

##### September 14 2022, from 9:00 to 11:55 am

##### Zoom meeting

**Draft Summary**

**of the Meeting’s Key Discussions, Decisions and Agreements**

A list of acronyms is provided at the end of this document.

##### Attendees:

*Work Group members, and the organizations and interest groups they represent:*

**Local Agencies*:***  **Stella Collier** (Bainbridge Island), Local Governments; **Dana de Leon** (Tacoma). **Todd Hunsdorfer** (King Co), PRO-C Chair, **Kevin Burell** (Seattle), **Aislin Gallagher** (Kitsap County), **Don McQuilliams** (Bellevue, and the SWG Chair)

**State Agencies: Brad Archbold** (WSDOT), **Abby Barnes** (WDNR), State Agencies, and the SWG Vice-Chair and 6PPD Subgroup Co-Chair, **Elene Trujillo** (PSP), **Jeff Killelea** (ECY WQP), **Mariko Langness** (WDFW), **Gary Bahr** (AGR)

**Federal Agencies** **Cindy Callahan** (FHWA), **Rich Sheibley** (USGS) **Lori Blair** (Boeing), Business Groups,; **Kelsey Payne** (Snoqualmie Tribe), Tribes.

*Work Group alternates in attendance:* **Bob Black** (USGS), **Carol Falkenhayn Maloy (**Pierce Co**),** *Jamie McNutt (US Tires*),  **Katrina Radach** (PSP); **Aaron Clark** (Stewardship Partners) Environmental Groups, **Margaret McCauley** (EPA)

*Other invited speakers that participated in the meeting:* **Eli Mackiewicz** (Bellingham, and co-chair of SWG 6PPD Subgroup) **Jen McIntyre** (WSC), **Joseph Cook** (WSU)

*Ecology Staff:* **Brandi Lubliner**, SAM Coordinator, **Amy Waterman**, SWG Coordinator

*Other participants:* **Nathan Hart** (SPU), **Nat Scholz** (NOAA/NWFSC), **Katie Rathmell** (Ecology WQP**), Rod Swanson** (Clark County), **Angela Bolton** (Mill Creek), **Jessica Atlakson** (Redmond), **Mark Maurer** EvergreenH2O), **Jacob Kirschner, Jeff Davis**, **Aaron Burkhart**, **Dorie Sutton**, **David Kangiser**, **Laurie Larson-Pugh** (WSC), **Ani Jayakaran** (WSU), **Keunyea Song** (Pierce County), **Jessica Schwing** (Ecology WQP), **Trevor Richardson** , **Jennifer Saltonstall** (Associated Earth Sciences, Inc.), **Jamie McNutt** (US Tires), **Alan Chapman**, **Evan Dobrowski** (ECY, WQP), **Dave Kansiger**, **Chris Thorn**, **Deanna Seaman**, **Andrew Silvia**, **Laura Nokes** (Tacoma), **Nancy Hansen** (Guest), **Cathy Craver** (Whatcom County), **Erika Harris** (PSRC), **Angela Bolton** (Mill Valley), Chair Effectiveness Subgroup, Acting Chair SAM Study Selection Subgroup, **Paul Knippel** , **Tyler Dearman**, **Mallory Little** (DOH), **Johnna Sandow** (NMFS), **Stefan** **Grozev** (Shoreline) **Eric Lambert** (Clark Co), **Janet Geer** (Bothell), **Sarah Montero,** **Scott Groce** (Pierce Co)

##### Work group hears findings of SAM Puget Sound small stream monitoring: 2022 Update by Rich Sheibley (USGS)

USGS is the lead on the [SAM Status and Trends project to monitor Puget Sound small streams](https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring/SAM-status-and-trends/Puget-small-streams) annually to track changes over time in relation to urban growth and stormwater management efforts. Under the current (new since 2020) they sample 33 sites per year in four categories of land use based on amount of impervious surface (0-10%, 10-20%, 20-40% and 40-100%) and two reference sites to establish reference conditions for comparison. Sampling includes BIBI, sediment chemistry, algae, water quality, habitat (riparian condition), and stage (including temperature). Results for 2020 will be reported soon and 2021 results will be published in winter 2022.

