Testimony Before the
Committee on Science and Technology
Subcommittee on Investigations and Oversight
United States House of Representatives

"Camp Lejeune: Contamination and Compensation, Looking Back, Moving Forward"

ATSDR's Activities at U.S. Marine Corps Base Camp Lejeune

Statement of:

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Good morning Chairman Miller, Ranking Member Broun, and other distinguished Members of the Subcommittee. On behalf of CDC Director/ATSDR Administrator Dr. Thomas Frieden, I thank you for the opportunity to be here today.

I am Dr. Christopher Portier, Director of the Agency for Toxic Substances and Disease Registry (ATSDR) and the Centers for Disease Control and Prevention's (CDC's) National Center for Environmental Health (NCEH), a position I have held since August of this year. I came to CDC from another agency in the Department of Health and Human Services, the National Institute of Environmental Health Sciences (NIEHS) at the National Institutes of Health (NIH). At NIEHS, I served most recently as the Senior Advisor to the Director and as a Principal Investigator in environmental systems biology. Prior to my time in that role, I served as Associate Director of NIEHS, Director of the Environmental Toxicology Program, and as Associate Director of the National Toxicology Program.

ATSDR has a unique mandate to conduct human health studies and research related to community exposures to hazardous substances. Although knowledge of the relationships between chemical exposures and human health is often based upon studies of highly exposed workers or animal toxicology testing, there remains a pressing need to know whether lower level exposures and exposures away from the workplace can cause human illness. Drinking water contamination at Camp Lejeune was identified as a circumstance that would benefit from this type of investigation. As I approach my new position at ATSDR, I am keenly aware of the Agency's important role in providing public health assistance and expertise to people and communities impacted by

hazardous substances. And, I am committed to continuing the critical work of the Agency at Camp Lejeune.

In my testimony I will discuss ATSDR's involvement at Camp Lejeune. First I will provide background on our health assessments and on the primary drinking water contaminants at Camp Lejeune. I will then address ongoing Agency activities related to the base, focusing on the Community Assistance Panel, water modeling, and health studies.

Background:

In 1989, the Environmental Protection Agency (EPA) placed U.S. Marine Corps Base Camp Lejeune and ABC One-Hour Cleaners, which is located very close to the base, on its National Priorities List of hazardous waste sites. Information that EPA had at the time indicated that releases of chemicals from both the cleaners and activities at Camp Lejeune contributed to contamination of two of the water supply systems serving certain areas of base housing.

ATSDR Public Health Assessments:

In August 1990, ATSDR completed a Public Health Assessment (PHA) addressing contamination from the ABC One-Hour Cleaners. This assessment found that tetrachloroethylene—also known as perchloroethylene or PCE—was in the Tarawa Terrace water system and its supply wells. This raised ATSDR's concerns regarding the health of persons who consumed this water over extended periods, leading the Agency to conduct a more thorough evaluation of the contamination.

In 1997, ATSDR completed a PHA addressing environmental contamination at Camp Lejeune. In this PHA, ATSDR concluded that past exposures in three drinking water systems on base to certain chemicals, including benzene and two common groundwater contaminants, trichloroethylene (TCE) and PCE, and their degradation products, posed a public health hazard. However, because of the limitations of the available scientific data relating to the harmful effects of these chemicals, the PHA recommended conducting an epidemiological study to assess risk to infants and children from potential maternal exposure during pregnancy to the VOC-contaminated drinking water.

In the 13 years since the 1997 PHA was published, ATSDR, with help from ATSDR's Camp Lejeune Community Assistance Panel (CAP) and others, has located additional information on VOCs in drinking water at Camp Lejeune. Based in part on information obtained through ATSDR's ongoing extensive water modeling and exposure reconstruction study, we have determined that persons in housing serviced by a third water distribution system, referred to as the Holcomb Boulevard system, were exposed to contaminated drinking water for a longer period than we knew in 1997, suggesting the possibility of increased risks. Further, recently discovered information indicates that benzene contamination at Hadnot Point was greater than what was known in 1997. ATSDR removed the PHA from its website in 2009 and plans to reassess the drinking water pathway and revise the PHA when water modeling analyses are completed.

Primary Contaminants

Benzene is a widely used chemical formed from both natural processes and human activities. Long-term benzene exposure has effects on the bone marrow and can cause anemia and leukemia. The National Toxicology Program (NTP) Report on Carcinogens has recognized benzene as a known carcinogen.

