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Oversight Hearing on:

EPA'S RESPONSE TO 9/11

AND

LESSONS LEARNED

FOR FUTURE EMERGENCY PREPAREDNESS

testimony of

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Good morning, Chairperson Clinton, Ranking Member Craig, and other members of the Superfund and Environmental Health Subcommittee. Thank you for this opportunity to present testimony. My name is David Newman. I am an industrial hygienist with the New York Committee for Occupational Safety and Health (NYCOSH). NYCOSH is a non-governmental, nonprofit organization that has provided technical assistance and comprehensive training in occupational safety and health to unions, employers, government agencies, and community organizations for over 25 years

The attacks of September 11, 2001 produced not only an initial catastrophic loss of life at the World Trade Center (WTC) site, but also a lingering environmental disaster, with adverse health consequences for responders at Ground Zero as well as for workers and residents in a much larger geographic area. Because we may unfortunately be faced with a similar situation again, it is imperative to examine and learn from government efforts to protect public and worker health in 9/11 response efforts.

Since the tragic events of September 11, 2001 and continuing to this day, NYCOSH, in partnership with the National Disaster Ministries of the United Church of Christ, has worked closely with unions, employers, and community and tenant organizations at Ground Zero and throughout Lower Manhattan. This work has included outdoor and indoor environmental sampling, technical assistance with the design or evaluation of sampling, cleanup, and re-occupancy protocols and with mechanical ventilation and filtration issues. Within days of 9/11, NYCOSH produced and distributed the first fact sheets describing respiratory hazards at Ground Zero and outlining appropriate respiratory protection. We provided technical assistance to unions at, under, and around Ground Zero. NYCOSH, in collaboration with the Queens College Center for the Biology of Natural Systems and the Latin American Workers

Project, operated a mobile medical unit near Ground Zero which provided medical screenings to hundreds of immigrant day laborers engaged in the cleanup of contaminated offices and residences. We also provided respirators to these cleanup workers, along with changeout filter cartridges, fit-testing, and training in proper respirator use. NYCOSH also trained additional hundreds of Lower Manhattan workers about 9/11-related occupational and environmental health issues. NYCOSH continues to work closely with the health care centers of excellence and with unions, employers, and tenant and community organizations to ensure that their constituents are informed about and have access to appropriate medical care for 9/11 health conditions.

In addition, I had the privilege of serving on the U.S. Environmental Protection Agency (EPA) World Trade Center Expert Technical Review Panel. I also served on the Exposure Assessment Working Group of the World Trade Center Worker and Volunteer Medical Screening Program and on the Advisory Board of Columbia University's Mailman School of Public Health World Trade Center Evacuation Study. I currently serve on the Community Advisory Committee of the World Trade Center Environmental Health Center at Bellevue Hospital and on the Labor Advisory Committee of the New York City Department of Health and Mental Hygiene's World Trade Center Health Registry.

My testimony will focus on five issues:

1. Whether the data available to EPA at the time of the 9/11 attacks and during subsequent recovery operations indicated a potential for elevated risk from environmental exposures;
2. Whether the actions of EPA were consistent with regulatory requirements for risk assessment and protection of human health;
3. Whether EPA's test and clean programs provide effective assessment and remediation of indoor environmental contaminants;
4. Whether exposure to 9/11 contaminants resulted in harm to human health, and, if so, whether this harm was avoidable; and

5. What lessons have been, or remain to be, learned from EPA's 9/11 response and recovery efforts.

NYCOSH is well situated to comment on these issues. In addition to our 9/11 efforts, we have provided training and technical assistance on respiratory protection, hazard assessment and control, confined space entry, and hazardous waste operations and emergency response, among other topics, to employers, unions, government agencies, and community-based organizations for several decades, often in collaboration with OSHA, the National Institute for Occupational Safety and Health (NIOSH), the National Institute for Environmental Health Sciences (NIEHS), the New York State Department of Labor, the New York City Department of Environmental Protection, and the New York City Department of Health and Mental Hygiene.

