Hammonton Creek and Hammonton Lake Watershed Restoration and Protection Plan

March 13, 2024 at 7 pm

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Rutgers Cooperative Extension

Rutgers Cooperative Extension (RCE) helps the diverse population of New Jersey adapt to a rapidly changing society and improves their lives through an educational process that uses science-based knowledge.

Water Resources Program

Our mission is to identify and address water resources issues by engaging and empowering communities to employ practical science-based solutions to help create a more equitable and sustainable New Jersey.

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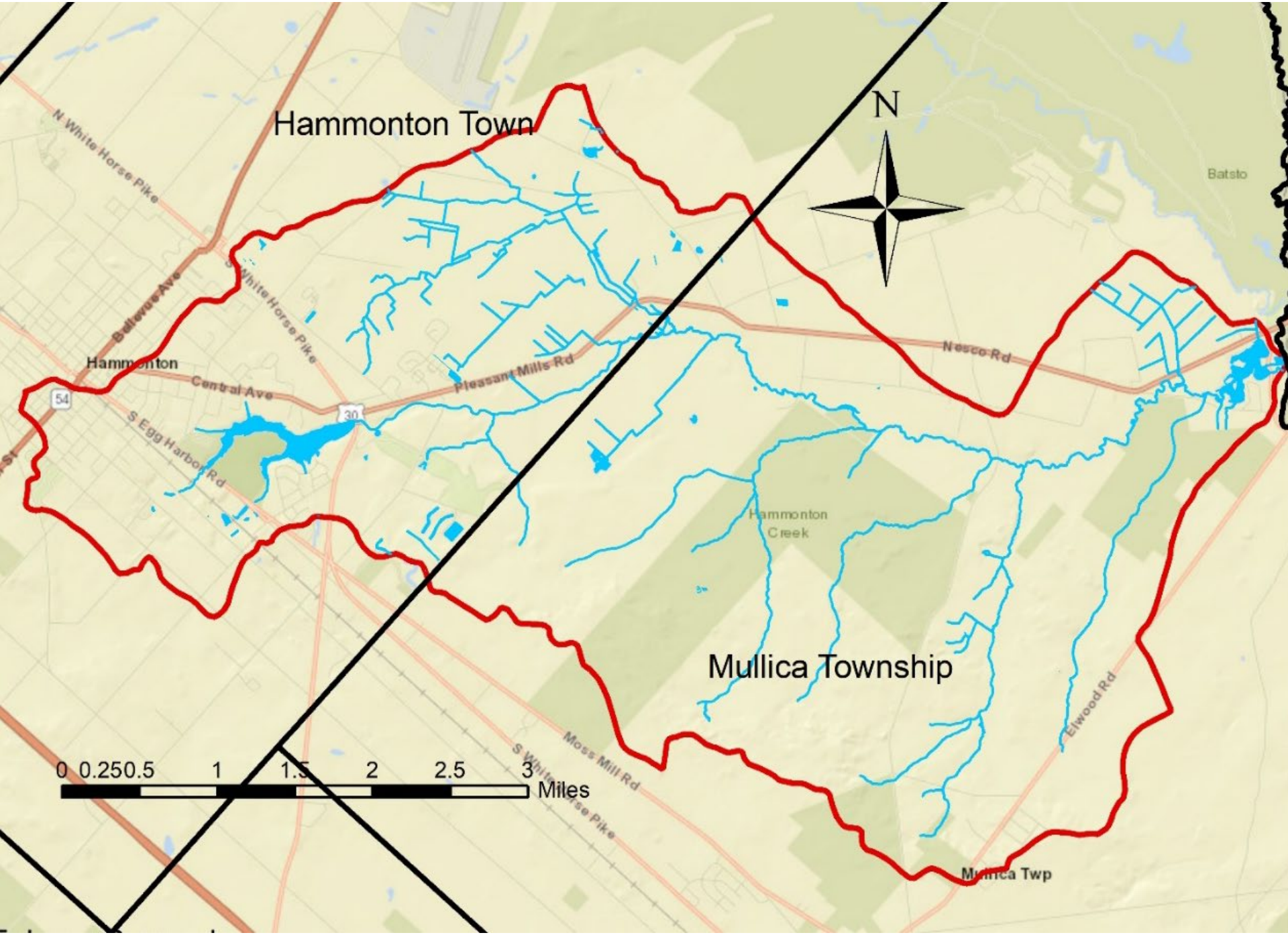
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Bellevue Ave
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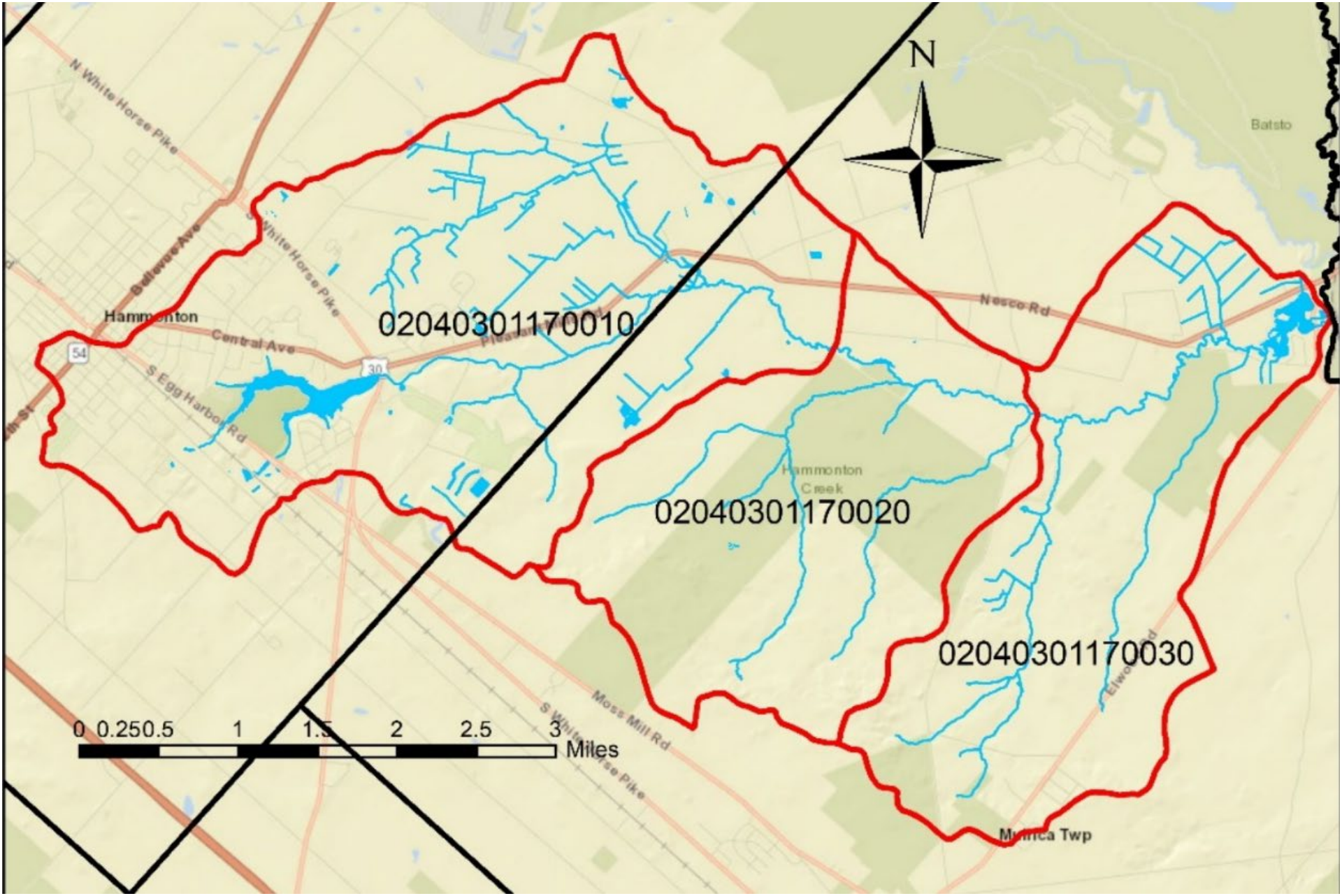
