DEPARTMENT OF
ECOLOGY
State of Washington

IAA No. C2000041

INTERAGENCY AGREEMENT (IAA)

BETWEEN

THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY

AND

WASHINGTON STATE UNIVERSITY

THIS INTERAGENCY AGREEMENT ("Agreement" or "IAA") is made and entered into by and between the state of Washington, Department of Ecology, hereinafter referred to as "ECOLOGY," and the Washington State University in Puyallup hereinafter referred to as the "WSU" and "CONTRACTOR," pursuant to the authority granted by Chapter 39.34 RCW.

THE PURPOSE OF THIS AGREEMENT is test the effects of hydraulic controls on water quality and hydraulic performance of bioretention with underdrains.

WHEREAS, ECOLOGY has legal authority (RCW 90.48 and WAC 173-220) and WSU has legal authority (RCW 90.48 and WAC 173-220) that allows each party to undertake the actions in this agreement.

THEREFORE, IT IS MUTUALLY AGREED THAT:

1) SCOPE OF WORK

WSU shall furnish the necessary personnel, equipment, material and/or service(s) and otherwise do all things necessary for or incidental to the performance of the work set forth in Appendix A, *Statement of Work and Budget*, attached hereto and incorporated herein. Purchased equipment is owned by WSU.

2) PERIOD OF PERFORMANCE

The period of performance of this IAA shall commence on **August 15, 2019**, (or the date of final signature, whichever comes later,) and be completed by **April 30, 2022**, unless terminated sooner as provided herein. Amendments extending the period of performance, if any, shall be at the sole discretion of ECOLOGY.

3) COMPENSATION

Compensation for the work provided in accordance with this IAA has been established under the terms of RCW 39.34.130 and RCW 39.26.180(3). This is a performance-based agreement, in which payment is based on the successful completion of expected deliverables.

The source of funds for this IAA is **General Fund/ Private-Local account for Stormwater Action Monitoring**. Both parties agree to comply with all applicable rules and regulations associated with these funds.

The parties have determined that the cost of accomplishing the work identified herein will not exceed **$214,480** including any indirect charges. Payment for satisfactory performance of the work shall not exceed this amount unless the parties mutually agree via an amendment to a higher amount. Compensation for services shall be based on the terms and tasks set forth in Appendix A, *Statement of Work and Budget*. ECOLOGY will not make payment until it has reviewed and accepted the completed work.

4) BILLING AND PAYMENT PROCEDURE

Payment requests shall be submitted on state form, Invoice Voucher A19-1A. Invoices shall describe and document to ECOLOGY's satisfaction a description of the work performed, the progress of the work, and related costs. Each invoice voucher shall reference the Agreement (IAA) number and clearly identify those items that relate to performance under this Agreement. Payment will be made within thirty (30) days of submission of a properly completed invoice (form A19-1A) with supportive documentation. All expenses invoiced shall be supported with copies of invoices paid.

Send invoices to:

State of Washington
Department of Ecology
Attn: Brandi Lubliner
P.O. Box 47600
Olympia, WA 98504-7600

Payment requests may be submitted as deliverables are completed or on a monthly basis following completion of deliverables, or at the completion of the work. Upon expiration of this Agreement, any claim for payment not already made shall be submitted to ECOLOGY within 30 days after the expiration date or the end of the fiscal year, whichever is earlier.

Payment will be issued through Washington State's Office of Financial Management's Statewide Payee Desk. To receive payment you must register as a statewide vendor by submitting a statewide vendor registration form and an IRS W-9 form at website, https://ofm.wa.gov/it-systems/statewide-vendorpayee-services. If you have questions about the vendor registration process, you can contact Statewide Payee Help Desk at (360) 407-8180 or email PayeeRegistration@ofm.wa.gov.

5) ALTERATIONS AND AMENDMENTS

This Agreement may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

6) ASSIGNMENT

The work to be provided under this Agreement, and any claim arising thereunder, is not assignable or delegable by either party in whole or in part, without the express prior written consent of the other party, which consent shall not be unreasonably withheld.

7) ASSURANCES

Parties to this Agreement agree that all activity pursuant to this agreement will be in accordance with all the applicable current federal, state, and local laws, rules, and regulations.

8) CONFORMANCE

If any provision of this Agreement violates any statute or rule of law of the state of Washington, it is considered modified to conform to that statute or rule of law.

