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Review for San Luis Obispo Creek TMDL for Nitrate-N

by

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General Comments: The reviewer suggests several, minor, non-substantive editorial changes, such as replace the word "nitrate" with the expression "nitrate-N," change the title of the document to state that it is a "Nitrate" TMDL, and not a "nutrient TMDL." In addition, the reviewer suggests several changes in wording with the objective of clarifying data and conclusions at several locations within the report. The reviewer also suggests several changes in document formatting.

Staff response: Most of the changes the reviewer suggests have been made. Some changes suggested by the reviewer are not made. Examples of non-substantive editorial changes not made include: 1) the word "nitrate" is used (as opposed to nitrate-N) when discussing nitrate in general, e.g. when a value is not quantified. However, nitrate is expressed as NO₃-N when being quantified.

Other comments made by the reviewer are included below, followed by a staff comment.

1. "p.6, para.2: There is no need to "slam" the USEPA.... Just say you are going to give the background for the 303(d) listing."

Staff response: The reviewer is referring to the discussion regarding the background of the 303(d) listing. US EPA is not mentioned in the paragraph referred to by the reviewer. There is an implied assumption in the reviewers comment that US EPA developed the 303(d) list resulting in San Luis Obispo Creek being placed on the 1994 303(d) list. However, the 1994 303(d) list was developed from a collaborative effort between Central Coast Water Board and EPA staff. There is no intention in this paragraph to speak negatively of any entity; the intention of the paragraph is to support the need for discussion of the history of the listing in an effort to support the direction of the analysis. The basis for early 303(d) listings (e.g. 1994) were in some cases not well documented, as is the case with San Luis Obispo Creek listing for nutrients. The reader is being advised of this fact. The paragraph is revised to clarify this intention.

2. "p.10, line 2: State how many months/year."
Staff response: the reviewer refers to discussion of the months during the year when San Luis Obispo Creek is effluent dominated. Staff has inserted language stating that the creek is typically from July-September.
3. "p.13, line 2: not just unionized ammonia – all forms of ammonia."
Staff response: the reviewer refers to the discussion of a wastewater treatment plant upgrade completed in the 1990's. The discussion suggests that unionized ammonia levels were reduced as a result of the upgrade. The reviewer would like the reader to understand that all forms of ammonia were reduced, not just unionized ammonia. This point is clarified in the sentence following the line referred to by the reader, i.e., line 2, which states that "The upgrade was completed specifically to address ammonia discharge with the intent to achieve the unionized ammonia objective."
4. "p. 13 Para 3, lines 3 and 4: Confusing – the discharge was into the sewer not upstream of the WRF into the Creek."
Staff response: the reviewer refers to a discussion of an illegal discharge into the sewer system by an unknown source which in turn caused an exceedence of the unionized ammonia objective in the treatment plant. The wording of the paragraph referred to by the reader has been clarified, as suggested by the reviewer.
5. "p. 13 Para 3: last sentence: well did it or didn't it meet the objective? A "maybe" is not acceptable."
Staff response: the reviewer refers to the discussion of an illegal spill of ammonia causing exceedence of the unionized ammonia water quality objective. The word "maybe" is not used in this paragraph or discussion, as the reviewer suggests. However, staff have clarified the sentence to state that the unionized ammonia objective was not met at the time of the spill.
6. "Section 3.2.2: lines 3 and 4: Total nitrogen (i.e. $\text{NO}_3 + \text{NO}_2 + \text{NH}_3 + \text{organic}$) or TKN ($\text{NH}_3 + \text{organic}$)?"
Staff response: the reviewer suggests that total nitrogen be defined for the reader as encompassing the forms of nitrogen included in total nitrogen. Staff has clarified the sentence for the reader by adding (in parenthesis, as the reviewer has in his comments) the constituents making up total nitrogen.
7. "p.28, paras 1 and 2: Why are you allowing the agricultural users to delay until changes of land use are made to implement the requirements for taking management measures. It does not seem fair to let them off the hook if you making the WRF do something right away."
Staff response: the reviewer has misunderstood a sentence. The sentence states that a land use conversion from irrigated agriculture to commercial may occur, and that any growers continuing operations would be required to implement nutrient reduction strategies. Growers will implement management measures

consistent with the Conditional Waiver of Waste Discharge Requirements for Discharges from irrigated lands (Agricultural Waiver), irregardless of when a land use conversion occurs. This section is clarified in the report by removing the wording "growers remaining (after the land use conversion)..."

8. Pp. 36-37, The use of just the land area adjacent to the stream rather than the entire watershed area needs to be justified by presenting published data that supports this assumption.

The reviewer is referring to the use of a 50-m buffer area to determine nitrate loading rate (flux rate) from agricultural sources. Staff calculated the flux loading rates using concentration data from San Luis Obispo Creek and adjacent land area from the location where the concentration data was gathered. As such, the flux rate is not a "literature" value, but a value derived from the watershed where it is being applied. The adjacent land area approach is used in a 1994 research project of San Luis Obispo Creek contracted by the Central Coast Water Board; using the adjacent land area approach for the TMDL allows staff to compare results with the 1994 study and therefore help validate nitrate mass loading calculated for this project. Results of the 1994 report are very similar to results used in the TMDL calculation; the flux rate used in the 1994 report is 47.7 lb/ac/year NO₃-N, the flux rate calculated for the TMDL report is 48.0 lb/ac/yr NO₃-N.

9. "pp.38-39: Can you give previous (literature) comparison data that confirms that your confined animal operation flux rate is reasonable?"

