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To Utilities Director

JR - Please review & provide comments to Alex by 1430 this afternoon.

Hayes

Date 26 Mar 85 From JHC

TALKED TO BOB 26 MARCH 'OK'

6280/4
FAC

SUBJECT: VOLATILE ORGANIC CHEMICALS (VOC) IN THE CAMP LEJEUNE WATER SUPPLY

INTRODUCTION: This staff study addresses the supply of adequate water to Tarawa Terrace (TT), and the mid- and long-term responses to the subject.

1. PROBLEM:

- To provide adequate, non-contaminated water supply to TT to meet the summertime demand.

- To develop milestones for the VOC study and interim and long-term alternatives.

2. ASSUMPTIONS:

- None.

3. FACTS BEARING ON THE PROBLEM:

- With the two wells closed at TT (#26 and new well), a water supply shortage of about 300,000 gallons per day is expected this summer.

- Annex A provides analytical data on the Tarawa Terrace (TT) water system. These data indicate no detectable VOC concentrations in the finished water without the TT new well in operation.

- Annex A also indicates that detectable levels of tetrachloroethylene (tetraCE) in the TT finished water would likely occur when the TT new well is operated and blended with other TT wells. The levels of the tetraCE in the finished water can only be estimated as between detectable levels 10 ppb and 20 ppb. Interestingly, the only parameter of significance appears to be tetraCE in the new well.

- Annex B provides the alternative for providing water to the

TT area and recommended construction of an 8" line from Brewster Blvd to TT (cost estimate: $90,000).

- Completion of this auxiliary line is anticipated in June 1985, if approved.

- Annex C describes the issues which must be addressed to develop the mid- and long-term responses to the VOC problem. Milestones for the completion of the NACIP study are requested in order for the CG, MCB to properly plan future responses and make decisions on courses of action.

- Annex D provides the results of our search for VOC standards among states and other agencies.

DISCUSSION:

- Annex A reinforces the recommendation to construct the 8" auxiliary raw water line to the TT system. Further, the data suggests interim use of the TT new well for contingency purposes would not pose any extreme health threat to the TT residents. Production for any duration should only be pursued following additional analyses of the "diluted" VOC concentrations in the finished water and review of these data by medical personnel.

- Construction of the 8" line offers future economic advantages in return of raw water from TT wells at a minimal cost. Even with the approval to proceed with the 8" line, the likelihood exists for the use of the new well and/or water conservation measures (with associated public information issues) in order to meet water demand until the new line is in place.

- Funding for both the NACIP confirmation study and any remedial actions will use pollution abatement funds managed by NAVFACENGCOM.

- At present there are no published or established treated water VOC standards applicable to Camp Lejeune. HQMC (LFL) continues to pursue the search for state standards with EPA offices.

5. CONCLUSIONS:

- The TT new well would be relatively safe to use for contingency purposes with caveats stated above.

- The construction of the 8" line offers much greater benefits than costs.

- The detailed NACIP study of the water system needs to be expedited.

- No clear regulatory limits for VOCs exist at present and will be slow in coming.

6. ACTION RECOMMENDED:

a. Proceed with construction of 8" line to TT.

CS: Concur_____Nonconcur_____

CG: Approved_____Disapproved_____

b. Forward message in Annex C.

CS: Concur_____Nonconcur_____

CG: Approved_____Disapproved_____

c. Pursue definition of "acceptable" VOC levels in finished water through HQMC, NAVHOSP and NAVFACENGCOM.