TCE is a colorless liquid which is used as a solvent for cleaning metal parts. The NTP Report on Carcinogens classifies TCE as reasonably anticipated to be a human carcinogen based on limited evidence of carcinogenicity from studies in humans and sufficient evidence of carcinogenicity from studies in experimental animals. Most available information comes from animal studies or studies of workers who use these chemicals in the workplace. Very few studies have been conducted of people exposed to low levels of these chemicals in their drinking water. A meta-analysis of seven cohort studies found that occupational exposure to TCE was associated with excess incidences of liver cancer, kidney cancer, non-Hodgkin's lymphoma, prostate cancer, and multiple myeloma, with the strongest evidence for the first three cancers (Wartenberg *et al*. 2000).

PCE is a manufactured chemical used for dry cleaning and metal degreasing. The NTP lists PCE as reasonably anticipated to be a human carcinogen, based on sufficient evidence of carcinogenicity in experimental animals. According to the NTP's 11th Report on Carcinogens, there is limited evidence for the carcinogenicity of PCE in humans.

Community Assistance Panel

Based on recommendations from a scientific panel convened by ATSDR in 2005, ATSDR established a Community Assistance Panel—or CAP—to facilitate the direct participation of the affected community in our Camp Lejeune-related health activities. The original purpose of the CAP was to voice the concerns of the affected community of Marines and their families and to provide input for future health studies. In its January 2010 meeting, the CAP's mission was articulated as: "To represent the interests, consequences, and quality of life of those impacted by exposure to toxic substances at Camp Lejeune. ATSDR will look at the potential for future studies at Camp Lejeune with the full inclusion of the community members affected." The CAP does not provide consensus advice to ATSDR in carrying out agency programs and activities, nor do CAP members speak for or represent ATSDR. The CAP consists of seven community members. Also participating in CAP meetings are one representative from the Department of Defense (DOD), two independent scientific experts, and ATSDR staff. Members of the CAP provide individual input, as well as represent the views of the community and groups to which they belong. Meetings are held quarterly and are open to the public.

The CAP has been instrumental in helping ATSDR by providing information vital both to the water modeling effort and to the design and implementation of the epidemiological studies. The CAP has reviewed archived data, disseminated information about historical drinking water contamination at the base, advised other members of the affected community on how to apply for benefits from the Department of

Veterans Affairs (VA), and represented the affected community's health concerns in discussions with VA administrators.

Water Modeling

Water modeling is a key component of ATSDR's ongoing studies at Camp Lejeune. Because only limited measurements of contaminant concentrations are available, ATSDR is using complex modeling techniques to reconstruct historical conditions of groundwater flow, contaminant fate and transport, and the distribution of drinking water contaminated with VOCs delivered to family housing areas.

Prior to the end of 1987, two of the water systems at Camp Lejeune were continuously contaminated, and one water system, Holcomb Boulevard, was intermittently contaminated with VOCs. This contamination changed in concentration over time depending on the source wells and other factors. Using water modeling ATSDR will estimate exposures for each housing area.

These models are being used to characterize historical contamination sources and predict drinking water concentrations of PCE (and its degradation by-products of TCE, 1,2-DCE, and vinyl chloride), TCE (and its degradation by-products of 1,2 DCE and vinyl chloride), and benzene. ATSDR published Tarawa Terrace reconstructed drinking water results during 2007-2009.

ATSDR-Department of the Navy Camp Lejeune Data Mining Technical Workgroup. Because of the vast amount of data and the historical nature of the information, it has been extremely difficult for ATSDR to obtain relevant information needed to complete its

work at Camp Lejeune. While ATSDR has been provided with much information and access to a large amount of information in the past, several new sources of critical and relevant information have recently been identified, and relevant documents exist in several large storage systems and catalogs maintained by the Navy. To make sure that relevant information is located, ATSDR and the Department of the Navy established a Camp Lejeune Data Mining Technical Workgroup in June 2010. The goal of this joint-agency workgroup is to identify and inventory relevant information and data. These data are necessary to complete current water modeling activities and other Camp Lejeune health activities. The work of the group is ongoing, and the group is planning to complete its major activities in the fall of 2010.

Completion of Water Modeling. Modeling of reconstructed drinking water concentrations for Hadnot Point and Holcomb Boulevard began in June 2007. Predictions from the modeling are expected to be available to ATSDR scientists conducting the epidemiological studies within a year, with publication of the water modeling results anticipated by the spring of 2012.

Health Studies

Adverse Pregnancy Outcomes Reanalysis. In 1995, ATSDR began a study of adverse pregnancy outcomes at Camp Lejeune in relation to exposure to VOCs in drinking water. ATSDR found statistically significant associations for some subgroups (older mothers and mothers with histories of fetal loss) living in homes in Tarawa Terrace

(PCE), and elevated risks of small for gestational age (SGA) births and low birth weights.

