United States Government Accountability Office

GAO

Report to Congressional Requesters

September 2007

WORLD TRADE CENTER

EPA's Most Recent Test and Clean Program Raises Concerns That Need to Be Addressed to Better Prepare for Indoor Contamination Following Disasters

GAO-07-1091

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Highlights

Highlights of GAO-07-1091, a report to congressional requesters

September 2007

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EPA's Most Recent Test and Clean Program Raises Concerns That Need to Be Addressed to Better Prepare for Indoor Contamination Following Disasters

Why GAO Did This Study

The September 11, 2001, terrorist attacks and World Trade Center (WTC) collapse blanketed Lower Manhattan in dust from building debris. In response, the Environmental Protection Agency (EPA) conducted an indoor clean and test program from 2002 to 2003. In 2003, EPA's Inspector General (IG) recommended improvements to the program and identified lessons learned for EPA's preparedness for future disasters. In 2004, EPA formed an expert panel to, among other goals, guide EPA in developing a second voluntary program; EPA announced this program in 2006.

As requested, GAO's report primarily addresses EPA's second program, including the (1) extent to which EPA incorporated IG and expert panel member recommendations and input; (2) factors, if any, limiting the expert panel's ability to meet its goals; (3) completeness of information EPA provided to the public; (4) way EPA estimated resources for the program; and (5) extent to which EPA has acted upon lessons learned regarding indoor contamination from disasters.

What GAO Recommends

GAO recommends that EPA develop (1) guidance on crisis communication, (2) guidelines on cost estimates for disaster response, and (3) protocols specific to indoor contamination. EPA stated that it is taking actions on these recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-07-1091.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

EPA has incorporated some recommendations and input from the IG and expert panel members into its second program, but its decision not to include other items may limit the overall effectiveness of this program. For example, while EPA agreed to test for more contaminants, it did not agree to evaluate risks in areas north of Canal Street and in Brooklyn. EPA reported that it does not have a basis for expanding the boundaries of its program because it cannot distinguish between normal urban, or background, dust and WTC dust.

The expert panel's ability to meet its goals was limited by two factors: (1) EPA officials' belief that some panel goals were more appropriately addressed by other agencies, and (2) EPA's approach to managing the panel process. Furthermore, the majority of expert panel members believe the panel did not meet any of its goals, and that EPA's second program does not respond to the concerns of residents and workers affected by the disaster.

EPA's second plan does not fully inform the public about the results of its first program. EPA concluded that a "very small" number of samples from its first program exceeded risk levels for airborne asbestos. However, EPA did not provide information such as how representative the samples were of the affected area. Residents who could have participated in this voluntary second program might have opted not to do so because of EPA's conclusion about its first program.

EPA did not develop a comprehensive cost estimate to determine the resources needed to carry out its second program. EPA is implementing this program with $7 million remaining from its first program.

While EPA has acted upon lessons learned following this disaster, some concerns remain about its preparedness to respond to indoor contamination following future disasters. Specifically, EPA has not developed protocols on how and when to collect data to determine the extent of indoor contamination, one of the concerns raised by panel members.

View of WTC Towers Collapse between 10:30 a.m. and 5:30 p.m. on September 11, 2001

Source: New York Police Department Photo Unit.

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Abbreviations

AEGL	acute exposure guideline level
AHERA	Asbestos Hazard Emergency Response Act
ATSDR	Agency for Toxic Substances and Disease Registry
CBR	chemical, biological, and radiological
CEQ	Council on Environmental Quality
CLC	Community-Labor Coalition
DHS	Department of Homeland Security
EBAM	electronic beta attenuation monitor
EPA	Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
ERAMS	environmental radiation ambient monitoring system
ERT	Environmental Response Team
ESF	emergency support function
FEMA	Federal Emergency Management Agency
HEPA	high efficiency particulate air
HHS	Department of Health and Human Services
HVAC	heating, ventilation, and air conditioning
MMVF	man-made vitreous fibers
NHSRC	National Homeland Security Research Center
NIOSH	National Institute of Occupational Safety and Health
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
PAL	provisional advisory level
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
TSP	total suspended particulate
WTC	World Trade Center

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Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

September 5, 2007

The Honorable Hillary Clinton
Chairman, Subcommittee on
Superfund and Environmental Health
Committee on Environment and Public Works
United States Senate

The Honorable Carolyn Maloney
House of Representatives

The Honorable Jerrold Nadler
House of Representatives

The September 11, 2001, terrorist attacks on the World Trade Center turned Lower Manhattan into a disaster site on a scale the nation had never experienced. The World Trade Center was a complex of seven buildings on 16 acres surrounding a 5-acre plaza. The twin towers were at the center of the complex. Each tower had 110 floors, with approximately 43,200 square feet on each floor. As the towers collapsed, the area was blanketed in a mixture of building debris and combustible materials that coated building exteriors and streets, as well as the interiors of apartments and offices, with dust. This complex mixture gave rise to another major concern: that thousands of residents and workers in the area would now be exposed to known hazards in the air and in the dust, such as asbestos, lead, glass fibers, and pulverized concrete.

On the day of the attacks, the President signed a major disaster declaration, which activated the Federal Response Plan. The Federal Response Plan, now replaced by the Department of Homeland Security (DHS) National Response Plan, established the process and structure for the federal government's assistance to state and local governments when responding to any major disaster or emergency declared under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).[1] In May 2002, after numerous cleanup, dust collection, and air monitoring

[1]42 U.S.C. § 5121, et seq. The purpose of the Stafford Act is "to provide an orderly and continuing means of assistance by the Federal Government to State and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from such disasters." 42 U.S.C. § 5121(b).

activities were conducted outdoors by the Environmental Protection Agency (EPA), other federal agencies, New York City, and New York State, New York City formally requested that FEMA provide the necessary funding for the hiring of contractors to perform the cleaning and testing of exterior and interior spaces in the vicinity of the World Trade Center (WTC) site for asbestos that might be present.

The Federal Emergency Management Agency (FEMA), which administered the Federal Response Plan, provided such assistance, entering into an interagency agreement with EPA in 2002 to develop EPA's first program. This voluntary program allowed residents of Lower Manhattan living south of Canal Street (representing over 20,000 residences) to elect to have their home professionally cleaned, followed by testing, or to have their home tested only.[2] Approximately 20 percent of the eligible residences participated in the program. As part of EPA's first program, the majority of these residences were professionally cleaned before they were sampled for airborne asbestos because their owners selected the clean and test option rather than the test only option.[3] Even though samples were collected after cleaning in most cases, some residences (less than 1 percent) were still found to have levels of asbestos exceeding EPA's cleanup benchmark.

Owing to concerns by members of the affected community regarding its first program, EPA developed a second program, which is the focus of our current work.[4] This second program was influenced by a variety of individuals, including the EPA Inspector General and an expert panel that EPA convened. In August 2003, EPA's Inspector General made recommendations and provided additional input that addressed EPA's first indoor WTC cleanup efforts, as well as EPA's preparedness for future

[2]In addition to using asbestos as a trigger for cleanup, in a small subset of residences, EPA conducted sampling for dioxin, mercury, and 22 metals to inform a study about the effectiveness of its cleaning techniques.

[3]EPA regional officials overseeing the program told us they assumed that some residents elected to have testing only because they had their residences cleaned before EPA's program.

[4]A lawsuit was filed in March 2004 that, among other things, challenged the adequacy of EPA's first program. The case is on appeal in the U.S. Court of Appeals for the Second Circuit. *Benzman v. Whitman*, 2006 WL 250527 (S.D.N.Y. Feb. 8, 2006), *appeal docketed*, Nos. 06-1166-cv, 06-1346-cv, 06-1454-cv (2nd Cir. Mar. 10, 2006). Pursuant to its long-standing policy of not addressing issues in ongoing litigation, GAO has not addressed EPA's first program.

large-scale disasters resulting in indoor contamination. The Inspector General reported that "additional actions can be taken to provide greater assurances that the program is fully protective of human health." For example, EPA's first program did not require that entire buildings be systematically cleaned, and therefore, the Inspector General recommended that EPA implement a program to verify that apartments that had participated in the first program had not been recontaminated by uncleaned apartments through heating, ventilation, and air conditioning (HVAC) systems. With regard to preparedness, the Inspector General identified lessons learned from the WTC disaster and recommended, among other things, that EPA develop protocols for determining how indoor environmental contamination would be handled in the event of a future disaster.

The White House Council on Environmental Quality (CEQ) indicated in October 2003 that EPA would organize and lead an expert technical review panel to address the concerns of the Inspector General and others. In March 2004, EPA convened the World Trade Center Expert Technical Review Panel, which met periodically through December 2005. The panel included 18 individuals from academe and from city and federal health and science agencies, such as the Department of Labor's Occupational Safety and Health Administration (OSHA) and the Department of Health and Human Services (HHS). It also included two representatives from the Community-Labor Coalition (CLC)—a network of community, tenant, labor, and environmental organizations formed after September 11, 2001, to advocate for appropriate health and safety efforts in the recovery from the WTC attacks. The panel was chaired by an EPA official.[5] The expert panel's broader goal or purpose, as outlined at the first panel meeting by the EPA chairman, was to advise EPA "on ongoing efforts to monitor the situation for New York City residents and workers potentially affected by the collapse of the WTC." This purpose included providing advice on the development of EPA's second program plan. The panel chairman also provided the following longer-term goals: (1) identify any remaining risks using exposure and health surveillance information, (2) identify unmet public health needs, and (3) determine steps to further minimize risks.[6] Expert panel members, including the CLC representatives, submitted individual recommendations to EPA.

[5]The first panel chairman retired and was replaced while the panel was ongoing.

[6]The panel was also given a number of requests for document reviews to be completed within 3 to 6 months.

After obtaining views from many sources, including the Inspector General, members of the expert panel, and the CLC, EPA announced its plan for a second program in December 2006. In this 2006 plan, EPA indicates that it will test residences for the presence of contaminants and clean residences if test results exceed EPA's cleanup benchmarks. The plan targets residents and building owners in the same portion of Lower Manhattan as its first program. The plan also provides the results of EPA's sampling from its first program. EPA told us that 272 residents and 25 building owners had enrolled in the second program, compared with 4,167 residents and 144 building owners that participated in the first program.

In this context, you asked us to determine (1) the extent to which EPA incorporated recommendations and additional input from the expert panel members and its Inspector General in its second program; (2) what factors, if any, limited the expert panel's ability to meet its goals; (3) the completeness of information EPA provided to the public in its second plan; (4) the way EPA estimated the resources needed to conduct the second program; and (5) the extent to which EPA has acted upon lessons learned to better prepare for indoor contamination that could result from future large-scale disasters. In June 2007, we testified on some of these issues before the Subcommittee on Superfund and Environmental Health, Senate Committee on Environment and Public Works.[7] In addition, owing to concerns raised in the media about EPA's use of classification authority, you asked that we determine the extent to which EPA has classified information, and, if so, whether any classified information discusses the environmental impact of the towers' collapse. Appendix I provides the results of our analysis of EPA's classification of information under this authority.

In conducting our work, we reviewed, among other things, EPA's 2002-2003 indoor program plan, EPA's planning leading to the December 2006 program plan, the 2003 EPA Inspector General report, all 13 summaries of EPA's WTC Expert Technical Review Panel meetings and conference calls, and funding data from EPA. We assessed the reliability of EPA's funding data and determined that these data were sufficiently reliable for the purposes of this report. In addition, we interviewed officials from EPA headquarters, including the Office of Research and Development and the

[7]GAO, *World Trade Center: Preliminary Observations on EPA's Second Program to Address Indoor Contamination Provide Lessons for the Future*, GAO-07-806T (Washington, D.C.: June 20, 2007).

Office of Solid Waste and Emergency Response; Region 2, which is responsible for New York City, and EPA's National Homeland Security Research Center, among others; FEMA Region 2; and the New York City Department of Environmental Protection. We also attended a National Institute of Standards and Technology technical seminar on WTC materials and observed the disaster area with a FEMA official. In addition, we conducted structured interviews with all 18 WTC Expert Technical Review Panel members and both EPA panel chairmen. A more detailed description of our scope and methodology is presented in appendix II. We performed our work from June 2006 to September 2007 in accordance with generally accepted government auditing standards.

Results in Brief

While EPA has taken some actions to incorporate recommendations and additional input from the Inspector General and expert panel members into its second program, it did not incorporate other items, which may limit the overall effectiveness of its program. For example, EPA's second program expands the number of contaminants tested from only asbestos to three additional contaminants, and it includes tests of dust as well as the air. However, EPA's program does not expand the boundaries of the cleanup to north of Canal Street and to Brooklyn. EPA reported it was unable to develop a method for distinguishing between normal urban dust and WTC dust; therefore, the agency reported it could not assess the extent of WTC contamination and had no basis for expanding the cleanup effort. EPA did not begin examining methods for differentiating between normal urban, or background, dust and WTC dust until May 2004—nearly 3 years after the disaster—making the process for distinguishing between the two types of dust more difficult. In addition, EPA's second program does not include sampling in HVACs or "inaccessible" locations within apartments and common areas, such as behind dishwashers, because EPA only included these efforts when it planned to determine the extent of contamination. The agency's second program plan notes that because EPA is not able to assess the extent of WTC contamination and because it is attempting to devote the maximum resources to testing requests, EPA will not test in these locations. Testing in such a restricted manner makes evaluating the adequacy of cleanup efforts difficult. Moreover, according to EPA officials, this program does not test workplaces because other federal agencies have procedures to address worker safety.

Two factors limited the expert panel's ability to meet its goals: (1) EPA officials' belief that some panel goals were more appropriately addressed by other agencies and (2) EPA's approach to managing the panel process. With respect to the first issue, EPA was acting in response to a CEQ letter

indicating that EPA would convene a panel to identify unmet public health needs. However, EPA believed that other federal agencies, such as the Department of Health and Human Services, were better equipped to address public health. Therefore, rather than having the expert panel members discuss and recommend actions to address this issue, EPA allowed time during panel meetings for public health presentations. EPA believed that these presentations allowed the panel to satisfy CEQ's request. While the expert panel members listened to these presentations, the majority of them told us that the panel did not successfully identify unmet public health needs. As to the second issue, in the view of expert panel members, EPA's management of the panel process was problematic in several ways. Specifically, EPA did not allow the panel to reach consensus on key issues and prepare a final report. Instead, EPA solicited individual recommendations and, according to the majority of panel members, did not have a fully transparent process for adopting or rejecting these recommendations. EPA did not have the panel reach consensus because this approach might limit individual contributions. In addition, several expert panel members told us that EPA dedicated half or less of each daylong panel meeting to technical discussion, instead devoting the remainder of each day to public comment. As a result of these and other factors, the majority of expert panel members do not believe the panel successfully met any of its goals. Furthermore, all 10 panel members who responded to a follow-up inquiry believe that EPA's second program is not responsive to the concerns of residents and workers impacted by the collapse of the WTC towers.

EPA did not fully disclose in its second plan the limitations in the testing results from its first program. This more complete information would have allowed the public to make informed choices about participation in its most recent voluntary program. EPA concluded in its second plan that a "very small" number of samples from its first program exceeded risk levels for airborne asbestos but did not explain that over 80 percent of the samples were taken after residences were professionally cleaned as part of EPA's program. In addition, EPA did not explain that its conclusion was based on participation from 20 percent of the eligible residences and that, due to the voluntary nature of the program, the sample of apartments may not have been representative of all residences eligible for the program. Without this additional information, some eligible residents of Lower Manhattan may have concluded that they were not at risk from indoor contamination and therefore elected not to participate in the second program.

Rather than estimate the resources needed to carry out its second program, EPA is implementing this program with the $7 million remaining from the first program. According to EPA officials, it would have been difficult to estimate program costs without knowing the number of participants as well as the size of apartments, which vary widely throughout Lower Manhattan. While EPA agreed to increase the number and type of contaminants being sampled in the second program, available funding is less than 20 percent of what was spent on the first program. In its final plan, EPA noted that it would prioritize requests for participation based on proximity to the WTC site.

EPA has acted upon lessons learned about its preparedness following the WTC disaster, but we are uncertain about how completely EPA has laid the groundwork for effective response to indoor contamination following future disasters. For example, EPA has identified likely threats and developed approaches to address them and has had an ongoing effort to clarify internal roles and responsibilities. EPA officials told us that they will use the National Response Plan in the future to guide their response actions following disasters and that they will develop site-specific responses; however, the National Response Plan does not explicitly address indoor contamination. Furthermore, EPA has not resolved some outstanding issues raised by expert panel members after the WTC disaster, such as how and when to collect data to determine the extent of indoor contamination, which we believe are important for addressing future disasters. Without clarifying actions that are appropriate for each federal agency in these scenarios, important public health needs, including resident and worker health, may not be promptly addressed.

To enhance EPA's ability to provide complete and clear information to the public and decision makers and to ensure that EPA is better prepared for future disasters that involve indoor contamination, we are recommending that EPA (1) facilitate the implementation of the agency's recently issued Crisis Communication Plan by issuing guidance that ensures the presentation of environmental data, such as testing results, in an appropriate context, with appropriate technical caveats noted in plain language; (2) establish guidelines for developing program cost estimates for disaster response programs; and (3) develop protocols that specifically address indoor contamination.

In commenting on a draft of this report, EPA's Assistant Administrator for Research and Development and Assistant Administrator for Solid Waste and Emergency Response identified actions that EPA has begun taking that are responsive to these recommendations. EPA also provided

comments on aspects of the report it considered misleading or inaccurate, such as the completeness of information EPA provided to the public. We continue to believe that EPA did not include appropriate caveats in its second program plan that articulated the limitations in the first program's results. For example, EPA did not explain in its second plan that 20 percent of eligible residents participated in its first program and, therefore, the results may not have been representative of all residences. We believe that the report offers a balanced portrayal of EPA's development of its second program, the expert panel process, and its actions to better prepare for future disasters. EPA also provided technical comments, which we incorporated as appropriate. EPA's letter and our detailed response to it appear in appendix V.

Background

On the day of the terrorist attacks on the World Trade Center, the President's declaration of a major disaster under the Stafford Act activated the Federal Response Plan (superseded by and incorporated into the National Response Plan). The Federal Response Plan established the process and structure for the federal government to provide assistance to state and local governments when responding to major disasters and emergencies declared under the Stafford Act. Under the Federal Response Plan, FEMA coordinated this assistance through mission assignments and interagency agreements, which assigned specific tasks to federal agencies with the expertise necessary to complete them. The Congress authorized $20 billion to respond to the attacks, of which $8.8 billion was provided through FEMA, for the New York City area.

