M60050.000244
MCAS EL TORO
SSIC # 5090.3

DEPARTMENT OF THE NAVY
OFFICER IN CHARGE OF CONSTRUCTION
SOUTHWEST
WESTERN DIVISION, NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
114B/7336
Ser 310
JAN 8 1988

Mr. James Reilly
Orange County Water District
P.O. Box 8300
Fountain Valley, CA 92728-8300

Dear Mr. Reilly:

Attached you will find copies of the comments generated from reviewing your document titled "Investigation of Trichloroethylene Contamination in the Vicinity of the El Toro Marine Corps Air Station". Reviewers were from the following organizations; Naval Facilities Engineering Command, Western Division, Marine Corps Air Station, El Toro and J. M. Montgomery Consulting Engineers, Inc.

We look forward to meeting with you to discuss these comments in greater detail prior to your finalizing this document. May we suggest a joint meeting be set for late January or early February?

An issue of great importance to both of use is potential reimbursement of funds spent by your organization to conduct this study. We have requested official guidance from the Commandant of the Marine Corps but have yet to receive a response. In any event, we view close cooperation as essential to our mutual programs but must request that detailed accounting be kept of moneys expended. We will review this information to determine the potential level of reimbursement, if allowed.

If you have any questions, please contact Mr. Ernest Cerini at (619) 696-5461.

Sincerely,

Stuart S. Sunderland
STUART S. SUNDERLAND
Head, Southwest Environmental Section

Copy to:
CMC (Paul Hubbell)
NAVFACENGCOM (Brian Higgins)

Encl:
(1) WESTNAVFACENGCOM Comments
(2) MCAS, EL Toro Comments
(3) J. M. Montgomery Consulting Engineers Comments

DESIGN COORDINATION AND REVIEW – COMMENTS
11ND WESTDIV 11012/2b (REV. 7-72)

JOB ORDER NO.	
DATE	

COMMENTS BY	CODE	PHONE
Ernie Cerini	114B	

PROJECT TITLE AND LOCATION

OCWD Investigation of TCE Contamination

TYPE OF REVIEW	
	30%
	100%
	FINAL
	OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
Page 1-1		
Par. 1.1	"... subsequent sampling of all other available wells ..." What data exists for these wells? It should be included in this POA.	
Par. 1.1	Why weren't the 2 monitoring wells and 7 irrigation wells sampled?	
Par. 1.1	"... TIC 35 and 47 are located west and downgradient of the base ..." From most recent groundwater elevations it appears that these wells are downgradient of MCAS El Toro but what about past levels. Show historical trends year by year for groundwater elevations?	
Fig 1-1	Figure 1-1 shows well 17 had no detectable TCE concentration. using flow lines in Figure 1-2 it is apparent that MCAS El Toro did not contaminate TIC 47 and contamination of TIC 35 is unlikely. (Care in interpreting information on Figure 1-2 is important since arrows shown are not perpendicular to flow lines but are rather applied in a way to show that MCAS El Toro is the only possible source)	
Page 1-2		
Par. 1.1	What's the impact of pumping 6,550 acre-feet for irrigation and 432 acre feet for non irrigation use on the general flow of groundwater?	
Figure 1-2	• Title block shows Nov. 1987 is this the date the GW elevations were take? If not when were data taken?	
	• Arrows showing water flow not perpendicular to flow lines. Why not?	
Page 1-4		
Par. 1.3	What does the QA/QC program look like?	
	How good are computer modelers? What experience do they have using this model? How good is this model, has it be calibrated to existing data? What are modelers qualifications?	

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	100%
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DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
Par 1.3	Not enough information on the well isolation testing process.	
Page 2-1		
Par. 2.1	Can the stainless steel submersible pumps cause sample contamination?	
	Define "sufficient time" and "generally accepted sampling procedures"?	
	Sampling wells clearly not associated with the goal of defining TCE contamination will not be paid for by the government in the event that reimbursement is made.	
Page 2-2		
Par. 2.2	"... and any other off-base wells containing TCE" Clearly sampling Osumi, TIC 194 and South Lake wells (at a minimum) should not be paid for since contamination observed in these wells is not from sources effecting TIC 35 and 47. Data on Figure 1-1 shows that wells in the general area of these above and up gradient have no detectable TCE concentrations.	
Page 2-3		
Par. 2.2	Prior to placement of new MW's we want to meet to discuss the locations chosen.	
Page 2-5		
Table 2-1	Does the use of oil lubed vertical turbine pumps cause any contamination?	
Page 2-10		
Par. 2.2.4	Why specifically was 700' depth for MW1 chosen? Isn't this a little deep for the 1st cut in the field evaluation?	
Par. 2.2.4.1	Is reverse circulation hydraulic rotary drilling the best possible method?	

