

RECORD OF DECISION

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



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

DECLARATION STATEMENT - RECORD OF DECISION

2350 Fifth Ave., New York (AKA, PS 141)
State Superfund Project
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Statement of Purpose and Basis

This document presents the remedy for the 2350 Fifth Ave., New York (AKA, PS 141) site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the 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, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 2350 Fifth Ave., New York (AKA, PS 141) site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected 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. The remedial design will include soil vapor delineation around SG-28 to confirm the source of contaminated soil vapor in this location. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise

be considered a waste;

- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

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.

New York State Department of Health Acceptance

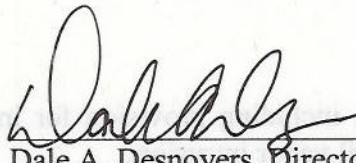
The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 29 2011

Date



Dale A. Desnoyers, Director

Division of Environmental Remediation

RECORD OF DECISION

2350 Fifth Ave., New York (AKA, PS 141)
New York, New York County
Site No. 231004
March 2011

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected 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. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the 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 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: 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 1.58 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 3: 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 4: 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 5: SITE CONTAMINATION

5.1: 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.

5.1.1: 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>

5.1.2: 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 SCGs for:

- groundwater
- soil
- indoor air

5.2: 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.

5.3: 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.

5.4: 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.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

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 6: 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 feasibility study (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.

6.1: 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.

6.2: Elements of the Remedy

The basis for the Department's 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 selected 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. The remedial design will include soil vapor delineation around SG-28 to confirm the source of contaminated soil vapor in this location. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

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
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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;

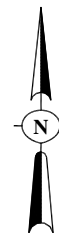
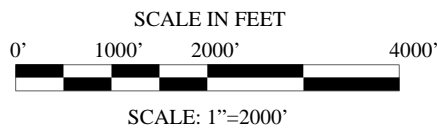
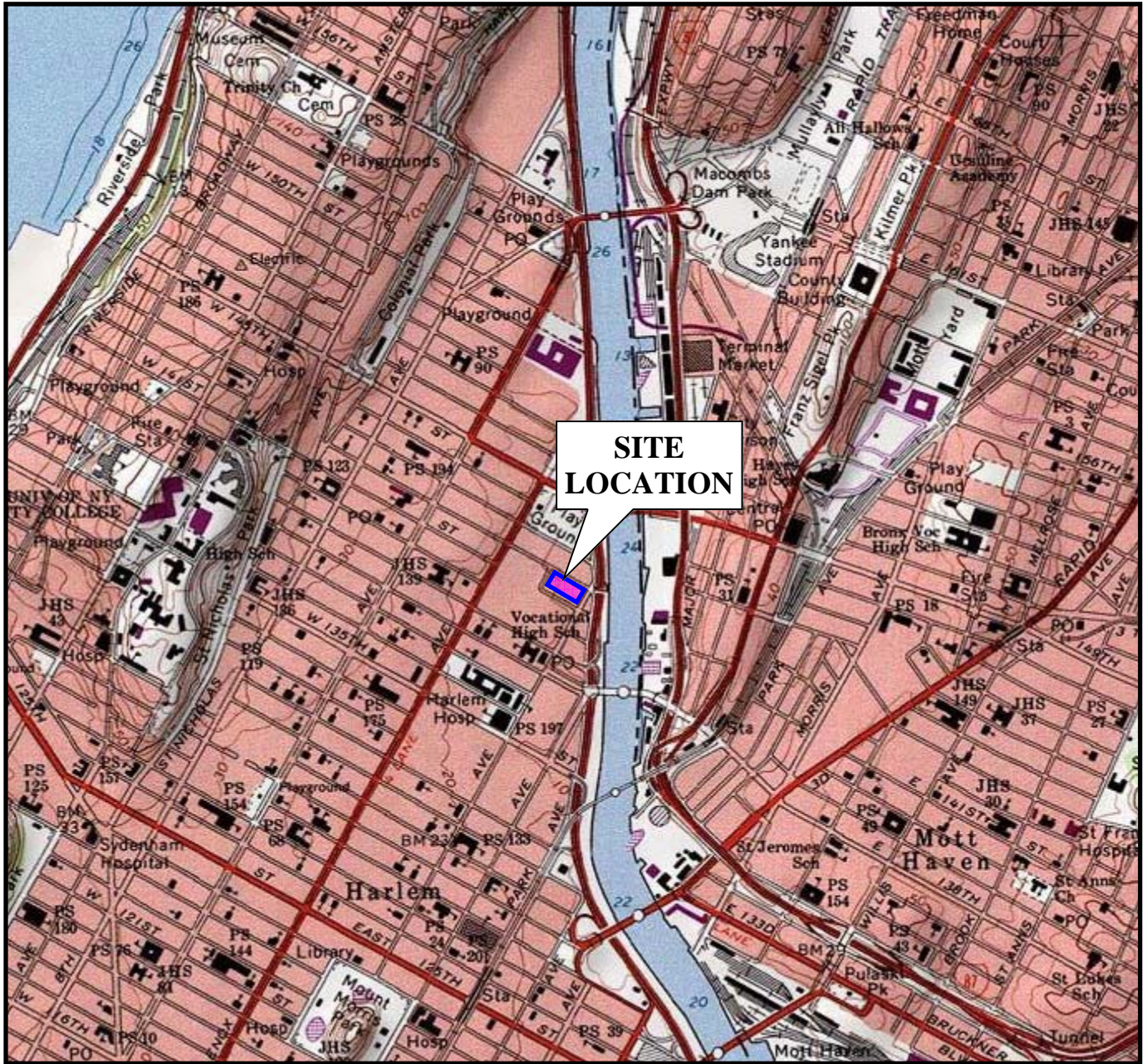
- (b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but is not to be limited to:

- (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.



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

**2350 FIFTH AVENUE
NEW YORK, NEW YORK**

PROJECT SITE LOCATION



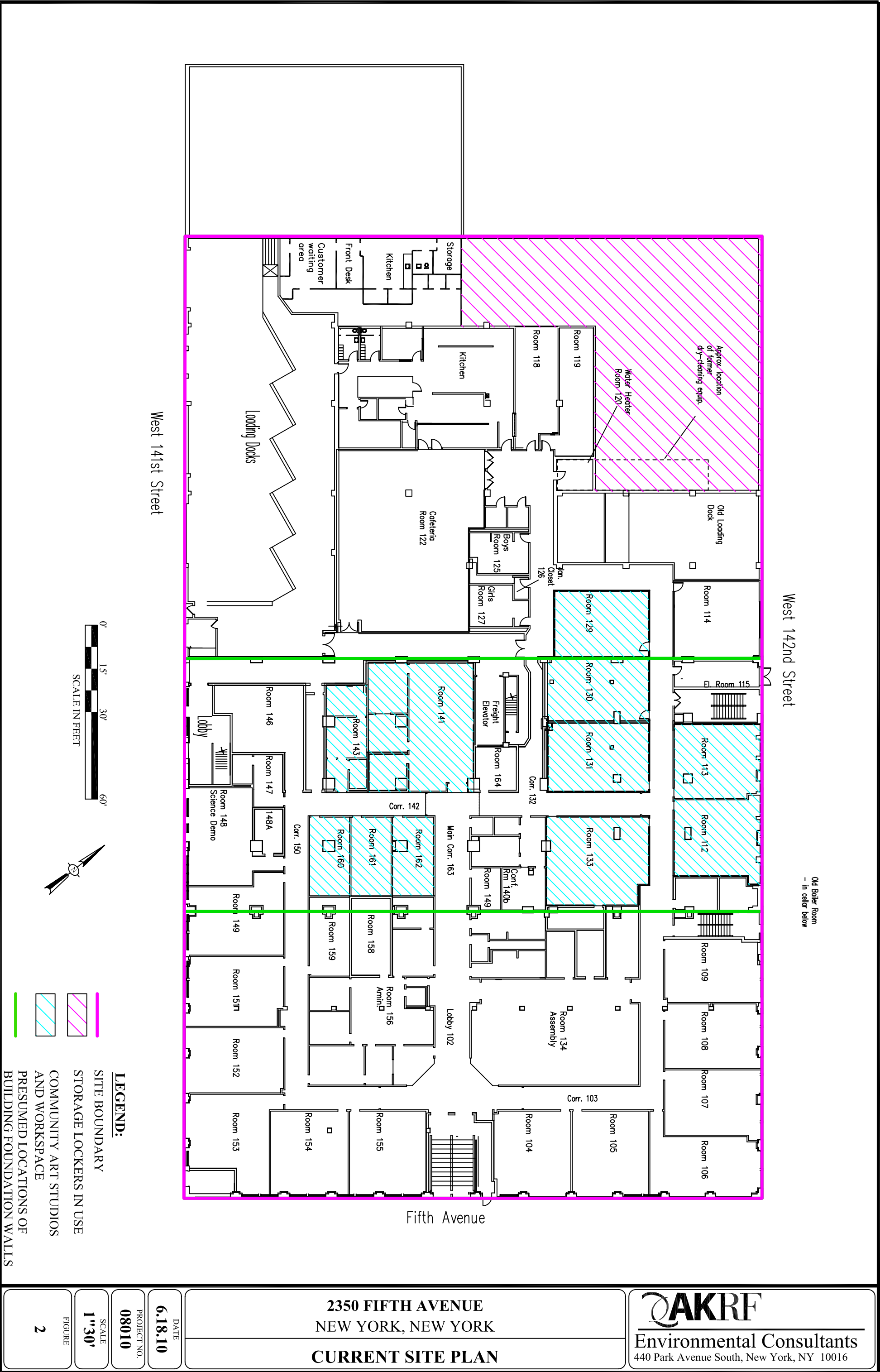
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

