

GAO

Report to the Honorable Lane Evans,
Ranking Minority Member, Committee
on Veterans Affairs, House of
Representatives

February 1999

GULF WAR ILLNESSES

Procedural and Reporting Improvements Are Needed in DOD's Investigative Processes





**United States
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**National Security and
International Affairs Division**

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The Honorable Lane Evans
Ranking Minority Member
Committee on Veterans Affairs
House of Representatives

In response to your request, we have reviewed the operations of the Department of Defense's Office of the Special Assistant for Gulf War Illnesses. This report focuses on the thoroughness of this Office's investigations into and reporting on veterans' potential exposure to chemical or biological agents during the Persian Gulf War.

We are sending copies of this report to the Chairmen and Ranking Minority Members of the House Committee on Appropriations, the House Committee on Government Reform and Oversight, the Senate Committee on Appropriations, and the Senate Committee on Governmental Affairs and to the Director, Office of Management and Budget. We will make copies available to others on request.

If you or your staff have any questions concerning this report, please contact me on (202) 512-5140. Major contributors to this report are listed in appendix IV.

Sincerely yours,

A handwritten signature in cursive script that reads 'Mark E. Gebicke'.

Mark E. Gebicke
Director, Military Operations
and Capabilities Issues

Executive Summary

Purpose

Many servicemembers who served in the Persian Gulf War have subsequently experienced health problems such as fatigue, muscle and joint pain, gastrointestinal complaints, headaches, memory loss, and sleep disturbances. Whether these health problems are related to these servicemembers' exposures to chemical, biological, or environmental agents during their Gulf War service has been a topic of much controversy. To ensure that all issues related to Gulf War illnesses were comprehensively addressed, the Department of Defense (DOD) established the Office of the Special Assistant for Gulf War Illnesses (OSAGWI) in November 1996.

To determine whether DOD is diligently addressing issues related to Gulf War illnesses, the Ranking Minority Member of the House Committee on Veterans Affairs asked GAO to examine selected OSAGWI operations. Specifically, GAO's objectives were to (1) describe DOD's progress in establishing an organization to address Gulf War illnesses issues and (2) evaluate the thoroughness of OSAGWI's investigations into and reporting on incidents of veterans' potential exposure to chemical or biological warfare agents during the Gulf War.

Background

More than 100,000 Gulf War veterans have participated in health examination programs established by DOD and the Department of Veterans Affairs (VA). Of those examined, nearly 90 percent have reported a wide array of health complaints and disabling conditions. Some veterans suspect that their health problems may be linked to chemical or biological warfare agents that Iraq may have used during the Gulf War. Other causes, such as stress, smoke from oil well fires, reactions to pesticides or vaccines, and exposure to depleted uranium munitions, have also been suggested as causes of these illnesses. Research to better identify the causes is ongoing but will not be completed for years.

Following the Gulf War, DOD claimed that chemical weapons were not present in the Gulf War theater. However, the Central Intelligence Agency disclosed in 1995 that chemical weapons were found at an ammunition storage site at Khamisiyah, Iraq. Following an investigation, DOD acknowledged in July 1997 that U.S. troops might have been exposed to a chemical warfare agent at Khamisiyah when demolitions were used there to destroy Iraqi rockets. Other incidents involving potential chemical warfare agent exposures have been cited by veterans in testimonies before various congressional committees. Consequently, some have called into question DOD's credibility on Gulf War illnesses issues.

In November 1996, DOD established OSAGWI to restore public confidence in DOD's efforts to deal with Gulf War illnesses issues. OSAGWI has focused its efforts on (1) establishing effective two-way communications with veterans and veterans groups, (2) investigating and reporting on incidents of possible chemical warfare agent exposures, and (3) applying lessons learned from the Gulf War experience to better protect U.S. servicemembers on a contaminated battlefield.

Each OSAGWI investigation into possible exposures of servicemembers to chemical warfare agents results in a summation document called a case narrative. The case narrative, a document updated as new evidence becomes known, contains all important investigative facts and OSAGWI's assessment—in terms of “definitely,” “likely,” “indeterminate,” “unlikely,” or “definitely not”—of the likelihood that servicemembers were exposed to chemical or biological warfare agents. The standard OSAGWI used for its assessments was whether all available facts would lead a reasonable person to conclude that a chemical or biological warfare agent was or was not present. At the time GAO began its evaluation, OSAGWI had issued eight case narratives. OSAGWI pursued these cases first because they involved incidents that were the most prominent and controversial.

GAO evaluated six of these eight investigations. GAO did not review the case narrative about the alleged exposure at Khamisiyah because it was already being heavily reviewed by other organizations, such as the Presidential Advisory Committee on Gulf War Veterans' Illnesses and the Senate Committee on Veterans Affairs' Special Investigation Unit. GAO also did not review the Possible Chemical Agent on SCUD Missile Sample case narrative because it appeared to be less controversial than the other case narratives. In conducting its evaluations, GAO (1) traced each statement in these reports to its underlying supporting documentation in OSAGWI files, (2) reviewed OSAGWI documentation associated with the incident to determine if all relevant information was included in the report, (3) contacted key sources of information to verify the accuracy and completeness of the information these sources provided to OSAGWI, (4) independently sought other sources of information, and (5) contacted key participants not originally interviewed to determine if relevant information was available that might affect OSAGWI's assessment of possible exposures to chemical warfare agents.

Results in Brief

DOD has made progress in carrying out its mandate to comprehensively address Gulf War illnesses-related issues. It has assisted veterans through its outreach program by clearing large backlogs of veterans' inquiries, using a toll-free hot line, setting up a Web site, and publishing a newsletter. In addition, it has assisted veterans in obtaining medical examinations and other services at DOD and VA facilities. Through the course of its investigations and other work, OSAGWI has identified needed improvements in DOD's equipment, policies, and procedures and has worked with various DOD agencies to implement changes designed to provide better protection to U.S. servicemembers on a contaminated battlefield. OSAGWI generally applied appropriate investigative procedures and techniques in conducting its work. However, GAO found that three of the six case narratives it reviewed contained weaknesses such as failures to follow up with appropriate individuals to confirm key evidence, to identify or ensure the validity of some evidence, to include some important information, and to interview some key witnesses. In the remaining three cases, OSAGWI conducted its investigations without evidence of these weaknesses. In all six cases, OSAGWI missed an opportunity to perform more complete investigations because it did not take advantage of potentially valuable sources of relevant information in DOD and VA clinical databases. GAO does not know whether the investigatory and reporting weaknesses it found in its review of these six cases might also exist in the cases that OSAGWI later investigated.

Despite these weaknesses, GAO agreed with OSAGWI's conclusions about the likelihood of the presence of chemical warfare agents in five of the six cases it reviewed. The one exception involved a potential exposure of U.S. Marine Corps personnel to a chemical warfare agent during a minefield breaching operation. OSAGWI concluded that exposure in this case was "unlikely." However, GAO found that OSAGWI had overlooked some information it had in its possession and also did not include all relevant information in its case narrative. After reviewing the overlooked information and considering all relevant information OSAGWI had in its files, GAO believes that OSAGWI should reassess the likelihood of exposure in this case. There is potential that this case could be more appropriately assessed as "indeterminate."

GAO believes that the lack of effective quality assurance policies and practices in OSAGWI's investigating and reporting processes contributed to the weaknesses noted. Although OSAGWI has taken steps to improve its quality assurance procedures, certain features should be incorporated to

ensure that all of its investigations are thoroughly conducted and accurately reported.

Principal Findings

DOD Has Made Progress in Establishing an Organization to Address Gulf War Illnesses Issues

DOD established OSAGWI to repair the credibility problems it faced regarding its past efforts to address Gulf War illnesses issues. It provided OSAGWI with an operating authority much broader than its predecessor, the Persian Gulf Illnesses Investigation Team, namely, to coordinate all aspects of DOD's programs concerning Gulf War illnesses. Compared with its predecessor, OSAGWI represents a significant increase in resources directed toward investigations and outreach efforts. For example, in 1996, the Persian Gulf Illnesses Investigation Team operated with a staff of 12 persons and a budget of \$4.1 million. In contrast, OSAGWI had a staff of 200 persons as of October 9, 1998, and a fiscal year 1998 budget of \$29.4 million. In addition, while the Persian Gulf Illnesses Investigation Team reported to the Assistant Secretary of Defense for Health Affairs, OSAGWI reports directly to the Deputy Secretary of Defense.

DOD has made progress in addressing Gulf War illnesses issues. To improve communications with veterans, OSAGWI has established the means to receive input from and provide information to veterans. Within its first year of operation, OSAGWI successfully cleared a backlog of 1,200 veterans' inquiries through personal telephone calls, and received an additional 1,200 letters and 2,700 E-mail messages. By January 1, 1999, OSAGWI had received 2,850 letters and 4,906 E-mail messages. OSAGWI officials met with the public and veterans at 18 town hall meetings and appeared at 41 national veterans conventions. Its Internet site reportedly receives over 60,000 inquiries each week, and over 12,000 individuals receive OSAGWI's bimonthly newsletter. OSAGWI also refers veterans to various sources of medical services. Finally, OSAGWI communicates directly with veterans that are affected by its investigations. After OSAGWI completes an investigation and publishes the corresponding case narrative, it sends to each directly affected veteran a letter that contains a synopsis of the investigation's results.

OSAGWI's mission requires that it advise the Secretary of Defense on changes needed in military equipment, policies, and procedures in order to better protect servicemembers during operations on a contaminated

battlefield. OSAGWI has identified several areas needing improvement on the basis of its experience in investigating and reporting on possible chemical, biological, or environmental exposures. OSAGWI is working with DOD and other executive branch agencies to implement these lessons learned. For example, OSAGWI was instrumental in prompting the Deputy Secretary of Defense to issue a requirement that the military services review their depleted uranium training programs. These programs are important in addressing potential health problems related to the use of depleted uranium in armor and ammunition. We did not review the impact this activity has had on making changes within DOD. However, in October 1998, OSAGWI established a directorate to focus on ensuring that lessons learned are implemented.

Investigative and Reporting Procedures Have Various Weaknesses

GAO found procedural, investigative, or reporting problems in three of the six cases it reviewed. These weaknesses were not evident in the other three cases. Specifically, it found that OSAGWI investigators sometimes failed to follow up with appropriate individuals to confirm key evidence, identify or ensure the validity of key evidence, include important information, and interview key witnesses. Despite these weaknesses, the preponderance of evidence led GAO to agree with the conclusions in OSAGWI case narratives concerning the presence of chemical warfare agents in all but one of the six cases GAO reviewed. This one exception involved a potential exposure of U.S. Marine Corps personnel during a minefield breaching operation. OSAGWI concluded that an exposure in this case was “unlikely.” However, GAO found that this case narrative did not include some key information contained in OSAGWI files. Specifically, OSAGWI had information regarding the presence of artillery fire that contradicted one of its primary determinations—that no artillery fire or chemical mines were present and therefore no means of chemical warfare agent delivery existed. Also, OSAGWI did not include information that chemical detection paper attached to a vehicle used in the operation changed color, indicating the potential presence of a chemical warfare agent. After reviewing the overlooked information and considering all relevant information OSAGWI had in its files, GAO concluded that reassessment is needed and that the probability of exposure might more appropriately be assessed as “indeterminate.”

The other two of the three cases in which GAO found investigative or reporting weaknesses involved (1) a possible exposure of a servicemember to a mustard agent and (2) a possible exposure of servicemembers to chemical agents in Al Jubayl, Saudi Arabia. In the case

involving the potential exposure of a servicemember to a mustard agent during an inspection of an Iraqi bunker complex, OSAGWI did not follow up adequately to confirm whether an in-theater urinalysis test was administered. GAO found insufficient evidence to support the existence of such a test. Moreover, OSAGWI did not establish whether clothing tested for chemical warfare agent in this case actually belonged to the individual allegedly exposed. Finally, OSAGWI reached its conclusion without interviewing some key witnesses. Despite these weaknesses, the evidence in this case supported OSAGWI's conclusion that exposure to a chemical warfare agent was "likely." In the case involving potential exposure to chemical agents in Al Jubayl, Saudi Arabia, GAO found that the available evidence generally supported OSAGWI's conclusions. However, OSAGWI did not include important information that would have made the case narrative more complete. Had OSAGWI included this information, it would have avoided any appearance that it had not completely reported what was known from the investigation. Specifically, OSAGWI did not report that many of the individuals associated with this case had reported unusually high levels of health problems since their service during the Persian Gulf War. Without this information, a reader could conclude that there was little basis for concern about exposure to hazardous substances in this case. The case report also failed to mention that health problems affecting many individuals associated with this incident were among the first Gulf War illnesses-related incidents reported and the subject of several major DOD investigations and studies.

For all six cases, GAO found that OSAGWI had not taken advantage of DOD and VA clinical databases that contain information on the health of thousands of Gulf War veterans who may have symptoms of the types commonly associated with Gulf War illnesses. Use of these databases is identified in OSAGWI's methodology for conducting investigations, and they were used by OSAGWI in some other investigations. Their use might have provided leads regarding whether more investigative effort was needed in cases where exposure to chemical warfare agents or other environmental hazards might have occurred.

During its review of the case narratives, GAO noted weaknesses in OSAGWI's internal quality assurance practices that contributed to some of the problems it found. In responding to GAO's findings, OSAGWI officials said that subsequent to the publication of these cases, they implemented internal review and quality assurance procedures that should prevent such shortcomings in future reports. This internal review mechanism has been evolving since July 1997. It remains to be seen whether these procedures

will effectively provide the quality assurances necessary for OSAGWI to thoroughly investigate potential chemical, biological, and environmental exposures and to maintain credibility with veterans.

Recommendations

To ensure that OSAGWI's case narratives contain all the facts that have surfaced to date, GAO recommends that the Secretary of Defense direct the Special Assistant for Gulf War Illnesses to

- revise the Marine Minefield Breaching, the Exposure to Mustard agent, and the Al Jubayl case narratives to reflect the new and/or unreported information identified by GAO and
- determine whether OSAGWI's conclusion in the Marine Minefield Breaching case that exposure to chemical warfare agent was "unlikely" should be changed to "indeterminate" in light of the additional information known about this case.

To enhance the thoroughness of OSAGWI's investigative and reporting practices, GAO recommends that the Secretary of Defense direct the Special Assistant for Gulf War Illnesses to

- use the DOD and VA Gulf War clinical databases to assist in designing the nature and scope of all OSAGWI investigations and
- ensure that OSAGWI's internal review procedures provide that (1) those reviewing an investigation and related report are independent of the team investigating the incident and (2) steps are in place that will lead the reviewers to thoroughly check that all relevant information obtained by the investigation teams has been included in the case narrative reports, all conclusions have been fully substantiated by the facts, and all logical leads have been pursued.

More detailed recommendations are found on pages 44 and 45.

Agency Comments and GAO's Evaluation

GAO asked DOD and VA to comment on a draft of this report.

