

RESOLUTION 2016-012
OF THE COUNCIL OF THE CITY OF FORT COLLINS
AUTHORIZING AN INTERGOVERNMENTAL AGREEMENT WITH COLORADO
STATE UNIVERSITY FOR STORMWATER RELATED RESEARCH SERVICES

WHEREAS, since 2008 the City of Fort Collins has contracted with the Colorado State University College of Environmental and Civil Engineering for a series of research studies aimed at improving the City's knowledge base and operational efficiency in water quality and water quality management as they are affected by Streets' operations treatment; and

WHEREAS, the studies help protect and enhance the City's water resources as they are affected by runoff from stormwater sources and comply with City's stormwater discharge permit; and

WHEREAS, the prior agreements with Colorado State University have expired; and

WHEREAS, further studies are necessary to maintain the continuity and the consistency of studies regarding the following matters: (1) water quality and quantity monitoring of a bioretention facility installed as a low impact development (LID) measure; (2) possible process improvements to the City's deicing program through a winter runoff monitoring program; (3) an investigation of nutrient sources in urban stormwater; and (4) an update to the construction details associated with stormwater control and treatment measures otherwise known as Best Management Practices; and

WHEREAS, Colorado State University is prepared to perform research studies analyzing the issues described above during 2016 through 2017; and

WHEREAS, City staff desires to enter into another intergovernmental agreement with Colorado State University which authorizes payment to Colorado State University in the amount of \$65,840 as consideration for said research studies; and

WHEREAS, Section 29-493(d) of the City Code authorizes the Utilities Executive Director to require sampling for such pollutant parameters according to such schedule as the Utilities Executive Director determines to be appropriate to ascertain water quality; and

WHEREAS, Colorado State University has been the City's research partner in the field of stormwater quality since 2008; and

WHEREAS, Colorado State University is uniquely qualified to provide the necessary services due to the academic quality of the needed research and to the University's ability to draw on specialized experts in the field of water engineering; and

WHEREAS, Article II, Section 16 of the City Charter and Section 1-22 of the City Code empower the City Council, by ordinance or resolution, to enter into contracts with other governmental bodies to furnish services or cooperative activities.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS as follows:

Section 1. That the City Council hereby makes and adopts the determinations and findings contained in the recitals set forth above.

Section 2. That City staff is hereby authorized to enter into an agreement with Colorado State University to conduct and prepare research activities to improve the understanding of stormwater management practices within the City during 2016 and 2017, for which consideration the City will pay to Colorado State University the sum of \$65,840.

Section 3. That the City Manager is hereby directed to enter into a negotiated intergovernmental agreement with Colorado State University for services for research activities and studies during 2016 and 2017 to improve the understanding of stormwater management practices within the City consistent with the terms of this Resolution and in substantially the form attached hereto as Exhibit "A", with such additional terms and conditions as the City Manager, in consultation with the City Attorney, determines to be necessary and appropriate to protect the interests of the City or effectuate the purpose of this Resolution.

Passed and adopted at an adjourned meeting of the Council of the City of Fort Collins this 9th day of February, A.D. 2016.



Mayor

ATTEST:

W Winkelmann
City Clerk

RESEARCH AGREEMENT

This Research Agreement ("Agreement") is entered into by and between the Board of Governors of the Colorado State University System acting by and through Colorado State University, an institution of higher education of the State of Colorado, located at Fort Collins, Colorado, 80523-2002 ("University"), and the Sponsor, _____ ("Sponsor"), collectively referred to as "Parties" and is effective _____.

PARTIES:

UNIVERSITY:

Board of Governors of the Colorado State University System acting by and through Colorado State University, an institution of higher education of the State of Colorado, located at Fort Collins, Colorado, 80523-2002
Sponsored Programs
Campus Delivery 2002
University Services Center, Rm. 408
Fort Collins, CO 80523-2002

SPONSOR:

Full legal name of Sponsor:
State of Business Registration:
Business Address:
Attn:
City, State, Zip:

RECITALS:

1. University is a comprehensive, land-grant University with experience and resources in a field of mutual interest between University and Sponsor.
2. Sponsor desires research to be performed in accordance with the Scope of Work described in Exhibit A and terms outlined in this Agreement (the "Project").
3. Performance of such research is consistent, compatible, and beneficial to the academic role and mission of the University as an institution of higher education.

