

Naval Air Engineering Center, Lakehurst
(a/k/a Naval Air Engineering Station, Lakehurst)

Final Release

PUBLIC HEALTH ASSESSMENT

NAVAL AIR ENGINEERING CENTER, LAKEHURST
(a/k/a NAVAL AIR ENGINEERING STATION, LAKEHURST)

LAKEHURST, OCEAN COUNTY, NEW JERSEY

EPA FACILITY ID: NJ7170023744

Prepared by:

Federal Facilities Assessment Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

PUBLIC HEALTH ASSESSMENT

Naval Air Engineering Center, Lakehurst

a.k.a.

Naval Air Engineering Station (NAES), Lakehurst
Jackson Township and Manchester Township, New Jersey

CERCLIS NO. NJ7170023744

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Foreword

The Agency for Toxic Substances and Disease Registry (ATSDR) is an agency of the U.S. Public Health Service. It was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the *Superfund* law. This law set up a fund to identify and clean up our country's hazardous waste sites. The Environmental Protection Agency (EPA) and the individual states regulate the investigation and cleanup of the sites.

Since 1986, ATSDR has been required by law to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. (The legal definition of a health assessment is included on the inside front cover.) If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements.

Exposure: As the first step in the evaluation, ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, by other government agencies, by businesses, and by the public. When there is not enough environmental information available, the report will indicate what further sampling data is needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ATSDR scientists then evaluate whether there will be any harmful effects from these exposures. The report focuses on public health, or the health impact on the community as a whole, rather than on individual risks. Again, ATSDR generally makes use of existing scientific information, which can include the results of medical, toxicologic and epidemiologic studies and the data collected in disease registries. The science of environmental health is still developing, and sometimes scientific information about the health effects of certain substances is not available. When this is so, the report will suggest what further research studies are needed.

Conclusions: The report presents conclusions about the level of health threat, if any, posed by a site and recommends ways to stop or reduce exposure within the report's public health action plan. ATSDR is primarily an advisory agency, so usually these reports identify what actions are appropriate to be undertaken by EPA, other responsible parties, or the research or education divisions of ATSDR. However, if there is an urgent health threat, ATSDR can issue a public

health advisory that warns people of the danger. ATSDR can also authorize health education or pilot studies of health effects; full-scale epidemiology studies; disease registries; surveillance studies; or research on specific hazardous substances.

Interactive Process: The health assessment is an interactive process. ATSDR solicits and evaluates information from numerous city, state and federal agencies, the companies responsible for cleaning up the site, and the community. It then shares its conclusions with them. Agencies are asked to respond to an early version of the report to make sure that the data they have provided is accurate and current. When informed of ATSDR's conclusions and recommendations, sometimes the agencies will begin to act on them before the final release of the report.

Community: ATSDR also needs to learn what people in the area know about the site and what concerns they may have about its impact on their health. Consequently, throughout the evaluation process, ATSDR actively gathers information and comments from the people who live or work near a site, including residents of the area, civic leaders, health professionals, and community groups. To ensure that the report responds to the community's health concerns, an early version is also distributed to the public for comment. All the comments received from the public are responded to in the final version of the report.

Comments: If, after reading this report, you have questions or comments, we encourage you to send them to us.

Letters should be addressed as follows:

Attention: Chief, Program Evaluation, Records, and Information Services Branch, Agency for Toxic Substances and Disease Registry, 1600 Clifton Road (E-56), Atlanta, GA 30333.

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List of Acronyms

AIRS	Aerometric Information Retrieval System
ATSDR	Agency for Toxic Substances and Disease Registry
BOMARC	Boeing Michigan Aeronautical Research Center
CEA	Classification Exception Area
CREG	cancer risk evaluation guide
CWM	chemical warfare materiel
DOD	US Department of Defense
EMEG	environmental media evaluation guide
EPA	US Environmental Protection Agency
°F	degrees Fahrenheit
IAS	Initial Assessment Study
IRP	Installation Restoration Program
LTA	Lighter Than Air
MCL	Maximum Contaminant Level
MRL	minimal risk level
MUA	Municipal Utilities Authority
NAAQS	National Ambient Air Quality Standard
NEHC	Navy Environmental Health Center
NJDEP	New Jersey Department of Environmental Protection
NJDHSS	New Jersey Department of Health and Senior Services
OCHD	Ocean County Health Department
NPL	National Priorities List
PCB	polychlorinated biphenyl
pCi/L	picocurie per liter
PHA	public health assessment
PM10	particulate matter having aerodynamic diameters less than or equal to 10 microns
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RI	remedial investigation
RMEG	reference dose media evaluation guide
TRI	Toxic Release Inventory
UXO	unexploded ordnance
US	United States
USGS	United States Geological Survey
VOC	volatile organic compound

For reference, Appendix A defines several technical terms used in this public health assessment.

