AMBIENT AIR MONITORING PROGRAM

for the

130 LIBERTY STREET DECONSTRUCTION PROJECT

September 7, 2005

LOWER MANHATTAN DEVELOPMENT CORPORATION
1 Liberty Plaza
New York, New York

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1.0 INTRODUCTION

1.1 Project Background and Evolution

This document entitled *Ambient Air Monitoring Program for the 130 Liberty Street Deconstruction* Project (Plan) represents a revised and combined air monitoring plan incorporating the following two prior plans: (i) the Draft Plan provided as Section 2 of the Draft Deconstruction Plan issued by Contractor on December 10, 2004 and (ii) the companion plan prepared by TRC Environmental Corporation (TRC) entitled *Proposed Enhanced Exterior Air Monitoring Approach and Conceptual Design 130 Liberty Street* (October 8 2004)**.** Both of these documents were issued by the Lower Manhattan Development Corporation (LMDC) in December 2004 for review and comment by federal, state, and local regulators and the general public. At the time of release, readers of the two companion plans were advised by LMDC that, due to their independent development, there were redundancies and a good deal of overlap in the two plans. For this reason, LMDC intended to revise the two programs to ensure that the Contractor's and property owner's monitoring programs were complementary and contained the necessary overlap to serve Quality Assurance/Quality Control purposes.

The December 2004 plans were submitted to regulatory agencies for review**.** Written responses from the United States Environmental Protection Agency (USEPA), the New York State Department of Environmental Conservation (NYSDEC)**,** and the New York State Department of Labor (NYSDOL) addressing the December 2004 plans were provided to LMDC on January 31, 2005. Thereafter, on June 13, 2005 a revised Air Monitoring Plan was submitted to the applicable regulatory agencies addressing the agencies' January 31, 2005 responses.

Under cover of a letter from USEPA dated July 26, 2005, the regulators provided additional responses concerning the Air Monitoring Plan. These July 26, 2005 responses have also been addressed and incorporated into this Plan.

Additionally, subsequent to release of the December 2004 air monitoring plans**,** an approved monitoring plan for the deconstruction of 4 Albany Street was issued. This plan**,** entitled *Specifications for Community Environmental Monitoring During Abatement and Demolition of 4 Albany Street* (December 22, 2004)**,** was approved for use by many of the same regulatory agencies reviewing the deconstruction of 130 Liberty. Accordingly, and at the direction of the regulators, the Plan adopts many of the features of the 4 Albany Street monitoring program**.** Most notably, the Plan adopts the two tiered system of action levels approved for use at 4 Albany Street.

Once approved, the Plan will be implemented and administered by the LMDC Environmental Consultant during Phase I and Phase II of the deconstruction of the 130 Liberty Street property. This Plan does not provide all of the details of the quality assurance/quality control measures that will be implemented by LMDC. Instead, these measures are addressed in a Quality Assurance Project Plan (QAPP) that is being submitted contemporaneously herewith and is incorporated herein by this reference. Compliance with the QAPP is a required component of this Plan.

1.2 Project Purpose and Objectives

The principal purpose of the air monitoring program is to monitor air quality in the vicinity of 130 Liberty Street during the deconstruction of the building on that property. The Proposed Plan consists of monitoring of dusts in the vicinity of the deconstruction site on both a real-time or continuous basis as well as a time-weighted or integrated basis.

Principal objectives of the program are as follows:

- Monitor dusts as PM_{10} and $PM_{2.5}$ on a real-time or continuous basis such that dust associated with the building deconstruction are maintained below target and trigger action levels.

- In the event that dust levels exceed target and trigger action levels, building deconstruction management personnel will be immediately notified so that all necessary corrective actions can be taken.

- Monitor PM_{10} and $PM_{2.5}$ on a time weighted or 24-hour average basis to provide assurances that levels of respirable particulate matter associated with the deconstruction are below 24 hour National Ambient Air Quality Standards (NAAQS) of 150 ug/m^3 and 65 ug/m^3, respectively.

- Collect particulate matter on a time-weighted or integrated basis such that samples are available for monitoring of target compounds potentially associated with World Trade Center dust (e.g., asbestos, lead).

- Compare measured concentrations of project target parameters to action levels established on a compound specific basis. In the event that measured concentrations exceed any project specific action level for one or more of these target compounds**,** appropriate corrective actions immediately will be taken.

1.3 Overview of Air Quality Monitoring Programs and Features

There are multiple aspects and levels to the overall air monitoring program proposed for the deconstruction of 130 Liberty Street. The following is a brief summary of the three (3) components or levels of air monitoring proposed for the project:

- "Level 1": The subcontractors performing aspects of Phase I deconstruction work (largely interior, non-structural efforts) will be responsible to collect air samples on their personnel directly performing various work activities to determine airborne levels of contaminants potentially generated by the work at the source as required by OSHA.

- “Level 2”: The next layer of sampling is for New York State, Title 12, NYCRR Part 56 (ICR 56) compliance. ICR 56-required sampling will be performed by the third party consultant who will sample the ambient air inside the building during Phase I work outside of work areas, at the personnel and waste load out decontamination stations and other locations. In addition, samples will be collected outside the building within ten (10) feet of the negative pressure ventilation exhaust. This sampling is further described in the Asbestos and COPC Abatement and Removal Plan.

- “Level 3”: Beyond that, exterior ambient air will continually be monitored within the site boundaries and at specific elevated locations, as described in this Ambient Air Monitoring Program.

While various parties will have responsibility for diligently executing different components of the program, information will flow through the Environmental Consultant to the LMDC as part of a coordinated review and quality control process**.** Additionally, all monitoring results requested by the various regulators overseeing this project will be provided to them on a timely basis.

This Ambient Air Monitoring Program documents the proposed program of “Level 3” only. The other two “levels” of air monitoring outlined above are documented in the Health and Safety Plan and The Asbestos and COPC Abatement and Removal Plan Sections of the Phase I Deconstruction Plan.

2.0 SAMPLING SITES

2.1 Network Design

Due to the unique circumstances associated with this deconstruction project three different types of monitoring sites are recommended for inclusion in the active monitoring network as follows:

- **On-Site Street Level Stations**- These locations essentially represent sidewalk settings situated around the perimeter of the building. Four (4) such stations will be included in the monitoring network as shown in Figure 1.