AGREEMENT:

1. **Independent Contractors.** It is understood and agreed by the Parties that the University is an independent contractor with respect to the Sponsor and that this Agreement is not intended and shall not be construed to create an employer/employee relationship or a joint venture relationship between the University and the Sponsor. The University shall be free from the direction and control of the Sponsor in the performance of the University's obligations under this Agreement, except that the Sponsor may indicate specifications, standards requirements and deliverables for satisfaction of the University's obligations under this Agreement.
2. **Term.** This Agreement shall begin on _____ and shall terminate on _____ unless sooner terminated as provided herein or extended by written agreement of the Parties.

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3. **Scope of Work.** The University agrees to perform the research activities described in the Project and made a part hereof as Exhibit A, under the direction and supervision of the University Principal Investigator and in accordance with any milestones or periodic deliverables specified in Exhibit A. The University Principal Investigator is _____ of the Department of _____ who will be responsible for the technical direction of the Project.

4. **Payment.** The Sponsor agrees to pay the University for the Project performed under this Agreement in a fixed price amount of _____ Dollars, (\$ _____) payable fifty percent (50%) _____ Dollars (\$ _____) upon execution; forty percent (40%) _____ Dollars (\$ _____) at mid-project (_____); and ten percent (10%) _____ dollars (\$ _____) upon University's submission of all deliverables.

Or

The Sponsor agrees to pay the University for the Project performed under this Agreement in amount not to exceed of _____ Dollars (\$ _____) on a cost reimbursement basis. University will invoice not more often than monthly based on actual expenditures. At the conclusion of the Project, the University will submit an invoice marked "Final."

If the Sponsor uses a purchase order or some other source document as a Sponsor method for paying invoices from the University and the purchase order or source document contains terms and conditions, those terms and conditions will be null and void and not applicable to this Agreement. The purchase order or source document is solely an internal Sponsor payment document.

5. **Reporting Requirements.** The University will provide reports on the progress of the research as required in the Scope of Work, Exhibit A.

6. **Confidentiality.**

(a) Parties may have certain documents, data, information, and methodologies that are confidential and proprietary to that Party ("Confidential Information"). During the term of this Agreement, either Party may, as the "Disclosing Party," disclose its Confidential Information to the other Party (the "Recipient"), in writing, visually, or orally. If submitted other than in writing, the Confidential Information shall be reduced to writing within 30 working days. Recipient shall receive and use the Confidential Information for the sole purpose of the performance of this Agreement, and for no other purpose (except as may be specifically authorized by the Disclosing Party, in writing). Recipient agrees not to make use of the Confidential Information except for research conducted under this Agreement and agrees not to disclose the Confidential Information to any third Party or Parties for a period of three (3) years after the end of this Agreement without the prior written consent of the Disclosing Party

(b) Recipient shall use reasonable efforts to preserve the confidentiality of the Confidential Information (using the same or similar protections as it would as if the Confidential Information were Recipient's own, and in any event, not less than reasonable care). Recipient shall obligate its affiliates with access to any portion of the Confidential Information to protect the proprietary nature of the Confidential Information at least to the extent set forth in this Section 6.

(c) "Confidential Information" shall not include, and Recipient shall have no obligation to refrain from disclosing or using, information which: is generally available to the public at the time of this Agreement; becomes part of the public domain or publicly known or available by publication or otherwise, not through any unauthorized act or omission of Recipient; is lawfully disclosed to the

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Recipient by third parties without breaching any obligation of non-use or confidentiality; or has been independently developed by persons in Recipient's employ, as proven with written records, or otherwise who have no contact with Confidential Information.

(d) In the event that Recipient is required by law to disclose Confidential Information, Recipient will promptly notify the Disclosing Party, and the Disclosing Party may, at its sole discretion and expense, initiate legal action to prevent, limit or condition such disclosure.

(e) Notwithstanding any other provision of this Agreement, a Party may retain one copy of the other Party's Confidential Information in its confidential files, for the sole purpose of establishing compliance with the terms hereof.

