PROPOSED REMEDIAL ACTION PLAN

2350 Fifth Ave., New York (AKA, PS 141)
State Superfund Project
New York, New York County
Site No. 231004
February 2011

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repositories identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repositories:

New York Public Library
Countee Cullen Branch
104 West 136 Street
New York, NY 10030
Phone: 2124912070

NYSDEC Region 2 Office
47-40 21St Street
Long Island City, NY 11101
Phone: (718)-482-4995

A public comment period has been set from:

2/16/2011 to 3/18/2011

A public meeting is scheduled for the following date:

3/3/2011 at 7:00 PM

Public meeting location:

369th Harlem Armory Center, 2366 Fifth Avenue, New York, NY 10037

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/18/2011 to:

Bryan Wong
NYS Department of Environmental Conservation
Division of Environmental Remediation
Hunters Point Plaza 47-40 21 St
Long Island City, NY 11101
yywong@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at

http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:
The site is located on the west side of Fifth Avenue between 141st Street and 142nd Street in the borough of Manhattan, City and State of New York.

Site Features:
The site is approximately 1.7 acres, and is nearly entirely occupied by a building. The building is comprised of three connected sections: a two-story section along Fifth Avenue, a three-story section in the center, and a one-story section to the west. See Figure 1 for the site location and Figure 2 for the site plan. Surrounding the site are high-rise residential buildings to the west, south, and southeast of the site. The Harlem River Drive is to the east/northeast, and a National Guard Armory occupies the block immediately to the north.

Current Zoning/Use:
The site is owned by 2350 Fifth Avenue Corporation and is currently occupied by a self storage facility and art studio space. It is zoned for light manufacturing (M1-1). The Harlem River is located approximately 200 to 300 feet east of the site. Neither the River nor groundwater are used as a source of potable water and no non-potable water supply wells or intakes are known to be located in the immediate area.

Historical Use:
Based on historical Sanborn fire insurance maps, the site and the surrounding area were in the process of being filled in between 1860 and 1893, and as of 1909 it was mostly vacant or occupied by a contractor's yard. The existing building was originally constructed as a Borden Company ice cream factory: the three-story section in 1923; the two-story section in 1932; and the one-story section in 1950. The floor slab in the one-story (western) section included layers of insulating materials for refrigeration. The area surrounding the site was mostly occupied by garages, auto repair shops, and light manufacturing in the 1930s through the 1950s, with the exception of the block directly north of the site, where the Fifth Avenue Armory was constructed between 1921 and 1933. The residential development, which occupies the area to the south and west of the site, was constructed between 1957 and 1959.

From 1970 to 1994 the site was occupied by an industrial laundry and dry cleaning operation which utilized tetrachloroethylene (PCE or "perc") as a cleaning solvent. The dry cleaning operation utilized both "first-generation" and "second-generation" dry-cleaning machines. The majority of PCE released was associated with the first generation machine use, which involved more handling of PCE than the later machines. The dry cleaning facility operated as registered hazardous waste handler with U.S. Environmental Protection Agency (EPA) ID number NYD071026173.

Between 1995 and 1996, most of the ground floor of the building, with the exception of the far western portion, was renovated for use as a New York City public school. The central and eastern portions of the building were occupied by P.S. 141 for a period in the fall of 1997, and

were later used by a church for services, offices, and classes. The church vacated the building in December 2004. The remainder of the central and western portion of the building was renovated in 2001 for use as a self storage facility, and in 2006 the self storage facility expanded into the former school portion of the building. Currently the site is use for self storage facility and for art studio space.

Investigation completed at the site also reveals that there is one closed-in-place underground fuel oil tank on the site.

As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in July 1998. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required. The site remedial program is being performed by 2350 Fifth Avenue Corporation as a Potential Responsible Party (PRP).

Site Geology and Hydrogeology:
Groundwater in the vicinity of the site is divided into two apparently semi-confined aquifers. The presence of a clay layer apparently acts as an aquitard/aquiclude separating the aquifer into a shallow aquifer above the clay and deeper aquifer below the clay. The groundwater surface in the shallow aquifer was irregular and approximately six to ten feet below grade. Measurements of groundwater elevation indicated varying horizontal flow directions: generally northward towards West 142nd Street and eastward along 142nd Street towards the Harlem River.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) is/are being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

2350 Fifth Avenue Corporation

The Department and 2350 Fifth Avenue Corporation entered into a Consent Order on July 3, 1997. The Order obligates the potential responsible parties (PRPs) to develop and implement a preliminary site assessment, and implement an interim Remedial Measure to prevent vapor intrusion.

The Department and 2350 Fifth Avenue Corporation enter into a Consent Order on March 30, 2001. The Order obligates the PRPs to develop and implement the Focused Remedial Investigation/Feasibility.

After the Remedy is selected, the Department will approach the PRP to implement the selected remedy.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

tetrachloroethylene (pce)	chlorinated solvents

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable standards, criteria and guidance for:

- groundwater
- soil
- indoor air

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM-Soil Vapor Extraction

The IRM was performed in the northwestern portion of the on-site building in 1997 to address indoor air contamination by volatile organic compounds associated with off-gassing and intrusion of contaminants from insulating materials that are present under one part of the building foundation. The IRM consisted of three measures: removal of a portion of the contaminated insulating material; installation of a shallow vapor extraction system/sub-slab vapor extraction system; and sealing penetrations through the slab.

Contaminated sub-slab insulation material was removed from an approximately 7,800 square foot area in the northwestern portion of the building in order to eliminate a source of PCE under the building. The concrete slab was broken up into pieces for removal, except for a strip

bordering the walls, which was retained to provide structural stability. As each section of floor slab was removed, the cork and/or Styrofoam insulation encountered was removed from the space below the slab. Both concrete and insulation materials were transported off-site for disposal.

A sub-slab vapor extraction system was installed in 1997 in the six-inch deep layer between the old building slab and the new floor slab of the school with six horizontal vapor extraction wells. In 1998, a shallow vapor extraction system consisting of one monitoring/extraction well with the screened section up to the bottom of the floor slab was connected to the sub-slab vapor extraction system. The sub-slab vapor extraction system was constructed in an effort to remove PCE remaining in the insulation under the old floor slab, and maintain negative pressure in the space beneath the floor, thereby preventing infiltration of vapors into the building. The vacuum blower and granular activated carbon treatment for the vapor extraction system were installed in the loading dock.

The initial indoor air investigation found that the highest PCE concentrations were present in and near floor drains and other penetrations of the floor slab. As part of the IRM, penetrations through the slab including utilities and spaces around floor drains or cleanouts were sealed. These included:

• The holes left by the coring done as part of the April 1997 site investigation: These were sealed with concrete.
• Spaces around floor drains and cleanouts: These were sealed using a silicone or latex sealant.
• Other openings through the floor: Several penetrations were found in the kitchen, including spaces around water pipes serving a work island, and a hole in the floor behind the door of the room leading off the kitchen to the west of the freezer. The larger holes were sealed with concrete and smaller cracks were sealed with silicone or latex sealant.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not contaminated by the site. Direct contact with contaminated soil is unlikely since it is located under pavement and the on-site building.

