

# Letter of intent (LOI)

Interested parties should submit a Letter of Intent (LOI) on or before February 28, 2023 for each individual proposal. Letter of intent should include applicant contact information and seven questions about proposed study. More details about SAM study selection process, eligibility and funding availability can be found in SAM REF guidelines in SAM Effectiveness webpage.

The respondent's email ([jen.mcintyre@wsu.edu](mailto:jen.mcintyre@wsu.edu)) was recorded on submission of this form.

## Applicant contact information

Applicant Full Name \*

Jenifer McIntyre

Organization \*

Washington Stormwater Center / WSU PREC

Phone number \*

253-445-4650

## Proposed Study Information

1. Proposed Study Title \*

How to build a BURito: determining design constraints for bioretention urban retrofits

## 2. Which topic(s) from the SWG's priority list do you propose to address? \*

The proposed study topic should be in the SWG's priority list

STORMWATER MANAGEMENT OF 6PPD-QUINONE

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## 3. Select type of project being proposed \*

- Survey
- Literature Review & Synthesis
- Environmental Sampling Study
- Other

## 4. Short Description of the Proposed Study \*

250 word limit: describe how results will assess effectiveness and advance regional understanding and permittees' implementation of specific stormwater management approaches

Installing green stormwater infrastructure can be costly, especially for the broad swaths of watersheds that are already developed. Existing infrastructure, including stormwater detention ponds is insufficient to protect watersheds from toxic impacts of runoff pollutants, as evidenced by multiple metrics of biological degradation of receiving waters. Ensuring better treatment of stormwater by detention ponds has been identified as a cost-effective approach to improving water quality in the region. In collaboration with the City of Bellevue and with assistance from Cedar Grove Composting, we conducted a pilot test of a bioretention-based retrofit of an existing stormwater detention pond and found improved water quality and reduced toxicity. We termed these 'Bioretention Urban Retrofits'; BURitos. However, before this retrofit approach can be recommended as a best management practice, key design parameters need to be refined including flow rate as a function of BURito dimensions, and treatment level as a function of flow through rates. We propose to compile design parameters for existing stormwater detention ponds, through a combination of surveys of municipalities and site visits, to understand the range of conditions within which BURitos might be applied. We then propose to construct model systems of BURitos where we can alter the slope and rate at which influent stormwater is applied to measuring hydraulics, pollutant movement, and changes in toxicity. This research will advance knowledge of how to retrofit existing treatment structures effectively by identifying design constraints.

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5. What type information will be collected or analyzed for this proposed study? \*

If existing permittees' data are needed, specify the type, and the expected timing of a request for existing information from Permittees.

For different sized and sloped BURitos, we will measure hydraulic conductivity rates (including saturation leading to overtopping), removal rates of pollutants (including phosphorus and 6PPD-quinone), and changes in toxicity to aquatic organisms.

We will request information from municipalities on stormwater detention pond drainage area, surface loading area, slope, and likely range of influent stormwater rates to be treated. This information would be used to help determine the range of parameters that we would adjust in our study, but if collected in conjunction with the experimental research could instead be used to make recommendations for implementation.

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6. 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? \*

Our research will identify conditions under which BURitos can provide effective treatment of pollutants entering stormwater detention ponds to help municipalities determine where these retrofits can be installed.

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7. Permittees or agencies you are proposing to coordinate with (provide staff names and contact information, if known) \*

Enter "NA" if not applicable.

Leah Mikulsky, Bellevue Utilities Environmental Project Planner, LMikulsky@bellevuewa.gov

Rachel Konrady, Kirkland Storm & Surface Water Division, RKonrady@kirklandwa.gov

Chris Cunningham, Cedar Grove Composting, chris.cunningham@cgcompost.com

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