Later information indicated that some women, who were considered not to be exposed because they were served by the Holcomb Boulevard system, were potentially exposed during pregnancy. ATSDR and the Department of Navy are engaged in intensive efforts to identify information needed for water modeling. ATSDR will conduct a new evaluation of adverse pregnancy outcomes when the modeled water concentrations are available.

Case-Control Study of Specific Birth Defects and Childhood Cancers. ATSDR identified children born during 1968-1985 to mothers who were exposed to VOC-contaminated drinking water at Camp Lejeune at any time during their pregnancy. Cases of neural tube defects (i.e., spina bifida and anencephaly), cleft lip, cleft palate, leukemia or non-Hodgkin's lymphoma were identified during a telephone survey conducted during 1999-2002, and have been confirmed by medical records. The parents of confirmed cases and a random sample of controls (i.e., children who did not have birth defects or childhood cancers) were interviewed in 2005. Analyses of this data will be conducted once the results of the water modeling become available.

Scientific Panel

In February 2005, ATSDR convened a scientific panel composed of scientists from government and academia with expertise in epidemiology and public health, biostatistics, drinking water contaminants, pesticides, toxicology, reproductive health,

and environmental health. The panel was asked to provide advice on whether additional epidemiological studies on the health effects of exposures to contaminated water at Camp Lejeune should be conducted. ATSDR convened this panel in response to concerns that ATSDR's studies of adverse birth outcomes and childhood cancers were too narrowly focused, and may have missed adult cancers and non-cancer diseases among children and adults. As this panel was not a federal advisory committee, panel members were asked to provide their individual opinions. ATSDR accepted panel recommendations to assess the feasibility of conducting a mortality study and a cancer incidence study. ATSDR subsequently concluded that a mortality study and a cancer incidence study are feasible.

Mortality Study of Former Marines and Civilian Employees. This study will look at all causes of death, including cancers and other fatal diseases. All active duty Marines stationed on base at any time between June 1975 and September 1987 who began active duty service on or after June 1975 have been identified. In addition, all civilians employed at the base at any time between June 1974 and September 1987 who began U.S. Department of Defense employment on or after June 1974 have been identified. These cohorts will be compared to cohorts of active duty Marines and civilian employees from Camp Pendleton who were not stationed at Camp Lejeune during the period of drinking water contamination. The study is designed to identify significant changes in causes of death between the Camp Lejeune cohort and the Camp Pendleton cohort.

Health Survey/Morbidity Study. The 2008 National Defense Authorization Act requires development of a health survey of persons possibly exposed to contaminated drinking water at Camp Lejeune. The survey will obtain information about cancers and other diseases thought to be related to exposures to the chemicals found in the drinking water at Camp Lejeune. The morbidity study will focus on those who were: active duty Marines stationed on base at any time between June 1975 and September 1987; civilians employed at the base at any time from December 1972 to September 1987; comparison cohorts of active duty Marines and civilian employees from Camp Pendleton who were not stationed at Camp Lejeune during the period of drinking water contamination; and active duty Marines and their dependents (spouses and children who are now all adults) who participated in the 1999-2002 survey to identify cases for the case-control study of specific birth defects and childhood cancers. Those who registered with the U.S. Marine Corps (USMC), but who are not members of these cohorts, will be sent a survey but will not be included in the morbidity study.

Conclusion

ATSDR has an essential role in providing public health support to people and communities impacted by hazardous substances. Our goal is to provide objective, scientific information to all who lived and worked at Camp Lejeune who want to know about the health risks from past exposures.

Much of our remaining work at Camp Lejeune depends on the data and analyses that will come from our water modeling effort. The state-of-the-art analysis, which

predicts drinking water concentrations, will provide us with the best possible exposure estimate.

However, the quality of the information produced by the water modeling effort is heavily dependent on beginning with the most accurate and complete data. The ATSDR /Department of the Navy joint Data Mining Technical Work Group was developed to provide high-level guidance in an intensive effort to identify and review Navy and Marine Corps documents, and to insure that any and all existing pertinent data is available to ATSDR's engineers and scientists.

ATSDR serves the men and women—and their families—who lived and worked at Camp Lejeune while the drinking water was contaminated. As an Agency, we are honored to have the trust and support of former Marines, their family members, and the civilian employees of Camp Lejeune. Our work at Camp Lejeune and many other sites would not be possible without the support and partnership of multiple people and organizations.

Thank you once again for this opportunity to testify before the Subcommittee.