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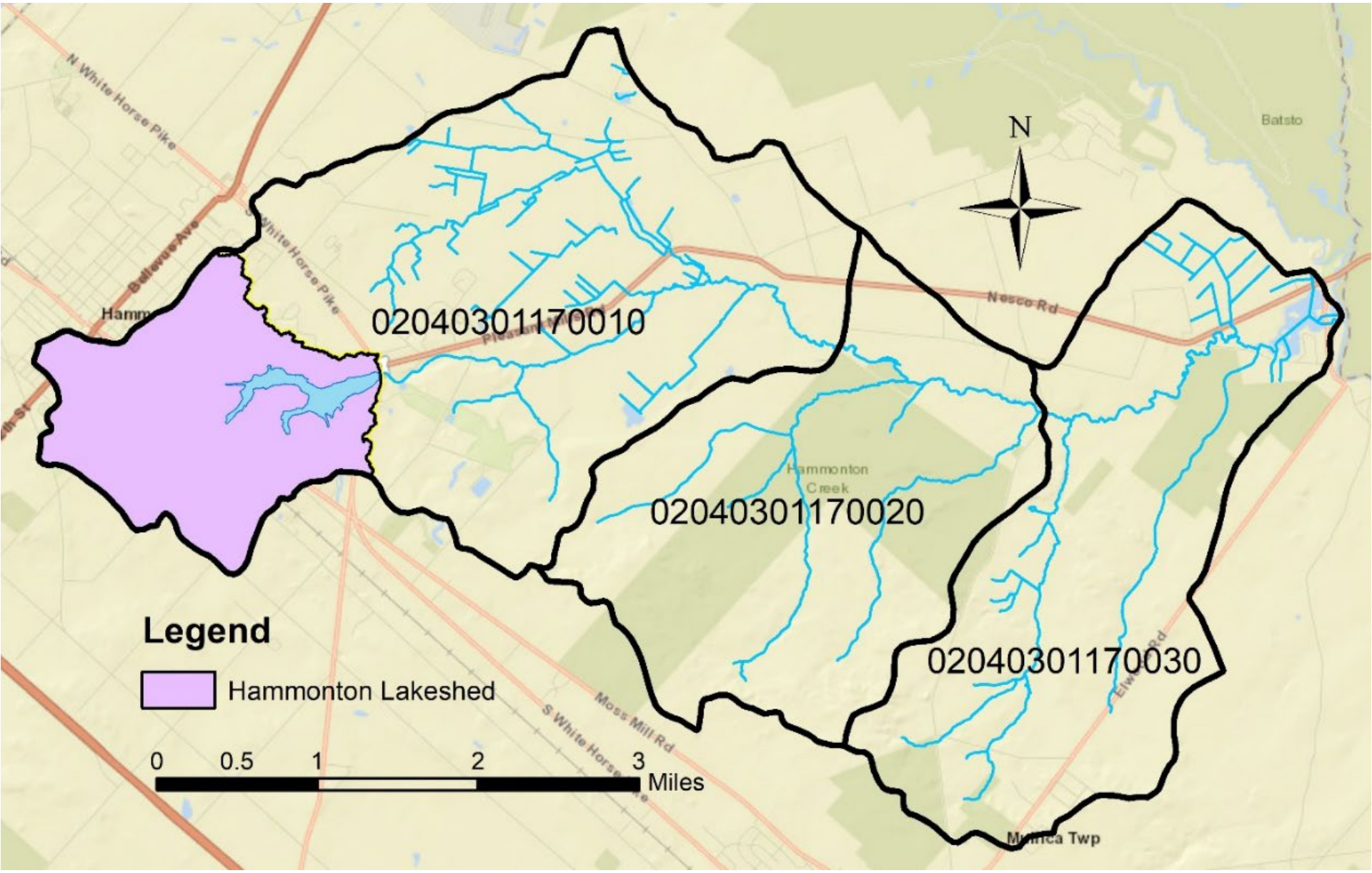
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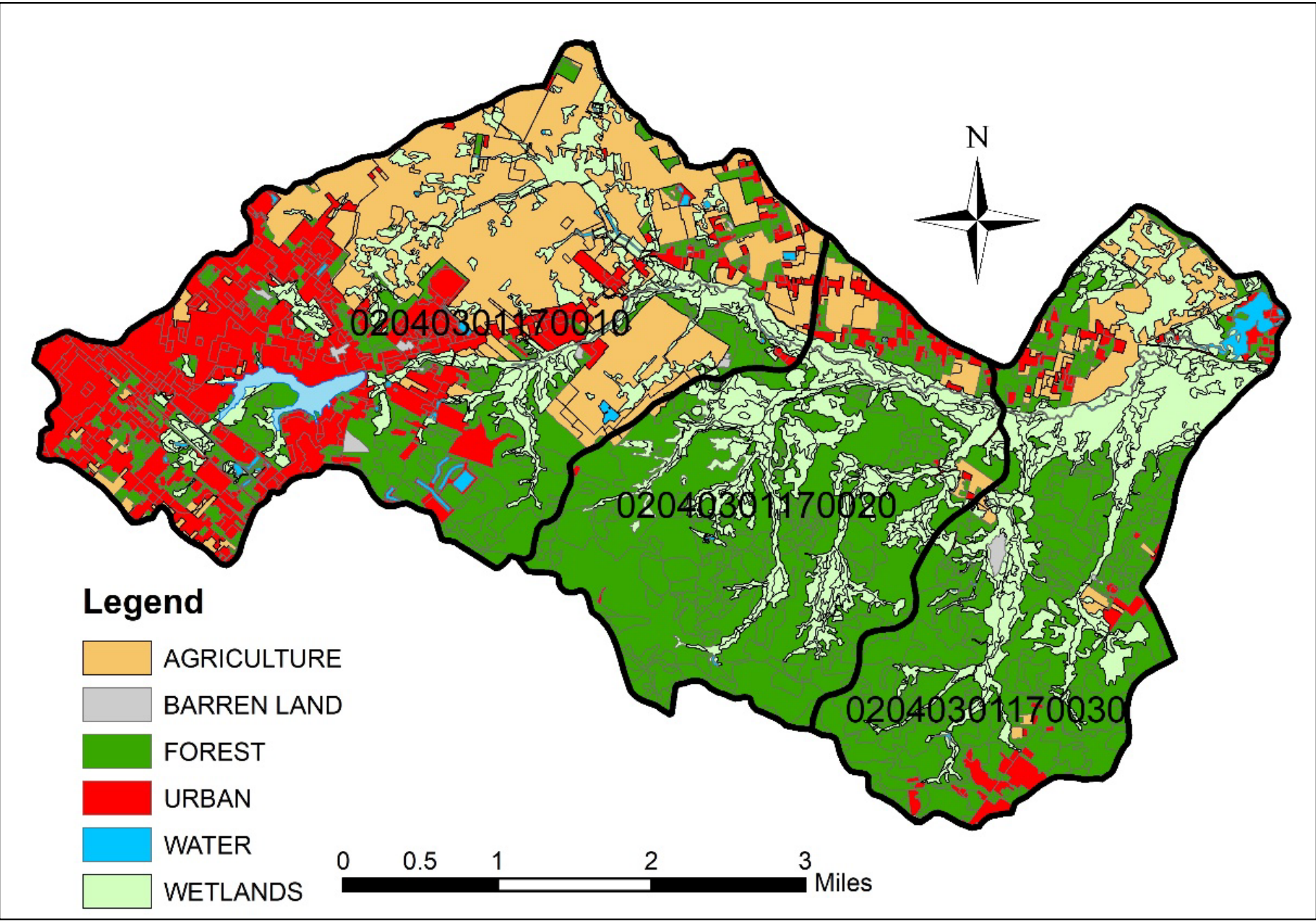
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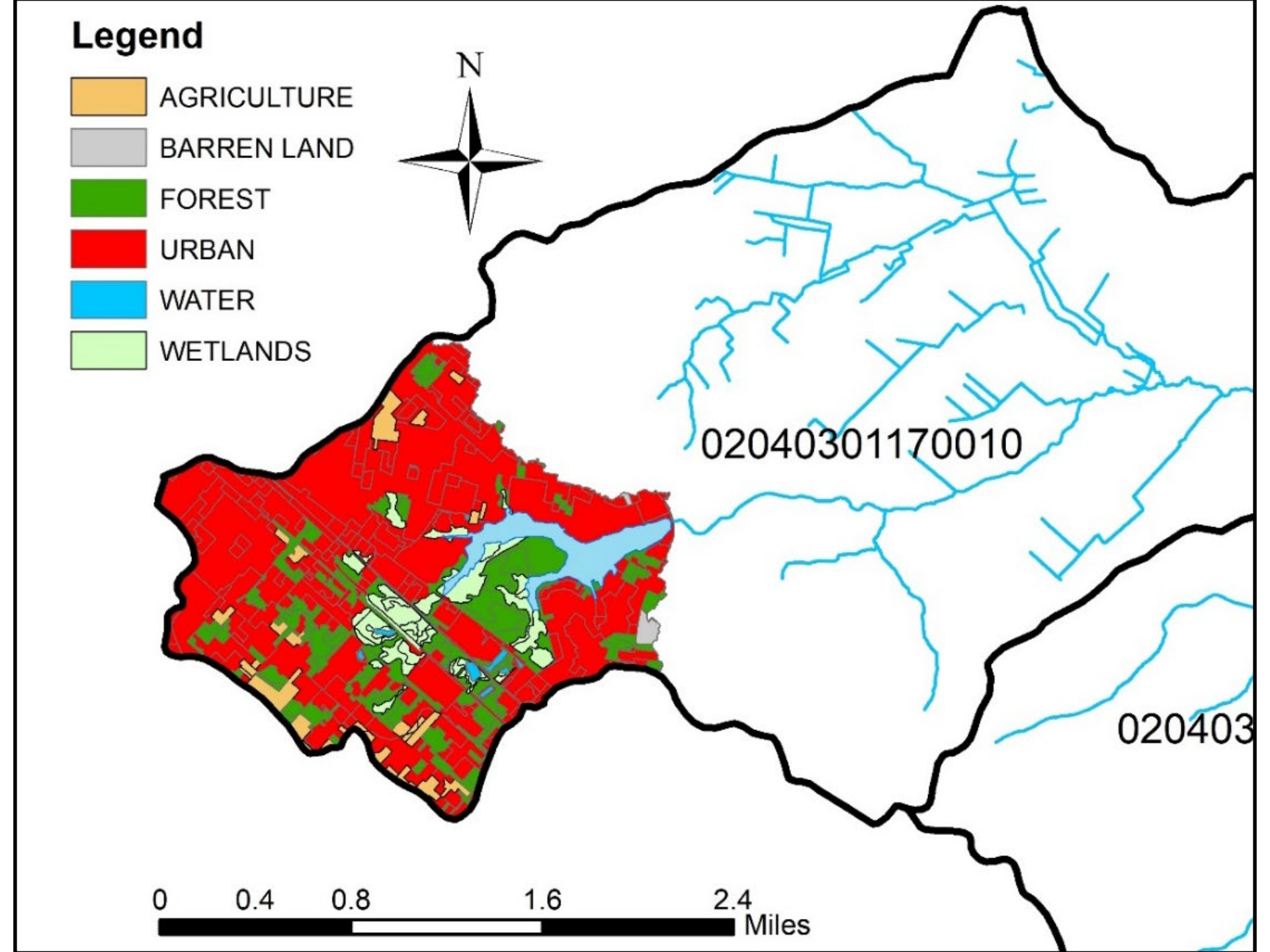
	Percentage (%)		
Land Use	HUC14		
	02040301170010	02040301170020	02040301170030
Agriculture	33.1%	3.8%	8.0%
Barren Land	0.5%	0.0%	0.4%
Forest	19.7%	65.8%	53.3%
Urban	29.1%	3.1%	5.5%
Water	2.3%	0.3%	1.5%
Wetlands	15.3%	26.9%	31.3%
Total:	100%	100%	100%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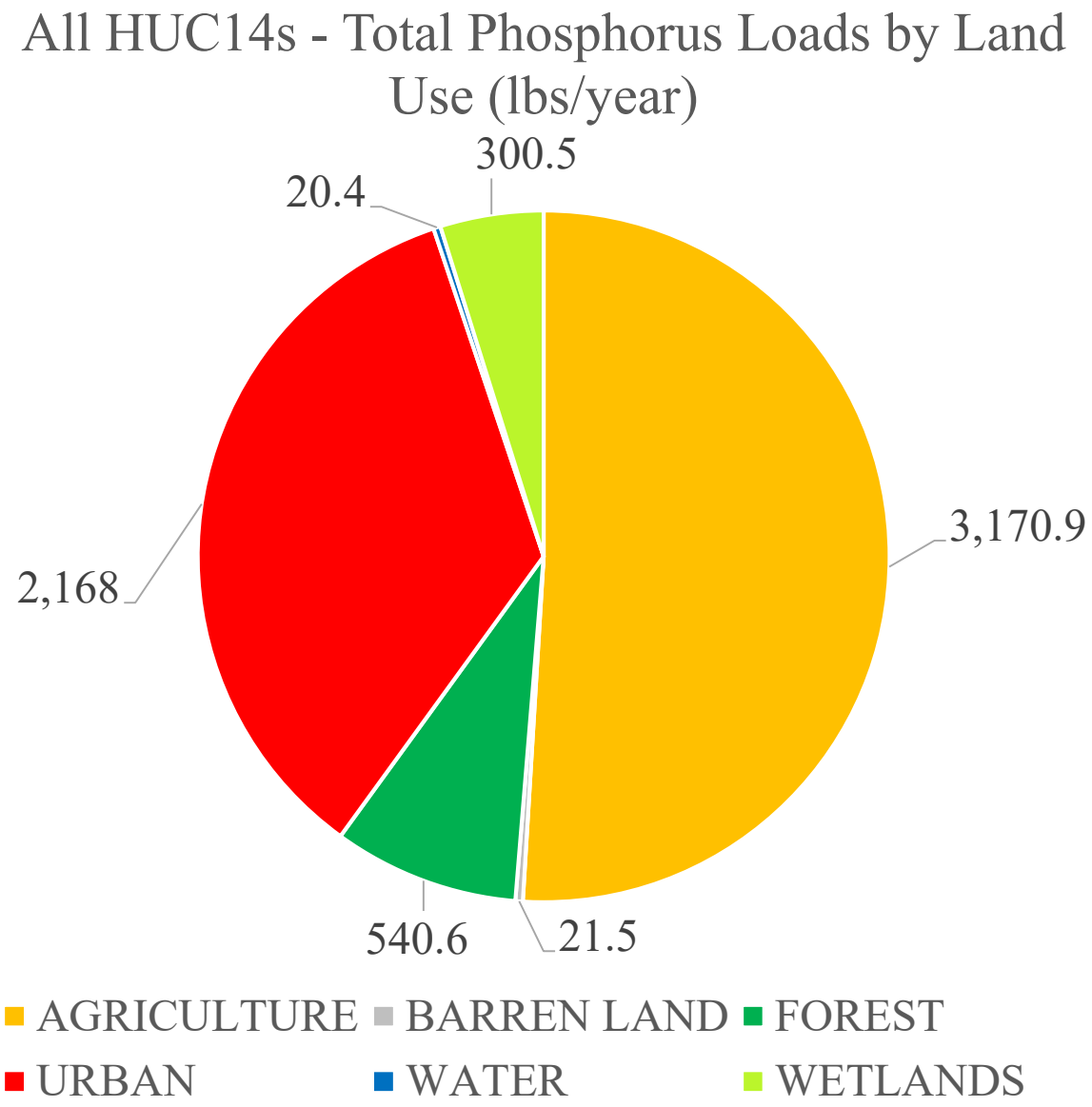
2.4
Miles

Land Use	Hammonton Lakeshed	
	(Acres)	(%)
Agriculture	70.4	4.6%
Barren Land	7.1	0.5%
Forest	270.3	17.7%
Urban	1,002.8	65.6%
Water	79.7	5.2%
Wetlands	98.3	6.4%
Total:	1,528.5	100.0%