Volatile organic compounds in the groundwater and/or soil may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Site-related contaminants have been found in the indoor air of the on-site building at concentrations exceeding NYSDOH's air guidelines. Sampling indicates that this may be a result of soil vapor intrusion and/or the off-gassing and intrusion of contaminants from insulating materials that are present under one part of the building's foundation. To minimize the potential for the inhalation of site-related

contaminants, a system that ventilates/removes contaminated air was installed beneath the portion of the on-site building with the insulation. Subsequent testing indicated that this system has been successful at reducing the levels of contaminants in the indoor air and that the installation of a similar system beneath the remaining portion of the building would help to maintain the levels to within background ranges. Environmental sampling indicates soil vapor intrusion is not a concern for off-site buildings.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The Fish and Wildlife Resources Impact Analysis (FWRIA), which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. In general, environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. An evaluation of exposure pathways did not identify any current or potential impacts to ecological resources.

Surface water resources near the site include the Harlem River, which is located 200 to 300 feet to the east of the site. The Harlem River is a Class I saline waterbody, suitable for secondary contact recreation, fishing, fish propagation and survival, but not suitable for swimming. No current or potential site-related surface water impacts have been identified.

Site related contamination is impacting groundwater; however, groundwater sampling has indicated that the groundwater plume is limited in extent and has not traveled a significant distance (and not to the Harlem River). The groundwater in Manhattan is not used as a source of potable water. Protection of the groundwater resource will be addressed in the remedy selection process. In addressing the groundwater resource, the Department will consider the current and reasonably anticipated future use of the groundwater in the area and technical practicability of achieving the SCGs.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit C. Cost information is presented in the form of present worth, which represents the amount of

money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit D.

7.1: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with

potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

7.2: Elements of the Proposed Remedy

The basis for the Department's proposed remedy is set forth at Exhibit E.

The estimated present worth cost to implement the remedy is $2,707,000. The cost to construct the remedy is estimated to be $1,370,000 and the estimated average annual cost is $129,000.

The elements of the proposed remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. Removal and off-site disposal of VOC contaminated insulation material present beneath the floor slab in the northwestern portion of the site near room 119, to the extent practical.

3. Install a Soil Vapor Extraction (SVE) system to remediate the contaminated vadose zone soil beneath the building in the northwestern portion of the site. The SVE system will also be effective in preventing the off-site migration of PCE and breakdown products in soil vapor. The VOC-contaminated air extracted from the SVE wells would be treated using activated carbon (or other air treatment as applicable).

4. Additional in-situ soil treatment will be achieved through the injection of a chemical oxidation product into the vadose zone in the northwestern portion of the site where the soil contaminant concentrations are highest.

5. In-situ groundwater treatment will be achieved through injecting a product to enhance reductive dechlorination. If necessary, additional treatment to promote aerobic degradation of breakdown products will be considered.

6. The petroleum LNAPL in monitoring well MW-12s will be removed using passive or active recovery methods to the extent practicable.

7. A sub-slab depressurization system will be installed throughout the existing site building to mitigate the potential for soil vapor intrusion.

8. The existing floor slab, buildings and pavement at the site form the site cover; there is currently no exposed surface soil. A site cover will be maintained as a component of any future site development. The cover will consist either of structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

9. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

10. To maximize the net environmental benefit, green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including;
• energy efficiency and green building design
• using renewable energy sources
• encouraging low carbon technologies
• conserving natural resources
• increasing recycling and reuse of clean materials

11. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
(b) land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for restricted-residential, commercial or industrial use;
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;

(d) prohibits agriculture or vegetable gardens on the controlled property;
(e) requires compliance with the Department-approved Site Management Plan;

12. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls:

• The Environmental Easement discussed in Paragraph 11 above.

Engineering Controls:

• The soil vapor extraction system discussed in Paragraph 3 above
• The sub-slab depressurization system discussed in Paragraph 7 above.
• The site cover discussed in Paragraph 8 above.

This plan includes, but may not be limited to:

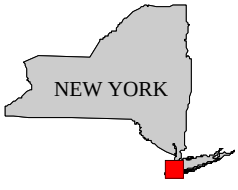
(i) Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
(iii) a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
(iv) provisions for the management and inspection of the identified engineering controls;
(v) maintaining site access controls and Department notification; and
(vi) the steps necessary for the periodic reviews and certification of the institutional and engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but is not to be limited to:

(i) monitoring of groundwater and indoor air to assess the performance and effectiveness of the remedy;
(ii) Monitoring of soil vapor to evaluate the effectiveness of the SVE system;
(iii) a schedule of monitoring and frequency of submittals to the Department;
(iv) monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required pursuant to item (a)(iii) above.

(c) an Operation and Maintenance Plan to assure continued operation, maintenance, monitoring, inspection, and reporting of for any mechanical or physical components of the remedy. The plan includes, but is not limited to:

(i) compliance monitoring of treatment systems to assure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
(ii) maintaining site access controls and Department notification; and
(iii) providing the Department access to the site and O&M records.



SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’

N

SOURCE:

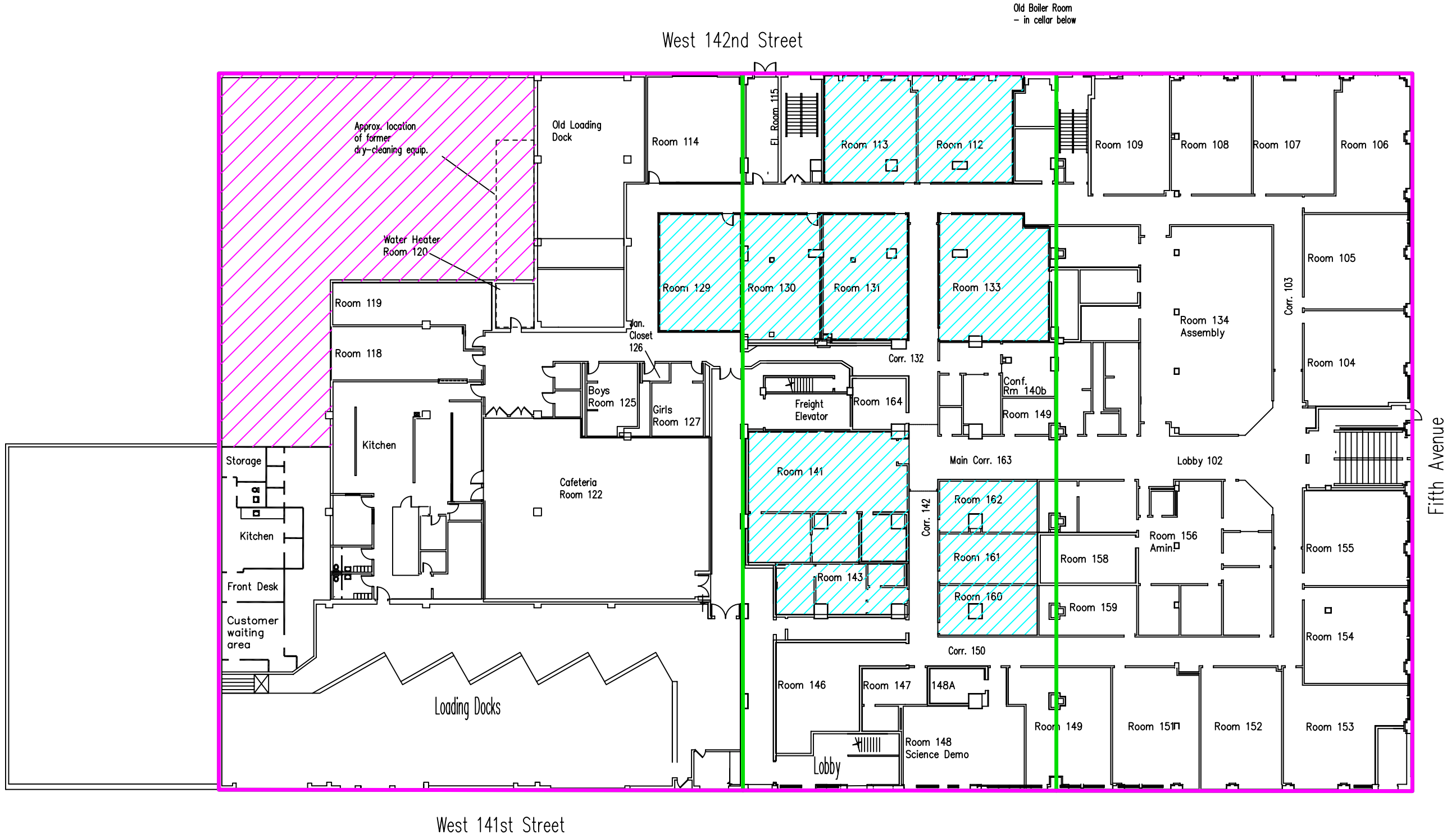
7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: CENTRAL PARK, NY 1995

