

November 12, 2001

Mr. Shaun Hession  
New York City Housing Authority  
23-02 49<sup>th</sup> Avenue  
Long Island City, New York 11101

Re.: 90 Church Street, Environmental Dust and Debris Sampling and Evaluation  
Interim Site Assessment Report  
EMTEQUE Project Number 010496

Dear Mr. Hession,

As per the discussions, meetings and EMTEQUE Corporation (EMTEQUE) proposal dated October 5, 2001 (revised October 7, 2001), EMTEQUE conducted the proposed sampling of the above referenced property on Saturday, October 13, 2001. Sampling was conducted within the 5<sup>th</sup> through 12<sup>th</sup> floors, areas occupied by the New York City Housing Authority (NYCHA) until September 11, 2001. The sampling was conducted by Messrs. Eric Telemaque, Ramon Henriquez, Juan Salcedo and Neil Feldscher. Representatives of NYCHA's Employee Health and Safety Office and Property Management Unit accompanied and observed all sampling. The Ambient Group, Inc., representing Boston Properties, the property management firm, accompanied the sampling team during the initial portion (i.e., 12<sup>th</sup> floor only) of the sampling. Personnel from the Ambient Group, Inc. reportedly took samples similar in quantity and method to the EMTEQUE sampling. EMTEQUE only observed the asbestos portion of the Ambient Group, Inc.'s sampling.

Due to the September 11, 2001 World Trade Center (WTC) tragedy, large quantities of dust and debris associated with the WTC complex entered the subject building through open windows and through windows that were broken during the collapse and subsequent fires. Fires occurred on the 5<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> (small localized fire on the 9<sup>th</sup> floor) floors of the subject building. The fires were generally located within the southwest corner of the subject property. Based upon the EPA's on-going study of contaminants along with EMTEQUE's information from other local sites, sampling was conducted for the following contaminants:

- Asbestos
- Metals
- Silica
- Polychlorinated biphenyls
- Polycyclic aromatic hydrocarbons
- Dioxin

While this list is not intended to be all inclusive of every possible contaminant present as a result of the WTC disaster, it is intended to provide good indicators of the current condition of the subject building and the potential industrial hygiene issues as related to that condition. EMTEQUE compared results of the sampling to the New York State

505 Eighth Avenue • Suite 900 • New York, NY 10018  
Phone: 212-631-9000 • Fax: 212-631-8066 • E-mail: info@emteque.com



Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 2

Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) Soil Cleanup Levels. While the TAGM levels do not apply except in soil contamination, these standards provide a risk-based standard for contamination in bulk material, allowing a means of comparison. The sampling was designed and conducted as a preliminary assessment to determine the presence and extent of contaminants within the dust and debris present within the formerly occupied space. These contaminants are suspected to exist due to the collapse of the World Trade Centers and the associated fires both outside and within the subject property. The intent of determining the extent and levels of contamination, if present, was to make initial recommendations concerning the removal and recovery of files, paperwork, computer equipment, personal items, etc.

In discussing the issues of contamination and potential cleanup, EMTEQUE has relied heavily on general industrial hygiene practices, professional experience, and standards that, in our opinion, most closely relate to the current subject matter.

Sampling for all contaminants was conducted throughout the floors. Bulk and wipe sampling was conducted based upon the level of dust or debris present at each sampling location; bulk sampling was conducted where sufficient material was able to be collected for laboratory analysis. The sampling was conducted in order to determine if contamination was localized or distributed throughout the floors. As such, sampling was conducted in the dirty and clean areas (based upon physical appearance) and then in the areas showing the tapering off of dust and debris.

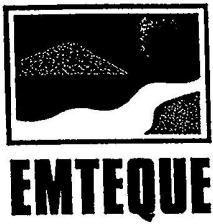
A summary of all sampling results is included as Attachment A to this report. Copies of drawings showing all sampling locations are included within Attachment B to this report. Copies of all analytical results are included within Attachment C to this report.

### **Asbestos**

A mixture of bulk and wipe samples were obtained for analysis for asbestos. Analysis for asbestos was conducted by EMSL Analytical, Inc. EMSL is an independent American Industrial Hygiene Association (AIHA) and New York State Department of Health Environmental Laboratory Accredited Program (ELAP) laboratory. Analysis was conducted utilizing Polarized Light Microscopy (PLM) via dispersion staining.

A total of nine samples were collected from each floor with the exception of the three samples collected from the partially occupied 7<sup>th</sup> floor and ten samples from the 10<sup>th</sup> floor. This yielded a total of 67 samples.