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Ernie Cerini			

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	OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
Page 2-12		
Par. 2.2.4.3	Isn't stainless steel casing overkill? Why 5" diameter? You probably can install another well just with the difference between stainless steel and PVC costs.	
	Why is the tremie pipe a permanent installation?	
	Where does all the water pumped from the wells go? What happens if it is contaminated? What happens to contaminated soil? Whatever process you use we will use.	
Page 2-14		
Par. 2.2.4.4	What QA/QC procedures will Westbay staff follow to sample these wells?	
Page 2-17		
Par. 2.3	Study appears obsessed with "linking" TCE contamination in TIC 35 and 47 to MCAS El Toro. Clearly, MWs shown in Figure 2-5 are tentatively placed to "reflect the likely points of TCE entry" which are specified as the washes ~~plus~~ passing through El Toro and the historic on-base solvent use/disposal areas. The report does nothing to address other off-base sites of TCE. If this investigation determines MCAS El Toro is not the source it will shed little light on areas that might have been the source.	
Page 3-1		
Par. 3.1	How was the OCWD two-dimensional groundwater flow and solute transport model improved? Who improved it? What were the qualifications of the improver(s)? Has this model been calibrated to existing data?	
Page 3-2		
Par. 3.2	Keeping the flow field constant for 5 to 10 years doesn't appear to reflect projected trends. How will the future IRWD wellfield affect the flow field?	

DESIGN COORDINATION AND REVIEW – COMMENTS
11ND WESTDIV 11012/2b (REV. 7-72)

JOB ORDER NO.

COMMENTS BY	CODE	PHONE	DATE
Ens. Michael Rehor	1JG	x2821	17 Dec 1987

PROJECT TITLE AND LOCATION
OCWD Investigation of TCE Contamination

TYPE OF REVIEW
- [ ] 30%
- [x] 100%
- [ ] FINAL
- [ ] OTHER

DWG. NO. OR PAR. NO.	COMMENTS (Make general comments after specific comments)	REVIEW ACTION (& reasons where significant)
Sec. 1.1 para 1	We may want to question the last sentence. To say that TIC 35 and 47 are located downgradient of the base with respect to groundwater flow is basically implying we are the source.	
Fig 1-2	We may want Montgomery to verify if this is accurate. Once again it seems like they are "stacking the deck" against the base.	
Sec 1.2	I think this should read "To provide information that... the Marines, identifies the source or sources of TCE contamination detected in TIC wells 35 and 47.	
Sec 1.3	If JMM is going to have some oversite, we may want it included in this section.	
App. C	All actual costs need to be very carefully documented.	
Gen Comment	Any type of agreement should include wording which establishes MCAS El Toro liability in the case of other sources of TCE	

SHEET OF SHEETS

REVIEW COMMENTS

OCWD Investigation of TCE Contamination MCAS El Toro

Reviewer Melih Ozbilgin Pg 1 of 6

Comment No.	Pg.	Par.	Section	Comment
1	1-2	1	1.1	PCE was detected at various locations throughout the area and not only at those "locations of runoff from the base".
2	1-3	1	1.1	It should be noted that the water levels shown in figure 1.2 are reflective of current conditions and not neccessarily representative of historic ground water levels and/or flow directions.
3	Fig. 1-2			The arrows depicting flow direction should be adjusted to more accurately represent flow lines for the water levels
4	1-4	1	1.2	It should be noted the U.S. will pay for the OCWD expenses only if the contamination is determined to be attributable to base. Hence, the OCWD study should also look at other potential sources for purposes of remedial investigation/cleanup cost sharing
5	2-1	1	2.1	It should be clarified that the density of 1.49 apply to TCE as pure product. At concentrations below its solubility in water TCE will be in solution. Specifically at concentrations observed in Tustin Plain the TCE will have no density effect within the transport media.
6	2.1	1	2.1	In light of comment 5, above, the "vertical leakage of TCE contamination" will not be a density related issue unless a drilling activity takes place through free TCE product.
7	2-1	2	2.1	In light of available data from TIC wells 78, 108, and 113 the sampling of wells 194, Osuna and So. Lake at cost to MCAS El Toro is not justified

