

**APPENDIX A  
SCOPE OF WORK**

**ELEMENT 06  
FY2018 Section 319(h) Grant**

1. **Project Title:** Green Infrastructure/Low Impact Development BMPs Implementation in the Vernon River Watershed

2. **Lead Organization:** City of Savannah  
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Savannah, GA 31401  
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**Project Start Date:** July 1, 2019  
**Project End Date:** June 30, 2022

**Federal Amount:** \$200,000  
**Match Amount:** \$ 75,000  
**Total Project Amount:** \$275,000

3. **Project Goals:**

Implement a nine-element watershed management plan to improve water quality in the Vernon River watershed of the Ogeechee River Basin located in Chatham County, one of Georgia's 11 coastal jurisdictions. Install recommended green infrastructure (GI), low impact development (LID) and rainwater harvesting best management practices (BMPs) according to technical and design specifications in the Coastal Stormwater Supplement (CSS) of the Georgia Stormwater Management Manual (GSMM). Estimate expected pollutant (nutrients, sediment and bacteria) load reductions resulting from the GI/LID stormwater BMPs.

#### 4. Project Background:

Three segments in the Vernon River HUC-10 #0306020403 watershed are listed as Not Supporting the designated use of fishing on Georgia's 2016 Integrated 305(b)/303(d) List - Coastal Streams. Casey Canal North (3 miles) and South (3 miles) of DeRenne Avenue, and Hayners Creek (2 miles) are all impaired due to fecal coliform and dissolved oxygen levels that do not meet water quality standards. In addition, a one-mile segment of the Little Ogeechee River and nine miles of the Vernon River appear on the list as Assessment Pending and as supporting the fishing designation, respectively.

The 2005 Total Maximum Daily Load Evaluation for Twenty-One Stream Segments in the Ogeechee River Basin for Fecal Coliform established a required 96% load reduction for each of the three impaired segments. The 2007 Revised Total Maximum Daily Load Evaluation for Twenty-Three Stream Segments in the Ogeechee River Basin for Dissolved Oxygen determined a 0% load reduction was required for all three reaches, with the TMDL expressed as Ultimate Oxygen Demand (UOD), which includes Carbonaceous Biochemical Oxygen Demand (CBOD) and Nitrogenous Biochemical Oxygen Demand (NBOD). A TMDL Implementation Plan and a bacteria source tracking study (BST) were both completed in 2010. Using the microbial antibiotic resistance method (MAR), the study identified septic, sanitary sewer, domestic pets, and wildlife as the sources of bacteria loadings at the Casey Canal, Vernon River and Hayners Creek sampling locations.

The City of Savannah will install a suite of GI/LID stormwater BMPs (rain garden(s)/bio retention and permeable pavement) at the Jacob G. Smith Elementary School which will result in infiltration and treatment of stormwater runoff in the Vernon River watershed. In addition, the City and its partners will implement a rainwater harvesting outreach and implementation program in the elementary school neighborhood and install rainwater harvesting systems. The project is located in an area of Abercorn and Habersham Streets near 63<sup>rd</sup> Street which is targeted by the Vernon River Watershed Management Plan for the Reduction of Nonpoint Human Sources of Bacteria (2013). In addition, BMP installation will focus on a section of the City where flooding has triggered community demand for stormwater management solutions. Conceptual designs (February 2019) funded by a Coastal Incentive Grant (CIG) through GADNR Coastal Resources Division are shown in Attachment 1.

The City confirms that design and construction components described in this project are retrofits to existing development and are in-addition-to or extend "above & beyond" current requirements of Savannah's Phase I Medium MS4 or other NPDES permits. The GI/LID BMPs and educational/outreach activities will not be reported as compliant with or fulfilling specific permit commitments. Long term assessments and maintenance requirements for these BMPs will be conducted by the City per the requirements of the MS4 permit.

## 5. Project Activities:

**Project Activity:** Form stakeholder committee and convene a kickoff meeting and a minimum of two other meetings throughout the project.