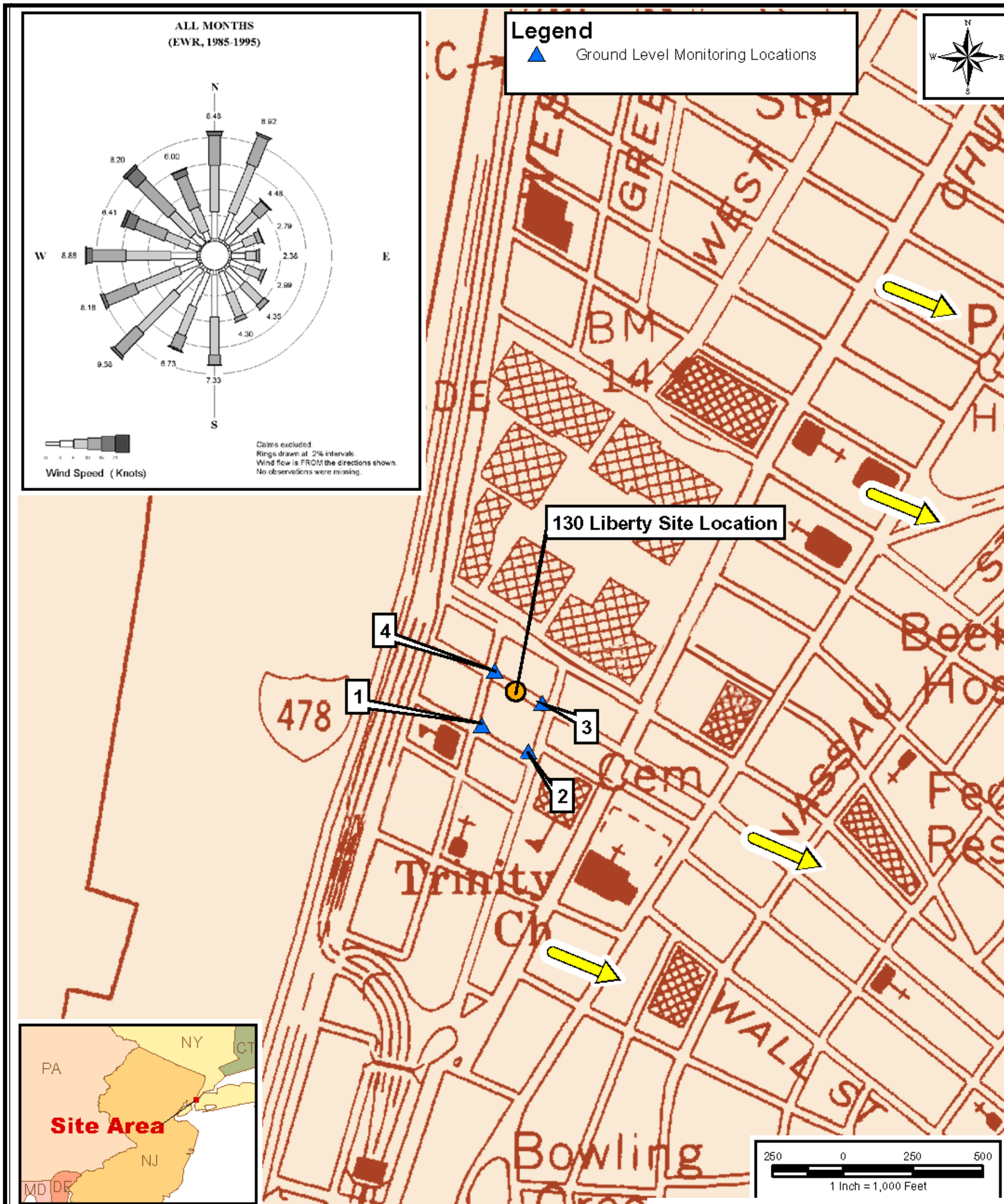
- **Off-Site Elevated Stations-** The proposed network will make use of monitoring sites in place at elevated locations above street level. It is LMDC's intention to include four (4) such stations in the monitoring network. All four (4) of the proposed off-site rooftop sampling locations are identified in Figure 2.

- **On-Site Scaffolding Elevated Stations-** Air monitoring stations will also be located on the four sides of the scaffolding. These four "floating" monitoring stations will be re-located on the scaffolding in ten floor increments (e.g. floors 30, 20 and 10) as the deconstruction work progresses from the roof level to ground level. Four (4) such stations will be included in the monitoring network (one on each side of the scaffolding) as shown in Figure 2. If Phase I Asbestos and COPC Abatement proceeds below these scaffold monitors, then additional air monitoring for metals utilizing NIOSH Methods will be conducted at the exhaust manifolds on the lowest elevation of the work area grouping.

2.2 Siting Criteria and Network Operations

The proposed full network will be comprised of twelve (12) stations in simultaneous operation at all times that building abatement and deconstruction activities are in progress, four (4) street level, four (4) off-site elevated, and four (4) on the scaffolding. The placement of sampling stations will follow USEPA and United States Army Corps of Engineers (ACOE) siting criteria for ambient particulate sampling systems to the extent possible. Strict adherence to these criteria at all stations may not be possible given the topography and logistics of the urbanized environment characteristic of the Lower Manhattan setting.

All of the stations will communicate with a central computer housed in the site vicinity. These on-site stations will collect data continuously and telemeter (wirelessly transmit) the data to the central computer. All of the monitoring stations in the immediate vicinity of the deconstruction site will monitor particulate as PM_{10} and $PM_{2.5}$ on a real-time basis. These data will be logged continuously at each of the sites as well as on the data logger contained in the on site computer center. These data will be stored and archived as 10-minute averages for each of the stations.



LEGEND:

PREVAILING WIND DIRECTION

SOURCE:
USGS 7.5 Minute Series (Topographic) Quadrangles: Jersey City, NJ-NY
Wind Roses for Newark International Airport, 1985-1995

PROJECT:
130 LIBERTY STREET
DECONSTRUCTION PROJECT

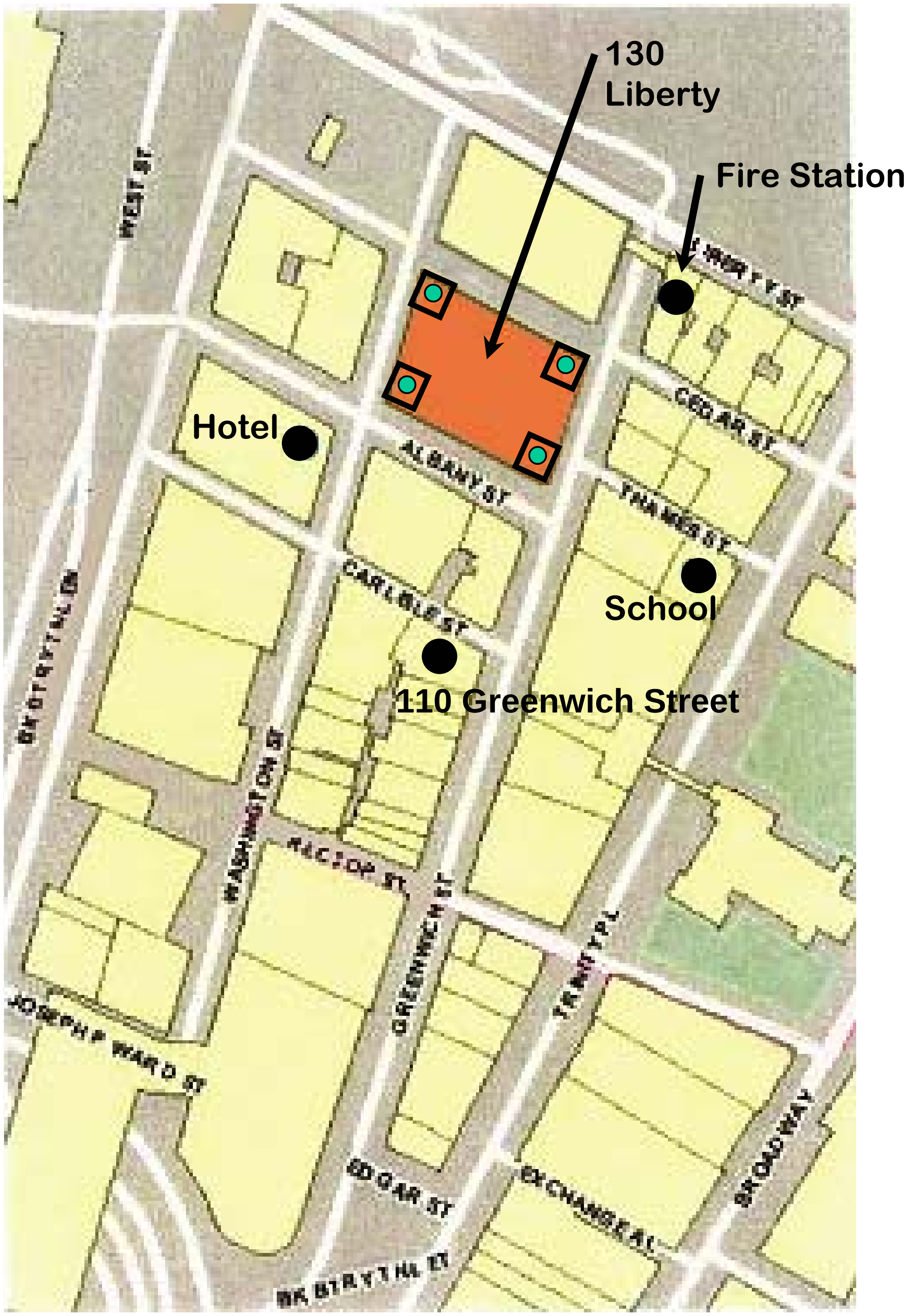
Site Location Map and Proposed Ambient Air Monitoring Locations
130 Liberty Street
New York, New York

TRC
Boott Mills South
116 John Street
Lowell, Massachusetts 01852
978-970-5600

FIGURE 1

DRAWN:MAN	SCALE: AS SHOWN	
CHECKED: GH	Date 8/12/05	

48970\siteppt



Legend:

● Roof top Stations (Off Site)

Roof top and Scaffolding Stations-130 Liberty Street.

