PERIODIC REVIEW REPORT (PRR)

(Reporting Period 12/18/2019 to 4/18/2021)

for

JACKSON HEIGHTS SHOPPING CENTER

75-11 31st Avenue
Jackson Heights, New York

Block 452, Lot 1
NYSDEC Site No. C241176

Prepared For:

Allied Jackson Heights, LLC
118-35 Queens Boulevard
Forest Hills, New York 11375

Prepared By:

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
300 Kimball Drive
Parsippany, New Jersey 07054
NJ Certificate of Authorization No: 24GA27996400

Allyson Kritzer
Senior Staff Engineer

Steven Ciambruschini, P.G.
Senior Principal / Senior Vice President

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August 2021
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1.0 INTRODUCTION

1.1 General

Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. (Langan) has prepared this Periodic Review Report for the 2019 to 2021 reporting period in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Site Management Plan (SMP), dated October 2019 and in response to the 23 June 2021 NYSDEC Comments on Site Management (SM) Periodic Review Report (PRR) Letter provided in Appendix A. A Certification of Completion for the site was issued in December 2019. A periodic review of all institutional controls and engineering controls (IC/EC), and monitoring results is required to fulfill the December 2019 Certificate of Completion for the site, which acknowledges that the applicable remediation requirements set forth in the New York State Environmental Conservation Law (ECL) have been achieved to the satisfaction of the NYSDEC Commissioner, pursuant to the 1 December 2015 Brownfield Cleanup Agreement (BCA) Index No. C241176-10-15 (NYSDEC Brownfield Cleanup Program [BCP] Site No. C241176) and the BCP Amendment to correct the BCP site size approved 31 July 2019. The 2019 to 2021 reporting period includes 18 December 2019 to 18 April 2021. Site remediation was performed in accordance with the Updated SSDS Proposal and Design Drawing & Response dated February 2017, Remedial Work Plan dated December 2018, and the NYSDEC Decision Document dated March 2019.

1.2 Site Summary

The site is located at 75-11 31st Avenue in Jackson Heights, County of Queens, New York and is identified as Block 1124 and Lot 1 on the New York City Tax Map. Approximately 0.72 acres of the 5.82 acre lot is currently in the BCP under Site No. C241176. The BCP Site is occupied by a portion of a strip mall shopping center improved with a commercial retail building, concrete sidewalks and asphalt paved parking areas. A map showing the site location is provided in Figure 1 and a figure showing the BCP Site boundary and other site features is provided in Figure 2.

Partner Engineering and Science (Partner) and PSG Engineering and Geology, D.P.C. (PSG) conducted numerous subsurface investigations throughout the site between February 2015 and August 2018. These investigations were documented in the Phase II Subsurface Investigation Report dated January 2015, the Additional Phase II Subsurface Investigation Report dated March 2015, and the Remedial Investigation Report (RIR) dated September 2018. Based on the results of the investigations:

- Several VOCs, including chlorinated VOCs (CVOCs) such as vinyl chloride and cis-1,2-dichloroethene (cis-1,2-DCE), SVOCs, and metals were detected in soil above the NYSDEC Restricted Use Soil Cleanup Objectives (SCOs) for Commercial Use.

- Several VOCs, including CVOCs PCE, TCE, cis-1,2-DCE, trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride, were detected in groundwater above the NYSDEC Technical and Operation Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values (collectively referred to as SGVs). Metals were also detected above the SGVs.

- CVOCs including PCE and TCE were identified in soil vapor and indoor air. Methylene chloride was also detected in indoor air.

As discussed in Section 2.2, remediation was completed in 2019 and a Certification of Completion for the site was issued in December 2019. Site management has been conducted since completion of the remedial activities in May 2019. See Section 2.2 for further information on the remedial program.

1.3 Effectiveness of the Remedial Program

The remedial actions at the Site were implemented to remove gross contamination and eliminate potential human exposure with any remaining residual impacts present in soil, groundwater, and soil vapor via the IC/ECs. The IC/ECs for the 2019 to 2021 reporting period continue to meet the remedial objectives for the site.

1.4 Compliance

All IC/ECs have remained fully in place at the site for the 2019 to 2021 reporting period and remain effective. No repairs or system modifications were made to the SSDS, groundwater well system, or the cover system during the 2019 to 2021 reporting period.

1.5 Recommendations

No recommendations are required at this time.