9) DISPUTES

Parties to this Agreement shall employ every effort to resolve a dispute themselves without resorting to litigation. In the event that a dispute arises under this Agreement that cannot be resolved among the parties, it shall be determined by a Dispute Board in the following manner. Each party to this Agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, agreement terms, and applicable statutes and rules, and then make a determination of the dispute. The determination of the Dispute Board shall be final and binding on the parties hereto, unless restricted by law. The cost of resolution will be borne by each party paying its own cost. As an alternative to this process, if state agencies, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control. The parties may mutually agree to a different dispute resolution process.

10) FUNDING AVAILABILITY

ECOLOGY's ability to make payments is contingent on availability of funding. In the event funding from state, federal, or other sources is withdrawn, reduced, or limited in any way after the effective date and prior to completion or expiration date of this Agreement, ECOLOGY, at its sole discretion, may elect to terminate the Agreement, in whole or part, for convenience or to renegotiate the Agreement subject to new funding limitations and conditions. ECOLOGY may also elect to suspend performance of the Agreement until ECOLOGY determines the funding insufficiency is resolved. ECOLOGY may exercise any of these options with no notification restrictions, although ECOLOGY will make a reasonable attempt to provide notice.

In the event of termination or suspension, ECOLOGY will reimburse eligible costs incurred by the CONTRACTOR through the effective date of termination or suspension. Reimbursed costs must be agreed to by ECOLOGY and the CONTRACTOR. In no event shall ECOLOGY's reimbursement exceed ECOLOGY's total responsibility under the agreement and any amendments.

11) GOVERNING LAW AND VENUE

This Agreement is entered into pursuant to and under the authority granted by the laws of the state of Washington and any applicable federal laws. The provisions of this Agreement shall be construed to conform to those laws. This Agreement shall be construed and interpreted in accordance with the laws of the state of Washington, and the venue of any action brought hereunder shall be in the Superior Court for Thurston County.

12) INDEPENDENT CAPACITY

The employees or agents of each party who are engaged in the performance of this Agreement shall continue to be employees or agents of that party and shall not be considered for any purpose to be employees or agents of the other party.

13) ORDER OF PRECEDENCE

In the event of an inconsistency in the terms of this Agreement, or between its terms and any applicable statute or rule, the inconsistency shall be resolved by giving precedence in the following order:

a. Applicable federal and state of Washington statutes, regulations, and rules.
b. Mutually agreed upon written amendments to this Agreement.

c. This Agreement, number C2000041.
d. Appendix A, *Statement of Work and Budget.*
e. Any other provisions or term of this Agreement, including materials incorporated by reference or otherwise incorporated.

14) RECORDS MAINTENANCE

The parties to this Agreement shall each maintain books, records, documents, and other evidence that sufficiently and properly reflect all direct and indirect costs expended by either party in the performance of the service(s) described herein. These materials shall be subject to inspection, review, or audit by personnel of both parties, other personnel duly authorized by either party, the Office of the State Auditor, and federal officials so authorized by law. All books, records, documents, and other materials relevant to this Agreement must be retained for six years after expiration of this Agreement. The Office of the State Auditor, federal auditors, and any persons duly authorized by the parties shall have full access and the right to examine any of these materials during this period. Each party will utilize reasonable security procedures and protections for all materials related to this Agreement. All materials are subject to state public disclosure laws.

15) RESPONSIBILITIES OF THE PARTIES

Each party of this Agreement hereby assumes responsibility for claims and/or damages to persons and/or property resulting from any act or omissions on the part of itself, its employees, its officers, and its agents. Neither party will be considered the agent of the other party to this Agreement.

16) RIGHTS IN DATA

Unless otherwise provided, data which originates from this Agreement shall be "work made for hire" as defined by the United States Copyright Act, Title 17 U.S.C. section 101 and shall be owned by state of Washington. Data shall include, but not be limited to, reports, documents, pamphlets, advertisements, books magazines, surveys, studies, computer programs, films, tapes, and/or sound reproductions. Ownership includes the right to copyright, patent, register, and the ability to transfer these rights.

17) SEVERABILITY

If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision, if such remainder conforms to the requirements of applicable law and the fundamental purpose of this Agreement, and to this end the provisions of this Agreement are declared to be severable.

18) SUBCONTRACTORS

CONTRACTOR agrees to take complete responsibility for all actions of any Subcontractor used under this Agreement for the performance. When federal funding is involved there will be additional contractor and subcontractor requirements and reporting.

Prior to performance, all subcontractors who will be performing services under this Agreement must be identified, including their name, the nature of services to be performed, address, telephone, WA State Department of Revenue Registration Tax number (UBI), federal tax identification number (TIN), and anticipated dollar value of each subcontract. Provide such information to ECOLOGY's Agreement manager.