DOD generally concurred with the report. In response to GAO's findings and recommendations, DOD agreed to revise OSAGWI's reports to include new or unreported data identified by GAO's efforts and to use this information in reassessing case narrative findings. DOD also stated that follow-up investigations were either planned or under way regarding the Marine Minefield Breaching, Reported Mustard Agent Exposure, and Al Jubayl

case narratives. While DOD agreed to update the Marine Minefield Breaching narrative, it also noted that there were still inconsistencies regarding the presence of artillery fire. DOD said that as part of its follow-up investigation, it would objectively consider all information and detail more completely the artillery issue and its relevance to whatever final assessment is made.

DOD and VA both disagreed with GAO's recommendation that OSAGWI incorporate the use of DOD and VA clinical databases into its evaluations. Their disagreement was based on their concern that these databases might be inappropriately used to establish a causal relationship between an event and the medical findings of the registries. However, DOD agreed that the databases needed to be examined and analyzed for what they can contribute to understanding the illnesses of Gulf War veterans.

GAO continues to believe that the VA and DOD databases could provide relevant information to investigators about whether individuals that were at or near a site under investigation are reporting health problems. This information could then be combined with other information to help guide the nature and scope of OSAGWI investigations. GAO agrees that information for these databases cannot be used to establish a causal association as described by DOD and VA and did not intend that this information should be used for such purposes.

DOD agreed that independent reviewers are critical to a thorough and acceptable report on its investigations. DOD commented that this was the reason it established its current multilevel review process. This is now being supplemented by the President's Special Oversight Board, which is examining OSAGWI cases in detail.

DOD and VA general comments are addressed in more detail in chapter 3. DOD and VA comments in their entirety and our evaluation of them are included in appendixes I and II, respectively.

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Abbreviations

ASP	Ammunition Supply Point
CCEP	Comprehensive Clinical Evaluation Program
DOD	Department of Defense
EPMU	Environmental and Preventive Medicine Unit
NMCB	Naval Mobile Construction Battalion
OSAGWI	Office of the Special Assistant for Gulf War Illnesses
VA	Department of Veterans Affairs

Introduction

Many Persian Gulf War veterans have complained of illnesses since the war's end in 1991. Over 100,000 of the approximately 700,000 Gulf War veterans have participated in health examination programs established by the Department of Defense (DOD) and the Department of Veterans Affairs (VA). Many of those examined reported health complaints, including fatigue, muscle and joint pain, gastrointestinal problems, headaches, depression, neurologic and neurocognitive impairments, memory loss, shortness of breath, and sleep disturbances. Many veterans claim that their medical symptoms, some of them debilitating in nature, were not present before their service in the Persian Gulf War. Some veterans suspect that their health problems may be linked to chemical or biological warfare agents that Iraq may have used during the Gulf War.

Various organizations have researched the causes of Gulf War illnesses—the source of much controversy over the past 7 years. By the end of 1996, DOD and the VA together had funded 82 research projects related to Gulf War illnesses. Despite these efforts, it remains unclear why some Gulf War veterans became ill following their service in the Persian Gulf War. It also remains unclear whether the rates of reported illnesses for veterans that deployed to the Gulf are higher overall than the rates for those that did not deploy or than the rates for the civilian or military population as a whole. Also unexplained are differences in the frequency of symptoms reported by reserve units and active duty units and any correlations between the location of units and the occurrence of particular illnesses. Research designed to answer these and many other Gulf War illnesses-related questions will not be completed for years. Of the 151 current federally sponsored research projects, less than 25 percent have been completed, and many are not scheduled for completion until after 2000.

Establishment of the Persian Gulf Illnesses Investigation Team

Prompted by the continuing controversy over Gulf War illnesses, President Clinton, in 1995, ordered DOD and other federal agencies to reexamine whether possible exposure to chemical or biological agents occurred during the Gulf War. In March 1995, the Deputy Secretary of Defense established the Persian Gulf Illnesses Investigation Team within the Office of the Assistant Secretary of Defense for Health Affairs to explore this question. The Investigation Team was established as DOD began to lose credibility among veterans and veterans' groups in its efforts to determine the causes of Gulf War illnesses and to support the problems experienced by veterans. The 12-member team included intelligence officers, an Army Chemical Corps officer, a pilot, a chemist, a physician, and a criminal

investigator. Beginning in 1991, senior Defense officials had taken the position, in testimony before the Congress and in press interviews, that Iraq did not use chemical or biological weapons during the Persian Gulf War and that no U.S. forces were exposed to chemical or biological agents. DOD officials maintained this position as late as 1994. This position came under attack because both U.S. and foreign detection teams had reported that chemical warfare agents were present on the battlefield. In 1995 and 1996, Central Intelligence Agency and U.N. reports established that during the Gulf War, Iraq had stored rockets filled with sarin, a deadly chemical warfare agent, at an ammunition storage site located at Khamisiyah, Iraq, about 60 miles from Kuwait's border. In June 1996, DOD announced that U.S. troops at Khamisiyah in March 1991 were likely to have destroyed a bunker of rockets containing chemical agents. By July 1997, DOD acknowledged that U.S. troops near Khamisiyah may have unknowingly been exposed to low levels of sarin when they used demolitions to destroy these rockets.

In the midst of this controversy, DOD became dissatisfied with the results of the Investigation Team's efforts. The Investigation Team did not have the resources needed to accomplish its mission. For example, it was unable to follow up on more than 1,200 toll-free calls received on DOD's hot line with Gulf War veterans. In addition, its operation was criticized in the December 1996 report by the Presidential Advisory Committee on Gulf War Veterans' Illnesses.¹ The report cited, for example, the Investigation Team's failure to take advantage of its unique access to classified and routine military records to fully investigate and help answer the public's questions about veterans' possible exposure to chemical and biological warfare agents.

A DOD team asked by the Deputy Secretary of Defense to evaluate DOD's responses to Gulf War illnesses concluded that DOD's work in this area needed a broader focus, a strategy for systematically examining the various theories concerning the nature and causes of Gulf War illnesses, and a method of effectively communicating DOD's findings to U.S. veterans and the public. On November 12, 1996, the Deputy Secretary of Defense established the Office of the Special Assistant for Gulf War Illnesses (OSAGWI).

¹Final Report, Presidential Advisory Committee on Gulf War Veterans' Illnesses, December 31, 1996, pp. 44-45.

OSAGWI's Mission and Implementation Strategy

The goal of restoring public confidence in DOD shaped the mission and organizational focus of OSAGWI. OSAGWI's mission was broadly defined as ensuring that (1) veterans of the Gulf War are appropriately cared for, (2) DOD is doing everything possible to understand and explain Gulf War illnesses, and (3) DOD puts into place all required military doctrine and personnel and medical policies and procedures to minimize any future problems from exposure to chemical and biological warfare agents and other environmental hazards.

Although OSAGWI's mission statement charges it with ensuring that veterans are appropriately cared for, specific responsibility for providing health care to servicemembers still on active duty and for conducting the health research program continues to reside with the Office of the Assistant Secretary of Defense for Health Affairs. Similarly, VA remains the primary health care provider for those who have left military service. OSAGWI officials told us, however, that they assist servicemembers and veterans with health care matters related to Gulf War illnesses by providing them with referrals to sources of health care or helping them with the registration and examination processes associated with DOD's Comprehensive Clinical Evaluation Program or the VA's Persian Gulf Registry. OSAGWI also works with the Assistant Secretary of Defense for Reserve Affairs to (1) help ensure that reservists receive all entitled benefits and (2) recommend changes to legislation or rules where needed.

At the time of our review, OSAGWI believed that its core activity involved investigating and reporting on incidents of possible exposure to chemical and biological warfare agents and investigating related military operations during the Gulf War. After OSAGWI has completed its investigation of an incident, the investigator writes a summation document called a case narrative. The purpose of OSAGWI's case narratives is essentially to get all of the facts before the American people about what OSAGWI has learned from its investigation of an incident. The case narrative, a document updated as new evidence becomes known, is to contain all important investigative facts and OSAGWI's assessment—in terms of “definitely,” “likely,” “indeterminate,” “unlikely,” or “definitely not”—of the likelihood that servicemembers were exposed to chemical or biological warfare agents. The standard OSAGWI used for its assessments was whether all available facts would lead a reasonable person to conclude that a chemical or biological warfare agent was or was not present.

As of January 1, 1999, OSAGWI had published a total of 19 reports—13 case narratives, 2 environmental exposure reports, and 4 information papers. At

that time OSAGWI also had 27 active investigations under way. Appendix III lists OSAGWI reports and their dates of publication as well as OSAGWI's active investigations.

Objective, Scope, and Methodology

On July 8, 1997, the Ranking Minority Member of the House Committee on Veterans Affairs asked us to examine OSAGWI operations. Specifically, we were asked to (1) describe DOD's progress in establishing an organization to address Gulf War illnesses issues and (2) evaluate the thoroughness of OSAGWI's investigations into and reporting on veterans' potential exposure to chemical or biological agents during the Gulf War. We did not review OSAGWI activities to coordinate and monitor research on the causes of Gulf War illnesses because this subject is addressed by other reviews. To determine DOD's progress in establishing an organization to address Gulf War illnesses issues, we obtained briefings from OSAGWI officials covering the range of activities performed to fulfill their mission objectives and reviewed associated documentation.

OSAGWI had issued eight case narratives at the time we began our review. It pursued these eight cases first because they involved incidents that were the most prominent and controversial at the time. To evaluate the thoroughness of OSAGWI's investigations and reporting on veterans' possible exposures to chemical or biological warfare agents, we reviewed six of these eight case narratives. The case narratives we selected for review were (1) "Reported Mustard Agent Exposure"; (2) "U.S. Marine Corps Minefield Breaching"; (3) "Fox Detections in an Ammunition Supply Point (ASP) Orchard"; (4) "Al Jubayl, Saudi Arabia"; (5) "Al Jaber Air Base"; and (6) "Reported Detection of Chemical Agent, Camp Monterey, Kuwait." We did not review the case narrative about the alleged exposure to chemical warfare agents at Khamisiyah, Iraq, because it was already being heavily reviewed by other organizations, such as the Presidential Advisory Committee on Gulf War Veterans' Illnesses and the Senate Committee on Veterans Affairs' Special Investigation Unit. We also did not review the "Possible Chemical Agent on SCUD Missile Sample" case narrative because it appeared to be less controversial than the other case narratives.

In reviewing each case narrative, we generally used as criteria OSAGWI's methodology, which had itself been derived from the United Nations and other international community protocols for investigating chemical warfare incidents. This methodology included (1) substantiating the incident by searching for documentation from operational, intelligence, and environmental logs; (2) documenting the medical reports related to

the incident; (3) interviewing appropriate people; (4) obtaining information available to external organizations; and (5) assessing the results. We also used the criterion that the case narrative should accurately and fully disclose all materially significant information relevant to the investigation of the incident in order to avoid any appearance that OSAGWI was selectively reporting what had actually happened.

We initially traced each statement in the published case narrative to its underlying supporting document to identify the accuracy and completeness of the text in the narrative. For those statements missing adequate supporting documentation, we requested that OSAGWI provide us with the appropriate documentation. We also reviewed additional documentation collected by the OSAGWI investigators in performing the investigation, even though some of this documentation might not have been cited in the published narrative. We looked for any inconsistencies in information that was not addressed in the published narrative. In addition, for the selected case narratives, we contacted 71 individuals interviewed by OSAGWI that were key sources of information and requested that they verify the accuracy and completeness of both the OSAGWI case narrative and the OSAGWI write-up of the investigator's discussions. We also contacted some key participants not originally interviewed by OSAGWI to determine whether other relevant information was available that might affect OSAGWI's assessment of possible exposures to chemical warfare agents. Finally, we contacted several Gulf War veterans organizations, including the following: the American Legion; the Disabled American Veterans; the Veterans of Foreign Wars; the National Gulf War Resource Center; GulfWatch; the Desert Storm Justice Foundation; the Operation Desert Storm/Shield Association; the Gulf War Veterans of Long Island, New York; and the Chronic Illnesses Net for Persian Gulf Veterans. We asked them to provide us with any information they had that refuted or added to the OSAGWI information. We did not systematically approach veterans' groups to obtain their assessments of overall OSAGWI effectiveness because this was beyond the scope of our review.

To further verify the case narratives, we interviewed officials and obtained pertinent documentary evidence from officials at the following locations: OSAGWI, located in Falls Church, Virginia; the U.S. Army Chemical and Biological Defense Command at Aberdeen, Maryland; the U.S. Army Chemical Center and School at Ft. McClellan, Alabama; the Office of the Surgeon General of the Navy, Washington, D.C.; the Naval Health Research Center, San Diego, California; the Department of Veterans Affairs, Washington, D.C.; the Deployment Surveillance Team, which operates the

Chapter 1
Introduction

Comprehensive Clinical Evaluation Program, Falls Church, Virginia; and the U.S. Army Gulf War Declassification Project, Falls Church, Virginia.

We conducted our review from September 1997 to January 1999 in accordance with generally accepted government auditing standards.

OSAGWI Has Made Progress in Addressing Issues Related to Gulf War Illnesses

In the face of severe criticism by veterans, veterans groups, and others of its handling of Gulf War illnesses issues, DOD committed additional resources to its efforts to determine the cause of veterans' health problems. With greater resources and a much broader mandate than its predecessor, OSAGWI has made significant progress in reestablishing communications between DOD and veterans. In addition, OSAGWI is actively engaged in identifying improvements DOD needs to make to protect servicemembers on contaminated battlefields.

DOD Increases Emphasis on Determining Cause of Gulf War Veterans' Health Problems

DOD is investing significantly more resources for OSAGWI's investigations and outreach efforts than it did for the Persian Gulf Illnesses Investigation Team. In 1996, the Investigation Team operated with a staff of 12 persons and a budget of \$4.1 million. In contrast, as of October 9, 1998, OSAGWI had a staff of about 200 persons and a fiscal year 1998 budget of \$29.4 million. In addition, OSAGWI was given much broader authority than the Investigation Team. Finally, OSAGWI reports directly to the Deputy Secretary of Defense; the Investigation Team reported to the Assistant Secretary of Defense for Health Affairs.

OSAGWI officials said that with an adequate budget and sufficient operating authority within DOD, they were generally unconstrained in their efforts to pursue OSAGWI's mandate. According to these officials, OSAGWI's operations have been fully funded, and OSAGWI has had largely unrestricted access to personnel, files, and other data necessary for its work. For example, OSAGWI has had full access to classified information from the military services and intelligence agency sources. To date, OSAGWI has over 12 million pages of classified information in its computerized database and approximately 500,000 additional pages of classified data in hard-copy format.

The Special Assistant (the head of OSAGWI) has been free to staff OSAGWI according to his needs. This authority has made it possible for him to obtain the expertise needed for OSAGWI's investigations. From the start, OSAGWI management decided to make extensive use of contractors to quickly obtain personnel with specific expertise and maintain the flexibility to change the mix of staffing as needed. By October 9, 1998, 173 (87 percent) of OSAGWI's personnel were contractor employees. As needed, OSAGWI has obtained specialized expertise from individuals in various governmental agencies, such as the Central Intelligence Agency, the Defense Intelligence Agency, and the Army's Chemical and Biological

Defense Command.¹ OSAGWI also has the authority to contract with private organizations to perform specialized functions.

