

Office, Office of Thrift Supervision, 1700 G Street, NW., Washington, DC 20552, by fax to (202) 906-6518, or by e-mail to [infocollection.comments@ots.treas.gov](mailto:infocollection.comments@ots.treas.gov). OTS will post comments and the related index on the OTS Internet site at <http://www.ots.treas.gov>. In addition, interested persons may inspect comments at the Public Reading Room, 1700 G Street, NW., by appointment. To make an appointment, call (202) 906-5922, send an e-mail to [public.info@ots.treas.gov](mailto:public.info@ots.treas.gov), or send a facsimile transmission to (202) 906-7755.

**FOR FURTHER INFORMATION CONTACT:** For further information or to obtain a copy of the submission to OMB, please contact Ira L. Mills at [ira.mills@ots.treas.gov](mailto:ira.mills@ots.treas.gov) (202) 906-6531, or facsimile number (202) 906-6518, Regulations and Litigation Division, Chief Counsel's Office, Office of Thrift Supervision, 1700 G Street, NW., Washington, DC 20552.

**SUPPLEMENTARY INFORMATION:** OTS may not conduct or sponsor an information collection, and respondents are not required to respond to an information collection, unless the information collection displays a currently valid OMB control number. As part of the approval process, we invite comments on the following information collection.

*Title of Proposal:* Consumer Complaint Form.

*OMB Number:* 1550-0NEW.

*Form Number:* 1723.

*Description:* The OTS Consumer Complaint form provides a model for the public to provide information to OTS to assist with the investigation of their complaint. The data collected via the form or letter is critical to investigating a complaint and will be used to create a record of the consumer's contact and will be entered into a database of information that can be incorporated into the OTS's supervisory process.

*Type of Review:* New Collection.

*Affected Public:* Individuals or households.

*Estimated Number of Respondents:* 1,180.

*Estimated Number of Responses:* 1,180.

*Estimated Burden Hours per Response:* 15 minutes.

*Estimated Frequency of Response:* On occasion.

*Estimated Total Burden:* 295 hours.

*Clearance Officer:* Ira L. Mills, (202) 906-6531, Office of Thrift Supervision, 1700 G Street, NW., Washington, DC 20552.

Dated: August 22, 2008.

**Deborah Dakin,**

*Senior Deputy Chief Counsel, Regulations and Legislation Division.*

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**BILLING CODE 6720-01-P**

## DEPARTMENT OF VETERANS AFFAIRS

### Determination of Presumption of Service Connection Concerning Illnesses Discussed in National Academy of Sciences Report on Gulf War and Health

**AGENCY:** Department of Veterans Affairs.

**ACTION:** Notice.

**SUMMARY:** As required by law, the Department of Veterans Affairs (VA) hereby gives notice that the Secretary of Veterans Affairs, under the authority granted by the Persian Gulf War Veterans Act of 1998, Public Law 105-277, title XVI, 112 Stat. 2681-742 through 2681-749 (codified in part at 38 U.S.C. 1118), has determined that there is no basis to establish a presumption of service connection at this time for any of the diseases, illnesses, or health effects discussed in the December 20, 2004, report of the National Academy of Science, titled "Gulf War and Health, Volume 3. Fuels, Combustion Products, and Propellants" based on exposure to fuels, combustion products, or propellants during service in the Persian Gulf during the Persian Gulf War. This determination does not in any way preclude VA from granting service connection for any disease, including those specifically discussed in this notice, nor does it change any existing rights or procedures.

**FOR FURTHER INFORMATION CONTACT:** Rhonda F. Ford, Chief, Regulations Staff (211D), Compensation and Pension Service, Veterans Benefits Administration, Department of Veterans Affairs, 810 Vermont Avenue, NW., Washington, DC 20420, (202) 461-9739.

#### SUPPLEMENTARY INFORMATION:

##### I. Statutory Requirements

The Persian Gulf War Veterans Act of 1998, Public Law 105-277, title XVI, 112 Stat. 2681-742 through 2681-749 (codified at 38 U.S.C. 1118), and the Veterans Programs Enhancement Act of 1998, Public Law 105-368, 112 Stat. 3315, directed the Secretary to seek to enter into an agreement with the National Academy of Sciences (NAS) to review and evaluate the available scientific evidence regarding associations between illnesses and exposure to toxic agents, environmental

or wartime hazards, or preventive medicines or vaccines to which service members may have been exposed during service in the Persian Gulf during the Gulf War. Congress directed NAS to identify agents, hazards, medicines, and vaccines to which service members may have been exposed during service in the Persian Gulf during the Gulf War.

Congress mandated that NAS determine, to the extent possible: (1) Whether there is a statistical association between exposure to the agent, hazard, medicine, or vaccine and the illness, taking into account the strength of the scientific evidence and the appropriateness of the scientific methodology used to detect the association; (2) the increased risk of illness among individuals exposed to the agent, hazard, medicine, or vaccine; and (3) whether a plausible biological mechanism or other evidence of a causal relationship exists between exposure to the agent, hazard, medicine, or vaccine and the illness.

Section 1118 provides that whenever the Secretary determines, based on sound medical and scientific evidence, that a positive association (*i.e.*, the credible evidence for the association is equal to or outweighs the credible evidence against the association) exists between exposure of humans or animals to a biological, chemical, or other toxic agent, environmental or wartime hazard, or preventive medicine or vaccine known or presumed to be associated with service in the Southwest Asia theater of operations during the Persian Gulf War and the occurrence of a diagnosed or undiagnosed illness in humans or animals, the Secretary will publish regulations establishing presumptive service connection for that illness. If the Secretary determines that a presumption of service connection is not warranted, the Secretary is to publish a notice of that determination, including an explanation of the scientific basis for that determination. The Secretary's determination must be based on consideration of the NAS reports and all other sound medical and scientific information and analysis available to the Secretary.

Although section 1118 does not define "credible evidence," it does instruct the Secretary to take into consideration whether the results (of any report, information, or analysis) are statistically significant, are capable or replication, and withstand peer review. See 38 U.S.C. 1118(b)(2)(B). Simply comparing the number of studies that report a significantly increased relative risk to the number of studies that report a relative risk that is not significantly increased is not a valid method for

determining whether the weight of evidence overall supports a finding that there is or is not a positive association between exposure to an agent, hazard, or medicine or vaccine and the subsequent development of the particular illness. Because of differences in statistical significance, confidence levels, control for confounding factors, and other pertinent characteristics, some studies are clearly more credible than others, and the Secretary has given the more credible studies more weight in evaluating the overall weight of the evidence concerning specific illnesses.

## II. Prior National Academy of Sciences Reports

NAS issued its initial report titled, *Gulf War and Health, Volume 1: "Depleted Uranium, Sarin, Pyridostigmine Bromide, Vaccines,"* on January 1, 2000. In that report, NAS limited its analysis to the health effects of depleted uranium, the chemical warfare agent sarin, vaccinations against botulism toxin and anthrax, and pyridostigmine bromide, which was used in the Gulf War as a pretreatment for possible exposure to nerve agents. On July 6, 2001, VA published a notice in the **Federal Register** announcing the Secretary's determination that the available evidence did not warrant a presumption of service connection for any disease discussed in that report. See 66 FR 35702 (2001).

NAS issued its second report titled, *"Gulf War and Health, Volume 2: Insecticides and Solvents,"* on February 18, 2003. In that report, NAS focused on the health effects of insecticides and solvents that were shipped to the Persian Gulf during the Persian Gulf War. The pesticides considered by NAS were organophosphorous compounds (malathion, diazinon, chlorpyrifos, dichlorvos, and azamethiphos), carbamates (carbaryl, propoxur, and methomyl), pyrethrins and pyrethyroids (permethrin and d-phenothrin), lindane, and N,N-diethyl-3-methylbenzamide (DEET). NAS considered 53 solvents in eight groups: Aromatic hydrocarbons (including benzene), halogenated hydrocarbons (including tetrachloroethylene and dry-cleaning solvents), alcohols, glycols, glycol esters, esters, ketones, and petroleum distillates. On August 24, 2007, VA published a notice in the **Federal Register** announcing the Secretary's determination that the available evidence did not warrant a presumption of service connection for any disease discussed in that report. 72 FR 48734 (2007).

## III. Gulf War and Health, Volume 3. Fuels, Combustion Products, and Propellants

NAS issued a third report, titled *"Gulf War and Health, Volume 3. Fuels, Combustion Products, and Propellants,"* on December 20, 2004. In that report, NAS focused on the health effects of hydrazines, red fuming nitric acid, hydrogen sulfide, oil-fire byproducts, diesel-heater fumes, and fuels (for example, jet fuel and gasoline).

In its report, NAS classified the evidence of an association between exposure to a specific agent and a specific health outcome into five categories:

- *Sufficient Evidence of a Causal Association:* This category means the evidence is sufficient to conclude that there is a causal association between exposure to a specific agent and a specific health outcome in humans. The evidence is supported by experimental data and fulfills the guidelines for sufficient evidence of an association. The evidence must be biologically plausible and satisfy several of the guidelines used to assess causality, such as: Strength of association, dose-response relationship, consistency of association, and a temporal relationship.

NAS did not find any health outcomes that met the criteria for this category.

- *Sufficient Evidence of an Association:* This category means the evidence is sufficient to conclude that a consistent association has been observed between exposure to a specific agent and a specific health outcome in human studies in which chance and bias, including confounding, could be ruled out with reasonable confidence. For example, several high-quality studies report consistent associations, and the studies are sufficiently free of bias, including adequate control for confounding.

NAS found sufficient evidence of an association between exposure to combustion products and lung cancer.

- *Limited/Suggestive Evidence of an Association:* This category means the evidence is suggestive of an association between exposure to a specific agent and a specific health outcome, but the body of evidence is limited by the inability to rule out chance and bias, including confounding, with confidence. For example, at least one high-quality study reports an association that is sufficiently free of bias, including adequate control for confounding. Other corroborating studies provide support for the association, but they were not sufficiently free of bias, including

confounding. Alternatively, several studies of lower quality show consistent associations, and the results are probably not due to bias, including confounding.