Land Cover	Total phosphorus (TP) load (lbs/acre/yr)	Total nitrogen (TN) load (lbs/acre/yr)	Total suspended solids (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

General Land Use Category	Area (acres)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
Agriculture	2,439	3,171	24,392	731,752
Barren Land	43.1	21.5	215.3	2,584
Forest	5,406	540.6	16,218	216,243
Urban	2,081	2,168	21,568	267,564
Water	204.5	20.4	613.4	8,179
Wetlands	3,005	301	9,014	120,189
Totals =	13,1789	6,222	72,021	1,346,510


All HUC14s - Total Phosphorus Loads by Land Use (lbs/year)
300.5
20.4
3,170.9
2,168
540.6
21.5
AGRICULTURE
BARREN LAND
FOREST
URBAN
WATER
WETLANDS

Storm	Existing Rainfall 2020 (inches)	Climate Change Conditions 2100 (inches)	Total Existing Rainfall Runoff Volume (Acre-Feet)	Total Climate Change Runoff Volume (Acre-Feet)
2-Year	3.34	4.04	1,066	1,408
10-Year	5.26	6.40	2,093	2,814
100-Year	9.17	12.37	4,787	7,344

	HUC 020403011 …			
Class	70010 Area (acres)	70020 Area (acres)	70030 Area (acres)	Lakeshed
Building	154.4	5.2	9.6	101.7
Other	366.9	25.7	29.4	201.0
Road	242.6	10.2	43.8	131.2
TOTAL	763.9	41.1	82.8	434.0
% Impervious cover	12.54%	1.20%	2.25%	28.38%

Class	Hammonton Town Area (acres)	Mullica Township Area (acres)	Total (acres)
Building	149.3	19.8	169.1
Other	343.5	78.5	422.1
Road	227.1	69.5	296.6
TOTAL	720.0	167.8	887.8
% Impervious cover by municipality	14.8%	2.0%	6.74%

Enhanced Leaf Collection

Street Sweeping

Stormwater Basin Evaluation

- 34 basins were identified in study area
- 20 of these were in the Hammonton Lakeshed
- 14 basins were wet pond or retention basins
- 14 basins were infiltration basins
- 3 basins were naturalized and acting like bioretention basins
- 3 remaining basins were detention basins that could be naturalized and converted to bioretention basins
- 3 basins to be naturalized are in the Hammonton Lakeshed

Basin ID	Project Name	Project Address	Basin Type	Township
115505	Walden Commons	326 & 340 11th Street	Detention	Hammonton
104884	Woodbridge	40 Magnolia Court	Detention	Hammonton
106071	Augusta Professional Center	85 White Horse Pike	Detention	Hammonton

Project Name	Basin Type	Land Use	Drain-age Area (acres)	TP Load (lb/ac/ yr)	TP Load (lb/yr)	Reduction (%)	TP Load Reduction (lb/yr)
Walden Commons	Detention	Residential	2.04	1.4	2.85	0.2	0.57
Woodbridge	Detention	Residential	23.98	1.4	33.57	0.2	6.71
Augusta Professional Center	Detention	Commercial	16.64	2.1	34.94	0.2	6.99

Naturalize these three basins and increase TP reduction by 28.6 lbs/yr.

Evaluating Green Infrastructure Retrofit Opportunities

- 23 sites were identified as possibilities
- 18 sites could be retrofitted with green infrastructure
- Three green infrastructure practices were considered
  - Rain gardens
  - Porous pavement
  - Rainwater harvesting systems
- If all were implemented, TP would be reduced by 7.25 lbs/yr

Green Infrastructure

…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 treat runoff as a resource.

Green Infrastructure Practices

Bioretention Systems

- Rain Gardens
- Bioswales
- Stormwater Planters
- Curb Extensions
- Tree Filter Boxes

Permeable Pavements

Rainwater Harvesting

- Rain Barrels
- Cisterns

Dry Wells

Rooftop Systems

- Green Roofs
- Blue Roofs



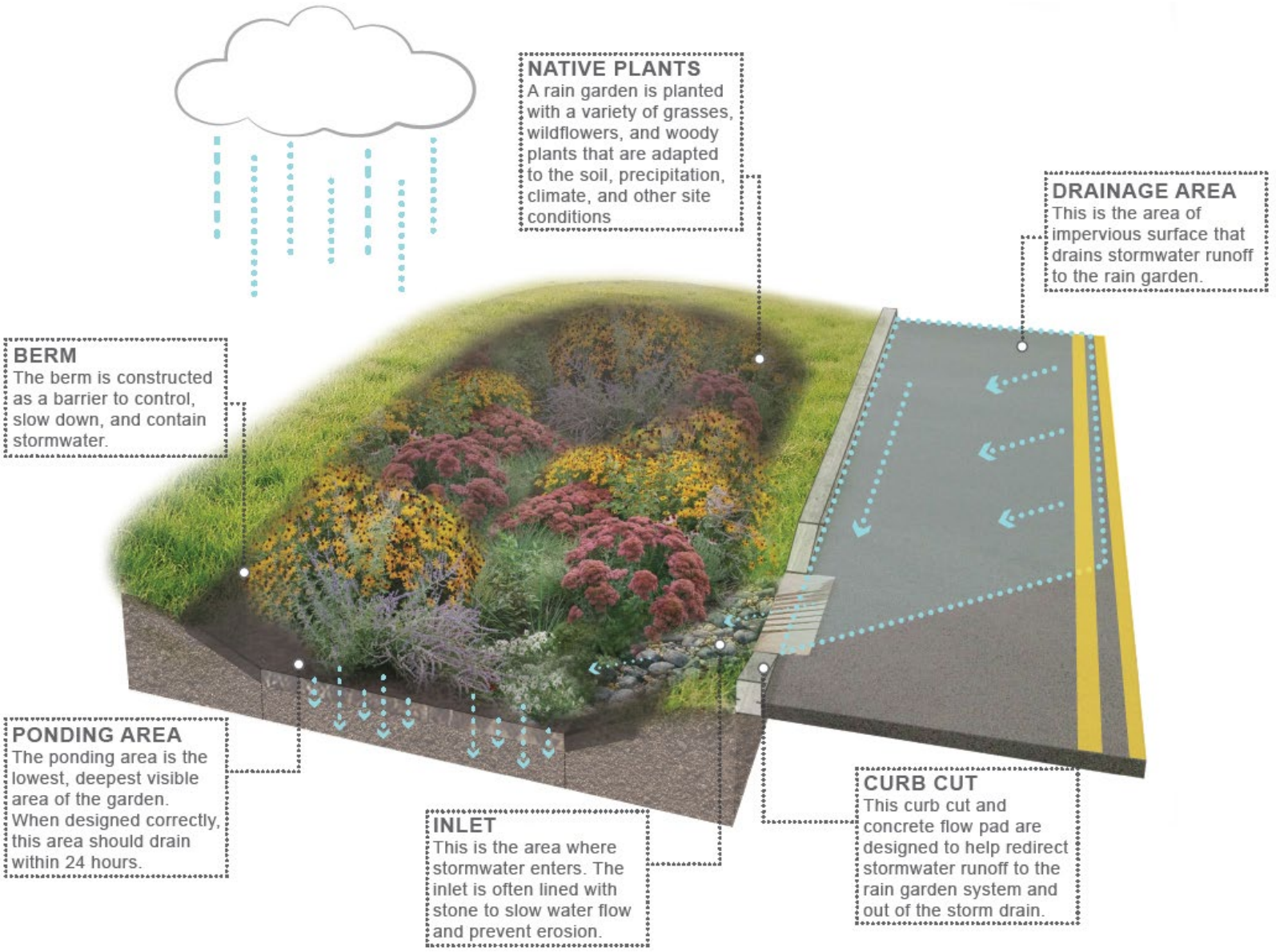






Parker Urban Greenscapes. 2009.

Rain Gardens

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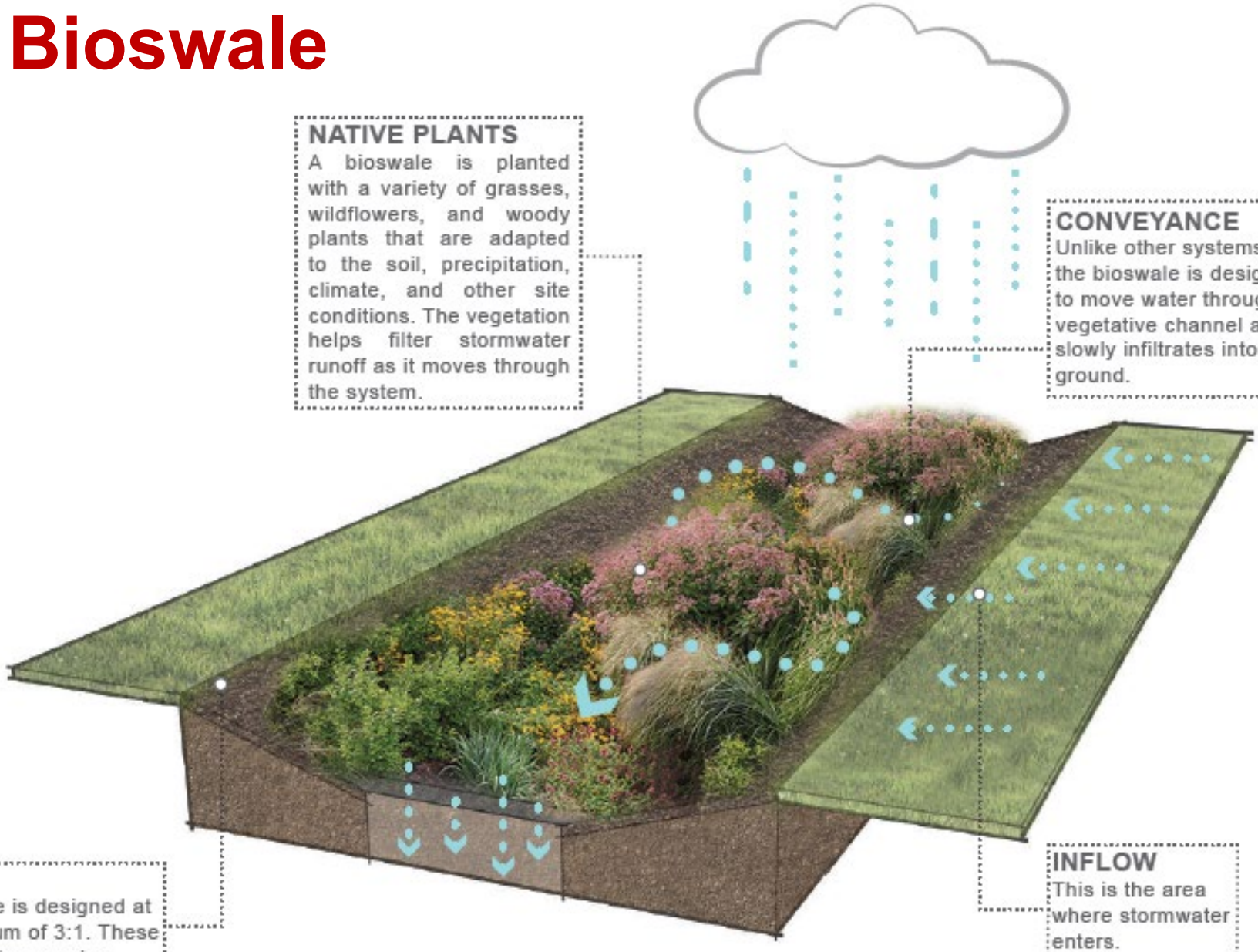
Lots of Rain Gardens


