APPENDIX A – REVISION 1
Scope of Work
Section 319(h) FY2021 Grant – Element12

1. **Project Title:** Phase 2 - Biota Improvement in an Urban Stream through Aquatic Habitat Restoration

2. **Lead Organization:** Augusta, GA (AKA Augusta-Richmond County)
535 Telfair Street, Building 4000
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Project Start Date: August 2022
Project End Date: December 31, 2025

Federal Amount Requested:	**$117,058**
Match Amount to be Contributed:	**$111,815**
Total Project Amount:	**$228,873**

3. **Project Goals:**

Phase 2 of this project continues to implement a 2018 Nine-Element Watershed Management Plan (WMP) for the Augusta Canal (HUC-12 #030601060601)/Butler Creek (HUC-12 #030601060602)/Beaverdam Ditch (HUC-12 #030601060607) Watersheds in the Savannah River Basin by addressing Bio F and Bio M water quality impairments in an 8-mile portion of Rocky Creek (HUC-12 030601060607) in Augusta-Richmond County, Georgia. Project goals are to increase a fish Index of Biotic Integrity (IBI) to >16 (Very Poor) and a macroinvertebrate Multi-Metric Index (MMI) in a 100-point scale to >5 (Very Poor). Restoration of biological health may also decrease fecal coliform concentrations based on a well-supported scientific food web theory. These efforts will be documented through pre- and post-BMP monitoring using GAEPD/GADNR standard protocols for sampling fish and macroinvertebrates in streams. Habitat will be restored by directly adding Best Management Practices (BMPs) to the stream to encourage a more natural riffle-pool geomorphology over time and support habitat diversity.

The project supports sections of **Georgia's Statewide NPS Management Plan (2014):** 319 Grants, Key Stakeholders, Funding, page 92; Water Quality Monitoring, Program Issues, Short Term Goal 1.1 page 64; Water Quality Monitoring, Program Issues, page 79; 319 Program, Short Term Goal 8.1, page 97; Water Quality Monitoring, Short Term Goal 2.4, Page 85; Urban, Short Term Goal 4.2, Page 105; and 319 Grants, Long Term Goal 13, Page 99.

4. Project Background:

Due to delays caused by the COVID-19 pandemic, project activities will be achieved in two phases. Contracted under a Section 319(h) FY2016 grant, Phase 1 resulted in the completion of the following Project Activities and Tasks plus quarterly, annual, and close-out reporting:

Project Activity: Reach out to representatives & convene 3 meetings of Watershed Partnership developed throughout the previous TMDL planning process

Task 1: Introduce project to appropriate watershed partners

Task 2: Convene 3 meetings to solicit input, encourage support, and publicize project

Project Activity: Survey and qualify assessment of existing habitat.

Task 3: Survey of existing habitat in 8-mile reach of Rocky Creek

Task 4: Pre-BMP installation assessment of macroinvertebrate and fish communities in observed habitats

Project Activity: Install BMPs from available options as determined by the assessment

Task 5: Survey of selected reach

Task 6: Engineering Design of Structures

Phase 2 will continue the project based on Project Activities and Tasks listed in **5. Project Activities** below. The BMP installation targets a minimum of 0.25 stream miles (1320 linear feet) along the 6-mile "Headwaters to SR56" reach, with a spacing of approximately one feature every 50-200 ft. Point Bar Formation/Stabilization Structure; Pipe Refugia; Widener/Woody Habitat/Low flow Concentrator; Pool Enhancer; and Cross-Channel Rock Vane BMPs have been evaluated and chosen based on in-stream assessment, project cost, ability to install, and six research/restoration priorities developed by the project team.

A 2016 Total Maximum Daily Load (TMDL) evaluated both a 6-mile segment (Headwaters to SR 56, formerly Headwaters to Phinizy Ditch) and a 2-mile reach (SR 56 to below New Savannah Road) of Rocky Creek in Augusta as Very Poor for diversity in fish and macroinvertebrate community populations. The TMDL does not call for further reduction in sediment loading from external sources into Rocky Creek:
https://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/Savannah%20Biota%20Impacted%20TMDL%20Report%20%5B2016%5D.pdf

Reduction of sediment will be pursued as an ancillary benefit of habitat BMPs and may improve biotic health further. Therefore, the BMPs selected for this project are intended to stabilize the creek bed and banks so they provide long term habitat as opposed to unconsolidated stream bed and bank sediments.