REVIEW COMMENTS

OCWD Investigation of TCE Contamination MCAS El Toro

Reviewer MMJ Pg 2 of 6

Comment No.	Pg.	Par.	Section	Comment
8	2.2	2	2.1	Our recent experience with California DOHS and U.S. EPA suggest that a multi screened monitoring well is not an acceptable technology. However, we believe that, when properly constructed, such wells are cost effective means of monitoring multi-layer aquifers. Since it is still possible that the MCAS El Toro may some day fall under Superfund, the investigative techniques may need to be approved technologies by the policing agency.
9	2-3	2	2.2	We agree that at least 265 ft deep well(s) will be needed to ascertain shallow aquifer contamination
10	2-6	3	2.2.1	The temperature log of TIC 55 indicated a gradient of <0.5°F per 100 Ft with no appreciable differentiation to indicate zones of groundwater flow to the well.
11	2-7	1	2.2.1	The TV survey of the TIC 55, which is about same age as TIC 35 and 47, indicated heavy encrustation within the saturated zone of the well casing. This was to an extent that even the perforations could not be identified. Under such conditions caliper survey to identify cracks or holes in the casing will be unproductive.
12.	2-7	2	2.2.1	The dynamic flowmeter surveys at rates 500 to 1,000 gpm will not identify low producing zones which may actually carry the contaminants
13.	2-8	3	2.2.2	As described in Comment 11, the cracks or holes in blank casing will be extremely difficult, if not impossible, to determine.

14	2-8	4	2.2.2	The oil present in the well, as well as the TCE at certain concentrations will be considered as "hazardous waste". Such water should be treated either on-site or drummed and disposed of off-site. The plan does not adress handling of either the contaminated water or the soil (obtained during drilling of monitoring wells).
15	2-9	1	2.2.3	The similar test conducted at TICSS indicated practically uniform distribution of TCE over the approximately 150 Ft screened aquifer zone. This suggest either leakage around well casings or uniform mixing of contaminants within that particular aquifer zone
16	2-9	2	2.2.4	The term "upgradient with respect to ground water flow" need to be clarified in respect to the changes has been occuring in water levels (hence in flow directions) within the past decade. More then one well may be needed to assess past impacts to the wells.
17	2-10	1	2.2.4	The rational given for monitoring well completion depth suggest that the contamination in both wells are related and is from the same source. This may or may not be the case.

18	2-10	1	2.2.4.	The justification given for selecting 700 Ft depth need to be eloborated. It should also be pointed out that the study is too much geared towards proving or disproving MCAS El Toro as the source. If study disproves MCAS El Toro as the source the results will not be suitable to identify other potential contributers.
19	2-12	1	2.2.4.3	A seperate well should be constructed for perched zone since they may have higher TCE concentrations (due to minimum mixing) and they are cheaper to construct This will eliminate any potential cross contamination.
20	2-12	1	2.2.4.3	Since the metals contamination is not an issue and since the concentrations observed to date are very low the use of expensive stainless steel casing and screen material is not justified.
21	2-12	1	2.2.4.3	Are the slots on screen pre-manufactured or perforated in-place?
22	2-12	1	2.2.4.3	Bentonite alone at thicknesses around 5 Ft may bridge between the borehole and the casing. furthermore, bentonite under pumping pressures, may leek into the sand pack and into the well, hence defeating its purpose. We suggest that the seals should be atleast 20 Ft long with cement/bentonite mixures placed above a bentonite plug to assure long term reliability.
23	2-12	1	2.2.4.3	The sandpack material should be chosen following lithologic loging of the boreholes.

