



Executive Committee Meeting Materials

February 10, 2022

1. Agenda
2. December 8, 2021, Executive Committee Meeting Minutes
3. Wet Weather Septic System Impacts to Surface Water Quality Study Contract

Agenda



Metropolitan North Georgia Water Planning District

International Tower | 229 Peachtree St., NE | Suite 100 | Atlanta, GA 30303

EXECUTIVE COMMITTEE AGENDA

February 10, 2022 – 9:00 a.m.

Gwinnett Environmental and Heritage Center

2020 Clean Water Drive, Buford, GA 30519

- I. Welcome
- II. Approve Meeting Minutes (*Action Item*)
- III. Approve Wet Weather Septic System Impact to Surface Waters Study Contract (*Action Item*)
- IV. Adjourn

December 8, 2021, Executive Committee
Meeting Minutes



EXECUTIVE COMMITTEE
Minutes
December 8, 2021

The Executive Committee of the Metropolitan North Georgia Water Planning District Governing Board met on Wednesday, December 8, 2021, at 9:00 a.m. via an online web-conference.

Members Present

Mr. Glenn Page, Chairman
Hon. Harry Johnston
Hon. Lisa Cupid
Hon. Cindy Mills Jones

City of Atlanta Designee: Ms. Mikita Browning
Clayton County Designee: Mr. Bernard Franks
Fulton County Designee: Mr. Nick Ammons
Gwinnett County Designee: Mr. Kevin Farrell
Hall County Designee: Mr. Srikanth Yamala
Henry County Designee: Mr. Tony Carnell

Members Not Present

Ms. Katie Kirkpatrick, Vice Chair
Dr. Mark Berry, Secretary/Treasurer
Hon. Michael Thurmond

Chairman Glenn Page called the meeting to order.

Approve Meeting Minutes

Chairman Page presented the September 8, 2021 meeting minutes for approval. No revisions were offered. Mr. Kevin Farrell made a motion to approve the meeting minutes. The motion was seconded by Mr. Tony Carnell and passed without opposition.

2022 Finance Committee Membership

Chairman Page presented the slate of 2021 Finance Committee Members for consideration which included Chairman Page, Vice Chair Kirkpatrick, Treasurer/Secretary Dr. Berry (Committee Chair), Hon. Lisa Cupid, Hon. Mike Thurmond, Hon. Carlotta Harrell, Hon. Nicole Hendrickson, Hon. David Carmichael, and Mr. Gerald Pouncey. Mr. Carnell made a motion to approve the 2021 Finance Committee Membership. The motion was seconded by Dr. Mark Berry and passed without opposition.

2021 Year End Budget Revision

Treasurer Dr. Berry provided an overview of the 2021 Year End Budget Revision for consideration. Mr. Bernard Franks made a motion to approve the 2021 Budget Revision. The motion was seconded by Mr. Farrell and passed without opposition.

BAC Membership New Member Approval

Mr. Danny Johnson presented the list of five applicants for Basin Advisory Council (BAC) Membership for consideration. Mr. Farrell made a motion to approve the new BAC members. The motion was seconded by Hon. Cupid and passed without opposition.

Wet Weather Septic System Impacts to Surface Water Quality Study Contract

MNGWPD Contract
No. _____

CONTRACT FOR PROFESSIONAL SERVICES

THIS AGREEMENT, entered into as of this ____ day of _____, 2022 by and between the University of Georgia Research Foundation, Inc., , of Athens, Georgia (hereinafter referred to as the "Consultant") and the Metropolitan North Georgia Water Planning District, (hereinafter referred to as "MNGWPD" or "the District").

WITNESSETHAT

WHEREAS, MNGWPD, pursuant to O.C.G.A. § 12-5-570 *et.seq.*, is obligated to develop regional and watershed-specific plans; and

WHEREAS, MNGWPD desires to engage the Consultant to render certain technical or professional services hereinafter described in connection with an undertaking or project (hereinafter referred to as the "Project") which is to be wholly or partially financed by funds from the State of Georgia, the United States Government, or participating Local Governments (hereinafter, along with the appropriate auditing agency of the entity providing such funds, referred to as the "Concerned Funding Agency or Agencies"); and

WHEREAS, the Consultant desires to render such services in connection with the Project;

NOW THEREFORE, in consideration of the premises, and the mutual covenants and agreements hereinafter contained, the parties hereto agree as follows:

1. Employment of the Consultant. MNGWPD hereby agrees to engage the Consultant and the Consultant hereby agrees to perform the services hereinafter set forth in accordance with the terms and conditions contained herein.

2. Time of Performance. The services of the Consultant are to commence no later than fifteen (15) days after the execution of this contract and shall be undertaken and pursued in such sequence as to assure their expeditious completion and as may be required in Attachment "A". The period of performance for this project will be from February 15, 2022 through August 31, 2023.

3. Compensation and Method of Payment. The Consultant shall be compensated for the work and services to be performed under this contract as set forth in Attachment "B" which is attached hereto and made a part hereof. Compensation will be based on a fixed price agreement. In no event, however, will the total compensation and reimbursement, if any, to be paid the Consultant under this contract exceed the amount as further described in Attachment "B" of this contract.

4. Scope of Services. The Consultant shall do, perform and carry out in a satisfactory and proper manner, with the skill and diligence normally employed by Consultants performing similar work and services, the work and services described in Attachment "A", which is attached hereto and made a part hereof. The Consultant shall insure adequate review, coordination and approval of the work with MNGWPD's Chief Executive Officer (CEO) or his authorized agent (as used herein the CEO's "authorized agent" shall mean that person designated by MNGWPD's CEO in Paragraph 27 of this contract).