NAS found limited/suggestive evidence of an association between exposure to combustion products and cancers of the nasal cavity and nasopharynx; cancers of the oral cavity and oropharynx; laryngeal cancer; bladder cancer; low birthweight/intrauterine growth retardation (with exposure during pregnancy); preterm birth (with exposure during pregnancy); and incident asthma.

NAS found limited/suggestive evidence of an association between exposure to hydrazines and lung cancer.

- *Inadequate/Insufficient Evidence:* This category means the evidence is of insufficient quantity, quality, or consistency to permit a conclusion regarding the existence of an association between exposure to a specific agent and a specific health outcome in humans.

NAS found inadequate/insufficient evidence of an association between exposure to fuels and cancers of the oral cavity and oropharynx; cancers of the nasal cavity and nasopharynx; esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; laryngeal cancer; lung cancer; melanoma; nonmelanoma skin cancer; female breast cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; kidney cancer; bladder cancer; Hodgkin's disease; non-Hodgkin's lymphoma; multiple myeloma; myelodysplastic syndromes; adverse reproductive or developmental outcomes (including infertility, spontaneous abortion, childhood leukemia, central nervous system (CNS) tumors, neuroblastoma, and Prader-Willi syndrome); peripheral neuropathy; neurobehavioral effects; Multiple Chemical Sensitivity symptoms; nonmalignant respiratory disease; chronic bronchitis; asthma; emphysema; dermatitis (irritant and allergic); and sarcoidosis.

NAS found inadequate/insufficient evidence of an association between exposure to combustion products and esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; melanoma; female breast cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; ocular melanoma; kidney cancer; non-

Hodgkin's lymphoma; Hodgkin's disease; multiple myeloma, leukemia; myelodysplastic syndromes; preterm births (based on exposure during a specific time period during pregnancy, such as the first trimester); low birth weight and intrauterine growth retardation (based on exposure before gestation or during a specific period during pregnancy, such as the first trimester); specific birth defects, including cardiac effects (with maternal or paternal exposure before conception or maternal exposure during early pregnancy); all childhood cancers identified, including acute lymphocytic leukemia, leukemia, neuroblastoma, and brain cancer; neurobehavioral effects; post-traumatic stress disorder; nervous system subgroupings (or individual nervous system diseases); Multiple Chemical Sensitivity symptoms; chronic bronchitis (less than 1 year of exposure); emphysema; chronic obstructive pulmonary disease; ischemic heart disease or myocardial infarction (less than 2 years of exposure); dermatitis (irritant and allergic); and sarcoidosis.

NAS found inadequate/insufficient evidence of an association between exposure to hydrazines and hematopoietic and lymphopoietic cancers; digestive tract cancers; pancreatic cancer; bladder cancer; kidney cancer; emphysema; ischemic heart disease or myocardial infarction; and hepatic disease.

NAS found inadequate/insufficient evidence of an association between exposure to nitric acid and stomach cancer; melanoma; lymphopoietic cancers; pancreatic cancer; laryngeal cancer; lung cancer; bladder cancer; multiple myeloma; and cardiovascular diseases.

• *Limited/Suggestive Evidence of No Association:* This category means the evidence is consistent in not showing an association between exposure to a specific agent and a specific health outcome after exposure of any magnitude. A conclusion of no association is inevitably limited to the conditions, magnitudes of exposure, and length of observation in the available studies. The possibility of a very small increase in risk after exposure studied cannot be excluded.

NAS did not find any health outcomes that met the criteria for this category.

#### A. Combustion Products

##### 1. Sufficient Evidence of an Association

NAS found sufficient evidence of an association between combustion products and lung cancer. NAS found that there was evidence of associations

between exposure to ambient air pollution, engine exhausts, and heating sources (coal) and lung cancer. Cohort and case-control studies showed consistently that risks increased with increasing ambient air pollution. There was evidence from both cohort and case control studies that increasing exposure to engine exhausts and its components such as polycyclic aromatic hydrocarbons (PAHs) increased the risk of lung cancer.

Based on 82 epidemiological studies, NAS derived a positive finding of "sufficient evidence of an association" between exposure to combustion products and lung cancer. The epidemiological studies included cohort studies on the health effects of ambient air pollution on people dwelling in cities, workers exposed to motor vehicle exhaust, and case-control studies of lung cancer patients. The case-control studies were of lung cancer patients who were exposed in their occupation, or in their homes or daily lives to indoor air pollution from combustion products from wood, coal, kerosene or gas burning stoves or heaters over years. Relevant occupational exposures included working as a bus, taxi, or truck driver, or as a miner or railroad worker.

NAS pointed out that lung cancer from all causes is the leading cause of cancer death among both men and women, and that smoking may be responsible for 80% of lung cancer cases. Nevertheless, NAS concluded that "there was evidence of associations between exposure to ambient air pollution, engine exhausts, and heating sources (coal) and lung cancer." Cohort and case-control studies showed consistently that risks increased with increasing ambient air pollution. There was evidence from both cohort and case-control studies that increasing exposure to engine exhausts and to its components increased the risk of lung cancer.

The Secretary has determined that, although there is sufficient evidence of an association between combustion products and lung cancer, VA does not consider this exposure to be "associated with" the 1991 Gulf War. Please see section IV for further detail.

##### 2. Limited/Suggestive Evidence of an Association

NAS found limited/suggestive evidence of an association between exposure to combustion products and cancers of the nasal cavity and nasopharynx; cancers of the oral cavity and oropharynx; laryngeal cancer; bladder cancer; low birthweight/ intrauterine growth retardation and exposure during pregnancy; preterm

birth and exposure during pregnancy; and incident asthma.

The results of the studies of the relationship between combustion products and cancers of the nasal cavity and nasopharynx were inconsistent, and indirect methods were used to assess exposure. However, positive associations were reported between combustion products (particularly wood smoke) and cancer of the nasopharynx.

NAS's positive finding of "limited/suggestive evidence of an association" between exposure to combustion products and cancers of the nasal cavity and nasopharynx was based on 4 epidemiological case-control studies. These studies involved patients with nasal cavity and nasopharynx cancer, who were exposed regularly to combustion products, by virtue of their occupation or in their daily lives, over many years. Relevant exposures included exposure to fumes from the burning of wood and other materials, use of fuels, and occupational exposures such as working as a motor vehicle driver. Although NAS found these studies showed inconsistent results, they concluded that positive associations were reported by studies conducted in China between combustion products (particularly wood smoke) and cancer of the nasopharynx.

NAS's positive finding of "limited/suggestive evidence of an association" between exposure to combustion products and cancers of the oral cavity and oropharynx was based on 9 epidemiological case-control studies. These epidemiological studies were of oral cavity and oropharynx cancer patients who were exposed to ambient air pollution in the cities where they lived, or who were exposed over many years due to their occupation or to indoor pollution in their homes due to combustion products from wood, coal, kerosene or gas burning stoves or heaters. Occupational exposures included working as a motor vehicle driver or railroad employee. NAS concluded that results of several studies suggested an association between cancers of the oral cavity and oropharynx and exposure to combustion products.

NAS's positive finding of "limited/suggestive evidence of an association" between exposure to combustion products and laryngeal cancer was based on one epidemiological cohort study of workers exposed to diesel exhaust, and 16 epidemiological case-control studies of patients with laryngeal cancer. These studies involved people who were exposed to combustion products due to their occupations as railway workers, motor

vehicle drivers, or as city commuters exposed to ambient air pollution. The studies also included people who used wood and other fuel burning stoves regularly. Several studies reported positive findings, including two studies regarding exposure to the emissions of fossil-fuel stoves and one study regarding exposure to wood-stove emissions. Several studies reported small increases in laryngeal-cancer risk for some exposures; however, overall, the results were inconsistent. NAS concluded that the epidemiologic literature overall provided limited/suggestive evidence of an association between exposure to combustion products and laryngeal cancer.

NAS found “limited/suggestive evidence of an association” between exposure to combustion products and bladder cancer. Studies that assessed the relationship between exposure to combustion products and bladder cancer have not been consistently positive, and no studies assessed measurements of exposure. One pooled analysis of occupational exposures found questionably increased risks in exhaust-related occupations, and the risk was increased with higher exposures to polycyclic aromatic hydrocarbons (PAHs) and benzopyrene, which are combustion products. A slightly increased risk was observed for diesel exhaust. In a related study, similar findings were noted with some exposures to exhausts and PAHs. A more detailed assessment of PAH exposures based on expert review of work-history information found apparently stable associations with average and cumulative PAH exposures and total duration of PAH exposures. Taken together, the results constituted limited or suggestive evidence of an association between combustion products and bladder cancer, but the lack of exposure measurements and the heterogeneity of results precludes classifying the association as sufficient.

NAS’s positive finding of “limited/suggestive evidence of an association” between exposure to combustion products during pregnancy and low birthweight or intrauterine growth retardation was based on 8 epidemiological studies of pregnant women. These women were exposed to ambient air pollution “smog” in heavily polluted cities in the Czech Republic where coal was burned, and in urban cities located in South Korea, China, Canada, and the United States.

Two studies found evidence of a relationship between low birthweight or intrauterine growth retardation and combustion-product exposure. Their analyses controlled for several known

risk factors, including maternal smoking. Several other studies reviewed by NAS provided supportive evidence of a relationship, but most were unable to adjust for maternal smoking.

NAS’s positive finding of “limited/suggestive evidence of an association” between exposure to combustion products during pregnancy and preterm birth was based on four epidemiological studies. The studies that found evidence of a relationship between preterm birth and combustion-product exposure were based primarily on maternal residence during pregnancy. Most of these studies controlled for several known risk factors for preterm birth (such as maternal age, race, education, and access to prenatal care), but none of the studies could completely control for maternal smoking, which is an important risk factor for preterm birth.

