

**INTERGOVERNMENTAL COOPERATIVE AGREEMENT FOR ADDITIONAL HINKSON CREEK SURFACE WATER MONITORING, SAMPLING, AND CHLORIDE REGRESSION MODEL DEVELOPMENT**

The parties hereto are the City of Columbia, Missouri, a Constitutional charter city of the State of Missouri (the "City"), the County of Boone, a first class non-charter county and political subdivision of the State of Missouri by and through its County Commission (the "County"), and The Curators of the University of Missouri (the "University") and those parties enter this Intergovernmental Cooperative Agreement ("Agreement") effective on the date of signing by the third party executing this Agreement ("Effective Date").

Whereas, the parties entered an Intergovernmental Cooperation Agreement, attached hereto as Exhibit A, on April 2, 2013; and,

Whereas, in that Agreement the parties acknowledged their mutual obligations in certain projects initiated under a Collaborative Adaptive Management (CAM) process emanating from a Municipal Separate Storm Sewer System (MS4) permit issued by the Missouri Department of Natural Resources; and,

Whereas, the parties now wish to agree to the scope and details and costs of a study project known as the "Additional Hinkson Creek Surface Water Monitoring, Sampling, and Chloride Regression Model Development".

Whereas, the County will enter into the contract with Geosyntec Consultants to perform work for the project.

Whereas, the County will provide the City and the University access to all data and deliverables received from the consultant.

NOW, THEREFORE, in consideration of the mutual covenants in this Acknowledgement, the parties agree as follows:

1. The parties agree to the scope and details of the project known as the "Additional Hinkson Creek Surface Water Monitoring, Sampling, and Chloride Regression Model Development" as described in the attached Exhibit B. This project has a total not to exceed amount of \$89,565.00, with each of the parties' total proportionate one-third costs not to exceed \$29,855.00. The proportionate payments shall be subject to the appropriations of each of the parties. Subject to appropriation, the City Finance Director will have the authority to make payment on behalf of the City to the County, after receiving an invoice for the proper amounts as set forth herein. Subject to appropriations, the University and County shall take whatever individual actions they deem appropriate to make payment for the proper amounts as set forth herein.

2. No party may assign or transfer any of its rights or obligations under this Agreement to any other person or entity without the prior, written consent of the other parties.
3. This Agreement is for the sole benefit of the parties, and nothing in this Agreement is intended to confer any rights or remedies on any third party.
4. Nothing in this Agreement will be deemed or construed by the parties, nor by any other entity or person, as creating any principal and agent relationship, or partnership, or joint venture, between the parties.
5. This Agreement will be governed by the laws of the State of Missouri, and any action relating to this Agreement will be brought in the Circuit Court of Boone County, Missouri.
6. The covenants, agreements, and obligations in this Agreement will extend to, bind, and inure to the benefit of the parties and their respective successors and approved assigns.
7. Each person signing this Agreement on behalf of any of the parties represents that he or she has been duly authorized and empowered, by order, ordinance, or otherwise, to execute this Agreement and that all necessary action on behalf of that party to effectuate that authorization has been taken and done.
8. The parties state that this Agreement, together with its attached Addenda A through B, contains the entire agreement between the parties, and there are no other oral, written, express, or implied promises, agreements, representations, or inducements not specified herein.
9. No Waiver of Sovereign Immunity. In no event shall the language of this Agreement constitute or be construed as a waiver or limitation for any Party's rights or defenses with regard to each Party's applicable sovereign, governmental, or official immunities and protections as provided by federal and state constitution or law.

IN WITNESS WHEREOF the parties hereto have caused this Acknowledgement to be executed by their duly-authorized officers on day and year indicated by their signature below.

**BOONE COUNTY, MISSOURI**

By: \_\_\_\_\_  
Kip Kendrick, Presiding Commissioner

\_\_\_\_\_  
Date

ATTEST:  
  
\_\_\_\_\_  
Brianna L. Lennon, County Clerk

APPROVED AS TO LEGAL FORM:  
  
\_\_\_\_\_  
C.J. Dykhouse, County Counselor

Boone County Auditor Certification:  
I hereby certify that a sufficient, unencumbered  
appropriation balance exists and is available to satisfy the  
obligation arising from this contract. (Note: Certification of  
this contract is not required if the terms of this contract do  
not create a measurable county obligation at this time.)

