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1017-142613

Subject: Peer Review of State Board Onsite Wastewater Treatment Systems Policy

Dear Mr. Thompson:

As requested by Dr David Jenkins, I have prepared comments on the 22 questions posed to the peer reviewers of the new onsite wastewater treatment systems policy.

Background

The State Water Resources Control Board is issuing policy for Onsite Wastewater Treatment Systems (OWTS). The Final Draft of "Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems" dated March 20, 2012 was reviewed.

Focused Review Comments

The following are my review comments for each of the assumptions, findings and conclusions that constitute the scientific portion of the proposed regulatory action.

1. It is reasonable to use expected waste strength as a trigger for submitting a report of waste discharge (State permit application) and for determining the necessary approach to direct State regulation and oversight through waste discharge requirements.

Comment: Yes. This is a reasonable assumption.

2. Use of the design flow as a trigger for submitting a report of waste discharge (State permit application) and for determining the necessary approach to direct State regulation and oversight through waste discharge requirements is reasonable.

Comment: Yes it is.

3. A site evaluation is required in Tier 1 (Section 7 of the proposed Policy) to determine that adequate soil depth is present in the dispersal area. Soil depth would be measured vertically to the point where bedrock, hardpan, impermeable soils, or saturated soils are encountered or an adequate depth has been determined.

Comment: A site evaluation of the depth of soil into which effluent is to be discharged is essential to the proper siting of soil treatment units.

4. A site evaluation for seasonal groundwater is required in Section 7.3 using one or a combination of the following methods: direct observation of the highest extent of soil mottling observed in the examination of soil profiles, direct observation of groundwater levels during the anticipated period of high groundwater, or other methods, such as historical records, acceptable to the local agency. Where a conflict in the above methods of examination exists, the direct observation method indicating the highest level shall govern.

Comment: It is appropriate to require direct observation of the highest extent of groundwater rise to avoid direct contact between the applied effluent and the groundwater. The other methods are also appropriate where direct observation is not reasonably attained.

5. Section 7.4 requires that percolation test results in the effluent disposal area shall not be faster than one minute per inch (1 MPI) or slower than ninety minutes per inch (90 MPI) because of problems associated with allowing OWTS on soils that exhibit faster percolation rates than 1 MPI and slower than 90 MPI. All percolation rates shall be based on actual or simulated wet weather conditions by performing the test during the wet weather period as determined by the local agency or by presoaking of percolation test holes and shall be a stabilized rate.

Comment: The performance of a soil treatment system depends on sufficient detention time of the wastewater within the soil matrix. At the 1 MPI (60 in/hr) end of the range, the fear is that too rapid of movement of wastewater through soil will result in insufficient treatment. At the 90 MPI (0.67 in/hr) end, the detention time is sufficient and there is adequate ability to move the water through the top layers of the soil matrix. In land treatment systems that rely on percolation, 0.2 in/hr (300 MPI) would be judged to be acceptable. In my opinion, the lower end of the range should be extended from 90 MPI to 120 MPI.

6. Setbacks

Comment: All of the setbacks in this section of the policy appear reasonable.

7. Natural ground slope in all areas used for effluent disposal shall not be greater than 25 percent for Tier 1 and 30 percent for Tier 2.

Comment: Steep slopes can be detrimental to the successful operation and performance of onsite systems. These restrictions are reasonable.

8. The average density for any subdivision of property occurring after the effective date of this Policy and implemented under Tier 1 shall not exceed one single-family dwelling unit, or its equivalent, per 2.5 acres for those units that rely on OWTS (Section 7.8).

Comment: An average density of one equivalent single-family dwelling unit per 2.5 acres is too restrictive. Based on Assumption No. 1 that wastewater strength is important and that loading rates should be proportional to the ability of the soil treatment system to treat the applied effluent, a more scientific approach to determining the appropriate average density of individual home treatment units should be taken.

One approach would be to use the average loading rate per acre of nitrogen from a conventional onsite system. For example, one County has set a loading rate of 45 grams/acre-day of nitrogen as the basis for a housing density. This loading rate would result in a housing density of one dwelling per 0.88 acres.

Several other counties have a minimum size of 1 acre per dwelling unit, which seems to be an appropriate minimum size for this policy.

9. All dispersal systems shall have at least twelve (12) inches of soil cover (Section 8.1.4).

Comment: This minimum cover should only be applied to conventional gravity distribution systems. Pressure dosed systems and drip emitters should be allowed as shallow as 6 inches.

