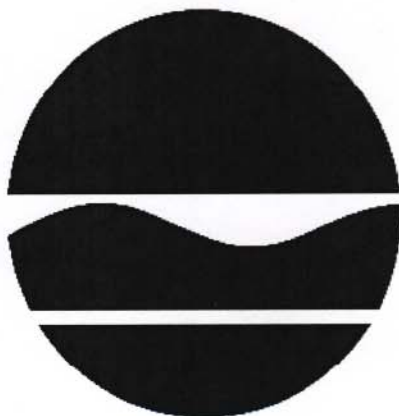


RECORD OF DECISION

Carol Cleaners, Staten Island Mall
State Superfund Project
Staten Island, Richmond County
Site No. 243020
March 2012



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

DECLARATION STATEMENT - RECORD OF DECISION

Carol Cleaners, Staten Island Mall
State Superfund Project
Staten Island, Richmond County
Site No. 243020
March 2012

Statement of Purpose and Basis

This document presents the remedy for the Carol Cleaners, Staten Island Mall 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 Carol Cleaners, Staten Island Mall 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. Remedial Design.

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

A site cover currently exists and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial 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).

3. Vapor Mitigation.

All existing and any new on-site buildings will be required to have a sub-slab depressurization system, or a similar engineered system, to prevent the migration of vapors into the building from soil and/or groundwater.

4. In-Situ Biological Treatment & Monitored Natural Attenuation (MNA).

In-situ biological treatment is a technology used to treat chlorinated ethene compounds (a type of volatile organic compound) in the soil and groundwater. The process injects a biological agent into the groundwater via injection wells. The method of injection and depth of injection is determined by location of the contamination. Biological agents have been chosen over chemical agents as biological agents are safer to handle and consist of food grade materials. Additionally, biological treatment will enhance reductive dechlorination that is already naturally occurring at the Site. Biological agents break down VOCs dissolved in groundwater, sorbed onto aquifer materials and present as free phase product through reductive dechlorination. The VOC molecules break down through the successive removal of chlorine atoms to produce end-product molecules of ethene.

At this site, the biological agent will be applied through injection wells screened to target PCE and its breakdown products.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

5. Institutional Control.

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

- 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);

- allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH, NYCDOH or NYCDEP;
- prohibits agriculture or vegetable gardens on the controlled property; and
- requires compliance with the Department approved Site Management Plan.

6. Site Management Plan.

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 ensure the following institutional and/or engineering controls remain in place and effective:
Institutional Controls: The Environmental Easement as discussed above.

Engineering Controls: The buildings, pavement, sidewalks and the sub-slab depressurization system as discussed above.

This plan includes, but may not be limited to:

- o an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - o descriptions of the provisions of the environmental easement including any land use and groundwater restrictions;
 - o 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;
 - o provisions for the management and inspection of the identified engineering controls;
 - o maintaining site access controls and Department notification; and
 - o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - o monitoring of groundwater, soil and soil vapor to assess the performance and effectiveness of the remedy;
 - o a schedule of monitoring and frequency of submittals to the Department;
 - o monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required by the Institutional and Engineering Control Plan discussed in item a. above.
 - c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
 - o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
 - o maintaining site access controls and Department notification; and
 - o providing the Department access to the site and O&M records.

New York State Department of Health Acceptance

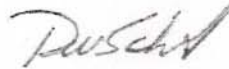
The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

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.

March 28, 2012

Date



Robert W. Schick, P.E., Acting Director
Division of Environmental Remediation

RECORD OF DECISION

Carol Cleaners, Staten Island Mall
Staten Island, Richmond County
Site No. 243020
March 2012

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: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in the responsiveness summary section of the ROD.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:

The site is located in a commercial section of a suburban area. The address is 280 Marsh Avenue in Staten Island, New York. The site is bordered to the north by Ring Road, to the west by Staten Island Mall Drive, to the south by Platinum Avenue and to the east by Marsh Avenue.

Site Features:

The Site consists of a single-story Convenience Center across from a two-story Main Mall building, both collectively known as the Staten Island Mall. The Convenience Center is also known as "The Crossings". The property was developed in the 1970s as a retail shopping mall. The building is a slab-on-grade steel frame and masonry construction.

Current Zoning/Use(s):

The site is currently active and is zoned for commercial use. The site contains 2 active dry cleaning establishments – Carol Cleaners and the Tumble Dry Laundry Center. Nearby parcels of land are used for residential and commercial purposes, with the nearest residences located approximately 500 feet to the north and east of the site.

Historic Use(s):

The property was developed in the early 1970s in three separate phases as a retail shopping mall (the Staten Island Mall). The portion of the building where Babies R Us, SI Shoe Repair, Carol Cleaners, Mon Amie Nails and Carvel retail spaces are situated was constructed during the initial phase in the early 1970s. Prior uses that appear to have led to site contamination are the operation of dry cleaners, i.e., Carol Cleaners.

In mid-1995 a limited Phase II subsurface investigation was conducted at the Staten Island Mall-Convenience Center property. The purpose of this investigation was to determine if past operations utilized at the Convenience Center (i.e. Carol Cleaners and Tumble Dry Laundry Center) had impacted the subsurface environment underlying the site. An expanded Phase II investigation was conducted later in 1995. The exact location of the source of contamination was not identified; however, based on the contaminant concentration gradient in groundwater, the source has been identified as being beneath the Carol Cleaners building. This site was added to the Registry of Inactive Hazardous Waste sites in February of 1996.

Site Geology and Hydrogeology:

The encountered depth to ground-water and bedrock ranged from about 8 ft bg to 14 ft bg, and 12 ft bg to 16 ft bg, respectively. The naturally-occurring materials below ground surface consisted mainly of finer grain-size deposits of clay, silt and fine sand followed by bedrock. Groundwater flow is directed toward the southwest, i.e., toward Platinum Avenue.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

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

SECTION 5: ENFORCEMENT STATUS

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

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

Rouse SI Shopping Center, Inc.

