May River Watershed Action Plan Advisory Committee Meeting

Thursday, January 23, 2025 at 3:00 PM

Virtually Held on Teams

AGENDA

I. CALL TO ORDER

II. ROLL CALL

III. ADOPTION OF MINUTES

1. Adoption of December 5th, 2024 Minutes

IV. PUBLIC COMMENT

V. OLD BUSINESS

1. Update on Work to Develop Town Wetland and Resiliency Zone Protections and Wetlands Restoration Program Data Gathering - Beth Lewis, Water Quality Program Manager

VI. NEW BUSINESS

1. Introduction of New Stormwater Inspector - Bill Baugher, Watershed Management Division Director
2. May River Watershed Action Plan Implementation Status Report - Dan Rybak, Project Manager
3. Progress Report on the May River Watershed Baseline Assessment - Beth Lewis, Water Quality Program Manager

VII. ADJOURNMENT

NEXT MEETING DATE: April 24th, 2025

"FOIA Compliance – Public notification of this meeting has been published and posted in compliance with the Freedom of Information Act and the Town of Bluffton policies."

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 ("ADA"), the Town of Bluffton will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs, or activities. The Town of Bluffton Council Chambers are ADA compatible. Auditory accommodations are available. Any person requiring further accommodation should contact the Town of Bluffton ADA Coordinator at 843.706.4500 or adacoordinator@townofbluffton.com as soon as possible but no later than 48 hours before the scheduled event.

Executive Session – The public body may vote to go into executive session for any item identified for action on the agenda.

**Please note that each member of the public may speak at one public comment session and a form must be filled out and given to the Town Clerk. To submit a public comment online, please click here: https://www.townofbluffton.sc.gov/FormCenter/Town-15/Public-Comment-60 Public comment is limited to 3 minutes per speaker.*

May River Watershed Action Plan Advisory Committee Meeting

Theodore D. Washington Municipal Building, Henry "Emmett" McCracken Jr. Council Chambers, 20 Bridge Street, Bluffton, SC

December 05, 2024

I. CALL TO ORDER

Acting chairman Stokes called the meeting to order at 3:00pm.

II. ROLL CALL

PRESENT
Amber Kuehn
Vice Chair Al Stokes
Jessie White
Chris Kehrer

ABSENT
Chris Shoemaker
Chair Stan Rogers
Larry Toomer

III. ADOPTION OF MINUTES

1. Adoption of July 25th, 2024 Minutes

   Motion made to adopt the July 25th, 2024 meeting minutes made by Kehrer, Seconded by Kuehn.
   Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

2. Adoption of August 22nd, 2024 Minutes

   Motion made to adopt August 22nd, 2024 meeting minutes made by Kuehn, Seconded by White.
   Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

IV. PUBLIC COMMENT

Jim Lawton 52 Oyster St - Mr. Lawton made comment on a project awaiting state approval within the Palmetto Bluff Development expressing a desire for the public to have time to make comments.

V. NEW BUSINESS

1. Adoption of the 2025 Meeting Dates and Times - Beth Lewis, Water Quality Program Manager

   Mr. Baugher and the Committee discussed the 2025 meeting schedule. The Committee moved the meetings from monthly to quarterly. The meetings will be remain at 3:00pm in Council

Chambers. The Committee unanimously voted to adopt the 2025 meeting schedule as discussed.

Motion made by Kehrer, Seconded by White.
Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

2. Presentation of Proposed Updates to the Southern Lowcountry Stormwater Design Manual - Andrea Moreno, MS4 Program Manager

   Ms. Moreno presented proposed updates to the Southern Lowcountry Stormwater Design Manual. The Committee was given time to ask questions. The Committee unanimously voted to proceed with certain amendments to the Southern Lowcountry Stormwater Design Manual and Post-Construction Stormwater Ordinance, as presented.

   Motion made by Kehrer, Seconded by White.
   Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

3. Presentation on Proposed Work to Develop Town Wetland and Resiliency Zone Protections and Wetlands Restoration Program Data Gathering - Beth Lewis, Water Quality Program Manager

   Ms. Lewis presented proposed work for Fiscal Year (FY) 2025 and FY 2026. FY25 work is for developing wetlands and resiliency ordinances. FY26 is to develop a Town Wetlands Restoration Program. The Committee was given time to ask questions. The committee unanimously recommended that the Town Council fund Fiscal Year 2025 and 2026 work associated with engineering services to develop Town Wetlands and Resiliency Zone Protections and Data Gathering Needs Related to a Potential Town Wetlands Restoration Program.

   Motion made by White, Seconded by Kehrer.
   Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

4. Progress Report on the May River Watershed Baseline Assessment - Beth Lewis, Water Quality Program Manager

   The last SCDNR quarterly report was provided to the committee. Staff stated the final report was expected to be completed by the end of March 2025. Staff said they would work with the DNR to try and arrange a presentation on their findings to the Committee once the study was completed.

VI. ADJOURNMENT

Meeting was adjourned at 4:30pm.

Motion made by Kehrer, Seconded by Kuehn.
Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer.

NEXT MEETING DATE: January 23, 2025

May River Action Plan Implementation

Status Report

Presentation to May River Watershed Action Plan Committee (WAPAC)
January 23, 2025
Department of Projects & Watershed Resilience
Dan Rybak, Project Manager

Septic to Sewer Projects

- **Stoney Creek/Palmetto Bluff Sewer Partnership:**
  - BJWSA's 2022 updated cost-estimate for the project from BJWSA increased to $7.2 million + contingencies.
  - BJWSA is the Project Manager as the awardee of the Rural Infrastructure Authority - South Carolina Infrastructure Investment Program (RIA-SCIIP) grant.

- **Next Steps**
  - BJWSA updates can be found at: https://bjwsa.org/251/Go2Sewer-for-a-Cleaner-Stoney-Creek.

Impervious Restoration Program Projects

Background:

Within the 2020 May River Watershed Action Plan Update & Modeling Report (MRWAP), eleven (11) project sites (incorporating various individual BMPs) were selected in consultation with the Town (prioritizing subcatchments with fecal coliform (FC) bacteria hotspot and/or large impervious areas). These sites were evaluated in terms of the potential benefits gained by retrofitting to meet the 95th percentile storm retention, to the maximum extent possible, under the proposed Impervious Area Restoration/Stormwater Retrofit Program.

Proposed project sites Rose Dhu Creek (6 projects) and Stoney Creek (5 projects):

- Bluffton Early Learning Center (BELC). Participating in preliminary design development phase.
- Boys and Girls Club of Bluffton (BGC). Participating in preliminary design development phase.
- Benton House (BH). Participating in preliminary design development phase.
- Bluffton High School (BHS). Participating in preliminary design development phase.
- Buckwalter Recreation Center (BRC). Participating in preliminary design development phase.
- ~~Lowcountry Community Church (LCC).~~ **Declined to Participate.**
- McCracken Middle School. Participating in preliminary design development phase.
- Bluffton Elementary School (MMSBES). Participating in preliminary design development phase.
- May River High School. Participating in preliminary design development phase.
- ~~One Hampton Lake Apartments (OHLA).~~ **Declined to Participate**
- Pritchardville Elementary School (PES). Participating in preliminary design development phase.
- ~~Palmetto Pointe Townes (PPT).~~ **Declined to Participate.**

Impervious Restoration Program Projects

Task 1 : MRWAP Update 11 Site Locations

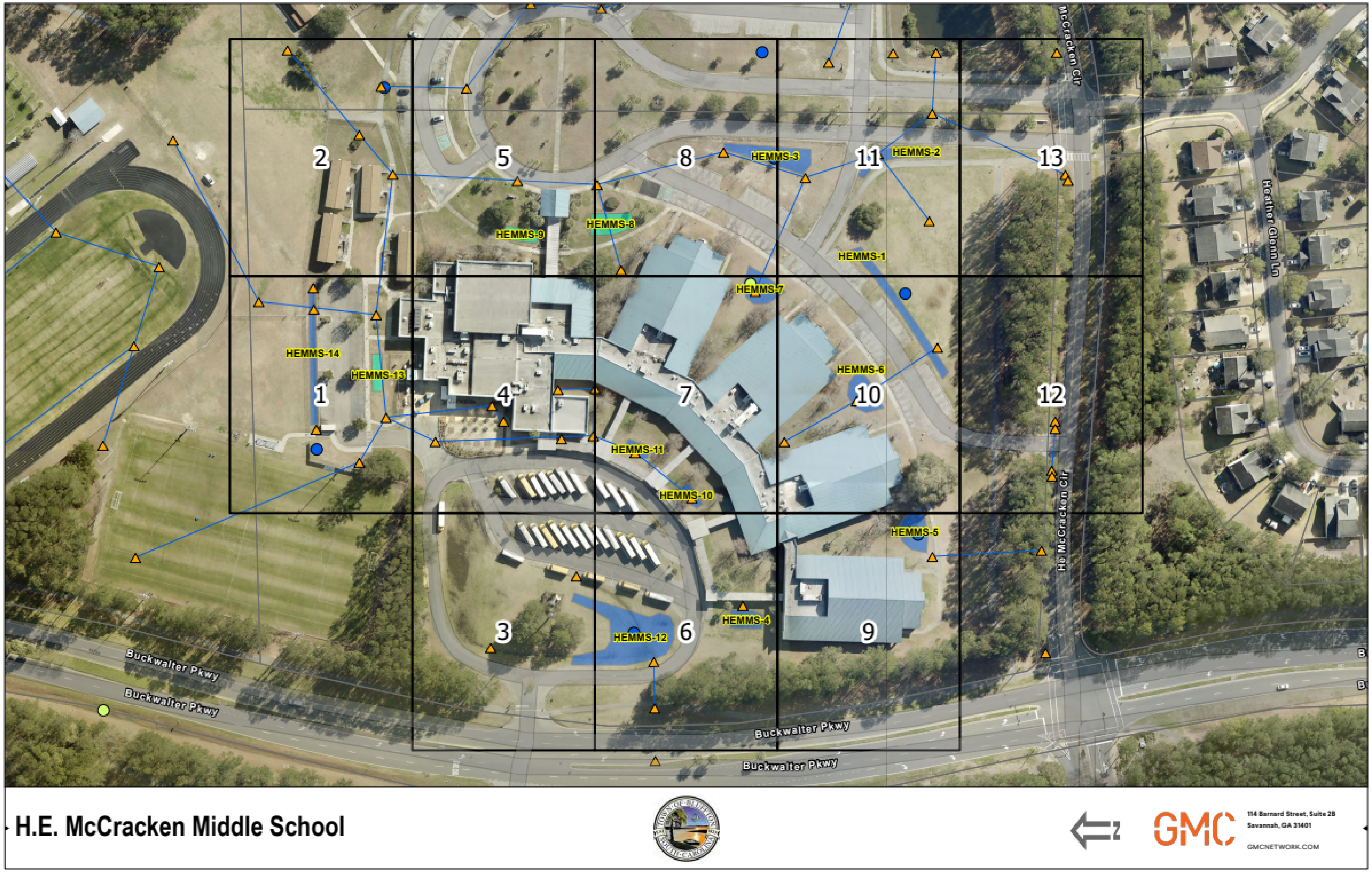
- Evaluate 11 sites and proposed BMPs. **Complete.**
- Update concept plans for 11 sites based on site evaluations, recommendations and discussions**. Complete.**
- Perform geotechnical evaluations at each site at locations related to BMP locations of updated concept plans. **All geotechnical work and reports completed.**
- Refine updated concepts and use for presentations to Property Owner to discuss Impervious Restoration Program goals, objectives and gain support for Program and their participation. **Complete.**
    - Develop list of "incentives" to secure Property Owner participation (**see Policy Document Formulation below**).
- Based on geotechnical information and Property Owner feedback further refine concept plans to Preliminary Design: **Complete**
    - Determine BMP types and location to maximize SWRv/WQ treatment in cost effective approach.
    - Determine estimated pollutant load reductions.
    - Develop site specific BMP details.
    - Develop preliminary BMP maintenance schedule and cost for each site.
- Preliminary Design development plans will be presented to the Property Owner for review and discussion. Other Restoration Program details (maintenance responsibilities, easements, incentives, etc.) developed as part of the Program (see Policy Document Formulation below) will also be discussed in hopes of establishing a commitment from the Property Owner to participate in the Program. Once a "commitment" is secured from the Property Owner, the project site will be moved to Final design, permitting, and ultimately construction. **Complete.**

Impervious Restoration Program Projects

- **Initial Site Investigations**
  - Initial site evaluations, geotechnical investigations reports are complete for 9 of the 11 participating project sites.
    - Boys and Girls Club
    - Bluffton Early Learning Center
    - Benton House
    - Bluffton High School
    - Buckwalter Recreation Complex
    - May River High School
    - H.E. McCracken Middle School
    - Pritchardville Elementary School
    - Bluffton Elementary School
- **Fiscal Year 2026 (FY26) CIP MRWAP Projects**
  - Proposing funding for planning, design and construction for three (3) MRWAP Imperious Restoration Projects in FY26
    - H.E. McCracken Middle School
    - Pritchardville Elementary School
    - Bluffton Elementary School

Impervious Restoration Projects Proposed for Fiscal Year 2026

H.E. McCracken Middle School



H.E. McCracken Middle School

Section VI. Item #2.

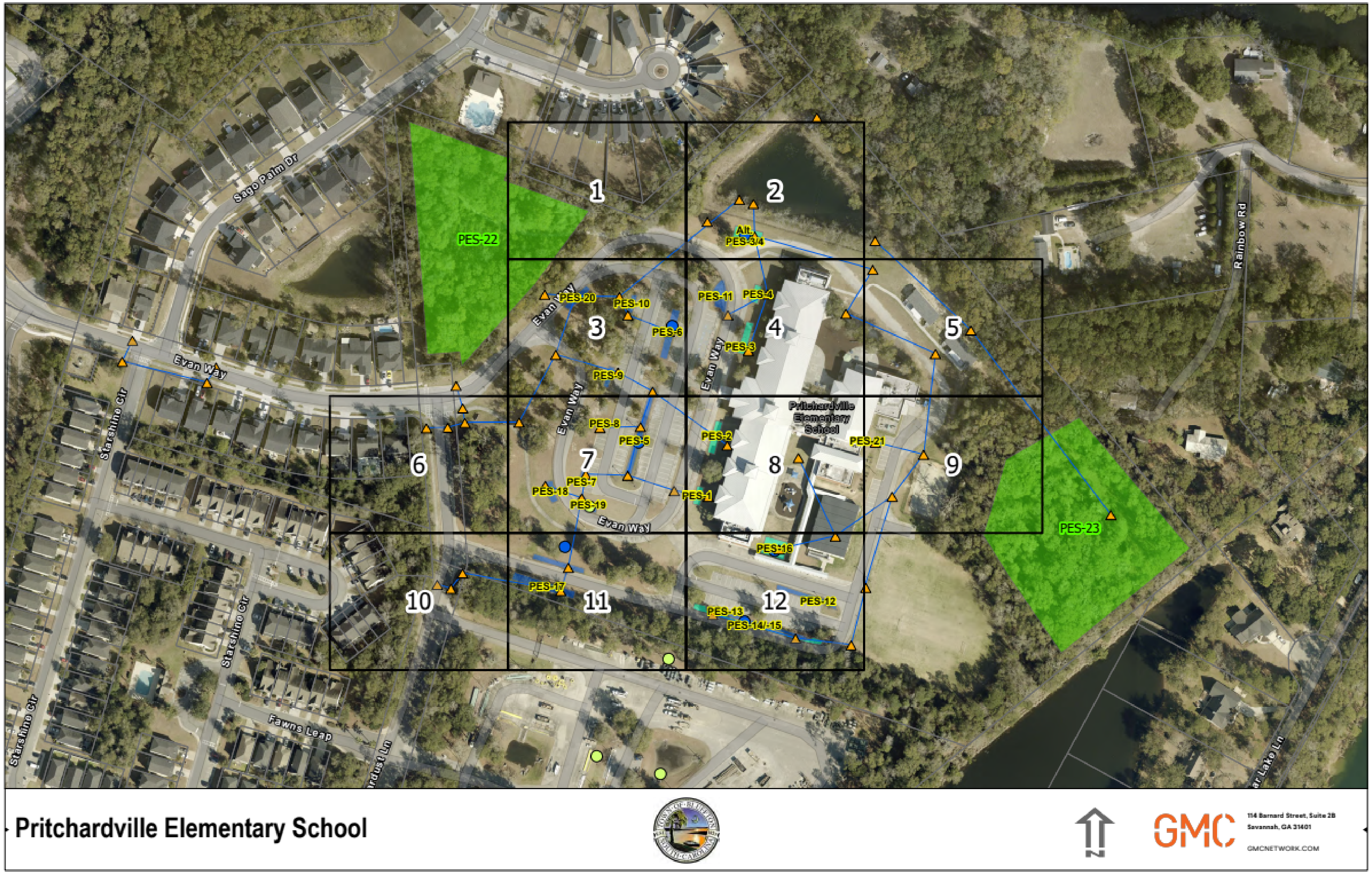
H.E. McCracken Middle School																				
Site ID	**BMP Type**	**Overall Ranking**	**Numerical Score**	**Drainage Area / Location**	**Impervious Area**	**SWRv**	**Construction Cost**	**Cost/SWRV**	**Constructability**	**Infil Rate**	**BMP Area**	**Length**	**Width**	**Media Depth**	**Gravel Depth**	**Ponding Depth**	**Underdrain[1]**	**Pipe Length**	**Pipe Diameter**	**Infilration Chamber Notes**
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
HEMMS-1	Bioretention	High	40	Parking Lot/Detention	0.41	3,388	$103,000	$30.40	High	0.42	2,400	213	10	2	1	1	75%	300	6	
HEMMS-2	Bioretention	Medium	39	Driveway	0.25	2,190	$64,000	$29.23	High	0.35	1,550	110	14	2	1	1	75%	100	6	
HEMMS-3	Bioretention	High	40	Front Parking Lot	0.42	3,739	$108,000	$28.88	High	0.35	2,650	121	22	2	1	1	75%	140	6	
HEMMS-4	Bioretention	High	48	Roof Runoff from Wings	0.19	1,459	$45,000	$30.85	High	3.67	1,050	43	24	2	1	1	75%	120	6	
HEMMS-5	Bioretention	High	54		0.40	3,187	$66,000	$20.71	High	5.97	1,700	54	36	2	1	1	100%			
HEMMS-6	Bioretention	High	55		0.42	3,314	$68,000	$20.52	High	5.97	1,750	58	35	2	1	1	100%			
HEMMS-7	Bioretention	High	55		0.41	3,299	$68,000	$20.61	High	5.97	1,750	55	40	2	1	1	100%			
HEMMS-8	Infil. Chamber	Low	27		0.36	2,737	$110,000	$40.20	Mod-Low	0.35	1,550	58	27		4		75%	350	30	7 rows of 50'
HEMMS-9	Infil. Chamber	Medium	29	Northern Building	0.23	1,544	$60,000	$38.87	Mod-Low	0.35	875	47	19		4		75%	180	30	4 rows of 45'
HEMMS-10	Bioretention	High	45	Bus Dropoff Wings	0.10	855	$17,000	$19.89	Moderate	3.67	450	34	14	2	1	1	100%			
HEMMS-11	Bioretention	High	45		0.11	899	$19,000	$21.12	Moderate	3.67	500	34	15	2	1	1	100%			
HEMMS-12	Bioretention	High	56	Bus Parking Lot	1.41	10,652	$303,000	$28.45	High	3.67	7,500	145	76	2	1	1	75%	350	8	
HEMMS-13	Infil. Chamber	Low	23	Northern Building	0.18	1,189	$49,000	$41.22	Low	0.35	700	52	14		4		75%	150	30	3 rows of 50'
HEMMS-14	Bioretention	High	50	Northern Parking Lot	0.37	2,769	$65,000	$23.47	Moderate	10.65	1,700	185	9	2	1	0.75	100%			
Total					**5.26**	**41,220**	**$1,145,000**				**26,125**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	**BMP Type**	**Other Design & Flow Routing/Implementation Notes**
HEMMS-1	Bioretention	Construct a berm along northern edge of detention pond to create a bioretention cell that will intercept runoff from parking lot before entering pond (pre-treatment), add a low point on berm to discharge overflow into pond
HEMMS-2	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow
HEMMS-3	Bioretention	Retrofit bioretention cell in grassed area around storm inlets and utilize them for overflow
HEMMS-4	Bioretention	Add gutter or regrade swale for western roof to flow to the north, retrofit bioretention cell in grassed area away from fire lane and construct overflow swale away from school
HEMMS-5	Bioretention	Retrofit bioretention cell immediately upstream of storm inlet and construct an earthen berm for overflow to pass through into nearby storm inlet, no underdrain
HEMMS-6	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-7	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-8	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area near school entrance, utilize existing structure for outflow
HEMMS-9	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area near school entrance, utilize existing structure for outflow
HEMMS-10	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-11	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-12	Bioretention	Retrofit large bioretention cell in grassed area next to bus circle, just upstream of driveway culvert, and create an earthern berm for overflow to pass into existing culvert
HEMMS-13	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area next to building, avoid utilities, and utilize existing structure for outflow
HEMMS-14	Bioretention	Rehabilitate existing bioswale into a bioretention cell, utilize existing storm inlet for overflow, no underdrain

Pritchardville Elementary School

Section VI. Item #2.