7. **Publication.** The University, as a state institution of higher education, engages only in research that is compatible, consistent, and beneficial to its academic role and mission. Therefore, significant results of research activities must be reasonably available for publication. The Parties acknowledge that the University shall have the right to publish results including student theses and dissertations. The University agrees, however, that during the term of this Agreement and for six (6) months thereafter, the Sponsor shall have forty-five (45) days to review and comment on any proposed publication. Should Sponsor believe that any part of such publication would constitute the disclosure of Confidential Information as defined in Paragraph six above or contain information that might be patentable as a result of this research, Sponsor will notify University in writing within such forty-five (45) day period, of the relevant material, and University shall delay publication of such article for up to an additional ninety (90) days in order to allow Sponsor to diligently pursue the filing of a patent application. University agrees that any Confidential Information supplied to it by the Sponsor will not be included in any published material without prior written approval by the Sponsor.

8. **Intellectual Property.** "Intellectual Property" as used herein shall mean all discoveries, inventions, methodologies, improvements, software (but not copyrightable works) conceived, made, discovered, and first reduced to practice in performance of the research under this Agreement ("IP").

(a) IP shall be owned as follows:

(i) IP created solely by one or more persons who are employees of University ("UNIVERSITY IP") shall be owned by Colorado State University, subject to the rights of its inventors in accordance with the policies of the University. The University may, at any time and without notice, assign or convey any or all of its rights in UNIVERSITY IP (and in JOINT IP under subsection (iii) below) to the Colorado State University Research Foundation (CSURF), which shall act as the University's patent and technology transfer agent. Sponsor will be provided a non-exclusive, unrestricted, perpetual, royalty-free license to use such UNIVERSITY IP, for any purpose, but without the right to sublicense, provided that Sponsor shall pay all costs incurred in the course of obtaining patent or other intellectual property protection on behalf of CSU and/or CSURF for IP that Sponsor intends to license, and will consult with CSU and/or CSURF on all UNIVERSITY IP issues and applications.

Or

Sponsor shall have an option to negotiate an exclusive worldwide license to any Inventions (the "Option"). CSU shall notify the Sponsor in writing of any such Inventions and shall provide a copy of the invention disclosure to the Sponsor. The above Option shall be for a period of 6 months from the date of receipt of the invention

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disclosure by Sponsor. The Sponsor shall pay for all reasonable costs for preparing and filing any patent application(s) covering Inventions during the period of the Option. The 6-month option period may be extended by mutual agreement of the Sponsor and CSU. If the Sponsor exercises its Option within the above period, the Sponsor and CSURF will negotiate in good faith a license agreement satisfactory to both Parties. All such negotiations, including the execution of a license agreement, shall be completed 60 days following the date at which Sponsor's Option would have expired, unless otherwise agreed by the Parties. Provisions of any such license agreement will be in accordance with the nature of the inventions, improvements, applications, and patents.

If a license agreement between CSU and the Sponsor is not signed in final form before expiration of the 60 day period as provided herein, the University and CSURF shall be free to negotiate with other companies not a Party to this Agreement without further obligation to the Sponsor.

(ii) IP created solely by one or more persons who are employees of Sponsor ("SPONSOR IP") shall be owned by Sponsor, subject to policies of Sponsor; provided, University shall retain a non-exclusive, perpetual, royalty-free license, without the right to sublicense, to use such SPONSOR IP for its own internal academic, research, and publication purposes, subject to the publication provisions of Section 7 above.

(iii) IP jointly created by one or more employees of University and one or more employees of Sponsor ("JOINT IP") shall be jointly owned by CSU and Sponsor. Sponsor shall pay all costs incurred in the course of obtaining patent or other intellectual property protection, and will consult University with regard to filing of patent and copyright registration for all JOINT IP. Each Party is free to enjoy its undivided interests in JOINT IP. Sponsor is not obligated to pay for JOINT IP protection; however, if Sponsor decides not to pay for specific JOINT IP patent or other intellectual property protection pursuant to this Section 8(a)iii, Sponsor shall fully assign in writing all of its right, title and interests in such specific JOINT IP to University, and shall have no continuing commercialization rights to such specific JOINT IP whatsoever.

(b) Each Party shall require its employees to promptly disclose to its respective technology transfer office any IP. Each Party agrees to provide the other Party with a copy of each IP disclosure within thirty (30) days after the disclosure is made, and in addition, will provide the other Party with a written listing of all IP created pursuant to this Agreement within sixty (60) days from the expiration or termination of this Agreement. For all such IP identified, CSURF will provide, upon agreement by Sponsor to its payment of patent costs to CSURF, via separate written agreement(s), licenses to UNIVERSITY IP and JOINT IP according to the provisions of Section 8(a)(i) and 8(a)(iii) above. Each Party will consult with the other Party at least thirty (30) days prior to filing any patent or copyright application for IP and shall promptly notify the other of any patents or copyright registrations issued.