GGP Staten Island Mall, LLC

Rouse SI Shopping Center, LLC was identified as a PRP, and entered into an Order on Consent for development and implementation of a remedial program on October 14, 2002. Rouse was subsequently taken over by GGP Staten Island Mall, LLC (successor in interest). On November 4, 2011, GGP entered into a Consent Order with the Department to address violations of Article 27, Title 13, specifically failure to timely submit documents required under the 2002 Order.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

The following general activities are conducted during an RI:

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

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)
TRICHLOROETHENE (TCE)

VINYL CHLORIDE
DICHLOROETHYLENE

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater

6.2: Interim Remedial Measures

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

There were no IRMs performed at this site during the RI.

6.3: 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.

Nature and Extent of Contamination

Based on investigations conducted to date the primary contaminant of concern is tetrachloroethylene, a dry-cleaning solvent also known as perchloroethylene (PCE), which was historically present at concentrations up to 2 ppm in soil, and up to 41,000 ppb (Carol Cleaners July 31st 1995 Groundwater Sampling Summary) in groundwater in the area immediately behind Carol Cleaners. Subsequent groundwater sampling and analysis revealed contaminant concentrations at a fraction of the 1995 levels. PCE up to 11 ppb was detected in groundwater near the Tumble Dry Laundry Center.

The analytical results for the recent groundwater sampling round indicates the PCE concentrations in the immediate vicinity of Carol Cleaners range from 6.9 to 2490 ppb. Site-related contaminants have been detected in downgradient monitoring points located approximately 200 feet from the suspected source area at concentrations of 1650 ppb (PCE) and 89 ppb (TCE).

Sub-slab soil vapor samples collected from the tenant spaces identified elevated concentrations of PCE (maximum concentration of 190 ug/m³) and trichloroethylene, or TCE (maximum concentration of 120 ug/m³). Indoor air samples collected in 2011 from tenant spaces on the downgradient property as part of the investigation for the Pergament Mall/Corniche Dry Cleaners site (site no. 243012) did not detect any PCE or TCE.

6.4: 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*.

Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in the groundwater 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. The 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 for the existing on-site buildings and any buildings constructed at the site in the future. The potential for soil vapor intrusion in off-site buildings is being addressed by a monitoring program for the Pergament Mall/Corniche DRY Cleaners (site #243012). Sampling has indicated that soil vapor intrusion does not represent a health hazard at this site.

6.5: 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 action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: SUMMARY OF THE SELECTED REMEDY

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 Section 6.5. 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 B. 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 C.

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

The selected remedy is referred to as the site cover with groundwater treatment and vapor mitigation remedy.

The estimated present worth cost to implement the remedy is \$204,000. The cost to construct the remedy is estimated to be \$120,000 and the estimated average annual cost is \$7,000.

The elements of the selected remedy are as follows:

1. Remedial Design.

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

A site cover currently exists and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial 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).

3. Vapor Mitigation.

All existing and any new on-site buildings will be required to have a sub-slab depressurization system, or a similar engineered system, to prevent the migration of vapors into the building from soil and/or groundwater.

4. In-Situ Biological Treatment & Monitored Natural Attenuation (MNA).

In-situ biological treatment is a technology used to treat chlorinated ethene compounds (a type of volatile organic compound) in the soil and groundwater. The process injects a biological agent into the groundwater via injection wells. The method of injection and depth of injection is determined by location of the contamination. Biological agents have been chosen over chemical agents as biological agents are safer to handle and consist of food grade materials. Additionally, biological treatment will enhance reductive dechlorination that is already naturally occurring at the Site. Biological agents break down VOCs dissolved in groundwater, sorbed onto aquifer materials and present as free phase product through reductive dechlorination. The VOC molecules break down through the successive removal of chlorine atoms to produce end-product molecules of ethene.

At this site, the biological agent will be applied through injection wells screened to target PCE and its breakdown products.

Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.

5. Institutional Control.

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

- 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);
- allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH, NYCDOH or NYCDEP;
- prohibits agriculture or vegetable gardens on the controlled property; and
- requires compliance with the Department approved Site Management Plan.

6. Site Management Plan.

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 ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement as discussed above.

Engineering Controls: The buildings, pavement, sidewalks and the sub-slab depressurization system as discussed above.

This plan includes, but may not be limited to:

- o an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - o descriptions of the provisions of the environmental easement including any land use and groundwater restrictions;
 - o 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;
 - o provisions for the management and inspection of the identified engineering controls;
 - o maintaining site access controls and Department notification; and
 - o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - o monitoring of groundwater, soil and soil vapor to assess the performance and effectiveness of the remedy;
 - o a schedule of monitoring and frequency of submittals to the Department;
 - o monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required by the Institutional and Engineering Control Plan discussed in item a. above.
 - c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
 - o compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
 - o maintaining site access controls and Department notification; and

- o providing the Department access to the site and O&M records.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media using the latest data available and compares the data with the applicable SCGs for the site. The contaminants of concern are volatile organic compounds (VOCs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, the Restricted Use (Commercial) SCGs identified in Section 6.1.1 are also presented.

Groundwater

Groundwater samples were collected from monitoring wells advanced to bedrock. These samples were analyzed to assess groundwater conditions on and off-site. The results indicate that contamination in groundwater at the site exceeds the SCGs for volatile organic compounds. The results of ground-water sampling and analysis conducted between 1995 and 2011 indicates that groundwater at the site is contaminated with Volatile Organic Compounds (VOCs) at concentrations above NYSDEC ground-water standards, as defined by 6 NYCRR Part 703. The following table reflects the most recent (2011) data.