**Georgia's Statewide NPS Management Plan:** *319 Grants, Key Stakeholders, Funding, page 92: Priority watershed management approach that promotes a high level of stakeholder involvement and uses the expertise and authority of multiple agencies.*

**State of Georgia Coastal NPS Program (CZARA) Chapter 1: Intra/Interagency Coastal Nonpoint Program and Project Coordination**

**Task 1:** Form stakeholder committee and have kickoff meeting to finalize strategy to move forward with design.

**Deliverables:** Outreach letters/emails/phone calls, agenda, minutes, sign-in sheet.

**Measures of Success:** Meeting attended by at least 10 stakeholders, summary of final design strategy.

**Task 2:** Convene at least two stakeholder committee meetings (by phone or in person) to update progress and solicit feedback throughout the project period.

**Deliverables:** Notices, agendas, presentations, minutes, hand-outs, sign-in sheets.

**Measures of Success:** Meetings attended by at least 50% of stakeholders.

**Project Activity:** Install a suite of GI/LID stormwater BMPs (rain garden(s)/bioretention and permeable pavement) at the Jacob G. Smith Elementary School.

**Georgia's Statewide NPS Management Plan:** *Urban Nonpoint Source Program – Stormwater, Short Term Goal 3.5, page 60: Encourage and/or incentivize green infrastructure retrofits to reduce NPS runoff from existing development in urban areas.*

**State of Georgia Coastal NPS Program (CZARA) Chapter 7 (Urban: New Development) & Chapter 8: (Urban: Watershed Protection & Existing Development):** *Minimum Measure – Urban Existing Development a) Identify priority local and/or regional watershed pollutant reduction opportunities, e.g., improvements to existing urban runoff control structures.*

**Task 3:** Final design of a suite of GI/LID stormwater BMP(s), including permeable pavement to reduce impervious surfaces and/or rain garden(s)/bioretention to capture runoff from existing impervious surfaces.

**Deliverables:** Required BMP designs & specifications, permits & certificates, maps, and public outreach meeting of final design.

**Measures of Success:** Completed design plans and specifications that are in accordance with CSS and GSMM Vol. II.

**Task 4:** Install at least one GI/LID stormwater BMP(s) as designed and permitted.

**Deliverables:**

- Memorandum of Understanding (MOU) between City of Savannah and Savannah/Chatham County Board of Education describing expectations, duties and responsibilities associated with installation of GI/LID stormwater BMPs at the Jacob G. Smith Elementary School;

- Procurement of qualified contractor, fully-executed contract, pre- and post-implementation inspections & photographs.

**Measures of Success:** Successful installation of at least one GI/LID stormwater management and runoff treatment BMP(s).

**Task 5: Operation and Maintenance of Structural Best Management Practices (BMPs)**

**Deliverables:**

- Memorandum of Understanding (MOU) between City of Savannah and Savannah/Chatham County Board of Education describing expectations, duties and responsibilities associated with operation and upkeep of GI/LID stormwater BMPs installed at the Jacob G. Smith Elementary School;
- Manufacturer or vendor SOP or O&M Manual or Schedule associated with BMP installation for the expected lifespan of the specific practice and in accordance with commonly accepted standards to ensure the proper functioning of the system as designed. Records of inspections and BMP maintenance kept on file with Contractor. This provision will survive the expiration of this contract.

**Measures of Success:** Properly functioning BMPs

**Project Activity:** Compare and analyze pre- and post-BMP construction water quality data collected from Vernon River watershed monitoring sites during the project period

**Georgia's Statewide NPS Management Plan:** *Urban Nonpoint Source Program – Stormwater, Short Term Goal 1.1, And page 57: Encourage and support performance monitoring of installed GI/LID practices in order to provide local-specific data on BMP cost, performance, and installation and maintenance requirements.*

**State of Georgia Coastal NPS Program (CZARA) Chapter 12:** *Monitoring and Tracking.*

**Task 6:** Share water quality data/analysis from fecal bacteria and dissolved oxygen monitoring conducted under the City of Savannah's MS4 permit in the Vernon River watershed during the project period.