2350 FIFTH AVENUE
NEW YORK, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE **4.16.10**
PROJECT No. **08010**
SCALE **as shown**
FIGURE **1**



LEGEND:

- SITE BOUNDARY
- STORAGE LOCKERS IN USE
- COMMUNITY ART STUDIOS AND WORKSPACE
- PRESUMED LOCATIONS OF BUILDING FOUNDATION WALLS

AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

2350 FIFTH AVENUE
NEW YORK, NEW YORK

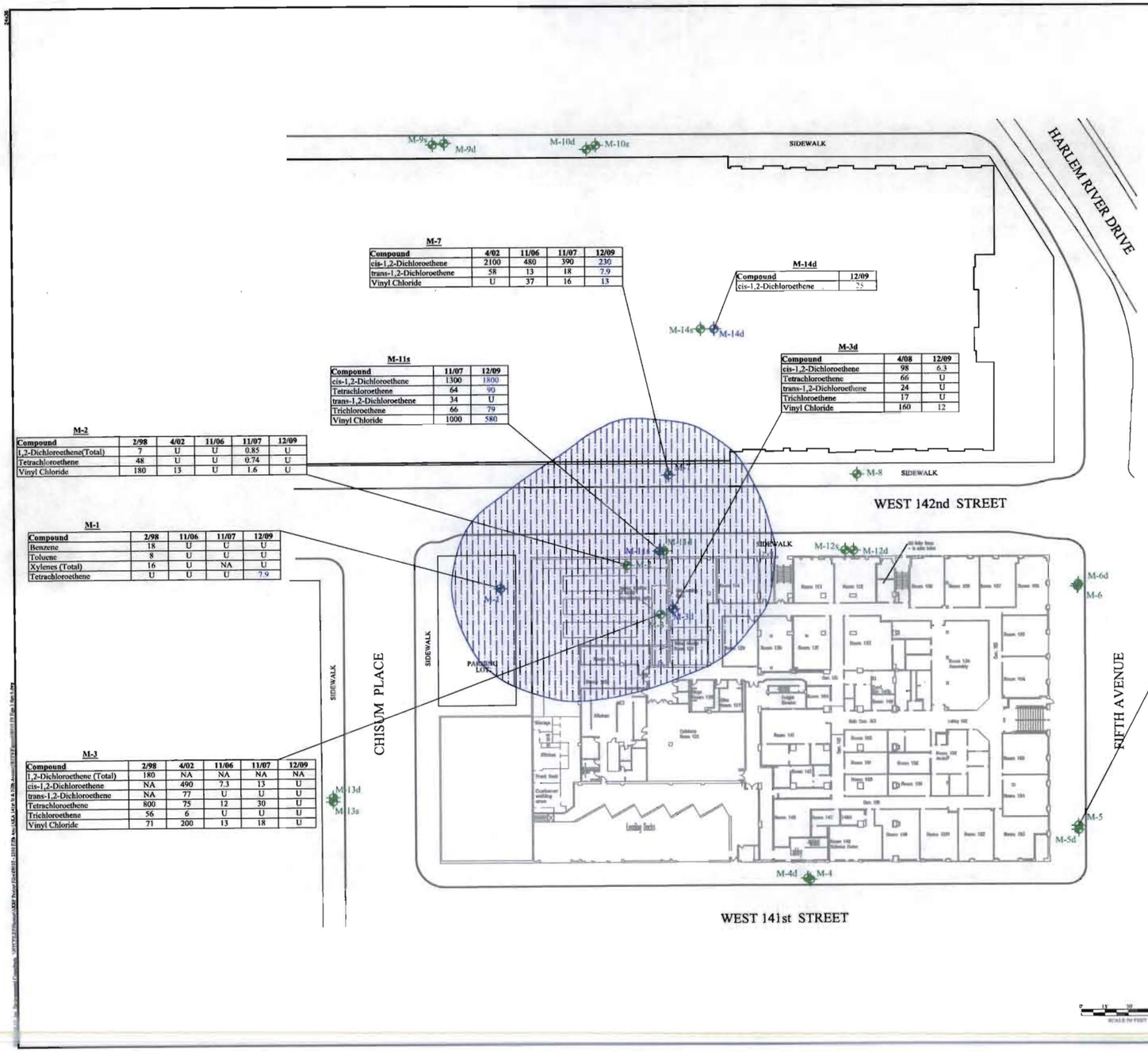
CURRENT SITE PLAN

DATE
6.18.10

PROJECT NO.
08010

SCALE
1"30'

FIGURE
2



M-7

Compound	4/02	11/06	11/07	12/09
cis-1,2-Dichloroethene	2100	480	390	230
trans-1,2-Dichloroethene	58	13	18	7.9
Vinyl Chloride	U	37	16	13

M-14d

Compound	12/09
cis-1,2-Dichloroethene	75

M-11s

Compound	11/07	12/09
cis-1,2-Dichloroethene	1300	1800
Tetrachloroethene	64	90
trans-1,2-Dichloroethene	34	U
Trichloroethene	66	79
Vinyl Chloride	1000	580

M-3d

Compound	4/08	12/09
cis-1,2-Dichloroethene	98	6.3
Tetrachloroethene	66	U
trans-1,2-Dichloroethene	24	U
Trichloroethene	17	U
Vinyl Chloride	160	12

M-2

Compound	2/98	4/02	11/06	11/07	12/09
1,2-Dichloroethene(Total)	7	U	U	0.85	U
Tetrachloroethene	48	U	U	0.74	U
Vinyl Chloride	180	13	U	1.6	U

M-1

Compound	2/98	11/06	11/07	12/09
Benzene	18	U	U	U
Toluene	8	U	U	U
Xylenes (Total)	16	U	NA	U
Tetrachloroethene	U	U	U	7.9

M-3

Compound	2/98	4/02	11/06	11/07	12/09
1,2-Dichloroethene (Total)	180	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	490	7.3	13	U
trans-1,2-Dichloroethene	NA	77	U	U	U
Tetrachloroethene	800	75	12	30	U
Trichloroethene	56	6	U	U	U
Vinyl Chloride	71	200	13	18	U

M-5

Compound	2/98	11/06	11/07	12/09
4-Methylphenol	26	NA	NA	NA
alpha-Chlordane	0.18	NA	NA	NA

SYMBOL LEGEND:

M-8 MONITORING WELL LOCATION

M-1 GROUNDWATER SAMPLE LOCATION WITH VOCs EXCEEDING CLASS GA GROUNDWATER STANDARDS IN 2009.