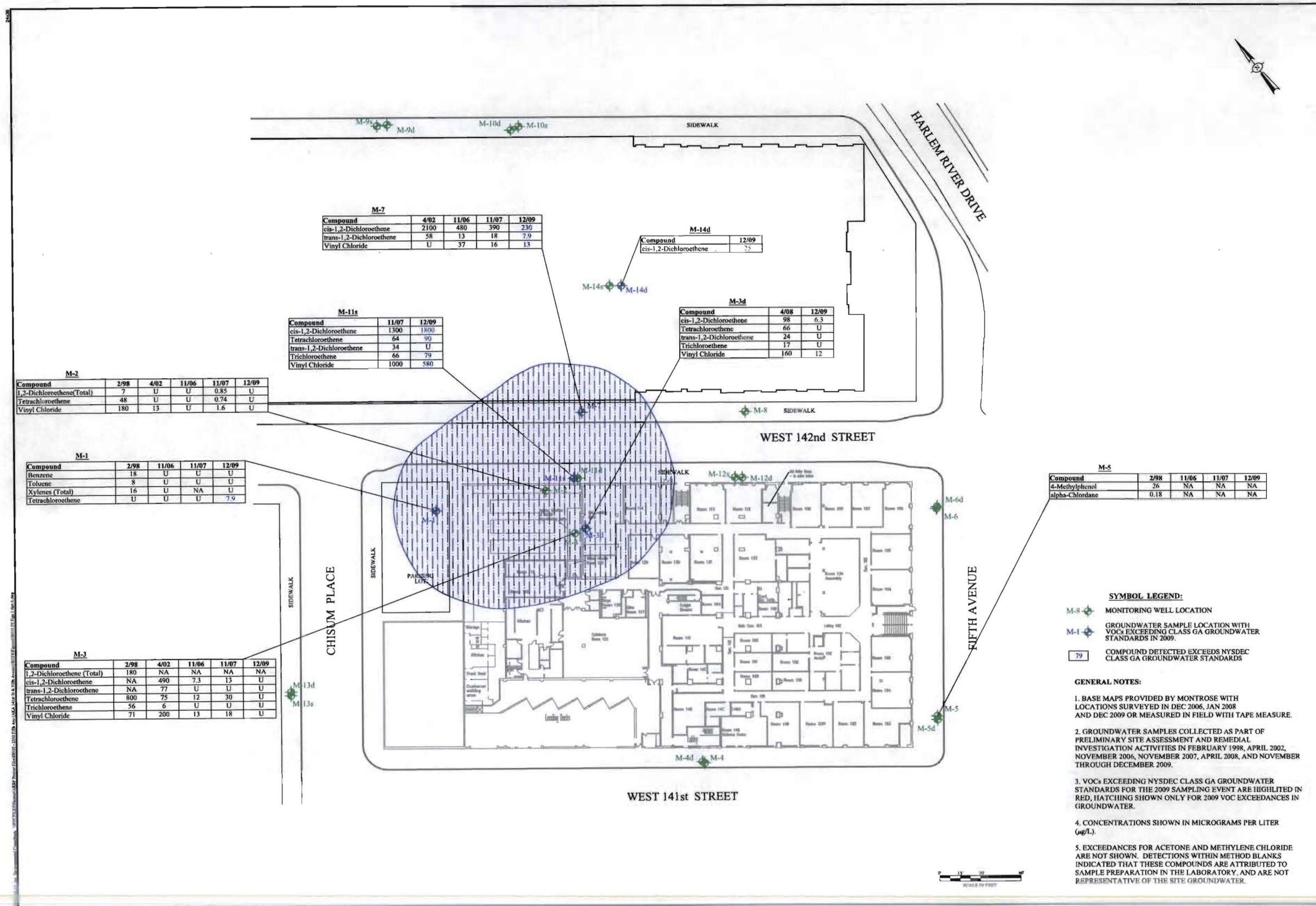
DATE
4.16.10

PROJECT No.
08010

SCALE
as shown

FIGURE
1





2350 FIFTH AVENUE
NEW YORK, NEW YORK

SOIL SAMPLES WITH COMPOUNDS EXCEEDING
SOIL CLEANUP OBJECTIVES

DATE _____

5.21-10

SCALE

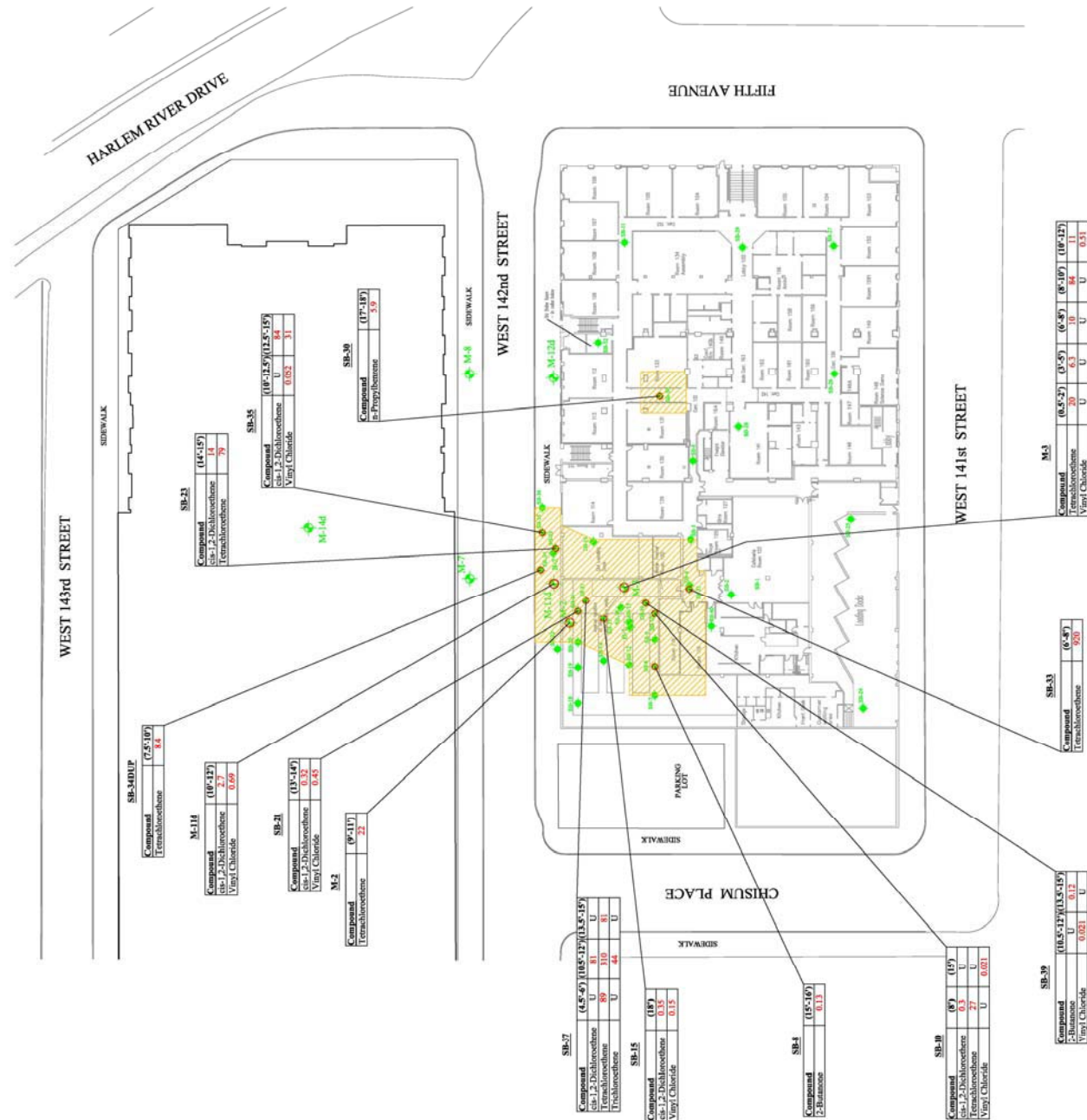
as shown

PROJECT No.