48970sampleloc1

Network Schematic-Locations of Off-Site Elevated Roof -Top Stations and "Floating" Stations on Scaffolding 130 Liberty Street New York, New York

TRC
Boott Mills South
116 John Street
Lowell, Massachusetts 01852
978-970-5600

DRAWN:MAN	SCALE: AS SHOWN	FIGURE 2
CHECKED: GH	Date 8/12/05	

2.3 Locations of Monitoring Stations

The list of proposed monitoring locations is provided in Table 1. These include four (4) stations situated at ground or street level, four (4) stations situated at elevated locations atop buildings in the vicinity of the 130 Liberty Street property, and four (4) stations on each side of the scaffolding. This initial location of the four “floating” monitoring stations will be on the roof to monitor the rooftop work prior to their re-location to subsequent floors. These “floating” monitoring stations will then be re-located from the roof to the 10th floor scaffold. Subsequently, as scaffold erection proceeds upward, the “floating” monitors will be relocated in ten floor increments (e.g. to floor 20 and then floor 30). Then, these four “floating” monitoring stations will be re-located downward on the scaffolding in ten floor increments (e.g. floors 30, 20 and 10) as the deconstruction work progresses from the roof level to ground level. In effect, these “floating” monitors are intended to monitor abatement and deconstruction work occurring above them. The approximate locations of each of these stations in relation to the 130 Liberty Street Site are shown in the site schematic provided as Figure 1. LMDC is committed to working with the EPA to site actual locations in the field. Figure 1 also includes a composite wind rose representative of the New York Metropolitan area noting predominant wind directions likely to be characteristic of the project work zone during the term of the deconstruction project. These wind directional data were taken into consideration in the actual placement of monitoring stations around the 130 Liberty Street Site.

Table 1. Locations of Monitoring Stations – 130 Liberty St. Deconstruction Air Monitoring Network

Location #	Description
1	Southwest of building (Washington St./Albany St.) at ground level.
2	Southeast of building (Albany St./Greenwich St.) at ground level.
3	North-northeast of building (Liberty St/Greenwich St) at ground level.
4	Northwest of building (Washington St./Cedar St.) at ground level.
5	Off-site roof top location (124 Liberty Street - FDNY 10-10 House).
6	Off-site roof top location (90 Trinity Place – School).
7	Off-site roof top location (85 West Street – Marriott Hotel).
8	Off-site roof top location (110 Greenwich Street)
9-12	Each side at elevation on scaffolding (Phase I and II only).

3.0 SAMPLING PHASES

Sampling phases will consist of the following segments: Background, Phase I – Preparation Phase, Phase I - Asbestos and COPC Abatement, and Phase II - Structural Deconstruction. General descriptions of the work included in each phase are presented below.

3.1 Background

The background ambient air sampling period will consist of two weeks (14 consecutive calendar days) of monitoring performed prior to the start of Phase I - Preparation Phase activities. Samples will be collected using the four (4) ground level stations in the monitoring network (Locations 1-4 in Table 1) and one (1) station located on roof of the fire house (FDNY 10-10 House). Target parameters and the frequency of sample collection will follow measures presented in Sections 4 and 6, respectively.

3.2 Phase I – Preparation Phase

The Phase I – Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, construction of interior hoist vestibules, erection of sidewalk sheds and perimeter fencing, exterior negative pressure tent enclosures to implement the Pilot Program, roof cleaning, localized façade and general exterior area clean-up and the removal of existing netting on the exterior of the building.

3.3 Phase I – Asbestos and COPC Abatement

Phase I – Asbestos and COPC Abatement and Removal Phase includes the cleaning and removal of all interior surfaces and non-structural elements within the building under containment. The cleanup and abatement will be conducted so that the building at 130 Liberty (Building) can be safely deconstructed to allow for redevelopment of the WTC Site. Phase I of the Deconstruction Project will occur while the work area is placed under negative pressure containment and includes the following general categories: (a) the general area cleanup of WTC dust and debris, (b) removal and disposal of installed porous and certain non-porous building materials and components, (c) cleaning and salvage of certain installed non-porous building equipment and components, (d) removal of building materials containing asbestos which were present in the Building prior to September 11th, 2001 (referred to herein as "ACBM"), primarily within the Building interior, (e) packaging of asbestos and other regulated waste including, but not limited to light bulbs, lighting ballasts, batteries, mercury-containing thermostats, etc. at generation points, movement of containers to the decontamination unit and movement of decontaminated containers to waste loading using an exterior hoist or crane, and (f) cleaning of exterior surfaces of the Building (i.e., building washdown).

During all Phase I activities, a minimum buffer zone of three floors initially for the top three floors and then two floors thereafter, will be maintained between the active abatement and clean-up (Phase I) area and the exterior abatement/structural deconstruction (Phase II) portion of the project. The proposed cleanup and abatement will be conducted so that the Building can be safely deconstructed in compliance with applicable law to allow for redevelopment of the WTC Site.

3.4 Phase II – Structural Deconstruction

Phase II will include the systematic floor-by-floor deconstruction and removal of the remaining "clean" building components including the clean exterior curtain wall, roof, CMU shafts, concrete deck, large-scale mechanical equipment components and structural steel components. Included in Phase II will be the abatement and removal of roof-top asbestos-containing cooling tower transite materials, rooftop caulking and asbestos-containing caulking found on the aluminum column covers and fascia. For each specific floor or regulated abatement work area, all Phase II asbestos abatement work must be completed prior to commencement of any Phase II floor-by-floor deconstruction for that floor or work area.

4.0 TARGET PARAMETERS/COPCS

In February 2002, a multi-agency task force headed by the USEPA was formed to evaluate indoor environments for the presence of contaminants related to the WTC terrorist attacks that might pose long-term health risks to local residents. As part of this evaluation, a task force sub-committee was established to identify Contaminants of Potential Concern (COPC Committee) that are likely associated with the WTC disaster and establish health-based benchmarks for those contaminants in support of planned residential cleanup efforts in Lower Manhattan.

In addition, a number of other studies conducted by USEPA (EPA/600/R-03/142 December 2003) and work performed by Louis Berger Group were examined as a means of establishing a listing of target parameters appropriate to satisfy the purpose and objectives of the current deconstruction project. These objectives include active real time monitoring of dusts potentially related to the deconstruction as well as identifying levels of COPC associated with the materials at 130 Liberty. In this manner the deconstruction project can proceed while providing an ample margin of safety for human health and the environment in the vicinity of the project site.

USEPA approved an air monitoring program for use during the deconstruction of 4 Albany Street, another building contaminated by WTC dust as a result of the WTC disaster. This Plan entitled *"Specifications for Community Environmental Air Monitoring During the Abatement and Demolition of 4 Albany Street"* was issued as approved for use by USEPA and NYCDEP on December 22, 2004. The target parameters identified for monitoring during this abatement and deconstruction program were also considered in the course of developing the list of target parameters for the 130 Liberty Street property.