USGS presented on the 2020 monitoring data. BIBI data showed most streams in poor condition (relative to the reference sites). When spatially weighted to represent the entire Puget Sound watershed of the study frame: 28% were in poor condition, 41% in fair, and 31% were in good condition. Metals concentrations were all below State clean-up levels. Zinc and lead concentrations showed patterns related to land use, but copper was ubiquitous. Nutrient concentrations showed phosphorus level varying between urban and non-urban areas, but nitrogen levels were overlapping in different land use intensities.

Comparing 2020 data to 2015 data: The only significant difference in results for the two timeframes were in BIBI scores declining in the highest urbanized areas (40-100% impervious surface). No other results showed significant differences. Because 100% of the streams with 40-100% impervious areas were in poor BIBI conditions in Puget Sound, USGS suggested a focus is needed on these highly urbanized areas to improve water quality.

Workgroup members asked how people should use this streams information relative to other regional work e.g. nutrients in rivers and Puget Sound; and if the impervious cover changed for the sites from 2015 to 2020 as a potential explanation of decreasing BIBI scores. USGS stated that they do have plans to back calculate impervious cover % for the 2015 data this wasn’t know at the time and the design was just in or out of UGAs. In terms of using the PSS data, these findings pertain to small “wadeable” streams and can help fill gaps for the larger regional datasets, that are primarily on bigger rivers, and loading or modelling efforts.

##### Work group hears interim findings of bioretention soil mix longevity study: Jen McIntyre (WSC)

This [SAM Effectiveness study on the longevity of bioretention soil mix](https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring/SAM-effectiveness-studies/Longevity-biological-protection-using-bioretention) (BSM) in laboratory columns at different depths to prevent coho toxicity over the course of 10 water years.

They are looking at five different depths of BSM: 18, 15, 12, 9, 6 inches and did three replicates for each column. They set up their dosing to replicate 10 water years over 2 years. Inflow and outflow of the columns are evaluated for the conventional stormwater quality parameters and 6PPD-q was added mid-study. The stormwater is gathered during storm events from two sites: under 520 bridge and near Route 5 and 16 in Puyallup. The columns are in an environmental chamber where temperature and humidity are controlled, there are no plants or sunlight. They have so far completed nine water years but showed results on 6 to 8 of the water years. The project has yet to have zebra fish assays to determine toxicity so that they can switch to a molecular approach for toxicity evaluation. At the request of Ecology, they are adding 3 more water years and extending the project to 2024. None of the 6PPD-q samples have been processed yet but lab analysis will start soon under a lab accreditation waiver. They recently had to switch one of the stormwater collection sites from the 520 site (due to theft of collection tank and safety concerns) to collecting from under the Tacoma Narrows Bridge.

So far they have encountered some need for ‘maintenance’ of the column to prevent surface clogging. They removed 1” of BSM and back flushed, to replicate normal maintenance guidelines from Ecology for a bioretention BMP site. Overflow is most common in the 18” depth. The early water years leach some metals, PAHs, and conventional pollutants from the BSM itself but are captured by water years 2-3 and thereafter, except for nitrate and ortho-phosphorus that continue to export from the BSM at lower concentrations. Generally, 6” BSM allows more influent pollutants to pass through than the other depths. All BSM depths prevent mortality when the influent stormwater is toxic to juvenile coho, although the occasional overflow (untreated water) produced toxicity when combined with the effluent. Through water year 8 so far BSM is still protecting against acute toxicity to coho. There is a slower loss of hydraulic conductivity for 6” BSM, yet the top layer of soil in 6” BSM concentrated more pollutants than the 18” depth. The 18” BSM may have more distributed pollutants through the column; this has yet to be confirmed.

Workgroup members asked about infiltration rates and clogging; discussion noted that study columns and lack of plants and insects may contribute to the lack of decomposition of incoming organic material in stormwater and increase clogging. The ‘routine maintenance’ of scratching/disturbing surface soil is likely to help. Workgroup members noted that this study is only looking at the inorganic nutrients which are the smallest fraction of total nutrients in stormwater. Particulate-bound organic nitrogen and phosphorus are the larger fraction in stormwater and are removed by filters or settling typically offered by the full size bioretention BMP in other studies.

Workgroup members are looking forward to more results from this study.

