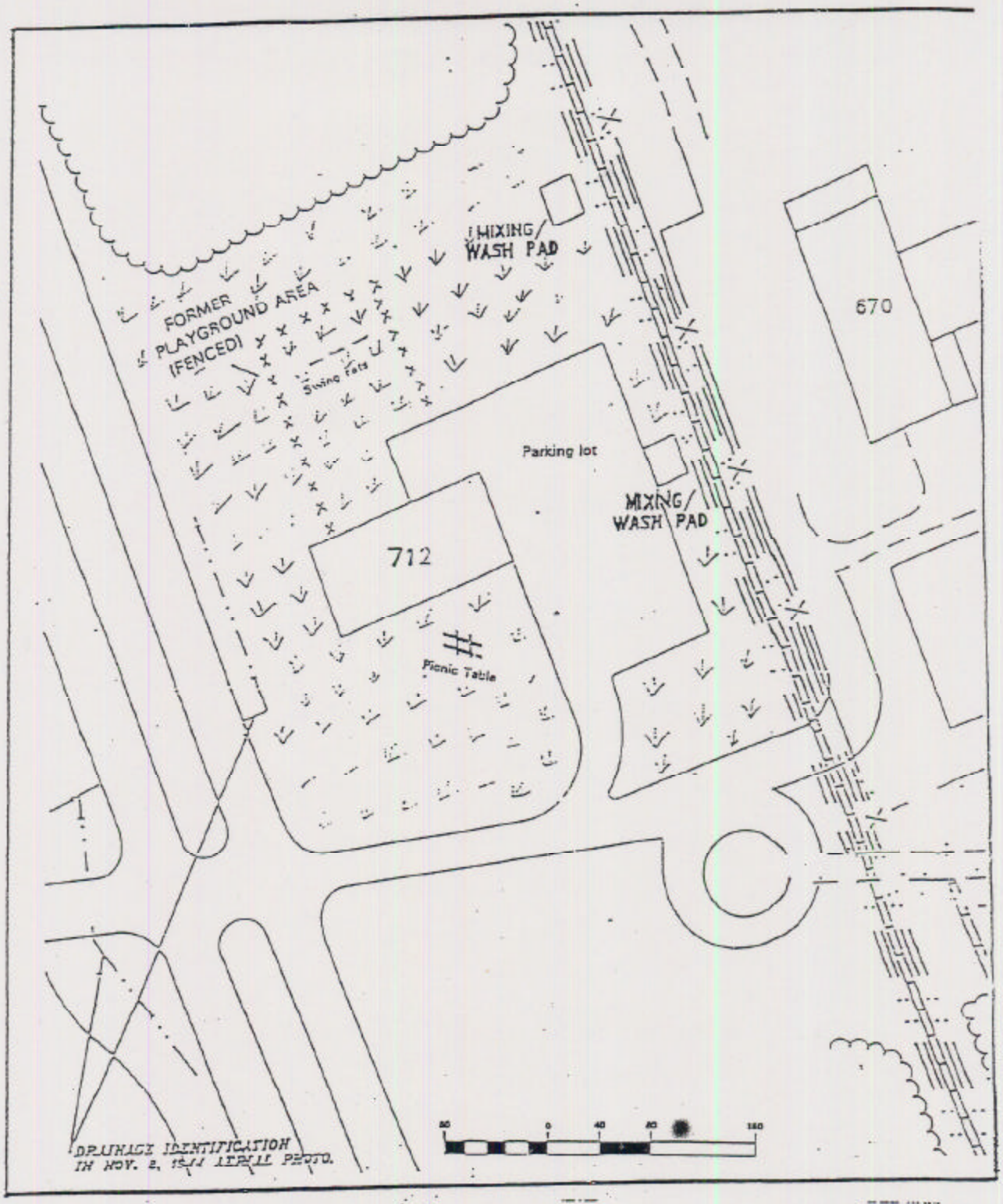

Figure 2
Site 2 Former Day Care Center
Marine Corps Base, Camp Lejeune

Source: Modified from Baker Draft Report 1993

decontaminated until 1994, when the contaminated soil was removed from the parking lot and lawn areas (24, 25).

In 1966, Building 712 was opened as a day-care facility for the children of MCB Camp Lejeune employees. The day-care center had an enrollment of approximately 45 children ranging in age from 6 weeks to 12 years; most were about 5 years old (55). The children's playground area was fenced and approximately 100 feet from the old concrete wash pad. A gravel parking lot is located at the rear of the building. The old concrete mix pad was adjacent to the parking lot, and cars could actually park on the concrete pad.

In 1982, during environmental contamination investigations at MCB Camp Lejeune, pesticides in surface soil were detected at several locations around the building, i.e., near the mix and wash pads, in the lawn area, in the parking lot, in the day-care playground area, and in the drainage ditch (3). Figure 2 diagrams those locations at Site 2. The pesticides detected (DDT and chlordane) are not water soluble. They bind tightly to soil particles and are not easily washed away from the soil. Therefore, movement of pesticides from the immediate area where they were released is not expected. However, migration of the soil particles from erosion due to heavy rains or winds may explain the presence of pesticides in the adjacent drainage ditch.