08010

FIGURE

4



SYMBOL LEGEND:

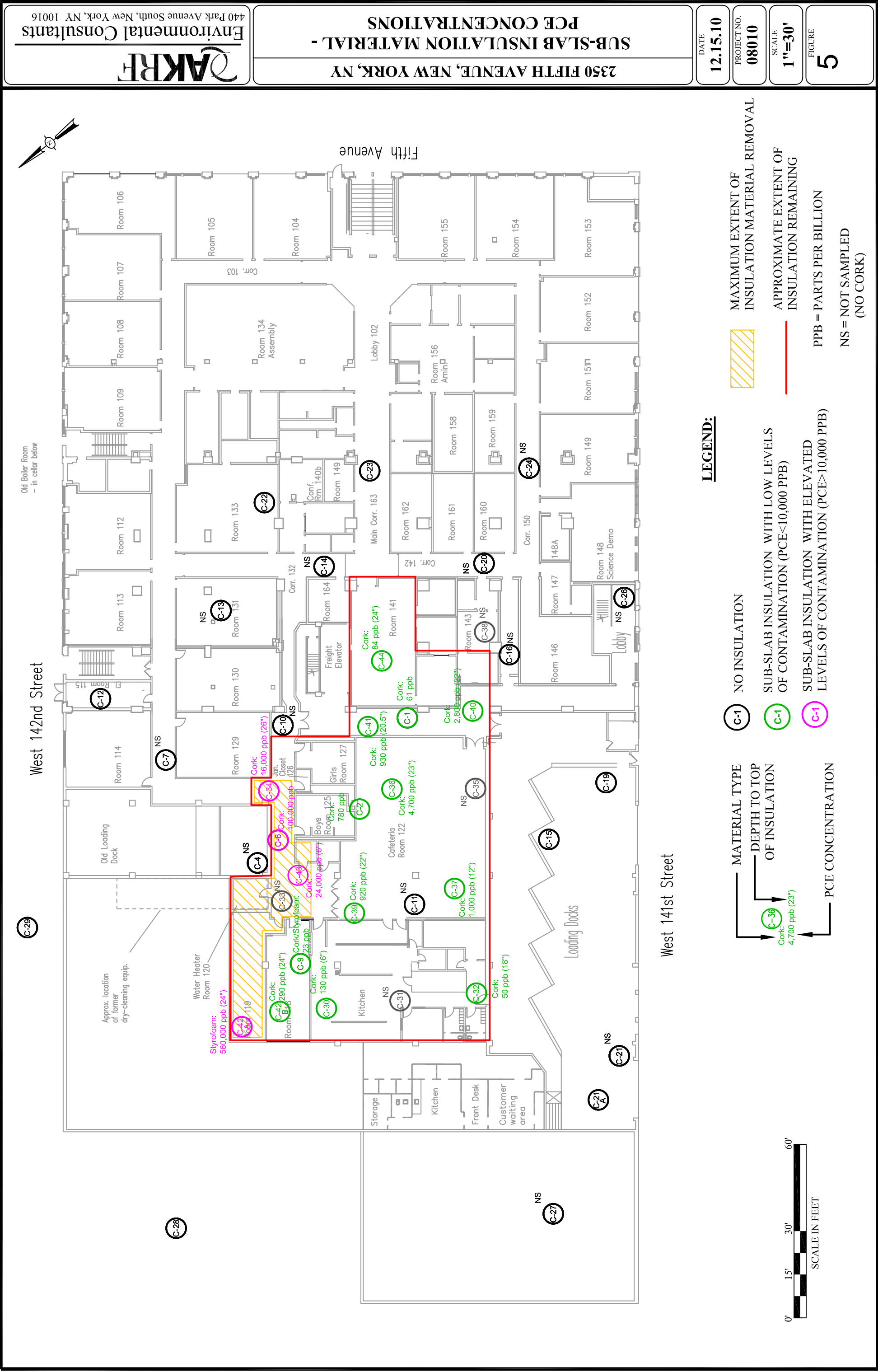
- | | | |
|---|------------|---|
|  | M-0 | MONITORING WELL LOCATION - COMPOUND NOT DETECTED ABOVE SCO |
|  | M-3 | MONITORING WELL LOCATION - COMPOUND DETECTED ABOVE SCO |
|  | S-0 | SOIL BORING LOCATION - COMPOUND NOT DETECTED ABOVE SCO |
|  | S-3 | SOIL BORING LOCATION - COMPOUND DETECTED ABOVE SCO |
|  | | SOIL WITH CONCENTRATIONS GREATER THAN SCO FOR PROTECTION OF GROUNDWATER |
|  | ID | COMPOUND DETECTED EXCEEDS SCO FOR PROTECTION OF GROUNDWATER |

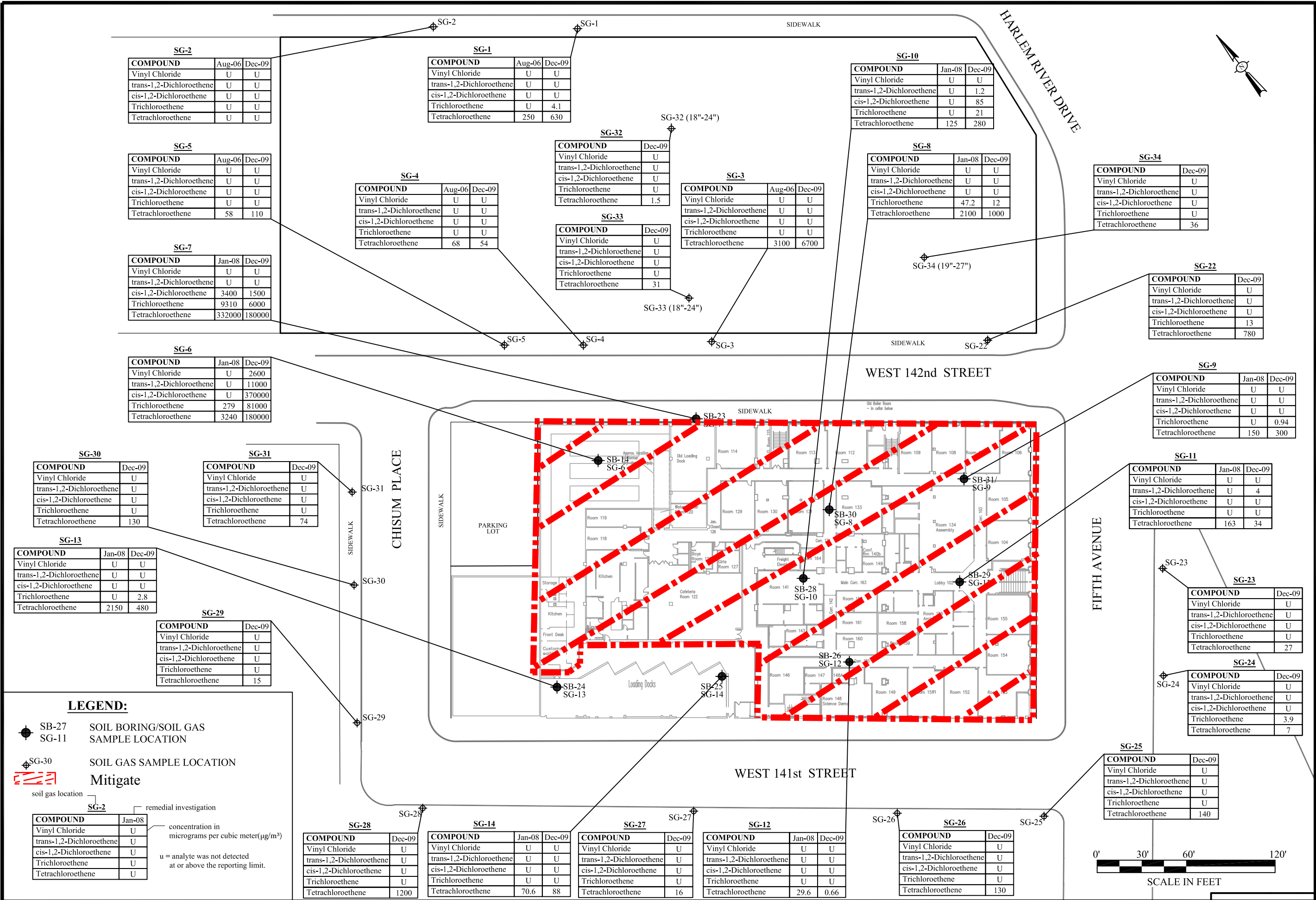
GENERAL NOTES:

1. BASE MAPS PROVIDED BY MONTROSE WITH LOCATIONS SURVEYED IN DEC 2002, JAN 2003, AND DEC 2003 OR MARCHED IN FIELD WITH TAPE MEASURE.
2. SOIL SAMPLES COLLECTED AS PART OF REMEDIAL INVESTIGATION ACTIVITIES PERFORMED IN JANUARY/FEBRUARY 1990, APRIL 2002, AUGUST/OCTOBER 2006, AND OCTOBER 2007 THROUGH DECEMBER 2009.
3. DATA ONLY SHOWN FOR SAMPLES AND DEPTHS WITH COMPOUNDS IN EXCESSANCE OF IN-SCOPE PART 375 SOIL CLEANUP OBJECTIVES FOR PROTECTION OF GROUNDWATER.
- CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
- EXCESSANCES FOR ACETONE AND METHYLENE CHLORIDE ARE NOT SHOWN. DETECTIONS WITHIN METHOD BLANKS INDICATED THAT THESE COMPOUNDS ARE ATTRIBUTED TO BACKGROUND LEVELS OF THE LABORATORY, AND ARE NOT REPRESENTATIVE OF THE SITE SOIL.



