



Public Health Assessment for

**MARINE CORPS BASE (MCB) CAMP PENDLETON
CAMP PENDLETON, SAN DIEGO COUNTY, CALIFORNIA
EPA FACILITY ID: CA2170023533
MAY 1, 2007**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE**
Agency for Toxic Substances and Disease Registry

Comment Period Ends:

JUNE 1, 2007

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment-Public Comment Release was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate. This document represents the agency's best efforts, based on currently available information, to fulfill the statutory criteria set out in CERCLA section 104 (i)(6) within a limited time frame. To the extent possible, it presents an assessment of potential risks to human health. Actions authorized by CERCLA section 104 (i)(11), or otherwise authorized by CERCLA, may be undertaken to prevent or mitigate human exposure or risks to human health. In addition, ATSDR will utilize this document to determine if follow-up health actions are appropriate at this time.

This document has previously been provided to EPA and the affected state in an initial release, as required by CERCLA section 104 (i) (6) (H) for their information and review. Where necessary, it has been revised in response to comments or additional relevant information provided by them to ATSDR. This revised document has now been released for a 30-day public comment period. Subsequent to the public comment period, ATSDR will address all public comments and revise or append the document as appropriate. The public health assessment will then be reissued. This will conclude the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Prepared by:

Site and Radiological Assessment Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

This information is distributed by the Agency for Toxic Substances and Disease Registry for public comment under applicable information quality guidelines. It does not represent and should not be construed to represent final agency conclusions or recommendations.

Foreword

The Agency for Toxic Substances and Disease Registry, ATSDR, was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, 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. If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by scientists from ATSDR and from states with which ATSDR has cooperative agreements. The public health assessment program allows flexibility in the format or structure of their response to the public health issues at hazardous waste sites. For example, a public health assessment could be one document or it could be a compilation of several health consultations—the structure may vary from site to site. Whatever the form of the public health assessment, the process is not considered complete until public health issues at the site are addressed.

Exposure

As the first step in the evaluation, ATSDR scientists review environmental data to see what chemicals are present, where the chemicals were found, and how people might come into contact with the chemicals. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, other government agencies, businesses, and the public. When environmental data does not allow ATSDR to fully evaluate exposure, 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 evaluate whether or not these exposures may result in harmful effects. ATSDR recognizes that developing fetuses, infants, and children can be more sensitive to exposures than are adults. As a policy, unless data are available to suggest otherwise, ATSDR considers children to be more sensitive and vulnerable than adults. Thus, the health impact to the children is considered first when evaluating exposure and the potential adverse effects to a community. The health impacts to other groups within the community (such as the elderly, chronically ill, and people engaging in high-exposure practices) also receive special attention during the evaluation.

ATSDR uses existing scientific information, which can include the results of medical, toxicologic, and epidemiologic studies and the data collected in disease registries, to determine the likelihood of health effects that may result from exposures. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances is not available. In this case, this report suggests what further public health actions are needed.

Conclusions

This report presents conclusions about the public health threat, if any, posed by a site. Any health threats that have been determined for high-risk groups (such as children, the elderly, chronically ill people, and people engaging in high-risk practices) are summarized in the Conclusions section of the report. Ways to stop or reduce exposure are recommended in the Public Health Action Plan section.

ATSDR is primarily an advisory agency, so its reports usually 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 warning 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.

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 their comments. 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:

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Table of Contents

Foreword.....	i
Acronyms.....	v
Summary	1
Background.....	3
Site Description.....	3
Operational History.....	4
Remedial and Regulatory History.....	4
ATSDR Activities.....	7
Demographics	7
Land Use	8
Natural Resources	9
Quality Assurance and Quality Control.....	11
Evaluation of Environmental Contamination and Exposure Pathways	11
Introduction.....	11
Ingestion of Contaminants in Base Drinking Water	14
Potential Exposure of Residents and Base Personnel to Volatile Organic Compounds in the 22/23 Area Groundwater via Base Production Wells.....	21
Exposure to Metals in Pulgas Lake Resulting from Recreational Activities.....	24
Exposure to Contaminants in Surface Soil by Base Residents and Base Personnel Entering Accessible IRP Sites	26
Community Health Concerns.....	31
Exposure to Possible Wind-Blown Contaminants to Residential Yards During Disposal Activities at Site 7—Box Canyon Landfill, Particularly Related to Thallium Exposure	31
Measures to Protect the Santa Margarita Elementary School During Remedial Activities at the Landfill.....	37
Integrity of Underground Storage Tanks	38
Concern about Unexploded Ordnance (UXO) on the Base	38
Concern about Sewage.....	39
Recommendations.....	44
Public Health Action Plan.....	44
Authors, Technical Advisors	46
References.....	47