Based upon these criteria the following target parameters were selected for inclusion in the monitoring program:

- PM_{10}-Respirable Particulate
- $PM_{2.5}$-Respirable Particulate
- Asbestos
- Crystalline Silica
- PCDDs/PCDFs
- PAHs
- PCBs
- Metals (antimony, barium, beryllium, cadmium, chromium, copper, lead, mercury (gaseous and total) manganese, nickel and zinc).

5.0 SAMPLING AND ANALYSES METHODOLOGY

A summary of all sampling and analyses methods proposed for use during the deconstruction of 130 Liberty Street is provided in Table 2. All analytes will be measured at Locations 1-5 identified in Table 1 during the Background Phase. All analytes will be measured at each of the stations identified in Section 2.0 of this plan during Phase I and Phase II. These phases as defined in Section 3.0 of this plan include background monitoring (2 weeks prior to Phase I), Phase I - Preparation Phase, Phase I - Asbestos and COPC Abatement, and Phase II - Structural Deconstruction. As noted, all samples in Table 2 will be collected over 24-hour integrated time periods with the exception of asbestos, silica, real-time PM_{10} and $PM_{2.5}$, and mercury vapor employing the Lumex device. Asbestos and silica samples will be collected over 8 hour averaging periods, while PM_{10} and $PM_{2.5}$ measurements will be collected on a continuous near "real time" basis. Proper chain of custody procedures will be employed for all intregrated samples collected. Details regarding the sampling and analyses methods planned for each type of target parameter is provided in the following sections.

Table 2. Summary of Sampling and Analysis Methods

Analyte	Sampling Method	Sample Rate*	Duration Per day	Comments
Metals				
Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, and Zinc	TSP High Volume Air Sampler 40 CFR Part 50 App B	1000 lpm	24 hours	ICP/MS EPA Method IO 3.5
Mercury (Gas)	Ohio Lumex RA 915+ Direct Read	20 lpm	Instantaneously	Elemental (gas) Mercury Analysis
Mercury (Total) includes particulate	Iodated Carbon Trap	0.4 lpm	24 hours	CVAFS EPA Method 324, modified
Particulate and Dust				
Asbestos	NIOSH 7402 mod.	6 lpm	Minimum of 8 hours	Analysis via AHERA Mod. Methodology (TEM/SEM)
Particulate PM_{10}	Met One EBAM/RAAS Sampler	16.7 lpm	24 hours	Gravimetry RAAS Reference Sampler. EBAM continuous monitor (10 min. avg.)
Particulate $PM_{2.5}$	Met One EBAM/RAAS Sampler	16.7 lpm	24 hours	Gravimetry RAAS Reference Sampler. EBAM continuous monitor (10 min. avg.)
Respirable Crystalline Silica and Dust	NIOSH 0600	2-2.1 lpm	8 hours	SKC Aluminum Cyclone NIOSH 7500
Organics (semivolatile)				
Dioxins/Furans (PCDDs/PCDFs)	EPA TO 9A	200-300 lpm	24 hours	Quartz Fiber Filter and PUF Cartridge
Polychlorinated biphenyls (PCB)	EPA TO-10A	5 lpm	24 hours	PUF Cartridge
Polycyclic Aromatic Hydrocarbons (PAH)	EPA TO-13A	200-300 lpm	24 hours	Quartz Fiber Filter and PUF/XAD-2 "Sandwich"

				Cartridge

*lpm = liters per minute

5.1 PM_{10}/$PM_{2.5}$ Monitoring (“Real-Time”/Continuous)

5.1.1 Beta – Attenuation PM_{10} and $PM_{2.5}$ Monitors (All Sites)

The monitors selected to continuously measure PM_{10} and $PM_{2.5}$ are beta-attenuation monitors manufactured by Met One Instruments, Inc. (Met One). The Met One E-BAM will be used for continuous PM_{10} and $PM_{2.5}$ measurements. The instrument operates on the principle of beta attenuation.

The E-BAM has not been officially designated by USEPA as either Reference or Equivalent Method. However, the E-BAM design is descended directly from the BAM-1020 (which has received USEPA’s designation as an Automated Equivalent Method – EQPM-0798-100), modified to provide portable battery operation and produce measurements in real-time (averaging times less than 1 hour). The accuracy and precision of the E-BAM are consistent with USEPA requirements for Class III designation for $PM_{10.}$ Class III equivalent method instruments include any candidate instruments that cannot qualify as Class I or Class II instruments. These may either be filter-based integrated samples not meeting Class I or Class II criteria, or filter or non-filter based continuous or semi-continuous samplers. Other methods include all non-FRM or non-equivalent measurement methods capable of characterizing fine particles that may not be or have not yet been classified as an equivalent method. Existing manual and continuous analyzers in this category include the dichotomous sampler, IMPROVE samplers, nephelomethers, beta attenuation monitors, and Tapered Element Oscillating Microbalances (TEOMs). Such instruments are not precluded from becoming equivalent on a site-specific, regional or national basis.

The beta attenuation process uses a small source of beta particles (carbon-14, 60 microcuries) that is coupled to a sensitive detector that counts the emitted beta particles. The dust particles are collected on a filter tape that is placed between the beta source and the detector. Dust on the filter will intercept some of the beta particles. The reduction of beta particles is proportional to the amount of dust on the filter, which allows the mass of dust to be determined from the beta particle counts. The dust mass is combined with the air volume collected during the filter exposure time to determine the PM concentration.

The E-BAM monitors will be equipped with particle size selective inlets. The design of the inlets is such that particles larger than the desired size range will be removed from the air flow, based on the air flow rate. The units will be equipped with an inlet head to separate PM_{10} or $PM_{2.5.}$ Sampling flow rate is critical to maintain the proper particle size cut points of the inlets. Flow rates are maintained at 16.7 liters per minute (LPM) in the E-BAM monitors using an integral flow meter, pressure sensor, and ambient temperature sensor on board each monitor.

The data from the E-BAM units will be recorded by digital data loggers using the analog signal outputs of the monitors. The PM_{10} and $PM_{2.5}$ data from the E-BAM monitors will be recorded as 10-minute, and daily (e.g., 8 AM – 8 AM) averages.

5.1.2 USEPA Reference Method PM_{10} and $PM_{2.5}$ Monitors

One reference method PM_{10} sampler and one reference method $PM_{2.5}$ sampler be collocated along side of the real-time PM_{10} and $PM_{2.5}$ monitors as a quality assurance (QA) check. The samplers will rotate on a monthly basis through all real-time PM_{10} and $PM_{2.5}$ monitor locations for the duration of the monitoring program. It is proposed that filter based PM_{10} and $PM_{2.5}$ EPA Reference Samplers be used such as an Andersen RAAS or performance equivalent system. In this manner the 24-hour average PM_{10} and $PM_{2.5}$ concentrations (ug/m3) measured gravimetrically using the filter collection method can be directly compared to the average PM_{10} and $PM_{2.5}$ concentrations measured using the collocated EBAM sampling system. The latter value will be expressed as a 24-hour average representing a composite of all 10-minute average values (144 values per 24-hour period).

5.2 Asbestos

Asbestos sample collection will be performed in accordance with NIOSH 7402 mod., "Asbestos by TEM". Asbestos analysis will be performed utilizing Transmission Electron Microscopy (TEM) analysis specified in 40 CFR Part 763, Asbestos Hazard Emergency Response Act, (AHERA), with the following modifications:

- The sensitivity on TEM air samples will be less than 0.002 s/cc.
- Both length and width of all asbestos fibers will be recorded.
- Fibers greater than 5 microns in length (PCM equivalents) will be recorded separately.
- Confirmation by Energy Dispersive Spectroscopy (EDS) and/or Selected Area Electron Diffraction (SAED) will be performed for each sample.
- The morphology of the fibers will be noted and recorded.