Sample results indicated the presence of asbestos in 23 of the 67 samples collected. Samples indicating the presence of asbestos were observed from all floors. The asbestos analytical results appear to indicate that the dust and debris may not be homogeneous despite the material appearing homogenous from a visual observation.



Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 3

## **Metals**

A mixture of bulk and wipe samples were obtained for analysis for metals. Analysis for metals was conducted by Philip Service Corporation (PSC). PSC is an independent AIHA and ELAP accredited laboratory. Analysis was conducted for the Environmental Protection Agency (EPA) priority pollutant metals (though mercury was only conducted in bulk samples).

Four samples were obtained from each floor with the exception of the 8<sup>th</sup> floor where EMTEQUE obtained five samples. This yielded a total of 33 samples. Based upon EMTEQUE's initial assumption that contamination would be localized to the southwest quadrant, sampling was broken down with four samples from the dirtiest area (southwest corner – one sample), cleanest area (usually the northwest – one sample), and the tapering off areas (two samples).

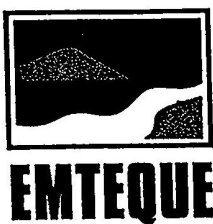
A review of the metals analysis revealed elevated presence of metals within all 33 samples of the dust and debris. Metals levels fluctuated within a single order of magnitude within the debris samples. Levels of beryllium, cadmium, chromium, copper and zinc within the bulk samples were generally above the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) Soil Cleanup Levels. All bulk samples analyzed for mercury were above the TAGM standards. While the TAGM levels do not apply except in soil contamination, these standards provide a risk-based standard for contamination in bulk material, allowing a means of comparison.

Wipe samples from within those areas lightly covered (or not covered) with dust revealed the presence of metals, though in generally lower levels than in the bulk debris. Twenty-five percent (25%) of the wipe samples taken revealed levels of lead greater than the standard established for the lead clearance criteria by the Department of Housing and Urban Development (HUD). It should be noted that metals were consistently present throughout the dust samples taken. Levels of metals appeared to be relatively consistent with the level of dust present.

## **Polychlorinated Biphenyls**

A mixture of bulk and wipe samples were obtained for analysis for polychlorinated biphenyls (PCBs). Analysis for PCBs was conducted by PSC.

One sample was obtained from each floor with the exception of the 5<sup>th</sup> and 6<sup>th</sup> floors from which EMTEQUE obtained three samples and the 8<sup>th</sup> floor from which two samples were taken. The additional samples were taken from each of the floors and areas that had fire damage. A total of 13 samples were taken for PCBs. This limited sampling was based upon EMTEQUE's initial assumption that PCBs would not be present within the inspected spaces.



Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 4

Detectable levels of PCBs were identified in 10 of the 13 samples. Results from the 6<sup>th</sup> floor revealed relatively low levels at the fire location (62 ppb) and below detection level away from the fire. Levels on the 5<sup>th</sup> floor ranged from 150 to 360 ppb near the fire to non-detected away from the fire. Levels on the 8<sup>th</sup> floor ranged from 290 ppb at the fire location to non-detect away from the location. Samples from the remaining floors (without fire damage) ranged from 130 to 1,400 ppb. For comparison purposes, only the sample from the 10<sup>th</sup> floor exceeded the TAGM soil cleanup objective (and the USEPA health based standard) of 1 ppm. A summary of samples above the TAGM standard is listed in Table 1.

| TABLE 1<br>POLYCHLORINATED BIPHENYLS                   |              |                     |                     |
|--------------------------------------------------------|--------------|---------------------|---------------------|
| Sample #/Location                                      | Compound(s)  | Concentration (ppm) | TAGM Standard (ppm) |
| PCB-10-01<br>10 <sup>th</sup> Floor – Southwest corner | Aroclor 1254 | 1.4                 | 1                   |

### Polycyclic Aromatic Hydrocarbons

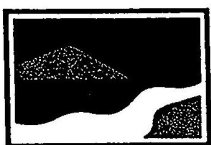
A mixture of bulk and wipe samples were obtained for analysis for polycyclic aromatic hydrocarbons (PAHs)/polynuclear aromatics (PNAs). Analysis for PAHs was conducted by PSC.

One sample was obtained from each floor with the exception of the 5<sup>th</sup> and 6<sup>th</sup> floors from which EMTEQUE obtained three samples and the 8<sup>th</sup> floor from which two samples were taken. Additional samples were taken from each of the floors and areas that had fire damage. A total of 13 samples were taken for PAHs. This limited sampling was based upon EMTEQUE's initial assumption that PAHs would not be present within the inspected spaces.