Table # - Groundwater

Detected Constituents	Concentration Range Detected (ppb) ^a	SCG ^b (ppb)	Frequency Exceeding SCG
VOCs			
Tetrachloroethene	ND-2490	5	14 of 20
Trichloroethene	ND- 1550	5	11 of 20
Cis-1,2-dichloroethene	ND-2300	5	10 of 20
Trans-1,2-dichloroethene	ND- 18.2J	5	1 of 20
Vinyl Chloride	ND- 73.6	2	5 of 20

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

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 primary groundwater contaminants are PCE and its breakdown products: TCE, cis-1, 2-DCE and VC, all associated with the operation of Carol Cleaners. As noted on Figures 1 and 2, based on the groundwater flow direction and distribution of the respective VOCs in ground water at the Site, it is determined that the source of the detected compounds at the monitoring wells is the Carol Cleaners facility. An actual location was not confirmed as the source area but suspicions persist regarding an area in the rear of Carol Cleaners (i.e. parallel to Platinum Avenue) where the only exceedance of a soil RSCO occurred.

Based on the findings of the RI, the past disposal of hazardous waste 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- and trans-1, 2-DCE and VC.

Soil

Soil samples were collected at the site during the RI in 2008 and 2011. These results indicated that tetrachloroethylene (PCE) was the only VOC detected in any of the collected soil samples at a concentration above the Part 375-6.8(a), Unrestricted Soil Cleanup Objectives (UUSCOs)). The detected concentration was 2.05 ppm versus the 1.3 ppm UUSCO, and occurred in only one soil sample that was collected at a depth of about 6-feet below grade (ft bg), just above the encountered local ground-water surface. This boring was installed near the suspected source area, which consisted of an area of broken-up asphalt near the discharge point for a building rooftop storm water leader at the rear of the Carol Cleaners. The 2008 and 2011 RI reports also indicated the generally dominant occurrence of finer-grain overburden materials. The encountered depth to bedrock was approximately 12 to 16 feet below ground surface (bgs). The observed conditions did not indicate any evidence of DNAPL in the overburden or at the bedrock interface at the onsite source areas or elsewhere at the Site. The 2011 supplemental RI included collection of ten (10) soil samples off-Site beneath Platinum Avenue. The analytical results for the respective soil samples did not indicate the occurrence of any of the CVOCs at concentrations in exceedance of the respective NYSDEC SCGs. No evidence of DNAPL was encountered at any of the boring locations.

Table # - Soil

Detected Constituents	Concentration Range Detected (ppm) ^a	Unrestricted SCG ^b (ppm)	Frequency Exceeding Unrestricted SCG	Groundwater Protection SCG ^c (ppm)	Frequency Exceeding GW Protection SCG
VOCs					
Tetrachloroethene	ND to 2.05	1.3	1 of 23	1.3	1 of 23
Trichloroethene	ND to ND	0.47	None	0.47	None
Cis-1,2-dichloroethene	ND to .0045J	0.25	None	0.25	None
Trans-1,2-dichloroethene	ND to ND	0.19	None	0.19	None
Vinyl Chloride	ND to ND	0.02	None	0.02	None

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

The primary soil contaminant is PCE, which is the only contaminant found above the SCGs. This sample was taken at a location 6 feet below ground. While soil conditions directly beneath the buildings were not confirmed by sampling due to technical constraints, the source of the groundwater contamination may be inferred by observation of the plume maps and interpretation of the soil and groundwater data. TCE is associated with the operation of dry cleaners.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which is considered to be the primary contaminants of concern, to be addressed by the remedy selection process are PCE, TCE, and DCE.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures, and indoor air inside structures. At this site, due to the presence of buildings in the impacted area, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

The results of the indoor air and sub-slab soil vapor sampling summarized in the RI report indicated that CVOCs have impacted the indoor air in the Convenience Center. The areas where indoor air impacts appear to be greatest are generally coincident with areas corresponding to the nearby groundwater plume (see Figure 3).

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are, PCE and its breakdown product TCE.

Exhibit B

Description of Remedial Alternatives

The following alternatives (for soil, groundwater and soil vapor respectively) were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Soil

Alternative S1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative S2: Cover System with Site Management

A site cover currently exists and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial 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). This alternative also includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site. Implementation of this alternative provides for maintenance of the existing surface cover and limiting disturbance of the area during any future construction or Site redevelopment activities.

Present Worth: \$11,000
Capital Cost: \$5000
Annual Costs: \$500

Alternative S3: Excavation

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include excavation of all soils exceeding UUSCOs to a depth of approximately 6 feet below ground surface (bgs).

Present Worth: \$300,000
Capital Cost: \$0
Annual Costs: \$300,000

Groundwater

Alternative GW1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative GW2: In-Situ Treatment and Monitored Natural Attenuation

Monitored natural attenuation and in-situ treatment are carried through jointly in order to monitor changes in the CVOC plume, the rate of degradation, and track the progress of the remediation. This alternative could be protective of public health and the environment if pilot testing indicated Site conditions were favorable.

In situ treatment involves the injection of chemical or biological agents into the groundwater to treat VOC-impacts. Biological agents are chosen over chemical agents as biological agents are safer to handle and consist of food grade materials, additionally; biological treatment does enhance reductive dechlorination that is already naturally occurring at the Site. Biological agents break down VOCs dissolved in groundwater, sorbed onto aquifer materials and present as free phase product through reductive dechlorination. The VOC molecules break down through the successive removal of chlorine atoms to produce end-product molecules of ethene and ethane. For the purpose of this discussion sodium lactate will be the amendment evaluated. At this site, the biological agent would applied through injection wells to target PCE, TCE, DCE and VC. Prior to the full implementation of this technology, laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters. It is estimated that the chemical oxidant would be injected during 1 event.

