



DEPARTMENT OF  
**ECOLOGY**  
State of Washington  
**AMENDMENT NO.1**

TO  
CONTRACT NO. 1500070  
BETWEEN THE  
STATE OF WASHINGTON DEPARTMENT OF ECOLOGY  
AND  
KING COUNTY

PURPOSE: To amend the Agreement between the Department of Ecology, hereinafter referred to as 'ECOLOGY' and, KING COUNTY, hereinafter referred to as 'KING COUNTY' or 'CONTRACTOR'.

IT IS MUTUALLY AGREED the agreement is amended as follows:

- 1) The agreement is amended as follows. Deletions are indicated with strikethrough (~~strikethrough~~), additions are indicated by a double underline (double underline):

**1) PERIOD OF PERFORMANCE**

Subject to its other provisions, the period of performance of this IAA shall commence on **October 30, 2014**, or date of final signature, whichever comes later, and be completed by ~~January 31, 2019~~ March 31, 2018, unless terminated sooner as provided herein. Amendments extending the period of performance, if any, shall be at the sole discretion of ECOLOGY.

**2) COMPENSATION**

Compensation for the work provided in accordance with this IAA has been established under the terms of Washington state law, and in accordance with Governor's Executive Order 10-07 and RCW 39.26.180(3). This is a performance-based contract, in which payment is based on the successful completion of expected deliverables. The parties have determined that the cost of accomplishing the work herein will not exceed ~~\$584,024.00~~ 469,568.00. Payment for satisfactory performance of the work shall not exceed this amount unless the parties mutually agree to a higher amount. Compensation for services shall be based on the terms set forth in accordance with the tasks listed in Appendix A, Statement of Work and Budget, which is attached hereto and incorporated herein. ECOLOGY will not make payment until it has reviewed and accepted the completed work.

- 2) Appendix A is amended as follows. Deletions are indicated with strikethrough (~~strikethrough~~), additions are indicated by a double underline (double underline):

## APPENDIX A

### STATEMENT OF WORK

#### Effectiveness of Stormwater Retrofits for Treating Highway Runoff to Echo Lake

##### A. BACKGROUND

There is a need for regional field studies to monitor potential water quality improvements in a receiving water body in response to stormwater retrofits designed to SWMMWW standards. The following question proposed by the Stormwater Work Group will be addressed by this study: Which combinations of retrofit BMPs and LID in a basin are most effective at reducing stormwater impacts in receiving waters? To address this question, the following hypotheses are proposed:

1. Stormwater retrofits along the Aurora corridor will effectively remove contaminants from highway runoff.
2. Stormwater retrofits along the Aurora corridor may result in measureable water quality improvements in the receiving water body, Echo Lake.

These hypotheses will be evaluated by comparing contaminant concentrations before and after treatment in individual features, and comparing pre- and post-retrofit contaminant concentrations in the combined stormwater system and in the ambient waters of Echo Lake. The retrofit includes bioretention planters (built to 2005 SWMMWW specifications), Filterra® (providing phosphorus treatment) and a corrugated metal pipe underground detention system that incorporates all stormwater (treated and untreated) before the Echo Lake outfall.

##### Short-term Outcomes:

- ~~Effectiveness~~ Measure effectiveness of retrofitted stormwater BMPs in removal of suspended solids, nutrients, bacteria, total and dissolved metals, diesel and motor oil range hydrocarbons, polycyclic aromatic hydrocarbons (PAHs) and PCBs from highway runoff. Toxicity reduction will also be considered.
- ~~Effectiveness~~ Measure effectiveness of a functioning retrofitted stormwater BMP in reducing stormwater flow rates delivered to a receiving water body.
- Measure possible benefits to receiving water quality (nutrients and bacteria) from a collective stormwater retrofit project.

##### Long-term Outcomes:

The results of this project can be used to guide recommendations and requirements in future SWMMWW. Results can also be used to refine expectations about the performance of stormwater treatment facilities. Furthermore, these results could help inform the design of future stormwater retrofits in urban areas and provide guidance for future effectiveness studies.

The remainder of this scope of work describes for each task the work to be completed with the total estimated cost and schedule. Note that the schedule is dependent on the date of signature of the project Interagency Agreement between the COUNTY and ECOLOGY, and construction completion, and is subject to change. Deliverables not requiring ECOLOGY approval (e.g., agendas, data summary tables, photos) will be delivered only as part of a semi-annual billing package as needed to provide documentation of work performed (i.e., "Documenting Progress" deliverables shown below). "Documenting Progress" deliverables will be delivered in the month following period end (i.e., January and July). Deliverables needing ECOLOGY approval will be submitted as completed. All deliverable costs are included within the cost of each task. Target budget percentages are estimates and do not represent a maximum allowable limit. Amounts billed above these estimates will be not result in an increase in total project cost.