In June 1982, after environmental contamination was detected, the Marine Corps relocated the day-care center to another area on base (56). In 1989, Building 712 was used as a personnel office. In 1994, the office workers consisted of one part-time and fifteen full-time employees (57). The area previously used as a playground is now covered with grass. Exposures were stopped in December 1993 when MCB Camp Lejeune installed a fence and posted signs in the lawn and parking lot warning people not to enter the contaminated areas (58). In 1994, the concrete pads and contaminated soil from the parking lot and lawn areas were removed (24, 25). The parking lot was backfilled with clean gravel. The lawn was backfilled with clean soil and seeded with grass.

Human Exposure Routes and Public Health Implications

Exposures to pesticide at Building 712 stopped in December 1993, so the discussion here is for estimates of past, not current, exposure. ATSDR identified four groups of people who were exposed to pesticide-laden soil. In the past, (1) office workers were exposed to parking lot dust, (2) lawn-care workers were exposed to soil stirred up by lawn mowers. During the time period from 1966 to 1982, (3) children were exposed to dust from the parking lot and soil in the playground, and (4) adults were exposed to dust from the day-care parking lot.

In 1982 and 1993, soil samples were collected from different locations surrounding Site 2. We discuss here the levels of exposure we estimate for each group beginning with the most highly exposed. The exposure levels are dependent on assumptions we make about the length of time people were exposed, their contaminant dose, and their own sensitivity based

on age. We have evaluated the exposure dose for each group of people who would have been exposed to contaminated soil at each sampling location. See Table 4 and Appendix E-2 for details.

ATSDR determined the likelihood that either cancerous and noncancerous adverse health effects will result from the exposure dose of the chemical contaminant. Because cancerous and noncancerous health effects occur through different biological mechanisms, they are evaluated separately, using different health guidelines and scientific information. If either cancerous or noncancerous health outcomes are likely to result from exposure to contaminants, the exposure is considered a public health hazard.

ATSDR's approach is conservative. (In other words, we include a wide margin of safety in our estimates of risk.) We use the maximum concentrations detected for estimating exposure dose. This estimate gives us a "worst case" estimate of the likelihood of adverse health effects. Thus, our public health recommendations are protective of the most sensitive members of the public.

1. Office Workers-Past Exposure

Office workers were exposed to pesticide contaminated dust when they parked their cars in the parking lot. The contaminated dust would have been absorbed by breathing or swallowing it. We assume that exposure would have lasted longer than 1 year because the length of employment is commonly longer than 1 year. The personnel office employs 16 employees.

Surface soil samples collected in 1993 from the parking lot area adjacent to the old concrete mix pad (the area with the highest concentrations of pesticide) contained these maximum levels: DDD at 1200 parts per million (ppm), DDT at 930 ppm, DDE at 30 ppm, and chlordane at 0.31 ppm (59).

The estimated exposure doses for office workers are listed in Table 4. Noncancerous adverse health effects resulting from those exposures are unlikely. However, when evaluated using the cancer risk values, we estimate that, as a result of their exposure, office workers may have an increased risk of developing cancer over their lifetime (Appendix E-2). Simultaneous exposures to those pesticides may increase this risk. Therefore, we concluded that exposure to pesticides at the levels detected in the parking lot area posed a public health hazard.

2. Lawn-Care Workers-Past Exposure

Lawn-care workers were exposed to pesticides by breathing or swallowing dust stirred up by the lawn mowers. We estimate those exposures would have been seasonal, occurring for 4

months of the year, 1 day per week, and possibly could have lasted more than 1 year for an estimated five individual lawn-care workers (24).

Surface soil samples collected in 1993 (Table 4) at the grass-covered areas contained maximum levels of DDT at 3000 ppm, DDD at 1200 ppm, DDE at 30 ppm, and chlordane at 7.4 ppm (59).

The estimated exposure doses for lawn-care workers are listed in Table 4. Most likely, lawn-care workers were exposed to lower doses of pesticides than are people who apply pesticides. However, pesticide applicators are aware that safety equipment such as respirators, gloves, and coveralls greatly reduce their chance of exposure, whereas lawn-care workers would not usually wear such equipment when mowing the lawn.

Noncancerous adverse health effects resulting from those exposures are unlikely. Additionally, we evaluated the likelihood of increased cancer risk to lawn-care workers from exposure to the chemicals (chlordane, DDT, DDE, and DDD). On the basis of the estimated duration of exposure, it is unlikely that lawn-care workers have any increased risk of developing cancer as a result of their exposure. Therefore, the exposure to lawn-care workers at Site 2 does not present a public health hazard. Appendix E-2 lists the exposure doses and cancer risk values estimated at Site 2.

3. Children at Day Care-Past Exposure: 1966–1982

Due to their hand-to-mouth activity, children ingest more soil than adults. As a result, children who attended the day-care center were exposed to higher doses of pesticides than were adults. Children at the day-care center absorbed the pesticides by touching the soil in the playground and by breathing or swallowing the soil. We estimated that approximately 225 individual children would have been exposed during the time the day-care center was in operation. We assumed that children would have attended the day care for longer than 1 year because the average tour of duty for military personnel at MCB Camp Lejeune at that time was 3 years. Therefore, we estimated exposure to be chronic.

When soil sampling was carried out in 1982, surface soil samples collected from the playground area contained DDT at 6.7 ppm and chlordane at 0.39 ppm. Because the breakdown of those compounds is slow, we assumed that the concentrations were within the same range throughout the 16-year period that the day-care center operated.