Pritchardville Elementary School

Pritchardville Elementary School

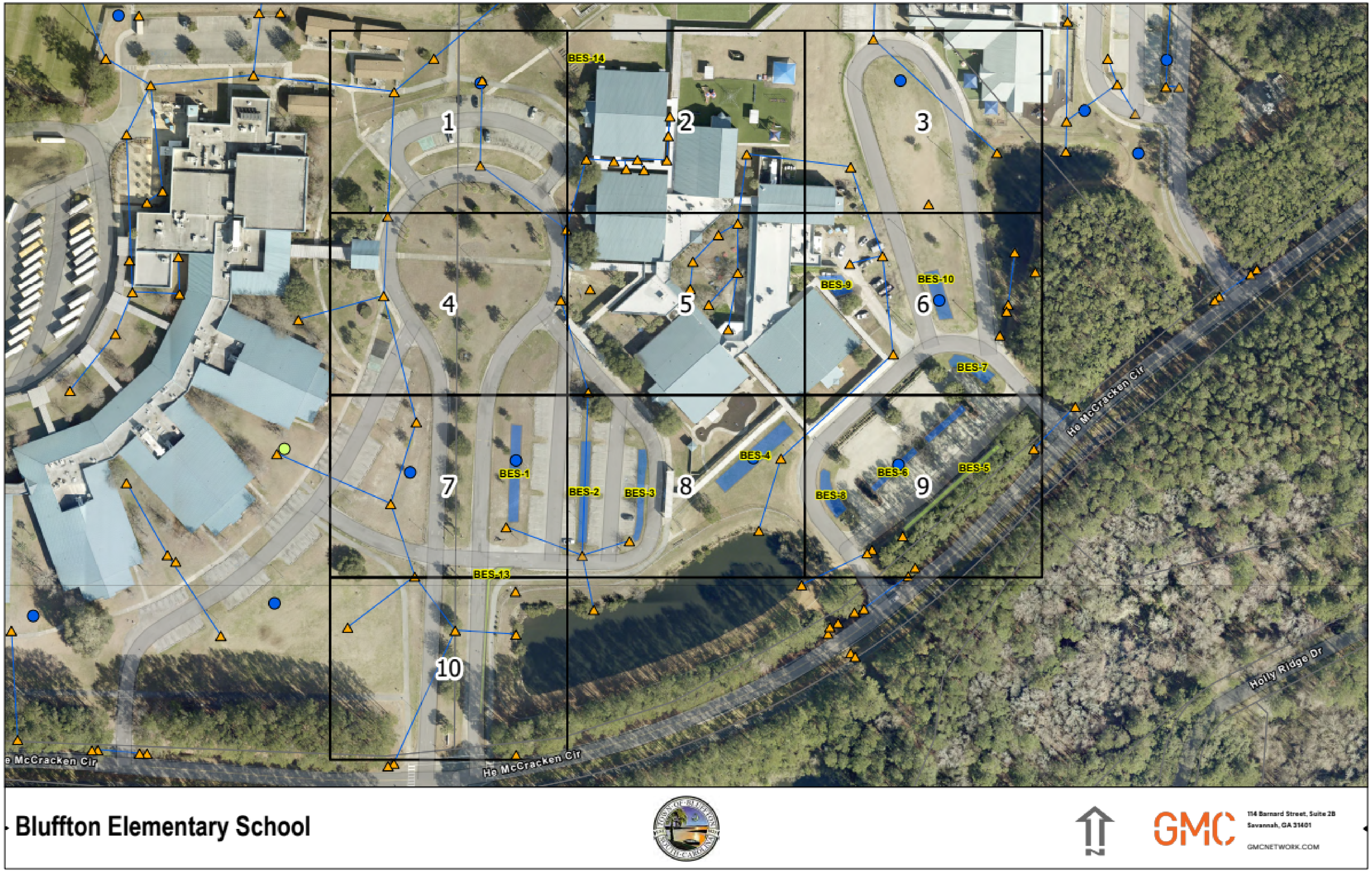
Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	CF		$/SWRv		in/hr	SF	ft	ft	ft	ft	ft	Credit	ft	in	
PES-1	Infiltration Chamber	Low	24	Front Roof	0.08	605	$27,000	$44.61	Mod-Low	0.81	450	33	14		3		75%	90	30	3 rows of 30'
PES-2	Infiltration Chamber	Low	25		0.15	1,126	$50,000	$44.40	Mod-Low	0.81	850	60	14		3		75%	165	30	3 rows of 55'
PES-3	Infiltration Chamber	Low	25		0.15	1,124	$50,000	$44.50	Mod-Low	0.84	850	60	14		3		75%	165	30	3 rows of 55'
PES-4	Infiltration Chamber	Low	24		0.08	596	$27,000	$45.34	Mod-Low	0.84	450	33	14		3		75%	90	30	3 rows of 30'
PES-5	Bioretention	High	41	Front Parking Lot Median	0.48	3,650	$76,000	$20.82	High	0.81	1,950	170	11.5	2	1	1	100%			
PES-6	Bioretention	High	48		0.33	2,536	$52,000	$20.51	High	2.08	1,350	92	14.5	2	1	1	100%			
PES-7	Bioretention	Medium	38	Western Pervious Concrete Parking Row, Front Parking Lot	0.05	401	$10,000	$24.91	High	0.81	250	29	8	2	1	1	100%			
PES-8	Bioretention	Medium	38		0.04	286	$6,000	$21.01	High	0.81	150	18	9	2	1	1	100%			
PES-9	Bioretention	High	46		0.10	702	$16,000	$22.78	High	2.08	400	39	10	2	1	1	100%			
PES-10	Bioretention	High	42		0.09	633	$14,000	$22.12	Moderate	2.08	350	34	10	2	1	1	100%			
PES-11	Bioretention	Medium	36	Main Driveway, North	0.29	2,138	$45,000	$21.05	Moderate	0.84	1,150	55	21	2	1	1	100%			
PES-12	Bioretention	High	42	Southern Parking Lot	0.21	1,567	$36,000	$22.98	High	1.58	950	115	8	2	1	0.75	100%			
PES-13	Bioretention	Medium	39		0.65	4,569	$125,000	$27.36	Moderate	1.58	2,650	240	11	2	1	0.75	100%			
PES-14/15	Infiltration Chamber														3		100%	240	30	1 row of 240'
PES-16	Infiltration Chamber	Low	20	Playground	0.36	2,549	$108,000	$42.37	Low	0.12	1,450	44	33		4		75%	360	30	9 rows of 40'
PES-17	Bioretention	Medium	37	Southern Driveway	0.50	3,744	$110,000	$29.38	High	0.31	2,650	118 / 97	14 / 10	2	1	1	75%	200	6	
PES-18	Bioretention	Medium	39	Main Driveway, South	0.14	1,027	$21,000	$20.46	High	0.81	550	40	14	2	1	1	100%			
PES-19	Bioretention	Medium	39		0.11	841	$17,000	$20.21	High	0.81	450	37	12	2	1	1	100%			
PES-20	Bioretention	High	43	Main Driveway, Front	0.17	1,250	$27,000	$21.59	Moderate	2.08	700	54	13	2	1	1	100%			
PES-21	Cistern	High		Rear of Building	0.07	t.b.d			High											
PES-22	Conservation Area	High		Northwest Corner	0.00	t.b.d			High		1.84-ac									
PES-23	Conservation Area	High		Southeast Corner	0.00	t.b.d			High		2.07-ac									
Total					**4.06**	**29,343**	**$817,000**				**17,600**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
PES-1	Infiltration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure
PES-2	Infiltration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure
PES-3	Infiltration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure; consider Alt. PES-3/4 if desired to be farther from school building
PES-4	Infiltration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure; consider Alt. PES-3/4 if desired to be farther from school building
PES-5	Bioretention	Utilize existing storm inlets as overflow structures, runoff already flows to this low point
PES-6	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-7	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-8	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-9	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-10	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-11	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-12	Bioretention	Install curb cut along curb and gutter to route flow into bioretention cells (grassed median), and route overflow as sheetflow into parking lot to the east
PES-13	Bioretention	Bioretention combined with Infiltration Chamber; bioretention cell to receive sheet flow from parking lot and infiltration chamber will receive runoff from two storm inlets along driveway
PES-14/15	Infiltration Chamber	
PES-16	Infiltration Chamber	Route roof drains and runoff from playground to infiltration chamber, configured system as subsurface due to proximity to school/playground
PES-17	Bioretention	Two linear bioretention cells; based on drainage areas, it is split as ~2/3 on southern side of driveway and ~1/3 on northern side of driveway; consider hybrid infiltration chamber system if more storage is needed and elevations warrant it
PES-18	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-19	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-20	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-21	Cistern	Connect up to two downspouts to route 3,200 SF of rooftop for capture and reuse for adjacent raised beds/gardens
PES-22	Conservation Area	Proposed Conservation Area for 1.84 acre (80,200 SF) wooded area
PES-23	Conservation Area	Proposed Conservation Area for 2.07 acre (90,000 SF) wooded area

Bluffton Elementary School

Section VI. Item #2.



Bluffton Elementary School

Bluffton Elementary School																				
Site ID	**BMP Type**	**Overall Ranking**	**Numerical Score**	**Drainage Area / Location**	**Impervious Area**	**SWRv**	**Construction Cost**	**Cost/SWRV**	**Constructability**	**Infil Rate**	**BMP Area**	**Length**	**Width**	**Media Depth**	**Gravel Depth**	**Ponding Depth**	**Underdrain[1]**	**Pipe Length**	**Pipe Diameter**	**Infilration Chamber Notes**
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BES-1	Bioretention	High	41		0.30	2,766	$80,000	$28.93	High	0.52	1,950	133	14	2	1	1	75%	120	6	
BES-2	Bioretention	High	41	Front Parking Lot Median	0.34	2,681	$78,000	$29.09	High	0.52	1,900	140	13	2	1	1	75%	120	6	
BES-3	Bioretention	High	41		0.25	1,953	$58,000	$29.69	High	0.52	1,400	125	11	2	1	1	75%	120	6	
BES-4	Bioretention	Medium	35	Southern Playground / Roof	0.52	3,974	$113,000	$28.44	Moderate	0.06	2,800	126	22	2	1	1	75%	120	8	
BES-5	Infil. Trench	Medium	39	Gravel Parking Lot	0.23	1,729	$52,000	$30.08	Moderate	1.76	1,200	174	7		3	0.75	75%	180	6	
BES-6	Bioretention	Medium	36		0.25	1,945	$66,000	$33.93	Moderate	1.76	1,600	150	10	2	1	0.75	75%	160	6	
BES-7	Bioretention	High	43	Southern Driveway	0.22	1,629	$47,000	$28.86	High	1.76	1,150	64	18	2	1	1	75%	60	6	
BES-8	Bioretention	High	43		0.22	1,629	$47,000	$28.86	High	1.76	1,150	67	16	2	1	1	75%	60	6	
BES-9	Bioretention	Low	27	Eastern Building	0.18	1,335	$38,000	$28.46	Low	0.05	950	35	26	2	1	1	75%	40	6	
BES-10	Bioretention	Medium	38	Loop Between BELC/BES	0.22	1,714	$47,000	$27.43	High	0.05	1,300	68	19	1.5	1	1	75%	70	6	
BES-13	Infil. Trench	High	40	Driveway Entrance	0.17	1,335	$40,000	$29.95	High	0.52	1,150	220	5		2	0.75	0.75	180	6	
BES-14	Cistern	High		NW Corner of Building	0.06	t.b.d			High											
Total					**2.95**	**22,690**	**$666,000**				**16,550**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	**BMP Type**	**Other Design & Flow Routing/Implementation Notes**
BES-1	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-2	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-3	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-4	Bioretention	Route roof drains through a combination of disconnection and shallow pipes to grassed area south of sidewalk, utilize nearby storm inlet for outflow
BES-5	Infil. Trench	Install infiltration trench on edge of parking lot to treat southern half of lot, construct a weir or berm on downstream end to discharge overflow into existing swale and storm inlet
BES-6	Bioretention	Retrofit bioretention cell in grassed area between parking rows to treat northern half of parking lot, allow overflow to sheetflow towards BES-5
BES-7	Bioretention	Retrofit bioretention cell in grassed area between driveway and parking lot to intercept runoff before entering existing storm inlet
BES-8	Bioretention	Retrofit bioretention cell in grassed area between driveway and parking lot to intercept runoff before entering existing storm inlet
BES-9	Bioretention	Route roof drains to grassed area next to driveway to intercept runoff, utilize nearby storm inlet for outflow
BES-10	Bioretention	Route runoff into grassed area adjacent to driveway to intercept runoff and create a berm to discharge overflow towards the pond
BES-13	Infil. Trench	Construct an infiltration trench along eastern edge of driveway and add an IWS underdrain that is connected to adjacent pond
BES-14	Cistern	Connect up to two downspouts to route 2,400 SF of rooftop for capture and reuse for adjacent raised beds/gardens

Proposed Motion

"I move to recommend that Town Council fund the proposed May River Watershed Action Plan Impervious Restoration Projects as part of the Town's Fiscal Year 2026 Capital Improvement Program (CIP) budget as presented."

Impervious Restoration Program Projects

- **Task 2 : Identify 15 new project sites for Town of Bluffton Impervious Restoration/BMP Retrofit Projects.**
  - Concept design development for the sites identified below ongoing:
    - Dominion Energy Engineering Office
    - Rose Dhu Equestrian Center
    - St. Gregory Catholic Church/School
    - River Ridge Academy
    - MC Riley Early Childhood Center
    - MC Riley Elementary School
    - MC Riley Sports Complex
    - Bluffton Middle School
    - Red Cedar Elementary School
    - ~~Seagrass Station Road Site~~ **Determined to be not feasible, low cost/benefit.**
    - Bluffton Pkwy West (170 to Buckwalter)
    - Buckwalter Pkwy (Hampton Hall to May River Road)
    - Persimmon St/Sheridan Park Cir/Pennington Dr
    - Vaden Nissan Hilton Head
    - ~~NHC Healthcare/Bluffton (Healthcare, Rehab, Assisted Living)~~ **Declined to participate**

Impervious Restoration Program Projects

- **Task 3 : Policy Document Formulation**
  - **TOB Fee-in-Lieu Program Policy Document** - completed and associated Fee-in-Lieu (FIL) cost matrix finalized and to be presented on January 28, 2025, Town Council Workshop meeting.

  - When a development project cannot accommodate the required stormwater retention volume (SWRv) due to on-site constraints identified in the approved Maximum Extent Practicable (MEP) analysis, the developer could opt to pay FIL to the Town of Bluffton for the shortfall according to the FIL fee schedule to be adopted as part of the FY26 budget Master Fee Schedule. Funds collected through FIL payments would then be used by the Town to fund other qualified uses that protect water quality within the same watershed as the original project including:
    - The construction and maintenance of impervious restoration program water quality BMPs;
    - Purchase of land for increased conservation areas, application of Better Site Design to the approved Master Plan, buffers, undisturbed open space, and natural resource of significance areas, and
    - Purchase of development rights.

  - **As Currently Drafted and Pending Town Council Approval:**
    - As part of the SoLoCo Stormwater Design Manual, developers may submit for MEP when the proposed development site has constraints or limitations to which prevent SoLoCo Stormwater Design Manual requirements from being met, specifically SWRv requirements. SWRv is the volume of stormwater runoff that a stormwater management system can store and treat to improve water quality. The MEP submittal must provide documentable evidence of the process the applicant has performed that demonstrates the restrictions to the use and implementation of the Best Management Practices (BMPs) to meet the SWRv requirements.

Impervious Restoration Program Projects

- **Task 3 : Policy Document Formulation (Cont.)**
  - FIL payment would be based and equal to a unit of SWRv in cubic feet or designating a conservation area/easement area that protects a qualified natural resource that would otherwise require the same SWRv treatment if developed. The monetary value for a unit of SWRv would be based on the current and typical costs for land as well as associated costs for design, construction, construction management, Town program management, post-construction inspection, and ongoing maintenance of water quality BMPs. The SWRv FIL rate would be found as part of the Town's Master Fee Schedule, under Section VII "Stormwater Management Fees,", allowing for annual review and updates as needed based on the Consumer Price Index (CPI) or based on updated information regarding the cost of water quality BMP construction and maintenance, changes in the construction industry, availability of supplies, etc. If the developer and/or private property owner take responsibility for maintaining the BMP or provide land, then the associated cost for a unit of SWRv could be lessened accordingly.
  - Proposed FIL **$151.92/ cubic foot of SWrv.**
  - Other Policy Document Development Status:
    - ToB CIP Project Impervious Restoration Program & Incentives – **Draft document in process.**
    - ToB SWrv Credit Trading Program - **(under evaluation)**

Impervious Restoration Program Projects

- **Other, Related MRWAP Update Recommendations**
  - Adopt proposed regional Southern Lowcountry Post-Construction Stormwater Ordinance and Design Manual - complete September 2021.
  - The Town should incorporate volume reduction BMPs (those that encourage infiltration) within existing and future CIP projects to the maximum extent practical, especially for project locations with well-drained soils (HSG A or B) – in progress, see below.
    - **Bridge Street Streetscape Project**
      - Project work and WQ monitoring complete.
    - **Pritchard Street Drainage Improvement Project**
      - 319 Grant Funding - $124,577.00
      - Project is in Bid Ready design development.
      - Projected anticipated to be advertised for construction in Spring 2025.

May River Action Plan Update & Modeling Report

5.0 Recommendations

- **5.1.1. In-House Microbial Source Tracking**
  - Dr. Pettay, USCB MST Laboratory lead, presented on the development of new markers to track fecal contamination in the May River to WAPAC at the 08/22/24 meeting.
  - In November 2024, samples from several SC Department of Environmental Services (SC DES) Shellfish Harvesting Stations in the May River had elevated fecal coliform concentrations.
    - The human genetic marker was not detected in any of the MST samples collected.
    - New MST markers for deer, dog, horse, and avian were analyzed in preserved samples.
    - All samples resulted in non-detects for human, deer, dog, horse, and avian.
  - Town staff are reviewing the Town's MST Monitoring Program and data historical SCDES Shellfish Harvesting samples (preserved at the USCB MST Lab).
  - Staff will be implementing new markers in the May River Watershed in 2025.

