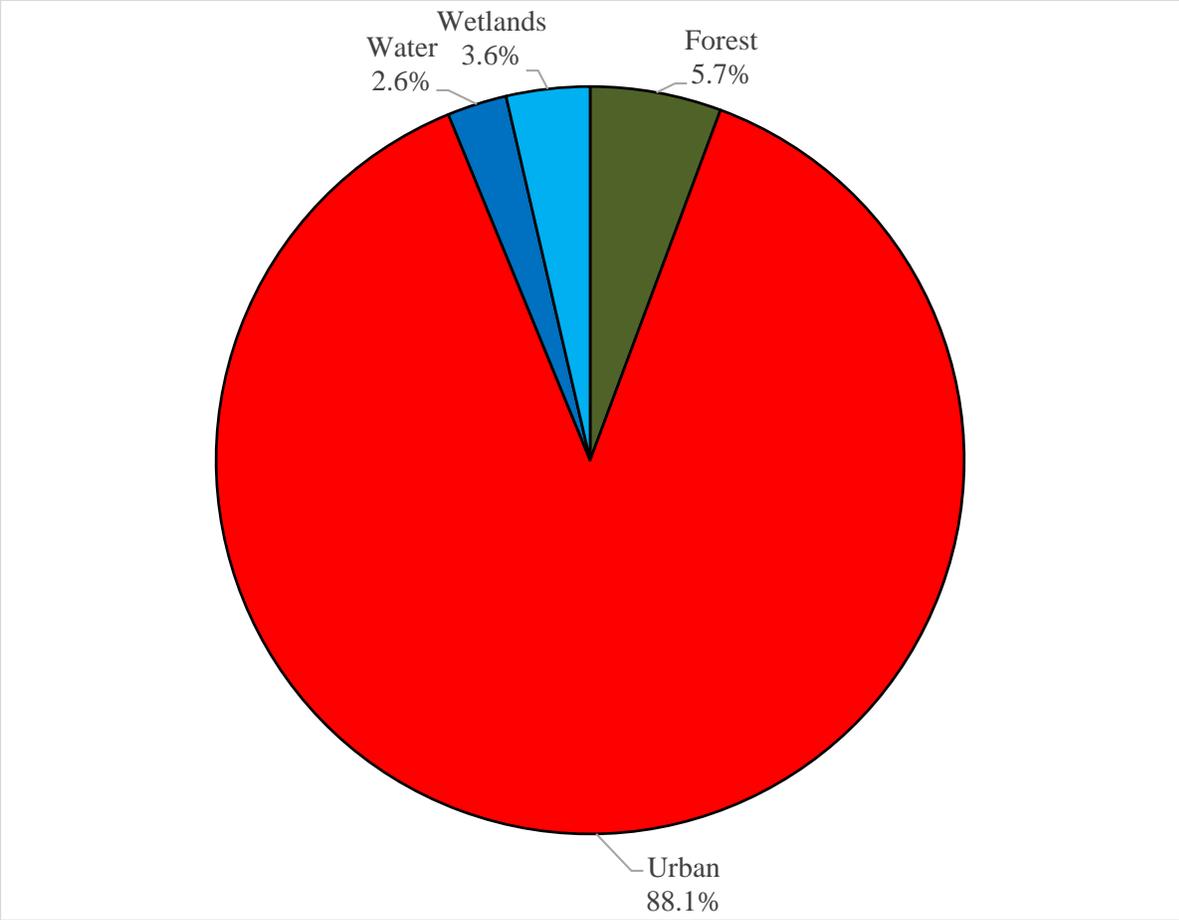


Figure 2: Pie chart illustrating the land use in Milltown Borough

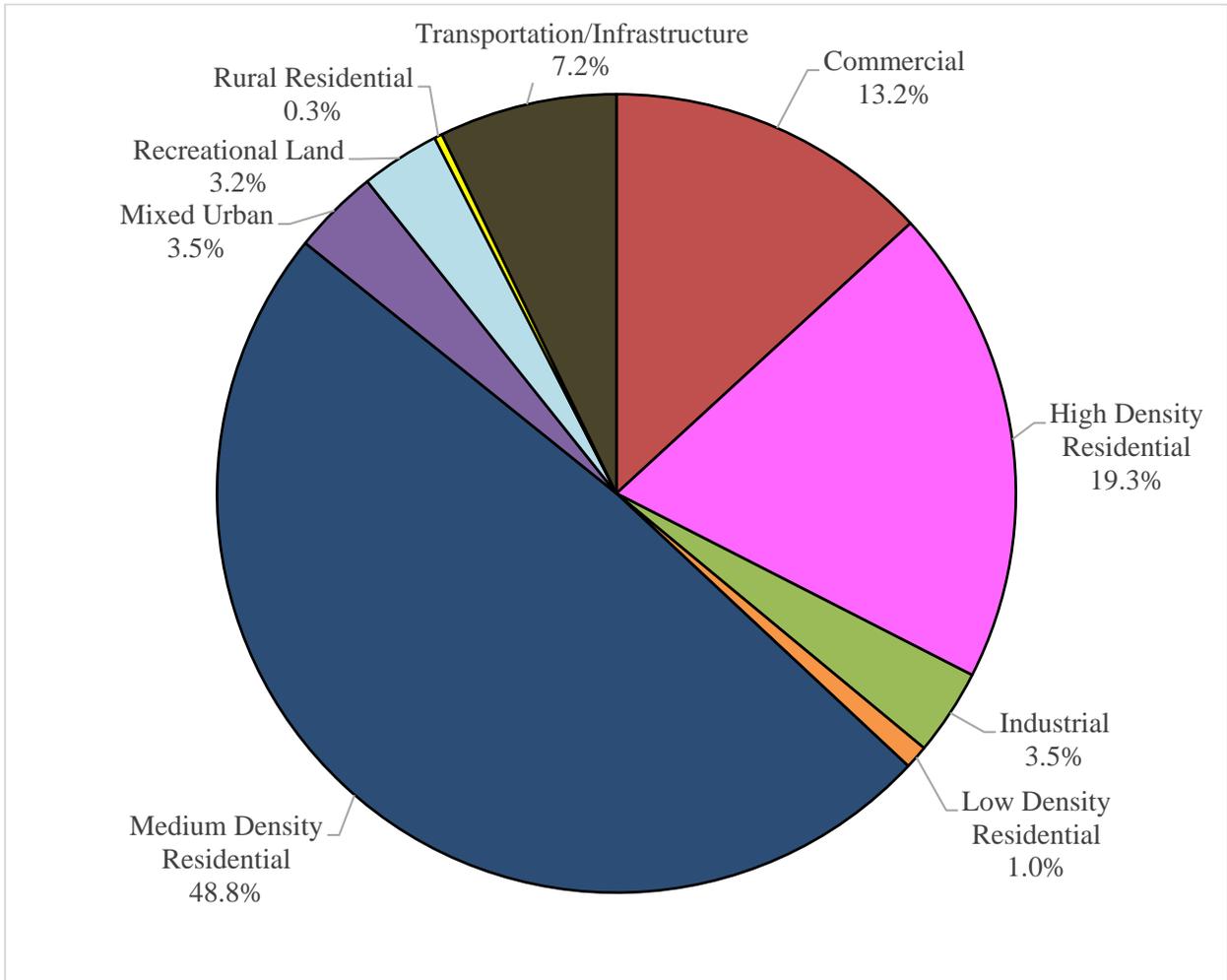


Figure 3: Pie chart illustrating the various types of urban land use in Milltown Borough

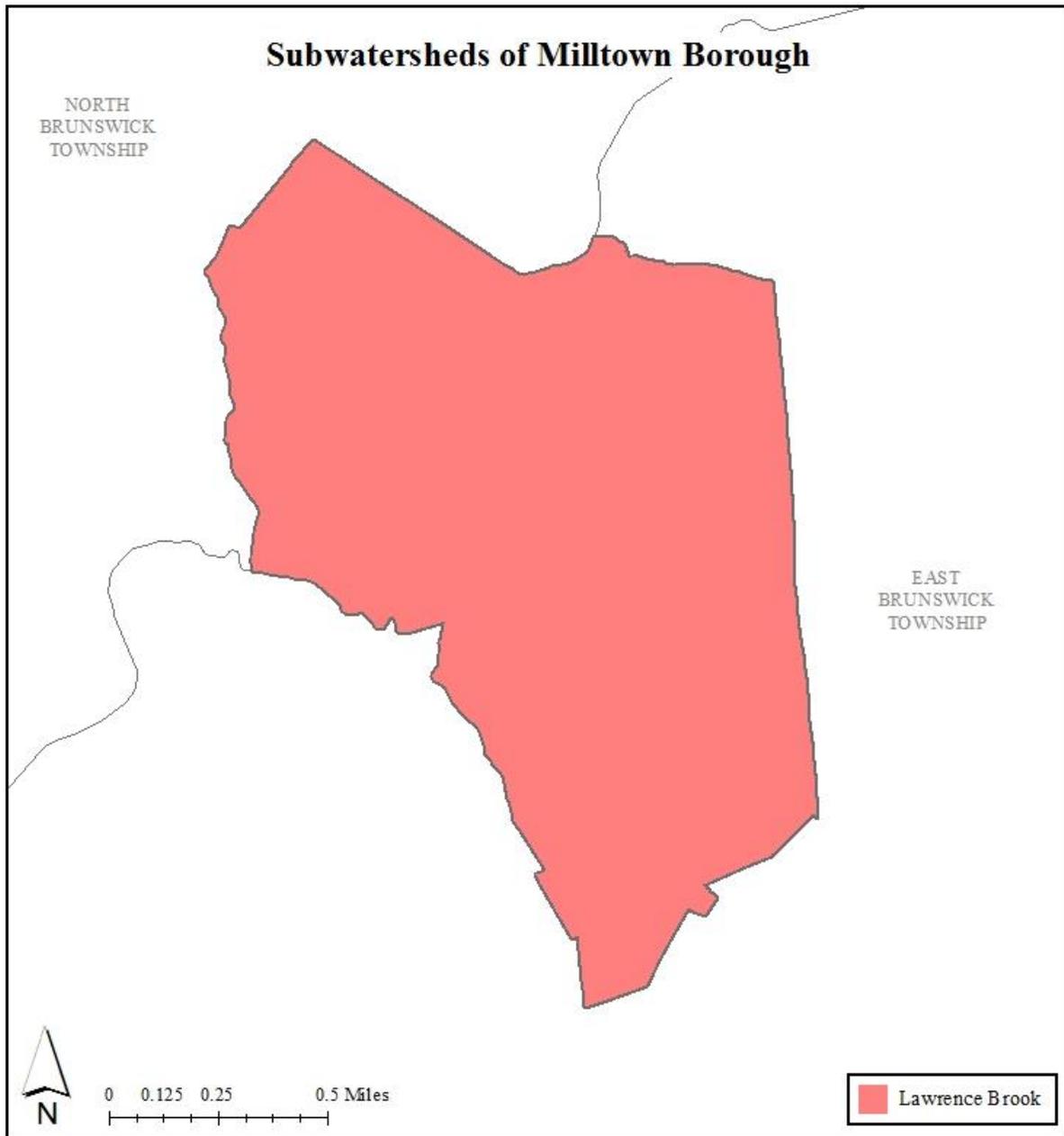


Figure 4: Map of the subwatersheds in Milltown Borough

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 2007 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 Milltown Borough 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 Coefficients²

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 benefits³. A wide range of green infrastructure practices have been evaluated for the potential project sites in Milltown Borough. 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 a 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 practice 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.

