Health on the Homefront:  
Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

Presentation by: Stephanie D. Enriquez, MPH  
Contact: enri_6463@hotmail.com

General Information

• Marine Corps Base Camp Lejuene Onslow County, NC, est. 1940, 233 sq. miles. Housing capabilities: 54,000 individuals including 11,000 dependents and Civilians. Families typically live in base housing 2-3 years.

• At the time the contamination was discovered 1980-1982, 8 water systems, 100 wells were in use. Tarawa Terrace, Hadnot Point, Holcomb Boulevard and the Rifle Range.

• Federal Water Pollution Control Act, 1948: Revised to its current shape “Clean Water Act” 1972. EPA water testing parameters instituted by the Navy in 1980, testing for Trihalomethanes (TTHM) a by product of the water treatment process.

• In 1980 there were no enforceable EPA regulations for maximum levels of TCE & PCE or testing requirements. There were suggested “no adverse reaction” levels for TCE in 1979 and PCE in 1980. Max safe levels were set for TCE in 1989 and PCE in 1992.
Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia's Veterans

Figure 1. Location of U.S. Marine Corps Base, Camp Lejeune, North Carolina.


Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia's Veterans

U. S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Camp Lejeune Chapter A Report, Summary and Findings, Analysis and Reconstruction of Drinking Water in the Hadnot Point and Holcomb Boulevard Water Treatment Plant Services Areas, Fig. 3.
Health on the Homefront:
Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

Toxicology and Possible Health Effects

1. Trichloroethylene (TCE): Toxic and Carcinogenic
2. Tetrachloroethylene (PCE) also known as Perchloroethylene: Toxic and Carcinogenic
3. Trans-1,2-dichloroethylene (DCE): Toxic, metabolite DCA Carcinogenic
4. Benzene: Toxic and Carcinogenic

Other Volatile Organic Chemicals of Concern

1. Vinyl Chloride: Carcinogenic
2. Methylene Chloride: Carcinogenic
3. Toulene: Toxic

- Many of these VOC’s lack sufficient study and their effects on the human body are poorly understood. In addition the synergistic effects of these chemicals are totally unknown. To date, the ATSDR has no plan for studying the teratogenic effects of the VOC’s that Veterans, their dependents, and the civilian workforce were exposed.
- Anyone working, living, or conceived at the Camp Lejeune Base could be at risk for adverse health effects. The law covers those who spent 30 days or more on the base from 1957 to 1987. However, the water modeling from Hadnot Point pushes the date back to 1953.
Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

Contamination Levels Over Time

U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry. Camp Lejeune: Chapter A Report; Summary and Findings; Analysis and Reconstruction of Drinking Water at the Hadnot Point Water Treatment Plant Services Area, pg. 3.

“Honoring America’s Veterans and Caring for Camp Lejeune Families Act of 2012”

Conditions Covered:
- Esophageal cancer
- Lung cancer
- Breast cancer
- Bladder cancer
- Kidney cancer
- Leukemia
- Multiple myeloma
- Myelodysplastic syndromes
- Renal toxicity
- Hepatic steatosis
- Female infertility
- Miscarriage
- Scleroderma
- Neurobehavioral effects
- Non-Hodgkin’s lymphoma

Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

Number of Virginia Veterans

Number of Veterans in Virginia (2007): 823,056
Men: 754,742
Women: 68,314

Table #1: Virginia Veterans by Sex and Branch of Service

<table>
<thead>
<tr>
<th>Branch of Service</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marines</td>
<td>75,474</td>
<td>5,260</td>
</tr>
<tr>
<td>Navy</td>
<td>6,287</td>
<td>550</td>
</tr>
<tr>
<td>Total</td>
<td>81,761</td>
<td>5,810</td>
</tr>
</tbody>
</table>

Total: 87,571 Virginia veterans possibly affected by the contamination at Camp Lejeune. Percentage of Virginia veterans: 10.6%

- These levels only reflect the number of veterans it does not include the dependents that may have been affected.

A Public Health Approach regarding Virginians Exposed to Contaminated Water at Camp Lejeune

Policy Development:

- Adoption of an action plan to educate Virginians and health care providers about the potential health effects of exposure to contaminated water at Camp Lejeune.
- Periodic review of relevant data and updating of intervention strategies.
A Public Health Approach regarding Virginians Exposed to Contaminated Water at Camp Lejeune

Assurance:

• Implementation of a statewide educational program aimed at the veteran community.

• Implementation of a statewide educational program aimed at health care providers.

Proposed Actions

1. Post information regarding the contamination on public websites with links to additional information.

2. Use existing public social media resources like Twitter, Facebook, LinkedIn, etc. to distribute the information to the veteran community.

3. Provide a briefing of this information to the Veterans Services Organizations and request that they share the information with their members.

4. Issue press releases/public service announcements initially and periodically as new information is obtained about the contamination.

5. Use billboards along Virginia’s most heavily traveled highways (i.e. I-95, I-64, Rt. 29) to alert the public about this issue.
A Public Health Approach regarding Virginians Exposed to Contaminated Water at Camp Lejeune

Monitor:

- Continuous monitoring of actions taken by Congress and federal agencies, the Community Assistance Panel (CAP) at Camp Lejeune, and other related organizations.