Table 4. Potential Health Effects of Pesticide Exposures at Site 2

Exposed Population	Exposure Time Frame	Exposure Activity	Surface Soil Contaminant		Maximum Estimated Exposure Dose (mg/kg/day)	Potential Health Effects	
			Chemical	Concentration Range (ppm)		Noncancer Effects	Cancer Risk Increase†
1. Office Workers (Adults)	Past 1989--1993	Swallowing contaminated dust stirred up when parking cars in the parking lot	Chlordane	ND - 0.310	0.000000	Not Likely	No
			DDD	5.7 - 1200	0.001714	Not Likely	Yes
			DDE	0.93 - 30.0	0.000043	Not Likely	No
			DDT	2.10 - 930	0.001329	Not Likely	Yes
2. Lawn-care workers (Adults)	Past 1989–1993	Swallowing contaminated dust stirred up during lawn mowing	Chlordane	ND - 7.4	0.000001	Not Likely	No
			DDD	ND - 1200	0.000154	Not Likely	No
			DDE	ND - 30.0	0.000004	Not Likely	No
			DDT	ND - 3000	0.000386	Not Likely	No
3a. Children	Past 1966–1982	Swallowing contaminated dust stirred up by cars being parked in the parking lot	Chlordane	0.06 - 45.7	0.000286	Unknown	Unknown
			DDD	0.100 - 644	0.004025	Unknown	Unknown
			DDE	0.02 - 68.7	0.000429	Unknown	Unknown
			DDT	0.061 - 7500	0.046875	Unknown	Unknown
3b. Day-Care Workers and Parents (Adults)	Past 1966–1982	Swallowing contaminated dust stirred up when parking cars in the parking lot	Chlordane	0.06 - 45.7	0.000065	Not Likely	No
			DDD	0.100 - 644	0.000920	Not Likely	No
			DDE	0.02 - 68.7	0.000098	Not Likely	No
			DDT	0.061 - 7500	0.010714	Not Likely	Yes
4a. Children (Pica)	Past 1966–1982	Swallowing and skin contact with contaminated surface soil while playing in the playground	Chlordane	< 0.10 - 0.390	0.000122	Unknown	Unknown
			DDT	0.030 - 6.7	0.002094	Unknown	Unknown
4b. Children (Nonpica)	Past 1966–1982	Swallowing and skin contact with contaminated surface soil while playing in the playground	Chlordane	< 0.10 - 0.390	0.000005	Not Likely	Unknown
			DDT	0.030 - 6.7	0.000084	Not Likely	Unknown

† - Increased cancer risk is based on $\geq 5.5 \times 10^{-5}$.
Values for children's cancer risk are reported here as unknown because generalizing cancer risk calculation for children is strongly questioned among the scientific community.
Appendix E-2 contains the assumptions used in estimating dose and cancer risk.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

FYI.

# of pages ▸ 7

To Mick Senus	From Craig Sakai
Dept./Agency	Phone #
Fax # (910) 451-5997	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

COVER SHEET FAX

To: Wade Jensen
NAVFACHQ (CODE 42WI)

Fax #: (703) 325-0183

Subject: PRESENTATION AT THE ARMED FORCES EPIDEMIOLOGICAL BOARD (AFEB) MEETING ON 21-22 AUGUST, REGARDING MCB CAMP LEJEUNE HEALTH STUDY

Date: 14 August 1997

Pages: 6, including this cover sheet.

COMMENTS:

Wade,

Per our phoncon discussion, I am forwarding you a copy of the two-page abstract we submitted yesterday, via fax, to the AFEB. I am also forwarding a copy of the agenda for the subject meeting, which indicates our presentation has been scheduled for the afternoon of Thursday, 21 August.

Yesterday afternoon I faxed a copy of the abstract to Dr. Nancy Sonnenfeld, at ATSDR, after discussing with her our intent to present the issue to the AFEB. I asked her to let me know if she found anything objectionable. She objected to the one sentence that states that "essentially nothing was found [in the first study]" (which refers to the Adverse Pregnancy Outcomes study that ATSDR completed this year.) Dr. Hyman is changing the sentence to read something like "The only differences found were in small subgroup analysis." This refers to the ATSDR conclusion that for a subgroup - women over 35, who had had problems with previous pregnancies - a "statistically significant association" was found with exposure and the "small for gestational age" parameter. The subgroup consisted of four women.

Chet Arbnot says that 8 September is good with him for a meeting. He will schedule a conference room there. I am faxing him this same information.

Very respectfully,
Andrea

CLW

0000002882

From the desk of...
Andrea E. Lunsford
Deputy Director for Environmental Programs
Navy Environmental Health Center
2510 Walmer Avenue
Norfolk, Virginia 23513-2617
Telephone: (757) 383-5554
Fax: (757) 444-7261
E-mail: aelunsford@med.navy.mil

-----Original Message-----
From: Skipper, Kathy [mailto:bos1@cdc.gov]
Sent: Friday, April 09, 1999 3:47 PM
To: 'Dreyer GS13 Kelly A'
Subject: RE: Camp Lejeune Health Study Conference Call

15th ok anytime. Also anytime 21 or 22.