79 COMPOUND DETECTED EXCEEDS NYSDEC CLASS GA GROUNDWATER STANDARDS

GENERAL NOTES:

1. BASE MAPS PROVIDED BY MONTROSE WITH LOCATIONS SURVEYED IN DEC 2006, JAN 2008 AND DEC 2009 OR MEASURED IN FIELD WITH TAPE MEASURE.

2. GROUNDWATER SAMPLES COLLECTED AS PART OF PRELIMINARY SITE ASSESSMENT AND REMEDIAL INVESTIGATION ACTIVITIES IN FEBRUARY 1998, APRIL 2002, NOVEMBER 2006, NOVEMBER 2007, APRIL 2008, AND NOVEMBER THROUGH DECEMBER 2009.

3. VOCs EXCEEDING NYSDEC CLASS GA GROUNDWATER STANDARDS FOR THE 2009 SAMPLING EVENT ARE HIGHLITED IN RED, HATCHING SHOWN ONLY FOR 2009 VOC EXCEEDANCES IN GROUNDWATER.

4. CONCENTRATIONS SHOWN IN MICROGRAMS PER LITER (µg/L).

5. EXCEEDANCES FOR ACETONE AND METHYLENE CHLORIDE ARE NOT SHOWN. DETECTIONS WITHIN METHOD BLANKS INDICATED THAT THESE COMPOUNDS ARE ATTRIBUTED TO SAMPLE PREPARATION IN THE LABORATORY, AND ARE NOT REPRESENTATIVE OF THE SITE GROUNDWATER.

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2350 FIFTH AVENUE
NEW YORK, NEW YORK

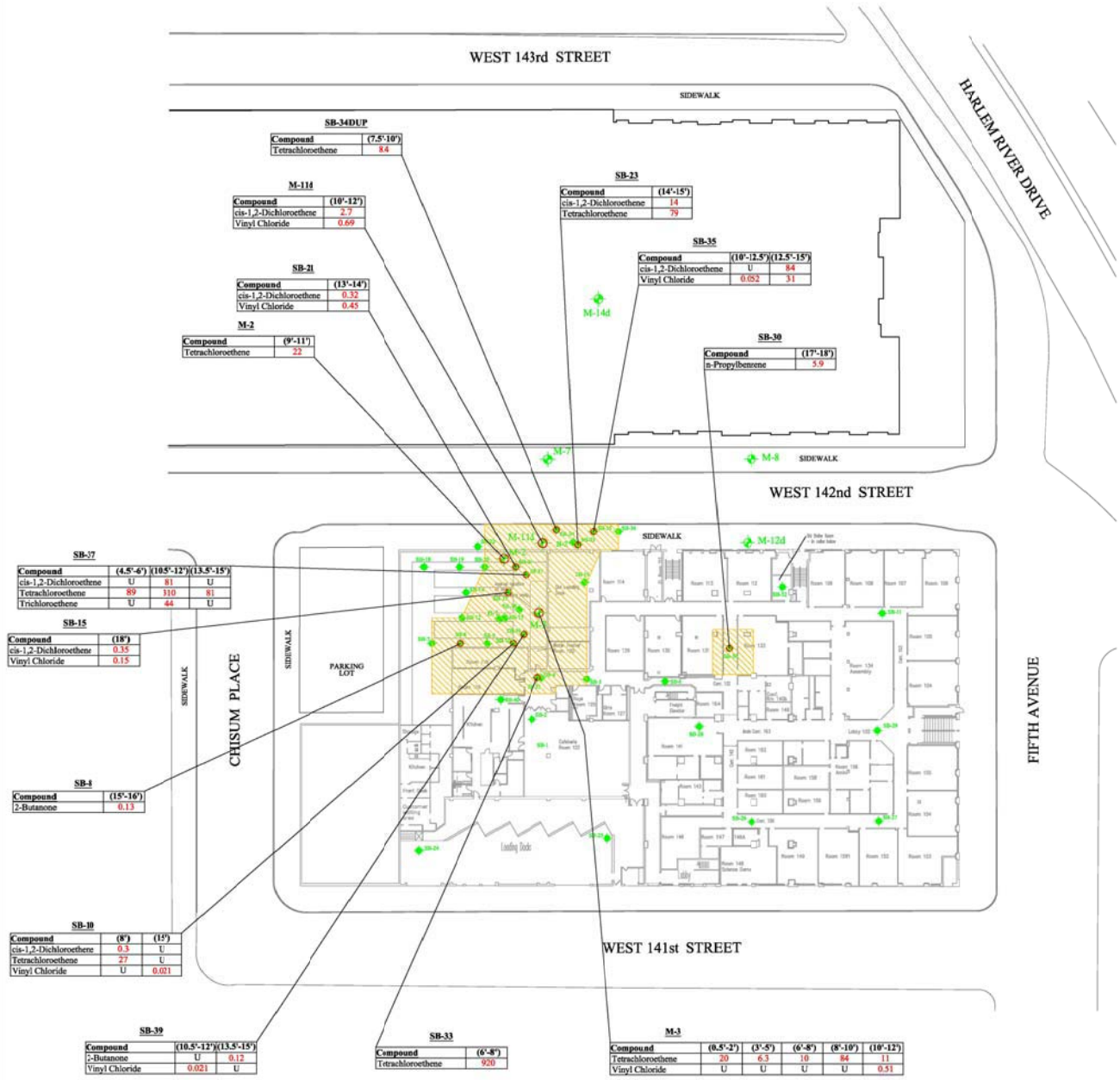
GROUNDWATER SAMPLES WITH VOCs EXCEEDING CLASS GA STANDARDS

DATE
5.21.10

SCALE
as shown

PROJECT No.
08010

FIGURE
3



SYMBOL LEGEND:

- M-8 — MONITORING WELL LOCATION - COMPOUNDS NOT DETECTED ABOVE SCO
- M-3 — MONITORING WELL LOCATION - COMPOUNDS DETECTED ABOVE SCO
- SB-16 — SOIL BORING LOCATION - COMPOUNDS NOT DETECTED ABOVE SCO
- SB-10 — SOIL BORING LOCATION - COMPOUNDS DETECTED ABOVE SCO
- SOIL WITH CONCENTRATIONS GREATER THAN SCOs FOR PROTECTION OF GROUNDWATER
- 10 — COMPOUND DETECTED EXCEEDS SCO FOR PROTECTION OF GROUNDWATER

GENERAL NOTES:

1. BASE MAPS PROVIDED BY MONTROSE WITH LOCATIONS SURVEYED IN DEC 2006, JAN 2008 AND DEC 2009 OR MEASURED IN FIELD WITH TAPE MEASURE.

2. SOIL SAMPLES COLLECTED AS PART OF REMEDIAL INVESTIGATION ACTIVITIES PERFORMED IN JANUARY/FEBRUARY 1998, APRIL 2002, AUGUST/OCTOBER 2006, AND OCTOBER 2007 THROUGH DECEMBER 2009.

3. DATA ONLY SHOWN FOR SAMPLES AND DEPTHS WITH COMPOUNDS IN EXCEEDANCE OF NYSDEC PART 375 SOIL CLEANUP OBJECTIVES FOR PROTECTION OF GROUNDWATER.

4. CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/Kg).

5. EXCEEDANCES FOR ACETONE AND METHYLENE CHLORIDE ARE NOT SHOWN. DETECTIONS WITHIN METHOD BLANKS INDICATED THAT THESE COMPOUNDS ARE ATTRIBUTED TO SAMPLE PREPARATION IN THE LABORATORY, AND ARE NOT REPRESENTATIVE OF THE SITE SOIL.

