

# Recommendations for Regional Stormwater Monitoring

---

September 18, 2013

- Decision  
 Discussion  
 Information

NOTES from the SWG discussion of this document are included in track changes herein.  
A record of SWG voting on these recommendations is included at the end of the document.

**SUBJECT:** Roads and Highways Subgroup (RHS) Recommendations to the Stormwater Working Group (SWG)

**ISSUE:** Define monitoring needs related to roads and highways (Task 11 from SWG '13-'14 Work Plan)

## BACKGROUND:

What monitoring and assessment information is needed and why?

The SWG directed the convening of a subgroup (i.e., RHS) to take a holistic approach to defining monitoring needs related to roads and highways across the full spectrum of urban to rural roads in Puget Sound<sup>1</sup>, and to make specific recommendations as to how WSDOT's permit-required monitoring should address a subset of those needs. The big picture of monitoring needs should include status and trends monitoring, effectiveness studies, and source control.

Who was involved in the Subgroup, and how were decisions made?

The following individuals were involved in the RHS:

### Cities

- Russell Cotton-Betteridge (Bellevue)
- Nancy Aldrich (Richland)
- Lynn Schmidt (Spokane)
- Art Jenkins (Spokane Valley/Staff to Subgroup)
- Mary Henley (Tacoma)

### Counties

- Rod Swanson (Clark County)
- Jennifer Keune (King County Roads)
- Rob Fritz (King County Roads)
- Bob Hutton (Clark County alternate)
- Chris May (Kitsap County)
- Matt Zarecor (Spokane County)

### State

- Fred Bergdolt (WSDOT)

---

<sup>1</sup> The RHS took upon itself to define monitoring needs related to roads and highways for other areas the state as well.

## Recommendations for Regional Stormwater Monitoring

---

- David Duncan (Ecology)
- Kathleen Emmett (Ecology)
- Dick Gersib (WSDOT)
- Foroozan Labib (Ecology/WSDOT's municipal SW permit administrator)
- Greg Lahti (WSDOT)
- Mark Maurer (WSDOT)
- Larry Schaffner (WSDOT/Subgroup Chair)

### *Federal*

- Chris Konrad (USGS)
- Ryan McReynolds (USFWS)

### *Other Stakeholders*

- Emmett Dobey (WSAC)
- Katelyn Kinn (Puget Soundkeeper Alliance)
- Aimee Navickis-Brasch (Gonzaga University)
- Curtis Nickerson (Cardno TEC)
- Heather Trim (Futurewise)

### Special thanks to:

- Zack Holt (WSDOT), Chad Hoxeng (Clark County), and Janice Sloan (WSDOT) who gave presentations during our first meeting.
- Kimberly Adams (Ecology) and Diana Hendrickson (WSDOT) who provided meeting logistical support throughout our process.

The RHS's decisions were made using an iterative deliberation process that involved reviewing and discussing proposals put forth by various subgroup member proponents. Proposals considered were not "voted on" per se. However, the RHS did employ the use of polling techniques early on in the process to help identify areas of common interest. The decision process also considered lessons learned from previous and existing monitoring and research efforts, particularly those conducted in road and highway settings. The recommendations put forth represent the product of our process and include those that received varying degrees of support. Degrees of subgroup member support for the recommendations ranged from broad consensus to areas with more narrow interest. Even in those areas with more narrow interest, the deliberations aimed to reveal whether any opposition to the proposed recommendation existed amongst the participants.<sup>2</sup>

Where are we in the SWG approval process, and when are decisions needed?

The RHS draft recommendations were discussed during the SWG's June 12, 2013 meeting. The RHS reviewed, discussed, and considered the feedback provided by the SWG during their effort to further develop and refine their recommendations. The finalized recommendations below represent the outcome of these efforts. The RHS submits these recommendations for consideration and approval during SWG's September 18, 2013 meeting.

---

<sup>2</sup> None of the RHS members expressed opposition to any of the recommendations appearing below.

# Recommendations for Regional Stormwater Monitoring

---

Ecology's projected release date for the public review draft of the WSDOT municipal stormwater permit, the SWG is November 6, 2013. The projected reissuance date of the permit is March 6, 2013.

How and when are recommendations envisioned to be implemented?

Details regarding implementation vary by recommendation and are include with the recommendation's supporting materials.

What are the funding implications?

Details regarding funding implications vary by recommendation and are contained in the research proposal supporting materials.