19) TERMINATION FOR CAUSE

If for any cause, either party does not fulfill in a timely and proper manner its obligations under this Agreement, or if either party violates any of these terms and conditions, the aggrieved party will give the other party written notice of such failure or violation. The responsible party will be given the opportunity to correct the violation

or failure within fifteen (15) business days. If failure or violation is not corrected, this Agreement may be terminated immediately by written notice of the aggrieved party to the other.

20) TERMINATION FOR CONVENIENCE

Either party may terminate this Agreement without cause upon thirty (30) calendar day prior written notification to the other party. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

21) WAIVER

A failure by either party to exercise its rights under this Agreement shall not preclude that party from subsequent exercise of such rights and shall not constitute a waiver of any other rights under this Agreement unless stated to be such in a written amendment to this Agreement signed by an authorized representative of the parties.

22) AGREEMENT MANAGEMENT

The representative for each of the parties shall be responsible for and shall be the contact person for all communications, notifications, and billings questions regarding the performance of this Agreement. The parties agree that if there is a change in representatives that they will promptly notify the other party in writing of such change, such changes do not need an amendment.

The ECOLOGY Representative is:	The WSU Representative is:
Name: Brandi Lubliner, P.E. Address: P.O. Box 47600 (standard mail) 300 Desmond Dr. SE (UPS or FedEx) Olympia, WA 98504-7600 Phone: 360-407-7140 Email: Brandi.Lubliner@ecy.wa.gov	Name: John Stark, Ph.D. Address: 2606 W Pioneer Ave Puyallup WA, 98371 Phone: 253-445-4568 Email: starkj@wsu.edu

23) ALL WRITINGS CONTAINED HEREIN

This Agreement contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

The signatories to this Agreement represent that they have the authority to bind their respective organizations to this Agreement.

IN WITNESS WHEREOF, the parties below, having read this Agreement in its entirety, including all attachments, do agree in each and every particular as indicated by their signatures below.

State of Washington Department of Ecology	**Washington State University**
By:	By:
Signature Date	Signature Date
Print Name:	Print Name:
Title:	Title:

Approved as to form only:
Office of Attorney General

APPENDIX A
STATEMENT OF WORK AND BUDGET

INTRODUCTION

Bioretention is a common stormwater best management practice (BMP) that may be designed with underdrains to route water back into surface water bodies, particularly in low permeability glacial till soils of Western Washington. There are two fundamentally different ways to control filter bed hydraulics in bioretention cells with underdrains. The traditional approach is to allow the permeability of the installed bioretention soil media (BSM) to be the rate-limiting layer (i.e., media-controlled). An alternative, passive, non-proprietary design approach involves a flow control outlet (e.g., orifice) affixed to the underdrains of the bioretention as the primary hydraulic control in the system (i.e., outlet-control). Washington State Department of Ecology (Ecology) has two stormwater management manuals (one for Western Washington and the other for Eastern Washington) that currently allow either media-controlled or outlet-controlled hydraulic approaches for bioretention with underdrains.

There are concerns that the outlet-controlled approach may be complicated to design and/or susceptible to maintenance issues. Additionally, it has not been studied whether increasing residence times and restricting flow through BSM could have negative effects related to pollutant export or plant health. Finally, the head loss effects associated with water flowing through media upstream of an orifice restriction have not been widely field verified.

This scope of work is to implement an effectiveness study as part of the Stormwater Action Monitoring (SAM) Program designed to address the following primary study questions:

- How does the water quality treatment performance of bioretention differ between outlet-controlled and media-controlled configurations? Does outlet control result in improvements or degradation in treatment performance for the sampled parameters?
- How does outlet-control vs. media-control effect the residence time and residence time distribution of water in the bioretention mesocosm? This will be used as an indicator of potential treatment performance.
- Are any differences in plant health and vigor notable at a mesocosm scale between outlet-controlled and media-controlled designs?
- Does the use of small orifices to facilitate outlet control pose notable operations and maintenance issues compared to standard bioretention BMPs without underdrain outlet controls? Note:orifices used for mesocosms will be in the range of 0.3 inches which is smaller than would be used for full-scale bioretention systems.
- What is the stage discharge relationship of each mesocosm? Is this consistent with theoretical calculations of soil and orifice hydraulics, or do additional effects need to be considered when modeling these configurations?
- How do hydraulic conditions of the systems (i.e., stage-discharge relationships) vary over time and between replicate mesocosms? Does one configuration result in more consistent operation than another?