5. Progress Payments. Unless otherwise provided in Attachment "B", the Consultant shall be entitled to receive progress payments on the following basis: As of the last day of each calendar month during the existence of this contract, the Consultant shall submit to MNGWPD an invoice for payment based on the percentage of completion of the Project through the invoice period. Subject to MNGWPD's right to verify the accuracy of the invoice and the satisfactory performance of the work evidenced thereby, MNGWPD will make payments to the Consultant as the work progresses but not more often than once a month. Invoices must cover a period ending with the end of a month and shall be received within thirty (30) days following the end of the invoice period. The Consultant will be paid an amount which bears the same ratio to the total compensation to be paid to the Consultant under this contract as the work and services actually performed as of the end of the invoice period bear to the total work and services to be performed by the Consultant under this contract, less all previous progress payments made pursuant hereto, and less an established retainage. Upon completion and acceptance by MNGWPD of the work, including the receipt of any final written submission of the Consultant, MNGWPD shall pay the Consultant a sum equal to one hundred per cent (100%) of the compensation to be paid under this contract, less the total of all previous payments made. Such payment shall be made no later than thirty days after MNGWPD's acceptance of the Consultant's invoice and MNGWPD's receipt of such funds from the Concerned Funding Agency.

6. Consultant's Personnel. The Consultant represents that he has, or will secure at his own expense, all personnel required in performing the services under this contract. Such personnel shall not be employees of MNGWPD, nor shall such personnel have been employees of MNGWPD during any time within the twelve-month period immediately prior to the date of this contract, except with the express prior written consent of MNGWPD's CEO or his authorized agent. Further, the Consultant agrees that no such personnel shall be involved in any way with the performance of this contract, without the express prior written approval of MNGWPD's CEO or his authorized agent.

7. Approval of Subcontracts. None of the work or services to be performed under this contract by the Consultant shall be subcontracted without the prior written approval of MNGWPD's CEO or his authorized agent with the understanding that the Consultant will subcontract performance of the project to the University of Georgia. If such subcontracting is authorized as herein provided, all subcontract documents shall be submitted to MNGWPD's CEO or his authorized agent, for his review and approval prior to the execution of such subcontract. Further, if requested by MNGWPD's CEO or his authorized agent, the Consultant shall provide such documentation as MNGWPD shall require, regarding the method the Consultant used in selecting its subcontractor. The Consultant acknowledges that if the work or services to be performed under this contract is financed solely or partially through Federal funds, the selection of subcontractors is governed by regulations requiring competition between potential subcontractors or adequate justification for sole source selection. The Consultant agrees to abide

by such regulations in its selection procedure.

8. Review and Coordination. To insure adequate review and evaluation of the work, and proper coordination among interested parties, MNGWPD shall be kept fully informed concerning the progress of the work and services to be performed hereunder. MNGWPD may require the Consultant to meet with designated officials of MNGWPD and the Concerned Funding Agency from time to time to review the work. Reasonable prior notice of such review meeting shall be given the Consultant.

9. Reports. The Consultant shall furnish MNGWPD with a monthly narrative progress report, in such form as may be specified by MNGWPD's CEO or his authorized agent, outlining the work accomplished by the Consultant during the month of such report and the current status of the Project, including the percentage of the work which has been completed as of the end of the month of such report. Such report shall be furnished within fifteen (15) days of the end of the month of such report.

10. Inspections. Authorized representatives of MNGWPD and the Concerned Funding Agency may at all reasonable times review and inspect the Project activities and data collected pursuant to this contract. All reports, drawings, studies, specifications, estimates, maps and computations prepared by or for the Consultant shall be made available to authorized representatives of MNGWPD and the Concerned Funding Agency for inspection and review at all reasonable times in the Consultant's office where data is normally accumulated. Approval and acceptance of such material shall not relieve the Consultant of his professional obligation to correct, at his expense, any errors found in the work.

11. Maintenance of Cost Records. The Consultant shall maintain all books, documents, papers, accounting records and other evidence pertaining to costs incurred on the Project and shall make such material available at all reasonable times during the period of the contract, and for three years from the date of final payment under the contract, for inspection by MNGWPD, the Concerned Funding Agency, and if the work and services to be performed under this contract is wholly or partially funded with Federal funds, the Comptroller General of the United States, or any other party as may be directed by MNGWPD. Notwithstanding this Section 11 or any other provisions of this contract and pursuant to the Georgia Open Records Act, O.C.G.A. § 50-18-70 *et seq.*, all records received or maintained by Consultant or any other private entity in the performance of work and services under this contract shall be subject to disclosure to the same extent that such records would be subject to disclosure if received or maintained by MNGWPD or any other agency, public agency, or public office. The Consultant shall include the provisions of this paragraph in any subcontract executed in connection with this Project.

12. Data to be Furnished Consultant. All information, data, reports, records and maps which are existing, readily available and reasonably necessary, as determined by MNGWPD's CEO or his authorized agent, for the performance by the Consultant of the work and services required by this contract shall be furnished to the Consultant without charge by MNGWPD. MNGWPD, its agents and employees, shall fully cooperate with the Consultant in the performance of the Consultant's duties under this contract.