NAS’s positive finding of “limited/suggestive evidence of an association” between exposure to combustion products and asthma was based primarily on two studies, which evaluated an association between asthma and exposure to combustion products in ambient air pollution. NAS also relied on a study of veterans of the 1991 Gulf War that found an association between oil-well fire smoke and asthma, and a study associating “biomass combustion” and asthma among people over 60 years old living in India.

The epidemiological studies found that new cases of asthma were associated with combustion-product exposure in air pollutants. A study of Gulf War veterans using an objective exposure-measurement method, found an association between oil-well fire smoke and asthma in Gulf War veterans, but could not distinguish between new cases arising after the war and exacerbation of pre-existing conditions. Although the other key Gulf War study found no relationship between exposure and asthma, its definition of asthma was inadequate. Other studies of biomass-fuel combustion and outdoor air pollution supported a relationship between combustion exposure and asthma.

The Secretary has determined that, although there is limited/suggestive evidence of an association between exposure to combustion products and cancers of the nasal cavity and nasopharynx; cancers of the oral cavity and oropharynx; laryngeal cancer; bladder cancer; low birthweight/ intrauterine growth retardation (with exposure during pregnancy); preterm birth (with exposure during pregnancy); and incident asthma, VA does not consider this exposure to be “associated

with” the 1991 Gulf War. Please see section IV for further detail.

### 3. Inadequate/Insufficient Evidence

NAS found inadequate/insufficient evidence between exposure to combustion products and esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; melanoma; female breast cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; ocular melanoma; kidney cancer; non-Hodgkin’s lymphoma; Hodgkin’s disease; multiple myeloma, leukemia; myelodysplastic syndromes; preterm births (based on exposure during a specific time period during pregnancy, such as the first trimester); low birth weight and intrauterine growth retardation (based on exposure before gestation or during a specific period during pregnancy, such as the first trimester); specific birth defects, including cardiac effects (with maternal or paternal exposure before conception or maternal exposure during early pregnancy); all childhood cancers identified, including acute lymphocytic leukemia, leukemia, neuroblastoma, and brain cancer; neurobehavioral effects; post-traumatic stress disorder; nervous system subgroupings (or individual nervous system diseases); Multiple Chemical Sensitivity symptoms; chronic bronchitis (less than 1 year of exposure); emphysema; chronic obstructive pulmonary disease; ischemic heart disease or myocardial infarction (less than 2 years of exposure); dermatitis-irritant and allergic; and sarcoidosis.

NAS reviewed five studies of combustion products and esophageal cancer, and concluded that no consistent association was observed in those studies.

NAS reviewed six studies of combustion products and stomach cancer. Two of the studies reported an increased risk for stomach cancer, but the method used to assess exposure was limited and there were no adjustments for confounders.

Studies of exposure to combustion products and colon cancer reported positive associations for exposure to some combustion products, but not to others. Further, a number of the positive findings were limited, due to their large confidence intervals. NAS found that the evidence of an association was inadequate because of the small number of studies available.

With regard to rectal cancer, NAS found the studies’ results were inconsistent, and the number of studies was small. NAS also noted that any

positive studies failed to include at least one high-quality study supported by an adequate exposure assessment.

NAS noted only one relevant study that evaluated exposure to combustion products and hepatic cancer. Although associations were noted for some occupations, there were few cases with relevant exposure, and the study did not consider all pertinent risk factors.

The four reviewed studies of combustion-product exposure and pancreatic cancer generally did not provide evidence of an association. One study found an association between exposure to coal combustion products and increased risk of pancreatic cancer, but it did not find a link between nine other types of combustion products and pancreatic cancer.

Studies regarding melanoma addressed exposure to combustion products but their reliability is limited because they failed to adjust for exposure to sunlight, a major risk factor for melanoma. Overall, the studies did not report significant findings of association for most types of exposure. Two studies found isolated effects of specific exposures (propane exhaust and being a traffic administrator, respectively) that were not among the major exposures considered by NAS.

NAS reviewed three studies concerning nonmelanoma skin cancer and combustion products. The studies generally did not report statistically significant findings of an association. NAS found that for the more common type of nonmelanoma skin cancer (basal cell carcinoma), the findings were largely negative. Two of the studies stated findings regarding squamous cell carcinoma, with one finding a statistically significant association for one type of exposure (diesel fumes), but not others, and one study finding no association.

The two studies involving female breast cancer and exposure to combustion products essentially had negative results.

Of the two reviewed studies regarding exposure to combustion products and male breast cancer, one did not find an association between PAH exposure and male breast cancer, and the other, although reporting a positive association, was limited by its method of exposure assessment.

NAS reviewed three studies regarding exposure to fuels or combustion products and cervical, endometrial, uterine, or ovarian cancer, and found that they provided inadequate support for an association.

NAS reviewed four prostate cancer studies that measured the relationship between occupations having potential

for exposure to combustion products or PAHs or having more rigorously derived estimates of exposure to such agents and prostatic cancer. Although the studies reported several positive associations, NAS noted that the results were not consistently positive. For example, one study showed results contrary to a dose-response relationship, while another study showed an increased risk in firefighters and railroad workers but not in other transportation or trucking workers.

Testicular cancer studies did not provide enough relevant data to draw any sort of conclusion about exposure to fuels or combustion products and testicular cancer.

Data on combustion products and brain cancer (nervous system cancers) were too sparse to determine whether an association exists.

Three studies of ocular melanoma reported increased, but imprecise, risks of ocular melanoma in occupations related to transportation. The reliability of these studies is limited by their small size, lack of statistical significance, and lack of adequate exposure assessment.

Although some studies of exposure to combustion products and kidney cancer suggested a possible association based on job title, NAS found that the results were not consistently positive, with some studies showing no increased risk. Further, the results of some studies showing positive associations were limited by considerations of statistical significance and other factors.

Studies on non-Hodgkin's lymphoma (NHL) had no firmly positive findings. In the study with the most objective exposure assessment, there was no indication of an association with any of the fuels or their combustion products.

The studies regarding Hodgkin's disease (HD) were limited by their small numbers of cases and the nonspecificity of their exposure assessments. Further, the three primary studies reviewed by NAS showed findings of no association.

NAS reviewed ten studies concerning multiple myeloma and exposure to combustion products. Three of the studies the NAS found to be among the most sizable or significant reported only marginally increased risks and are just barely suggestive of an association. Other studies showed no association, and yet other studies are limited due to imprecise estimates of increased multiple-myeloma risk in association with exhaust exposure and concerns regarding exposure assessments. NAS concluded that the literature overall provided insufficient evidence of an association.

NAS reviewed six studies of leukemia and exposure to combustion products.

Four of the studies showed no findings of a statistically significant increased risk. In the other two studies, the apparent associations were related to separate types of leukemia, and the authors of the studies noted that any increase in leukemia risk was difficult to attribute specifically to exhaust because of concurrent exposure to fuels and benzene. The exposure assessments in all the studies were based on information from sources of questionable reliability (personal interviews or medical records) or had a low degree of specificity for combustion products.

NAS reviewed two studies regarding myelodysplastic syndromes and exposure to combustion products. One study found no significant evidence of an association. The other study found stable evidence of an association for the not particularly substance-specific occupation of machine operator. Further, the reliability of that study is limited because the analyses by researchers were rudimentary and failed to adjust for possible confounders when the information was available.

As noted above in section III.A.2, NAS found limited/suggestive evidence of an association between exposure to combustion products during pregnancy and preterm birth. NAS similarly found limited/suggestive evidence of an association between exposure to combustion products during pregnancy and low birth weight or intrauterine growth retardation. However, NAS also found that there was inadequate/insufficient evidence of an association between combustion products exposure at any specific point during pregnancy (such as the first trimester) and these reproductive effects. Although several of the studies NAS reviewed reported results for exposure at different stages of pregnancy, there were no consistent findings as to whether the risks were greater with exposure early or late in pregnancy. Additionally, none of the studies completely controlled for the significant risk factor of smoking during pregnancy.

One study of an association between maternal exposure to air pollutants and the risk of birth defects reported relationships between certain cardiac defects and increasing exposure to CO and O<sub>3</sub>. NAS discussed two studies that examined the association between paternal employment as a firefighter and the risk of cardiac birth defects. One of the studies found no evidence of an association, while the other found some evidence that certain cardiac defects were associated with paternal employment as a firefighter. Both studies had limitations due to size,

potential confounding and/or inadequate information about duration of paternal firefighting. In a study of maternal or paternal exposures among residents of Rotorua, New Zealand, a city with high geothermal exposure to hydrogen sulfide, no excess birth defects were reported in comparison with residents in the rest of New Zealand.

NAS discussed eleven studies of the association between combustion-products exposure and childhood cancers, including acute lymphocytic leukemia, leukemia, neuroblastoma, and brain cancer. All of the studies were limited by their inability to validate employment history and by the lack of details on specific assessments of exposure to combustion products. The exposure groups were broad and included many diverse occupations where exposure to other chemicals was noted in addition to combustion products. Six of the studies found no association between combustion products exposure and the studied childhood cancers. One study reported general findings of associations for a variety of childhood cancers, while the remaining four studies contained mixed findings, reporting positive associations for certain types of cancers.

All of the studies on neurobehavioral effects and combustion-product exposure suffered from significant methodological limitations. Several Gulf War studies reported positive relationships between self-reported exposure and self-reported neuropsychologic, cognitive, or mood symptoms or multiple unexplained symptoms, but the lack of objective measurement of exposure limits the reliability of those findings. Among two non-veteran studies reporting positive findings for certain neurobehavioral effects, one study did not have a control group, and the other had serious limitations, especially in subject selection.

NAS identified no studies showing an association between combustion-products exposure and post-traumatic stress disorder (PTSD). Although several studies addressed the prevalence of PTSD among firefighters, the result is most likely attributable to the hazardous nature of the job rather than exposure to combustion products. Only a few Gulf War studies have examined whether self-reported combustion-product exposure was related to PTSD as an outcome measure, and none has found such a relationship. None of the studies with objectively measured oil-well fire smoke examined PTSD as an outcome measure.