OSAGWI Has Improved Communications With Veterans

A key element of OSAGWI's attempt to regain credibility with veterans, veterans' organizations, and the public was to improve communications with them. OSAGWI recognized that major improvements were needed from earlier DOD efforts to listen to veterans' concerns and incorporate the information they provided into DOD's investigations and help provide health referral services to veterans. Our review confirmed that OSAGWI has made significant progress in establishing communications with veterans and others.

OSAGWI established an E-mail address and encouraged veterans and others to use both this and the DOD toll-free hotline to communicate with OSAGWI regarding Gulf War illnesses issues. Within the first year of operation, it received almost 1,200 letters and 2,700 E-mail messages. OSAGWI staff contacted over 3,900 veterans through personal telephone calls, which included the vast majority of the Investigation Team backlog of unanswered calls from 1,200 veterans. According to OSAGWI, as of January 1, 1999, it had received 2,850 letters and 4,906 E-mail messages and answered 2,803 and 4,866, respectively. OSAGWI used a staff specifically trained to deal with Gulf War veterans' concerns, obtain information from veterans, provide information about OSAGWI activities, and make referrals for those needing medical support from DOD or VA.

OSAGWI uses a variety of methods to disseminate information on its operations. For example, it uses a Web site called GulfLINK on which it publishes its case narrative reports, information papers, and much of the supporting documentation used in its investigations. OSAGWI reports that this site typically receives over 60,000 inquiries each week. OSAGWI also publishes a bimonthly newsletter called GulfNEWS. Over 12,000 individuals receive the newsletter. OSAGWI's leadership and staff have met with veterans at 18 town hall meetings and made appearances at 41 national veterans conventions. In addition, OSAGWI officials frequently meet with veterans and military service organizations to discuss Gulf War illnesses topics of interest to them.

Finally, OSAGWI communicates directly with veterans that are affected by its investigations. After OSAGWI completes an investigation and publishes

¹The Chemical and Biological Defense Command was later renamed the Soldier and Biological Chemical Command.

the corresponding case narrative, it sends to each affected veteran a letter that contains a synopsis of the investigation's results. For example, following its investigation of the potential chemical warfare agent exposure in Khamisiyah, Iraq, OSAGWI sent letters to 97,837 veterans concerning the possibility that they might have been exposed to low levels of sarin, a chemical warfare agent.

OSAGWI Has Identified Chemical and Biological Warfare Force Protection Issues Requiring Attention

According to OSAGWI officials, OSAGWI must go beyond investigating and reporting on possible veterans' exposures to chemical or biological warfare agents and identify ways to better protect servicemembers from nontraditional battlefield threats. From its investigations and reports on possible veterans' exposures to chemical, biological, or environmental agents, OSAGWI has identified force protection issues that need improvement. These lessons learned generally fall into the following three categories: how to build trust and confidence in DOD, how to better account for what happened on the battlefield, and how to better protect servicemembers on the battlefield. Specific examples of the lessons learned include the need for

- institutionalizing a veterans' outreach capability after OSAGWI is disestablished;
- improving systems for tracking troop movements during a conflict so that accurate data is available to show where individuals or units were located on the battlefield at any point in time;
- improving wartime records development and post-war records management systems and addressing issues such as the lack of a uniform records management program for joint commands;
- improving chemical and biological warfare agent detection equipment to make it less prone to false alarms and requiring doctrinal changes to collect and retain detector-produced printouts of detections;
- implementing techniques to better safeguard the health of deployed troops, such as deploying forward field laboratories early and taking samples to determine whether contamination may have occurred subsequent to the use of depleted uranium ammunition; and
- improving and implementing depleted uranium training programs.

OSAGWI is presently working with DOD agencies to implement the lessons learned. Discussions by the Special Assistant with the Director of the Joint Staff and the military service Chiefs of Staff resulted in revised Joint Staff policy concerning record-keeping by joint commands. OSAGWI was also instrumental in developing a DOD-initiated requirement for the military

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Issues Related to Gulf War Illnesses

services to review their depleted uranium training programs. We did not review what impact OSAGWI's lessons learned have had toward making changes within DOD. Until recently, OSAGWI had no office for monitoring and measuring the extent to which OSAGWI lessons learned were being acted upon. In October 1998, the Special Assistant created a new OSAGWI directorate to focus attention on ensuring that lessons learned are effectively communicated to and implemented by the responsible DOD agencies.

Some Case Narratives Have Investigative and Reporting Weaknesses

We reviewed six of the eight case narratives OSAGWI had published at the time we began our review to evaluate the thoroughness and accuracy of OSAGWI's investigations. OSAGWI generally followed its investigation methodology and used appropriate investigative procedures and techniques. However, we found significant weaknesses in the scope and quality of OSAGWI's investigations for three of the six cases: the Reported Exposure to Mustard Agent, the Marine Minefield Breaching, and the Al Jubayl, Saudi Arabia, case narratives. Also, OSAGWI did not use DOD or Department of Veterans Affairs medical databases on Gulf War illnesses in conducting any of the six investigations. Despite the weaknesses we noted, in all but one case—the Marine Minefield Breaching case—we found no basis to question OSAGWI's determinations of the likelihood that chemical warfare agents were present.

Except for failing to take advantage of the VA and DOD medical databases, we did not find significant weaknesses in the remaining three cases: the Camp Monterey, the Al Jaber Airfield, and the ASP Orchard case narratives. In investigating these cases, OSAGWI followed its methodology, identified and interviewed important witnesses, appropriately used information from other key sources, included all important information in the case narratives, and accurately presented the information found. These investigations were performed in a generally thorough manner, and the evidence collected by OSAGWI supported its assessments.

OSAGWI officials told us that they have revised their internal review processes for conducting and reporting investigations. They said that (1) improvements to these processes have evolved since the publication of the six case narratives we reviewed, (2) some of the process revisions were influenced by the findings we reported as our review progressed, and (3) enhancements to their processes would considerably minimize the recurrence of similar weaknesses in future case narratives.

OSAGWI's Investigations and Reporting Procedures Have Various Weaknesses

Our review of the six selected case narratives disclosed some weaknesses in the investigations and in the accuracy and completeness of OSAGWI's reporting. OSAGWI's investigations were usually conducted in accordance with the established methodology. OSAGWI also generally identified and interviewed the appropriate witnesses, obtained relevant evidence and information, accurately documented witness testimonies, and otherwise generally used appropriate investigative techniques and procedures. However, we found that three of the six selected case narratives still contained significant investigative and reporting problems. The types of

problems varied. In three of the six case narratives, we found investigative problems such as failures to (1) follow up with appropriate individuals to confirm key evidence, (2) identify or ensure the validity of key physical evidence, (3) include important information, and (4) interview key witnesses. Following is a more detailed description of the three case narratives containing most of these weaknesses.

**Case Narrative on
Reported Exposure to
Mustard Agent**

This case narrative addresses the reported exposure of an individual soldier to mustard agent while he was exploring an Iraqi bunker. OSAGWI assessed this incident as a “likely” exposure. OSAGWI’s assessment of this case has been highly controversial. Some veterans organizations and others believe that the evidence presented in OSAGWI’s case narrative and the Army’s presentation of the Purple Heart medal to this soldier for his injuries warranted an assessment of “definite” exposure. However, we found that this case was affected by many investigative and evidentiary problems. Some of these are more closely associated with shortcomings in DOD procedural practices during the Gulf War than with how OSAGWI did its investigation. Despite the problems identified, we believe that OSAGWI’s original assessment of “likely” exposure remains appropriate for this case.

Incident Synopsis

According to OSAGWI’s case narrative, the soldier (an Army armored cavalry scout) was exploring enemy bunkers in southeastern Iraq near Kuwait’s border on March 1, 1991. He entered one bunker through a tight passageway and twice brushed against the bunker’s doorway and wall. About 8 hours later, he began to experience a stinging pain on the skin of his left upper arm. Three hours later, blisters had formed there. About 15 hours after the exposure, the company medic checked the soldier’s blisters and suspected a heater burn. Eight hours later, after more blisters had formed on the soldier’s arm, aid station medical personnel suspected he might be a casualty of blister agent, treated him, and evacuated him to the company support battalion. There, an Army physician photographed the blisters and confirmed the diagnosis of exposure to a blister agent.

An Army chemical officer also observed the soldier’s blisters and examined his clothing. He observed a wet spot on the soldier’s coveralls. The officer took the coveralls to a Fox vehicle for testing.¹ From its tests on March 2, 1991, the Fox vehicle reportedly confirmed the presence of a

¹The Fox Nuclear Biological and Chemical Reconnaissance Vehicle was the most sophisticated and technically complex piece of chemical detection equipment that the United States used during the Persian Gulf War. It was designed to provide an initial alert to warn personnel of the possible presence of dangerous chemicals and subsequently to provide detailed confirmation by means of an on-board mass spectrometer.

mustard chemical warfare agent. After this positive test, the soldier's coveralls were buried at the scene in Iraq as contaminated waste.

On March 3, 1991, a senior medical officer (a physician and an expert in chemical warfare agents who was also at the time the Commander of the U.S. Army Medical Research Institute of Chemical Defense) examined the soldier's blisters and concluded that they had been caused by exposure to a liquid mustard agent. This officer based his diagnosis largely on (1) the latent period of 8 hours between exposure and the first symptoms, which is characteristic of mustard exposure and (2) the absence of any other known chemical compounds present on the battlefield that have this characteristic.

On March 4, 1991, following an order from chemical officers at the division level to confirm the positive results from the first day of Fox vehicle testing, tests on the soldier's flak vest were performed by two Fox vehicles—apparently because the vest had not been buried along with the coveralls. Initially, both Fox vehicles registered the potential presence of chemical warfare agents, but only one was apparently able to confirm the presence of mustard agent. At the bunker complex where the soldier was injured, a Fox vehicle also initially detected a chemical warfare agent but was unable to confirm the presence of mustard or any other chemical warfare agent.

The case narrative reported that an in-theater analysis of the soldier's urine tested positive for thiodiglycol, a breakdown product of mustard agent. It also reported that a second urinalysis was performed by the U.S. Army Medical Research Institute of Chemical Defense at Aberdeen Proving Ground, Maryland. This analysis found no evidence of thiodiglycol. Clothing samples were also sent to the U.S. Army Chemical Research, Development and Engineering Center for analysis. Tests of these items also revealed no evidence of any chemical warfare agent. However, the negative test results from one of the urinalyses were not considered unusual due to the low level of the exposure.

OSAGWI based its assessment of "likely" exposure primarily on the following factors: (1) the medical assessments of two physicians who examined the soldier—a senior medical officer and a physician who had recently been trained to identify chemical warfare agent injuries; (2) the latent period of 8 hours between the soldier's exposure and his first symptoms, which is consistent with exposure to mustard agent; and

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(3) the positive detections of mustard agent made in-theater from analyses of the soldier's clothing and urine.

We agree with OSAGWI's assessment that exposure to a chemical agent was "likely." However, we found several investigative procedural problems with this case, primarily concerning insufficient follow-up with witnesses, failure to interview key officials about tests conducted on the soldier's clothing, and uncertainties about the identity and validity of key physical evidence sent to the United States for testing.

First, information we discovered causes us to question the existence of the soldier's positive in-theater urinalysis for mustard agent. OSAGWI based the existence of this test on an Army Central Command message reporting a positive in-theater test for thiodiglycol. However, OSAGWI was unable to find any documented test results from this urinalysis, and OSAGWI investigators did not perform sufficient follow-up with the involved individuals to verify that this test had actually taken place.

In discussing what OSAGWI knew about the positive in-theater urinalysis, we learned that OSAGWI had not interviewed either the senior medical officer or the officer who wrote the message describing the positive in-theater analysis during its investigation. Instead OSAGWI relied upon the senior medical officer's testimony to the Presidential Advisory Committee, his medical journal article, and his review of OSAGWI's draft case narrative. However, this procedure failed to identify important information. In early 1998, our subsequent interviews with the senior medical officer and OSAGWI's interviews with him revealed that he was unaware of the existence of any in-theater urinalysis involving the soldier. He also stated that, because of his position in the theater as the head of a team of scientists responsible for assessing any chemical casualties, he would have known about the existence of any positive urinalysis performed there. We then contacted the officer who had written the Army Central Command message and asked him about his basis for reporting the positive urinalysis. He told us that his message was based on 3rd Armored Division reports that the senior medical officer had found thiodiglycol in the soldier's urine specimen. The available evidence is thus contradictory and insufficient to establish that this test actually occurred.

Second, the results of the tests conducted on March 2, 1991 (the first day of testing), for mustard agent on the soldier's clothing cannot be confirmed with the available documentation, and OSAGWI did not interview some key officials involved in the case about the tests. According to the

Commander of the Fox vehicle involved, the Fox tests on the soldier's clothing conducted on March 2, 1991, indicated the presence of blister agent on the soldier's coveralls. However, the Fox printout of the test results was apparently lost. We located and interviewed the Fox test operator involved, who told us that several tests were conducted on the soldier's clothing that day and that there was one positive confirmation for mustard agent. During our review, OSAGWI found a printout from one of these tests in its files, but it was negative for chemical agent. We noted that this printout had not been logged into OSAGWI's document receipt system. We also noted that OSAGWI had never interviewed the Fox vehicle Commander in person or the operator who conducted the tests. OSAGWI relied upon information provided by E-mail from the Commander of the Fox vehicles involved because he was then stationed in Germany and could not easily be interviewed in person. OSAGWI said it did not interview the test operator because it could not locate him.

On the second day of Fox testing, the Fox Commander returned with both the original and a second Fox vehicle to confirm the positive test results from the first day of Fox testing of the soldier's clothing. One of the Fox vehicles was unable to confirm the presence of mustard agent on the soldier's flak vest because of a high concentration of oil products on the vest.² The other Fox vehicle, whose detailed confirmatory procedure was videotaped by a crewmember but for which the printout is unavailable, did show the presence of mustard agent. DOD sent the printout from the original Fox vehicle and the videotape from the second one to the U.S. Army Chemical and Biological Defense Command at Aberdeen Proving Ground, Maryland, for analysis. A Command expert found that the surviving printout did not confirm the presence of chemical warfare agent when the detailed confirmatory procedure was performed. However, after examining the printout and viewing the videotape, this official concluded that the incident had involved an actual mustard agent detection.