13. Rights in Documents Materials and Data Produced. Consultant agrees that all reports,

drawings, studies, specifications, estimates, maps, computations and other data prepared by or for it under the terms of this contract shall be delivered to, become and remain the property of MNGWPD upon termination or completion of the work. MNGWPD shall have the right to use same without restriction or limitation and without compensation to the Consultant other than that provided for in this contract. For the purposes of this contract, "data" includes writings, sound recordings, or other graphic representations and works of a similar nature. No materials or data produced in whole or in part under this contract shall be the subject of an application for copyright by or on behalf of the Consultant or its subcontractors. If the work to be performed under this contract is financed wholly or partially by Federal funds, the Consultant acknowledges that matters regarding the rights to inventions and materials generated by or arising out of this contract may be subject to certain regulations issued by the Concerned Funding Agency. Information regarding these relevant regulations may be obtained upon written request to MNGWPD's CEO or his authorized agent. If this contract provides for the development of systems analysis products, models, electronic data processing systems, software and related services, the methods, material, logic and systems developed under this contract shall be the property of Consultant. However, MNGWPD, and the Concerned Funding Agencies shall retain the right, in perpetuity, to use, and to authorize others within the State of Georgia to use the systems analysis products, models, electronic data processing systems, software and related services, the methods, material, logic and systems without restriction or limitation and without compensation to the Consultant other than that provided for in this contract.

14. Identification of Documents. Unless otherwise provided in Attachment "A", all reports, maps and other documents completed as a part of this contract shall bear on the title page of such report, map or document, the following legend: "Prepared by (insert name of Consultant) under Contract with the Metropolitan North Georgia Water Planning District. The preparation of this (insert either report, map or document, as appropriate) was financed in part by funds provided by (insert name of the Concerned Funding Agency and an identification of the grant program)." The date (month and year) in which the document was prepared shall also be shown.

15. Publication and Publicity. MNGWPD acknowledges and agrees that UGARF, UGA, and/or the Principal Investigator shall have the sole and unrestricted right to publish or otherwise disclose the Project protocol and results of the Project, but only to the extent doing so does not impermissibly disclose Confidential Information disclosed by MNGWPD to UGARF and/or UGA hereunder. To avoid loss of patent rights from premature public disclosure, Consultant shall require the Principal Investigator to deliver to MNGWPD all proposed articles, manuscripts, presentations, or any other publication of the Project prior to public disclosure. MNGWPD may review and provide comment, if any, for a period of thirty (30) days after receipt of the proposed publication or other public disclosure. Upon MNGWPD's notice to Consultant that MNGWPD's desires to file an application to protect certain Project Intellectual Property related to the proposed publication, Consultant shall require Principal Investigator to delay publication until the first of the following has occurred: (i) a patent application has been filed on such Project Intellectual Property; or (ii) the Parties agree not to pursue protection for such Project Intellectual Property; or (iii) sixty (60) days have expired after MNGWPD's notice to Consultant. "Confidential Information" shall be defined as all Project Intellectual Property and descriptions thereof shared by one Party (the "Provider") to the other ("the Recipient"), and also means all information embodied in written, electronic, biological, chemical, or any other tangible form, which is disclosed or provided under this Agreement by one Party (the "Provider") to the

other Party (the “Recipient”) and is marked confidential at time of disclosure. “Confidential Information” also includes all orally disclosed information where Provider declares such information to be confidential at the time of initial disclosure and confirms such declaration by written notice to the Recipient within thirty (30) days of initial disclosure. All articles, paper, bulletins, reports or other material reporting plans, progress, analysis or results and findings of the work conducted under this contract are subject to Georgia’s Open Records Act, O.C.G.A. § 50-18-70 *et. seq.* Consultant shall notify MNGWPD of the receipt of any and all requests to review any such articles, paper, bulletins, reports or other material.

16. Interest of Consultant. The Consultant covenants that neither the Consultant, nor anyone controlled by the Consultant, controlling the Consultant, or under common control with the Consultant, nor their agents, employees or subcontractors, presently has an interest, nor shall acquire an interest, direct or indirect, which would conflict in any manner or degree with the performance of its service hereunder, or which would prevent or tend to prevent, the satisfactory performance of the Consultant's service hereunder in an impartial and unbiased manner. The Consultant further covenants that in the performance of this contract no person having any such interest shall be employed by the Consultant as an agent, subcontractor or otherwise. If the Consultant contemplates taking some action which may constitute a violation of this paragraph 17, the Consultant shall request in writing the advice of MNGWPD's CEO or his authorized agent, and if MNGWPD's CEO or his authorized agent shall notify the Consultant in writing that the Consultant's contemplated action will not constitute a violation hereof, then the Consultant shall be authorized to take such action without being in violation of this paragraph.

17. Interest of Member of MNGWPD and Others. No officer, member or employee of MNGWPD, and no public official of any local government which is affected in any way by the Project, who exercises any function or responsibilities in the review or approval of the Project or any component part thereof, shall participate in any decision relating to this contract which affects his personal interest or the interest of any corporation, partnership or association in which he is, directly or indirectly, interested; nor shall any such officer, member or employee of MNGWPD, or public official of any local government affected by the Project, have any interest, direct or indirect, in this contract or the proceeds arising therefrom.

18. Official Not to Benefit. No member of or delegate to the Congress of the United States of America, resident Commissioner or employee of the United States Government shall be admitted to any share or part of this contract or to any benefit to arise here from.