May River Action Plan Update & Modeling Report
5.0 Recommendations

- **5.1.2. Future (new) Bacteria Monitoring Locations &**
- **5.1.3. Future (new) Water Flow Monitoring Locations**
  - Water Environmental Consultants (WEC) removed the water elevation meter from the Duck Pond subwatershed (it was located on the Palmetto Bluff overpass). This monitor was installed to provide 6 months of water elevation data for stormwater model calibration, as there is no channelized flow into the Duck Pond.
    - A final report from WEC for this work will be forthcoming.
  - Town staff have finalized all bacteria and flow monitoring data collection efforts recommended in sections 5.1.2 and 5.13 of the May River Watershed Action Plan Model Report. These efforts aim to improve/calibrate the Town's stormwater model with a comprehensive dataset.
  - Town staff are working with the original Project Team that developed the Town's May River headwaters stormwater model in 2020.
    - The scope of work to update/calibrate the Town's May River headwaters stormwater model is currently in progress.
    - The Town has Fiscal Year 2025 (FY25) funding for this work.

Supporting Documents

Attachment 1. MRWAP Implementation Summary

- Summary document outlining updates to the May River Watershed Action Plan Project Implementation

Attachment 2. MRWAP IRP Maps and Summary Tables

- Initial site evaluations and summary tables completed for 9 of the May River Watershed Action Plan impervious restoration projects

Attachment 3. CIP Fund Project Data Sheets

- Fiscal Year 2026 Capital Improvement Program’s proposed cost data sheets for the three proposed May River Watershed Action Plan impervious restoration projects

QUESTIONS & DISCUSSION

May River Watershed Action Plan Update & Modeling Report (MRWAP) Implementation Summary

1. MRWAP Background

- *May River Watershed Action Plan Update & Modeling Report* (MRWAP) was completed November 2020.
- Town Council adopted the MRWAP as a supporting document to the Comprehensive Plan in February 2021.
- The Action Plan Update & Modeling Report included the development of watershed-water quality models (WQ Model) for the four (4) May River Headwaters subwatersheds (Stoney Creek, Rose Dhu Creek, Duck Pond, and Palmetto Bluff) where the shellfish impairments are located.
- The purpose of the modeling effort was to better understand fecal coliform (FC) fate and transport in the Headwaters subwatersheds to develop strategies ultimately intended to open all shellfish stations to harvesting. To capture the variety of storm events and environmental conditions, the Project Team developed a continuous simulation of both water quantity and quality.
- The MRWAP included new water quality improvement projects resulting from the WQ Model. Additionally, the potential fecal bacteria reduction benefits of septic to sewer conversion in the four (4) Headwaters subwatersheds were modeled.

2. Septic to Sewer Project Recommendations/Evaluations

Background:

- The MRWAP evaluated four (4) septic to sewer conversion projects in the Rose Dhu Creek and Stoney Creek subwatersheds:
    - Cahill
    - Gascoigne
    - Stoney Creek
    - Pritchardville
- These projects overlap with 42 subcatchments in the Stoney Creek watershed and 11 in Rose Dhu Creek. Based on WQ Model outputs, these projects alone may potentially reduce FC loading by 3.46x1013 FC per year.
- The estimated septic to sewer conversion costs of these projects is $5.5 million.

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Update: Stoney Creek/Palmetto Bluff Sewer Partnership

- BJWSA's 2022 updated cost-estimate for the project from BJWSA increased to $7.2 million + contingencies.
- BJWSA is the Project Manager as the awardee of the RIA-SCIIP grant.
- Next Steps:
    - BJWSA continues with community outreach and design of the system. BJWSA updates can be found at: https://bjwsa.org/251/Go2Sewer-for-a-Cleaner-Stoney-Creek

3. MRWAP Impervious Restoration Water Quality Projects

Task 1: MRWAP Eleven (11) Proposed Projects Background

- Eleven (11) project sites (incorporating various individual BMPs) were selected in consultation with the Town (prioritizing subcatchments with FC bacteria hotspot and/or large impervious areas). These sites were evaluated in terms of the potential benefits gained by retrofitting to meet the 95th percentile storm retention, to the maximum extent possible, under the proposed Impervious Area Restoration/Stormwater Retrofit Program.
- Based on WQ Model outputs, these projects alone may potentially reduce FC loading by
    - 2.99×1014 FC reduction for the Full SWRv (entire sub-basin drainage area catchment).
    - 2.53×1014 FC reduction for the Reduced SWRv projects (impervious area drainage area of sub-basin catchment).
- The estimated Full SWRv projects costs is $32.7 million and the estimated cost of Reduced SWRv projects is $22.6 million.
- Currently the Towns' Impervious Restoration Program is targeting Reduced SWRv for future projects.

Task 1: MRWAP Eleven (11) Proposed Projects Update

- Eleven (11) proposed project sites Rose Dhu Creek (6 projects) and Stoney Creek (5 projects):
    - All geotechnical work, evaluations, site assessments, planning and engineering is completed and preliminary Designs submitted.
        - Bluffton Early Learning Center (BELC).
        - Boys and Girls Club of Bluffton (BGC).
        - Benton House (BH).
        - Bluffton High School (BHS).
        - Buckwalter Recreation Center (BRC).
        - ~~Lowcountry Community Church (LCC).~~ **Declined to Participate.**
        - McCracken Middle School/Bluffton Elementary School (MMSBES).

- May River High School.
- ~~One Hampton Lake Apartments (OHLA).~~ **Declined to Participate.**
- Pritchardville Elementary School (PES).
- ~~Palmetto Pointe Townes (PPT).~~ **Declined to Participate.**

<u>Task 2: Identify Fifteen (15) New Project Sites Background</u>

- Identify 15 new project sites for Town of Bluffton Impervious Restoration/BMP Retrofit Projects.
- The Town wishes to identify an additional 15 project sites located within the municipal limits of Bluffton for the Impervious Restoration/BMP Retrofit Program. However, the criteria for site selection will be considered to be more "low hanging fruit" based on the following:
  - Within Town of Bluffton Municipal limits.
  - Soils – sandy soils with high infiltration rates offer the biggest bang for the buck for water quality treatment/improvement. Utilizing soil survey and other information target sites where infiltration can be maximized on-site.
  - Public or governmental agency land/property owner (not SCDOT RoW).
  -

<u>Task 2: Identify Fifteen (15) New Project Sites Update</u>

- Concept design development for the sites identified below ongoing:
  - Dominion Energy Engineering Office
  - Rose Dhu Equestrian Center
  - St. Gregory Catholic Church/School
  - River Ridge Academy
  - MC Riley Early Childhood Center
  - MC Riley Elementary School
  - MC Riley Sports Complex
  - Bluffton Middle School
  - Red Cedar Elementary School
  - Seagrass Station Road Site determined to be not feasible, low cost/benefit.
  - Bluffton Pkwy West (170 to Buckwalter)
  - Buckwalter Pkwy (Hampton Hall to May River Road)
  - Persimmon St/Sheridan Park Cir/Pennington Dr
  - Vaden Nissan Hilton Head
  - ~~NHC Healthcare/Bluffton (Healthcare, Rehab, Assisted Living)~~ **Declined to Participate**

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Task 3: MRWAP Impervious Restoration Policy Documents Background

- MRWAP Section 5.4.4. Stormwater BMP Retrofit Projects of the May River Watershed Action Plan Update and Model Report identifies potential Impervious Restoration/BMP Retrofit projects located on Public and Private Land. As mentioned earlier, one of the primary site selection criteria, at time of report development, was to identify sites with large impervious areas so that pollutant load reductions could be estimated and the benefits of such projects on stormwater quality quantified/estimated, if implemented into construction. Generally, Public Funds are not expended to improve private property nor is Town of Bluffton funding generally expended on Public Land owned by another government entity. In order for such projects identified in Section 5.4.4. to move forward in the interest of improved water quality and for the overall benefit and welfare of the constituents of the Town of Bluffton, Policy Documents need to be formulated that establishes the parameters of such a Program to be initiated and implemented.

Task 3: MRWAP Impervious Restoration Policy Documents Update

- Policy Document Formulation has been initiated and includes research of similar Programs Nationwide.
- Fee-in-Lieu Program Policy Document - completed and associated Fee-in-Lieu cost matrix finalized and to be presented in January 2025 Town Council Workshop meeting.
- As Currently Drafted and Pending Town council Approval:
    - As part of the SoLoCo Stormwater Design Manual, developers may submit for MEP when the proposed development site has constraints or limitations to which prevent SoLoCo Stormwater Design Manual requirements from being met, specifically stormwater retention volume (SWRv) requirements. SWRv is the volume of stormwater runoff that a stormwater management system can store and treat to improve water quality. The MEP submittal must provide documentable evidence of the process the applicant has performed that demonstrates the restrictions to the use and implementation of the Best Management Practices (BMPs) to meet the SWRv requirements.
    - When a development project cannot accommodate the required SWRv due to on-site constraints identified in the approved MEP analysis, the developer could opt to pay a Fee-In-Lieu (FIL) to the Town of Bluffton for the shortfall according to the FIL fee schedule to be adopted as part of the FY26 budget Master Fee Schedule. Funds collected through FIL payments would then be used by the Town to fund other qualified uses that protect water quality within the same watershed as the original project including:
        - The construction and maintenance of impervious restoration program water quality BMPs;

  - Purchase of land for increased conservation areas, application of Better Site Design to the approved Master Plan, buffers, undisturbed open space, and natural resource of significance areas, and
  - Purchase of development rights.
- FIL payment would be based and equal to a unit of SWRv in cubic feet or designating a conservation area/easement area that protects a qualified natural resource that would otherwise require the same SWRv treatment if developed. The monetary value for a unit of SWRv would be based on the current and typical costs for land as well as associated costs for design, construction, construction management, Town program management, post-construction inspection, and ongoing maintenance of water quality BMPs. The SWRv FIL rate would be found as part of the Town's Master Fee Schedule, under Section VII "Stormwater Management Fees,", allowing for annual review and updates as needed based on the Consumer Price Index (CPI) or based on updated information regarding the cost of water quality BMP construction and maintenance, changes in the construction industry, availability of supplies, etc. If the developer and/or private property owner take responsibility for maintaining the BMP or provide land, then the associated cost for a unit of SWRv could be lessened accordingly.

Item/Description	Fee
Fee-In-Lieu (FIL) For projects with an approved Maximum Extent Practicable (MEP) submittal, the FIL amount is calculated based on an applicant's shortfall, in cubic feet (CF), of the required Stormwater Retention Volume (SWRv).	$151.92/CF of SWRv

  - ToB CIP Project Impervious Restoration Program & incentives – Draft document in process.
  - ToB SWrv Credit Trading Program - (under evaluation)

4. Other, Related MRWAP Recommendations

Background:

- The Town should incorporate volume reduction BMPs (those that encourage infiltration) within existing and future CIP projects to the maximum extent practical (MEP), especially for project locations with well-drained soils (HSG A or B).

Other, Related MRWAP Recommendations Update:

- Town is in progress of incorporating volume reduction BMPs within existing and future CIP projects to the MEP. Specific projects currently in progress include:

- Bridge Street Streetscape Project
  - Water quality monitoring has been completed
- Pritchard Street Drainage Improvement Project
  - Incorporated Infiltration BMPs within the project to capture and treat 1.95” of rainfall over impervious surfaces within the project area, prior to discharge into Heyward Cove.
  - Submitted Section 319 Grant proposal to DHEC to cost-share cost of construction of proposed BMPs. Pre-proposal was accepted, and Full Proposal was requested by DHEC. Under Review.
  - Project in Bid Ready Design Development
  - Project anticipated to be advertised for construction in Spring 2025.

5. MRWAP Water Quality Program Recommendations Update

Background:

- Section 5.0 of the MRWAP included recommendations for the Town of Bluffton to improve upon their existing monitoring program (concentration and source typing) and flow.

MRWAP Water Quality Program Recommendations Update:

- 5.1.1 In-House Microbial Source Tracking:
  - Dr. Pettay, USCB MST Laboratory lead, presented on the development of new markers to track fecal contamination in the May River to WAPAC at the 08/22/24 meeting.
  - In November 2024, samples from several SC Department of Environmental Services (SC DES) Shellfish Harvesting Stations in the May River had elevated fecal coliform concentrations.
  - The human genetic marker was not detected in any of the MST samples collected.
  - New MST markers for deer, dog, horse, and avian were analyzed in preserved samples.
  - All samples resulted in non-detects for human, deer, dog, horse, and avian.
  - Town staff are reviewing the Town’s MST Monitoring Program and data historical SCDES Shellfish Harvesting samples (preserved at the USCB MST Lab).
  - Staff will be implementing new markers in the May River Watershed in 2025.
- 5.1.2 Future (New) Bacteria Monitoring Locations & 5.1.3 Future (New) Water Flow Monitoring Locations
  - Water Environmental Consultants (WEC) removed the water elevation meter from the Duck Pond subwatershed (it was located on the Palmetto Bluff overpass). This monitor was installed to provide 6 months of water elevation

data for stormwater model calibration, as there is no channelized flow into the Duck Pond.

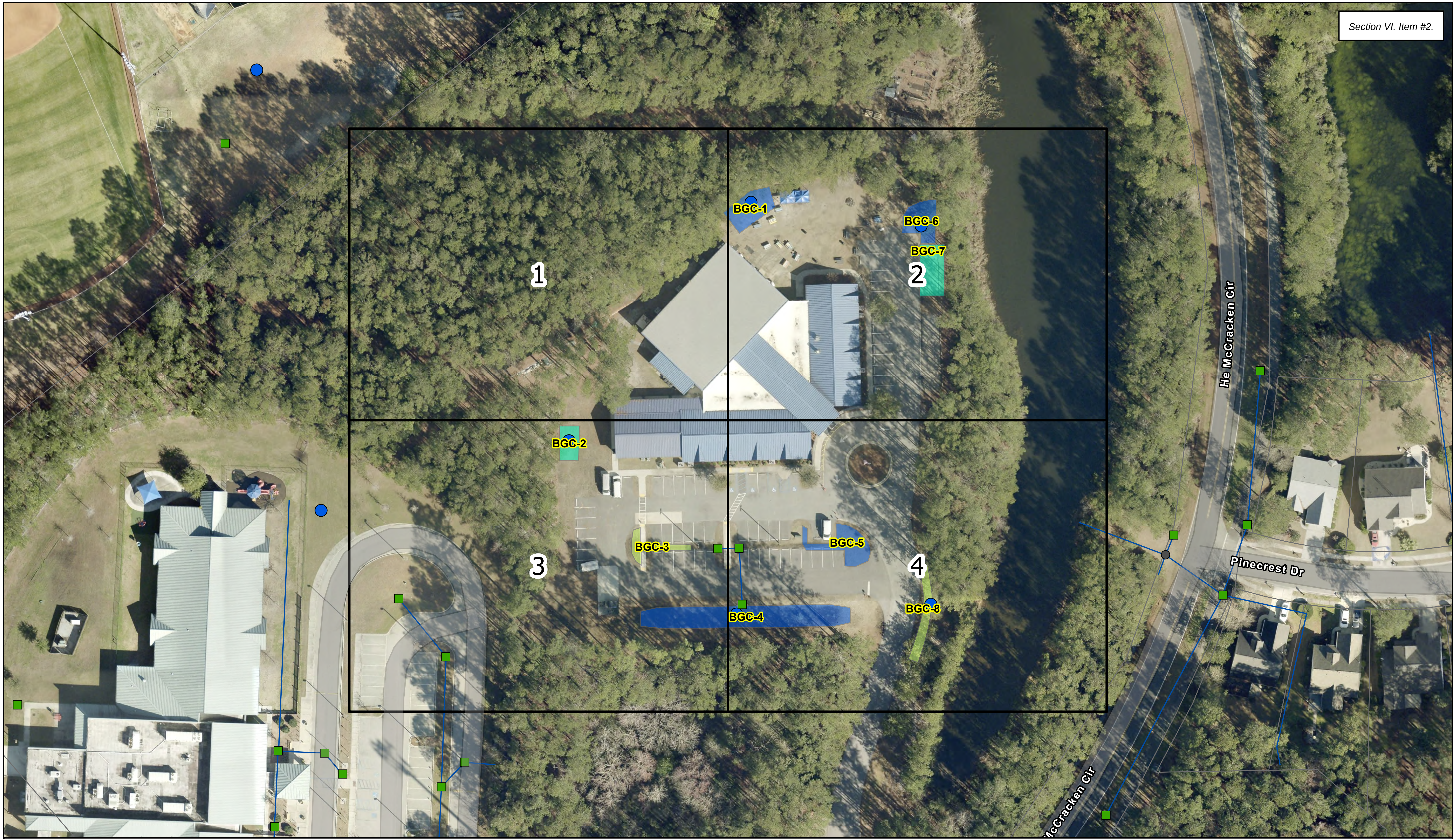
- A final report from WEC for this work will be forthcoming.
- Town staff have finalized all bacteria and flow monitoring data collection efforts recommended in sections 5.1.2 and 5.13 of the May River Watershed Action Plan Model Report. These efforts aim to improve/calibrate the Town's stormwater model with a comprehensive dataset.
- Town staff are working with the original Project Team that developed the Town's May River headwaters stormwater model in 2020.
- The scope of work to update/calibrate the Town's May River headwaters stormwater model is currently in progress.
- The Town has Fiscal Year 2025 (FY25) funding for this work.