116

Bioswale



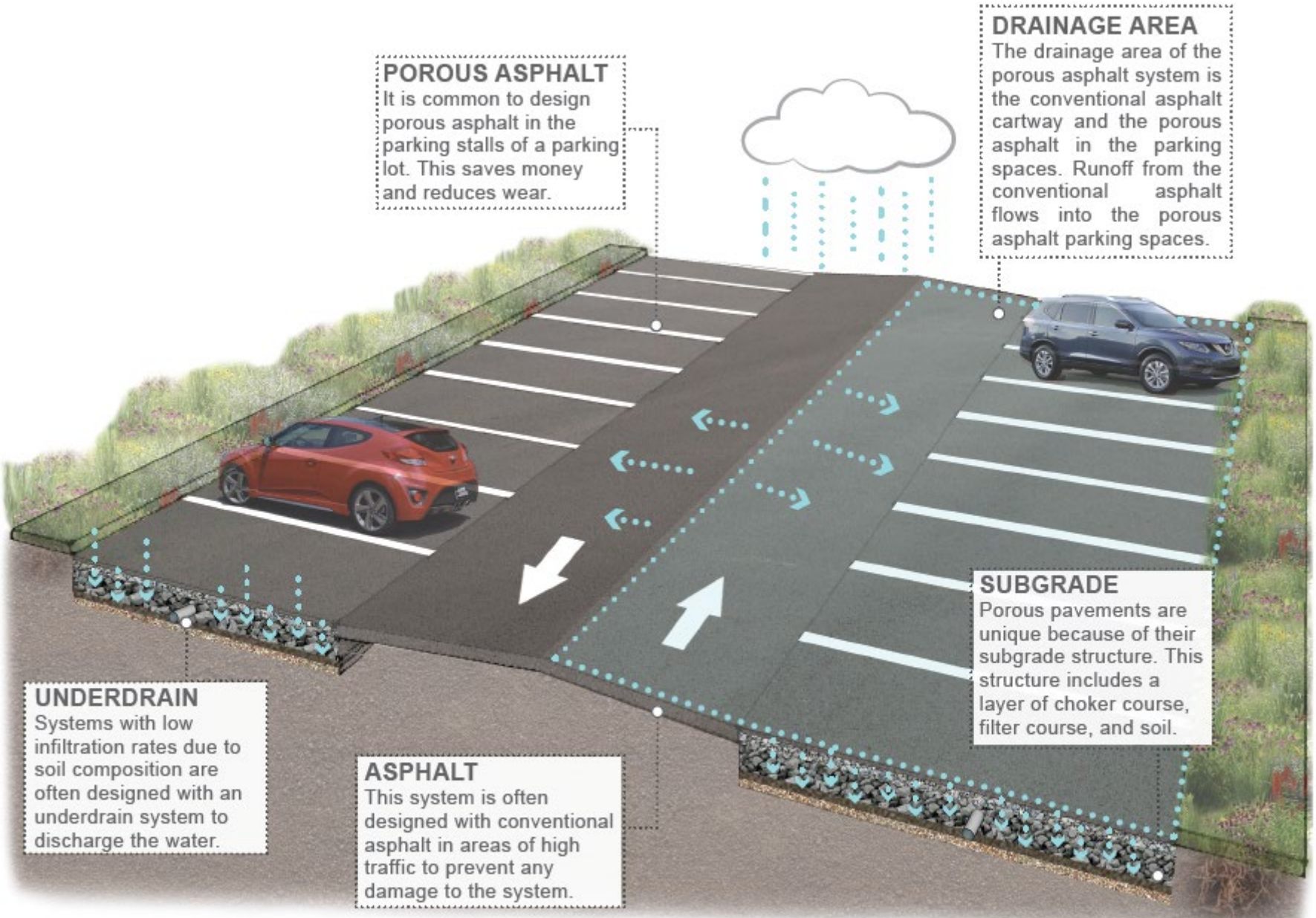
NATIVE PLANTS
A bioswale is planted with a variety of grasses, wildflowers, and woody plants that are adapted to the soil, precipitation, climate, and other site conditions. The vegetation helps filter stormwater runoff as it moves through the system.

CONVEYANCE
Unlike other systems, the bioswale is designed to move water through a vegetative channel as it slowly infiltrates into the ground.

SLOPE
The slope is designed at a maximum of 3:1. These slopes often require erosion control materials for stabilization.

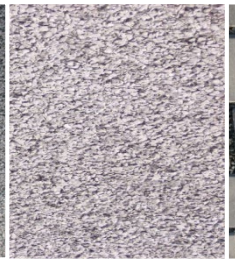
INFLOW
This is the area where stormwater enters.

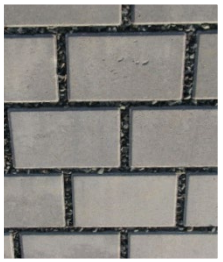
Permeable Pavement



Permeable Pavements

- Underlying stone reservoir
- Porous asphalt and pervious concrete are manufactured without "fine" materials to allow infiltration
- Grass pavers are concrete interlocking blocks with open areas to allow grass to grow
- Permeable paver systems are concrete pavers with infiltration between the spaces of the pavers
- Ideal application for porous pavement is to treat a low traffic or overflow parking

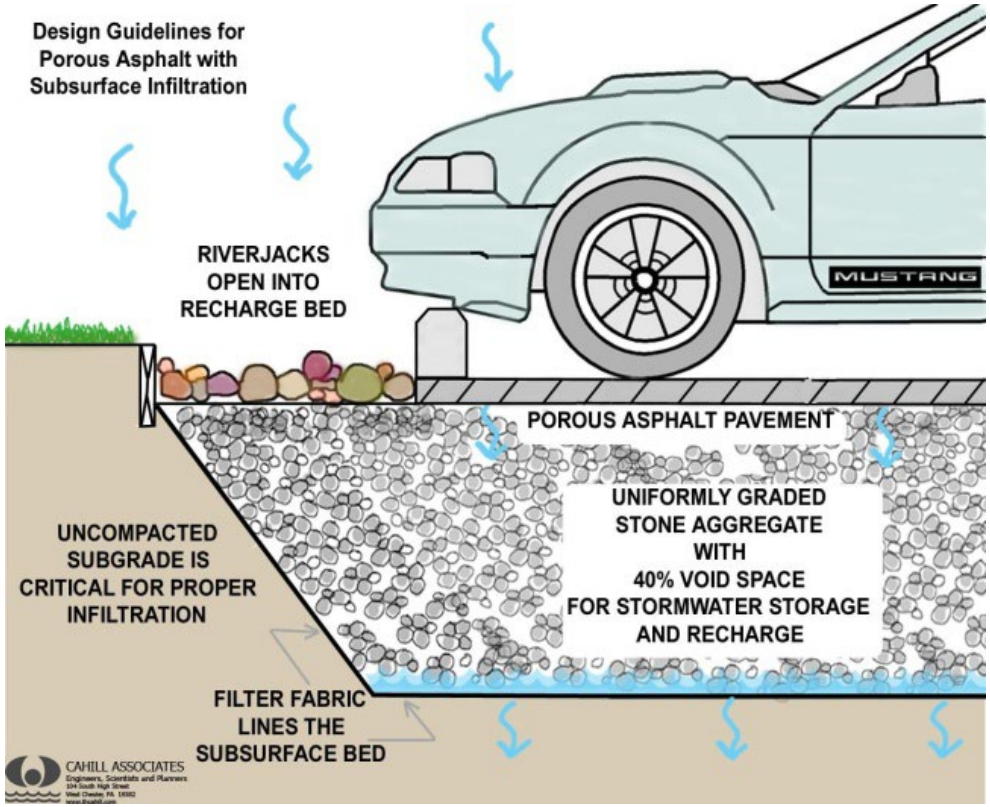




ADVANTAGES

- Manage stormwater runoff
- Minimize site disturbance
- Promote groundwater recharge
- Low life cycle costs, alternative to costly traditional stormwater management methods
- Mitigation of urban heat island effect
- Contaminant removal as water moves through layers of system