In addition to collection and analysis of samples for asbestos via TEM, air samples will also be collected and analyzed for asbestos utilizing the Scanning Electron Microscopy (SEM) analysis via the German VDI method 3492. The air samples will be collected and analyzed by SEM should TEM air samples be found to be overloaded with general particulate matter.

5.3 Metals

- Metals sampling and analysis will be performed following EPA Reference Methods for the collection of Total Suspended Particulate (TSP) and lead (40 CFR Part 50 App B and G) in combination with EPA Method IO 3.5 for the analyses of metals by ICP/MS.

- Metals to be analyzed by ICP/MS and reported are: Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel and Zinc.

5.4 Mercury (Gas/Vapor)

Real-time monitoring for mercury will be performed utilizing a Lumex RA 915+ direct read instrument. The readings will be included with the daily download of sample collection data.

The Lumex RA 915+ will be utilized to obtain detection levels below established site air contaminant criteria. At a minimum, mercury readings will be taken twice a shift (e.g., 8-hour period) at each of the eight (8) fixed air monitoring locations situated in the immediate vicinity of the 130 Liberty Street property. This includes four (4) ground level stations and four (4) floating stations on the scaffolding. At the discretion of the Environmental Consultant and as daily site conditions may dictate, additional mercury readings may be taken.

5.5 Mercury (Total Elemental)

A separate sampling and analysis method is required for mercury, as field studies have indicated that atmospheric mercury is generally greater than 95% in the vapor phase. An iodated carbon trap will be analyzed for total elemental mercury (particulate associated/vapor) using cold vapor atomic fluorescence (CVAFS). The carbon trap is a proven and sensitive method for detecting trace ambient levels of atmospheric mercury. To collect the mercury sample, a low volume pump will be attached to the carbon trap and set at a flow rate of approximately 0.4 liter per minute.

5.6 Respirable Dust and Crystalline Silica

Respirable dust and crystalline silica sampling will be performed according to NIOSH Method 0600 protocol with analysis following NIOSH Method 7500 (XRD).

5.7 Semivolatile Organics

5.7.1 PCDDs/PCDFs and PAHs

Each site will have two (2) General Metal Works (GMW) model PS-1 high volume air samplers to collect 24-hour samples of PAHs and Dioxins/Furans following USEPA Method TO-13A and TO 9A, respectively. Method TO-13A and TO-9A use the PS-1 samplers to draw air through a sampling train consisting of a 102 millimeters diameter microquartz filter first to collect the semivolatile particulates and then a glass cylinder holding a polyurethane foam (PUF) plug (1 inch of XAD-2 adsorbent resin is used in the middle of the PAH sampling media) to collect the semivolatile vapors. The entire sampling train (filter, XAD-2, and/or PUF plugs) are extracted together and analyzed for speciated PAHs and D/Fs compounds using gas chromatography/mass spectrometry. The samplers will be set to run at approximately 200 liters per minute resulting in a total air volume of 288 m^3 over the prescribed 24-hour sampling period.

5.7.2 PCBs

Each site will have one (1) SKC Leland Legacy pump equipped with a glass cylinder containing a PUF plug. Samples will be collected at a flow rate of five liters per minute with a sampling period of approximately 24 hours for a resulting total air volume of 7.2 m^3.

5.8 Visible Emissions

Visible emissions during the deconstruction project will be monitored as follows:

- **Abatement Phase**

  During each work shift, the Environmental Consultant will be tasked with observing the Building's containment barriers and exterior. Special attention will be paid to established isolation barriers and area(s) of high emission potential to identify any visible emissions. If any visible emission is noted exterior of the work area, the work will be stopped and an immediate evaluation of in-place engineering controls for the emission location will take place. The evaluation may include, but is not limited to, work activities and smoke testing of the isolation barriers. Any damaged or malfunctioning engineering control will be repaired immediately. The work will not be restarted until engineering controls are repaired or determined to be functioning properly.

- **Deconstruction Phase**

  During each work shift, the Environmental Consultant will observe deconstruction operations to monitor visible dust in the air and suppression measures being applied by the deconstruction contractor. The Environmental Consultant may, depending on the severity and duration of dust condition, order a stoppage of the work or require modified work practices to reduce visible dust.

- **Notification**

  The EPA Region 2 office and NYCDEP will be notified promptly of any visible emissions observed to cross the property line of the Building, as well as promptly advised of the corrective actions taken.

6.0 SAMPLING FREQUENCY

6.1 Background

The background ambient air sampling period will consist of two weeks (14 consecutive calendar days) of monitoring performed immediately prior to the start of Phase I - Preparation Phase activities. Samples will be collected at the four (4) ground level stations in the monitoring network (Locations 1-4 in Table 1) and one (1) station located on the roof of the Fire Station situated at 124 Liberty Street (FDNY 10-10 House). All target parameters will be collected over a 24-hour integrated period with the exception of asbestos, silica, PM_{10}, $PM_{2.5}$, and mercury utilizing the Lumex instrument. $PM_{10}$and $PM_{2.5}$ will be monitored continuously at each of the five (5) sites while asbestos and silica measurements will be taken at a frequency of once per work shift at each of the sites.

6.2 Phase I – Preparation Phase

The Phase I - Preparation Phase air monitoring will follow the schedule and frequency as described below and will commence with the start of Preparations Phase site work.

During the first three (3) days only of Phase I Preparation Phase work, samples will be collected and analyzed for semivolatile organics to include PCDDs/PCDFs, PAHs and PCBs. After this first three (3) day period, sampling for semivolatile organics will be reduced to a once per week frequency employing the entire station network**.** One day per week on a rotating basis (week #1 Monday, week #2 Tuesday, etc.) samples will be collected at every station in the network. The schedule will be repeated until project completion.

The semivolatile organic samples collected employing this sampling frequency will not be processed for analyses; rather they will be placed in archival storage at the laboratory. A single set of samples will be selected from each weekly sampling event to undergo analyses for PCDDs/PCDFs, PAHs and PCBs. The station with the highest 24-hour average PM_{10} concentration (ug/m3) recorded with a collocated organic sample each week will be selected for semivolatile organic analyses.

<u>Roof Cleaning:</u> four (4) ground level stations and one (1) off-site elevated station (Locations 1-5 in Table 1) and four (4) rooftop locations. Target parameters for these stations will follow those presented in Section 4.

<u>Scaffold Erection and associated tasks:</u> Scaffold erection up to and including completion of scaffold work on the 10^{th} Floor - four (4) ground level stations and one (1) off-site elevated station (Locations 1-5 in Table 1). Target parameters and the frequency of sample collection for these stations will follow those presented in Section 4. Once the scaffold erection work is completed on the 10^{th} floor, seven (7) additional stations (Locations 6-12) will be installed. Target parameters for these additional stations will follow measures presented in Section 4. As

scaffolding is erected, the “floating” stations (Locations 9-12) will move up the building in ten floor increments. See Table 3 for Phase I – Minimum Air Sample Phase-In Schedule.