A fecal coliform bacteria TMDL developed in 2000 for the 2-mile segment of Rocky Creek established an 80% load reduction to achieve state water quality standards: https://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/EPA_Rocky_Creek_Fecal_TMDL.pdf

By improving the fish and macroinvertebrate communities, this project will upgrade the overall food web, and help to create an environment that is less hospitable for fecal bacteria.

5. Project Activities:

Project Activity: Install BMPs from available options as determined by the assessment

Task 1: Install and provide for operations and maintenance of structures that create in-stream habitat for biota including fish and macroinvertebrates over a wide range of the food web and varying depth in the water column.

Deliverables: Installation of structural practices; Records of BMP inspections and maintenance kept and made available for review beyond the term of this contract.
Measures of Success: Completion of structural practice installations; BMPs operated and maintained for expected lifespan and in accordance with commonly accepted standards to ensure proper functioning of system as designed.

Project Activity: Targeted monitoring to track post-BMP water quality trends including improvement towards achieving stated goals

Task 2: Post-BMP sampling assessment of macroinvertebrates and fish above, in, and below the BMP installations, including the historic GAEPD monitoring sites, using GAEPD (2007)/GADNR(2005) protocols

Deliverables:

- Finalized QA/QC Water Quality Monitoring Plan for macroinvertebrate & fish assessments
- Post-BMP metrics for stream showing value of BMP compared to areas of stream without habitat restoration

Measures of Success:

- Finalized QA/QC Water quality Monitoring Plan approved by GAEPD
- Data showing an IBI >16 in fish and an MMI >5 in macroinvertebrate biometric values

Project Activity: Publicize study results to scientific and general audience

Task 3: Develop a Case Study paper to summarize the project and publicize through project partner websites and social media outlets

Deliverables:

- Completed paper and
- Presentation made accessible to general public

- Access to presentation through social media

Measures of Success: Documented views of presentation on social media outlets

Task 4: Develop a Case Study paper to summarize the project and present to scientific community at regional water conference

Deliverables:

- Completed paper and
- Presentation at Georgia Water Resources Conference or similar conference

Measures of Success: Acceptance of talk and paper at conference

Project Activity: Reporting Requirements

Task 5: Submit Quarterly Reports, including WBE/MBE reports and invoices, by the 15th of January, April, July, and October of each year during the grant period.

Deliverables: Quarterly deliverables, monitoring data reports, invoices and supporting documentation reporting progress on project and using template provided by GAEPD.
Measures of Success: Quarterly deliverables, monitoring data reports, invoices and supporting documentation reviewed and approved by GAEPD.

Task 6: Participate in project review meetings with GAEPD based on the following schedule: Six months and twelve months after the project start date, then annually through the project term.

Deliverables: Attendance at meetings and verbal or written responses to GAEPD.
Measures of Success: Full participation at all project review meetings.

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Task 7: Submit Final Invoice and Closeout Report to GAEPD for review.

Deliverables: Final Invoice and Closeout Report
Measures of Success: Final Invoice and Closeout Report reviewed and approved by GAEPD.

6. Roles and Responsibilities of Participating Organizations:

Organization Name	Specific Responsibilities
City of Augusta	• Account for 40% of total project costs in matching funds or in-kind services • Pay funds to appropriate contractor(s) and vendor(s) • Request reimbursements from GAEPD on a quarterly basis • Track the progress of project activities completed, grant funds expended, and match values provided in accordance with the drawdown & implementation schedule • Complete and submit quarterly progress reports and

	invoices to GAEPD by January 15th, April 15th, July 15th, and October 15th of each project year • Participate in project review meetings with GAEPD each project year • Complete & submit close-out report at conclusion of project
GAEPD	• Provide 60% of total project costs • Review and approve project deliverables • Participate in meetings, as appropriate • Review and assist as needed with 319(h) Grant protocols • Provide project oversight and contract management • Provide monitoring guidance and training
Phinizy Center for Water Sciences	• Contract with City of Augusta to perform the following: • Sample, identify, and enumerate aquatic insect and fish species • Assist in report writing • Assist in BMP construction • Subcontract for the following services under an existing subagreement and with a previously approved professional: o Install and maintain rain gauges and water level loggers o Develop rating curves o Assist in report writing

7. Project Location:

Rocky Creek runs through and lies entirely within Richmond County. It is a tributary to the Savannah River.

a) Project Area Description and Map:

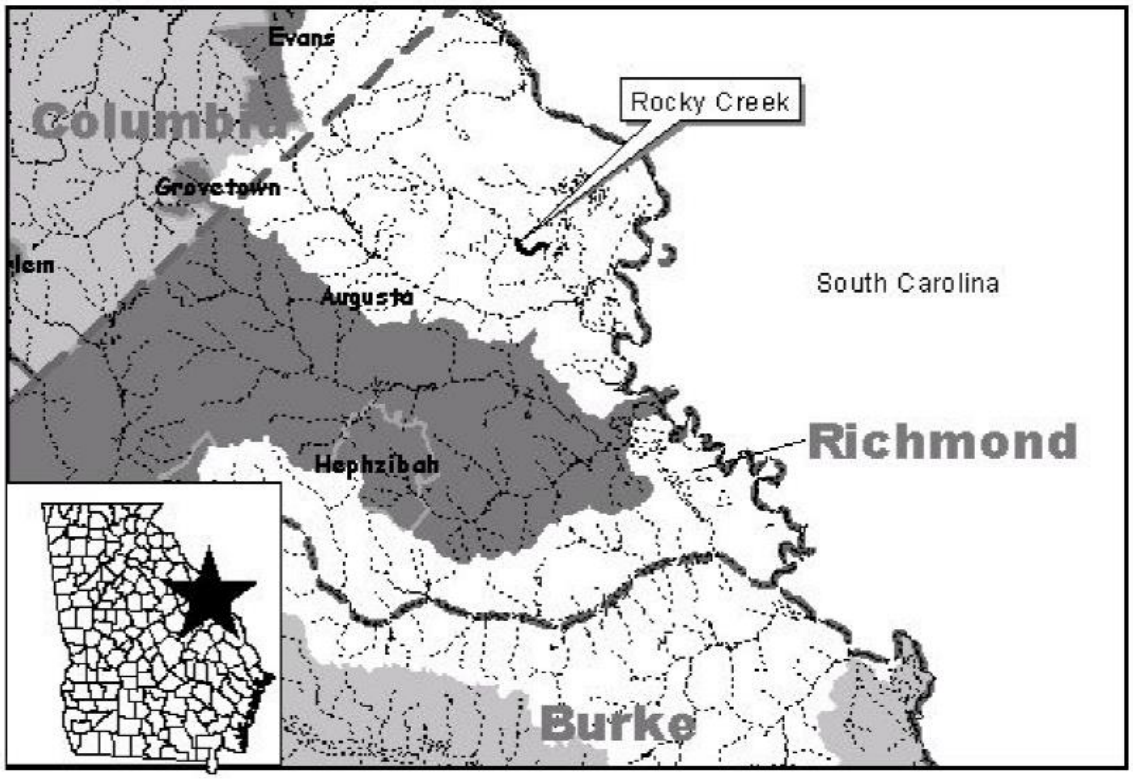

Figure 1. Location of Rocky Creek in the Augusta-Richmond County Area

Figure 2. Rocky Creek Watershed including impaired reaches and proposed restoration area (Red-Fecal Coliform Impaired Reach, Orange-Macroinvertebrate Impaired Reach, Blue-Proposed Target Area)

Figure 3. Aerial photo of the extent of proposed restoration area with Milledgeville Road bordering upstream on the left and Wheeless Road bordering downstream on the right

b) Project Area Size (Acres): 8,107 acres

c) County or Counties: Richmond

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

Agricultural	6%
Commercial Forestry	0%
Urban/Residential	78%
Mining/Extraction	1%
Forest/Natural Areas	13%
Water/Wetlands	2%
TOTAL	100%

Data Source & Date: *Draft Total Maximum Daily Load Evaluation for Seven Stream Segments in the Savannah River Basin for Sediment, 2015*

e) Hydrologic Unit Code(s), Watershed Name(s) and Priority Watershed(s):
HUC-10: #0306010606 Name: Rocky Creek Priority: NA

8. Nonpoint Source Pollution Impairments and Healthy Waters:

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

Water Body Segment Name (Segment Length (Miles) or Embayment Acreage)	County Location(s)	Criterion Violated or Water Quality Concern (Healthy Water)	Listing Status Category 4a, 5 or 1
Rocky Creek (2 miles)	Richmond	Bio M, Bio F, Fecal Coliform	4a
Rocky Creek (6 miles)	Richmond	Bio M, Bio F	4a

b) Secondary Pollutant(s):
In addition to the impairments already listed, there is evidence that sediment from the stream itself could be contributing to sediment load in the stream. Significant gully and

channel erosion can be observed in the channel as well as a great deal of bed movement. Higher flows cause significant movement of bed features.

