

APPENDIX A: STATEMENT OF WORK

Business Inspection Stormwater Source Control Effectiveness Study and IDDE Data Compilation, Review, and Evaluation for Washington State Department of Ecology Regional Stormwater Monitoring Program City of Lakewood, Washington

Introduction

This scope of work is to implement a regional business inspection stormwater source control effectiveness study as part of the Regional Stormwater Monitoring Program (RSMP). The background of the study and activities associated with developing the scope of work for the study are provided below. An additional task is included in this scope of work at the request of Ecology to compile, review, and (optionally) evaluate illicit discharge detection and elimination (IDDE) data submitted to Ecology by of the Phase I and Phase II Western Washington Municipal NPDES National Pollutant Discharge Elimination System (NPDES) Stormwater permittees. Attached to this document is the cost estimate associated with this scope of work.

Background

This business inspection stormwater source control effectiveness study (source control study) is based on a proposal to Ecology and the Stormwater Work Group (SWG) by the City of Lakewood (Lakewood) to study stormwater source control data and activities at small businesses and on commercial properties in western Washington. The proposal, dated April 28, 2014, was prepared in cooperation with Cardno Government Services environmental consultants (Cardno). The proposal was approved for funding by the SWG and Ecology as one of several effectiveness studies intended to support permittees through the RSMP.

The source control study was presented in three parts in the proposal. Ecology as the RSMP administrator is seeking to contract this effectiveness study in phases; thus, the focus of this scope is part one - analysis of existing data. Scoping and estimating costs for the other two study components – developing a coordinated inspection framework and publishing and presenting the results – will occur at a later stage. The objective and study design of part one are as follows.

Part 1 Objective: Provide NPDES Municipal permittees with regional information to help improve their business inspection programs by answering the source control effectiveness questions related to stormwater source control activities. Topics include focusing on commercial property owners versus business owners, compliance rates, inspection frequency of stormwater treatment and control facilities, use of best management practices (BMP), and barriers to BMP implementation.

Part 1 Study Design: Compile and analyze data from existing NPDES permittees' inspection programs that include stormwater source control information from businesses and on commercial properties in western Washington.

The source control effectiveness questions referred to in the objective are from the SWG's Effectiveness Studies subgroup. The questions are in the table below and include two main questions and four sub-questions related to stormwater source control at existing sites in western Washington:

Source Control Effectiveness Questions from the Stormwater Work Group

Topic	Recommended questions for 2014-2108 RSMP effectiveness studies
<p><u>Source control:</u> inspections of existing sites</p>	<ul style="list-style-type: none"> • What is the optimum frequency of inspections to maintain the functionality of stormwater treatment and control facilities and ensure the proper use of source control BMPs at businesses? <ul style="list-style-type: none"> ○ Which is more effective for specific high value BMPs: focusing on the property owners or focusing on the business owners, or a combination of the two? <ul style="list-style-type: none"> ▪ Target both structural and operational BMP types, and situations where a business owner is and is not cooperative and willing. ○ Which required BMPs were implemented based upon follow up inspection? Which optional BMPs were installed based upon follow up inspection? ○ What were the primary barriers to not adopting or installing BMPs? ○ Address the connection between in-person visits and source control BMPs, and identify situations where technical assistance and/or follow-up inspections are needed to ensure required BMPs are implemented. <ul style="list-style-type: none"> ▪ Gather data about percent compliance. Partner with LSC to do this study. • Are stormwater source control inspections more effective if combined with other types of inspections? How can coordination of inspections be improved or better organized regionally for referral of issues to the correct entity?

Task 1. Identify Data Requirements, Prepare Survey, Assemble Technical Advisory Committee

Task 1 is for identifying the likely data available for the project, preparing a survey and an initial data analysis plan, and requesting data from western Washington jurisdictions about their small business and private facility stormwater inspection programs. Data received will be organized and securely stored on a computer network. In addition, jurisdictional representatives will be invited to participate in a technical advisory committee (TAC) to provide input and review of project work.