0' 15' 30' 60'
SCALE IN FEET

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NEW YORK, NEW YORK

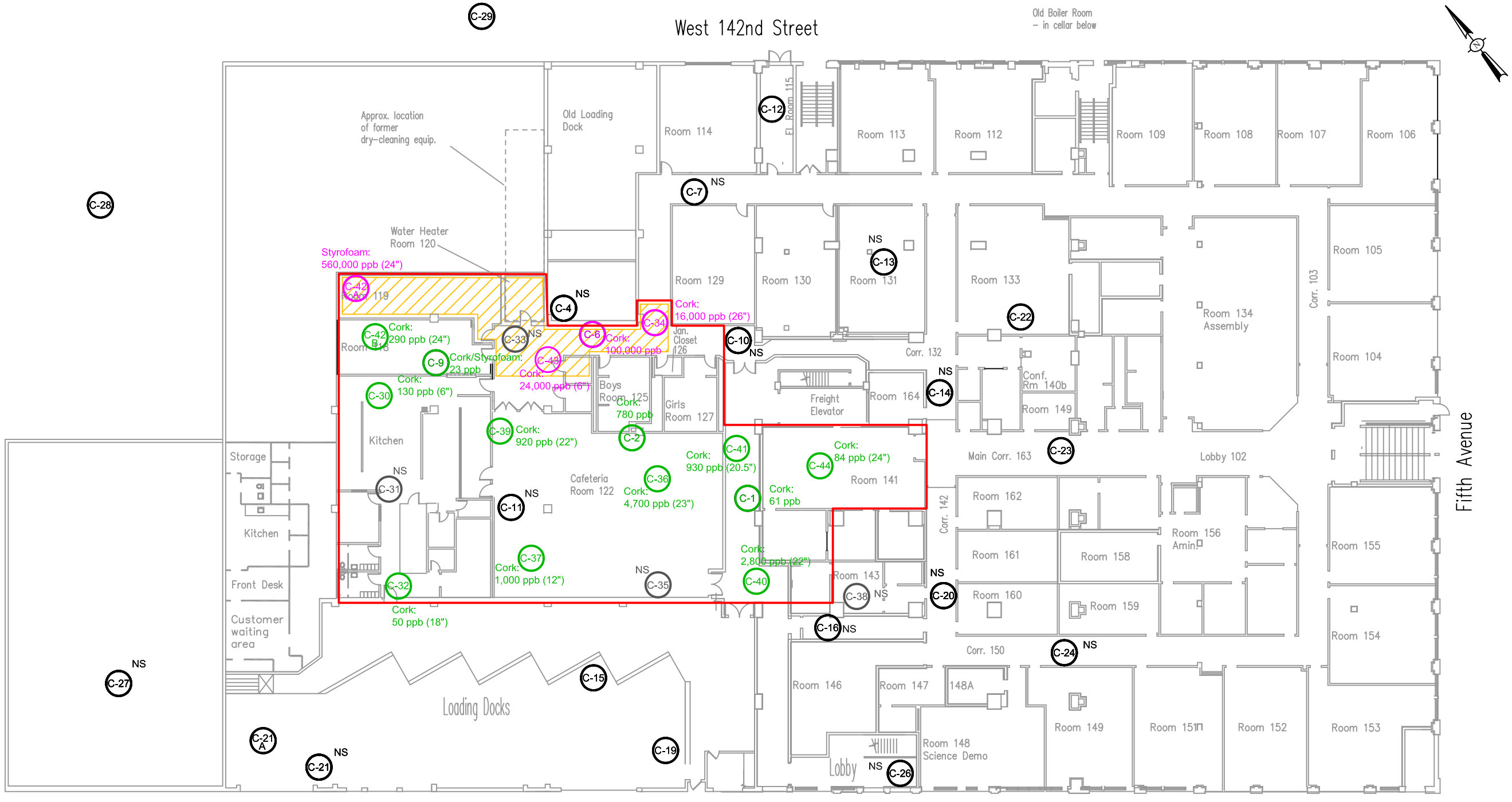
SOIL SAMPLES WITH COMPOUNDS EXCEEDING SOIL CLEANUP OBJECTIVES

DATE 5.21.10

SCALE as shown

PROJECT No. 08010

FIGURE 4



LEGEND:

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2350 FIFTH AVENUE, NEW YORK, NY

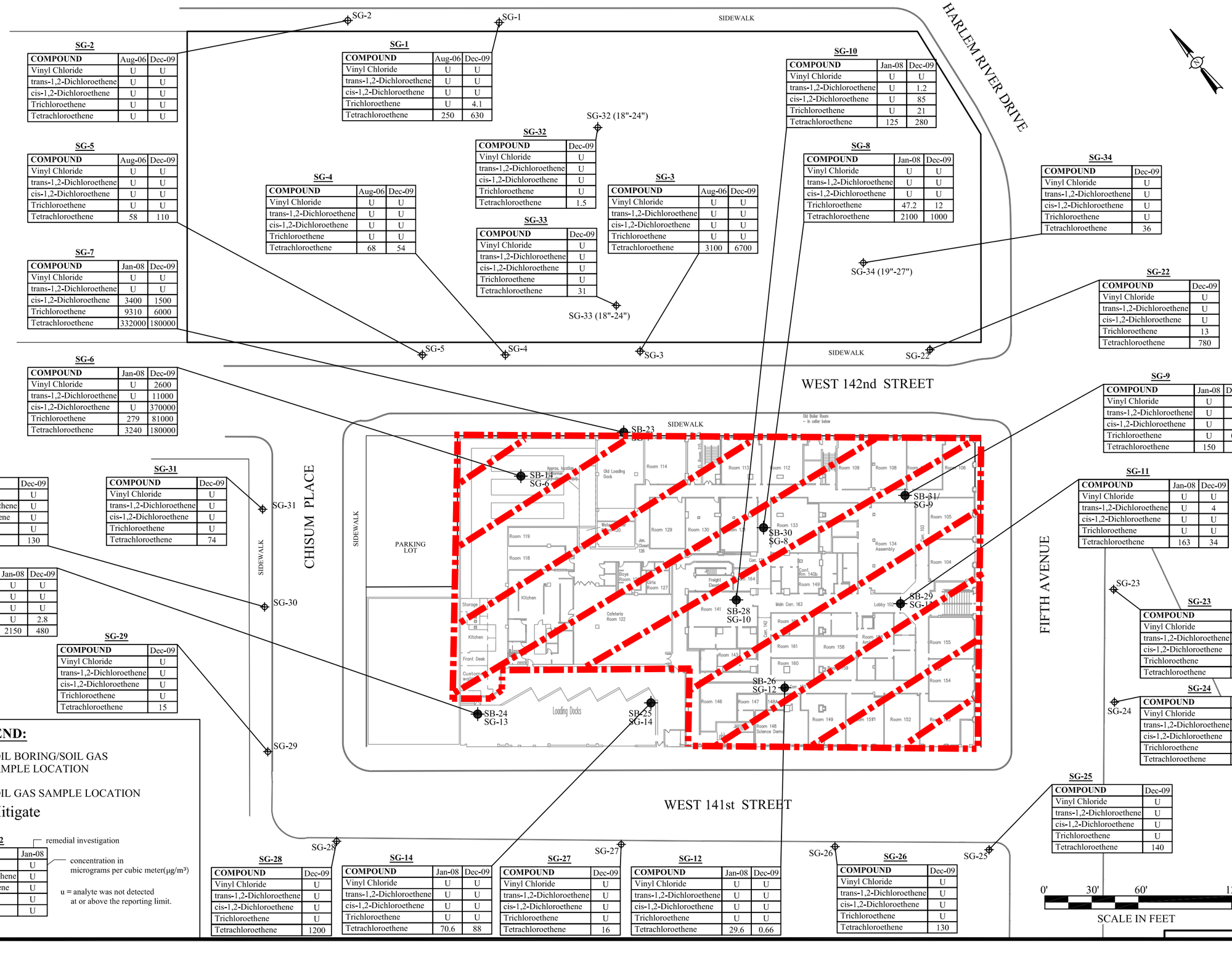
SUB-SLAB INSULATION MATERIAL - PCE CONCENTRATIONS

DATE
12.15.10

PROJECT NO.
08010

SCALE
1"=30'