We found other procedural discrepancies that raise questions regarding this case. First, DOD did not adequately identify or ensure the validity of important physical evidence. We noticed a difference between the inventory of items that the Commander of the Fox vehicles had reportedly packaged for shipment back to the United States for analysis and the items that were received at the U.S. Army Chemical Research, Development and Engineering Center. The Commander reported on his inventory list that he did not include samples from the soldier's coveralls since they were unavailable; however, the Center's inventory showed receipt of such

²This was confirmed by analysis of the available printout from these Fox vehicle tests.

samples. When we interviewed the Commander, he told us that he believed the sample material was in fact from the Commander's own protective suit that he wore during the Fox vehicle testing. These discrepancies raise the possibility that either someone recovered the soldier's coveralls and then repackaged the contents for shipment to the United States or that at least some of the clothing sent back to the United States for testing was not the soldier's. The circumstances surrounding the testing of the soldier's clothing in-theater thus remain unclear. It is impossible to determine whether the samples are actually from this soldier.

In discussing the investigative weaknesses we found, the OSAGWI lead investigator told us that this investigation had begun under the Investigation Team before OSAGWI was established and that the case was carried over to OSAGWI. She said that the case's outcome appeared to be obvious on the surface—particularly since the soldier had received a medical diagnosis indicating exposure to mustard agent. She said that the investigation process at OSAGWI has matured since this case narrative was published. She also said that OSAGWI would do more cross-checking of the facts if this investigation were being done today.

Despite the investigation's shortcomings, we believe that OSAGWI's assessment of "likely" exposure to a chemical warfare agent in this case is reasonable. The senior medical officer's clinical diagnosis that the soldier's injuries were caused by exposure to mustard agent is significant in that this expert in chemical warfare agents made his assessment contemporaneously at the time of the injury and continues to believe that the latent period of 8 hours from exposure to the first symptoms supports his diagnosis. In addition, an expert at the U.S. Army Chemical and Biological Defense Command, after reviewing the Fox vehicle printout and viewing a videotape of another Fox vehicle conducting tests, concluded that this incident involved a valid detection of mustard agent. However, we believe the lack of confirmation of exposure through urinalysis or retained confirmatory printouts from the Fox vehicles involved prevents OSAGWI's exposure assessment in this case from being classified as "definitely."

**Marine Minefield
Breaching Case Narrative**

This case narrative addresses reports that U.S. Marines might have been exposed to chemical warfare agents while breaching minefield barriers on the first day of Operation Desert Storm's ground war. OSAGWI concluded that the presence of chemical warfare agents was "unlikely" during this incident, in part because it found that no mechanism was present for

delivering such agents. However, we found that OSAGWI overlooked information indicating that a means for delivering chemical warfare agents might have been present, and that the case narrative does not include other relevant information indicating that chemical warfare agents might have been present. We believe that these shortcomings are sufficient to cause a reasonable person to question OSAGWI's assessment.

Incident Synopsis

On February 24, 1991, the first day of Operation Desert Storm's ground war, Marine Corps forces breached two rows of minefields that stretched for miles near the border between Saudi Arabia and Kuwait. As they passed through the first row of minefields, two Fox vehicles (one assigned to units of the 1st Marine Division and another assigned to the 2nd Marine Division) indicated potential detections of chemical agents. The detection by the 1st Division's Fox vehicle was described as a trace detection of such a small magnitude that no official report of the detection was made and no Fox printout was kept to document the detection. OSAGWI concluded that the presence of chemical warfare agents in the 1st Division area was "unlikely."

The detection by the 2nd Division's Fox vehicle, however, indicated the potential presence of mustard, sarin, and lewisite—all chemical warfare agents. In this instance, the Fox vehicle printouts were kept, but because of the hostile environment, the Fox vehicle was not stopped to perform a more detailed confirmation procedure to conclusively determine whether chemical warfare agents were present.

One possible chemical warfare agent injury was reported during the breaching: a 2nd Division Marine riding in an amphibious assault vehicle at the time of the detection claimed his hands were burned, presumably by a chemical warfare agent, as he closed the vehicle hatch after hearing the Fox vehicle alert by radio. However, the validity of this reported injury was controversial. Some witnesses supported the Marine's claim that his hands were blistered, but the examining physician stated that the Marine had no injury of any kind.

In investigating the breaching incident, OSAGWI interviewed key participants in the breaching operations, including members of the Fox vehicle crews, chemical warfare specialists, some unit commanders, the Marine who claimed to have been injured, other Marines from the injured man's unit, and the medical personnel who examined him. The investigators also reviewed unit logs and other pertinent documentation,

including classified data, and consulted with Fox vehicle and chemical weapons technical experts.

On the basis of reviews of the 2nd Division Fox vehicles' printouts by three different laboratories, OSAGWI concluded that the Fox vehicle detections were false alarms, probably caused by the high concentrations of smoke from oil well fires and petroleum particles in the atmosphere. OSAGWI further indicated that except for the possible injury to one Marine, no other troops reported claimed chemical warfare agent injuries. In its overall assessment of the incident, OSAGWI stated that the presence of chemical warfare agent was "unlikely." In supporting its assessment, OSAGWI stated that since no chemical land mines were ever found in Kuwait and since no artillery fire was encountered by the Marines who breached the first row of mines, there was no delivery mechanism for chemical warfare agents.

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OSAGWI overlooked a key piece of evidence and did not report other significant information in its case narrative. OSAGWI concluded that the Marines had encountered no Iraqi artillery fire as they moved through the first row of Iraqi minefields. This conclusion was based on comments made by the commanding officer and others of the Marine company that carried out the minefield breach where the 2nd Division Fox vehicle reported the presence of a chemical warfare agent. However, our review of OSAGWI files disclosed a Marine Corps unit log entry indicating that Iraqi artillery and mortar fire was present during the first minefield breach. The OSAGWI investigator told us that he had inadvertently overlooked this information during his investigation. We also interviewed Marines who told us that Iraqi artillery and mortar fire was present as they passed through the first minefield. Consequently, we believe a delivery mechanism for chemical warfare agent may have been present.

Also, the timing of events was significant. For example, the log entry indicating that enemy artillery was encountered was made around 6:15 a.m. on February 24, 1991. The Fox vehicle detection was made at 6:22 a.m. of that same day. The Marine who claimed to be injured was riding in an amphibious assault vehicle that was following the Fox vehicle. He said his injury occurred just after he heard the Fox vehicle's report of the chemical warfare agent detection over the radio.

We also learned that the Commander of the 2nd Division's Fox vehicle told OSAGWI investigators that chemical detection paper taped to the outside of the Fox vehicle was noted to have changed colors after passing through

the first minefield (indicating possible contact with a chemical agent). However, this information was not reported in OSAGWI's narrative. The OSAGWI investigator said that this information was omitted because technical experts had told him that the detection paper could change colors because of the heavy concentrations of petroleum products in the air coming from the oil well fires the Iraqis had set. Furthermore, as mentioned in the case narrative, three different laboratories had reviewed the Fox vehicle printout and concluded that the detections were probably false alarms. The narrative did not point out, however, that one of the three laboratories had also said that it could not rule out the possibility of the presence of a chemical warfare agent.

Finally, a classified document in OSAGWI's files contained intelligence evidence not included in the narrative that could support the possibility of an Iraqi chemical attack. This information, some of which has since been declassified, refers to a report indicating the end of a chemical attack on February 24, 1991, the same date as this incident. OSAGWI was aware of this information, but because of its vagueness, unknown origin, fragmentary nature, and time of report (about 4 hours after the breaching event), it was not given much weight during OSAGWI's analysis. We agree that the potential impact of this evidence is unclear. However, when combined with the other information we have cited, it provides additional cause for further investigation by OSAGWI, regardless of its potential for association with this case.

We believe that OSAGWI's assessment of "unlikely" in this case is subject to question. While the information we found does not conclusively prove that chemical warfare agents were present, it does increase the potential that some might have been present. In our opinion, the weaknesses we found in this case narrative are sufficient to warrant OSAGWI's reconsideration of its assessment. We discussed our findings with OSAGWI investigators and officials, and they agreed that this information needs to be evaluated. OSAGWI officials told us they would include this information in their follow-up investigation of the minefield breaching incident and would address the questions we raised.

Al Jubayl, Saudi Arabia,
Case Narrative

Regarding this case narrative about three significant events occurring in the Al Jubayl area during the Persian Gulf War, OSAGWI concluded that the presence of chemical warfare agents was "unlikely" for one of the events and "definitely did not occur" in the remaining two. We believe that the available evidence generally supports OSAGWI's assessment, but OSAGWI is

still performing work regarding alternate explanations for some events affecting this case. However, we also found that OSAGWI did not include important information in this case narrative regarding the unusually high levels of post-war veterans' complaints of medical symptoms they associated with the incidents involved in this case. Furthermore, OSAGWI did not adequately identify and coordinate some of this information that could potentially provide evidence to help resolve research questions concerning whether there is a correlation between high levels of reported Gulf War illnesses symptoms and duty during the Gulf War at Al Jubayl.

Incident Synopsis

Al Jubayl is the largest of eight planned industrial cities in Saudi Arabia. It consists of an industrial zone and port facilities, as well as residential and other noncommercial areas. The Al Jubayl area was developed during the early 1980s along what was then essentially undeveloped coast line and was designed to take advantage of Saudi Arabia's vast oil resources. Al Jubayl played a crucial role during the Gulf War—many U.S. and coalition military units either passed through or were stationed there.

OSAGWI's case narrative addresses three separate events that allegedly involved exposure to chemical agents in the Al Jubayl area: the "loud noise" event and alerts on January 19 through 21, 1991; an Iraqi SCUD missile attack on February 16, 1991; and a noxious fumes event on March 19, 1991, which some U.S. military personnel claim caused them to experience medical problems and turned portions of the T-shirts they were wearing from brown to purple.

The need for OSAGWI to investigate these events was underscored by concerns about Gulf War illnesses expressed in a May 1994 report of the U.S. Senate's Banking, Housing, and Urban Affairs Committee (known as the Riegle Committee) by veterans of Naval Mobile Construction Battalion 24 (NMCB-24). NMCB-24 was a reserve "Seabee" or military construction battalion of 724 enlisted persons and 24 officers. During Operation Desert Shield/Desert Storm, NMCB-24 was stationed alongside NMCB-40, an active duty "Seabee" battalion. Both units occupied Camp 13, a housing and billeting area located in the Al Jubayl industrial zone that was commanded by the senior officer of NMCB-40.

The "Loud Noise" Event

OSAGWI found that the "loud noise" event actually referred to several loud explosive-like noises and related events occurring between January 19 and 21, 1991. As stated in the OSAGWI narrative and confirmed by our review, early on January 19, a very loud noise like an explosion was heard throughout the Al Jubayl area. Units in the area subsequently reported

additional explosions, went on alert, and conducted tests for the presence of a chemical warfare agent. A variety of confusing and contradictory actions subsequently occurred. All NMCB-24 tests for chemical warfare agent were officially reported as negative, but one member of this unit alleged that he had obtained positive test results for a chemical warfare agent in two of three attempts. British units in the vicinity initially reported positive tests for a chemical warfare agent, but detection teams sent to investigate these reports were unable to confirm any such agents. Some eyewitnesses from NMCB-24 reported a large fireball that illuminated the sky and medical symptoms such as runny noses, burning sensations, blisters, and numbness. They stated that those experiencing symptoms reported for medical attention within the next few days. However, other NMCB-24 personnel said that although they were unprotected during these events, they experienced no such symptoms. After reviewing NMCB-24's medical logs, neither OSAGWI nor we found any records indicating that medical attention for these symptoms was sought on or shortly after January 19, 1991. OSAGWI and our interviews with the NMCB-24 Commander, medical personnel, and senior noncommissioned officers similarly revealed no evidence that any medical attention was sought.

OSAGWI found, and we confirmed, that many coalition aircraft were engaged in the air war on the day in question, and Air Force records show that two coalition aircraft flew over the Al Jubayl area at supersonic speed during the early hours of January 19, 1991. OSAGWI concluded that the loud noise and related events were due to sonic booms from these aircraft. It also concluded that the presence of chemical or biological warfare agents was "unlikely" because (1) DOD records show that no SCUD missiles were launched toward Saudi Arabia by Iraq on January 19, (2) no verifiable tests in the Al Jubayl area were positive for chemical warfare agents, and (3) no records were found of any individual receiving treatment for symptoms associated with exposure to chemical or biological warfare agents.

On January 20-21, 1991, air raid sirens and explosions were heard again in the Al Jubayl area, but available records reviewed by OSAGWI, and checked by us, indicated that chemical detection tests were again negative. OSAGWI again concluded that the presence of chemical or biological warfare agents was "unlikely" because (1) records show a SCUD missile aimed at Dhahran was intercepted and destroyed at high altitude by a Patriot air defense missile at approximately the same time as this incident, (2) there is no record of an impact site in the Al Jubayl area, and (3) no records were found of anyone receiving medical treatment for symptoms associated with exposure to chemical or biological warfare agents.

The SCUD Missile Attack

A second possible exposure of veterans to chemical and biological warfare agents in the Al Jubayl area occurred as the result of an Iraqi SCUD missile attack early in the morning of February 16, 1991. The OSAGWI narrative explains that U.S. national sensors detected this missile early in flight and provided warning of the launch. The missile landed in the waters of Al Jubayl harbor, and the site of impact was quickly found and marked by Coast Guard and Navy boat crews. Later that day, a Navy explosive ordnance disposal team surveyed the marked area with an underwater television system and located missile debris on the harbor's bottom. Divers confirmed that the missile had broken apart and that the site contained an intact SCUD warhead, guidance section, rocket motor, and miscellaneous components. Recovery of the smaller SCUD components began on February 19 and concluded with the warhead on March 2. During the recovery operation, tests were conducted, but no evidence was found indicating the presence of chemical or biological agents. The Joint Captured Material Exploitation Center then took custody of the SCUD components, which were subsequently shipped to the Army Missile Command in Huntsville, Alabama. The Command's evaluation of the recovered SCUD missile components confirmed that the warhead did not contain chemical or biological warfare agent.

Some eyewitnesses to this event reported that the SCUD missile was intercepted and shot down by a Patriot missile and during this process could have dispersed chemical or biological warfare agents over Al Jubayl. A Patriot battery was defending Al Jubayl at the time. However, OSAGWI found and we confirmed that this battery was not operational for maintenance reasons at the time of the attack and therefore was not able to engage the SCUD. OSAGWI concluded in its case narrative that while an Iraqi SCUD missile had hit the waters of Al Jubayl harbor, it had not detonated, had caused no damage or injuries, had tested negative for chemical warfare agents, and therefore was definitely not armed with chemical warfare agents.

The Purple T-Shirt Event

The third known possibility of exposure to chemical agents at Al Jubayl occurred on March 19, 1991, when personnel from NMCB-24 were exposed to unidentified airborne noxious fumes. These fumes affected nine persons working in three separate groups. They experienced acute symptoms such as burning throats, eyes, and noses and difficulty in breathing. In addition, portions of the brown T-shirts being worn by these individuals turned purple, as did some of the individuals' combat boots. Seven persons composing two of the groups immediately sought medical attention and returned to work with no further symptoms after showering

and changing clothes. The two persons in the third group did not seek medical assistance and continued to work. The nine persons involved stated that they had experienced a choking sensation when a noxious cloud enveloped them. None saw the origin of the cloud, but all believed it had come from one of the industrial plants located nearby.