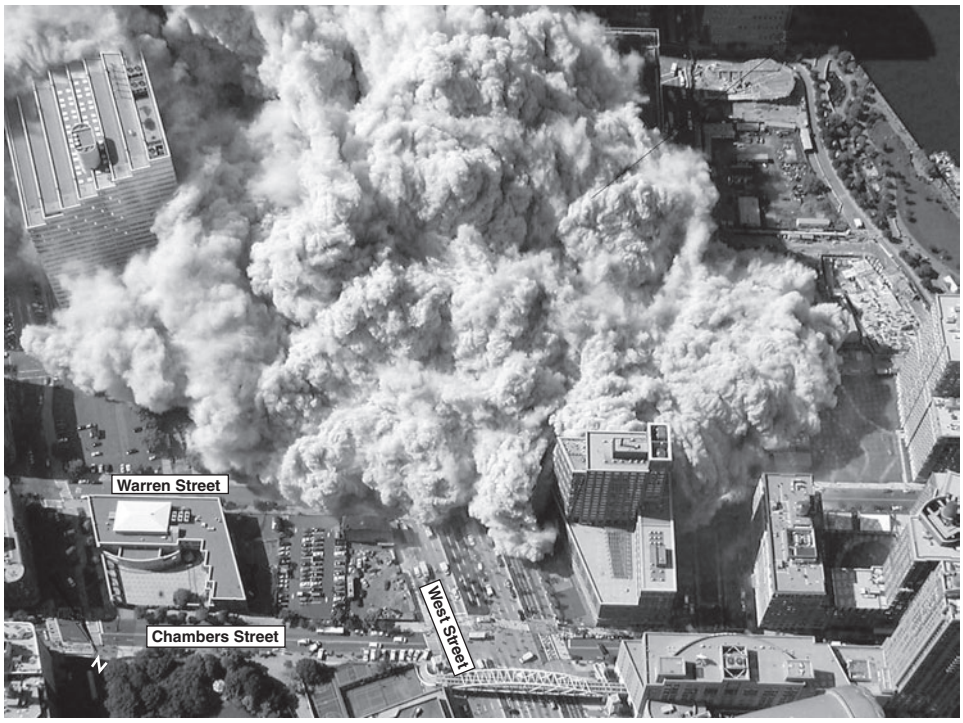
Under the Federal Response Plan (and the National Response Plan today), EPA served as coordinator during large-scale disasters for 1 of 15 emergency support functions (ESF)—ESF 10, which addresses oil and hazardous material releases. ESF 10 encompasses various phases of hazardous material response, including assessment and cleanup. In the first 6 months after the WTC disaster, EPA responded to FEMA mission assignments to assist with the response efforts and, among other tasks, provided wash stations for responders and disposed of waste from the WTC site.

There are an estimated 330 office buildings in Lower Manhattan below Canal Street and roughly 900 residential buildings with approximately 20,000 apartments. In 2002, after initial efforts by the city of New York to advise New York residents how to clean the World Trade Center dust in their homes, FEMA and EPA entered into an interagency agreement to address indoor spaces affected by the disaster. While EPA has responded

to hazardous material releases for decades, the WTC disaster was the first large-scale emergency for which EPA provided testing and cleanup in indoor spaces.

WTC dust is a fine mixture of materials that resulted from the collapse and subsequent burning of the twin towers and includes pulverized concrete, asbestos, and glass fibers. WTC dust entered homes and offices through open windows, was tracked in, or was picked up by air-conditioning system intakes. Figures 1 and 2 show the dust generated by the WTC disaster.

Figure 1: Collapse of WTC Building 1 at Approximately 10:30 a.m. on September 11, 2001



Source: New York Police Department Photo Unit.

Figure 2: Collapsed WTC Towers on September 11, 2001

Source: New York Police Department Photo Unit.

The amount of dust in indoor spaces in and around Lower Manhattan varied due to a variety of factors, including distance from the WTC site; weather conditions, such as wind; and damage to individual buildings. In the years since the disaster, the level of WTC dust in indoor spaces has varied, depending upon the cleaning performed by residents and other groups, including EPA and professional cleaning companies.

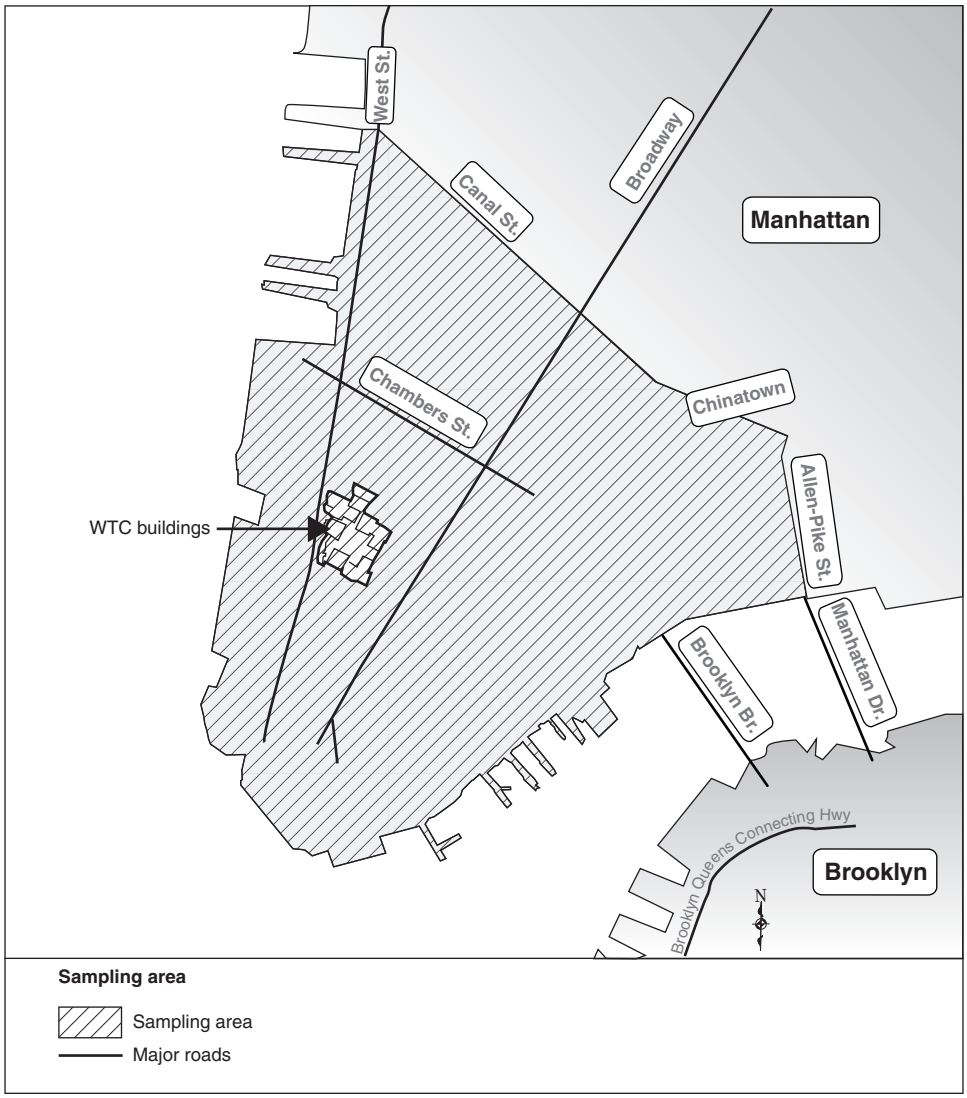
In May 2002, EPA, New York City, and FEMA officials announced a program, to be overseen by EPA, offering a cleanup of residences in Lower Manhattan. Between September 2002 and May 2003, residences were cleaned and tested, or tested only, for airborne asbestos.[8] EPA analyzed samples from 4,167 apartments in 453 buildings and 793 common areas in 144 buildings. This program cost $37.9 million—$30.4 million for indoor cleaning and testing by the New York City Department of Environmental

[8]In addition to residents, building owners could ask EPA to evaluate common areas, such as lobbies, and HVAC systems.

Protection and $7.5 million for EPA oversight and sample analysis. Figure 3 shows the area in Lower Manhattan eligible for participation in EPA's program. Residents could choose either an aggressive or modified aggressive testing method for providing samples of indoor air to EPA. For the modified aggressive method, the contractor ran a 20-inch fan for the duration of testing. For the aggressive method, a leaf blower was used, in addition to the 20-inch fan, to direct a jet of air toward corners, walls, fabric surfaces, and the ceiling to dislodge and resuspend dust. The contractors HEPA vacuumed and wet-wiped hard surfaces,[9] including floors, ceilings, ledges, trims, furnishings, appliances, and equipment; and they HEPA vacuumed soft surfaces, such as curtains, two times. In addition, in cases where there were still significant amounts of WTC dust and debris, contractors used asbestos abatement procedures such as the use of personal protective equipment, including respirators and a properly enclosed decontamination system; posting of warning signs; isolation barriers to seal off openings; and disposal of all waste generated during the cleaning in accordance with applicable rules and regulations for asbestos-containing waste.

[9]HEPA is an acronym for "high efficiency particulate air" filter. HEPA vacuums contain HEPA filters that can remove at least 99.97 percent of airborne particles 0.3 micrometers (µm) in diameter.

Figure 3: EPA's 2002-2003 Indoor Clean and Test Program Boundaries in Lower Manhattan



Sources: EPA and GAO.

The New York City Department of Health and Mental Hygiene and the U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) collected samples from in and around 30 buildings in Lower Manhattan from November though December 2001. In

September 2002, these agencies released their assessment of the public's exposure to contaminants in air and dust,[10] recommended additional monitoring of residential spaces in Lower Manhattan, and referred residents to EPA's program.

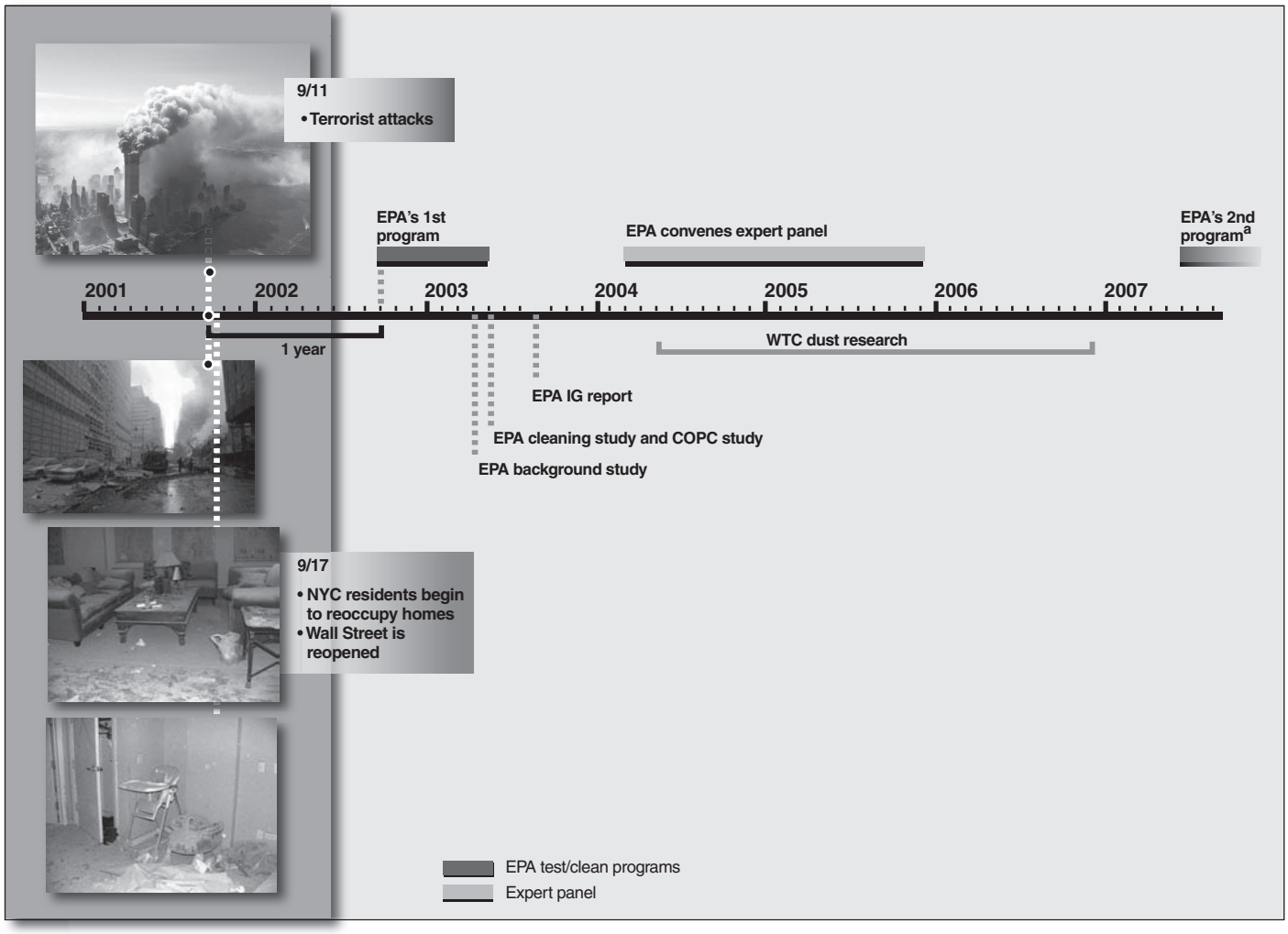
Before EPA finalized its second indoor program plan, several assessments related to indoor contamination were conducted: an August 2003 EPA Inspector General report; an expert technical review panel that EPA conducted from March 2004 through December 2005; and three EPA studies. The studies identified background levels of contamination in New York City ("background study"); the WTC-related contaminants of potential concern, and associated cleanup benchmarks ("COPC study"); and the efficacy of various cleaning methods in eliminating WTC-related contaminants of concern ("cleaning study").

During the time EPA met with the WTC Expert Technical Review Panel, some expert panel members encouraged EPA to develop a method for differentiating between contaminants found in the New York City urban environment and those found in WTC dust. This method would have served as the basis for determining the extent of WTC-related contamination, and EPA officials believed it would have enabled the agency to limit its focus to contamination specific to the WTC disaster. Early in the panel process, EPA formed a subpanel of these experts to assist EPA's Office of Research and Development in developing such a methodology. In August 2005, EPA released its final report describing its methodology, which was peer reviewed. In their October 2005 final report, the peer reviewers criticized the reliability of EPA's method and provided suggestions on improving EPA's approach. In a November 2005 letter, EPA officials told expert panel members that in the absence of a valid method, EPA could not definitively distinguish between WTC contaminants in dust and levels of the same contaminants found in an urban environment. At the same time, 2 weeks before the final panel meeting, the EPA chairman informed the panel that it would be disbanded as of the final meeting and that EPA would not be implementing a plan that included determining the extent of WTC contamination. Experts that were a part of the subpanel addressing this method reported that the peer-review comments could be addressed and that EPA should perform additional sampling. Nonetheless,

[10]EPA officials told us that the results of this study were made available to them in February 2002.

EPA ultimately decided not to pursue developing this methodology. Figure 4 shows the chronology of events preceding the second program.

Figure 4: Timeline of EPA's WTC Indoor Contamination Activities



Source: GAO analysis of EPA data; photos (top to bottom): NYPD Photo Unit; Federal Emergency Management Agency; Dr. Lung Chi Chen, New York University.

[a]EPA's registration period ended in March 2007, and on June 18, 2007, EPA began implementing the program.

In January 2006, EPA formally requested funds from FEMA. EPA and FEMA signed an interagency agreement to conduct EPA's second program in July 2006, and EPA announced the agency's second program to test

indoor spaces in Lower Manhattan in December 2006. Appendix III provides information regarding EPA's first and second indoor programs.

EPA Incorporated Some Recommendations, but It Did Not Adopt Other Input, Which May Limit the Second Program's Effectiveness

In response to recommendations and additional input from the Inspector General and expert panel members, EPA's second program incorporates some additional testing elements. However, EPA's second program does not incorporate other items. Figure 5 shows the key recommendations and additional input the EPA Inspector General and expert panel members provided to EPA.

Figure 5: Key Recommendations and Additional Input Regarding EPA's Second WTC Indoor Test and Clean Program

Key Recommendations and Additional Input	Provided by		Adopted by EPA	
	EPA IG	Panel members	Yes	No
Expand the list of contaminants tested for.		●	●	
Test in dust as well as in air.		●	●	
Address contamination of spaces, rather than re-contamination since EPA's first program.		●	●	
Evaluate potential health risks from pollutants for geographic areas north of Canal Street and in Brooklyn.	●	●		●
Test in HVACs.		●		●
Test in inaccessible areas.		●		●
Treat buildings as a system, rather than individual residential units.	●			●
Evaluate potential health risks from pollutants in workplaces.[a]	●	●		●
Investigate a method to distinguish between normal urban, or background, dust and WTC dust.		●	●	
Use a method for distinguishing between normal and WTC dust to determine the extent of contamination.		●		●

Source: GAO.

Notes: Not all expert panel members made each recommendation.

[a]The program allows commercial building owners to request testing, but it does not permit workers or employers to do so. EPA officials noted that employees who have concerns about their working conditions could file a complaint with OSHA or request an evaluation by HHS's National Institute of Occupational Safety and Health.

EPA Expanded the Number of Contaminants It Will Evaluate in Testing

While EPA tested solely for airborne asbestos in order to trigger cleanup in the first program, it agreed to test for three additional contaminants in its second program—man-made vitreous fibers, polycyclic aromatic hydrocarbons, and lead. These contaminants, as well as two additional ones—dioxin and silica, were identified as WTC contaminants of potential

concern in a May 2003 report issued by EPA and other federal, New York City, and New York state agencies.[11] EPA did not include dioxin and silica in the second program for several reasons. Regarding dioxin, EPA noted that concentrations were elevated in the weeks following the disaster when fires were still burning, but concentrations returned to predisaster levels by December 2001. Furthermore, because "only eight" of 1,500 dioxin samples exceeded cleanup benchmarks during tests in 2002 and 2003, EPA decided not to sample for this contaminant in its second program. Regarding silica, EPA noted that in 2002 an ATSDR/New York City Department of Health and Mental Hygiene report stated that short-term exposure to silica is unlikely to cause adverse health effects and that adverse health effects from chronic exposure are possible but unlikely if recommended cleaning is conducted.[12] EPA also explained that levels of silica are likely to have been reduced by cleaning activities over the past 3 years.

EPA also agreed to test for contaminants in dust. To do so, EPA developed site-specific cleanup benchmarks for asbestos and man-made vitreous fibers in dust over the course of nearly a year. In its second program plan, EPA explains that these benchmarks are not risk based but rather are based on, among other things, work by experts in the field as to what constitutes contamination and how it compares with site-specific background levels, and the benchmarks employed for cleanup at a Superfund site with asbestos-contaminated residences.

EPA Is Not Assessing the Extent of WTC Contamination, and It Did Not Agree to Evaluate Risk in Workplaces

Though EPA expanded the number of contaminants tested for in its second program, it did not adopt recommendations and additional input from the EPA Inspector General or the expert panel that addressed the following issues:

- *Evaluating risks in geographic areas north of Canal Street and in Brooklyn*. EPA did not expand the scope of testing north of Canal Street,

[11]EPA, OSHA, ATSDR, New York State Department of Health, and New York City Department of Health and Mental Hygiene, *World Trade Center Indoor Environment Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks* (May 2003).