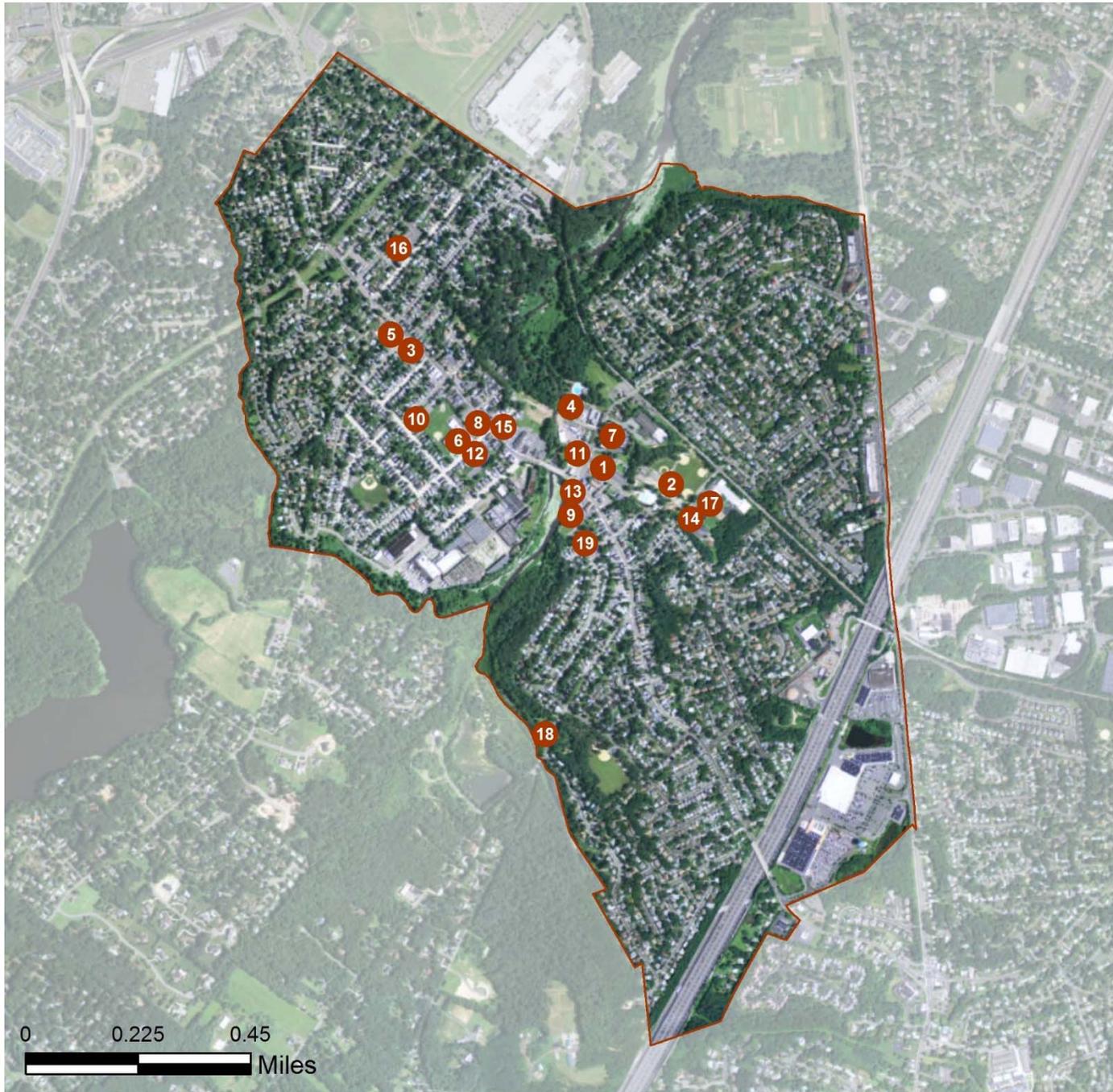
a. Overview Map of the Project

MILLTOWN: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

MILLTOWN: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE LAWRENCE BROOK SUBWATERSHED:

1. American Legion Building and Lot
2. Borough Park
3. Bronson & Guthlein Funeral Home
4. Brookside Swim Club
5. Crabel Home for Funerals
6. Joyce Kilmer School
7. Lasting Impressions
8. Middlesex Academy of Dance
9. Millpond Park
10. Milltown Borough Fire Department
11. Milltown Post Office
12. Milltown Public Library
13. Milltown Rescue Squad
14. Milltown Senior Center
15. Milltown United Methodist
16. Our Lady of Lourdes School
17. Parkview Elementary School
18. Rangers Hall
19. St. Paul's Church and Good Day Preschool

c. Proposed Green Infrastructure Concepts

AMERICAN LEGION BUILDING AND LOT



Subwatershed: Lawrence Brook

Site Area: 120,241 sq. ft.

Address: 4 JFK Blvd.
Milltown, NJ 08850

Block and Lot: Block 73, Lot 1.03



Downspouts on the southwest side of the building currently direct water onto an adjacent lot. A rain garden can be planted in the small grass area at the back of the building, and water from the downspouts can be directed into it. Rain gardens can also be planted next to the American Legion lot to capture runoff from parking spaces and from the roofs of nearby structures. A preliminary soil assessment suggests that 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"
65	77,863	3.8	39.3	357.5	0.061	2.14

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 systems	0.177	30	13,008	0.49	1,798	\$8,990

GREEN INFRASTRUCTURE RECOMMENDATIONS



**American Legion
Building and Lot**

-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



BOROUGH PARK



Subwatershed: Lawrence Brook

Site Area: 527,528 sq. ft.

Address: 80 Violet Terrace
Milltown, NJ 08850

Block and Lot: Block 73, Lot 9.01



Currently, runoff from the parking lot and basketball courts is directed into catch basins throughout the site. The basketball courts can be replaced with porous asphalt to capture runoff. The areas adjacent to the eastern most basketball court can be de-paved into rain gardens to capture runoff too. A preliminary soil assessment suggests that more soil testing would be required before determining soil 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	177,452	8.6	89.6	814.7	0.138	4.87

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	0.082	14	6,021	0.23	797	\$3,987
Pervious pavements	0.280	47	20,525	0.77	9,258	\$231,462

GREEN INFRASTRUCTURE RECOMMENDATIONS



Borough Park

-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



BRONSON & GUTHLEIN FUNERAL HOME



Subwatershed: Lawrence Brook

Site Area: 38,786 sq. ft.

Address: 152 N Main St.
Milltown, NJ 08850

Block and Lot: Block 45, Lot 11

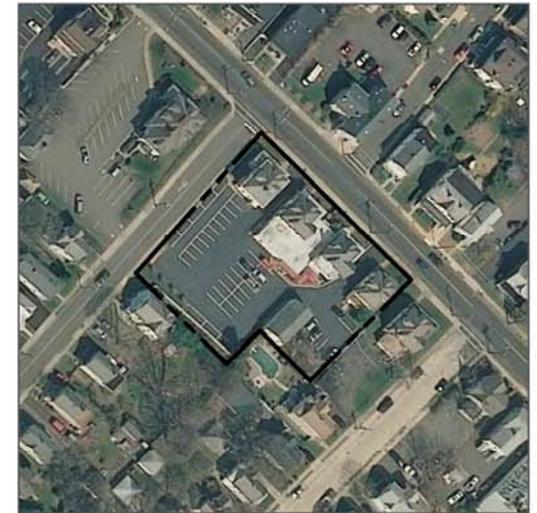
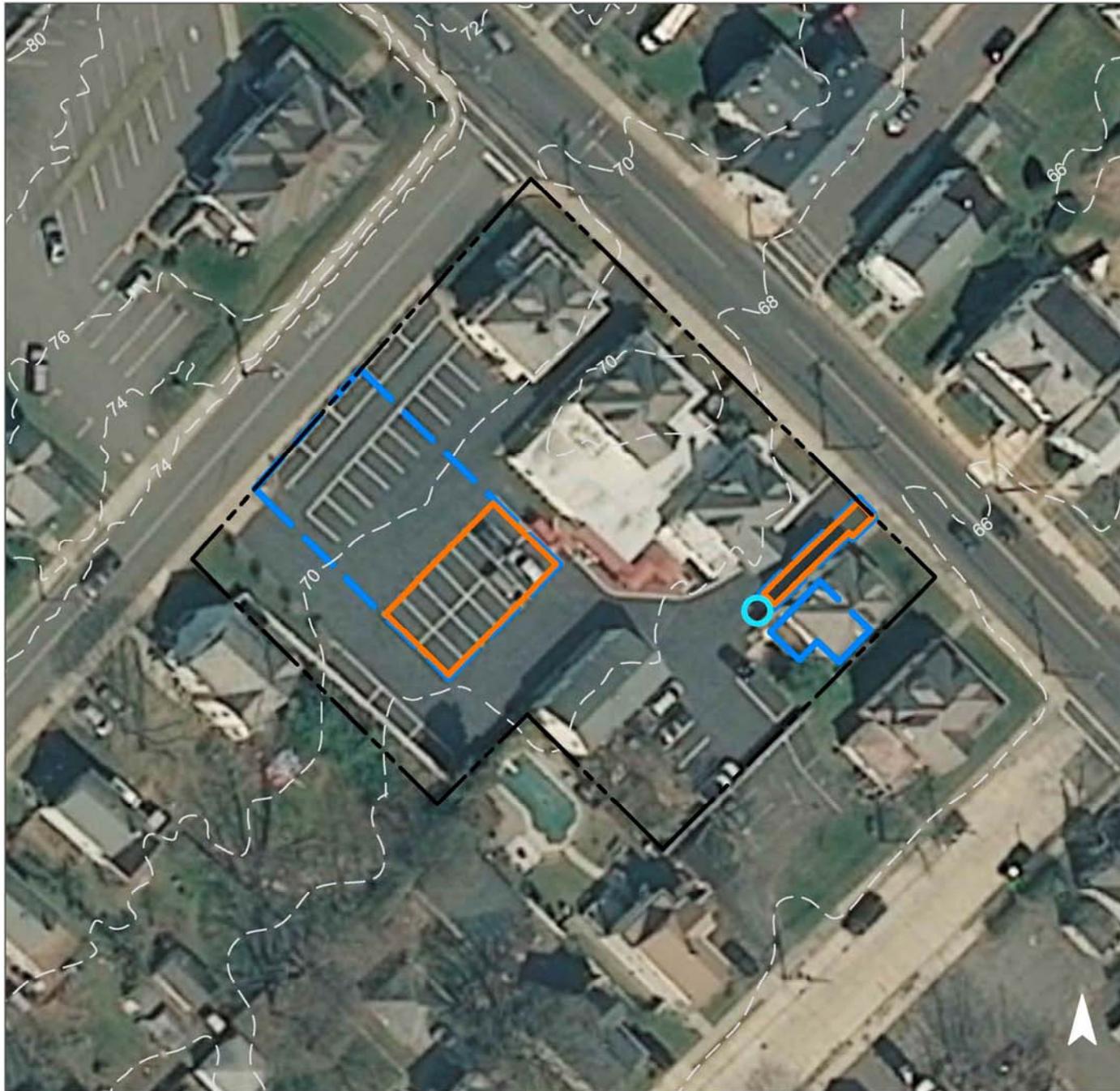


Several disconnected downspouts currently direct water onto the parking lot behind the buildings. Parking spots can be replaced with porous asphalt to infiltrate this runoff. Some downspouts can also be connected to a rainwater harvesting feature. There is an opportunity for de-paving asphalt into lawn between the buildings as well. A preliminary soil assessment suggests that 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"
84	32,520	1.6	16.4	149.3	0.025	0.89

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 pavements	0.171	29	12,574	0.47	2,232	\$55,811
Rainwater harvesting systems	0.017	3	500	0.05	500 (gal)	\$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Bronson & Guthlein Funeral Home

-  pervious pavements
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



BROOKSIDE SWIM CLUB



Subwatershed: Lawrence Brook

Site Area: 124,417 sq. ft.

