

ID#1062



Utilities & Engineering Department  
Contracts  
1136 Washington Street, Columbia, SC 29201 · Phone 803-545-3372 · Fax 803-545-3322

### INTER OFFICE MEMORANDUM

TO: Ms. Teresa Wilson, City Manager  
FROM: Kimberley R. Roof, Asst. Contracts Administrator  
SUBJECT: **CITY COUNCIL AGENDA ITEM:** Agreement for water quality monitoring within Rocky Branch and Saluda River Watersheds: CIP#SD8385  
Date: October 28, 2013 Initial: *KRR*

The attached subject Agreement will evaluate current baseline conditions, identify potential pollutant sources within and/or outside the City limits, and assess long term improvements in water quality; due to the implementation of various best management practices within the Rocky Branch and Saluda River watersheds.

Staff has negotiated a not to exceed fee totaling \$573,997.00 with Woolpert, Inc., a non-M/F/SBE firm located in Columbia, South Carolina. While Woolpert, Inc. formally mentors Chao & Associates, the protégé will not be utilized due to the specialty nature of the project. Sub-consultants are expected to participate under this Agreement in the following capacities:

- Rogers and Callcott, Inc., a Non M/F/SBE firm located in Greenville, SC, will perform storm water runoff sample analysis and general laboratory services at 5.22% of the contract value
- YSI, Inc., a Non M/F/SBE firm located in St. Petersburg, FL, will perform monitoring equipment sales, monitoring site installation services at 8.36% of the contract value

Funding for the Agreement will come from the Storm Water Utility Fund (5534202-638505). Services to be performed will impact City Council Districts two (2) and three (3).

The Legal Department has reviewed the Agreement and the Director of Utilities and Engineering recommends its approval and ACM for Operations recommends its approval.

Enclosure

Cc: Ms. Melissa A. Smith Gentry, P.E., ACM for Operations  
Mr. Joseph D. Jaco, P.E., Director of Utilities & Engineering  
Ms. Dana R. Higgins, P.E., City Engineer



We Are Columbia

Utilities & Engineering Department  
Contracts

1136 Washington Street, Columbia, SC 29201 · Phone 803-545-3400 · Fax 803-545-3322

**INTEROFFICE MEMORANDUM**

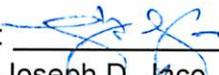
To: Joseph D. Jaco, P.E., Director of Utilities & Engineering  
From: Kimberley R. Roof, Assistant Contracts Administrator  
Subject: **REQUEST FOR SIGNATURE:** Agreement for Consulting Services with Woolpert, Inc. for water quality monitoring within Rocky Branch and Saluda River Watersheds

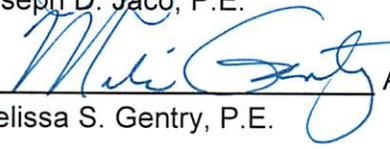
Date: October 17, 2010

Initial 

The attached Agreement will allow the City to thoroughly evaluate current baseline conditions, identify potential pollutant sources within and/or outside the City limits, and assess long term improvements in water quality due to the implementation of various best management practices within the Rocky Branch and Saluda River watersheds. The scope of services is more fully described in the attachment. The cost for services is in the amount not to exceed Five Hundred Seventy-Three Thousand, Nine Hundred Ninety-Seven and No/100 (\$573,997.00) Dollars.

The Legal Department has reviewed and approved the Agreement. Please indicate your recommendation by signing the space provided below:

RECOMMENDED BY:  Director of Utilities & Engineering  
Joseph D. Jaco, P.E.

RECOMMENDED BY:  Asst. City Manager for Operations  
Melissa S. Gentry, P.E.

Attachment

Cc: Dana R. Higgins, P.E., City Engineer  
Tracy Mitchell, Stormwater Manager

## AGREEMENT FOR CONSULTING SERVICES

THIS AGREEMENT is made this \_\_\_\_ day of \_\_\_\_\_, 2013, by and between the City of Columbia, South Carolina (hereinafter referred to as the "City") and Woolpert, Incorporated (hereinafter referred to as the "Engineer") for Engineer to conduct a Water Quality Monitoring Study to thoroughly evaluate current baseline conditions, identify potential pollutant sources within and/or outside of City limits, and assess long-term improvements in water quality due to the implementation of various Best Management Practices specifically in the Rocky Branch and Saluda River Watersheds. This project is further described as Capital Improvements Program Project SD8385 (the Project).

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

### I. Scope of Services

Upon written notification by the City to proceed, the Engineer shall initiate and complete Tasks 1-7 outlined in the Scope of Services, Exhibit A, attached hereto. The Engineer shall perform any and all incidental services not specifically set forth in Exhibit A, which are necessary to fully complete the Tasks described in Exhibit A.