Kelly, some personal thoughts:

We very much need to work out a way that this can happen. With OMB approval a "done deal," this whole issue could prove very embarrassing and problematic for the Marine Corps if the public perception is that names aren't being provided or needed information isn't being provided "proactively." As a former military PAO and one married to a retired officer, I feel a strong allegiance to the military community and don't want to see this thing go in this direction.

However, you need to know that full page ads for the Federal and Navy Times, and other publications are being discussed. I think you and I both know how this would "play in Peoria" not to mention inside the beltway. What can I do to help prevent this scenario from developing?

CLW 0000003130

Call me Monday if you have any ideas (404) 639-0505.

Regards

ks

B. Kathy Skipper
Chief, Public Affairs & Marketing
ATSDR
Mail Stop E-60, 1600 Clifton Rd
Atlanta, GA 30333
ph (404) 639-0501
fax (404) 639-0522

0490

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

JUL 16 1997

Elsie L. Munsell
Deputy Assistant Secretary of the Navy (Environment and Safety)
Office of the Assistant Secretary (Installations and Environment)
1000 Navy Pentagon
Washington, D.C. 20350-1000

Dear Ms. Munsell:

I am writing to express my concern regarding information discussed at a recent workgroup meeting held June 23 between representatives of the Agency for Toxic Substances and Disease Registry (ATSDR) and the Department of Defense (DOD), including representatives of the Naval Environmental Health Center (NEHC). The concerns revolve around an apparent reluctance to provide funding to support a study of childhood cancer associated with exposures to trichloroethylene (TCE) and tetrachloroethylene (PCE) at Marine Corps Base - Camp Lejeune, NC. It appears that some of this reluctance may be attributable to a lack of understanding regarding the need and requirement for the study.

ATSDR's investigation indicates that more than 6,000 children were probably exposed to TCE and PCE *in utero* between 1968 and 1985 in base housing at Camp Lejeune. Based on an epidemiologic study recently completed by the Massachusetts Department of Public Health in the town of Woburn, Massachusetts, there is evidence indicating that these children exposed to TCE and PCE may be at increased risk of adverse health effects.

The Woburn study observed an association between the mother's potential for exposure to TCE and PCE in drinking water and childhood leukemia, particularly when exposure occurred during pregnancy. To our knowledge, no other study has explicitly examined the potential association between these environmental contaminants and childhood leukemia. Although the solvent mixture was slightly different at Woburn than at Camp Lejeune, the levels of solvents found in the drinking water at Camp Lejeune were comparable to, or higher than, the solvents found in wells at Woburn.

Although a single epidemiologic study can rarely if every establish causality in absence of other evidence, the association observed at Woburn was unusually strong, specific to exposure during pregnancy, and consistent with a dose-response relationship between potential exposure and the cancer risk. In light of the findings of the Woburn study and in absence of evidence to the contrary, we feel that there is a substantial possibility that the children exposed to solvents *in utero* at Camp Lejeune are at increased risk of childhood cancer.

CLW

Section 104(i)(7)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) states in part "Whenever in the judgment of the Administrator of ATSDR it is appropriate on the basis of the results of such pilot study or other study or health assessment, the Administrator of ATSDR shall conduct such full scale epidemiological or other health studies as may be necessary to determine the health effects on the population exposed to hazardous substances from a release or threatened release." Based on the findings of the public health assessment and the study of pregnancy outcomes conducted on the base, ATSDR has determined that a health study of the association between exposure to TCE and PCE and childhood cancer is warranted. Under Section 107 and 120 of CERCLA, DOD is liable for the cost of this study.

I am enclosing a copy of the health study proposal developed by ATSDR to investigate the potential relationship between exposure to volatile organic compounds in drinking water and childhood leukemia at Camp Lejeune. I am also including a copy of the study conducted at Woburn.

ATSDR is currently negotiating the Fiscal Year 1998 Annual Plan of Work with Department of Defense representatives. The funding for conducting this study has been included into those negotiations. We would appreciate your assistance in ensuring that adequate funds are provided so that this important health study can be conducted.

Sincerely yours,

Joseph L. Heybert for

Mark M. Bashor, Ph.D.
Associate Administrator for
Federal Programs
Director, Office of Federal Programs

cc:
Andrea Lunsford, NEHC
Bill Judkins, NAVFAC
Kathleen Buchi, Ph.D., USACHPPM

CLW

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

- call LANTDIV (Response planned?)
- call Yvonne Walker
(fax copy of Aug 16, 94 - what generated this letter)
- Need "list of documents" not generalized "bill of complaint"

September 2, 1994

Ms. Yvonne P. Walker, CIH
Engineering Support Department
Navy Environmental Health Center
2510 Walmer Avenue
Norfolk, VA 23513-2617

Yvonne
why NAVENVHC not fwd: not us?
Carol Hassum
What's up?

Dear Ms. Walker:

I am responding to a letter received from Captain W.P. Thomas dated August 16, 1994 requesting a list of documents which ATSDR needs to conduct the public health assessment on Marine Corps Base (MCB) Camp Lejeune, North Carolina.