Summary

Naval Air Engineering Station (NAES) Lakehurst is a 7,400-acre U.S. Navy (Navy) base located in central New Jersey=s Jackson and Manchester Townships, adjacent to the Borough of Lakehurst. The base conducts research, development, and engineering activities to support the interface between aircraft and marine vessels. NAES Lakehurst=s routine operations generate various wastes which are either managed on base, transferred to off-base waste facilities, or discharged according to the terms of the facility=s operating permits. Some past waste disposal practices, some accidental spills, and other activities on the base released contamination directly into the environment. NAES Lakehurst has made extensive efforts to clean up or otherwise address the resulting contamination.

This public health assessment (PHA) evaluates exposure pathways and community concerns related to NAES Lakehurst=s past, current, and future releases. The evaluations are intended to determine whether these releases have caused base residents, community members, or both to be exposed to unhealthy levels of environmental contamination. To prepare this PHA, the Agency for Toxic Substances and Disease Registry (ATSDR) reviewed data from many sources. The agency also consulted with representatives from the local community, the U.S. Environmental Protection Agency (USEPA), the U.S. Geological Survey (USGS), the New Jersey Department of Environmental Protection (NJDEP), the New Jersey Department of Health and Senior Services (NJDHSS), the Ocean County Health Department (OCHD), NAES Lakehurst, and other parties.

This assessment also discusses four health concerns communicated to ATSDR by community members, base personnel, and public officials in relation to NAES Lakehurst:

1) Drinking or contacting contaminated groundwater, either on or off base

Past operations at NAES Lakehurst have contaminated the groundwater at several locations on and near base property. This contamination has been extensively studied and is closely monitored. In the past and at this time, no one is exposed to the groundwater contamination at NAES LakehurstCthe local private and public water supplies do not pump drinking water from the contaminated areas. Also, several measures are in place to ensure that the groundwater contamination does not become a hazard in the future, including perimeter wells that would detect that contamination *before* it enters drinking water supplies. Therefore, the groundwater contamination at NAES Lakehurst did not pose a public health hazard in the past, does not currently pose a public health hazard, and is not likely to in the future.

2) Contacting unexploded ordnance (UXO) or chemical warfare materiel (CWM) while hunting, hiking, or playing on base

An unknown amount of unexploded ordnance (UXO) and chemical warfare materiel (CWM) remain on NAES Lakehurst property from past munitions testing operations and military training exercises. (The term materiel is defined as the equipment, apparatus, and supplies of a military force or other organization.) Most UXO/CWM are believed to be located in the more remote, western part of NAES Lakehurst, far from base housing. However, these areas are accessible by hunters and others, including children living on base. NAES has taken measures to prevent contact with UXO/CWM, including posting warning signs in areas believed to have the greatest amount of UXO/CWM, requiring hunters to take an annual training course about the dangers of UXO/CWM, and informing all new base personnel (civilian and military) and contractors about the specific risks these items pose. An explosive ordnance disposal team from either the Army (Fort Dix) or the Navy (Naval Weapons Station Earle) is called before digging in any areas suspected to have unexploded ordnance or chemical munitions and emergency response teams are on hand to respond to chemical releases, explosions, or fires. In addition, NAES Lakehurst has developed contingency plans and standard operating procedures for response to a release of chemicals either on base or in the community. This includes coordination with local, state, and federal agencies dealing with emergency response.

ATSDR believes that there is insufficient data to evaluate potential levels of exposure in and around the proving ground and test facilities during 1918-1921. However, there is no indication that past releases or exposures have occurred since chemical warfare testing ended in 1921. For example, there have been no reported or unexplained deaths or injuries to a wide variety of fish and wildlife, nor unexplained vegetation stress or obvious changes in the numbers and types of insects.