19. Nondiscrimination.

(A) The Consultant will not discriminate against any qualified employee, applicant for employment or subcontractor because of age, handicap, religion, creed or belief, political affiliation, race, color, sex or national origin. The Consultant shall take affirmative action to insure that qualified applicants are employed and qualified subcontractors are selected, and that qualified employees are treated during employment, without regard to their age, handicap, religion, creed or belief, political affiliation, race, color, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotions, or transfers; recruitment or recruitment advertising; layoffs or terminations; rates of pay or other forms of compensation; selection for training including apprenticeship; and participation in recreational

and educational activities. If the Consultant has fifty or more employees and if the total compensation and reimbursement to be paid to the Consultant as specified in paragraph 3 of this contract is Fifty Thousand Dollars (\$50,000) or more, the Consultant certifies that: (1) It has developed a written Affirmative Action Program (AAP) which includes: (a) an analysis of the Consultant's work force showing by job category the extent to which minorities and females are being underutilized, and (b) where minorities and females are being underutilized, realistic goals and timetables in each job category for correcting the underutilization; and (2) It presently has such a plan in effect and such plan will remain in effect at least until the Project completion date specified in paragraph 2 of the contract. The Consultant agrees to post in a conspicuous place available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause. The Consultant will in all solicitations or advertisements for subcontractors or employees placed by or on behalf of the Consultant, state that all qualified applications will receive consideration for employment without regard to age, handicap, religion, creed or belief, political affiliation, race, color, sex or national origin. The Consultant will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this contract so that such provisions will be binding upon each subcontractor provided that the foregoing provisions shall not apply to subcontracts for less than \$10,000.00.

(B) The Consultant shall keep such records and submit such reports concerning the racial and ethnic origin of employees and applicants for employment as MNGWPD or the Concerned Funding Agency may require.

(C) The Consultant agrees to comply with such rules, regulations or guidelines as MNGWPD or the Concerned Funding Agency may issue to implement the requirements of this paragraph 20.

20. Changes. MNGWPD may require changes in the work and services that the Consultant is to perform hereunder. Such changes, including any increase or decrease in the amount of the Consultant's compensation which are mutually agreed upon by and between MNGWPD and the Consultant, shall be incorporated in written amendments to this contract.

21. Assignability. The Consultant shall not assign, sublet or transfer all or any portion of its interest in this Agreement without the prior written approval of MNGWPD's CEO or his authorized agent, except the Consultant to the University of Georgia.

22. Insurance. Consultant is insured under policies of insurance issued by the State of Georgia, Department of Administrative Services against tort claims, in the amount of \$1,000,000 per person and \$3,000,000 per occurrence; Consultant maintains workers' compensation insurance through the State of Georgia.

23. Termination of the Contract for Cause. If the Consultant, due to its action or failure to act, shall fail to fulfill in a timely and proper manner his obligations under this contract, or if the Consultant has or shall violate any of the covenants, agreements, representations or stipulations of this contract, MNGWPD shall thereupon have the right to terminate this contract by giving written notice to the Consultant of such termination and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In such event, all finished or unfinished documents and other materials collected or produced under this contract (as more fully described in paragraph 14 hereof) shall, at the option of MNGWPD, become its

property and the Consultant shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents or materials.

24. Termination for Convenience. MNGWPD may terminate this contract at any time by giving written notice to the Consultant of such termination and specifying the effective date thereof, at least thirty (30) days before the effective date of such termination. In that event, all finished or unfinished documents and other materials produced or collected under this contract (as more fully described in paragraph 14 above) shall, at the option of MNGWPD, become its property. If this contract is terminated by MNGWPD as provided in this paragraph 26, the Consultant will be paid either (a) an amount which bears the same ratio to the total compensation to be paid to the Consultant under this contract as the services actually performed prior to the termination of this contract bear to the total services to be performed by the Consultant under this contract, less payments of compensation previously made, provided, however, that if less than sixty percent (60%) of the services covered by this contract have been performed by the effective date of such termination, the Consultant shall be reimbursed (in addition to the foregoing payment) for that portion of the actual out of pocket expenses (not otherwise reimbursed under this contract) incurred by the Consultant during the contract period, which are directly attributable to the uncompleted portion of the services covered by this contract; or if payment under this contract is on a cost reimbursement basis, (b) the actual expenses incurred by the Consultant prior to the effective date of such termination, as authorized in Attachment "B", plus any profit shown in Attachment "B". Provided, however, if this contract is terminated due to the fault of the Consultant, the provisions of paragraph 25 hereof shall prevail.

25. Consultant Termination for Convenience. Consultant may terminate this contract at any time by giving written notice to MNGWPD of such termination and specifying the effective date thereof, at least thirty (30) days before the effective date of such termination.

26. Designation of Authorized Agent: Under an existing agreement between the MNGWPD and the Atlanta Regional Commission (ARC) certain administrative, financial and technical staff support functions are performed by ARC for the MNGWPD. The following terms apply to this contract:

- a. ARC shall administer this contract on behalf of the MNGWPD, including but not limited to approval and acceptance of work or services, approval of subcontracts, and authorization of payment.
- b. ARC's Manager, Natural Resources Division is designated as the Authorized Agent for such administration.

27. Georgia Security and Immigration Compliance: The Consultant agrees and hereby certifies that it will comply with the Georgia Security and Immigration Compliance requirements of O.C.G.A. § 13-10-91.

28. Applicable Law. This contract shall be deemed to have been executed and performed in the State of Georgia, and all questions of interpretation and construction shall be construed by the laws of such State.

IN WITNESS WHEREOF, the Consultant and MNGWPD have executed this Agreement as of the day first above written.