1. ***What data were available to EPA at the time of the 9/11 attacks and during subsequent recovery operations? Did these data indicate a potential for elevated risk to human health from environmental exposures?***

Although the chemical composition and extent of dispersion of WTC dust remain poorly characterized, the current scientific literature is unambiguous as to its general nature and scope. Contaminants were dispersed over a wide area of Lower Manhattan and Brooklyn, and for "miles beyond." Hundreds of contaminants have been identified in air, dust, and bulk samples.^{1,2,3} Toxic contaminants of concern include asbestos, PCBs (polychlorinated biphenyls), PAHs (polycyclic aromatic hydrocarbons), manmade vitreous fibers, dioxins, volatile organic compounds, crystalline silica, pulverized glass shards, highly alkaline concrete dust, and lead, mercury, and other heavy metals.

Credible, substantive data that indicated the presence of toxic substances in significant quantities at the WTC site were readily available to EPA prior to and on September 11, 2001.

Prior to and on 9/11, information on the documented presence of toxic substances at the WTC site was available in government databases that itemize storage of hazardous raw materials, as per the hazardous chemical storage reporting requirements of the federal Emergency Planning and Community Right to Know Act.⁴ These data, readily available at the time, indicated at a minimum the probable presence of barium, lead, chloroform, chlordane, carbon tetrachloride, cadmium, chromium, mercury, hydrogen sulfide, arsenic, and other toxic raw materials at the offices of the United States Customs Service, 6 World Trade Center, and of mercury, tetrachloroethylene, PCBs, arsenic, ethane, and other toxic raw materials at the offices of the Port Authority of New York and New Jersey, 1 World Trade Center. The purpose of the hazardous raw materials databases is precisely to facilitate safe emergency response and effective containment and cleanup in the event of an unanticipated chemical release.

Additional information on hazardous in-place building materials and office furnishings was widely known in the regulatory and public health communities. Knowledge and use of this information was a prerequisite to appropriate preliminary risk assessment, design of safe and effective work methods, and selection of protective equipment, including respirators.

An estimated 400 or more tons of asbestos had been utilized in sprayed-on fireproofing during the construction of the WTC towers.^{5,6} Additional unknown amounts of asbestos-containing material were used in pipe insulation. The extensive use of asbestos at the WTC site was well documented prior to September 11, 2001. In 1971, while the WTC was still under construction, New York City passed Local Law 49, which banned the use of sprayed-on fireproofing that contained asbestos, effective February 25, 1972. Application of structural fireproofing at the WTC continued with non-asbestos-based materials.⁷ The 1993 bombing of the WTC again raised the issue of inadvertent releases of WTC asbestos during disaster events, and some WTC asbestos was abated (removed). Thus, the regulatory agencies were without doubt cognizant of the potential for the release of hundreds of thousands of pounds

of asbestos into the ambient air during the collapse of the WTC towers on September 11, 2001.

Further essential, albeit imprecise, information about the potential for the release of additional toxic substances should have been intuitive to any environmental or occupational health professional. For example, computers and computer components contain significant amounts of lead.⁸ It can be conservatively estimated that there were greater than 10,000 personal computers in the WTC complex, each containing 4 or more pounds of lead, as well as numerous mainframe computers and servers. Consequently, it is likely that at least 40,000 pounds of lead were released into the general environment on 9/11, and very possibly a substantially larger amount.

Similarly, fluorescent light bulbs contain tiny but environmentally significant amounts of mercury.⁹ Estimates of the amount of mercury in a single bulb range from 3 milligrams to 21 milligrams. The Port Authority acknowledges the presence of 500,000 fluorescent light bulbs in the WTC complex.¹⁰ It is therefore possible that the amount of mercury released from fluorescent light bulbs only (and not including additional sources of mercury such as electric switches) ranged from 3 to 23 pounds. This is the approximate equivalent of 8% of the total daily mercury emissions from all coal-fired utility boilers in the United States or 26% of the daily mercury emissions from all municipal waste incinerators.¹¹

Environmental sampling results obtained by or available to EPA subsequent to September 11 indicated the presence of toxic substances at levels of concern at Ground Zero as well as at other locations in Lower Manhattan, both outdoors and indoors.