(c) Intellectual property created external to the Project ("EXTERNAL IP") will be owned by the originating Party. Nothing in this Agreement will be construed as any conferral of rights to any of the Parties regarding such EXTERNAL IP. Nothing contained herein is to be construed as permission, a recommendation or an inducement to use or practice any product, process, equipment or formulation that may infringe upon any other intellectual property rights without the prior written permission of the intellectual property owner.

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(d) University does not make any representation or warranty, express or implied that the use of UNIVERSITY IP and/or JOINT IP will not infringe any patent or other intellectual property rights.

9. **Equipment.** Unless otherwise provided in the Scope of Work or in a writing signed by the Parties, all equipment purchased with funds provided under this Agreement for use in connection with this Agreement shall be the property of the University, and shall be dedicated to providing services under this Agreement while this Agreement is in effect.

10. **Liability; Insurance.** Each Party hereto agrees to be responsible for its own wrongful or negligent acts or omissions, or those of its officers, agents, or employees to the full extent allowed by law. Liability of the University is at all times herein strictly limited and controlled by the provisions of the Colorado government Immunity Act, C.R.S. §§ 24-10-101, *et seq.* as now or hereafter amended. Nothing in this Agreement shall be construed as a waiver of the protections of said Act. Each Party represents and warrants that it maintains comprehensive general liability insurance and all coverages required by law sufficient for the purpose of carrying out the duties and obligations arising under this Agreement. A Party will furnish the other Party a certificate evidencing such insurance upon written request.

11. **Exclusive Warranty; Disclaimer.** University warrants that all deliverables provided under this Agreement will be provided substantially in accordance with the Scope of Work and/or written protocol provided by Sponsor. Research results, deliverables, reports, IP disclosures and IP provided by University are provided strictly "as-is" without any other warranty or guaranty of any kind. All other warranties, express and implied, are hereby expressly disclaimed **INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.** University does not perform any services under this agreement that may be subject to FDA Regulations, e.g. GMP, cGMP, GLP, GCP work/services. University shall not be liable for any indirect, special, incidental, consequential or punitive loss or damage of any kind, including but not limited to lost profits (regardless of whether or not University knows or should know of the possibility of such loss or damages). The liability of either party under this Agreement shall not exceed the amount paid or payable to the University under this Agreement.

12. **Use of Tradenames and Service Marks.** Neither Party obtains by this Agreement any right, title, or interest in, or any right to reproduce or to use for any purpose, the name, tradenames, trade- or service marks, or logos (the "Marks"), or the copyrights of the other Party. Neither Party will include the name of the other Party or of any employee of that Party in any advertising, sales promotion, or other publicity matter without the prior written approval of that other Party. In the case of the University, prior written approval is required from the University Vice President for Research. In the case of the Sponsor, prior written approval is required from an authorized representative of the Sponsor.

13. **Termination.** Either Party may terminate this Agreement, without cause, upon not less than sixty (60) days' written notice, given in accordance with the Notice provisions of this Agreement. Termination of this Agreement shall not relieve a Party from its obligations incurred prior to the termination date. Upon termination of this Agreement by Sponsor, except in the case of a material breach by University, Sponsor shall pay all costs accrued by University as of the date of termination including non-cancelable obligations for the term of this Agreement, which shall include all appointments of staff incurred prior to the effective date of the termination. University shall take steps to limit or terminate any outstanding financial commitments for which Sponsor is to be liable. University shall furnish, within ninety (90) days of the effective termination date, a final report of all costs incurred and all funds received and shall reimburse Sponsor for payments which may have been advanced in excess of total costs incurred with no further obligations to Sponsor.

OR

Upon termination of this fixed price Agreement, the Sponsor will pay a pro rata share of the Agreement total price. This will be calculated by adding the start up costs (which include category/cost _____) plus the total Project budget divided by the total number of days of the Agreement (which will give a cost per day) and at that point multiplied by the number of days the Agreement was in force including the 60 days after the termination notice.