Tables.....	57
Figures.....	105
Appendices.....	112

List of Tables

Table 1. Evaluation of Potential Public Health Hazards at Marine Corps Base Camp Pendleton	58
Table 2. Exposure Pathways Evaluation Table.....	92
Table 3. Chemicals Detected above Comparison Values in North System Drinking Water—Well Samples Collected from 1989 to 2004.....	95
Table 4. Chemicals Detected above Comparison Values in South System Drinking Water—Well Samples Collected from 1989 to 2004.....	97
Table 5. Copper and Lead Detected above Comparison Values in Tap Water Samples from 1993 to 2005	99
Table 6. Chemicals Detected above Comparison Values in 22/23 Area Groundwater in Multiple Sampling Events (1988–2001).....	101
Table 7. Chemicals Detected above Comparison Values in Site-Wide Surface Soil—Potentially Accessible Base Areas	103
Table 8. Average and Maximum Detected Concentrations for Chemicals Exceeding Comparison Values in Soil at Sites 1A, 1E, 1F, and 2A	104

List of Figures

Figure 1. Location of MCB Camp Pendleton	106
Figure 2. Location of IRP Sites and OUs at MCB Camp Pendleton	107
Figure 3. Base Areas at MCB Camp Pendleton.....	108
Figure 4. Population Demographics Within 1 Mile of MCB Camp Pendleton	109
Figure 5. ATSDR Exposure Evaluation Process	110
Figure 6. Recreational Areas and Public Access	111

List of Appendices

Appendix A. ATSDR Glossary of Terms	A-1
Appendix B. ATSDR’s Comparison Values	B-1
Appendix C. Dose Calculation Formulas for Drinking Water, Fish, Sediment, Surface Water, and Surface Soil	C-1
Appendix D. Detailed Chemical Information	D-1

Acronyms

ACU	Assault Craft Unit
AST	aboveground storage tank
AT&SF	Atchison, Topeka, and Santa Fe
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BLL	blood lead level
Cal-EPA	California Environmental Protection Agency
CAMU	Corrective Action Management Unit
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminants of concern
CREG	cancer risk evaluation guide
CRP	Community Relations Plan
CURTT	Cleanup Review Tiger Team
CV	comparison value
1,2-DCA	1,2-dichloroethane
1,2-DCE	1,2-dichloroethene
DHS	Department of Health Services
DoD	U.S. Department of Defense
DoN	Department of the Navy
DPDO	Defense Property Disposal Office
DRMO	Defense Reutilization and Marketing Office
DRO	diesel range organics
DTSC	Department of Toxic Substances Control
EMEG	environmental media evaluation guide
ENRMO	Environmental and Natural Resources Management Office
ESHWRD	Environmental Security Hazardous Waste and Remediation Department
ET	evapotranspiration
FFA	federal facility agreement
FS	feasibility study
FSSG	Force Service Support Group
FWENC	Foster Wheeler Environmental Corporation
IAS	initial assessment study
IRP	Installation Restoration Program
LCAC	Landing Craft Air Cushion
LOAEL	lowest-observed-adverse-effect level
LTHA	lifetime health advisory
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCL	maximum contaminant level
MCPP	2-(2-methyl-4-chlorophenoxy)propionic acid
MCTSSA	Marine Corps Tactical System Support Activity

Acronyms (continued)

mg/kg	milligrams per kilogram
mg/kg/day	milligrams per kilogram per day
MRL	minimal risk level
MWR	morale, welfare, and recreation
NA	not available
ND	not detected
NOAEL	no-observed-adverse-effect level
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	National Research Council
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
pCi/L	picocuries per liter
PHA	public health assessment
PHAP	public health action plan
PLPP	Pediatric Lead Prevention Program
ppb	parts per billion
PSH	phase-separated hydrocarbon
PWCSD	Public Works Center San Diego
µg/dL	micrograms per deciliter
µg/L	micrograms per liter
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RfD	reference dose
RI	remedial investigation
RMEG	reference dose media evaluation guide
ROD	record of decision
RWQCB	California Regional Water Quality Control Board-San Diego Region
SI	site investigation
SSL	soil screening level
SVOC	semi-volatile organic compound
SWDIV	southwest division
1,1,1-TCA	1,1,1-trichloroethane
TCE	trichloroethylene
1,2,3-TCP	1,2,3-trichloropropane
TRC	Technical Review Committee
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WHO	World Health Organization

Summary

The Agency for Toxic Substances and Disease Registry (ATSDR) prepared this public health assessment to evaluate contamination at Marine Corps Base (MCB) Camp Pendleton, and to determine if past, current, and future exposure to site contamination could potentially harm people who live at the base. MCB Camp Pendleton, occupying about 125,000 acres, lies along the Pacific Ocean in southern California. With the exception of about 125 acres in southern Orange County, the base is within northern San Diego County. MCB Camp Pendleton is 38 miles north of San Diego and 82 miles south of Los Angeles.