ATSDR identifies and obtains documents needed for evaluation to develop the public health assessment by discussing the public health issues with the installation and having them send us documents where the information can be found. As you are aware, we have had much difficultly getting the needed documents from MCB Camp Lejeune. We have sent MCB Camp Lejeune several requests for information and, in most cases, the responses were inadequate and no supporting documentation was forwarded. For example, ATSDR does not have any of the Remedial Investigation (RI) documents for this site nor do we have a copy of the administrative record index to help us identify which documents would be useful in our evaluation. The situation at MCB Camp Lejeune is also somewhat complicated in that several of our public health questions could not be answered with information from the RI reports (e.g., lead in drinking water).

copies of ?

need LANTDIV support
RI's - never requested
no valuation

The initial release of the MCB Camp Lejeune public health assessment is currently being prepared for the printer and will be released in the near future. For an ATSDR public health assessment to be useful, it is important that all pertinent information be provided for evaluation. The public health assessment lists the information ATSDR had available for evaluation for inclusion in the document. After the base has had an opportunity to read the MCB Camp Lejeune report, we must rely on the base personnel to identify and provide the additional source documentation as appropriate. We would appreciate your efforts to assure that this occurs.

Sincerely yours,

Knee Jerk

Mark Bryant's
- Carol Aloisio

Carol H. Aloisio FF Coordinator
- Dennis Jackson

Carol H. Aloisio
Office of Assistant Administrator

CLW

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Enclosure (1)

DEPARTMENT OF THE NAVY
NAVY ENVIRONMENTAL HEALTH CENTER
2510 WALMER AVENUE
NORFOLK, VIRGINIA 23513-2617

6200.1
Ser 06B/ 03270
13 SEP '94

From: Commanding Officer, Navy Environmental Health Center
To: Commander, Naval Facilities Engineering Command (41)

Subj: AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR)

Encl: (1) ATSDR, OFP, ltr of 2 Sep 94

1. We are forwarding, as enclosure (1), ATSDR's comments on information needs for Marine Corps Base, Camp Lejeune.

2. In general, we recommend that Department of the Navy installations routinely provide ATSDR with documents distributed to the installation's Restoration Advisory Board. Two issues deserving emphasis, as discussed in enclosure (1), are: the installation should provide revisions to the administrative index to ensure ATSDR is kept updated; and, the installation should respond to requests for information promptly with appropriate supporting documents.

3. If you have any questions, please contact Commander Gary E. Williams, MSC, USN, Deputy Director for Environmental Programs at DSN 564-7575, extension 399.

W. P. THOMAS
By direction

Copy to:
CNO (N453)
CMC (LFL)
BUMED (MED-24)
LANTNAVFACENGCOM
MCB, Camp Lejeune (Mr. Paul)

- cell LANTDIV

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL
# of pages ▶ 3
To Neal
Dept./Agency 5997
Fax #
From RW
Phone #
Fax #
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

0000002406

HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

IN REPLY REFER TO
5090
LFL/CL
13 AUG 1997

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT AND SAFETY)

Subj: FUNDING STUDY OF CHILDHOOD CANCER ASSOCIATED WITH EXPOSURES TO TCE AND PCE MCB CAMP LEJEUNE, NC

Ref: (a) Navy Route Slip 97U103000320 dtd 16 Jul 97

1. The reference tasked this Headquarters to comment and provide a recommendation on funding a study of childhood cancer associated with exposure to trichloroethylene (TCE) and tetrachloroethylene (PCE) at Marine Corps Base (MCB) Camp Lejeune, NC. The estimated cost of this proposed study is $1,790,000.

2. The Navy Environmental Health Center (NEHC) is the Department of the Navy's (DON) technical expert for public health issues. The Center also acts as a liaison to the Agency for Toxic Substances and Disease Registry (ATSDR) for Navy and Marine Corps installations. As such, NEHC is very familiar with this issue at MCB Camp Lejeune and is conducting a comprehensive review of the work proposal and the basis for the study (Woburn study) for technical merit and cost effectiveness. This review should provide the necessary technical data to recommend a preferred DON position.

3. We understand that an initial epidemiological study at MCB Camp Lejeune did not generate sufficient proof of causation to warrant a full scale study. Since limited information exists, we recommend that a smaller scale pilot study be conducted. Additional information collected during the pilot study will allow an informed decision regarding the necessity and value added of a full scale study. This approach will ensure protection of human health in a fiscally responsible manner.

4. A small scale pilot study will also allow time for a determination of the appropriate cost allocation should a full scale study be necessary. A significant share of the contamination entering the MCB Camp Lejeune drinking water system prior to 1985 can be attributed to an off-base source (ABC Cleaners). The cost of a full scale study should rightfully be borne by all the parties responsible for the contamination.

CLW

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Subj: FUNDING STUDY OF CHILDHOOD CANCER ASSOCIATED WITH EXPOSURES TO TCE AND PCE MCB CAMP LEJEUNE, NC

5. The point of contact for this Headquarters (LFL-6) is Ms. Kelly Dreyer at (703) 696-2138, facsimile: (703) 696-1020, or internet: dreyerk@hqi.usmc.mil.