**Deliverables:**

- Copy of City of Savannah's QA/QC Water Quality Monitoring Plan that describes the sampling sites, collection schedule and analysis protocol;
- Chain-of-Custody and data reports/analysis for fecal bacteria and dissolved oxygen monitoring collected during the project period.

**Measures of Success:**

- Assurance/control of samples collected, stored, and transported;
- Analysis of data to demonstrate baseline conditions and trends in water quality pre- and post-BMP installation.

**Task 7:** Model reductions in sediment, nitrogen, and phosphorus loads to report to USEPA Grants Reporting & Tracking System.

**Deliverables:** Using Region 5, STEPL, SWIMM or other model, estimate load reductions for total nitrogen, phosphorus and sediment.

**Measures of Success:** Report results of load reduction models to GA EPD in Quarterly, Annual or Close-Out Reports, as appropriate.

**Project Activity:** Education/outreach to promote results from this project

**Georgia's Statewide NPS Management Plan:** *Urban Nonpoint Source Program – Stormwater, Short Term Goal 1.2, page 58: Disseminate relevant green infrastructure research through partnerships with existing conferences, institutions and organizations.*

**State of Georgia Coastal NPS Program (CZARA) Chapter 1:** *Intra/Inter-Agency Program and Project Coordination to Lift Program Conditions*

**Task 8:** Develop and install educational signage/artwork messages that include description of project and role of GI/LID in managing stormwater.

**Deliverables:**

- Design and produce at least one sign/artwork message for each project site;
- Signage to give the City of Savannah recognition and to contain the following notation: *The preparation of this sign was financed in part through a grant from the U.S. Environmental Protection Agency under the Provisions of Section 319(h) of the Federal Water Pollution Control Act, as amended. Environmental Protection Division of the Department of Natural Resources, State of Georgia, Month and Year (date sign was produced).* (Example: January 2020).

**Measures of Success:** 100% installation of sign/art messages as designed at each project site.

**Task 9:** Implement a rainwater harvesting outreach and implementation program along in the elementary school neighborhood.

**Deliverables:**

- Conduct an outreach campaign to recruit residential homeowners, businesses and institutions to install rainwater harvesting systems on their properties;
- Purchase and install a minimum of 10 rainwater harvesting systems (rain barrel, cistern) in the neighborhood.

**Measures of Success:** 100% installation of rainwater harvesting as designed and specified at each neighborhood site.

**Project Activity: Reporting Requirements.**

**Georgia's Statewide NPS Management Plan** page 99; **Long Term Goal 13:** *Effectively manage Section 319(h) grant funds.*

**Task 10:** Submit Quarterly and Annual progress reports and invoices to GAEPD

**Deliverables:** Quarterly and Annual Reports, including WBE/MBE information, and invoices submitted by January 15<sup>th</sup>, April 15<sup>th</sup>, July 15<sup>th</sup> and October 15<sup>th</sup> of each year during the life of the contract for inclusion in the USEPA Grants Reporting and Tracking System (GRTS)

**Measures of Success:** Timely submission of Quarterly and Annual Reports

**Task 11:** Submit Closeout Report and Final Invoice to GAEPD

**Deliverables:** One (1) Closeout Report and Final Invoice submitted to GAEPD for inclusion in the USEPA Grants Reporting and Tracking System

