

SAFE CLEAN WATER PROGRAM SCIENTIFIC STUDY PROPOSAL QUESTIONNAIRE

1. Proposal identification information and summary of the project goals.

Title: **Regional Pathogen Reduction Study**

Proposing Organization: **Gateway Water Management Authority**

Your summary of the Project Goals and Objectives:

The reviewers agreed that the overarching goal of this project is to develop targeted, science-informed management strategies for remediating the specific sources of human fecal pollution in L.A. County watersheds that pose the greatest human health risks. Specifically, the study will leverage recent scientific advances in fecal pollution tracking and fecal risk assessment to: (1) determine the sources of fecal pollution that pose the greatest human health risks during both dry and wet weather, (2) identify beaches and other recreational water bodies where these risks are greatest, and (3) develop management actions for combatting fecal pollution in the highest-risk areas.

2. Are the objectives clearly stated? What portion of the objectives need more clarification?

The reviewers agreed that the study's goals are clearly stated. One reviewer was unequivocally positive in their assessment, while the other two reviewers caveated their assessments. Of the latter two reviewers, one said that while the goals were clearly stated, the goals were unrealistic (see Question 6). The second of the latter two reviewers said that the proposal lacks important details in how specifically the objectives will be achieved, although this reviewer simultaneously suggested that this lack of clarity will resolve itself once the technical team begins gaining internal clarity via a stakeholder engagement process.

3. How do the project goals directly support a nexus to increasing stormwater or urban runoff capture and/or reducing stormwater or urban runoff pollution?

The reviewers disagreed on the likelihood of the study supporting the SCWP's goals of increasing stormwater or urban runoff capture and/or reducing stormwater or urban runoff pollution. Two of the reviewers expressed confidence and optimism about the project's management impact, noting that the project is likely to produce information that directly informs how fecal pollution is managed. The third reviewer expressed significant doubts about the project's ability to influence management actions – a consequence of what the third reviewer characterized as potentially erroneous assumptions baked into the study design. Specifically, the third reviewer noted that the proposal's lack of detail in the methods sections casts doubt on the technical rigor of the study design. This third reviewer also expressed skepticism about whether high-risk fecal sources can be "clearly identified," and whether viable stormwater BMPs presently exist to effectively target the high-risk sources.

4. What is (are) the overarching technical approach element(s) of the proposed project as you understand them (not necessarily the same as the elements described in the proposal)?

The reviewers agreed that the study's technical elements will consist of: (1) collecting water samples from beaches, rivers, creeks and channels across L.A. County, (2) using both legacy fecal

pollution detection methods and next-generation molecular methods to measure fecal indicators, fecal genetic markers, viruses and other pathogens, (3) estimating human health risks at beaches and other recreational water bodies and (4) developing a management tool and management plans for addressing the highest-risk human fecal contamination sources.

5. Has the proposal provided sufficient information to describe the technical approach for each element? If not, what information is missing?

The reviewers disagreed on whether the proposal adequately describes the study's technical approach. One reviewer said the technical approach is sufficiently described and reiterated that any information gaps will be filled via stakeholder engagement. The other two reviewers said the technical approach is not sufficiently described. Both of the latter two reviewers said information is woefully lacking about the molecular methods for detecting fecal contamination, how health risk assessment work will be performed on the water-quality constituents that are measured, and how stormwater BMPs will be selected to target the highest-risk sources. These two reviewers noted that the success of the project will be dependent on getting all of these key aspects of the study right. One of the latter two reviewers also noted that when it comes to optimizing stormwater BMPs to remove human viruses and other pathogens, the science itself remains "very poorly understood."

6. Is the technical approach sound? If not, what do you recommend should be done to improve the technical approach of the proposed project?

The reviewers disagreed in their assessment of the soundness of the study's technical approach. One reviewer expressed confidence that the technical approach is sound and offered no caveats. A second reviewer said that not enough information was provided to evaluate the technical approach itself, citing multiple potential shortcomings with the study's methods, including whether the study will properly account for human behavior and how the study will account for pathogen concentrations that could fall below detection limits. The third reviewer was even more critical of the study's technical approach, noting that the chance of the study succeeding as designed is "unrealistic" and suggesting that the study be redesigned to focus on assessing risk at beaches first, then moving upstream into the watershed "in a much more focused and targeted manner."