ATTEST:

By: _____

Title: _____

EIN: _____

METROPOLITAN NORTH GEORGIA
WATER PLANNING DISTRICT

ATTEST:

Secretary - Treasurer

By: _____
Chairperson & CEO

**ATTACHMENT A
SCOPE OF WORK
WET WEATHER SEPTIC SYSTEM IMPACT TO
WATER QUALITY STUDY**

General

The work to be accomplished by the consultant is in support of the following work program components:

| | | |
|-------------|---------|--------------------------|
| Cost Center | 203 DDU | 2022 Water District Dues |
| | 303 DDU | 2023 Water District Dues |

Overview

The Metropolitan North Georgia Water Planning District (the District) was created by the Georgia General Assembly in 2001 as the designated agency for water resource planning in the fifteen county metropolitan Atlanta area. The District represents 15 counties (Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Paulding and Rockdale), 95 cities and includes over 50 water and wastewater providers. In its 15 years of existence, the District has produced three rounds of water resource planning documents with the first release of the Water Supply and Water Conservation Management Plan, the Wastewater Management Plan, and the Watershed Management Plan in 2003 and the most recent update in [2017](#).

As these water resource management plans were developed, the District Governing Board and its Technical Coordinating Committee and Basin Advisory Councils have discussed management policies surrounding on-site sewage management systems or septic systems. The Water Resource Management Plan addresses many aspects of septic management including land use planning, coordination among multiple jurisdictional departments and the local boards of health, management of septic systems in critical areas, as well as proper planning for septage disposal. Moving forward, the District Governing Board has considered implementing additional required actions to improve surface water quality across the region. In order to assess what, if any, measures would provide benefits to water quality, the District Governing Board directed the District to execute a [Septic System Impact to Surface Water Quality Study](#) in 2019 (2019 Study). Since the 2019 Study only assessed septic system impacts on water quality during dry weather, a second septic study is being commissioned to assess impacts during wet weather. Specifically, the 2022 Study should assess the potential connection between septic systems and poor surface water quality during wet weather using technology and sampling methods focused on nutrients, fecal indicator bacteria and microbial source tracking (MST) markers. While new approaches and technologies may be available to perform the 2022 Study, the consultant should consider how these can be compared to the 2019 Study results to ensure continuity and comparison between dry and wet weather sampling results.

Work Plan and Deliverables

The work plan and deliverables are included in the following pages.

WET WEATHER SEPTIC SYSTEM IMPACT TO WATER QUALITY STUDY SCOPE OF WORK

University of Georgia

Dr. Krista Capps, Odum School of Ecology & the Savannah River Ecology Laboratory

Dr. Rebecca Abney, Warnell School of Forestry and Natural Resources

Dr. Nandita Gaur, Department of Crop and Soil Sciences

Dr. Erin Lipp, Department of Environmental Health Sciences

SCOPE OF WORK:

Purpose: The purpose of this study is to support the District in evaluating the impact of septic infrastructure on surface water quality in streams within the 15-county metro Atlanta area. Specifically, this study will employ time-sensitive sampling techniques to assess the effects of rain events on interactions between septic system characteristics (e.g., system age and density) on surface water conditions that compromise human health and the environment.

Research Questions:

Though they will change with input from the District, we propose to conduct a study that will address several questions. The methods to accomplish this goal are detailed in the methods section below. Our tentative research questions include:

1. Can we attribute declines in surface water quality with rainfall events in watersheds dominated by septic infrastructure and is there evidence that such declines are derived from human wastewater (i.e., increases in fecal coliform bacteria and the HF₁₃₈ marker)?
2. If increases in fecal coliform bacteria and the HF₁₃₈ marker are detected, are they related to corresponding changes in conductivity, nitrogen, and phosphorus concentrations?
3. If additional system specific data (e.g., exact location, age, etc.) are integrated into the data collected from the 2019 study and analyzed using our proposed methods, what else can we learn about the relationships between surface water quality parameters and septic infrastructure from the data collected in that study?
4. If changes in water quality due to rainfall events are documented in the watershed, are they maintained long enough to forgo the need for immediate sample collection in response to changing discharge (i.e., ISCO samplers)?

Questions 1-3 will address key points detailed in the project solicitation. The primary motive of this project is to relate wet weather to septic-derived surface water pollution. This will be addressed through questions 1 and 2. The District also hopes to relate data collected in the new project to data collected in the 2019 study. We propose to enhance the power of the data collected in 2019 by adding additional information to the dataset and then applying additional statistical analysis to the data. In consultation with the District, the results from the re-analysis of the 2019 data may also inform our study design for the proposed study. In addressing question 4, we hope to inform future management and monitoring programs of the District. We propose to separate the effects of the “first flush” of pollution moving through the system during a rain event from baseflow conditions. If our data document that there are significant relationships between rain events and declining water quality and they provide support that these changes are rapid and short-lived, the District may want to consider investing in real-time monitoring and sampling technology.

Study Sites and Number of Sampling Events: We propose to collect data in Stamp Creek (control <5 systems per km²), Byrd Creek (control <5 systems per km²), West Fork Little River (Low <25 systems per km²), and Pond Fork (Medium 25-50 systems per km²). We will collect samples in four sites in each watershed during 10 sampling periods, four under baseflow conditions and six during wet weather conditions. Sample collection during baseflow will allow us to assess the influence of rain events on surface water quality and to support data comparison between the two studies (Table 1). We have also budgeted up to 10 additional trips to the sample locations to evaluate site characteristics using the

Rapid Bioassessment Protocol developed by the US EPA¹, update site-specific land use conditions, and maintain in-situ sampling equipment (e.g., conductivity sensors, pressure transducers, ISCOS).