1. Subtasks

- 1.1. Write description for the study's TAC, including purview, anticipated activities, and schedule. In coordination with Ecology, invite jurisdictional representatives to participate in the TAC. Follow-up with jurisdictions and identify members of TAC.
- 1.2. Prepare a draft study design and data analysis plan to help ensure that compiled data can be properly analyzed for answering the effectiveness questions. The design will include a list of likely data available from permittees (based on permit requirements and preliminary information known about regional and local jurisdiction's inspection programs), expected

ranges of values, data quality objectives (DQOs), a draft database design, and draft data analysis procedures to address the effectiveness questions.

- 1.3. Prepare draft survey for permittees with approximately 20 questions about municipal stormwater inspection programs. Survey questions will be designed to align with the draft study design and data analysis plan.
- 1.4. Prepare letter (to accompany survey) to explain the study background and goals and request stormwater source control data from western Washington permittees.
- 1.5. Coordinate with Ecology to obtain contact information for municipal NPDES permittees in western Washington who have inspection programs that include stormwater source control assessment.
- 1.6. Arrange for a review of the draft study design and data analysis plan, draft survey, and draft cover letter by the TAC and approval by Ecology.
- 1.7. Prepare revised study design and data analysis plan.
- 1.8. Prepare final survey and cover letter.

Deliverables	Subtasks Included	Cost	Target date
1.1 Description of TAC and list of TAC members.	1.1	\$2,026.42	5/22/15
1.2 Draft study design and data analysis plan.	1.2	\$3,686.42	6/2/15
1.3 Draft survey and cover letter.	1.3, 1.4, 1.5, 1.6	\$7,785.69	6/2/15
1.4 Revised study design and data analysis plan.	1.7	\$2,366.42	7/3/15
1.5 Final survey and cover letter.	1.8	\$2,346.42	7/3/15
	Total Cost	\$18,211.38	

Assumptions

- The proposed schedule assumes consultant work on project begins by May 4, 2015.
- Ecology will provide input on identifying TAC members.
- A member of the TAC will be identified to be a third party liaison to the SWG to report on the project's progress and provide review comments on content deliverables to the RSMP coordinator.
- Review of draft study design and data analysis plan, draft survey, and draft cover letter by TAC and Ecology will take up to two weeks.
- The draft study design and data analysis plan will be revised per comments by the TAC and Ecology. The final data analysis procedures will be prepared after reviewing the data (see Task 3).

Task 2. Request and Compile Data

Task 2 is for transmitting the final survey and cover letter with the request for data to the NPDES permittees, tracking the receipt of data and survey results, and transmitting the survey results and raw data files to Ecology.

2. Subtasks

- 2.1. Transmit survey and cover letter with data request to each permittee in western Washington with an inspection program that includes stormwater source control assessment.

- 2.2. Track data receipt progress and follow-up with jurisdictions by phone and email. Confirm receipt of survey, encourage delivery of data for study, and ask questions about data received.
- 2.3. Organize and store all transmitted data received in response to survey on secure computer network.

Deliverables	Subtasks Included	Cost	Target date
2. Completed survey results in spreadsheet format with list of survey respondents and a copy of the raw data files transmitted by permittees (digital copy of permittee datasets).	2.1, 2.2, 2.3	\$9,405.78	8/31/15

Assumptions

- Data sent by permittees in response to the data request will be in electronic format from existing databases (preferred) and/or scanned files of field notes or other forms completed during source control assessments.

Task 3. Create Database, Review Data, Update Data Analysis Procedure

Task 3 is for reviewing permittees' data received in response to the data request, transforming data as needed to be comparable across jurisdictions, and creating and populating a database to facilitate data analysis. This task will also include preparing a technical memo that will describe the data quality, the data review process, the database parameters, and a final data analysis plan.

3. Subtasks

- 3.1. Review data sent by jurisdictions and identify issues and unexpected fields or data values.
- 3.2. Where applicable, transform data (i.e. qualitative information to quantitative values) for comparable numerical analysis.
- 3.3. Assemble comprehensive dataset from data sent by permittees.
- 3.4. Create and populate a database in Microsoft Access®. Database development will include:
 - 3.4.1. Consistent set of data fields with clear definitions (data key).
 - 3.4.2. Tables to logically group like data together and organize tables around useful fields for addressing the effectiveness questions.
 - 3.4.3. Data entry/import form to transcribe qualitative data and metadata from survey.
 - 3.4.4. Queries based on proposed data analysis procedures.
- 3.5. Verify functionality of database and test associated reports, queries, and tables.
- 3.6. Update the description of the data analysis procedures (from Task 1) based on information learned from reviewing the data and creating the database.
- 3.7. Prepare a draft technical memo that summarizes the process of reviewing the data, preparing the database, the final data analysis procedures, and issues encountered. The memo will be reviewed by the TAC and Ecology.
- 3.8. Prepare final database and technical memo.