24	2-12	1	2.2.4.3	Please give rational for leaving a permanent tremie pipe in the well.
25	2-12	1	2.2.4.3	Electrical conductivity and temperature of the development water need to be monitored to assure that stable conditions exist prior to completion of well development.
26	2-12	1	2.2.4.3	The method of disposal of the development water and soil cuttings need to be discussed
27	2-13	2	2.2.4.4	It is possible that, at low concentrations the TCE or PCE will not be detected at a composite sample obtained from pump discharge or bail sample obtained near water surface, especially on monitoring wells which may be 700 to 1500 ft deep. Since these wells will be placed based on some prior justification, a limited testing (i.e. certain zones) should be conducted.
28	2-13	2	2.2.4.4	Need to define "... <u>conclusive</u> in determining the TCE distribution"
29	2-13	2	2.2.4.4	Since monitoring wells will have perforations at pre-determined elevations (based on some justification) conduct of flowmeter survey is not justified.
30	2-14	2	2.2.4.4	It was previously indicated that these well may be converted into production/recovery wells (pp2-10 par. 1). The MP system appears to be extremely costly for one-time testing. Cheaper testing methods do exists and should be considered more in depth (i.e. by conducting cost/benefit analysis).

31	2-15	2	2.2.4.4.	Neither in text or in references provided in appendicies an amount which can be pumped from MP system port is given. Such amount is necessary to assess usefullness of conducting rising- or falling-head tests utilizing MP sampling instrument.
32	2-15	3	2.2.4.5	The method and equipment used to conduct the pump test on wells TIC 35 and and 47 are not clear (i.e pump sizes, pump rates, duration, monitoring ... etc).
33	2-15	4	22.4.5	The packers inflated on TIC wells will most likely leak due to encrustation in the well. Cleaning of the well with wire brush prior to packer testing should be considered.
34	2-17	1	2.3	Again, the study is targeted towards identifying base as the source. Other potential sources (i.e. the raceway located upgradient of the contaminated wells as well as on Bee Canyon wash).
3.5	2-17	1	2.3.1	This section suggest that all monitoring wells may be 700 to 1500F deep. Other than the two wells drilled near TIC 35 and TIC47 such depths are not justified. For initial assessment more shallow wells should be constructed at the shallow groundwater.
36	3-1	1	3.1	The model should also be utilized to evaluate locations of monitoring wells and to assess how the CRISAP contamination may have occured

REVIEW COMMENTS

OCWD Investigation of TCE Contamination MCAS El Toro

Reviewer DC Azevedo Pg 1 of 2

Comment No.	Pg.	Par.	Section	Comment
1	4	1	1	Why should the objective of the OCWD investigation be to confirm or deny the El Toro MCAS as a source of TCE contamination. Objective should be to attempt to find source without bias attitude.
2	7	1	2	A caliper survey will not identify cracks or holes in the casing and perferations.
3	9	1	2	"The maximum depth at which a sample can be obtained using the syringe is 400 feet." Not correct.
4	9	1	2	"If TCE concentrations are detected at shallow depths but diminish to ND at the 400' depth, no further depth-specific sampling will be undertaken." Page 1 section 2 states "TCE is heavier than water (d 4/4 = 1.49)"
5	10	2	2	16" borehole to be drilled however figure 2-3 shows 12" borehole
6	12	1	2	"All significant water producing formations, including suspended perched zones, shall be screened," Page 2-1 states, "Thus care must be taken during all phases of the investigation to prevent vertical leakage of TCE contamination into clean aquifers." The design of the monitoring wells will not accomplish is objective.
7	12	1	2	5" Threaded stainless steel casing is very expensive, and unnecessary for a monitoring well.

REVIEW COMMENTS

OCWD Investigation of TCE Contamination MCAS El Toro

Reviewer DC Azevedo Pg 2 of 2

Comment No.	Pg.	Par.	Section	Comment
8	13	2	2	At conclusion of well development pumping, a composite sample shall be taken. If no contamination, no further testing will follow. - Should run a dynamic flowmeter survey to insure all screened zones are producing water and have been properly developed. Then run a static flowmeter survey to see if water in an aquifer of high hydrostatic pressure is flowing into aquifers of lower hydrostatic pressure: ie, perched into regional, and perhaps pushing the contaminents back into the formation making depth-specific sampling information useless.

General comment: Should work w/ MCAS and study the results on current work on T/C 55 well before making elaborate plans to perform testing on other wells.

Table 2-2 TV survey $2,000 - too high

Depth specific sampling $1,000 too low