<i>Present Worth:</i>	<i>\$130,000</i>
<i>Capital Cost:</i>	<i>\$70,000</i>
<i>Annual Costs:</i>	<i>\$5,000</i>

Alternative GW3: Air Sparge/Soil Vapor Extraction and Pump and Treat

Groundwater pump and treat and AS/SVE are carried through jointly to address both residual soil impacts and groundwater plume control and treatment.

Air sparging is an in-situ technology used to treat groundwater contaminated with VOCs. The process physically removes contaminants from the groundwater by injecting air into a well that has been installed into the groundwater. As the injected air rises through the groundwater it volatilizes the VOCs from the groundwater into the injected air. The VOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a soil vapor extraction (SVE) system is used to remove the injected air. The SVE system pulls a vacuum on wells that have been installed into the vadose zone to remove the VOCs along with the air introduced by the sparging process. The air extracted from the SVE wells is then run through activated carbon (or other air treatment as applicable) which removes VOCs from the air before it is discharged to the atmosphere.

Pump and treat (or Extraction and Treatment) is used for groundwater plume control and treatment and involves actively pumping the CVOC-impacted groundwater out of the subsurface for treatment, likely via carbon

adsorption. Extraction and Treatment creates a depression in the water table so that contaminated groundwater is directed toward pumping wells within the plume area. The groundwater extraction system is designed so that the capture zone is sufficient to cover the lateral extent of the area of concern. The total number of extraction wells are determined during the pilot test and the design. Both free product (if present) and groundwater are collected during recovery operations. A variety of methods may be used to treat the extracted groundwater which includes, but is not limited to, air stripping, granular activated carbon and chemical/UV oxidation.

<i>Present Worth:</i>	\$683,000
<i>Capital Cost:</i>	\$300,000
<i>Annual Costs:</i>	\$35,000

Soil Vapor

Alternative SV1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment. A 'No Action' response for soil vapor does not involve any remedial efforts, therefore this GRA does not mitigate the impacts identified in indoor air at the respective tenant spaces. This alternative does not successfully achieve the RAOs for soil vapor intrusion at the Site.

Alternative SV2: Sub-Slab Depressurization (SSD) System

Any on-site buildings would be required to have a sub-slab depressurization system, or a similar engineered system, to prevent the migration of vapors into the building from groundwater.

<i>Present Worth:</i>	\$63,000
<i>Capital Cost:</i>	\$45,000
<i>Annual Costs:</i>	\$1,500

Exhibit C**Remedial Alternative Costs**

Remedial Alternative	Capital Cost (\$)	Annual Costs (\$)	Total Present Worth (\$)
S1, GW1, SV1 - No Action	0	0	0
S2 - Cover System with Site Management	5,000	500	11,000
S3 - Excavation	300,000	0	300,000
GW2 - In-Situ Treatment and Monitored Natural Attenuation	70,000	5,000	130,000
GW3 - Air Sparge/Soil Vapor Extraction and Pump and Treat	300,000	35,000	623,000
SV2 - Sub Slab Depressurization System	45,000	1,500	63,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department is selecting the following Alternatives for soil, groundwater and soil vapor respectively as the remedy for this site. These alternatives will achieve the remediation goals for the site in the following manner:

Soil

The remedial technology selected for soil is Alternative S2 (Cover System with Site Management). A site cover currently exists and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial 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). The Site Management Alternative requires only institutional controls for the site. This alternative also includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site. An institutional control for soil does not involve any remedial efforts, however implementation of this alternative provides for maintenance of the existing surface cover and limiting disturbance of the area during any future construction or Site redevelopment activities. The cost of this alternative is approximately \$10,000.

Groundwater

The remedial technology selected for groundwater is Alternative GW2: In-Situ Treatment and Monitored Natural Attenuation. Monitored natural attenuation and in-situ treatment are carried through jointly in order to monitor changes in the CVOC plume, the rate of degradation, and track the progress of the remediation. This alternative could be protective of public health and the environment if pilot testing indicated Site conditions were favorable.

Soil Vapor

The remedial technology selected for soil vapor mitigation is Alternative SV2 (Sub Slab Depressurization System). Any on-site buildings will be required to have a sub-slab depressurization system, or a similar engineered system, to prevent the migration of vapors into the building from groundwater.

The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 4.

Basis for Selection

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

Soil

The selected remedy Alternative S2 will satisfy this criterion by providing for the continued maintenance of the existing surface cover and limiting direct contact with contaminated media. Alternative S1 does not provide any protection to public health and the environment and will not be evaluated further. Alternative 3, by removing all soil contaminated above the Unrestricted soil cleanup objective, meets the threshold criteria.

Groundwater

The selected remedy Alternative GW2 will satisfy this criterion by promoting the continued degradation of contaminants in the groundwater. Alternative GW1 does not provide any protection to public health and the environment and will not be evaluated further. Alternative GW3 also meets the threshold criteria.

Soil Vapor

The selected remedy Alternative SV2 will satisfy this criterion by mitigating the indoor air impacts identified in the respective tenant spaces. Alternative SV1 does not provide any protection to public health and the environment and will not be evaluated further.

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.

Soil

Alternatives S2 and S3 both conform to SCGs by addressing the suspected source areas of contamination and complying with the soil cleanup objectives at the surface.

Groundwater

Both Alternative GW2 and Alternative GW3 conform to the SCGs, as these are proven remedial technologies which reduce VOC concentrations in groundwater.

Soil Vapor

Alternative SV2 conforms to the SCGs by mitigating the impacts in indoor air.

Because Alternatives S2, S3, GW2, GW2, and SV2 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. 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.

Soil

Both Alternative S2 and Alternative S3 are considered effective in the long term. However, only Alternative S3 is considered a permanent remedial technology as it removes the impacted soils.