Table 3
PHASE I - MINIMUM AIR SAMPLE PHASE-IN SCHEDULE

WORK PHASES	BACKGROUND AIR SAMPLING	PHASE I - SOUTH HOIST/VESTIBULE CONSTRUCTION UP TO 10TH FLOOR	ROOFTOP CLEANING	PHASE I - SCAFFOLD ERECTION UP TO 10TH FLOOR	PHASE I - COPC ABATEMENT CELLAR & BOTTOM 8 FLOORS	PHASE I - SOUTH HOIST/VESTIBULE CONSTRUCTION - 10TH to 40TH FLOOR	PHASE I - SCAFFOLD ERECTION ABOVE 10TH FLOOR	PHASE I - COPC ABATEMENT TOP DOWN	PHASE II
ON-SITE GROUND LEVEL STATIONS	4	4	4	4	4	4	4	4	4
ON-SITE ELEVATED STATIONS	-	-	4 (Roof)	-	-	-	4 (Scaffold*)	4 (Scaffold**)	4 (Scaffold**)
OFF-SITE ELEVATED STATIONS	1	1	1	1	1	4	4	4	4

*** First Elevated Scaffold station to be installed at 10th floor when scaffold leading edge is at 12th floor. When leading edge is at 22nd floor, stations to be moved to 20th floor. When leading edge is at 32nd floor, stations to be installed on 30th floor as feasible.**

**** Downward moving of Elevated Scaffold stations will be based on highest reasonable floor in relationship to work as will be determined in consultation with EPA.**

6.3 Phase I – Asbestos and COPC Abatement Phase

During Phase I (abatement phase) air monitoring will take place at twelve (12) stations each day (Table 1 Locations 1-12). During the first three (3) days only of Phase I Abatement work, samples will be collected and analyzed for semivolatile organics to include PCDDs/PCDFs, PAHs and PCBs. After this first three (3) day period, sampling for semivolatile organics will be reduced to a once per week frequency employing the entire station network**.** One day per week on a rotating basis (week #1 Monday, week #2 Tuesday, etc.) samples will be collected at every station in the network. The schedule will be repeated until project completion.

The semivolatile organic samples collected employing this weekly sampling frequency will not be processed for analyses; rather they will be placed in archival storage at the laboratory. A single set of samples will be selected from each weekly sampling event to undergo analyses for PCDDs/PCDFs, PAHs and PCBs. The station with the highest 24-hour average PM_{10} concentration (ug/m3) recorded with a collocated organic sample each week will be selected for semivolatile organic analyses.

A summary of sampling frequencies on a target parameter specific basis applicable to Phase I of the deconstruction program is provided in Table 4.

Table 4. Phase I: Preparation Phase & Asbestos and COPC Abatement and Removal Sampling and Analysis Summary

Location	Parameter(s)	Sample Frequency	Analysis Method
Site Area	Mercury (vapor/gas)	Each Day	Lumex, portable mercury analyzer
Site Area	Visible dust emissions	Each Day	Visual observation
Ground/Street Level (4 Locations)	1. Asbestos 2. Silica	Each Day (asbestos and silica are sampled during work shift)	1. TEM/SEM 2. XRD
	3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs 7. Mercury (total)	Each Day (24 hr. Basis)	3. ICP/MS 4. HRGC/HRMS 5. GC/MS 6. GC/ECD 7. IodatedCarbon Trap/CVAFS
	8. PM_{10} 9. $PM_{2.5}$	Continuously "Real-Time" Each Day (PM_{10} and $PM_{2.5}$ on 24 hour basis at each location; PM_{10} and $PM_{2.5}$ reference sampler at 1 location per day on 24-hour basis with location changed monthly)	8. EBAM/Gravimetric 9. EBAM/Gravimetric

Table 4. Phase I: Preparation Phase & Asbestos and COPC Abatement and Removal Sampling and Analysis Summary

Location	Parameter(s)	Sample Frequency	Analysis Method
Off –Site Roof Top and Scaffolding (4 locations on off-site roof tops and 4 locations on scaffolding)*	1. Asbestos 2. Silica	Each Day (asbestos and silica are sampled during work shift)	1. TEM/SEM 2. XRD
	3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs 7. Mercury (total)	Each Day (24 hr. Basis)	3. ICP/MS 4. HRGC/HRMS 5. GC/MS 6. GC/ECD 7. Iodated Carbon Trap/CVAFS
	8. PM_{10} 9. $PM_{2.5}$	Continuously "Real-Time" Each Day (PM_{10} and $PM_{2.5}$ on 24 hour basis at each location; PM_{10} and $PM_{2.5}$ reference sampler at 1 location per day on 24-hour basis with location changed monthly)	8. EBAM/Gravimetric 9. EBAM/Gravimetric

* - If Phase I Asbestos and COPC Abatement proceeds below the scaffold monitors, then additional air monitoring for metals utilizing NIOSH Methods will be conducted at the exhaust manifolds on the lowest elevation of the work area grouping.

6.4 Phase II – Structural Deconstruction

During Phase II of the deconstruction project, air monitoring will take place at twelve (12) stations each day (Table 1 Locations 1-12). During the first three (3) days only of Phase II, samples will be collected and analyzed for semi-volatile organics to include PCDDs/PCDFs, PAHs and PCBs. After this first three (3) day period, sampling for semivolatile organics will be reduced to a once per week frequency employing the entire station network. One day per week on a rotating basis (week #1 Monday, week #2 Tuesday, etc.) samples will be collected at every station in the network. The schedule will be repeated until project completion.

The semivolatile organic samples collected employing this weekly sampling frequency will not be processed for analyses; rather they will be placed in archival storage at the laboratory. A single set of samples will be selected from each weekly sampling event to undergo analyses for PCDDs/PCDFs, PAHs and PCBs. This sample set will be selected after consideration of the PM_{10} data corresponding to the sites and days where organic samples were collected. The station with the highest 24-hour average PM_{10} concentration (ug/m3) recorded with a collocated organic sample each week will be selected for analyses.

A summary of sampling frequencies on a target parameter specific basis applicable to Phase II (deconstruction phase) of the deconstruction program is provided in Table 5.

Table 5. Phase II – Structural Deconstruction Phase Sampling and Analysis Summary			
Location	**Parameter(s)**	**Sample Frequency**	**Analysis Method**
Site Area	Mercury (vapor/gas)	Each Day	Lumex, portable mercury analyzer
Site Area	Visible dust emissions	Each Day	Visual observation
Ground/Street Level (4 Locations)	1. Asbestos 2. Silica	Each Day (asbestos and silica are sampled during work shift)	1. TEM/SEM 2. XRD
	3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs 7. Mercury (total)	Each Day (24 hr. Basis)	3. ICP/MS 4. HRGC/HRMS 5. GC/MS 6. GC/ECD 7. Iodated Carbon Trap/CVAFS
	8. PM_{10} 9. $PM_{2.5}$	Continuously "Real-Time" Each Day (PM_{10} and $PM_{2.5}$ on 24 hour basis at each location; PM_{10} and $PM_{2.5}$ reference sampler at 1 location per day on 24-hour basis with location changed monthly)	8. EBAM/Gravimetric 9. EBAM/Gravimetric
Off-site Roof Top and Scaffolding (4 locations on roof top and 4 locations on scaffolding)*	1. Asbestos 2. Silica	Each Day (asbestos and silica are sampled during work shift)	1. TEM/SEM 2. XRD
	3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs 7. Mercury (total)	Each Day (24 hr. Basis)	3. ICP/MS 4. HRGC/HRMS 5. GC/MS 6. GC/ECD 7. Iodated Carbon Trap/CVAFS
	8. PM_{10} 9. $PM_{2.5}$	Continuously "Real-Time" Each Day (PM_{10} and $PM_{2.5}$ on 24 hour basis at each location; PM_{10} and $PM_{2.5}$ reference sampler at 1 location per day on 24-hour basis with location changed monthly)	8. EBAM/Gravimetric 9. EBAM/Gravimetric

* - If Phase I Asbestos and COPC Abatement proceeds below the scaffold monitors, then additional air monitoring for metals utilizing NIOSH Methods will be conducted at the exhaust manifolds on the lowest elevation of the work area grouping.

7.0 METEOROLOGICAL MONITORING

Due to the complex nature of wind movement in an around buildings in the urbanized setting of Lower Manhattan, monitoring of wind velocity and direction on a continuous basis is warranted. Data available from regional National Weather Stations (NWS) such as Newark Airport, LaGuardia and Kennedy Airports can be used to complement the localized data but is likely NWS data may not always representative of conditions in and around the 130 Liberty Street site. A meteorological station will be deployed in the immediate vicinity of the site. The actual station will initially be located at roof top level at the deconstruction site.