2.0 SITE OVERVIEW

2.1 Site Location

The site is located in Jackson Heights, County of Queens, New York and is identified as Block 1124 and Lot 1 on the New York City Tax Map. Approximately 0.72 acres of the 5.82 acre lot is currently in the BCP under Site No. C241176. The BCP Site is occupied by a portion of a strip mall shopping center improved with concrete sidewalks and asphalt paved parking areas. Strip mall tenants within the BCP Site boundary include: a portion of a Food Universe Marketplace (a supermarket), Rock Realty (a real estate agency), Super Smiles (a dental office), a dry cleaner, a vacant tenant space (formerly identified as Pearle Vision or Optical Academy), Stand-Up MRI (a medical imaging facility), Angel Tips Nail Spa (a salon), Keller Williams Realty (a real estate agency), Subway (restaurant) and a stationary store, and JJ Garden Chinese Cuisine (a restaurant). According to the 2015 Phase I ESA prepared by Partner Engineering and Science, Inc., the dry cleaning tenant space operated as an active dry cleaning establishment since 1979. As of 1 September 2020, the PCE solvent dry cleaning machinery was decommissioned and the business is no longer operating as a PCE-utilizing dry cleaning facility. The facility now operates as a dry cleaning drop off/pick up facility and will continue to do so for the foreseeable future. Documentation regarding dry cleaning machinery decommissioning is provided in Appendix A.

The BCP Site is bordered by commercial units attached to and associated with the on-Site strip mall followed by 30th Street to the north, residential multi-family properties followed by a pet store and 31st Street to the south, a parking lot associated with the strip mall followed by 77th Street to the east, and 75th Street followed by residential properties to the west.

2.2 Remedial Summary

To address the impacts identified at the site a Track 4: Restricted Residential Use remediation was completed in accordance with 6 NYCRR Part 375 Environmental Remediation Programs (2006), DER 10 (2010), NYCRR Part 375-1.5 March 2015 Brownfields Cleanup Agreement (amended July 2019), the April 2016 Remedial Investigation Work Plan (RIWP), the Updated SSDS Proposal & Design

Drawing and Response to NYSDEC's December 27, 2016 Letter dated 17 February 2017, the May 2018 Construction Completion Report (CCR), the September 2018 Remedial Investigation Report (RIR), the December 2018 Remedial Action Work Plan (RAWP), and the March 2019 Decision Document as described in the November 2019 Final Engineering Report (FER). Implementation of the remedial activities commenced in March 2017 (SSDS installation), and remedial activities were completed in May 2019 (remedial groundwater injections). The components of the selected remedy included:

- Construction and maintenance of a cover system consisting of building concrete slab, concrete sidewalk, and asphalt caps to prevent human exposure to remaining contaminated soil/fill remaining at the site;

- Installation of an SSDS to prevent exposure of workers or visitors/patrons to contaminated soil vapors entering through the basement's slab. The as-built drawing of the sub-slab components of the active SSDS are provided in Appendix J of the SMP (SSDS OMM Plan);

- Remedial action activities per the approved RAWP began on April 25, 2019. The remedial treatment consisted of injecting a 5% by weight potassium permanganate solution via 20 temporary injection points into the areas surrounding the contaminated soil borings and groundwater monitoring wells. Partner completed 20 injection points at the Site between April 26, 2019 and May 3, 2019. The potassium permanganate was injected at 2-foot intervals from 6 to 23 feet bgs covering the soil and groundwater column. Each injection point received 190 gallons of reagent for an approximate total of 3,800 gallons. The approximate area covered by the chemical injection plan was 1,350 square feet. Approximately 1,050 square feet was exterior (outside the building) and approximately 300 square feet was interior (beneath the building);

- Execution and recording of an Environmental Easement to restrict land use and prevent future exposure to any contamination remaining at the site. The institutional controls would restrict the Site's use to commercial and industrial uses and would prohibit the use of groundwater as a drinking water source.

- Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

- Periodic certification of the institutional and engineering controls listed above.

Historic fill material impacted with VOCS, polycyclic aromatic hydrocarbons (PAHs) a subset of SVOCs, and metals at concentrations typical of historic urban fill, remain present at the site beneath the composite cover system. Groundwater at the site is impacted with concentrations of VOCs and metals in exceedance of the SGVs. Historical indoor air and soil vapor analytical results revealed CVOCs impacts were present at the site.

The RAWP required implementation of institutional controls/engineering controls (IC/ECs) at the Site to prevent exposure to remaining contamination. ECs included construction of a composite cover system and a sub-slab depressurization system. The SMP specifies annual groundwater and indoor air monitoring in addition to annual composite cover system and site wide inspections to assess the effectiveness of the remedy. ICs included Groundwater Use Restriction, Excavation Work Plan, Monitoring and Sampling Plan, Land Use Restriction, SMP, IC/EC Plan, and O&M Plan, as specified in the SMP and Environmental Easement (provided in Appendix B).

The IC/ECs continue to be implemented at the site.

