



LOI # 3

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Organization: City of Tacoma

Study Title: BMP Effectiveness Evaluation & Guidance for Treating Contaminants of Emerging Concern (CEC)

Which topics from the SWG's priority list (Appendix A) do you propose to address?

14

What type of project is being proposed?

Literature review & synthesis; Guidance

Short description of the proposed project

Ecology stormwater manuals (SWMMWW/EW) provide BMP selection and design guidance for treating pollutants regulated by the MS4 Permits; however, there is limited guidance for CECs on BMP selection. This project proposes to advance the understanding and implementation of BMPs (primarily treatment BMPs) for CECs as follows:

- Conduct a qualitative evaluation of BMPs in SWMMWW/EW to identify which are likely to reduce CEC and/or should be avoided.
- Evaluate the long-term implications of treating CECs using SWMMWW/EW BMPs to estimate the impact the CEC could have on the BMP lifecycle as well as the contributing conditions (land use, ADT, etc.) that could influence these results.
- Assess the design guidance for SWMMWW/EW BMPs to determine if design modifications could be made to potentially extend the BMP lifecycle and/or improvement treatment when targeting CECs.
- Assess the impact CECs could have on disposal and/or reuse.



The work completed will be summarized into a whitepaper that documents the approach and sources for the work completed. Results will be summarized into a “BMP menu” format like the first page of design guidance for BMPs in the WSDOT Highway Runoff Manual (HRM) Section 5-4. This information can then be inserted into the SWMMEW/WW and provide designers guidance when selecting BMPs for CEC treatment.

Gaps identified during the literature search will also be summarized in the whitepaper. Specifically, gaps that are essential to advance the understanding of BMP treatment, design, and/or long-term implications. This information can be used to help guide and prioritize future research work.

What type of information will be collected or analyzed for this proposed study?

For evaluating BMP effectiveness, we propose to collect information/data from a literature review (journal articles, research reports, etc.) and follow a process like what was used for 6PPDQ (Stormwater Treatment of Tire Contaminants BMP Effectiveness whitepaper [Navickis-Brasch, et al., 2022]):

- Conduct a literature search to identify CEC physiochemical properties as well as fate and transport to understand their behavior in stormwater runoff and how they get into and move through the MS4.
- Develop a qualitative rating system to determine which BMPs have a high-to-low potential for reducing the CEC using the results from the literature search.
- Apply the rating system by comparing the literature search results to the treatment mechanisms (sorption, plant uptake, etc.) provided by BMPs identified in SWMMWW/EW. The treatment mechanisms for each BMP in the SWMMWW/EW are already summarized in (Navickis-Brasch, et al., 2022).

Results from CEC treatment effectiveness studies will also be considered and, if available, could be used to provide a quantitative review of the BMP effectiveness and/or confirm the rating system used to evaluate BMPs. For BMP studies performed in other states, the BMPs would first need to be assessed to determine if they are comparable to BMPs in SWMMWW/EW and if the results are transferable. This is because BMPs with the same name from other states are not always the same as the BMPs in SWMMWW/EW and/or they use completely different methods to design (size) the BMP.



The long-term implications of treating CECs using SWMM/WW/EW BMPs will be evaluated using the following data/information and processes:

- Collect and analyze data from studies, databases, and literature that measured CEC concentrations to determine the range of CEC concentrations in stormwater from different land uses (current SAM CEC study led by Tacoma).
- Determine data range of concentrations for pollutants in Washington stormwater data.
- Estimate the BMP treatment mechanism capacity relative to the CEC concentrations.
- Find past SAM studies that included information/results about BMP longevity.

A literature search will be conducted to determine how other states handle management disposal and/or reuse of BMP media related to CECs. Discuss disposal thresholds for CECs and potential fiscal impacts if BMP media could be considered a hazardous waste, as well as the steps that would need to be taken for disposal in the future.

What are the anticipated measurable outcomes and key deliverables that will be produced by the proposed study and how will they be used by Permittees and the Washington State Department of Ecology?

A whitepaper synthesizing the literature review, recommendations for applying the results, and gaps. The recommendations will be formatted such that the information can be inserted into the next update of the SWMMWW/EW or be use by Permittees in their manuals.

List the permittees or agencies you are proposing to coordinate with.

No coordination yet; likely Phase I Permittees.