FIGURE
5



SG-2

COMPOUND	Aug-06	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	U	U

SG-1

COMPOUND	Aug-06	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	4.1
Tetrachloroethene	250	630

SG-10

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	1.2
cis-1,2-Dichloroethene	U	85
Trichloroethene	U	21
Tetrachloroethene	125	280

SG-32

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	1.5

SG-4

COMPOUND	Aug-06	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	68	54

SG-3

COMPOUND	Aug-06	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	3100	6700

SG-8

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	47.2	12
Tetrachloroethene	2100	1000

SG-34

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	36

SG-33

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	31

SG-22

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	13
Tetrachloroethene	780

SG-7

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	3400	1500
Trichloroethene	9310	6000
Tetrachloroethene	332000	180000

SG-9

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	0.94
Tetrachloroethene	150	300

SG-6

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	2600
trans-1,2-Dichloroethene	U	11000
cis-1,2-Dichloroethene	U	370000
Trichloroethene	279	81000
Tetrachloroethene	3240	180000

SG-11

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	4
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	163	34

SG-30

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	130

SG-31

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	74

SG-13

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	2.8
Tetrachloroethene	2150	480

SG-29

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	15

SG-23

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	27

SG-24

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	3.9
Tetrachloroethene	7

SG-25

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	140

SG-28

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	1200

SG-14

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	70.6	88

SG-27

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	16

SG-12

COMPOUND	Jan-08	Dec-09
Vinyl Chloride	U	U
trans-1,2-Dichloroethene	U	U
cis-1,2-Dichloroethene	U	U
Trichloroethene	U	U
Tetrachloroethene	29.6	0.66

SG-26

COMPOUND	Dec-09
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	130

LEGEND:

SB-27 / SG-11 — SOIL BORING/SOIL GAS SAMPLE LOCATION

SG-30 — SOIL GAS SAMPLE LOCATION

Mitigate

soil gas location — SG-2 — remedial investigation

COMPOUND	Jan-08
Vinyl Chloride	U
trans-1,2-Dichloroethene	U
cis-1,2-Dichloroethene	U
Trichloroethene	U
Tetrachloroethene	U

concentration in micrograms per cubic meter(µg/m³)

u = analyte was not detected at or above the reporting limit.

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REMEDIAL INVESTIGATION - CONCENTRATIONS OF PCE & BREAKDOWN PRODUCTS IN SOIL GAS

2350 FIFTH AVENUE
NEW YORK, NEW YORK

DATE **1.12.10**

PROJECT NO. **08010**

SCALE **as shown**

FIGURE **6**

WEST 142nd STREET

CHISUM PLACE

SIDEWALK

PARKING LOT

SIDEWALK

Approx. location of former dry-cleaning equip.

Old Loading Dock

Water Heater Room 120

Old Boiler Room – in cellar below

El. Room 115

Room 114

Room 113

Room 112

Room 109

Room 108

Room 107

Room 106

Room 105

Room 104

Room 119

Room 118

Room 129

Room 130

Room 131

Room 133

Corr. 132

Corr. 143

Room 134 Assembly

Boys Room 125

Girls Room 127

Freight Elevator

Room 164

Conf. Rm 140b

Room 149

Kitchen

Storage

Kitchen

Front Desk

Customer waiting area

Cafeteria Room 122

Main Corr. 163

Lobby 102

Room 141

Corr. 142

Room 162

Room 161

Room 158

Room 156 Amin.

Room 155

Room 143

Room 160

Room 159

Room 154

Corr. 150

Room 146

Room 147

148A

Room 148 Science Demo

Room 149

Room 151

Room 152

Room 153

Lobby

Loading Docks

LEGEND

- PROPERTY BOUNDARY
- MAXIMUM EXTENT OF INSULATION REMOVAL
- SVE, CHEM-OX (SOIL), AND GROUNDWATER REMEDIATION ZONES
- LNAPL REMEDIATION ZONE
- SSDS REMEDIATION ZONES

0' 15' 30' 60'

SCALE IN FEET

GENERAL NOTES:

1. BASE MAPS PROVIDED BY MONTROSE WITH LOCATIONS SURVEYED IN DEC 2006, JAN 2008 AND DEC 2009 OR MEASURED IN FIELD WITH TAPE MEASURE.
2. DETAILS REGARDING THE PLANNED REMEDIATION REFERENCED ON THIS DRAWING WERE PROVIDED IN A SEPTEMBER 2010 *DRAFT FEASIBILITY STUDY* AND A DECEMBER 2010 *FEASIBILITY STUDY ADDENDUM*.
3. REMEDIAL AREAS AND SPECIFICS OF REMEDIES TO BE FURTHER EVALUATED DURING REMEDIAL DESIGN PHASE.

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2350 FIFTH AVENUE
NEW YORK, NEW YORK

APPROXIMATE TREATMENT ZONES

DATE
1.20.11

PROJECT NO.
08010

SCALE
as shown

FIGURE
7

Exhibit A

Nature and Extent of Contamination

This section describes the findings for all environmental media that were evaluated. As described in the RI report, groundwater, soil, soil vapor, indoor air and sub-slab insulation material samples were collected to characterize the nature and extent of contamination.

For each media, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. For comparison purposes the SCGs that allow for both unrestricted use and Restricted Residential Use are provided for each medium.

Groundwater

Groundwater samples were collected from shallow and deep monitoring wells beneath the structure located on the site, in the sidewalk around the site and beneath a structure on an off-site property (the Armory). As shown on Figure 3, PCE and its decomposition products were detected at levels that exceeded Class GA (Drinking Water) Ambient Water Quality Standards and Guidelines in 6 NYCRR Section 703.5 in samples from 7 of the 24 groundwater monitoring wells sampled from 1998 to 2009. Table 1 shown below includes all contaminants (volatile organic compounds [VOCs]) that exceed the drinking water SCGs for the 23 samples collected in the most recent (December 2009) sampling event.

Table 1 – Groundwater Analytical Summary for 2009 Sampling Event

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Cis-1,2-Dichloroethene	6.3 - 1800	5	5 of 23
Methylene chloride	25	5	1 of 23
Tetrachloroethene	7.9 - 90	5	2 of 23
Trans-1,2-Dichloroethene	7.9	5	1of 23
Trichloroethene	79	5	1of 23
Vinyl Chloride	12 - 580	2	3 of 23

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water. Concentration range includes only those concentrations detected greater than the SCG.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

The highest VOC concentrations in groundwater were in the samples from monitoring well M-11s, located on the West 142nd Street sidewalk just north of the source area. The primary contaminants at this location were cis-1,2-DCE and vinyl chloride. No PCE or decomposition products were detected in M-11d, the deep well at this location. The groundwater sampling completed from 1998 to 2009 indicated that elevated concentrations of PCE and decomposition products were identified in seven monitoring wells, , and other VOCs exceeding the Class GA groundwater standards were present in one monitoring well, for the 1998 sample only.
During the 2009 sampling event, chlorinated VOCs (PCE, TCE, cis- and trans-1,2-dichloroethene, and vinyl chloride) were detected at levels exceeding the Class GA groundwater standards in samples from 5 of the 24 monitoring wells (M-1, 3d, 7, 11s, and 14d), and other VOCs were detected above Class GA Standards in

monitoring well M-5. In nearly all the monitoring wells, the concentrations of chlorinated VOCs have shown a decreasing trend from 1998 to 2009.