Regarding nervous system disease subgroupings (or individual nervous system diseases), NAS excluded studies involving only overbroad and nonspecific health outcomes and focused on individual neurologic diseases or subgroupings of nervous-system diseases. Only two identified studies examined nervous-system subgroupings in relation to combustion-products exposure. One study found exposure-response relationships with nervous-system subgroupings in a hospital discharge survey. The limitation of this study was assignment of exposure (residence only) and potential for exposure misclassification. The other study did not find a relationship between combustion product exposure and multiple sclerosis. No other studies of nervous system subgroups or the individual diseases met NAS's criteria for inclusion.

Although NAS reviewed several studies of Multiple Chemical Sensitivity (MCS) in Gulf War veteran or civilian samples, those studies provided relatively little evidence that MCS was associated with combustion-products exposure in service. Several studies involved questionnaires on which veterans or civilians self-reported that exposure to certain combustion products (e.g., tobacco smoke, car exhaust) are among the factors that can trigger their symptomatology. However, NAS noted that most of the studies did inquire as to the first onset of symptoms. Further, the studies generally were limited by methodologic concerns, including self-reported exposures and symptoms and the possibility of recall bias.

Although the studies reviewed by NAS indicated a probable relationship between long-term (over 1 year) exposure to combustion products and chronic bronchitis, a key unresolved issue was whether shorter-term exposures (less than 1 year) can cause the condition. NAS found inadequate published data that addressed the effect of shorter term combustion-product exposures (less than 1 year) on the risk of developing chronic bronchitis. Even if it could be shown that long-term exposure to combustion products caused chronic bronchitis, it might be expected to cease after exposure without long-term health consequences. NAS found inadequate published data to evaluate the natural history of chronic bronchitis after cessation of exposure to combustion products.

A study found that mortality due to emphysema was not considerably increased among workers exposed to diesel exhaust. This result was found

after adjustments for the effects of smoking were made. Likewise, a study of veterans exposed to oil-well fires also did not find a relationship with emphysema. Other studies that included emphysema in the analysis were methodologically inadequate.

NAS did not identify any high-quality studies that evaluated the effect of exposure to combustion products on the risk of chronic obstructive pulmonary disease (COPD), as defined by objective evidence of irreversible airflow obstruction with spirometry. Several studies of biomass-smoke exposure used measures of airflow obstruction but had methodologic limitations that precluded clear conclusions about the connection between combustion exposure and COPD.

There was relatively consistent epidemiologic evidence of the relation between ischemic heart disease (including myocardial infarction) and long-term exposure to fossil-fuel combustion products, including motor-vehicle exhaust and combustion-derived fine particulate matter. However, the increased risk was small in absolute terms, and there was no adequate epidemiologic evidence to support the role of relatively short exposures (similar to that experienced in the Gulf War), followed by an exposure-free period, and then development of ischemic heart disease events. Accordingly, NAS found inadequate/insufficient evidence to determine whether an association exists between short-term exposure (less than 2 years) to combustion products and the development of ischemic heart disease after an exposure-free period of months or years.

Rashes were frequently reported by Gulf War veterans, but only one study of Gulf War veterans searched for relationships between dermatitis and self-reported exposure during the Gulf War. No exposure to combustion products or any other self-reported exposure was related to dermatitis, defined as rashes, eczema, or skin allergies.

NAS identified three epidemiologic studies on the relationship between occupational or residential exposure to fires and sarcoidosis, all of which had significant methodologic limitations. One study had numerous limitations, such as inadequate description of how the cases without biopsy confirmation were diagnosed and the lack of control for employment history (besides farming), recall bias, and lack of measurement of pollutant concentrations. The authors noted that sarcoidosis could be associated with a component of wood-burning or wood-

handling, namely contact with smoke, ash, wood particles, or wood molds. Another study was limited by the lack of specific exposure assessment and of analysis of duration or frequency of exposure to combustion products. There was no control for potential confounders, such as race or familiar aggregation of sarcoidosis. In addition, there was no way to determine the role of combustion products or exposure to other toxicants, allergens, or infectious agents. The third study was limited by the small sample, the low statistical power, the lack of a risk estimate for firefighters versus police officers, the lack of exposure assessment for combustion products, and the lack of assessment of coexposures to other chemicals in the workplace.

Based on the information and analysis in the NAS report, the Secretary has determined that there is insufficient credible evidence to conclude that there is a positive association between exposure to combustion products and esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; melanoma; nonmelanoma skin cancer; female breast cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; ocular melanoma; kidney cancer; non-Hodgkin's lymphoma; Hodgkin's disease; multiple myeloma, leukemia; myelodysplastic syndromes; preterm births (based on exposure during any specific time period during pregnancy, such as the first trimester); low birth weight and intrauterine growth retardation (based on exposure before gestation or during any specific period during pregnancy, such as the first trimester); specific birth defects, including cardiac effects (with maternal or paternal exposure before conception or maternal exposure during early pregnancy; all childhood cancers identified, including acute lymphocytic leukemia, leukemia, neuroblastoma, and brain cancer; neurobehavioral effects; post-traumatic stress disorder; nervous system disease subgroupings (or individual nervous system diseases); MCS symptoms; chronic bronchitis (less than 1 year of exposure); emphysema; chronic obstructive pulmonary disease; ischemic heart disease or myocardial infarction (less than 2 years of exposure); dermatitis-irritant and allergic; and sarcoidosis. Further, as explained in section IV of this notice, VA does not consider the combustion-products exposures underlying the NAS findings to be exposures "associated with" the 1991 Gulf War. Therefore, a

presumption of service connection is not warranted for any such illness based upon exposure to combustion products during service in the Gulf War.

#### *B. Hydrazines*

##### *1. Limited/Suggestive Evidence of an Association*

NAS found limited/suggestive evidence of an association between exposure to hydrazines (monomethylhydrazine "MMH," and unsymmetrical (1,1-)dimethylhydrazine "UDMH") used as rocket propellants, and lung cancer. This conclusion was based primarily on one high-quality study, as discussed below.

An occupational study of a U.S. cohort of aerospace workers engaged in testing rockets using hydrazine fuel demonstrated an association between hydrazine exposure and risk of lung cancer. Several sources of potential confounding, including sex and radiation exposure, were controlled by study design. Other potentially confounding variables were controlled in multivariate analysis, including age, pay type, and time since hire or transfer. Although the smoking status of most workers was unknown, there was indirect evidence that smoking did not confound the results.

Two other studies of lung cancer were limited by small sample size and inadequate study power. In addition, another study was limited by its failure to control for coexposure to other carcinogenic substances, including asbestos and PAHs. The lack of internal control subjects and the lack of information on smoking constitute major limitations for both studies. Consequently, there was inadequate evidence to evaluate the consistency of the association between hydrazine and lung cancer beyond the study of the U.S. cohort.

NAS stated in its report that U.S. military personnel could have been exposed to UMDH during Operation Desert Storm if UMDH was used as a rocket fuel in Scud missiles launched by Iraq and the U.S. military personnel were in the vicinity of the Scud missiles when they disintegrated. However, NAS stated that hydrazines were apparently not used in Scud missiles during the 1991 Gulf War even though Iraq had apparently experimented with UDMH as a rocket fuel. NAS further stated that it was not aware of any other potential use of hydrazines that could have resulted in exposure of U.S. service personnel.

Based on information and analysis in the NAS report and from DoD, VA does not consider exposure to hydrazines to be exposures "associated with" the 1991

Gulf War. Please see section IV for further detail. Therefore, a presumption of service connection is not warranted for lung cancer based upon exposure to hydrazine during service in the 1991 Gulf War.

##### *2. Inadequate/Insufficient Evidence*

NAS found inadequate/insufficient evidence between hydrazines and hematopoietic and lymphopoietic cancers; digestive tract cancers; pancreatic cancer; bladder cancer; kidney cancer; emphysema; ischemic heart disease or myocardial infarction; and hepatic disease.

NAS noted that relatively few studies existed concerning the health effects of hydrazine exposure, and that lung cancer was the only health outcome represented in all three cohort studies reviewed by the committee. NAS further noted that individual findings in those studies also reported somewhat increased mortality from cancer at sites other than the lung (hematopoietic and lymphopoietic, bladder and kidney, digestive tract, and pancreas) and from two noncancer conditions (emphysema and ischemic heart disease). NAS concluded, however, that the few available studies do not provide adequate or consistent evidence of an association between exposure to hydrazines and any of those other health outcomes.

Based on the information and analysis in the NAS report, the Secretary has determined that there is insufficient credible evidence to conclude that there is a positive association between exposure to hydrazines and hematopoietic and lymphopoietic cancers; digestive tract cancers; pancreatic cancer; bladder cancer; kidney cancer; emphysema; ischemic heart disease or myocardial infarction; and hepatic disease. Further, as explained in section IV of this notice, VA does not consider exposure to hydrazines to be exposures "associated with" the 1991 Gulf War. Therefore, a presumption of service connection is not warranted for any such illness based upon exposure to hydrazine during service in the 1991 Gulf War.

#### *C. Fuels—Inadequate/Insufficient Evidence*

NAS found inadequate/insufficient evidence of an association between exposure to fuels and cancers of the oral cavity and oropharynx; cancers of the nasal cavity and nasopharynx; esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; laryngeal cancer; lung cancer; melanoma; nonmelanoma skin cancer; female breast



cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; kidney cancer; bladder cancer; Hodgkin's disease; non-Hodgkin's lymphoma; multiple myeloma; myelodysplastic syndromes; adverse reproductive or developmental outcomes (including infertility, spontaneous abortion, childhood leukemia, CNS tumors, neuroblastoma, and Prader-Willi syndrome); peripheral neuropathy; neurobehavioral effects; MCS symptoms; nonmalignant respiratory disease; chronic bronchitis; asthma; emphysema; dermatitis-irritant and allergic; and sarcoidosis.

