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Document: Draft Staff Report: Total Maximum Daily Loads for Indicator Bacteria (*E. coli* and enterococci) and Trash in the Lower Tijuana River.

Based on my expertise and experience, I am reviewing the findings, assumptions, or conclusions I agreed I could review with confidence:

- 1.a. Are the proposed numeric targets in the draft staff report reasonable and adequately protective?
- 2.a. Are the seven transboundary flows the significant sources of anthropogenic indicator bacteria and trash in the lower Tijuana River?
- 3.a. Are the proposed TMDLs and load/wasteload allocations reasonable and adequately protective?
- 3.b. Are the reductions in indicator bacteria concentrations that are required to attain water quality standards calculated appropriately?

General Comments:

- Throughout the report, *Escherichia coli* is abbreviated as "*E. Coli*," this should be modified to "*E. coli*" (lower case c)

1.a. Are the proposed numeric targets in the draft staff report reasonable and adequately protective?

The proposed numeric targets in the draft staff report were both reasonable and adequately protective. Specifically, they fall in line with the targets suggested by the United States Environmental Protection Agency (USEPA) in their "Recreational Water Quality Criteria" from 2012. This includes the use of *E. coli* in low salinity waters and enterococci in higher salinity waters. Notably, the draft staff report uses the more protective of the two criteria established by the USEPA, choosing an estimated illness rate of 32 per 1,000 primary contact recreators. Finally, the proposed numeric targets are for primary contact waters, which results in the most stringent criteria. For trash, a target of zero is as protective as possible.

My additional comment on this section is in regards to the assumption that control of indicator bacteria and trash will likely result in a significant degree of control of the remaining pollutants. While I agree with this statement, I would caution that for some pollutants, in-channel sources can also be significant. Pollutants that have accumulated in the stream sediments can be remobilized during storm events and contribute to water quality degradation. Thus, further actions may be needed in the future if there are additional pollutants that have elevated concentrations after implementation of this TMDL.

2.a. Are the seven transboundary flows the significant sources of anthropogenic indicator bacteria and trash in the lower Tijuana River?

The report provides multiple lines of evidence that the seven transboundary flows are a significant source of indicator bacteria and trash. Specifically, the visual evidence (photos) and results of water quality monitoring are convincing. Additional studies using human specific markers further support the conclusions of the report that wastewater is present in the system (SCCWRP, 2020; Weston Solutions, 2012).

3.a. Are the proposed TMDLs and load/wasteload allocations reasonable and adequately protective?

The source assessment reasonably suggests that the vast majority of the pollution stems from the transboundary discharges. I agree that this is correct and that addressing these sources is most critical for the watershed. However, I think as these sources are controlled, there are some sources such as those from animal operations that are labeled "*de minimus*" but in fact could be contributing excess indicator bacteria to the system. Overall, controlling the transboundary discharges is most critical, but attainment of the proposed numeric standards may require revisiting some of these other potential sources after control of the largest contributors. At this point, its hard to tell given the overwhelming contributions from the transboundary discharges.

One point that should be clarified in the text is the use of "The extensive epidemiological studies and risk analyses conducted by USEPA, upon which the indicator bacteria WQOs are based" as a factor of safety. How this acts as a factor of safety is not very clear and should be detailed further.

Overall, the goal to significantly reduce indicator bacteria and trash from the transboundary flows is reasonable, targets the most influential sources, and is adequately protective. Anthropogenic sources of indicator bacteria should be of primary concern.

3.b. Are the reductions in indicator bacteria concentrations that are required to attain water quality standards calculated appropriately?

The methodology used in this report (the Statistical Rollback Method) is a commonly utilized approach in TMDLs when calculating the reduction needed to reach target geometric mean (GM) and 90th percentile (STV) concentrations. This method is applied to the data collected from key sites in the watershed to find the current GM and STV, then these values are compared to the target GM and STV for the watershed to estimate the required reductions. While viable, the approach does require substantial amounts of data. I have the following concerns based on the results of this procedure:

- For Dairy Mart Bridge, the data do not seem to reasonably form a line when plotted on a logarithmic scale. While a perfect linear relationship is not reasonable to expect, for this site the plotted data and regression line are a factor of 10 apart at a z-score of zero. Some consideration should be given in the text as to the implications of this deviation.

- For Canyon del Sol and Smuggler's Gulch, there are some plots with only 3 data points. While the end result is a reduction of > 99%, which is reasonable and in line with the other locations, more data may be needed for these sites (as the project proceeds) in an effort to provide a more confident estimate of the current GM and STV.