CS: Concur_____Nonconcur_____

CG: Approved_____Disapproved_____

TARAWA TERRACE WATER SYSTEM
SUMMARY OF WATER QUALITY DATA (ppb)

Date: 3/19/85

CATION	VOC Parameters	SAMPLE DATA 16 Jan* (L)	12 Feb (L)	19 Feb(N)	19 Feb(L)	11 Mar(N)**
26 Well	TCE	57	ND	ND	ND	
	4CE	1,580	ND	55	64	
	DCE	92	ND	ND	ND	
	B	ND	ND	ND	ND	
	VC	27	ND	ND	ND	
						Pumped 2 Hours
New Well	TCE	ND	ND	53	ND	ND
	4CE	132	37	26	ND	15
	DCE	11	ND	ND	13	ND
	B	ND	ND	ND	ND	-
	VC	ND	ND	ND	ND	-
						Pumped 24 Hours
	TCE					ND
	4CE					41
	DCE					ND
	B					-
						W/O New Well
T Finished Water	TCE					ND
	4CE					ND
	DCE					ND
	B					ND
						Upstream of Reservoir at 24 Hours
	TCE					ND
	4CE					21.3
	DCE					ND
	B					-
						Downstream of Reservoir at 24 Hours
	TCE					ND
	4CE					Trace (6.6)
	DCE					ND
	B					-

LEGEND: ND = Not Detectable at limit of 10 ppb
TCE = Trichoroethylene
4CE = Tetrachloroethylene
DCE = Dichlorobenzene
B = Benzene
VC = Vinyl Chloride
(L) = LANTDIV Laboratory
(N) = State of NC Laboratory

*Wells having no detectable VOC's also included: 25,30,31,32,52,54,67

**Dash (-) indicates parameters not reported telephonically-hard copy data to follow

HEADQUARTERS, MARINE CORPS BASE, CAMP LEJEUNE

ACTION BRIEF

Date: 1 MAR 1985

Staff Section: Assistant Chief of Staff, Facilities

Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

Problem: Because of the recent shutdown of two water wells in the Tarawa Terrace water system due to the presence of Volatile Organic Chemicals (VOC) in the raw water, sufficient well capacity is not expected to be available to satisfy water demand this summer. A shortage of 300,000 gpd (gallons per day) is expected this spring/summer if the present situation remains unchanged.

Background/Discussion: The following alternatives are listed as possible options for addressing the problem.

a. Alternative 1: New well, Tarawa Terrace. Estimated cost: $80,000.

Advantages: Increase capacity by 100 gpm to 250 gpm (gallons per minute).

Disadvantages: Based on recent new wells and test wells in Tarawa Terrace, water in significant quantitities is difficult to locate (e.g., well TT-25 is producing approximately 100 gpm although designed for 150 gpm. New well would be abandoned after completion of expansion of Holcomb Blvd plant in approximately two years. Wells in Montford Point area are high in iron content. Construction of a new well by spring is questionable but could possibly be completed.

b. Alternative 2: Transport water via tanker trucks from other Camp Lejeune plants. Assume hauling 300,000 gpd with 5,000 gallon tankers which would require 60 trips per day. Assuming a tanker can make 12 trips per day, a total of five tanker trucks would be required. Estimated cost: $2,000 per day.

Advantages: Timely method of providing water.

Disadvantages: Logistics of loading/unloading/ transporting; nonavailability of trucks.

c. Alternative 3: Tap to City of Jacksonville water line on Lejeune Blvd. Informal discussion with city officials indicates they probably could not provide 300,000 gpd at this time. No costs for taps or rates were quoted. A water line under Lejeune Blvd would have to be constructed. Estimated cost: Unknown.

Advantages: Timely response to problem, if available.

Disadvantages: Problems associated with connecting separate systems. Chance of requests for reciprocating favors from the City of Jacksonville would increase. VOCs in the city system could be higher than we are now facing.

d. Alternative 4: Change schedule of Holcomb Blvd plant contract to construct the water line to Tarawa Terrace immediately. The expansion of the Holcomb Blvd plant includes running a water line to TT and Camp Johnson. Contract has been awarded. Estimated cost: Unknown (additional cost to contractor).

Advantages: No unnecessary construction would be required.

Disadvantages: Serious doubts exist that contractor would complete line prior to high usage months. Line serving Tarawa Terrace is a 16" submerged line across Northeast Creek.

e. Alternative 5: Construct 8" water line from Brewster Blvd to Tarawa Terrace. Line could be tied to the railroad trestle to cross Northeast Creek. Estimated cost: $75,000.