KIM G. WEINOK
Assistant Head, Land Use and
Military Construction Branch
Facilities and Services Division
Installations and Logistics Department
By direction of the Commandant
of the Marine Corps

Copy to:
CG MCB CAMP LEJEUNE, NC (EMD/IRD)
NAVFAC (Code 42WJ)
CNO(N453)
NEHC (Attn: Ms. Lunsford)

CLW
0000002907

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances and Disease Registry
Atlanta GA 30333

June 25, 1998

Kathleen Buchi
c/o USACHPPM DOD Lead Agent
U.S. Army Center for Health Promotion and Preventive Medicine
5158 Blackhawk Road
Aberdeen Proving Ground, Maryland 21010-5422

Dear Dr. Buchi:

As discussed and agreed upon at the March quarterly meeting and per our conversation, ATSDR is requesting the assistance of the Department of Defense (DOD) in obtaining personnel data for a proposed ATSDR assessment of childhood leukemia at U.S Marine Corps Base Camp Lejeune, Jacksonville, North Carolina. This assessment involves children born to personnel living in base housing while stationed at Camp Lejeune.

In 1982, volatile organic compound (VOC) contamination was identified in certain groundwater supply wells which supplied drinking water to housing units at Camp Lejeune. These wells potentially could have been contaminated since the 1960's. There is limited evidence that *in utero* exposure to VOCs in drinking water may be strongly associated with the incidence of childhood leukemia. ATSDR has proposed a health study to investigate the potential relationship between exposure to VOCs in drinking water and incidence of childhood leukemia at Camp Lejeune. A secondary objective of the proposed study is to investigate the potential relationship between VOCs in drinking water and birth defects in this population.

The first phase of this project involves location of military personnel and/or their children who lived on base from 1968 through 1985. ATSDR currently has a computerized file containing the names of approximately 90,000 Naval and Marine Corps personnel who lived in base housing from 1968-85. Of these, 12,493 personnel are known to have had a child born while living in base housing at Camp Lejeune. ATSDR estimates that an additional 4,000 personnel who had pregnancies while living in Camp Lejeune base housing actually delivered the child after being transferred to another duty station. The exact number and identity of these personnel is currently unknown.

ATSDR desires to locate the approximately 16,500 personnel for eligibility screening for the planned health study; however, the current location of these personnel is unknown. As ATSDR only has the names of the military personnel, the task of tracing will be very difficult. National media advertising will be used to attempt to locate personnel; however, this tracing method has only limited effectiveness. In order to maximize the number of personnel traced, ATSDR wants to be able to use personal identifiers such as last known address and Social Security Numbers in order to locate personnel. The Agency is requesting assistance from the Navy and Marine Corps

CLW

in this endeavor. The following types of information are requested for approximately 90,000 personnel:

1. Social Security Number
2. If discharged, last known address and phone number
3. If active duty, current tour of duty

ATSDR understands and will comply with the confidentiality protection procedures of the Department of Defense. If this request is feasible, please give us the name and telephone number of the person to contact. We will then work with your designee to get the needed information.

Thank you for your assistance. If you have any questions please contact me at(404)639-0733.

Sincerely,

Linnet P. Griffiths
Senior Program Analyst

cc: OFP
DHS/OD

CLW

0000002958

COPY

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.

CLW

Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

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.

CLW

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

CLW

0000001131

09.07-04/30/85-02

UNITED STATES MARINE CORPS
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

IN REPLY REFER TO:
1110.1
FAC
30 APR 1985

NOTICE TO RESIDENTS OF TARAWA TERRACE

We are having some serious problems supplying enough water for the Tarawa Terrace housing area.

Two of the wells that supply Tarawa Terrace have had to be taken off line because minute (trace) amounts of several organic chemicals have been detected in the water. There are no definitive State or Federal regulations regarding a safe level of these compounds, but as a precaution, I have ordered the closure of these wells for all but emergency situations when fire protection or domestic supply would be threatened.

What is the VOC's found?

With the advent of warmer weather, increased water consumption is depleting the supply in the reservoir faster than the remaining wells can replenish it. Even after opening the lines to the Camp Johnson water system (which has caused the bad taste and odor many of you noticed), the supply cannot meet the demand. This critical situation will be relieved somewhat in early June with the completed construction of an auxiliary water line from Hadnot Point.

Until then, however, daily water consumption must be reduced significantly. You are the only ones who can make this happen. I solicit your cooperation and assistance in implementation of the following water use restrictions:

1. Reduce domestic water use.

   a. Don't let water run while washing, shaving, brushing teeth, etc.

   b. Wash clothes only when you have a full load.

   c. Flush toilet only for sanitation purposes.

   d. Store cold water in refrigerator for drinking.

   e. Take short showers.

   f. Report any drips, leaks or running toilets immediately to Base Maintenance.

2. Car washing is prohibited until further notice.

3. Yard watering is permitted only from 0600-0900, Mondays through Thursdays. Do not water excessively or allow water to run into the street.

Suggested No-Adverse-Effect Recommended levels

Subj: NOTICE TO RESIDENTS OF TARAWA TERRACE

Thank you for your understanding in this matter. If these measures are effective in reducing overall water usage, we should be able to open the Tarawa Terrace swimming pool as scheduled. We will keep you informed.