Address: Washington Ave.
Milltown, NJ 08850

Block and Lot: Block 60, Lot 6



Several disconnected downspouts direct water onto existing porous pavement. A lot of runoff also flows onto the basketball court at the corner of the site, which could be replaced with porous pavement. A preliminary soil assessment suggests that more soil testing would be required before determining soil 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"
65	81,212	3.9	41.0	372.9	0.063	2.23

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 pavements	0.029	5	2,102	0.08	1,101	\$27,525

GREEN INFRASTRUCTURE RECOMMENDATIONS



Brookside Swim Club

-  pervious pavements
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



CRABIEL HOME FOR FUNERALS



Subwatershed: Lawrence Brook

Site Area: 28,609 sq. ft.

Address: 170 N Main St.
Milltown, NJ 08850

Block and Lot: Block 43, Lot 3

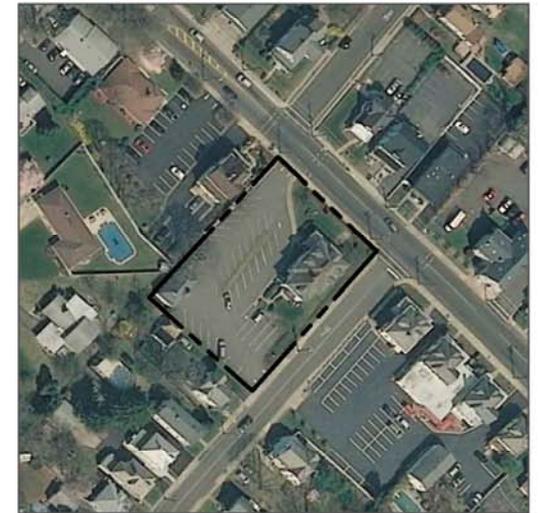
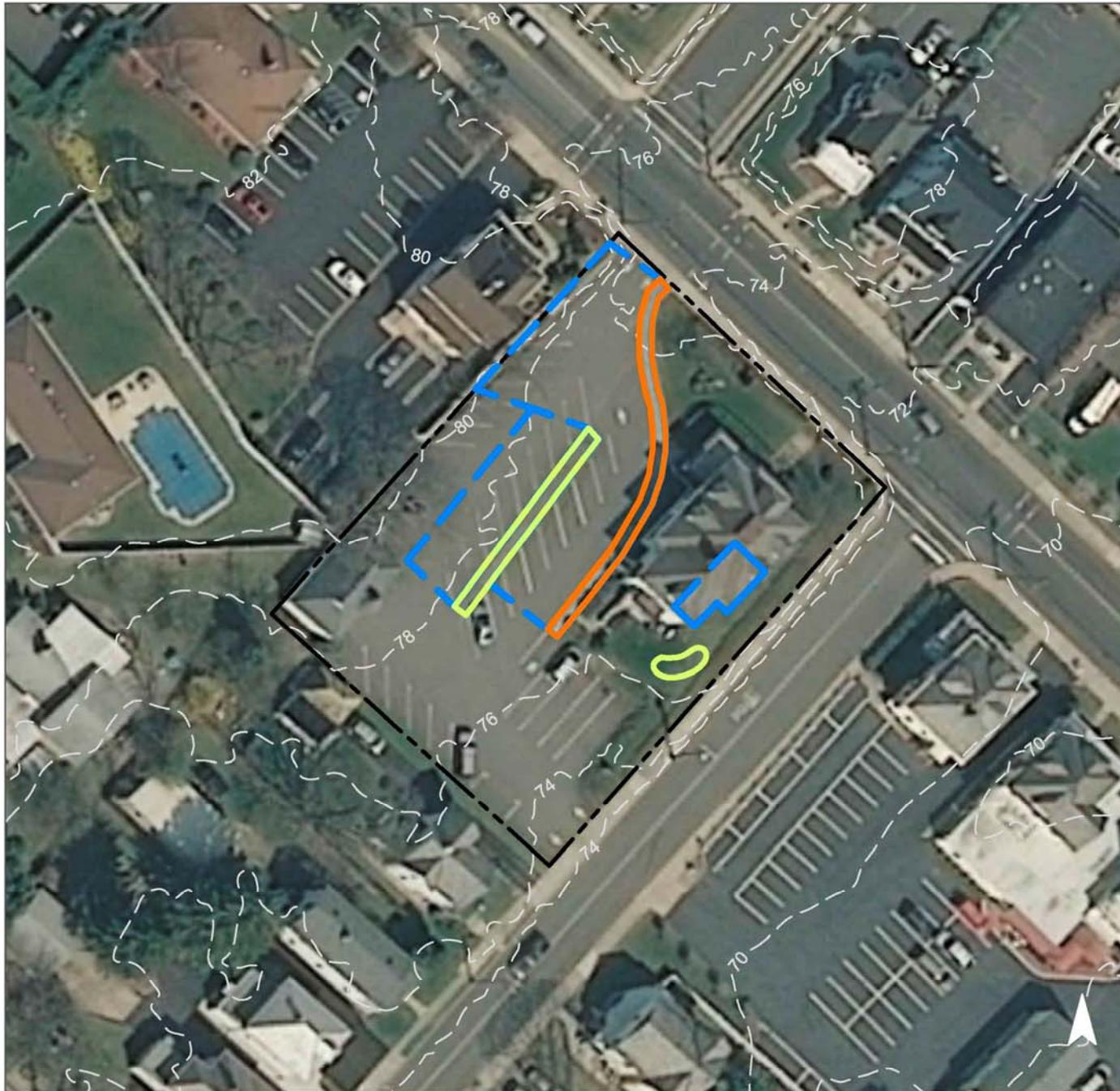


Water currently drains from the parking lot towards the building. The grass buffer in the parking lot can be converted to a rain garden to capture and treat runoff. The sidewalk can be replaced with porous pavement to infiltrate runoff as well. A preliminary soil assessment suggests that soils have suitable 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"
84	24,001	1.2	12.1	110.2	0.019	0.66

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 systems	0.061	10	4,481	0.17	634	\$3,169
Pervious pavements	0.152	25	11,160	0.42	754	\$18,843

GREEN INFRASTRUCTURE RECOMMENDATIONS



Crabiell Home for Funerals

-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



JOYCE KILMER SCHOOL



Subwatershed: Lawrence Brook

Site Area: 237,933 sq. ft.

Address: 21 W Church St.
Milltown, NJ 08850

Block and Lot: Block 51, Lot 27

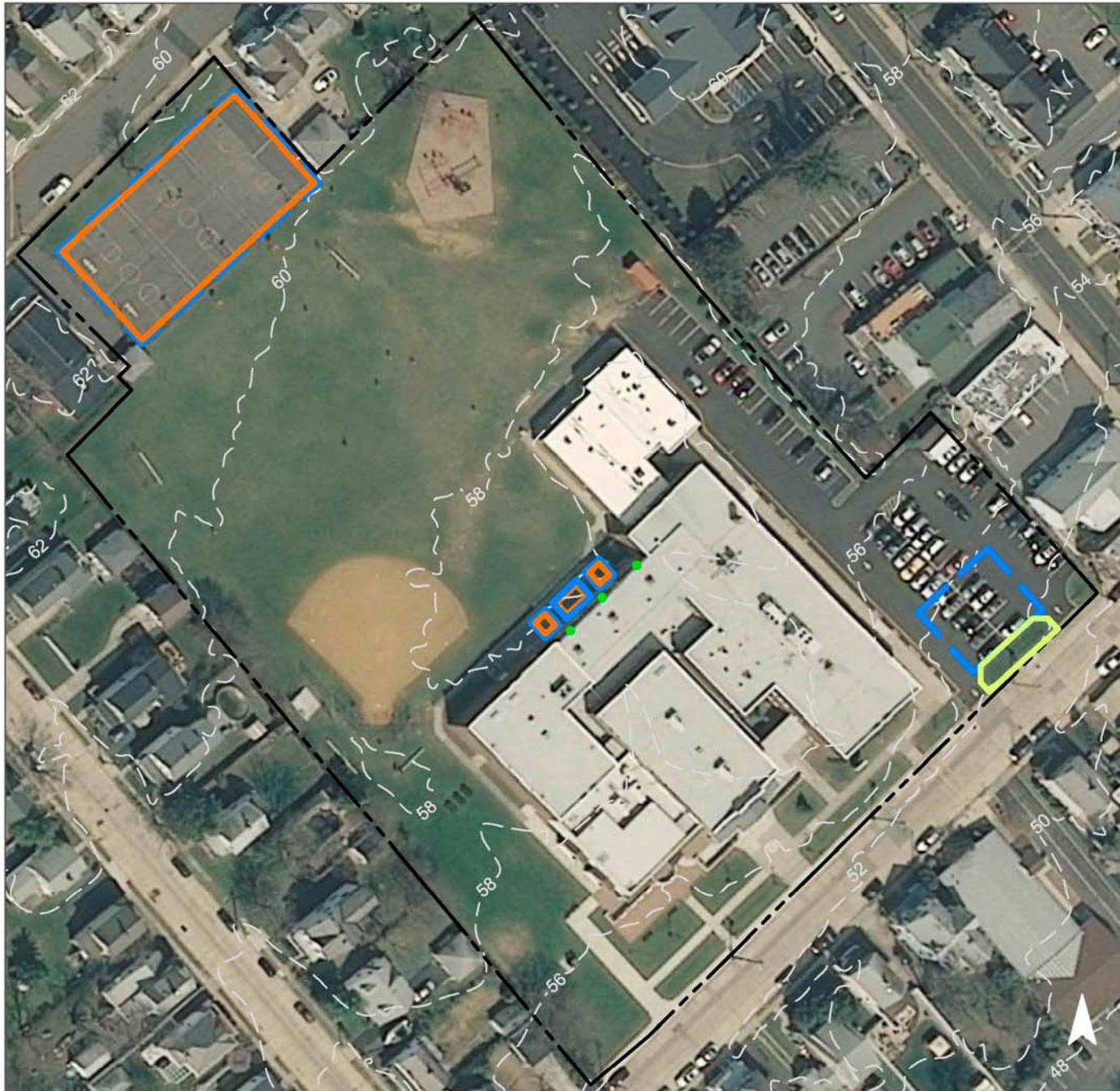


Runoff from the parking lot currently drains toward the street. The grass buffer in the parking lot can be replaced with a rain garden to capture, infiltrate, and treat this runoff. Additionally, areas behind the school can be de-paved into lawn and the basketball courts can be replaced with porous pavement. A preliminary soil assessment suggests that 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"
44	104,066	5.0	52.6	477.8	0.081	2.85

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	6,096	0.23	917	\$4,587
Pervious pavements	0.322	54	23,644	0.89	12,368	\$309,200

GREEN INFRASTRUCTURE RECOMMENDATIONS



Joyce Kilmer School

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



LASTING IMPRESSIONS



Subwatershed: Lawrence Brook

Site Area: 209,359 sq. ft.