Groundwater

Both Alternative GW2 and Alternative GW3 are considered effective in the long term and permanent if pilot testing indicated that Site conditions were favorable. Reductive dechlorination is naturally occurring at the Site and therefore the effectiveness of Alternative GW2 is expected to be favorable.

Soil Vapor

Alternative SV2 will effectively mitigate impacted soil vapor for as long as the SSD system is required.

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.

Soil

Only Alternative S3 reduces the toxicity, mobility or volume of the contamination in soil.

Groundwater

Both Alternative GW2 and Alternative GW3 will reduce the toxicity, mobility and volume of the contamination in groundwater. As described previously, pilot testing is needed to determine if these alternatives conform to the SCGs and effectively achieve the RAOs for groundwater at the Site.

Soil Vapor

Alternative SV2 reduces the toxicity, mobility and volume of the soil vapor by transferring it into the atmosphere, thereby mitigating the indoor air impacts.

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.

Soil

Alternatives S2 and S3 are effective and viable in the short term as it limits the potential for ingestion and dermal adsorption from soil. However, Alternative S3 excavation activities are disruptive to current Site tenants' operations, and may expose the population to dust, vapors and potentially impacted ground water.

Groundwater

Alternatives GW2 and GW 3 are effective short-term treatment technologies which include longer term monitoring. Alternative GW2 requires the installation of injection points, therefore the short-term impact to the currently exposed population is minimal. Alternative GW3 also requires installation of significant infrastructure for the treatment system, which could potentially expose the public to noise and other short-term impacts, and will require many years of operation.

Soil Vapor

Alternative SV2 is effective and viable in the short term as it immediately mitigates the potential for soil vapor intrusion into the respective tenant spaces. There is only minimal impact on the currently exposed population from the installation and operation of an SSD system.

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.

Soil

Alternative S2 does not require any technical implementation with the exception of maintenance of the existing cover, Alternative S3 is moderately implementable; however the area is relatively small, and adjoins the mall building proximal to Carol Cleaners. Excavation to the water table would require dewatering, and excavation near the building would require building structural support. Additionally, potential VOC-impacted soil could extend beneath the building footprint which would disrupt tenant operations and again would require structural support. The excavated soils would require disposal and the excavation would need to be filled with 'clean fill'. Local permits including those for dewatering would likely be required. Excavation of the soil impacts would effectively achieve the RAOs for soil, however costs would be high considering how impacts to soil are minimal, localized, and do not appear to be acting as a continuing source for impact to groundwater. Consequently, Alternative S3 will require significantly more technical and administrative implementation associated with potential dewatering, and construction in close proximity to, and possibly beneath, the building footprint.

Groundwater

Alternative GW2 is easily implementable as it only requires installation of injection points, and monitoring of the treatment/MNA can be performed through the existing monitor well network. Alternative GW3 requires significant infrastructure and operation and maintenance (O&M), and is technically and administratively more difficult to implement.

Soil Vapor

Alternative SV2 is both technically and administratively implementable. The infrastructure required for an SSD system is minimal and, once installed, the system will run without the need for significant operation and maintenance.

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.

Soil

Alternative S2 has a low cost, but the contaminated soil would not be addressed other than by institutional and existing engineering controls. Given the need for structural support, excavation dewatering, and hazardous waste disposal, Alternative S3 would have the highest present worth cost.

Groundwater

The most cost effective alternative for groundwater is Alternative GW2. In-situ treatment treats the groundwater in place with only the installation of injection points. Alternative GW3 requires infrastructure and long term O&M, which extends the costs over many years.

Soil Vapor

The costs to install and operate Alternative SV2 are relatively low, therefore this is a cost effective alternative for soil vapor intrusion.

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.

As described previously, the Site's current primary use is commercial. The current receptor population includes tenant employees and customers. The anticipated future use of the Site remains commercial, therefore the receptor population will remain the same.

Soil

As there are no plans to change the commercial use of the Site in the near future, Alternative S2 is the best alternative as it does not impact the surrounding population, as does Alternative 3. Alternative S2 also takes into account potential future exposure by limiting disturbance of the area. In the event that land use changes in the future (i.e., construction or redevelopment activities are proposed), Alternative S3 is an option.

Groundwater

The best alternative for the surrounding population is Alternative GW2 as it requires minimal impact to the currently exposed population as compared with the significant infrastructure required for Alternative GW3.