L. H. BUEHL
Major General, U.S. Marine Corps
Commanding General

To: tsm@EMD
From: GS-13 N NEAL PAUL@EMD
Originated by: Newman Capt Beth A <NewmanBA@hqmc.usmc.mil>
Cc:
Bcc:
Subject: fwd: RE: Public Affairs Plan
Attachment: WATER.DOC
Date: 3/4/99 10:02 AM

Original text
From: "Newman Capt Beth A" <NewmanBA@hqmc.usmc.mil>, on 3/4/99 10:42 AM:
To: SMTP2@SMTP2@MCB LEJEUNE["Dreyer GS13 Kelly A" <DreyerKA@hqmc.usmc.mil>]
Cc: SMTP2@SMTP2@MCB LEJEUNE["White Maj Kenneth D" <WhiteKD@hqmc.usmc.mil>], SMTP2@SMTP2@MCB LEJEUNE["White Maj Kenneth D" <WhiteKD@hqmc.usmc.mil>], SMTP2@SMTP2@MCB LEJEUNE["Campbell LtCol Scott R" <CampbellSR@hqmc.usmc.mil>], SMTP2@SMTP2@MCB LEJEUNE["Wagner Col Stuart W" <WagnerSW@hqmc.usmc.mil>], SMTP2@SMTP2@MCB LEJEUNE["'simmonsm@nehc.med.navy.mil'" <simmonsm@nehc.med.navy.mil>], SMTP2@SMTP2@MCB LEJEUNE["Shy Maj Shannon A" <ShySA@hqmc.usmc.mil>], GS-13 N NEAL PAUL@EMD@MCB LEJEUNE, MAJ SCOTT B JACK@CPAO@MCB LEJEUNE

Kelly,
The bottom line for the leadership is that there's a plan in place and we're already using it. You can tell them that now. It will be ever-evolving, however, as we get more questions and are able to answer more questions. I literally change it every day. We've ginned-up answers to about 30 of the questions and Mary Ann Simmons from NEHC has graciously offered to help me sort through the rest. Maj Jack provided an initial chop to the existing plan and I'm hoping they can further flesh out some of the info as time goes on. The attachment is the latest iteration. If there's anything in the plan that you or Maj Shy would recommend changing at this point, just let me know. Bottom line for those who are concerned is that CLNC PA has immediate audiences and media under control and is able to answer inquiries. They will coordinate with MARFORLANT and HQMC PA as necessary. As we agreed at the January meeting, April 1st is still the goal for a staffed plan (i.e. staffed through HQMC agencies). However, everyone needs to make sure they understand that the April 1 formalized document is only a milestone. With such a long-range and complex issue it will be constantly changing before and after that date. As I continue to wade through the questions developed in January, I'm staffing questions for answers to the appropriate people. My goal is to at least attempt to answer all the legitimate ones prior to staffing for the April 1 deadline.

Hope this answers your questions.

r/s,
<<WATER.DOC>>
Beth Newman
Capt, USMC

CLW

0000003098

Major General Smith,
Col Gombar,

Chnl 12 piece was a bit sensational, but this is playing out as we predicted. We have received no calls from our citizens.
Capt Newman, Media Officer HQMC, asked me to give an update on review of the news piece. Since this will probably be forwarded to a number of people in the Pentagon, I have info'd all our local CG's and Chiefs.

OLA passed the buck on notifying our local Congressional reps. to me at approx. 1500 yesterday. I briefed Col Gombar and then contacted as many of their Press Officers as possible to give them a verbal heads-up on the Chnl 12 series. They appreciated advance notice. HQMC had indicated they would do this from their level, but changed that late yesterday.
v/r, Maj Jack

From: MAJ SCOTT B JACK@CPAO@MCB LEJEUNE, on 3/2/99 7:08 AM:
To: FORCE[PEPA17@PESNAD05@GGSNAD0B], SMTP[HaddockEK@marforlant.usmc.mil], FORCE[MAJ SHANNON A SHY@CL@HQMC]

LtCol Haddock
Capt Newman,

The USMC's manipulation of the media.

Watched the taped 1800 broadcast by Chnl 12 last night, again. Timed it out at 3 minutes 20 seconds. They ran it the last story before Sports. Factual for the most part, but sensational on tease and lead-in by on air hosts. Dale Ream understandably went with a sensational title "Masses of Poison."

CLW

Dale used the time frame of "during the late 1950's" and then did his stand-up in front of ABC Cleaners. He cut my statements down to short clips on when CLNC found out about it and how our process of closing a well.

Basically, he stated that the base took two years to close the wells after discovering the compounds in 1982. True statement, but transitioned to his claim that for potentially 30 years the water was contaminated at CLNC. He obviously was drawing this fact from how long ABC Cleaners had been operating. I don't know if that is completely accurate. However, Chnl 12 incorporated a graphic of how the solvents seeped from ABC Cleaners to base via the ground water. He then interviewed NC Water Quality spokesperson on generally how individuals can tolerate some chemicals for short periods but over time it is more problematic for especially pregnant women. He ended with our wells were shut down in 1985.

Tomorrow he will "go to Woburn, Mass. and show you how the same chemicals found at Camp Lejeune effected ravished Woburn and its families." More sensationalism, but we'll see where it goes.

Presently, we have a number things on our side with regard to timing. This regional audience sees this as "old news," Capt Ashby's GCM will go to closing arguments today (most regional and national media are focused on that) and this entire region focuses on ACC Basketball for March madness (including nearly all the NC journalists!).

I was in the office until 2100 and we received no phone calls from the public. Our 24 hour duty did not receive any either. Thus, we'll see how tomorrow's and Wednesday's news stories by Chnl 12 will result in any. My assessment remains the same. Anticipate a couple of queries from our print side and that's it. We may not even get that with potential findings on the merit of Capt Ashby's GCM at the end of the week.