14. **Default.** A Party will be considered in default of its obligations under this Agreement if such Party should fail to observe, to comply with, or to perform any term, condition, or covenant contained in this Agreement and such failure continues for thirty (30) days after the non-defaulting Party gives the defaulting Party written notice thereof. In the event of default, the non-defaulting Party, upon written notice to the defaulting Party, may terminate this Agreement as of the date specified in the notice, and may seek such other and further relief as may be provided by law. Notwithstanding the foregoing, in the event of a breach or threatened breach of paragraph 6 of this Agreement, the non-defaulting Party may terminate the Agreement immediately without affording the defaulting Party the opportunity to cure, and may seek an injunction or restraining order as required to prevent unauthorized disclosures of Confidential Information or unauthorized use of its Marks or copyrights.

15. **Late Charges; Expenses.** All amounts payable by Sponsor to CSU under this Agreement shall be paid to CSU without any setoff, deduction or counterclaim. Any amounts billed to Sponsor not paid within five (5) days of the due date thereof may be subject to a late charge of five percent (5%) of the amount billed. In addition, such unpaid amount may bear interest until paid at the rate of eighteen percent (18%) per annum. In the event any payment from Sponsor by check is returned by the financial institution on which it is drawn for any reason, a service charge of One Hundred Dollars (\$100.00) shall be due and payable in addition to the late charge set forth above. In the event of any default by Sponsor hereunder, Sponsor shall pay to CSU all attorneys' fees incurred by CSU in connection with such default or the enforcement of CSU's rights or remedies arising in connection therewith, whether or not this Agreement is terminated and whether or not CSU institutes any lawsuit against Sponsor as a result of such default.

16. **Notices.** All notices and other correspondence related to this Agreement shall be in writing and shall be effective when delivered by: (i) certified mail with return receipt, (ii) hand delivery with signature or delivery receipt provided by a third Party courier service (such as FedEx, UPS, etc.), (iii) fax transmission if verification of receipt is obtained, or (iv) email with return receipt, to the designated representative of the Party as indicated below. A Party may change its designated representative for notice purposes at any time by written notice to the other Party. The initial representatives of the Parties are as follows:

University:

Sponsored Programs
408 University Services Center
601 So. Howes Street
Colorado State University
Fort Collins, CO 80523-2002
Telephone: (970) 491-XXXX
E-mail

Sponsor:

[Name]
[Address 1]
Address 2]

Telephone
E-mail

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17. **Legal Authority.** Each Party to this Agreement warrants that it possesses the legal authority to enter into this Agreement and that it has taken all actions required by its procedures, bylaws, and/or applicable law to exercise that authority, and to lawfully authorize its undersigned signatory to execute this Agreement and to bind it to its terms. The person(s) executing this agreement on behalf of a Party warrant(s) that such person(s) have full authorization to execute this Agreement. This Agreement shall not be binding upon Colorado State University, its governing board or the State of Colorado unless signed by the University Vice-President for Research or his/her authorized delegate.
18. **Entire Agreement; Changes and Amendments.** This Agreement constitutes the entire agreement between the Parties, and supersedes any previous contracts, understandings, or agreements of the Parties, whether verbal or written, concerning the subject matter of this Agreement. No amendment to this Agreement shall be valid unless it is made in a writing signed by the authorized representatives of the Parties.
19. **Governing Law, Jurisdiction and Venue.** Each Party agrees to comply with all applicable federal, state and local laws, codes, regulations, rules, and orders in the performance of this Agreement. This Agreement shall be governed by and construed under the laws of the State of Colorado. Any claim arising under this Agreement shall be filed and tried in a court of competent jurisdiction in the City and County of Denver, State of Colorado.
20. **Assignment.** This Agreement shall not be assigned without the prior written consent of the other Party, which consent shall not be unreasonably withheld or delayed, provided however, such consent shall not be required in the case of a sale or transfer to a third Party of all or substantially all of a Party's business. Subject to the foregoing, this Agreement shall inure to the benefit of and be binding on the successors and permitted assigns of the Parties.
21. **Export of Technology.** It is understood that University and Sponsor are subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities, and that obligations hereunder are contingent on compliance with applicable U.S. export laws and regulations (including the Arms Export Control Act, as amended, and the Export Administration Act of 1979). The transfer of certain technical data and commodities may require a license from the cognizant agency of the United States Government and/or written assurances that such data or commodities will not be exported to certain foreign countries without prior approval of the cognizant government agency. Sponsor and University agree to cooperate in securing any license which the cognizant agency deems necessary in connection with this Agreement. Sponsor shall notify University if any data or materials to be supplied to University by Sponsor are subject to export control license requirements or are listed under export control regulations.
22. **Waiver and Severability.** No waiver of any breach of any provision of this Agreement shall operate as a waiver of any other or subsequent breach thereof or of the provision itself, or of any other provision. No provision of this Agreement shall be deemed to have been waived unless such waiver is in writing and signed by the Party waiving the same, with the signature on behalf of University being that of a vice president of University. If any provision of this Agreement is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability shall attach only to such provision or part thereof and the remaining part of such provision and all other provisions hereof shall continue in full force and effect.