Detectable levels of PAHs were identified in 10 of the 13 samples. Samples among the non-fire damaged floors appeared relatively consistent. All sample results were below the TAGM Soil Cleanup Objective. Sample results from the fire damaged floors also appeared relatively consistent though slightly higher in concentration than the levels from the other floors. One sample from the fifth floor, located at a secretary's desk in the southwest corner, exceeded the TAGM Recommended Soil Cleanup Objective for chrysene. A summary of samples above the TAGM standard is listed in Table 2.

### Silica

A mixture of bulk and wipe samples were obtained for analysis for silica. Analysis for silica was conducted by the RJ Lee Group, Inc. (RJ Lee). RJ Lee is an independent AIHA accredited laboratory.


**EMTEQUE**

Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 5

| TABLE 2<br>POLYCYCLIC AROMATIC HYDROCARBONS                                          |             |                     |                     |
|--------------------------------------------------------------------------------------|-------------|---------------------|---------------------|
| Sample #/Location                                                                    | Compound(s) | Concentration (ppm) | TAGM Standard (ppm) |
| PNA-5-02<br>5 <sup>th</sup> Floor – South wall toward SW corner (3 offices from end) | Chrysene    | 0.7                 | 0.4                 |

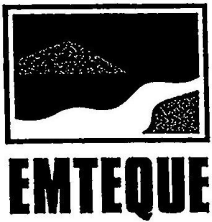
Four samples were obtained from each floor with the exception of the 8<sup>th</sup> floor where EMTEQUE obtained five samples. A total of 33 samples were obtained. Based upon EMTEQUE's initial assumption that contamination would be localized to the southwest quadrant, sampling was broken down with four samples from the dirtiest area (southwest corner – one sample), cleanest area (usually the northwest – one sample), and the tapering off areas (two samples).

Detectable levels of silica were observed within all 33 samples. Sample results ranged from 1.1 to 12.0 percent quartz by weight.

### Dioxins

Only bulk samples were obtained for analysis for dioxins. Analysis for dioxin was conducted by PSC. One sample was obtained from each of the subject floors that did not have fire damage. One sample was obtained from the eighth floor, two samples from the fifth floor and three samples were taken from the sixth floor. A total of 11 samples were obtained.

All 11 samples obtained revealed detectable levels of dioxin compounds. In order to review the data, EMTEQUE utilized the World Health Organization (WHO) dioxin equivalency factors (1997). These factors are intended to allow correlation from a level of each dioxin compound to the concentration of 2,3,7,8-Cl<sub>4</sub>-Dibenzo-p-dioxin (TCDD). 2,3,7,8-TCDD is considered the most hazardous of the dioxin compounds and each of the other dioxin compounds are compared to this toxicity. After correlation with 2,3,7,8-TCDD, the levels are added to generate a total equivalent concentration. This level was then compared to the TAGM standard of 600 parts per trillion (ppt). Sample results from the fire damaged floors, specifically the 5<sup>th</sup> and 6<sup>th</sup> floors were higher in concentration than the levels from the other floors. One sample from each of the fifth and sixth floors were above the TAGM standard. Observed concentrations did not appear completely consistent with the locations of the fires since much higher levels were identified in the two samples away from the fire on the 6<sup>th</sup> floor rather than the sample at the fire location. The two samples from the 5<sup>th</sup> floor away from the fire location appeared consistent with the samples away from the fire on the 6<sup>th</sup> floor. A summary of samples above the TAGM standard is listed in Table 3.



Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 6

| TABLE 3<br>DIOXIN                                                                                  |                                      |                        |                                    |
|----------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|------------------------------------|
| Sample #/Location                                                                                  | Equivalent<br>Concentration<br>(ppt) | TAGM<br>Standard (ppt) | EPA<br>Superfund<br>Standard (ppt) |
| D-5-02<br>5 <sup>th</sup> Floor – South wall toward<br>SW corner (3 offices from end)              | 972                                  | 600                    | 1,000                              |
| D-6-03<br>6 <sup>th</sup> Floor – Toward western<br>wall, second cubicle row from<br>southern wall | 1098                                 | 600                    | 1,000                              |

Due to the nature and hazards associated with dioxins, various groups have recommended that all avoidable exposures be reduced. The EPA and NIOSH have done significant studies on dioxin. Various exposure limits have been proposed but no limits have been established. NIOSH's policy has been that when a threshold for carcinogens that would protect 100% of the population has not been identified then NIOSH usually recommended that occupational exposures to carcinogens be limited to the lowest feasible concentration.