COMPONENTS



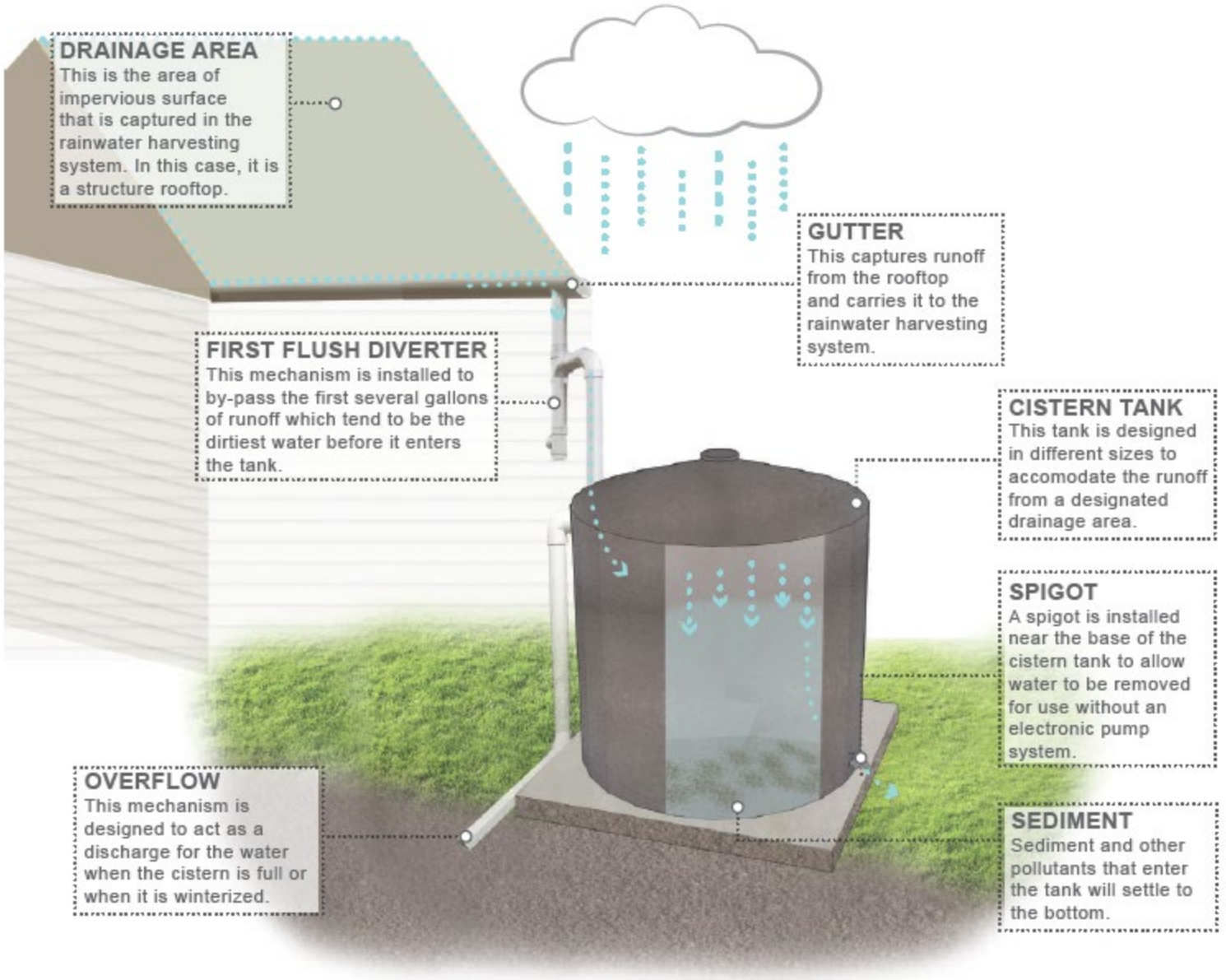
Porous Asphalt


Pervious Concrete


Permeable Pavers

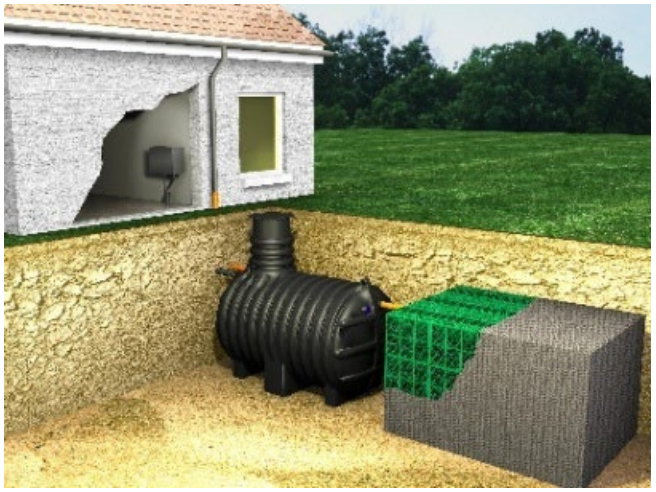

Grass Pavers

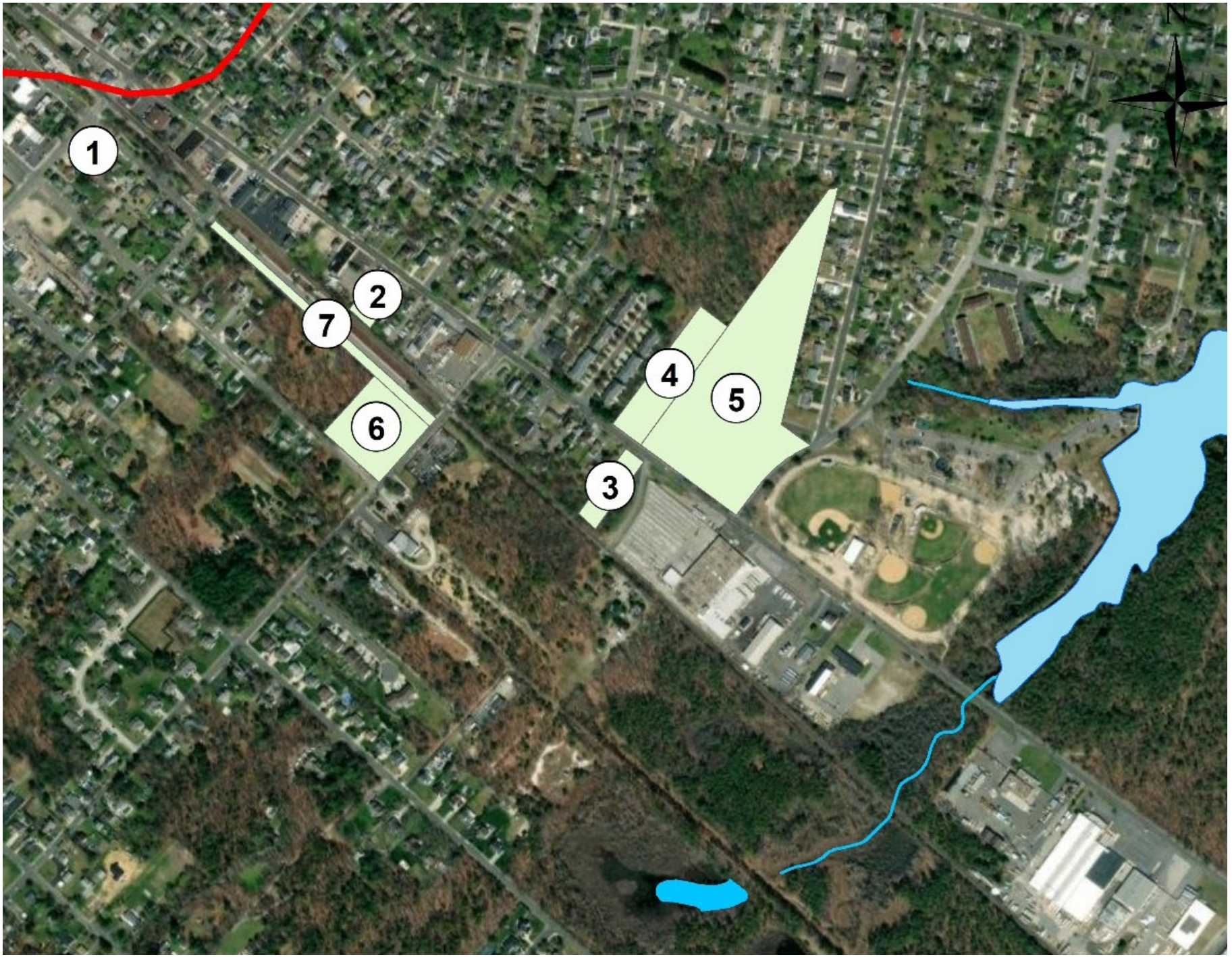
Rainwater Harvesting Systems



Rain Barrels

Cisterns

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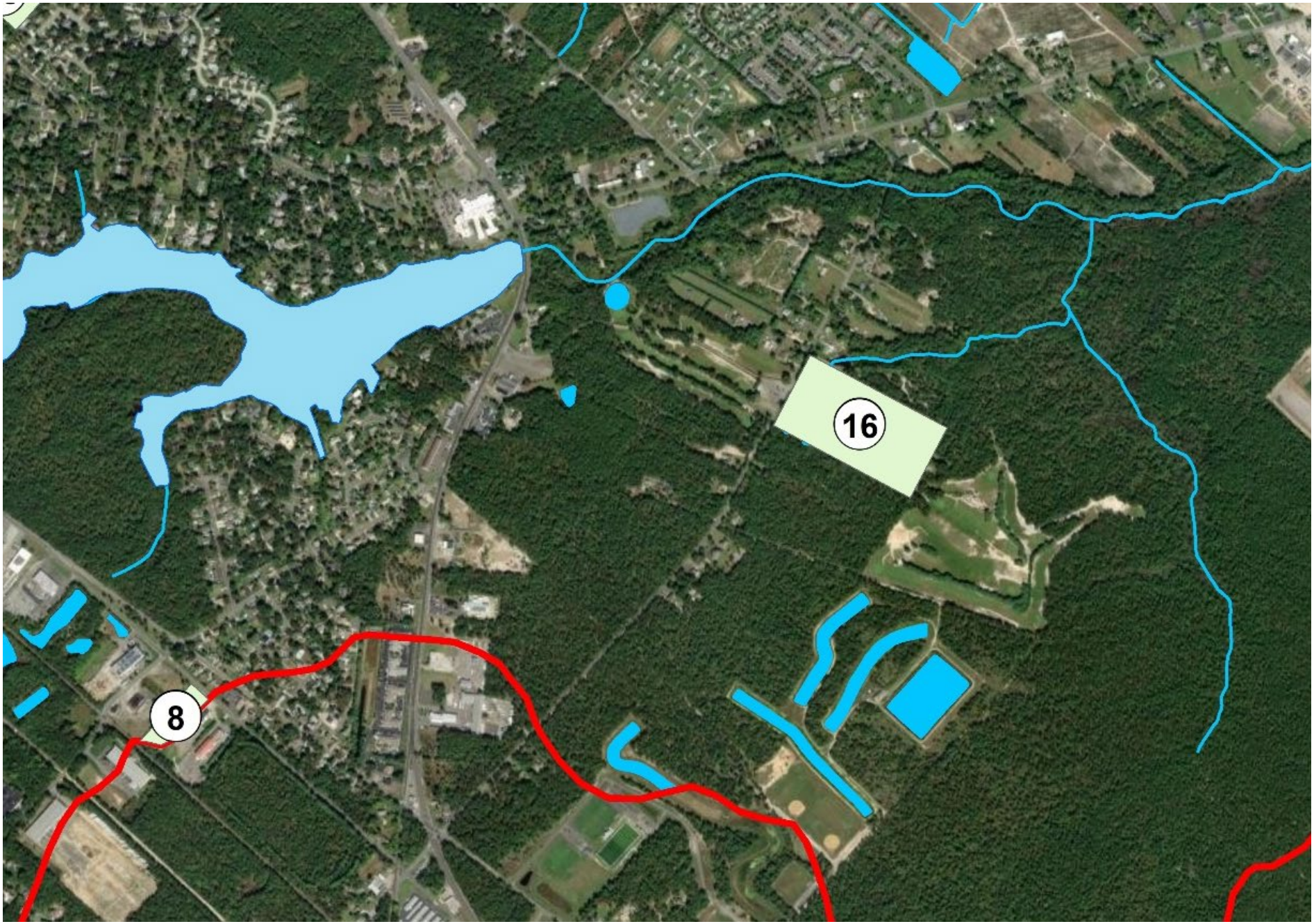
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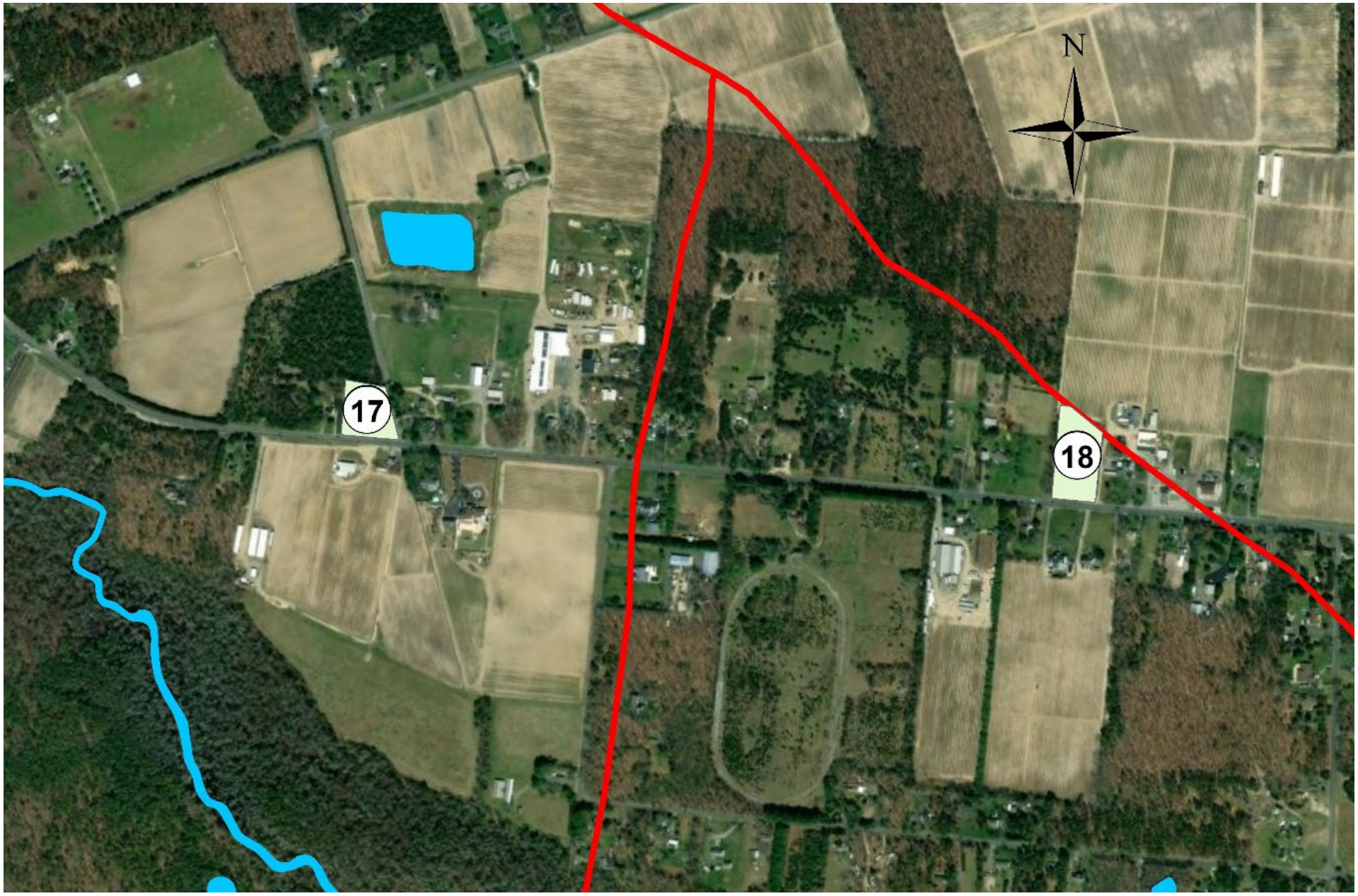
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Hammonton Volunteer Fire Company #1

Site Area:	**28,560 sq. ft.**
Address:	**108 Front Street** **Hammonton, NJ**
Block and Lot:	**Block 2527** **Lot 1 and 2**

Veterans of Foreign Wars

Site Area:	**40,805 sq. ft.**
Address:	**390 South Egg Harbor Road Hammonton, NJ**
Block and Lot:	**Block 2902 Lot 9 and 10**