A scale bar labeled "SCALE IN FEET" with markings for 0, 10, 20, and 30 feet.





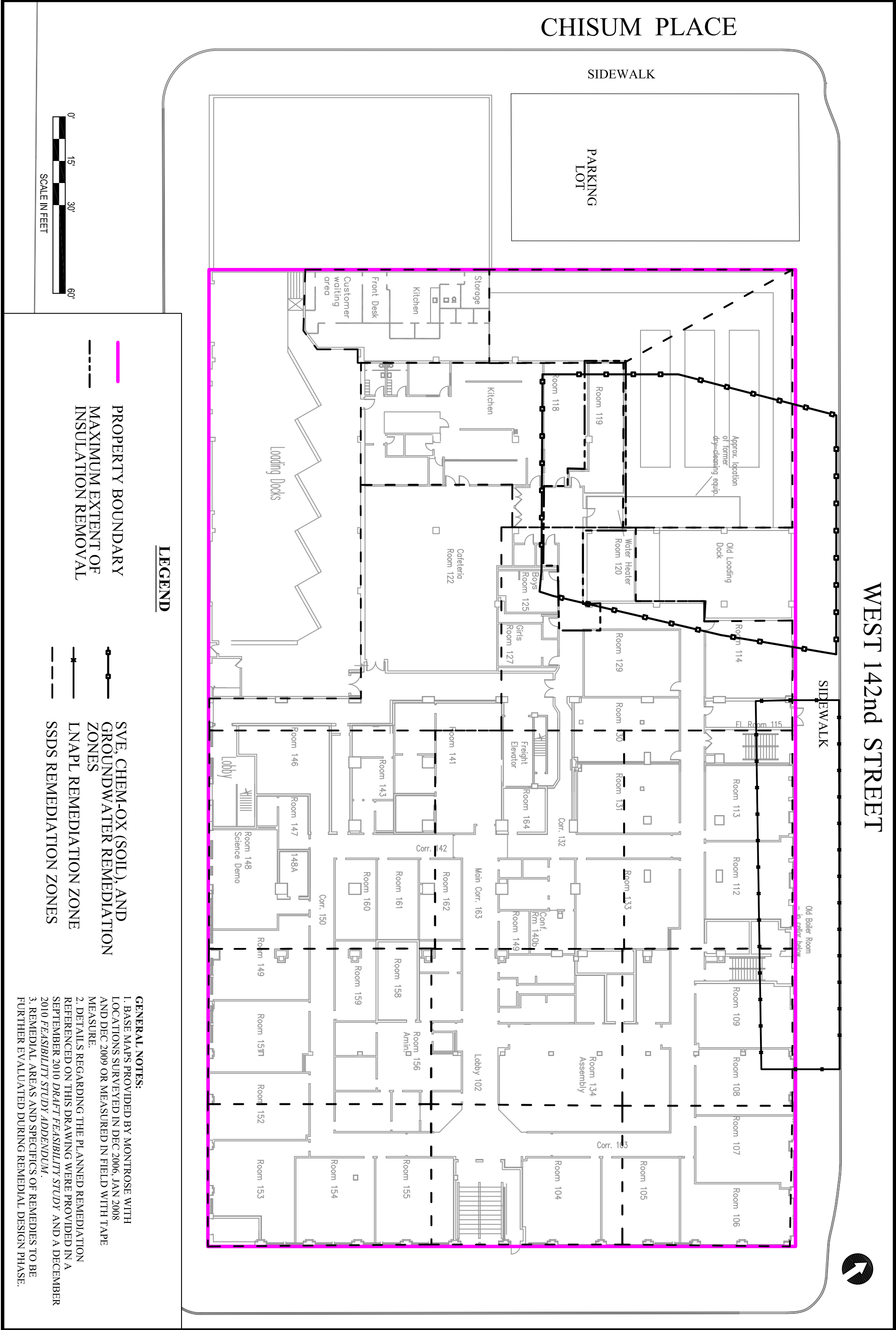


Exhibit A

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	1 of 23
Trichloroethene	79	5	1 of 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 than 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 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	1 of 125
Vinyl chloride	0.021 - 31	0.02	6 of 125	0.9	1 of 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 where 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/m³ and TCE ranging up to 81,000 ug/m³ 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/m³, 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.

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

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

The Proposed Remedial Action Plan (PRAP) for the 2350 Fifth Ave., New York (AKA, PS 141) site, was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 15, 2011. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater, and soil vapor at the 2350 Fifth Ave., New York (AKA, PS 141) site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 3, 2011, which included a presentation of the remedial investigation feasibility study (RI/FS) for the 2350 Fifth Ave., New York (AKA, PS 141) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 18, 2011.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

The following verbal comments were received during the public meeting on March 3, 2011:

COMMENT 1: *How will the groundwater contamination that extends under the sidewalk on the north side of 142nd Street be addressed to prevent it from migrating further off-site?*

RESPONSE 1: The proposed remedy includes in-situ groundwater treatment via direct injection of a product to promote reductive dechlorination in the source area. This treatment is expected to improve the quality of the groundwater leaving the site, thus preventing further off-site migration of contaminants.

COMMENT 2: *Is natural bio-degradation of the contamination in groundwater occurring?*

RESPONSE 2: Yes, the subsurface capacity for natural bio-degradation of the chlorinated solvents was evaluated near the source area, and results indicate that the subsurface conditions are generally conducive for biodegradation. The groundwater sample results obtained during the Remedial Investigation (RI) have demonstrated signs of this in the form of dechlorination indicator parameters (byproducts of dehalogenation of chlorinated solvent), which were detected in the majority of samples. However, the capacity of the existing microbes is limited, therefore it

is not expected that natural bio-degradation would completely remediate the contamination without the proposed injection.

COMMENT 3: *Why doesn't the remedy require complete soil removal, even if it means demolition of the building?*

RESPONSE 3: The Department evaluates the remedial alternatives based on nine different criteria, which are defined in 6NYCRR Part 375. These criteria include (1) overall protectiveness; (2) compliance with standards, criteria and guidance (SCGs); (3) long-term effectiveness and permanence; (4) reduction in toxicity, mobility or volume of contaminants; (5) short-term effectiveness and impacts; (6) implementability; (7) cost-effectiveness; (8) community acceptance; and (9) land use factors such as current, intended and reasonably anticipated future uses of a site. The alternative which included complete soil removal (Alternative 5) was not selected because, while both this and the selected alternative would achieved the SCGs (criteria 2), Alternative 5 would only result in a small incremental increase in the amount of contaminated mass removed for nearly double the cost. Furthermore, removal of the entire mass of contamination, including transport for off-site disposal, would result in significantly greater potential short-term adverse impacts on the community (criteria 5) in the form of truck trips, construction noise, and potential for increased exposure to contaminants than with Alternative 4.

COMMENT 4: *Why not require a cleanup that would allow vegetable gardens?*

RESPONSE 4: Criteria 9 requires the Department to evaluate the current, intended and reasonably anticipated future uses of a site. The current use of the site is for self-storage and as an adult art school. The reasonably anticipated future use of the site is for a public school. The owner has no plan to demolish the building to establish a community garden on the site. Therefore, Alternative 4 provides for overall protectiveness (criteria 1) for the land use. The remedy also includes Institutional Controls in the form of an Environmental Easement which prevent the site from being used for a community garden or other unrestricted use. However, under a restricted residential use, community vegetable gardens may be considered with Department approval.

COMMENT 5: *Why would a cleanup be different for a single family home compared to a school? Why would a school be defined as restricted residential instead of unrestricted?*

RESPONSE 5: Single family homes fall under both the residential and unrestricted use category as defined in 6 NYCRR part375-1.8(g)(2). A school, in addition to the unrestricted and residential use categories, is also allowable under the restricted residential use definition. Each of these uses is based on the same assessment and calculation of potential human health exposures (i.e. inhalation of soil vapor, incidental ingestion of soil, and dermal contact with soil) in determining the soil cleanup objectives (SCOs). The difference between the SCOs for these uses is that the restricted residential use prohibits vegetable gardens unless constructed using residential SCO level soil, residential use prohibits producing animal products for human consumption (farms), and unrestricted allows any use. All three allow for active recreational

use, such as playgrounds or playing fields, which would be the most likely contact with the exposed surface soil at a site to be used as a school.