\_\_\_\_\_  
Kyle Rieman, County Auditor Date

**THE CURATORS OF THE UNIVERSITY OF MISSOURI**

By: \_\_\_\_\_

Name

\_\_\_\_\_

Date

**CITY OF COLUMBIA, MISSOURI**

By: \_\_\_\_\_  
De'Carlton Seewood, City Manager

\_\_\_\_\_  
Date

ATTEST:  
  
\_\_\_\_\_  
Sheela Amin, City Clerk

APPROVED AS TO FORM:  
  
\_\_\_\_\_  
Nancy Thompson, City Counselor

I hereby certify that this contract is within the purpose of the appropriation to which it is to be charged, that is, account 55806610-504990 \_\_\_\_\_ and that there is an unencumbered balance to the credit of such account sufficient to pay therefore.

\_\_\_\_\_  
Matthew Lue, Director of Finance

## INTERGOVERNMENTAL COOPERATION AGREEMENT

This intergovernmental cooperation agreement (the "Agreement") is entered into on this 2<sup>ND</sup> day of APRIL, 2013, by and between the City of Columbia, Missouri, a Constitutional charter city of the State of Missouri (hereinafter referred to as the "City"), and the County of Boone in the State of Missouri (hereinafter referred to as "County"), and The Curators of the University of Missouri (hereinafter referred to as "University"); and may collectively be referred to as the "Parties."

WHEREAS, a Total Maximum Daily Load (TMDL) for Hinkson Creek was issued by the Federal Environmental Protection Agency (EPA) in 2011; and

WHEREAS, the City, County, and University are partners in a Municipal Separate Storm Sewer System (MS4) permit issued by the Missouri Department of Natural Resources, which is affected by the TMDL; and

WHEREAS, the City, County, and University entered into an agreement with the EPA and the Missouri Department of Natural Resources (DNR) to address the TMDL with a Collaborative Adaptive Management (CAM) process; and

WHEREAS, the City, County, and University wish to enter into an agreement with regard to how the Parties will contribute to projects that are initiated in the CAM process to address the TMDL.

NOW, THEREFORE, the parties agree as follows:

- 1 **TYPES OF PROJECTS.** The Parties will contribute to projects which are initiated in the CAM process to address the TMDL for research, study, or monitoring-type projects and for construction projects.

For research, study, or monitoring-type projects, the three entities will each be responsible for one-third of the project cost. The University shall coordinate research, study, or monitoring-type projects on behalf of the parties. Before any research, study, or monitoring-type project is started, the Parties shall agree in writing regarding the scope and details of the project, including a not-to-exceed amount for each project.

For construction projects, each entity will exercise discretion and control over projects and be responsible for the costs of projects conducted on its own property unless otherwise agreed between the parties in writing.

2. **APPROPRIATIONS.** All types of projects shall be subject to the appropriations of the Parties who shall pay for the projects. Subject to these appropriations, the Parties shall each delegate in writing a person who shall be responsible for implementing this agreement and any associated documents or contracts to give this agreement effect.



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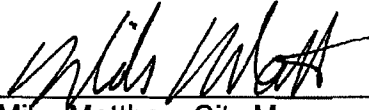
COL CITY  
CAM PROJ HINKSON CREEK

3. **TERM.** The effective date of this Agreement is the date the last party executes the Agreement and provides original executed documents to the other Parties. Any of the Parties may terminate this Agreement at any time by providing the other Parties written notice of their intent to terminate at least thirty (30) days in advance of the intended termination date
4. **ASSIGNMENT.** None of the Parties may assign or transfer any of its rights or obligations under this Agreement to any other person or entity without the prior, written consent of the other Parties.
5. **SOLE BENEFIT OF PARTIES.** This Agreement is for the sole benefit of the City, County and University. Nothing in this Agreement is intended to confer any rights or remedies on any third party.
6. **ENTIRE AGREEMENT.** The Parties state that this Agreement contains the entire agreement between the Parties, and there are no other oral, written, express or implied promises, agreements, representations or inducements not specified herein.
7. **AUTHORITY.** The signatories to this Agreement warrant and certify that they have obtained the necessary authority, by resolution or otherwise, to execute this Agreement on behalf of the named party for whom they are signing.