Boys & Girls Club

Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BGC-1	Bioretention	Medium	39	Gym Roof	0.18	1,351	$42,000	$31.09	High	1.18	950	41	22	2	1	1	75%	160	6	
BGC-2	Infiltration Chamber	Low	26	Western Roof	0.09	618	$30,000	$48.58	Mod-Low	1.98	500	30	17		3		75%	100	30	4 rows of 25'
BGC-3	Infiltration Trench	Medium	28		0.22	574	$20,000	$34.86	Mod-Low	0.77	450	51	28		3	0.5	75%	100	6	
BGC-4	Bioretention	Medium	31	Front Parking Lot	0.27	3,279	$107,000	$32.63	Moderate	0.77	3,300	180	19	1.5	0.5	0.75	75%	250	8	
BGC-5	Bioretention	Medium	28		0.13	1,034	$42,000	$40.61	Moderate	0.77	1,000	57	36	2	1	0.5	75%	130	6	
BGC-6	Bioretention	High	40	Eastern Parking Lot/Roof	0.33	1,211	$36,000	$29.72	High	1.53	850	37	28	2	1	1	75%	100	6	
BGC-7	Infiltration Chamber	Medium	29	Eastern Parking Row	0.02	1,283	$58,000	$45.22	Moderate	1.53	950	44	21		3		75%	200	30	5 rows of 40'
BGC-8	Infiltration Trench	Medium	30	Driveway	0.12	903	$29,000	$32.11	Mod-Low	0.82	650	85	7		3	0.75	75%	120	6	
Total					**1.35**	**10,253**	**$364,000**				**8,650**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
BGC-1	Bioretention	Route gymnasium roof drains to open space, adjacent to edge of wooded area.
BGC-2	Infiltration Chamber	Route roof drains to infiltration chamber, and add gutter on front side of building to route additional flow here too
BGC-3	Infiltration Trench	Utilize existing storm inlet as overflow structure and route IWS here; convert landscape island into an infiltration trench due to narrower width
BGC-4	Bioretention	Retrofit existing detention pond with gravel layer and in IWS underdrain system that routes outflow to the pond on eastern edge of property
BGC-5	Bioretention	Utilize existing storm inlet as overflow structure and route IWS here; convert landscape island into bioretention
BGC-6	Bioretention	Retrofit low point into bioretention and add earthen berm to route overflow into adjacent pond
BGC-7	Infiltration Chamber	For gravel parking area that is adjacent to BGC-6, add an infiltration chamber that is interconnected under half of the parking row for additional storage
BGC-8	Infiltration Trench	Construct an infiltration trench along eastern edge of driveway and add an IWS underdrain that is connected to adjacent pond



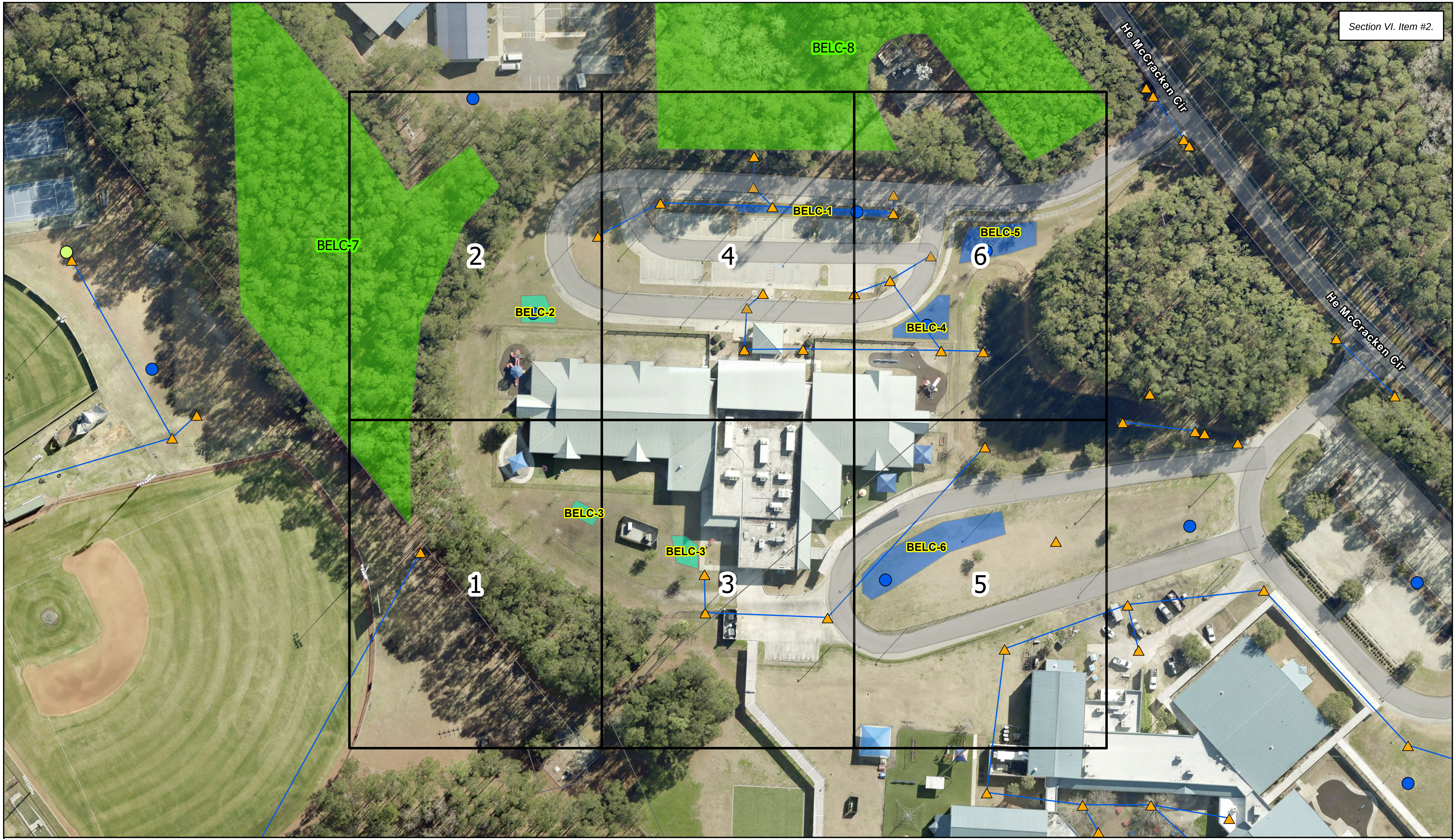
Boys and Girls Club

114 Barnard Street, Suite 2B
Savannah, GA 31401
GMCNETWORK.C

Bluffton Early Learning center																				
Site ID	**BMP Type**	**Overall Ranking**	**Numerical Score**	**Drainage Area / Location**	**Impervious Area**	**SWRv**	**Construction Cost**	**Cost/SWRV**	**Constructability**	**Infil Rate**	**BMP Area**	**Length**	**Width**	**Media Depth**	**Gravel Depth**	**Ponding Depth**	**Underdrain[1]**	**Pipe Length**	**Pipe Diameter**	**Infilration Chamber Notes**
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BELC-1	Bioretention	Low	24	Driveway, East	0.20	1,528	$51,000	$33.37	Mod-Low	0.04	1,200	149	8	1.5	1.5	0.75	75%	140	6	
BELC-2	Infil. Chamber	Low	24	Roof, Northeast	0.22	1,467	$61,000	$41.59	Mod-Low	0.20	825	31	27		4		75%	200	30	8 rows of 25'
BELC-3	Infil. Chamber	Low	24	Roof, Northwest	0.28	1,914	$78,000	$40.75	Mod-Low	0.20	1,075	30 / 27	25 / 15		4		75%	250	30	4 rows of 25' & 6 rows of 25'
BELC-4	Bioretention	Medium	31	Roof, Southeast	0.23	1,806	$57,000	$31.56	Moderate	0.06	1,600	55	44	1.5	1	0.75	75%	80	6	
BELC-5	Bioretention	Low	26	Parking Lot	0.43	2,516	$87,000	$34.58	Mod-Low	0.01	2,200	76	31	1.5	1	0.75	75%	160	6	
BELC-6	Bioretention	High	54	Roof, Southwest; Rear Parking Lot	0.87	6,592	$198,000	$30.04	High	5.80	4,650	157	32	2	1	1	75%	300	8	
BELC-7	Conservation Area	High		North of School	0.00	t.b.d			High		1.52-ac									
BELC-8	Conservation Area	High		East of School	0.00	t.b.d			High		1.97-ac									
Total					**2.23**	**15,824**	**$532,000**				**11,550**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	**BMP Type**	**Other Design & Flow Routing/Implementation Notes**
BELC-1	Bioretention	Route runoff from driveway into grassed median through trench drain or pavement regrading or moving speed bumps, connect to nearby structure with IWS
BELC-2	Infil. Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured outside of playground fence
BELC-3	Infil. Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured outside of playground fence, two smaller structures likely needed due to location of utilities
BELC-4	Bioretention	Adjust roof drains to discharge at ground surface and flow into bioretention cell, utilize existing grate inlet as overflow structure and tie-in with IWS
BELC-5	Bioretention	Regrade driveway section to force overland flow into grassed area immediately to the south of drop inlet, create a new discharge point into pond with IWS and a dome overflow structure
BELC-6	Bioretention	Route roof drains to disharge into large bioretention cell; adjust grading near parking lot grate inlet to allow for overland flow into bioretention or install a new storm inlet structure with shallower pipe to discharge closer to the surface
BELC-7	Conservation Area	Proposed Conservation Area for 1.52 acre (66,000 SF) wooded area
BELC-8	Conservation Area	Proposed Conservation Area for 1.97 acre (86,000 SF) wooded area



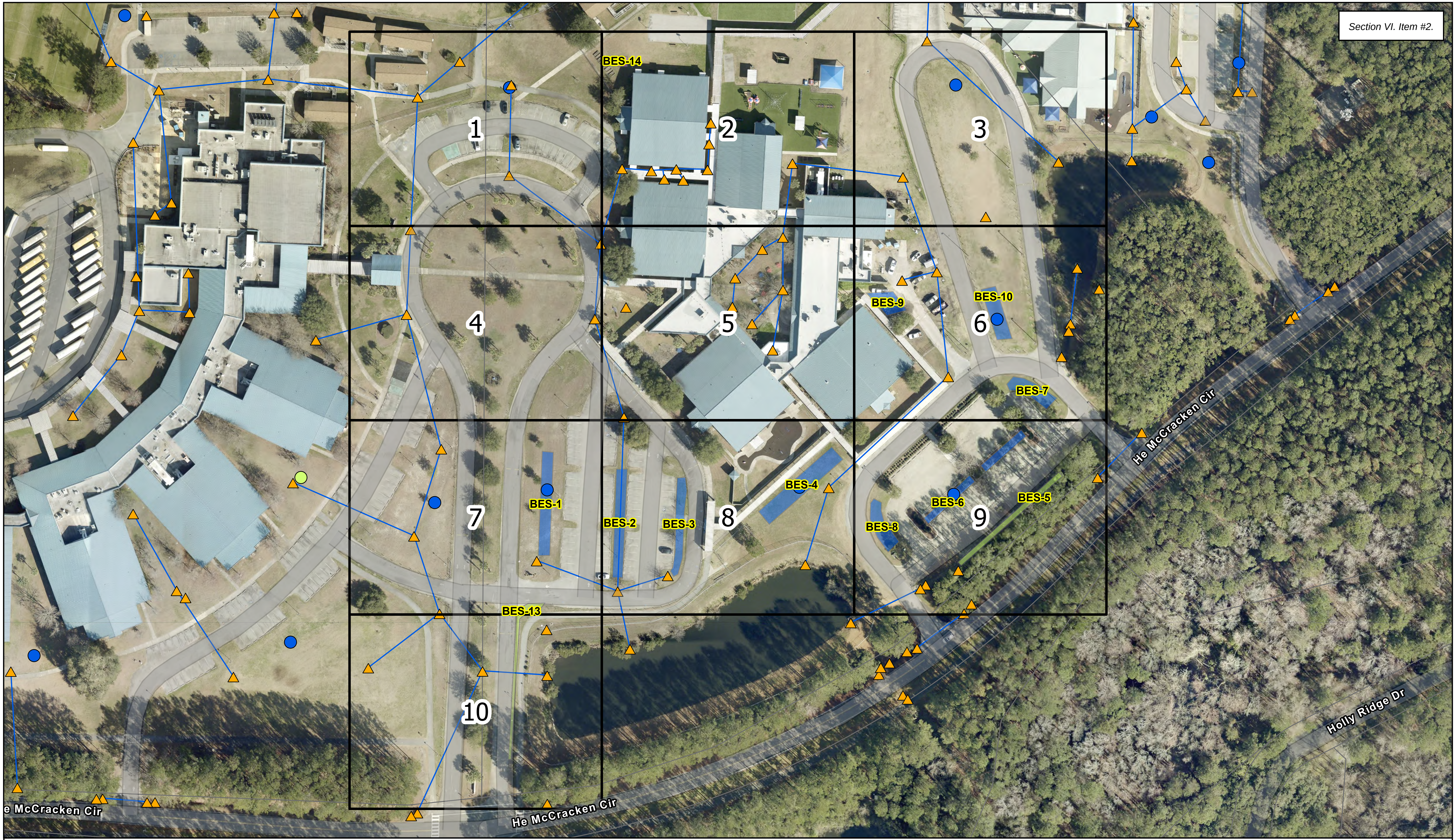
Bluffton Early Learning Center

GMC
114 Barnard Street, Suite 2B
Savannah, GA 31401
GMCNETWORK.C

Bluffton Elementary School																				
Site ID	**BMP Type**	**Overall Ranking**	**Numerical Score**	**Drainage Area / Location**	**Impervious Area**	**SWRv**	**Construction Cost**	**Cost/SWRV**	**Constructability**	**Infil Rate**	**BMP Area**	**Length**	**Width**	**Media Depth**	**Gravel Depth**	**Ponding Depth**	**Underdrain[1]**	**Pipe Length**	**Pipe Diameter**	**Infilration Chamber Notes**
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BES-1	Bioretention	High	41		0.30	2,766	$80,000	$28.93	High	0.52	1,950	133	14	2	1	1	75%	120	6	
BES-2	Bioretention	High	41	Front Parking Lot Median	0.34	2,681	$78,000	$29.09	High	0.52	1,900	140	13	2	1	1	75%	120	6	
BES-3	Bioretention	High	41		0.25	1,953	$58,000	$29.69	High	0.52	1,400	125	11	2	1	1	75%	120	6	
BES-4	Bioretention	Medium	35	Southern Playground / Roof	0.52	3,974	$113,000	$28.44	Moderate	0.06	2,800	126	22	2	1	1	75%	120	8	
BES-5	Infil. Trench	Medium	39	Gravel Parking Lot	0.23	1,729	$52,000	$30.08	Moderate	1.76	1,200	174	7		3	0.75	75%	180	6	
BES-6	Bioretention	Medium	36		0.25	1,945	$66,000	$33.93	Moderate	1.76	1,600	150	10	2	1	0.75	75%	160	6	
BES-7	Bioretention	High	43	Southern Driveway	0.22	1,629	$47,000	$28.86	High	1.76	1,150	64	18	2	1	1	75%	60	6	
BES-8	Bioretention	High	43		0.22	1,629	$47,000	$28.86	High	1.76	1,150	67	16	2	1	1	75%	60	6	
BES-9	Bioretention	Low	27	Eastern Building	0.18	1,335	$38,000	$28.46	Low	0.05	950	35	26	2	1	1	75%	40	6	
BES-10	Bioretention	Medium	38	Loop Between BELC/BES	0.22	1,714	$47,000	$27.43	High	0.05	1,300	68	19	1.5	1	1	75%	70	6	
BES-13	Infil. Trench	High	40	Driveway Entrance	0.17	1,335	$40,000	$29.95	High	0.52	1,150	220	5		2	0.75	0.75	180	6	
BES-14	Cistern	High		NW Corner of Building	0.06	t.b.d			High											
Total					**2.95**	**22,690**	**$666,000**				**16,550**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	**BMP Type**	**Other Design & Flow Routing/Implementation Notes**
BES-1	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-2	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-3	Bioretention	Retrofit bioretention cell in grassed area between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet
BES-4	Bioretention	Route roof drains through a combination of disconnection and shallow pipes to grassed area south of sidewalk, utilize nearby storm inlet for outflow
BES-5	Infil. Trench	Install infiltration trench on edge of parking lot to treat southern half of lot, construct a weir or berm on downstream end to discharge overflow into existing swale and storm inlet
BES-6	Bioretention	Retrofit bioretention cell in grassed area between parking rows to treat northern half of parking lot, allow overflow to sheetflow towards BES-5
BES-7	Bioretention	Retrofit bioretention cell in grassed area between driveway and parking lot to intercept runoff before entering existing storm inlet
BES-8	Bioretention	Retrofit bioretention cell in grassed area between driveway and parking lot to intercept runoff before entering existing storm inlet
BES-9	Bioretention	Route roof drains to grassed area next to driveway to intercept runoff, utilize nearby storm inlet for outflow
BES-10	Bioretention	Route runoff into grassed area adjacent to driveway to intercept runoff and create a berm to discharge overflow towards the pond
BES-13	Infil. Trench	Construct an infiltration trench along eastern edge of driveway and add an IWS underdrain that is connected to adjacent pond
BES-14	Cistern	Connect up to two downspouts to route 2,400 SF of rooftop for capture and reuse for adjacent raised beds/gardens



Bluffton Elementary School

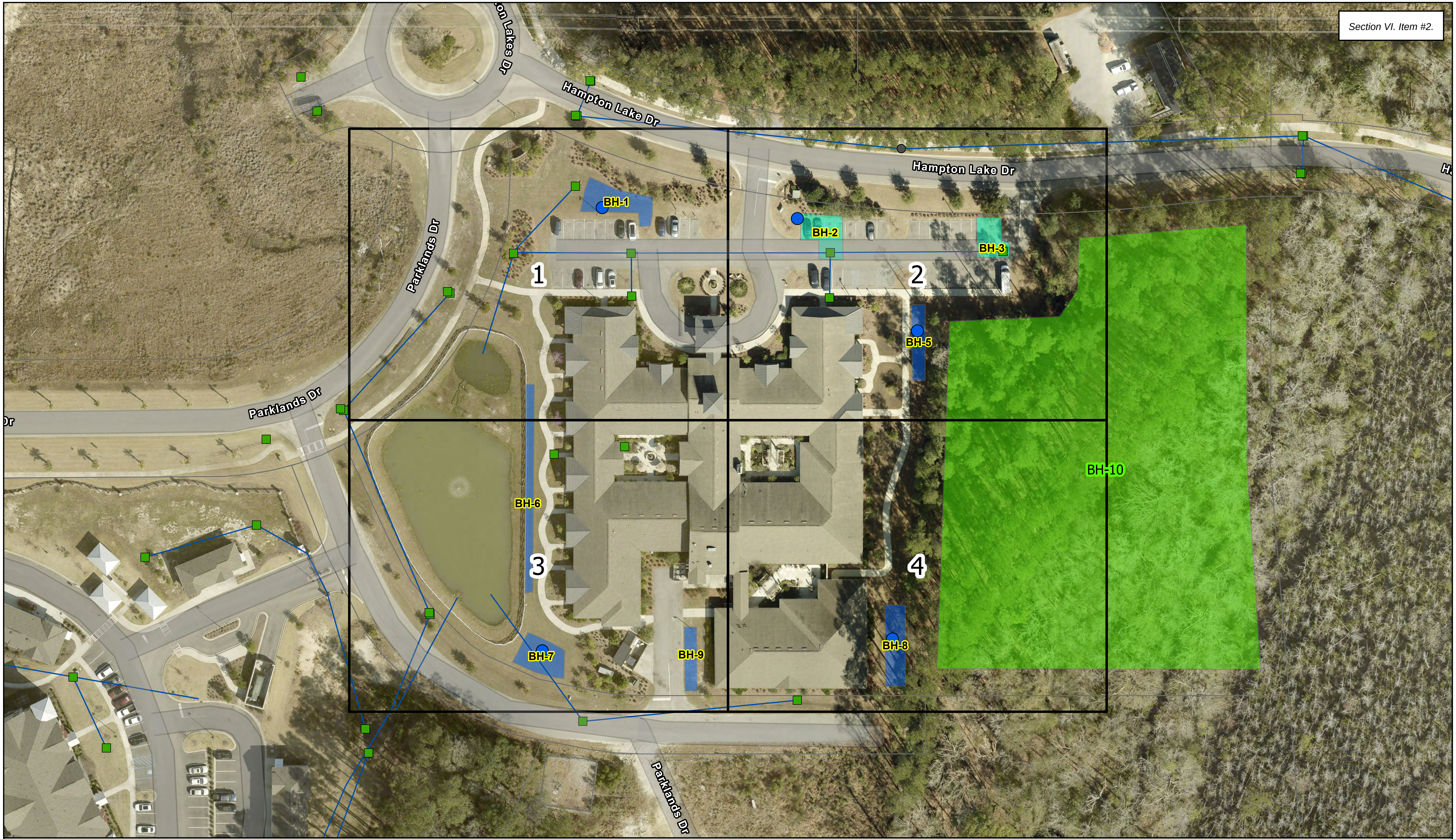
GMC
114 Barnard Street, Suite 2B
Savannah, GA 31401
GMCNETWORK.C