### II. Other Engineering Services

The Engineer shall be responsible for securing and coordinating any other services related to the Project which are required for construction of the Project, are not provided by the City, and the Engineer is unable to perform. The City shall review and approve all proposals for Other Engineering Services before the Engineer accepts them.

### III. Additional Services

The following Additional Services may be required of the Engineer by the City or recommended by the Engineer and approved by the City in writing, which are listed by way of illustration and not limitation:

- A. Verifying the accuracy of drawings or other information provided by the City;
- B. Filing maps or reports for litigation or other reasons;

C. Revising drawings, specifications or other documents if the City, in writing, modifies the design or specifications after Engineer receives written authorization to proceed as specified in the Final Design Phase.

Engineer shall not be entitled to compensation as provided for herein for any revisions during the Preliminary Design Phase, for any reason whatsoever, or for any revisions required because of the acts or omissions of the Engineer or other persons or entities, excluding the City, during any phase; and,

- D. Services during re-advertisement for bids for construction.

If the City and Engineer agree by Change Order that Additional Services are required, they will be provided on a time and material basis. The Engineer must obtain written approval from the City for any Additional Services prior to the work being performed. If the Engineer fails to obtain prior written approval to perform the work, the City is under no obligation to compensate the Engineer for Additional Services

performed.

#### IV. Term of Agreement

Unless earlier terminated as provided for herein, this Agreement shall expire at such time the Engineer has completed all services required by this Agreement and the total compensation provided for herein is reached or on March 31, 2015, whichever is earlier.

#### V. Schedule for Completion of Services

Time is of the essence. The Engineer shall not exceed the deadlines specified in Exhibit A, attached hereto.

#### VI. Compensation

A. The compensation paid by the City to the Engineer under this Agreement for Tasks One (1) through Seven (7), outlined in Exhibit A, attached hereto, shall not exceed Three Hundred Fifteen Thousand and no/100 (\$315,000.00) Dollars.

B. The compensation paid by the City to the Engineer under this Agreement for reimbursable expenses, outlined in Exhibit A, attached hereto, shall not exceed Two Hundred Fifty-Eight Thousand, Nine Hundred Ninety-Seven and no/100 (\$258,997.00) Dollars. Reimbursable expenses will be compensated at the suppliers invoiced price only. Proof of expenses may be required prior to compensation.

C. The total compensation paid by the City to the Engineer under this Agreement shall not exceed Five Hundred Seventy-Three Thousand, Nine Hundred Ninety-Seven and no/100 (\$573,997.00) Dollars.

D. The Engineer shall submit invoices no more frequently than monthly for services rendered during each phase of the Project. Each invoice submitted must describe the services for which payment is requested, show payment calculations and specify the person(s) rendering such service(s). **Each invoice must also clearly identify any portion of the fee invoiced for subcontracted services, including any such services that are specified in the Summary of Proposed Subconsultants shown on Exhibit B hereto, and identify if the subcontractor is a Minority, Female or Small Business Enterprise.** Each invoice shall bear the signature of the Engineer, which signature shall certify that the information contained in the invoice is true and accurate and that the invoice amount is currently due and owing. The City will not pay interest or penalty on any past due amount.

#### VII. Indemnification, Hold Harmless and Insurance

A. The Engineer shall provide to the City evidence of General Liability Insurance in an amount not less than One Million Dollars (\$1,000,000.00) per occurrence and Two Million Dollars (\$2,000,000.00) aggregate, Workers Compensation Insurance in the amount of Five Hundred Thousand Dollars (\$500,000.00) per occurrence and Automobile Insurance in the amount of Five Hundred Thousand Dollars (\$500,000.00) per occurrence.

B. The Engineer shall furnish the City with a certificate showing satisfactory proof of carriage of the insurance required hereunder and such insurance shall be approved by the City prior to the Engineer and any subcontractor of the Engineer commencing any services under this Agreement.

C. The Engineer shall hold harmless, defend and indemnify the City from any and all claims, actions, suits, charges and judgments whatsoever that arise out of the Engineer's performance or nonperformance of the services or subject matter called for in this Agreement.

### VIII. Permits and Licenses

A. The Engineer shall be responsible for obtaining any approvals, permits and/or licenses as may be required of the Engineer in performing the services required under this Agreement. The Engineer shall be responsible for any costs relating to same.

B. The Engineer shall be responsible for identifying and providing any applications and supporting documentation to the City for any approvals and/or permits required of the City in order for the Engineer to perform the services required under this Agreement. Such approvals and/or permits may include, but not necessarily be limited to, SCDHEC Construction Permits, SCDHEC Stormwater Management for Construction Sites Permits, SCDHEC Water Resources Permits, Corps of Engineers Permits, City/County/SCDOT Encroachment Permits, Encroachment Permits for other utility rights-of-way and Railroad Right-of-Way Encroachment Permits/Agreements. The City shall obtain the approvals and/or permits identified by the Engineer and pay any costs relating to same.