Address: 40 Washington Ave.
Milltown, NJ 08850

Block and Lot: Block 73, Lot 1.04

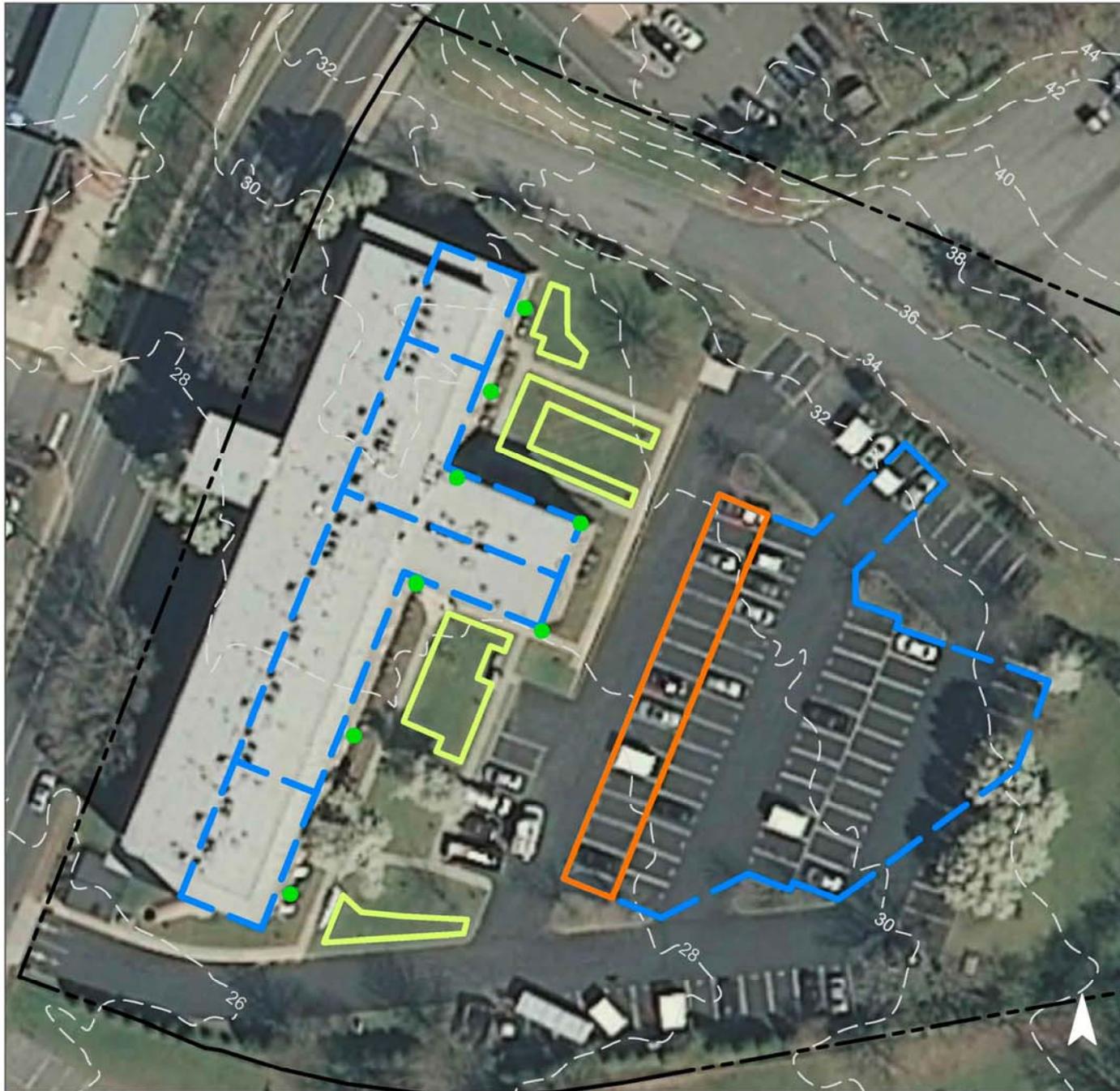


Runoff currently flows into catch basins within the parking lot or pools in lawn areas next to the building. Parking spaces can be replaced with porous pavement to infiltrate runoff from the parking lot. Rain gardens can also be planted between the building and parking lot, to capture, treat and infiltrate roof runoff. A preliminary soil assessment suggests that 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	131,274	6.3	66.3	602.7	0.102	3.60

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	0.306	51	22,440	0.84	2,890	\$14,448
Pervious pavements	0.477	80	34,984	1.32	3,278	\$81,938

GREEN INFRASTRUCTURE RECOMMENDATIONS



Lasting Impressions

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MIDDLESEX ACADEMY OF DANCE



Subwatershed: Lawrence Brook
Site Area: 7,011 sq. ft.
Address: 74 N Main St.
Milltown, NJ 08850
Block and Lot: Block 51, Lot 7.04

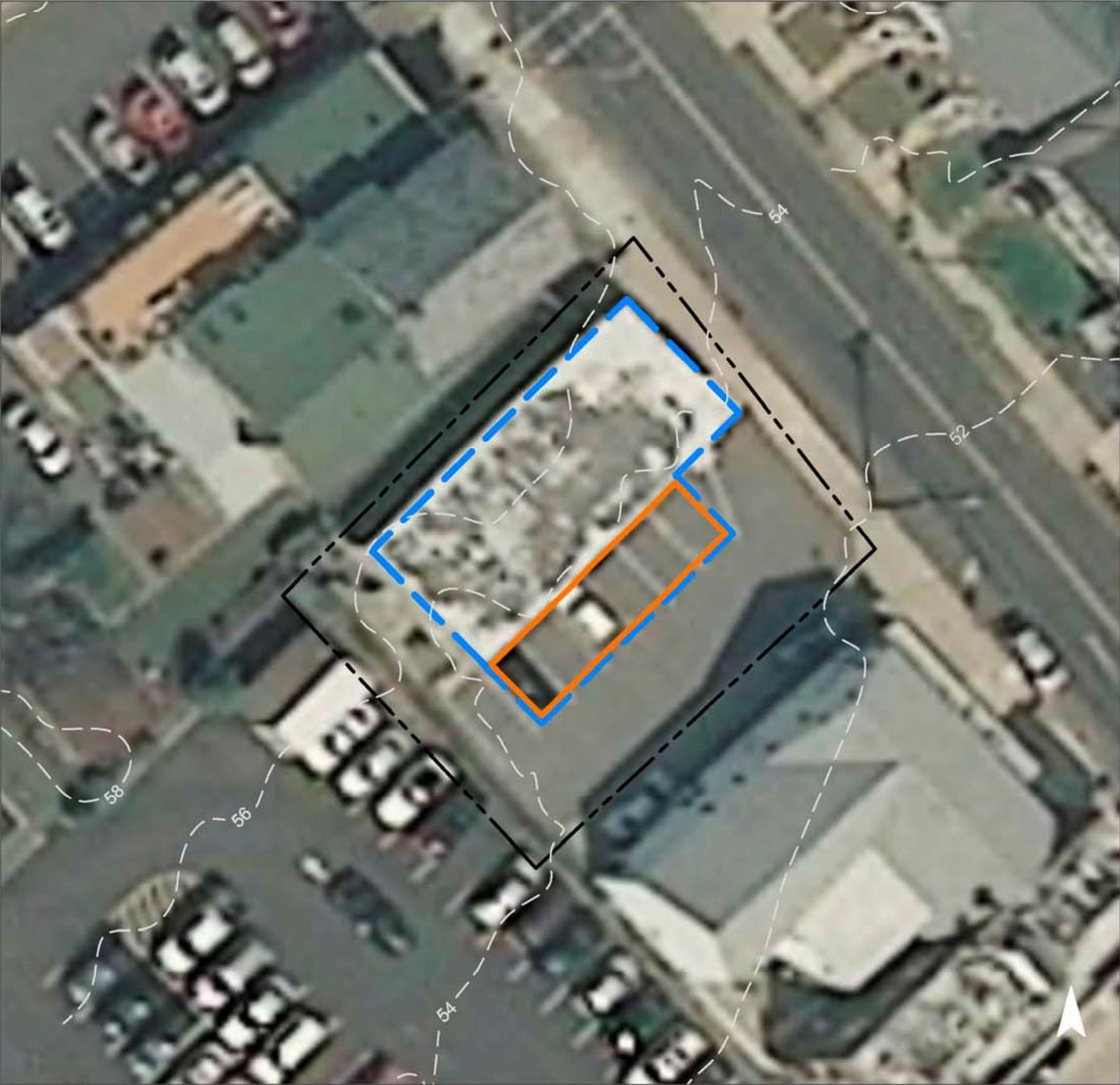


Runoff from the parking lot is currently directed towards an adjacent southeast building. Parking spots can be replaced with porous asphalt to capture and infiltrate this runoff. A preliminary soil assessment suggests that soils have suitable drainage characteristics for green infrastructure.

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"
90	6,309	0.3	3.2	29.0	0.005	0.17

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 pavements	0.078	13	5,752	0.22	834	\$20,841

GREEN INFRASTRUCTURE RECOMMENDATIONS



Middlesex Academy of Dance

-  pervious pavements
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLPOND PARK



Subwatershed: Lawrence Brook

Site Area: 49,224 sq. ft.

Address: Main St.
Milltown, NJ 08850

Block and Lot: Block 86, Lot 2.01



Runoff on the site currently drains toward a nearby lake. Rain gardens can be planted adjacent to the parking lot and path to capture, infiltrate and treat runoff before it reaches the lake. A preliminary soil assessment suggests that 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	9,262	0.4	4.7	42.5	0.007	0.25

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	16,935	0.64	2,824	\$14,120

GREEN INFRASTRUCTURE RECOMMENDATIONS



Millpond Park

-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLTOWN BOROUGH FIRE DEPARTMENT



Subwatershed: Lawrence Brook
Site Area: 6,439 sq. ft.
Address: 40 Cottage Ave.
Milltown, NJ 08850
Block and Lot: Block 51, Lot 26

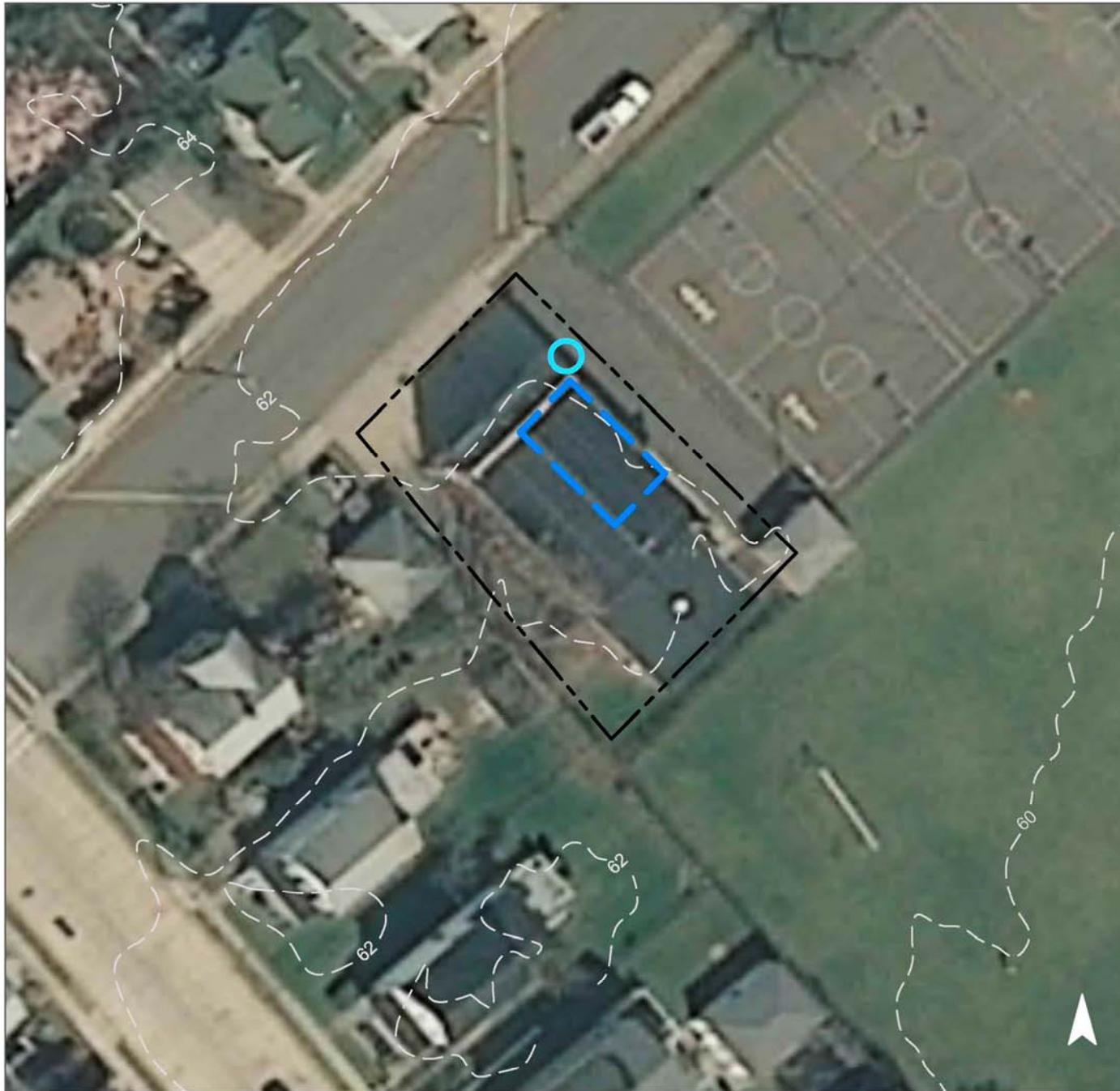


Downspouts currently direct water onto the lot beside the building. The downspouts can be connected to a rainwater harvesting feature. A preliminary soil assessment suggests that soils have suitable drainage characteristics for green infrastructure.