Field & Laboratory Methods: Our research approach is designed to investigate relationships between septic systems and surface water quality, including, but not limited to conductivity, nitrogen and phosphorus concentrations, and fecal coliform bacteria in surface water. We will also employ conduct microbial source tracking (MST) in the study watersheds to evaluate the contribution of human waste to fecal coliform concentrations. We will employ the same analytical methods to analyze surface water nutrients, fecal coliform concentrations, and microbial source tracking detailed in the Final Report for the Septic System Impact to Surface Water Quality Study in Metropolitan Atlanta that was prepared by Geosyntec in 2019² (2019 study) to support direct comparisons of data collected in both studies. Specifically, we will measure nitrate+nitrite as N using EPA Method 353.2 and dissolved phosphorus using EPA Method 365.1. We will estimate fecal coliform concentrations using Standard Method 9222D and will quantify human fecal marker (HF183) using ddPCR. Handheld multiparameter probes will be used to measure pH, temperature, dissolved oxygen, turbidity, and conductance using standard methods. We will also measure stream flow using a flow meter at each site during each sampling event. Additionally, we will supply and deploy continuous weather sensors and conductivity sensors (supplied by UGA \$750 each) in each of the study watersheds. We will deploy six ISCO samplers (\$7,100 each; five supplied by us and one supplied through proposed budget) and pressure transducers (\$650 each; supplied by UGA) to estimate changes in discharge in the study watersheds. In each watershed, one ISCO sampler will be deployed at the furthest downstream sampling point. In two of the study watersheds (one of the control watersheds and in Pond Fork, we will also deploy an ISCO sampler in the furthest upstream sampling location to estimate changes along the reach through time.

Table 1: Sampling Locations and Descriptions of Samples to be Collected

| Septic System Density (Reported in 2019 Study) | Name of Subwatershed | Number of Sampling Locations | Number of Events | Dry or Wet Weather Sampling | Replicates | Total Number of Samples |
|------------------------------------------------|------------------------|------------------------------|------------------|-----------------------------|-------------------------|-------------------------|
| <5 systems per km ² | Stamp Creek | 4 | 6 | Wet | 3 | 72 |
| <5 systems per km ³ | Byrd Creek | 4 | 6 | Wet | 3 | 72 |
| <25 systems per km ² | West Fork Little River | 4 | 6 | Wet | 3 | 72 |
| 25-50 systems per km ² | Pond Fork | 4 | 6 | Wet | 3 | 72 |
| <5 systems per km ² | Stamp Creek | 4 | 4 | Dry | 3 | 48 |
| <5 systems per km ³ | Byrd Creek | 4 | 4 | Dry | 3 | 48 |
| <25 systems per km ² | West Fork Little River | 4 | 4 | Dry | 3 | 48 |
| 25-50 systems per km ² | Pond Fork | 4 | 4 | Dry | 3 | 48 |
| | | | | | Total number of samples | 480 |

To comprehensively evaluate the impact of wet weather on stream water quality and identify the causes of poor stream water quality, we will perform additional sampling to separate the effects of runoff and baseflow. First, we will collect rainfall data in each watershed using a rain gauge and the data will be recorded on a cloud to enable near real time monitoring of rainfall. Continuous stream gauge data will be collected using a pressure transducer and we will run hydrograph analysis on the data for

¹ Barbour, M. T. (1999). Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates and fish. US Environmental Protection Agency, Office of Water.

² <https://northgeorgiawater.org/wp-content/uploads/2019/08/2019-Septic-System-Surface-Water-Quality-Study.pdf#page%3D132>

each storm to identify the start and end times of runoff to streams and the amount of runoff to streams. This will be done using the Web-Based Hydrograph Analysis Tool^{3,4}. We also propose to collect time-based stream water samples during and after a storm event using an automated ISCO sampler. Again, four of the samplers would be deployed in the lower reaches of all the study watersheds. This will enable us to estimate the amount of nutrients and bacteria (described above) carried in runoff and baseflow. To separate the contribution of first flush, flow data will be analyzed based on Bertrand-Krajewski JL et al.⁵ During each rainfall event, time-based samples will be collected for the duration of the storm (10-minute samples for the first hour and subsequently one composite sample every day for 5 days). The 10-minute samples will be composited based on the first flush analysis above and analyzed for the same analytes. The statistics (described below) will be run on 1) the nutrients, bacteria, and other physicochemical parameters (described above) that will be collected during first flush; 2) data collected during baseflow conditions; 3) composite stream water quality data. We will follow the procedure described in the dry weather sampling report to determine discharge areas for each sampling location and retain the number of sampling locations identified in the 2019 study for comparing between the two sampling periods.

Statistical Analysis: We propose to integrate system-specific age and location with the existing dry weather data and reanalyze the findings of the initial study. We will also use these data to enhance our ability to detect septic-specific influence on surface water quality. In addition to the analysis run on the wet weather events, we will complete factorial ANOVA on the different analytes to determine the impact of septic system density, cumulative rainfall, septic system age and distance to stream (in isolation and their interaction effect) to determine whether combinations of rainfall amounts and septic system age or septic system density, age, and cumulative rainfall make the streams more susceptible to pollution from septic systems. The ability to perform these analysis will depend upon access to data that will be supplied by the District. All the statistics will be run in R and the codes will be provided for repeatability of the analysis in different sites. While all the factors mentioned above are important for proper septic effluent discharge, often the interaction between them can create conditions for system failure. Thus, we will perform a comprehensive two-way ANOVA to test the interaction of all these factors on stream water quality. The null hypothesis that we will test would be that the interaction of two factors (we will test all combinations) is significant in determining the amount of pollutant loading to the stream. Depending on the factors that are found to be significant in the factorial ANOVA, we will create a Generalized Linear Model to predict stream water quality as a function of the significant factors.