Early environmental sampling data by EPA confirmed that asbestos was a constituent of WTC dust, at levels of concern. The EPA website posted data for 143 bulk samples of dust collected in Lower Manhattan, outside of the 16-acre collapse site. Asbestos was detected in 76% of the samples. Twenty-six percent of the samples contained asbestos at levels

between 1.1% and 4.49%—i.e., at levels between 110% and 449% of the level at which legal requirements are triggered. Most of EPA’s outdoor air samples found relatively low concentrations of asbestos or no asbestos above the detection limit of the sampling, but the EPA website listed at least 25 12-hour samples, obtained at 10 separate locations, that exceeded the EPA clearance standard established under the Asbestos Hazard Emergency Response Act, the benchmark that EPA was using for 9/11 asbestos measurements.

Additionally, 12 of 21 personal air samples obtained in September 2001 by the U.S. Public Health Service from workers sifting WTC debris at the Staten Island landfill exceeded the OSHA Permissible Exposure Limit for asbestos.¹² Sixty percent of asbestos air samples collected at Ground Zero by the International Union of Operating Engineers’ National Hazmat Program exceeded the EPA clearance standard.¹³ Twenty-seven percent of 177 bulk samples initially collected by EPA and OSHA at Ground Zero were greater than 1% asbestos, the level at which legal requirements are triggered.¹⁴ Early independent air monitoring in two Lower Manhattan apartments found significantly elevated indoor levels of asbestos, including results 2 to 5 times the EPA 9/11 asbestos clearance level in one apartment and 89 to 151 times the clearance level in the other apartment.¹⁵

EPA test results for outdoor sampling for dioxin showed “unambiguous elevation” when compared to typical urban background levels. An EPA report noted:

the concentrations to which individuals could potentially be exposed . . . within and near the WTC site found through the latter part of November are likely the *highest ambient concentrations that have ever been reported*. [emphasis added]¹⁶

These findings indicated that workers and residents who returned to areas that were reopened to the public as safe one week after 9/11 were potentially exposed to concentrations of dioxin “nearly 6 times the highest dioxin level ever recorded in the U.S.” The findings also indicated that the dioxin concentrations to which rescue and recovery workers were potentially exposed were between 100 and 1,500 times higher than the levels

of dioxin typically found in urban air.¹⁷

In another example, benzene was detected at Ground Zero in 57 of 96 air samples, at levels from 5 to 86,000 parts per billion (ppb). (The OSHA permissible exposure limit (PEL) for benzene exposure averaged over 8 hours is 1,000 ppb. The OSHA short term exposure limit (STEL) for benzene exposure averaged over a 15-minute period is 5,000 ppb.)

Even during November, readings exceeded the OSHA levels in half the tests conducted. . . .

On November 8, an EPA grab sample at the North Tower plume detected 180,000 ppb of benzene—180 times above [sic] the OSHA limit. Even as late as January 7, benzene readings were as high as 5,300 ppb.¹⁸

The United States Geological Survey (USGS) reported the results of its WTC environmental studies to government response teams as early as September 18, 2001. USGS found that steel beams from the WTC site were coated with fireproofing containing chrysotile asbestos at concentrations up to 20%. It reported that in the “area around the WTC . . . potentially asbestiform minerals might be present in concentrations of a few percent to tens of percent” and may occur “in a discontinuous pattern radially in west, north, and easterly directions perhaps at distances greater than 3/4 kilometer from ground zero.” USGS also found that WTC dusts “can be quite alkaline,” reaching a pH of 11.8. The agency warned government response teams that “cleanup of dusts and the WTC debris should be done with appropriate respiratory protection and dust control measures.”¹⁹

2. *Were the actions of EPA consistent with regulatory requirements for risk assessment and protection of human health?*

Multiple federal statutes have applicability to the protection of public health during catastrophic environmental emergencies. The applicability of statutory requirements to disaster response efforts and to subsequent cleanup operations and the uses of agency discretionary power in the application of legal standards are central to assessing

governmental response to 9/11.

