PUGET SOUND ECOSYSTEM MONITORING PROGRAM

STORMWATER WORK GROUP

June 12, 2019

Vince McGowan, PE
Water Quality Program PDS Section Manager
Washington Department of Ecology
P.O. Box 47696
Olympia, WA 98504-7696

Dear Vince,

The Stormwater Work Group (SWG) has identified priorities for Stormwater Action Monitoring (SAM) projects that Ecology should fund using municipal stormwater permittees' contributions pursuant to Special Condition S8 Monitoring and Assessment in the Municipal Stormwater Permits. Our local, state, and federal caucus groups endorse the recommendations on the following pages. These recommendations are the product of extensive committee work over the past two-plus years, a survey conducted last fall, and stakeholder workshops on February 27.

We ask that the SAM Coordinator conduct two rounds of requests for proposals during the 2019 permit term. This list provides the basis for the first round of proposals. To receive good proposals, we recommend going back to the survey responses to provide further detail on each topic. For efficient contracting, we recommend grouping together the topics identified as "white papers," and utilize the SWG's technical subgroups and STORM to review the proposals.

For the second round, please be open to the SWG adding new topics based on emerging stormwater management issues or needs.

If you have any questions please contact the SWG Project Manager, Karen Dinicola, at (360) 407-6550 or me at (425) 556-2741.

Sincerely,

Andy Rheaume, Chair

Purpose Statement for SAM studies

The primary audience for SAM is stormwater managers. SAM studies provide applied scientific information to improve how stormwater is managed, specifically under Ecology's municipal stormwater permits. SAM studies help us to better understand and address stormwater impacts and sources of stormwater pollution, improve selection and implementation of BMPs, improve permittees' oversight of developers, and/or improve the permits or the *Stormwater Management Manual for Western Washington*.

SAM Priorities for the 2019-2024 Municipal Stormwater Permit Term

Ongoing SAM Effectiveness Studies and Source Identification Projects

These SAM studies are in various stages of completion and will continue in the 2019-2024 permit term.

Effectiveness studies:

- Redmond paired watershed retrofits
- Oyster shell retrofits in catch basins
- Bioretention amendment with fungi
- Bioretention reduction of PCBs
- Longevity of biological protection using bioretention
- Mulch choices for bioretention
- Orifice controls for bioretention
- Water budgets of individual trees

Source identification projects:

- Regional stormwater spill hotline feasibility study
- Illicit Connection/Illicit Discharge field screening manual updates and trainings

Current SAM contracts fully fund all of these studies except the Redmond paired watershed retrofit study. SWG has approved long-term funding for the paired watershed retrofit study. The SAM Coordinator should include ongoing funding for this project in the SAM budget along with new studies.

Future SAM Effectiveness Studies and Source Identification Projects

The SWG recommends that the SAM Coordinator request proposals in winter 2019-2020 for SAM Effectiveness Studies and Source Identification Projects to either answer the following questions or provide effective guidance to address the following problems:

Education and outreach – *Topics for White papers*

- What steps are needed to achieve behavior change? What are the most effective behavior change tools? What types of stormwater problems are appropriate for meaningful behavior change efforts? Such as:
    - What are the most effective behavior change and other approaches to get mobile businesses to use best practices for handling their wastes?
    - What are the most effective behavior change approaches to get homeowners, businesses/retailers, landscapers, and property managers to reduce their use of pesticides? fertilizers?
    - What are the most effective behavior change approaches to expand use and acceptance of bioretention and raingardens on private land?
    - What behavior change approaches are most effective to get small businesses to adopt stormwater BMPs?

LID, Structural BMPs, Retrofits, O&M – *Topics for White Papers*

- What are the relative water quality benefits of various retrofits and enhanced O&M?
    - Gather data on structural retrofits and other controls to support adjustments to SSC point assignments.
    - Inform how to go about determining the right mix of retrofits and O&M.
    - Help inform overall choices as to whether and where we should be building retrofits.
- Quantify the benefit of replacing traditional pavement with permeable pavement.
    - What are the lifecycle costs of permeable pavement?
- What is the minimum maintenance frequency for bioretention required to achieve full benefits of the facilities?
- What maintenance frequency should be required for TAP-E approved facilities that are currently failing?
    - How can we apply these principles to other BMPs, particularly in situations where modified installations need different maintenance schedules than those recommended by the manufacturers?
    - Recommend new criteria to improve maintenance schedules and provide a feedback loop to TAP-E.
- Which BMPs are most effective under typical pollutant loadings/sediment particle size ranges?
- What is known about the water quality benefits of the maintenance thresholds that are required in the SWMMWW for vaults, ponds, and trenches?
    - Can we more cost-effectively clean vaults, ponds, infiltration trenches, and catch basins?
    - When is it more effective to replace/retrofit versus provide significant maintenance to a facility?
- What do we know about designs and installations that have and have not worked in the past?
- What should permittees be doing with pre-1991 MS4 infrastructure, including instream features? Should they be left as is, or should permittees redesign and rebuild them?
- Following completion of the current SAM study of tree hydrology:
    - Gather examples of programs that are working well to preserve mature trees and soil volumes, and