The following secondary study question will also be addressed:

- Does outlet control improve the degree of hydrologic control provided by a bioretention system, even if not specifically designed to meet MR#7 Flow Control such as for retrofit situations?

The background, activities, deliverables and schedule associated with this study are provided below. Work on these tasks will be performed by Washington State University (WSU) with assistance from Geosyntec Consultants. WSU and Geosyntec Consultants are hereafter referred to as the "Project Team".

PROJECT OVERVIEW

This study is intended to serve as a controlled, side-by-side evaluation of the degree to which the hydraulic control approach influences the performance and maintenance requirements of underdrained bioretention. This study will provide information to permittees to help understand the tradeoffs of these approaches relative to water quality performance, ease of construction (and resilience to construction error), ability to reliably quantify marginal improvements in hydrologic control (even if not designed for full flow control), and O&M needs.

This study will be conducted at a bioretention mesocosm scale using the existing mesocosm research facility at the Washington State University Stormwater Center (WSC) in Puyallup with minor modifications. The mesocosm research facility consists of fourteen individually-monitored bioretention mesocosms approximately 5 feet in diameter. The experimental design is presented in Table 1 and further described in Tasks 2 and 3.

This scope of work describes the first phase of a two-phase project. The second phase of this project is anticipated to be funded in late 2019 or early 2020. The first phase includes startup, completion of the first three monitoring events (of six), and interim reporting. The second phase includes completion of the second half of the monitoring events, a modeling study, and final reporting.

Table 1. Mesocosm experimental design approach

Type	BSM Design Description	Media-Control	Outlet-Control	Research Comparison
Mature Mesocosms	Existing Cells with Existing BSM (60%sand/40%compost) and Mature Plants	3 replicates, 1 with full instrumentation and WQ sampling[2]	3 replicates[1], 1 with full instrumentation and WQ sampling[2]	Effect of outlet control on performance of standard BSM with mature plants
Newly Installed Mesocosms	Newly installed BSM with newly installed plants. Mix characteristics/suppliers will be finalized as part of detailed project planning in consultation with the project technical advisory committee (TAC).	4 replicates[1], 1-2 with full instrumentation and WQ sampling[2]	4 replicates[1], 1-2 with full instrumentation and WQ sampling[2]	Effect of outlet control across a range of newly-installed BSM mixes. Additionally, these cells will have younger plants compared to mature plants in the existing mesocosms.

1 – All replicates will be monitored for hydraulics, vegetation, and maintenance.
2 – A subset of replicates will be monitored for water quality, soil moisture, and conductivity monitoring.

SCHEDULE

Table 2. Task schedule

	2019			2020				2021			
Task Descriptions	2	3	4	1	2	3	4	1	2	3	4
1. Project Planning and QAPP											
2. Installation and Startup											
3. Monitoring Study Implementation (conditioning and first three events)											
4. Modeling Study	Anticipated in second phase										
5. Reporting and Communication of Findings (Interim Reporting only)											

Task 1: Project Planning and QAPP Development (Total Cost $27,266)

The project team will convene a technical advisory committee (TAC) and hold a project Kickoff meeting. The object of this meeting is to refine the study design. The project team will develop a Quality Assurance Project Plan (QAPP) according to Ecology's *Guidelines and Specifications for Preparing Quality Assurance Project Plans for Environmental Studies,* February 2001 (Ecology

Publication No. 01-03-003). The QAPP will utilize substantial elements of the existing QAPP, titled *Low Impact Development Research Program: Mesocosm Performance Monitoring* that was completed for WSU mesocosm research facility in 2010. The TAC will review the QAPP and the project team will revise the QAPP in response to TAC comments. The QAPP will be submitted to Ecology at least four weeks before the scheduled start of any Task 2 activities, to allow time for Ecology review and comments. The final QAPP will be revised to incorporate Ecology comments and to include the details of equipment after the equipment is purchased.

Deliverable 1.1: Meeting notes from project Kickoff meeting with TAC.
$8,000 Target Date: September 15, 2019

Deliverable 1.2: Draft QAPP
$18,266 Target Date: October 15, 2019

Deliverable 1.3: Final QAPP
$1,000 Target Date: November 30, 2019

Task 2: Installation and Startup (Total Cost $80,480)

The project team will modify the mesocosm facility as detailed in the QAPP. This will include installing new BSM and replanting, adding outlet controls, and installing monitoring equipment. Specific activities vary between mesocosm, as summarized in Table 1 and outlined below. For example, some mesocosms will be left in place and some will be rebuilt with new soil and plants. After modifications are completed, the project team will conduct a monitoring startup and calibration event.