Disabled American Veterans

Site Area:	**54,895 sq. ft.**
Address:	**446 South Egg Harbor Road Hammonton, NJ**
Block and Lot:	**Block 3701 Lot 12 and 13**

Hammonton Branch Library (Atlantic County Library System)

Site Area:	**93,895 sq. ft.**
Address:	**451 South Egg Harbor Road Hammonton, NJ**
Block and Lot:	**Block 3001 Lot 41.01**

Kathedral Event Center

Site Area:	**470,625 sq. ft.**
Address:	**499 South Egg Harbor Road Hammonton, NJ**
Block and Lot:	**Block 3001 Lots 40 and 41**

Hammonton Community Garden

Site Area:	**105,695 sq. ft.**
Address:	**Washington Street & 11th Street Hammonton, NJ**
Block and Lot:	**Block 2608 Lot 1**

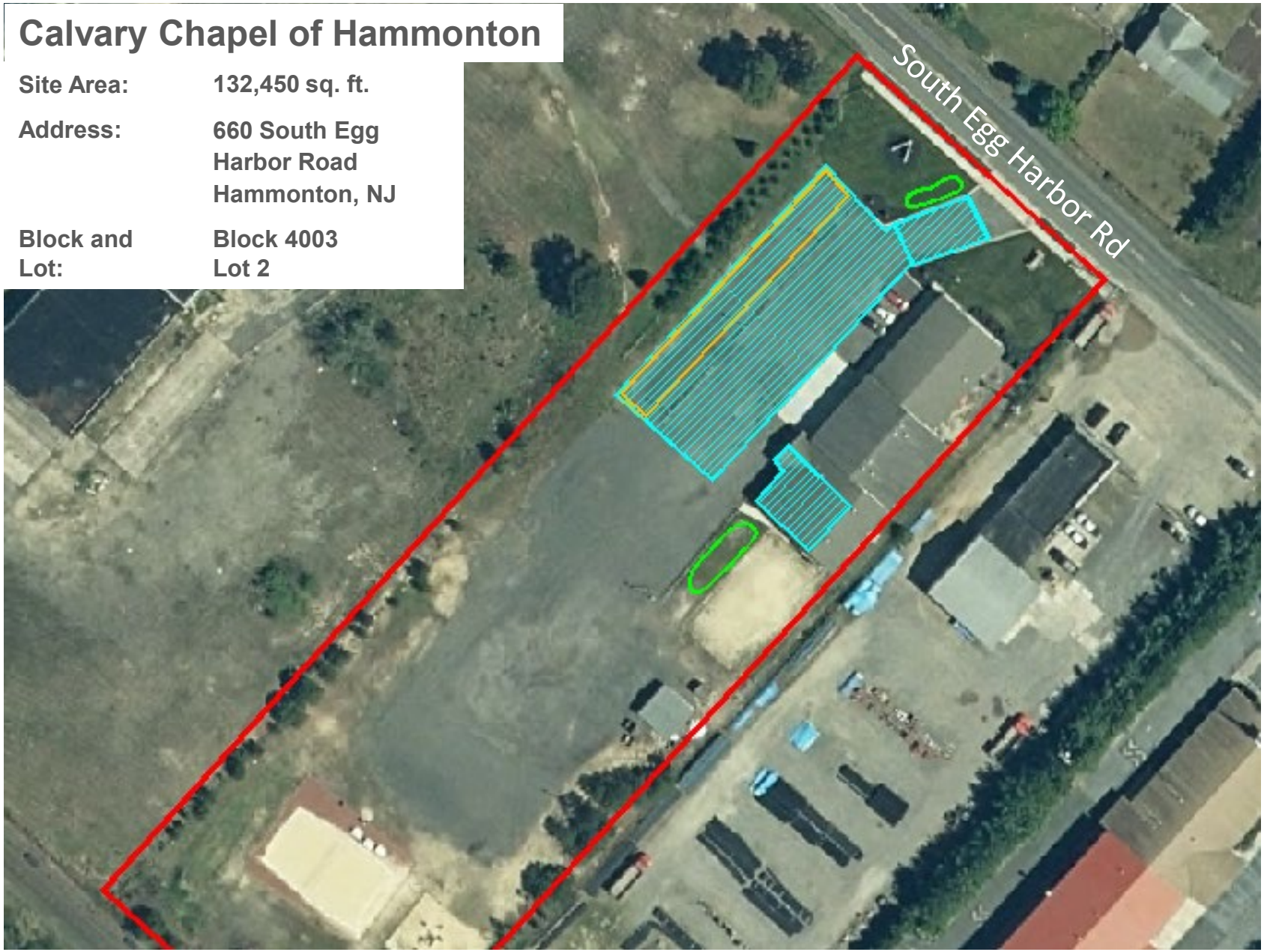
NJ Transit Parking Lot

Site Area:	**80,000 sq. ft.**
Address:	**Between Line Street & 11th Street Hammonton, NJ**
Block and Lot:	**Block 2909 Lot 1**

Section of the NJ Transit Parking Lot to provide greater detail. Lot lines are slightly off for this project site.

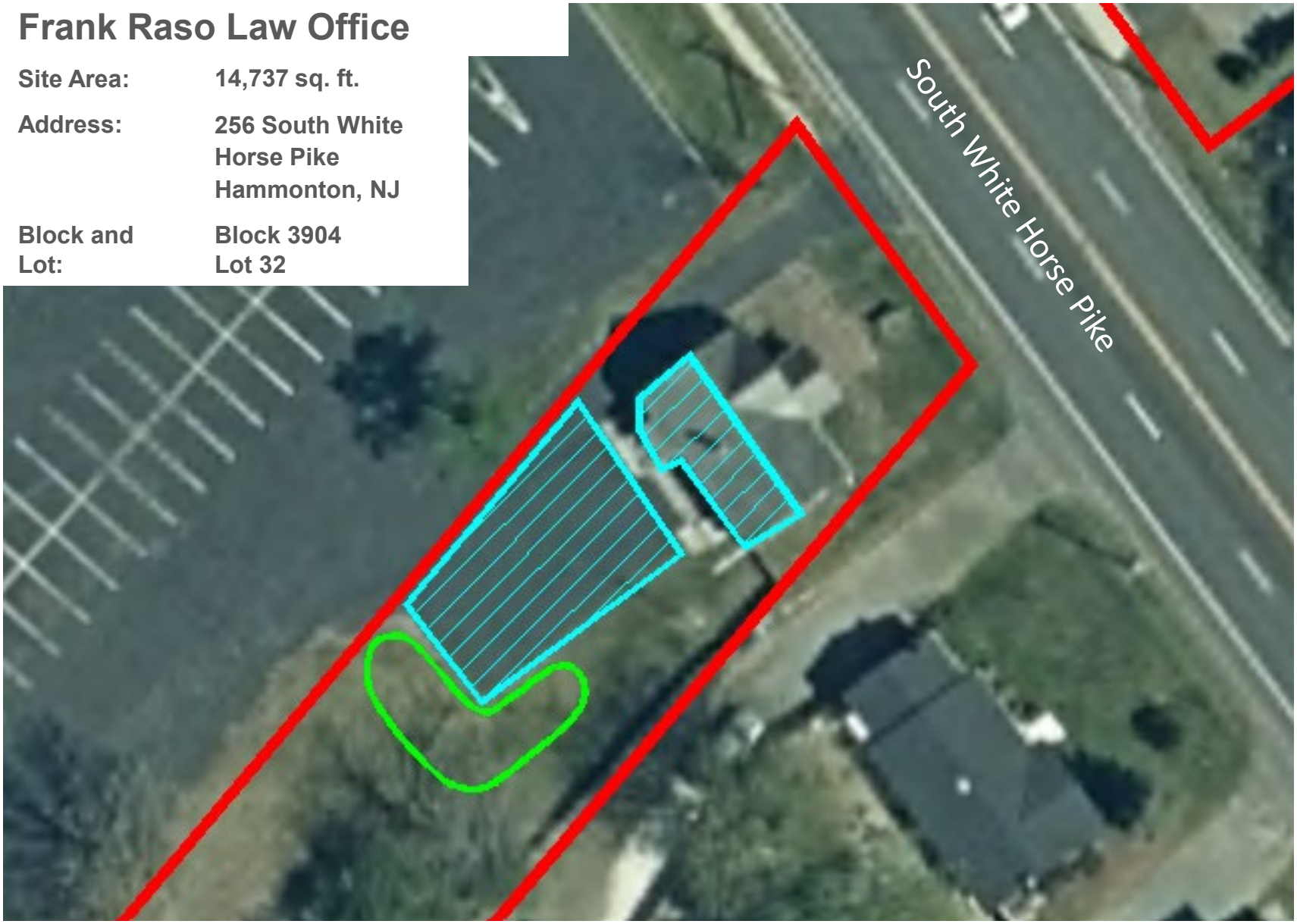
Calvary Chapel of Hammonton

Site Area:	**132,450 sq. ft.**
Address:	**660 South Egg Harbor Road Hammonton, NJ**
Block and Lot:	**Block 4003 Lot 2**



Frank Raso Law Office

Site Area:	**14,737 sq. ft.**
Address:	**256 South White Horse Pike Hammonton, NJ**
Block and Lot:	**Block 3904 Lot 32**



Littlefield Real Estate

Site Area:	**18,525 sq. ft.**
Address:	**245 South White Horse Pike Hammonton, NJ**
Block and Lot:	**Block 3901 Lot 4**

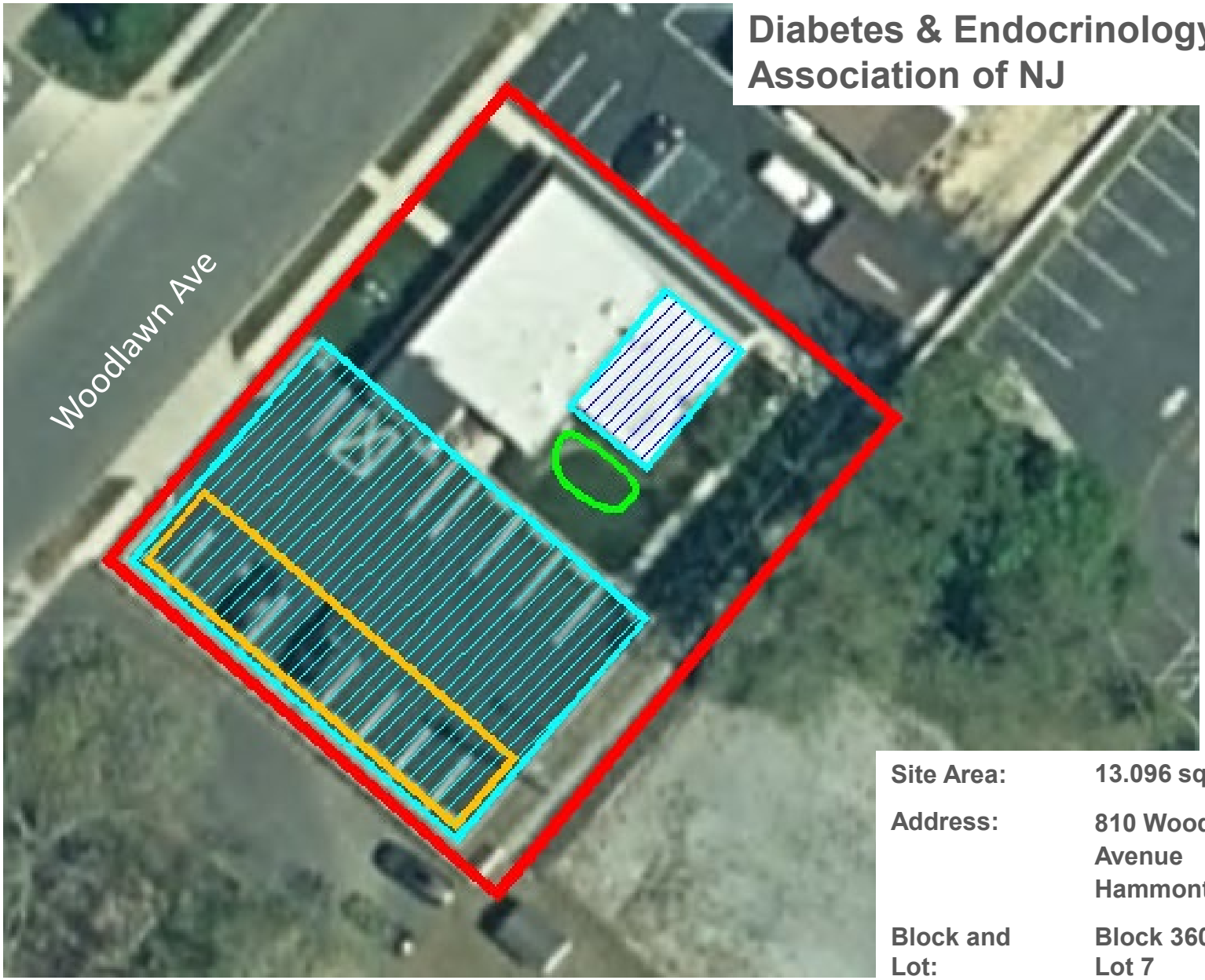
TSD Motorsports

Site Area:	**47,916 sq. ft.**
Address:	**225 Broadway Hammonton, NJ**
Block and Lot:	**Block 3604 Lot 1**