**Measures of Success** Timely submission of Close-Out Report and Final Invoice

**6. Roles & Responsibilities of Participating Organizations:**

Organization Name	Specific Responsibilities
City of Savannah	<ul style="list-style-type: none"> <li>• Execute grant contract with GAEPD</li> <li>• Account for matching funds or in-kind services contributed towards total project costs</li> <li>• Continue to collect water quality samples in Vernon River watershed and share data analysis during project period</li> <li>• Pay funds to appropriate contractor(s) and vendor(s)</li> <li>• Request reimbursements from GAEPD on a quarterly basis</li> <li>• Track the progress of project activities completed, grant funds expended, and match values provided in accordance with the drawdown &amp; implementation schedule</li> <li>• Complete and submit Quarterly and Annual progress reports and invoices to GAEPD by January 15<sup>th</sup>, April 15<sup>th</sup>, July 15<sup>th</sup> and October 15<sup>th</sup> of each project year</li> <li>• Complete &amp; submit Close-Out report &amp; Final Invoice at conclusion of project</li> </ul>
Georgia DNR Environmental Protection Division (GAEPD)	<ul style="list-style-type: none"> <li>• Provide federal award towards total project costs</li> <li>• Review and approve project deliverables</li> <li>• Participate in meetings, as appropriate</li> <li>• Review and assist as needed with 319(h) Grant protocols</li> <li>• Provide project oversight and contract management</li> <li>• Provide monitoring guidance and training</li> </ul>
The following organizations have provided Letters of Commitment to provide specific services:	
Jacob G. Smith Elementary School	<ul style="list-style-type: none"> <li>• Serve on stakeholder committee</li> <li>• Assist with education/outreach Task 8</li> </ul>
Savannah/Chatham County Board of Education	<ul style="list-style-type: none"> <li>• Serve on stakeholder committee</li> <li>• Assist with education/outreach Task 8</li> <li>• Provide personnel and fringe match through participation in this project</li> </ul>
Ogeechee River Keeper	<ul style="list-style-type: none"> <li>• Serve on stakeholder committee</li> <li>• Provide match for the sign and drain design Task 8</li> <li>• Assist with bioretention area plantings</li> <li>• Assist with rainwater harvesting outreach and implementation program Task 9</li> </ul>
Contractors and Consultants will be procured through an MOU or Sub agreement according to	

State procurement rules on an as needed basis to perform the following functions:	
Goodwyn, Mills and Cawood (GMC)	<ul style="list-style-type: none"> <li>• Amendment to existing City of Savannah contract</li> <li>• Develop and manage GI/LID BMP design specifications, engineering surveys, permits, and construction costs/schedules</li> <li>• Compare and analyze pre- and post-BMP construction water quality data collected from Vernon River watershed monitoring sites during the project period</li> <li>• Model pollutant load reductions from BMPs</li> <li>• Inspect and approve BMP installations, appropriate forms and vendor bills/receipts</li> <li>• Ensure all BMPs are completed according to designs and functionality standards</li> <li>• Assist with Quarterly and Annual status reports</li> <li>• Assist with Close-Out Report and Final Invoice</li> </ul>
Sub-Contractors, Consultants, and Public Agencies secured by City of Savannah on an as needed basis (TBD)	<ul style="list-style-type: none"> <li>• Support GI/LID BMP installation with engineering designs, geotechnical and/or additional surveys, maps and drawings, educational signage and artwork, rainwater harvesting outreach and implementation program as needed</li> </ul>

The following represents a list of possible state/regional agencies and local organizations associated with the Vernon River watershed that will be invited to join the stakeholder committee. The Lead Organization will report the value of participation and/or contributions from these groups as volunteer or professional in-kind services (match):

- Chatham County-Savannah Metropolitan Planning Commission*
- The Coastal Regional Commission of Georgia*
- Georgia DNR Coastal Resources Division*
- University of Georgia, Marine Extension and Georgia Sea Grant*

Levels of involvement may include, but shall not be limited to:

- Meetings
- Conference Calls
- Electronic Feedback (i.e. email, web-based message boards)
- Comment Periods

**7. Project Location:**

- a) Project Area Description and Map (Attachment 2):** The project is located in the City of Savannah neighborhood of Habersham Village on the property of the Jacob G. Smith Elementary School at Latitude 32.036419, Longitude -81.101229.
- b) Size of Watershed(s) or Sub-Drainage Area(s) to Project (acres):** The project impacts a drainage area of 3.3 acres within the Vernon River HUC-10 #0306020403 watershed. The HUC-10 watershed delineation includes the Casey Canal (North), which terminates

at the DeRenne Avenue Pump Station, the Casey Canal (South), which terminates at the Montgomery Crossroads Station south of DeRenne Avenue, and Hayners Creek.