[12]Agency for Toxic Substances and Disease Registry and New York City Department of Health and Mental Hygiene, *Final Report of the Public Health Investigation to Assess Potential Exposures to Airborne and Settled Surface Dust In Residential Areas of Lower Manhattan* (September 2002).

or to Brooklyn, as advisory groups had advised. EPA reported it did not expand the scope of testing because it could not differentiate between normal urban dust and WTC dust; differentiating between the two would have enabled EPA to determine the geographic extent of WTC contamination. Some expert panel members had suggested that EPA investigate whether it was feasible to develop a method for distinguishing between normal urban dust and WTC dust. EPA initially agreed to do so. Beginning in 2004—almost 3 years after the disaster—EPA conducted this investigation into developing a WTC dust signature. However, EPA officials told us that because so much time had passed since the terrorist attack, it was difficult to distinguish between WTC dust and urban dust.[13] EPA ultimately abandoned this effort because peer reviewers questioned its methodology; EPA decided not to explore alternative methods that some of the peer reviewers had proposed. Instead, EPA will test only in an area where visible contamination has been confirmed by aerial photography conducted soon after the WTC attack, although aerial photography does not reveal indoor contamination.[14] Furthermore, EPA officials told us that some WTC dust was found immediately after the terrorist attacks in areas, including Brooklyn, that are outside the area eligible for its first and second program.

- *Testing in HVACs and inaccessible areas*. In its November 2005 draft plan for the second program, EPA had proposed collecting samples from a number of locations in HVACs. In some buildings, HVACs are shared; in others, each residence has its own system. In either case, contaminants in the HVAC could recontaminate the residence unless the system is also professionally cleaned. However, EPA's second program will not provide for testing in HVACs under any circumstances but will offer cleaning in HVACs if tests in common areas reveal that cleanup benchmarks for any of four contaminants have been exceeded. EPA officials told us that EPA will sample near HVAC outlets in common areas and will obtain dust samples in proximity to these locations. EPA explained in the second plan that it will not sample within HVACs because it is no longer assessing the extent of contamination resulting from the WTC disaster and because it is attempting to devote the maximum resources to testing requests.

[13]In addition to the lack of a specific indicator for WTC dust, EPA officials also noted that a sampling effort to identify additional areas whose cleanup would result in a reduction in exposure to WTC contaminants is not feasible for the following reasons: the nature of the contaminants; the widespread, low-level background contamination from other urban sources; and the large and varied nature of the spaces involved.

[14]Appendix I of EPA's December 2006 program plan states that EPA's assessment of the extent of contamination was also based on modeling and monitoring data.

Similarly, EPA had proposed sampling for contaminants in "inaccessible" locations, such as behind dishwashers and rarely moved furniture within apartments and common areas. Again, because it was unable to differentiate between normal urban dust and WTC dust, EPA stated that it would not test in inaccessible locations in order to devote its resources to as many requests as possible. EPA told us that 272 residents and 25 building owners had enrolled in the second program, compared with 4,167 residents and 144 building owners that participated in the first program.[15]

- *Evaluating risks to workers/workplaces*. According to EPA, its second program plan is "the result of ongoing efforts to respond to concerns of residents and workers." Workers were concerned that workplaces in Lower Manhattan experienced the same contamination as residences. In its second program, EPA will test and clean common areas in commercial buildings, but only if an individual owner or manager of the property requests the service. EPA stated that employees who believe their working conditions are unsafe as a result of WTC dust may file a complaint with OSHA or request an evaluation by HHS's National Institute of Occupational Safety and Health (NIOSH). Concerns remain, however, because these other agencies do not have authority to conduct cleanup in response to contaminant levels that exceed cleanup benchmarks. In addition, OSHA's benchmarks are designed primarily to address airborne contamination, while EPA's test and clean program is designed to address contamination in building spaces, whether the contamination is airborne or in settled dust. OSHA requires individual employers to adopt work practices to reduce employee exposure to airborne contaminants, whereas EPA's test and clean program is designed to remove contaminants from affected spaces.

- *Addressing whole buildings*. Between March 2004 and December 2005, when EPA met with expert panel members, officials discussed sampling a representative number of each buildings' apartments in order to "characterize the building," which would have allowed EPA to characterize areas in Lower Manhattan. This information would have been used to inform decision-making regarding the extent of indoor contamination. According to EPA officials, all residents from each building would need to volunteer their individual apartments, and EPA would select the units it then tested. The approach that EPA developed entailed cleaning a building, including all units, common areas and HVACs, if there was a high degree of certainty that the average concentration of at least

[15]Of the 640 residents and building owners who registered for the second program, 272 residents and 25 building owners submitted the necessary access agreements.

one contaminant, across all apartments tested, exceeded the benchmark, and dust could be associated with the WTC.[16] While this method addressed the Inspector General recommendation that buildings be treated as a system so that potentially contaminated apartments did not contaminate previously cleaned apartments, EPA did not ultimately include this particular methodology in its second program plan due to the lack of a method to identify WTC dust. Instead, EPA will clean whole common areas, such as lobbies, and HVACs in buildings. It will clean common areas when at least one contaminant is found to exceed the cleanup benchmark in that area. It will clean HVACs and common areas when there is a high degree of certainty that the mean contaminant level for accessible areas, infrequently accessed areas, or air samples in common areas exceeds one contaminant benchmark.

Two Factors Limited the Expert Panel's Ability to Meet Its Goals

The expert panel's ability to meet its goals was limited by two factors: (1) EPA officials' belief that some panel goals were more appropriately addressed by other agencies and (2) EPA's approach to managing the panel process. Furthermore, the majority of expert panel members do not believe the panel successfully met any of its goals. All of the panel members who responded to our follow-up inquiry regarding EPA's second program (10 out of 10 members) told us the program is not responsive to the concerns of residents and workers affected by the collapse of the WTC towers. Appendix IV provides the full range of responses from structured interviews with expert panel members about EPA's management of the panel process.

EPA Officials Believed That Some Panel Goals Were More Appropriate for Other Agencies

According to EPA officials, some panel goals were more appropriately addressed by other agencies. We believe this view limited the panel's ability to address these issues. In particular, one panel goal, as stated by CEQ, was to advance the identification of unmet public health needs. However, EPA officials believed that other federal agencies, such as HHS, were better equipped to address the issue of public health. Therefore, rather than having the expert panel members discuss and identify actions to address this issue, EPA allowed time during panel meetings for public health presentations. EPA officials believe that the panel met CEQ's

[16]According to EPA's May 2005 draft plan, a building would be cleaned when the 95 percent upper confidence limit on the mean concentration of at least one contaminant of potential concern in all units was above the cleanup benchmark.

charge by including health experts on the panel and by including health presentations during panel meetings.

While the panel was provided with these presentations, the majority of expert panel members (16 out of 18) told us the panel did not successfully identify unmet public health needs. Outside of the panel, a multiagency effort established a WTC health registry to assess the health impact of the WTC collapse. The EPA panel chairman noted that panel member recommendations to maintain the WTC health registry for more than 20 years and to link the results of subsequent indoor testing to the registry had been provided to the appropriate agencies.

In addition, EPA officials believed that, despite the panel's broader goal, which was to help guide EPA in its ongoing efforts to "monitor the situation for New York residents and workers impacted by the collapse of the WTC towers," OSHA should address the issue of workplace safety because that is OSHA's mission. Consequently, as noted earlier, the second program does not address workers' concerns, and employers and workers are not eligible to request testing or cleaning.[17] EPA stated that employees who believe their working conditions are unsafe as a result of WTC dust may file a complaint with OSHA or request an evaluation by HHS's National Institute of Occupational Safety and Health (NIOSH).

EPA's Management of the Panel Process Was Problematic, According to Expert Panel Members

EPA's management of the panel process limited the panel's ability to successfully meet its goals. According to 9 or more of the 18 expert panel members we interviewed, problematic aspects of EPA's management included (1) the lack of a consensus approach, (2) inadequate time for technical discussion, and (3) no fully transparent decision-making process. In addition, a number of expert panel members told us that failure to document recommendations created other concerns.

- *Lack of a consensus approach*. EPA did not allow the panel to reach consensus on key issues and prepare a final report; instead it obtained recommendations from each member of the expert panel. The majority of expert panel members (13 out of 18) told us that EPA's approach was not appropriate, and one panel member noted that the lack of a consensus approach prevented the resolution of key issues. The EPA chairman told the panel that the panel would not be asked to reach consensus because

[17]Residential and commercial building owners may participate in this program.

this approach might limit the contribution of individual panel members. EPA officials also noted that it would have been difficult to reach consensus with such a diverse panel of experts and the technical nature of the discussion.

- *Inadequate time for technical discussion*. The majority of expert panel members (14 out of 18) told us there was not adequate time on the agenda for the panel to discuss issues. According to several panel members, EPA dedicated half or less of each daylong panel meeting to technical discussions, devoting the remainder of each day to public comment.

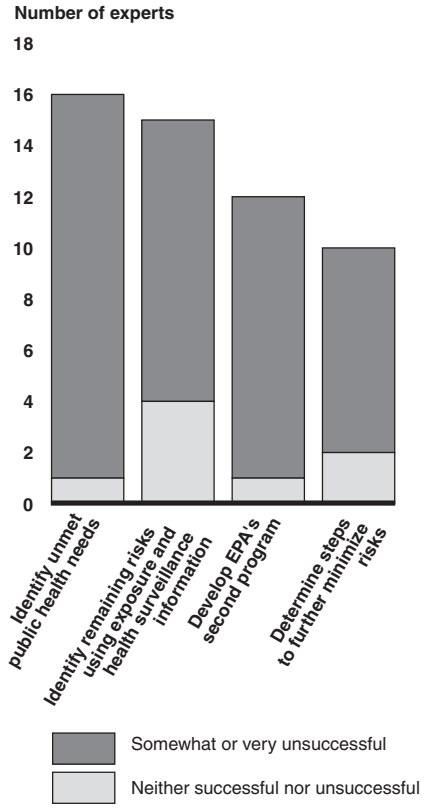
- *Lack of a fully transparent decision-making process*. EPA's reasons for accepting or rejecting expert panel members' recommendations were not at all transparent, according to half of the panel members (9 out of 18). Furthermore, six panelists said that EPA did not respond to their recommendations or provide any explanation for rejecting recommendations. In contrast, the two EPA panel chairmen we interviewed told us they believed the decision-making process was completely transparent.

- *Failure to document recommendations*. Although EPA stated in its operating principles that it would keep detailed minutes of each panel meeting, including all individual recommendations, whether oral or written, EPA did not maintain a list of recommendations. Instead, EPA provided "summaries" of each meeting that included an overview of issues raised, and, starting with the fifth meeting, EPA provided audio recordings of six of the remaining panel meetings. The majority of expert panel members (10 out of 18) said that having written transcripts of the meetings available would have been somewhat or very helpful. Some expert panel members told us the lack of transcripts presented a problem because they had no record of EPA agreement with several recommendations that were later not adopted.

Most Expert Panel Members Did Not Believe They Addressed the Panel's Goals and Ultimately Did Not Agree with EPA's Final Indoor Test and Clean Program

The majority of expert panel members told us that the panel was unable to meet its goals as outlined by EPA. As figure 6 shows, these included guiding EPA in: (1) developing the second program, (2) identifying unmet public health needs, (3) identifying any remaining risks using exposure and health surveillance information, and (4) determining steps to further minimize risks.

Figure 6: Expert Panel Members Who Viewed the Panel As Somewhat or Very Unsuccessful, or Neither Successful Nor Unsuccessful, at Meeting Its Goals



Source: GAO.

According to all expert panel members who responded to our follow-up inquiry regarding EPA's second program (10 out of 10 members), this program does not respond to the concerns of residents and workers affected by the collapse of the WTC towers. At the final panel meeting, some expert panel members said publicly that they would discourage participation in EPA's program and several expert panel members said

that the data yielded by the test and clean program will not be useful and the program is unlikely to adequately identify or clean up contaminants. In addition, the Community-Labor Coalition distributed information that also discouraged participation, citing lack of expert panel member support.

EPA Did Not Provide the Public with Complete Information to Make Fully Informed Decisions

EPA did not provide complete information in its second plan to allow the public to make informed choices about their participation in its voluntary program. While EPA stated that the number of samples in its first program exceeding risk levels for airborne asbestos was "very small," EPA did not provide the following additional information to help inform residents' decisions regarding participation in the second program:

- *Voluntary program participation*. Participation in the first program came from about 20 percent of the residences eligible for participation. In addition, participation was voluntary, which may suggest that the sample of apartments was not representative of all residences eligible for the program.

- *Only asbestos tested*. EPA's conclusions were based only on tests for asbestos, rather than other contaminants, and the conclusions focused on airborne contamination rather than contamination in dust inside residences.

- *Sampling protocols varied*. EPA did not explain that over 80 percent of the samples were taken after professional cleaning was completed as a part of EPA's program. In addition, EPA did not identify the portion of the samples that were collected following aggressive, as opposed to modified aggressive, techniques. In the first case, the air inside apartments was more actively circulated before sampling occurred. In these instances, about 6 percent of apartments tested were found to exceed EPA's asbestos level, compared with roughly 1 percent that used the modified aggressive technique. Out of 4,167 apartments sampled, 276 were sampled using the aggressive method.

- *Discarded sample results*. EPA also did not explain in its second program plan that its first program's test results may have been affected by sample results that were discarded because they were "not cleared"—that is, they could not be analyzed because the filter had too many dust particles to be analyzed under a microscope. However, EPA's final report on its first program stated that residences with more than one inconclusive result, such as filter overload, were encouraged to have their residences recleaned and retested.

Without complete explanations of EPA's sampling data, residents who could have elected to participate might have decided not to do so. The number of participants declined from roughly 4,200 residents and 144 building owners in the first program to 272 residents and 25 building owners in the second program. In addition, community leaders on the panel believed that allowing participants to choose between two sampling techniques, coupled with the voluntary nature of the program, had the effect of making the overall program appear unnecessary.

EPA Did Not Assess Resource Needs for the Second Program

EPA did not take steps to ensure that it would have adequate resources to effectively implement the second program. Instead, EPA is implementing this program with the approximately $7 million in Stafford Act funds remaining after its first program. Although this program increases the number and type of contaminants being sampled, the funds available are less than 20 percent of those used in the first program.

EPA Is Implementing the Second Program with $7 Million and Did Not Complete a Cost Estimate to Determine Whether This Was an Appropriate Amount

EPA is implementing its second program with the funding remaining after completion of its first program—approximately $7 million—but EPA did not determine whether this amount would support the effective implementation of its second program. According to EPA officials, they could not estimate the cost of the second program without information on the number of program participants and the size of residences, which vary widely throughout Lower Manhattan. Nevertheless, the interagency agreement between FEMA and EPA for the first program included estimated costs, although EPA faced the same challenges. This first estimate of $19.6 million was based on projections for the number of eligible residents participating in the program—specifically, 10,000 residences requesting cleaning and 3,000 residences requesting testing only—and included, among other things, detailed estimates for sample analysis, equipment and supplies, and EPA salary and travel costs.

In the first program, EPA spent $7.5 million—of $19.6 million obligated by FEMA to EPA—on program oversight and analysis of air samples, while New York City spent approximately $30.4 million to collect air samples and clean residences. EPA returned $12.1 million in unspent funds to FEMA. According to FEMA officials, when the agency learned about the establishment of the expert panel, FEMA retained $7 million for additional EPA activities. EPA officials told us that in discussions with FEMA about whether the amount was appropriate, FEMA responded that only $7 million was available.

In July 2006, an interagency agreement was signed by EPA and FEMA for the second program that describes EPA's role as developing and implementing a program to test and clean in the specified area. After EPA entered into this agreement, EPA officials told us that if the number of registrants for the program exceeded the number that could be covered by the $7 million, they were unsure where additional funds could be obtained. EPA did not provide information to FEMA in the agreement about how many residents and building owners could potentially be served under the program. Thirteen of the 18 expert panel members told us they did not believe the $7 million for the sampling and cleanup was sufficient. According to one of the expert panel's chairmen, the $7 million was sufficient for initial sampling in the second program but not for sampling and cleanup. In its final plan, EPA noted that requests for participation from eligible residents and building owners would be prioritized based on proximity to the WTC site.

Although EPA's second program increases the number and type of contaminants being sampled, the $7 million available is less than 20 percent of the $37.9 million spent on the first program. While only 1 percent of roughly 20,000 eligible residences are participating in the second program, compared with 20 percent who participated in the first program, it is not clear whether funding for the second program will be adequate without a cost estimate.

EPA Has Taken Preparedness Actions, but Some Concerns Remain

EPA has acted upon lessons learned from the WTC disaster to prepare for future disasters, such as clarifying internal roles and responsibilities and improving health-related cleanup benchmarks. Nevertheless, we are uncertain about how completely these activities address EPA's ability to respond to contamination in indoor environments in the face of future disasters. For example, EPA has not yet addressed certain methodological challenges raised by expert panel members regarding the WTC disaster, such as how it will determine the extent of contamination, which we believe are important for addressing future disasters. Without addressing this and other challenges, it is uncertain whether people in affected areas will be protected adequately from risks posed by indoor contamination stemming from future disasters.

EPA Has Taken Preparedness Actions Following the WTC Disaster

Since the WTC disaster, EPA has taken actions to improve its ability to respond to future disasters. However, EPA's approach to emergency response does not differentiate between indoor and outdoor contamination, and therefore it is difficult to determine how EPA's preparedness actions have improved EPA's readiness to respond specifically to indoor contamination. EPA's actions are consistent with several Inspector General recommendations, as the following examples of EPA's preparedness actions illustrate:

- *Clarified roles and responsibilities*. EPA has completed response policies, established various specialized response teams, and conducted training. Though not specific to indoor contamination, EPA's June 2003 National Approach to Response policy outlines EPA roles and responsibilities in the event of future large-scale disasters. Its October 2004 Homeland Security Strategy also notes that in the event of a national incident, EPA has the lead responsibility for decontaminating affected buildings and neighborhoods and for advising and assisting public health authorities on when it is safe to return to these areas and on what the safest disposal options for contaminants are. EPA's National Decontamination Team provides general scientific support and technical expertise for identifying technologies and methods for decontaminating buildings and other infrastructure. EPA also expanded the capabilities of its existing Environmental Response Team (ERT), which is responsible for technological support and training through the establishment of an additional ERT office in Las Vegas, Nevada. Along with the Radiological Emergency Response Team and the National Decontamination Team, these teams provide support during emergencies. In addition, EPA officials noted that they have developed and delivered a training course on the Incident Command System, to be used under the National Response Plan, to 2,000 staff as well as senior managers in all regions to provide additional guidance on roles and responsibilities. Finally, in its newly developed Crisis Communication Plan, EPA outlines the responsibilities of agency staff in providing the public with information during disasters. EPA officials told us they have added 50 on-scene coordinators to their emergency response staff to improve preparedness and response capabilities.