Benton House

Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BH-1	Bioretention	Low	25	Front Parking Lot	0.25	1,891	$65,000	$34.37	Moderate	1.03	1,350	61	22	2	1	1	75%	80	6	
BH-2	Infilration Chamber	Low	17		0.22	1,482	$77,000	$51.96	Mod-Low	0.50	1,100	38	35		3		75%	200	30	4 rows of 35' & 3 rows of 20'
BH-3	Infilration Chamber	Low	14		0.17	1,127	$59,000	$52.35	Mod-Low	0.36	850	34	28		3		75%	150	30	5 rows of 30'
BH-5	Bioretention	Low	20	Eastern Roof	0.14	1,057	$34,000	$32.15	Mod-Low	0.36	750	65	11	2	1	1	75%	140	6	
BH-6	Bioretention	Low	15	Western Roof	0.20	1,505	$62,000	$41.19	Mod-Low	0.39	1,250	180	7	2	1	0.75	75%	220	6	
BH-7	Bioretention	Low	21	Southern Roof	0.21	1,598	$47,000	$29.42	Mod-Low	0.39	1,150	40	28	2	1	1	75%	70	6	
BH-8	Bioretention	Low	21	Building Addition (S)	0.22	1,652	$52,000	$31.48	Mod-Low	0.25	1,200	70	17	2	1	1	75%	150	6	
BH-9	Bioretention	Low	19	Back Driveway	0.11	803	$26,000	$32.39	Mod-Low	0.39	600	55	11	2	1	1	75%	65	6	
BH-10	Conservation Area	High		East of Site	0.00	t.b.d			High		2.07-ac									
Total					**1.51**	**11,115**	**$422,000**				**8,250**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
BH-1	Bioretention	Route runoff from parking lot into grassed area through trench drain or regrading and making landscape island a swale; utilize storm inlet in grassed area as overflow structure and tie-in for IWS; tie-in vegetation with landscaped area
BH-2	Infilration Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
BH-3	Infilration Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
BH-5	Bioretention	Disconnect downspouts to allow for overland flow into bioretention cell, route IWS into nearby storm structure
BH-6	Bioretention	Disconnect downspouts to allow for overland flow into bioretention cell, route IWS into adjacent pond
BH-7	Bioretention	Reroute roof drains into bioretention cell, route IWS into adjacent pond
BH-8	Bioretention	Reroute roof drains into bioretention cell, route IWS into nearby storm structure
BH-9	Bioretention	Reroute roof drains and driveway runoff into bioretention cell, route IWS into nearby storm structure
BH-10	Conservation Area	Proposed Conservation Area for 2.07 acre (90,000 SF) wooded area



Benton House

114 Barnard Street, Suite 2B
Savannah, GA 31401
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Bluffton High School																				
Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BHS-1	Bioretention	High	50	Front Parking Lot	0.29	2,123	$52,000	$24.50	Moderate	7.21	1,150	60	21	2	1	1	100%			
BHS-2/-3	Bioretention	High	50	Front Parking Lot/ Entrance	0.37	2,678	$56,000	$20.91	Moderate	7.21	1,450	58	22	2	1	1	100%			
BHS-4	Bioretention	High	46	Entrance	0.12	865	$19,000	$21.98	Moderate	2.11	500	35	14	2	1	1	100%			
BHS-5	Bioretention	High	54	Front Parking Lot	0.72	5,249	$122,000	$23.24	High	2.08	2,800	240	12	2	1	1	100%			
BHS-6	Bioretention	High	47		0.09	710	$21,000	$29.57	High	2.08	500	52	10	2	1	1	75%	50	6	
BHS-7	Infil. Chamber	High	42	Rooftop	0.31	2,069	$79,000	$38.19	Mod-Low	5.21	1,150	65	18		4		75%	240	30	4 rows of 60'
BHS-8	Bioretention	High	48		0.58	4,268	$91,000	$21.32	Moderate	2.11	2,250	54	44	2	1	1	100%	120	6	
BHS-9	Bioretention	High	46		0.20	1,467	$33,000	$22.50	Moderate	2.11	800	44	20	2	1	1	100%	50	6	
BHS-11	Infil. Chamber	High	41		0.81	5,449	$213,000	$39.09	Low	2.11	3,050	121	28		4		75%	660	30	6 rows of 110'
BHS-12A	Bioretention	High	42	Rear Parking Lot	0.37	2,810	$81,000	$28.83	Mod-Low	2.11	2,000	75	35	2	1	1	75%	110	6	
BHS-12B	Perm. Pavement	Medium	34		0.14	1,662	$149,000	$89.67	Mod-Low	2.11	6,200	305	20		0.67		100%			
BHS-13	Infil. Trench	High	50	Bus Entrance	0.15	1,142	$21,000		High	2.08	1,000	389	6		1	0.75	100%			
BHS-14	Bioretention	High	49	Tennis Courts	0.40	3,018	$90,000		High	2.08	2,150	122	18	2	1	1	75%	200	6	
BHS-15	Bioretention	High	41		0.76	5,696	$161,000	$28.26	High	0.11	4,000	101	48	2	1	1	75%	180	8	
BHS-16	Infil. Chamber	Medium	37	Front Parking Lot Islands	0.23	1,544	$66,000	$42.75	Mod-Low	2.11	875	100	9		3		100%	200	30	2 rows of 100'
BHS-17	Infil. Chamber	High	42		0.27	1,806	$69,000	$38.20	Mod-Low	7.21	1,000	108	9		3		100%	200	30	2 rows of 100'
BHS-18	Infil. Chamber	High	42		0.27	1,806	$69,000	$38.20	Mod-Low	7.21	1,000	108	10		3		100%	200	30	2 rows of 100'
BHS-19	Infil. Chamber	High	42		0.26	1,760	$69,000	$39.21	Mod-Low	7.21	1,000	102	10		3		100%	200	30	2 rows of 100'
BHS-20A	Conservation Area	High		East of Tennis Courts	0.00	t.b.d			High		1.65-ac									
BHS-20B	Conservation Area	High			0.00	t.b.d			High		2.04-ac									
BHS-21	Conservation Area	High		Bus Circle	0.00	t.b.d			High		0.80-ac									
BHS-22	Conservation Area	High		South of Football	0.00	t.b.d			High		1.54-ac									
BHS-23	Conservation Area	High		NE Corner of Property	0.00	t.b.d			High		2.41-ac									
Total					**6.33**	**46,122**	**$1,461,000**				**32,875**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
BHS-1	Bioretention	Route runoff from parking lot storm inlet into grassed area through trench drain or regrading pavement; add new dome structure to route overflow back to nearby/original storm structure, no underdrain
BHS-2/-3	Bioretention	Add curb cut/flume adjacent to storm inlet to route runoff to bioretention cell behind curb and utilize existing structure for overflow connection, no underdrain
BHS-4	Bioretention	Add curb cut/flume adjacent to storm inlet to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection, no underdrain
BHS-5	Bioretention	Route runoff from parking lot storm inlets into grassed area through trench drain or regrading pavement; add new dome structure to route overflow back to nearby/original storm structure, no underdrain
BHS-6	Bioretention	Add curb cut/flume adjacent to storm inlet to route runoff to linear ROW bioretention cell and add earthern berm to discharge to adjacent pond
BHS-7	Infil. Chamber	Route downspout connection to infiltration chamber and utilize nearby structure for outlet connection
BHS-8	Bioretention	Route downspout connection to bioretention cell adjance to landscape area and utilize existing structure for overflow connection, no underdrain
BHS-9	Bioretention	Intercept runoff from storm inlets on concrete patio into bioretention cell in grassed area, construct bioretention next to storm inlet and utilize for overflow connection, no underdrain
BHS-11	Infil. Chamber	Route downspout connections to infiltration chamber and utilize nearby structure for outlet and IWS connection, fit shape to avoid utilities
BHS-12A	Bioretention	Retrofit bioretention cell in grassed landscape island to intercept runoff before entering existing storm inlet, utilize storm inlet for overflow and IWS connection
BHS-12B	Perm. Pavement	Convert gravel parking stalls into permeable pavement to treat direct rainfall only, no underdrain
BHS-13	Infil. Trench	Construct an infiltration trench along northern edge of driveway, add earthen berm for overflow into adjacent pond, no underdrain
BHS-14	Bioretention	Retrofit roadside swale into bioretention cell to intercept road and tennis court runoff, add an earthern berm on eastern side to route overflow to wooded area, no underdrain
BHS-15	Bioretention	Route runoff from swale to west of tennis court into grassed area around storm inlet and utilize it for overflow and IWS connection
BHS-16	Infil. Chamber	Route parking lot runoff into infiltration chamber within landscape island using a new inlet with shallower pipe or a pretreatment device or sand filter at existing structure to mimize influx of sediment and debris into chamber
BHS-17	Infil. Chamber	Route parking lot runoff into infiltration chamber within landscape island using a new inlet with shallower pipe or a pretreatment device or sand filter at existing structure to mimize influx of sediment and debris into chamber
BHS-18	Infil. Chamber	Route parking lot runoff into infiltration chamber within landscape island using a new inlet with shallower pipe or a pretreatment device or sand filter at existing structure to mimize influx of sediment and debris into chamber
BHS-19	Infil. Chamber	Route parking lot runoff into infiltration chamber within landscape island using a new inlet with shallower pipe or a pretreatment device or sand filter at existing structure to mimize influx of sediment and debris into chamber
BHS-20A	Conservation Area	Proposed Conservation Area for 1.65 acre (72,000 SF) wooded area
BHS-20B	Conservation Area	Proposed Conservation Area for 2.04 acre (89,000 SF) wooded area
BHS-21	Conservation Area	Proposed Conservation Area for 0.80 acre (35,000 SF) wooded area
BHS-22	Conservation Area	Proposed Conservation Area for 1.54 acre (67,000 SF) wooded area
BHS-23	Conservation Area	Proposed Conservation Area for 2.41 acre (105,000 SF) wooded area

Bluffton High School

TOWN OF BLUFFTON SOUTH CAROLINA EST. 1825

GMC
114 Barnard Street, Suite 2B
Savannah, GA 31401
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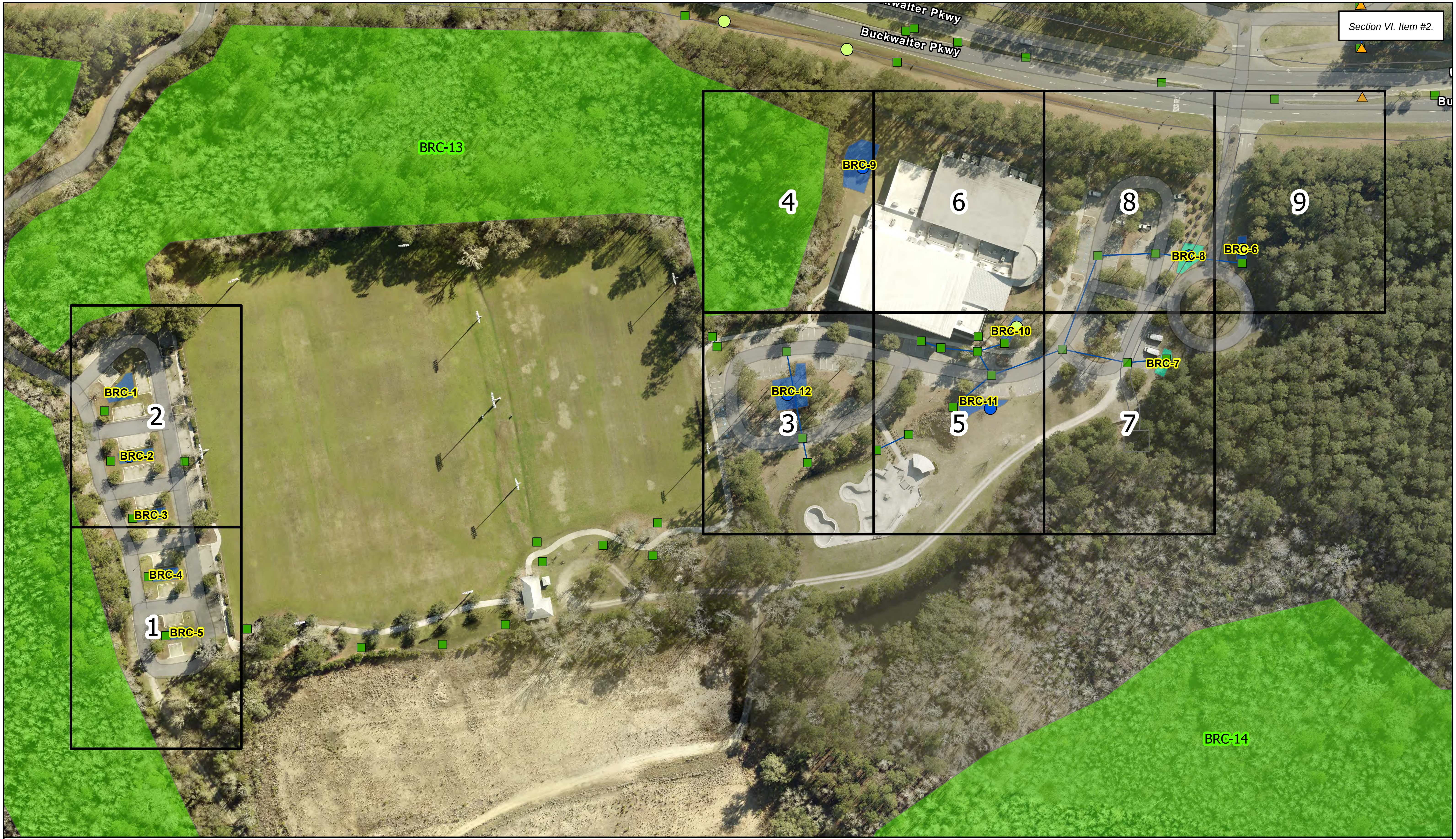
Buckwalter Recreation Center

Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
BRC-1	Bioretention	High	46	Northern Parking Lot (east to west)	0.21	1,598	$47,000	$29.42	High	1.21	1,150	45	26	2	1	1	75%	60	6	
BRC-2	Bioretention	High	45		0.17	1,281	$37,000	$28.88	High	1.21	900	52	17	2	1	1	75%	60	6	
BRC-3	Bioretention	High	45		0.13	1,011	$31,000	$30.66	High	1.21	750	45	16	2	1	1	75%	50	6	
BRC-4	Bioretention	High	45		0.13	973	$29,000	$29.82	High	1.21	700	40	18	2	1	1	75%	50	6	
BRC-5	Bioretention	High	44		0.10	780	$23,000	$29.50	High	1.21	550	32	17	2	1	1	75%	40	6	
BRC-6	Bioretention	High	44	Driveway Entrance/Front Parking Lot (southern end)	0.09	695	$21,000	$30.23	High	1.33	500	34	15	2	1	1	75%	40	6	
BRC-7	Infiltration Chamber	Medium	32		0.17	1,127	$57,000	$50.58	Mod-Low	1.33	650	40	17		4		75%	150	30	2 rows of 40' & 2 rows of 35'
BRC-8	Infiltration Chamber	Medium	34		0.30	2,022	$91,000	$45.00	Mod-Low	1.33	1,150	46	31		4		75%	250	30	6 rows of 25' & 5 rows of 20'
BRC-9	Bioretention	High	45	Eastern Roof	0.55	4,145	$120,000	$28.95	High	0.77	2,950	74	40	2	1	1	75%	160	8	
BRC-10	Bioretention	Medium	39	Entrance Roof	0.13	973	$29,000	$29.82	Moderate	0.94	700	48	15	2	1	1	75%	40	6	
BRC-11	Bioretention	Medium	31	Side Parking Lot	0.23	1,737	$58,000	$33.40	Low	0.94	1,250	65	18	2	1	1	75%	80	6	
BRC-12	Bioretention	High	40		0.49	3,690	$118,000	$31.98	Mod-Low	1.10	2,600	64	48	2	1	1	75%	100	8	
BRC-13	Conservation Area	High		East of Soccer Fields	0.00	t.b.d			High		7.32-ac									
BRC-14	Conservation Area	High		Northern/Western Boundary	0.00	t.b.d			High		40.86-ac									
Total					**2.70**	**20,030**	**$661,000**				**13,850**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
BRC-1	Bioretention	Retrofit bioretention cell in swale between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet along driveway lane
BRC-2	Bioretention	Retrofit bioretention cell in swale between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet along driveway lane
BRC-3	Bioretention	Retrofit bioretention cell in swale between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet along driveway lane
BRC-4	Bioretention	Retrofit bioretention cell in swale between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet along driveway lane
BRC-5	Bioretention	Retrofit bioretention cell in swale between parking rows and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet along driveway lane
BRC-6	Bioretention	Retrofit bioretention cell in ditch along driveway and build up an earthen berm on the downstream end to create surface ponding, overflow from this BMP can flow into existing storm inlet that is immediately downstream
BRC-7	Infiltration Chamber	Route driveway runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; retrofit the adjacent, existing storm inlet in parking lot with a shallower configuration to route smaller storms to infiltration chamber and add a pretreatment device or sump to mimize influx of sediment and debris into chamber
BRC-8	Infiltration Chamber	Route driveway runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; retrofit the adjacent, existing storm inlet in parking lot with a shallower configuration to route smaller storms to infiltration chamber and add a pretreatment device or sump to mimize influx of sediment and debris into chamber
BRC-9	Bioretention	Route runoff from small roof to open space, adjacent to edge of wooded area, by disconnecting three downspouts; route runoff from larger roof area through addition of swale or shallow pipe along sidewalk
BRC-10	Bioretention	Route unguttered roof runoff through a shallow swale and route guttered runoff with downspout disconnection directly to bioretention cell; utilize existing storm inlet as overflow structure
BRC-11	Bioretention	Route runoff from parking lot into grassed area through trench drain or regrading pavement (consider shifting landscape island to this location); add an earthen berm to direct overflow direclty into adjacent detention pond
BRC-12	Bioretention	Route runoff from both parking lot storm inlets into landscape island through trench drain or regrading pavement (consider shifting landscape island to this location); add a new storm structure that ties into existing storm pipe for outflow
BRC-13	Conservation Area	Proposed Conservation Area for 7.32 acre (319,000 SF) wooded area
BRC-14	Conservation Area	Proposed Conservation Area for 40.86 acre (1,780,000 SF) wooded area; some wetlands are proposed to be filled or converted to stormwater BMPs for Masterplan Expansion
OTHER	Pond Retrofit	Consider retrofit to outlet pipe or expansion of small pond adjacent to BRC-11 to provide additional infiltration; this requires additional modeling and soil testing to design and coordination with County on future park expansion plans



Buckwalter Recreation Complex

GMC
114 Barnard Street, Suite 2B
Savannah, GA 31401
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H.E. McCracken Middle School

Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
HEMMS-1	Bioretention	High	40	Parking Lot/Detention	0.41	3,388	$103,000	$30.40	High	0.42	2,400	213	10	2	1	1	75%	300	6	
HEMMS-2	Bioretention	Medium	39	Driveway	0.25	2,190	$64,000	$29.23	High	0.35	1,550	110	14	2	1	1	75%	100	6	
HEMMS-3	Bioretention	High	40	Front Parking Lot	0.42	3,739	$108,000	$28.88	High	0.35	2,650	121	22	2	1	1	75%	140	6	
HEMMS-4	Bioretention	High	48		0.19	1,459	$45,000	$30.85	High	3.67	1,050	43	24	2	1	1	75%	120	6	
HEMMS-5	Bioretention	High	54		0.40	3,187	$66,000	$20.71	High	5.97	1,700	54	36	2	1	1	100%			
HEMMS-6	Bioretention	High	55	Roof Runoff from Wings	0.42	3,314	$68,000	$20.52	High	5.97	1,750	58	35	2	1	1	100%			
HEMMS-7	Bioretention	High	55		0.41	3,299	$68,000	$20.61	High	5.97	1,750	55	40	2	1	1	100%			
HEMMS-8	Infil. Chamber	Low	27		0.36	2,737	$110,000	$40.20	Mod-Low	0.35	1,550	58	27		4		75%	350	30	7 rows of 50'
HEMMS-9	Infil. Chamber	Medium	29	Northern Building	0.23	1,544	$60,000	$38.87	Mod-Low	0.35	875	47	19		4		75%	180	30	4 rows of 45'
HEMMS-10	Bioretention	High	45	Bus Dropoff Wings	0.10	855	$17,000	$19.89	Moderate	3.67	450	34	14	2	1	1	100%			
HEMMS-11	Bioretention	High	45		0.11	899	$19,000	$21.12	Moderate	3.67	500	34	15	2	1	1	100%			
HEMMS-12	Bioretention	High	56	Bus Parking Lot	1.41	10,652	$303,000	$28.45	High	3.67	7,500	145	76	2	1	1	75%	350	8	
HEMMS-13	Infil. Chamber	Low	23	Northern Building	0.18	1,189	$49,000	$41.22	Low	0.35	700	52	14		4		75%	150	30	3 rows of 50'
HEMMS-14	Bioretention	High	50	Northern Parking Lot	0.37	2,769	$65,000	$23.47	Moderate	10.65	1,700	185	9	2	1	0.75	100%			
Total					**5.26**	**41,220**	**$1,145,000**				**26,125**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
HEMMS-1	Bioretention	Construct a berm along northern edge of detention pond to create a bioretention cell that will intercept runoff from parking lot before entering pond (pre-treatment), add a low point on berm to discharge overflow into pond
HEMMS-2	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow
HEMMS-3	Bioretention	Retrofit bioretention cell in grassed area around storm inlets and utilize them for overflow
HEMMS-4	Bioretention	Add gutter or regrade swale for western roof to flow to the north, retrofit bioretention cell in grassed area away from fire lane and construct overflow swale away from school
HEMMS-5	Bioretention	Retrofit bioretention cell immediately upstream of storm inlet and construct an earthen berm for overflow to pass through into nearby storm inlet, no underdrain
HEMMS-6	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-7	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-8	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area near school entrance, utilize existing structure for outflow
HEMMS-9	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area near school entrance, utilize existing structure for outflow
HEMMS-10	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-11	Bioretention	Retrofit bioretention cell in grassed area around storm inlet and utilize it for overflow, no underdrain
HEMMS-12	Bioretention	Retrofit large bioretention cell in grassed area next to bus circle, just upstream of driveway culvert, and create an earthern berm for overflow to pass into existing culvert
HEMMS-13	Infil. Chamber	Route/pipe rooftop runoff into infiltration chamber in grassed area next to building, avoid utilities, and utilize existing structure for outflow
HEMMS-14	Bioretention	Rehabilitate existing bioswale into a bioretention cell, utilize existing storm inlet for overflow, no underdrain

H.E. McCracken Middle School

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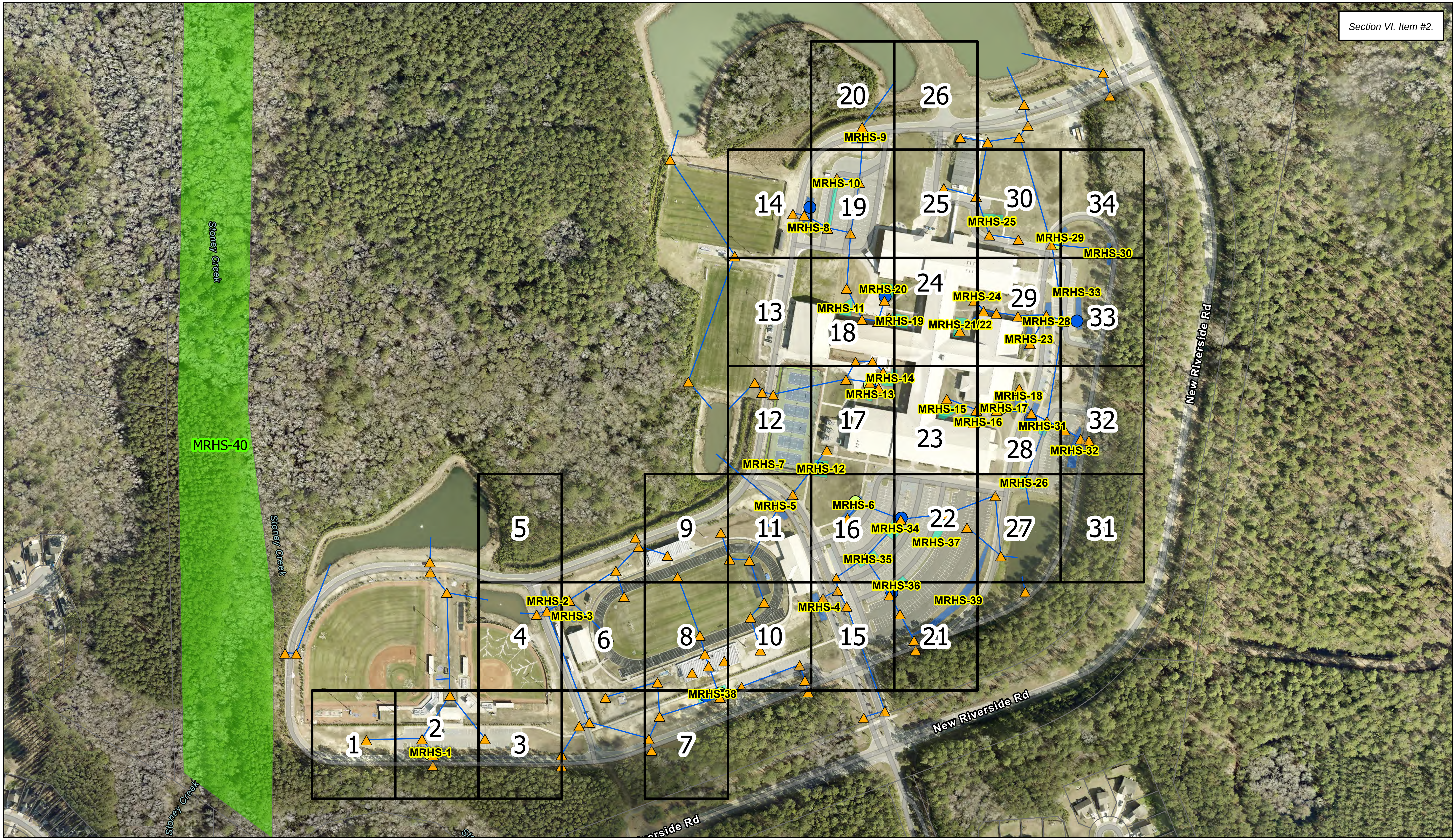
May River High School

Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
MRHS-1	Bioretention	Medium	30	Road near Baseball	0.21	1,613	$47,000	$29.13	Mod-Low	1.76	1,150	89	13	2	1	1	75%	80	6	
MRHS-2	Bioretention	Medium	33	Road N. of Track	0.25	1,876	$55,000	$29.32	Moderate	1.76	1,350	80	17	2	1	1	75%	90	6	
MRHS-3	Bioretention	Medium	32	Bldg N. of Track	0.12	919	$27,000	$29.39	Moderate	1.76	650	41	17	2	1	1	75%	65	6	
MRHS-4	Bioretention	Medium	28	Rd/Bldg S. of Track	0.34	2,586	$75,000	$29.00	Mod-Low	0.99	1,850	87	21	2	1	1	75%	100	6	
MRHS-5	Bioretention	Medium	29		0.32	2,424	$69,000	$28.47	Moderate	0.35	1,700	85	19	2	1	1	75%	90	6	
MRHS-6	Bioretention	Medium	29	Western Parking Lot	0.34	2,563	$73,000	$28.49	Moderate	0.35	1,800	96	22	2	1	1	75%	90	6	
MRHS-7	Infil. Trench	Medium	36	Tennis Courts	0.84	6,306	$146,000	$23.15	Moderate	0.35	4,350	540	8		2	0.75	75%	500	6	
MRHS-8	Bioretention	Medium	29	Road NE of School	0.50	3,759	$107,000	$28.46	Moderate	0.06	2,650	102	26	2	1	1	75%	120	6	
MRHS-9	Bioretention	Medium	28		0.23	1,737	$51,000	$29.37	Moderate	0.06	1,250	69	18	2	1	1	75%	80	6	
MRHS-10	Infil. Chamber	Low	20	Parking NE of School	0.45	3,041	$156,000	$51.30	Mod-Low	0.06	1,700	132	13		4		75%	390	30	3 rows of 130'
MRHS-11	Infil. Chamber	Low	26	Rooftops	0.42	2,841	$108,000	$38.02	Mod-Low	0.52	1,600	53	35		4		75%	320	30	7 rows of 35' & 3 rows at 25'
MRHS-12	Infil. Chamber	Low	24		0.59	3,937	$157,000	$39.88	Mod-Low	0.35	2,200	50	45		4		75%	500	30	10 rows of 50'
MRHS-13	Infil. Chamber	Low	23		0.22	1,513	$62,000	$40.98	Mod-Low	0.52	850	42	20		4		75%	200	30	5 rows of 40'
MRHS-14	Infil. Chamber	Low	26		0.54	3,659	$144,000	$39.36	Mod-Low	0.52	2,050	54	42		4		75%	450	30	5 rows of 40' & 5 rows at 50'
MRHS-15	Infil. Chamber	Low	23		0.48	3,196	$120,000	$37.55	Mod-Low	0.11	1,800	45	44		4		75%	350	30	7 rows of 40' & 2 rows at 35'
MRHS-16	Infil. Chamber	Low	22		0.32	2,146	$83,000	$38.68	Mod-Low	0.11	1,200	57	21		4		75%	250	30	5 rows of 50'
MRHS-17	Infil. Chamber	Low	18		0.10	648	$30,000	$46.27	Mod-Low	0.11	400	27	15		4		75%	100	30	4 rows of 25'
MRHS-18	Bioretention	Low	27		0.18	1,351	$39,000	$28.87	Moderate	0.11	950	54	18	2	1	1	75%	50	6	
MRHS-19	Infil. Chamber	Low	24		0.58	3,921	$157,000	$40.04	Mod-Low	0.52	2,200	54	41		4		75%	500	30	10 rows of 50'
MRHS-20	Infil. Chamber	Low	24		0.52	3,473	$140,000	$40.31	Mod-Low	0.52	1,950	49	41		4		75%	450	30	10 rows of 45'
MRHS-21/22	Infil. Chamber	Low	24		0.49	3,304	$134,000	$40.56	Mod-Low	0.54	1,900	62	36		4		75%	420	30	5 rows of 60' & 4 rows at 30'
MRHS-23	Bioretention	Medium	31		0.23	1,737	$51,000	$29.37	Moderate	0.54	1,250	72	17	2	1	1	75%	70	6	
MRHS-24	Infil. Chamber	Low	25		0.26	1,760	$68,000	$38.64	Mod-Low	0.54	1,000	52	20		4		75%	200	30	4 rows of 50'
MRHS-25	Infil. Chamber	Low	23		0.36	2,439	$106,000	$43.46	Mod-Low	0.54	1,400	60	24		4		75%	360	30	6 rows of 60'
MRHS-26	Infil. Chamber	Low	19	Road in Front of School	0.27	1,822	$100,000	$54.90	Mod-Low	0.11	1,050	40	26		4		75%	240	30	6 rows of 40'
MRHS-27	Bioretention	Medium	28		0.28	2,115	$61,000	$28.84	Moderate	0.11	1,500	82	18	2	1	1	75%	80	6	
MRHS-28	Bioretention	Medium	31		0.29	2,184	$63,000	$28.84	Moderate	0.54	1,550	78	19	2	1	1	75%	75	6	
MRHS-29	Bioretention	Medium	28		0.23	1,768	$51,000	$28.85	Mod-Low	0.54	1,250	72	17	2	1	1	75%	75	6	
MRHS-30	Bioretention	Medium	30		0.16	1,235	$37,000	$29.96	Moderate	0.54	900	67	14	2	1	1	75%	70	6	
MRHS-31	Infil. Chamber	Low	19	Southern Parking Lot	0.28	1,883	$100,000	$53.10	Mod-Low	0.11	1,050	44	23		4		75%	240	30	6 rows of 40'
MRHS-32	Bioretention	Low	26		0.53	4,037	$122,000	$30.22	Mod-Low	0.11	2,850	126	26	2	1	1	75%	125	6	
MRHS-33	Bioretention	Medium	28		0.39	2,933	$94,000	$32.05	Mod-Low	0.54	2,100	114	19	2	1	1	75%	160	6	
MRHS-34	Infil. Chamber	Low	24	Western Parking Lot	0.66	4,415	$220,000	$49.83	Mod-Low	0.43	2,500	62	40		4		75%	540	30	9 rows of 60'
MRHS-35	Infil. Chamber	Low	22		0.38	2,532	$130,000	$51.35	Mod-Low	0.99	1,450	64	22		4		75%	300	30	5 rows of 60'
MRHS-36	Infil. Chamber	Low	22		0.39	2,624	$141,000	$53.73	Mod-Low	0.99	1,500	67	22		4		75%	360	30	6 rows of 60'
MRHS-37	Infil. Chamber	Low	23		0.62	4,153	$212,000	$51.05	Mod-Low	0.43	2,350	97	24		4		75%	540	30	6 rows of 90'
MRHS-38	Infil. Chamber	Medium	30	Track/Football Bleachers	0.66	4,431	$175,000	$39.50	Mod-Low	1.76	2,500	93	27		4		75%	540	30	6 rows of 90'
MRHS-39	Bioretention	Medium	38	Western Parking Lot (Southern Island)	1.26	9,525	$288,000	$30.24	Moderate	0.99	6,700	376	20	2	1	1	75%	400	8	
MRHS-40	Conservation Area	High		Northern Boundary	0.00	t.b.d			High		28.65-ac									
Total					**15.30**	**108,402**	**$3,999,000**				**68,450**									

1 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
MRHS-1	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-2	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-3	Bioretention	Disconnect and reroute downspouts to eastern side of building and utilize adjacent structure for outflow connection
MRHS-4	Bioretention	Modify inlet or add flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection, route half of building downspouts here too
MRHS-5	Bioretention	Add flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection, route half of building downspouts here too
MRHS-6	Bioretention	Add curb cut/flume at two existing structures to route runoff to bioretention cell and utilize eastern existing structure for overflow connection, western structure and pipe can be removed, realign sidewalk
MRHS-7	Infil. Trench	Install infiltration trench along perimeter of tennis courts to intercept runoff, and route runoff to adjacent structure along road
MRHS-8	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection; for catch basin across street, attempt to route stormwater into bioretention subsurface
MRHS-9	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-10	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-11	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-12	Infil. Chamber	Route primary pipe from multiple downspout connections to infiltration chamber and utilize existing structure for outlet connection; as an alternate, install infiltration chambers or bioretention near downspouts adjacent to parking lot
MRHS-13	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-14	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-15	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-16	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-17	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-18	Bioretention	Disconnect downspout and route flow to bioretention cell via a shallow swale; connect bioretention cell with existing landscaping
MRHS-19	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-20	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-21/22	Infil. Chamber	Route downspout connections from -21 & -22 to infiltration chamber and utilize existing structure for outlet connection
MRHS-23	Bioretention	Disconnect downspout and route flow to bioretention cell via a shallow swale; connect bioretention cell with existing landscaping
MRHS-24	Infil. Chamber	Route downspout connection to infiltration chamber and utilize existing structure for outlet connection
MRHS-25	Infil. Chamber	Route downspout connection to infiltration chamber in grassed area across driveway, while avoiding utilities, and utilize existing structure for outlet connection
MRHS-26	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-27	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-28	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-29	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-30	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection
MRHS-31	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-32	Bioretention	Add curb cut/flume adjacent to catch basin to route runoff to linear ROW bioretention cell and utilize existing structure for overflow connection; for catch basin across street, attempt to route stormwater into bioretention subsurface
MRHS-33	Bioretention	Route runoff from parking lot into grassed area through trench drain, regrading pavement, or adding a new inlet with shallower pipe; utilize existing storm inlet for outlet connection
MRHS-34	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-35	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-36	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-37	Infil. Chamber	Route parking lot runoff into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-38	Infil. Chamber	Route runoff from pipe draining bleachers and part of track into infiltration chamber and utilize existing storm structure for overflow/bypass; add a pretreatment device or sump to mimize influx of sediment and debris into chamber
MRHS-39	Bioretention	Route runoff from two storm inlets in parking lot into grassed area through adding a new inlet with shallower pipe; utilize the eastern structure for an outlet connection
MRHS-40	Conservation Area	Proposed Conservation Area for 28.65 acre (1,248,000 SF) wooded area; approximately a 200-ft buffer around northern and eastern boundary of parcel



May River High School

114 Barnard Street, Suite 2B
Savannah, GA 31401

Pritchardville Elementary School																				
Site ID	BMP Type	Overall Ranking	Numerical Score	Drainage Area / Location	Impervious Area	SWRv	Construction Cost	Cost/SWRV	Constructability	Infil Rate	BMP Area	Length	Width	Media Depth	Gravel Depth	Ponding Depth	Underdrain[1]	Pipe Length	Pipe Diameter	Infilration Chamber Notes
					acres	*CF*		*$/SWRv*		*in/hr*	*SF*	*ft*	*ft*	*ft*	*ft*	*ft*	*Credit*	*ft*	*in*	
PES-1	Infilration Chamber	Low	24	Front Roof	0.08	605	$27,000	$44.61	Mod-Low	0.81	450	33	14		3		75%	90	30	3 rows of 30'
PES-2	Infilration Chamber	Low	25		0.15	1,126	$50,000	$44.40	Mod-Low	0.81	850	60	14		3		75%	165	30	3 rows of 55'
PES-3	Infilration Chamber	Low	25		0.15	1,124	$50,000	$44.50	Mod-Low	0.84	850	60	14		3		75%	165	30	3 rows of 55'
PES-4	Infilration Chamber	Low	24		0.08	596	$27,000	$45.34	Mod-Low	0.84	450	33	14		3		75%	90	30	3 rows of 30'
PES-5	Bioretention	High	41	Front Parking Lot Median	0.48	3,650	$76,000	$20.82	High	0.81	1,950	170	11.5	2	1	1	100%			
PES-6	Bioretention	High	48		0.33	2,536	$52,000	$20.51	High	2.08	1,350	92	14.5	2	1	1	100%			
PES-7	Bioretention	Medium	38	Western Pervious Concrete Parking Row, Front Parking Lot	0.05	401	$10,000	$24.91	High	0.81	250	29	8	2	1	1	100%			
PES-8	Bioretention	Medium	38		0.04	286	$6,000	$21.01	High	0.81	150	18	9	2	1	1	100%			
PES-9	Bioretention	High	46		0.10	702	$16,000	$22.78	High	2.08	400	39	10	2	1	1	100%			
PES-10	Bioretention	High	42		0.09	633	$14,000	$22.12	Moderate	2.08	350	34	10	2	1	1	100%			
PES-11	Bioretention	Medium	36	Main Driveway, North	0.29	2,138	$45,000	$21.05	Moderate	0.84	1,150	55	21	2	1	1	100%			
PES-12	Bioretention	High	42	Southern Parking Lot	0.21	1,567	$36,000	$22.98	High	1.58	950	115	8	2	1	0.75	100%			
PES-13	Bioretention	Medium	39		0.65	4,569	$125,000	$27.36	Moderate	1.58	2,650	240	11	2	1	0.75	100%			
PES-14/15	Infilration Chamber														3		100%	240	30	1 row of 240'
PES-16	Infilration Chamber	Low	20	Playground	0.36	2,549	$108,000	$42.37	Low	0.12	1,450	44	33		4		75%	360	30	9 rows of 40'
PES-17	Bioretention	Medium	37	Southern Driveway	0.50	3,744	$110,000	$29.38	High	0.31	2,650	118 / 97	14 / 10	2	1	1	75%	200	6	
PES-18	Bioretention	Medium	39	Main Driveway, South	0.14	1,027	$21,000	$20.46	High	0.81	550	40	14	2	1	1	100%			
PES-19	Bioretention	Medium	39		0.11	841	$17,000	$20.21	High	0.81	450	37	12	2	1	1	100%			
PES-20	Bioretention	High	43	Main Driveway, Front	0.17	1,250	$27,000	$21.59	Moderate	2.08	700	54	13	2	1	1	100%			
PES-21	Cistern	High		Rear of Building	0.07	t.b.d			High											
PES-22	Conservation Area	High		Northwest Corner	0.00	t.b.d			High		1.84-ac									
PES-23	Conservation Area	High		Southeast Corner	0.00	t.b.d			High		2.07-ac									
Total					**4.06**	**29,343**	**$817,000**				**17,600**									