Hammonton Swim Club

Site Area:	**62,761 sq. ft.**
Address:	**115 Berwyn Avenue Hammonton, NJ**
Block and Lot:	**Block 3604 Lot 5**

Diabetes & Endocrinology Association of NJ



Site Area:	**13.096 sq. ft.**
Address:	**810 Woodlawn Avenue Hammonton, NJ**
Block and Lot:	**Block 3604 Lot 7**

Hammonton Arms Apartments

Site Area:	**441,779 sq. ft.**
Address:	**360 Valley Avenue Hammonton, NJ**
Block and Lot:	**Block 3301 Lot 33**

Silver Terrace Apartments

Site Area:	**441,779 sq. ft.**
Address:	**80 Broadway Hammonton, NJ**
Block and Lot:	**Block 3904 Lot 10**

Frog Rock Golf and Country Club

Site Area:	**441,779 sq. ft.**
Address:	**420 Boyer Avenue Hammonton, NJ**
Block and Lot:	**Block 4303 Lot 13**

Nesco Liquor Store

Site Area:	**51,698 sq. ft.**
Address:	**31800 Nesco Road Mullica, NJ**
Block and Lot:	**Block 1502 Lot 8**

Mullica in the Pines Historical Society

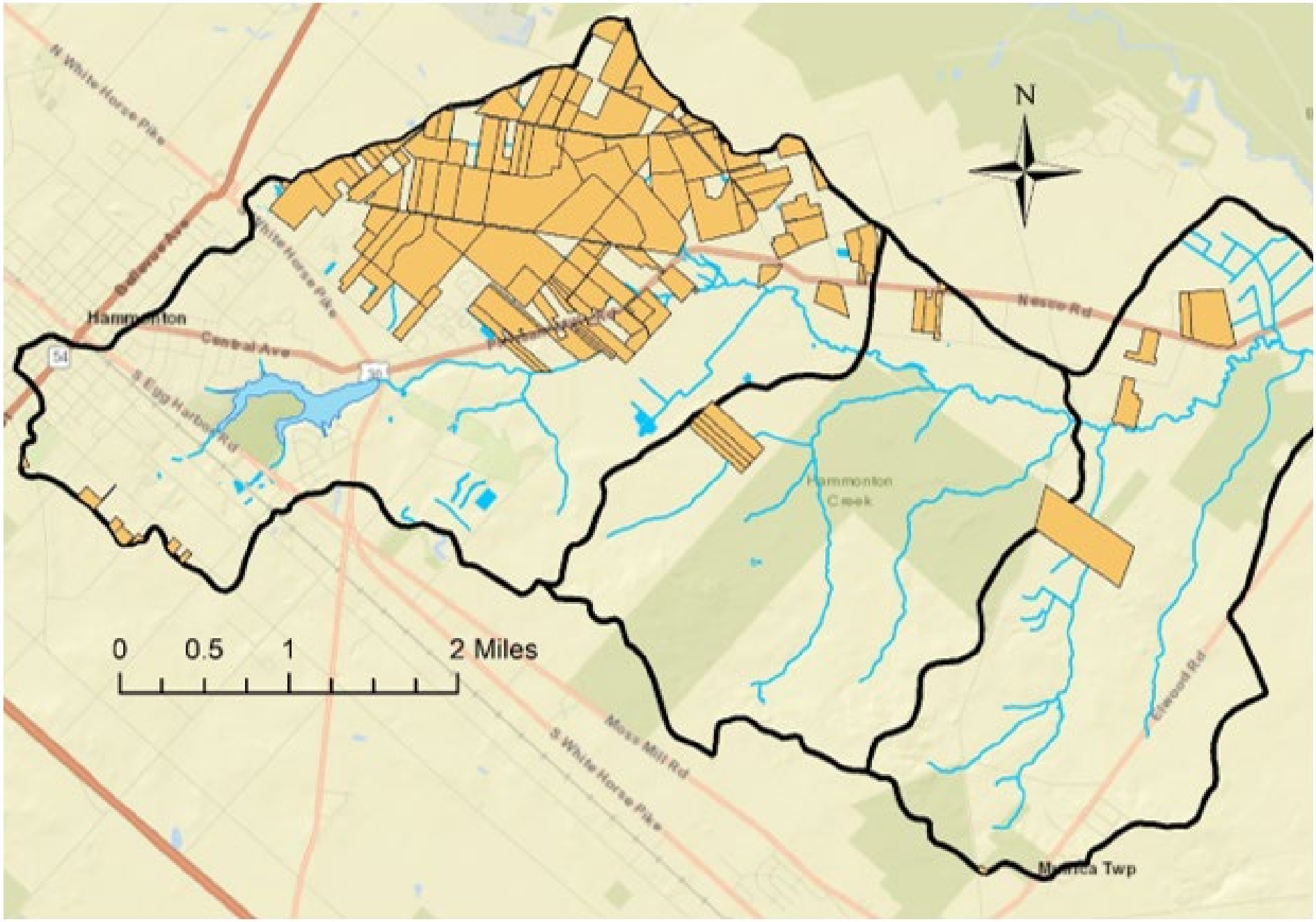
Site Area:	**82,390 sq. ft.**
Address:	**3410 Nesco Road Mullica, NJ**
Block and Lot:	**Block 1001 Lot 39**

Other Recommendations

- Residential Rain Garden Program – retrofit 25% of the homes with a rain garden
- Roadside Bioswale Program – capture 25% road runoff in bioswales

Agricultural Land Uses

- Farms contribute 3,171 lbs of TP/year
- 140 parcels are classified as farms
- Grouping them together = 41 farmers
- There are 11 farms that have greater than 70 acres
- These 11 farms total 70% of the farmland in the watershed (1,460 acres total)
- On these 11 farms, the agricultural land use is only 933 acres
- From this 933 acres, TP load is 1,213 lbs/yr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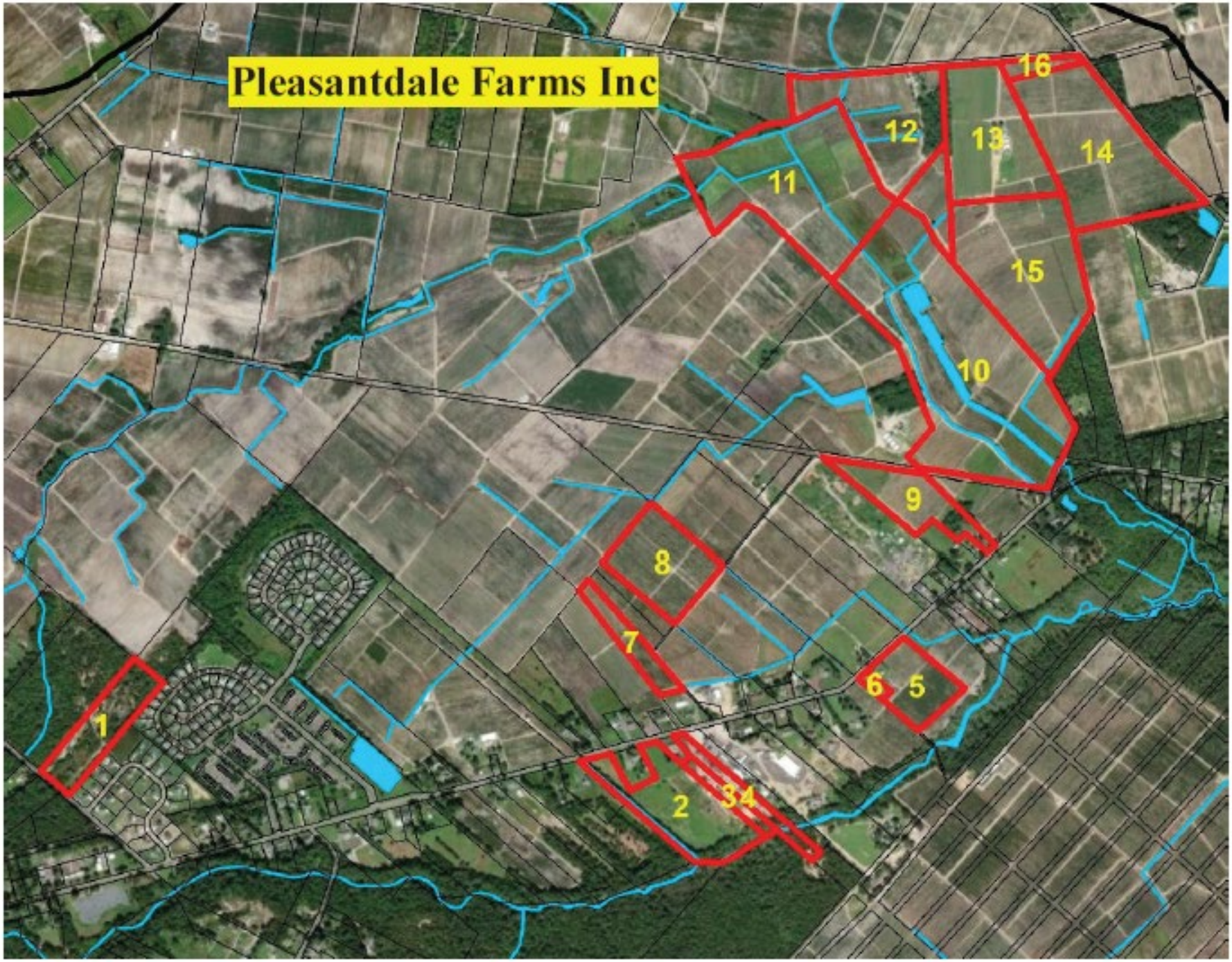
Pleasantdale Farms Inc
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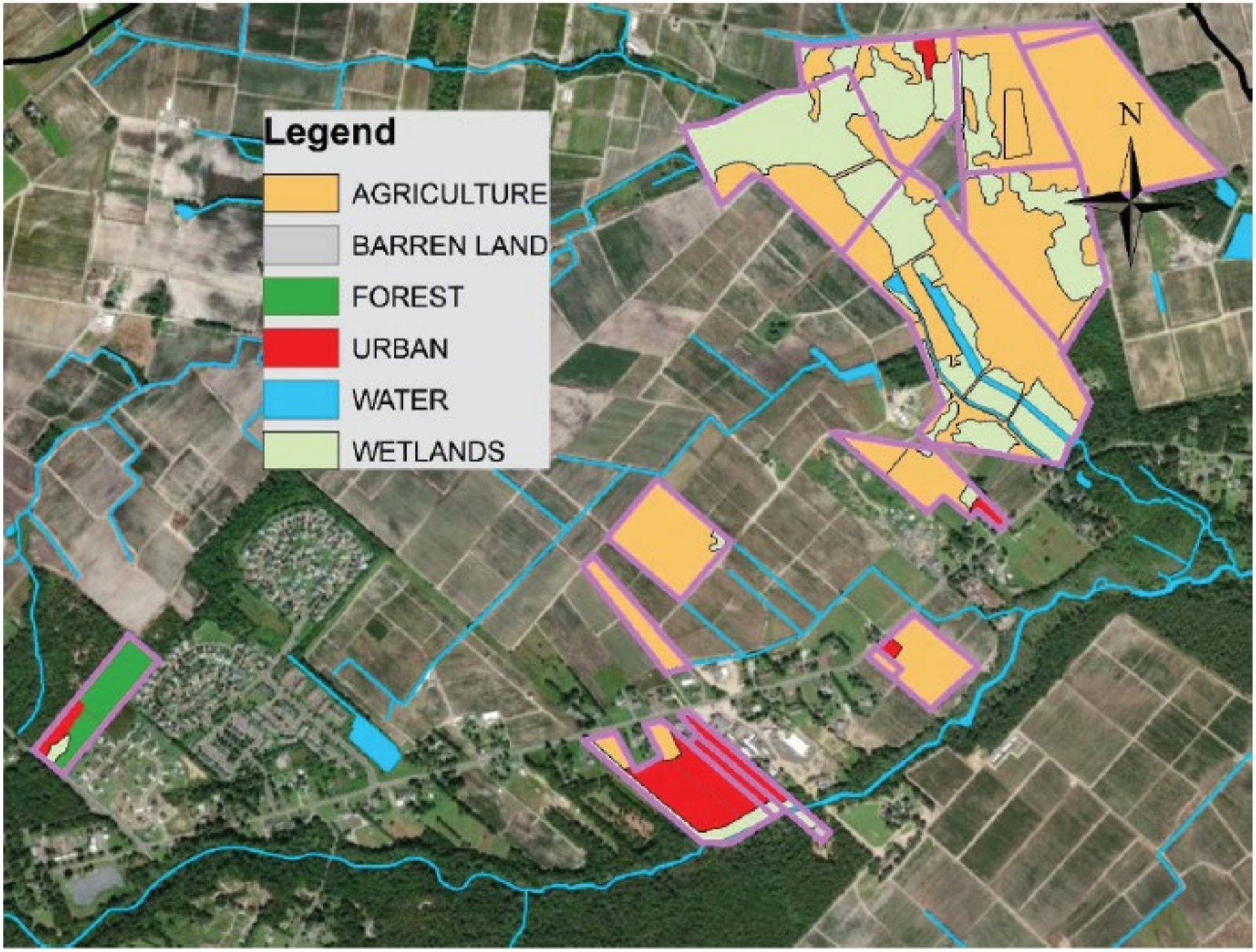
34