7. How achievable are the study's stated technical objectives, especially within the proposed timeframe and budget?

The reviewers disagreed about how achievable the study's objectives are within the proposed timeframe and budget. One reviewer expressed full optimism about the timeframe, and did not explicitly comment on the budget. A second reviewer expressed cautious optimism about the study's timeframe and budget, but noted that the proposal's lack of technical detail makes it "difficult" to properly assess the timeline and budget. The third reviewer, while not explicitly commenting on the budget or timeline, was the most pessimistic, noting that the study's ability to measure fecal constituents will depend on the qualifications of the team tasked with performing this work – qualifications that were not sufficiently described in the proposal. The third reviewer also reiterated that the science remains too underdeveloped for managers to identify and implement specific stormwater BMPs that will reliably remove human fecal contamination.

8. What are the greatest technical risks that you foresee the proposing agency facing when implementing the project?

All three reviewers identified technical risks that could affect the study's success. While one reviewer said that the greatest technical risk is simply that the project will not be completed on time, the other two reviewers agreed that the greatest technical risk will lie in the qualifications of the study team, which was not explicitly described in the proposal. Both of these latter two reviewers stressed that the consequences of using an unqualified study team for this type of work could be profound. One reviewer explained that the data obtained "might be highly variable or inaccurate" and, moreover, "not suitable" for conducting human health risk assessments. The other reviewer noted that it is "very easy" to misuse fecal pollution data and risk assessment analyses; this reviewer also stressed that measuring pathogens in water "is like looking for a needle in a haystack."

9. Please describe the linkages between the project's technical objectives and the types of decisions that stormwater managers will make based on the project's outcome(s)? Will the technical achievements provide stormwater managers useful linkages that extend beyond this study?

The reviewers disagreed about whether the study will produce results that are relevant and directly applicable to stormwater managers. Two of the reviewers expressed confidence that the project will be directly used to inform decision-making, citing the study's potential to understand which specific fecal contamination control measures to implement across L.A. County, as well as which specific fecal parameters should be monitored going forward to optimally manage human health risks. The third reviewer stated they are "very dubious" that the study will be used to inform management decisions, noting that the study is unlikely to produce actionable management recommendations because human fecal pollution in watersheds is too ubiquitous and diffuse, and because the science remains underdeveloped to advance viable stormwater BMP solutions that effectively address this pervasive contamination challenge.

10. Please provide any additional technical perspectives you would like to share.

All three reviewers provided additional comments. One reviewer complimented the overall study design, noting its potential to "greatly increase knowledge" about fecal contamination sources and removal strategies. A second reviewer reiterated previously expressed concerns about how the ubiquitous, diffuse nature of fecal contamination is likely to put inherent limitations on the study's ability to viably identify stormwater BMPs that will effectively control fecal contamination. And the third reviewer reiterated the importance of ensuring the study design is technically rigorous, including by properly accounting for pathogen concentrations that are below detection limits, by using a full suite of methods to detect fecal contamination, and by using robust data analysis and risk assessment methods.

11. Please answer each of the following questions by selecting one of the following five answer choices: *Excellent, Very good, Adequate, Inadequate or Not applicable because of insufficient information*. Please add an explanation to accompany your answer choice (or refer to the question number above for appropriate context and rationale):

- a. How well do the proposal objectives address the County's goals of increasing stormwater or urban runoff capture and/or reducing stormwater or urban runoff pollution?

The reviewers disagreed in their assessment of how effectively the study will address SCWP goals. Two reviewers gave "excellent" and "very good" ratings, respectively, with both reviewers expressing confidence that the study will provide managerially actionable insights. The third reviewer gave an "inadequate or not applicable because of insufficient information" rating, reiterating concerns about "no real technical details" in the study and the lack of broader management context for the study.

- b. How well do you think the technical approaches will achieve the study objectives and stated outcomes?

The reviewers disagreed in their assessment of the likelihood of the study's success. One reviewer gave a "very good" rating and did not elaborate further. The other two reviewers offered a more pessimistic outlook, providing "inadequate" and "not applicable because of insufficient information" ratings, respectively. Both of the latter two reviewers said too little information was presented in the study to properly assess its likelihood of success, especially a lack of information on the study team's qualifications.

- c. Technical experience and qualifications of the study team?

The reviewers disagreed in their assessment of the study team's capabilities. One reviewer gave a "very good" rating and did not elaborate further. The other two reviewers expressed reservations about the study team. One of the latter two reviewers gave an "inadequate" rating and reiterated concerns about the lack of specifics presented in the proposal regarding the study team's qualifications. The other reviewer, who gave a "not applicable because of insufficient information" rating, expressed reservations about the fact that the study team will be assembled "via stakeholder engagement" after the project gets underway; this reviewer, however, noted the background information presented in the proposal is solid and will put the study team on a solid scientific foundation – at least initially.