**c) County or Counties:** Chatham County

**d) Land Uses within the Watershed(s) or Project Area (Percentages):**

Distribution of Land Cover Types in project area

(About 3.3 acres):

Agricultural	0%
Commercial Forestry	0%
Urban/Residential	100%
Mining/Extraction	0%
Forest/Natural Areas	0%
Open Water	0%
Wetlands	0%
TOTAL	100%

Data Source & Date: *City of Savannah SAGIS, 2017-2018*

The Vernon River watershed covers approximately 18,400 acres, including wetlands. Primary land uses in the watershed are classified as urban, residential and commercial. The developed area covers 85% of the total watershed. The remaining 15% includes water and wetlands. The water and wetland components include 19 miles of stormwater canals, 9 miles of natural streams, 500 acres of borrow pits, and 3,200 acres of salt marsh. The Casey Canal no longer functions as a natural waterway. Flood remediation projects from the 1980's have channelized the banks and increased the canal's capacity to hold stormwater. The presence of two stormwater pump stations and associated tide gates restrict natural tidal movement resulting in a stagnant waterbody with the exception of natural groundwater infiltration. The land surrounding the Casey Canal is served by the City of Savannah sanitary sewer system. Land uses worthy of notation within the land adjacent to the Casey Canal include a golf course, regional parks, and a community lake.

**e) Hydrologic Unit Code(s), Watershed Name(s) and Priority Watershed(s):**

The project focuses on the HUC-10 #0306020403 watershed and targets the priority HUC-12 #030602040303 Vernon River watershed.

**8. Nonpoint Source Pollution Impairments and Healthy Waters:**

**a) Section 305(b)/303(d) List of Waters:**

Segment Name Length (Miles) or (Embayment Acreage)	Reach Description 2016 Section 305(b)/303(d) List of Waters	County Location(s)	Criterion Violated, Healthy Water or Documented Water Quality Impairment	Listing Status Category 1, 2, 3, 4 (a-c), or 5
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Casey Canal (3 miles)	Head of Canal to DeRenne Ave, Savannah	Chatham	Dissolved Oxygen; Fecal Coliform	4a
Casey Canal (3 miles)	DeRenne Ave. to Montgomery Crossroad, Savannah	Chatham	Dissolved Oxygen; Fecal Coliform; FCG	4a
Hayners Creek (2 miles)	Casey Canal (Montgomery Crossroad) to Vernon River	Chatham	Dissolved Oxygen; Fecal Coliform	4a
Little Ogeechee River (1 mile)	Vernon River to Ossabaw Sound	Chatham	Assessment Pending for Dissolved Oxygen	3
Vernon River (9 miles)	Headwaters to Little Ogeechee River	Chatham	Healthy Water	1

**b) Other Documented Nonpoint Source Impacts (Only Applicable to Project): N/A**

**9. Post-BMP Water Quality Monitoring:**

The City of Savannah will share pre- and post-construction water quality monitoring data to compare fecal coliform and dissolved oxygen levels sampled at monitoring sites in the Vernon River watershed. In addition, water quality modelling of the stormwater BMPs will evaluate nutrients and sediment load reductions.

**10. Project Budget**

Item	Item Class Category	319(h) Grant Funds	Non-Federal Match Funds	Total
A	<b>Personnel</b> One (1) Water Resources Environmental Administrator at 5% of FTE x 3 years – City of Savannah Public Works and Water Resources Department (\$70,000) Description of Duties: BMP logistics; grant and project supervision and management	\$0	\$10,500	\$10,500
	One (1) Project Administrator at 5% of FTE x 1 year – Savannah Stormwater Department (\$65,000/year) Description of Duties: review engineering design plans, provide coordination of information needed for grant	\$0	\$3,250	\$3,250
	One (1) Construction Supervisor at 5% of FTE x 1 year – Savannah Stormwater Department (\$64,000/year) Description of Duties: supervise project construction and inspect BMP installations	\$0	\$3,200	\$3,200