Ref	Block No.	Lot No.	Property Class	Property Location	Owner Name	City, State	Area (ac)
1	4301	1	3A	151 MAIN RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	9.97
2	4902	12	3A	450/490 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	16.36
3	4902	11	3B	REAR PLEAS MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	2.45
4	4902	9	3A	540 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	3.92
5	5502	2	3A	660 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	8.26
6	5502	1	3B	658 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	0.67
7	4901	9	3B	539 PLEASANT MILLS RDREAR	PLEASANTDALE FARMS INC	HAMMONTON, NJ	4.66
8	4901	27	3B	569 PLEASANT MILLS RD RR	PLEASANTDALE FARMS INC	HAMMONTON, NJ	12.97
9	5501	14	3B	733 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	9.61
10	5504	4	3B	345-385 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	59.45
11	5402	3	3B	BRIDGE AVE REAR	PLEASANTDALE FARMS INC	HAMMONTON, NJ	36.27
12	5402	4	3A	832 LAUREL AVE	PLEASANTDALE FARMS INC	HAMMONTON, NJ	20.88
13	5504	6	3A	854 LAUREL AVE	PLEASANTDALE FARMS INC	HAMMONTON, NJ	21.18
14	5504	11	3B	488-530 COLUMBIA RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	29.99
15	5504	7	3B	767 PLEASANT MILLS RD	PLEASANTDALE FARMS INC	HAMMONTON, NJ	29.52
16	5504	10	3B	862 LAUREL AVE	PLEASANTDALE FARMS INC	HAMMONTON, NJ	1.93
TOTAL							268.08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AGRICULTURE
BARREN LAND
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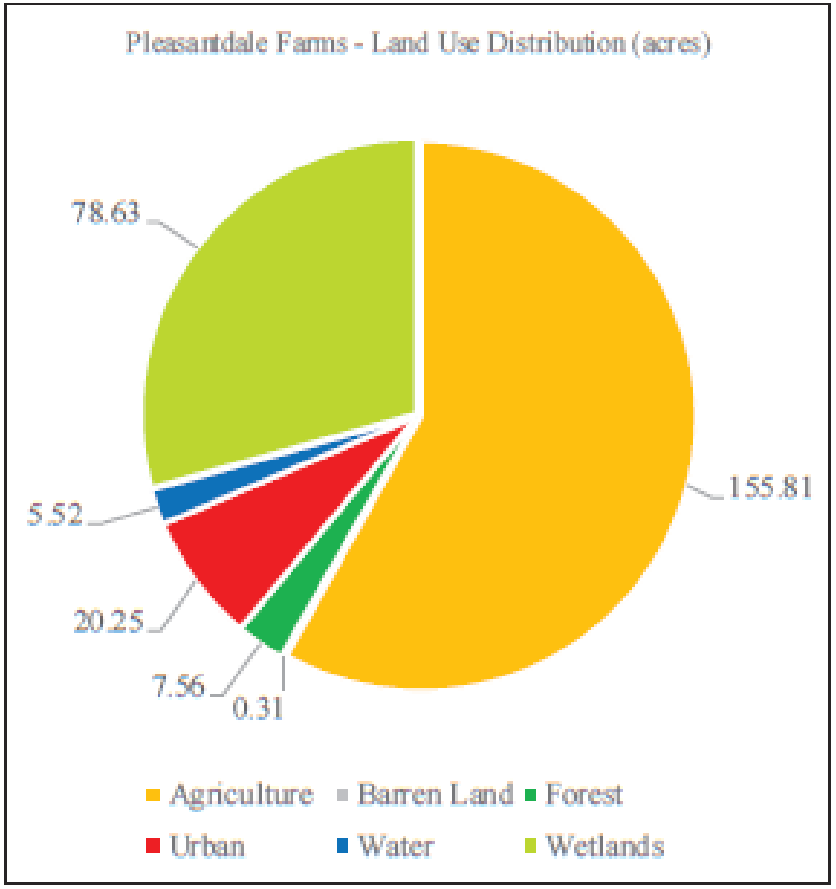
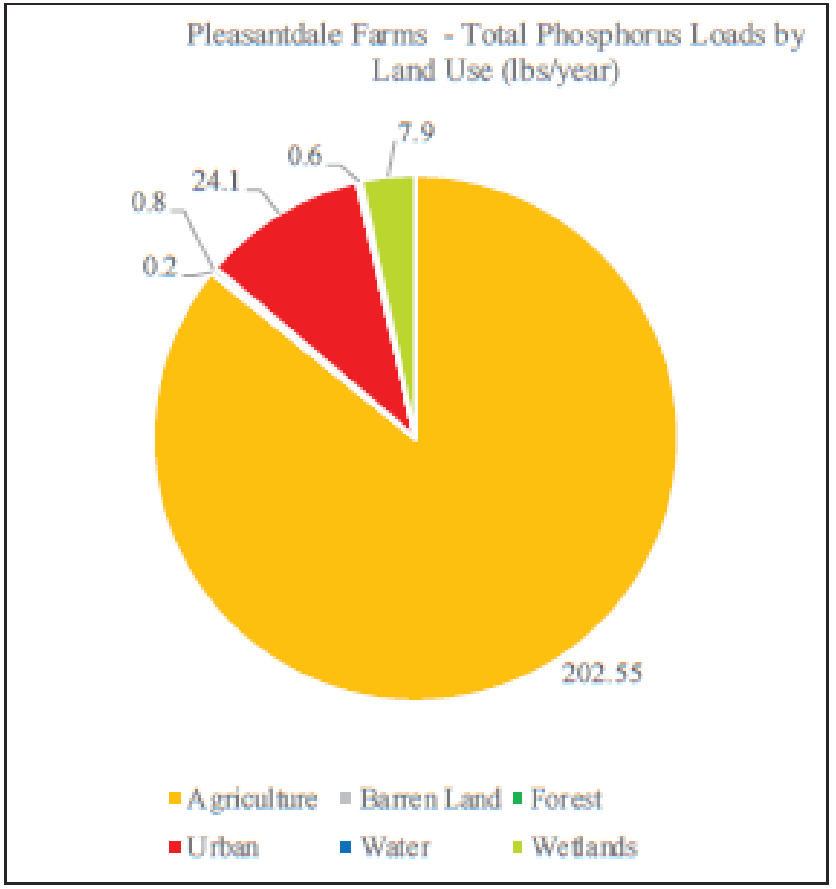
Pleasantdale Farms – Land Use and Total Phosphorus Load

Land Use 2020	Area (acres)	TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
Agriculture	155.81	202.55	1,558	46,742
Barren Land	0.31	0.2	1.6	18.7
Forest	7.56	0.8	22.7	302.6
Urban	20.25	24.1	247.4	3,164
Water	5.52	0.6	16.6	220.8
Wetlands	78.63	7.9	235.9	3,145
TOTAL	268.08	235.98	2,082	53,594





Land cover of the largest 11 farms

Land Use Type	Area (acre)	TP Load (lbs/yr)	TN Load (lbs/yr)	TSS Load (lbs/yr)
Agriculture	933	1,213	9,327	279,817
Barren Land	1.0	0.5	5.0	60.0
Forest	83	8	248	3,307
Urban	52	60	616	8,102
Water	13	1	40	540
Wetlands	378	38	1,134	15,126
TOTALS	1,082	1,283	10,237	291,825

Land cover summary for all the farm parcels

Land Use Type	Area (acre)	TP Load (lbs/yr)	TN Load (lbs/yr)	TSS Load (lbs/yr)
Agriculture	1,407	1,829	14,073	422,175
Barren Land	1.00	0.50	5.00	60.00
Forest	115.1	11.51	345.2	4,603
Urban	84.89	81.36	796.7	11,460
Water	15.14	1.51	45.42	605.6
Wetlands	459.4	45.94	1,378	18,377
TOTALS	2,083	1,970	16,643	457,281

More on Agriculture

- Total Ag land use is 2,439 acres
- Total Ag land use on farm parcels is only 1,407 acres
- Remaining Ag land use is due to non-classified parcels and leasing of non-agriculture lands

Recommended Actions

- 4R Nutrient Management (right source, right rate, right time, and right place)
- Work with NRCS to install agricultural management practices (vegetative buffers/filter strips, bioswales, etc.)
- Account for practices already installed

Other Measures

- Stream Bank Erosion
- Septic Management
- Wildlife Management

Load reductions for proposed management strategies

Management Strategy	TP Reduction (lb/yr)
Street sweeping	59.3
Leaf collection and street sweeping	205.5
Green infrastructure for proposed retrofit sites	7.4
Rain gardens for ¼ rooftops for ¼ of buildings	13.4
Bioswales for 25% of roadways	135.5
Converting existing detention basins to bioretention basins	28.6
Agricultural management practices on the 41 farms	1,097.7
TOTAL =	1,547.4 (29%)

Action	Management Strategy	Cost
1	Annual street sweeping	$100,000
2	Annual leaf collection and additional street sweeping	$100,000
3	Green infrastructure for proposed retrofit sites	$1,632,780[6] $81,639[7]
4	Rain gardens for 25% of a rooftop for 25% of the buildings	$923,472[6]
5	Bioswales for 25% of roadways outside of the 1,000-ft buffer	$6,220,368[6] $311,018[7]
6	Converting existing detention basins to bioretention basins	$150,000[6]
7	Riparian buffers for farms	$703,500[6] $31,175[7]
	Total construction cost estimate =	$9,830,120
	Total annual maintenance cost estimate =	$423,832

Educational Programs

- Hammonton Lake – Problems and Solutions
- Green Infrastructure for Hammonton Creek and Hammonton Lake Watershed
- What can you do to help Hammonton Creek and Hammonton Lake?
- How to Build a Rain Garden
- Landscape Makeover Program


Questions?