The subsurface capacity for natural biodegradation of chlorinated solvents was evaluated near the source area and found to be generally reducing (conditions that encourage biodegradation of chlorinated solvents). Natural attenuation of chlorinated solvents can also be accelerated by the presence of dehalogenating bacteria in addition to a reducing environment. These bacteria were not sampled for directly, but indicator parameters (byproducts of bacterial dehalogenation of chlorinated solvents) were detected in the majority of samples including indicators for anaerobic dechlorinating bacteria which are the most efficient at breakdown of chlorinated solvents.

About 1 inch of light non-aqueous phase liquid (LNAPL) was measured in monitoring well M-12s from 2007 to 2009. The LNAPL was sampled in December 2009 for petroleum fingerprint analysis and was reported to be consistent with motor oil.

Based on the findings of the RI, the disposal of hazardous waste and petroleum has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride and petroleum LNAPL.

Soil

Subsurface soil sampling was performed beneath the building slab, the sidewalks and the armory building north of the site property. Twenty-three of the 148 soil samples collected since the Preliminary Site Assessment in 1998 had one or more VOCs at a concentration greater that the 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Unrestricted Use(which are identical to the SCOs for the Protection of Groundwater (SCOPG) for the Site-specific contaminants of concern). Twenty samples contained PCE or associated decomposition products at concentrations above unrestricted SCOs with the remaining three samples exceeding unrestricted SCOs for petroleum-related hydrocarbons. PCE and associated decomposition products (TCE, cis-1,2-DCE, trans 1,2-DCE, and vinyl chloride) were only detected in soil samples from the northwestern portion of the site. VOCs exceeding unrestricted SCOs, although confined to the northwestern portion of the site, were encountered in discrete areas (both horizontally and vertically), separated by samples with VOC concentrations below unrestricted SCOs, as shown on Figure 4. Depths of the samples with VOCs above unrestricted SCOs were also inconsistent, isolated areas, ranging from 1 to 19 feet below grade. Over 85 percent of soil samples collected from October 2007 to December 2009 had PCE levels less than 1 mg/kg.

Petroleum-related hydrocarbons were detected at concentrations below unrestricted SCOs in samples from several locations on the northern side of the building and around the old boiler room. All of these samples were at least 10 feet below sidewalk grade. N-propylbenzene was detected at a concentration greater than the unrestricted SCOs in one sample collected from a boring in the center of the building, from a depth 17 feet below grade.

A possible source of the hydrocarbon contamination is a former diesel tank that was reportedly located under the northern side of the building. It was noted that that the building's former boilers for the laundry used #6 oil that does not contain significant levels of the compounds detected.

Samples with concentrations exceeding unrestricted SCOs are presented in Figure 4. Table 2 includes the VOCs that exceed the Unrestricted Use SCOs for the 125 soil samples collected from 2007 to 2009.

Table 2 - Soil Analytical Summary					
Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b]/Protection of Groundwater SCG[c] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Residential[d](ppm)	Frequency Exceeding Restricted Residential SCG
Acetone	0.053 – 0.94	0.05	27 of 125	100	0 of 125
2-Butanone (MEK)	0.13	0.12	1 of 125	100	0 of 125
Cis-1,2-Dichloroethene	0.3 – 84	0.25	7 of 125	100	0 of 125
n-Propylbenzene	5.9	3.9	1 of 125	100	0 of 125
Tetrachloroethene	27 – 920	1.3	7 of 125	19	6 of 125
Trichloroethene	44	0.47	1 of 125	21	1of 125
Vinyl chloride	0.021 - 31	0.02	6 of 125	0.9	1of 125

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil. Concentration range includes only those concentrations detected greater than the SCG;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Protection of Groundwater Soil Cleanup Objectives.
d - SCG: Part 375-6.8(b), Restricted Residential Soil Cleanup Objectives.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process, are PCE and its breakdown products (TCE, cis and trans-1,2-DCE and vinyl chloride).

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting soil vapor.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and Source areas identified at the site include contaminated insulation materials.

The floor slab in the western portion of the site building was constructed with layers of insulation materials consisting of tar paper, cork and/or styrofoam. Sub-slab insulation material was sampled to evaluate the extent, thickness and concentrations of VOCs. Insulation material was identified as remaining beneath the slab in the northwestern portion of the site building, south and southeast of the area of cork removal from the IRM. Insulation material identified in the 2009 investigation was primarily brown cork 3 to 12 inches thick (average 8.25 inches) at depths ranging from 6 inches to 3.5 feet below grade. VOCs were detected above unrestricted SCOs in six of the 13 core samples collected in 2009 (with the exception of acetone which was discounted as a laboratory artifact). Of the six samples exceeding unrestricted SCOs, PCE was detected above unrestricted SCOs in five samples. The highest

PCE concentration detected in the insulation samples was 560,000 µg/kg. Sub-slab insulation sample locations and results are presented in Figure 5.
Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of sub-slab insulation material. The areal extent of the contaminated insulation is delineated in figure 5. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of sub-slab insulation material to be addressed by the remedy selection process are PCE and its breakdown products.

Certain of the sub-slab insulation material identified at the site were addressed by the IRM described in Section 6.2. The remaining sub-slab insulation materials identified during the RI will be addressed in the remedy selection process.

Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site-related soil or groundwater contamination was conducted by the sampling of sub-slab vapor and indoor air inside structures. At this site, due to the presence of a building in the impacted area, a full suite of samples were collected to evaluate whether actions were needed to address exposure related to soil vapor intrusion and off-gassing from insulating materials.

The sub-slab vapor samples were collected from beneath the on-site structure, sidewalks around the site, and the Armory building north of the site. The primary soil vapor contaminants are PCE and degradation products (such as TCE). These data are noted on Figure 6.

Elevated soil vapor concentrations for both PCE and TCE are present beneath the majority of the existing on-site building, with concentrations of PCE ranging up to 180,000 ug/m^3 and TCE ranging up to 81,000 ug/m^3 in a sample (SG-6) collected in 2009 near the location of the contaminated insulating material. Site-related contaminants have been found in the indoor air of the on-site building at concentrations exceeding NYSDOH's air guidelines. Therefore, mitigation is warranted for major portions of the on-site building. To minimize the potential for the inhalation of site-related contaminants, a system that ventilates/removes contaminated air was installed during the IRM beneath the portion of the on-site building with the insulation; however, additional mitigation is necessary.

The off-site vapor intrusion assessment indicated that site contamination does not appear to be impacting indoor air quality on the adjacent off-site Armory property. Sub-slab sampling of the Armory building showed PCE concentrations up to 36 ug/m^3, and TCE was not detected. No further action is warranted for off-site properties.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of insulating materials in the building's floor and soil vapor. The site contaminants that are considered to be the primary contaminants of concern in soil vapor to be addressed by the remedy selection process are PCE and degradation products. Based on the results of the soil vapor, sub-slab and indoor air sampling, actions to reduce the potential for vapor intrusion are recommended.