COMMENT 6: *Why would there continue to be the potential for soil vapor exposure if the site is covered with clean fill and a building cap?*

RESPONSE 6: Some contaminated insulating materials will remain within the building's floor. Also, contamination will be present in groundwater and soil while remedial measures, such as soil vapor extraction, are implemented. These chemicals may migrate into the on-site building through soil vapor intrusion. The "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" states: "The phrase "soil vapor intrusion" refers to the process by which volatile chemicals migrate from a subsurface source into the indoor air of buildings. Soil vapor, also referred to as soil gas, is the air found in the pore spaces between soil particles." Although the contamination may be adequately covered to prevent direct contact, the potential for soil vapor intrusion to occur still exists. Therefore the selected remedy includes an SSDS to address this potential for soil vapor intrusion.

COMMENT 7: *How is the site use monitored/enforced under the Institutional Controls? How can the community be assured that the owner won't use the site for a higher use?*

RESPONSE 7: The environmental easement provides for use restrictions and/or the prohibition of activities at the site that are inconsistent with the engineering controls. The easement becomes an enforceable part of the remedy which requires the implementation of the Site Management Plan to ensure proper long-term protection of public health with respect to exposure to any contamination remaining at the site. The responsible party or owner is required to periodically file a remedy review report with the Department (known as a Periodic Review Report). Under the terms of the easement and in accordance with 6 NYCRR Part 375-1.11(d), any proposal by the owner to sell the property, or modify the use of the site from that set forth in the Record of Decision, the person(s) proposing the change must make notification to the Department. The notification must include an explanation as to how the change might affect the site's remedial program. After reviewing the proposed use change, the Department may make a new determination whether the remedial program remains protective of public health and the environment. If the Department determines that the change in use will result in the remedy not being protective, it will require that the remedial action be modified to remain protective.

COMMENT 8: *Why are so many schools being placed at sites that require clean up under the BCP program with a restricted residential cleanup where clean fill and/or a floor slab are used as the final cover?*

RESPONSE 8: As defined in 6 NYCRR Part 375-1.8(g), a site remediated under any of the Department's remedial programs for restricted residential use can be used for a school. See response no. 5, above.

COMMENT 9: *What were the outdoor (ambient or background) concentrations of the contaminants of concern at the time of the indoor air sampling?*

RESPONSE 9: Outdoor ambient air samples were collected during the soil vapor intrusion investigation conducted in 2009. These results are presented in Table 11 of the Remedial Investigation Report. The results indicate a range of concentrations from non-detectable to 2.4 ug/m³, which is within the range that is typical of background concentrations in New York City.

COMMENT 10: *Was the groundwater ever sampled in the vicinity of soil-gas sampling point SG-28?*

RESPONSE 10: Although no groundwater samples were collected in the immediate vicinity of SG-28, groundwater flows away from SG-28 towards the site, so there was no need to sample there. However, there are two monitoring wells (MW-13s and MW-13d) located approximately 150 feet northwest of SG-28; and two monitoring wells (M-4s and M-4d) located approximately 300 feet northeast of SG-28. Groundwater sampling results from the 2007 and 2009 sampling events did not detect any exceedances of groundwater standards for chlorinated solvents in any of these monitoring wells.

COMMENT 11: *Was indoor air or sub-slab soil sampling ever conducted in any of the residential buildings to the south of the site?*

RESPONSE 11: No sub-slab or indoor air sampling was performed in the residential buildings. Based on the groundwater flow direction and the contaminant concentrations identified in soil and groundwater, sub-slab and indoor air sampling was conducted in the on-site building and in the Armory located north of the site during the Remedial Investigation.

The following written comments were received from WE ACT (3/3/11) and from the Center for Public Environmental Oversight (3/18/11):

COMMENT 12: *Of the 5 alternatives that DEC has considered, it has selected Alternative 4 (Treatment Plus Partial Insulation Removal) instead of Alternative 5 (Removal plus Treatment for Unrestricted Use). The preferred alternative would require institutional controls. Alternative 5 would cost twice as much, a difference of \$2.8 million. The savings do not seem to justify leaving contamination in place and restricting use particularly because (as is typical in these proposals) expenses beyond 30 years are entirely discounted. Yet we know that people will be living and working in the area well beyond 30 years. In addition, in reviewing the Proposed Plan and the Remedial Investigation, we were not convinced that the contaminated insulation material is not the source of continuing releases of volatile organic compounds into the subsurface.*

RESPONSE 12: The selected remedy will allow for restricted residential use of the site, which would allow a school, apartments, or other similar uses. The only use that would not be allowed under the selected remedy would be single-family houses or farms. Furthermore, the remedy will result in removal of the bulk of the contaminated insulation material, thus addressing the commenter's concern that the insulation continues to act as a source for downward migration of contaminants. Also see Response 3.

COMMENT 13: *DEC and the New York State Department of Health (DOH) have concluded*

that vapor intrusion is not a problem at the Armory property, just north of the site, despite the presence of PCE in sub-slab soil gas at 36 $\mu\text{g}/\text{m}^3$ and adjacent sidewalk soil gas as high as 6700 $\mu\text{g}/\text{m}^3$. The highest indoor air concentration reported was 1.5 $\mu\text{g}/\text{m}^3$. This is far below New York DOH's PCE indoor air action level of 100 $\mu\text{g}/\text{m}^3$, but it lies between the levels used by U.S. EPA and many other states for residential uses and the level used for non-residential occupancy. We believe indoor PCE concentrations are high enough, particularly given the high soil gas concentrations immediately adjacent to the Armory, to merit additional study if not mitigation directly.

RESPONSE 13: Since contaminated soil vapor migrated to the north sidewalk of 142nd Street, a soil vapor intrusion investigation was conducted in the Armory. Three sub-slab soil vapor samples and three indoor air samples were collected. Tetrachloroethene was detected up to 31 $\mu\text{g}/\text{m}^3$ in sub-slab soil vapor and up to 1.5 $\mu\text{g}/\text{m}^3$ in indoor air. These concentrations indicate that no further action is needed in the armory at this time. However, soil vapor monitoring is part of the selected remedy. Soil vapor monitoring will help us evaluate the effectiveness of the remedy for controlling soil vapor migration off-site and verify that off-site soil vapor levels are decreasing. If monitoring indicates that additional sampling is needed we will consider it. Please see our response to Comment 15 below.

COMMENT 14: *There has been no indoor air or sub-slab sampling at the residential buildings (Delano Village) immediately to the south of the site, despite significantly elevated levels of PCE in soil gas at the south-sidewalk monitoring points. In particular, the soil-gas well at the corner of Chisum and 141st St. showed PCE at 1200 $\mu\text{g}/\text{m}^3$. This high soil-gas reading does not necessarily demonstrate that there are high levels of PCE indoors, but it clearly calls for indoor air and sub-slab sampling. If soil-gas levels under any of the nearby buildings approach the 1200 $\mu\text{g}/\text{m}^3$ level, New York's current Vapor Intrusion Matrix 2... would require mitigation. Furthermore, there are no groundwater monitoring wells at that corner that might be used to delineate the edge of the site's groundwater plume.*

RESPONSE 14: The referenced soil vapor concentration of 1200 $\mu\text{g}/\text{m}^3$ was detected at SG-28, a sampling point which is located the farthest from the identified source of contamination. There are also soil vapor sample locations with lower concentration of PCE located between the source area and the SG-28 sampling location. It is not believed that this anomalous soil vapor concentration at SG-28 is related to the site contamination because it is located hydraulically upgradient from the source, and may be related to an unknown upgradient source. However, during the remedial design phase, the Department will require the collection of additional soil vapor samples in the vicinity of SG-28 to better define the source of the elevated levels of PCE at this location. Following review of the results of the additional soil vapor sampling, NYSDOH will determine whether sub-slab and indoor air sampling is needed in the residential buildings.

COMMENT 15: *DOH's indoor air action level is based on the assumption that PCE is not a carcinogen, so its PCE exposure standard (of 100 $\mu\text{g}/\text{m}^3$ or 30 $\mu\text{g}/\text{m}^3$) is much less protective than EPA's Regional Risk Screening Level (for 10^{-6} excess lifetime cancer risk) of .41 $\mu\text{g}/\text{m}^3$ for residential uses and about 2 $\mu\text{g}/\text{m}^3$ for non-residential uses. Furthermore, in July 2008 EPA published a draft toxicological review that could lower the levels to .1 and .5 respectively $\mu\text{g}/\text{m}^3$. Since outdoor air in New York City is generally above the RSL, the effective action level would*

be background. (One cannot normally lower indoor air concentrations of contaminants below what is found outside.)

In December 2009, 30 New York state organizations wrote the DOH requesting that the state's PCE indoor air exposure standard be brought into line with EPA's. In response, DOH reported that it planned to revisit its standard in 2010, but we have seen nothing. Meanwhile, [Armory] building occupants may be exposed, without response, to levels approaching what would not be permitted in several other states. In the absence of state review, we urge you to use EPA's Regional Risk Screening Level (for 10^{-6} excess lifetime cancer risk) of $.41 \mu\text{g}/\text{m}^3$ for residential uses and about $2 \mu\text{g}/\text{m}^3$ for non-residential uses.

RESPONSE 15: The current NYS air guideline for tetrachloroethene is $100 \mu\text{g}/\text{m}^3$ and was derived after consideration of the potential for non-cancer and cancer effects from long-term exposures. The air guideline is currently under review and may be revised. The preparation and review of a guideline is complex and lengthy process and we do not know when it will be complete.