Advantages: Timely response to problem.

Disadvantages: Problems related to material procurement and construction could surface. The temporary line may require State approval. Pressures and elevations of the two systems have been investigated to determine feasibility.

f. Alternative 6: Modify Tarawa Terrace plant to include aeration or granular activated carbon (GAC) capable of removing VOCs. Estimated cost: $300,000.

Advantages: Removal of VOCs would eliminate the problem.

Disadvantages: The modifications could not be made in the time frame required. The Tarawa Terrace plant will be discontinued upon completion of Holcomb Blvd plant expansion.

g. Alternative 7: Turn on contaminated wells that have been shut down if required to maintain adequate water levels. Estimated cost: None.

Advantages: Adequate quantity of water could be provided.

Disadvantages: Although no maximum contaminate levels have been set for VOCs and no regulations presently prevent using water containing VOCs, the potential health hazards must be weighed against the need and cost of providing water from other sources.

Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

Recommended Action: Alternative 5, construct 8" line from Brewster Blvd to Tarawa Terrace. Preliminary engineering study indicates this would provide approximately 250 gpm (360,000 gpd).

Advantages:

(1) Timely - target date for completion 1 June 1985.

(2) Availability of water - can draw from Holcomb Blvd and Hadnot Point system.

(3) Auxiliary line for future use during repair/maintenance of other system.

(4) Minimum cost.

(5) Potential future use to return raw water from Tarawa Terrace wells.

Very respectfully,

M. G. LILLEY
AC/S, Facilities

Decision on Recommended Action:

CS Concur _____ Nonconcur _____

CG Approved _____ Disapproved _____

Need more info as we discussed

LAB TO PROVIDE LOCAL TESTING CAPABILITY.

C. PROCEEDING WITH THE HOLCOMB BLVD PLANT EXPANSION PROJ (82-2243) WHICH WILL SUPPLY ALL WATER TO TT AND MONTFORD PT WHEN COMPLETE. THIS PROJECT, HOWEVER, DOES NOT INCLUDE SOLUTIONS TO VOC PROBLEMS IN WELLS.

3. FOR MID/LONG-TERM ACTIONS, REQ THE SUBJ STUDY BE EXPEDITED AND THE FOLLOWING ISSUES BE ADDRESSED AS DESCRIBED IN REF (B):

A. VERIFICATION OF EXISTENCE OF CONTAMINATION IN ALL WATER SUPPLY SYSTEMS. MOST WELLS IN THE EIGHT SYSTEMS HAVE BEEN SAMPLED ONCE. FOR THOSE SAMPLING LOCATIONS WHERE REPLICATE SAMPLES HAVE BEEN TAKEN, REPORTED VOC LEVELS HAVE VARIED GREATLY. THUS, THE VERIFICATION OF THE VOC'S IN ALL SYSTEMS APPEARS WARRANTED.

B. VERIFICATION OF THE LOCATION OF SOURCES OF VOC'S IN THE TEN WELLS WHICH HAVE BEEN CLOSED DUE TO DETECTABLE VOC'S: 601, 602, 608, 634, 637, 651, 652, 653, TT-26 AND TT NEW WELL.

C. CHARACTERIZATION OF VOC PROBLEMS IN THE HADNOT PT, HOLCOMB BLVD AND TT SYSTEMS TO FIND THE EXTENT AND RATE OF MIGRATION OF VOC'S, INCLUDING MIGRATION FROM POSITIVE WELLS TO CLEAN WELLS DURING

CG MCB CAMP LEJEUNE NC

LANTNAVFACENGCOM NORFOLK VA

INFO CMC WASHINGTON DC

UNCLAS //N11000//

LANTDIV FOR 114; CMC FOR LFL

SUBJ: NACIP STUDY OF CAMLEJ WATER SUPPLY SYSTEMS

A. CG MCB CAMLEJ NC 082305Z FEB 85

B. LANTDIV LTR 114:JGW:SSW 6280 DTD 10 MAY 83

1. REF (A) DESCRIBED ONGOING ACTIONS TO ADDRESS THE PRESENCE OF VOLATILE ORGANIC CHEMICALS (VOC) IN ISOLATED WATER SUPPLY WELLS AT CAMLEJ. VOC'S HAVE BEEN DETECTED IN TEN WELLS WHICH HAVE BEEN CLOSED; NOTHING HAS BEEN DETECTED IN 67 WELLS.