The research team will conduct the following activities during this task:

- Confirm the proper functioning and good working condition of components of the existing mesocosm system including:
    - Weir boxes, water level sensors, pumps, distribution piping and other components of the distribution system,
    - Plastic mesocosm structures and piping,
    - Tipping bucket flow meters and associated data loggers,
    - Tipping bucket rain gauge,
    - Autosamplers
- Purchase all new monitoring instruments and data loggers,
- Remove existing BSM and vegetation from eight existing mesocosms, then install new BSM and new plants in these mesocosms,
- Install stilling wells and pressure transducers to measure ponded water level in each of the fourteen mesocosms,
- Install soil moisture sensors in six of the mesocosms,
- Install overflow pipes with V-notch weirs to allow monitoring of overflow rate,

- Install electrical conductivity probes to measure influent and effluent of selected mesocosms to be used as part of tracer studies (optionally rented handheld probes may be used for tracer testing),
- Reconfigure underdrain outlets in seven of the mesocosms with outlet control orifices,
- Install and configure new data loggers to record data from all pressure transducers, conductivity probes, and soil moisture sensors,
- Conduct a monitoring and calibration "dry run" to confirm proper monitoring setup and calibrate sensors.

An Installation and Startup report will be prepared to summarize these activities.

Deliverable 2.1: Table of equipment purchases, and dates received.
$35,000 Target Date: November 15, 2019 (prior to final QAPP)

Deliverable 2.2: Installation photolog
$35,000 Target Date: January 15, 2020

Deliverable 2.3: Installation and Startup Report
$10,480 Target Date: January 31, 2020

Task 3: Monitoring Study Implementation (Total Cost $99,339)

The monitoring period of Phase 1 of the study will be implemented over the course of 12 months following the completion of the installation and startup phase. The following monitoring types will be completed:

Continuous Hydraulic Monitoring: Precipitation, inlet flow, outlet flow, soil moisture, surface ponding depth, overflow, and water temperature will be measured and logged continuously throughout the monitoring period of the project. Table 3 presents anticipated instrumentation for each of these data types. Continuous data will be logged on sub-hourly time intervals. The project team will access and download data on a monthly basis. Continuous hydraulic data will be analyzed to investigate stage-discharge relationships, flow attenuation metrics, and hydraulic treatment capacity. These data will also be used to evaluate trends over time.

Table 3. Continuous monitoring instrumentation

Hydraulic monitoring	Instrumentation	Number of mesocosms
Precipitation	Existing tipping bucket rain gauge	NA
Inlet flow	Water level sensor in distribution cistern	14
Outlet flow	Tipping bucket flow meters	14

Surface ponding, overflow, temperature	Combination water level, temperature, conductivity sensors	6
Soil moisture	Soil moisture sensors	6

Water Quality Sampling: Flow-weighted composite water quality samples (via autosamplers) will be taken and analyzed for three storm events within the monitoring period for up to six mesocosms to characterize influent and effluent concentrations of common stormwater pollutants. Water quality samples will be submitted to an accredited commercial water quality laboratory for analysis of total suspended solids, total phosphorus, orthophosphate, total nitrogen, nitrate + nitrite, total and dissolved zinc and copper, and dissolved organic carbon. Samples will also be field analyzed for pH using a handheld field meter. Storms will be targeted to comply with requirements in the Washington Technology Assessment Protocol – Ecology (TAPE) program. These sampling events will be spread throughout the rainy season to capture a range of storm types.

In-Situ Hydraulic Conductivity Testing: Hydraulic conductivity testing of mesocosms will be conducted two times within the monitoring period for up to six of the mesocosms to characterized initial media bed hydraulics. For these tests, mesocosms will be temporarily configured with outlet standpipes to maintain saturated conditions in the media and water will be pumped onto the surface of the mesocosm at a high enough rate to result in measurable head difference between the ponded water in the mesocosm and the height of the standpipe. Hydraulic observations obtained from standard sensor measurements (e.g., the head differential between ponded water level and standpipe, and the system flowrate) will be used to estimate saturated hydraulic conductivity.

Vegetation Monitoring: Vegetation monitoring will be conducted at two points within the monitoring period to characterize vegetation health in each of the mesocosms. Photographic/visual assessment methods will be used.