## ALTERNATIVES CONSIDERED:

Alternatives considered by the RHS were numerous and included, but were not limited to, deliberations on:

- Priority BMP effectiveness studies
- Priority source identification and diagnostic studies
- Priority characterization studies
- Additional monitoring needs, if any, specific to the Puget Sound basin, including status and trends monitoring sites
- The 2014 reissuance of the WSDOT municipal stormwater permit and further reissuance of other municipal stormwater permits

The SWG's *support page* (and companion Ecology support page) for the RHS contains more information on the various alternatives considered by the subgroup:

- <https://sites.google.com/site/pugetsoundstormwaterworkgroup/home/runoff-from-roads-and-highways>
- <http://www.ecy.wa.gov/programs/wq/psmonitoring/roadshighwaySubgrp.html>

## RECOMMENDATIONS AND REASONING:

### **Priority BMP effectiveness studies**

1. Evaluate stormwater treatment performance of Modified Vegetated Filter Strips. See *Attachment A* for further details and the reasoning behind this recommendation.
2. Evaluate the effectiveness of Roadside Ditch Water Quality Enhancements for pollutant removal from rural roads. See *Attachment B* for further details and the reasoning behind this recommendation.
3. Evaluate the water quality treatment benefits of Porous Asphalt Shoulders and the optimization of its performance through operations and maintenance. See *Attachment C* for further details and the reasoning behind this recommendation. **BW: what about rest stops? Park and rides? LS: some have been built according to HRM, including at ferry terminals, and are being evaluated (but not monitored), BW are their other studies of reducing pollution**

# Recommendations for Regional Stormwater Monitoring

---

from ferry terminals? LS: not a topic of wide interest to the group, More a WSDOT source control issue.

4. Evaluate the use of Compost-amended Biofiltration Swales to reduce pollutant concentrations at road maintenance yard in eastern Washington. See *Attachment D* for further details and the reasoning behind this recommendation.
5. Evaluate stormwater BMP performance in ultra-urban settings. See *Attachment E* for further details and the reasoning behind this recommendation.

## **Priority source identification & diagnostic studies**

6. Identify and characterize stormwater pollutant hotspots in roads and highways projects. See *Attachment F* for further details and the reasoning behind this recommendation. Might WSDOT do a paper study of IDDE results and findings from prior permits, define a starting point of what characterizes hot spots? This topic has come up for high-accident areas: lots of spills there; also bridge spill containment. Also need to investigate how/where operation of cars is causing hot spots (source control rather than spills). Vulnerable geologic settings?
7. Test for the presence-levels of PCBs in motor oils and fuels. See *Attachment G* for further details and the reasoning behind this recommendation. Discussion: why focus on this pollutant? Coordinate effort with statewide toxics reduction plan for PCBs. This is focused on transportation system sources.

## **Priority characterization studies**

8. None. However, the RHS recognizes that additional characterization monitoring typically occurs as a necessary component of effectiveness study designs.

## **Additional monitoring needs specific to the Puget Sound basin**

9. The attached Pollutants of Interest List (i.e., *Attachment H*) contain pollutant parameters of interest from a roads and highways perspective to consider including for analysis as part of the Puget Sound Region's status and trends monitoring efforts. WSDOT part of the watershed.

The list was built by examining the RSMP parameter lists. *The Pollutants of Interest List* includes the RSMP parameter lists alongside pollutants identified in the studies/papers reviewed to develop the pollutants of interest list. *Attachment I* identifies the studies and papers reviewed in generating the list of recommended parameters. The general listing and discussion of priorities in the [2011 AASHTO Stormwater Community of Practice Paper](#) was considered particularly useful in identifying and confirming pollutants of interest from a roads and highways perspective.

Add DOC to RSMP list? Yes.

Based on some of the pesticides, herbicides that the WSDOT is using, the RHS recommends to possibly add diclobenil and 2,4-D to the list. Some road departments typically follow WSDOT herbicide use and guidance so would probably use the 2,4-D as well. Inclusion of these constituents should warrant future review as risk priorities are weighed from use on roadway areas versus non-roadway areas and cause(s) of impairment downstream, if any. In table, more than these two pesticides are identified as priority.

Include diuron and triclopyr.

LS: Current permit requirement to evaluate pesticide applications and minimize them.

## Recommendations for Regional Stormwater Monitoring

---

In addition to the papers and studies listed in Attachment I, the RHS reviewed the following investigating the roads and highways/phthalate connection:

- [Potential Effects of Highway Runoff on Priority Fish Species in Western Washington](#)
- [Highway Stormwater Runoff Study](#)
- [Monitoring of Contaminants in Delaware Street Sweeping Residuals and Evaluation of Recycling/Disposal Options](#)
- [Summary of Findings and Recommendations from the Sediment Phthalates Work Group](#)
- Excerpt from the City of Tacoma's *Thea Foss and Wheeler-Osgood Waterways 2003-2004 Stormwater Source Control Report*

10. Obtain a better understanding regarding the long-term impacts and performance, including under extreme conditions, of infiltrative best management practices (BMPs) and flow control facilities (including low-impact development facilities). While not roads and highways-specific, the RHS identified the assessment of flow attenuation on small streams as a gap in the overall Puget Sound Region's status and trends framework. ~~See Attachment J for details for further details and the reasoning behind this recommendation.~~ ~~Confusing proposal, last-minute RHS add. Gap has been id'd in June 2010 strategy and SWG has work to address in subsequent projects; continue on that path. May not be likely to be successfully studied.~~ Placeholder for further discussion. Look at Taylor paper for synthesizing LID effectiveness studies. Not enough of these facilities have been installed. Don't focus on extreme conditions. We can't size facilities big enough. Climate change driver. What are instream ecological needs to drive sizing. Questions about groundwater aspects. Broader than stormwater. Proposed rewrite of recommendation (rather than this field study, more general Puget Sound study): SWG should investigate opportunities to learn more about influences of these facilities on streamflow. Ask Ryan McReynolds to present this idea at a later meeting for further discussion.