The on site meteorological station will be connected directly to the computer station situated at ground level. Data will be transmitted continuously and recorded as 10-minute average values. Data from the roof top station will be logged continuously at the unit's data logger and also transmitted via telemetry to the street level computer station.

The meteorological monitoring component of the air sampling and monitoring program will consist of equipment designed to continuously record wind speed, wind direction, standard deviation of wind direction, precipitation, and air temperature from a 10-foot tripod or roof mount tower. Monitoring will be done from the roof of the building at 130 Liberty Street until deconstruction activities warrant its physical removal when the roof is removed or access is denied due to ongoing construction activities. The 130 Liberty Street roof mounted station will then be collocated with one of the other roof top air monitoring stations.

Meteorological variables and their importance in air quality modeling and ambient air monitoring is provided below as follows:

- Wind Speed: The wind speed is a major determinant of the travel distance and travel time of the contaminant. For example, in the air quality models, concentration is inversely proportional to the wind speed. Wind speed also affects the volatilization of contaminants from a work zone and thus influences the ambient air concentrations.
- Wind Direction: The wind direction indicates the direction in which contaminants will be transported. For example, ambient air quality models use hourly averages of wind direction to determine which location specific concentrations. The observed wind directions during ambient air sampling will be used to designate samples as upwind, downwind, or crosswind relative to potential contaminant emissions sources.
- Standard Deviation of Wind Direction: can be used to perform stability calculations for air contaminant transport calculations.
- Barometric Pressure: can be used in the calibration of the high-volume samples.
- Ambient Temperature: The ambient temperature is used in determining the rise of a buoyant plume. A plume rise calculated by an air quality model determines the final height above ground of the centerline of the pollutant plume from a point source. Ambient temperature can be helpful in quantifying the degree of contaminant volatilization.

- Rainfall: rainfall and moisture may have the effect of scrubbing particulates from the air.

8.0 ACTION LEVELS AND MITIGATION MEASURES

A two tiered system will be in place during the entire term of the deconstruction project. This system includes use of both Target Air Quality Levels and USEPA Site Specific Trigger Levels for each of the target parameters identified previously in Section 4. A summary listing of these Action Levels provided on a parameter specific basis is shown in Table 6.

Table 6. Target Air Quality Levels and USEPA Site Trigger Levels

Analyte	Target Air Quality Levels[1]	USEPA Site Specific Trigger Levels[2]
Metals		
Antimony	5 ug/m^3	14 ug/m^3
Barium	5 ug/m^3	5 ug/m^3
Beryllium	0.02 ug/m^3	0.2 ug/m^3
Cadmium	0.04 ug/m^3	2 ug/m^3
Chromium[3]	0.6 ug/m^3	0.6 ug/m^3
Copper	10 ug/m^3	100 ug/m^3
Lead	1.5 ug/m^3	5 ug/m^3
Manganese	0.5 ug/m^3	0.5 ug/m^3
Mercury (Total)	0.3 ug/m^3	3 ug/m^3
Nickel	0.2 ug/m^3	28 ug/m^3
Zinc	16 ug/m^3	160 ug/m^3
Particles and Dust		
Asbestos	0.0009 f/cc (PCME fibers)	70 S/mm^2 (TEM AHERA structures)
Particulate PM_{10} (24 hour average)	150 ug/m^3	150 ug/m^3
Particulate $PM_{2.5}$ (24 hour average)	40 ug/m^3	65 ug/m^3
Respirable Silica (crystalline)	10 ug/m^3	10 ug/m^3
Organics (semi-volatiles)		
Dioxins/Furans (2,3,7,8 – TCDD equivalent)	0.00025 ng/m^3	0.025 ng/m^3
PCB (total Aroclors)	0.12 ug/m^3	12 ug/m^3
PAH (benzo-a-pyrene equivalent)	0.034 ug/m^3	3.4 ug/m^3

[1]A cumulative average after the first week of sampling, except for $PM_{2.5}$ and PM_{10}.
[2]A 24-hour value.
[3]USEPA site-specific trigger level for hexavalent chromium used.

8.1 Action Levels

The following actions will be taken if there is an exceedance of any Target Air Quality Level. If there is an exceedance of both the Target Air Quality Level and USEPA Site Specific Trigger Level, actions associated with the USEPA Site Specific Trigger Level will govern.

8.1.1 Target Air Quality Levels

Any 24-hour PM_{10} and $PM_{2.5}$ value in excess of the Target Air Quality Level will be considered an "exceedance" and the actions described below will be taken.

During the first week of sampling, any sample of an analyte, other than PM_{10} and $PM_{2.5}$, in excess of 3 times the Target Air Quality level for that analyte unless superseded by a USEPA Site Specific Trigger Level, will be considered an exceedance and the actions described below will be taken.

Following the first week of sampling, a cumulative average will be established based initially on the first week's results, to which will be added daily values as results are received from the laboratory. A cumulative average value for any analyte other than $PM_{2.5}$ and PM_{10} in excess of the relevant Target Air Quality Level will be considered an exceedance and the actions described below will be taken.

Exceedances of an established Target Air Quality Level for any analyte calculated as provided above will result in an evaluation of engineering controls and work techniques in the source area. The evaluation of engineering controls and work techniques shall determine whether: (i) negative pressure is being maintained in active work areas at the required levels (ii) there are breaches in the containment in active work areas, and (iii) there are any visible emissions from the containment areas. In addition, the evaluation will consider other potential sources contributing to or causing the exceedance.

8.1.2 USEPA Site Specific Trigger Levels

Any 24-hour value (eight-hour value in the case of asbestos and silica) in excess of the USEPA Site Specific Trigger Level will be considered an "exceedance" and the actions described below will be taken.

Exceedance of USEPA Site Specific Trigger Levels will result in a stoppage of work associated with the exceedance until an evaluation of emission controls is performed and corrective action is in place. The USEPA Site Specific Trigger Levels are applicable to individual sample results. If any of the individual sample results exceed an USEPA Site Specific Trigger Level, then notification must be made to the USEPA Region 2, NYCDEP and NYSDOL as well as LMDC and LMCCC. Work will be reinitiated once the USEPA Region 2 has agreed (and NYSDOL during the Abatement Phase in the case of asbestos exceedances) to the corrective action(s) proposed to prevent the potential for exceedances in future work and such corrective actions have been implemented. The only exception to the work stoppage requirement will be for an exceedance of the USEPA Site Specific Trigger Level for $PM_{2.5}$ at one of the off-site roof top locations. If the USEPA Site Specific Trigger Level for $PM_{2.5}$ is exceeded at an off-site roof top location, regulator notifications as described above will be made and an assessment, with the active involvement of the USEPA, will be performed to determine if the exceedance was due to an off-site or regional condition unrelated to 130 Liberty Street work If the assessment determines the exceedance to be associated with 130 Liberty Street, the exceedance will result in a stoppage of work associated with the exceedance until an evaluation of emission controls is performed and corrective action acceptable to USEPA is in place.

LMDC's Consultant will monitor PM_{10} and $PM_{2.5}$ at each station in the network on a continuous basis. These data will be reviewed on a routine basis during the course of each 24 hour monitoring period and used to alert LMDC of any potential exceedances of 24 hour action levels established for these parameters. Corrective actions will be taken as needed during the course of the work when warranted from review of the continuous monitoring data.

9.0 EXCEEDANCE NOTIFICATION

Notification

The USEPA Region 2 (any exceedance), NYCDEP (asbestos exceedance only) and the NYSDOL (asbestos exceedance only) as well as the LMDC and the LMCCC will be notified promptly via phone and electronic mail of any exceedance of either a Target Air Quality Level or a USEPA Site Specific Trigger Level and will be notified promptly of any corrective actions taken in connection with a Target Air Quality Level exceedance or an USEPA Site Specific Trigger Level exceedance.