[1] 75% = Internal Water Storage (IWS); 100% = No Underdrain

Site ID	BMP Type	Other Design & Flow Routing/Implementation Notes
PES-1	Infilration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure
PES-2	Infilration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure
PES-3	Infilration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure; consider Alt. PES-3/4 if desired to be farther from school building
PES-4	Infilration Chamber	Route roof drains to infiltration chamber, utilize IWS to return flow to storm system, configured closer to sidewalk due to proximity to school structure; consider Alt. PES-3/4 if desired to be farther from school building
PES-5	Bioretention	Utilize existing storm inlets as overflow structures, runoff already flows to this low point
PES-6	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-7	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-8	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-9	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-10	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-11	Bioretention	Utilize existing storm inlet as a curb cut/flume to route flow into bioretention cell
PES-12	Bioretention	Install curb cut along curb and gutter to route flow into bioretention cells (grassed median), and route overflow as sheetflow into parking lot to the east
PES-13	Bioretention	Bioretention combined with Infiltration Chamber; bioretention cell to receive sheet flow from parking lot and infiltration chamber will receive runoff from two storm inlets along driveway
PES-14/15	Infilration Chamber	
PES-16	Infilration Chamber	Route roof drains and runoff from playground to infiltration chamber, configured system as subsurface due to proximity to school/playground
PES-17	Bioretention	Two linear bioretention cells; based on drainage areas, it is split as ~2/3 on southern side of driveway and ~1/3 on northern side of driveway; consider hybrid infiltration chamber system if more storage is needed and elevations warrant it
PES-18	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-19	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-20	Bioretention	Utilize existing storm inlet as overflow structure, runoff already flows to this low point
PES-21	Cistern	Connect up to two downspouts to route 3,200 SF of rooftop for capture and reuse for adjacent raised beds/gardens
PES-22	Conservation Area	Proposed Conservation Area for 1.84 acre (80,200 SF) wooded area
PES-23	Conservation Area	Proposed Conservation Area for 2.07 acre (90,000 SF) wooded area

Pritchardville Elementary School

114 Barnard Street, Suite 2B
Savannah, GA 31401
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Capital Improvements Program Fund Project Data Sheet

Project Name	Bluffton Elementary School MRWAP Impervious Restoration Project			**Project #**	S0016
Program Type	Stormwater	**Project Manager**	Dan Rybak	**Start to End**	FY 2026-2028

Project Scope

As a result of the 2021 MRWAP update, 11 new project/site locations were recommended. These eleven sites were evaluated for feasibility, cost/benefit and preliminary design plans were developed for 9 sites (2 sites declined to participate) under prior year CIP. Bluffton Elementary School has been selected to proceed to final design and construction due to it's large impervious foot print and proposed water quality benefit/pollutant removal based on site conditions, geotechnical feasibility and preliminary design results. This project will take the completed preliminary design information to final design, permitting and construction on the property. Expenditures of this and future May River Action Plan Impervious Restoration Program CIP will be supported by SWU fees, potential developer participation and/or fee-in-lieu contributions.

Project Photo or Map

Project Budget

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
Planning	$ -	$ -	$ -	$ 24,000	$ -	$ -	$ -	$ -	$ 24,000
Design	-	-	-	75,000	-	-	-	-	75,000
Construction	-	-	-	-	-	530,000	-	-	530,000
Other	-	-	-	1,000	3,000	1,000	-	-	5,000
Total	$ -	$ -	$ -	$ 100,000	$ 3,000	$ 531,000	$ -	$ -	$ 634,000

Project Funding Sources

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Strategic Focus Area & Guiding Principle

Infrastructure
Guiding Principle #3: Establish long term planning, prioritization and investment strategies for future infrastructure and facilities that improve the quality of life for citizens while being financially sustainable.
May River & Surrounding Rivers and Watersheds
Guiding Principle #1: Support initiatives, such as the May River Watershed Action Plan, to improve water quality of the May, Okatie/Colleton and New Rivers and their watersheds.
Guiding Principle #2: Seek collaboration and partnerships that protect and improve the May, Okatie/Colleton and New Rivers and their watershed.
Guiding Principal #4: Support active planning and management for resilience of natural resourcesand our response to weather events, future disasters and changingenvironmental conditions

Project Status

Preliminary Design of proposed project improvements was completed under the parent CIP and resulted in BMP Types and locations being selected for 9 of the 11 sites identified in the 2021 MRWAP Update. This CIP will take Bluffton Elementary School proposed water quality BMPs to final design, permitting and construction.

Project Origination

1) FY23-24 Strategic Plan and 2) citizen input.

Project Performance Measures

Reduce pollutant loads associated with stormwater runoff and improve water quality of receiving streams and May River.

General Fund Operations & Maintenance (O&M) Costs

	Description	FY2026 Forecast	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Forecast
Operations							$ -
Maintenance							-
Total		$ -	$ -	$ -	$ -	$ -	$ -

Method for Estimating Costs:

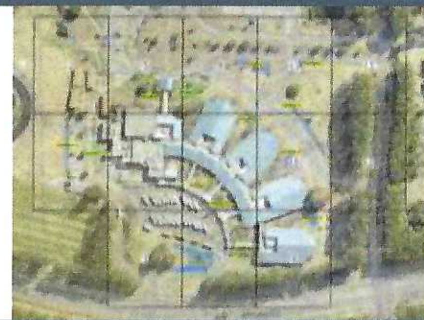
Capital Improvements Program Fund Project Data Sheet

Project Name	McCraken Middle School MRWAP Impervious Restoration Project			**Project #**	S0015
Program Type	Stormwater	**Project Manager**	Dan Rybak	**Start to End**	FY 2026-2028

Project Scope

As a result of the 2021 MRWAP update, 11 new project/site locations were recommended. These eleven sites were evaluated for feasibility, cost/benefit and preliminary design plans were developed for 9 sites (2 sites declined to participate) under prior year CIP. HE McCraken Middle School has been selected to proceed to final design and construction due to it's large impervious foot print and proposed water quality benefit/pollutant removal based on site conditions, geotechnical feasibility and preliminary design results. This project will take the completed preliminary design information to final design, permitting and construction on the property. Expenditures of this and future May River Action Plan Impervious Restoration Program CIP will be supported by SWU fees, potential developer participation and/or fee-in-lieu contributions.

Project Photo or Map



Project Budget

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
Planning	$ -	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	$ 30,000
Design	-	-	-	78,000	-	-	-	-	78,000
Construction	-	-	-	-	-	610,000	-	-	610,000
Other	-	-	-	1,500	2,500	1,000	-	-	5,000
Total	$ -	$ -	$ -	$ 109,500	$ 2,500	$ 611,000	$ -	$ -	$ 723,000

Project Funding Sources

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Strategic Focus Area & Guiding Principle

Infrastructure
Guiding Principle #3: Establish long term planning, prioritization and investment strategies for future infrastructure and facilities that improve the quality of life for citizens while being financially sustainable.
May River & Surrounding Rivers and Watersheds
Guiding Principle #1: Support initiatives, such as the May River Watershed Action Plan, to improve water quality of the May, Okatie/Colleton and New Rivers and their watersheds.
Guiding Principle #2: Seek collaboration and partnerships that protect and improve the May, Okatie/Colleton and New Rivers and their watershed.
Guiding Principal #4: Support active planning and management for resilience of natural resourcesand our response to weather events, future disasters and changingenvironmental conditions.

Project Status

Preliminary Design of proposed project improvements was completed under the parent CIP and resulted in BMP Types and locations being selected for 9 of the 11 sites identified in the 2021 MRWAP Update. This CIP will take McCraken Middle School proposed water quality BMPs to final design, permitting and construction.

Project Origination

1) FY23-24 Strategic Plan and 2) citizen input.

Project Performance Measures

Reduce pollutant loads associated with stormwater runoff and improve water quality of receiving streams and May River.

General Fund Operations & Maintenance (O&M) Costs

	Description	FY2026 Forecast	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Forecast
Operations							$ -
Maintenance							-
Total		$ -	$ -	$ -	$ -	$ -	$ -

Method for Estimating Costs:

Capital Improvements Program Fund Project Data Sheet

Project Name	Pritchardville Elementary School MRWAP Impervious Restoration Project	**Project #**	S0014
Program Type	Stormwater	**Project Manager**	Dan Rybak
Start to End	FY 2026-2028		

Project Scope

As a result of the 2021 MRWAP update, 11 new project/site locations were recommended. These eleven sites were evaluated for feasibility, cost/benefit and preliminary design plans were developed for 9 sites (2 sites declined to participate) under prior year CIP. Pritchardville Elementary School has been selected to proceed to final design and construction due to it's large impervious foot print and proposed water quality benefit/pollutant removal based on site conditions, geotechnical feasibility and preliminary design results. This project will take the completed preliminary design information to final design, permitting and construction on the property. Expenditures of this and future May River Action Plan Impervious Restoration Program CIP will be supported by SWU fees, potential developer participation and/or fee-in-lieu contributions.

Project Photo or Map

Project Budget

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
Planning	$ -	$ -	$ -	$ 22,000	$ -	$ -	$ -	$ -	$ 22,000
Design	-	-	-	60,000	-	-	-	-	60,000
Construction	-	-	-	-	-	410,000	-	-	410,000
Other	-	-	-	1,500	2,500	1,000	-	-	5,000
Total	$ -	$ -	$ -	$ 83,500	$ 2,500	$ 411,000	$ -	$ -	$ 497,000

Project Funding Sources

	Prior Years' Expended	FY2025 Amended Budget	FY2025 Estimate	FY2026 Proposed Budget	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Project Forecast
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Strategic Focus Area & Guiding Principle

Infrastructure
Guiding Principle #3: Establish long term planning, prioritization and investment strategies for future infrastructure and facilities that improve the quality of life for citizens while being financially sustainable.
May River & Surrounding Rivers and Watersheds
Guiding Principle #1: Support initiatives, such as the May River Watershed Action Plan, to improve water quality of the May, Okatie/Colleton and New Rivers and their watersheds.
Guiding Principle #2: Seek collaboration and partnerships that protect and improve the May, Okatie/Colleton and New Rivers and their watershed.
Guiding Principal #4: Support active planning and management for resilience of natural resourcesand our response to weather events, future disasters and

Project Status

Preliminary Design of proposed project improvements was completed under the parent CIP and resulted in BMP Types and locations being selected for 9 of the 11 sites identified in the 2021 MRWAP Update. This CIP will take Pritchardville Elemenary School proposed water quality BMPs to final design, permitting and construction.

Project Origination

1) FY23-24 Strategic Plan and 2) citizen input.

Project Performance Measures

Reduce pollutant loads associated with stormwater runoff and improve water quality of receiving streams and May River.

General Fund Operations & Maintenance (O&M) Costs

	Description	FY2026 Forecast	FY2027 Forecast	FY2028 Forecast	FY2029 Forecast	FY2030 Forecast	Total Forecast
Operations							$ -
Maintenance							-
Total		$ -	$ -	$ -	$ -	$ -	$ -

Method for Estimating Costs:

May River Preliminary Land Cover Assessment

Andrew Tweel
Environmental Research Section, South Carolina Department of Natural Resources
November 2024

Introduction

At the request of the Town of Bluffton, SCDNR is providing some summaries of land cover datasets that summarize how development patterns, freshwater wetlands, and other related factors have changed over the last 20 years. These summaries will include spatial data to show where this has occurred, as well as graphs and tabular summaries to show changes over time.

Methods

The following data layers were assembled in ArcGIS Pro and analyzed using Town-provided boundaries for watershed basins (SUBBASINS_WTRSHED.shp, provided to SCDNR November 2024). Spatial data was obtained from the Multi-resolution Land Characteristics Consortium (MRLC- National Land Cover Dataset), US Census Bureau, and SCDNR. To this file, basin areas were calculated in acres, and a unique ID was assigned to each basin. For the purposes of calculating percentage of impervious cover, the US National Wetlands Inventory dataset was used to remove estuarine and marine habitats (i.e. protected areas). The remaining basin areas would then, by definition, constitute developable land. A second layer was created by merging all of the smaller basins into one file representing the watershed as a whole.

Data Layer	Purpose	Years
National Land Cover Dataset (NLCD)	Land cover classes (e.g. forested wetlands)	2001, 2004, 2006, 2008, 2011, 2013, 2016, 2019, 2021
NLCD Impervious Cover Dataset	Impervious cover percentages	2001, 2004, 2006, 2008, 2011, 2013, 2016, 2019, 2021
US Census	Population density data	2000, 2010, 2020
Stormwater Ponds (SCDNR)	Area of stormwater ponds	2013, 2021

Areas of land cover were calculated as percentages and acreage of developable areas (i.e. excluding estuarine wetlands and estuarine surface waters). Impervious cover was averaged at the basin level for developable pixels. Stormwater pond area was summarized by basin for both data years. Census data was prorated using the *Apportion* tool to proportionally apply a given census block's population to the basins.

Results

Satellite-derived datasets help quantity the changes in various metrics associated with development patterns that have occurred in the May River watershed since 2001. Population increases were associated with increases in developed land cover classes, associated impervious cover and stormwater ponds, and decreases in vegetated land cover classes and wetlands. Total watershed population increased over four fold during the study period, from 5,934 people in 2000 to 18,242 in 2010, and to 26,363 in 2020. Similarly, population density increased from a basin-level average of 0.32 people per acre in 2000 to 1.19 people per acre in 2020.

The highest development classes (NLCD High and Medium Intensity) increased from 1.4% in 2001 to 7.9% in 2021 (258 to 1,444 acres). Adding in the lower intensity classes (NLCD Low and Open Development), these percentages increased from 16.9% in 2001 to 35.6% in 2021. Concurrently, there was a loss of vegetated land cover classes, which decreased from 80.6% to 61.2% during that same period (14,732 acres to 11,200 acres). Within that class, woody wetlands decreased from 26.3% to 23.6% (4,820 to 4,307 acres) from 2001 to 2021, representing a loss of 513 acres of forested wetland habitat.

Impervious cover, a derived metric representing surfaces that do now allow for the infiltration of precipitation, also changed dramatically throughout the area. Overall, developable land impervious cover increased from 2.54% to 9.62% from 2001 to 2021. Within basins, these differences were potentially much greater. On average, this increase was 6.09% (± 0.65 s.e.) per basin (note: this is different from the overall totals because of differences in basin area that are accounted for in the overall total). The greatest impervious cover among all the basins is 48% as of 2021. In the context of previously-established thresholds that relate to various levels of degradation of downstream habitats (Holland et al. 2004), 63 of the 208 basins contain greater than 10% impervious cover, 29 contain greater than 20% impervious cover, and 14 contain greater than 30% impervious cover.

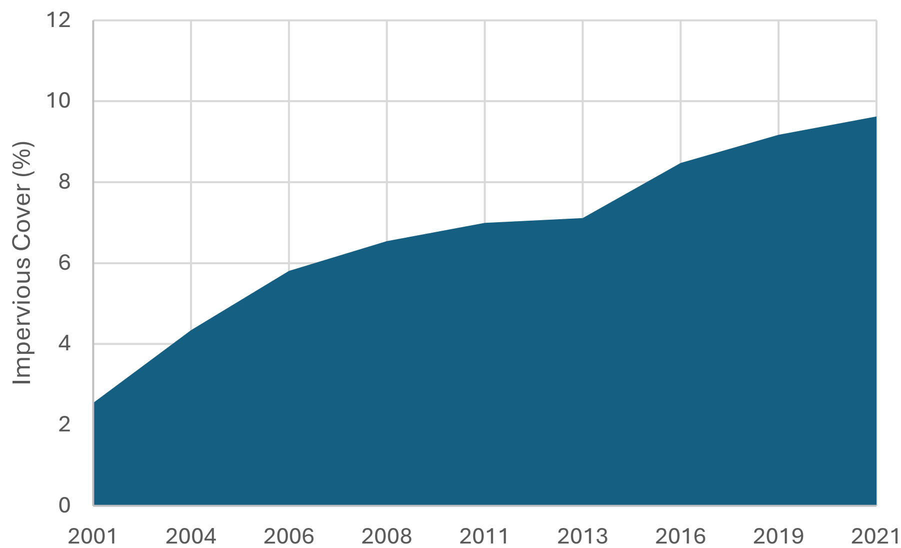
Stormwater ponds represent an areal coverage of 912.2 acres and 352 ponds as of 2021. In 2013, there were 820.1 acres of pond coverage and 298 ponds. These areas were hand digitized from aerial imagery at a coast-wide scale and are likely not as accurate as any development or permit-level spatial data.

Comparing between datasets, percent impervious cover is strongly negatively correlated with woody wetland percent cover ($r^2 = 0.962$), indicating that the decline in woody wetland cover corresponds linearly to the increase in percent impervious cover.

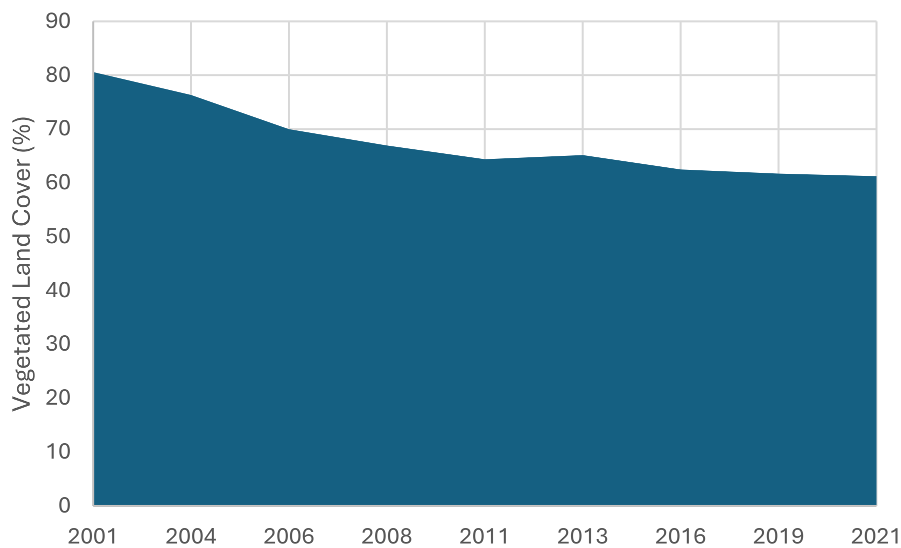
References

MRLC. Multi-resolution Land Characteristics Consortium. https://www.mrlc.gov/data?f%5B0%5D=project_tax_term_term_parents_tax_term_name%3ALegacy%20NLCD&f%5B1%5D=region%3Aconus&f%5B2%5D=region%3Anorth%20america

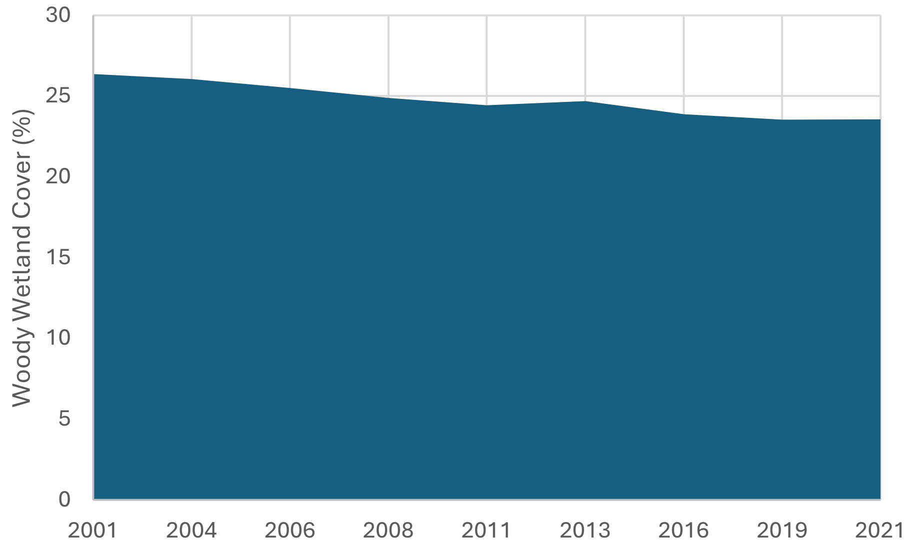
Holland, A.F., Sanger, D.M., Gawle, C.P., Lerberg, S.B., Santiago, M.S., Riekerk, G.H., Zimmerman, L.E. and Scott, G.I., 2004. Linkages between tidal creek ecosystems and the landscape and demographic attributes of their watersheds. *Journal of Experimental Marine Biology and Ecology*, *298*(2), pp.151-178.