O&M Monitoring: Outlet structures will be inspected on a quarterly basis throughout the monitoring period. O&M needs will be documented with photographs and measurements, as applicable.

Tracer Testing of Residence Time Distribution: A conservative tracer consisting of a moderate pulse of salt will be used to characterize residence time distributions within the mesocosms for four to six mesocosms two times during the monitoring period. Tracer testing will be conducted using pumped artificial storm events. Inflow and outflow distributions of conductivity will be measured using electrical conductivity. These data will be interpreted to evaluate the residence time distribution and the relative prevalence of plug flow conditions (under which better treatment is typically achieved) and mixed flow or preferential flow paths, such as macropore flow.

Monitoring will be conducted in the following phases:

- **Establishment Phase**. This phase will immediately follow installation and startup and will allow approximately 3 months for vegetation growth and soil structure development. During this phase runoff will be directed to each mesocosm under passive flow conditions during storm events, but no water quality samples will be collected. Continuous hydraulic data will be collected. O&M observations will be made on a quarterly basis.
- **Normal Operating Phase.** This phase represents the primary research monitoring phase and will be conducted for approximately 9 months (anticipated as April 2020 through December 2020). During this phase, runoff will be continuously routed to each of the mesocosms under passive flow conditions. Continuous hydraulic data will be recorded, and regular O&M observations will also be made. Three water quality sampling events will occur during this phase according to the following tentative scheduled, which depends upon natural rainfall events:
    - **Event #1:** April or May 2020
    - **Event #2:** May or November 2020
    - **Event #3:** December 2020 or January 2021

  An additional three water quality sampling events are anticipated as part of the second phase of this project.
- **Special Testing**. During dry weather periods within the normal operating phase, two hydraulic conductivity, residence time, and vegetation monitoring events will be conducted. The special testing events will be conducted using artificial runoff made by WSC, and will be completed on the following approximate schedule:
    - **Event #1**: April 2020
    - **Event #2**: November 2020

Deliverable 3.1: Progress Report #1 summarizing vegetation establishment, water quality event #1, special testing event #1, and O&M observations.
$40,000 Target Date: June 1, 2020

Deliverable 3.2: Progress Report #2 summarizing water quality event #2 and O&M observations
$30,000 Target Date: July 1, 2020

Deliverable 3.3: Progress Report #3 summarizing water quality event #3, special testing event #2, and O&M observations.
$29,339 Target Date: January 15, 2021

Task 4: Modeling Study (anticipated in second phase of scope)

This section is a placeholder for a task that may be authorized in the second phase of the project.

Task 5: Reporting and Communication of Findings (Total Cost $7,396)

The research team will prepare an interim presentation to be presented to the TAC and then submitted to Ecology.

Deliverable 5.1: Interim Presentation. This presentation will be developed after completion of monitoring event #3. This presentation will be given to the TAC to present interim findings and facilitate discussion regarding the remainder of the project. The interim presentation will include partial, preliminary analysis of study data and partial, preliminary observations. After review by the TAC, the interim presentation will be submitted to Ecology.

$7,396 Target Date: February 2021

BUDGET

Table 4. Effort and Budget by Task

Task	WSC		Geosyntec		Direct Costs	WSC F&A[1]	Total
	Months FTE	Budget	Hours	Budget			
Task 1 - Planning and QAPP	0.5	$4,695	120	$16,944	0	$5,626	$27,266
Task 2 - Install and Startup	1	$9,391	108	$15,250	$40,717	$15,123	$80,480
Task 3 - Study Implementation (first three events)	3.75	$35,215	331	$46,765	$6,510	$10,849	$99,339
Task 4 – Modeling Study	Not part of this phase; anticipated for Phase 2.						
Task 5 – Reporting (interim reporting only)	0.1	$939	44	$6,213	$0	$244	$7,396
Project Total	**5.35**	**$50,240**	**603**	**$85,172**	**$47,227**	**$31,841**	**$214,480**

1 - WSU Facilities and Administration for State-funded projects is 26%. Does not apply to subcontractor costs after first $25,000.

PROJECT MANAGEMENT

This project will be collaboratively executed by the Washington Stormwater Center and Geosyntec Consultants. John Stark of the Washington Stormwater Center will be the sole point of the contact for all contract-related matters. All invoices and deliverables will be sent from WSC to the Department of Ecology per the instructions in this agreement. John Stark, Myles Gray, and Aaron Poresky are each authorized to be points of contact for project execution, including coordination of meetings and technical communication. Division of scope assignments between WSC and Geosyntec will be described in a separate subcontractor agreement.