EPA is clearly required to protect the public health against exposure to toxic environmental contaminants associated with catastrophic disasters.

EPA has legal authority and responsibility to respond to a hazardous substance release that presents or has the potential to present an imminent and substantial danger to public health. EPA is required to assume lead authority with regard to issues of environmental health by the National Contingency Plan, the National Response Plan, and Presidential Decision Directive 62 of 1998.

The National Emissions Standards for Hazardous Air Pollutants (NESHAPS), section 112 of the Clean Air Act, establishes standards for air pollutants that may cause fatalities or serious, irreversible, or incapacitating illness.^{20,21} Hazardous air pollutants regulated under the Clean Air Act are also regulated as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), known as Superfund. The National Contingency Plan (NCP), part of CERCLA, is the federal plan for responding to hazardous substance releases. The NCP assigns the authority to respond to the release of hazardous substances to EPA. In the event of a hazardous release, the NCP requires that the release site be assessed to characterize the source and type of the release, the pathways of exposure, and the nature and magnitude of the threat to public health. In addition, EPA is authorized to “enter any vessel, facility, establishment or other place, property, or location . . . and conduct, complete, operate, and maintain any response actions. . . .” Further, “the NCP applies to and is in effect when the Federal Response Plan and some or all of its Emergency Support Functions (ESFs) are activated.”²²

The National Response Plan (NRP) mandates a comprehensive response to terrorism incidents. (The Federal Response Plan²³ preceded the National Response Plan, was in effect on September 11, 2001, and was substantively similar to the NRP.) The NRP establishes

protocols to protect the health and safety of the public, responders, and recovery workers. National Response Plan Emergency Support Function #10, the Oil and Hazardous Materials Response Annex, assigns explicit responsibility to EPA as both the primary agency and the emergency support function coordinator in response to an actual or potential discharge or uncontrolled release of hazardous materials.²⁴

Presidential Decision Directive (PDD) 62 names EPA as the lead agency for responding to the release of hazardous materials in a terrorist attack and gives EPA specific responsibility for indoor remediation.^{25,26} Shortly after 9/11, then-EPA Administrator Christine Whitman confirmed EPA's responsibility under PDD 62: "Under the provisions of PDD 62 . . . EPA is assigned lead responsibility for cleaning up buildings and other sites contaminated by chemical or biological agents as a result of an act of terrorism."²⁷

EPA's response actions were not consistent with its legal obligations to protect the health of the public against exposure to outdoor and indoor toxic environmental contaminants associated with a catastrophic disaster.

EPA's 9/11 response efforts were predicated on the agency's contention that environmental regulations were not applicable to natural or technological disasters or to terrorist incidents.²⁸ EPA minimized the issue of hazardous waste and chose not to consider the WTC site as either a Resource Conservation and Recovery Act (RCRA)²⁹ hazardous waste site or a Superfund site, even though the collapse and combustion of the WTC "must have released chemicals orders of magnitude times the reporting thresholds."^{30,31} According to an EPA senior policy analyst, this was the first major chemical or hazardous waste release in 20 years for which EPA did not conduct a site characterization for environmental hazards and risks.³² In addition, the agency did not ensure that clearance tests were conducted at the conclusion of the waste and debris removal project to confirm that environmental contaminants had been effectively removed from the WTC site, and no such tests were conducted.³³

EPA provided limited, and sometimes incorrect and hazardous, technical guidance to the impacted public. EPA press releases counseled residential and business tenants to clean their indoor spaces using “appropriate” equipment, following “recommended” and “proper” procedures, without defining these terms.³⁴ EPA’s technical advice sometimes contradicted regulatory requirements and even common sense. In one instance EPA advised that “if dust or debris from the World Trade Center site has entered homes or offices, people should be sure to clean thoroughly and avoid inhaling dust while doing so.”³⁵ The same press release referred readers to the website of the New York City Department of Health for further technical guidance. That website advised “residents and workers returning to homes and offices in Lower Manhattan” to clean up WTC dust (i.e., asbestos and other toxic substances, in many cases) with wet rags and HEPA vacuum cleaners, in violation of federal and city regulations. It further advised that respiratory protection was not necessary so long as these “guidelines” were followed.³⁶ The report of the EPA Inspector General ultimately concluded that advice such as this “may have increased the long-term health risks for those [tenants] who cleaned WTC dust.”³⁷