- *Shared information on likely targets and threats and developed approaches to address them*. EPA's Office of Research and Development (ORD) has several efforts to develop approaches to address future threats, including research on building decontamination, and EPA's Office of Solid Waste and Emergency Response has begun to establish a network of environmental laboratories. In 2003, EPA created the National Homeland Security Research Center (NHSRC), part of ORD, to develop expertise and

products to prevent, prepare for, and recover from public health and environmental emergencies arising from terrorist threats and incidents. Its research focuses on five areas: threat assessment, decontamination, water infrastructure protection, response capability, and technology evaluation. In November 2004, NHSRC reported on several threat scenarios for buildings and water systems;[18] these threat scenarios guide NHSRC's research, which is focused heavily on chemical, biological, and radiological (CBR) agents. EPA also participates on a number of interagency workgroups, including policy coordination committees formed by the White House Homeland Security Council; DHS work groups addressing sampling and other issues; and FEMA work groups that address various aspects of the National Response Plan. Although an interagency team, including EPA, has developed tabletop exercises to respond to nationally significant incidents, these exercises have not yet included residential contamination. EPA has also developed standardized analytical methods that environmental laboratories can use to analyze biological and chemical samples during disasters caused by terrorist attacks, and the agency has begun to establish a network of environmental laboratories capable of analyzing CBR agents, which would benefit from these methods.

- *Improved health-related benchmarks for assessing health risks in emergencies*. According to EPA officials, EPA's Office of Prevention, Pesticides and Toxic Substances is leading the agency's participation in developing acute exposure guideline levels (AEGL), an international effort aimed at describing the risk resulting from rare exposure to airborne chemicals. The AEGLs focus on exposures of 10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours. To date, AEGLs have not been developed under emergency situations; however, EPA officials told us the availability of methodologies such as those used to derive AEGLs make it possible to develop emergency benchmarks quickly, if necessary. EPA is also developing subchronic exposure guidance—provisional advisory levels (PAL)—to bridge the gap between acute exposure durations addressed by AEGLs and the chronic lifetime exposure guidance. EPA officials told us that NHSRC is developing this guidance for contaminants in air and water, and it will focus on exposure periods of 1 day, 30 days, and 2 years. EPA officials noted that, to date, it has developed PALs for over 20 chemical

[18]EPA, Office of Research and Development, National Homeland Security Research Center, *Threat Scenario for Buildings and Water Systems Report* (November 2004).

agents.[19] In addition, EPA officials told us that the agency has completed a method to assess risk from exposure to contaminated building surfaces and that it is also completing guidance on how to address future incidents involving asbestos.

- *Additional monitoring capabilities*. The Deputy Director of EPA's Office of Emergency Management told us the agency has five total suspended particulate (TSP) monitors in each region; however, these are not real-time monitors. For real-time data monitoring, each region has portable air monitors—Data-Rams—to provide approximate measures of ambient particulate matter concentrations. EPA officials told us they also have mobile monitoring labs, as well as specialized vans and aircraft, that can be deployed during disasters to conduct monitoring. EPA officials said they are evaluating other monitors—electronic beta attenuation monitors (EBAM)—that have the capability to work with higher dust loads. The Deputy Director of EPA's Office of Emergency Management also told us that fixed near real-time radiation monitors, part of the environmental radiation ambient monitoring system (ERAMS), are currently being deployed at a rate of five per month at cities across the United States.

EPA Has Not Demonstrated How It Will Overcome Methodological Challenges Identified by Expert Panel Members to Better Respond to Future Disasters

While EPA has taken actions since the WTC disaster to prepare for future incidents, it has not demonstrated how it will overcome several methodological challenges that expert panel members identified. These challenges include determining the extent of contamination; developing appropriate cleanup benchmarks; and testing for contaminants that cause acute or short-term health effects. In addition, some expert panel members questioned EPA's reliance on visual evidence, rather than sample data, as the primary basis for its actions, as well as its use of the modified aggressive sampling technique.

- *Assessing extent of contamination*. Some expert panel members recommended that EPA reconsider its decision to abandon its efforts to develop a method for differentiating between normal, urban dust, and WTC dust, which would have allowed EPA to determine the extent of WTC contamination. Several panel members encouraged EPA to continue to refine the method and collect applicable sample data, saying that collecting data now could provide critical information for future

[19]Each PAL has three exposure durations, three levels of severity, and two media (water and air) for which it is to be applied, and therefore EPA has developed over 360 different values for these chemicals.

responses. EPA was unable to develop a WTC dust signature that would have allowed it to determine the extent of WTC contamination, in part, because of the limited number of dust samples taken immediately after the disaster, and the length of time that elapsed between the event and development of the signature. EPA officials told us they would need to identify contamination signatures in responding to future disasters.

- *Developing cleanup benchmarks*. Some expert panel members also expressed concerns regarding the cleanup benchmarks that EPA developed in response to the WTC disaster. Some expert panel members agreed with the concept of dividing sampled spaces into categories, such as accessible and inaccessible areas, with associated cleanup benchmarks; however, these panel members disagreed with how EPA defined the categories. For example, an expert panel member noted that children access areas under beds, which were not considered "accessible" by EPA's definitions, and workers such as telecommunications technicians and housing inspectors access areas defined by EPA as "inaccessible" on a daily basis. In addition, expert panel members disagreed with some cleanup benchmarks that EPA developed for the various categories. For example, two panel members asserted that EPA's proposed cleanup benchmark for man-made vitreous fibers was not stringent enough. While EPA then changed the benchmark for man-made vitreous fibers in inaccessible areas from 100,000 fibers/cm^2 to 50,000 fibers/cm^2, EPA has not demonstrated how it will determine appropriate cleanup benchmarks for future indoor contamination events.

- *Testing for contaminants with acute effects*. An expert panel member questioned whether it was appropriate for EPA to focus on contaminants that could cause future long-term health problems, rather than those that could cause immediate problems. At a subsequent meeting, an expert panel member also noted that it would be useful to identify the contaminants causing acute health effects in the affected population.

- *Relying on visual evidence*. Some expert panel members questioned EPA's reliance on visual evidence rather than on sample data during its two programs. For example, during the first program, in response to requests from building owners, EPA "visually" evaluated some HVAC systems rather than obtaining wipe samples. When EPA decided to clean 28 of the 116 HVACs, the reinspection was also visual. In addition, some expert panel members questioned EPA's reliance on aerial photos as primary support for assigning boundaries to its first and second program because not all contaminants are visible.

- *Using the modified aggressive sampling technique.* Some expert panel members questioned EPA's use of the modified aggressive sampling technique. The number of samples exceeding cleanup benchmarks was greater when the aggressive sampling technique was used. EPA's rationale for departing from the technique specified by the Asbestos Hazard Emergency Response Act (AHERA) is that the aggressive technique does not appropriately represent conditions of human exposure in a residence.

EPA has not identified in its protocols how these methodological concerns can be overcome, such as how and when data collection will occur, in order to facilitate determining the extent of contamination. Without clarifying actions that are appropriate for EPA and other federal agencies in these scenarios, important determinations about risk from disaster-related contamination may not be promptly addressed.

Conclusions

Shortcomings in EPA's second program to test and clean residences for WTC contamination raise questions about the agency's preparedness for addressing indoor contamination resulting from future disasters. With respect to communication, the public relies on EPA to provide accurate and complete information about environmental hazards that may affect them. However, in announcing its plan for the second program, EPA did not fully disclose the limitations of its earlier test results. Consequently, some eligible residents of Lower Manhattan may have concluded that they were not at risk from contaminated dust and therefore elected not to participate in the second program.

EPA did not develop a cost estimate to support its use of available Stafford Act funds for its second program. Without this information, EPA and other decision makers could not know how many residents and building owners could potentially be served by the program. Given limited federal disaster response funds and competing priorities, the federal government must carefully consider how best to allocate these monies to be sure that these funds are used most cost effectively. In the future, unless officials justify the Stafford Act funds necessary for achieving program objectives prior to implementation, EPA will not have a sound basis for securing needed funds and, as a result, may be forced to scale back its programs in ways that limit their effectiveness.

Moreover, EPA has reported that it faced several challenges in addressing WTC indoor contamination, including limited indoor sampling protocols, health benchmarks, and background data for urban areas. In addition, since the National Response Plan does not explicitly address indoor

contamination, it is unclear how EPA, in concert with other agencies—including the Departments of Homeland Security, Health and Human Services, and Labor—will address these challenges. Unless these agencies establish an approach for responding to indoor contamination, the nation may face the same challenges after future disasters.

Recommendations for Executive Action

To enhance EPA's ability to provide environmental health risk information to the public that is complete and readily understandable, we recommend that the Administrator of EPA facilitate the implementation of the recently issued Crisis Communication Plan by issuing guidance that, among other things, ensures the presentation of environmental data in an appropriate context, with appropriate technical caveats noted in plain language.

To provide decision makers with a sound basis for the Stafford Act funds needed for future disaster response programs, we recommend that the Administrator of EPA establish guidelines for developing program cost estimates. These cost estimates should support the programs' objectives and promote the efficient and effective use of government resources.

To ensure that EPA is better prepared for future disasters that involve indoor contamination and that it captures important information that could guide future cleanup decisions, we recommend that the Administrator of EPA, in concert with the Departments of Homeland Security, Health and Human Services, and Labor, and other appropriate federal agencies, develop protocols or memorandums of understanding under the National Response Plan that specifically address indoor contamination. These protocols should define when the extent of contamination is to be determined, as well as how and when indoor cleanups are to be conducted. EPA should seek additional statutory authority if it determines that such additional authority is necessary.

Agency Comments and Our Evaluation

In commenting on a draft of this report, EPA's Assistant Administrator for Research and Development and Assistant Administrator for Solid Waste and Emergency Response identified actions that EPA has begun taking that are responsive to these recommendations. EPA also provided comments on aspects of the report it considered misleading or inaccurate, such as our characterization of the Expert Technical Review Panel process, including the panel's goals. Though EPA preferred that we present the charges identified by CEQ, we reported the goals that EPA provided directly to the expert panel at its first meeting, and we believe this accurately characterizes the priorities that EPA established for the

panel. In addition, EPA asserted that the report creates a misleading impression that EPA did not fully disclose the limitations of test results from its first program. EPA refers to an appendix in its second plan, which includes a discussion of EPA's methodology; raw data, such as the total number of samples taken; and the results of sampling efforts, but does not include a discussion of the factors that may have influenced these results. We continue to believe that EPA did not include appropriate caveats that clearly articulated the limitations in the results in its discussion, such as that 20 percent of eligible residents participated and, therefore, the results may not have been representative of all residences. We believe that the report offers a balanced portrayal of EPA's development of its second program, the expert panel process, and EPA's actions to better prepare for future disasters. EPA also provided technical comments, which we incorporated as appropriate. EPA's letter and our detailed response to it appear in appendix V.

We are sending copies of this report to the Administrator, EPA; appropriate congressional committees; and other interested parties. In addition, this report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you have any questions about this report or need additional information, please contact me at (202) 512-3841 or stephensonj@gao.gov. Contact points for our Offices of Congressional Relations and of Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.

John B. Stephenson
Director, Natural Resources
and Environment

Appendix I: Information Classified by the Environmental Protection Agency Does Not Address the World Trade Center

Since the Environmental Protection Agency (EPA) was given the authority to classify information in May 2002, it has classified information in three documents. However, none of these documents address the World Trade Center (WTC) or the environmental impact of its destruction.

EPA Received Authority to Classify Information Related to National Security in May 2002

In May 2002, through Executive Order 12958, the President gave the EPA Administrator the authority to classify information as "Secret."[1] Section 1.4 of the executive order, as amended,[2] prescribes a uniform system for classifying, safeguarding, and declassifying national security information, including information relating to defense against transnational terrorism. It also identifies the types of information that should be considered for classification: military plans, weapon systems, and operations; foreign government information; intelligence activities, sources, and methods, and cryptology; scientific, technological, and economic matters relating to the national security, which includes defense against transnational terrorism; U.S. programs for safeguarding nuclear materials and facilities; vulnerabilities and capabilities of systems, installations, infrastructures, projects, plans, and protection services relating to the national security, which includes defense against transnational terrorism; and weapons of mass destruction.

The executive order also describes several different classification types and levels. Original classification refers to the classification of information that has not already been classified by another authority. Derivative classification refers to the classification of a document that uses information that has already been classified. The levels of classification—"Top Secret," "Secret," or "Confidential"—refer to the severity of national security damage that disclosure of the information would result in.

EPA Originally Classified Information in Three Documents

Since it received its classification authority in May 2002, EPA has originally classified information in three documents, according to EPA's review of classified information, and identified 51 documents with derivative classification. This assessment concurs with our review of National Archives program data, as table 2 shows.

[1]Delegation of this authority is in accordance with section 1.4 of Executive Order 12958, "Classified National Security Information."

[2]Amended by Executive Order 13292 (March 2003).

Table 1: EPA Classification Decisions Pursuant to Executive Order 12958

	Fiscal year						
	2001	2002	2003	2004	2005	2006	Total
Original classification	0	0	0	1	2	0	**3**
Top secret	0	0	0	0	0	0	**0**
Secret	0	0	0	0	1	0	**1**
Confidential	0	0	0	1	1	0	**2**
Derivative classification	0	0	0	0	5	46	**51**
Top secret	0	0	0	0	0	8	**8**
Secret	0	0	0	0	3	21	**24**
Confidential	0	0	0	0	2	17	**19**

Source: National Archives.

In information that EPA submitted to the National Archives, it explained that, although EPA did not originally classify information in any documents in fiscal year 2006, the three documents containing originally classified information significantly increased the number of derivative classification decisions made by EPA because subsequent documents included the originally classified information.

Information EPA Originally Classified Does Not Concern the Environmental Impact of the WTC Collapse

EPA has not classified any WTC information, including environmental information, according to our review of the three documents that EPA has classified. According to nonclassified portions of these three documents, they discuss threat scenarios for buildings, water systems and drinking water infrastructure, and water decontamination.

Appendix II: Objectives, Scope, and Methodology

We were asked to determine (1) the extent to which the Environmental Protection Agency (EPA) incorporated recommendations and additional input from the expert panel and its Inspector General in its second program; (2) what factors, if any, limited the expert panel's ability to meet its goals; (3) the completeness of information EPA provided to the public in its second plan; (4) the way EPA estimated the resources needed to conduct the second program; and (5) the extent to which EPA has acted upon lessons learned to better prepare for indoor contamination that could result from future large-scale disasters. In addition, owing to concerns raised in the media about EPA's use of classification authority, we were asked to determine the extent to which EPA has classified information, and, if so, whether any classified information discusses the environmental impact of the towers' collapse.

To examine EPA's actions to incorporate recommendations and additional input from the expert panel and its Inspector General, we reviewed four Inspector General recommendations on EPA's test and clean program; all 13 WTC Expert Technical Review Panel meeting summaries, which included input from the WTC Community-Labor Coalition representatives to the panel and other panel members; and EPA's 2002-2003 indoor test and clean program plan and all drafts leading to the 2006 program plan. We analyzed the December 2006 Final Test and Clean Plan to determine whether EPA had incorporated individual panel member and Inspector General input. We relied upon EPA's summaries of the panel meetings to obtain information on individual panel member input because EPA did not have a comprehensive list of panel recommendations. We also conducted interviews with EPA officials from headquarters (Washington, D.C.) and Region 2 (New York City) to identify actions EPA took to incorporate the expert panel and Inspector General input into the test and clean program plan. Finally, we conducted structured interviews with all 18 expert panel members, as well as the two chairs of the WTC Expert Technical Review Panel. The expert panel members included community representatives, local and federal government officials from the Federal Emergency Management Agency (FEMA), the Department of Labor's Occupational Safety and Health Administration, the New York City's Department of Environmental Protection and Department of Health and Mental Hygiene, and nongovernment members.

To determine the factors that affected the expert panel's ability to meet its goals, we conducted structured interviews with all 18 WTC expert panel members, as well as the two former EPA Assistant Administrators for the Office of Research and Development who chaired the panel. We analyzed expert panel member and panel chair responses to both qualitative and

quantitative questions in order to describe the panel process and obtain information on EPA's management of the process. In follow-up correspondence, we asked panel members whether EPA's second program was responsive to the concerns of residents and workers; we were only able to obtain 10 panel member responses. We also reviewed all 13 panel meeting summaries and reviewed selected video or audio recordings of meetings.

To evaluate the completeness of information EPA provided to the public in its second plan, we reviewed EPA's 2002-2003 program plan and all drafts leading to the December 2006 program plan, information on testing data included on EPA's Web site, the 2003 EPA Inspector General report, and all 13 summaries of EPA's Expert Technical Review Panel meetings.

To examine EPA efforts to estimate the resources needed to conduct the second program, we obtained and analyzed funding documentation, including interagency agreements between FEMA and EPA, as well as documentation related to funding and expenditure data for the WTC indoor test and clean program. We found discrepancies in the data EPA and FEMA provided. We assessed the reliability of expenditure data received from EPA but were unable to assess the reliability of expenditure data provided by FEMA. We assessed the reliability of the EPA expenditure data by interviewing officials knowledgeable about the data and reviewing existing information about the data and the system that produced them. We determined that EPA's funding data were sufficiently reliable for the purposes of our review. We also interviewed agency officials to gather information on EPA's expenditures, its plans to spend funding, and whether EPA plans to seek additional funds.

To examine the extent to which EPA has acted upon lessons learned for addressing indoor contamination resulting from future large-scale disasters, we interviewed officials from EPA headquarters, including the Office of Research and Development and the Office of Solid Waste and Emergency Response; from Region 2, which is responsible for New York City; and from EPA's National Homeland Security Research Center, among others. We compared EPA's activities with the Inspector General's recommendations on preparedness and with recommendations in EPA's Lessons Learned in the Aftermath of September 11, 2001.[1] We also attended a National Institute of Standards and Technology technical

[1]EPA, *Lessons Learned in the Aftermath of September 11, 2001* (February 2002).

seminar on WTC materials and observed the disaster area with a FEMA official.

To determine the extent to which EPA has classified information, and, if so, whether any classified information discusses the environmental impact of the towers' collapse, we requested a statement from EPA on (1) whether any EPA officials, including former EPA Administrators, authorized by Executive Order 12958 to classify information as secret have done so since the executive order was promulgated; and (2) whether any of the classified information pertains to the environmental impact of the WTC collapse, including the indoor test and clean program, contaminants of potential concern, or geographic boundaries, that are relevant to EPA's approach to addressing indoor contamination. After EPA responded, we requested access to and we reviewed all classified information to determine whether it was related to the WTC disaster. In addition, we obtained and reviewed data from the National Archives to determine the number of documents EPA has classified since receiving authority to do so. Appendix I provides the results of our analysis of EPA's classification of information under this authority.

We performed our work between June 2006 and September 2007 in accordance with generally accepted government auditing standards.