**Work group hears findings of sam behavior change literature review: Joe Cook (WSU)**

This [SAM Effectiveness study is developing tools and guidance to evaluate stormwater education/behavior change programs](https://ecology.wa.gov/Regulations-Permits/Reporting-requirements/Stormwater-monitoring/Stormwater-Action-Monitoring/SAM-effectiveness-studies/Evaluating-ed-outreach-programs). The project will produce a decision support tool, write guidance and training manual on how to design and then evaluate behavior change campaigns for stormwater topics. The project is nearly complete with tasks 1-5 which involved gathering campaign information from stakeholder interviews, nation-wide surveys of behavior change professionals in stormwater and water quality, and literature reviews which are written up in bibliography of studies linking pollutants and water quality. The bibliography of studies linking pollutants and water quality that Ani Jayakaran is working on will be coming out soon.

They found that pet waste and yard waste were the most common target for behavior change programs. They evaluated behavior change studies and gave them points for different attributes, with a total possible score of nine. Most studies do not include a counterfactual or control group and few included water quality measurements. Thirty studies were ranked as “good” in their ranking.

Task 4 is completed which includes developing and testing a new tool for stormwater managers to use for their behavior change campaigns: <https://www.waterbehaviorchange.org/>. This decision support tool has case studies on behavior change campaigns in stormwater and water quality in the US. There is a tab to add campaigns, to search existing campaigns, and a tool to help you build your campaign, which is undergoing some changes. Joe shared a notable other resource he found, [Chesapeake Behavior Change](https://www.chesapeakebehaviorchange.org/) which also has evaluated different kind of campaigns, such as rain gardens or dog waste, and given them a behavior score, based on their Stewardship Index Survey, a compilation of opportunity and likelihood of adoption.

The remaining work on this project is Task 5 and 6 which has the sub, EvergreenH2O, working on a report template and evaluation guidance for MS4 permittees evaluating their education and outreach campaigns. The training manual, final white paper and SAM fact sheet will be finished by early next year.

**Work group briefed on PRO-C and SAM implementation**

PRO-C discussed the “report card” evaluation of SAM administration (both Ecology’s performance and PRO-C service in the oversight role) that is done twice each permit cycle. Todd Hunsdorfer reported that PRO-C members agree, without exception, that Ecology staff are doing a great job administering SAM. PRO-C’s performance was also positively rated. PRO-C is discussing an update to their charter and is working on a best practices document to provide clarity and assist transitions with member turnover.

PRO-C recognizes that SWG will need to make a SAM Status and Trends budget recommendation to Ecology for the next permit cycle (Appendix 11) in time for the draft permits next summer. This budget estimate will need to address all of the SAM Status and Trends studies (streams, mussels, nearshore sediment (if continued), and the Lower Columbia Urban Streams study. PRO-C unanimously voted to create budget estimates for the SAM Puget Sound nearshore studies (sediment and mussels) for a total of at 3 studies total per permit cycle. Therefore, alternating 5 year permit terms would include three studies on marine mussels (the next term), and the two mussel studies and one nearshore sediment study (next permit term). This will ‘level-out’ the revenue collection needs (Appendix 11) and workloads for the S&T nearshore across permit terms. SWG still needs to determine (over the next permit cycle) whether the nearshore sediment sampling study should be re-designed and conducted.

With regard to SAM implementation, Ecology recently lost the SAM scientist Keunyea Song who took an engineering position at Pierce County. Ecology will aim to rehire quickly and Brandi will manage all the SAM contracts in the short term. Since the SWG meeting in May, PRO-C has contracted DNR for the particle size distribution study and the City of Olympia for a bioretention infiltration rate and lifespan study. PRO-C has also extended WSU contract on the Education and Behavior Change Effort.

Ecology’s SAM Coordinator reported on program administration and shared that SAM revenue for 2022 has been collected and we had more late submissions than usual.

In addition to the receiving water monitoring that we heard earlier, annual status reports are coming in and being reviewed for all the S&T programs. They will be posted to the web when approved.