Staff response: the reviewer refers to a flux rate calculated for the confined animal operations in the watershed and would like to verify with literature values. Staff cannot confirm this flux rate for confined animal operation with published literature values; the flux rate determined for this TMDL is not consistent with literature values. Loading from the confined animal source in upper San Luis Obispo Creek Watershed is lower than literature values. This is so because the loading from confined animal operations is zero during the critical flow period, which is the period used to calculate the TMDL. The loading is zero during the critical flow period because the confined animal operations are located along creeks tributary to San Luis Obispo Creek that are dry during the critical flow period.

10. "Section 4.2.2, para after 2.: do not average 1 and 2. Use 1. since that is the correct way to do it!"

Staff response: the reviewer refers to the method used for determining the wasteload of nitrate. Two methods were used in the analysis and the average of the two methods stated as the wasteload in the report. Staff have recalculated the wasteload using method-1 only, as suggested by the reviewer, and have made the necessary changes in the report. However, staff note that the change in total nitrate-N load using the reviewers suggestion results in a change of 0.37% of the total calculated mass load, which does not affect the TMDL or implementation.

11. "p.41: statement after Table 4.2. I strongly disagree with the format of this statement. It is unfair to single out the WRF as the leading source of nitrate when what you really have are two significant (or major) sources (WRF and croplands) and four minor sources. This statement should be changed to reflect the truth about this situation."

Staff response: the reviewer refers to a statement in the report concluding that the wastewater treatment plant (WRF) is the "leading source of nitrate in the system." The statement was based on the estimation that the WRF contributes 71% of the total nitrate load on an annual basis, compared to the next greatest source of croplands at 28%. Staff has deleted the statement.

12. "Fig.5.1: why are the bars segmented? Isn't this Figure supposed to show total NO₃-N? In any case there is no indication of what the various segments refer to."

Staff response: the reviewer refers to a bar chart that contains horizontal lines within the bars. The reviewer would like clarification of what the horizontal lines signify. The paragraph above the figure states: "The horizontal lines on the bars of the graph in Figure 5.1 denote concentration values..."

13. "Pg 43. "Para 4: The site between 5 and 6 miles is just as high as the two sites you mention. Also only one site can be the "highest"."

Staff response: the reviewer refers to discussion of a graph showing nitrate concentration along the main stem of San Luis Obispo Creek. The wording is changed to reflect the reviewers' comments, stating the site-6 carries the highest concentration of nitrate.

14. "p.49: You are setting the stream limit at 10 mg NO₃-N/L which is the MUN limit. Therefore there is **NO FACTOR OF SAFETY** in your TMDL. I do not see where you get a safety factor of 2.2 mg NO₃-N/L from?"

Staff response: there is a factor of safety of 2.2 mg NO₃-N/L. The factor of safety is calculated through the difference in total maximum daily load and the allocated nitrate load. Growers in Prefumo Creek watershed and the WRF are allocated a maximum nitrate-N concentration of 10 mg/L. However, the resulting nitrate-N concentration in San Luis Obispo Creek will be 7.8 mg/L because waters upstream of these two sources carry lower concentration of nitrate, thereby having a dilution effect. This is discussed in the paragraph immediately following Figure 5.1. Language is added to the Margin of Safety section to clarify this point.

15. "p.51, Section 8.1.1: This section is too vague. You need to say what you expect the WRF will have to do (i.e. denitrify) and give some idea of to what level of NO₃-N. Note that the plant (by relatively simple modifications) may be able to achieve some denitrification quite soon."

Staff response: the reviewer is referring to the implementation plan of the TMDL. The reviewer suggests that Central Coast Water Board staff suggest the means by

which the regulated entity (WRF) achieves the allocation for nitrate. However, the WRF is regulated pursuant to an NPDES permit. The California Water Code precludes the Regional Board from specifying the manner in which a discharger may achieve compliance. The level of NO₃-N expected of the WRF is specifically described in the allocation section of the report.

16. "p.52, Section 8.2.1: when are you going to make the cropland users comply?"
Staff response: the reviewer refers to irrigated land owners and operators in the Prefumo Creek subwatershed. Irrigated land owners and operators in lower Prefumo Creek watershed are now subject to the requirements of the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (conditional waiver, see RWQCB, Central Coast Region, Resolution R3-2004-0117). The Central Coast Water Board will take appropriate action if it is determined that owners and operators are not meeting the terms of the conditional waiver. The requirements are described in Section 8.2.1 of the report.
17. "p.53, Section 8.4.1: You should ask the City to monitor NH₃-N at all places listed for NO₃-N because NH₃-N can be converted to NO₃-N in the receiving water."
Staff response: Receiving water monitoring for unionized ammonia, as well as nitrate-N, is currently required pursuant to the City's monitoring and reporting requirements associated with the NPDES permit. This requirement will continue into the implementation phase of the TMDL.
40. "Section 8.4.2: You need to give specific monitoring requirements for the cropland owners just as you did for the WRF. Treat everyone equally."
Staff response: Cropland owners and operators do have specific monitoring and reporting requirements; they are specified in the monitoring and reporting program for the conditional waiver.
41. "p.55, para 1: What is the source of your cost estimate? (a reference is needed)...unless you just plucked the figures out of the air?"
Staff response: the cost estimate is based on the City of San Luis Obispo's estimate to construct the plant upgrade needed to achieve the allocation for nitrate. The estimate is based on personal communication with City staff. Wording is added to the report to reflect this reference.
42. "p.55 Para 2: The cropland costs are vague. Don't you have any idea?"
Staff response: Staff have estimated the cost to comply with the conditional waiver and have included this estimate in the report, as the reviewer suggests.