The current guideline is not a "bright line" between air levels that cause health effects and those that do not. The guideline is lower than the air levels that caused non-cancer or cancer effects and is based on the assumption that people are continuously exposed to tetrachloroethene in air all day, every day for as long as a lifetime. This is rarely true for most people, who are more likely to be exposed for a part of the day and part of their lifetime.

The guideline is not an "action level" to determine whether or not remedial actions are taken to address exposure. Remedial actions may be recommended at much lower air levels. In fact, the NYS DOH recommends that reasonable and practical actions be taken to reduce exposure to tetrachloroethene when indoor air levels are above background levels, even when they are below the guideline of $100 \mu\text{g}/\text{m}^3$. Commonly found concentrations of chemicals in indoor and outdoor air are referred to as "background concentrations." These concentrations are generally determined from the results of samples collected in homes, offices and outdoor areas not known to be affected by external sources of chemicals (for example, a home not known to be near a chemical spill, a hazardous waste site, a drycleaner, or a factory).

The NYSDOH's guideline of $100 \text{ mcg}/\text{m}^3$ for PCE in air does not determine whether actions are taken to address exposures related to soil vapor intrusion. The guideline is used to help guide decisions about the urgency and nature of the actions to reduce exposures. In addition, the Risk Screening Levels noted in the comment are not action levels or cleanup guidelines, they are merely screening levels to determine if further investigations or actions are necessary.

Finally, the three indoor air concentrations ranged from 0.97 to $1.5 \mu\text{g}/\text{m}^3$. All these concentrations are within the concentration ranges considered to be 'background levels' from studies conducted where there are no known sources of environmental contamination or in residences unaffected by subsurface vapor intrusion. As such, these concentrations (in conjunction with the sub-slab vapor results) do not warrant further action.

The following written comments were received from the Mr. Lenny Siegel of Center for Public Environmental Oversight (3/18/11):

COMMENT 16: *Particularly because of the history of this site, the state of New York should act promptly to conduct full remediation and to fully characterize the potential for soil vapor exposure to the occupants of nearby properties.*

RESPONSE 16: The remedial actions for the site have been selected after careful consideration of all the factors necessary to remediate the site in a manner that is protective of public health and the environment. Also see Response 14.

The following written comments were received from Mr. John Bee of Tapash (3/20/11):

COMMENT 17: *We note the Remedial Investigation and Remedial Action has fallen well behind schedule. The cleanup of the solvent vapor intrusion into 2350 Fifth Avenue has been delayed six years. The present soil vapor extraction system (SVE system) has proved to be ineffective: because the source of the solvent under the building remains.*

- *The vapor intrusion will not be addressed in an effective manner by soil vapor extraction alone*
- *The present vapor extraction system is inefficient and will not deliver a timely and permanent cleanup when a contaminated source remains.*
- *Source Removal (Mitigation) and treatment is needed in conjunction with vapor extraction*

RESPONSE 17: The existing shallow vapor extraction system/sub-slab vapor extraction system was installed as an Interim Remedial Measure to mitigate soil vapor intrusion into the occupied (at the time) portion of the building. The IRM was not intended to be the final remedy. The comprehensive remedy outlined in the ROD, which encompasses source material removal and treatment, is intended to be the final remedy for the site.

COMMENT 18: *We propose that AKRF shall:*

- *Sample the soils under the floor slab and around SG-7 for treatability testing*
- *Further investigate the building foundation and structure*
- *Then remove all the solvent in the insulation between the various subfloors and excavate the contaminated soil beneath the building – removing the source. This is the only way to clean up the spill and the vapor intrusion in our lifetime and provide an unrestricted use for the property – returning it the school use as much needed PS 141 for which it was renovated with \$3 million tax payer's dollars.*

RESPONSE 18: Samples collected during the various phases of the remedial investigation have identified the nature and extent of contaminated insulation material between the floor slabs, as well as the soil, groundwater and soil vapor contamination beneath the bottom slab. Furthermore, core samples collected during the RI have identified the various structural differences among the main building components. The proposed remedy will require removal of the bulk of contaminated insulation material. In addition, the remedy proposes treatment of the contaminated soils beneath the building, thus addressing the source material. The remedy will allow the site to be used as a school. Also see Response

COMMENT 19: *However, high concentration of vapor was detected outside the building under the sidewalk of West 142nd Street with 332,000 ug/m³ (ppb) Tetrachloroethylene in SG-7 indicating the Vapor Intrusion is leaving the site in a northerly direction. This is [sic] above the [sic] solubility limit for Tetrachloroethylene so undoubtedly there is DNAPL present that should be investigated. These concentrations of solvent are typical of soils with an insoluble separate phase of pure solvent (DNAPL) still in the formation. This suspected DNAPL may not follow the groundwater flow and appears to be headed north towards the Armory foundations.*

RESPONSE 19: Soil vapor concentrations at location SG-7 were recorded at 332,000 ug/m³ in January 2008, and at 180,000 ug/m³ in December 2009. (It should be noted that the concentration ug/m³ does not have a direct correlation to parts per billion, or ppb, as it is stated by the commenter.) Groundwater and soil samples collected from the immediate vicinity of SG-7 identified low to moderate concentrations of contaminants (maximum concentration in soil is 79 ppb, maximum concentration in groundwater is 90 ppb). These concentrations do not approach the solubility limit (which applies to groundwater, but not to soil vapor). None of the more than 150 soil and groundwater samples collected during the various phases of investigation have identified concentrations which suggest a source of mobile DNAPL exists at the site.

COMMENT 20-: *The Sensitivity [sic] Receptor Report completed by Toxics Targeting on March 14, 2008 was included in the RIR by AKRF but was incomplete and cursory and needs to be redone. Of particular concern was the potential exposure to occupants of the Harlem Armory to a vapor intrusion on the north side of the source area at the subject site 2350 Fifth Avenue and the residential Blocks to the south. The concern at the Armory was investigated in 2009 and trace levels of solvent were found.*

RESPONSE 20: The Sensitive Receptor Report prepared by Toxics Targeting identified sensitive receptors as people that may have a significantly increased sensitivity or exposure to contaminants by virtue of their age and health (e.g., schools, day care centers, hospitals, nursing homes), proximity to the contamination, dwelling construction (e.g., basement), or the facilities they use (e.g., water supply well). The survey did not include residential buildings. However, AKRF did identify both the Armory and Delano Village as being sensitive receptors (see Section 1.3 of the RI Report). As a result of their identification as sensitive receptors, soil vapor sampling was conducted around the perimeter of the site. Results from that sampling effort, coupled with groundwater sampling data, indicated that the Armory may be subject to soil vapor intrusion. Sub-slab and indoor air samples were collected in the Armory and were compared to the NYS DOH's guidance, which indicated that no mitigation or monitoring is required for that building. As mentioned in Responses 14 and 16, above, the potential for SVI in the Delano Village buildings will be evaluated during the Remedial Design phase.

COMMENT 21: *However, it is noted that during the original investigation high solvent readings were detected in the air in the janitor's closet and 100,000 ppb Tetrachloroethylene was analyzed in the cork at 10" deep in boring C-6. To our knowledge this insulation under the Cafeteria and Kitchen of the School area has yet to be removed.*

RESPONSE 21: The insulation material at coring location C-6 is to be removed as part of the selected remedy, along with other areas where high concentrations of contaminants were identified in the insulating materials.

APPENDIX B

Administrative Record

Administrative Record

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

Proposed Remedial Action Plan for the 2350 Fifth Ave., New York (AKA, PS 141) site, dated February 2011, prepared by the Department.

Order on Consent, Index No. W2-0792-98-07, between the Department and 2350 Fifth Avenue Corporation, executed on March 30, 2001.

1. "Preliminary Site Assessment Report" - March 1998, Prepared by AKRF Engineering, P.C.
2. "Interim remedial Measures Work Plan" – April 2001, Prepared by AKRF Engineering, P.C
3. "Citizen Participation Plan" –Revised January 2011, Prepared by AKRF, Inc.
4. "Draft Remedial Investigation Report" – June 2008, Prepared by AKRF, Inc.
5. "Remedial Investigation Report" – June 2010, Prepared by AKRF, Inc.
6. "Feasibility Study " – March 2011, Prepared by AKRF Engineering, P.C.
7. "Testimony to DEC on Remediation of PS 141" – March 3, 2011, Prepared by Peggy Shepard, Executive Director of West Harlem Environmental Action (WE ACT)
8. Letter dated March 18, 2011 from Lenny Siegel (Center for Public Environmental Oversight) and Vernice Miller-Travis (Co-Founder of WE ACT, and Vice-Chair of Maryland Commission on Environmental Justice and Sustainable Communities)
9. E-mail dated March 20, 2011 from John Bee (Tapash) – note that this e-mail included an unsolicited work plan, which is not addressed in the Responsiveness Summary and was not included in the Administrative Record.