Evidence collected by OSAGWI regarding the source of the noxious fumes was inconclusive. One eyewitness of the event said that he had seen purple dust falling in the area that was coming from a smokestack at a nearby fertilizer plant. The Navy's Environmental and Preventive Medicine Unit No. 2 (EPMU-2) conducted an environmental/occupational hazard investigation and site visit to Al Jubayl in 1994. The resulting EPMU-2 study did not determine the source of the irritant. It noted, however, that the camp was located in a heavily industrialized area and that emissions from a petrochemical plant or from a spill within the camp's motor park could have been the source of the irritant. The T-shirts and the boots that changed color were given to unnamed U.S. military and Saudi officials. However, the chain of custody cannot be identified, and no reports have been found other than an informal telephone call to NMCB-24 shortly after the incident indicating that "there was nothing to worry about." The U.S. Army Material Test Directorate and the Natick Research Development and Engineering Center later conducted tests on the type of military T-shirts involved. The Natick tests showed that these T-shirts do turn purple when exposed to acids such as sulfuric (battery) acid or oxides from nitric acid.

OSAGWI concluded that chemical warfare agents were definitely not involved in the purple T-shirt event. OSAGWI reached this conclusion because (1) the event occurred after the cessation of Gulf War hostilities, (2) there was no record of hostile attack during the time period of the event, and (3) the types of medical problems affecting the individuals involved and their rapid recovery are not consistent with exposure to chemical warfare agents.

Our Review of OSAGWI's Investigation

As a result of our review of evidence, procedures, and other information obtained from OSAGWI and other sources regarding the Al Jubayl case narrative, we generally concur that OSAGWI's assessments of whether chemical warfare agents were present are reasonable. The evidence generally supports OSAGWI's assessment that chemical warfare agents were "definitely not" involved in the SCUD missile and purple T-shirt events. The loud noise incident involved some contradictions in evidence or testimony that we could not resolve, but our work confirmed the credibility of the vast majority of the evidence used by OSAGWI. We noted

the existence of another potential explanation of some of the events involved in the loud noise incident. Some documents and other evidence we acquired from a veterans' organization indicate that an Iraqi aircraft or a patrol boat might have been involved in an attempted chemical attack on Al Jubayl at the time of this incident. OSAGWI is currently investigating this version of events. However, pending the outcome of this continuing investigation, we believe that the currently available evidence still provides a reasonable level of support for OSAGWI's conclusion that exposure to chemical warfare agents was "unlikely" in this incident.

Although we concur with OSAGWI's assessments in the Al Jubayl case, we believe that the case narrative is not complete and could be misleading because it does not mention the fact that many members of NMCB-24 have reported unusually high levels of health problems since their service in the Persian Gulf War. We also found that OSAGWI had not coordinated some information developed during this investigation with the Naval Health Research Center for inclusion in its Gulf War illnesses research on Seabees.

OSAGWI's Al Jubayl case narrative states that the methodology it used was designed to investigate reports of exposure to chemical warfare agents and to determine whether chemical weapons were used. OSAGWI officials told us that in this case they had expanded their methodology to include a considerable amount of information in the narrative regarding environmental cleanliness factors affecting the Al Jubayl area. They said they had done this in an effort to better explain the circumstances of the case because some veterans had expressed concern over the hazardous materials they could have been exposed to while they were in Al Jubayl. The narrative thus contained much information explaining that (1) Saudi environmental protection standards were equivalent to those of the U.S. Environmental Protection Agency, (2) these standards were monitored and maintained by the Saudis throughout Operation Desert Storm/Desert Shield, and (3) Saudi monitoring records indicate no detections that normal standards were exceeded on the date of the purple T-shirt incident. The environmental data included in the narrative, much of which was obtained by EPMU-2, thus indicated that Al Jubayl was no worse or better than comparable industrialized sites in the United States.

We concur that OSAGWI's decision to expand its stated methodology in order to include this information was appropriate. As indicated at the beginning of the narrative, OSAGWI's charge is to investigate all possible causes of Gulf War illnesses. However, most of the information presented

in this case narrative leads the reader to conclude that exposure to either chemical warfare agents or other chemical agents at Al Jubayl was “unlikely” and probably did not involve a health threat in the limited incident involving the purple T-shirts. The narrative mentions that some NMCB-24 veterans testified before the Congress (the Riegle Commission) but does not state why. The narrative text also contains no information regarding significant DOD actions taken to address the high incidence of post-war health problems reported by members of NMCB-24.

DOD has long been aware of health problems reported by NMCB-24. In 1992, DOD began to identify clusters of military personnel who were complaining of medical symptoms they attributed to their Gulf War service. As a result, DOD initiated two field investigations. One of these, performed at the request of the Navy Surgeon General, was a study of illnesses reported by members and former members of NMCB-24 conducted during 1993-94 by the same unit (EPMU-2) that conducted the Al Jubayl environmental study. EPMU-2 personnel visited 6 of NMCB-24’s 12 detachments during this period, conducted a questionnaire study, performed medical examinations, reviewed military and other medical records, interviewed veterans and family members, and otherwise attempted to identify prevalent symptoms experienced by the members of NMCB-24 and diagnoses of their illnesses. Much of the information they collected was computerized and used to produce a series of tables and other statistical data relevant to Gulf War illnesses issues and included in EPMU-2’s final report. This report contained the following conclusions:

- A significant number of NMCB-24 veterans of the Gulf War have experienced an array of nonspecific symptoms since returning from the Persian Gulf. More than 41 percent of the veterans from three of the six detachments experienced 10 or more symptoms.
- No common syndrome or diagnosis was identified in these veterans.
- The diagnoses identified were the same as those that might be expected in a group of the same age that had not served in the Persian Gulf War.
- More research was needed.

Our review of OSAGWI’s files, our visit to EPMU-2, our interviews of current and former EPMU-2 officials, and our review of all remaining EPMU-2 documentation related to this study revealed additional information. For example, 44 of the 67 witnesses OSAGWI interviewed regarding the facts of the loud noise incident are now reporting health problems they attribute to their service during the Persian Gulf War. A former EPMU-2 physician directly involved in the EPMU-2 study told us that while he had no factual

baseline for comparison, it appeared to him that the frequency of symptoms found in NMCB-24 veterans was greater than the frequency to be expected in the general population. This observation, along with the high symptom rates, was one of the reasons the EPMU-2 report recommended more research. NMCB-24 veterans have been involved in testimony before the Congress regarding health problems they attribute to their service in the Persian Gulf War, and the Naval Health Research Center in San Diego, California, is currently performing a major, multiyear, Gulf War illnesses-related epidemiological study involving the vast majority of the Navy's Seabees. NMCB-24 veterans have also been the subject of several additional research studies related to Gulf War illnesses.

OSAGWI was aware of the existence of the EPMU-2 medical study and had a copy on file that was originally obtained by its predecessor, the Persian Gulf Illnesses Investigation Team, in 1996. However, no OSAGWI investigators visited EPMU-2 to review files regarding this study. No information regarding this study, the Naval Health Research Center research project, or other epidemiological studies or research on Gulf War illnesses was included in the case narrative. A high-ranking OSAGWI official told us that OSAGWI investigators had been instructed to consider such medical information as outside their charter for inclusion in the case narratives. This official said that they had been so instructed because this line of inquiry was more appropriately the responsibility of the Office of the Assistant Secretary of Defense for Health Affairs and because OSAGWI did not have the expertise to conduct or evaluate epidemiological studies such as the one performed by EPMU-2.

We believe that much more information regarding the health complaints of NMCB-24 veterans should have been included in the case narrative. OSAGWI was aware of this information and could have included it without conducting or evaluating epidemiological studies. Including information developed by EPMU-2 regarding the environmental cleanliness of Al Jubayl but excluding EPMU-2's report and other information specifically related to post-war health complaints by NMCB-24 veterans makes OSAGWI vulnerable to an appearance of bias. Such omissions tend to reinforce the beliefs of some that DOD is inappropriately withholding information.

We also found that some information developed by OSAGWI might have significantly added to what is known about Gulf War illnesses issues involving NMCB-24 had OSAGWI coordinated the information with the Naval Health Research Center for use in its currently ongoing Seabee epidemiological study. For example, as determined by OSAGWI and reported

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in the Al Jubayl case narrative, both NMCB-24 and NMCB-40 were located at Camp 13 during Operations Desert Shield and Desert Storm. Complaints by NMCB veterans regarding post-war medical problems they attribute to Persian Gulf service are well known, having been the subject of several congressional hearings, various research efforts, and other activities addressing Gulf War illnesses issues. An OSAGWI official told us that interviews with selected NMCB-40 personnel indicated that personnel from this unit were not experiencing health problems of the same nature and extent as those reported by NMCB-24 veterans.

Since NMCB-24 and NMCB-40 occupied the same camp at Al Jubayl, we believe that a determination of whether NMCB-40 veterans are encountering medical problems similar to those being reported by NMCB-24 veterans would be of considerable interest to those concerned with resolving Gulf War illnesses issues. The Naval Health Research Center study is obtaining for analysis a wide range of Gulf War illnesses-related information from current and former Seabees and plans to perform a multifaceted analysis of the information collected.

In August 1998, Naval Health Research Center officials told us they had coordinated with OSAGWI officials regarding the Seabee study on several occasions but that OSAGWI officials had not informed them of the relationship between NMCB-24 and NMCB-40. The study's methodology therefore did not include plans to specifically compare Gulf War illnesses information obtained from veterans of these two units. They acknowledged, however, that such comparisons could be conducted and that they might provide useful information. They said they would be willing to discuss adding such comparisons if OSAGWI officials requested that they do so. We believe such comparisons, especially regarding the extent and nature of post-war medical symptoms, might provide information important to OSAGWI's investigation and reporting of Gulf War illnesses issues involving the Al Jubayl and other case narratives.

OSAGWI officials agreed that the Al Jubayl case narrative needed to be modified to acknowledge the high rate of symptoms reported by members of NMCB-24 and that they would modify the case narrative accordingly. They also told us they would coordinate with the Naval Health Research Center regarding new information that might be developed through comparisons of NMCB-24 and NMCB-40 data in the Naval Health Research Center Seabee study.

OSAGWI Did Not Use DOD and VA Medical Databases in Conducting Its Investigations for Cases We Reviewed

DOD and the VA maintain databases that contain self-reported health information and clinical information on thousands of Gulf War veterans. Some of these veterans may have symptoms associated with Gulf War illnesses. Although OSAGWI's methodology calls for the use of the DOD and VA databases in its investigations, we found it did not access them for the six case narratives selected for our review. Therefore, OSAGWI missed an opportunity to determine whether individuals involved in possible exposure incidents were also reporting symptoms in the databases. Information thus obtained could provide leads to help scope and guide the nature of the investigation and potentially could be combined with other evidence and research efforts conducted by DOD and others to help evaluate whether chemical warfare agents might have been present.

Gulf War Illnesses Databases Maintained by DOD and VA

In response to the complaints of many military personnel that returned from the Gulf War with health problems they believed were related to their deployment, DOD and VA created programs to track the health of Gulf War veterans. Information collected in these programs is stored in databases that describe the health status of a large group of Gulf War veterans who have undergone a standardized examination process to document their health.

DOD's Comprehensive Clinical Evaluation Program

The multiphase Comprehensive Clinical Evaluation Program (CCEP) was implemented by DOD in June 1994 to provide a systematic clinical evaluation for the diagnosis and treatment of active duty military personnel who have medical complaints they believe could be related to their service in the Persian Gulf. Phase I of the CCEP consists of a medical history, physical examinations, and laboratory tests that are comparable to an evaluation conducted during an inpatient internal medicine hospital admission. CCEP participants are evaluated by a primary care physician at their local medical treatment facility and receive specialty consultations if deemed appropriate.

The primary care physician may refer patients to phase II for further specialty consultations depending on the clinical findings of phase I. Phase II evaluations consist of targeted, symptom-specific examinations; laboratory tests; and consultations. During this phase, potential causes of unexplained illnesses are assessed, including infectious agents, environmental exposures, psychological factors, and vaccines. DOD maintains a database that summarizes the clinical evaluations of CCEP participants. The database shows self-reported complaints and symptoms from everyone and physician diagnoses for examined participants. In

addition, the database shows unit assignments, medical complaints, diagnoses, and possible exposures of individuals who were part of units during the Gulf War that may have come in contact with chemical warfare agents or other environmental hazards. As of October 31, 1998, the CCEP database contained health information on 34,963 service members who had received clinical evaluations as a part of the program.

VA's Persian Gulf Registry

The VA's Persian Gulf Registry (VA Registry) was established in 1992. Any Gulf War veteran may participate in the registry, even if that person has no current health complaints. Like the CCEP, the registry consists of a two-phase examination process. During phase I, the veteran completes a standardized questionnaire on exposures during the Gulf War and health complaints and undergoes a physical examination with laboratory testing. Veterans who have health problems that remain undiagnosed after phase I are referred to more extensive phase II medical evaluations.

VA maintains a database that summarizes the results of clinical evaluations of registry participants. It contains information on symptoms and complaints self-reported by veterans and diagnosed by physicians. It also contains information on exposures, birth defects, and undiagnosed illnesses. Like the DOD database, the registry database also contains information on which units the participants were assigned to during the Gulf War. As of July 31, 1998, the VA Registry contained information on the health conditions of 70,051 Gulf War veterans who had physical examinations under the VA program.

Identifying Program Participants Could Help OSAGWI Better Focus Its Investigative Efforts

Each of the case narratives selected for our review describes possible chemical exposure incidents that involve individuals acting alone or as a part of larger units. Many of these individuals may have enrolled in either the CCEP or the VA Registry. OSAGWI could use this data to identify whether individuals involved in the incidents described in the case narratives might be experiencing health problems.

Several of the case narratives included in our review describe events that could have been the subject of further analysis using the CCEP and VA Registry. For example, OSAGWI's ASP Orchard case narrative describes chemical warfare agent alarms at an ammunition storage facility near an orchard outside Kuwait City, Kuwait. OSAGWI collected information from many of the personnel that inspected this facility and from a variety of other sources, such as the Central Intelligence Agency and the Defense

Intelligence Agency. OSAGWI concluded that the alarms were false and that chemical warfare agents probably had not been stored at this facility.

However, for the six case narratives we reviewed, OSAGWI investigators did not query the CCEP or the VA Registry in an attempt to determine whether any of the several personnel that inspected the site or any of the hundreds of other personnel encamped nearby had enrolled and had reported or been diagnosed with health problems. Although it would not be definitive, unusually high levels of participation accompanied by the reporting of certain health problems and possible exposures might have led OSAGWI to investigate further. Performing this investigative step would serve to enhance the credibility of OSAGWI's case narratives and would confirm OSAGWI's intention to investigate these events leaving no stone unturned.