C. The Engineer shall answer questions and consult with the City and/or appropriate authorities as necessary to assist the City's efforts in obtaining required permits/approvals.

D. The Engineer shall procure a City of Columbia business license while performing services under this Agreement.

### IX. Duties Upon Termination

At termination of this Agreement, the Engineer shall immediately provide the City with all records and data in any format the Engineer is capable of producing and at no cost to the City, which were generated, created or received by the Engineer in performance of the services required by this Agreement or as the City may deem necessary to perform the required services by the City or the Engineer's successor. All records shall be free from any proprietary claims or interest. The Engineer agrees to fully cooperate with the City and any successor to ensure an effective transition to continuously provide the required services.

### X. Termination of Agreement

The City may terminate this Agreement at any time upon any of the following grounds:

A. Failure by the City to appropriate funds for the performance of any of the services required in this Agreement in any annual budget;

B. The Engineer fails to perform any of the services required in this Agreement and does not correct such deficiency within fifteen (15) days having been notified by the City of such deficiency;

C. Force Majeure;

D. The City shall, at its sole option and discretion, have the right to terminate this contract for any reason whatsoever. A termination for default under this Agreement, if wrongfully made, shall be treated as a termination for convenience under this clause;

E. Upon expiration of the term of this Agreement; and

F. By mutual agreement.

Notice of termination shall be sent by registered mail, return receipt requested. In the event of

termination, the Engineer shall only be entitled to the actual direct costs of all labor and material expended on the services required under this Agreement prior to the effective date of the termination plus 10% or the Engineer shall be entitled to be paid a pro-rata percentage of the total Agreement price which is equal to its percent of completion, whichever of the two methods provides the lowest sum to be paid to the Engineer. In no event shall the Engineer be entitled to anticipatory profit or damages for any termination under this Agreement. In no event shall the Engineer be entitled to assert a claim in quantum meruit or any other measure of damages other than that stated herein.

#### XI. Ownership of Project Documents

All data, documents or other information of any description generated by or used by the Engineer or any subcontractor retained by the Engineer and related to the services required by this Agreement shall be the property of the City and shall not be used by the Engineer for any purpose whatsoever except to perform the services required by this Agreement.

#### XII. Notice

A. Written notice to the City shall be made by placing such notice in the United States Mail, postage prepaid and addressed to: Director of Utilities and Engineering, City of Columbia, Post Office Box 147, Columbia, South Carolina 29217.

B. Written notice to the Engineer shall be made by placing such notice in the United States Mail, postage prepaid and addressed to: Woolpert, Incorporated, 2000 Center Point Drive, Suite 2200, Columbia, South Carolina 29210.

#### XIII. Miscellaneous

A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Engineer.

B. The Engineer shall be responsible for performance of all services required by this Agreement. The Engineer does not act as the City's agent or employee.

C. The Engineer will not assign or sublet its obligations to perform the services required by this Agreement without the written consent of the City.

D. In the event there are any disagreements between the City and the Engineer with regard to any of the requirements, specifications or interpretation of this Agreement, the Engineer agrees to defer to the reasonable interpretations of the City as, from time to time may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.

E. This Agreement shall be construed in accordance with the laws of the State of South Carolina. The Engineer agrees to subject itself to the jurisdiction and venue of the Circuit Courts of Richland County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Engineer agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Engineer.

F. This Agreement represents the entire agreement between the City and the Engineer and supersedes all prior communications, negotiations, representations or agreements, either written or oral.

Only written Change Order signed by both the City and the Engineer may amend this Agreement.

G. The failure of either the Engineer or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.

H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.

I. This Agreement is subject to City Council approval.

J. The Engineer is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, City employees are prohibited from accepting anything of value from any person. "Anything of value" includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.

Witness the parties' respective hands and seals on the date first written above.

CITY OF COLUMBIA, SOUTH CAROLINA

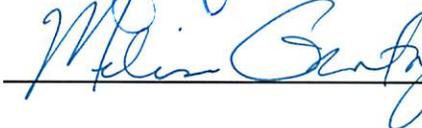
\_\_\_\_\_  
Witness

By: \_\_\_\_\_  
City Manager

  
\_\_\_\_\_  
Witness

WOOLPERT, INCORPORATED  
  
By: William E. Spearman, III, PE  
Title: Vice President

RECOMMENDED BY:  Director of Utilities and Engineering

RECOMMENDED BY:  Assistant City Manager for Operations

## SCOPE OF SERVICES

### City of Columbia, SC

### Water Quality Monitoring - Phase 2



<b>Project Name:</b>	City of Columbia Water Quality Monitoring Program - Phase 2
<b>Project Number:</b>	TBD
<b>Watersheds Monitoring:</b>	Rocky Branch, Saluda River
<b>Number of Stations:</b>	4 Stations (2 on Rocky Branch, 2 on Kinley Creek)
<b>Estimated Project Start Date:</b>	October 2013
<b>Estimated Project End Date:</b>	March 2015
<b>Project Duration:</b>	18 months (includes 12 months of data collection)
<b>Project Total Fee:</b>	\$ 573,997
<b>Project Manager:</b>	Trevor Gauron

### Project Understanding

In 2012, the City began developing a monitoring program in response to requirements outlined in the City's Phase I MS4 permit. Specifically, the City developed a monitoring program to gather more data regarding total maximum daily loads (TMDLs) in the Gills Creek watershed. The comprehensive program included the implementation of a permanent monitoring network that incorporates the use of various water quality sensors, rainfall gages, stage/flow information, remote telemetry, and supplementary manual grab sampling. The program, when fully implemented, will allow the City to thoroughly evaluate current baseline conditions, identify potential pollutant sources within and/or outside of City limits, and assess long term improvements in water quality due to the implementation of various BMPs. In addition, the rainfall data will likely be useful for a range of other City needs, while data from the monitoring network may also provide further ancillary benefits including data for floodplain model calibration, spill tracking, and emergency response.

The Phase 2 work will include developing a similar permanent monitoring network in the Rocky Branch and Saluda River watersheds. The following sub-tasks highlight the proposed scope of services for this effort:

#### Task 1 - Site Selection/Field Reconnaissance

Woolpert staff will begin the project by conducting a kickoff meeting with appropriate City staff to discuss the general expectations of the City and the proposed scope of services.

After obtaining available GIS data in these areas and reviewing property owner information, Woolpert will perform a desktop analysis to identify and prioritize more detailed locations for field inspections. Based upon experiences with similar projects, Woolpert will attempt to identify potential sites on City owned or other publicly owned properties before consideration is given to working with private landowners. Based on a preliminary review and general knowledge of the two watersheds, it is anticipated that Woolpert staff will recommend conceptual locations for **four (4) permanent water quality stations** (2 stations in Rocky Branch watershed and 2 stations in Saluda River watershed) and will solicit input from the City regarding potential locations in these areas.

One two-man field crew will inspect each of the locations for numerous conditions including, but not limited to, creek accessibility, field crew/equipment safety, channel/bank stability, sediment bed load, laminar well-mixed baseflow, tree cover, local pollutant sources, flow depths, and evidence of bedrock. Field notes and photographs will be taken to document preferred locations for each station. Woolpert will then discuss the potential locations with a sub-contractor to seek input regarding potential installation concerns or challenges associated with each site. Woolpert anticipates using Yellow Springs, Inc. (YSI) as the sub-contractor (as was used in Phase 1) for the installation and vendor for the datasondes/sensors discussed below. Upon approval of the four preferred locations by City staff, Woolpert will contact the appropriate landowners to obtain approval for the installations of the stations on behalf of the City. Woolpert will provide location maps, photographs, or other pertinent information to the landowner during this negotiation process. Dependent upon the landowner, Woolpert may require assistance from the City in the pursuit of such approvals including attendance at meetings and correspondence with the landowner. The City should anticipate the need to include the City Attorney in the development of long term agreements and easements if requested by the property owner.<sup>1</sup>

## Task 2 - Station Installation

After obtaining approval for the **four (4) water quality station locations**, Woolpert will work closely with YSI to determine an installation approach, schedules, materials, access, safety, and personnel needed for the project. YSI staff will install the permanent stations, in addition to installing equipment enclosures, remote telemetry components, solar panels/regulators, rainfall gages, and wiring/cables. Although subject to modification based on site-specific conditions, the typical permanent monitoring stations will include a 4-inch steel or PVC pipe (perforated at the bottom) laying down the slope of the creek bank, anchored into place with 2-inch galvanized steel pipe driven into the ground. In some cases when conditions allow, a 4-inch aluminum or PVC pipe is used and anchored into the concrete bridge deck and piers. The larger pipe, in either case, will provide a robust casing for installing and removing a YSI multi-parameter datasonde (6-Series). In some cases, the geography at potential monitoring

---

<sup>1</sup> See Attachment 1 for an example of a Memorandum of Understanding to be used in negotiations with landowners.

locations may require the installation of aluminum platforms and fencing in order to maintain the minimum required water depth of the datasonde sensors.

This scope/fee includes the **purchase of four datasondes**, which Woolpert staff will deploy after installation of all the station components by YSI. A cable attached to each datasonde will be attached to a Campbell Scientific datalogger mounted within a fiberglass enclosure near the creek bank. The enclosure will be attached to a steel pole adjacent to the creek bank and also include a Sierra Wireless cellular modem, battery, and solar regulator. Both a solar panel and Hydrological Services rain gage will be attached near the top of the steel pole. YSI will provide systems integration services during installation of the station.

Woolpert will coordinate the installation of each station with YSI to include directions/photographs of each location, initiation of utility markings, site access including keys where required, and storage for installation of materials and equipment if needed. Woolpert staff will be present during the initial stages of installation on an as needed basis until completion.

### **Task 3 – Programming/Data Hosting**

After integration of the field equipment, Woolpert will develop a customized data collection program to transmit the measured field parameters at the desired frequency. This task will also include the programming of alarm conditions for various parameters to initiate maintenance or notify staff of potential illicit discharges in real-time. Alarms will likely include texting or e-mails to notify appropriate Woolpert and/or City personnel.

### **Rating Curve Development**

Accurate rating curves are critical for estimating annual loads. Woolpert will request Hydrologic Engineering Center River Analysis System (HEC-RAS) floodplain model data from FEMA or the City (if available) to extract a portion of the model upstream and downstream of the monitoring stations. After installation of the monitoring stations, Woolpert will **survey the elevation of the pressure transducer and a stream cross section at the station**. Woolpert will use a **handheld impellor-velocity probe to calculate flow rates** at the four station locations in accordance with methodologies developed by the USGS. Using real-time stage information, staff will be deployed during varying wading conditions to build a stage versus flow relationship. Woolpert will collect discharge measurements on up to five (5) separate occasions to build the rating curve, some of which will likely be collected during rainfall events.

The cross sections and flow rates will be added to the model to refine the rating curve (i.e. stage versus flow rate) for the location of the pressure transducer at the monitoring stations. This effort is important for calculation of pollutant mass loadings and for comparison to TMDL allocations if any TMDL are developed in the watersheds in the future. Rating curves will be programmed into the data loggers and will be used to estimate continuous flow rates.

## Data Hosting

All recorded field data will be transmitted at a predefined interval, via the cellular modems, to a dedicated Woolpert server. Woolpert will host the data (see Data Hosting section of this document) and setup a secure website for the City and Woolpert's use with various graph templates to view the real time data. Woolpert will monitor recorded field data each work day during the deployment period. The data hosting effort will help identify any potential problems as they occur and reduce the potential for inaccurate water quality/rainfall reporting over significant periods of time. Costs associated with this task include a monthly data hosting fee for the use, maintenance, and updates of software/hardware that are needed for real-time observations and quality control services provided by Woolpert staff.

## Task 4- Operation and Maintenance

This task includes **monthly site visits** by Woolpert personnel for the purposes of maintaining the **four (4) water quality monitoring stations** and associated hardware/sensors for **12 months**. This includes inspections of the casing pipe and equipment enclosure, removal of debris/pests, retrieval of the datasondes, confirmation of sufficient power supply, inspection of the rain gages (when needed), and documentation of field observations.

After retrieval of all four datasondes, the sensors on each datasonde will be calibrated at the Woolpert office in accordance with the manufacturer's recommendations. This will include the **calibration of sensors for pH, conductivity, temperature, turbidity, dissolved oxygen, and ammonium**. Upon completion of the successful calibration of the sensors, the datasondes will be redeployed at each station. During routine calibration, the sensors will be out of the water for up to 72 hours.

Based on daily observations of field conditions via the project website (work days only), this task will include a maximum of **six (6) unscheduled site visits** to address obvious maintenance needs such as buried sensors, sensors that have fouled or likely need maintenance/replacement, and/or rain gages where funnels have become clogged with debris.

## Illicit Discharge Tracking Assistance

Woolpert will monitor recorded field data and alarm conditions each work day during the deployment period for various water quality parameters. If conditions appear to be indicative of an illicit discharge, Woolpert will consult with the City regarding the discharge, any suspected sources, and a suitable approach to identify the source. As directed by the City, Woolpert will provide assistance in tracking the discharges. Due to the uncertainties associated with this type of effort, this task includes **up to forty (40) hours of illicit discharge tracking assistance** and may include, but is not limited to, tracking in the field, sample collection for laboratory analysis, quantification of the illicit discharge, and

documentation/mapping of the measured pollutant concentrations. It should be noted that the time of day, the duration of the illicit discharge, and the type of pollutant that is elevated could make it difficult to definitively identify the source.

### **Task 5- Grab Sampling**

This task includes near daily weather tracking for the collection of **manual grab samples over the one year data collection period**. This task will require the use of a SCDHEC certified laboratory and detailed coordination during a potential approaching storm. **Up to four samples will be collected for TP, TN, TSS, and E. coli during eight storm events** pending appropriate weather conditions (**target of 2 events/season**) at each of the three monitoring stations. The samples will be spaced based upon the anticipated duration of storm water runoff, but the period of time for collection during each event will be heavily influenced by inclement or dangerous weather conditions, pollutant holding times, and/or laboratory staff availability. **Additional E. coli samples will be collected** as needed during dry weather conditions to assist with the regression analysis discussed in Task 6. Woolpert intends to establish a subcontract agreement with a local business (SCDHEC certified laboratory) to provide the laboratory services to analyze samples collected at the monitoring stations. Invoices from the laboratory will be passed directly through on Woolpert invoices to the City during months where the laboratory services were used on the project.

### **Task 6 - Data Management/Statistical Analysis**

This task includes a **brief monthly evaluation of the continuous collected field data** for quality control to identify any unusual or suspect looking pollutant concentrations. This includes noting any questionable data to be further analyzed or potentially removed from the final dataset based upon field observations during maintenance activities.

Upon the completion of **data collection over the 12 month period** descriptive statistics for the grab sample data and for each continuously measured field parameter will be calculated. In addition, Woolpert will attempt to develop a **predictive regression equation for E. coli** using the continuous sensor data and the E. coli grab samples. The potential continuous data for E. coli after application of the regression approach and the continuous dissolved oxygen data will be used to **calculate annual loads** for each parameter for comparison to approximate loads (loading data may not be available at the exact location of the four stations) in both watersheds.

The statistical analysis for all parameters and regression/annual load calculations for E. coli and DO will be summarized in a supporting narrative, all of which will be included in a brief **summary report**. The draft report will be completed within two months of the conclusion of data collection for review by the City.

## Task 7 – Project Management

This project will require routine project management needs such as project setup, scheduling, client correspondence, team management, and invoicing. This task also includes sub-consultant management and up to three client meetings.

A general consulting fee has been added to the fee estimate to account for unforeseen situations that may occur in the field that require consultation between City and Woolpert staff.

*\* At the request of the City, Woolpert will mentor a City representative on various aspects of this project throughout its completion.*

### Reimbursable Expenses

Expenses requiring reimbursement will include but are not limited to analytical expenses from the laboratory, monitoring equipment, monthly data hosting, calibration solutions, sonde parts/replacements, assorted equipment maintenance supplies, and mileage or work truck fees. The reimbursable expenses are, in part, determined by quotes Woolpert receives from sub consultants hired to perform work encompassed by this scope of services. The reimbursable expense contained in the Fee Estimate is subject to change based on quotes received by Woolpert.

### Assumptions / Notes

- Based upon similar previous experience, the installation of the monitoring stations should not require permitting from the Corps of Engineers.
- It is assumed that bedrock or other unfavorable sub-surface conditions will not be encountered during installation at the new sites. In the event that such conditions impact the proposed installation, installation estimates are subject to change.
- Woolpert will attempt to select a location for each station with perennial flow without creating a significant obstruction for organic debris by minimizing the length of the casing pipe into the creek. However, this may prevent the measurement of data for low flows during drought conditions.
- Due to the location of the station and the need for in-stream data, debris and potential damage during a high flow event will always be a risk. Woolpert will take precautions to minimize such risk with the use of steel pipe to resist damage and the installation of electronics as high as practical (yet

still accessible). This scope of work does not include services associated with replacement of any components of the station if destroyed due to water or debris.

- This scope does not include signage for the monitoring station or fencing for safety or to deter potential vandalism. Dependent upon the final location of each station, the City may want to consider both.
- The City will be responsible for the setup and monthly payment of cellular service for each of the modems.
- The life span of the ammonium sensors varies (usually 3-6 months) and will require replacement during this 12 month data collection period.
- Woolpert cannot guarantee the accuracy of the predictive regression equation for E. coli. However, Woolpert has experienced positive results with this approach for TP with other clients.
- This scope does not include detailed seasonal or baseflow/stormflow analysis among the four monitoring stations. Woolpert recommends this analysis pending the results of the regression analysis, annual loads, and after the continued collection of additional data.
- It is anticipated that this scope of services will require approximately 18 months from notice to proceed to complete.
- Woolpert staff will make every effort to sample two storm events/season, but this task is contingent upon appropriate rainfall and safe weather conditions. It should also be noted that snow melt and smaller rainfall events will be avoided if possible due to lack of sufficient runoff. Woolpert will also attempt to avoid events that would cause the City to incur overtime billing rates from the laboratory.
- The recommended rain gauges for purchase cannot distinguish between rainfall and various forms of frozen precipitation.

## **Data Hosting**

Woolpert's data hosting responsibilities are intended to ensure that data is stored in such a manner as to permit access by the City as well as interested and affected parties as designated by the City. Woolpert's data hosting responsibilities are:

- a) Install, maintain, and operate software on a dedicated server to host data from each monitoring and sampling station. This responsibility shall include customary maintenance of the software and associated servers during normal business hours which are defined as 8:00 AM to 5:00 PM EST/EDT, Monday through Friday, and not including the following holidays- New Year's Day, President's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and the day after , and Christmas Day.
- b) Program modems at each monitoring station to call the server at selected intervals with appropriate phone numbers and routing information.
- c) Provide training in a timely manner to the City on the access of the data, including changes and/or upgrades to the system.

- d) Provide coordination between vendors and various Woolpert personnel to develop an IP address and web page to display the field data. Each station will be setup on the web page for viewing purposes and various security levels will be setup to maintain data security
- e) Designate, by name or position a representative who shall act as the Woolpert Data Hosting Coordinator and designate also at least one back-up representative.

Data posted to the Woolpert-hosted web page will be raw data and will not have any quality control routines or checks prior to posting. Each individual user of the real-time data will be responsible for any quality control processes before use. Woolpert cannot and does not warrant the accuracy of the real-time data and shall not be responsible for any use of such data.

## Fee Estimate

Task Description	Fee Estimate
<b>Task 1 Site Selection/ Field Reconnaissance</b> - Kickoff Meeting - Preliminary Site Selection - Field Reconnaissance - Location Maps - Landowner Meetings/Negotiation - Agreements/Permit Applications	\$ 28,000
<b>Task 2 Station Installations</b> - Station Design - Installation Planning/Logistics - YSI Installation/Systems Integration - Installation Administration - Equipment Testing - Initial Deployment	\$ 27,000
<b>Task 3 Programming/Data Hosting</b> - Develop/Upload Logger Programs/Alarms - Obtain FEMA Model (if available) - Develop/Program Rating Curves - Develop Website for Hosting	\$ 44,000
<b>Task 4 Operation and Maintenance</b> - Monthly Field Inspections - Sensor Calibration - Daily Data Observations - Unscheduled Maintenance - Illicit Discharge Tracking	\$ 55,000
<b>Task 5 Grab Sampling</b> - Weather Tracking - Laboratory Coordination - Sample Collection	\$ 24,000
<b>Task 6 Data Management/Statistical Analysis/Reporting</b> - General Monthly Quality Control - Descriptive Statistics - Regression Equation for E. coli - Annual Load Calculations - Summary Report	\$ 44,000
<b>Task 7 Project Management</b> - Project Setup - General Consulting Services - Scheduling - Team Management - Client Meetings	\$ 93,000
<b>Project Subtotal:</b>	\$ 315,000
<b>Reimbursable Expenses<sup>2</sup>:</b>	\$ 258,997

<sup>2</sup> See Attachment 2 for a cost breakdown for reimbursable expenses. The reimbursable expenses are, in part, determined by quotes Woolpert receives from sub consultants hired to perform work encompassed by this scope of services. The reimbursable expense contained in the Fee Estimate is subject to change based on quotes received by Woolpert.

	<b>Project Total:</b>	<b>\$ 573,997</b>
--	-----------------------	-------------------

## Hourly Rate Table

Principal	\$250
Technical Team Leader	\$200
Project Manager	\$150
Senior Professional Engineer	\$135
Professional Engineer	\$125
Junior Professional Engineer	\$100
Environmental Scientist	\$90
Senior Technician	\$100
Technician	\$80
GIS Analyst	\$150
Business Manager	\$85
Intern	\$60

## Approximate Project Schedule<sup>3</sup>

Task Number	Task Description	Approximate Start Date	Approximate End Date
Task 1	Site Selection / Field Reconnaissance	October 1, 2013	December 31, 2013
Task 2	Station Installation	January 1, 2014	March 31, 2014
Task 3	Programming / Data Hosting	April 1, 2014	March 31, 2015
Task 4	Operation and Maintenance	April 1, 2014	March 31, 2015
Task 5	Grab Sampling	April 1, 2014	January 31, 2015
Task 6	Data Management / Statistical Analysis	April 1, 2014	March 31, 2015
Task 7	Project Management	October 1, 2013	March 31, 2015

<sup>3</sup> It is anticipated that this scope of services will require approximately 18 months from notice to proceed to complete. However, the completion of the scope tasks is highly dependent on the frequency of rainfall events that occur during the project schedule timeframe.

Woolpert staff will make every effort to sample two storm events per season, but this task is contingent upon appropriate rainfall and safe weather conditions. It should also be noted that snow melt and smaller rainfall events will be avoided if possible due to lack of sufficient runoff. Woolpert will also attempt to avoid events that would cause the City to incur overtime billing rates from the laboratory.