3. When were the wells closed? ← 15 wells were shut down – not 2
A: In February 1985, two (2) wells were shut down and water was supplied to TT from the Holcomb Blvd water plant.

4. Is the Base cooperating with the ATSDR study?
The Base will cooperate with the study in any way we can.

In short, Dale Ream asked about TT and did not expand his query.
v/r, Maj Jack

5. How is the USMC helping in the study?
A: Headquarters Marine Corps is assisting ATSDR in obtaining phone numbers of past residents at TT. Any questions on the details of the study should be addressed to ATSDR.

To: nnp
Cc: brm
From: GS-9 MICHAEL P SENUS@EMD2@MCB LEJEUNE
Certify: N
Subject: ATSDR report
Date: Friday, August 15, 1997 at 3:15:16 pm EDT
Attached: None

FYI- Acute affects of TCE/PCE are "Chloracne". Chronic affects of TCE/PCE are kidney and/or liver complications.

ANDREA LUNSFORD'S REVIEW

1. Points out that there were other risk factors at Woburn such as alcoholism and influence from father. There is also an analogy to MCB CL.
2. Weakness of Woburn study- small # of cases; dynamic hydrogeo; metals influence.
3. MCB CL's population is subject mixing- introduction of "viruses as promoters".
4. MCB CL's population is mobile and hard to track.
5. Woburn's control was the general population, MCB CL's should be a military installtion like Bragg or Pendleton.
6. Proposal- Cost estimates are not spelled out and there no other study to compare it to.
7. A good point is made when the Nat'l Institues of Health is the guru of medical research, not ATSDR. Additionally, go thru the Armed Forces Epidemiaology Board first (bottom of page 10).
8. One question that really needs to be asked is, "has there really been a high incidence of leukemia at MCB CL or is ATSDR looking for a problem that doesn't really exist". In other words, just b/c hits of TCE and PCE were found, it doesn't mean there has been a noteable 'cause and affect'.

8/13/97 W'LMN 'MORNING STAR' NEWS RELEASE

1. Article doesn't state a valid correlation between cause and affect. A fault more so w/ ATSDR than the news.
2. Overall the article is so condensed a lot of information is taken out of context.
3. Why were only 10 of 94 sites studied? Why is this even brought up?
4. Article says that tap water was contaminated. Was it? Was the tap water tested?
5. The USTs referred to are 'ABC Cleaner' tanks, off base.
6. Mothers and infants did not live at Hadnot Point and Holcomb Blvd.
7. This article brings in 2 other unrelated sites, former day-care center and Brinson Creek.

Mick

UNSENT

CLW
0000002896

To: sakai
Cc: FORCE[BBEM61@CLBMCB02@GGSNAD0C]
From: GS13 KELLY A DREYER@LFL@HQMC
Certify: N
Subject: Childhood Cancer study at Camp Lejeune
Date: Tuesday, August 26, 1997 at 4:23:58 pm EDT
Attached: None
Forwarded By: GM-13 N NEAL PAUL@EMD2@MCB LEJEUNE

Forwarded to: SAB@EMD1
cc: IRLIST
Comments by: GM-13 N NEAL PAUL@EMD2@MCB LEJEUNE
Comments:

fyi

---------- [Original Message] ----------

The following information is provided for your information.

ISSUE: In June 1997, The Agency for Toxic Substances and Disease Registry (ATSDR) submitted a proposal to investigate the potential relationship between exposure to solvent contamination in drinking water and childhood leukemia at MCB Camp Lejeune. The cost of this investigation is estimated at $1.8M.

Because DoD and the Navy Environmental Health Center (NEHC) did not support funding such a large study based on a undetailed proposal and limited background information, ATSDR wrote a letter to Ms. Munsell asking for her support in funding this study.

SUMMARY: ATSDR is pressuring DON to fund a full scale epidemiological study at Camp Lejeune to link Childhood cancer to exposure of solvent contamination in drinking water at Camp Lejeune. LFL recommends that ATSDR gather additional information (conduct a pilot study) prior to embarking on a full scale investigation.

On 22 Aug 97, representatives from NEHC met with the Armed Forces Epidemiological Board (well respected and recognized epidemiologists) to discuss this issue and obtain their support. The Board verbally concurred that a pilot study or gathering of additional information should be conducted first as some assumptions made by ATSDR could not be validated and many data gaps exist.

However, in order to remain impartial, the Board officially recommended that the Navy ask ATSDR to prepare a detailed proposal following National Institute of Health standards so that they could conduct a sound, scientific third party review.

As these discussions are occurring, ATSDR released a Public Health Assessment which suggested that drinking water contamination at Camp Lejeune may be linked to childhood cancer. This information was picked up by both the local newspaper and television. Also, Mr. Binsminger, a former resident of Camp Lejeune who's daughter was born during the years in question, has made several calls and is convinced that the drinking water contamination caused his daughter to contract Leukemia and die.

NEXT STEPS:

(1) On 8 Sep 97, NEHC will present this issue to CNO(N45), CMC(LFL), and NAVFAC and recommend a course of action to resolve the situation.

(2) NEHC will prepare a fact sheet to help Camp Lejeune respond to public inquiries generated by the press and release of the Public Health Assessment.

VR,
Kelly Dreyer

CLW
0000002900