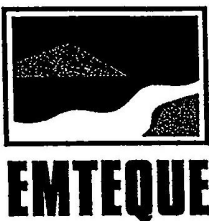
### Conclusions and Recommendations

The initial intent of this preliminary assessment was to determine whether potential environmental hazards exist. Based upon the sampling conducted and analytical results obtained, environmental hazards have been identified within the subject space. Based upon the analytical results obtained, EMTEQUE presents the following conclusions:

- Asbestos appears to be present in the debris and settled dust throughout the building.
- Metals and silica were observed to be present throughout the dust and debris. The levels appear relatively consistent and appear dependent upon the amount of dust present.
- Polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) were detected in debris within the building.
- Dioxins were detected within debris in the building.
- Based upon the concentrations identified during the sampling, EMTEQUE concludes that contamination is present throughout the inspected space.

Based upon the identified conclusions, EMTEQUE presents the following recommendations:

- Due to the presence of mercury containing dust that has settled on papers on throughout the space, EMTEQUE has a concern that the mercury may bind itself to the organic fibers within the paper. As such, EMTEQUE recommended sampling paper after it was cleaned by the restoration contractor in order to



Mr. Shaun Hession  
New York City Housing Authority  
November 12, 2001  
Page 7

ensure that the mercury could be completely removed. On Saturday November 3, 2001, EMTEQUE conducted sampling of a single piece of paper that had been covered with heavy levels of dust since September 11, 2001. A second piece of paper was obtained from an area considered to have a medium level of dust. A third piece of paper was obtained from within a file cabinet that had some dust infiltration. A fourth piece of paper was obtained from an unopened ream of paper to serve as a control sample. Belfour conducted all cleaning of the paper products.

- Due to the levels of dioxins, PCBs, PAHs and mercury observed (with the realization that none of these contaminants would typically be expected to be found in an office environment – or most other environments), EMTEQUE recommends that porous materials (i.e., carpeting, cubicle dividers, ceiling tiles, etc.) be disposed. EMTEQUE's recommendation is based on the fact that it may be difficult (or perhaps impossible) to clean these items. Though EMTEQUE anticipates that cleaning may provide a small cost savings over replacement, the issues of attempting to clean these materials, ensuring their cleanliness at the completion, and ensuring employees' satisfaction with those materials will at least be very difficult. If an attempt is made to perform cleaning of porous materials, EMTEQUE recommends that a pilot study be performed to ensure that any cleaning performed will be sufficient and successful prior to starting a complete cleaning program.
- Recommendations for access, clean-up procedures, salvage of equipment, personal protective equipment, engineering controls, training, etc. will be identified in future specifications and procedures to be drafted by EMTEQUE and approved by NYCHA.
- Due to the concentrations detected in the sampling for PCBs, PAHs and dioxins, EMTEQUE recommended additional sampling. This work was approved by NYCHA and conducted by EMTEQUE on Thursday and Friday, October 25 and 26, 2001. This data was not received in time to incorporate into this report though much of this data has already been incorporated into the summary tables included as an attachment to this report. This additional data will be incorporated into the text of the final site assessment report. The additional sampling was anticipated to allow EMTEQUE to characterize the dust and debris throughout the entire space. The additional sampling results for dioxin indicate that elevated dioxin levels are present in various areas throughout the various floors.

Should you have any questions or require additional information, please contact us at (212) 631-9000.

Submitted by,

  
Neil A. Feldscher, CIH, CSP  
Senior Environmental Manager

Reviewed by,

  
Eric Telemaque  
President

Attachments



**AIRTEK ENVIRONMENTAL CORP.**

39 WEST 38TH STREET, 12TH FLOOR, NEW YORK, NY 10018  
PHONE (212) 768-0516 FAX (212) 768-0759  
WWW.AIRTEKENV.COM

**TECHNICAL SPECIFICATIONS  
FOR REMOVAL OF  
DUST AND ASSOCIATED DEBRIS FROM THE  
LEGAL AID SOCIETY  
FLOOR 7 – Southwest Corner  
AT  
90 CHURCH STREET  
NEW YORK, NY**

Prepared for:

Legal Aid Society  
90 Church Street  
New York, NY 10007

Prepared by:

**Airtek Environmental Corp.  
39 West 38th Street  
New York, New York 10018**

December 7, 2001

**TECHNICAL SPECIFICATION FOR REMOVAL OF  
ACM DUST AND ASSOCIATED DEBRIS  
FROM THE LEGAL AID SOCIETY  
FLOOR 7  
90 CHURCH STREET  
NEW YORK, NY**