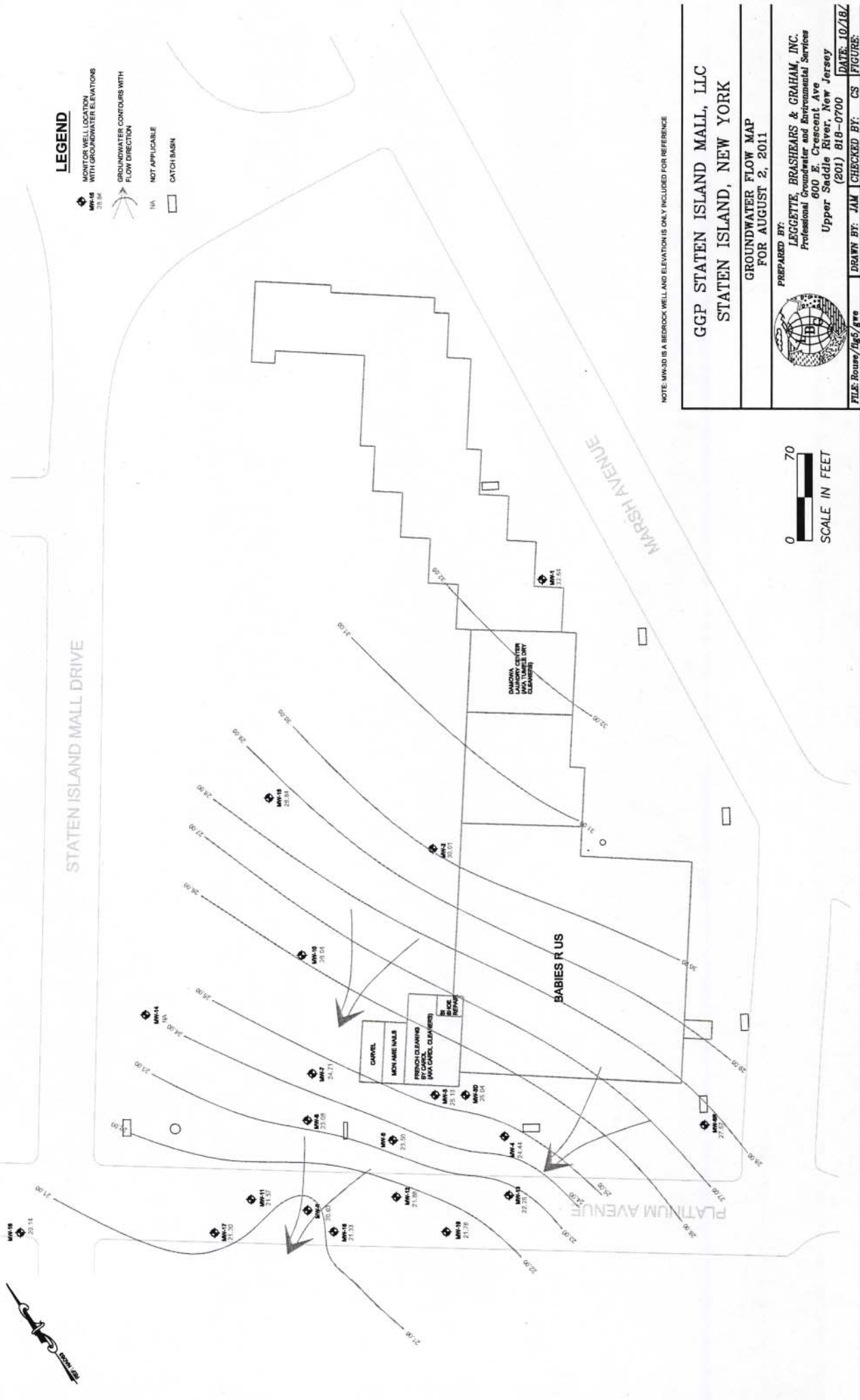
Soil Vapor

Installation and operation of Alternative SV2 requires minimal disruption to the surrounding population and is adequate to mitigate impacts in the breathing zone.

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.

Alternatives S2, GW2 and SV2 are being selected because, as described above, they satisfy the threshold criteria and provide the best balance of the balancing criterion.



LEGEND

- MONITOR WELL LOCATION WITH GROUNDWATER ELEVATIONS
 MW-18 20.14
- GROUNDWATER CONTOURS WITH FLOW DIRECTION
- NA NOT APPLICABLE
- CATCH BASIN

NOTE: MW-30 IS A BEDROCK WELL AND ELEVATION IS ONLY INCLUDED FOR REFERENCE

GGP STATEN ISLAND MALL, LLC STATEN ISLAND, NEW YORK	
GROUNDWATER FLOW MAP FOR AUGUST 2, 2011	
	PREPARED BY: LEGGETT, BRASHEARS & GRAHAM, INC. Professional Groundwater and Environmental Services 800 E. Crescent Ave Upper Saddle River, New Jersey (201) 818-0700
	DATE: 10/18/2011
FILE: Rouse 1105.gxd	DRAWN BY: JAM CHECKED BY: CS



LEGEND

MONITOR WELL
MW-19

PCE CONCENTRATION CONTOURS
(DASHED WHERE INFERRED)

PCE CONCENTRATION
5-50 ug/L

PCE CONCENTRATION
50-500 ug/L

PCE CONCENTRATION
500+ ug/L

WELL	PCE	TCE	CIS-1,2-DCE	VC
MW-1	ND	ND	0.3 J	0.58 J
MW-2	31.9	3.9	ND	ND
MW-3	694	146	115	3.2
MW-4	2,490	894	898	10.2
MW-5	43.3	2.4	0.42 J	ND
MW-6R	ND	ND	ND	ND
MW-7	6.9	0.52 J	ND	ND
MW-8	37.1	0.4	3.2	ND
MW-9	131	21.7	40.1	0.82 J
MW-10	ND	ND	1.1	ND
MW-11	590	84	117	ND
MW-12	145	124	159	3
MW-13	487	90.5	126	3.7
MW-15	ND	ND	ND	ND
MW-16	171	25.6	58.7	1.8
MW-17	1,650	88.7	275	3.7
MW-18	418	99.9	97.5	1.4
MW-19	287	25.4	30.3	ND