Task-Specific Methods and Activities:

Task 1: Develop a Wet Weather Monitoring Plan: We will work with representatives from the District to develop and finalize a 2022 Wet Weather Monitoring Plan (Plan). The plan will include:

- re-analysis of the 2019 study and a detailed description of how the 2019 data will be integrated into the findings of the wet weather study. By including system-specific data including location and estimated age into the analyses, we may be able to obtain a better understanding of the

³ Lim, K. J., Engel, B. A., Tang, Z., Choi, J., Kim, K. S., Muthukrishnan, S., & Tripathy, D. (2005). Automated web GIS based hydrograph analysis tool, WHAT 1. JAWRA Journal of the American Water Resources Association, 41(6), 1407-1416.

⁴Lim, K. J., Park, Y. S., Kim, J., Shin, Y. C., Kim, N. W., Kim, S. J., ... & Engel, B. A. (2010). Development of genetic algorithm-based optimization module in WHAT system for hydrograph analysis and model application. Computers & Geosciences, 36(7), 936-944.

⁵ Bertrand-Krajewski JL, Chebbo MG, Saget A (1998) Distribution of pollutant mass vs volume in stormwater discharges and the first-flush phenomenon. Water Res 32(8):2341–2356

impacts of septic infrastructure on water quality. We will couple these methods with the sample analysis used in the previous study so that the results of both studies could be analyzed together.

- discussion of updated land use conditions that will be developed using in-person site visits and the 2019 National Land Cover Database. Existing land use conditions will be mapped using Arc GIS.
- monitoring schedule, definition of wet and dry weather events, rationale for dry weather sampling, and mutually agreed upon modifications or expansions of the project beyond the activities described in this Scope of Work.
- alternative plans for the study if no qualifying weather events occur during the approved project timeframe.

Deliverables:

- Draft Monitoring Plan in PDF and Word format
- Final Monitoring Plan in PDF and Word format

Assumptions:

- The District will provide raw data collected during the “Septic System Impact to Surface Water Quality Study in Metropolitan Atlanta” that was conducted by Geosyntec
- The District will provide the coordinates for the septic systems and the approximate system ages for the systems in the dry study watersheds and help gather data from the Georgia Department of Public Health for any systems that have been installed or repaired as available from the Environmental Health Information System
- UGA will communicate with any private landowners for sampling access and installation of ISCO samplers in study watersheds
- In-person data collection of individual septic system permits from local health departments to access additional data related to septic system design and installation date as well as failure logs is not included within this scope of work.

Task 2: Implement Water Quality Monitoring and Lab Testing: The water quality monitoring will be supervised by Dr. Capps and primarily carried out by Mr. Thibodeaux and the ecology-based graduate student. All laboratory analysis will be conducted by the University of Georgia in Athens, GA.

- Nutrient samples will be processed in the Center for Applied Isotope Studies and overseen by Dr. Capps.
- Fecal Coliform Analysis will be conducted in the Lipp Lab by the public-health based graduate student. HF183 analysis will be completed in the Georgia Genomics and Bioinformatics Core and overseen by Dr. Lipp.
- Continuous data collection (i.e., conductivity, pressure transducer, weather station) and time-sensitive sampling (i.e., ISCO samplers) will be overseen and managed by Dr. Gaur and the ecology-based graduate student.

Deliverables:

- Each month, the results from samples that were analyzed during that month will be provided in PDF format, acknowledging that sampling is weather dependent, and we may not collect samples each month. Data from continuous sensors will be provided quarterly rather than monthly.
- Results compilation in Excel format

Task 3: Perform Statistical Assessment and Develop Draft Report: Drs. Capps, Abney, Gaur, and Lipp will meet to finalize the statistical analyses of all the data generated by this study and the 2019 study. Drs. Capps and Gaur will be primarily responsible for analysis and data visualization. Dr. Capps will draft the final report. The statistical analyses will evaluate relationships between septic system characteristics and surface water quality. The assessment will include:

- a visualization and interpretation of the findings from the 2019 study and this study
- discussion about the limits of the study and the applicability of the results to regions outside of the study watersheds.

The draft report will include:

- a summary of the project approach
- statistical assessment data visualization and discussion
- recommendations for future work.

Drs. Capps, Gaur, and Lipp will hold one meeting with the District to review the findings and obtain initial feedback about the draft.

Deliverable:

- Draft report in Word format

Task 4: Final Report and Delivery: Dr. Capps will prepare the final report by integrating comments and recommended changes from the District into the draft report. Drs. Capps and Gaur will present the final data to the District Governing Board.

Deliverables:

- One in-person presentation to the District Governing Board
- Presentation slides in PowerPoint format
- Final report in Word and PDF format

Research Schedule, Interim Deliverables, & Milestones:

The proposed research schedule, interim deliverables, and milestones are detailed in Table 2. We shall provide monitoring and lab test results in digital form to the District on a monthly basis, acknowledging that sampling is weather dependent and that we may not collect samples each month. Data from continuous sensors will be provided quarterly, as we may not download and process continuous sensor data each month.