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"
21	1,339	0.1	0.7	6.1	0.001	0.04

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
Rainwater harvesting systems	0.017	3	500	0.05	500 (gal)	\$1,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown Borough Fire Department

-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLTOWN POST OFFICE



Subwatershed: Lawrence Brook

Site Area: 38,979 sq. ft.

Address: 27 Washington Ave.
Milltown, NJ 08850

Block and Lot: Block 60, Lot 1.02

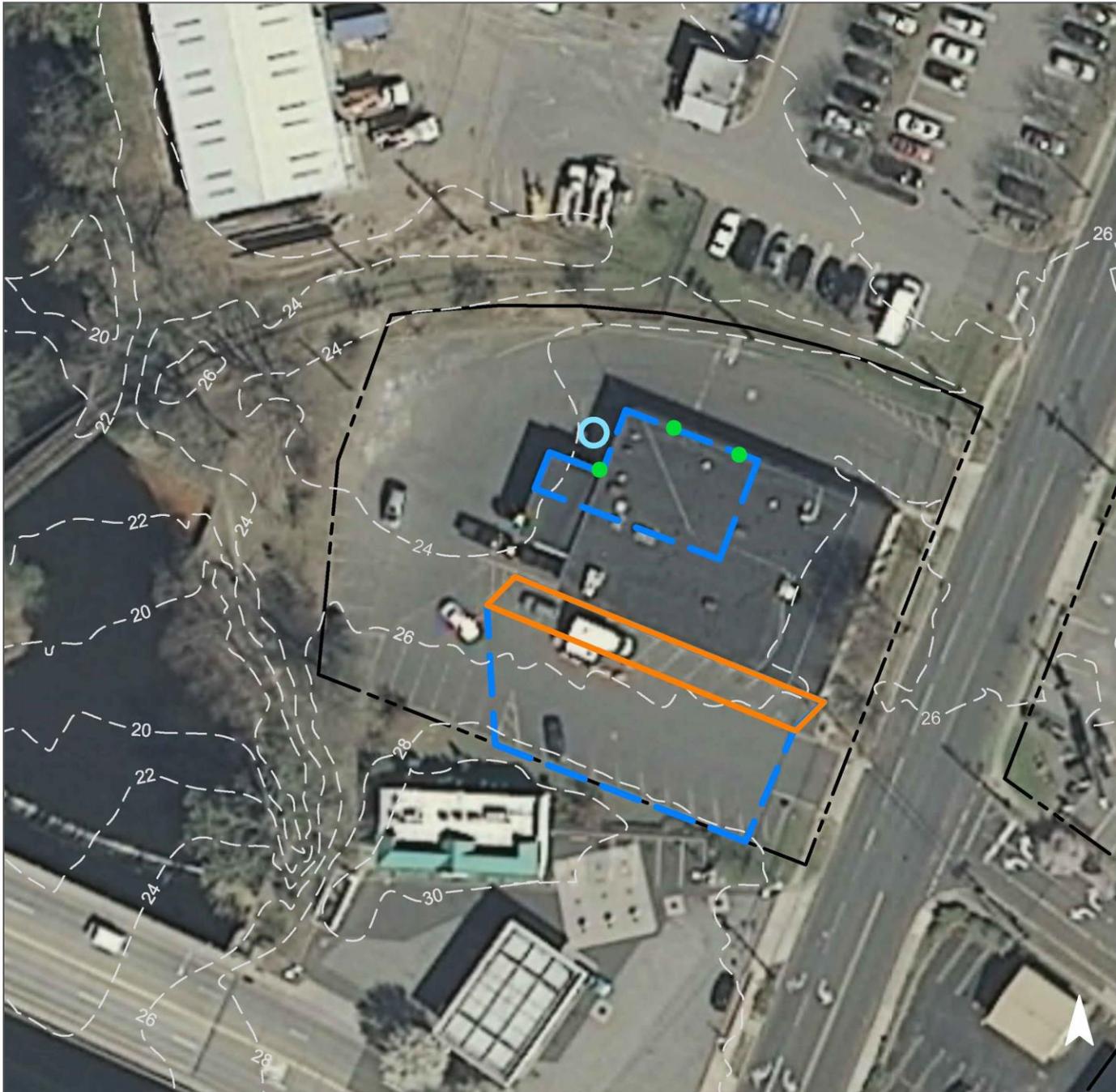


Water from the parking lot currently drains into catch basins behind the building. Parking spots can be replaced with porous asphalt to infiltrate this runoff. Downspouts can also be disconnected into a rainwater harvesting system as well. A preliminary soil assessment suggests that more soil testing would be required before determining soil 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"
94	36,755	1.8	18.6	168.8	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
Pervious pavements	0.194	32	14,227	0.53	1,853	\$46,320
Rainwater harvesting systems	0.066	11	2,362	0.18	2,362 (gal)	\$4,724

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown Post Office

-  disconnected downspouts
-  pervious pavements
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLTOWN PUBLIC LIBRARY



Subwatershed: Lawrence Brook

Site Area: 46,108 sq. ft.

Address: 20 West Church St.
Milltown, NJ 08850

Block and Lot: Block 56, Lot 12

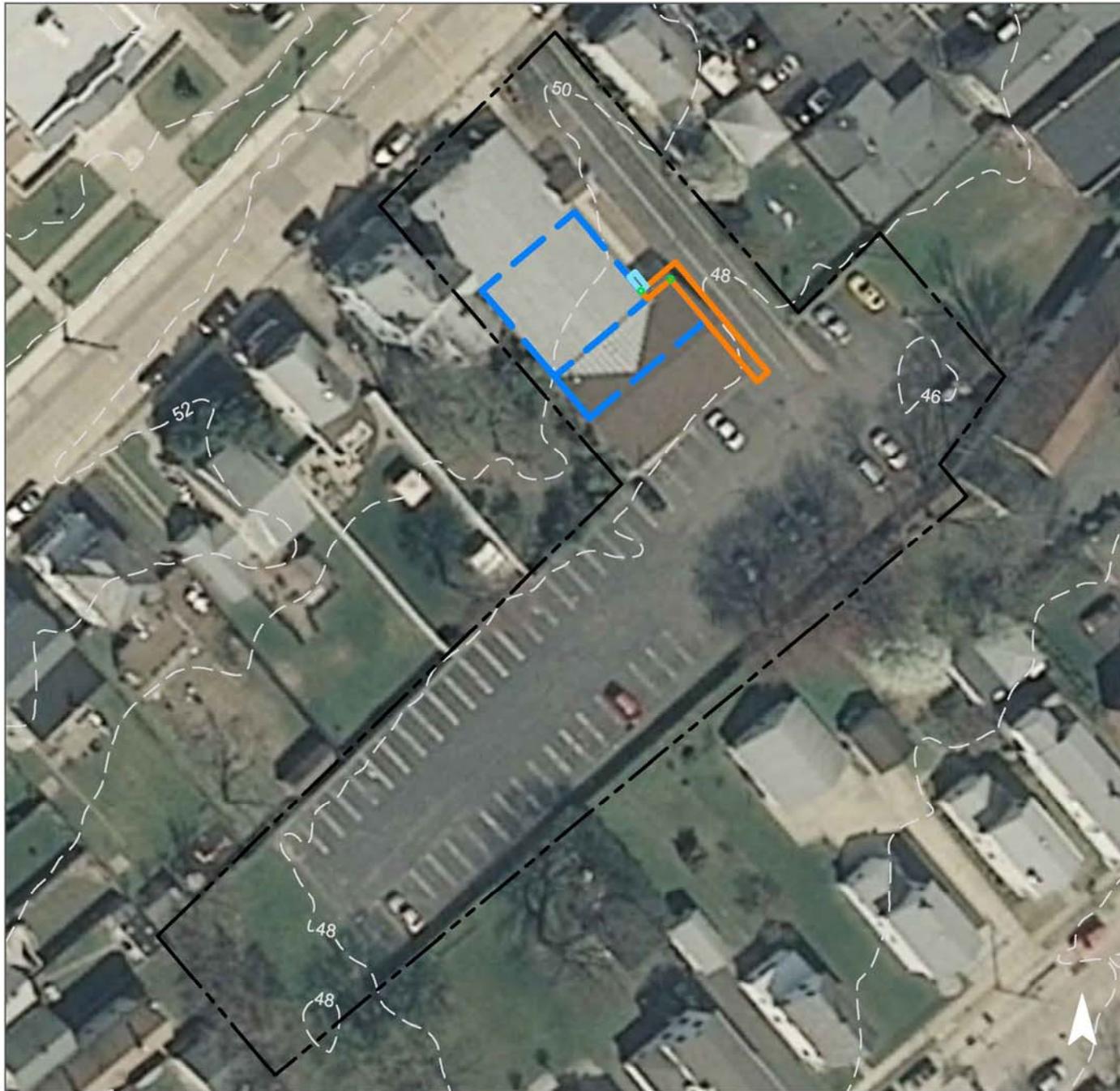


A cistern can harvest roof runoff to water an existing garden. A portion of the sidewalk can be converted into pervious pavement. A preliminary soil assessment suggests that soils have suitable drainage characteristics for green infrastructure.

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"
87	39,949	1.9	20.2	183.4	0.031	1.10

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
Pervious pavements	0.032	5	2,311	0.09	366	\$9,150
Rainwater harvesting systems	0.054	9	1,948	0.15	1,948 (gal)	\$3,895

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown Public Library

-  disconnected downspouts
-  pervious pavements
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLTOWN RESCUE SQUAD



Subwatershed: Lawrence Brook

Site Area: 31,084 sq. ft.