## B. SCOPE OF WORK

### **Task 1.0: Planning – (~~\$49,217~~ 56,680; ~~October 2014 – January~~ May 2015)**

This task will include project team meetings for project design planning and delegation, status updates, and problem-solving. The planning phase will also include King County Environmental Lab (KCEL) field and lab staff coordination on sampling and analysis phases of the project, site visits, and equipment purchasing. The final project design details will be described in a quality assurance project plan (QAPP) following ECOLOGY guidance. A draft QAPP will be reviewed by King County and City of Shoreline and one final draft QAPP will be reviewed by ECOLOGY (target date: ~~December 2014~~ March 2015). After revision based on the ECOLOGY review, a final QAPP will be submitted to ECOLOGY for approval.

#### Deliverables:

D 1.1: Documenting Progress – Target: January 2015; target budget ~~30~~ 10% of task total

*This deliverable may include: results from discussions with KCEL staff on sampling and analysis (i.e., draft summary tables of sample numbers by station, equipment needs and analytical methods), photos from site visits, etc. to document progress during the prior 6-month period.*

D 1.2: Documenting Progress – Target: July 2015; target budget ~~40~~ 30% of task total  
*See deliverable description above.*

D 1.3: Draft QAPP – Target: ~~December 2014~~ March 2015; target budget 45% of task total

D 1.4: Final QAPP – Target: ~~January~~ May 2015; target budget 15% of task total

*If the target completion date is not met, interim documentation of progress during the prior six months will include: draft summary tables of sample numbers by station, equipment needs and analytical methods, photos from site visits, review comments on draft text, etc., as completed.*

### **Task 2.0: Field Sampling and Analysis – (~~\$249,254~~, ~~January~~ \$271,522, ~~February 2015 – September~~ December 2016)**

~~This task will include inlet and outlet sampling at six bioretention features (one storm season) and the detention tank system, where flow will also be monitored (two storm seasons). Composite grab samples will be collected with peristaltic pumps at all sites for 6 to 8 storms per season, unless preliminary flow monitoring at the detention tank system suggests it is a long term detention system. If the retention time is in the order of hours the Technology Assessment Protocol Ecology (TAPE) protocol for Long Detention Best Management Practice (BMP) Monitoring should be followed at the inlet and outlet of this feature, at which point Optional~~

Task 7.0 would be implemented for both sampling seasons. KCEL will conduct all chemical and toxicity analysis, except PCBs will be analyzed by a contract laboratory.

Flow meters will be installed at the inlet and outlet of the detention tank system and will record continuous flow from installation (target date: February 2015) through the end of the sampling period (approximately June 2016). This task also includes inlet and outlet sampling at six bioretention features (four rain gardens and two Filterra) and the detention tank system in the 2015/2016 storm season, after construction of the Aurora Corridor from 192<sup>nd</sup> to 200<sup>th</sup> St. is complete. At the six bioretention features, composite grab samples will be collected with peristaltic pumps at each inlet and outlet for 6 to 8 storms. Flow-weighted samples will be collected at the inlet and outlet of the detention tank system using ISCO autosamplers for 12 to 14 storms. The KCEL will conduct all chemical and toxicity analysis, except PCBs which will be analyzed by a contract laboratory.

Deliverables:

D 2.1: Documenting Progress – Target: July 2015; target budget 30 05% of task total  
*This deliverable will include: flow data summary to document progress during the prior 6-month period.*

D 2.2: Documenting Progress – Target: January 2016; target budget 15% of task total  
*See deliverable description above.*

D 2.3: Documenting Progress – Target: July 2016; target budget 40% of task total  
*See deliverable description above.*

D 2.2: Documenting Progress – Target: January 2016; target budget 10% of task total  
*This deliverable will include: flow data summary to document progress during the prior 6-month period. If construction is complete, and samples collected, this deliverable will include the components described in deliverable D 2.3.*

D 2.3: Documenting Progress – Target: July 2016; target budget 60% of task total  
*This deliverable will include: flow data summary, a record of any maintenance visits, summaries of quantity of samples collected at each location, status of sample analysis by analytical group, status of toxicity tests, and unvalidated data from KCEL or contract laboratory, if available, to document progress during the prior 6-month period.*

D 2.4: Documenting Progress – Target: January 2017; target budget 15 25% of task total  
*See deliverable description above (D 2.3).*

**Task 3.0: Summary of Echo Lake Historical Data – (\$12,274, July –November 2015)**

This purpose of this task is to summarize all existing pre-retrofit ambient water quality data to establish the baseline for Echo Lake. This will include compiling nutrient and bacteria data from the King County database, organizing and summarizing the historical data in preparation for analyzing changes in Echo Lake water quality as it relates to changes in the stormwater system. A draft technical memo will be reviewed by the COUNTY and City of Shoreline and a final draft memo will be reviewed by ECOLOGY. The final technical memo will be submitted for approval by ECOLOGY.