9. Monitoring:

DRAFT QA/QC Water Quality Monitoring Plan as Attachment *(listed in Section 11.)*

GADNR, 2005-*Standard operating procedures for conducting biomonitoring on fish communities in wadeable streams in Georgia* at http://www.georgiawildlife.com/node/913

GAEPD, 2007-*Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia; Standard Operating Procedures* at http://epd.georgia.gov/macroinvertebrate-bioassessment-standard-operating-procedures-sop-and-metric-spreadsheets

GAEPD is working on revising the multi metric index (MMI) used to assess the health of macroinvertebrate communities. Until the MMI revision is completed, GAEPD will consider resampling sites where the macroinvertebrate score is 80 or above using the guidelines below. http://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/Guidelines%20for%20Listing%20and%20Delisting%20of%20Biological%20Data_Feb2016_Version1_2_Revised_August%202016.pdf

10. Project Budget:

Item	Item Class Category	319(h) Grant Funds (60% Maximum)	Non-Federal Matching Funds (40% Minimum)	Total
A	Personnel: One (1) AED Director – approximately 0.007 FTE ($170,000/year) for 2 years Description of Duties: City Project Management, Project oversight, BMP decisions		2,380	2,380
	One (1) Stormwater Serv. Mgr. - approximately 0.15 FTE ($122,000/year) for 2 years Description of Duties: Project Management, Project oversight, Fieldwork, BMP decisions		36,600	36,600
	One (1) Engineering Mgr. - approximately 0.01 FTE ($109,900/year) for 2 years Description of Duties: Engineering Design, Permitting, Project Management, BMP decisions		2,198	2,198
	One (1) Stormwater Coordinator - approximately 0.01 FTE ($60,672/year) for 2 years Description of Duties: Engineering Design, Permitting, Project Management, BMP decisions		1,213	1,213
	One (1) Staff Engineer - approximately 0.01 FTE ($79,000/year) for 2 years Description of Duties: Engineering Design, Permitting, Project Management, BMP decisions		1,580	1,580
	One (1) AED Assist. Director – approximately 0.01 FTE ($101,000/year) for 2 years Description of Duties: City Project Management, Project oversight, BMP decisions		2,020	2,020
	One (1) Asset Manager - approximately 0.01 FTE ($106,000/year) for 2 years Description of Duties: GIS, Survey, BMP decisions		1,908	1,908
	One (1) GIS analyst - approximately 0.01 FTE ($48,847/year) for 2 years Description of Duties: GIS, Survey, BMP decisions		977	977
	One (1) GIS analyst - approximately 0.01 FTE ($58,532/year) for 2 years Description of Duties: GIS, Survey, BMP decisions		1,171	1,171
	Sub Total:	**0**	**50,047**	**50,047**
B	Fringe Benefits: Included in Item A @ a rate of 30%		0	0
	Sub Total:	**0**	**0**	**0**
C	Travel: Staff Position: Purpose of Travel: 833 Miles x Mileage Rate ($.545 mile)		0	0
	Sub Total:	**0**	**0**	**0**
D	Equipment: Equipment: Purpose/Use:			
	Sub Total:	**0**	**0**	**0**
E	Supplies: Supplies: Purpose/Use:			
	Sub Total:	**0**	**0**	**0**

Item	Item Class Category	319(h) Grant Funds (60% Maximum)	Non-Federal Matching Funds (40% Minimum)	Total
	CONTRACTUAL: PHINIZY CENTER (NGO) Up to four (4) Aquatic Ecologists – approximately 0.125 FTE ($35,000/year) for 2 years = $35,000 Description of Duties: Assisting with BMP sites survey, aquatic sampling and subcontracting the following for BMP construction: • One (1) Project Engineer- approximately 0.25 FTE ($80,000/year) for 2 years = $40,000 Description of Duties: BMP selection and engineering, assist with survey, report writing and project management • One (1) Construction Contractor - TBD = $103,826 Description of Duties: Install BMPs	117,058	61,768	178,826
	Sub Total:	**117,058**	**61,768**	**178,826**
G	Construction: (Does not apply to GAEPD Section 319(h) Grants)	N/A	N/A	N/A
H	Other:			
	Sub Total			
I	Total Direct Charges: (Sum of A-H)	**117,058**	**111,815**	**228,873**
J	Indirect Charges: (0% Eligible for Reimbursement with Federal Dollars)	N/A	Up to 100%	
K	**Total:** (Sum of I and J)	**117,058**	**111,815**	**228,873**