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23. **Conflict of Interest.** Except as set forth herein, Sponsor certifies that no officer, employee, student or agent of University has been employed, retained, or paid a fee, or has otherwise received or will receive during the term of this Agreement any personal compensation or consideration by or from Sponsor or any of Sponsor's directors, officers, employees, or agents in connection with the obtaining, arranging, negotiation or conducting of this Agreement without advance, written notification to the University.

24. **Headings.** Paragraph headings are for reference and convenience only and shall not be determinative of the meaning or the interpretation of the language of this Agreement.

25. **Survival.** The respective rights and obligations of University and Sponsor under Paragraphs 6, 7, 8, 11, 12 and 19 shall survive the expiration or earlier termination of this Agreement.

IN WITNESS WHEREOF, the Parties have executed this Agreement on the day and year written below.

**Board of Governors of the Colorado State
University System acting by and through
Colorado State University:**

Sponsor:

By: _____

By: _____

Printed Name: _____

Printed Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

**- Proposal -
Stormwater Related Research Services**

Introduction

City of Fort Collins Utilities (City) has requested research services from the Colorado State University (CSU) Urban Water Center to improve the understanding of stormwater management practices within the City. This document is a proposal of several potential research activities that may be conducted by CSU in collaboration with the City during 2016-2017.

Task 1: Performance Monitoring of 700 Wood Street Bioretention Cell

Background

In Spring 2012, the City constructed a bioretention stormwater treatment cell at the Utility Service Center (USC) located at 700 Wood Street to better understand the performance of bioretention systems in Fort Collins. To date, most bioretention performance research has been completed in locations with very different hydrology than Fort Collins (e.g. Wisconsin, North Carolina, Pennsylvania and the Pacific Northwest) and the applicability of the results of those research projects to semi-arid environments such as Colorado is unknown. Given the City's requirement for installing LID-type stormwater facilities for future development, it is important to understand how these facilities will operate in Fort Collins' climate.

CSU has previously monitored this bioretention cell performance during the summers of 2013 and 2014. Prior to the 2014 sampling season, the bioretention cell underdrain system was retrofitted to evaluate how performance is affected by the underdrain design. Results of the modified design showed significantly higher performance in terms of runoff and pollutant reduction. CSU recommends that the the bioretention cell be monitored for at least one more season to collect a sufficient number of data points to improve confidence in the results.

Objectives and Scope of Work

The primary objective of this task is to quantify runoff and pollutant removal achieved by the bioretention cell for multiple precipitation events. To do so, CSU will monitor the quality and quantity of bioretention cell influent and effluent for the 2016 monitoring season (approximately May 1-September 30). Stormwater samples will be submitted to a local laboratory and analyzed for total suspended solids and nutrients (nitrogen/phosphorus). Based on historic precipitation data, we can expect to collect data for about 8 precipitation events during this period; however the actual number may be more or less depending on precipitation and bioretention cell performance. Results of the 2016 monitoring will be documented in a technical memorandum.

Budget

The following table outlines the individual tasks and costs associated with this work.

Task	Labor (\$) ⁽¹⁾	Other Costs (\$)	Subtotal
Bioretention Equipment Installation	\$793	-	\$793
Bioretention Weekly Site Maintenance and Data Collection	\$3962	\$457 ⁽²⁾	\$4419
Bioretention Storm Event Data Collection	\$6340	\$2760 ⁽³⁾	\$9100
Bioretention Final Report	\$1585	-	\$1585
		<i>Subtotal</i>	\$15,897
		<i>F&A*</i>	\$7287
		Total	\$23,184
Notes:			
(1) – Assumes average and current labor rates for Graduate/Undergraduate Students and Research Associate. Labor costs include Graduate Student tuition.			
(2) – Costs for AirGas rentals and various equipment needs			
(3) – Sample analysis: 2 samples per event x 8 events			

Task 2: Winter Runoff Monitoring in Spring Creek

Background

The City Streets Department (Streets) is responsible for keeping major roadways safe and passable, including during winter months when snow and ice hamper travel in roadways. In order to do so, Streets employs the use of various deicing materials (e.g. salt, Apex liquid deicer, etc.) to melt snow and ice so that it runs off of travel lanes. Ultimately, the melted snow/ice and the deicing materials end up in local rivers and streams where the “chemicals” from deicing materials may have detrimental impacts on aquatic life.