NAS reviewed five studies regarding cancer of the oral cavity and oropharynx and fuels. NAS found that the three occupational cohort studies it reviewed each had limited statistical power and were therefore uninformative. NAS further concluded that the two case-control studies it reviewed failed to report any consistent relationship between fuel exposure and cancers of the oral cavity and oropharynx.

NAS found little information available on exposure to fuels and cancers of the nasal cavity and nasopharynx, and that the two studies it reviewed failed to provide convincingly positive findings.

NAS found that studies of an association between fuel exposure and esophageal cancer were few and results were inconsistent and inadequate to support an association. Some of the studies were unreliable because they analyzed esophageal cancer and stomach cancers together, and NAS therefore could not determine which specific cancer type may have been associated with fuel exposure. Other studies showed no evidence of association.

NAS also found that studies of an association between fuel exposure and stomach cancer were inconsistent and inadequate to support an association. As noted above, some of the studies were unreliable because they analyzed esophageal cancer and stomach cancers together in relation to fuel exposure and NAS could not determine which specific cancer type may have been associated with fuel exposure. Other studies showed no evidence of association.

NAS found that the studies concerning fuel exposure and colon cancer provided no consistent evidence of an association. Although some studies showed increased risk of colon cancer, the increases were modest and the confidence intervals in several instances included the null. Three

studies analyzed colon cancer and rectal cancer together and, therefore, NAS could not determine whether exposure to fuels may have been associated with a specific type of cancer.

NAS found that the studies reporting positive associations between fuels and rectal cancer were not consistent and the number of studies was small. Furthermore, the positive studies failed to include at least one high-quality study supported by an adequate exposure assessment. Some studies found no evidence of association between fuel exposure and rectal cancer.

NAS noted only one relevant study that evaluated exposure to fuels and hepatic cancer in which there were few cases with relevant exposure, and the study did not consider all pertinent risk factors.

NAS found only two relevant studies on the risk of pancreatic cancer posed by fuel exposure. One study found no association. The other study reported an association, but the results were imprecise, due in part to a large confidence interval that included the null.

NAS found that the results regarding exposure to fuels and laryngeal cancer were inconsistent. Two studies reviewed by NAS reported a modest increase in the risk of laryngeal cancer associated with exposure to fuels, but the reliability of those findings is limited because the exposures in both studies were self-reported. Another study reported an increased, but imprecise, risk of laryngeal cancer in vehicle mechanics, but found no increase in garage and gasoline-station workers.

NAS found the results of studies of fuel exposure and lung cancer risk were inconsistent. One study reported an association between kerosene and crude-oil exposure and squamous-cell lung cancer, between diesel-fuel exposure and nonadenocarcinoma, and between heating-oil exposure and oat-cell lung cancer. Two studies did not find an association in workers most likely to have been exposed to fuels.

The studies examined by NAS addressing melanoma and exposure to fuels were not adjusted for sun exposure, a major risk factor for melanoma, and the workers—particularly the exploration, drilling, and pipeline workers—may have received considerable sun exposure while performing their jobs. But the one case-control study with fairly reliable exposure analysis did not support an association in workers likely to have been exposed to fuels.

Of the available epidemiologic studies regarding nonmelanoma skin cancer that met NAS's criteria, one study reported one borderline association between fuel exposure and squamous-cell carcinoma. The other two reports reviewed by NAS had methodologic limitations and did not provide reliable evidence of an association. For the more common type of nonmelanoma skin cancer (basal cell carcinoma), the findings were largely negative.

NAS reviewed three studies concerning fuel exposure and female breast cancer. One study found no increased risk of breast cancer, while the other two found only an insignificant increase in risk.

NAS found no studies assessing the possible relationship of male breast cancer to fuel exposure alone. NAS reviewed one study that reported a positive finding regarding combined exposure to fuels and combustion products and male breast cancer. NAS found, however, that the method used to assess exposure in that study was limited.

NAS reviewed three studies concerning fuel exposure and female genital cancers. The studies failed to provide any significant evidence of an association between exposure to fuels and cervical, endometrial, uterine, or ovarian cancer.

NAS reviewed several studies regarding an association between fuel exposure and prostatic cancer. Only one of those studies reported a positive association between a fuel-related exposure and prostatic cancer. That study found an association between exposure to diesel fuel and prostate cancer, but did not find significant evidence of an association for other types of fuel exposure. The other reports reviewed by NAS were negative for any association.

Only one study addressed the association between fuel exposure and testicular cancer, and it found no evidence of an association. NAS concluded that there was not enough relevant data to draw any sort of conclusion about exposure to fuels and testicular cancer.

Several studies reported sporadic associations between fuel exposure and nervous system cancers (brain cancer), but the results were limited by several factors, including wide confidence intervals that include the null. In some studies, the increased risk was found only among workers likely to have lesser fuel exposure, while no increased risk was seen among workers likely to have greater fuel exposure. None of the studies could be considered a high-quality study supported by an adequate



exposure assessment. Additionally, some studies found no evidence of association.

No key study that was positive for an association between exposure to fuels and kidney cancer was identified. NAS found the uniformly negative results of a study of a comprehensive sample of renal cell carcinoma cases in the petroleum industry with excellent exposure assessment to be compelling.

NAS reviewed several studies concerning fuel exposure and bladder cancer. Several of the studies found no evidence or no significant evidence of an association. Other studies provided evidence of a relationship between fuel exposure and bladder cancer, but the relationship was not consistently increased in any study with a detailed and specific exposure assessment. The positive findings in some studies were further limited by the methods used to estimate exposure and the difficulty in segregating fuel exposure from combustion-product exposure in some instances.

Regarding Hodgkin's disease, the studies were limited by their small numbers of cases and the nonspecificity of their exposure assessments. Of the five studies reviewed by NAS, two found no evidence of an association between fuel exposure and Hodgkin's disease, one found an insignificant increase only among males. The other two studies showed evidence of an association, but were limited by wide confidence intervals and the lack of any relationship to a specific job or duration of employment.

Studies on non-Hodgkin's lymphoma had no firmly positive findings. The most well conducted studies showed no evidence of association.

NAS found no consistent relationship between exposure to fuels and multiple myeloma in the studies reviewed. Most studies reported no association.

NAS reviewed two studies that showed evidence of an association between myelodysplastic syndrome and exposure to petroleum-related substances. However, a significantly larger study using similar methods and procedures failed to produce consistent results. The larger study reported only a modest increased risk, with confidence intervals including the null, and did not find any evidence of a dose-response relationship with duration or intensity of exposure.

NAS determined that it was difficult overall to reach conclusions on the epidemiologic studies of adverse reproductive outcomes and exposure to fuels. The assessment of findings was limited by the small number of studies available on each health outcome, the

possibility of recall bias, and the lack of specificity of exposure to the agents of concern in this report. NAS found no adequate studies regarding the relationship between fuel exposure and female infertility. NAS found one study concerning fuel exposure and male fertility, and that study showed no effect on sperm measures among persons exposed to jet fuels. NAS found only one study on fuel exposure and spontaneous abortion. The study showed a significant increase in spontaneous abortion among women living in an area where water used for drinking, cooking, and bathing was contaminated by nearby oil fields, however, the finding was potentially limited by recall bias and methods of estimating exposure. NAS identified one study showing an increased risk of childhood leukemia in the offspring of men exposed to petroleum for 1,000 days or more before conception, and one study showing an increased risk of childhood leukemia based on maternal exposure to fuels during pregnancy. The latter study was potentially limited by recall bias, interviewer bias, control-selection procedures, and lack of validation for other risk factors. NAS noted that three other occupational studies showed no relationship between parental employment in a field involving fuel exposure and childhood leukemia. With respect to childhood cancers of the central nervous system, NAS identified one study showing no increase in neuroblastoma based on maternal exposure to fuels during pregnancy, but moderate increases based on paternal exposures. The study authors were unable to distinguish between paternal exposures occurring before or after conception. Another study showed an increased risk of neuroblastoma based on maternal or paternal exposures, although the study authors noted several limitations on the interpretation of the data, including bias, chance, and self-reporting of exposure information. NAS noted that two studies showed a possible association between parental exposure to hydrocarbons and the occurrence of Prader-Willi Syndrome in offspring, although neither study collected information on potential confounders. A third study found no association between exposure to hydrocarbons and Prader-Willi Syndrome in offspring. In view of the minimal and indeterminate data, NAS concluded that there was inadequate/insufficient evidence of an association between parental fuel exposure and adverse reproductive or developmental outcomes.

Regarding neuropathy, NAS reviewed two studies, in which certain neurological symptoms were more prevalent among subjects with higher exposures to jet fuels, while other neurological symptoms were either not increased or were more prevalent among controls. NAS concluded that, although certain symptomatic differences were apparently related to exposure, there were no objective measures to support a relationship between jet-fuel exposure and neuropathy. The limitations of the studies included small samples and the lack of internal nonexposed groups of controls.

Regarding neurobehavioral effects, NAS found that several studies of Gulf War veterans found a relationship between the veterans' self-reported fuel exposure and their self-reported neuropsychologic, cognitive, or non-specific symptoms, but that these studies provided weak evidence of any relationship, due to recall bias. NAS also discussed a study of increased neurologic and cognitive abnormalities among persons who engaged in "petrol-sniffing," but found those results inconclusive because the effects were most likely due to exposure to lead rather than the fuels themselves.

NAS found that studies of MCS in Gulf War veteran or civilian samples generally provided relatively little evidence that MCS was associated with fuel exposure in service. Several studies involved questionnaires on which veterans or civilians self-reported that exposure to fuels are among the factors that can trigger their symptomatology. The studies generally were limited by methodologic concerns, including self-reported exposures and symptoms and the possibility of recall bias. Further, NAS noted that most of the studies did not address the factors relating to the first onset of symptoms as distinguished from subsequent recurrence of symptoms. The only study addressing first onset was an occupational study that incorporated objective exposure measurement and found a relationship between symptoms of MCS and fuel exposure. However, because the study was limited by the small sample and lack of a matched control group of workers, NAS found that it did not meet the criteria for a primary study that could support an association.