EPA’s public statements mischaracterized or ignored sampling results. Its September 18 announcement that the “air is safe to breathe”³⁸ was not supported by the available data.³⁹ EPA risk communication statements were altered to conform to political directives from the White House. “Guidance for cleaning indoor spaces and information about the potential health effects from WTC debris were not included in EPA’s issued press releases. . . . Reassuring information was added . . . and cautionary information was deleted” after intervention by the White House Council on Environmental Quality.⁴⁰ Other government agencies also issued inaccurate risk communication statements. EPA’s unsupported assurances of lack of risk had the unfortunate effect of giving a green light to employers and workers not to use respiratory protection and to landlords, employers, and government agencies that remediation of contaminants was not necessary.

For eight months after 9/11, EPA contended that it had no legal responsibility for assessing or addressing indoor environmental contamination.^{41,42} Indoor environmental testing and remediation in common spaces were left to building owners; testing and remediation of private spaces were left to commercial and residential tenants.^{43,44} Because government financial assistance, reoccupancy guidelines, oversight, and enforcement were not provided, private environmental sampling and remediation efforts occurred only on an occasional, haphazard, limited, and often ineffectual basis. The single government-sponsored indoor cleanup effort that ultimately took place, EPA's 2002–2003 “test or clean” program, was modest, non-mandatory, limited to residences, and of questionable effectiveness and scientific and technical merit. Only 18% of eligible downtown apartments were cleaned or tested.⁴⁵ Approximately 1,500 Lower Manhattan buildings were excluded, including all schools, hospitals, firehouses, workplaces, businesses, and commercial and government buildings—even City Hall. Most of Chinatown and other impacted communities were also excluded. The failure of EPA to require or even encourage indoor environmental assessments, and cleanup where warranted, in commercial and government buildings, coupled with the agency's limited and inadequate sampling and cleanup in residential spaces, is likely to have subjected area workers and residents to unnecessary and avoidable exposures.

3. *Will EPA's December 2006 Lower Manhattan Indoor Dust Test and Clean Program provide effective assessment and remediation of indoor environmental contaminants?*

The current EPA test and clean program disregards virtually all of the recommendations and concerns expressed by members of the EPA WTC Expert Technical Review Panel in its 21 months of deliberations. The current program fundamentally replicates the ineffective 2002–2003 Residential Dust Cleanup Program. This program, like its predecessor, is technically and scientifically flawed and is unlikely to provide any significant public health or scientific benefit. It is unlikely to adequately identify or clean up 9/11 contaminants if and

where they exist. It is probable that it will under-report any residual 9/11 contamination. The potential consequences of these shortcomings are worrisome. Scientists may receive skewed data on the extent of geographic dispersion of 9/11 contaminants. Residents may receive inaccurate assessments of the presence or absence of 9/11 contaminants in their living spaces and may receive inadequately supported assurances of safety. Workers and employers will continue to lack effective access to environmental testing or cleanup.

Among the many significant deficiencies of the current plan are the following:

- *Insufficient financial resources are allocated for testing or cleaning, if warranted, of potentially affected residences and workplaces.* According to EPA and FEMA, funds allocated for EPA's 2002–2003 program were in excess of \$25 million, while funds allocated for the current program are capped at approximately \$7 million. The geographic boundaries and eligibility criteria for the plans are virtually identical. That is, the current program is funded at a level approximately 28% of the prior program, yet is charged with providing sampling and cleanup in 100% of the geographic area served by the prior program.
- *The geographic boundaries of the program are arbitrarily determined.* EPA has cited images and mapping results from aerial photographs taken on September 13, 2001 as the basis for the geographic boundaries of the current program. However, EPA misinterprets or misuses that data, which actually indicate the “probable” and “possible” deposition of WTC dust and debris over a larger geographic area than that included in the current sampling program.⁴⁶ These data themselves are of limited scientific utility as they rely entirely on detection of visible dust. The Environmental Photographic Interpretation Center (EPIC) report acknowledges that its analysis is limited to “ground dust/debris deposition as an aggregate (paper, pulverized concrete and wall board, larger building materials, etc.).”⁴⁷ Smaller particles that are invisible to the naked eye or to the camera lens, such as PM10, PM 2.5, and asbestos fibers, are

likely to have been dispersed over a wider geographic area and are of considerable health concern. These are not addressed by these data. The EPIC report notes that “it is possible that dust/debris may extend beyond the boundaries as delineated in this report.”⁴⁸ Members of the EPA WTC Panel strongly recommended that the program’s geographic boundaries be expanded further north in Manhattan, including all of Chinatown, and east into parts of Brooklyn. EPA agreed to do so in May 2005 but has reneged on that commitment in its current program.⁴⁹

- *There is no scientific or legal justification for the exclusion of workplaces and places of business from the current program.* EPA has not offered any evidence demonstrating that workplaces were impacted differently or less severely than residences. I believe no such data exist and no such assertion could be plausibly made. Nor has EPA presented any data that indicate that a significant number (or any number) of workplaces benefitted from employer-conducted and -financed cleanup efforts, or that these efforts were effective. Because the EPA program leaves employers to bear the financial and technical burden of testing and cleanup, it is likely that workplaces which have not yet been privately tested or cleaned will never be tested or cleaned.

Neither OSHA nor NIOSH can effectively address the issue of 9/11 contaminants in workplaces. Comments at the July 12, 2005 meeting of the EPA WTC Expert Technical Review Panel by representatives from OSHA and NIOSH made clear that while these agencies will continue to be responsive to queries from workers, unions, and employers, neither agency engages in or funds remediation of workplace contaminants. OSHA, if it finds violations of OSHA standards, may require employers to engage in cleanup, or in other protective measures short of cleanup, at employer expense. NIOSH may recommend but cannot require remediation, nor can it fund remediation. It is possible that indoor environmental conditions in downtown workplaces may not violate OSHA Permissible Exposure Limits (PELs), or that there may be no applicable OSHA standards (as is the case for PAHs), while at the same

time they may exceed EPA benchmarks for settled 9/11 dust. In such situations, OSHA could not require remediation. Thus, contamination at levels that would compel remediation in residences will be allowed to remain in workplaces.

- *Because it de-emphasizes testing in indoor areas that are most likely to harbor residual contaminants and emphasizes testing in areas that are most likely to have been routinely and repeatedly cleaned, the EPA program has a built-in selection bias toward sampling cleaner areas. It is designed to avoid finding residual contaminants.*

The nature and extent of residual indoor WTC-derived contamination, if any, is unknown at this point in time. Residual indoor contamination, if present, will most likely be found in spaces that have been subjected to the least disturbance. Typically, these spaces include: infrequently cleaned areas such as those behind refrigerators, above suspended ceilings, and in cable chases; porous materials such as carpets and drapes that act as reservoirs or “sinks” for settled particulates; and “dead spots” where deposition occurs in mechanical ventilation systems, such as in areas of low velocity and at bends in high velocity areas in ducts.⁵⁰

The current EPA program does include testing on porous materials like carpets and in infrequently cleaned spaces behind furniture and equipment such as refrigerators. However, it excludes without justification testing in what it mistakenly labels “inaccessible spaces,” i.e, mechanical ventilation systems, ceiling plenums, cable chases, etc. This is problematic for two reasons.

First, so-called inaccessible spaces are accessed by maintenance and utility workers on a regular basis. These workers engage in activities that may disturb settled dust and resuspend it in the air, where it becomes available for inhalation both by the workers and by tenants. Although a particular “inaccessible space” may not be accessed regularly, workers routinely access these kinds of spaces repeatedly over

the course of every work day.