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Testimony To DEC on Remediation of PS 141

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Hope K. Plasha
Regina Smith

Executive Director

Peggy M. Shepard

Good Evening. My name is Peggy Shepard, and I am Executive Director of West Harlem Environmental Action known as WE ACT. Back in 1997, I was one of only 2 very prescient people in NYC who attended a meeting of School Board 6 in Washington Heights and urged the School Board to vote no on sending 5-year olds into PS 141, the Toxic School. However, Suzanne Mattei then with the Public Advocate's Office, and I were not successful in getting the school board to think more critically about the School Construction Authority's declaration that there would be no negative impact. Fortunately, the Public Advocate's Office was able to demand that ongoing air monitors be installed, and so, a few weeks later, the children were evacuated from the school due to vapor intrusion of PCE emissions in the cafeteria.

Now there is an opportunity to remediate this property where wastes have contaminated the soil, groundwater, and soil vapor at the site, a significant threat to public health and the environment. So this must be done well with attention to the vapor intrusion issues affecting the Armory and nearby residential buildings.

On-Site Remedy

Of the 5 alternatives, that DEC has considered, it has selected Alternative 4 (Treatment Plus Partial Insulation Removal) instead of Alternative 5, (Removal plus Treatment for Unrestricted Use). Alternative 5 would cost twice as much, a difference of \$2.8 million. I do not believe the savings justify leaving contamination in place and restricting use. Let's have a cleanup that allows the site's use for facilities that would house children and families.

Armory Property

The agencies have concluded that vapor intrusion is not a problem at the Armory property, just north of the site, despite the presence of PCE in sub-slab soil gas at $36 \mu\text{g}/\text{m}^3$ and adjacent sidewalk soil gas as high as $6700 \mu\text{g}/\text{m}^3$. The highest indoor air concentration reported was $1.5 \mu\text{g}/\text{m}^3$. This is far below New York DOH's PCE indoor air action level of $100 \mu\text{g}/\text{m}^3$, but it lies between the level used by EPA and many other states for residential uses and the level used for non-residential occupancy. (See below.) I believe indoor PCE concentrations are high enough, particularly given the high soil gas concentrations immediately adjacent to the Armory, to merit additional study.

Residential Property

There have been no indoor air or sub-slab sampling at the residential buildings immediately to the south of the site, despite significantly elevated levels of PCE in soil gas at south-sidewalk monitoring points. In particular, the soil-gas well at the corner of Chisum and 141st St. showed PCE at $1200 \mu\text{g}/\text{m}^3$ (micrograms). There are no groundwater monitoring wells at that corner.

This high soil-gas reading does not necessarily demonstrate that there are high levels of PCE indoors, but it clearly calls for indoor air and sub-slab sampling. If soil-gas levels under any of the nearby buildings approach the $1200 \mu\text{g}/\text{m}^3$ level, then indoor air concentrations could exceed an unacceptable $20 \mu\text{g}/\text{m}^3$.

NYC's PCE Standard

Currently, the New York Department of Health does not recognize PCE as a carcinogen, so its PCE exposure standard (of $100 \mu\text{g}/\text{m}^3$ or $30 \mu\text{g}/\text{m}^3$) is much less protective than EPA's Regional Risk Screening Level (for 10^{-6} excess lifetime cancer risk) of $.41 \mu\text{g}/\text{m}^3$ for residential uses and about $2 \mu\text{g}/\text{m}^3$ for non-residential uses. Furthermore, in July 2008 EPA published a draft toxicological review that could lower the levels to .1 and .5 respectively $\mu\text{g}/\text{m}^3$. Since outdoor air in New York City is generally above the RSL, the effective action level would be background. (One cannot normally lower indoor air concentrations of contaminants below what is found outside.)

In December 2009, 30 New York state organizations wrote the DOH requesting that the state's PCE indoor air exposure standard be brought into line with EPA's. In response, DOH reported that it planned to revisit its standard in 2010. Meanwhile, in February 2010 the National Academies issued a report reinforcing EPA's findings that PCE causes cancer and nervous system disorders. EPA has not yet finalized its toxicological review.



CENTER FOR PUBLIC ENVIRONMENTAL OVERSIGHT

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March 18, 2011

Bryan Wong
NYS Department of Environmental Conservation (DEC)
Division of Environmental Remediation
Hunters Point Plaza 47-40 21st Street
Long Island City, NY 11101

Dear Mr. Wong,

We welcome the opportunity to comment on the Proposed Remedial Action Plan for 2350 Fifth Avenue, New York, New York. This site has a history of unacceptable environmental exposures to highly toxic substances, and the evidence suggests that such exposures may be continuing to this date. While we appreciate the level of effort that has gone into studying this site, we find the both the proposed remedy and extent of investigation inadequate. In particular, very little has been done to determine if the thousands of people who live in the immediate area have been or continue to be exposed to cancer-causing compounds from the site.

Background

In the early 1960s 2350 Fifth Ave. operated as a Borden's ice cream factory and distribution center. Because of this use, the building contains an unusual amount of insulating material such as cork and styrofoam. Some time in the mid-1960s Borden's vacated the site. It then became the location of an industrial laundry and dry-cleaning facility, which operated continuously from 1970 to 1994. This facility appears to be the source of large quantities of perchloroethylene (PCE), which not only spread into the soil and groundwater in the area, but which also remain in the building's insulation.

Community residents had no inkling that there could be environmental contaminants that threaten human health and the environment at this site (and to a large extent they remain relatively uninformed) until the New York City Board of Education leased this property in 1999 and turned it into additional classroom space for pre-kindergarten through fourth-grade students in 2000. Over the objections of West Harlem Environmental Action, the Natural Resource Defense Council, and the Office of the Public Advocate, vulnerable children were placed in confined classroom spaces inside 2350 Fifth Ave. In short order—October, 2000—they were permanently emergency-evacuated out of the building, after indoor air monitors showed dangerous levels of PCE vapors in the school.

Directly across Chisum Place and West 141st Street sits Delano Village, a Mitchell-Lama housing development of six buildings, each containing 17 stories and 323 apartment units. The housing complex spans West 139th to West 141st streets from Lenox to Fifth Avenues. The approximate population of this housing complex is 4,000 people. Delano Village was a part of the City and State of New York's urban renewal housing program. It replaced hundreds of tenement row houses in the Central Harlem community.

Within the Delano Village complex are several playgrounds that have been continuously filled with thousands of children who spent their entire childhoods playing over the fifty-year life of this housing complex. Each of the six buildings contains three elevators that have moved people from the basement to 18th floors continuously over the fifty-plus years that these buildings have existed.

On the western side of the same block on Lenox Avenue is the Minisink camp facility, which ran youth-based community activities for decades. Their activities included drum-and-bugle corps, boy and girl scouts, and after-school and summer day-camp programs.

Directly across the street from 2350 Fifth Avenue, also on Fifth Avenue sits Riverbend Houses, an apartment complex that houses another approximately 1,000 persons.

Because of the narrowing geography of this section of Northern Manhattan, and the designed land-use patterns, a large number of housing developments, where thousands of people have resided for forty to fifty years, are located in close proximity to 2350 Fifth Avenue. Many of the seniors in the area have lived alongside this site for decades. Many have likely been exposed to cancer-causing substances, originating in this innocuous-looking building, since the opening of the dry-cleaning operation.

2350 Fifth Avenue is surrounded by housing and community-use facilities where vulnerable populations of senior citizens and children have lived and played in close proximity to this site for decades. It is therefore essential that there be more comprehensive investigation of off-site contamination, as well as more aggressive remediation of the on-site sources.

On Site

DEC proposes Alternative 4, Treatment Plus Partial Insulation Removal, over Alternative 5, Removal plus Treatment for Unrestricted Use. The preferred alternative would require institutional controls. Alternative 5 would cost twice as much, a difference of approximately \$2.8 million. The savings do not seem to justify leaving contamination in place and restricting use, particularly because (as is typical in these proposals) expenses beyond 30 years are entirely discounted. Yet we know that people will be living and working in the area well beyond 30 years. In addition, in reviewing the Proposed Plan and the Remedial Investigation, We were *not* convinced that the contaminated insulation material is *not* the source of continuing releases of volatile organic compounds into the subsurface.

Armory Property

DEC and the New York State Department of Health (DOH) have concluded that vapor intrusion is not a problem at the Armory property, just north of the site, despite the presence of PCE in sub-slab soil gas at $36 \mu\text{g}/\text{m}^3$ and adjacent sidewalk soil gas as high as $6700 \mu\text{g}/\text{m}^3$. The highest indoor air concentration reported was $1.5 \mu\text{g}/\text{m}^3$. This is far below New York DOH's PCE indoor air action level of $100 \mu\text{g}/\text{m}^3$, but it lies between the levels used by U. S. EPA and many other states for residential uses and the level used for non-residential occupancy. We believe indoor PCE concentrations are high enough, particularly given the high soil gas concentrations immediately adjacent to the Armory, to merit additional study if not mitigation directly.