Deliverables	Subtasks Included	Cost	Target date
3.1 Draft technical memo about the data review process, the database, and the updated data analysis procedures.	3.1, 3.2, 3.6, 3.7	\$21,705.69	10/16/15
3.2 Access database.	3.3, 3.4, 3.5	\$18,179.27	11/30/15
3.3 Final technical memo.	3.8	\$5,806.42	11/20/15
	Total Cost	\$45,691.38	

Assumptions

- A robust dataset will be obtained through the participation of the vast majority of western Washington permittees who have data on stormwater source control.
- Final selection of data fields will be based on available data, data quality, and the source control effectiveness questions.
- Review of technical memo by TAC and Ecology will take up to two weeks.

Task 4. Analyze and Summarize Data

Task 4 is for analyzing the data received from western Washington NPDES permittees. Data analysis will focus on addressing the source control effectiveness questions.

4. Subtasks

- 4.1. Write R scripts for statistical evaluation of data based on the final data analysis procedures identified in Task 3.
- 4.2. Prepare data for statistical analysis, run statistical analysis, and organize results.
- 4.3. Prepare graphs, tables, and diagrams to summarize the data analysis and trends observed.
- 4.4. Write technical memo to briefly explain the preliminary data results. The memo will be reviewed by the TAC and Ecology.

Deliverables	Subtasks Included	Cost	Target date
4. Technical memo with preliminary graphs, tables, and diagrams summarizing the data analysis results.	4.1,4.2, 4.3, 4.4	\$29,386.13	1/8/16

Assumptions

- Review of technical memo by TAC and Ecology will take up to two weeks.
- The results of revisions to the data analysis steps (from comments on the technical memo) will be transmitted to Ecology and the TAC as part of the draft report (see Task 5).

Task 5. Write Report

Task 5 is for preparing a report that summarizes the final data analysis procedures and results, addresses the data quality, and articulates answers to the effectiveness questions to the extent possible from the data analysis. The draft report will be reviewed by the TAC and Ecology, and a final report will be prepared

incorporating the review comments. The final report will be transmitted to Ecology as the final deliverable for this phase of the project.

5. Subtasks

- 5.1. Revise and/or add data analysis steps based on comments on technical memo.
- 5.2. Evaluate results of data analysis and identify answers to effectiveness questions.
- 5.3. Write draft report. Update graphs, tables, and diagrams to summarize the final data analysis performed. The draft report will be reviewed by the TAC and Ecology.
- 5.4. Edit report into final stage and submit to Ecology.

Deliverables	Subtasks Included	Cost	Target date
5.1 Draft report.	5.1, 5.2, 5.3	\$23,747.49	2/15/16
5.2 Final report.	5.4	\$7,695.83	3/21/16
	Total Cost	\$31,443.33	

Assumptions

- Review of draft report by the TAC and Ecology will take up to two weeks.

Task 6. Coordinate Technical Advisory Committee

Task 6 is for coordinating the activities and meetings of the project Technical Advisory Committee (TAC). Up to four meetings of the TAC are expected to occur to discuss comments on deliverables in Tasks 1 through 5 and to provide general guidance and input on the project progress.

6. Subtasks

- 6.1. Coordinate, facilitate, and attend up to four TAC meetings to discuss project progress, review comments on deliverables, and provide adaptive guidance to project design.
- 6.2. Prepare and distribute agendas and meeting materials prior to TAC meetings and minutes following each meeting.

Deliverables	Subtasks Included	Cost	Target date
6.1 Agenda and minutes for first TAC meeting.	¼ of 6.1 and 6.2	\$3,961.47	6/16/15
6.2 Agenda and minutes for second TAC meeting.	¼ of 6.1 and 6.2	\$3,961.47	11/2/15
6.3 Agenda and minutes for third TAC meeting.	¼ of 6.1 and 6.2	\$3,961.47	1/25/16
6.4 Agenda and minutes for fourth TAC meeting.	¼ of 6.1 and 6.2	\$3,961.47	2/2/16
	Total Cost	\$15,845.86	

Assumptions

- TAC meetings are likely to occur at City of Lakewood offices, although TAC members will be requested to host meetings to get broader participation.
- It is expected that TAC meetings will occur in person but some may occur by conference call if possible depending on TAC members' availability and the agenda for each meeting.

Task 7. Compile, Review, and Evaluate Illicit Discharge Detection and Elimination (IDDE) Data from Permittees

Task 7 is for a separate task not associated with the source control study and the effectiveness questions. This task is included in this scope of work at the request of the SWG Source Identification Information Repository (SIDIR) to compile, review, and evaluate data received by Ecology of IDDE incident tracking as reported by NPDES Municipal Stormwater permittees (per Phase I section S5C.8 and Phase II section S5.C.3). The data compilation and review will focus on the quality and usability of the data submitted by permittees in the 2014 annual reports (question 48 for Phase Is and question 20 for Phase IIs) for conducting regional analyses to inform stormwater management programs. The questions to be answered for the data compilation and review efforts include:

- How is Ecology receiving this data?
- What methods are people using to report this information?
- How many permittees submitted their data in spreadsheet or database output format that is easily incorporated in a single database for regional analysis?
- How many submitted pdfs or other formats that will require hand entry and what level of effort will be required to enter those data into the regional database?

The data compilation and review will result in a report on the metadata and describe a plan for completing the dataset and conducting the ensuing data evaluation. A report of the findings from the data compilation and review will be prepared for review by Ecology and the SIDIR committee.

An additional set of optional subtasks for data evaluation will be approved dependent upon the outcome of the initial data compilation and assessment. The optional data evaluation subtasks will include analysis of the data and presenting findings at a workshop for permittees on a date to be determined (estimated to occur in late 2015).

7. Subtasks: Review and Compile Data, Create Database, Summarize Data, and Prepare Data Summary Report

- 7.1 Download and compile the IDDE data submitted by permittees as spreadsheet or character-delimited files. Data will be obtained via Ecology's permit and reporting information system (PARIS) using a filter developed by Ecology (personal communication, K. Dinicola, 3/3/15).
- 7.2 Create and populate an Access database based on the data fields available in the submitted data.
- 7.3 Identify and list datasets with inconsistent data types and formats that cannot be easily imported into the database.
- 7.4 Identify the number of permittees and records for which data would need to be entered by hand from scanned field notes or other raw data sources.
- 7.5 Determine the number of respondents and number of incidents reported.
- 7.6 Identify recommendations for further data compilation and evaluation.
- 7.7 Write a draft memo of the data compilation and review tasks and submit to Ecology for review. The memo will describe how data is being provided by permittees, the methods permittees are using to report the IDDE information, the overall completeness of the dataset, and the

estimated level of effort required to complete the dataset with inclusion of hand-entered records. The memo will also provide recommendations for further data review and evaluation, including statistical analysis (as part of the optional subtasks below).

- 7.8 Meet with the SIDIR subgroup to discuss the draft report findings and ideas of how the data could be further evaluated to support the SIDIR activities.
- 7.9 Write final memo of the data compilation and initial review based on comments from Ecology and the SIDIR subgroup on the draft memo and from discussion at the meeting with the SIDIR subgroup.

7.10 Optional Subtasks: Evaluate Data, Prepare Report, and Present Findings at Workshop

The RSMP Coordinator will notify Lakewood by email to move forward with Optional Task 7.10 based upon the SIDIR subgroup committee decisions.