Deliverables:

D 3.1: Draft Historical Data Summary Memo – Target: September 2015; target budget: 75% of task total

D 3.2: Final Historical Data Summary Memo – Target: November 2015: target budget; 25% of task total

**Task 4.0: Final Report – (~~\$87,564~~, July 83,433, August 2016 – July 2017)**

This task will include data management (storing data in a secure database and organizing data for analysis), data validation for KCEL data (conducted by project manager) and data validation for PCB data (conducted by an outside contractor). This will also include data analysis (comparing inlet and outlet concentrations, flow and toxicity) and summarizing data for use in the final report. The final report will describe the study design, field and laboratory methods, data analysis methods and findings of the study. A draft report will be reviewed by the COUNTY and City of Shoreline and a final draft will be reviewed by ECOLOGY. The final report will be submitted for approval by ECOLOGY.

Deliverables:

- D 4.1: Documenting Progress – Target: January 2017; target budget: 50% of task total  
*This deliverable will include: an outline for the entire report, summary data tables, draft figures, data analysis and completed draft text sections.*
- D 4.2: Draft Report – Target: May 2017; target budget: 35% of task total
- D 4.3: Final Report – Target: July 2017; target budget: 15% of task total  
*If the target completion date is not met, interim documentation of progress during the prior six months will include: data analysis and completed draft text sections not submitted in January 2017, review comments on draft report components, final data tables, final figures, and completed final text sections.*

**Task 5.0: Distribution of Findings – (~~\$12,454~~ 12,320, January 2017 – December 2017)**

This task will include EIM submittal for ambient lake data, National BMP database submittal for system data, at least two presentations of results to permittees and other interested parties, and the development of a project website to provide electronic access to project documents and results.

Deliverables:

- D 5.1: Ambient lake data submitted to EIM – Target: December 2017;  
target budget: 20% of task total
- D 5.2: System data submitted to National BMP Database – Target: December 2017;  
target budget: 30% of task total
- D 5.3: Copies of presentations – Target: December 2017; target budget: 30% of task total
- D 5.4: Posting of QAPP to project website – Target: June 2015;  
target budget: 13% of task total
- D 5.5: Posting of Historical Data Memo to project website – Target: December 2015;  
target budget: 2% of task total
- D 5.6: Posting of Final Report to project website – Target: December 2017;  
target budget: 5% of task total

**Task 6.0: Project Management – (~~\$33,143~~ 33,339, Throughout Project)**

This task will take place throughout the project and include coordination with KCEL staff in the field and laboratory (this will be critical during Tasks 1.0 and 2.0), budget management and staff management. Semi-annual project reports will be created and submitted to ECOLOGY to communicate project status.

Deliverables:

- D 6.1: Semi-annual Project Report – ~~January~~ July 2015; target budget: 15 ~~30~~% of task total
- D 6.2: Semi-annual Project Report – ~~July 2015~~ January 2016; target budget: 20% of task total
- D 6.3: Semi-annual Project Report – ~~January~~ July 2016; target budget: 15% of task total
- D 6.4: Semi-annual Project Report – ~~July 2016~~ January 2017; target budget: 10% of task total
- D 6.5: Semi-annual Project Report – ~~January~~ July 2017; target budget: 10% of task total
- D 6.6: Semi-annual Project Report – ~~July~~ December 2017; target budget: 15% of task total
- D 6.7: Semi-annual Project Report – ~~December 2017~~; target budget: 15% of task total

**Task 7.0: Optional Sampling Following TAPE Protocol for Long Detention BMP Monitoring – (Additional \$140,118, January 2015 – September 2016)**

This task will be implemented if the initial flow monitoring at the detention tank system inlet and outlet suggests a retention time of several hours. For both sampling seasons, flow-weighted autosamplers will be used at the detention tank system for 12 to 14 storms each season. TAPE protocol for Long Detention BMP Monitoring will be followed for sampling methods and data analysis. KCEL will conduct all chemical and toxicity analysis, except PCBs will be analyzed by a contract laboratory.

The COUNTY will notify the RSMP coordinator if this condition is met. RSMP coordinator will then notify the COUNTY to begin work on Task 7. If the RSMP coordinator does not give approval to begin work on Task 7 the COUNTY will not receive compensation from ECOLOGY for this task.