There are eight active effectiveness study projects. The last project for Round 3 is the WSU permeable pavement that will be scoped in 2023. The WSU-led Mulches for Bioretention project was completed. There are two active source identification projects. There are two active projects that are both approximately ¾ complete. Trainings on business source control inspections from WSU will get started this fall; they will be advertised on the SAM website and through the Permit Coordinators groups.

**SWG 6PPD Subgroup co-chairs summarize findings and recommendations**

Eli Mackiewicz presented a summary of where the subgroup has been and where they may be going. The group met on July 7 and discussed more ideas for SAM studies, other funding sources, and concerns about testing. The subgroup’s [recommendations to SWG](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fcontent.govdelivery.com%2Fattachments%2FWAECY%2F2022%2F07%2F26%2Ffile_attachments%2F2227986%2FSWG%25206PPD%2520Subgroup%2520findings%2520and%2520recommendations%2520-%2520July%25207%2520update%2520to%2520April%252020%2520document%2520trkchng.docx&wdOrigin=BROWSELINK) in their April 20 report were shared with many groups: TAPE, SAM, SIL, UWT, NOAA, and NIMFS. The [Osborn/Evergreen StormH2O BMP evaluation report](https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/Content/Resources/DocsForDownload/2022_SWTreatmentOfTireContaminants-BMPEffectiveness.pdf)“Stormwater Treatment of Tire Contaminants Best Management Practices Effectiveness” was completed in June and should be referenced for 6PPD properties, research needs, and BMP effectiveness. Of course, new information is coming in all the time.

Subgroup next steps: The group will meet again in October 6 and will presumably continue to meet quarterly through next year. The group will continue to share findings, sources of funding, and recommendation on next projects among attendees.

Ecology’s next steps: Ecology is extending the consultant contract to support 6PPD subgroup.

MEL has completed testing the stormwater method, the QA/QC requirements, and the SOP. However, sample preservation and holding time is TBD by EPA. MEL is now seeking accreditation for the method and hopes to be accredited soon. MEL has started method development for sediments.

Hazardous Waste, Water Quality, EAP are all hiring positions related to 6PPD, incorporating into existing work, developing internal coordination. Also coordinating with other state and federal agencies.

**Proposed SAM Round 4 Study topic selection has begun**

The SAM Study Selection Subgroup has met twice, July 12 and September 6 to discuss SWG 6PPD Subgroup recommendations and other potential Round 4 effectiveness and source ID study topics. A survey of topics was conducted with input from full SWG. Sources for the potential topic list included: Round SAM carryover topics, 6PPD Subgroup and related Ad Hoc recommendations, completed SAM study recommendations, Structural Stormwater Control recommendations (from Scientific Synthesis), and other AD-Hoc group recommendations. A summary of the steps taken to analyze the [survey results](https://www.ezview.wa.gov/Portals/_1962/Documents/StormwaterWorkGroup/Round%204%20SAM%20Topic%20Survey%20Resultsfinal.pdf), [group results](https://www.ezview.wa.gov/Portals/_1962/Documents/StormwaterWorkGroup/Round%204%20SAM%20Topic%20Survey%20Grouped%20Results_final.pdf), and prioritize them to come up with a proposed topic list was shared with the SWG. The [proposed topic list](https://www.ezview.wa.gov/Portals/_1962/Documents/StormwaterWorkGroup/Round%204%20SAM%20Study%20Topic%20Proposal%20List%209_6_22.docx) was presented for consideration.

Lori Blair brought up a smart technology project that Boeing is working on with Stewardship Partners and Geosyntec. They are going to use passive sensors in bioretention media beds to collect information that may indicate clogging to help with maintenance. Lori offered to share information on the project to the SWG at a future date.

Next steps: SAM Study Selection Subgroup will meet again on October 10 and SWG will vote on the final Round 4 SAM topics at the November meeting. We will finalize the list on November 16 so that the solicitation can go out at the beginning of January. The SAM Coordinator will send out the Round 4 solicitation in January 2023.

SWG will hear about letters of interest in February, about full proposals in May, host a workshop over the summer, discuss project selection in September, and finalize the list in November 2023.

SWG next steps: Caucuses should discuss the proposed topic list before the November 16 meeting. Contact Amy Waterman or Brandi Lubliner if you have questions.

**SWG communication**

Amy shared that Karen completed the [MEMO to SWG on SAM 2010-2021.docx](https://content.govdelivery.com/attachments/WAECY/2022/07/26/file_attachments/2228467/MEMO%20to%20SWG%20on%20SAM%202010-2021.docx), a history of the SWG and key recommendations for the future. The [“SWG 101”](https://www.youtube.com/watch?v=thrR0xA0Xv0) video is now on Ecology’s You Tube page. It is a useful introduction for new SWG members.

Amy asked for feedback from the SWG on communications – what is working, what is needed, and what is not. In addition to the SWG Reporter, we have a SWG Google site, an Ecology website, a couple of e-mail lists (for SWG and S4), and three Gov Delivery lists for different audiences: SWG, SAM, SWG Reporter. Amy asked the group to give feedback on: “How do you get most of your SWG news? Which communications seem repetitive? Are there ones that you don’t bother to open?”

Some feedback from participants was that there a lot of list serv announcements and not everyone opens all of them. Also the SWG Reporter is somewhat repetitive of meeting summaries. Amy pointed out the Legislature is one important audience for the Reporter. There was a request to link agenda and materials to meeting invite. There was also a request to provide links and some duplicate information that goes out to the list servs on the Google site.

SWG next steps: Caucuses should gather feedback on the three questions above and ideas for how communication could be streamlined. Individual participants are encouraged to contact Amy Waterman for feedback as well. Amy will work with these recommendations and Ecology staff to find ways to streamline communications while keeping vital communications going, keeping in mind her dual job roles.

**Ecology permit updates**

Ecology still plans to release preliminary draft permit language this fall for an informal comment period. There will be some additional preliminary drafts released in January. The current permits expire on July 31, 2024. SSC Policy Advisory Committee meeting met on August 24 and will meet four more times. PAC is offering recommendations on SSC types, points, multipliers, and program implementation*.*

**Future SWG meeting dates, communications, and expected discussion topics**

The last regular SWG meeting date in 2022 is November 16. The dates in 2023 are February 8, May 17, September 13, and November 15. Please mark your calendars for these dates – all Wednesdays, from 9-noon. We may occasionally extend our meeting time an additional 1-3 hours if needed; any extended meeting time will be determined at the previous meeting.

*At our meeting on Wednesday, November 16, we will:*

* *Hear findings of SAM studies: Orifice control for bioretention effectiveness study and the Source ID project to provide guidance on business source control & inspection programs*
* *Decide on topics for SAM Round 4 solicitation*
* *Hear updates on SAM implementation and administration*
* *Hear budget estimates for SAM’s Status and Trends for th­­­­­e next permit cycle*
* *Hear updates on permit reissuance and informal comment period*
* *Discuss annual updates to our work plan*
* *Hear other updates related to our work*
* *Nominate SWG chair and vice chair*

Our remaining scheduled meeting in 2022 is on November 16. Dates in 2023 are February 8, May 17, September 13, and November 15. Please mark your calendars for all of these Wednesdays from 9am to noon.

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**Acronyms used in this meeting summary:**

ADT – average daily traffic  
CDF – cumulative distribution function  
EAP – Environmental Assessment Program  
ECY – Washington Dept. of Ecology  
FHWA – Federal Highways Administration  
MS4 – Municipal separate storm sewer system  
PAC – Policy Advisory Committee  
PRO-C – Pooled Resources Oversight Committee  
PSEMP – Puget Sound Ecosystem Monitoring Program  
PSP – Puget Sound Partnership  
S&T – Status and trends (regional monitoring in receiving waters)  
SAM – Stormwater Action Monitoring, the regional stormwater monitoring program funded primarily by permittees  
SSC – Structural Stormwater Controls (retrofit and other “above and beyond” stormwater management activities in Phase I permit)  
SWG – Stormwater Work Group  
UGA – Urban Growth Area (designated under the state Growth Management Act)  
USFWS – U.S. Fish and Wildlife Service

USGS – U.S. Geological Survey, Washington Water Science Center  
WDFW – Washington Dept. of Fish and Wildlife  
WDNR – Washington Dept. of Natural Resources

WQP – Water Quality Program   
WSC – Washington Stormwater Center (at WSU-Puyallup)  
WSU – Washington State University   
WSDOT – Washington State Dept. of Transportation