Narrative Justification for Item Class Categories:

Personnel (A): Personnel in this item class category are all Augusta-Richmond County employees within the Augusta Engineering Department (AED) and are all contributing time as Non-Federal matching contributions to the project. Since this project includes stream restoration efforts that have potential impacts on in-stream flows within one of the Richmond County streams, the AED will treat this as a submitted county construction project which will go through our plan review and permitting processes. In addition, this project requires more specialized elements that include engineering, buffer assessments and permitting, BMP installation and monitoring, aquatic ecology, project management, and water quality assessments. All necessary personnel to perform those necessary duties are included in this grant.

- AED Director: approximately (0.007 FTE @ $170,000/year) will have project oversight duties, will be involved in planning, and will participate in draft and final report reviews.
- AED Stormwater Services Manager: approximately (0.15 FTE @ $122,000/year), will oversee, manage and coordinate project, provide aquatic ecology and water quality technical advice, input on BMP decisions, and organize and participate in fieldwork.
- AED Engineering Manager: approximately (0.01 FTE @ $109,900/year), will provide plan review oversight, engineering design support, permit writing support, input on BMP decisions and monitoring, and project management support.
- AED Stormwater Coordinator: approximately (0.01 FTE @ $60,672/yr) will have BMP design input, fieldwork and project management responsibilities.
- AED Staff Engineer: approximately (0.01 FTE @ $79,000/yr) will have BMP design input, engineering design support, fieldwork and project management responsibilities.

- AED Assistant Director-Maintenance: approximately (0.01 FTE @ $101,000/yr) will have project management, project oversight, and site maintenance responsibilities.
- AED Asset Manager: approximately (0.01 FTE @ $106,000/yr) will have GIS, survey, and BMP design input.
- AED GIS analyst: approximately (0.01 FTE @ $48,847/yr) will have GIS, survey, and BMP design input.
- AED GIS analyst: approximately (0.01 FTE @ $58,532/yr) will have GIS, survey, and BMP design input.

Fringe benefits (B): Personnel in this item class category are all Augusta-Richmond County employees within the Augusta Engineering Department (AED) and are all contributing time as Non-Federal matching contributions to the project. Fringe benefits rate for AED employees is 30% and fringe benefits are included in Personnel Line Item.

Supplies (E): Supplies have been reallocated to Contractual expenses

Contractual (F): Phinizy Center for Water Sciences will be the Contractual Manager for the project and will make use of an existing subcontract and approved professional relationship as well as subcontract with qualified companies, consultants, and institutions to outsource monitoring, engineering and construction services. See below Justification for scope of services.

- Phinizy Center for Water Sciences: Phinizy Center (0.125 FTE @$35,000/year) includes at a maximum four (4) staff members experienced in aquatic ecology and geomorphology in urban streams. Personnel qualified for this function include aquatic ecologists, researchers, and other specialists to perform post-BMP implementation surveys, geomorphic characterizations, hydrologic analyses, and report writing. The team will also be involved in taking advantage of an existing subagreement and a previously approved professional relationship to outsource aquatic monitoring services. In addition, Phinizy Center will outsource for microelectronics, survey assistance, and report writing, where needed and subcontract the following for BMP construction:
- One (1) Project Engineer - approximately 0.25 FTE ($80,000/year) for 2 years = $40,000 for BMP selection and engineering, assist with survey, report writing and project management.
- One (1) Construction Contractor - TBD = $103,826 to install BMPs.

Phase 2 of this project will install Bioengineering BMPs within Rocky Creek to increase available habitat for aquatic insect and fish populations. Most supplies have already been acquired in Phase 1. However, the budgets for BMP installation in this Line Item may include additional items for construction and live plants.

Planting

- Live Stakes: ($1-$4 each) assuming a minimum of 12 groups of 50 at $4 each = $2,400
- Herbaceous Plugs = $3,000

Additional Items

- Temporary Construction Entrances (2) = $4,000

11. Project Attachment(s):

Link: 2018 Nine-Element Watershed Management Plan for the Augusta Canal (HUC-12 #030601060601) / Butler Creek (HUC-12 #030601060602) / Beaverdam Ditch (HUC-12 #030601060607) Watersheds in Savannah River Basin
https://epd.georgia.gov/document/document/augustacanalbutlercreekbeaverdamditchwmp0306010606y2018pdf/download

Attachment 1: Post-BMP QA/QC Water Quality Monitoring Plan