- Continuous monitoring of relevant data from Cancer and Disease Registries and other sources of health data.

Proposed Assessments

Overall success could be measured by:

1. Number of Virginia Veterans Registered with the Camp Lejeune Contaminated Water Registry.

2. Number of “Hits” and “posts” on the various social media outlets: public websites, Facebook Pages, and Twitter Accounts.

3. Number of respondents to the phone numbers and websites set up for the Press Release/Public Service Announcements.
Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

Recommended Actions by Individuals Exposed to Contaminated Water at MC Base Camp Lejeune 1953-1987

<table>
<thead>
<tr>
<th>Groups (some people may be in more than one group)</th>
<th>Join Registries</th>
<th>See health care pro &amp; notify re. exposure</th>
<th>Apply for health care from VA</th>
<th>Apply for VA Disability Compensation</th>
<th>Apply for VA reimbursement for health care when funds appropriated</th>
<th>File claim under FECA</th>
<th>File claim under Federal Tort Claims Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veterans</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Veterans’ Family Members or in utero</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Civilian Employees</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

WHAT SHOULD I DO?

Step 1: Visit the health care provider of your choice. Veterans registered with the VA, Contact your local VA healthcare provider. Not registered? Call 1-877-222-8387 to register. Everyone: Health Survey for your doctor: http://drclaudiamiller.com/publications-presentations/, download PDF free for personal use, appendix C.

Step 2: Everyone: Register for information or inclusion in current or future studies: clwater@usmc.mil and 1-877-261-9782, M-F, 8:30 a.m. - 5 p.m., or https://clnr.hqi.usmc.mil/ Or call Marine Corps Call Center staff at 1-877-261-9782, M-F, 8:30 a.m. - 5 p.m.
**Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans**

**WHAT SHOULD I DO?**

**Step 3: Filing a Claim:** 
Service members and dependents: Request your health records. 
National Personnel Records Center, Military Personnel Records, 9700 Page Avenue, St. Louis, MO 63132-5100, or www.archives.gov/facilities/mo/st_louis/military_personnel_records.html.

Claims and Compensation for Military Veterans and Family members:
Questions: Navy JAG at 202-685-4600, or http://www.publichealth.va.gov/exposures/camp-lejeune/. Filing a Claim: “Claims for personal injury/death as a result of exposure to contaminated drinking water at Camp Lejeune”:

Questions contact the Navy JAG office, Personnel Claims Unit at: (888) 897-8217, commercial (757) 440-6315, or DSN 564-3310. Federal Civilian employees should: contact your doctor for health records then go to:
http://www.dol.gov/owcp/dfec/regs/compliance/camplejeuneguidance.htm or call 1-866-487-2365. Additional information can be received by writing to: U.S. Dept. of Labor, OWCP, DFEC, Charles E. Bennett Federal Building, 400 West Bay Street, Room 826, Jacksonville, FL 32202, (904) 366-0100, Fax: (904) 366-0101.

**Step 4: Educate Yourself!** 
Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

ATSDR Health Studies for Camp Lejeune Expected to be Released in 2013 and 2014

- Birth Defects and Childhood Cancer Study—Looks at whether children born from 1968-1985 to mothers who were exposed to contaminated drinking water at Camp Lejeune have increased risk for specific birth defects and childhood cancers.

- Health Survey of Marine Corps Personnel and Civilians—Will help determine whether contaminated water may have affected people’s health and provide more information about how environmental and chemical exposures affect human health.

- Male Breast Cancer Study—Will look at cases of male breast cancer among Marines to determine whether a link exists between cases and exposure to contaminated drinking water at Camp Lejeune.

- Mortality Study—Looks at all causes of death to determine if there is a link between specific causes of death and exposure to contaminated drinking water at Camp Lejeune.


Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia’s Veterans

UPDATE 2013 NEWLY RELEASED STUDY

Evaluation of exposure to contaminated drinking water and specific birth defects and childhood cancers at Marine Corps Base Camp Lejeune, North Carolina: a case—control study.

- An association between the contaminated water and children born with neural tube defects has been found.

- A weak association between the contaminated water and children who developed hematopoietic cancers (blood cancers) has been found.

- There is no current information regarding how the VA will handle these new conditions or how and when they will be added to the list of illnesses covered by H.R. 1627.

UPDATE 2014 NEWLY RELEASED STUDY

**Mortality Study** Released 2014 by Bove, et al.

- Mortality Hazard Ratio (HR) 1.10, 95% CI 1.00, 1.20.
- Strength: No. of Individuals in study and minimal loss of individuals to follow-up.
- Weaknesses: 97% under age of 55; 6% mortality; disease misclassification, lack of info. on other risk factors; poor historical records.


NEWLY RELEASED STUDY

**Epigenetic Transgenerational Actions of Vinclozolin on Promoter Regions of the Sperm Epigenome. (2013) (Skinner, et. al.)**

- Vinclozolin – fungicide commonly used in agriculture.
- Endocrine disruptor-cancers, infertility, and obesity-transgenerational effects.