Exhibit B

SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Public Health Protection

Groundwater

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

Soil

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of contaminants volatilizing from contaminants in soil.

Sub-Slab Insulation Material

- Prevent ingestion/direct contact with contaminated insulation material.
- Prevent inhalation of contaminants volatilizing from contaminants in insulation material.

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at or near a site.

Environmental Protection

Groundwater

- Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.
- Remove/treat the source of ground water contamination.

Soil

- Prevent migration of contaminants that would result in groundwater contamination.

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Exhibit B) to address the contaminated media identified at the site as described in Exhibit A:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Present Worth: *$0*
Capital Cost: *$0*
Annual Costs: *$0*

Alternative 2: Institution/Engineering Control for Exposure Reduction

This alternative includes no further remediation relative to soil, groundwater and sub-slab insulation contamination. The heating, ventilation and air conditioning (HVAC) system operating under positive pressure will be modified to addresses potential vapor intrusion for the entire building, but this alternative does not address the contaminated media directly. Rather than attempt to remove all of the subsurface contamination, this alternative prevents building users from being exposed by severing the pathways from the subsurface contamination to the inside of the building. Institutional controls to prevent groundwater use, uncontrolled excavation of residual contamination, and to ensure operation and maintenance of the HVAC system adjustments and floor slab (site cover) would be specified in a Site Management Plan (SMP) for long-term management of the site.

Present Worth: *$446,000*
Capital Cost: *$146,000*
Annual Costs (for 30 years): *$10,000*

Alternative 3: Soil and Insulation Material Removal

This alternative includes excavation and off-site disposal of contaminated soil and insulation material beneath the building, to the extent practical given the limitations that excavation close to foundation elements and utilities may not be feasible. This would entail demolition of the sidewalk, building floor slabs and non-structural walls to the extent that would not compromise the building integrity. Because of public utilities, structural walls, foundations and ceilings which must remain in-place, the removal alternative does not achieve complete removal to allow for unrestricted use without some form of engineering and institutional controls. Alternative 3 includes operation of the HVAC system under positive pressure to address potential vapor intrusion and an SMP for long-term management of the site. Long term engineering and institutional controls (in the form of an environmental easement) would be implemented for this alternative.

Present Worth: *$4,770,000*

Capital Cost:.....*$4,470,000*
Annual Costs (for 30 years):.....*$10,000*

Alternative 4: Treatment Plus Partial Insulation Removal

This alternative includes in-situ treatment of soil and groundwater contamination. In-situ soil treatment consists of injecting a chemical oxidation product and groundwater treatment consists of injecting a product to enhance reductive dechlorination and LNAPL recovery, as appropriate. It includes removal and off-site disposal of the identified source area of contaminated insulation material beneath the building floor slabs to the extent practical. This alternative also includes installation of a soil vapor extraction (SVE) system to address the contaminated soils above the water table in an estimated 8,000 square foot area located in the northwestern portion of the site. A sub-floor depressurization system (SFDS) installed through the existing site building to mitigate the potential for soil vapor intrusion is also included under this alternative. Alternative 4 includes an SMP for long-term management of the site. It would take approximately 6 to 9 months to implement this alternative, plus an additional 5 years of SVE operation and maintenance and 30 years of SFDS operation. Long term engineering and institutional controls (in the form of an environmental easement) would be implemented for this alternative.

Present Worth:.....*$2,707,000*
Capital Cost:.....*$1,370,000*
Annual Costs (for first 5 years):.....*$129,000*
Annual Costs (for next 25 years):.....*$27,500*

Alternative 5: Removal plus Treatment for Unrestricted Use

This alternative includes soil excavation and insulation material removal to the extent practical given the limitations that excavation close to foundation elements and utilities would not be feasible. Because the removal alternative (see Alternative 3) will not achieve complete removal of contaminated soil, Alternative 5 would include in-situ treatment of soil and groundwater in an effort to further address residual contamination. Upon completion of the work under this alternative, no residual contamination would likely remain in soil, insulation, soil vapor and potentially groundwater that may represent complete exposure pathways following implementation of the remedy. No long term engineering or institutional controls would be implemented for this alternative. It would take approximately 12 to 18 months to implement this alternative, plus an additional 5 years of SVE operation and maintenance.

Present Worth:.....*$5,523,000*
Capital Cost:.....*$5,013,000*
Annual Costs(for 5 years):.....*$102,000*

Exhibit D

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 - No Further Action	0	0	0
Alternative 2 – Institution/Engineering Control for Exposure Reduction	146,000	10,000 for 30 years	446,000
Alternative 3: Soil and Insulation Material Removal	4,470,000	10,000 for 30 years	4,770,000
Alternative 4: Treatment Plus Partial Insulation Removal	1,370,000	129,000 for first 5 years 27,500 for the next 25 years	2,707,000
Alternative 5: Removal Plus Treatment for Unrestricted Use	5,013,000	102,000 for 5 years	5,523,000

Exhibit E

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Treatment Plus Partial Insulation Removal as the remedy for this site. The elements of this remedy are described in Section 7.2.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Exhibit C. It would achieve the remediation goals for the site by removal and off-site disposal of the identified source of contamination for insulation material to the extent practical, treating contamination in subsurface soil and groundwater, and removing LNAPL identified on site. The summary of the proposed treatment zone is presented in Figure 7.

Alternative 4 would address all areas with soil, groundwater and soil vapor contamination within the limitations posed by the current building constraints. This alternative is as effective in protection of human health and the environment as Alternative 5 (which strives to achieve unrestricted use) and would satisfy SCGs to the extent practicable. Alternative 4 is also preferable compared to Alternatives 1, 2, and 3 because it would reduce the toxicity, mobility, and volume of the contaminated media through treatment, would be more effective and permanent in the long term. Alternative 4 is more cost effective, more readily implementable, and would have minimal short term impacts during implementation compared to Alternative 5. Implementation of an SMP and environmental easement would ensure proper long-term protection with respect to exposure to residual contamination and protection of public health.

Alternative 1 is not considered a reasonable remedial option because it does not accomplish the remedial action goals for protection of public health and the environment and will not be evaluated further.

Alternative 2 would be readily implementable and protective of human health, but does not include reduction of contaminant toxicity, mass, or volume by removal or treatment and does not comply with the SCGs. Alternative 2 would be less effective and less permanent in the long term than Alternatives 3, 4, or 5, while it would have no significant short term impacts and minimal costs.

Alternative 3 includes removal of soil and insulation material, within the physical constraints imposed by the structure of the existing site building and public utilities. Alternative 3 would be protective of public health and would partially meet SCGs for soil. It would reduce the toxicity, mobility, and volume of much of the contaminated soil and insulation but would leave some residual behind and would not address contaminated groundwater or LNAPL. This makes Alternative 3 less effective and permanent in the long term than alternatives 4 and 5. Alternative 3 has much greater short term impacts than Alternative 4 and is almost double the cost. Given this comparison, Alternative 3 is less preferable than Alternative 4.

While Alternative 5 strives to achieve full removal and treatment of contamination in soil, insulation, and groundwater to allow for unrestricted use, some residual contamination would remain in these media. It is technically impracticable to achieve the unrestricted use SCGs. While Alternative 5 would be protective of

public health and the environment, and would achieve SCGs to the extent practicable, the incremental amount of contaminant mass removed or treated for Alternative 5 compared to Alternative 4 would be modest. Alternative 5 has much greater short term impacts than Alternative 4 and is more than double the cost. Given this comparison, Alternative 5 is less preferable than Alternative 4.