Address: Main St.
Milltown, NJ 08850

Block and Lot: Block 86, Lot 1.02

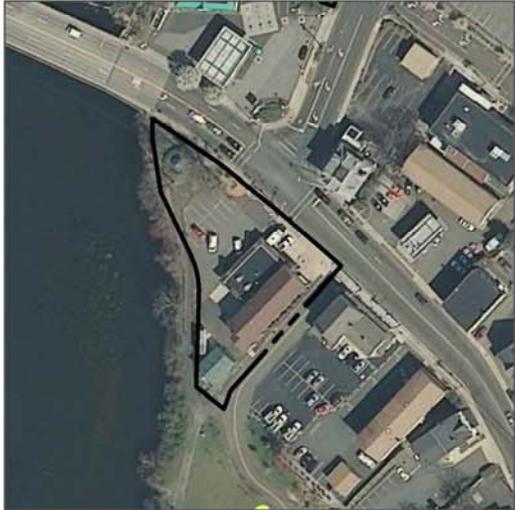
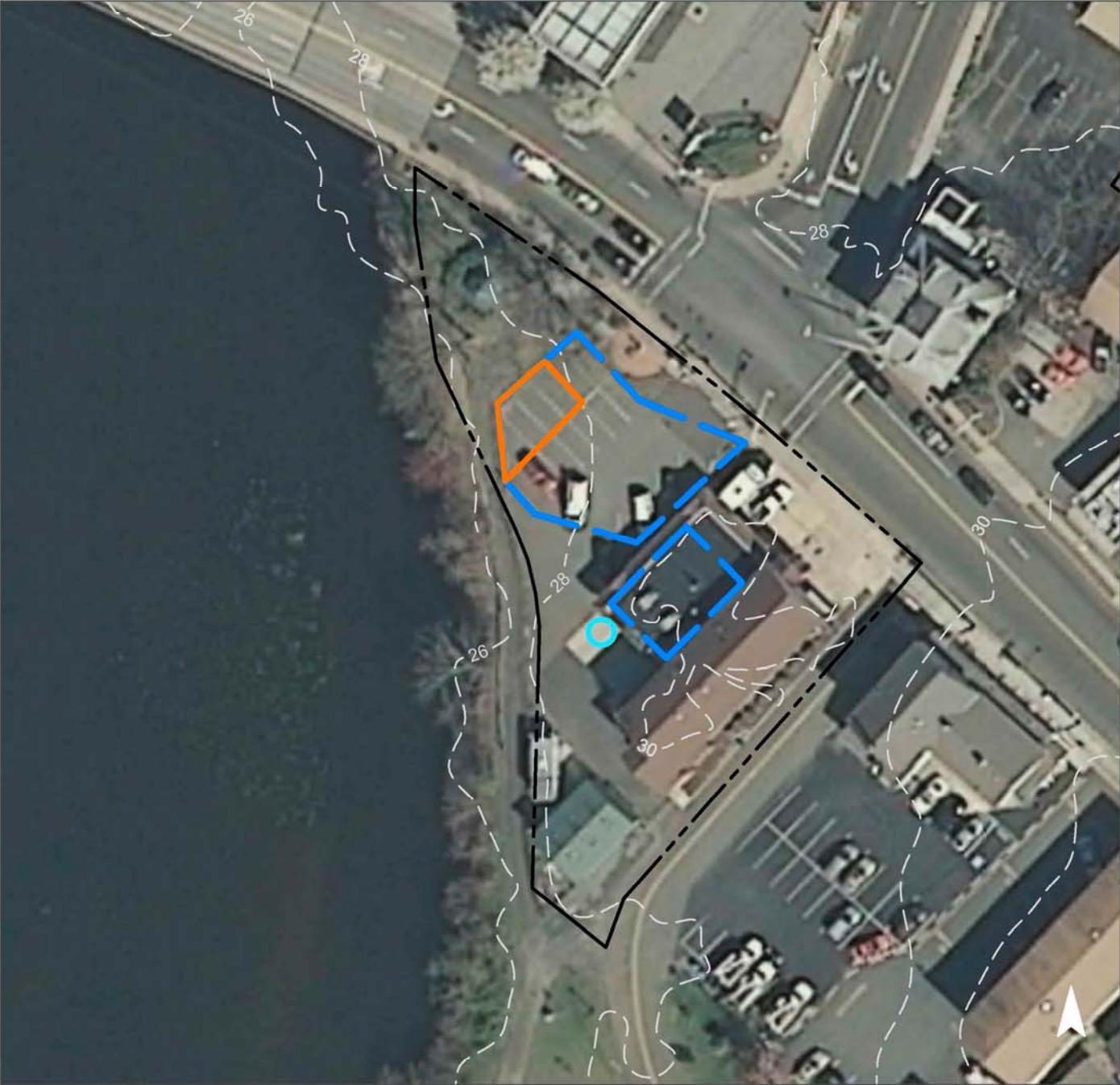


Runoff from the site currently flows onto a parking lot beside the building. Several downspouts can be connected to a cistern to harvest this water. Parking spots can also be replaced with porous asphalt to capture and infiltrate runoff as well. A preliminary soil assessment suggests that soils have 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"
76	23,597	1.1	11.9	108.3	0.018	0.65

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
Pervious pavements	0.114	19	8,340	0.31	775	\$19,369
Rainwater harvesting systems	0.033	6	1,000	0.09	1,000 (gal)	\$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown Rescue Squad

-  pervious pavements
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





MILLTOWN SENIOR CENTER

Subwatershed: Lawrence Brook
Site Area: 169,609 sq. ft.
Address: 60 Violet Terrace
Milltown, NJ 08850
Block and Lot: Block 73, Lot 10.02

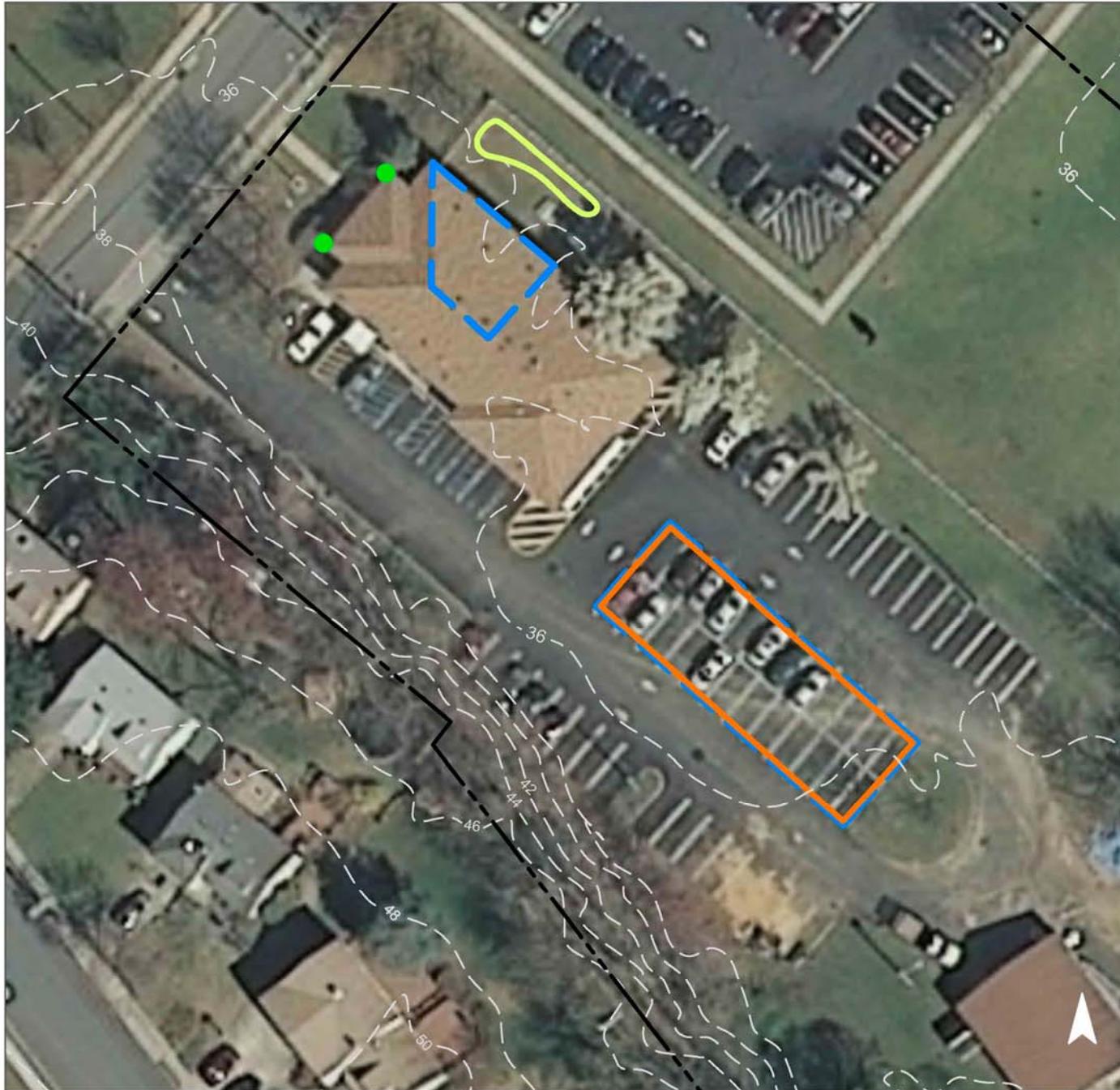


Runoff from the parking lot is currently directed towards several catch basins. Parking spots can be replaced with porous asphalt to infiltrate this runoff. A rain garden can also be placed along the east side of the building to capture roof runoff and minimize water flowing onto the parking lot. A preliminary soil assessment suggests that 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	63,801	3.1	32.2	292.9	0.050	1.75

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 systems	0.031	5	2,281	0.09	306	\$1,530
Pervious pavements	0.100	17	7,360	0.28	3,848	\$96,200

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown Senior Center

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



MILLTOWN UNITED METHODIST



Subwatershed: Lawrence Brook
Site Area: 44,164 sq. ft.
Address: 47 N Main St.
Milltown, NJ 08850
Block and Lot: Block 32, Lot 15

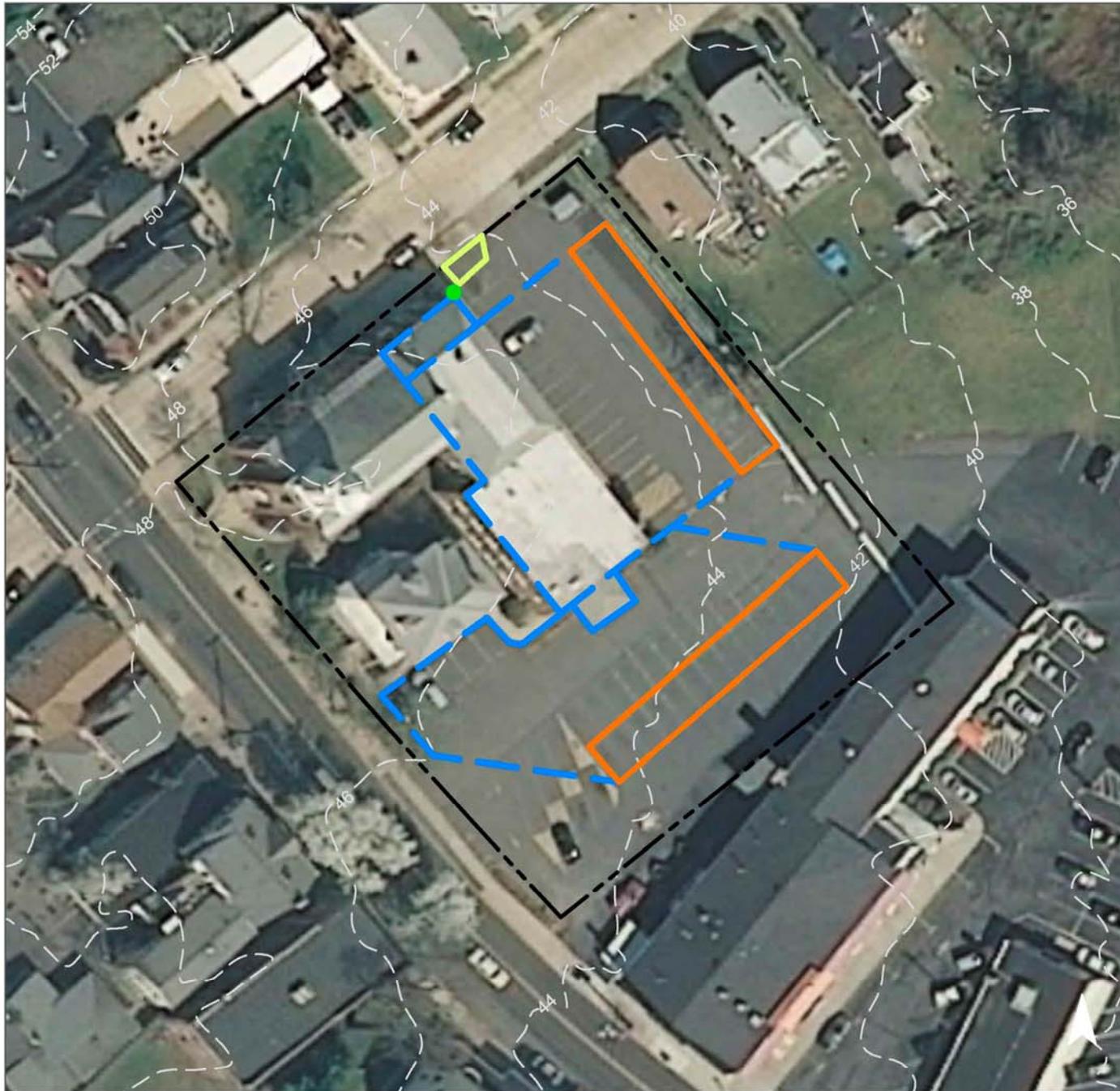


Currently, roof runoff is directed onto the parking lot behind the building. Parking spots can be replaced with porous asphalt to capture and infiltrate this runoff. A rain garden can also be planted to treat some of the roof runoff as well. Additionally, concrete barriers behind the building can be removed to allow rainwater to flow onto the grass, and parking spots south of the building can be replaced with porous asphalt to capture runoff too. A preliminary soil assessment suggests that 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"
90	39,747	1.9	20.1	182.5	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	0.013	2	987	0.04	142	\$710
Pervious pavements	0.533	89	39,098	1.47	3,982	\$99,559

GREEN INFRASTRUCTURE RECOMMENDATIONS



Milltown United Methodist

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



OUR LADY OF LOURDES SCHOOL



Subwatershed: Lawrence Brook

Site Area: 98,901 sq. ft.