**1.0 PROJECT SUMMARY**

- 1.1 The Work includes cleanup and disposal of contaminated dust from the specified area of the 7th floor of the Legal Aid Society (LAS) at 90 Church St. The accumulation of dust was the result of the recent World Trade Center collapse. Dust and pulverized building construction debris has migrated into areas/floors of the building through penetrations/openings in the building's exterior facade. The dust is contaminated with ACM. Cleanup work shall be accomplished using individuals certified by the New York City Department of Environmental Protection (NYC DEP) as asbestos handlers. All work shall be performed in general accordance with Title 15, Chapter 1 of the Rules of the City of New York, and with the specific procedures outlined in the NYC DEP Memorandum dated September 26, 2001 titled, "Clean-up of Debris inside Buildings."
- 1.2 All porous surfaces including the suspended ceiling tiles shall be treated as a contaminated. Porous surfaces include carpets, ceiling tiles, cubicle partitions, chairs, etc.
- 1.3 Perform the work in general compliance with applicable federal, state, and local regulations, codes, standards and guidelines regarding asbestos abatement. Require that all work be executed by skilled craftsman experienced in their respective trades.
- 1.4 The most recently dated issue or set of the following documents shall govern. If any of these documents are revised or updated prior to the final completion of the project, the revised or updated issue shall govern and all work affected by the revision or update shall be modified accordingly.
  - a) New York State Industrial Code, Rule 56 "Asbestos (12 NYCRR 56)
  - b) New York City Local Law 70 and Title 15, Chapter 1.
  - c) All other applicable NYS and NYC laws, codes, variances and ordinances.
  - d) USEPA regulations for asbestos abatement projects, Final Rule (CFR 40 Part 763)
  - e) USEPA regulations for Asbestos, CFR 40 Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - f) U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Asbestos Regulations (CRF 29, Parts 1910 and 1926).
  - g) USEPA Office of Pesticides and Toxic Substance, "Guidance for Controlling Asbestos-Containing Materials in Building", EPA 560/5-85-024, June 1985.

Maintain one copy of each reference standard on site for the duration of the project.

1.5 The Work shall be sequenced as follows:

- a) Isolate the work area by establishing a restricted zone around the area. Protect as necessary.
- b) Construct applicable remote decontamination system.
- c) Erect appropriate enclosure in the work area (isolation barriers).
- d) Establish negative air pressure (minimum of 6 ACH).
- e) Cleanup all contaminated dust within the affected work area.
- f) Project decontamination.
- g) Final air clearance and demobilization.

- 1.6 Ensure that all workers entering the work areas have valid New York City and New York State Asbestos Abatement Handler's certificates in their possession.
- 1.7 Coordinate with Building Engineer for location of temporary electrical service, as needed, during the work.
- 1.8 Air monitoring for the LAS will be performed by Airtek Environmental Corp. The clean up contractor shall be responsible for air monitoring for the safety of its employees.
- 1.9 Contractor, subcontractors and their employees shall strictly adhere to all building admittance and exit procedures
- 1.10 Limit use of the premises to work areas indicated. Access the premises through designated locations only.
- 1.11 Maintain each respective floor in which cleanup activity will be performed in a safe and weather tight condition throughout the work. Take all precautions necessary to protect any clean unaffected areas adjacent to the work from being contaminated.
- 1.12 Do not allow any accumulation of waste, rubbish or construction debris in the work area while cleanup work is in progress.
- 1.13 Do not permit smoking or open fires within the building enclosure or on the premises. Do not permit any alcoholic beverages on site.
- 1.14 Except for toilet room facilities designated for use by Contractor, use of existing toilets within the building by Contractor will not be permitted.
- 1.15 Except for the designated elevator, use of elevators by Contractor will not be permitted. Contractor will be permitted to use the designated elevator, if available, for temporary freight service and the transportation of construction personnel during the construction period. Coordinate elevator usage with the Engineer.
- 1.16 Removal of waste from the building will be in accordance to any time restriction imposed by the Owner.