Second, the ability of a mechanical ventilation system to capture contaminants in the dead spots of the duct work is well known. These settled particulates will lie dormant and cannot be identified or measured by sampling that is conducted outside the mechanical ventilation system. However, if the settled particulates are disturbed at a later date by maintenance activities or other causes, the mechanical ventilation system can provide a very efficient mechanism for the distribution of contaminants throughout occupied indoor spaces.

- *The EPA program diverges significantly from established regulatory and best work practices in industrial hygiene and environmental remediation.* For example, the plan establishes different benchmarks, or triggers, for cleanup of asbestos in different parts of residences. It permits higher levels of asbestos contamination to remain in “infrequently accessed areas” such as “out of reach shelving”⁵¹ or “on top, beneath, or behind large objects of furniture such as bookcases.”⁵² By contrast, city⁵³ and state⁵⁴ asbestos regulations explicitly and appropriately require that all areas of a contaminated space be cleaned to a single protective standard.

4. *Did exposure to WTC-derived contaminants result in harm to human health, and was this exposure and harm avoidable?*

Within days of the attacks, EPA declared Lower Manhattan’s air “safe to breathe.”⁵⁵ EPA maintained until recently that “short-term health effects dissipated for most once the fires were put out [and] there is little concern about any long-term health effects.”⁵⁶ Unfortunately, there is considerable evidence to the contrary. It is now well-established that a large and increasing number of people who were exposed to 9/11 contaminants, primarily rescue and recovery workers but also area workers and residents, are suffering serious and persistent adverse health outcomes.

The incidence and persistence of 9/11-induced respiratory illness among response workers and area workers is extensively documented in the scientific literature, including among rescue, recovery, and service workers,^{57,58} firefighters,^{59,60,61,62} transit workers,⁶³ and immigrant day laborer cleanup workers at buildings outside Ground Zero.⁶⁴ Although there is no question that, in general, those working on the pile experienced more severe exposures and health impacts than did community residents, students, and workers, it is of note that adverse health impacts have also been documented among these latter groups.^{65,66,67,68,69}

Because Ground Zero workers and other exposed populations may have been exposed at varying levels to a robust array of carcinogens, including asbestos, dioxins, silica, benzene, PAHs, and PCBs, there is concern for the potential development of late-emerging cancers.⁷⁰ It is as yet unknown whether or when 9/11-derived exposures will produce late-emerging diseases, but it is prudent and scientifically appropriate to anticipate the possibility. While the latency period for solid tumors is 10 to 50 years, the latency period for hematologic and lymphatic malignancies can be as short as 4 to 5 years.⁷¹ Although neither the World Trade Center Medical Monitoring Program nor the scientific literature has yet reported the occurrence of 9/11-related cancers, the Monitoring Program has begun the process of verification of self-reported cases among responder and recovery worker patients.⁷²

We know now that there is an association between the chronology of firefighters' 9/11-related exposures and the severity of their adverse health effects; i.e., those caught in the dust cloud and/or those responding at the WTC site in the first hours or days tend to have higher incidences and greater severities of health impacts. Presumably, the intensity and duration of exposure and the lack of access to appropriate respiratory protection were significant factors in this association. These early exposures were unavoidable. However, EPA's early and inappropriately reassuring pronouncements that "the air is safe to breathe" were counterproductive to efforts at implementation of respiratory protection programs by employers and respirator use by rescue, recovery, and cleanup workers. EPA's actions thus contributed to the unnecessary and avoidable exposures to toxic WTC-derived contaminants

incurred by thousands of workers and volunteers. Similarly, EPA's risk communications served as disincentives to landlords, employers, and government agencies regarding the suitability of conducting indoor environmental testing and remediation of contaminants, as appropriate. The failure of EPA to provide, require, or even encourage indoor environmental assessments, and cleanup where warranted, in commercial and government buildings, coupled with the agency's limited and inadequate sampling and cleanup in residential spaces, is likely to have subjected area workers and residents to additional unnecessary and avoidable exposures.