Deliverables:

- D 7.1: Documenting Progress – Target: July 2015; target budget: 35% of task total  
*This deliverable will include: summaries of quantity of samples collected at each location, status of sample analysis by analytical group, unvalidated data from KCEL or contract laboratory, if available, to document progress during the prior 6-month period.*
- D 7.2: Documenting Progress – Target: January 2016; target budget: 15% of task total  
*See deliverable description above.*
- D 7.3: Documenting Progress – Target: July 2016; target budget: 35% of task total  
*See deliverable description above.*
- D 7.4: Documenting Progress – Target: January 2017; target budget: 15% of task total  
*See deliverable description above.*

C. SCHEDULE DETAIL BY TASK

Schedule for Tasks and Deliverables	2014	2015		2016		2017	
	Q3/Q4	Q1/Q2	Q3/Q4	Q1/Q2	Q3/Q4	Q1/Q2	Q3/Q4
<b>Task 1.0 – Planning</b>							
D 1.1 Documenting Progress	■						
D 1.2 Documenting Progress		■					
D 1.3 Draft QAPP		■					
D 1.4 Final QAPP		■					
<b>Task 2.0 - Field Sampling and Analysis</b>							
D 2.1 Documenting Progress		■					
D 2.2 Documenting Progress			■				
D 2.3 Documenting Progress				■			
D 2.4 Documenting Progress					■		
<b>Task 3.0 – Summary of Echo Lake Historical Data</b>							
D 3.1 Draft Memo			■				
D 3.2 Final Memo			■				
<b>Task 4.0 – Final Report</b>							
D 4.1 Documenting Progress					■		
D 4.2 Draft Report					■	■	
D 4.3 Final Report							■
<b>Task 5.0 – Distribution of Findings</b>							
D 5.1. Ambient data submitted to EIM							■
D 5.2 System data submitted to database							■
D 5.3 Copies of presentations							■
D 5.4 Posting of QAPP to website		■					
D 5.5 Posting of Memo to website			■				
D 5.6 Posting of Final Report to website							■
<b>Task 6.0 – Project Management</b>							
D 6.1 Semi-annual Project Report		■					
D 6.2 Semi-annual Project Report			■				
D 6.3 Semi-annual Project Report				■			
D 6.4 Semi-annual Project Report					■		
D 6.5 Semi-annual Project Report						■	
D 6.6 Semi-annual Project Report							■
D 6.7 Semi-annual Project Report							■
<b>Task 7.0 – Optional TAPE Protocol for Long Term Detention BMP Monitoring</b>							
D 7.1 Documenting Progress		■					
D 7.2 Documenting Progress			■				
D 7.3 Documenting Progress				■			
D 7.4 Documenting Progress					■		

**D. BUDGET DETAIL BY TASK**

	Task 1.0	Task 2.0	Task 3.0	Task 4.0	Task 5.0	Task 6.0	Optional Task 7.0	Totals (with Task 7.0)
King County WLR salary & benefits	\$22,512	-	\$9,819	\$67,630	\$9,963	\$25,693	NA	\$135,617 (same)
City of Shoreline salary & benefits	\$1,427	-	-	\$927	-	\$1,027	NA	\$3,381 (same)
KCEL Laboratory Analyses	-	\$163,587	-	-	-	-	\$20,345	\$163,587 (\$183,932)
Subcontracts	-	\$42,000	-	\$2,100	-	-	NA	\$44,100 (same)
Field Equipment	\$19,650	-	-	-	-	-	\$9,000	\$19,650 (\$28,650)
KCEL Field Labor	-	\$43,667	-	-	-	-	\$110,773	\$43,667 (\$154,440)
King County WLR staff indirect costs	\$5,628	-	\$2,455	\$16,907	\$2,491	\$6,423	NA	\$33,904 (same)
<b>Total Task</b>	<b>\$49,217</b>	<b>\$249,254</b>	<b>\$12,274</b>	<b>\$87,564</b>	<b>\$12,454</b>	<b>\$33,143</b>	<b>\$140,118</b>	<b>\$443,906 (\$584,024)</b>

NA = No additional cost.

(Revised)

	Task 1.0 Planning	Task 2.0 Sampling & Analysis	Task 3.0 Historical Data	Task 4.0 Final Report	Task 5.0 Distrib. Of Findings	Task 6.0 Proj. Mgmt.	Totals
King County WLR salary & benefits	\$23,064	-	\$9,819	\$65,477	\$9,856	\$26,671	\$134,887
KCEL Laboratory Analyses	-	\$138,972	-	-	-	-	\$138,972
Subcontracts	-	\$40,250	-	\$1,587	-	-	\$41,837
Field Equipment	\$27,850	-	-	-	-	-	\$27,850
KCEL Field Labor	-	\$92,300	-	-	-	-	\$92,300
King County WLR staff indirect costs	\$5,766	-	\$2,455	\$16,369	\$2,464	\$6,668	\$33,722
<b>Total Task</b>	<b>\$56,680</b>	<b>\$271,522</b>	<b>\$12,274</b>	<b>\$83,433</b>	<b>\$12,320</b>	<b>\$33,339</b>	<b>\$469,568</b>