We noted that OSAGWI's investigative methodology includes the use of the CCEP and the VA registry and that OSAGWI had used such an analysis in investigating the Khamisiyah incident and in developing its Depleted Uranium environmental exposure report issued on August 4, 1998. For example, in performing the investigation on depleted uranium, OSAGWI investigators queried the CCEP to determine whether an unusually high proportion of the participants involved in the case had experienced kidney damage—a possible medical effect of being exposed to depleted uranium. According to OSAGWI, the analysis showed that these CCEP participants did not suffer unusually high rates of kidney damage compared to the general U.S. population.

Three Case Narratives Appear to Have Been Appropriately Investigated

Except for not using the DOD and VA medical databases, the Al Jaber Air Base, ASP Orchard, and Camp Monterey case narratives generally did not have the weaknesses we found in the other three cases. In investigating these cases, OSAGWI followed its methodology, identified and interviewed important witnesses, appropriately used information from other key sources, included all important information, and accurately presented the information found. These investigations were performed in a thorough manner, and the evidence collected by OSAGWI convincingly supported its assessments.

The Camp Monterey case is a good example. In this case, soldiers of the 8th U.S. Army Infantry Division were moving wooden Iraqi crates containing metal canisters out of a building in a bivouac area north of Kuwait City, Kuwait, so that it could be used to house troops. One of the canisters broke open, spilling a white powder-like substance and causing

several soldiers to become ill. At the request of the local commander, two Fox vehicles tested the spilled substance. Both Fox vehicles initially reported detections of sarin, a deadly nerve agent, and this apparently led to some initial reports that soldiers had been exposed to a nerve agent. Later, mass spectrometer tests by these Fox vehicles confirmed that the substance was actually a relatively harmless riot control agent rather than sarin. OSAGWI found, and we confirmed, that after interviewing the personnel present (including the Fox crews) and after reviewing Fox crew and laboratory analyses of the Fox printouts, the initial alarm for sarin was an error. Similarly, in both the Al Jaber and ASP Orchard cases, initial Fox alarms for persistent chemical warfare agent could not be confirmed in some instances even by repeated attempts by the same Fox vehicles. OSAGWI concluded, and we agreed, that had the chemical warfare agents been present, they would have been detected in the repeated tests.

OSAGWI Has Made Changes to Improve Its Investigative and Reporting Processes

We believe that inadequate quality control procedures within OSAGWI contributed to the investigative and reporting problems discussed in this report. During our review of OSAGWI operations, we periodically briefed OSAGWI officials on the nature and types of weaknesses we had found and on our preliminary observations. OSAGWI officials agreed that they needed to improve their investigations and their reporting of the investigation results. They said that they have instituted several changes to their internal quality assurance practices that they believe will considerably strengthen their investigative and reporting processes.

According to OSAGWI officials, their current investigative and reporting process has evolved over the 2 years since OSAGWI was established. Consequently, certain enhancements are now in place that were not present when the six case narratives we reviewed were published. More specifically, OSAGWI now requires its investigators to prepare a written investigation plan. The investigation plan must specify the information that will be obtained, the direction the investigation will take, and the schedule. The plan is expected to mirror the overall methodology adopted by the division within the Investigation and Analysis Directorate for its investigations. The division chief is to review the investigation plan and provide feedback to the investigator on the scope and direction of the investigation and the proposed schedule. Following approval of the plan by the division chief, the investigator can begin the investigation.

Also, the process now includes a requirement for a team directional guidance meeting when the investigation is 50- to 75-percent complete. At

this meeting, the investigator briefs a small group of analysts from within the investigator's division on the investigation's scope, direction, and findings to that point. The purpose of the meeting is to identify at an early stage any problems in the direction of the investigation and to identify any major information sources that are not being used.

According to OSAGWI, each case investigation is now periodically reviewed by the Director of the Investigations and Analysis Directorate to allow the Director to adjust, as necessary, the scope of the investigation and the case narrative development. Furthermore, the peer review process for case narratives is now more robust because the peer review team, comprising experienced individuals, reviews the completed case narrative along with the source materials. The peer reviewers are responsible for ensuring that the text in the case narrative is supported by the source material and also for identifying portions of the text needing footnotes to source materials. In addition, an OSAGWI official said the internal review of case narratives by key individuals within the OSAGWI organization is more rigorous than it used to be. OSAGWI officials believe that these enhancements to their review processes will preclude the recurrence of the types of investigative and reporting weaknesses we found.

Conclusions

The weaknesses in the scope and quality of OSAGWI's investigations and in reporting the results of these investigations in the Reported Exposure to Mustard Agent, Marine Minefield Breaching, and Al Jubayl case narratives are significant; however, we agree with OSAGWI's assessments of the likelihood of the presence of chemical warfare agents in all but the Marine Minefield Breaching case narrative. In our opinion, the lack of effective quality assurance policies and practices within OSAGWI contributed to the weaknesses we noted. A stronger quality control mechanism for its investigations would provide greater assurance that all relevant facts are included and that the information presented is accurately and properly sourced. More consistent use of some types of medical information would also strengthen the rigor of OSAGWI's investigations. By querying available medical databases for all cases, OSAGWI investigators might have been able to better determine whether personnel at or near the sites of incidents had reported or been diagnosed with unusual health problems, thus helping indicate whether increased investigative efforts regarding the potential presence of chemical warfare agents or other environmental hazards in these incidents might be appropriate.

OSAGWI's changes to its internal review process appear to be positive steps in ensuring the quality of investigations and the related case narrative reports. Because OSAGWI initiated these changes after the case narratives we reviewed were published, we could not determine their effectiveness in ensuring the quality of OSAGWI investigations and reports. However, the procedures should incorporate two features to enhance the credibility of the review process. First, it is critical that those named to review OSAGWI's investigations are independent of the team investigating the incidents to avoid the appearance of a conflict of interest. Second, it is important that the procedures in place lead reviewers to thoroughly check to ensure that all relevant information obtained by the investigation teams has been included in the case narrative reports, that all important leads have been pursued, and that the investigation team has reached conclusions that are fully substantiated by the facts.

Information about the potential for differences in the occurrence of Gulf War illnesses symptoms between NMCB-24 and NMCB-40 developed during the Al Jubayl case investigation was not shared with the Naval Health Research Center for consideration for inclusion in its ongoing Gulf War illnesses research. We believe this information has potential for use in helping DOD evaluate issues related to the high levels of health problems reported by many of the Seabees stationed at Al Jubayl during the Gulf War.

Recommendations

To ensure that OSAGWI's case narratives contain all relevant facts, we recommend that the Secretary of Defense direct the Special Assistant for Gulf War Illnesses to

- revise the Marine Minefield Breaching, Exposure to Mustard Agent, and Al Jubayl, Saudi Arabia, case narratives to reflect the new and/or unreported information noted in our report and
- examine whether it should change its conclusion about the likelihood of the presence of chemical warfare agents in the Marine Minefield Breaching case from "unlikely" to "indeterminate" in light of the additional information now known about this case.

To enhance the thoroughness of OSAGWI's investigative and reporting practices, we recommend that the Secretary of Defense direct the Special Assistant for Gulf War Illnesses to

- use the DOD and VA Gulf War clinical databases to assist in designing the nature and scope of all OSAGWI investigations;
- include relevant medical information in its case narratives where it is needed to fully explain incidents of possible exposure to chemical agents or other potential causes of Gulf War illnesses; and
- ensure that its internal review procedures provide that (1) those reviewing an investigation and related report are independent of the team investigating the incident and (2) steps are in place that will lead the reviewers to thoroughly check that all relevant information obtained by the investigation teams has been included in the case narrative reports, all conclusions have been fully substantiated by the facts, and that all logical leads have been pursued.

Because of the potential research value of information developed through OSAGWI investigations, we further recommend that OSAGWI contact the Naval Health Research Center regarding the usefulness and desirability of comparing data between the veterans of NMCB-24 and NMCB-40 for purposes such as helping to determine whether veterans of these two units are reporting the same types and numbers of symptoms.

Agency Comments and Our Evaluation

DOD generally concurred with a draft of this report, agreeing to revise the case narratives we reviewed to include new or unreported data, and to reassess case narrative findings based upon any new evidence. In particular, DOD agreed to update the Marine Minefield Breaching case to reflect new information, conduct additional analysis on the issue of artillery fire during the breaching operation, and reassess its conclusions as appropriate.

DOD disagreed with our proposed use of the CCEP and the VA Gulf War Health Examination Registry in OSAGWI investigations. In commenting on this report, DOD stated it was concerned that these databases might be inappropriately used to establish a causal relationship between an event and the medical findings of the registries. DOD therefore maintains it would be inappropriate for case investigations, which were designed to report simply on what happened on the battlefield, to make assumptions about the significance or validity of the data in these databases without the establishment of a causal association by scientific research. DOD also stated concerns about preempting scientific research in this area and drawing premature conclusions that would be fallacious. However, DOD agreed that these databases need to be examined and analyzed for what they can contribute to understanding the illnesses of Gulf War veterans,

and noted that the Department has been involved in a number of research and other analyses of these databases.

We agree that information from these databases should not be used by investigators to establish a causal association and/or conclusions as described by DOD, and did not intend that it should be used for this purpose. We also agree that the establishment of Gulf War illnesses causal relationships is most appropriately a research activity. However, we also believe that the VA and DOD databases could potentially provide relevant information to the investigator about whether individuals who were at or near a site under investigation are reporting health problems, and that this information could be appropriately used, when combined with other information, to help guide the nature and scope of OSAGWI investigations. For example, case investigators could use VA Registry and CCEP data, particularly where it shows that large numbers of individuals at or near a given site are reporting health problems, as an indicator for providing investigative leads and for use in establishing the nature and scope of an investigation. This does not mean, as implied in DOD's comments, that such use of these databases would entail routine inclusion of the reviewed data in the published case narratives, their use as a replacement for research activities, or that its use would result in interpretations of non-scientifically based cause and effect relationships. We believe that these databases can be used by investigators to help guide and scope their efforts without entailing the types of misuse described by DOD. We modified the final report text and recommendations to clarify our position regarding this finding.

DOD agreed that the Al Jubayl case narrative needed to be modified to place the events of this incident in fuller context, and that this would include that some servicemembers stationed at Al Jubayl, especially members of NMCB-24, have reported high levels of health problems. DOD also agreed to request that the Naval Health Research Center undertake an analytical comparison regarding NMCB-24 and NMCB-40, and that independent reviewers are critical to a thorough and acceptable report on OSAGWI investigations.

VA also disagreed with our proposed use of the CCEP and the VA Gulf War Health Examination Registry in OSAGWI investigations in its written comments on a draft of this report. VA's comments were similar to DOD's regarding this matter. VA also expressed doubts regarding the usefulness to research of data comparisons involving NMCB-24 and NMCB-40.

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Additional discussion of DOD's and VA's comments and our evaluation is included in appendixes I and II.

Comments From the Department of Defense



SPECIAL ASSISTANT
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FEB 04 1999

Mr. Mark E. Gebicke
Director, Military Operations and Capabilities Issues
National Security and International Affairs Division
U.S. General Accounting Office
Washington, D.C. 29548

Dear Mr. Gebicke:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "GULF WAR ILLNESSES: Procedural and Reporting Improvements Are Needed in DoD's Investigative Processes," dated January 21, 1999 (GAO Code 703223/OSD Case 1738).

The Department generally concurs with the report. We appreciate the highly professional, in-depth review of our processes and our early reports. In many ways, despite previous oversight by the Presidential Advisory Committee, this is the first detailed review of our processes and our case reports. We appreciate that the GAO has acknowledged that our methodology, investigative procedures, and techniques are appropriate; found no appreciable errors in four of the six cases investigated, and agreed with our interim assessments in five of the six. One of our goals has been to report accurately, completely, and credibly on events that occurred during the Gulf War that might help us better understand the illnesses of Gulf War veterans. Your suggestions during your review and your findings and recommendations in this report will help us achieve this goal. Your report is by far the most thorough and helpful review of our efforts.

DoD agrees that our reports will be revised to include new or unreported data, and the findings will be reassessed based upon any new evidence. This philosophy is the basis of our decision to publish interim narratives, and we encourage anyone with additional information to contact us to help better explain each incident. DoD also agrees that independent reviewers are critical to a thorough and acceptable report on our investigations. Many experts, both inside and outside the Department, review each case narrative before we publish. Our investigation and report generation processes, including several levels of independent review, will continue to evolve as we develop better and more comprehensive methods to improve our efforts. Additionally, we now have the President's Special Oversight Board examining our cases in detail, much like your review.

The Department does not agree with the GAO's proposed use of the Gulf War health examination registries (DoD's Comprehensive Clinical Evaluation Program (CCEP) and the Department of Veteran Affairs' Gulf War Health Examination Registry) in each and every case narrative. While clearly the GAO believes that this would be an appropriate means to determine if personnel at each site under investigation are "reporting" illnesses and that conclusions from this should guide our investigations, we defer to the experts at the Institute of Medicine who

FEDERAL RECYCLING PROGRAM



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Appendix I
Comments From the Department of Defense

emphasized in their report, *Adequacy of the Comprehensive Clinical Evaluation Program – Nerve Agents*, dated April 22, 1997, the need to recognize the scientific imperative that caution must be used when considering the CCEP and the VA Registry for any interpretation of relationship between an event and the medical findings of the registries. Consequently, it would be inappropriate for case investigations, which were designed to report simply on what happened on the battlefield, to make assumptions about the significance or validity of the data in these registries without the result of scientific research that established a causal association. Until we can understand why people choose to enroll or not enroll in these programs, drawing conclusions about the health status of individuals or the connection to chemical or biological warfare agents from the number of individuals listed in the databases or their self-reported symptoms and complaints would be fallacious.

However, while we disagree that the health registries should be included in each and every case narrative, we concur with the GAO that these registries need to be examined and analyzed for what they can contribute to our understanding of the illnesses of Gulf War veterans. In the process of each of our investigations, the Department has realized that medical information about individuals in the CCEP and VA Registry could be important in the development of hypotheses to be tested through clinical studies designed to determine if there are associations between clinical symptoms and service in the Gulf War. The Institute of Medicine "... believes strongly that although data from the CCEP cannot be used to test for potential associations between exposures and health effects, it can, combined with other information, be used to identify promising directions for separate research studies."

The Department also disagrees with the conclusion by the GAO that we "did not take advantage of a potentially valuable source of relevant information." (p.4) In fact, the Department has a long history of analyzing the health registries, often using the mapping capability of the Center for Health Promotion and Preventative Medicine (CHPPM), to help guide our investigations and follow-up medical research. Specifically, the following information reviews CHPPM's collaboration in this area going back to 1996.