In the event that an exceedance of a USEPA Site Specific Trigger Level occurs, LMDC shall prepare an Exceedance Summary Report, following completion of the exceedance assessment, for submission to the USEPA. This will be a 1-2 page report stating nature of the exceedance, causes of the exceedance and corrective actions taken if it was determined to be associated with 130 Liberty Street.

Monitoring Data

All Sampling results collected pursuant to this specification, in suitable electronic form, will be promptly provided to the USEPA Region 2, NYCDEP, NYSDEC and NYSDOL offices weekly and exceedances will be reported as provided above. In addition, 24-hour averages and graphical data for all continuous sampling data will be provided to the USEPA Region 2.

10.0 QUALITY ASSURANCE/QUALITY CONTROL

10.1 Overview

The program described herein will be performed by LMDC's Environmental Consultant. The Environmental Consultant will assume responsibility for the collection and analyses of all samples identified previously in Sections 5 and 6 of this plan. The Environmental Consultant will assume responsibility for the quality of all data to be collected in the conduct of the deconstruction project. This role will include all QA/QC measures to be implemented to further insure that all monitoring data meet predetermined data quality goals and objectives. A separate document or Quality Assurance Project Plan (QAPP) is being submitted contemporaneously herewith and is incorporated herein by this reference.

10.2 Quality Assurance/Quality Control

The Environmental Consultant will have primary responsibility for implementation of all program Quality Control measures identified in the QAPP. These will include but not be limited to the following types of QA/QC features:

- Data Quality Objectives
- Detection Limit Goals
- Data Capture Goals
- Chain of Custody
- Calibration Procedures and Frequencies
- Field/Trip Blanks
- Lab Blanks
- Collocated Samples
- Matrix Spikes
- Lab Control Spikes
- Lab Method Blanks
- Field Surrogate Spikes
- Lab Surrogate Spikes
- Corrective Action Measures

Elements of QA/QC contained in the QAPP are listed in Table 7.

Table 7. Elements Typically Contained in a Quality Assurance Project Plan (QAPP)	
Title Page. Should include the name of the document and the date it was prepared. The QA officer should sign the title page, ensuring that field and laboratory personnel are aware of the requirements for precision, accuracy, completeness, representativeness, and comparability. *Table of contents*. Includes a listing of the QAPP elements and any appendices, figures, and tables. A list of the recipients of official copies of the QAPP should also be provided. *Project description*. Consists of a general paragraph describing the scope of work, general objectives, and required measurements. (If the project description is discussed in the field sampling plan, it does not need to be repeated in the QAPP.) *Proved organization and responsibility*. Identifies key field and laboratory personnel or organizations that are necessary for each analytical activity during the study. A table or chart showing the organization and lines of authority should be included. The organizational chart should also include all subcontractors and their key points of contact. The QA officer should be organizationally independent of project management so that the risk of conflict of interest is minimized. *Data quality objectives.* Describes the QA objectives for the data so that the data can achieve their intended use. Project-specific data quality objectives that have been identified for the project, short-term decisions that will be made during the project planning phase, and long-term decisions that will be made prior to project closeout should be highlighted. *Sampling locations and procedures*. References the sections of the field sampling plan that discuss the general rationale for choosing sampling locations and the sampling procedures proposed for each matrix. *Sample custody and holding times*. References the appropriate sections (e.g., sample custody/ documentation) of the field sampling plan for all custody and holding requirements pertaining to the field and laboratory activities. *Sampling and analytical procedures*. Identifies the appropriate sampling and analytical test methods that should be used for each environmental sample.	*Calibration procedures and frequencies*. Discusses the calibration procedures to be used, the number and concentration of calibration standards, and the calibration range and procedures to establish and verify the calibration of instruments. *Internal QC checks*. Identifies the specific internal QC methods to be used, including analyses of method blanks; use of laboratory control samples, and use of environmental samples as duplicates, matrix spikes, and duplicates. *Calculation of data quality indicators*. Discusses how precision, accuracy, completeness, representativeness, and comparability goals are to be calculated from the project data. *Corrective actions*. Addresses corrective actions that must be implemented if QA specifications are not met. Corrective actions could include resampling, reanalyzing samples, or auditing laboratory procedures. Persons responsible for initiating these actions should be identified. *Data reduction, review, validation and reporting*. Discusses the data review process that is required to assure the validity of the data. Data reduction procedures should be summarized and the persons responsible for data reduction identified. The format for reporting the data and the data reporting schedule should be specified. *Preventive maintenance*. Discusses the preventive maintenance plan that will be implemented to minimize downtime of field and laboratory instrumentation. *Audits*. Describes the performance, systems, data quality, and management audits that will be performed onsite and at the laboratory. *QC reports to management*. Discusses QC reports that will be prepared. These reports typically include an assessment of accuracy, precision, completeness, representativeness, and comparability; audit results; and significant QA problems encountered.

Source: Design, Installation and Utilization of Fixed-Fenceline Sample Collection and Monitoring System, US Army Corps. of Engineers, EM 200-1-5 – 1 October 1997

11.0 ELECTRONIC DATA MANAGEMENT AND REPORTING

11.1 Data Management

11.1.1 Real-Time Data

Real-time data (i.e., PM_{10} and $PM_{2.5}$) will be downloaded daily from data loggers using cellular telephone modems on each monitor. Ten-minute averages from each station will be transmitted to a central station. Daily plots of real-time data will be generated. Twenty-four hour averages of PM_{10} and $PM_{2.5}$ will be calculated using these data and included on the daily summaries posted on the LMDC website. Graphical presentation of PM_{10} and $PM_{2.5}$ data will be provided on a weekly basis. The gaseous mercury results will be noted on a form during the collection of data. These results will be hand-entered into the central station and included on the daily summaries posted on the LMDC website. The data from the meteorological station units will be recorded on a dedicated data logger, and telemetered back via cellular modems to the central computer.

11.1.2 Fixed Laboratory Data

Laboratory data will be received as hard copy and electronic data deliverables (EDD). EDDs associated with fixed laboratory analyses will be in Excel format. A spreadsheet will be provided to each laboratory for completion and to allow easy compilation of the data by TRC from all laboratories. The spreadsheet will provide results of the target parameters compared to the Target Air Quality Levels, 3x the Target Air Quality Levels, and the USEPA Site-Specific Trigger Levels. The laboratory will calculate all results using sample volumes provided by the Environmental Consultant.

A cumulative average will be generated after the first week of sampling. Results will subsequently be compared and rolled into this cumulative average. Daily summaries of all results will be posed on the LMDC's website.

The spreadsheets associated with dioxin/furan results will include speciated results for each dioxin/furan congener, the TEFs used, and the TEQ. The spreadsheets associated with PAH results will include speciated results for each target PAH, the BAP-factors used, and the BAP-equivalent concentration. The spreadsheets associated with PCB results will include the results for individual Aroclors as well as the result for total PCBs.

Authorized personnel from USEPA Region 2, NYCDEC, NYSDEC and NYSDOL will also be provided direct access to the website where all air monitoring data will be posted. In addition, once the air monitoring data has been subject to QA/QC review validated results will also be posted on the website in a dedicated location for direct access by the general public.

11.1.3 Electronic Communication Equipment and Software

As previously described, communications with the data loggers will be via cellular modems, or equivalent at each station. The loggers will be polled automatically from the Environmental Consultant's office and the retrieved data will be automatically uploaded immediately after receipt. Data can be downloaded by users directly to Microsoft® Excel® or Access®.

Table 8. Data Reporting Schedule and Frequency for Each Program Phase

Analyte	Lab Turnaround Time (TAT)	Reporting Frequency	Sample Period
Background Phase			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	Work Shift
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time $PM_{2.5}$	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously
Phase I - Abatement			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	Work Shift
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time $PM_{2.5}$	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously
Phase II – Structural Deconstruction			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	Work Shift
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time $PM_{2.5}$	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously