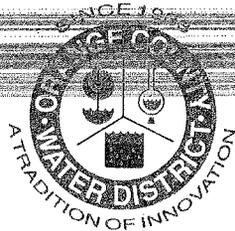


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# ORANGE COUNTY WATER DISTRICT

Orange County's Groundwater Authority

February 20, 2003

Mr. Karnig H. Ohannessian  
Remedial Project Manager  
Naval Facilities Engineering Command  
Southwest Division – Code 06CC.KHO  
1220 Pacific Highway  
San Diego, CA 92132-5187

**Subject: Comments on Draft Technical Memorandum – Groundwater Modeling, OU-1 and OU-2A, Marine Corps Air Station, El Toro**

Dear Mr. Ohannessian:

The purpose of this letter is to provide comments of Orange County Water District (OCWD) staff on our review of the subject memorandum dated January 2003, prepared by Earth Tech, Inc.

Overall, OCWD is pleased with the improvements that Earth Tech has made to the pre-existing groundwater flow model, thereby increasing its accuracy and making the revised model a more viable tool for simulating various extraction scenarios to most effectively clean up the El Toro VOC plumes without impacting the proposed Irvine Desalter Project (IDP) potable wells.

1. The fourth paragraph of the Executive Summary states, "The simulation results also suggest that under both scenarios the non-potable IDP extraction wells will prevent VOCs above cleanup levels from migrating to existing potable drinking water wells." This statement is also echoed in the Conclusions and Recommendations. Although first glance at figures 3-4 and 3-10 showing the predicted pathlines for scenarios 1 and 2, respectively, appear to support this statement, closer inspection suggests that this may only appear to be true because no particles were located directly along the leading edge of the Principal Aquifer VOC plume. The initial spacing of particles along the plume periphery is relatively uniform except on the leading edge or westernmost periphery, where there appears to be a gap with at least one or possibly two missing particles. In addition, these apparently missing particle(s) would be the most likely to have paths that migrate past ET-2 and IRWD-78, towards well TIC-106.

Furthermore, the predicted 5 ppb TCE contour for model layer 5 (Principal Aquifer) at 40 years for both scenarios 1 and 2 (figures 3-8 and 3-14, respectively) appears to be migrating past the non-potable IDP wells. Although there is no higher (10 ppb) contour inside the 5ppb line in this case, contouring principles would imply that inside the 5 ppb contour the concentrations would be expected to be less than 10 ppb but greater than 5 ppb.

OCWD recommends that the pathline figures 3-4 and 3-10 be amended with the apparently missing particle(s) and to modify pertinent text in the various sections of the report to better qualify the results in this area.

2. Although the draft report states that a comprehensive monitoring program will be developed under separate cover, more specific examples of data gaps already identified in the modeling effort would be a helpful preview. Especially in light of the discussion in Comment #1 above, there exists a need for at least one monitoring well in the vicinity of Culver Drive at the leading edge of the current plume in the Principal Aquifer. TCE concentrations have been in the range of one ppb at non-potable wells IRWD-78 and TIC-113 on Culver Drive for several years, as the Navy is well aware. Because these wells produce water from a large screened interval of the Principal Aquifer, they likely produce water from at least one zone that exceeds 5 ppb that is blended before reaching the wellhead discharge. A multi-depth monitoring well strategically located in this area would provide baseline (pre-remedial action) conditions and indicate whether TCE exceeding 5 ppb is escaping capture. We understand this comment pertains to issues that will be addressed in a future document, but the modeling results provide a good justification for reiterating the need for this well.
3. On page 2-1, the last paragraph states "Consistent with previous modeling, the storage coefficient and specific yield assigned to all the layers was  $1 \times 10^{-6}$  and 0.2." It appears that these stated values are for the current model, even though this sentence is found in the section describing the previous models. We recommend moving this sentence to the section entitled "Current Model" and remove the phrase "Consistent with previous modeling." It is our understanding that all of the previous modeling was steady state only, in which case storage coefficient and specific yield would not have been used.

Although the current model calibrates well to observed water level elevations in the vicinity of the project, any future enhancements made to the model over the life of the project as more data are acquired should consider refinements to storage coefficient and specific yield values for both the SGU, the intermediate zone, and the Principal Aquifer, as well as any spatial variation within each of these zones based on aquifer test data.

4. Additional future refinements should also consider temporal variation of natural recharge (e.g., along the Santa Ana Mountains) as some dampened function of rainfall rather than the current representation of constant annual recharge independent of rainfall.

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5. Regarding the model calibration, figures 2-8, 2-9, and 2-10 were very illustrative in showing the spatial match between observed versus simulated water level contours for the shallow groundwater unit (SGU). These figures would be more useful if they included the entire model domain rather than focused in on the project area. Also, at least one figure of this type should be shown for the Principal Aquifer. Omission of this spatial comparison for the Principal Aquifer based on the argument of large monthly water level fluctuations (page 2-4) is not entirely valid.
6. All relevant figures should state the pertinent units in each figure legend. For example, the groundwater contour maps (figures 2-11 and 2-12) should say "feet msl" and the plume map (Figure 2-13) should say "ppb" somewhere in the legend.
7. On page 2-25, "Table A-1" in the second paragraph should read "Table D-1."

We trust you will find these comments useful. If you have any questions, please call either Tim Sovich at (714) 378-3226 or Roy Herndon at (714) 378-3260.

Sincerely,



Timothy J. Sovich, P.E.  
Principal Engineer, Hydrogeology Dept.



Roy L. Herndon, R.G.  
Chief Hydrogeologist

cc: Steve Conklin, OCWD  
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