1. Report for Dr. Joseph and September 5, 1996, PAC meeting. This epidemiological study looked at CCEP participation, ICD-9 codes, and CCEP medical information for individuals in various units at differing distances from Khamisiyah. CHPPM also performed extensive geographical information system (GIS) analysis for this report (August 30, 1996 CHPPM document). These studies revealed no patterns of participation rate.
2. During July 1996, CHPPM performed numerous GIS/CCEP analyses (using participation rates and ICD-9 codes) relating to Khamisiyah detonations (March 4 and 10, 1991) and the Czech detections at Hafar Al Batin (January 1991).
3. In the March – May 97 timeframe, CHPPM conducted the CCEP participation rate vs. geographic location (i.e., the 50km block analysis) study relative to Khamisiyah. This study included all services plus National Guard and reserves and we conducted the analysis on combined data and the individual components. This study revealed no patterns of participation rate and did not show higher rates closer to Khamisiyah.

See comment 1.

Appendix I
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4. Newer studies include a study of oil fire particulate exposure and the incidence of asthma diagnosis in the CCEP program. This study has been presented at a number of national and international conferences and will hopefully be published shortly.

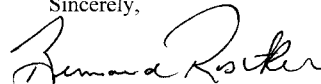
In the case of Khamisiyah, as we shared with the GAO team, we did initiate an examination of the DoD and VA registries to generate potential hypotheses on relationships between location and registry participation. This work was not published, but the Institute of Medicine did undertake feasibility studies on the long-term health effects of exposure to nerve agents. In early 1997, the Research Working Group established a small subgroup of experts on the health effects of nerve agents to develop a broad-based research strategy for investigation of the long-term health effects of low-level exposure to nerve agents. There are now 14 identified research focus areas ranging from the effects of service in the Gulf War on the brain and nervous system to the potential health consequences of low-level exposure to chemical warfare agents.

In the investigation of depleted uranium (DU), we examined the CCEP for diagnoses of kidney damage because there are relevant medical studies indicate the primary toxic effect of DU is kidney damage. This relationship was relevant for veterans exposed to DU. The DU narrative stated unexplained illnesses were not due to DU exposure because, by definition, kidney functions have been normal in veterans who have unexplained illnesses. This example is particularly important because unlike the issue of illness and chemical warfare agent exposure where no specific medical symptoms have been associated with low-level exposure, there is a well-known and specific relationship between uranium exposure and kidney function.

We do note, however, in the spirit of "leaving no stone unturned," the Department (Health Affairs, CHPPM, and OSAGWI), in cooperation with the Department of Veterans Affairs, has initiated a project to review once again the use of these registries, in conjunction with other sources and in a manner that meets the Institute of Medicine criteria, to develop general hypotheses for future research of the symptoms and complaints of the Gulf War veterans.

The Department appreciates the opportunity to review the draft GAO report. Detailed comments on the report's recommendations and findings are enclosed. Technical comments were provided separately to the GAO staff.

Sincerely,



Bernard Rostker

Enclosure

GAO DRAFT REPORT DATED JANUARY 21, 1999
(GAO CODE 703223) OSD Case 1738

“GULF WAR ILLNESSES: PROCEDURAL AND REPORTING IMPROVEMENTS
ARE NEEDED IN DoD’s INVESTIGATIVE PROCESSES”

DEPARTMENT OF DEFENSE COMMENTS TO
THE GAO RECOMMENDATIONS

RECOMMENDATION 1: To ensure that the Office of the Special Assistant for Gulf War Illnesses’ (OSAGWI’s) case narratives contain all relevant facts, the GAO recommended that the Secretary of Defense direct the OSAGWI Special Assistant to:

- (a) revise the Marine Minefield Breaching, Exposure to Mustard Agent, and Al Jubayl, Saudi Arabia case narratives to reflect the new and/or unreported information noted in the GAO report; and
- (b) examine whether it should change its conclusion about the likelihood of exposure to a chemical warfare agent in the Marine Minefield Breaching case from “Unlikely” to “Indeterminate” in light of the additional information now known about this case. (p. 8-9, p. 51/GAO Draft Report).

Now on pp. 8 and 44.

DoD’s RESPONSE:

- (a) DoD agrees that our reports will be revised to include new or unreported data, and the findings will be reassessed based upon any new evidence, including the information in the GAO report. This is consistent with our long-standing policy to publish interim narratives, and we encourage anyone with additional information to contact us to help better explain each incident.

In regard to the three specified cases, follow-up investigations are planned or already underway, e.g., we are currently re-investigating the Marine Minefield Breaching case concentrating on information brought to our attention by a veteran and the reported injury to a Marine during the breaching operations. We will add the GAO’s findings to this investigative effort. For Al Jubayl, again in response to additional information brought to us by a veteran, we are examining the possibility that an Iraqi patrol boat or a low-flying aircraft may have been involved in an attack on Al Jubayl that caused the Loud Noise event. This report will be published as a separate case narrative. We will republish the Al Jubayl and Mustard Injury narratives to include consideration of the new material as suggested.

- (b) Although the Department agrees to update the Marine Minefield Breaching narrative to reflect new information, we are concerned that the GAO seems to have reached a conclusion that the assessment “in the Marine minefield breaching case that exposure to chemical warfare agent ... should be changed to “indeterminate” in light of the additional information known about this case.” (p.9) We would remind the GAO of the transcripts of interviews with several key participants of the 2nd Marine Division’s breach of the first obstacle belt in lane Red One -- they state that there was no incoming artillery at that time. Nevertheless, as

See comment 2.

Now on p. 8.

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part of our follow-up investigation, we will objectively consider all information and detail more completely the artillery issue and its relevance to whatever final assessment is made.

RECOMMENDATION 2: To enhance the thoroughness of OSAGWI's investigative and reporting practices, the GAO recommended that the Secretary of Defense direct the OSAGWI's Special Assistant to:

- (a) incorporate the use of DoD and Department of Veterans Affairs clinical databases into its investigations as a means of identifying whether personnel at sites under investigation are reporting illnesses;
- (b) include relevant medical information in its case narratives where it is needed to fully explain incidents of possible exposure to chemical agents or other potential causes of Gulf War illness; and
- (c) ensure that its new internal review procedures provide that (1) those reviewing an investigation and related report are independent of the team investigating the incident and (2) steps are in place that will lead the reviewers to thoroughly check that all relevant information obtained by the investigation teams has been included in the case narrative reports, all conclusions have been fully substantiated by the facts, and that all logical leads have been pursued. (p. 9, pp. 51-52/GAO Draft Report)

Now on pp. 8 and 44-45.

DoD RESPONSE:

- (a) The Department disagrees with the GAO's proposed use of the Gulf War health examination registries (DoD's Comprehensive Clinical Evaluation Program (CCEP) and the Department of Veteran Affairs' Gulf War Health Examination Registry) in each and every case narrative. While clearly the GAO believes that this would be an appropriate means to determine if personnel at each site under investigation are "reporting" illnesses and that conclusions from this should guide our investigations, we defer to the experts at the Institute of Medicine who emphasized in their report, *Adequacy of the Comprehensive Clinical Evaluation Program – Nerve Agents*, dated April 22, 1997, the need to recognize the scientific imperative that caution must be used when considering the CCEP and the VA Registry for any interpretation of relationship between an event and the medical findings of the registries. Consequently, it would be inappropriate for case investigations, which were designed to report simply on what happened on the battlefield, to make assumptions about the significance or validity of the data in these registries without the result of scientific research that established a causal association. Until we can understand why people choose to enroll or not enroll in these programs, drawing conclusions about the health status of individuals or the connection to chemical or biological warfare agents from the number of individuals listed in the databases or their self-reported symptoms and complaints would be fallacious.

The comments by the GAO do not reflect the current body of scientific evidence on the research dealing with illnesses among Gulf War veterans. Studies have been completed and many are ongoing to clarify the nature of reported illnesses in veterans who deployed to the Gulf. Several studies are proceeding to determine what factors may have been important in the development of symptoms. Service in the Gulf is clearly associated with a wide range of

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Comments From the Department of Defense

self-reported health outcomes. The rates of self-reported adverse health outcomes are higher among Gulf War veterans than non-deployed veterans and the frequency of symptoms and severity appear to be related to the frequency and perceived severity of the self-reported exposures. However, it cannot be assumed that those having symptoms are uniformly associated with those registering with either health registry, or that the registries are a good proxy for the health status of those stationed at a particular site or associated with an incident reported in a case narrative. In fact, we know that many veterans reporting symptoms do not register with either the DoD or VA. Moreover, the preponderance of evidence does not support any association specific to the Gulf War other than the deployment itself (e.g., "Chronic Multisymptom Illness Affecting Air Force Veterans of the Gulf War," Dr. Fukuda, et.al., Journal of the American Medical Association, September 16, 1998.) Therefore, it would not be appropriate to identify whether personnel at sites under investigation are reporting illnesses because this could be interpreted as a cause-and-effect (or cause-and-no-effect) that is not scientifically based. Finally, the Institute of Medicine has stated that it "... believes strongly that ... data from the CCEP cannot be used to test for potential associations between exposures and health effects of low-level exposure to nerve agents. Those questions must be addressed through rigorous scientific research. The CCEP is a treatment program. Therefore, it is important not to attempt to use the findings of the CCEP to answer research questions."

- (b) The Department does not agree that case narratives are appropriate vehicles to report medical research, and as noted above, should not routinely include assessments of registry data. However, in the case of the Al Jubayl case narrative, we do agree that our readers might find useful an appendix which would contain an annotated bibliography that would place the events in a fuller context. This would include that service members stationed at Al Jubayl, especially the members of the NMCB-24, have reported high levels of health problems. Such an appendix will be included in the next version of the Al Jubayl case narrative.
- (c) DoD agrees that independent reviewers are critical to a thorough and acceptable report on our investigations. That is why the Department has established a multi-level review process. Initial reviews are completed by experienced investigators of similar cases who are not part of the case investigation who help identify any major information sources that are not being used, commonalties and relationships to other investigations, and any gaps or misdirection in the investigation. Next comes an Internal Review involving review and comment by key individuals within the Special Assistant's organization, including, but not limited to the risk communications expert, medical personnel, an intelligence officer, appropriate subject matter experts, the deputy and Director, IAD, and the Deputy Special Assistant. Following Internal Review, the narrative may be reviewed by key witnesses related to the case. This step has been used in some narratives, but not all. The final quality assurance step is coordination with key governmental organizations both in and out of the Department, all of whom are independent of the investigating team.

Additionally, the Department now has the President's Special Oversight Board examining our cases in detail. Their paragraph-by-paragraph, line-by-line, and footnote-by-footnote scrutiny of each narrative is providing us a level of outside review that, except for GAO, we have never had before. Their efforts have already identified areas where we can improve our narratives.

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Now on p. 45.

RECOMMENDATION 3: Because of the potential research value of information developed through OSAGWI investigations, the GAO further recommended that OSAGWI exercise greater diligence in sharing information with organizations involved in Gulf War illness research. For example, OSAGWI should contact the Naval Health Research Center regarding the usefulness and desirability of comparing data between veterans of Naval Mobile Construction Battalion (NMCB)-24 and NMCB-40 in order to help determine whether veterans of these two units are reporting the same types and numbers of symptoms. (p. 52/GAO Draft Report)

DoD RESPONSE:

The Department has shared and, of course, will continue to share information with organizations involved in Gulf War illnesses research including the Naval Health Research Center. As the GAO team noted in their report, “the Naval Health Research Center ... told us they had coordinated with OSAGWI ... on several occasions.” With regard to the specific inquiry that the GAO would like carried out concerning a comparison between the NMCB-24 and NMCB-40 units, we will be pleased to request that such an analysis be undertaken. Such an inquiry would continue the long-standing interaction between OSAGWI and the Naval Health Research Center. We reject, however, the implication that there was in any way a lack of “diligence” in sharing information with organizations involved in Gulf War illnesses research. A fair reading of our frequent visits, both in Washington and in San Diego, with the Naval Health Research Center would show substantial consultations. The fact that the specific questions raised by the GAO concerning a comparison between the NMCB-24 and NMCB-40 units was not suggested by either party does not, in our judgement, constitute a failure of “diligence.”

We would also note that the case narratives are reviewed by the Special Assistant’s medical staff and they are circulated to agencies within the federal government which have responsibility for medical care and medical research. The medical staff is alert to spot potential hypotheses of interest to researchers. These narratives, by this process, become part of the information available to the research community.

Further, we note that we are a participant in both the Research Working Group and the Clinical Working Group of the Persian Gulf Veterans Coordinating Board. Part of that participation is to bring to the table the results of our investigations of reported chemical incidents so those findings can become part of the data used to formulate a scientific approach to combining medical information within the CCEP and the VA Registry with other appropriate information to generate hypotheses for appropriate medical research. The established processes of the Research Working Group and the Clinical Working Group will determine the most appropriate agency or agencies to conduct the indicated research.

See comment 3.

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COMMENTS ON OTHER POINTS:

Now on p. 25.

- p.26, 3rd full paragraph, line 2 and 3: “OSAGWI had not interviewed either the senior medical officer or the officer who wrote the message describing the positive in-theater analysis. The OSAGWI investigator should have been alerted to the need for further investigation because a urine sample tested in the United States showed no evidence of thiodiglycol.”

See comment 4.

See comment 5.

While we agree that this senior medical officer was not interviewed during the preparation of the draft case narrative, his first-hand testimony to the PAC and in his medical journal article were fully incorporated into the draft. We are concerned that the GAO team knew, but did not mention in the report that he reviewed this narrative before it was published and made no changes to it. The GAO’s statement leaves the reader with the impression that we did not avail ourselves of involving the senior medical officer in the preparation of this case narrative. Such is not the case. Furthermore, on the specific point raised by the GAO team, he has stated publicly and reviewed his statements in our draft that the negative test for thiodiglycol in the United States was not a surprise.

Now on p. 30.

- p.32, 3rd paragraph, line 1: “... we found a classified document in OSAGWI’s files containing intelligence evidence undisclosed in the narrative that could support the possibility of an chemical attack.” [Marine Breaching]

See comment 6.

The Department disagrees that this message should have been referenced in the narrative. There is little in the message that links it to the Marine Breaching incident except that it was received on the same day. The message contains no location, mentions no units, was received hours after the incident, does not indicate that it relates to an Iraqi attack, and, although the GAO report doesn’t say so, the message states that there is “no further evidence to suggest that a chemical attack actually occurred”

Now on p. 31.

- p.33, 2nd paragraph, line 6: “... OSAGWI did not include important information in this case narrative that directly links this case with post-war veterans’ complaints of Gulf War illnesses symptoms.”

See comment 7.

The Department agrees that for completeness we will include an appendix which will contain an annotated bibliography of medical research concerning Al Jubayl. However, this does not, as the GAO implies, “directly link this case with post-war veterans’ complaints.” As much as we would all like to find an explanation for “post-war veterans complaints,” the use of the word “link” implies a direct causal relationship and is an example of the erroneous conclusions that can be drawn from inappropriate use of registry data. Again, we defer to the experts at the Institute of Medicine who emphasized in their report, *Adequacy of the Comprehensive Clinical Evaluation Program – Nerve Agents*, dated April 22, 1997, the need to recognize the scientific imperative that caution must be used when considering the CCEP and the VA Registry for any interpretation of relationship between an event and the medical findings of the registries.

Now on p. 35.