2. SHORT-TERM ACTIONS BEING TAKEN ARE:

A. WELL CLOSURES HAVE NOT AFFECTED PRODUCTION OF WATER SUPPLIES EXCEPT AT THE TARAWA TERRACE (TT) SYSTEM. SEVERAL ALTERNATIVES FOR PROVIDING AMPLE WATER TO TARAWA TERRACE HAVE BEEN REVIEWED INCLUDING AN AUXILIARY LINE TO THE TT SYSTEM FROM THE HOLCOMB BLVD PLANT.

B. EXPEDITING INSTALLATION OF GAS CHROMATOGRAPH IN THE BASE

INCREASED PUMPING.

D. IN THE VICINITY OF THE CONTAMINATED WELLS, REVIEW OF THE EXTENT OF USAGE AND EFFECTS OF TEST BORINGS AND THE IMPACTS OF ABANDONED WELLS TO DETERMINE THE POTENTIAL FOR INTER-AQUIFER EXCHANGE OF CONTAMINANTS VIA THESE ROUTES.

E. PREPARATION OF THE FEASIBILITY STEP AND COST ESTIMATES FOR INTERIM AND LONG-TERM ALTERNATIVES.

F. RECOMMENDATIONS FOR INTERIM AND LONG-TERM MONITORING OF RAW WATER WELLS AND TREATMENT SYSTEMS.

4. REQ YR ASSISTANCE IN DEVELOPMENT OF MILESTONES FOR EACH OF THE ABOVE ISSUES BY 15 APR 85.

5. POC IS MR. BOB ALEXANDER, AV 484-3034/5.

UNITED STATES MARINE CORPS
Natural Resources and Environmental Affairs Division
Marine Corps Base
Camp Lejeune, North Carolina 29542

IN REPLY REFER TO:
6280/1
NREAD
11 Mar 1985

From: Director, Natural Resources and Environmental Affairs Division, Marine Corps Base, Camp Lejeune
To: Assistant Chief of Staff, Facilities, Marine Corps Base, Camp Lejeune

Subj: STANDARDS FOR CERTAIN TYPES OF VOLATILE ORGANIC CHEMICALS FOUND IN DRINKING WATER WELLS

1. The Chief of Staff recently requested the subject information. NREAD contacted Mr. Paul Hubbell, Code LFL, HQMC, regarding standards for the subject chemicals. Mr. Hubbell recommended that we not attempt to call individual States. He also advised that he would request the information from EPA and other sources he had available. Mr. Hubbell provided the following information on 8 March 1985:

a. Sources contacted:

(1) American Water Works Association (AWWA);

(2) All DOD services, except U. S. Air Force;

(3) Criteria and Standards Division, EPA Office of Water;

(4) Office of Drinking Water, EPA Office of Water; and

(5) State Programs Division, EPA Office of Water.

b. Mr. Hubbell expressed surprise at the lack of information. He was, however, able to identify the following information:

(1) The Army has provided a letter from the Office of Emergency and Remedial Response, EPA to the Director of Policy, DOD. The letter establishes short term exposure limits of 200 ppb and long term limits of 5-50 ppb for Trichlorodethylene. The letter limits these recommendations to incidents at two specific DOD installations. Mr. Hubbell is mailing MCB CLNC a copy. (Copy attached.)

(2) The Criteria and Standards Division, EPA Office of Water is providing "Non-Binding Health Adviseries for Short Term Exposures" for several of these chemicals. Mr. Hubbell anticipates receipt of these on 11 March 1985 and will forward to MCBCLNC immediately. (See note on next page.)

(3) The AWWA has just started a data search but information will not be available for several months.