0 70
SCALE IN FEET

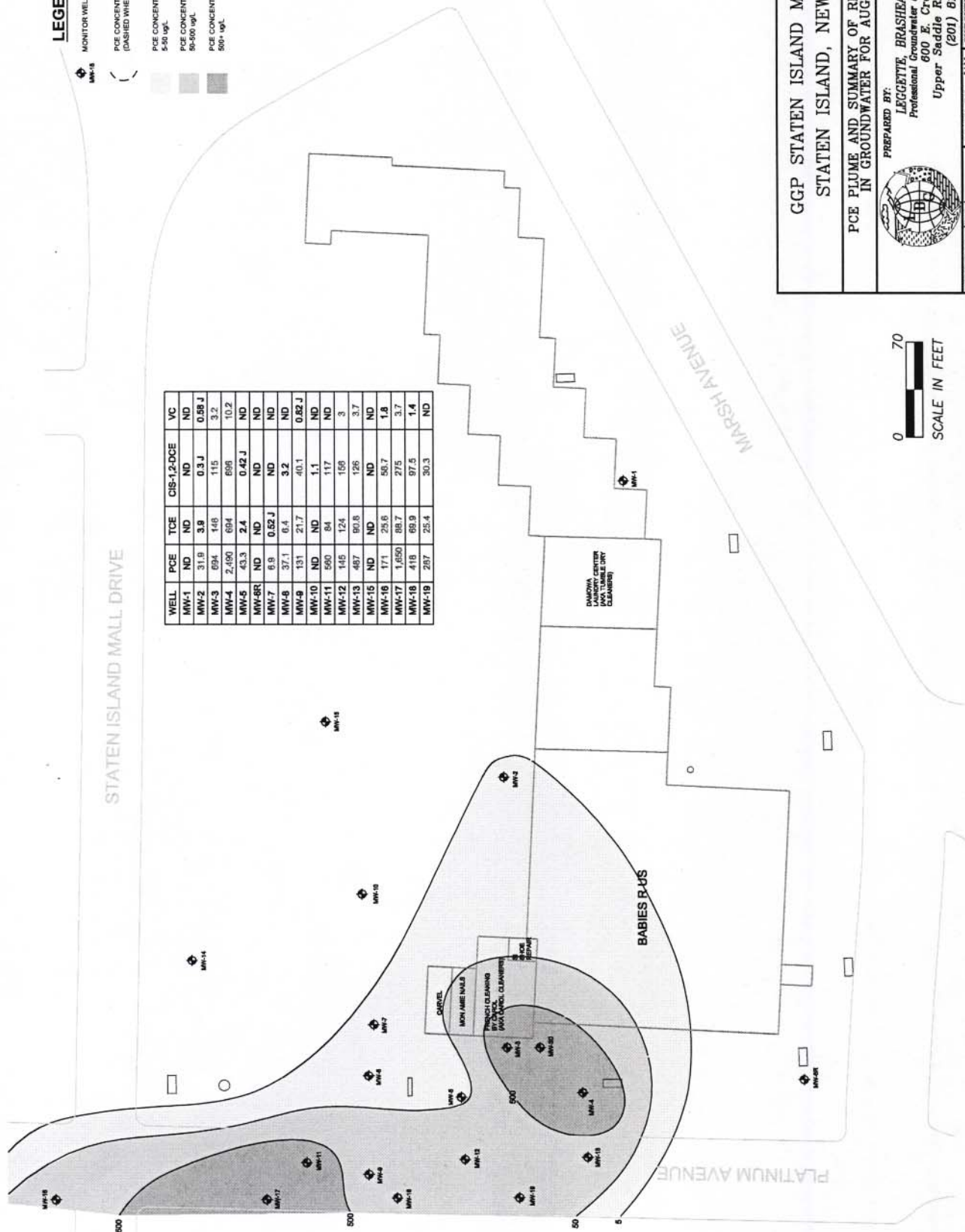
GGP STATEN ISLAND MALL, LLC
STATEN ISLAND, NEW YORK

PCE PLUME AND SUMMARY OF RELATED CVOCs
IN GROUNDWATER FOR AUGUST 2011



PREPARED BY:
LEGGETT, BRASHEARS & GRAHAM, INC.
Professional Engineer and Environmental Services
600 E. 15th Street, Suite 100
Upper Saddle River, New Jersey
(201) 818-0700

DATE: 10/18/11
FILE: Rouse/1105/ CHECKED BY: CS FIGURE:





	(001) 010-0100	DATE: 1/28	
	ROUSE/SUB SLAB RESULTS	DRAWN BY: JAM	CHECKED BY: CS

APPENDIX A

Responsiveness Summary

Responsiveness Summary

**Carol Cleaners, Staten Island Mall
State Superfund Project
New York City, Richmond New York
Site No. 243020**

The Proposed Remedial Action Plan (PRAP) for the Carol Cleaners 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 21st 2012. The PRAP outlined the remedial measure proposed for the contaminated soil, groundwater and soil vapor at the Carol Cleaners 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 Thursday March 1, 2012, which included a presentation of the remedial investigation/feasibility study (RI/FS) for the Carol Cleaners 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 23rd 2012.

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:

COMMENT 1: 1. What about my drinking water?

RESPONSE 1: Contaminated groundwater at the site is not used for drinking or other purposes, and the area is served by the NYC public water system which obtains its water from upstate reservoirs not affected by this contamination.

COMMENT 2: Will the air vented to the atmosphere by the Sub Slab Depressurization System (SSDS) affect the air we breathe in the neighborhood?

RESPONSE 2: Evaluations of sub-slab depressurization exhausts across the State have found no appreciable impact to the ambient air of a community. However, the exhaust will be tested and treatment of the system exhaust will be implemented if necessary.

COMMENT 3: Why wasn't the Fresh Kills Landfill tested as part of this project?

RESPONSE 3: The contamination at the Carol Cleaners site is unrelated to the landfill.

COMMENT 4: How many stores had indoor air samples taken?

RESPONSE 4: Four tenant spaces in the shopping plaza surrounding the site were sampled.

COMMENT 5: In which of the buildings does DEC and DOH believe they were using the chemicals that were detected during indoor air sampling and analysis?

RESPONSE 5: The sampling indicates that two tenant spaces had levels of site-related chemicals in the indoor air that were greater than what would be expected from vapor intrusion. This leads us to believe that the chemicals were being used and/or stored in the nail salon and the shoe repair business.

COMMENT 6: What about Babies "R" Us? During the indoor sampling, were chemicals detected from volatilization of contamination from the soil and groundwater?