Item	Item Class Category	319(h) Grant Funds	Non-Federal Match Funds	Total
	One (1) Project Manager at 5% of FTE x 2 years – Chatham County Board of Education (\$20.30/hr) Description of Duties: Project management and coordination for Board of Education and implementation of BMPs on school property	\$0	\$4,222	\$4,222
	<b>Sub Total:</b>	\$0	<b>\$21,172</b>	<b>\$21,172</b>
B	<b>Fringe Benefits</b> Position: One (1) Water Resources Environmental Administrator at 5% of FTE x 3 years x fringe rate of 42% –	\$0	\$4,410	\$4,410
	One (1) Project Administrator at 5% of FTE x 1 year x fringe rate of 42% – Savannah Stormwater Department	\$0	\$1,365	\$1,365
	One (1) Construction Supervisor at 5% of FTE x 1 year x fringe rate of 42% – Savannah Stormwater Department	\$0	\$1,344	\$1,344
	One (1) Project Manager at 5% of FTE x 2 years x fringe rate of 29% – Chatham County Board of Education	\$0	\$1,224	\$1,224
	<b>Sub Total:</b>	<b>\$0</b>	<b>\$8,343</b>	<b>\$8,343</b>
C	Travel: N/A	\$0	\$0	\$0
	<b>Sub Total:</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
D	Equipment: N/A			
	<b>Sub Total:</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
E	Supplies: Purpose/Use: Stakeholder/technical assistance meetings; educational/outreach materials	\$0	\$485	\$485
	<b>Sub Total:</b>	<b>\$0</b>	<b>\$485</b>	<b>\$485</b>
F	Contractual: Contractor Name: Goodwyn Mills and Cawood (GMC) Description of Duties: Manage GI/LID BMP design, engineering & installations; assist with Quarterly, Annual & Close-Out Reports; and design, engineer, survey and obtain permits for GI/LID BMPs	\$65,000	\$0	\$65,000
	Contractor Name: TBD Description of Duties: Install GI/LID BMPs	\$135,000	\$35,000	\$175,000
	Contractor Name: Ogeechee Riverkeeper Description of Duties: Design educational/outreach signage/artwork messages	\$0	\$5,000	\$5,000
	<b>Sub Total:</b>	<b>\$200,000</b>	<b>\$40,000</b>	<b>\$240,000</b>
G	Other: City of Savannah & Ogeechee Riverkeeper Description of Duties: Purchase and install rainwater harvesting systems in neighborhood	\$0	\$5,000	\$5,000
	<b>Sub Total:</b>	<b>\$0</b>	<b>\$5,000</b>	<b>\$5,000</b>

Item	Item Class Category	319(h) Grant Funds	Non-Federal Match Funds	Total
H	<b>Total Direct Charges:</b> (Sum of A-G)	<b>\$200,000</b>	<b>\$75,000</b>	<b>\$275,000</b>
I	Indirect Charges: Indirect Charge Rate			
J	<b>Total:</b> (Sum of H and I)	<b>\$200,000</b>	<b>\$75,000</b>	<b>\$275,000</b>

### 11. Project Attachment(s) and References:

**Attachment 1:** *Conceptual Designs*

**Attachment 2:** *Project Area Map*

**References:**

Link to *GSMM Coastal Stormwater Supplement (CSS)*

[https://epd.georgia.gov/sites/epd.georgia.gov/files/related\\_files/site\\_page/Georgia\\_Coastal\\_Stormwater\\_Supplement\\_2009.pdf](https://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/Georgia_Coastal_Stormwater_Supplement_2009.pdf)

**ATTACHMENT 1**  
**See Attachment 1 .pdf file**

**ATTACHMENT 2**  
**GI/LID Project Area**  
**And**  
**Casey Canal, Hayners Creek and Vernon River Drainage Basins**