Table 2: Project Timeline

| Date | Proposed Activity or Milestone |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20-Feb-22 | Begin developing wet weather monitoring plan with the Metro District staff |
| 21-Mar-22 | Completion of wet weather monitoring plan |
| 1-Apr-22 | Begin water quality monitoring program and lab testing* |
| 10-Apr-22 | Collect baseline data and habitat descriptions of all sampling locations |
| 20-Apr-22 | Deploy ISCO sensors, conductivity loggers, and weather monitoring stations |
| 31-Aug-22 | Submit statistical re-analysis of dry weather data and system specific characteristics |
| 31-Dec-22 | Submit a mid-project report and video recording of a PowerPoint presentation of data collected between April and October. |
| 28-Apr-23 | Complete water quality monitoring and lab testing |
| 1-May-23 | Begin statistical analyses and drafting final report |
| 15-Jun-23 | Complete draft report that will, at minimum, include a comparison to the 2019 dry weather study and an analysis relating weather, septic system characteristics, and surface water quality |
| 16-Jun-23 | Begin preparing final report and final presentation |
| 28-Jul-23 | Deliver final report and presentation to the District Governing Board |

*We shall provide all monitoring and lab test results in digital form to the District on a monthly basis, acknowledging that sampling is weather dependent, and we may not collect samples each month. Data from continuous sensors will be provided quarterly rather than monthly.

ADDITIONAL USAGE OF DATA BEYOND THE SCOPE OF WORK:

As an additional research effort beyond the scope of work, we plan to work to publish the data presented in the final report in peer-reviewed academic journals. If we can acquire the additional resources needed, we may also conduct additional source tracking on the bacteria to assess contribution for bird, ruminants, and dogs. We may also analyze samples for the diversity of bacteria and for the presence of antibiotic resistance genes in the bacterial population. If we are able to acquire detailed soils data for each site, we may also incorporate it into the statistical analysis to assess the impact of soils in combination with septic system age, density and rainfall on stream water quality.

ATTACHMENT B

COMPENSATION AND METHOD OF PAYMENT

I. Compensation: The total lump-sum compensation to be paid by the Metro Water District to the Contractor for the Project as described in "Attachment A" is \$199,062. A breakdown of this compensation is shown in Exhibit B-1, "Contract Budget", which is attached to and made part of this contract for financial reporting, monitoring and audit purposes.

II. Method of Payment: The following method of payment replaces that specified in the main body of the contract.

A. Progress Payments: The Contractor shall be entitled to receive progress payments on the following basis. As of the last day of each month during the existence of this contract, the Contractor shall submit to the Metro Water District an invoice for payment documenting work performed during the invoice period. Any work for which payment is requested may be disallowed at the Metro Water District's discretion if not properly documented, as determined by the Metro Water District, in the required monthly narrative progress report.

Upon the basis of its audit and review of such invoice and its review and approval of the monthly reports called for in the paragraph concerning "Reports" in the main body of the contract, the Metro Water District will, at the request of the Contractor, make payments to the Contractor as the work progresses but not more often than once a month. Invoices shall be numbered consecutively and submitted each month until the project is completed.

The Contractor's monthly invoices and monthly narrative progress reports are to be submitted to the Manager of the Metro Water District or his authorized agent and must be received by him not later than the 30th day of the following month. The Metro Water District may, at its discretion, disallow payment of all or part of an invoice received after this deadline.

B. Final Payment: Final payment shall only be made upon determination by the Metro Water District that all requirements hereunder have been completed. Upon such determination and upon submittal of a final invoice, the Metro Water District shall pay all compensation due to the Contractor, less the total of all previous progress payments made.

The Contractor's final invoice and final narrative progress report must be received by the Metro Water District no later than 30 days after the project completion date specified in Paragraph 2 of the contract. The Metro Water District may, at its discretion, disallow payment of all or part of a final invoice received after this deadline.

III. Completion of Project: It is agreed that in no event will the maximum compensation and reimbursement, if any, to be paid to the contractor under this contract exceed \$199,062 and that the contractor expressly agrees that he shall do, perform and carry out in a satisfactory and proper manner, as determined by the Metro Water District, all of the work and services described in Attachment A.

IV. Access to Records: The contractor agrees that the Metro Water District, the Concerned Funding Agency or Agencies and, if appropriate, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers and records of the contractor which are directly pertinent to the project for the purpose of making audit, examination, excerpts and transcriptions.

The contractor agrees that failure to carry out the requirements set forth above shall constitute a breach of contract and may result in termination of this agreement by the Metro Water District or such remedy as the Metro Water District deems appropriate.

EXHIBIT B-1
CONTRACT BUDGET

| Task Item | Budget (\$) |
|------------------------------------------------------------------------|--------------------------|
| Task 1: Develop Wet Weather Monitoring Plan | <u>\$ 2,136</u> |
| Task 2: Implement Water Quality Monitoring and Lab Testing | <u>\$ 165,892</u> |
| Task 3: Perform Statistical Assessment and Develop Draft Report | <u>\$ 26,625</u> |
| Task 4: Final Report Preparation and Delivery | <u>\$ 4,409</u> |
| Total Contract Amount | <u>\$ 199,062</u> |

Note: The estimates for Tasks 1-4 listed above are preliminary and actual costs by task may vary so long as the total contract value does not increase. Any change to the budget estimates shown above must be requested in writing and approved by the Metro Water District Project Manager.

Cost Center Distribution: \$199,062 203DDU, 303DDU