5. *What lessons have been, or remain to be, learned from the 9/11 response and recovery efforts?*

Less than four years after the disastrous events of September 11, 2001, Hurricane Katrina struck the Gulf Coast. Rescue, recovery, and cleanup efforts there sadly were hampered by a failure to learn from the WTC experience. In October 2005, a group of more than 100 of the nation's foremost labor, religious, environmental, community, public health and public interest organizations and more than 100 academic, medical, religious and public health leaders, including some of the nation's top experts in the fields of occupational and environmental medicine and industrial hygiene, called on Congress to give the highest priority to the protection of the health of cleanup workers and of the public at large during cleanup efforts.⁷³ Coupled with the recommendations of the report of the EPA Office of the Inspector General,⁷⁴ the following principles for disaster response, adapted in part from the call, provide a sound basis for lessons that, unfortunately, have yet to be learned:

- *Presume contamination until proven otherwise.*

Given the wide range and toxic nature of contaminants to which workers, volunteers, and residents may be exposed, it is imperative that work areas be presumed to be contaminated and that appropriate precautionary measures be implemented until the work environment is demonstrated to be safe.

- *Implement the National Response Plan provisions for worker and community environmental testing and monitoring.*

The worker and community environmental testing and monitoring provisions of the National Response Plan must be followed closely. They provide for hazard identification, environmental sampling, personal exposure monitoring, collecting and managing exposure data, development of site-specific safety plans, immunization and prophylaxis, and medical surveillance, medical monitoring and psychological support.

- *Enforce all OSHA and EPA regulations.*

Environmental and occupational health standards must be strictly enforced. We are distressed that OSHA has defined its role in Katrina response, as in 9/11, as advisory rather than enforcement.

- *Assess the hazards.*

EPA should conduct comprehensive environmental sampling to characterize the nature and extent of environmental hazards. NIOSH and OSHA must conduct a comprehensive assessment of the hazards posed to recovery workers. Hazard assessment should include evaluation of environmental hazards contaminants originating in external sources, in-place building materials, biological agents, and other potential sources. Environmental monitoring should be ongoing. Sampling results should be accessible to the public in a timely manner. Toxic materials should be catalogued, evaluated and tested, and any known or potential releases contained. Failure to act will threaten returning residents and workers and will increase long-term cleanup costs as toxic substances spread to larger areas.

- *Train and protect cleanup workers.*

All cleanup workers (public and private sector, paid and unpaid) should receive the appropriate OSHA-required training and equipment for protection against the hazards to which they may be exposed. OSHA should specify the minimum training that must be provided to workers engaged in clean-up and recovery. Training may include that which is

required under OSHA's Hazard Communication, Respiratory Protection, Personal Protective Equipment, and Hazardous Waste Operations and Emergency Response standards.. Protective equipment may include respirators and protective clothing and equipment.

- *Provide medical surveillance.*

Provision must be made for early detection and treatment of occupational, environmental, and psychological illnesses. To ignore the medical needs of potentially exposed workers and residents is asking them to be guinea pigs in a long-term experiment the consequences of which remain unknown. All public and private sector rescue, response, and cleanup workers, including volunteers, should be entered into a centralized database to facilitate medical surveillance.

- *Protect vulnerable workers.*

Special consideration must be given to protection of immigrant and temporary workers. In 9/11 response efforts, immigrant and temporary workers were the workers least likely to be provided with proper training and respiratory protection, and were the workers least likely to have medical insurance. As a result, they incurred high rates of illness without having access to medical treatment.

- *Adopt uniform reoccupancy standards.*

EPA must ensure that a protective health and safety standard for reoccupancy applies uniformly to all communities and also is sensitive to the needs of vulnerable populations. EPA has indicated that it will permit local authorities to determine reoccupancy criteria, but it is critical to ensure that all reoccupancy occurs according to standards that are adequately protective of public health.

Thank you for your concern on these matters.

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