Appendix III: Comparison of EPA's First and Second Indoor Programs

Activity	World Trade Center residential dust cleanup program (2002-2003)	Lower Manhattan indoor dust test and clean program (December 2006)
Agency roles	New York City Department of Environmental Protection • entered into contracts for cleaning and monitoring, as well as for a hotline to register residents for the program EPA • provided oversight of cleaning and testing and contracted for the analysis of samples collected by cleaning and monitoring contractors	EPA only
Contaminants tested	Air[a] • asbestos	Air • asbestos • man-made vitreous fibers (MMVF) Dust • asbestos • MMVF • polycyclic aromatic hydrocarbons • lead
Sampling	Air samples taken • 4,167 residential units[b] • 28,702 total samples • 22,497 residential samples • 6,205 common area samples	Registrants • 272 residents and 25 building owners registered and filled out necessary paperwork to have sampling and, if necessary, cleanup conducted
Cleaning	Residents were offered a choice of services: either to have their residence professionally cleaned, followed by confirmatory testing, or to have testing only. • 3,403 residential units cleaned • 144 buildings' common areas cleaned	In general, a cleanup will be offered if a benchmark for any contaminant is exceeded in any unit or building common area tested. EPA will conduct surveys to determine if contamination levels exceeding benchmarks may be attributed to sources within or adjacent to the place of business or residence. This information will be considered with information on building cleaning history to determine whether additional sampling or further cleaning will be offered.
Program boundaries	• below Canal Street and west of Allen and Pike Streets based on the EPIC visual[c]	• below Canal Street and west of Allen and Pike Streets based on the EPIC visual[c]
Eligibility	• residents: owners or renters • residential buildings: common areas, as well as evaluation of HVAC systems	• residents: owners or renters • buildings: residential or commercial building common areas • employees and employers not eligible

Source: GAO.

[a]Air samples were also analyzed for total fibers, including MMVF; however, this did not affect cleanup decisions. In a subset of residences, pre- and post-cleanup dust wipe samples were collected and analyzed for dioxin, mercury, lead, and 21 other metals. This included over 1,500 samples from 263 residences and 157 buildings.

[b]Depending on the size of the residence, three to five air samples were collected.

[c]The targeted area was based, in part, on an analysis conducted by EPA's Environmental Photographic Interpretation Center (EPIC) to determine the geographic extent of the dust and debris produced by the collapse.

Appendix IV: Questions and Responses to the Structured Interview Questions for the Expert Panel

The body of this report generally identifies expert responses to our questions about EPA's management of the panel process. The following tables include the full range of experts (out of 18) who responded to these questions. The tables also indicate the number of experts who provided no response.

Question: Was EPA's decision to obtain individual recommendations rather than have the panel arrive at consensus appropriate?

	Yes	No	No response
Lack of consensus approach was appropriate	2	13	3

Question: Did expert panel members have adequate agenda time for panel discussion of issues?

	Yes	No	No response
Adequate agenda time	4	14	0

Question: How transparent was EPA's decision-making process behind changes in the test and clean plan versions?

	Completely transparent	Mostly transparent	Somewhat transparent	Not at all transparent	No response
Transparency of EPA's decision-making process behind changes in the test and clean plan	1	4	4	9	0

Question: How helpful would it have been to have written transcripts of the meetings available?

	Very helpful	Somewhat helpful	Not helpful at all	No response
Helpfulness of written transcripts	6	4	7	1

Question: How successful do you think the panel was in meeting each of the following panel goals?

	Success meeting goals					
Goals	**Very successful**	**Somewhat successful**	**Neither successful nor unsuccessful**	**Somewhat unsuccessful**	**Very unsuccessful**	**No response**
Identify unmet public health needs	0	1	1	2	13	1
Identify any remaining risks using exposure and health surveillance information	0	3	4	2	9	0
Develop EPA's second program	1	4	1	6	5	1
Determine steps to further minimize risks	2	4	2	1	7	2

Follow-up question: Is the Lower Manhattan Indoor Dust Test and Clean Program Plan responsive to the concerns of residents and workers impacted by the collapse of the World Trade Center towers?

	Yes	**No**	**No response**
Responsiveness of EPA's second program	0	10	8

Source: GAO.

Note: Tables give the number of experts (out of 18) who indicated each rating.

Appendix V: Comments from the Environmental Protection Agency

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 21 2007

Mr. John B. Stephenson
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review the Draft Report entitled *World Trade Center: EPA's Most Recent Test and Clean Program Raises Concerns That Need to Be Addressed to Better Prepare for Indoor Contamination Following Disasters* (GAO-07-1091). EPA appreciates GAO's efforts in reviewing the substantial amount of material that EPA provided about the Agency's response to indoor contamination related to the collapse of the World Trade Center (WTC) towers and EPA's continuing efforts related to disaster preparedness. However, EPA believes that the resulting report does not present an accurate picture of the WTC Indoor Dust Test and Clean Program (Test and Clean Program – the second program currently underway to address concerns about potential remaining indoor contamination from the collapse of the WTC), the WTC Expert Technical Expert Review Panel process or the Agency's programs for responding to disasters.

See comment 1.

As discussed in detail below, EPA has a number of general and specific concerns about the report. Additionally, we are including responses to GAO's draft recommendations.

General EPA Concerns

The report creates a misleading impression about the transparency of the WTC Expert Technical Review Panel process and EPA's communications with the public. EPA believes that the record for the panel process does not support GAO's contention that the proceedings were lacking in transparency. Panel members, the public and EPA staff participated in 12 day-long public meetings and an extended public conference call. Summary reports of the matters discussed were prepared for each meeting and provided to panel members for comment prior to posting on the panel web site (www.epa.gov/wtc/panel). Recordings of panel meetings were posted on the panel web site, along with all written comments submitted by individual panel members and the public.

See comments 2, 3, and 4.

See comments 5 and 6.

EPA believes that the report has not sufficiently incorporated the complex technical and scientific information we have provided. The report ignores information documenting the fact that our determination of the geographic extent of contamination was based on modeling, monitoring and visual evidence. We evaluated all this information and concluded that the area most impacted by the collapse of the WTC towers was in lower Manhattan. The report incorrectly asserts that we used the Environmental Photographic Interpretation Center (EPIC) report alone to guide our investigations of WTC contamination.

See comment 7.

The report creates confusion about the purpose for sampling inaccessible areas, including in heating, ventilation and air conditioning units (HVACs). HVAC sampling in EPA's second program was intended to utilize a WTC dust screening method that would solely determine the extent of WTC indoor contamination.

See comment 8.

The report suggests that EPA did not develop appropriate cost estimates for its second program. As discussed below, the record shows that we prepared appropriate cost estimates for our program using existing government contracting guidance.

See comment 9.

The report does not accurately portray the recommendations of EPA's Inspector General (IG) or EPA's efforts to implement the charge to the panel from the Council on Environmental Quality (CEQ).

Concerns with GAO Findings

a) The extent to which EPA implemented recommendations from the expert panel members and the Inspector General in its second program.

See comment 9.

GAO claims that while EPA has taken some actions to incorporate input from the Inspector General and individual panel members into its second program, it did not incorporate other recommendations, which may limit the overall effectiveness of the second program. EPA believes that its public record and its decision to implement one of the plans presented to the panel demonstrate the manner in which comments from the panel and the public were considered. EPA has included Table 1, below, as a supplement to its comments, to provide a concise summary of its responses to the recommendations of the IG and the CEQ charge.

b) The factors, if any, that limited the expert panel's ability to meet its goals.

See comment 4.

The report is critical of EPA's approach to the expert panel process. GAO attributes the panel's alleged difficulty in meeting its goals to EPA officials' beliefs as opposed to EPA's actions. We do not agree with GAO's conclusions about why the panel did not meet the specific goals and objectives stated in the letter from CEQ.

EPA also believes that GAO has reported the views of the individual panel members in a misleading manner. The report states broad conclusions based, in some instances, on only half of the 18 panel members. The opinions appear to be based on a

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ranking scheme devised by GAO for purposes of the report rather than an analysis by GAO of the factors that formed the individual panel members' opinions.

The operating principles of the panel, cited on EPA's panel web site, were devised to facilitate accomplishing the goals and objectives set forth in the CEQ letter. We believe that the record reveals that the scope of what members of the panel could consider was not limited by EPA officials' belief that some goals could more appropriately be addressed by other agencies. Panel members were free to suggest new approaches and to chart pathways to accomplish their goals. The freedom to refocus key issues became evident at the April 2004 panel meeting when individual panel members strongly recommended that EPA abandon CEQ's first charge to consider the results of post-cleaning verification sampling to be done by EPA in residential areas included in the 2002/3 Indoor Air Residential Assistance Program (the first program) to verify that recontamination had not occurred from central heating and air conditioning systems. As a result, the mission changed markedly.

See comment 10.

With the changed focus of the panel, a number of issues arose that were not part of the initial CEQ charge. Discussions of proposed sampling plans, the use of slag wool as a potential WTC dust "signature," as well as the concerns of individual panel members about these matters focused attention away from the initial CEQ charge (see EPA's Table 1, below, for a summary). After extensive review, EPA determined that development of a WTC dust "signature" was not feasible. The Agency decided to implement a voluntary program to test and clean residences and whole buildings, both commercial and residential, within the area of lower Manhattan most impacted by the collapse of the WTC towers.

See comment 11.

c) The completeness of information EPA provided to the public in its second plan.

The report creates the misleading impression that EPA did not fully disclose to the public the limitations of the test results from the first program. The summary minutes of the first panel meeting reveal that EPA presented in detail the results of its initial sampling and cleaning efforts. In addition, a detailed report on the information gathered during the first program has been available on EPA's WTC web site. Further analysis of this data was presented at subsequent panel meetings and was posted on the panel web site. EPA also presented a plan for assessment of "recontamination" at the first expert panel meeting in March 2004. The possible biases inherent in voluntary sampling approaches were discussed at this meeting, as well as at many subsequent panel meetings. In the report of its first program, EPA reported that it collected approximately 28,000 asbestos in air samples in 466 buildings. Of the approximately 28,000 residential asbestos in air results generated, the number of samples that exceeded the health-based benchmarks for airborne asbestos was very small, 0.47% for the clean and test residences and 0.5% for the test only residences. As a result, EPA concluded that the results appeared indistinguishable from background contamination.

See comment 12.

d) The manner in which EPA estimated the resources needed to conduct the second program.

GAO contends that EPA did not take steps to ensure that it would have adequate funds to implement the second program effectively, and it is using $7 million in remaining Federal Emergency Management Agency (FEMA) funding from the first program. The report states incorrectly that EPA did not complete a cost estimate for the second program.

See comment 8.

For its cost estimates, EPA utilized guidance from the Agency's Contracts Management Manual, which were provided to GAO. The Contracts Management Manual has general applicability for cost estimation, and it was appropriately utilized for estimating the cost of the second program. EPA calculated the cost for Plan A which was based on finding a "signature" for WTC dust and for Plan B which is being implemented in the absence of a WTC dust "signature." EPA told GAO that its initial cost estimate for Plan A exceeded $7 million. EPA also informed GAO that the ultimate cost of the second program could not be calculated until after the registration period closed, because the total cost was directly proportional to the number of eligible registrants. EPA provided GAO with a copy of the outline it was using to estimate costs for the second program and with the overall cost estimate for the plan that was included in the interagency agreement (IAG) with the Federal Emergency Management Agency (FEMA). EPA explained to GAO that it had prepared independent government cost estimates for all of the components of the second program using the Contracts Management Manual. In accordance with contracting procedures, those individual estimates could not be shared until EPA had concluded the contract procurement process. As each portion of the procurement process was completed, EPA provided GAO with the cost of that portion of the program.

e) EPA Has Not Demonstrated How It Will Overcome Methodological Challenges Identified by Expert Panel Members to Better Respond To Future Disasters.

See comment 13.

EPA is concerned with the title of this section. We believe it undermines all the valuable work the Agency has undertaken since the collapse of the WTC towers. The WTC Expert Technical Review Panel was not tasked to address preparedness for future disasters. Specifics are provided in 3c below.

Response to GAO Recommendations

GAO's report recommends that EPA develop (a) guidance on crisis communication, (b) cost estimates that inform decision makers, and (c) protocols specific to indoor contamination.

a) Recommendation that EPA develop guidance on crisis communication.

EPA is implementing its Crisis Communication Plan. EPA has formed a Crisis Communication Workgroup that is co-chaired by the Office of Public Affairs and the

See comment 14.

Office of Solid Waste and Emergency Response. This workgroup developed the recently issued Crisis Communication Plan and is now working on a companion resource guide. The plan summarizes EPA's public information roles at the field, regional and national levels during an incident of national significance; provides guidelines for developing and distributing information to the public in coordination with partner agencies; and outlines the Agency's training requirements for public information staff. The resources guide will include message maps, fact sheets and templates for communication of sampling data, job aids and other tools to assist the public information staff during a response.

An important aspect of communicating risk is the coordination between the Incident Command System Public Information Officer (PIO) staff and the Environmental Unit (EU) staff to assure that environmental data is communicated in an appropriate context in plain language. During and following the Agency response to Hurricane Katrina, a policy was established to include an EU in headquarters that will work with PIO staff after the data has been evaluated, validated and interpreted to assure that the data is presented in language that is easily understood and in formats easily accessible to the public.

b) Recommendation that EPA develop cost estimates to inform decision makers.

EPA agrees with the importance of good cost estimates that support program objectives and promote efficient use of government resources. The Agency would like to clarify the existing practices and also indicate our commitment to improve these practices where possible.

When EPA responds under the Stafford Act, the Agency is tasked by FEMA to work on activities requested by the State, most often related to Emergency Support Function (ESF) #10 of the National Response Plan (NRP), Oil and Hazardous Materials Response (for which EPA is the coordinator and primary agency, along with the U.S. Coast Guard), as well as other Emergency Support Functions. This work is requested by the State, based on the situation. The State request addresses specific assistance that is needed (e.g., household hazardous waste collection, environmental cleanup, environmental sampling) and takes into consideration the State's capabilities and EPA's capabilities and responsibilities under the NRP. There are often collaborative conversations between the affected State, FEMA and EPA in planning EPA's assignments, and EPA may be asked to estimate costs for those assignments. In developing the estimates for the assignments, EPA must conform to the requirements for the NRP, including the Financial Management Annex, which ensures that EPA and all agencies participating in a Stafford Act response operate in accordance with established Federal law, policies, regulations and standards. Furthermore, FEMA has provided training to participating agencies, including EPA, on the development of mission assignment supporting documents, including cost estimates, and EPA must conform to this FEMA-authorized training and practices. This guidance provided by the NRP and FEMA training help ensure high quality cost estimates.

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See comment 15.

During very large responses, such as the Hurricanes Katrina and Rita responses, EPA and other agencies have developed more extensive cost estimates for longer time periods. For instance, during the first few months of the Katrina/Rita response, EPA was working with the States and with FEMA to develop projections for as much as a year in advance. These projections were used to help FEMA establish the scope for additional mission assignments. Thus, in large incidents since the WTC disaster, EPA has developed more detailed cost estimates to help plan the Agency's Stafford Act activities.

Additionally, FEMA has requested that all ESF coordinating agencies prepare Prescribed Mission Assignments (PSMAs) for short and long-term response activities anticipated under their ESF. The PSMAs are designed to minimize the time necessary to prepare and process mission assignments during a response by providing a description of the work and an initial cost estimate prior to the actual response. EPA has responded by developing PSMAs for both short and long term duration response activities under ESF #10.

EPA has also undertaken an effort to improve the cost tracking during disaster responses, and it is included as part of the Agency's "Green Plan" (President's Management Agenda). EPA is working to establish more specific reporting requirements with pre-established formats and criteria as to the various breakouts and categories that will be tracked. This will help provide improved financial reports after the fact, and also help well inform planning and estimates during large incidents.

See comment 8.

EPA believes, however, that many of GAO's comments on cost estimates for our second program are based on errors. We have provided general comments in the discussion, above, and more specific details are described below.

c) Recommendation that EPA develop protocols specific to indoor contamination.

See comment 16.

With regard to protocols and memoranda of understanding, the Department of Homeland Security (DHS) will make the determination as to which department or agency is best suited to address indoor contamination based upon existing authorities and capabilities as well as the specific scenario to be addressed. When EPA has been requested to provide assistance under the NRP related to indoor contamination, the Agency has responded. EPA is currently involved in several interagency efforts to address decontamination that are coordinated by the Executive Office of the President. EPA is a member of the National Science and Technology Council's Committee on Homeland & National Security and its Subcommittee on Decontamination Standards & Technologies. Its working groups are developing *Cleanup Decision-Making Guidance for Biological Incidents and Chemical Incidents*. These documents are currently undergoing interagency review. EPA is also in the final stages of working with DHS and other agencies to develop *Remediation Guidance for Major Airports after a Bioterrorist Attack*, which EPA will issue jointly with DHS this year. EPA has also created a National Decontamination Team (NDT) to augment its decontamination capabilities for chemical, biological and radiological incidents. The NDT is working closely with EPA's National Homeland Security Research Center to develop and compile protocols that

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specifically address indoor contamination for these types of incidents. The NDT can also provide scientific support and technical expertise for decontamination of buildings and building contents.

Specific Comments

In addition to the discussion above, we also have a number of comments specific to individual factual errors in the report that are described in the following section of this letter. An excerpt from the language of GAO's report is cited in bold to identify the section commented on. EPA's comment follows in italics. The page numbers referenced below are those printed on the pages in the PDF version of GAO's draft report.

Page 2
In May 2002, after numerous cleanup, dust collection and air monitoring activities were conducted outdoors by the Environmental Protection Agency (EPA), other federal agencies, New York City and New York State, New York City formally requested federal assistance to clean and/or test residences in the vicinity of the World Trade Center (WTC) site for airborne asbestos.
This is not correct. In May 2002, New York City (NYC) sent a letter to FEMA stating that many building still have visible deposits of WTC debris. NYC requested that FEMA provide funding to hire contractors to perform cleaning and/or testing of interior and exterior spaces, as appropriate. The request does not cite testing or cleaning for airborne asbestos.

See comment 17.

Even though samples were collected after cleaning in most cases, some residences (less than 1 percent) were still found to have unsafe levels of asbestos.
The use of the term "unsafe" in this context is misleading, and the import of the entire statement is an exaggeration. EPA's 2002/3 Indoor Air Residential Assistance Program (the first program) was intended to allay the concerns of lower Manhattan residents regarding the long-term habitability of their residences. Clearance for this program was established if all samples in a residential dwelling were below the health-based benchmark of 0.0009 f/cc for asbestos in air. This concentration equates to a one-in-ten-thousand excess lifetime cancer risk based on long-term (30 year) continuous (24/7) respiration of asbestos-containing air.. If a single exceedance was recorded, it should not be assumed that the average concentration (reflective of exposure over an extended time period) of airborne asbestos in the residence was and/or would remain for any extended period of time at a level above the benchmark. Consequently, characterizing a single exceedance as "unsafe" is highly speculative and provocative. In its effort to address the concerns of lower Manhattan residents, however, EPA offered recleaning or initial cleaning in any residence where there was a single exceedance of the benchmark. The benchmark EPA used to clear apartments was approximately 24 times more stringent than that used in the Asbestos Hazard Emergency Response Act (AHERA) program to clear schools after an asbestos abatement.

See comment 18.

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Page 3
For example, EPA's first program did not require that entire buildings be systematically cleaned, and therefore the Inspector General recommended that EPA implement a program to verify that apartments that had participated in the first program had not been re-contaminated by uncleaned apartments through heating, ventilation, and air conditioning (HVAC) systems. With regard to future preparedness, the Inspector General identified lessons learned from the WTC disaster and recommended, among other things, that EPA develop protocols for determining how indoor environmental contamination would be handled in the event of a future disaster.

See comment 19.

This is incorrect. GAO's report consistently misstates IG recommendations. See EPA Table 1, below. IG recommendation 6-3 stated: Due to concerns over possible recontamination of residences cleaned under the 2002/3 Indoor Air Residential Assistance Program, EPA should treat buildings as a system and implement a post-cleaning verification program to ensure that residences cleaned by the program have not been recontaminated.

The expert panel's broader goal or purpose, as outlined at the first panel meeting by the EPA chairman, was to advise EPA "on ongoing efforts to monitor the situation for New York City residents and workers potentially affected by the collapse of the WTC." This purpose included providing advice on the development of EPA's second program plan. The panel chairman also provided the following longer-term goals as outlined by CEQ: (1) identify unmet public health needs; (2) identify any remaining risks using exposure and health surveillance information; and (3) determine steps to further minimize risks.

See comment 10.

This is not accurate. The actual charge is cited on the panel web site as follows:

▪ *Review post-cleaning verification sampling in the residential areas included in EPA's Indoor Air Cleanup to verify re-contamination has not occurred from central heating and air conditioning systems.* ▪ *Review the World Trade Center Residential Confirmation Cleaning Study which concluded asbestos was an appropriate surrogate in determining risk for other contaminants.*	▪ *Identify areas where the health registry could be enhanced to allow better tracking of post-exposure risks by workers and residents.* ▪ *Review and synthesize the ongoing work by the federal, state and local governments and private entities to determine the characteristics of the WTC plume and where it was dispersed, including the geographic extent of EPA and other entities' monitoring and testing, and recommend any additional evaluations for consideration by EPA and other public agencies.*

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See comment 20.

Page 4
EPA told us that 297 residents and building owners had enrolled in the second program, compared to 4,167 eligible participants in the first program.
This is stated incorrectly in multiple places in the report. There were 4,167 eligible residences and 144 whole buildings participating in the first program. The 297 represents 272 residences and 25 whole buildings for the second program.

Page 5
EPA reported that it was unable to develop a method for distinguishing between normal urban, or background, dust and WTC dust; therefore, the agency reported that it could not assess the extent of WTC contamination, and had no basis for expanding the cleanup effort.
EPA notes that the Agency was considering levels of background contamination in urban dust. The statement, above, is incorrect for two reasons.

See comment 21.

1) EPA endeavored to develop a method to screen for WTC dust. Additional development work and inter-laboratory testing of the slag wool component would have been necessary to improve the precision and accuracy of the method and reduce inter- and intra-laboratory variability from levels observed in the inter-laboratory evaluation to render this method usable. Such efforts would be without assurance of a successful result (see page 13 and 18 of this response letter).

See comment 6.

2) EPA conducted extensive monitoring and modeling after 9/11 in order to determine the extent of contamination. There are summaries of these efforts in Appendix 1 attached to the WTC Indoor Dust Test and Clean Program Plan and in EPA's National Center for Environmental Assessment's Exposure and Human Health Evaluation of Airborne Pollution from the World Trade Center Disaster.

See comment 22.

With the exception of heavily impacted buildings which remain uncleaned (such as the former Deutsche Bank building at 130 Liberty Street), the level of contamination measured in indoor environments in the area most heavily impacted by the plume is low. No pattern that could be related to the WTC collapse was detectable in this area of lower Manhattan. It appears that cleaning efforts by residents, building owners and operators, EPA and NYC, where applied, have been successful in reducing levels of contamination. The contaminants of potential concern (COPC) asbestos, man-made vitreous fibers (MMVF) and lead are common materials in the urban environment. Silicates form 59% of the earth's crust. Polycyclic aromatic hydrocarbons (PAHs) and dioxins are produced by many combustion sources, including automobiles and the 28,000 structural fires that occur in NYC each year. We estimate that there are over 170 million square feet of interior space in lower Manhattan. There may be areas within this space that have not been cleaned of WTC dust. Therefore, a sampling effort to identify additional areas whose cleanup would result in a reduction in exposure to WTC contaminants is not feasible for the following reasons: the lack of a specific indicator for WTC dust; the nature of the contaminants; the widespread, low-level, background contamination from other urban sources; and the large and varied nature of the spaces involved (see Appendix I of the Test and Clean Program plan).

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See comment 23.

EPA did not begin examining methods for differentiating between normal urban dust and WTC dust until May 2004 – nearly three years after the disaster – making the process for distinguishing between the two types of dust more difficult.
This is incorrect. EPA began looking into ways in which WTC contaminants could be identified soon after the WTC disaster. EPA participated in the workgroup that developed the sampling methodology implemented by the Agency for Toxic Substances and Disease Registry (ATSDR) and the New York City Department of Health and Mental Hygiene (NYCDOHMH) commencing in November 2001. This study was explicitly comparing the composition of dust in lower Manhattan with dust composition in areas of Manhattan not impacted by the collapse. In the summer of 2002, EPA formed a multi-agency task force specifically to evaluate indoor environments for the presence of contaminants that might pose long-term health risks to local residents. In September 2002, the committee released a draft document titled World Trade Center (WTC) Indoor Air Assessment: Selecting Contaminants of Potential Concern (COPC) and Setting Health-Based Benchmarks. The final report was released in February 2003. These activities were all related to examining methods to distinguish between background contamination and WTC contamination.

See comment 7.

EPA's second program does not include sampling in HVACs or "inaccessible" locations within apartments and common areas, such as behind dishwashers because EPA only included these efforts when it planned to determine the extent of contamination. The agency's second program plan notes that because EPA is not able to assess the extent of WTC contamination and because it is attempting to devote the maximum resources to testing requests, EPA will not test in these locations. Testing in such a restricted manner makes evaluating the adequacy of cleanup efforts very difficult.
This is incorrect. Testing in inaccessible areas was never suggested as a means of determining the adequacy of cleanups by EPA or panel members. Some individual panel members suggested testing in inaccessible areas as a means of determining extent of contamination. None of the proposed plans were intended to establish benchmarks that could be used for testing and/or cleaning inaccessible areas.

Page 6
Moreover, this program does not test workplaces because, according to EPA officials, other federal agencies have procedures to address worker safety.

See comment 24.

This statement is misleading. It is worded to suggest that this is an EPA opinion. An Occupational Safety and Health Administration (OSHA) representative sat on the WTC Expert Technical Review Panel, and both OSHA and the National Institute for Occupational Safety and Health (NIOSH) made presentations at panel meetings and indicated that they would address the concerns of workers or employers. The Test and Clean Plan documents this and includes information directing workers or employers to contact OSHA or NIOSH and request an evaluation if they have concerns. So far as we know no one has contacted OSHA or NIOSH.

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See comment 25.

See comment 3.

See comment 12.

See comment 8.

Two factors limited the expert panel's ability to meet its goals: (1) EPA officials' belief that some panel goals were more appropriately addressed by other agencies, and (2) EPA's approach to managing the panel process.
We have commented earlier about EPA's approach to managing the panel process. This statement also creates the impression that other agencies were not addressing the health related issues that were part of the panel charge. The WTC Health Registry began operations in September 2003. The Registry was funded by FEMA and is managed by NYCDOHMH and ATSDR. All three agencies were represented on the expert technical review panel, and EPA facilitated the presentations made to them by scientists and the public. We do not consider this a failing in our management of the panel process.

Furthermore, all panel members we asked believe that EPA's second program is not responsive to the concerns of residents and workers impacted by the collapse of the WTC towers.
This is a misleading statement that makes it seem as if all panel members have this belief. It is either incorrect or inconsistent with GAO's summary on page 41 in Appendix IV. There GAO states that it asked 18 panel members this question, ten responded no and eight did not respond.

EPA did not fully disclose in its second plan the limitations in the testing results from its first program.
GAO's contention that EPA failed to disclose the limitations in testing results is not supported by the record. Appendix 1 of the second plan has an extensive discussion of the results of the first program. The results of the first program were also extensively discussed during panel meetings, e.g., http://www.epa.gov/wtc/panel/pdfs/resampling.pdf.

EPA also made available information comparing aggressive and modified aggressive sampling results on its website at:
http://www.epa.gov/wtc/aggvsmod.htm#summary_test_modifiedaggressive.

GAO's conclusion that EPA withheld data and thereby discouraged participation in the second program has no basis. This contention is incorrectly repeated on page 24. We also note that the rate of benchmark exceedances was similar for residences cleaned and then tested and residences which were tested only in the first program.

Page 7
Rather than estimate the resources needed to carry out its second program, EPA is implementing this program with the $7 million remaining from the first program. According to EPA officials, it would have been difficult to estimate program costs without knowing the number of participants and the size of apartments, which vary widely throughout Lower Manhattan.
This is an inaccurate statement. EPA told GAO that we estimated the cost of implementing the second program when we negotiated the IAG with FEMA for that program. GAO was provided a copy of the IAG which includes the cost estimate. EPA also told GAO that it had independent government cost estimates (IGCE) for the contracts that it was going to procure for the program. The IGCE is developed by the

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program office. It is based on the individual elements of costs that are estimated for each of the components and sub-components of the statement of work for each contract. The IGCE is one of the tools used by the contracting officer to determine if the contractors' proposed price/cost is fair and reasonable. EPA could not share those with GAO while the procurements were in process but provided GAO with actual costs as the contracts were procured. Ultimate program cost is dependent upon the number and size of the apartments and buildings that participate and the number that will require cleaning. These inaccurate statements are reiterated on page 25.

Page 9

There are an estimated 330 office buildings in Lower Manhattan below Canal Street and roughly 900 residential buildings with approximately 20,000 apartments. In 2002, after initial efforts by the City of New York to advise New York residents how to clean the World Trade Center dust in their homes, FEMA and EPA entered into an interagency agreement to address indoor spaces affected by the disaster.

What is the source of these numbers? They do not compare with the current information in NYC databases nor do they compare with the 2001 information used in the initial response.

See comment 26.

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GAO's description of EPA's 2002/3 Indoor Air Residential Assistance Program (the first program) on this page.

EPA is concerned that GAO's description of our first program is not accurate and is misleading. GAO describes only one aspect of a multipart program. All aspects of the program and their interrelationship are described in EPA's final report on the program, which can be found on EPA's web site. The statement also raises concerns since GAO's intention was not to discuss the first program because of ongoing litigation against EPA. In Footnote 4 on Page 2, GAO states, "A lawsuit was filed in March 2004 that, among other things, challenged the adequacy of EPA's first program. The case is on appeal in the U.S. Court of Appeals for the Second Circuit. Benzman v. Whitman, 2006 WL 250527 (S.D.N.Y. Feb. 8, 2006), appeal docketed, Nos. 06-1166-cv, 06-1346-cv, 06-1454-cv (2nd Cir. March 10, 2006). Pursuant to its longstanding policy of not addressing issues in ongoing litigation, GAO has not addressed EPA's first program." In fact, the report discusses the first program in numerous sections. We suggest that rather than providing an incomplete and misleading summary, you provide the link to the final report on the first program available at http://www.epa.gov/wtc/finalreport/.

See comment 27.

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While EPA's program was ongoing, the New York City Department of Health and Mental Hygiene and the U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) analyzed samples taken in and around 30 buildings in Lower Manhattan, and released their assessment of the public's exposure to contaminants in air and dust.

This statement is misleading. The samples referenced were collected and analyzed before the EPA program started. Although the final report, which included this

See comment 28.

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sampling, was issued in September 2002, the analytical results were released in February 2002 and utilized by EPA.

Page 13
Before EPA finalized its second indoor program, several assessments related to indoor contamination were conducted: an August 2003 EPA Inspector General report; an expert technical review panel that EPA conducted from March 2004 through December 2005; and three EPA studies.
This is misleading. The IG report and expert technical review panel occurred prior to the time EPA finalized its second indoor program. The three EPA studies cited by GAO were conducted at the start of EPA's first program. The timeline in Figure 4 is incorrect because it only states the publication dates for the studies without any recognition that the results were available and used by EPA at an earlier point in time. These studies commenced in May 2002, and they were designed to, and they did inform, implementation of the cleanup program. In fact, the studies were conducted before EPA commenced its first program in September 2002.

See comment 29.

During the time EPA met with the WTC Expert Technical Review Panel, some expert panel members encouraged EPA to develop a method for differentiating between contaminants found in the New York City urban environment and those found in WTC dust.
It is incorrect to contend that a "method" could be developed for this purpose. Based on previous work by Greg Meeker (panel member) at the U.S. Geological Survey (USGS), two government agencies and six commercial laboratories collaborated to refine a comprehensive screening method to distinguish WTC-affected dust from background dust, using slag wool, gypsum, and concrete as markers for WTC dust. It was determined that concrete and gypsum did not appear to be useful indicators of WTC dust but that slag wool had potential as a screening tool. Additional development work and inter-laboratory testing of the slag wool component would have been necessary to improve the precision and accuracy of the method to render this method useable as a WTC dust screening tool. Such efforts would be without assurance of a successful result.

See comment 21.

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Figure 4: Timeline of EPA's WTC Indoor Contamination Activities
The timeline in Figure 4 is incorrect. The EPA Confirmation Cleaning, Background and COPC studies, cited in the timeline, were conducted at the start of EPA's first program and commenced in May 2002. As indicated, GAO's timeline in Figure 4 is incorrect because it only reflects publication dates for the studies. They were designed to inform the cleanup approach in the first program, and they were conducted before EPA commenced its first program in September 2002. In addition, there was no single date for reoccupation of residences. Areas were reopened over a period that extended to April of 2002, and some residents delayed their return for a longer period of time.

See comment 29.

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See comment 9.

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GAO Table 1: Key Input Regarding EPA's Second WTC Indoor Program
GAO Table 1 does not accurately characterize the IG recommendations and the relationship between them and the CEQ charges. EPA has prepared its own table that it submits to accurately represent the IG recommendations and the CEQ charges.

EPA Table 1

Question	Status
IG Chapter 6-1: Submit the revised *World Trade Center Indoor Air Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks* document to TERA for a second peer review.	The response to peer review comments for the *World Trade Center Indoor Air Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks* (peer review draft, September 2002) adhered to EPA's peer review guidance (Science Policy Council Peer Review Handbook, EPA 100-B-00-001, December 2000). Given the substantial amount of comments on the peer review draft, it was reasonable for the peer reviewers to recommend additional review of the report. The inclusion of most of the peer review comments into the final report (May 2003) significantly reduced the need for a second formal review. The time-critical need to implement a cleanup program with established clearance benchmarks further dictated that additional refinement to the report would not justify the time, expense and logistic challenges of further peer review. The contaminants of potential concern (COPC) and addition of benchmarks were discussed during the expert technical review panel process. No further COPC were identified by the panel or EPA. However, panel members recommended that benchmarks for asbestos and MMVF fibers in dust be established despite the objections of the peer reviewers about establishing such benchmarks.
IG Chapter 6-2: Implement a post-cleaning testing program to ensure that, in addition to asbestos, the indoor cleanup program has reduced residents' risk of exposure from all of the identified COPC to acceptable limits.	See discussion below under CEQ 3.
IG Chapter 6-3: Due to concerns over possible recontamination of residences cleaned under the 2002/3	See discussion below under CEQ 2.

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Indoor Air Residential Assistance Program, EPA should treat buildings as a system and implement a post-cleaning verification program to ensure that residences cleaned by the program have not been recontaminated.	
IG Chapter 6-4: Work with FEMA and OSHA to assess whether the ongoing residential testing and cleaning program should be expanded to address potential contamination in workspaces in lower Manhattan, or whether other measures need to be taken to ensure that workspaces are not contaminated with WTC dust.	Both FEMA and OSHA had representatives on the expert technical review panel. During panel meetings, OSHA stated that it was willing to respond to any complaints that individual employers or workers might have about their workplaces. Union and other worker representatives deemed this unsatisfactory. EPA's plan stated: "The Occupational Safety and Health Act of 1970 gives employees the right to file complaints about workplace safety and health hazards. If employees or their representatives believe that their working conditions are unsafe or unhealthful as a result of contamination by WTC dust they may follow the procedures outlined at http://www.osha.gov/as/opa/worker/complain.html to file a complaint. Alternatively, employees, authorized representatives of employees or employers can request an evaluation by the National Institute of Occupational Safety and Health (NIOSH) of possible health hazards associated with a job or workplace. The procedure to be followed is outlined at http://www.cdc.gov/niosh/hhe/Request.html."
CEQ 1 Extend the health follow-up associated with the Agency for Toxic Substances and Disease Registry's (ATSDR) registry of residents and workers.	NIOSH funds the WTC Medical Monitoring Program which provides, through Mount Sinai Medical Center, free medical monitoring examinations and treatment to workers and volunteers who responded to the WTC attacks. The program started in 2004 and is funded through 2009. Details are provided at http://www.wtcexams.org/programoverview.html.
CEQ 2 Review post cleaning verification sampling to be done by EPA in the residential areas included in EPA's 2002/3 Indoor Air Residential Assistance Program to verify that recontamination has not occurred from	The panel considered EPA's plan to determine whether recontamination has occurred during the first two panel meetings. During the April 2004 meeting, individual panel members requested that EPA abandon this approach and instead determine the extent to which contaminants from the WTC collapse might have entered the indoor environment.

central heating and air conditioning systems.	
CEQ 3 Review the peer reviewed *World Trade Center Indoor Air Assessment and Selection of Contaminants of Concern and Setting Health-Based Benchmarks*, which concluded asbestos was an appropriate surrogate in determining risk for other contaminants.	The CEQ letter cited the wrong document. The conclusion that asbestos was an appropriate surrogate was reached based on results in the *Confirmation Cleaning Study*. EPA established a peer review panel whose results were presented in the report titled *Summary Report for the Peer Review on the Use of Asbestos as a Surrogate Contaminant for Determining the Risk from Other Contaminants* (April 2004). One peer reviewer determined that asbestos was an appropriate surrogate and another concluded that asbestos was not. The remaining reviewers provided qualified answers to this question, such as asbestos would be an appropriate surrogate if EPA included validation sampling. After discussions each of the reviewers agreed that adding lead wipe sampling, in addition to asbestos air sampling, would provide a better estimate of risk from other WTC COPC. Each of the five reviewers concluded that they knew of no other contaminants associated with the WTC that were not included in the COPC document or the *Confirmation Cleaning Study* that could serve as an appropriate surrogate for determining risk. EPA's Office of Research and Development then evaluated whether there was any association between the lead wipe sampling results and a visible pattern of contamination from the WTC collapse. The results were presented at the November 15, 2004 panel meeting. http://www.epa.gov/wtc/panel/pdfs/wipedata-20041115.pdf Lead results show that 12% of the measurements exceed the health-based benchmark. The results were examined as a function of three factors that may affect measured lead concentrations: 1) location (Environmental Photographic Interpretation Center (EPIC) zone and distance from Ground Zero), 2) age of building, and 3) floor of building where measurement is taken. The overall results do not appear meaningful among the distance categories. There is a suggestion that higher lead concentrations are found on lower building floors. The clearest relationship is between lead concentrations and age of building, i.e., older buildings tend to have higher concentrations regardless of location.
CEQ 4 Identification of any areas where the health registry could be enhanced to allow better tracking of post-exposure risks by workers and residents.	The WTC Health Registry is maintained by NYCDOHMH and ATSDR. Both agencies participated in the expert panel meetings. The Registry will be used to monitor periodically the mental and physical health of 71,437 enrollees for 20 years. It is now the largest health registry in the United States. The Registry has its own Community Advisory Board, Labor Advisory Committee and Scientific Advisory Committee. NYCDOHMH provided updates to the panel on the registry progress during the September 13, 2004 and July 12, 2005 panel meetings:

	http://www.epa.gov/wtc/panel/pdfs/henning-20040913.pdf http://www.epa.gov/wtc/panel/pdfs/thorpe.pdf). Panel member input to the Registry is discussed in the link below: http://www.epa.gov/wtc/panel/pdfs/oppelt_letter_112905.pdf
CEQ 5 Review and synthesize the ongoing work by the federal, state and local governments and private entities to determine the characteristics of the WTC plume and where it was dispersed, including the geographic extent of EPA and other entities' monitoring and testing, and recommend any additional evaluations for consideration by EPA and other public agencies.	In October 2002, EPA's National Center for Environmental Assessment published a summary of state and federal agencies air monitoring activities to better understand the ongoing impact of emissions from the WTC disaster. The report focused on evaluating what is typical for NYC or general urban background and interpreting potential human health consequences. The draft report, peer and public comments are available at: http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=54667 EPA's Environmental Photographic Interpretation Center (EPIC) evaluated aerial photographs and digital imagery of the area around the WTC in order to identify those areas most significantly impacted by dust, debris and other structural materials resulting from the collapse of the buildings on 9/11. EPIC is EPA's primary source of interpreted remote sensing data. The final report is available at: http://www.epa.gov/wtc/panel/pdfs/WTC5_WTC_Report_TextOnly_December_2005.pdf http://www.epa.gov/wtc/panel/pdfs/WTC5_WTC_Report_FiguresOnly_December_2005.pdf A brief summary is also included in Appendix 1 of the December 2006 Test and Clean Program plan.

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EPA also agreed to test for contaminants in the dust. In order to do so, EPA developed site-specific cleanup standards, or benchmarks, for asbestos and man-made vitreous fibers in dust over the course of nearly a year. In its second program plan, EPA explains that these standards are not risk based, but rather are intended to, among other things, ensure consistency with the standards employed for cleanup at a Superfund site with asbestos-contaminated residences.
This is misleading. EPA developed only cleanup benchmarks, not standards. These benchmarks measure adequacy of cleanup (assuming there was something present to begin with). The statement is also incorrect as to EPA's rationale for developing benchmarks for asbestos and MMVF. Benchmarks for asbestos and MMVF were based on work by experts in the field as to what constitutes contamination and how it compares with site specific background.

See comment 30.

Page 17
EPA did not expand the scope of testing north of Canal Street, or to Brooklyn, as advisory groups had recommended. EPA reported that it did not expand the scope

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of testing because it could not differentiate between normal urban dust and WTC dust; differentiating between the two would have enabled EPA to determine the geographic extent of WTC contamination.

However, EPA officials told us that because so much time had passed since the terrorist attack, it was difficult to distinguish between WTC dust and urban dust. EPA ultimately abandoned this effort because peer reviewers questioned its methodology; EPA decided not to explore alternative methods that some of the peer reviewers had proposed.
These two sections do not accurately reflect EPA's discussions with GAO about expanding the geographic area to be investigated and its determinations related to the WTC dust screening method.

Initially, the proposed sampling plans involved sampling dust to find levels of specific constituents that would be indicative of WT-related residue. When identifying and measuring specific dust constituents proved to be unworkable, some panel members recommended using a dust "signature" consisting primarily of high levels of slag wool fibers as a surrogate measure that would serve as an indicator of WTC contamination and thereby attempt to establish the geographic extent of WTC contamination. With guidance and technical input and support from a subcommittee of panel members, a method for measuring slag wool in dust was drafted and tested. The intent in developing the method was to use it as the fundamental basis for deciding whether dust from a sampled site was contaminated with WTC residue. The GAO report is not clear about this essential element of the method. The method was never intended to distinguish "WTC contaminants in dust." In particular, one of the difficulties in using slag wool as a surrogate was that high levels of slag wool in dust were measured at sites that could not have been contaminated by the WTC collapse (e.g., Yonkers, NY and RTP, NC). Other problems were directly related to the method which proved to have poor reproducibility among laboratories. Peer reviews of the method were negative. The Agency decided not to pursue the use of the slag wool method as the basis for assessing the extent of WTC contamination although some individual panel members indicated that it would be possible to do so with additional development work. Such efforts would be without assurance of a successful result.

See comment 21.

Instead, EPA will test only in an area where visible contamination has been confirmed by aerial photography conducted soon after the WTC attack, although aerial photography does not reveal indoor contamination. Furthermore, some aerial photography identified dust in Brooklyn, and EPA officials told us that some WTC dust was found immediately after the terrorist attacks in areas, including Brooklyn, that are outside the area eligible for its first and second program.
This is inaccurate. We have summarized the information used to consider the extent of contamination in Appendix 1 of our plan. In brief:

EPA and many other agencies collected and analyzed environmental samples after the September 11, 2001 attack on the WTC. EPA has posted monitoring data on its web site.

See comment 6.

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The EPA sampling data and the data from many other federal and state agencies are also available at http://oaspub.epa.gov/nyr/cd.

Remote monitoring data was collected and analyzed by the U.S. Geological Survey (USGS, 2001) the Aerospace Corporation (2002), and EPA's Environmental Photographic and Interpretation Center (US EPA, December 2005). The New York City Department of Environmental Protection (NYCDEP) conducted a building-by-building survey of the lower Manhattan buildings to determine the extent of external contamination. The plumes resulting from the collapse of the towers and subsequent fires were modeled by EPA (Gilliam, et al., 2005, Huber, et al., 2004).
It is clear from this data that the plumes from the collapse of the WTC and subsequent fires impacted much of the NYC metro area. The most heavily impacted area is bounded on the north by Chambers Street and the Brooklyn Bridge approaches. This area is entirely contained within the area that was the subject of EPA's 2002/3 Indoor Air Residential Assistance Program (the first program) and the current plan.

However, EPA's second program will not provide for testing in HVACs under any circumstances, but will offer cleaning in HVACs if tests in common areas reveal that cleanup standards for any of four contaminants have been exceeded.
This is incorrect. GAO has correctly stated the issue on page 19. EPA will clean common areas when at least one contaminant is found to exceed the cleanup standard in that area. EPA will clean HVACs and common areas when there is a high degree of certainty that the mean contaminant level for accessible areas, infrequently accessed areas or air samples in common areas exceed one contaminant benchmark.

See comment 31.

Page 18
Addressing whole buildings
The description of the objective of the plans that were considered between March 2004 and December 2005 is inaccurate. The intent of these plans was not to characterize buildings but to use the information from representative buildings to characterize areas. This information would then be used to inform decision making about the remaining extent of indoor contamination from the WTC collapse plume.

See comment 32.

The description of EPA actions is also inaccurate. The IG recommendation stated: "Due to concerns over possible recontamination of residences cleaned under the Indoor Air Residential Assistance program, EPA should treat buildings as a system and implement a post-cleaning verification program to ensure that residences cleaned by the program have not been recontaminated." EPA's proposal to do this was rejected by both individual panel members and the public.

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Consequently, the majority of expert panel members do not believe the panel successfully met any of its goals. All of the panel members we asked (10 of 10) told us that EPA's second program is not responsive to the concerns of residents and workers affected by the collapse of the WTC towers.

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See comment 3.

This is a misleading statement that makes it seem as if all panel members have this belief. It is either incorrect or inconsistent with GAO's summary on page 41 in Appendix IV. There GAO states that it asked 18 panel members this question, ten responded no and eight did not respond.

Page 21
Inadequate time for technical discussion: The majority of expert panel members (14 of 18) told us there was not adequate time on the agenda for the panel to discuss issues.

See comment 4.

EPA notes that WTC Expert Technical review Panel agendas with proposed timetables were circulated for comment prior to each panel meeting. We do not recollect that panel members requested more time to discuss technical issues at panel meetings.

Lack of a transparent decision-making process: EPA's reasons for accepting or rejecting expert panel members' recommendations were unclear, according to most panel members (13 of 18). Furthermore, six panelists said that EPA did not respond to their recommendations or provide any explanation for rejecting recommendations.

See comment 4.

The record does not support this statement. EPA held 12 panel meetings and an extended conference call. Detailed summaries of each meeting were prepared and presented to the panel members for comment before posting to the panel web site. Most of the meetings were recorded and the recordings posted on the panel web site.

Any comments submitted by panel members or the public are posted on the panel web site at: http://www.epa.gov/wtc/panel/backdocs.html.

Each of the plans contains within it an explanation of the rationale for the plan. Although the panel members may not have been satisfied with the outcome, it was not due to lack of transparency.

Page 22
Failure to document recommendations: Although EPA stated in its operating principles that it would keep detailed minutes of each panel meeting, including all individual recommendations, whether oral or written, EPA did not do so. Instead, EPA provided "meeting summaries" of each meeting that included an overview of issues raised and, starting with the fifth meeting, EPA provided audio recordings of panel meetings.

See comment 33.

It is misleading to state that EPA failed to document recommendations. As GAO indicated in the report EPA provided meeting summaries of each meeting. These are typically 20 pages long and include an overview of issues raised. All written comments provided were posted on the panel web site as were copies of all presentations made by members of the public and panel members. There are also a series of summaries of comments made by the public or panel members posted on the panel web site at: http://www.epa.gov/wtc/panel/backdocs.html.

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In addition, as noted above EPA included within each plan a rationale for the activities included with the plan. It appears that GAO is questioning the format in which we have documented the recommendations, rather than an EPA failure to document recommendations.

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Discarded samples: EPA also did not explain in its second program plan that its first program's test results excluded samples that were discarded because they were "not cleared"– that is, could not be analyzed because the filter had too many fibers to be analyzed under a microscope. However, EPA's final report on its first program stated that residences with more than one inconclusive result, such as filter overload, were encouraged to have their residences re-cleaned and re-tested.

This discussion is incorrect. There were no samples discarded. In addition, GAO's definition of" not cleared" is incorrect. EPA reported three classes of results – cleared, not cleared and not determined. "Not determined" results were reported as such and the occupants offered an opportunity to retest or reclean as they desired. To our knowledge, none of the filters were classified as "not determined" because they had too many fibers to be analyzed. With the exception of a few filters that were physically damaged the filters were reported to be overloaded because of too much particulate matter. This is not uncommon in urban environments.

See comment 34.

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EPA did not take steps to ensure that it would have adequate resources to effectively implement the second program. Instead, EPA is implementing this program with the approximately $7 million in Stafford Act funds remaining after its first program. Although this program increases the number and type of contaminants being sampled, the funds available are less than 20 percent of those used in the first program.

This is a misleading statement. As we noted in our comments on page 7 of the GAO report, ultimate program cost is dependent upon the number and size of the apartments and buildings that participate and the number that will require cleaning.

See comment 8.

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For example, EPA guidance has not yet addressed certain methodological challenges raised by expert panel members, such as how it will determine the extent of contamination resulting from disasters.

This is not correct. The ability to determine the extent of contamination is largely based on analytical capabilities and verifiable sampling plans. EPA has developed over the years a robust library of verified analytical methods for the analysis of inorganic and organic constituents of concern. Since the WTC disaster, EPA has added to that capability through the development of Standardized Analytical Methods for Environmental Restoration following Homeland Security Events. The manual contains methods for laboratories to use in measuring specific contaminants possibly associated with a terrorist attack. EPA formed an interagency workgroup of experts to review many analytical methods, seeking to balance the need to use existing techniques and methodologies against the goal of obtaining consistent results. The workgroup selected

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methods for measuring chemical agents in aqueous/liquid, solid, oily solid and air matrices, as well as biological agents in water, dust and aerosol matrices for the analysis of chemical, radiological and biological agents of concern.

In addition, since the WTC incident, EPA has also been engaged in an interagency effort for the development of a Validated Sampling Plan. This validation process has included both the development and extensive testing of sampling methods in the laboratory and testing the sampling methods and sampling strategies in the field (the field exercise is planned for September 2007). The first Validated Sampling Plan in development is for biological agents of concern. The second is for chemical agents of concern.

Clarified roles and responsibilities
The information on teams at the end of this page (carried over to the top of page 28) is inaccurate. We suggest the following correction: EPA also expanded and extended the capabilities of its existing Environmental Response Team (ERT) responsible for technological support and training through the establishment of an additional ERT office in Las Vegas, NV. Along with the Radiological Emergency Response Team and the National Decontamination Team, these teams provide support during emergencies.

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Shared information on likely targets and threats and develop approaches to address them
Please note that EPA's Office of Solid Waste and Emergency Response is responsible for the establishment of a network of environmental laboratories, rather than the Office of Research and Development. It may be less confusing to avoid attribution to specific offices within the Agency here and in other parts of the report.

See comment 37.

Although an interagency team including EPA has developed table-top exercises to respond to nationally significant incidents, these exercises have not yet included residential contamination.
EPA wants to clarify that although the exercise scenarios may not have explicitly included residential contamination, the methods (including analytical detection, risk assessment and remediation) developed for response to incidents of national significance are directly applicable to residential contamination. EPA's risk assessment guidance (that can inform both cleanup and analytical method verification) can, by design, accommodate a variety of exposure scenarios including residential exposure assumptions.

Page 29
Improved health-related benchmarks for assessing health risks in emergencies
Please correct the text on the fourth line of this section to read: "... (AEGLs), an international effort aimed at describing the risk resulting from rare exposure to airborne chemicals." Delete "once in a lifetime."

See comment 38.

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See comment 13.

Page 30
While EPA has taken actions since the WTC disaster to prepare for future incidents, it has not demonstrated how it will overcome several methodological challenges that expert panel members identified. These challenges include identifying the extent of contamination; developing appropriate cleanup standards; and testing for contaminants that cause acute or short-term health effects. In addition, some expert panel members questioned EPA's reliance on visual evidence, rather than sample data, as the primary basis for its actions, and its use of the modified aggressive sampling technique.
This is not correct. Please see the response to EPA's effort in the determination of extent of contamination, above, on page 21 of this response letter.

With regard to the development of cleanup standards (goals), EPA has stated that we have well established methods for the calculation of site-specific cleanup goals for soil, water and air through the Risk Assessment Guidance for Superfund. During WTC response and subsequent to the response, EPA has been engaged in the development of indoor surface cleanup goal methods. World Trade Center Indoor Environmental Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks provides details of the methods used to calculated cleanup goals (benchmarks) during the WTC response and the benchmarks calculated for that response. Subsequent to the WTC response, EPA has been engaged in an effort to incorporate methodologies for the calculation of indoor cleanup goals into a more broadly applied risk assessment guidance. This will enable the utilization of the indoor cleanup goals into remedial measures throughout EPA as well as other agencies throughout the government, assisting both traditional environmental cleanup efforts and cleanup efforts following terrorist events.

Testing for contaminants that cause acute or short-term health effects implies both the analytical measure in the environment of chemicals that cause acute or short-term health effects and the ability to determine the level (environmental concentration) at which a chemical may cause an acute or short-term health effect. As we have stated in the past, EPA is actively involved in both of these issues. With regard to EPA's analytical capabilities, please see the response above concerning our efforts in the development and validation of Standardized Analytical Methods. Our efforts regarding acute or short-term advisory levels were summarized within GAO's draft report on page 29, which references EPA's contributions in the development of Acute Exposure Guidance Levels (AEGLs) and Provisional Advisory Levels (PALs) that address three short-term exposure durations (1 day, 30 day, and 2 years) and three levels of severity. AEGLs address inhalation exposures while PALs address both inhalation and oral exposures.

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See comment 13.

Testing for contaminants with acute effects
The report states that a panel member questioned whether it was appropriate for EPA to focus on contaminants causing long-term rather than short-term health effects. The Agency wants to clarify that chemicals often cause adverse health effects at much lower

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See comment 13.

See comment 13.

concentrations when exposed for longer durations when compared with acute exposure durations. Therefore, in the absence of available, acute exposure duration criteria, the use of criteria that are based on long-term or chronic exposures to monitor health effects from chemical exposures that are acute in duration is often a conservative, health protective approach.

EPA's COPC reports considered both short-term and long-term effects for the COPC. It should be noted that with respect to the panel member comment that this is a speculative discussion. Ultimately neither panel members nor the public suggested health effects or COPC beyond those included by EPA in the COPC reports.

Relying on visual evidence: Some expert panel members questioned EPA's reliance on visual evidence rather than on sample data during its two programs. For example, during the first program, in response to requests from building owners, EPA "visually" evaluated some HVAC systems when requested by building owners rather than obtaining wipe samples. When EPA decided to clean 28 of the 116 HVACs, the re-inspection was also visual. In addition, some expert panel members questioned EPA's reliance on aerial photos as primary support for assigning boundaries to its first and second program because not all contaminants are visible.
Two different issues are condensed into one paragraph which could be misleading. It is important to understand the relevance of visual evidence of outdoor contamination. The most visibly impacted outdoor area was contained within the area addressed during EPA's first program. This area was also the area that monitoring, modeling and interpretation of aerial and satellite data indicate were most impacted. All of these data sources agree, and it is valid to focus our indoor testing on the area they indicate are most impacted.

HVAC system evaluations
The visual assessment of HVAC systems during the first EPA cleanup effort was not a simple process. The process was developed after consultation with NYCDEP and an EPA contractor with extensive HVAC expertise. Below is a description of the process excerpted from direction to the HVAC contractor during the first program.

Visual Assessment

All required interior surfaces in contact with the air stream shall be inspected for visible accumulations of dust and/or debris. Inspect all surfaces in contact with the air stream. Information indicates that some of the defining characteristics of WTC-related dust are that it contains extremely fine particles similar to talcum powder in consistency, is light-colored, contains pulverized concrete and/or gypsum wallboard, and may contain asbestos fibers. The visual inspection shall document:

A general description of the appearance of interior surfaces of the various system components. The description for each component will include, but may not be limited to:

- *Interior duct/fan housing surfaces are porous/non-porous*

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- *Interior duct and fan housing surfaces are lined with insulation*
- *Interior duct and fan housing surfaces are double-walled (i.e. interior insulation with perforated metal cover)*
- *Filter loading, condition of filters and filter rack*
- *Interior surfaces are free/not free of visible dust and debris or suspect WTC-related dust and debris*
- *Description of dust color, level of dust loading that may include:*
  - *The depth of dust observed on each component (e.g., less than 1/16 inch, greater than or equal to 1/16 inch)*
  - *The depth and location of dust on ducts and fan housing (i.e., on interior bottom, top and sides of ducts)*
  - *Visually estimated percentage of surface area with suspect WTC-related dust*
- *Whether or not there are materials that are likely not associated with WTC-related dust such as building-related asbestos-containing materials, animal carcasses, delaminating lining material, visible mold growth, water damage, fecal matter, feathers or other evidence of animals, etc.*

Historical Assessment

The evaluation team shall attempt to describe any other available information from site occupants or building managers, such as the known status of system operating conditions at the time of the WTC collapse, ventilation system maintenance (i.e., cleanings, filter changes, or replacement since the WTC collapse).
Based on these assessments, to the best of his/her ability the Environmental Professional will state a general impression of the overall cleanliness of each component, and whether or not it appears to be impacted by WTC-related dust.