ATSDR recommends that NAES Lakehurst continue indefinitely administrative controls for all portions of the base that have not been otherwise cleared for safe and unlimited access and use. ATSDR recommends that, as new information becomes available, NAES Lakehurst continue to update its materials used to inform base residents and base personnel about the hazards associated with disturbing UXO and CWM. Providing information to residents is important to ensure that children of families who reside in housing on base understand the hazards associated with UXO and CWM.

3) Eating deer possibly containing radiologic contamination from BOMARC

Some base personnel and base residents have expressed concern that radioactive materials might be present in deer hunted on NAES Lakehurst property. The concern is based on an explosion and fire that occurred on June 7, 1960 at the nearby BOMARC (Boeing Michigan Aeronautical Research Center) guided missile site. This accidental explosion and missile meltdown released

trace levels of radiological materials into the environment. ATSDR reviewed information on the trace levels of radioactive chemicals that remain on and near the BOMARC site and the extent to which these contaminants are expected to accumulate in plants and animals, including deer on NAES Lakehurst property. Because deer retain a very small fraction of radioactive materials that they might eat, and amounts that are retained occur primarily in body parts that people do not eat, ATSDR does not consider that deer meat harvested from NAES Lakehurst poses a public health hazard in the past, currently, or in the future.

4) Air pollution

In response to community concerns regarding air quality, ATSDR obtained data on the amount of chemicals NAES Lakehurst releases to the air. ATSDR used an air modeling analysis to evaluate this concern. The results of the model suggest that emissions from NAES Lakehurst both in the past and currently do not cause off-base air pollution to reach unhealthy levels and are therefore a no apparent public health hazard.

However, general air quality in Ocean County is sometimes poor, given the high levels of ozone that occur during the summer months. The ozone problem is regional in nature and is from industrial and motor vehicle emissions over a broad geographic area. Some people exposed to elevated ozone levels could experience health effects such as lung irritation and difficulty breathing. On days when ozone levels are expected to be high, NJDEP issues warnings that explain how people can reduce their exposure and avoid these and other ozone-related health effects. ATSDR agrees with NAES Lakehurst's recommendation that the base day care center and medical facilities subscribe to the NJDEP's Bureau of Air Monitoring air advisory program which directly notifies members when air pollution reaches unhealthy levels. It is especially important for adults to convey these warnings to their children, particularly children with asthma.

I. Introduction

The Agency for Toxic Substances and Disease Registry (ATSDR) is required by law to conduct public health assessments (PHAs) for all sites on the U.S. Environmental Protection Agency's (USEPA's) National Priorities List (NPL). USEPA placed Naval Air Engineering Station (NAES) Lakehurst on the NPL in 1987. This led to the Navy conducting extensive remediation activities to reduce levels of environmental contamination on base property. This PHA evaluates whether the contamination levels at NAES Lakehurst were health hazards to base personnel, base residents, and local community members in the past, currently, or in the future.

After reviewing numerous base documents, discussing health concerns with community members, and meeting with base personnel, ATSDR identified four key concerns regarding how people might be exposed to contamination at NAES Lakehurst. These concerns are 1) groundwater contamination, 2) the presence of unexploded ordnance (UXO) and chemical warfare materiel (CWM) on base property, 3) potential radiological contamination in deer meat, and 4) air contamination. This PHA focuses on these four health concerns and also evaluates other environmental contamination in soils, surface water, sediments, and fish (see Appendix C).

Table 1 describes the exposure situations for NAES Lakehurst, ATSDR's health conclusion category for those situations, and the actions taken to limit exposure from them. ATSDR assigns conclusion categories to sites based on their level of public health hazard. Also, ATSDR has further clarified the "No Apparent Public Health Hazard" conclusion category by stating whether it is a past, current, or a future hazard. ATSDR's conclusion categories are explained in the Glossary (Appendix A).

Although ATSDR completed this PHA specifically to assess how contamination released from NAES Lakehurst might affect public health, the agency is aware that local community members have concerns about several sites throughout Ocean County and in neighboring counties. ATSDR and the New Jersey Department of Health and Senior Services (NJDHSS) have already completed PHAs for many of these other sites. Community members who would like to learn more about the public health implications of other sites near NAES Lakehurst should refer to the text box below.