## **2.0 TESTING LABORATORY SERVICES**

- 2.1 LAS may provide a qualified Testing Laboratory to perform quality assurance testing of the work performed under the Contract Documents to determine general compliance.
- 2.2 Provision of the Testing Laboratory by LAS to perform testing for LAS shall not relieve Contractor from providing its own air testing for compliance with all applicable codes, regulations, requirements and as specified in this Section and elsewhere in the Contract Documents (e.g. OSHA air monitoring).
- 2.3 Cooperate with Testing Laboratory in all aspects of the testing to expedite results.
- 2.4 Provide Testing Laboratory representative access to the Work in locations requested as necessary to perform testing.
- 2.5 Pay for all re-testing subsequent to unsatisfactory final air tests as required in the Contract Documents.
- 2.6 Provide electrical power service to all locations where Testing Laboratory is to perform testing.
- 2.7 All analytical methods shall be in accordance with New York State and New York City requirements, the more stringent to apply.
- 2.8 Before start of the Work, the Testing Laboratory will secure air samples at the work site to establish a background level before start of Work.
- 2.9 Samples will be collected by Testing Laboratory at times during the Work as deemed necessary by Testing Laboratory.
- 2.10 Testing Laboratory will perform final aggressive clearance air monitoring once the area has been cleaned in accordance to regulatory requirements.
- 2.11 LAS will pay for daily environmental air testing and initial and final air clearance testing required by the Contract Documents.
- 2.12 If additional testing is required due to either a breach in the containment or Contractor's non-compliance with the Contract Documents, the testing will be performed by Testing Laboratory.

## **3.0 WORKER PROTECTION**

- 3.1 This Section describes the equipment and procedures required for protecting workers against asbestos contamination and other work place hazards.
- 3.2 Require that each worker always wear a respirator, properly fitted on the face, in the work area from the start of any operation until the work area is completely decontaminated. Provide respiratory protection appropriate for the fiber level

encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

- 3.3 Instruct and train each worker involved in abatement in proper use of protective clothing and require that each worker always wear protective clothing in the work area from the initiation of work area preparation until the work area is completely decontaminated.
- 3.4 Provide disposable full-body coveralls, disposable head covers, proper foot protection as required by OSHA and require that they be worn by workers in the work area. Provide sufficient number for all required changes, for all workers in the work area.
- 3.5 Provide hard hats and work gloves to all workers and require that they be worn at all times in the work area. Do not remove gloves while in the work area. Dispose of gloves as asbestos contaminated waste at the end of the work. Provide eye protection, where required by OSHA, for all workers.
- 3.6 Provide Type "A" Respirators (Negative Pressure Respirator). Half face or full face type respirators shall be used to reduce the concentrations of airborne copper, zinc, nickel, cadmium and mercury in the respirator below the exposure limits specified by federal, state, and local regulations when the ceiling or the 8-hour time-weighted average airborne concentrations of metal dusts are reasonably expected to exceed no more than 10 times those limits.
- 3.7 Require that a respirator be worn by anyone in a work area at all times, regardless of activity, (including construction of decontamination units, construction of airtight barriers/barricades, etc.) until the area has been cleared for re-occupancy. Regardless of airborne copper, zinc, nickel, cadmium and mercury levels, require that the minimum level of respiratory protection used be Type "A" respirators with HEPA filters.
- 3.8 Require that workers do not eat, drink, smoke, chew gum or tobacco in the work area.

#### **4.0 WORK AREA PREPARATION**

- 4.1 This Section describes the general procedures to be followed prior to the removal of contaminated dust and debris.
- 4.2 Establish temporary electric power, as needed, for negative air filtration, lighting and other equipment.
- 4.3 Coordinate with the Engineer/Environmental Consultant for actual extent of cleanup required at each respective floor/area. Refer to attached floor plans for general extent of cleanup required at each respective area.
- 4.4 Perform the work in general accordance with applicable City and State regulations governing demolition activities. The Contractor is solely responsible for complying with regulatory requirements for the safety of structures and persons, and for maintaining safeguards in accordance with applicable regulations.
- 4.5 Construct remote decontamination unit(s) in accordance with applicable Sections of New York City Title 15. Decontamination of workers and waste shall be performed in

accordance with applicable regulatory requirements. Filter all water used for showering and cleaning equipment through a 5-micron filtration system. Dispose of water in the sanitary sewer system.

- 4.6 Provide temporary connection to existing building utilities or provide temporary facilities as required or as necessary to carry out the Work.

## **5.0 NEGATIVE PRESSURE SYSTEM**

- 5.1 If needed provide fully operational diminished air equipment to be used as needed in each work area while cleanup procedures are in affect. The exhaust of the negative pressure system shall be directed outside of the building.
- 5.2 Allow exhaust units to run until completion of work area cleanup.
- 5.3 When a final inspection and the results of final air tests indicate that the area has been decontaminated, HEPA filtration system shall be removed from the work area in conjunction with the isolation barriers.
- 5.4 A minimum of 6 air changes per hour is specified in negative pressure zones.

