



November 14, 2019

Mr. Harold Simmons  
City Manager  
City of Senoia  
P.O. Box 310  
Senoia, Georgia 30276-0310

Re: City of Senoia  
Long Term Watershed Monitoring  
Project No. 210021

Dear Mr. Simmons:

We are enclosing a copy of a proposal dated November 8, 2019 from CCR Environmental, Inc. The proposal is for 2020 chemical water quality and biological monitoring for the City's Watershed Protection Plan and includes all sampling, laboratory analysis and data preparation required by current Georgia Environmental Protection Division (EPD) guidelines for water quality and biological monitoring. The monitoring results will be incorporated into annual watershed monitoring reports we prepare for the City.

The total estimated annual fee is \$16,575.00. The cost includes biological monitoring, which is required twice every five years, in non-consecutive years. Utilizing CCR for both water quality and biological monitoring will ensure more reliable, coordinated sampling at a lower overall cost than utilizing separate sampling consultants. If acceptable, please sign, date and return the agreement sheet to us. Once received, we will provide necessary coordination to have this work completed.

If you have questions or need additional information, please call us.

Yours truly,

A handwritten signature in black ink, appearing to read "Kenneth O. Bryan".

Kenneth O. Bryan

KOB:sn  
Enclosure

**CCR ENVIRONMENTAL, Inc.**

3772 PLEASANTDALE ROAD, SUITE 150, ATLANTA, GEORGIA 30340  
TEL: 770-458-7943, FAX: 770-458-2454

November 8, 2019

**LONG-TERM WATER QUALITY AND BIOLOGICAL/HABITAT MONITORING  
CITY OF SENOIA, GEORGIA  
G. BEN TURNIPSEED ENGINEERS, INC.**

**WORK PLAN**

**Water Quality Monitoring**

Water quality monitoring will be conducted at three (3) study locations in 2020. A total of three sampling events (two dry and one wet) shall be conducted. A dry event is one with no rainfall for 72 hours prior to sampling. A wet event will be defined as > 0.2 inches of rainfall over previous 24 hours with dry conditions (no rainfall) for 72 hours prior. Rainfall information will be tracked (real-time) using the USGS website (<http://water.usgs.gov/realtime.html>) for nearby sites. Stream flow will be measured directly during all dry sampling events at each site. Single, discreet grab samples will be collected for all events. The wet sample will be collected on the rising limb of the hydrograph, whenever possible.

Samples from all study sites will be analyzed in the laboratory (GEPD-approved) for the following parameters: COD, BOD<sub>5</sub>, TSS, alkalinity, hardness, total phosphorus and orthophosphate, TKN, ammonia, and nitrate-nitrite. Additionally, the wet sample will be analyzed for total recoverable metals (Pb, Cu, Zn, and Cd). "Clean metals" sampling techniques will be employed for the wet/metals sampling. In addition to laboratory analyses, the following *in situ* parameters will be measured during sample collection: air and water temperature, dissolved oxygen (DO), % DO, salinity, pH, turbidity, and specific conductance.

In addition to the aforementioned parameters, bacteriological monitoring (fecal coliform and *E. coli*) will be monitored over two sampling periods. During each sampling period, a total of four grab samples will be collected on a regular schedule (regardless of weather) within a 30-day period. No sample will be collected within 24 hours of another sample. Sampling will be performed between the months of May – October to correspond to state standards. No flow measurements will be made during bacteriological monitoring.

A report will be provided that describes the methods used, results, and discussion of results and potential problem areas, and EPD spreadsheets will be completed and submitted for each year. The report will be provided to G. Ben Turnipseed Engineers, Inc. in early 2021.



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## LONG-TERM WATER QUALITY AND BIOLOGICAL/HABITAT MONITORING CITY OF SENOIA, GEORGIA G. BEN TURNIPSEED ENGINEERS, INC.

### Biological Monitoring

Long-term biological monitoring will be performed at three (3) study sites. The macroinvertebrate and habitat assessments will be conducted at the three sites under the GEPD's current SOP *Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia* dated March 2007. The fish assessment also will be performed at three sites under the GDNR's Wildlife Resources Division current protocols for fish sampling, *Part I: Standard Operating Procedures for Conducting Biomonitoring on Fish Communities in Wadeable Streams in Georgia* (GDNR, 2005).

Biological sampling for fish will occur from April through October, and macroinvertebrate sampling will occur from October through February, as per the state protocols. Macroinvertebrate sampling and habitat assessments will be performed by a 2-person crew, and fish sampling will be conducted by a 3-person crew. Benthic macroinvertebrates will be collected via dip netting, and fish will be sampled by electrofishing (backpack or tow boat). Macroinvertebrate samples will be preserved and analyzed in the laboratory; whereas, the fish will be primarily processed (enumerated and identified) in the field and returned to the collection area of the stream. Some voucher fish specimens may be preserved and taken to the laboratory for identification.

Prior to biological surveys, water quality will be assessed via *in situ* measurements of the following parameters: air and water temperature, dissolved oxygen (DO), % DO, salinity, pH, turbidity, and specific conductance. During macroinvertebrate monitoring efforts, the following water chemistry parameters should be sampled: TSS, alkalinity, hardness, ammonia, nitrate-nitrite, TKN, and total phosphate and ortho-phosphorus. Total recoverable metals (cadmium, copper, lead, and zinc) should also be sampled during macroinvertebrate sampling. CCR will be responsible for any water chemistry sampling. The final dry water quality monitoring effort will be performed during the macroinvertebrate sampling.

No reference site is required for biological monitoring because reference data are incorporated in the scoring criteria and/or the state will supply ecoregion reference data to use for comparative purposes.



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**COST ESTIMATE**

**Water Quality Monitoring**

**Labor**

Senior Biologist – 10 hrs. @ \$110/hr. = \$ 1100  
Staff Biologist – 64 hrs. @ \$75/hr. = \$ 4800  
Total = \$5,900

**Laboratory (water chemistry; includes biological monitoring)**  
Total = \$2,955

**Other Expenses (mileage, field supplies, copying, etc.)**  
Total = \$675

**Lump sum bid for water quality monitoring = \$9,530**

**Biological Monitoring**

**Labor**

Senior Biologist – 20 hrs. @ \$110/hr. = \$ 2200  
Staff Biologist – 46 hrs. @ \$75/hr. = \$ 3450  
Total = \$5,650

**Laboratory (identification and enumeration of macroinvertebrates)**  
\$350 per site @ 3 sites = \$1,050

**Other Expenses (mileage, field supplies, copying, etc.)**  
Total = \$345

**Lump sum total for biological monitoring = \$7,045**

**Total Lump Sum Bid for Water Quality and Biological Monitoring = \$16,575**



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This proposal represents a lump sum bid, based on the previous assumptions. Additional or out-of-scope work will be billed at an hourly rate of \$110 per hour for senior biologist and \$75 per hour for staff biologist plus expenses. No additional or out-of-scope will be conducted without expressed permission of the client

Your acceptance of this proposal may be indicated by signing in the space provided below. Payment terms are 30 days upon receipt of invoice.

### ACCEPTANCE OF PROPOSAL AND AUTHORIZATION TO PROCEED

Authorized By:

Title:

Firm Name:

Date:

