

**GAO**

Testimony

Before the Subcommittee on Superfund  
and Environmental Health, Committee on  
Environment and Public Works, U.S.  
Senate

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**WORLD TRADE CENTER**

**Preliminary Observations  
on EPA's Second Program  
to Address Indoor  
Contamination**

Statement of John B. Stephenson, Director  
Natural Resources and Environment



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# Highlights

Highlights of [GAO-07-806T](#), testimony before the Subcommittee on Superfund and Environmental Health, Committee on Environment and Public Works, U.S. Senate

## Why GAO Did This Study

The September 11, 2001, terrorist attack on the World Trade Center (WTC) turned Lower Manhattan into a disaster site. As the towers collapsed, Lower Manhattan was blanketed with building debris and combustible materials. This complex mixture created a 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. In May 2002, New York City formally requested federal assistance to address indoor contamination. The Environmental Protection Agency (EPA) conducted an indoor clean and test program from 2002 to 2003. Several years later, after obtaining the views of advisory groups, including its Inspector General and an expert panel, EPA announced a second test and clean program in December 2006. Program implementation is to begin later in 2007, more than 5 years after the disaster.

GAO's testimony, based on preliminary work evaluating EPA's development of its second program, addresses (1) EPA's actions to implement recommendations from the expert panel and its Inspector General, (2) the completeness of information EPA provided to the public in its second plan, and (3) EPA's assessment of available resources to conduct the program. We discussed the issues we address in this statement with EPA.

[www.gao.gov/cgi-bin/getrpt?GAO-07-806T](http://www.gao.gov/cgi-bin/getrpt?GAO-07-806T).

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](mailto:stephensonj@gao.gov).

## WORLD TRADE CENTER

# Preliminary Observations on EPA's Second Program to Address Indoor Contamination

## What GAO Found

EPA has taken some actions to incorporate recommendations from the Inspector General and expert panel members into its second program, but its decision not to incorporate other recommendations may limit the overall effectiveness of this program. For example, EPA's second program incorporates recommendations to expand the list of contaminants it tests for, and to test for contaminants in dust as well as the air. However, it does not incorporate a recommendation to expand the boundaries of cleanup to better ensure that WTC contamination is addressed in all locations. EPA reported that it does not have a basis for expanding the boundaries because it cannot distinguish between normal urban dust and WTC dust. EPA did not begin examining methods for differentiating between normal urban dust and WTC dust until nearly 3 years after the disaster, and therefore the process for finding distinctions was more difficult. In addition, EPA's second program does not incorporate recommendations to sample heating, ventilation, and air conditioning (HVAC) systems. According to EPA's plan, the agency chose to offer limited testing in a greater number of apartments and common areas rather than provide more comprehensive testing (such as in HVACs) in a smaller number of these areas.

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 explain that this conclusion was to be expected because it took over 80 percent of the samples after residences were professionally cleaned. Without this additional information, residents who could have participated might have opted not to do so because of EPA's conclusion.

EPA did not assess the adequacy of available resources for the second program. EPA stated that it plans to spend \$7 million on this program, which is not based on any assessment of costs, but is the funding remaining from the first program. Without careful planning for future disasters, timely decisions about data collection, and thorough communication of sampling results, an evaluation of the adequacy of cleanup efforts may be impossible.

**Aerial Image of North World Trade Center Tower on 9/11**



Source: NYPD Photo Unit.

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Madam Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the preliminary results of our ongoing work on the development of the Environmental Protection Agency's (EPA) second program to address World Trade Center (WTC) indoor contamination. As you know, the September 11, 2001, terrorist attack 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 in Lower Manhattan. 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, Lower Manhattan 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. 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 National Response Plan, established the process and structure for the federal government's assistance to state and local agencies when responding to any major disaster or emergency declared under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).<sup>1</sup> In May 2002, after numerous cleanup, dust collection, and air monitoring activities were conducted outdoors by 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 WTC site for airborne asbestos.<sup>2</sup>

The Federal Emergency Management Agency (FEMA), which administered the Federal Response Plan, provided such assistance, entering into interagency agreements with EPA in 2002 to develop EPA's first program.

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<sup>1</sup>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).

<sup>2</sup>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.

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This 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. Approximately 20 percent of the eligible residences participated in the program. The majority of these residences were professionally cleaned before they were sampled for asbestos because their owners selected the clean and test option rather than the test only option.<sup>3</sup> 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.

EPA's first program was criticized by several entities; as a result, EPA developed a second program, which is the focus of our ongoing work and our testimony today.<sup>4</sup> Let me provide some information on the events leading up to the second program.

In August 2003, EPA's Inspector General made recommendations that addressed EPA's initial efforts to clean up indoor contamination following the towers' collapse, as well as recommendations that focused on EPA's future preparedness for large-scale disasters resulting in indoor contamination. The Inspector General reported that the effort to clean up indoor WTC contamination was inadequate for multiple reasons. For example, according to the Inspector General, the WTC cleanup did not require that entire buildings be systematically cleaned, including heating, ventilation, and air conditioning (HVAC) systems. As a result, the Inspector General concluded, the contaminants in uncleaned apartments and common areas could enter the air supply system and re-contaminate cleaned spaces. With regard to future preparedness, the Inspector General recommended, among other things, that EPA develop protocols for determining how indoor environmental contamination would be handled in the event of a future disaster.

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<sup>3</sup>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.

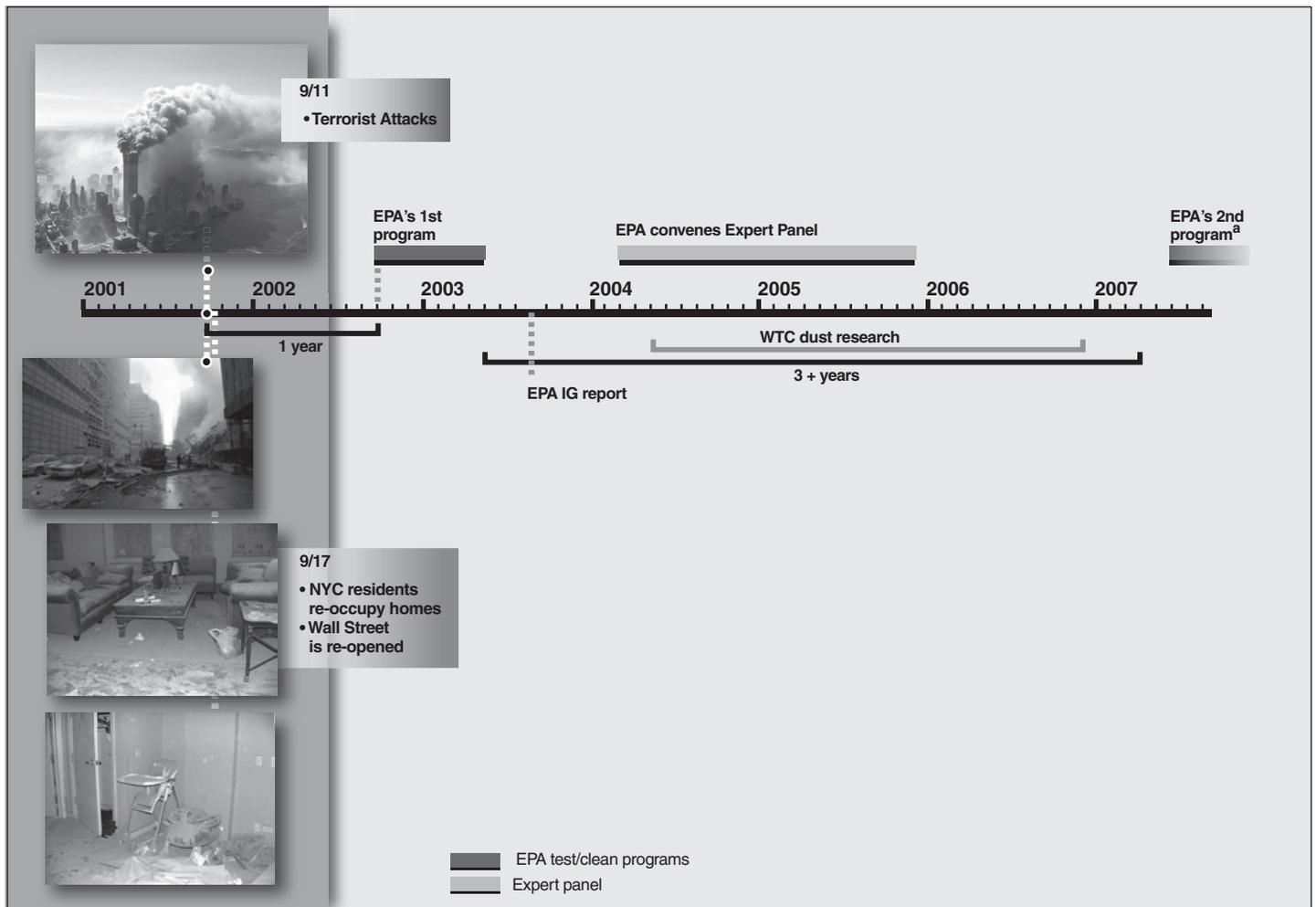
<sup>4</sup>A lawsuit was filed in March 2004 that, among other things, challenged the adequacy of EPA's first test and clean program. The case is on appeal in the U.S. Court of Appeals for the Second Circuit. *Benzman v. Whitman*, No. 04-1888 (S.D.N.Y. filed March 10, 2004), *appeal docketed*, Nos. 06-1166-cv, 06-1346-cv, 06-1454-cv (2nd Cir. March 10, 2006). Pursuant to its long-standing policy of not addressing issues in ongoing litigation, GAO has not addressed EPA's first test and clean program.

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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 WTC Expert Technical Review Panel, which met periodically through December 2005. The panel was composed of 20 individuals from academia 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), which is 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 attack. The panel's overall task, as outlined by CEQ, was to advise EPA on efforts to protect New York City residents and workers potentially affected by the collapse of the World Trade Center. Specifically, the panel's goals were to help guide EPA in (1) identifying any remaining risks using exposure and health surveillance information; (2) identifying any unmet public health needs; and (3) determining steps to further minimize the risks. In addition, the panel was asked to provide advice for EPA's second program. Panel members, including the CLC representatives, submitted individual recommendations to EPA.

After obtaining the views of advisory groups, including the Inspector General, the expert panel, and the CLC, EPA announced its plan for a second program in December 2006. This 2006 plan targets residents and building owners in the same portion of Lower Manhattan as EPA's first program. In the 2006 plan, EPA also provided the results of the sampling from its first program. The second program is set to begin later in 2007. As of May 10, 2007, EPA told us, 295 residents and building owners had enrolled in the second program, compared with 4,166 eligible participants in the first program. Figure 1 shows the chronology of events preceding the second program.

**Figure 1: Timeline of EPA's WTC Indoor Contamination Activities**



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

<sup>a</sup>EPA's registration period ended in March 2007, but as of June 20, 2007, EPA has not begun implementing the program.

Our testimony, which is based on our ongoing work evaluating EPA's development of its second program, discusses (1) EPA's actions to implement recommendations from the expert panel and its Inspector General, (2) the completeness of information EPA provided to the public in its second plan, and (3) EPA's assessment of available resources to conduct the program.

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In summary, while we found that EPA has taken some actions to incorporate recommendations from the Inspector General and expert panel members into its second program, it decided 'not to incorporate other recommendations, which may limit the program's overall effectiveness. For example, EPA's second program incorporates recommendations to expand the number of contaminants tested, from asbestos only, to three additional contaminants and to test in dust as well as in the air. However, EPA's program does not incorporate a recommendation to expand the boundaries of cleanup to north of Canal Street and to Brooklyn. EPA reported that it was unable to develop a method for distinguishing between normal urban dust and WTC dust; therefore, the agency reported that it cannot assess the extent of WTC contamination, and has no basis for expanding the cleanup effort. EPA did not begin examining methods for differentiating between normal urban dust and WTC dust until May 2004—nearly 3 years after the disaster—and therefore the process for differentiating was more difficult. In addition, EPA's second program does not incorporate recommendations to sample in HVACs or "inaccessible" locations within apartments and common areas, such as behind dishwashers. The agency chose to offer more limited testing in a greater number of apartments and common areas rather than to provide more comprehensive testing (such as in HVACs) in a smaller number of these areas. Testing in such a restricted manner make evaluating the adequacy of clean up efforts very difficult, and may discourage participation. Moreover, this program does not incorporate the recommendation to test workplaces because, according to EPA officials, other federal agencies have procedures to address worker safety. We discussed the issues we address in this statement with EPA.

EPA did not provide sufficient information in its second plan to allow the public to make informed choices about their participation. Specifically, EPA did not fully disclose the limitations in the testing results from 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 explain that this conclusion was to be expected because it took over 80 percent of the samples after residences were professionally cleaned. In addition, EPA did not fully explain that its conclusion was based on participation from only 20 percent of the eligible residences. Without this additional information, residents who could have elected to participate might have been discouraged from doing so because of EPA's conclusion.

EPA did not assess the adequacy of available resources to carry out its second program effectively. Instead of assessing the costs of carrying out

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its program and providing resources accordingly, EPA has simply identified how much money was left over from the first program. Further, the amount of funding provided for the second program seems inconsistent with the scale of second program activities. Specifically, the \$7 million EPA plans to spend for the second program's testing and cleaning is less than 20 percent of the first program's funding, despite an increase in the number and type of contaminants being sampled. EPA indicated that if demand had exceeded available resources, EPA would have simply limited participation in the program.

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## Background

After the collapse of the World Trade Center and the accompanying spread of dust resulting from the collapse, EPA, other federal agencies, and New York City and New York State public health and environmental authorities focused on numerous outdoor activities, including cleanup, dust collection, and air monitoring. In May 2002, New York City formally requested federal assistance to clean and test building interiors in the vicinity of the WTC site for airborne asbestos. Such assistance may be made available to state and local governments under the Stafford Act and the National Response Plan, which establishes the process and structure for the federal government to provide assistance to state and local agencies when responding to threats or acts of terrorism, major disasters, and other emergencies.<sup>5</sup> FEMA, which coordinates the federal response to requests for assistance from state and local governments, entered into interagency agreements with EPA to develop and implement the first and second indoor cleanup programs for residents in Lower Manhattan.

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<sup>5</sup>The National Response Plan replaced the Federal Response Plan. The Federal Response Plan was in effect on September 11, 2001.

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## EPA Incorporated Some Recommendations, but Its Decision Not to Adopt Others May Limit the Second Program's Effectiveness

In response to recommendations from the Inspector General and expert panel members, EPA's second program incorporates some additional testing elements. For example, EPA is testing for a wider range of contaminants. In addition to asbestos, EPA will test for man-made vitreous fibers, which are in such materials as building and appliance insulation; lead; and polycyclic aromatic hydrocarbons, a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil, gas, and garbage. EPA will also test dust as well as the air. In order to test the dust for these contaminants, EPA had to develop cleanup standards. However, EPA's second program does not incorporate the following other recommendations: (1) broadening the geographic scope of the testing effort, (2) testing HVACs and "inaccessible" locations, and (3) expanding the program to include workplaces.<sup>6</sup>

*Broadening the geographic scope of testing.* EPA did not expand the scope of testing north of Canal Street, as well as to Brooklyn, as advisory groups had recommended. EPA reported that it did not expand the scope of testing because it was not able to differentiate between normal urban dust and WTC dust, which would have enabled it 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 ultimately agreed to do so. Beginning in 2004—almost 3 years after the disaster—EPA conducted this investigation. 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 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. However, aerial photography does not reveal indoor contamination, and EPA officials told us that they knew that some WTC dust was found immediately after the terrorist attacks outside the area eligible for its first and second program, such as in Brooklyn.

*Testing HVACs and in 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, and

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<sup>6</sup>EPA's second program does allow commercial building owners to request testing and cleaning, but does not permit workers or employers to do so.

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in others each residence has its own system. In either case, contaminants in the HVAC could re-contaminate the residence unless the system is also professionally cleaned. However, EPA's second program will not provide for testing in HVACs unless tests in common areas reveal that standards for any of four contaminants have been exceeded. EPA explains in the second plan that it will not sample within HVACs because it chose to offer more limited testing in a greater number of apartments and common areas rather than provide more comprehensive testing in a smaller number of these areas. 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. In fact, EPA only received 295 requests from residents and building owners to participate in the second program, compared with 4,166 eligible participants in the first program.<sup>7</sup>

*Expanding the program to include workers/workplaces.* According to EPA's second program plan, the 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 will do so only if an individual property owner or manager 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. Concerns remain, however, because these other agencies do not have the authority to conduct cleanup in response to contaminant levels that exceed standards. In addition, 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 the contamination is airborne or in settled dust. Thus, OSHA can require 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.

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<sup>7</sup>A total of 640 individual residents and building owners registered for the second program. Of this total, 295 eligible participants submitted the necessary access agreements.

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## EPA Did Not Provide the Public With Sufficient Information to Make Fully Informed Decisions

EPA did not provide sufficient information in its second plan so that the public could make informed choices about their participation. Specifically, EPA did not fully disclose the limitations in the testing results from its first program. While EPA stated that the number of samples in its first program exceeding risk levels for airborne asbestos was “very small,” it did not fully explain that this conclusion was limited by the following factors.

*Participation.* Participation in the 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 the residences eligible for the program. Those who chose to participate may not have been at greatest risk.

*Contaminants tested.* EPA’s cleanup decisions were based only on tests for asbestos, rather than other contaminants, and the decisions focused on airborne contamination rather than contamination in dust inside residences.

*Sampling protocol.* EPA took over 80 percent of the samples after professional cleaning was complete. Therefore it is not surprising that EPA found few samples exceeding its asbestos standard.

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. EPA did not explain the impact of excluding these samples or other data limitations from its conclusion that the number of samples exceeding asbestos standards was very small. Without providing complete explanations of the data, residents who could have elected to participate might have been discouraged from doing so.

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## EPA Did Not Adequately Assess Resource Needs for the Second Program

EPA did not take steps to ensure that resources would be adequate to achieve the second program’s objectives. Instead, EPA is implementing this program with the funding remaining after its first program—approximately \$7 million. EPA could not provide us with any basis for determining whether this funding level is appropriate. EPA officials told us that they were unable to determine the cost of the program without knowing the number of participants. However, we note that funds available for the second program are less than 20 percent of the first

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program's funding, despite an increase in the number and type of contaminants being sampled.

Almost two-thirds of the 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—a former EPA Assistant Administrator—the \$7 million was sufficient for initial sampling in the second program, but not for sampling and cleanup. If demand had exceeded available resources, EPA would have simply limited participation by ranking program applicants on the basis of their proximity to the WTC site.

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## Concluding Observations

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. The effectiveness of this program may be limited because some important recommendations were not incorporated, and because program implementation will not begin until later this year—more than 5 years after the World Trade Center collapsed. Furthermore, owing to these factors, the majority of panel members do not support EPA's second program, noting that it was not responsive to the concerns of residents and workers harmed by the collapse of the WTC towers, it was scientifically and technically flawed, or it was unacceptable because it would not identify the extent of contamination. Some panel members questioned the value of participating in EPA's program, and even stated that they would discourage participation.

Madam Chairman, this concludes my prepared statement. I would be happy to respond to any questions that you or Members of the Subcommittee may have.

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## Contacts and Acknowledgments

Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this testimony. For further information about this testimony, please contact John B. Stephenson, Director, Natural Resources and Environment (202) 512-3841, or [stephensonj@gao.gov](mailto:stephensonj@gao.gov). Key contributors to this testimony were Janice Ceperich, Katheryn Summers Hubbell, Karen Keegan, Omari Norman, Diane B. Raynes, Carol Herrnstadt Shulman, and Sandra Tasic. Additional assistance was provided by Katherine M. Raheb.

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