Regarding respiratory diseases, the studies generally did not report specific respiratory disease outcomes and exposure assessment, so it was difficult to reach a conclusion as to a relationship between respiratory disease outcomes and exposure to fuels. However, NAS noted that most of the studies it reviewed showed

standardized mortality ratios of 1.0 or less in study populations, showing no increased risk of death due to nonmalignant respiratory disease, asthma, chronic bronchitis, or emphysema in populations exposed to fuels.

Regarding irritant contact dermatitis, many fuels (for example, gasoline and kerosene) were generally acknowledged skin irritants, as indicated by the studies reviewed by NAS. Irritant contact dermatitis was evident soon after exposure but usually disappeared soon after removal of the irritant. There are few epidemiologic studies, however, of exposure to fuels and irritant and allergic contact dermatitis. Accordingly, NAS concluded that there was inadequate/insufficient evidence of an association between fuel exposure and chronic irritant and allergic contact dermatitis after cessation of exposure.

The NAS report does not identify any studies concerning the possible relationship between exposure to fuels and sarcoidosis. However, NAS concluded, presumably based on the absence of relevant studies, that there is inadequate/insufficient evidence of an association between fuel exposure and sarcoidosis.

Based on the information and analysis in the NAS report, the Secretary has determined that there is insufficient credible evidence to conclude that there is a positive association between exposure to fuels and cancers of the oral cavity and oropharynx; cancers of the nasal cavity and nasopharynx; esophageal cancer; stomach cancer; colon cancer; rectal cancer; hepatic cancer; pancreatic cancer; laryngeal cancer; lung cancer; melanoma; nonmelanoma skin cancer; female breast cancer; male breast cancer; female genital cancers (cervical, endometrial, uterine, and ovarian cancers); prostatic cancer; testicular cancer; nervous system cancers; kidney cancer; bladder cancer; Hodgkin's disease; non-Hodgkin's lymphoma; multiple myeloma; myelodysplastic syndromes; adverse reproductive or developmental outcomes (including infertility, spontaneous abortion, childhood leukemia, CNS tumors, neuroblastoma, and Prader-Willi syndrome); peripheral neuropathy; neurobehavioral effects; Multiple Chemical Sensitivity symptoms; nonmalignant respiratory disease; chronic bronchitis; asthma; emphysema; dermatitis-irritant and allergic; and sarcoidosis. Therefore, a presumption of service connection is not warranted for any such illness based upon exposure to fuels during service in the 1991 Gulf War.

#### *D. Nitric Acid—Inadequate/Insufficient Evidence*

NAS found inadequate/insufficient evidence between nitric acid and stomach cancer; melanoma; lymphopoietic cancers; pancreatic cancer; laryngeal cancer; lung cancer; bladder cancer; multiple myeloma; and cardiovascular diseases.

Generally, on the basis of NAS's review of the epidemiologic evidence, no available studies directly examined the association between exposure to nitric acid and long-term human health effects. Most studies were able only to investigate the health effects of nitric acid in combination with other strong inorganic acids, such as sulfuric acid, or other known carcinogens such as asbestos: that is, an independent assessment of nitric acid exposure was impossible because workers were exposed simultaneously to such mixtures. As a result, the health effects associated with exposure to nitric acid alone cannot be assessed.

It appears that NAS stated conclusions with respect to nitric acid and nine disease categories because certain studies state findings with respect to those disease categories in populations that potentially were exposed to a group of carcinogens that may have included nitric acid. As explained above, however, NAS concluded that the existing data are not sufficiently specific to nitric acid and, therefore, do not provide reliable evidence of an association between exposure to nitric acid and the occurrence of any disease.

Based on the information and analysis in the NAS report, the Secretary has determined that there is insufficient credible evidence to conclude that there is a positive association between exposure to nitric acid and stomach cancer; melanoma; lymphopoietic cancers; pancreatic cancer; laryngeal cancer; lung cancer; bladder cancer; multiple myeloma; and cardiovascular diseases. Therefore, a presumption of service connection is not warranted for any such illness based upon exposure to nitric acid during service in the 1991 Gulf War.

#### **IV. VA Response to the National Academy of Sciences Report**

In order to facilitate action on the 2004 update report from NAS, VA established the 2005 Gulf War Health Effects Task Force to consider and develop recommendations for the Secretary of Veterans Affairs. The Task Force consisted of top Departmental officials, specifically the Under Secretaries for Health and Benefits, the

General Counsel, and the Assistant Secretary for Policy and Planning. The review provided the basis for the Secretary's determination regarding health outcomes related to service in the Gulf War.

#### *A. 1991 Gulf War Hazard Exposure Data*

Although the statutes necessarily contemplate that NAS would evaluate non-veteran studies concerning the health effects of various exposures, they also require NAS to attempt to relate its findings to the actual experiences of Gulf War veterans.

For example, Public Law 105-277, § 1603(e)(1)(B) directs NAS to evaluate and summarize "the increased risk of the illness among human or animal populations" including but not limited to Gulf War veterans. Public Law 105-368, § 101(c)(1)(C) directs NAS to "identify the illnesses \* \* \* for which there is scientific evidence of a higher prevalence among populations of Gulf War veterans when compared with other appropriate populations of individuals." The statute goes on to require that for each illness NAS finds to be more prevalent in Gulf War veterans or to be associated with a possible Gulf War hazardous exposure, NAS "shall determine (to the extent available scientific evidence permits) whether there is scientific evidence of an association of that illness with Gulf War service or exposure during Gulf War service to one or more agents, hazards, or medicines or vaccines." Public Law 105-368, § 101(e)(1).

Public Law 105-368, § 101(e)(1)(E), (F) directs NAS to consider "in any case where information about exposure levels is available, whether the evidence indicates that the levels of exposure of the studied populations were of the same magnitude as the estimated likely exposures of Gulf War veterans; and \* \* \* whether there is an increased risk of illness among Gulf War veterans in comparison with appropriate peer groups."

Congress further provided that "[i]n conducting the review and evaluation \* \* \* [NAS] shall \* \* \* assess the latency period, if any, between service or exposure to any potential risk factor (including an agent, hazard, or medicine or vaccine [reviewed]) \* \* \* and the manifestation of such illness." Public Law No. 105-368, § 101(c)(3).

Determinations concerning the increased risk of illness among Gulf War veterans, as well as the latency periods for manifestation of illness, necessarily require consideration of the degree and the duration of exposure to the relevant environmental hazards. Findings based on non-veterans dwelling in cities or

typical civilian occupational studies may not necessarily support findings specific to Gulf War service because of differences in the magnitude and duration of exposure between these groups.

NAS concluded in its report that it was essentially unable to respond to Congress' charge to relate their literature-based health findings to the actual exposure magnitude and duration for Gulf War veterans. NAS explained:

To estimate the magnitude of risk of a particular health outcome among Gulf War veterans, the committee would need to compare the rates of disease or other health effects in veterans exposed to the putative agents with the rates in those who were not exposed. That would require information about the specific agents to which individual veterans were exposed and about their doses. However, there is a paucity of data regarding the agents and doses to which individual Gulf War veterans were exposed. \* \* \* Because of the lack of various kinds of data on veterans, the committee could not extrapolate from the exposures in the studies it reviewed to the exposures of Gulf War veterans. Therefore, it could not determine the likelihood of increased risk of adverse health outcomes among Gulf War veterans due to exposure to the agents examined in this report.

"Gulf War and Health, Volume 3. Fuels, Combustion Products, and Propellants," pp.16–17 (December 20, 2004).

NAS further noted that the studies it reviewed often "included people whose exposures had been over a lifetime (such as to air pollution in their communities) or included workers employed in a particular industry over many years." NAS stated: "In contrast, the exposures of veterans in the Persian Gulf were of relatively short duration with varying intensity. Therefore, the exposures experienced during the Gulf War might only approximate the exposures described in the occupational and environmental literature reviewed in this report." "Gulf War and Health, Volume 3. Fuels, Combustion Products, and Propellants," p. 17 (December 20, 2004).

As such, NAS was unable to relate their health findings to the actual exposures experienced by Gulf War veterans. However, some relevant data is available.

#### 1. Gulf War Exposure to Combustion Products

In its September 2000 report, "Environmental Exposure Report: Oil Well Fires" the Department of Defense (DoD) summarized its investigations on exposure of Gulf War veterans to oil-well-fire smoke and related combustion products during the 1991 Gulf War. The report describes how from January

through late February 1991, retreating Iraqi forces set fire to more than 600 Kuwaiti oil-wells, creating huge columns of smoke. These fires were brought under control within 9 months.

The report concludes that, although the oil-well fires produced smoke plumes, the actual exposure to combustion products of U.S. service members in that region was generally unremarkable. Furthermore, unlike many Gulf War environmental hazards of concern, the results of extensive monitoring efforts by various agencies for air pollutants and combustion products from the 1991 Gulf oil-well fires are available to support the report's conclusions about such exposure. The report also concludes that some individual veterans who were near the oil-well fires could have been exposed to high levels of large particulates, primarily as material deposited directly to skin or clothing rather than through inhalation.

According to the report,

For about eight months immediately after the ground war, U.S. and international organizations conducted comprehensive air monitoring to characterize the contaminants of concern and, by measuring their relative concentrations in the atmosphere, lay the groundwork for assessing their likely short- and long-term impacts to human health and the environment. \* \* \* Ground-level and airborne-based monitoring platforms collected numerous samples. The U.S. Army Environmental Hygiene Agency conducted the most comprehensive monitoring program, including taking more than 4,000 samples.