Since 1946, MCB Camp Pendleton has been the headquarters for the U.S. Marine Corps' (Marine Corps) military activities on the West Coast. In addition to the Marine Corps, personnel of other U.S. Department of Defense (DoD) and government entities use the base for amphibious assault training. Several commands operate on base, including the I Marine Expeditionary Force, 1st Marine Division, Marine Aircraft Group 39, First Force Service Support Group, and several tenant units. Approximately 60,000 servicemen and women train at MCB Camp Pendleton each year—more than 35,000 of whom are assigned to the base.

Environmental contamination at the base primarily resulted from previous disposal of hazardous wastes. Several activities, such as airfield operations and pest control management, contributed to base contamination due to past disposal practices. Wastes released as a result of these activities included solvents, oils, battery acid, paint, paint stripper, mixed fuels, hydraulic fluids, pesticide rinsate, hospital refuse, photographic processing chemicals, and batteries.

Under the DoD's Installation Restoration Program (IRP), the Department of the Navy (DoN) has been conducting environmental investigations at MCB Camp Pendleton since the early 1980s. On November 15, 1989, the U.S. Environmental Protection Agency (USEPA) placed MCB Camp Pendleton on the National Priorities List (NPL) of sites requiring further environmental investigation. To date, investigations have been conducted at all 57 IRP sites. Many of these sites contained no contaminants of concern, whereas others have undergone remediation. Forty-three sites have been closed, while investigations and/or remedial activities are ongoing at 14 sites.

As part of the public health assessment process, ATSDR conducted a site visit in March 2005. ATSDR staff met with MCB Camp Pendleton and DoN representatives, toured active IRP sites, and requested site documents. ATSDR examined the nature and extent of contamination, and evaluated potential exposures for people living at MCB Camp Pendleton based on environmental data, the site visit, and interviews with MCB Camp Pendleton representatives. ATSDR reached the following conclusions regarding each exposure scenario evaluated:

- *Ingestion of contaminants in base drinking water.* MCB Camp Pendleton maintains two water supplies—North System and South System—that supply drinking water to all areas of the base, except for San Mateo Point housing. These systems provide drinking water to residents who live on base and personnel who work aboard MCB Camp Pendleton.

Copper. As a result of corrosion of copper pipes in buildings and residences on base, copper concentrations exceeded the EPA action level (1,300 µg/L) in residential tap samples (1993–

1995 and 1997–2005) and in drinking water fountains used by base personnel (2005).¹ ATSDR compared the concentrations detected in residential tap and drinking water fountain samples to EPA's Reference Dose (RfD) for chronic, *lifetime* exposure (0.04 mg/kg/day) and to the range of no-observed-adverse-effect levels (NOAELs) (0.042–814 mg/kg/day). Even at the *maximum* concentrations of copper detected, the estimated 6-year dose for children and 30-year dose for adults were within the range where no adverse effects have been observed. However, because copper was detected above the EPA action level in some residential tap samples, MCB Camp Pendleton is implementing a water treatment solution approved by the California Department of Health Services (DHS) to control copper corrosion in the North System.

Lead. Sampling of water fountains used by base personnel has not detected lead above health-based comparison values. However, during sampling in August 2005, lead was detected above the EPA action level in 11 homes in the South System, seven of which were occupied at the time of sampling. The families were notified in writing of the exceedences, provided with bottled water, and informed about actions they could take to limit potential exposure to lead. In addition, MCB Camp Pendleton offered blood lead screening to all base residents. As of September 2006, a total of 1,057 residents had undergone blood lead screening; results received to date were all below concern levels established by the Centers for Disease Control and Prevention (CDC). Further, two subsequent sampling events since September 2005 at these 11 homes detected no lead above the EPA action level in drinking water. Currently, MCB Camp Pendleton is implementing a water treatment solution approved by DHS to control lead corrosion in the South System. In the event that residential tap water samples exceed the action level for lead, ATSDR recommends that the base notify these residents and explain measures that can decrease lead concentrations in their tap water. In addition, MCB Camp Pendleton should continue to provide educational materials to residents prior to their moving into base housing.

- *Potential exposure of residents and base personnel to volatile organic compounds and other contaminants in the 22/23 Area Groundwater via base production wells is not a health hazard.* The 22/23 Area Groundwater is a contaminated groundwater plume under six IRP sites: 4, 4A, 6, 16, 17, and 27. Chemicals detected in this plume include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and metals. In 2003 and 2004, a VOC detected in this plume—1,2,3-trichloropropane (1,2,3-TCP)—was also detected in base production wells, suggesting that this contaminant could possibly be entering the water system from the 22/23 Area Groundwater. No evidence suggests, however, that other contaminants have migrated into the drinking water system from this area. Even if 1,2,3-TCP is migrating to base production wells, the maximum concentration is 800 times less than ATSDR's screening values and 12,000 times less than EPA's drinking water recommendations. Results of ATSDR's evaluation indicate that estimated exposure doses for pesticides and metals were either below background levels or below levels shown to cause adverse health effects and previously detected SVOCs were not found in production

¹ It is important to note that the copper corrosion is occurring in the distribution system itself, not in the water supply.