Subj: STANDARDS FOR CERTAIN TYPES OF VOLATILE ORGANIC CHEMICALS FOUND IN DRINKING WATER WELLS

2. NREAD contacted Mr. Ken Orloff, Toxicologist, Region IV EPA, Atlanta, Georgia. Mr. Orloff advised that to his knowledge the only standards for the subject chemicals in Region IV was a limit of 3 ppb in Florida for Trichloroethylene.

3. It appears that the documents being forwarded by Mr. Hubbell constitute the best information available. NREAD concurs with Mr. Hubbell's recommendation relative to direct contacts with States addressed in paragraph 1.

J. I. WOOTEN

NOTE: Between 1979 and 1982, EPA suggested the level of a contaminant in drinking water at which adverse health effects would not be anticipated with a margin of safety. These levels are reviewed in the June 12, 1984 Federal Register which published the proposed rule to establish recommended maximum contaminant levels for VOCs.

R.E. Alexander, 3/26/85

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 25 1983

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Peter S. Daley, Lt. Col., USAF, BSC
Director, Environmental Policy
Office of the Assistant Secretary of Defense
Department of Defense
Washington, DC 20301

Dear Colonel Daley:

Thank you for your letter of May 3, 1983. I believe that it is critical for the Environmental Protection Agency (EPA) and the Department of Defense (DOD) to expeditiously resolve problems at Air Force Plant #44 (Tucson, Arizonia) and Twin Cities Army Ammunition Plant (New Brighton, Minnesota) so that response actions can proceed. Therefore, the following is our position on trichloroethylene (TCE) cleanup and health protection levels at these facilities. In addition, I have provided you with a proposed agreement on response jurisdiction at sites where DOD has not been confirmed as a source of contamination.

(1) Recommended TCE Levels:

Federal Drinking Water Standards for TCE are currently under development by EPA. Based upon our present assessment of the potential cancer risk and the feasibility of treatment it appears likely that a proposed standard would be in the general range of 5 to 50 parts per billion (ppb). These values are rounded off from the risk calculations performed by the National Academy of Science Safe Drinking Water Committee using the linear multistage extrapolation model and are nominally equivalent to lifetime risks of 1 in 1,000,000 and 1 in 100,000 respectively, assuming consumption of two liters of water per day per person. Of course these are subject to change as the rulemaking process proceeds. For planning your response action, I would recommend that 5 ppb should be viewed as a goal. Alternatives within this range should be examined, and depending on available technology, cost, and the consideration of population and other factors (which is important in major urban areas), an appropriate remedy should be selected. Once the Federal drinking water standard is established, it would be controlling.

EPA's recommended level for short-term exposure is 200 ppb, with respect to the Twin Cities Army Ammunition Plant in New Brighton, Minnesota. In lieu of drinking water standards applicable to TCE, however, our Office of Drinking Water has developed methodologies for determining non-binding health advisories for short-term exposures for a number of chemicals including TCE. These are currently being revised and updated and the numbers may change when that review is completed. However, at this time, this represents our best estimates for minimizing the risk for short-term exposures.

INCL 1

As a note of caution, I might add that both of these recommended levels are of an interim nature and should not be applied to all TCE sites without addressing individual specific site conditions.

(2) Response Jurisdiction Where DOD is a Suspected Source of Contamination

With respect to jurisdictional issues, if DOD is not confirmed as the source of the contamination in areas surrounding a DOD facility, EPA will fund a remedial investigation to determine the source and extent of contamination. Once a determination is made that some or all of the contamination is DOD's responsibility, DOD will reimburse EPA for the DOD share of the costs incurred to date and then a decision will be made on who will take the remaining actions.

I appreciate the efforts you have made in developing a joint DOD/EPA approach to resolving contamination problems suspected to be from DOD facilities. I am also confident that we will continue a concerted effort to address the hazardous waste contamination problems at DOD facilities. Should you have any questions or need further information, please contact me directly.

Sincerely yours,

William N. Hedeman, Jr.
Director
Office of Emergency and Remedial Response