Address: Corner of Willow St.
and Cleveland Ave.
Milltown, NJ 08850

Block and Lot: Block 18, Lot 1



Water on the site currently pools in the parking lot behind the building complex. The lot behind the school can be partially de-paved into a lawn area to address the pooling. Pedestrian walkways can be replaced with porous pavement to capture runoff. A rain garden can also be planted at the back of the site to capture roof runoff and serve as an educational opportunity for students. A preliminary soil assessment suggests that 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"
80	79,121	3.8	40.0	363.3	0.062	2.17

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	2,783	0.10	760	\$3,799
Pervious pavements	1.072	179	78,652	2.96	2,400	\$60,000
Rainwater harvesting systems	0.084	14	2,999	0.23	2,999 (gal)	\$5,999

GREEN INFRASTRUCTURE RECOMMENDATIONS



Our Lady of Lourdes School

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



PARKVIEW ELEMENTARY SCHOOL



Subwatershed: Lawrence Brook
Site Area: 229,693 sq. ft.
Address: 80 Violet Terrace
Milltown, NJ 08850
Block and Lot: Block 73, Lot 10.03

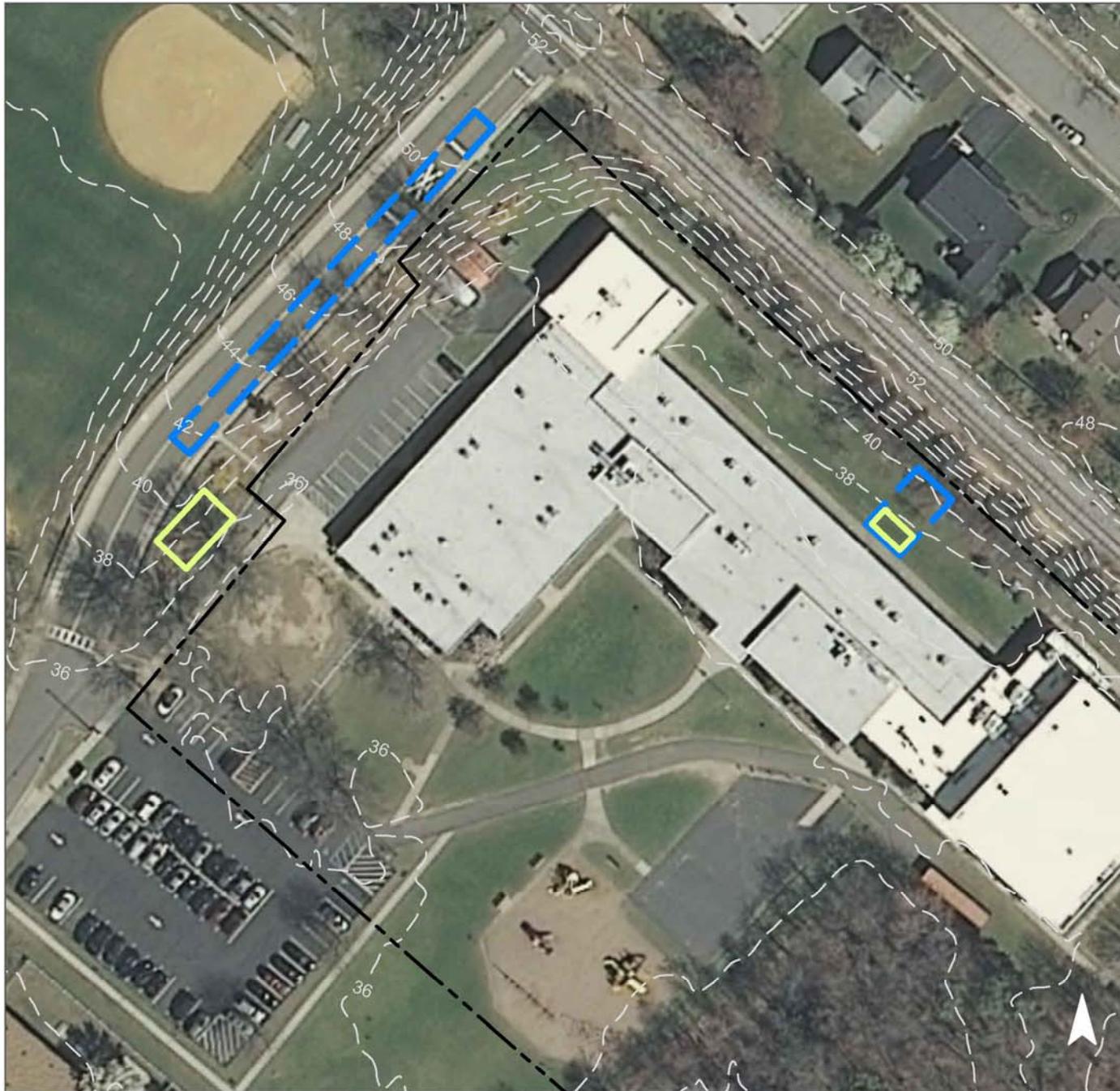


A demonstration rain garden can be installed outside classrooms and adjacent to an existing garden. Road runoff can also be diverted into a terraced rain garden along the main driveway. A preliminary soil assessment suggests that more soil testing would be required before determining soil suitability 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	96,364	4.6	48.7	442.4	0.075	2.64

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	0.076	13	5,543	0.21	950	\$4,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Parkview Elementary School

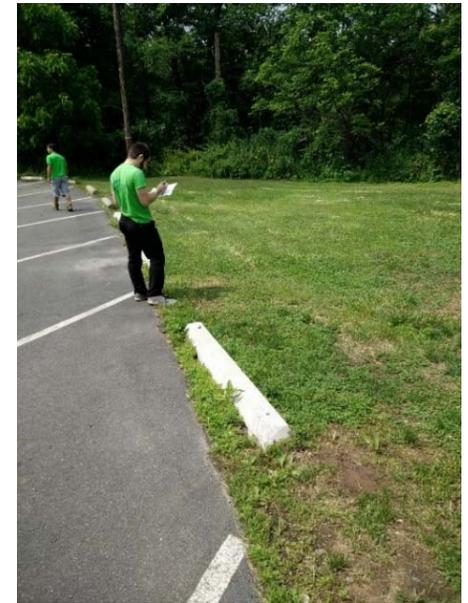
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



RANGERS HALL



Subwatershed: Lawrence Brook
Site Area: 27,010 sq. ft.
Address: 111 Kuhlthau Ave.
Milltown, NJ 08850
Block and Lot: Block 89.04, Lot 7.01

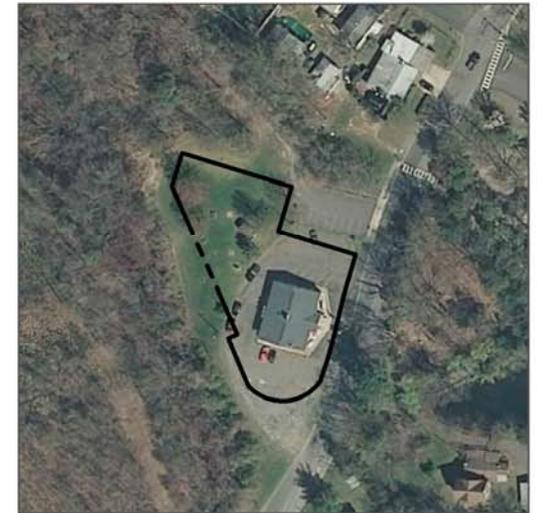
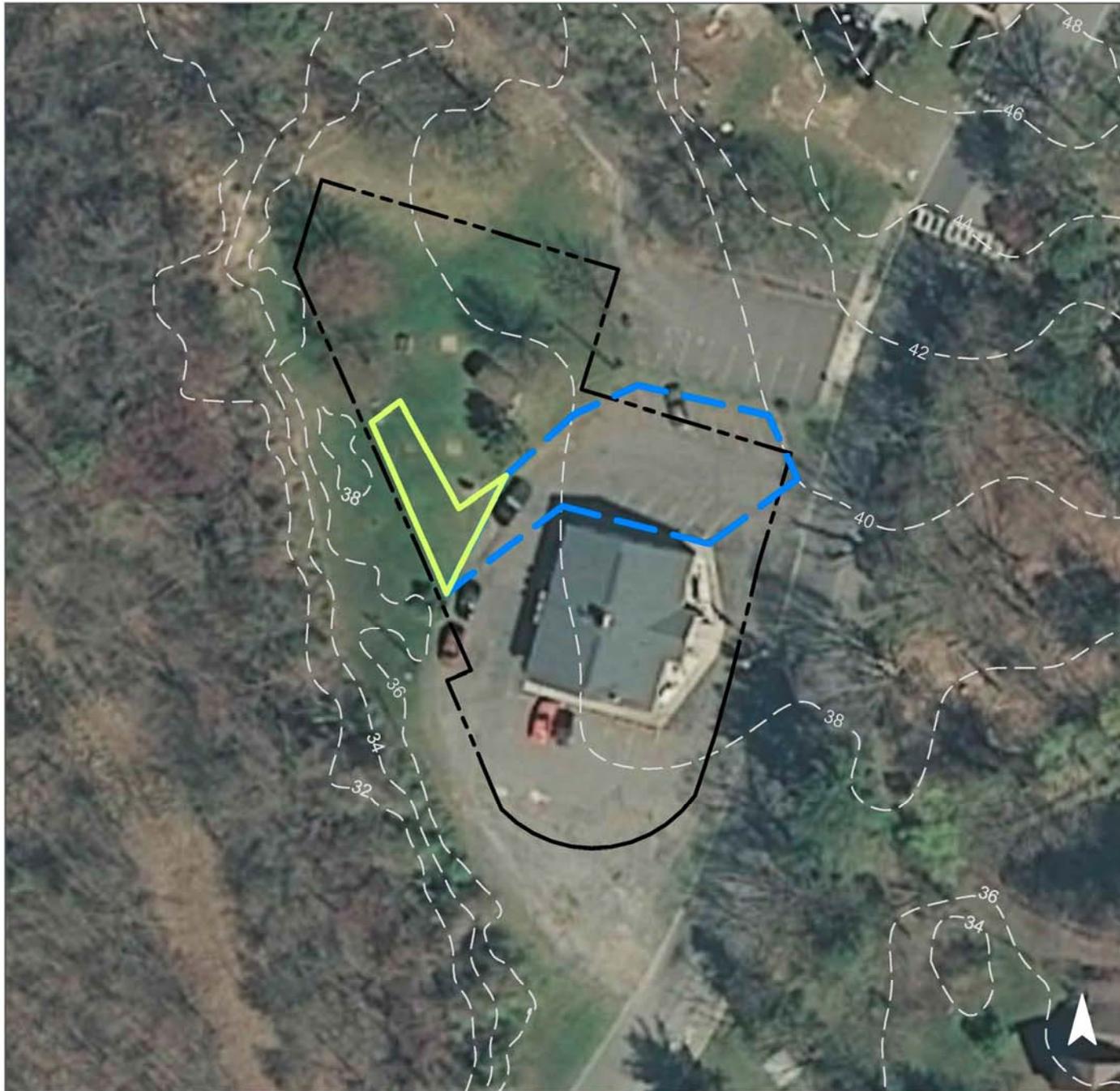


Water from the entire site currently drains into a body of water behind the building. The grass area between the water and the parking lot can be converted into a rain garden to capture and treat this runoff. A preliminary soil assessment suggests that more soil testing would be required before determining soil 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"
55	14,855	0.7	7.5	68.2	0.012	0.41

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	0.129	22	9,470	0.36	1,225	\$6,124

GREEN INFRASTRUCTURE RECOMMENDATIONS



Rangers Hall

-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



ST. PAUL'S CHURCH AND GOOD DAY PRESCHOOL



Subwatershed: Lawrence Brook

Site Area: 67,285 sq. ft.