- p.39, 1st full paragraph, line 1: “... narrative ... is not complete ... because it does not disclose the fact that many members of NMCB-24 have reported unusually high levels of health problems since ...”

See comment 7.

Now on p. 3.

The Department disagrees that the narrative is incomplete. Case narratives were designed to, as the GAO team noted on p. 2 “contain all important investigative facts ... of the likelihood that

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Comments From the Department of Defense

service members were exposed to chemical or biological warfare agents.” Case narratives are neither medical research reports nor epidemiological studies. As we have discussed with the GAO team, we are unaware of any case definition or set of long-term symptoms that mark exposure to biological or chemical warfare agents that do not show up in immediate health symptoms. If we knew what we were looking for, we would agree with the GAO that such a search might suggest the link that they are trying to make. If the GAO can provide us with the medical research finding that makes such a “link,” we certainly would agree to include it in our investigatory methodology, and it would be an appropriate part of our case narratives. However, neither we nor the GAO can prove if “service members were exposed to chemical or biological warfare agents,” which is the purpose of the case narratives, by noting that “many members of the NMCB-24 unit have reported unusually high levels of health problems.

We do note, however, in the case of Khamisiyah where we were trying to determine why no alarms went off if it was a significant chemical warfare agent event, we did correlate the results of our simulation concerning “first noticeable effects” with a health survey of all soldiers within fifty kilometers of Khamisiyah. In this case, as in the case of exposure to depleted uranium, we had specific symptoms that a review of the medical literature said would be associated with levels of exposure. In these cases, medical science had established the link that we were looking for. In the case of Al Jubayl and the NMCB-24 unit, medical science has yet to provide the link between exposure to chemical warfare agents and the health problems reported by veterans at Al Jubayl.

Also, please note that the use of the word, “disclose,” suggests that we were trying to hide something. Nothing could be further from the truth. In fact, because so many of our veterans are concerned about the health of the Seabees, we have a whole GulfLINK page devoted to information concerning the Seabees. This information can be obtained from <http://www.gulflink.osd.mil/seabee/>. At this location, we also note that “This collection (of documents) is made available because of the intense interest in the illnesses many Gulf War Seabee veterans are experiencing.” (emphasis added).

See comment 8.

The following are our comments on the Department of Defense's (DOD) letter dated February 4, 1999.

GAO Comments

1. Our report states that the Office of the Special Assistant for Gulf War Illnesses (OSAGWI) case investigators did not attempt to use Comprehensive Clinical Evaluation Programs (CCEP) or Department of Veterans Affairs (VA) registry information in the six cases we reviewed. The report acknowledges OSAGWI's use of the CCEP and VA registry regarding to the Khamisiyah incident and the Depleted Uranium Environmental Exposure Report.
2. Our report recommends that OSAGWI examine whether to change its conclusion about the likelihood of exposure to a chemical agent in light of the additional information now known about this case. We agree that additional assessment is needed by OSAGWI to make this determination, and that some of the evidence regarding this incident is contradictory and otherwise in need of additional analysis. Until additional analysis is performed, it is not clear whether the likelihood of the presence of a chemical warfare agent in this case should be assessed as "unlikely" or "indeterminate." However, we believe the new evidence tends to increase the possibility that an "indeterminate" assessment might be more appropriate.
3. OSAGWI should have identified the potential research value of information it had in its files regarding the relationship between Naval Mobile Construction Battalion 24 (NMCB-24) and NMCB-40, and shared this information with researchers at the Naval Health Research Center for use in the Seabee study—a major Gulf War illnesses research project. We agree that this finding cannot be used by itself as sufficient evidence to show an overall lack of diligence by OSAGWI in sharing information from case investigations with researchers. However, the fact that neither we nor OSAGWI could find any evidence that an attempt was made to identify or coordinate this information in the Al Jubayl case does raise questions about the adequacy and effectiveness of OSAGWI procedures for identifying and referring this kind of information. The word "diligence" was removed from the final report.
4. The sentence referring to how the OSAGWI investigator should have been alerted to the need for further investigation based on the absence of thiodiglycol in the urine sample has been deleted from the final report. We

agree that other inferences could also be drawn from the absence of thiodiglycol in this analysis.

5. Information has been added to the final report regarding the senior medical officer's testimony, his medical journal article, and his review of the narrative draft. However, OSAGWI was remiss in failing to interview the senior medical officer, especially in view of the importance of this witness' involvement in the case. This officer was still on active duty and stationed in the Washington, D.C., area at the time of our review. OSAGWI could have avoided some of the accuracy problems associated with this case narrative had it interviewed this officer prior to publication of the narrative.

6. We agree that this message was fragmentary, incomplete, and leaves many unanswered questions about its meaningfulness and reliability. However, this message deserves further investigation because of its date and reference to a chemical attack. In our opinion, the fact that the message was received hours after the incident does not rule out the possibility there could have been a delay between the time of the event and the time the message was transmitted. Even if the message is shown to be unassociated with the incident in question, its very nature justifies further investigation by OSAGWI. OSAGWI officials agreed that they would attempt to investigate further.

7. We agree with OSAGWI regarding the need for caution when interpreting the relationship between an event, medical findings of the CCEP and VA registries, and other medical information. Accordingly, the final report text was modified regarding the term "direct linkage with post-war veterans' complaints."

We do not agree that the issue in point necessarily implies such connotations. Our concern is simply that while the Al Jubayl narrative contains much information to the effect that chemical warfare agents were either "definitely not" or "unlikely" to have been present at Al Jubayl and that the Al Jubayl area appeared environmentally clean during the Gulf War, it fails to point out that (1) many servicemembers stationed there are now reporting unusually high levels of health problems and (2) DOD has conducted or is conducting several investigations and major research projects addressing this issue. These important facts need to be mentioned in the case narrative. If DOD is concerned about the possible misuse of information regarding reported veterans' illnesses, then the need for caution regarding its use and research implications could also be included

in the case narrative. We trust that OSAGWI's planned modifications to the Al Jubayl case narrative will resolve this issue.

8. In response to this comment, we have changed the report in several places to refrain from using the word "disclose." However, in the case narrative involving the Seabees, as well as in one other case, OSAGWI for various reasons originally chose not to include information that we believe should have been included.

Comments From the Department of Veterans Affairs



DEPARTMENT OF VETERANS AFFAIRS
WASHINGTON DC 20420

FEB 10 1999

Mr. Mark E. Gebicke
Director, Military Operations and Capabilities Issues
National Security and International Affairs Division
U. S. General Accounting Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Gebicke:

This is in response to your draft report, ***GULF WAR ILLNESSES: Procedural and Reporting Improvements Are Needed In DOD's Investigative Processes*** (GAO/NSIAD-99-nn). Although your recommendations are directed to the Secretary of Defense, they deal with VA and DoD Gulf War illness registry data and concern us greatly. The Department of Veterans Affairs does not agree with the associated recommendations as presented in GAO's draft report.

On pages 43-47 of the draft report GAO criticizes the DoD Office of the Special Assistant for Gulf War Illnesses (OSAGWI) for failure to use VA and DoD registry information in its investigation of various exposure incidents during the Gulf War. GAO makes the suggestion on page 43 that "Information thus obtained could provide leads to help guide further investigation, and potentially could be combined with other evidence and research efforts conducted by DoD and others to help evaluate whether an exposure occurred." Furthermore, the draft report states that "Performing this investigative step would serve to enhance the credibility of OSAGWI's case narratives and would confirm OSAGWI's intention to investigate these events leaving no stone unturned." These statements lead to a recommendation by GAO that OSAGWI should use VA and DoD registry data in its incident investigations. We disagree.

We do not believe that use of the Gulf War Health Registries or Comprehensive Clinical Evaluation Program (CCEP) is an "essential step" in all exposure investigations carried out by OSAGWI. These databases contain the results of voluntary, self-selected medical examinations and are limited by participation bias. They can provide early hypothesis-generating information, but the findings are not generalizable to the entire exposure group under investigation or to the population of Gulf War Veterans. Any preliminary conclusions drawn from such analyses will be limited. Use of registry data that could in any way be construed as research leading to generalizable conclusions about either health outcomes or exposures is inappropriate. We have made these points to GAO in response to several of its previous reports on Gulf War issues. We believe that a more appropriate use of the Registries would be to complete the OSAGWI investigative process first and then decide if there is evidence supporting a hazardous exposure. If evidence exists that a group of Gulf War veterans were exposed to a toxin(s), then a cohort of exposed individuals could be identified by OSAGWI and further evaluated by DoD Health Affairs and the Veterans Health Administration (VHA) using the health care databases.

Now on pp. 39-41.

Now on p. 39.

See comment 1.

**Appendix II
Comments From the Department of
Veterans Affairs**

2.

Mr. Mark E. Gebicke

In fact, since June 1997, VHA has had a Memorandum of Understanding (MOU) with DoD Health Affairs for joint use of the VA Registry and DoD CCEP databases. The MOU established the procedures by which VA and DoD can analyze and report database information from their respective medical registry and evaluation programs for Gulf War veterans. These data include demographic and administrative information, self-reported exposures and symptoms and diagnoses resulting from the evaluation program. A group of VA and DoD officials is currently meeting to outline a protocol for analyses of the databases that complement the on-going health care research program and specific research projects. This protocol will be peer-reviewed for scientific merit and reviewed by the Clinical Working Group of the Persian Gulf Veterans Coordinating Board before approval. We will also provide OSAGWI with a copy for comment and review.

In addition to the general problem with GAO's recommended use of registry data, the GAO report recommends on pages 42-43 that the Naval Health Research Center in San Diego expand its epidemiological investigation of the NMCB-24 unit to encompass the NMCB-40 unit. This is an issue to be addressed by the DoD; however, VA would note that a study of NMCB-40 for the purpose of comparing it with NMCB-24 would likely result in criticism by the epidemiology research community.

Upon review of GAO's methodology, it is not clear whether or not GAO had the benefit of scientific input when developing its recommendations regarding the use of VA and DoD clinical registries. We believe that such input would have the effect of strengthening the link between GAO's objective to evaluate the thoroughness of OSAGWI's investigation into and reporting on potential chemical or biological agent exposures and GAO's recommendation to use VA and DoD clinical registries to develop further information on such exposures. In turn, we believe that the resulting recommendations would not possess the scientific flaws that we pointed out.

We appreciate the opportunity to review your report.

Sincerely,



Dennis Duffy
Assistant Secretary
for Planning and Analysis

Now on p. 45.

See comment 2.

See comment 3.

The following are our comments on VA's letter dated February 10, 1999.

GAO Comments

1. We are not suggesting that OSAGWI should use data from the DOD and VA registries to reach conclusions about causal relationships between participants' health outcomes and the likelihood of their exposure to chemical warfare agents. We recognize that these databases contain the results of medical examinations for voluntary, self-selected individuals that if used for research purposes could be affected by participation bias. However, the databases contain information about whether the participants believe that they were exposed to various chemical or environmental hazards, their general health status, and the results of medical examinations performed by DOD or VA. It is also possible that some or many of these participants may have been at or near a site under investigation by OSAGWI. Consequently, the databases may contain potentially relevant information about individuals that were at a site under investigation by OSAGWI—information which OSAGWI did not access for the cases we reviewed. We are not suggesting that this information would necessarily change the course of the OSAGWI investigation; however, review of this information could possibly suggest additional investigative steps that should be undertaken.

2. In our report, we recommend that OSAGWI contact the Naval Health Research Center regarding the usefulness and desirability of comparing data about veterans of NMCB-24 and NMCB-40. Center researchers told us that such a comparison might be useful. The point of our recommendation is that information developed in OSAGWI investigations that might have research usefulness should be forwarded to organizations performing the research. DOD agreed with this recommendation. Furthermore, it should be noted that the Seabee study is one of the research projects being performed under the management of the Research Working Group of Persian Gulf Veterans Coordinating Board (Project DOD-1E) and as such is one of the federally sponsored research projects addressing Gulf War illnesses. This project is using scientific methods for collecting data from both former and current Seabees and plans a multifaceted comparison of this data. We made no judgments regarding what the outcome of this work might be or how it might be reviewed by the epidemiology research community. However, we believe that all data or ideas for comparisons that might have applicability to Gulf War illnesses research should be forwarded for consideration by the appropriate research organization. Otherwise, an opportunity for learning more about Gulf War illnesses could be missed.

3. OSAGWI's own methodology for chemical incident investigations, which was derived from the United Nations and the international community, calls for obtaining information from the DOD and VA registries about the medical condition of personnel involved in an incident under investigation. We are not suggesting that OSAGWI establish a hypothesis from which it could derive undisputed conclusions. We are suggesting that the DOD and VA databases may contain potentially relevant information that could assist OSAGWI in determining the scope and nature of its investigations.

OSAGWI Reports and Active Investigations

Table I.1 lists reports published by OSAGWI. It is followed by a listing of active OSAGWI investigations.

Table I.1: OSAGWI Published Case Narratives, Information Papers, and Environmental Exposure Reports (as of Jan. 1, 1999)

Case name	Publication date
Khamisiyah	April 15, 1997
Camp Monterey	May 22, 1997
Fox Information Paper	July 29, 1997
Marine Minefield Breaching	July 29, 1997
Al Jubayl, Saudi Arabia	August 13, 1997
SCUD Piece	August 13, 1997
Exposure to Mustard Agent	August 28, 1997
Al Jaber Air Base	September 25, 1997
ASP/Orchard	September 25, 1997
M8A1 Information Paper	October 30, 1997
MOPP Information Paper	October 30, 1997
Medical Surveillance During ODS/DS Information Paper	November 6, 1997
Tallil Air Base	November 13, 1997
Kuwaiti Girls' School	March 19, 1998
An Nasiriyah SW	August 4, 1998
Czech/French Detections	August 4, 1998
Depleted Uranium Environmental Exposure Report	August 4, 1998
11th Marines	November 5, 1998
Oil Well Fire Environmental Exposure Report	November 5, 1998

Active OSAGWI Investigations (as of Jan. 1, 1999)

Air Campaign Information Paper
 Al Muthanna
 Biological Warfare
 CARC Paint Environmental Exposure Report
 Cement Factory
 Chemical Munitions Markings Information Paper
 Chemical Weapons Sites
 Edgewood Tapes
 Injured Marine
 Khamisiyah - Update
 M256 Information Paper
 Marine Breaching Followup
 Medical Record Keeping Information Paper

Appendix III
OSAGWI Reports and Active Investigations

Medical Surveillance Information Paper
Muhammadiyah
Pesticides/Insecticides Environmental Exposure Report
Possible Terrorist Attack at Al Jubayl
Possible Post-War Chemical Warfare Use on Iraqis
Rafha M256 Detections
Inhibited Red Fuming Nitric Acid Information Paper
Retrograde Equipment Environmental Exposure Report
Sand Environmental Exposure Report
SCUD Information Paper
Ukhaydir
Vaccine Administration Information Paper
XM21 RSCAAL Detection
JCMEC-TEU Sampling Process Information Paper

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