## **6.0 WORKER DECONTAMINATION PROCEDURES**

- 6.1 Require all workers to adhere to the following personal decontamination procedures whenever they leave the work area:
- a) When exiting area, remove outer layer of disposable coveralls, disposable head covers, and disposable footwear covers or boots in the first airlock at the exit of the tent enclosure.
  - b) Still wearing respirators and remaining layer of disposable covering, proceed to remote shower unit and follow procedures as outlined for worker decontamination.

## **7.0 CONTAMINATED DUST REMOVAL**

- 7.1 All surfaces within each respective work area shall first be cleaned with a HEPA vacuum followed by wet wiping with amended water. When dry the area shall be cleaned again using a HEPA filtered vacuum.
- 7.2 All items that will not be physically removed shall be cleaned and decontaminated and left in-place. Coordinate with Tenant Representative prior to discarding any items that cannot be decontaminated.
- 7.3 All non-porous personal items on work desks shall be HEPA vacuumed, wet wiped and again HEPA vacuum before removal.
- 7.4 All porous personal items such as clothing, leather items, footwear, books, phones/cell phones, stuffed animals, pencils and cardboard must be discarded.

- 7.5 All other porous items (paper goods, books, files, etc.), which were exposed and covered with dust, will be cleaned using HEPA vacuum, wet wiped and again HEPA vacuumed before removal.
- 7.6 All dust covered floor surfaces shall be HEPA vacuumed first, followed by wet cleaning and again HEPA vacuumed. Repeat this process until all visible of dust has been removed.
- 7.7 When cleaning any perimeter area of the floor, remove all convector covers in order to HEPA vacuum behind the convector. Replace cover after cleanup is completed. Enclose the units with 2 layers of 6 mil poly held in place by duct tape after cleaning.

#### **8.0 REMOVAL AND DISPOSAL OF CONTAMINATED MATERIALS FROM THE BUILDING**

- 8.1 Packaged waste and large equipment will pass through the waste removal chamber. Contaminated workers shall clean the outside of the bags and equipment in the bagged waste washroom with a HEPA vacuum and wet wiping techniques prior to being passed into a "clean" area.
- 8.2 Contaminated workers shall then pass the waste bags and equipment out through the airlock to "clean" workers.
- 8.3 The location of the enclosed dumpsters for the removal of the wastes from the site shall be in an area approved by the Owner or the Owner's Agent.
- 8.4 All disposable equipment shall be packaged for disposal.
- 8.5 All routes through the building, elevators, stairways, etc. to be used for the transportation of contaminated wastes to the storage area shall be at the direction of the Owner's Agent. All waste shall be transported through the building in hard watertight containers that shall be lined with one (1) layer of 6 mil. Polyethylene sheeting.
- 8.6 All contaminated waste shall be disposed of at the end of each work shift or at a time coordinated with the Owner's Agent. At no time shall there be random removal of contaminated waste from the work site be allowed.
- 8.7 No materials shall be thrown from windows or doors of buildings. Building waste system shall NOT be used to remove refuse.
- 8.8 The debris shall be removed from the site daily. Premises shall be left neat and clean after each work shift so that business may proceed the next regular workday without interruption.
- 8.9 All waste shall be removed through the decontamination chamber.
- 8.10 The exterior of all waste containers shall be cleaned with a HEPA vacuum and wet wiping techniques prior to leaving the decontamination chamber.

- 8.11 All contaminated materials shall be stored in a securely locked dumpster or storage area. The dumpster or storage area must be approved by the Environmental Consultant prior to its use.
- 8.12 The container used for the storage of bagged contaminated waste shall be an enclosed dumpster. The dumpster shall have a solid metal roof and a solid metal door with a padlock. No unbagged contaminated waste shall be stored in these dumpsters. The Contractor shall ensure that all bags and drums placed in the dumpster are undamaged.
- 8.13 The Contractor shall provide a secured storage area for the storage of packaged contaminated waste prior to the transport to the waste site. The storage area shall be equipped with lockable doors
- 8.14 All waste shall be disposed of at an approved landfill as construction debris.

## **9.0 WORK AREA CLEARANCE**

- 9.1 The abatement work area is cleared when the work area is visually clean and clearance air testing for ACM indicates that airborne asbestos fiber concentrations are below 70 s/mm<sup>2</sup>.
- 9.2 In the event that release criteria is not met, all costs associated with re-testing and re-cleaning shall be borne by the Contractor.
- 9.4 Clearance Air Monitoring and Analysis by TEM
  - a. Acceptance Criteria: Decontamination of the work site meets the requirements of this test when every work area sample indicates an airborne concentration of fibers of less than 70 structures per millimeter squared. If any sample is above this clearance level, then the decontamination is incomplete and the work area shall be re-cleaned.