[SIGNATURES ON THE FOLLOWING PAGES]

IN WITNESS WHEREOF, the Parties hereto have been duly authorized to execute this Agreement as of the day and year first above written.


**CITY OF COLUMBIA, MISSOURI**

By:   
Mike Matthes, City Manager

ATTEST:

  
Sheela Amin, City Clerk

APPROVED AS TO FORM:

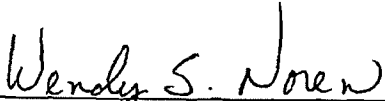
  
~~Fred Boeckmann, City Counselor~~  
Cavanaugh Noe




**BOONE COUNTY, MISSOURI**

By:   
Dan Atwill, Presiding Commissioner

ATTEST:

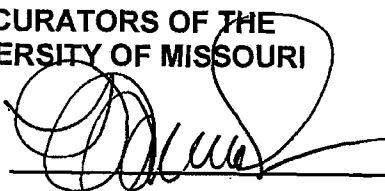
  
Wendy Noren, County Clerk *my*

APPROVED AS TO FORM:

  
C.J. Dykhouse, County Attorney

THE CURATORS OF THE  
UNIVERSITY OF MISSOURI

By:



Lisa J. Wimmenauer  
Assoc. Director, Business Services

ATTEST:

~~Approved By~~

MAR 05 2013

PJH  
General Counsel via EMAIL

021646

Permanent Record  
Filed in Clerk's Office

Introduced by McDavid

First Reading 3-18-13

Second Reading 4-1-13

Ordinance No. 021646

Council Bill No. B 78-13

**AN ORDINANCE**

authorizing an intergovernmental cooperation agreement with Boone County, Missouri, and The Curators of the University of Missouri as it relates to the collaborative adaptive management implementation (CAM) process to address the total maximum daily load (TMDL) for Hinkson Creek; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Manager is hereby authorized to execute an intergovernmental cooperation agreement with Boone County, Missouri, and The Curators of the University of Missouri as it relates to the collaborative adaptive management implementation (CAM) process to address the total maximum daily load (TMDL) for Hinkson Creek. The form and content of the agreement shall be substantially as set forth in "Exhibit A" attached hereto and made a part hereof as fully as if set forth herein verbatim.

SECTION 2. This ordinance shall be in full force and effect from and after its passage.

PASSED this 1st day of April, 2013.

ATTEST:

[Signature]  
City Clerk

[Signature]  
Mayor and Presiding Officer

APPROVED AS TO FORM:

[Signature]  
City Counselor



2009 East McCarty St., Suite 1  
Jefferson City, MO 65101  
PH 573.443.4100  
FAX 573.443.4140  
[www.geosyntec.com](http://www.geosyntec.com)

*VIA EMAIL*

August 1, 2024

Lynne Hooper  
Urban Hydrologist  
Boone County Resource Management (BCRM)  
801 E. Walnut  
Columbia, MO 65201-7732  
[lhooper@boonecountymo.org](mailto:lhooper@boonecountymo.org)

**Subject: Proposal for Additional Hinkson Creek Surface Water Monitoring, Sampling, and Chloride Regression Model Development**

Dear Ms. Hooper:

Geosyntec Consultants (Geosyntec) has prepared the following scope of work and cost estimate to perform surface water quality sampling and develop chloride and specific conductance regression models at the six (6) sites on the Hinkson Creek and its tributaries currently maintained by Geosyntec. This scope of work and cost estimate also includes the verification, maintenance, water quality sampling, and development of chloride and specific conductance regression models at up to five (5) additional water quality monitoring stations, formerly known as Dr. Sean Zeiger's water quality stations.