Address: 7 W Lakewood Ave.
Milltown, NJ 08850

Block and Lot: Block 86, Lot 12



Runoff from the roof of the preschool currently drains onto pavement behind the building. The lawn area at the front can be converted into two rain gardens to capture and infiltrate this roof runoff. Downspouts may be redirected into rain barrels as well to harvest rainwater that could be used to water existing gardens behind the school. A preliminary soil assessment suggests that 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"
82	55,228	2.7	27.9	253.6	0.043	1.51

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	0.068	11	5,019	0.19	741	\$3,705
Pervious pavements	0.206	35	15,132	0.57	1,449	\$36,219
Rainwater harvesting systems	0.005	1	170	0.01	170 (gal)	\$340

GREEN INFRASTRUCTURE RECOMMENDATIONS



St. Paul's Church and Good Day Preschool

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



d. 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			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
					LAWRENCE BROOK SUBWATERSHED	48.26	2,102,380					
American Legion Building and Lot Total Site Info	2.76	120,241	73	1.03	3.8	39.3	357.5	65	1.8	77,863	0.061	2.14
Borough Park Total Site Info	12.11	527,528	73	9.01	8.6	89.6	814.7	34	4.1	177,452	0.138	4.87
Bronson & Guthlein Funeral Home Total Site Info	0.89	38,786	45	11	1.6	16.4	149.3	84	0.7	32,520	0.025	0.89
Brookside Swim Club Total Site Info	2.86	124,417	60	6	3.9	41.0	372.9	65	1.9	81,212	0.063	2.23
Crabiel Home for Funerals Total Site Info	0.66	28,609	43	3	1.2	12.1	110.2	84	0.6	24,001	0.019	0.66
Joyce Kilmer School Total Site Info	5.46	237,933	51	27	5.0	52.6	477.8	44	2.4	104,066	0.081	2.85
Lasting Impressions Total Site Info	4.81	209,359	73	1.04	6.3	66.3	602.7	63	3.0	131,274	0.102	3.60
Middlesex Academy of Dance Total Site Info	0.16	7,011	51	7.04	0.3	3.2	29.0	90	0.1	6,309	0.005	0.17
Millpond Park Total Site Info	1.13	49,224	86	2.01	0.4	4.7	42.5	19	0.2	9,262	0.007	0.25
Milltown Borough Fire Department Total Site Info	0.15	6,439	51	26	0.1	0.7	6.1	21	0.0	1,339	0.001	0.04
Milltown Post Office Total Site Info	0.89	38,979	60	1.02	1.8	18.6	168.8	94	0.8	36,755	0.029	1.01
Milltown Public Library Total Site Info	1.06	46,108	56	12	1.9	20.2	183.4	87	0.9	39,949	0.031	1.10

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
Milltown Rescue Squad Total Site Info	0.71	31,084	86	1.02	1.1	11.9	108.3	76	0.5	23,597	0.018	0.65
Milltown Senior Center Total Site Info	3.89	169,609	73	10.02	3.1	32.2	292.9	38	1.5	63,801	0.050	1.75
Milltown United Methodist Total Site Info	1.01	44,164	32	15	1.9	20.1	182.5	90	0.9	39,747	0.031	1.09
Our Lady of Lourdes School Total Site Info	2.27	98,901	18	1	3.8	40.0	363.3	80	1.8	79,121	0.062	2.17
Parkview Elementary School Total Site Info	5.27	229,693	73	10.03	4.6	48.7	442.4	42	2.2	96,364	0.075	2.64
Rangers Hall Total Site Info	0.62	27,010	89.04	7.01	0.7	7.5	68.2	55	0.3	14,855	0.012	0.41
Saint Paul's Church and Good Day Preschool Total Site Info	1.54	67,285	86	12	2.7	27.9	253.6	82	1.3	55,228	0.043	1.51

e. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
LAWRENCE BROOK SUBWATERSHED	204,578	4.70	5.330	892	380,406	14.73	65,429			\$1,200,589	18.7%
1 American Legion Building and Lot											
Bioretention systems/rain gardens	6,805	0.16	0.177	30	13,008	0.49	1,798	5	SF	\$8,990	8.7%
Total Site Info	6,805	0.16	0.177	30	13,008	0.49	1,798			\$8,990	8.7%
2 Borough Park											
Bioretention systems/rain gardens	3,148	0.07	0.082	14	6,021	0.23	797	5	SF	\$3,987	1.8%
Pervious pavements	10,734	0.25	0.280	47	20,525	0.77	9,258	25	SF	\$231,462	6.0%
Total Site Info	13,882	0.32	0.362	61	26,547	1.00	10,056			\$235,448	7.8%
3 Bronson & Guthlein Funeral Home											
Pervious pavements	6,578	0.15	0.171	29	12,574	0.47	2,232	25	SF	\$55,811	20.2%
Rainwater harvesting systems	635	0.01	0.017	3	500	0.05	500	2	gal	\$1,000	2.0%
Total Site Info	7,213	0.17	0.188	31	13,074	0.52	2,732			\$56,811	22.2%
4 Brookside Swim Club											
Pervious pavements	1,101	0.03	0.029	5	2,102	0.08	1,101	25	SF	\$27,525	1.4%
Total Site Info	1,101	0.03	0.029	5	2,102	0.08	1,101			\$27,525	1.4%
5 Crabiel Home for Funerals											
Bioretention systems/rain gardens	2,344	0.05	0.061	10	4,481	0.17	634	5	SF	\$3,169	9.8%
Pervious pavements	5,838	0.13	0.152	25	11,160	0.42	754	25	SF	\$18,843	24.3%
Total Site Info	8,182	0.19	0.213	36	15,641	0.59	1,388			\$22,012	34.1%
6 Joyce Kilmer School											
Bioretention systems/rain gardens	3,187	0.07	0.083	14	6,096	0.23	917	5	SF	\$4,587	3.1%
Pervious pavements	12,368	0.28	0.322	54	23,644	0.89	12,368	25	SF	\$309,200	11.9%
Total Site Info	15,555	0.36	0.405	68	29,740	1.12	13,285			\$313,787	14.9%
7 Lasting Impressions											
Bioretention systems/rain gardens	11,738	0.27	0.306	51	22,440	0.84	2,890	5	SF	\$14,448	8.9%
Pervious pavements	18,300	0.42	0.477	80	34,984	1.32	3,278	25	SF	\$81,938	13.9%
Total Site Info	30,038	0.69	0.783	131	57,424	2.16	6,167			\$96,386	22.9%
8 Middlesex Academy of Dance											
Pervious pavements	3,009	0.07	0.078	13	5,752	0.22	834	25	SF	\$20,841	47.7%
Total Site Info	3,009	0.07	0.078	13	5,752	0.22	834			\$20,841	47.7%

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
9 Millpond Park											
Bioretention systems/rain gardens	8,858	0.20	0.231	39	16,935	0.64	2,824	5	SF	\$14,120	95.6%
Total Site Info	8,858	0.20	0.231	39	16,935	0.64	2,824			\$14,120	95.6%
10 Milltown Borough Fire Department											
Rainwater harvesting systems	642	0.01	0.017	3	500	0.05	500	2	gal	\$1,000	48.0%
Total Site Info	642	0.01	0.017	3	500	0.05	500			\$1,000	48.0%
11 Milltown Post Office											
Pervious pavements	7,442	0.17	0.194	32	14,227	0.53	1,853	25	SF	\$46,320	20.2%
Rainwater harvesting systems	2,526	0.06	0.066	11	2,362	0.18	2,362	2	gal	\$4,724	6.9%
Total Site Info	9,968	0.23	0.260	43	16,589	0.71	1,853			\$50,320	27.1%
12 Milltown Public Library											
Pervious pavements	1,210	0.03	0.032	5	2,311	0.09	366	25	SF	\$9,150	3.0%
Rainwater harvesting systems	2,083	0.05	0.054	9	1,948	0.15	1,948	2	gal	\$3,895	5.2%
Total Site Info	3,293	0.08	0.086	14	4,259	0.24	2,314			\$13,045	8.2%
13 Milltown Rescue Squad											
Pervious pavements	4,362	0.10	0.114	19	8,340	0.31	775	25	SF	\$19,369	18.5%
Rainwater harvesting systems	1,284	0.03	0.033	6	1,000	0.09	1,000	2	gal	\$2,000	5.4%
Total Site Info	5,646	0.13	0.147	25	9,340	0.40	1,775			\$21,369	23.9%
14 Milltown Senior Center											
Bioretention systems/rain gardens	1,194	0.03	0.031	5	2,281	0.09	306	5	SF	\$1,530	1.9%
Pervious pavements	3,848	0.09	0.100	17	7,360	0.28	3,848	25	SF	\$96,200	6.0%
Total Site Info	5,042	0.12	0.131	22	9,642	0.37	4,154			\$97,730	7.9%
15 Milltown United Methodist											
Bioretention systems/rain gardens	517	0.01	0.013	2	987	0.04	142	5	SF	\$710	1.3%
Pervious pavements	20,452	0.47	0.533	89	39,098	1.47	3,982	25	SF	\$99,559	51.5%
Total Site Info	20,969	0.48	0.546	91	40,085	1.51	4,124			\$100,269	52.8%
16 Our Lady of Lourdes School											
Bioretention systems/rain gardens	1,457	0.03	0.038	6	2,783	0.10	760	5	SF	\$3,799	1.8%
Pervious pavements	41,138	0.94	1.072	179	78,652	2.96	2,400	25	SF	\$60,000	52.0%
Rainwater harvesting systems	3,208	0.07	0.084	14	3,000	0.23	3,000	2	gal	\$6,000	4.1%
Total Site Info	45,803	1.05	1.193	200	84,435	3.29	6,160			\$69,799	57.9%

Summary of Proposed Green Infrastructure Practices

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
17 Parkview Elementary School											
Bioretention systems/rain gardens	2,900	0.07	0.076	13	5,543	0.21	950	5	SF	\$4,750	3.0%
Total Site Info	2,900	0.07	0.076	13	5,543	0.21	950			\$4,750	3.0%
18 Rangers Hall											
Bioretention systems/rain gardens	4,954	0.11	0.129	22	9,470	0.36	1,225	5	SF	\$6,124	33.3%
Total Site Info	4,954	0.11	0.129	22	9,470	0.36	1,225			\$6,124	33.3%
19 St. Paul's Church and Good Day Preschool											
Bioretention systems/rain gardens	2,627	0.06	0.068	11	5,019	0.19	741	5	SF	\$3,705	4.8%
Pervious pavements	7,916	0.18	0.206	35	15,132	0.57	1,449	25	SF	\$36,219	14.3%
Rainwater harvesting systems	177	0.00	0.005	1	170	0.01	170	2	gal	\$340	0.3%
Total Site Info	10,720	0.25	0.279	47	20,321	0.77	2,190			\$40,264	19.4%