DOH's indoor air action level is based on the assumption that PCE is not a carcinogen. Since DOH made that finding, both U.S. EPA and the National Research Council have found otherwise. DOH committed to revisiting its guidance in 2010, but we have seen nothing. Meanwhile, building occupants may be exposed, without response, to levels approaching what would not be permitted in several other states. In the absence of state review, we urge you to use EPA's Regional Risk Screening Levels (for 10^{-6} excess lifetime cancer risk) of $.41 \mu\text{g}/\text{m}^3$ for residential uses and about $2 \mu\text{g}/\text{m}^3$ for non-residential uses.

Residential Property

There has been no indoor air or sub-slab sampling at the residential buildings in the Delano Village housing, despite significantly elevated levels of PCE in soil gas at 141st St. south-sidewalk monitoring points. In particular, the soil-gas well at the corner of Chisum Place and West 141st St. showed PCE at $1200 \mu\text{g}/\text{m}^3$. If this concentration were found under any of the nearby apartment buildings, New York's current Vapor Intrusion Matrix 2, based upon the state's weak, non-cancer standard, would require mitigation. Furthermore, there are no groundwater monitoring wells at that corner that might be used to delineate the edge of the site's groundwater plume.

We recognize that high soil-gas readings do not necessarily demonstrate that there are high levels of PCE indoors, but to us it clearly calls for indoor air and sub-slab sampling. Particularly because of the history of this site, the state of New York should act promptly to conduct full remediation on site and to fully characterize the potential for vapor exposure to the occupants of nearby properties.

Sincerely,

(submitted electronically)

Lenny Siegel
Executive Director, CPEO

Vernice Miller-Travis
Co-founder, We ACT for Environmental Justice
Resident of Delano Village from 1960-1980
Vice-Chair, Maryland Commission on Environmental Justice and
Sustainable Communities

Yuk Yin Wong - Public Comment 2350 Fifth Avenue -

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Subject: Public Comment 2350 Fifth Avenue -
Attachments: RIR COMMENTS and IRM ACTION WORKPLAN & ESTIMATE.docx

Public Comment 2350 Fifth Avenue - Summary of Remedial Investigation and needed Remedial Action

We note the Remedial Investigation and Remedial Action has fallen well behind schedule. The cleanup of the solvent vapor intrusion into 2350 Fifth Avenue has been delayed six years. The present soil vapor extraction system (SVE system) has proved to be ineffective: because the source of the solvent under the building remains

- The vapor intrusion will not be addressed in an effective manner by soil vapor extraction alone
- The present vapor extraction system is inefficient and will not deliver a timely and permanent cleanup when a contaminated source remains.
- Source Removal (Mitigation) and treatment is needed in conjunction with vapor extraction

We propose that AKRF shall

- Sample the soils under the floor slab and around SG-7 for treatability testing
- Further investigate the building foundations and structure
- Then remove all the solvent in the insulation between the various subfloors and excavate the contaminated soil beneath the building – removing the source. This is the only way to clean up the spill and the vapor intrusion in our lifetime and provide an unrestricted use for the property – returning it the school use as much needed PS141 for which it was renovated with \$3 million tax payer's dollars.

In the original investigation reported May 12, 1997 a map Figure 3 was presented of the soil contamination. The subsurface Tetrachloroethylene contamination centered on C8 (maximum concentration 27,000 ppb, at 1.1 feet, total depth of contamination 0-18 feet); C-3 (maximum concentration 20,000 ppb, at 10.7 feet, total depth of contamination 0-21.7 feet); and C-5 (maximum concentration 100,000 ppb, at 1.2 feet, total depth of contamination 0-10.8 feet). The contamination was centered on the northwest quarter of the building on the approximate location of the former dry cleaning equipment, adjacent to the old loading dock in the rear yard but extended under the whole west side of the building under the kitchen and cafeteria to the present location of the AM SS site office.

After the SVE was shut off, there was a rebound in vapor levels and air quality exceedances in the building compared to NYSDOH indoor air guideline for Trichloroethylene (TCE) in and for Tetrachloroethylene. This rebound in soil vapors entering the building is from the remaining solvent in the insulation under the building

Remedial Investigation.

Soil vapor sampling of the nine permanent soil vapor sampling ports installed through the

concrete floor was completed on January 17-18, 2008. Trace levels of Tetrachloroethylene vapor (below 200 ug/m^3 (ppb)) were found under the southeastern 1/3 of the site. Concentrations of Tetrachloroethylene vapor were found under the remainder of the site between 2000 and 5000 ug/m (ppb).

However, high concentration of vapor was detected outside the building under the sidewalk of West 142nd Street with 332,000 ug/m^3 (ppb) Tetrachloroethylene in SG-7 indicating the Vapor Intrusion is leaving site in a northerly direction. This is above the solubility limit for Tetrachloroethylene so undoubtedly there is DNAPL present that should be investigated. These concentrations of solvent are typical of soils with an insoluble separate phase of pure solvent (DNAPL) still in the formation. This suspected DNAPL may not follow the groundwater flow and appears to be headed north towards the Armory foundations.

The existing Vapor Extraction System is under-designed and ineffective, restricted in its installation to the Northwest quarter of the building. In March 2008, no radius of influence was detected when measuring the vacuum drawn on the nine soil vapor monitoring points through the floor slab and neighboring wells such as M-2. The existing soil vapor extraction system was poorly maintained and ineffective both in reducing Tetrachloroethylene concentrations in the building air and in removing Tetrachloroethylene from the subfloor insulation.

Risk Assessment

A sensitive receptor survey was completed for the site that should have included all sensitive receptors downgradient of the contamination identified at the subject property. The Sensitivity Receptor Report completed by Toxic Targeting on March 14, 2008 was included in the RIR by AKRF but was incomplete and cursory and needs to be redone. Of particular concern was the potential exposure of occupants of the Harlem Armory to a vapor intrusion on the north of the source area at the subject site 2350 Fifth Avenue and the residential Blocks to the south. The concern at the Armory was investigated in 2009 and trace levels of solvent were found

- A Vapor Intrusion exists at the site and contaminated soils and insulation remain under the floor slabs
- The spill has had a significant adverse impact on the site soils and groundwater and has produced a vapor intrusion emanating from the site soils and inter-slab insulation.
- This environmental problem has impeded the best use of the property – as a school
- We believe the vapor intrusion into the Armory warrants further attention
- No vapor intrusion assessment were made in the adjacent residential structures

Remedial Actions Required

- All of the Contaminated Insulation under the Building needs to be Removed: Some of the insulation between the floor slabs and some contaminated soil fill outside the building were removed (cross-hatched area portrayed in the Remedial Investigation Report) in the L-shaped area to the west of the School portion of the building. NYSDEC's background Information indicated the owner had taken out some of the insulation between the floor slabs. However, it is noted that during the original investigation high solvent readings were detected in the air in the janitor's closet and 100,000 ppb Tetrachloroethylene was analyzed in the cork at 10" deep in boring C-6. To our knowledge this insulation under the Cafeteria and Kitchen of the School area has yet to be removed. This can be done by breaking through the floor in each room while maintaining the integrity of the footings with underpinning if necessary.
- We support the installation of a Soil Vapor Extraction ("SVE") system to remediate the contaminated soil beneath the building with VOC contaminated air extracted by the SVE system and treated using activated charcoal or other treatment;
- We support the injection of a chemical oxidation product in the area under the building to
- Additional soil remediation will be achieved where the soil contaminant concentrations are highest;
- We support the installation of a sub-floor depressurization system throughout. This can be installed in the backfill to the excavations to mitigate the potential for soil vapor intrusion;
- We support the In-situ treatment groundwater through injecting a product to enhance reductive dechlorination promoting aerobic degradation of breakdown and protecting the

Armory from the contaminated groundwater moving north.

The one major finding of the RIR Remedial Investigation Report (RIR) for 2350 Fifth Avenue
 - the remaining solvent is primarily concentrated in the cork insulation under the floor of the cafeteria, kitchen and hallway

Estimate for this work –it is a menu and you can choose any or none of the Sections- see attached: Source Removal Estimate

Alternative 1: Removal of the Source in the Insulation under the Floor Slab (cafeteria/kitchen) and SG-7

Breaking thru Existing Wall on Loading Dock	\$39,084
Break Concrete Floor Cafeteria Kitchen	
Break Sidewalk and Install Fence SG-7	\$10,000
Removal of Insulation and	\$7,584
Replacing Wall and Concrete floor	\$14,448
Treatment of Soil	20,000
Disposal of Insulating Material	\$9,240
Subtotal	\$100,356
Plus 10% contingency	\$10,036
	\$110,392

Alternative 2: Removal of the Source in the Insulation under the Floor Slab (cafeteria/kitchen) and SG-7 and Treat the Soil beneath

Breaking thru Existing Wall on Loading Dock	\$39,084
Break Concrete Floor Cafeteria Kitchen	
Break Sidewalk and Install Fence SG-7	\$10,000
Removal of Insulation and	\$7,584
Testing	\$33,300
Chemical Treatment	\$83,500
Replacing Wall and Concrete floor	\$14,448
Disposal of Insulating Material	\$9,240
Subtotal	\$197,156
Plus 10% contingency	\$19,716
	\$216,872

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