10. The minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench, and the native soil depth immediately below the leaching trench, shall not be less than prescribed in Table 1.

Comment: These minimum depths are appropriate.

11. Dispersal systems shall be a leachfield, designed using not more than 4 square-feet of infiltrative area per linear foot of trench as the infiltrative surface, and with trench width no wider than 3 feet. Seepage pits and other dispersal systems may only be authorized for repairs where siting limitations require a variance. Maximum application rates shall be determined from stabilized percolation rates as provided in Table 2, or from soil texture and structure determination as provided in Table 3.

Comment: This is a reasonable approach.

12. Dispersal systems shall not exceed a maximum depth of 10 feet as measured from the ground surface to the bottom of the trench.

Comment: This is a reasonable limit.

13. No dispersal systems or replacement areas shall be covered by an impermeable surface, such as paving, building foundation slabs, plastic sheeting, or any other material that prevents oxygen transfer to the soil.

Comment: Under Tier 1 conditions, this is a reasonable restriction.

14. Rock fragment content of native soil surrounding the dispersal system shall not exceed 50 percent by volume for rock fragments sized as cobbles or larger and shall be estimated using either the point-count or line-intercept methods.

Comment: This is a reasonable assumption.

15. Septic Tank Construction and Installation: All new or replaced septic tanks and new or replaced grease interceptor tanks shall comply with the standards contained in Sections K5(b), K5(c), K5(d), K5(e), K5(k), K5(m)(1), and K5(m)(3)(ii) of Appendix K, of Part 5, Title 24 of the 2007 California Code of Regulations.

Comment: This is appropriate.

16. New and replaced OWTS septic tanks shall be designed to prevent solids in excess of three-sixteenths (3/16) of an inch in diameter from passing to the dispersal system. Septic tanks that use a National Sanitation Foundation/American National Standard Institute (NSF/ANSI) Standard 46 certified septic tank filter at the final point of effluent discharge from the OWTS and prior to the dispersal system shall be deemed in compliance with this requirement.

Comment: Containment of suspended solids within the septic tank is an important step in the sustainable performance of OWTS. This is a reasonable assumption.

17. The proposed regulations (Section 9.4.5) would allow design of gravel-less dispersal systems with a reduction (adjustment multiplier of 0.7) of the minimum required dispersal system area for effluent application.

Comment: This is appropriate.

18. The proposed Policy identifies OWTS within 600 lateral feet of an impaired water body listed for nitrogen or for pathogens pursuant to §303(d) of the Federal Clean Water Act as contributing to the impairment of the water body when further designated by the Regional Water Board. For purposes of this Section, impairment is limited to nitrate or bacterial contamination.

Comment: This is appropriate.

19. Effluent from the supplemental treatment components designed to reduce nitrogen shall be certified by NSF, or other approved third party tester, to meet a 50 percent reduction in total nitrogen when comparing the 30-day average influent to the 30-day average effluent (Section 10.9).

Comment: Fifty percent is a conservative value for nitrogen reduction treatment. I would favor a higher bar of 80 percent reduction. In actual practice many nitrogen reduction technologies can meet 50 percent under controlled conditions, but under actual conditions their performance will vary significantly.

20. Where a drip-line dispersal system is used to enhance vegetative nitrogen uptake, the dispersal system shall have at least six (6) inches of soil cover.

Comment: Drip dispersal should be encouraged in this policy. This is an appropriate condition.

21. Supplemental treatment components designed to perform disinfection shall provide sufficient pretreatment of the wastewater so that effluent from the supplemental treatment components does not exceed a 30-day average TSS of 30 mg/L and shall further achieve an effluent fecal coliform bacteria concentration less than or equal to 200 Most Probable Number (MPN) per 100 milliliters (Section 10.10).

Comment: This is appropriate.

22. The minimum soil depth and the minimum depth to the anticipated highest level of groundwater below the bottom of the dispersal system shall not be less than three (3) feet. All dispersal systems shall have at least twelve (12) inches of soil cover.

Comment: This is appropriate.

23. BIG PICTURE

Comment: The policy contains sufficient minimum standards for the range of conditions found in California. The use of tiers and risk categories is appropriate.

Please call Ron Crites at 530.204.5204 if you have questions.

Very truly yours,

Brown and Caldwell,

Ronald W. Crites

Ronald W. Crites, P.E.
Natural Systems Service Leader

cc: Dr. David Jenkins