RESPONSE 6: The sampling of Babies "R" Us indicates that actions are necessary to mitigate vapor intrusion.

COMMENT 7: Over what period of time were the indoor air samples taken?

RESPONSE 7: The indoor air samples were collected over an 8-hour period to represent the typical exposure period for on-site workers.

COMMENT 8: Were indoor air samples done when the stores were open?

RESPONSE 8: The stores were operational during the 8-hour sample duration.

COMMENT 9: How long ago were the samples taken? Was sampling and analysis affected in any way by the presence of a HVAC system? Was stagnant air present in any of the stores where indoor air sampling took place reflecting the improper functioning of the HVAC systems at that time?

RESPONSE 9: The last round of indoor air samples were collected in 2008. These samples were collected under normal operating heating, ventilation and air conditioning system conditions.

COMMENT 10: Are the contamination levels still the same in Babies "R" Us from when the samples were taken?

RESPONSE 10: Sampling of soil, groundwater and soil vapor has already documented what the contaminants of concern are for the site. It is impossible to know what the levels of contaminants are at any given moment. However, it is assumed that the levels of contaminants in indoor air have remained the same since the last sampling event. Mitigation activities are expected to reduce indoor air contaminants that are a result of vapor intrusion in all tenant spaces.

COMMENT 11: Over the past three years (since the indoor air samples were taken), was there anything in the analysis of the data that was of concern to you?

RESPONSE 11: The data indicate that actions are required to minimize the potential for soil vapor intrusion and subsequent exposures. However, the levels of contaminants in indoor air do not reflect an immediate health hazard.

COMMENT 11: Will the exhaust system [i.e., the Sub Slab Depressurization System] be the first thing you are going to do?

RESPONSE 11: Since the remedial technology selected for the groundwater contamination may temporarily increase the level of contamination in on-site soil vapor, the SSDS will be installed first.

COMMENT 12: Will perimeter ambient air sampling be done?

RESPONSE 12: It is not necessary to collect perimeter air samples. Instead, the exhaust of the SSDS will be sampled and if required, treatment of the exhaust will be implemented.

COMMENT 13: How long will the SSDS have to operate?

RESPONSE 13: The SSDS will be operated until sampling indicates that the system is no longer necessary to prevent exposures that are a result of vapor intrusion. The system will not be turned off prior to State approval.

COMMENT 14: If there was a spike in soil vapor contaminant concentrations, how would you know it?

RESPONSE 14: There is no continuous monitoring of soil vapor conditions at the site. Pressure gauging is conducted during the design and installation of the SSDS system to ensure that the entire slab has been depressurized and that vapor intrusion is being mitigated. In this manner, the soil vapor beneath the structure will be removed from below the slab regardless of the soil vapor concentration. The SSDS system will also be fitted with an alarm that will indicate if the system is not operating properly.

COMMENT 15: Is DEC going to notify City agencies about the conditions on Platinum Avenue?

RESPONSE 15: Contamination beneath Platinum Avenue consists of elevated concentrations of solvents in groundwater. As part of the PRAP process, a fact sheet was mailed to the New York City Mayor's Office of Environmental Coordination, as well as to the Borough President's office. Those notifications identified the presence of contamination both on-site and off-site.

COMMENT 16: If we see any kind of intrusive work on Platinum Ave., will DEC stop the work?

RESPONSE 16: We will have a Site Management Plan which will govern site activities after the implementation of the remedy. We have no authority over a public thoroughfare; however, soil contamination from the Carol Cleaners site did not extend to Platinum Ave.

COMMENT 17: The street in this area flooded last year. Was that water contaminated?

RESPONSE 17: The water table in this area is between 8 and 10 feet below grade. Any flooding in the street was likely due to heavy rain, not to a rise in the water table.

COMMENT 18: Are there any cracks in the slab?

RESPONSE 18: No cracks have been observed in the slab. In addition, the current state of the slab will be inspected as part of the site management for the site.

COMMENT 19: Were any upgradient samples taken?

RESPONSE 19: Yes, upgradient groundwater samples were collected and they did not show a significant amount of contamination.

COMMENT 20: Does the plume extend upgradient to Marsh Avenue?

RESPONSE 20: No. Groundwater contamination is moving towards Platinum Avenue and away from Marsh Avenue.

COMMENT 21: Why did the Remedial Investigation of the site take so long?

RESPONSE 21: The original Remedial Party on the site was the Rouse Company. General Growth Properties (GGP) bought the Rouse Company in 2004. There were several years of back and forth between DEC and GGP, centering on a difference of opinion as to the scope of the investigation. Once the scope of work was agreed to, GGP declared bankruptcy, and there were no funds available to complete the investigation. GGP recently emerged from bankruptcy and completed the investigation. Under its Consent Order with the Department, GGP is committed to implementing the remedy in a timely fashion.

APPENDIX B

Administrative Record

Administrative Record

**Carol Cleaners Staten Island Mall
State Superfund Project
New York City, Richmond, New York
Site No. 243020**

Proposed Remedial Action Plan for the Carol Cleaners site, dated February 2012, prepared by the Department.

Order on Consent, Index No. D2-0002-02-08, between the Department and Rouse SI Shopping Center LLC, executed on October 4, 2002.

Order on Consent, Index No. R2-20111017-719, between the Department and GGP Staten Island Mall LLC, executed on November 4, 2011.

Remedial Investigation/Feasibility Study Work Plan, January 2000 prepared by Leggette, Brashears and Graham (LBG)

Supplemental IRM Work Plan, March 2005 prepared by LBG

Addendum IRM Work Plan, July 2005 prepared by LBG

Remedial Investigation Report, June 2008 prepared by LBG

Final Remedial Investigation Report, October 2011 prepared by LBG

Final Feasibility Study, November 2011 prepared by LBG