Objectives and Scope of Work

The primary objective of this research activity is to assess the potential impact of deicing material applications on aquatic life in Spring Creek. Specifically, chloride concentrations in Spring Creek will be compared to water quality metrics that are known to effect aquatic life. A secondary objective is to estimate the amount of applied deicing material that can result in chloride concentrations exceeding water quality metrics. To accomplish these objectives, CSU will perform the following tasks:

- Install four water quality sondes at strategic locations within Spring Creek to continuously monitoring specific conductance and water depth.
- During deicing/runoff events, collect water quality grab samples in Spring Creek and analyze the samples for chloride
- Using specific conductance/chloride relationship, generate continuous record of chloride concentrations within Spring Creek.

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- Compare the magnitude and duration of chloride concentrations against criteria established for aquatic health.
- Obtain deicing material application data from Streets and calculate the total amount of deicing material applied during each event. Compare amounts against in-stream chloride concentrations.
- All of the above activities will take place from approximately Feb. 1, 2016-May 1, 2016.

The results of this task will be documented in a technical memorandum.

Budget

The following table outlines the individual tasks and costs associated with this work.

Task	Labor (\$) ⁽¹⁾	Other Costs (\$) ⁽²⁾	Subtotal
Monitoring Equipment Installation	\$634	\$760 ⁽²⁾	\$1394
Weekly Equipment Maintenance and Data Collection	\$3170	\$228 ⁽³⁾	\$3398
Deicing GIS Data Analysis	\$5072	-	\$5072
Runoff Event Grab Samples	\$634	\$608 ⁽⁴⁾	\$1242
Bioretention Final Report	\$1585	-	\$1585
		<i>Subtotal</i>	\$12,691
		<i>F&A*</i>	\$5635
		<i>Total</i>	\$18,326
Notes:			
(1) – Assumes average and current labor rates for Graduate/Undergraduate Students and Research Associate. Labor costs include Graduate Student tuition.			
(2) – Equipment refurbishment and materials for installation			
(3) – Calibration fluids and supplies			
(4) – Sample analysis: 4 samples per event x 4 events			

Task 3: Literature Review of Nutrient Sources in Urban Stormwater

Background

The discharge of nutrients (i.e. nitrogen and phosphorus) to receiving waters is a significant problem in Colorado and elsewhere in the US. Recently, the Colorado Department of Public Health and Environment (CDPHE) has promulgated new rules to limit the discharge of nutrients from the urban environment. In terms of urban stormwater discharges, the new rules require targeted education and outreach campaigns to address sources that contribute to nutrient discharges.

In order to conduct a targeted education and outreach campaign, the regulated community (i.e. City) must first know what the primary sources of urban stormwater nutrient discharges are. Potential sources of nutrients in urban stormwater include lawn fertilizers, erosion of native soils, atmospheric deposition, etc. However, the City does not currently have a good understanding of all of the potential sources that may contribute to urban stormwater nutrient discharges.

Objectives and Scope of Work

The objective of this research activity is to identify potential sources of nutrients, and their relative magnitude, in urban stormwater through a review of existing studies. To complete this work, a thorough search will be conducted to identify peer-reviewed studies that have identified, quantified, or otherwise evaluated sources of nutrients in the urban environment. The results of those studies will be summarized and documented in a report submitted to the City.

Budget

The following table outlines the individual tasks and costs associated with this work.

Task	Labor (\$) ⁽¹⁾	Other Costs (\$)	Subtotal
Literature Review and Final Report	\$5713	-	\$5713
		<i>Subtotal</i>	\$5713
		<i>F&A*</i>	\$2544
		<i>Total</i>	\$8257
Notes:			
(1) – Assumes average and current labor rates for Graduate Student and Research Associate. Labor costs include Graduate Student tuition.			