## **INTRODUCTION AND PURPOSE**

In November 2023, Geosyntec installed six (6) water quality monitoring stations in Hinkson Creek and its tributaries to continuously monitor specific conductance levels. Specific conductance is a known surrogate for monitoring dissolved ions such as chloride. Previous specific conductance monitoring indicates that specific conductance in Hinkson Creek may increase substantially during certain months of the year. Continuously monitoring specific conductance provides information critical to characterize frequency, magnitude, duration, and travel time of chloride in Hinkson Creek and its tributaries. To establish specific conductance and chloride relationships at each monitoring station, surface water samples must be collected across a variety of specific conductance levels and analyzed for chloride and other dissolved ion concentrations.

## **SCOPE OF WORK**

This scope of work is divided into two tasks: 1) perform surface water quality sampling and develop chloride and specific conductance regression models at the six (6) sites on the Hinkson Creek and its tributaries currently maintained by Geosyntec; and 2) verification, maintenance, water quality sampling, and development of chloride and specific conductance regression models

at up to five (5) additional water quality monitoring stations, formerly known as Dr. Sean Zeiger's water quality stations.

### **Task 1. Water Quality Sample Collection, Laboratory Analysis, and Regression Model Development at the Six (6) Current Geosyntec Monitoring Stations**

**Objective:** Geosyntec will collect surface water samples from each of the six (6) monitoring stations that are currently maintained by Geosyntec across a variety of specific conductance levels. Surface water samples will be analyzed using approved laboratory methods for chloride, sulfate, and magnesium and calcium (hardness) by Engineering Surveys and Services (ES&S) laboratory in Columbia, Missouri. Geosyntec will compile laboratory analytical data and continuous specific conductance data to develop a regression model to predict chloride concentration from continuous specific conductance data at each of the six (6) monitoring stations. Analytical data and developed regressions will be summarized in a brief technical memorandum.

#### **Activities:**

- Collect ten (10) surface water samples (mid-stream, surface grab method) at each of the six (6) monitoring stations for a total of sixty (60) ambient samples.
- Six (6) additional samples will be collected for duplicate quality control analyses (10% of total ambient samples).
- Specific conductance values will be evaluated at each station prior to sample collection to determine if levels are suitable to develop chloride regressions over the range of observed or potential specific conductance values in urban freshwater ecosystems (e.g. 20; 40; 80; 160; 320; 640; 1,280; 2,560; 5,120; 10,240 microsiemens per centimeter).
- Deliver collected samples to ES&S laboratory for analysis of chloride, sulfate, and hardness.
- Compilation and evaluation of data.
- Development of a regression model for specific conductance and chloride per monitoring station.
- Development of a brief technical memorandum summarizing analytical data and developed regression model for each monitoring station.

#### **Deliverables:**

- Provide analytical data associated with each sampling event.
- Brief technical memorandum summarizing analytical data and developed regressions for each monitoring station.
- PowerPoint presentation to the Hinkson Creek Collaborative Adaptive Management group summarizing specific conductance and chloride relationship at each monitoring station.

## Assumptions

- ES&S laboratory will provide new and appropriate sample bottles.
- Geosyntec will deliver analytical samples to ES&S laboratory within required hold times.
- Analytical data from ES&S laboratory will be provided to Geosyntec within four (4) weeks of sample submission.
- This scope assumes environmental conditions will facilitate ten (10) surface water sampling events during a variety of specific conductance levels prior to the conclusion of continuous water quality monitoring in November 2026.
  - At least one (1) full year and winter season will likely be required to collect samples across a range of specific conductance values. Several events will occur during and after winter snowmelt conditions to capture potential elevated chloride and specific conductance levels.
- Previously collected chloride and specific conductance data that are spatially similar may be used in development or refinement of regression models; however, these data must have been analyzed using approved field and laboratory methods and met quality control objectives. These data must be previously peer reviewed and compiled.
- One (1) meeting between Geosyntec and BCRM will be conducted to discuss the brief technical memorandum.