  - Discuss what additional information is needed to assess ways the SWMMWW tree credit might be more effective in achieving retention of mature trees and soil volumes.

LID, Structural BMPs, Retrofits, O&M – *Topics for Field Studies*

- Gather data to inform more site specific application of Ecology's 0.3 inches/hour infiltration rate criterion in the SWMMWW, and identify situations where flexibility might be warranted.
- Quantify the habitat and other benefits and reduced O&M provided by mature vegetation in stormwater ponds. Are we still getting the pollutant removal? What are the tradeoffs?
- Compare cleaned/uncleaned ditches to assess effectiveness of ditch cleaning at removing legacy pollutants. Include evaluation of likely release of pollutants.
- Evaluate effectiveness of ditch enhancement techniques (*i.e.*, turning ditches in to bioswales) at removing pollutants.
- Informed by a white paper, do a controlled field study to evaluate maintenance thresholds required in the SWMMWW.

Source Control, Source ID, and IDDE – *Topics for White Papers*

- What additional regional or statewide regulatory systems or approaches would likely support local government oversight of mobile businesses that discharge waste to the MS4?
  - How can the business licensure process and requirements support proper waste handling?
  - What are barriers to proper handling of waste?
- What are the main barriers to compliance that business inspections should be prepared to address? Are regulatory incentives insufficient to get small businesses to adopt stormwater BMPs?
- What is the range of options to address spills on permeable pavement, and what are the most effective and lower cost methods?
  - Include approaches to assess the magnitude of a spill and the treatment layer's capacity.
  - Consider a second phase to either expand the white paper question to green stormwater infrastructure in general after addressing permeable pavement, and/or follow up with a project to create consistent guidance.
- What are the most effective approaches for notification and following up on firefighting activities after the emergency response is complete?
- How can we improve cleanup and coordination with emergency responders to address vehicle leaks and spills across the region?
- What are the most effective approaches to source control for bacteria? In what situations do E&O, IDDE, and O&M activities most effectively address bacteria problems?

Source Control, Source ID, and IDDE – *Topics for Projects*

- Evaluate the IDDE data reported by permittees and gather additional information needed to identify mobile and other multi-jurisdictional business' violations, to support coordinated and effective multi-jurisdiction enforcement.
- Develop a source control program guidance manual and trainings to help Phase II permittees implement new business inspection source control program requirements. Base this on existing Phase I business inspection programs.

Ongoing and Future SAM Receiving Water Studies

The SWG recommends that the SAM Coordinator and SAM Scientist continue to implement Receiving Water Status and Trends Monitoring according to the adjusted core status and trends monitoring design. The SAM Scientists should (1) ensure that adequate water monitoring of B-IBI related stressors is done along with B-IBI sampling, and (2) conduct additional analyses that help tie receiving water findings to management actions, *i.e.*, review MS4 map features and information about the age of stormwater infrastructure in the watersheds draining to each site.

If SAM has additional funds available for special studies in receiving waters, the SWG will select the topic(s), which may include:

- The class of chemicals associated with tire wear that has been linked to urban runoff mortality system (URMS); sample for these at selected mussels and streams sites.
- Microplastics and rubber particles in stream sediments at selected sites.
- Use of passive samplers to gather data for additional pollutants and inform whether they might replace biological indicators; place alongside mussel cages and in streams at selected sites.
- Drift cell impacts on nearshore pollutant transport; this analysis is needed in support of site selection for 2024 permit term nearshore sediment monitoring and may inform mussel analyses.

In selecting the topic(s), the SWG will further investigate ongoing work in these areas. All of these topics are of interest to many stakeholders, and are the subject of current conversations and targeted research. Additional ideas will be solicited as part of the process to prioritize additional receiving water related research.