**END**

**ATTACHMENTS TO THESE PROCEDURES WILL INCLUDE THE FLOOR PLANS SHOWING THE AREAS AND EXTENT OF CLEANUP REQUIRED BASED ON BULK SAMPLE TESTING PERFORMED ON EACH FLOOR.**

**November 14, 2001**

**To: Brian Clarke, NYCHA**  
**CC: Laurie Hurst, Boston Properties**  
**From: Gerard Baril, Marta Lutsky, Ambient Group**

**Re: 90 Church St. – Summary of Environmental Sampling Results**

Ambient Group has performed environmental sampling at the above location with the following results presented below. See appendix A for sample locations by floor.

1. **Asbestos** – Ambient performed dust characterization testing on floors 4-6 and 8-12. Ambient took 7-11 samples on each floor. Twenty-eight (28) of the fifty-five (55) samples taken, registered positive results for asbestos. There were positive results on all floors ranging from trace to 4% of bulk samples. The southwest corner of the building consistently showed the highest percentage of asbestos. On the floor plans, all positive asbestos samples (including trace amounts) are marked in yellow. Chrysotile was the only mineral identified in the positive results. See appendix B for raw data.
  
2. **Metals** – Ambient tested bulk samples for Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, and Zinc. There are no established standards that indicate acceptable heavy metal concentrations in wipe/bulk samples. As a comparison, Superfund site minimum soil clearance limits (NYSDEC TAGM #4046) were used. When compared to the TAGM soil clearance levels, overall metal levels were determined to be high on all floors. The metals found in greatest abundance are iron, zinc, and manganese. Silica, though technically not a metal, was also prevalent in all the samples. See appendix C for raw data.  
  

Though HEPA vacuuming would be effective in removing the dust from non-porous surfaces, this technique cannot sufficiently remove the dust from porous surfaces such as carpets, ceiling tiles and other fabric items, including personal belongings. Further, it is highly probable that computer equipment has also sustained contamination and/or damage from the dust.
  
3. **Mercury** - All floor bulk samples showed high Mercury readings. Mercury levels showed a range of 0.06 – 0.88 ppm. Mercury is usually a liquid, but in this case it is in particulate form (as a component of the dust). Most likely it has accumulated as a result of the high volume of fluorescent light bulbs and thermostats that were destroyed. Cleaning with a HEPA-vacuum will remove the Mercury containing particulates from non-porous surfaces. Tests conducted by Emteque report that paper materials emitted no detectable levels of mercury after HEPA vacuuming and cleaning had occurred. See appendix D for raw data.
  
4. **PAHs** (Polycyclic Aromatic Hydrocarbons) - Using NYSDEC TAGM Superfund soil clearance levels as reference standards for bulks and any levels above detection limits for wipes, Ambient found positive results on all floors. As the PAHs will eventually vaporize, they are not a major concern. See appendix E for raw data.
  
5. **PCBs** (Poly Chlorinated Biphenyls) – Based on NYSDEC TAGM Superfund soil clearance level standards for bulk samples and any levels above detection limits for wipes, Ambient found positive results for PCBs on all floors except the 6<sup>th</sup> floor. The PCBs will be cleaned as part of the dust removal. See appendix F for raw data.

6. **Dioxins** – There are no standards that establish safe levels of dioxins in bulk or wipe samples. After reviewing various data, Ambient chose a level of 1 ppb as a level requiring risk management decisions. Based on this criterion, no elevated dioxin levels were detected. Also, the most toxic of the dioxins, 2,3,7,8 – TCDD, was not detected in any of the samples. The dioxins will be cleaned as part of the dust removal. See appendix G for raw data.

Based on the above, Ambient recommends that all floors be remediated using asbestos abatement project techniques due to the contaminants that compose the dust. The dust contains metals, fiberglass, cement, mercury, PAHs, and low amounts of asbestos. All porous surfaces, including carpeting, ceiling tiles, fabric workstation partitions and chairs must be completely disposed. Non-porous surfaces should be HEPA-vacuumed and wet wiped. The HEPA-vacuuming process should capture all particulate matter such as asbestos, metals, PCBs, dioxin, PAHs along with other dust components (i.e. Cement dust, decayed organic matter, fiberglass etc.).