## **Task 2. Water Quality Station Verification, Maintenance, Sample Collection, Laboratory Analysis, and Regression Model Development for up to Five (5) Former Dr. Zeiger's Hinkson Creek Monitoring Stations**

**Objective:** Geosyntec will verify the functionality of these water quality monitoring stations on Hinkson Creek that were previously maintained by Dr. Sean Zeiger. These stations will be maintained by Geosyntec for two (2) years thereafter, coinciding with water quality monitoring, sample collection, and data analysis being conducted at the six (6) stations maintained by Geosyntec for a total of up to eleven (11) water quality monitoring stations.

Geosyntec will collect surface water samples from up to five (5) monitoring stations that were previously maintained by Dr. Sean Zeiger during a variety of specific conductance levels. Surface water samples will be analyzed using approved laboratory methods for chloride, sulfate, and magnesium and calcium (hardness) by Engineering Surveys and Services (ES&S) laboratory in Columbia, Missouri. Geosyntec will compile laboratory analytical data and continuous specific conductance data to develop a regression model to predict chloride concentration from continuous specific conductance data at up to five (5) monitoring stations. Analytical data and developed regressions will be summarized in a brief technical memorandum.

Geosyntec offers the option of maintaining and sampling a subset of the five (5) water quality monitoring stations.

### **Activities:**

- Water quality monitoring station functionality and location verification.
- Monthly station maintenance (cleaning, calibration/checks) and data download.
- Monthly data compilation and review.
- Monthly drift corrections, as applicable; quality assurance and quality control reviews; and data validation.
- Collect ten (10) surface water samples (mid-stream, surface grab method) at each of the five (5) additional monitoring stations for a total of fifty (50) ambient samples.
- Five (5) additional samples will be collected for duplicate quality control analyses (10% of total ambient samples).
- Specific conductance values will be evaluated at each station prior to sample collection to determine if levels are suitable to develop chloride regressions over the range of observed or potential specific conductance values in urban freshwater ecosystems (e.g. 20; 40; 80; 160; 320; 640; 1,280; 2,560; 5,120; 10,240 microsiemens per centimeter).
- Deliver collected samples to ES&S laboratory for analysis of chloride, sulfate, and hardness.
- Compilation and evaluation of data.
- Development of a regression model for specific conductance and chloride per monitoring station.
- Development of a brief technical memorandum summarizing analytical data and developed regression model for each monitoring station.

### **Deliverables:**

- Monthly maintenance (calibration) data sheets will be available upon request.
- Quarterly summary report will be provided per station.
- Data collected from the five (5) monitoring stations will be included in the final database and PowerPoint presentation alongside the six (6) previously installed monitoring stations.
- Provide analytical data associated with each sampling event.
- The technical memorandum discussed in **Task 1** will be expanded to summarize analytical data and regressions for up to five (5) additional monitoring station.
- The PowerPoint presentation discussed in **Task 1** will be expanded to summarize specific conductance and chloride relationships for up to five (5) additional monitoring station.

### **Assumptions**

- One day will be allotted to verifying the functionality and locations of the additional monitoring stations.
- The three (3) Solinst Levellogger 5 LTC instruments originally purchased for contingency purposes for the six (6) previously installed Hinkson Creek and tributary sites will be used

to replace any monitoring instruments that are found to be non-functional or non-existent. Additional replacements instruments beyond the three (3) described above will be the responsibility of the funding entity.

- Maintenance and sampling at additional monitoring stations will likely require a second day of mobilization in the field to complete per month.
- Data are not transmitted real-time and require manual download (monthly interval).
- Replacement of instruments stolen or damaged from vandalism or flooding will be the responsibility of the funding entity.
- Monthly station maintenance and data downloads will coincide with the six (6) previously installed Geosyntec monitoring stations.
- Station removal will coincide with the removal of the six (6) previously installed stations.
- ES&S laboratory will provide new and appropriate sample bottles.
- Geosyntec will deliver analytical samples to ES&S laboratory within required hold times.
- Analytical data from ES&S laboratory will be provided to Geosyntec within four (4) weeks of sample submission.
- This scope assumes environmental conditions will facilitate ten (10) surface water sampling events during a variety of specific conductance levels prior to the conclusion of continuous water quality monitoring in November 2026.
  - At least one (1) full year and winter season will likely be required to collect samples across a range of specific conductance values. Several events will occur during and after winter snowmelt conditions to capture potential elevated chloride and specific conductance levels.
- Previously collected chloride and specific conductance data that are spatially similar may be used in development or refinement of regression models; however, these data must have been analyzed using approved field and laboratory methods and met quality control objectives. These data must be previously peer reviewed and compiled.
- If a subset of the five (5) additional monitoring stations are selected, a separate cost estimate will be proposed based on the number of stations selected.