In general, the monitoring results were consistent among the various organizations involved. \* \* \* the maximum observed concentrations of air contaminants, other than particulate matter, were similar to levels found in U.S. suburbs and generally lower than those found in large urban areas. Overall, \* \* \* monitoring data show the pollutant concentrations present in the environment, particularly in areas where U.S. troops and civilians were located, fell below NIOSH [National Institute for Occupational Safety and Health], OSHA [Occupational Safety and Health Administration], or ACGIH [American Conference of Government Industrial Hygienists] recommended exposure limits for hazardous substances in the workplace.

The DoD report states:

At the time of the destruction, the medical and environmental community feared exposure to the fires would result in catastrophic acute and chronic health effects. However, the fires' high combustion efficiency, the nature and amount of the smoke's contaminants, the lofting effect created by solar heating, and the local wind and weather conditions combined to reduce the fires' impact on military and civilian populations.

Results of air monitoring studies indicated, except for particulate matter, air contaminants were below levels established

to protect the health of the general population. However, there were self-reports by a number of veterans who complained of acute symptoms they allege were a result of their proximity to the burning oil wells.

The DoD report points out that exposures to the fires by U.S. service members were quite short compared to civilians dwelling in U.S. cities exposed to urban "smog" and indoor air pollution, or workers exposed to engine exhaust: "Fortunately, the time period during which military and civilian populations were subjected to the fires' pollution was relatively short."

Nevertheless, some 1991 Gulf War troops apparently reported various short-term adverse health symptoms that could have been related to exposures to oil fire smoke. The report characterized these as follows: "Several troops reported significant short-term exposures to oil fire smoke, soot, and unburned oil, usually after having been totally enveloped in oil-well-fire fallout. At times troops reported being soaked with unburned oil." "Several monitoring sites observed high levels of airborne particulates, sand, and soot. Analysis of samples, however, indicated the particles were mostly sand-based materials typical for this region of the world. In the particulate matter samples, PAH and toxic metal concentrations were low." Finally, "[w]hile smoke plumes occasionally touched the ground, enveloping nearby personnel, few were in those areas for extended periods of time."

DoD's finding that the oil-well fires did not result in significant unique exposures has been confirmed by several other sources. The Presidential Advisory Committee on Gulf War Veterans' Illnesses noted that, while the oil well fires were burning, numerous U.S. and international agencies performed extensive air monitoring; these groups included a U.S. Interagency Air Assessment team comprised of scientists from the Environmental Protection Agency, the National Oceanographic and Atmospheric Administration, and the Department of Health and Human Services; and a group of scientists from twelve countries engaged in a data-collection effort overseen by the World Meteorological Organization. The Presidential Advisory Committee stated that "[a]ll groups found that levels of nitrogen oxides, carbon monoxide, sulfur dioxide, hydrogen sulfide, other pollutant gases, and [PAHs] were lower than anticipated and did not exceed those seen in urban air in a typical U.S. industrial city." *Presidential Advisory Committee on Gulf War Veterans' Illnesses: Final Report* (Washington, DC:

U.S. Government Printing Office, December 1996). The Presidential Advisory Committee further noted that biological samples taken from persons deployed in the vicinity of the oil-well fires generally revealed lower levels of volatile organic compounds (VOCs), polycyclic aromatic carbons, and lead than in reference populations located elsewhere, except in the case of firefighters, who had significantly elevated levels of VOCs in comparison to the reference population.

NAS's finding linking oil-well-fire smoke and lung cancer was based primarily on studies of workers exposed to engine exhaust on the job and to civilians exposed to "smog" and indoor air pollution from heaters and stoves in the cities in which they dwelled. Health effects from these relatively long-term exposures may not be relevant to effects from short-term but intense exposures experienced by some veterans of the 1991 Gulf War who became heavily covered with fallout from oil well fires.

Apart from the oil-well fires, exposure to combustion products could also have occurred through more routine operations that involve burning fuels. The 1996 Final Report of the Presidential Advisory Committee stated that "[o]perating the vehicles and machinery used in the Gulf War involved exposure to petroleum-based material," and that "[p]etroleum fuels also were used for burning wastes and trash, dust suppression, and fueling stoves and tent heaters. The Presidential Advisory Committee stated that "none of these uses is unique to the Gulf War," but that such uses probably led to increased petroleum vapor and combustion product exposures. With respect to the use of heaters, the Committee noted that "[b]urning leaded fuels indoors without proper ventilation—e.g., heaters in tents—could have caused increased lead exposure," and that "[k]erosene heaters, widely used in the United States, also could have been significant sources of exposure to nitric oxides, sulfur dioxide, inorganic combustion gases, carbon monoxide, and particles when used with inadequate ventilation."

## 2. Gulf War Exposure to Hydrazine Rocket Propellants

In January 2005, VA's Under Secretary for Health formally requested DoD's Assistant Secretary of Defense for Health Affairs to provide all available information about possible exposures of U.S. service members to hydrazine rocket fuels during the 1991 Gulf War. DoD's response in an April 8, 2005, letter from the Assistant Secretary of Defense was that the best available

information indicated it was unlikely there was any exposure to hydrazine among U.S. military personnel in the Gulf. U.S. missiles and other munitions did not employ hydrazine during the Gulf War. Also, investigations indicated Iraq had not switched to hydrazine as a propellant for Scud missiles.

Accordingly, there was no basis upon which to conclude that U.S. veterans of the Gulf War were exposed to hydrazine from either U.S. or Iraqi missiles.

A very small number of personnel working with the U.S. Air Force F-16 aircraft might have had minimal exposure to hydrazine. F-16 aircraft are equipped with a sealed tank (bottle) of hydrazine as an emergency propellant to be employed in the event of engine stall. When employed, the hydrazine is consumed. F-16 squadrons deployed with spare bottles during the Gulf War. If used, the bottles would have been returned to the U.S., Europe, or Turkey to be refilled and shipped back. The Air Force has long been keenly aware of the potential health hazards of hydrazine, so refilling operations are conducted in a manner consistent with the strictest of occupational health standards.

DoD's August 1999 report, "Information Paper: Inhibited Red Fuming Nitric Acid," concluded that the rocket fuel used by Iraqi forces in Scuds and several smaller missiles during the 1991 Gulf War was a type of kerosene and red fuming nitric acid (also known as IRFNA). DoD states that apparently Iraq had experimented with hydrazine rocket fuels including UDMH, however, it concluded that these fuels were not used during that conflict:

The missile fuel that Iraq used in its older Soviet systems was a specially refined kerosene-like substance (called kerosene in the literature). Some improved missiles used UDMH in combination with IRFNA. The Soviet Union used UDMH in their Scuds, but we have no evidence that Iraq used UDMH. Therefore, it is unlikely that any U.S. service members were exposed to hydrazine rocket fuels during the 1991 Gulf War.

### *B. VA Determination on Combustion Products and Hydrazines*

Based upon the evidence currently available, VA has determined that a presumption of service connection is not warranted at this time for any disease based upon an association with exposure to combustion products or hydrazines during service in the Gulf War. This determination is based on the conclusion that current evidence does not establish that service in the Gulf War entailed exposures to combustion products that were unique to Gulf War

service when compared to other military and civilian populations and that could be expected to produce the increased risk of adverse health effects based on the findings set forth in the NAS report. The best evidence currently available indicates that hydrazines were used in limited circumstances during the Gulf War and that hydrazine exposure generally would not have occurred. With respect to combustion products, although the 1991 oil well fires were the product of a unique event, the best evidence currently available indicates that they did not result in combustion-products exposures that were unique in kind or degree when compared to exposures incurred generally by other military and civilian populations as the result of ambient air pollution, vehicle exhaust, and other means. Currently available evidence further indicates that other potential means of exposure to combustion products, such as through proximity to vehicles, aircraft, or the use of fuel-based heaters, did not differ significantly in the Gulf War from similar exposures occurring in other military and civilian populations generally.

In the absence of unique exposures associated with Gulf War service that could be correlated to the increased risks of health effects discussed in the NAS report, a generally applicable presumption of service connection is not warranted based on exposure to combustion products or hydrazines in the Gulf War. The governing statute requires VA to establish presumptions when the Secretary determines that an illness is associated with exposure to substances or hazards "known or presumed to be associated with service in the Southwest Asia Theater of operations during the Persian Gulf War." 38 U.S.C. 1118(b)(1)(B)(i).

VA has determined that hydrazines were used during the 1991 Gulf War only under extremely limited conditions, and, therefore, hydrazines are not substances or hazards "associated with" service in the 1991 Gulf War. Consequently, VA need not establish a presumption of service connection for any disease identified in the NAS report as associated with such exposure.

VA has determined that combustion products, the prevalence and use of which in the Gulf War did not differ significantly from the prevalence and use of such substances in other military and civilian populations, are not substances or hazards "associated with" service in the 1991 Gulf War, because they are not unique to such service. Consequently, VA need not establish presumptions of service connection for

any of the eight diseases that NAS associated with exposure to combustion products in its report.

This approach is similar to that taken in our notice concerning the 2002 NAS report on insecticides and solvents. Public Law 105-277 specifically directed NAS to consider combustion products, fuels, and propellants among the substances to which veterans may have been exposed in their service in the 1991 Gulf War. The statute does not specifically identify these agents as substances "associated with" such service. Although Congress directed NAS to consider them in its reports, the language and structure of the statute indicates that Congress delegated to VA the responsibility for determining, based on NAS reports and other available information, whether such substances were "associated with" Gulf War service for the purpose of establishing presumptions under the statute.