As the summary of activities demonstrates, this was a complex process.

Reliance on Aerial Photography
As we have noted in our detailed comments on page 17 and 31 of the report, aerial photographic analysis was only one of many elements of information used to inform our decision as to the boundary encompassed by the our programs.

See comment 6.

Page 36
We relied upon EPA's summaries of the panel meetings to obtain information on individual panel member input because EPA did not have a comprehensive list of panel recommendations.
This statement is a more accurate statement of EPA's documentation than earlier statements in the report. Our documentation is reliable, but EPA did not have a single list with every recommendation on it. It has multiple lists. As suggestions and recommendations were made we documented them. GAO's criticism appears to relate to the fact that EPA did have a single list with all the recommendations.

See comment 33.

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See comments 27 and 39.

Page 39
Appendix III: Comparison of EPA's First and Second Programs
This Appendix is not accurate. The comparison also conflicts with GAO's representation in Footnote 4 on Page 2 that states: "A lawsuit was filed in March 2004 that, among other things, challenged the adequacy of EPA's first program. The case is on appeal in the U.S. Court of Appeals for the Second Circuit. Benzman v. Whitman, 2006 WL 250527 (S.D.N.Y. Feb. 8, 2006), appeal docketed, Nos. 06-1166-cv, 06-1346-cv, 06-1454-cv (2nd Cir. March 10, 2006). Pursuant to its longstanding policy of not addressing issues in ongoing litigation, GAO has not addressed EPA's first program." The following matters need to be corrected:

1) EPA did not supervise contract workers. It acted purely in an oversight role.
2) All air samples were also analyzed for total fibers these include MMVF and a subset of approximately 260 apartments were also tested for lead, mercury, a suite of other metals and dioxin.
3) The common areas in 144 buildings were sampled for asbestos and total fibers.
4) The extent was not based solely on the EPIC "visual."

Thank you again for the opportunity to review GAO's draft report. Your consideration of our comments and concerns will be appreciated.

Sincerely,

George M. Gray
Assistant Administrator for
Research and Development

Susan Parker Bodine
Assistant Administrator for
Solid Waste and Emergency Response

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The following are GAO's comments on the Environmental Protection Agency's letter dated August 21, 2007.

GAO Comments

1. We believe that the report offers a balanced portrayal of EPA's development of its second program, the WTC Expert Technical Review Panel process, and EPA's actions to better prepare for future disasters. In several cases we have clarified the language in the draft report to address EPA concerns.

2. In regard to EPA's comments about the transparency of the WTC Expert Technical Review Panel process, we reported on the factors that limited the panel's ability to meet its goals and not on the overall transparency of the process. We stated that two factors limited the panel's ability to meet its goals: (1) EPA officials' assertion that other agencies were better equipped to address public health and (2) EPA's approach for managing the panel process. Regarding EPA's management of the panel process, however, expert panel members told us that EPA did not have a transparent process for adopting or rejecting their recommendations, as we stated in the draft report.

3. Regarding panel members' views on the responsiveness of EPA's second program to concerns of residents and workers, we clarified our report to note that the source of the views included all of the expert panel members who responded to a follow-up inquiry regarding this question.

4. We disagree that the draft report provided panel member views in a misleading manner. However, we clarified the report language to indicate that 9 of 18 panel members reported that the decision-making process behind EPA's changes to its plan were not at all transparent. In doing so, we reported the category with the largest number of responses and, as indicated in the draft report, the full range of responses can be found in appendix IV. As stated in the draft report, in order to determine the factors that affected the expert panel's ability to meet its goals, we conducted structured interviews with all 18 expert panel members. We analyzed these responses in order to describe the panel process, including EPA's management of the panel process. We reported the views that panel members provided to us during structured interviews and included the full range of responses to these questions in an appendix, as stated above. Regarding comments supporting inadequate time for decision making, panel members requested at the final panel meeting that EPA allow time for additional

discussion. According to the December 2005 meeting summary, the panel co-chair "summarized that the overall sense of the panel members is that there is a need for additional discussion."

5. We acknowledge that EPA would have preferred for us to include more detailed information in our discussion of the agency's second WTC program, the WTC Expert Technical Review Panel process, and its programs for responding to disasters. However, the purpose of our report was not to reiterate the technical details of EPA's efforts but to summarize specific findings related to our key objectives.

6. EPA asserts that it conducted extensive monitoring and modeling after September 11, 2001, in order to determine the extent of contamination. We acknowledge that appendix I in EPA's December 2006 plan states, "the plumes resulting from the collapse of the towers and subsequent fires were modeled by EPA" and that "EPA and many other agencies collected and analyzed environmental samples after the September 11, 2001, attack on the WTC," and we incorporated these facts in the report. However, when we asked EPA to identify which samples were taken indoors, EPA officials told us they did not have this information. Furthermore, in the body of EPA's December 2006 program plan, EPA acknowledges that it is no longer attempting to assess the extent of WTC contamination. We maintain that the challenge of identifying the extent of WTC contamination in indoor spaces remains.

7. We agree that neither EPA nor panel members suggested testing in inaccessible areas as a means of determining the adequacy of its cleanups. However, our statement was intended to convey our belief that if EPA had information about these areas, a more complete picture of both the extent of contamination and the adequacy of overall efforts directed toward cleaning and testing could be assessed.

8. EPA takes issue with our assertion that EPA did not estimate the resources needed to carry out its second program. We believe that EPA did not conduct a cost estimate that identified the resources needed to effectively implement the second program. As EPA stated in comments, it provided information for potential contract costs for the second program; however, we continue to believe that the information was limited as it related to only one program component—sampling—and it was unclear how the sampling costs related to an overall cost estimate. In EPA's comments, it states that cost data provided in its interagency agreement constituted a cost estimate; however, information on key assumptions such as estimated participation rates

as well as key program elements, including the cost of sampling, were not included. Further, the information provided in the interagency agreement was not the basis for determining whether $7 million in funding would be adequate for implementing the second program—as this amount had already been established as the remaining funds FEMA set aside for EPA's use. In contrast, for its first program, EPA provided information in the interagency agreement with FEMA that included details associated with individual cost elements, such as sample analysis, equipment and supplies, and salary and travel costs. For example, EPA provided detailed estimates for analytical services based on key assumptions related to participation, samples per unit, and the testing for specific contaminants. EPA did not provide this information in the second interagency agreement to support its identification of resources needed for analytical activities. We note that the interagency agreement for EPA's first program identified over $9 million for sampling and analysis of asbestos. While the second program is addressing three additional contaminants, the interagency agreement has limited detail on the associated sampling and analysis costs or how these relate to the total funding of $7 million.

9. EPA asserts that table 1 in the draft report (figure 5 in the final report) does not accurately characterize the IG recommendations and the relationship between them and the CEQ charges. As the draft report stated, table 1 in the draft report (figure 5 in the final report) showed key recommendations and additional input that the IG and panel members provided to EPA. We believe that the figure accurately presents both recommendations such as those found in Chapter 6 of the IG report, as well as input the IG provided in other sections of the report that supports these specific recommendations. The figure also presents input provided by panel members, which we believe is not documented comprehensively in other locations.

10. In EPA's comments, it notes that panel members were free to refocus issues, and our draft report acknowledged that EPA adopted panel members' input to address contamination, rather than recontamination, of spaces. On page 8 of its comments, EPA took issue with our description of the panel's goals. EPA provided the charges identified by CEQ in its October 27, 2003, letter to the agency. In our report, rather than present these charges, we instead reported goals that EPA directly provided to the expert panel at its first meeting on March 31, 2004. We believe this is an accurate characterization of the priorities EPA established for the panel.

11. In its comments, EPA states that the agency decided to implement a voluntary program to test and clean residences and whole buildings. In fact, when requested by building owners, the December 2006 program plan offers testing and cleaning in residential and commercial buildings' common areas, but does not use the term "whole buildings."

12. EPA takes issue with our assessment that EPA failed to disclose the limitations in testing results. EPA refers to appendix I of its second plan and notes that it contains an "extensive discussion" of the results of the first program. The appendix includes a discussion of EPA's methodology, raw data such as the total number of samples taken, and the results of sampling efforts but does not include a discussion of the limitations that may have influenced these results. EPA also notes that discussion of its first program's test results were available in panel meeting summaries and on EPA's WTC Web site; however, these sources summarized presentations made to the panel and responses to panel member comments but lacked the same discussion of limitations as EPA's second program plan. We continue to believe that EPA did not include appropriate caveats that clearly articulated the limitations in the results in its discussion, such as that 20 percent of eligible residents participated and, therefore, the results may not have been representative of all spaces. Finally, GAO did not conclude that EPA withheld data, as EPA suggested in its comments.

13. In EPA's comments, EPA disagrees with our assessment that EPA has not demonstrated how it will overcome certain challenges identified by expert panel members. We acknowledge EPA's analytical capabilities and the acute exposure guideline levels and other benchmarks that are available to EPA. We continue to believe that expert panel members raised valid issues regarding EPA's second program following the WTC disaster, including what cleanup benchmarks EPA used, what contaminants EPA tested for, and EPA's reliance on visual evidence. We believe these issues point to the need for protocols or interagency agreements that clarify how EPA, along with other agencies, is to address indoor contamination in the future. Further, after reviewing the summary that EPA provided on pages 24 and 25 of its comments of the HVAC system evaluation process it employed, we continue to believe that this process is primarily a visual assessment and that we accurately portrayed panel member concerns with EPA's reliance on visual evidence rather than sample data for HVAC evaluations.

14. We encourage EPA to complete and implement its Crisis Communication Plan's companion resource guide, described in its comments, in a timely fashion. The public relies on EPA to provide accurate and complete information about environmental hazards that may affect them. Assuring that environmental data are presented in language that is easily understood and in easily accessible formats will improve the public's ability to make informed decisions.

15. We note that EPA's comments indicated that since the WTC disaster, EPA has developed more detailed cost estimates to help plan the agency's Stafford Act activities and that the agency is working to establish more specific reporting requirements. In order to more fully inform planning and to allow for the efficient allocation of disaster funds, we encourage the agency to continue these efforts.

16. We recognized in our recommendation the role that DHS and other federal agencies would play in developing protocols and memorandums of understanding under the National Response Plan that specifically address indoor contamination. We acknowledge that EPA plays a critical role under Emergency Support Function 10 for addressing oil and hazardous waste releases. It is encouraging that EPA is pursuing a number of efforts related to chemical, biological, and radiological incidents, including the development of protocols that specifically address indoor contamination involving these types of agents. In addition to these areas, we believe that protocols specific to indoor contamination, which define when the extent of contamination is to be determined, as well as how and when indoor cleanups are to be conducted, should be priorities.

17. We edited the sentence as suggested, but we note that the May 3, 2002, letter from Christopher Ward, New York City Department of Environmental Protection, to Brad Gair, FEMA, refers specifically to asbestos. It states, "The City of New York believes that it is in the public's interest to remove this material from buildings in the vicinity of the WTC site. Samples collected during the inspections indicate that *asbestos* [italics added] may be present in some of the debris. The removal of this material will assure that it will not become re-entrained in the air in the future, thereby protecting against any adverse affects on air quality or public health and safety."

18. We edited the sentence on residential sampling as suggested.

19. EPA is concerned that we provided additional detail beyond the specific statement of IG recommendation 6-3. We believe our statement accurately characterizes the recommendation by taking into consideration other information in the IG report. Specifically, preceding this recommendation, the IG provides details that support this recommendation. The IG states on page 51 of its August 2003 report that "in the case of centralized HVAC systems, selective cleaning does not ensure that cleaned apartments will not be recontaminated by uncleaned apartments through the HVAC system. Consequently, the cleaning of contaminated buildings should proceed by treating the building as a system."

20. We included this information in our final report.

21. EPA asserts that our discussions of EPA's efforts to develop a WTC dust screening method are incorrect. We recognize that additional development would have been necessary to improve the precision and accuracy of the method and, in doing so, render the method usable as a WTC dust screening tool. Our draft report described the subpanel's work to help EPA develop such a methodology and provided information about the peer review of the methodology. As indicated on page 18 of its comments, EPA suggested that its method was never intended to distinguish "WTC contaminants in dust." Our draft report asserted that EPA was unable to develop a method for differentiating between normal background dust and WTC dust and therefore EPA was unable to determine the extent of WTC contamination. We believe the phrase "WTC contaminants in dust" is synonymous with dust contaminated with "WTC residue."

22. We included this information in our final report.

23. EPA disagrees with our statement that EPA did not begin examining methods for differentiating between normal urban dust and WTC dust until May 2004. While multiagency workgroup and task force activities were related, EPA initiated its specific effort to develop a method for identifying a WTC dust signature after individual expert panel members recommended that it do so at its May 12, 2004, meeting. This decision is documented in a September 8, 2006, letter from the EPA Region 2 Administrator to a Member of Congress that states, "As a result of these [panel] discussions, EPA decided to explore whether a WTC signature exists in dust." We continue to believe that our statement is accurate.

24. We disagree that our statement regarding workplaces is misleading. Despite OSHA and NIOSH presentations made at panel meetings, we continue to have concerns because these agencies do not have authority to conduct cleanup in response to contaminant levels that exceed EPA's site-specific cleanup benchmarks. Furthermore, our draft report stated that OSHA's standards are designed primarily to address airborne contamination, while EPA's test and clean program is designed to address contamination in building spaces, whether it is airborne or in settled dust.

25. We disagree with EPA's assertion that this statement creates the impression that other agencies were not addressing health-related issues. Our comments were limited to the panel's ability to meet its goals, one of which was to identify unmet public health needs. While EPA's facilitation of public health presentations may have provided information about health issues, all but two expert panel members told us that the panel did not successfully identify unmet public health needs. We did not address the quality of the WTC Health Registry or other agencies' public health activities.

26. The source of the office and residential building data is the May 12, 2004, panel meeting summary posted on EPA's Web site. The summary identifies a New York City Department of Buildings database from which EPA drew this information.

27. The draft report provided basic facts and background information about EPA's first program that were derived from EPA's December 2006 program plan and other EPA reports in order to provide context for the development of the second program.

28. EPA takes issue with our draft regarding our characterization of the availability of sample results from the New York City Department of Health and Mental Hygiene and the Agency for Toxic Substances and Disease Registry's study. In fact, our draft report provided a footnote pointing out the results of the study were made available to EPA in February 2002.

29. EPA said the dates we provided in a timeline of events did not accurately portray when the results of agency studies were available for its use. We provided publication dates for three EPA studies in our timeline to illustrate the range of activities that EPA engaged in prior to its second program. EPA also asserted that there was no single date for reoccupation of residences. In fact, our timeline

specifically includes the date, 9/17/2001, that New York City residents *began to* reoccupy homes and Wall Street was reopened.

30. As suggested, we replaced the term "cleanup standards" with "cleanup benchmarks" and we expanded our discussion of how these benchmarks were developed.

31. EPA asserts that our statement is incorrect because it omits discussion of cleaning in common areas. We acknowledge that EPA will clean in common areas under certain circumstances; however, the context of this discussion was the panel members' recommendations that EPA clean in HVACs.

32. We believe that the draft report correctly presents the IG recommendation, what EPA considered, and the agency's rationale for not electing to pursue a sampling approach that would have addressed whole buildings; however, we clarified the report's language to include more detail regarding EPA's proposed approach. The July 26, 2004, panel meeting summary supports our description of how EPA considered various approaches. While EPA said that its intent was not to characterize buildings but rather to use the information from buildings "to characterize areas," the meeting summary includes a presentation by an EPA official on a sampling approach that involved "…conducting air and dust sampling in several units within the building to characterize the building." Further, we disagree with EPA's explanation of why its proposal to do so was rejected by panel members and the public. Panel members rejected the aspect of the plan that would have limited the sampling to the same residences that participated in EPA's first program, as panel members wanted the plan to allow for sampling in residences that had not participated previously. Thus, EPA's assertion in its comments that the panel members rejected EPA's approach because it was addressing whole buildings is not accurate.

33. We clarified this statement in the report, noting that EPA did not maintain a list of recommendations; however, we continue to believe that the meeting summaries maintained by EPA did not constitute comprehensive documentation of recommendations made by expert panel members.

34. We disagree that our discussion of overloaded samples is incorrect; however, we clarified report language to indicate that sample results, rather than samples, were discarded and that dust particles, rather

than fibers, obscured analysis. In EPA's final report from its first program, the agency states, "there were a number of outcomes that resulted in inconclusive results. Filter overload was the most common. Filter overload occurs when too many dust particles are captured on the filter. The filter becomes obscured so technicians examining it under a microscope cannot separate out individual fibers. This causes an inconclusive result, which is discarded." In its second program plan, EPA does not present this information in its description of its first program's test results. We continue to believe that this information would have provided additional context to the public.

35. EPA disagrees with our assessment that EPA guidance has not yet addressed how the agency will determine the extent of contamination resulting from disasters. We acknowledge that EPA has built its capacity to address contamination since the WTC disaster and that it continues to work to develop additional sampling methods. In fact, the draft report provided examples of research EPA is conducting, benchmarks EPA is developing, and other preparedness activities that EPA has undertaken. However, we do not believe that existing guidance or protocols have provided additional assurances that EPA has addressed the challenges it faced from 2004 to 2005 when working to develop a reliable screening method for WTC dust.

36. As suggested, we edited the sentence regarding the Environmental Response Team.

37. As suggested, we edited the sentence regarding environmental laboratory networks.

38. As suggested, we edited the sentence regarding acute exposure guideline levels.

39. EPA noted matters for correction in an appendix that provides background information on EPA's first and second programs. We edited the statement regarding EPA's role in the first program, as suggested. However, we note that in its final report on its first program EPA states, "contractors cleaned and tested homes, under the direction of the EPA." In addition, our draft report included a table note referring to the subset of 263 residences that EPA tested for additional contaminants, and we have added detail regarding total fibers. For common areas, the draft report included the number of samples taken from common areas, and it also notes that 144

buildings had common areas cleaned. We clarified the appendix III language regarding geographic extent to note that the appendix provides program boundaries.

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

John B. Stephenson, (202) 512-3841 or stephensonj@gao.gov

Staff Acknowledgments

In addition to the contact named above, Diane B. Raynes, Assistant Director; Janice Ceperich; Michele Fejfar; Brandon H. Haller; Katheryn Summers Hubbell; Karen Keegan; Omari Norman; Carol Herrnstadt Shulman; and Sandra Tasic made major contributions to this report. Additional assistance was provided by Katherine M. Raheb.

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