## **SCHEDULE**

The project will commence in November 2024 and occur for two (2) years thereafter, ending approximately November 2026, which coincides with the monitoring schedule of the six (6) currently maintained Geosyntec stations.

Collection of surface water quality samples for laboratory analysis will commence upon authorization and is estimated to require one (1) full year to complete during a variety of environmental conditions and specific conductance levels. Samples will be collected when field staff have confirmed that monitoring station specific conductance levels are appropriate for developing a specific conductance and chloride relationship. Geosyntec will compile laboratory



Ms. Lynne Hooper

August 1, 2024

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data and develop regressions for all monitoring stations within three (3) months of completing sample collection. BCRM will be updated monthly on progress.

### **PROJECT SUMMARY ESTIMATE**

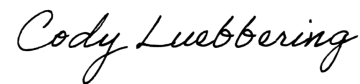
The estimated cost to complete the proposed scope of work is dependent on the number of selected monitoring stations described in Task 2 and **Table 1**. As a result, an optional range of estimated project costs are presented in **Table 2**. The cost estimate was developed using projected labor rates and direct costs, which includes costs associated with ES&S laboratory analyses. The project work will be conducted on a time-and-materials basis.

Should you have any questions, please contact Josh Horne at 573-499-5445 or [jhorne@geosyntec.com](mailto:jhorne@geosyntec.com).

Sincerely,  
Geosyntec Consultants



Josh Horne  
Professional Scientist



Cody Luebbering  
Senior Scientist

**TABLE 1: Scope of Work Estimated Costs**

<b>Task</b>	<b>Task Description</b>	<b>Hours</b>	<b>Labor Cost (\$)</b>	<b>Expense Cost (\$)</b>	<b>Total Cost (\$)</b>
1	Sample Collection and Analysis at the Currently Maintained Geosyntec Monitoring Stations with Regression Models Development	70	11,800	8,000	19,800
2 (Options)	Verification and Maintenance of One (1) Additional Water Quality Monitoring Stations with Sample Collection, Analysis, and Regression Model Development, formerly Dr. Zeiger's station	67	10,981	2,972	13,953
	Verification and Maintenance of Two (2) Additional Water Quality Monitoring Stations with Sample Collection, Analysis, and Regression Models Development, formerly Dr. Zeiger's stations	134	21,961	5,945	27,906
	Verification and Maintenance of Three (3) Additional Water Quality Monitoring Stations with Sample Collection, Analysis, and Regression Models Development, formerly Dr. Zeiger's stations	201	32,942	8,917	41,859
	Verification and Maintenance of Four (4) Additional Water Quality Monitoring Stations with Sample Collection, Analysis, and Regression Models Development, formerly Dr. Zeiger's stations	268	43,922	11,890	55,812
	Verification and Maintenance of Five (5) Additional Water Quality Monitoring Stations with Sample Collection, Analysis, and Regression Models Development, formerly Dr. Zeiger's stations	335	54,903	14,862	69,765

**TABLE 2:** Summary of Estimated Project Costs Based on Task 2 Options

<b>Task 1 Total Cost (\$)</b>	<b>Task 2 Options and Total Costs (\$)</b>		<b>Total Project Cost (\$)</b>
19,800	One (1) Additional Water Quality Monitoring Stations	13,953	33,753
	Two (2) Additional Water Quality Monitoring Stations	27,906	47,706
	Three (3) Additional Water Quality Monitoring Stations	41,859	61,659
	Four (4) Additional Water Quality Monitoring Stations	55,812	75,612
	Five (5) Additional Water Quality Monitoring Stations	69,765	89,565