We conclude that the statutory phrase "associated with service in the Armed Forces in the Southwest Asia theater of operations during the Persian Gulf War" is most reasonably construed to refer to a relationship between the substance or hazard and the specific circumstance of service in the Southwest Asia theater of operations during the Persian Gulf War, as distinguished from features of military or civilian life in general that are not unique to service in the Gulf War. The phrase "associated with" clearly connotes a direct relationship, and the requirement that the substance or hazard be associated with service at a particular time and place indicates an intent to distinguish between substances and hazards associated with general military or civilian life and those unique to service at the specified time and place. If civilian and military populations are commonly exposed to a substance, we believe it would be unreasonable to conclude that the substance is "associated with" service in the Persian Gulf during the Gulf War merely because it was present during such service. We do not believe that Congress intended VA to establish presumptions for the known health effects of all substances common to military or civilian life. Rather, the requirement that the substance be "associated with" Gulf War service makes clear that VA's task is to focus on the unique exposure environment in the Persian Gulf during the Persian Gulf War.

This reading of the statutory language comports with the clear purpose of both Public Law 105-277 and Public Law 105-368. Both statutes reflect the Government's commitment to addressing the unique health issues

presented by Gulf War veterans, by establishing a process for identifying diseases and illnesses that may be associated with Gulf War Service. It is by now well known that many Gulf War veterans have reported a variety of similar symptoms that cannot presently be identified with a known diagnosis or cause and that were not considered "diseases" for the purposes of the statutes generally authorizing VA to pay compensation for service-connected disability or death due to disease or injury. Congress responded initially to that situation by authorizing VA to pay compensation for "undiagnosed illness" in such veterans. The process established by Public Law 105-277 and Public Law 105-368 reflects a further effort to bridge the existing gaps in medical and scientific knowledge and to ensure that Gulf War veterans may obtain compensation for diagnosed or undiagnosed illnesses that may have been caused by the unique exposures or hazards of service during the Gulf War. Establishing presumptions of service connection for illnesses associated with exposures or hazards specifically related to Gulf War service obviously would further that objective. In contrast, establishing presumptions of service connection for the exclusive benefit of Gulf War veterans based solely on the well-known health effects of exposures shared in common with the general veteran population would not significantly further the purposes of those statutes. Moreover, establishing such presumptions would create significant inequities in the veterans' benefits system that Congress could not have intended.

Public Law 105-277 requires VA to establish presumptions of service connection, when the statutory requirements are met, exclusively for veterans who served in the Southwest Asia theater of operations during the Persian Gulf War. If the statute were construed to require presumptions based on exposure in the Persian Gulf War to substances to which other veterans serving at other times and places are commonly exposed at similar levels, it would raise significant concerns of fairness and reasonableness. For example, veterans exposed or presumably exposed to combustion products during the Gulf War might be entitled to presumptive service connection for certain diseases associated with such exposure, while veterans who served stateside and had equal or greater combustion product exposure would not be entitled to presumptive service connection for those diseases. The fact that most

service members, and most civilians, routinely incur some degree of background exposure to the substances NAS considered further underscores the arbitrariness that would attach to establishing presumptions for a limited class of veterans based on such common exposures. Apart from the fact that it is generally unnecessary to establish presumptions of service connection for health effects that are well documented in the medical literature, establishing presumptions applicable only to a small percentage of the veteran population potentially exposed to the relevant substances would have significant adverse effects on the veterans benefits system. Providing by statute and regulation for the disparate treatment of similarly situated veterans would substantially undermine confidence in the objectivity and fairness of the veterans benefits system. Additionally, establishing different adjudicative rules for the claims of similarly situated veterans without any reasoned basis for the distinction would undoubtedly cause confusion to the VA personnel responsible for deciding claims, as well as to veterans and their representatives in presenting and supporting their claims.

We do not believe that Congress intended VA to establish presumptions unique to Gulf War veterans based on the well-known health effects of exposures common to military and civilian life outside the Gulf War theater of operations. As explained above, the language and purpose of Public Law 105-277 and Public Law 105-368 indicate that Congress did not intend such a result, and we believe it is reasonable to presume that Congress did not intend arbitrary or unfair distinctions. We note that statutes generally must be construed to avoid serious constitutional concerns. See *Edward J. DeBartolo Corp. v. Florida Gulf Coast Building & Construction Trades Council*, 485 U.S. 568, 575 (1988). We cannot say it is beyond Congress' power to establish presumptions exclusively for Gulf War veterans based on exposures not known to differ significantly from service outside the Gulf War. However, the apparent unfairness, in our view, of that result supports the conclusion that Congress did not intend such a result.

We recognize that Public Law 105-277 and Public Law 105-368 both required NAS to consider the health effects of exposure to fuels, combustion products, and propellants as part of its investigations of illnesses potentially associated with Gulf War service. However, the direction to consider those substances does not compel the

conclusion that those substances, considered in isolation, are themselves agents “known or presumed to be associated with service in the Southwest Asia theater of operations during the Persian Gulf War” for purposes of VA’s duty to establish presumptions of service connection. Section 1603 of Public Law 105–277 describes the scope of NAS’ inquiry. Section 1603(c)(1) directs NAS to “identify the biological, chemical, or other toxic agents, environmental or wartime hazards, or preventive medicines or vaccines to which members of the Armed Forces who served in the Southwest Asia Theater of operations during the Persian Gulf War may have been exposed by reason of such service.” Section 1603(d) of that statute provides that, in identifying substances to which Gulf War veterans “may have been exposed,” NAS will consider, among other things, oil fire byproducts. In contrast, section 1602 of Public Law 105–277 does not direct the Secretary to establish presumptions of service connection for the health effects of every substance to which Gulf War veterans “may have been exposed,” but requires presumptions only for the health effects of exposure to substances known or presumed to be “associated with” service in the Gulf War. Congress used different language in section 1602 and 1603 of Public Law 105–277, and we must conclude that the different language was intended to have different meanings. See *Bank of America National Trust & Savings Ass’n v. 203 N. LaSalle St. Partnership*, 526 U.S. 434, 450 (1999); *Russello v. United States*, 464 U.S. 16, 23 (1983). Congress reasonably defined the scope of NAS’ inquiry broadly, to include consideration of all substances to which veterans may have been exposed during the Gulf War, irrespective of whether the exposures were unique to Gulf War service or common to all service. In defining VA’s regulation-writing obligations, however, Congress reasonably required VA to establish presumptions of service connection only for the health effects of substances that are “associated with” Gulf War service. As noted above, that limitation furthers Congress’ purpose of establishing presumptions for the unique health concerns of Gulf War veterans and also avoids the inequity of establishing presumptions exclusively for Gulf War veterans based on exposures that are common to most veterans.

Our conclusion that the hydrazines and combustion products in question, in isolation, cannot at this time be

determined to be “associated with” Gulf War service is not intended to suggest that they are irrelevant to further investigations of Gulf War veterans’ health or that they may not in any circumstance form the basis for presumptions of service connection under Public Law 105–277. In the event future evidence links any illnesses to a combination of exposures associated with Gulf War service, whether or not including exposure to fuels, combustion products, and propellants, VA may establish presumptions of service connections for such illnesses pursuant to Public Law 105–277.

This determination also in no way prevents veterans from obtaining service connection for the health effects discussed in the NAS report where the potential for above-normal exposures was present in service. Under established current procedures, VA develops and considers evidence concerning events or aspects of service that may contribute to the incurrence of an illness. Accordingly, if a veteran’s occupation in service, such as a firefighter or mechanic, entailed above-normal exposure to combustion products, VA will give due consideration to that unique exposure in determining whether service connection is warranted for a health effect known to be associated with such exposure. Similarly, if a veteran served in a role that may have involved exposure to hydrazines, VA will evaluate that factor in determining whether service connection is warranted for a disease associated with such exposure. These standards apply to claims by veterans of any period of service, and are not dependent upon any presumption of service connection. A presumption of service connection is not needed for the purpose of establishing a link between exposure to combustion products or hydrazines and any disease identified in the NAS report as associated with such exposures, because those health effects are generally well known and, in any event, the NAS report itself provides significant additional evidence of such an association. Accordingly, the determination not to establish a generally applicable presumption based on the NAS report will not preclude the grant of benefits to any individual whose service entailed the type of exposure NAS found to be associated with an increased risk of disease incurrence.

## V. Conclusion

After careful review of the findings of the 2004 NAS report, “Gulf War & Health Vol. 3: Fuels, Combustion Products, and Propellants,” and other

pertinent information including reports from DoD on potential exposure of U.S. service members, the Secretary has determined that the scientific evidence presented in the 2004 NAS report and other information available to the Secretary indicates that no new presumption of service connection is warranted for any of the illnesses described in the 2004 NAS report.

Approved: August 21, 2008.

**James B. Peake,**

*Secretary of Veterans Affairs.*

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## DEPARTMENT OF VETERANS AFFAIRS

### Voluntary Service National Advisory Committee; Notice of Meeting

The Department of Veterans Affairs (VA) gives notice under Public Law 92–463 (Federal Advisory Committee Act) that the Executive Committee to the Department of Veterans Affairs Voluntary Service (VAVS) National Advisory Committee (NAC) will meet October 6–7, 2008, at the Marriott West Chase, Houston, Texas. The sessions will begin at 8 a.m. each day and end at 4:30 p.m. on October 6 and at noon on October 7. The meeting is open to the public.

The NAC consists of 63 national organizations and advises the Secretary, through the Under Secretary for Health, on the coordination and promotion of volunteer activities within VA health care facilities. The Executive Committee consists of 18 representatives from the NAC member organizations.

On October 6, agenda topics will include: NAC goals and objectives, minutes of April 2008 NAC meeting, Veterans Health Administration update, VAVS update on the Voluntary Service program’s activities since the 2008 NAC annual meeting, Parke Board update, evaluations of the 2008 NAC annual meeting and plans for the 2009 NAC annual meeting (to include workshops and plenary sessions). On October 7, agenda topics will include: Recommendations from the 2008 NAC annual meeting, subcommittee reports, standard operating procedure revisions, 2010 NAC annual meeting planning, and new business.

No time will be allocated at this meeting for receiving presentations from the public. However, interested persons may either attend or file statements with the Committee. Written statements may be filed either before the meeting or within 10 days after the meeting and addressed to: Ms. Laura Balun,