### **WSDOT Municipal stormwater permit-related recommendations**

#### Discussion:

- It's premature to vote on these recommendations. Not final.
- Attachment K doesn't seem to reflect the recommendations above. More of the broad recommendations need to be incorporated into the permit.
- There is some overlap but not 100%. Focus on some effness studies. WSDOT thinks #1 and #4 are their most effective contribution, and can come up with future priorities later. Would RHS subgroup come up with the next list? Frustration about timing. Placeholder? also will be getting another year of highway characterization data.
- Why the short parameter lists in Appendix K? Metals? Pesticides? – this list addresses TAPE objectives, not Puget Sound objectives.
- When collecting samples and paying for broad analytical scans, report the entire laboratory results not just the parameters listed in the permit.
- Consider additional studies that we can add to Appendix K, i.e., specific source id/source control studies and/or WSDOT involvement in RSMP status and trends monitoring (kick in some \$, i.e., for pesticides?).
- Purpose of S&T is to better understand ecological impacts and work backward to improve our management practices. What aspects of RSMP specifically address transportation land uses; where are they a significant proportion of inputs? Shared

## Recommendations for Regional Stormwater Monitoring

---

responsibility (muni's can't control all inputs either but recognize significance). Low priority for subgroup; higher priority for stakeholders at SWG. Priority for regional policy makers.

10.11. Endorse the preliminary draft monitoring language for the 2014 WSDOT municipal stormwater permit contained in Appendix K. The objectives of the proposed permit's monitoring program include evaluating BMP effectiveness at facility and highway monitoring sites.<sup>3</sup> A byproduct of effectiveness monitoring efforts would include enriching the highway and facility characterization data set. The proposed permit requirements build off the efforts and lessons learned under WSDOT's existing permit and are intended to:

- Produce scientifically credible and representative data;
- Provide information that WSDOT can use for designing and implementing effective stormwater management strategies for WSDOT's highways and facilities; and
- Provide information WSDOT can use to refine requirements, guidelines, and procedures contained in the *Highway Runoff Manual* (HRM).

11.12. The Department of Ecology should include background and supporting information regarding their decision to eliminate the Whole Effluent Toxicity testing requirement (a requirement also removed from the 2012 reissued Phase 1 municipal stormwater permits) in the *Fact Sheet* for the reissued WSDOT municipal stormwater permit.

12.13. Consider the RHS's priority effectiveness monitoring and source identification & diagnostic research proposals for inclusion in future permits and/or as part of Puget Sound Regional monitoring efforts.

### **Additional Recommendations:**

13.14. Hold an annual reoccurring daylong workshop regarding roads & highways-related research and monitoring. The workshop would provide an opportunity to share research finding, facilitate dialog, and foster collaborative partnerships. Planning discussions have already been initiated with the Washington Stormwater Center for such a reoccurring event.

14.15. Sunset the RHS in September. Upon delivery of the subgroup's final recommendations to the SWG and Ecology, the RHS completed its assigned task. RHS members see the annual reoccurring daylong workshop described in recommendation #14 as a venue for future dialog, direction, and the development of collaborative partnerships on roads & highways stormwater-related monitoring and research efforts. What would be SWG role in evaluating future research priorities? How would the process go?

The SWG voted on the following recommendations:

1. Recommendations #1-7 above: acknowledge/agree that these are important studies to conduct for transportation systems. (Include notes/edits.)

**Agreed by consensus**

2. Recommendation #9 above: these pollutant lists should be considered when developing road and highway monitoring plans. We will update our SWAMPPS framework to include this list.

**Agreed by consensus**

3. Recommendation #14 above: we've talked about this for effectiveness studies. Yes, have a workshop. Okay to focus on transportation, but try to combine it with other stormwater

---

<sup>3</sup> This includes evaluation of the modified VFS, RHS recommendation #1. Evaluation of Compost-amended Biofiltration Swales, RHS recommendation #4, is another effectiveness study under consideration for inclusion in the reissued WSDOT municipal stormwater permit.

## Recommendations for Regional Stormwater Monitoring

---

monitoring workshop topics as much as possible.

**Agreed by consensus**

4. Recommendations #11-13 above: We are not recommending the subgroup's proposed WSDOT permit language; however we do support the overall intent to continue current studies and apply the findings to WSDOT facilities. SWG should help define future studies. (Do not sunset the RHS subgroup per recommendation #15.)

**Agreed by consensus (ECY rep abstained)**

5. Include in next WSDOT permit a requirement to conduct study #6

**Rejected by consensus (ECY rep abstained)**

6. Include in next WSDOT permit a requirement to participate in Puget Sound RSMP status and trends monitoring

**Agreed by majority (ECY rep abstained, WSDOT rep not in favor)**

Note to work group members and interested parties: SWG staff Karen Dinicola's computer stopped responding in the midst of the discussion of these recommendations. These notes include notes added while the onscreen version of the document was live and also notes Karen took by hand for the last half hour or so of the discussion, including voting.