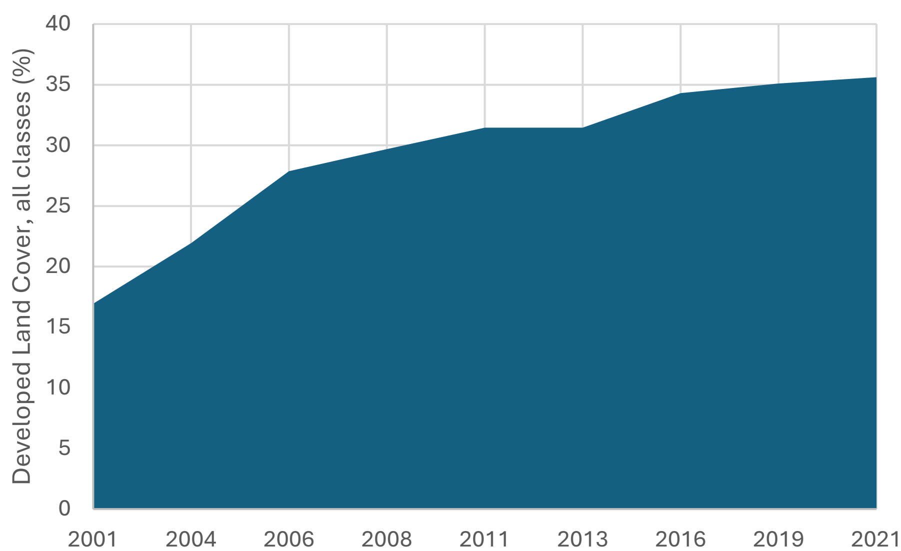
Graph of the change in impervious cover percent between 2001 and 2021, derived from NLCD data.



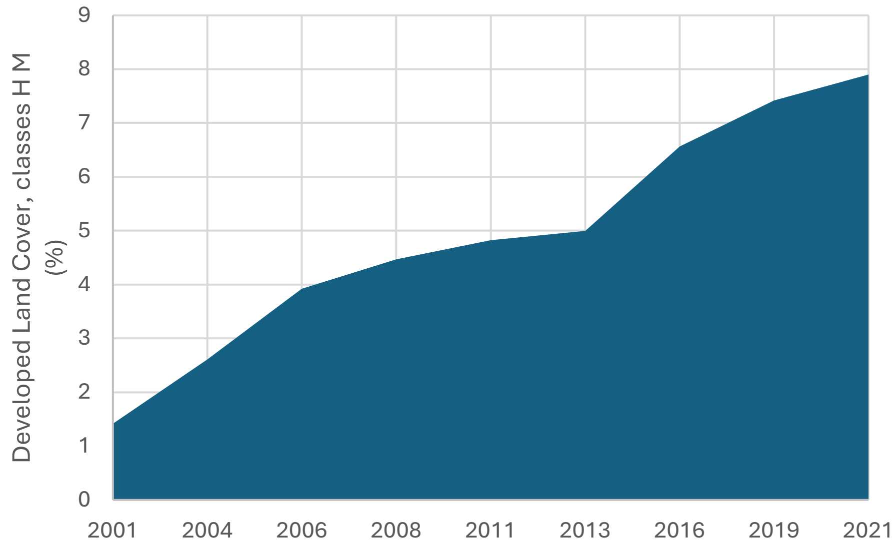
Graph of the change in vegetated land cover percent between 2001 and 2021, derived from NLCD data.



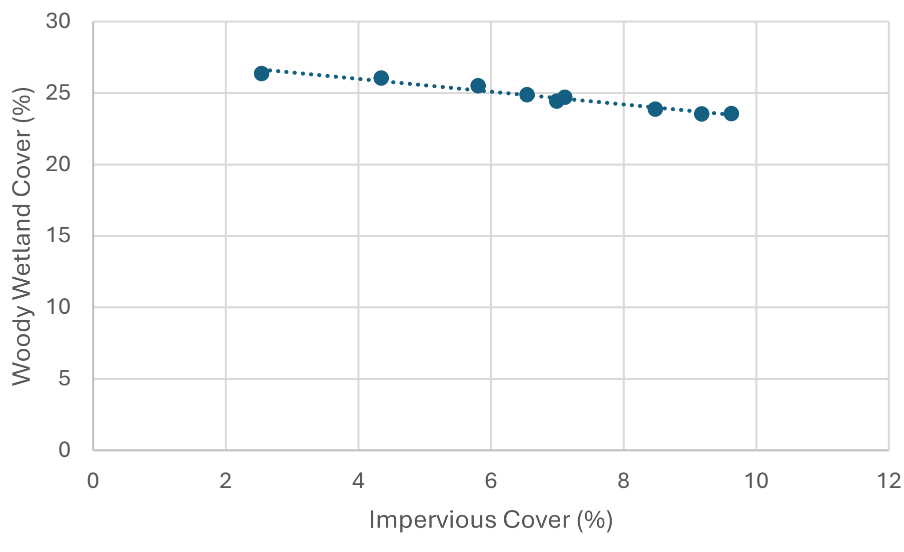
Graph of the change in woody wetland cover percent between 2001 and 2021, derived from NLCD data.



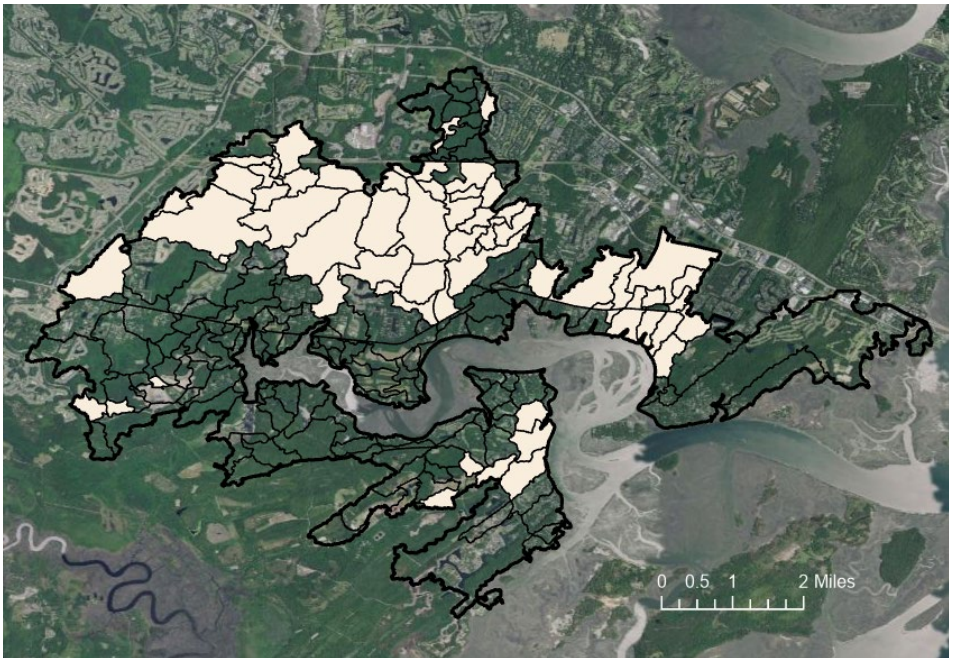
Graph of the change in developed land class cover percent between 2001 and 2021, derived from NLCD data.



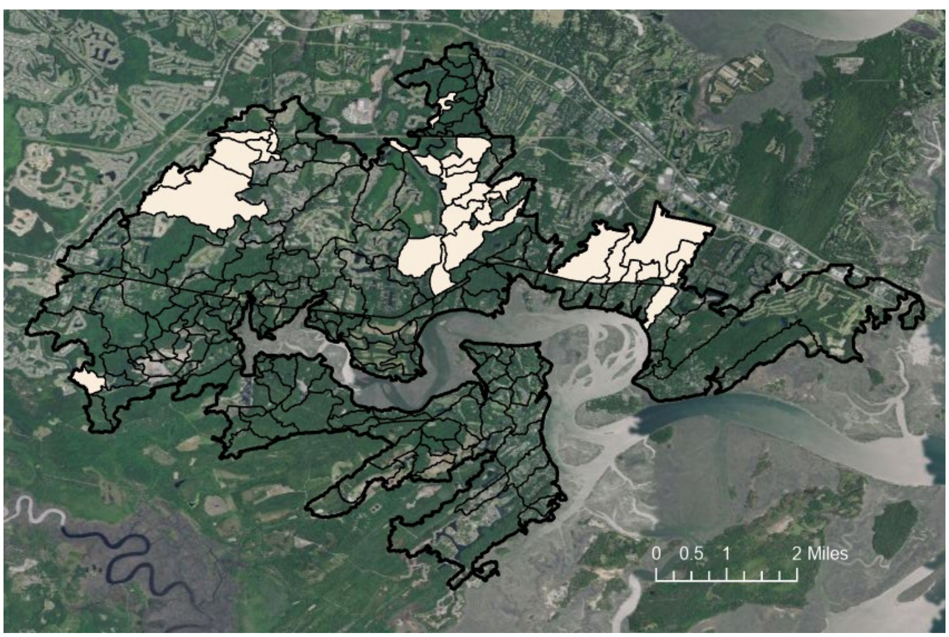
Graph of the change in developed land class cover (high and medium only) percent between 2001 and 2021, derived from NLCD data.



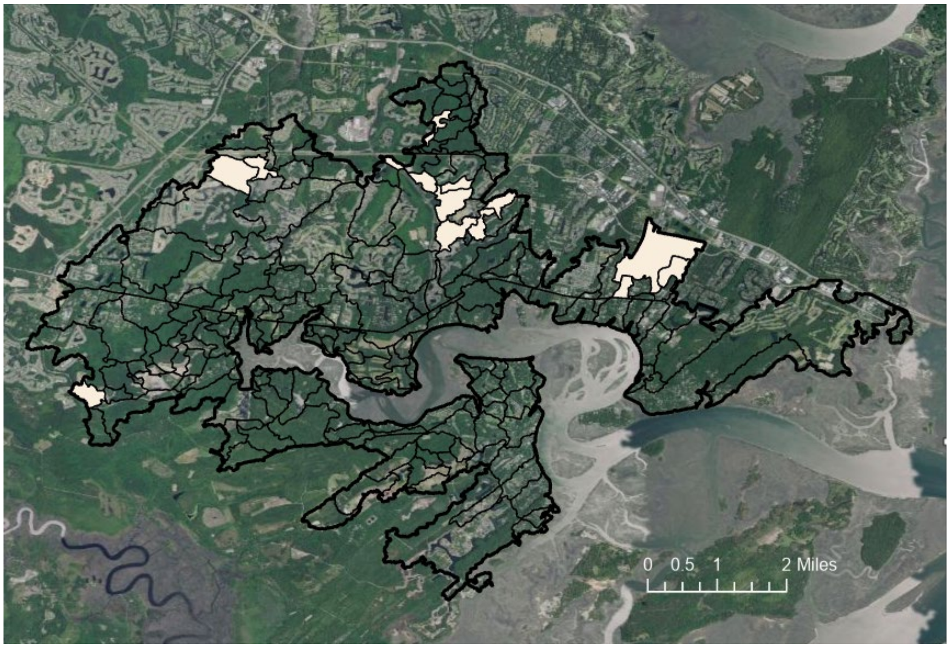
Graph of relationship between impervious cover percent and woody wetland cover percent using data from NLCD between 2001 and 2021.



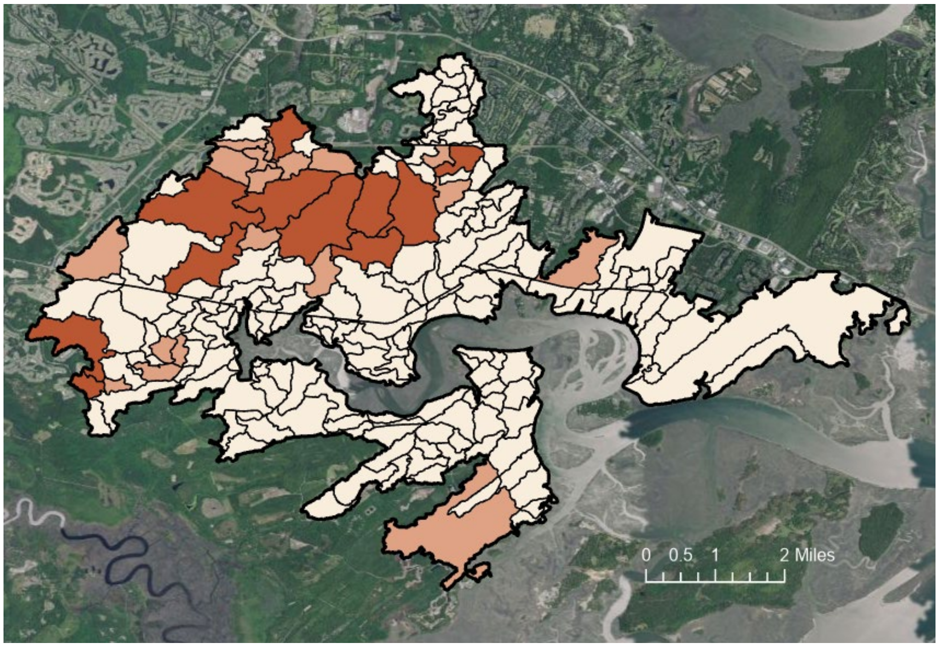
Map of watershed basins exceeding the 10% threshold of impervious cover, derived from 2021 NLCD data.



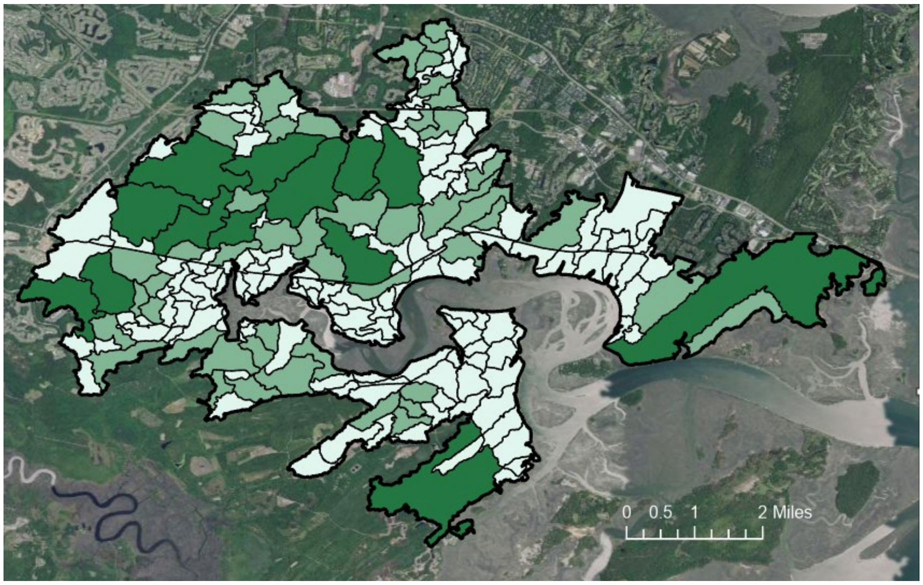
Map of watershed basins exceeding the 20% threshold of impervious cover, derived from 2021 NLCD data.



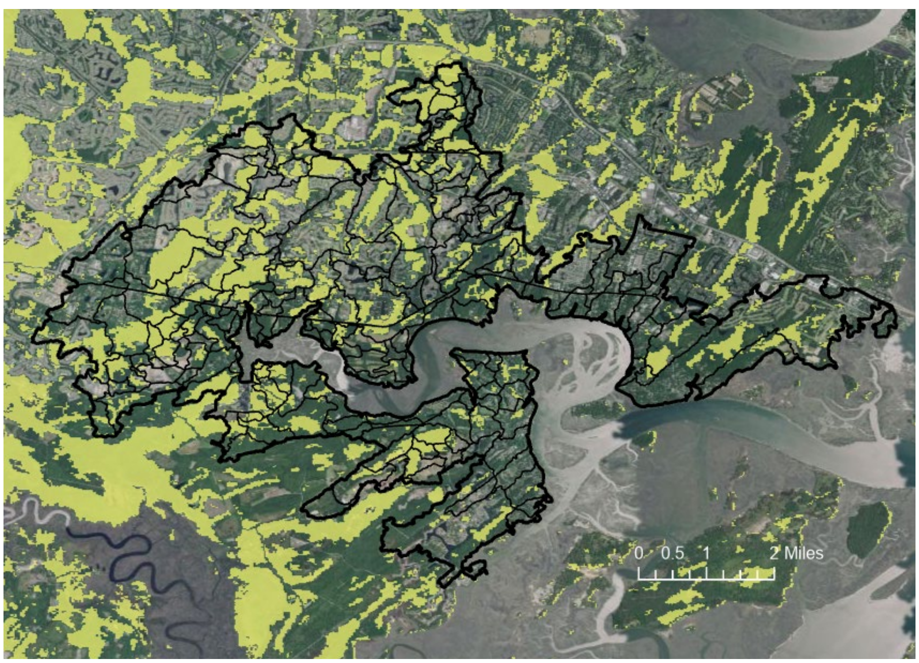
Map of watershed basins exceeding the 30% threshold of impervious cover, derived from 2021 NLCD data.



Map of acreage loss of woody wetlands between 2001 and 2021 derived from NLCD. The lightest shading indicates 0-4 acres lost, the medium shading indicates 4-16 acres lost, and the darkest shading indicates over 16 acres lost (maximum 55 acres lost).



Map of woody wetland acreage in 2021 derived from NLCD. The lightest shading indicates 0-22 acres, the medium shading indicates 22-76 acres, and the darkest shading indicates over 76 acres (maximum 200 acres).



Map of classified woody wetlands in the 2021 NLCD dataset.