Task 4: Literature Review of Bioretention Media

Background

The City now requires that low impact development (LID) be utilized on all new and re-developments. Bioretention is one LID technique that is being used extensively. Bioretention removes pollutants from stormwater by filtering the stormwater through a “media” that currently consists of sand, compost and shredded mulch. Previous monitoring results performed at the 700 Wood St. bioretention cell suggests that the current media is not very effective at removing nutrients and the City is considering modifying its requirements for bioretention media to increase the removals of nutrients.

As a first step towards modifying the bioretention media requirements, the City would like to determine what other bioretention media are being used and how effective those media are at removing nutrients.

Objectives and Scope of Work

The objective of this research activity is to identify potential bioretention media that could increase the removal of nutrients from urban stormwater. In order to achieve this objective, CSU will identify peer-reviewed studies that have quantified nutrient removal in bioretention cells. The results of those studies (e.g. nutrient removal effectiveness and media) will be summarized in a report submitted to the City.

EXHIBIT A - FORM OF AGREEMENT

Budget

The following table outlines the individual tasks and costs associated with this work.

Task	Labor (\$) ⁽¹⁾	Other Costs (\$)	Subtotal
Literature Review and Final Report	\$5713	-	\$5713
		<i>Subtotal</i>	\$5713
		<i>F&A*</i>	\$2544
		<i>Total</i>	\$8257
Notes:			
(1) – Assumes average and current labor rates for Graduate Student and Research Associate. Labor costs include Graduate Student tuition.			

Potential Addendum Task: Modification of BMP Construction Details

The City is interested in updating its standard BMP construction details to include ultra-urban stormwater BMPs and to modify existing details. At this time, the City is waiting on the completion of a similar effort being conducted by the City/County of Denver and Urban Drainage Flood Control District before it begins its own BMP construction detail updates. Once the Denver/UDFCD effort is completed, the City expects to contract with CSU to review the BMP construction details of Denver, UDFCD and other cities (e.g. Portland, New York) and provide modifications to address Fort Collins-specific stormwater criteria. This work would be funded as an addendum to this scope of work, and the addendum will include a more details scope of work for this activity.

Technical Supervision

This research will be conducted under the primary supervision of Chris Olson, P.E. Chris is a Research Associate III at CSU working under Dr. Sybil Sharvelle. Chris has been managing stormwater research for the City for the past 8 years.

Deliverables and Schedule

Below is a list of deliverables that will be submitted to the City and the proposed schedule for those deliverables:

- Task 1: Bioretention Monitoring Technical Memorandum: June 1, 2016
- Task 2: Winter Runoff Monitoring Technical Memorandum: May 1, 2016
- Task 3: Nutrient Source Literature Review Report: January 31, 2017
- Task 4: Bioretention Media Literature Review Report: January 31, 2017

EXHIBIT A - FORM OF AGREEMENT

Budget**

The following table presents the estimated budget for all services outlined in this proposal.

Task	Subtotal	F&A*	Subtotal
1 – Bioretention Monitoring	\$15,897	\$7287	\$23,184
2 – Winter Runoff Monitoring	\$12,691	\$5635	\$18,326
3 – Nutrient Source Literature Review	\$5713	\$2544	\$8257
4 – Bioretention Media Literature Review	\$5713	\$2544	\$8257
5 – Technical Supervision ⁽¹⁾	\$5503	\$2313	\$7816
Total			\$65,840
(1) – Salary for Research Associate to provide technical supervision of all research activities			

*Indirect Costs: F&A rates are negotiated and approved by the Department of Health and Human Services, Colorado State University's cognizant federal agency. CSU's approved Modified Total Direct Costs (MTDC) rate beginning July 1, 2015 is 50% followed by 51% and 52% in subsequent years. On this proposal, MTDC F&A is applied to direct costs minus GRA tuition. Tuition is a condition of employment for Graduate Research Assistants at Colorado State University.

Colorado State University's Indirect Cost Agreement and Fringe Benefit Rates may be viewed here: <https://vprnet.research.colostate.edu/OSP/facilities-and-administrative-rates-fa/>

**As with all proposal budgets the numbers herein are good-faith estimates based on the best information available at the time of proposal submission, and may be subject to change. University policy dictates that all rates and expenses will be charged at their actual costs or negotiated rates, as applicable, at the time of project performance. University regulations require that all contractual agreements be in place prior to the commencement of any work. Contract language and payment schedules are negotiated through the Office of Sponsored Programs and Colorado State University. Scheduling is determined as contracts are finalized.