REIMBURSABLE EXPENSES

<b>DataSonde Related Costs - YSI</b>			
<b>Equipment</b>	<b>Unit Costs</b>	<b>Qty</b>	<b>Total Costs</b>
YSI 660004 Shallow Vented Level DataSonde	\$6,600	4	\$26,640
Turbidity Sensor	\$1,610	4	\$6,440
Dissolved Oxygen (DO) Sensor	\$1,870	4	\$7,480
DO membrane	\$146	4	\$584
pH Sensor	\$310	4	\$1,240
Ammonium Sensor	\$460	4	\$1,840
Field Cable (vented)	\$660	4	\$2,640
Calibration Cable	\$220	1	\$220
Preventative Maintenance Service (DataSonde)	\$350	4	\$1,400
Preventative Maintenance Service (optical probe)	\$75	4	\$300
Standard 126 Turbidity (1 gallon)	\$340	1	\$340
Standard pH 4 (6 pints)	\$79	1	\$79
Standard pH 7 (6 pints)	\$79	1	\$79
Standard pH 10 (6 pints)	\$79	2	\$158
Standard NH4 1 mg/L (pint)	\$82	12	\$984
Standard NH4 100 mg/L (pint)	\$82	6	\$492
Standard Conductivity 1 mS/cm (8 pints)	\$120	1	\$120
Miscellaneous (Deionized water, chem-wipes, etc.)	\$250	1	\$250
<b>Subtotal:</b>			<b>\$51,286</b>

<b>Telemetry Related Costs - Campbell Scientific</b>			
<b>Equipment</b>	<b>Unit Costs</b>	<b>Qty</b>	<b>Total Costs</b>
CR850 Datalogger	\$1,330	5	\$6,650
Airlink LS300 Modem (includes mounting kit)	\$705	5	\$3,525
Omni Cellular Antenna	\$59	5	\$295
Modem Antenna Cable	\$55	5	\$275
CS450 level transducer	\$695	4	\$2,780
14 X 16 Enclosure with Back Plate	\$218	1	\$218
14 X 16 Enclosure	\$256	5	\$1,280
<b>Subtotal:</b>			<b>\$15,023</b>

<b>Hydrological Services</b>			
<b>Equipment</b>	<b>Unit Costs</b>	<b>Qty</b>	<b>Total Costs</b>
TB4 rain gauge	\$795	3	\$2,385
Rain gauge bird spike kit	\$182	3	\$546
Rain gauge mounting bracket	\$144	3	\$432
<b>Subtotal:</b>			<b>\$3,363</b>

<b>Affordable Solar</b>			
<b>Equipment</b>	<b>Unit Costs</b>	<b>Qty</b>	<b>Total Costs</b>
BP Solar, Solar Panel, 90W	\$430	5	\$2,150
BP Solar, Solar Panel Mount	\$115	5	\$575
Morningstar SunSaver 10	\$60	5	\$300
33 Amp-hr battery	\$140	5	\$700
<b>Subtotal:</b>			<b>\$3,725</b>

<b>Miscellaneous Supplies / Services</b>			
<b>Equipment</b>	<b>Unit Costs</b>	<b>Qty</b>	<b>Total Costs</b>
Station platform parts and equipment	\$30,000	1	\$30,000
<b>Subtotal:</b>			<b>\$30,000</b>

**Subtotal A: \$103,397**

<b>Additional Reimbursable Expense</b>	
<b>Service</b>	<b>Total Costs</b>
Analytical expenses, YSI installation expenses, equipment rental fees, mileage or work truck fees, additional supplies and equipment	\$155,600
<b>Subtotal: \$155,600</b>	

**Subtotal B: \$155,600**

**Reimbursable Expense Total A + B: \$258,997**

NOTE: Total Costs are round up or down to the nearest dollar.

## SUBCONSULTANT FIRM INFORMATION RECORDS

The Engineer shall list all firms, including minority and female owned firms, providing sub-consulting services under this Agreement. The list shall be submitted in the format provided below. Any proposed changes must be submitted in writing to the City, including the reason(s) for the proposed changes, prior to initiation of any action by the Engineer. Any invoices submitted for payment under this Agreement must include the dollar amount to be paid to each firm listed below for the invoice period.

Firm Name and Address	Contact Name and Telephone Number	Group (MBE, FBE SBE, Non M/F/SBE)	Services to be Provided	Dollar Value of Services
Rogers and Callcott, Inc. 426 Fairforest Way Greenville, SC 29607  Or  PO Box 5655 Greenville, SC 29606	Sam Avery, Jr. President Phone: 864 232-1556	Non M/F/SBE	Stormwater runoff sample analysis and general laboratory services	Approximately \$30,000
YSI, Inc. 9843 18th Street N #1200 St Petersburg, FL 33716	Kevin McClurg Sales & Business Development Southeastern Regional Manager Phone: 508.243.4083	Non M/F/SBE	Monitoring equipment sales, monitoring site installation services	Approximately \$48,000