- 7.10.1 Compare data fields reported by permittees to Ecology's online Western Washington IDDE Incident Tracking Form and associated (offline) spreadsheet. Determine a percent completeness and gaps in the data submitted relative to the Incident Tracking Form and associated instructions.
- 7.10.2 Contact permittees to try to fill data gaps in the reported data.
- 7.10.3 Compile additional data received from data gaps request to permittees. Import data into database.
- 7.10.4 Enter by hand into the database the data submitted in PDF format. Create database form to expedite data entry.
- 7.10.5 Summarize metadata, including the number and types of data fields available: qualitative, quantitative, geographic, date range, and number and type of data package formats.
- 7.10.6 Tabulate the range of responses for each quantitative data field.
- 7.10.7 Categorize the IDDE issues reported in terms of frequency of occurrence, potential severity of impact, and location.
- 7.10.8 Compare IDDE methods used with type of issue (discharge or connection) and water body affected.
- 7.10.9 Perform statistical evaluation of data based on recommendations in the memo for the data compilation and review tasks above.
- 7.10.10 Write a draft report with the results of the data evaluation. Discussion in the report will include the applicability of findings to the NPDES stormwater management program, the usability of the data for the Status and Trends monitoring program, and the consistency of data reporting with the IDDE Field Screening Manual (King CITY 2013). Report will be reviewed by Ecology and the SIDIR subgroup.
- 7.10.11 Prepare final report based on comments on draft report.
- 7.10.12 Prepare a presentation of up to one hour of the data evaluation findings for a workshop for permittees. The RSMP coordinator will notify Lakewood in the fall of 2015 with a range of appropriate dates for workshop planning. Attend workshop and give presentation.

Deliverables for Subtasks 7.1-7.12	Subtasks Included	Cost	Target date
7.1 Preliminary database composed of permittee data not requiring entry by hand and with data gaps from initial permittee submittal of IDDE data.	7.1, 7.2	\$13,072.68	6/22/15
7.2 Draft memo from data compilation and initial review.	7.3-7.7	\$12,261.70	7/20/15
7.3 Meeting with SIDIR subgroup.	7.8	\$1,488.40	8/7/15
7.4 Final memo from data compilation and initial review.	7.9	\$3,206.34	8/21/15
Total for tasks 7.1-7.9		\$30,029.12	
Deliverables for Optional Subtask 7.13			
7.5 Complete database including data entered by hand and additional data provided by permittees from data gaps request.	7.10.1-7.10.4	\$45,825.36	10/16/15
7.6 Draft report on data evaluation.	7.10.5-7.10.10	\$23,428.04	11/13/15
7.7 Final report on data evaluation.	7.10.11	\$3,956.34	12/11/15
7.8 Presentation at workshop or SWG meeting.	7.10.12	\$4,016.34	TBD
Total for task 7.10		\$77,226.08	
Total Cost		\$107,255.20	

Assumptions:

- It is unknown exactly how much and what quality of data will be received by Ecology. For purposes of this scope and cost estimate, it is assumed there will be up to 10,000 records, 1,000 of which would need to be entered by hand at 15 minutes per record on average.
- Proposed schedule assumes contracting will be completed and work will begin by May 4, 2015.
- Ecology and the SWG will organize and facilitate the workshop at which the findings will be presented.
- Ecology's review of the draft memo and draft report will take up to two weeks each.

Task 8. Manage Project

Task 8 is for managing the project, which will include tracking and reporting project costs, managing and adjusting the project schedule as needed, preparing monthly progress reports and invoices, and general project communications and coordination.

8. Subtasks

- 8.1. Prepare monthly invoices and status reports with summary of deliverables completed and TAC activities.
- 8.2. Track and manage project budget with calculation of percent project completion. Identify expenditure issues and make recommendations for their remedy.
- 8.3. General communication by email and phone with project team, TAC, and Ecology.

Deliverables	Subtasks Included	Cost	Target date
8.1. 1 st status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	2 nd month of project
8.2. 2 nd status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	3 rd month of project
8.3. 3 rd status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	4 th month of project
8.4. 4 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	5 th month of project

Deliverables	Subtasks Included	Cost	Target date
8.5. 5 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	6 th month of project
8.6. 6 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	7 th month of project
8.7. 7 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	8 th month of project
8.8. 8 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	9 th month of project
8.9. 9 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	10 th month of project
8.10. 10 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	11 th month of project
8.11. 11 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	12 th month of project
8.12. 12 th status report.	1/12 th of 8.1, 8.2, and 8.3	\$2,224.82	13 th month of project
	Total Cost	\$26,697.88	

Assumptions

- This phase of the project will be completed within 13 months.
- Invoices and status reports will be prepared using a standard template and following reporting requirements of the agreement between Ecology and Lakewood.