3.0 IC/EC PLAN COMPLIANCE REPORT

IC/ECs are required to protect human health and the environment from remaining contaminated soil, groundwater, and soil vapor beneath the site. The Engineering and Institutional Control Plan included in the SMP describes the procedures for the implementation and management of the IC/ECs.

3.1 IC/EC Components

A summary of the IC/ECs implemented at the site per the RAWP, FER, CCR, and SMP are as follows:

- Maintenance of a composite cover system to prevent human exposure to residual contaminated soils remaining under the site;
- Installation of an active SSDS to prevent vapor migration into the building;
- Annual groundwater sampling of select onsite permanent monitoring wells;
- Annual indoor air sampling within select tenant spaces;
- An environmental easement with ICs to prevent future exposure to any contamination remaining at the site (a copy of the environmental easement is provided in Appendix B); and,
- A SMP for implementation of the IC/ECs.

Refer to Figures 2, and 3 as well as the as-built drawings in the SMP provided within Appendix B for the locations of the ECs and on-site groundwater monitoring wells.

3.2 Goal Status and Corrective Measures

No deviations of the IC/ECs were observed during the 2019 to 2021 reporting period.

No corrective measures are required at this time.

3.3 Conclusions and Recommendations

No recommendations are required at this time.

4.0 MONITORING PLAN COMPLIANCE REPORT

4.1 Monitoring Plan Components

The components of the Monitoring Plan during the 2019 to 2021 reporting period are as follows:

- Annual groundwater sampling of five onsite permanent monitoring wells (MW-2, MW-3, MW-4, MW-8, and MW-10);
- Periodic vapor mitigation system monitoring;
- Annual indoor air monitoring;
- An annual composite cover system inspection; and,
- An annual site-wide inspection.

4.2 Summary of Monitoring Completed

4.2.1 Annual Groundwater Sampling

The annual groundwater sampling event occurred in November 2020. Groundwater samples were collected from five monitoring wells (MW-2, MW-3, MW-4, MW-8, and MW-10) during the sampling event.

Groundwater Sampling

At each well location on Site (MW-1 through MW-5 and MW-7 through MW-11), upon removal of the well plug, head space readings were measured for organic vapors with a photoionization detector (PID). Head space PID readings ranged from 0.1 parts per million (ppm) in MW-9 to 0.7 ppm in MW-2. Depth to product (if present) and depth to water measurements were also obtained at all on Site locations. The resulting measurements identified that the groundwater levels ranged from 8.62 to 12.45 feet below ground surface, corresponding to elevation el 17.33 to el 12.88 North American Datum of 1988 (NAVD88). Product was not observed in any on Site wells. Groundwater field measurements are provided in Table 1 and a potentiometric surface map is provided as Figure 4.

Prior to collecting groundwater samples, each monitoring well was purged using a peristaltic pump and dedicated, disposable polyethylene and silicone tubing. During purging, the turbidity, pH, temperature, conductivity, redox potential, and dissolved oxygen of the groundwater were monitored using a Horiba U-52 Water Quality meter with a flow-through cell. The wells were purged until the water quality parameters listed above revealed that stabilization had occurred. Measurements were recorded on Langan field sampling forms, which are included in Appendix C. Purge water was containerized in a 55-gallon drum.

After physical and water quality parameters stabilized, a sample was collected from each well using a dedicated polyethylene bailer. Each sample was numbered and recorded in a field log book. Groundwater samples were collected into laboratory-prepared containers, tightly sealed, uniquely labeled, and stored on ice for transport to York Analytical Laboratories Inc. (York), in Stratford, Connecticut, under standard chain-of-custody procedures to document custody for the acquisition, possession, and analysis. One field blank, one trip blank, and one duplicate sample were included for quality assurance/quality control (QA/QC) purposes. Groundwater samples, the field blank, the duplicate sample, and the trip blank were analyzed for VOCs by EPA Method 8260.

Groundwater Analytical Results

Laboratory analytical data were compared to the NYSDEC SGVs. A summary of analytical results are presented in Table 2 and are shown on Figure 5. Historical VOC data for groundwater is provided in Appendix D and Figure 5. The data usability summary report (DUSR) and laboratory analytical report for the annual sampling event is included as Attachment B.

Benzene (5.77 µg/L) and vinyl chloride (8.79 µg/L) were the only VOCs detected in exceedance of the SGVs in source area well MW-2. No other VOCs were detected above the SGVs in any other wells sampled on Site.

Data validation was completed for all post remediation groundwater sample results which included verification of sample results, verification of the identification of sample results, and recalculation of 10% of all sample results. Following data validation, a Data Usability Summary Report (DUSR) was prepared for all samples (and related QA/QC samples) collected during the groundwater monitoring event. The DUSR presents the results of the data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. All data are considered usable, as qualified. In addition, completeness, defined as the percentage of analytical results that are judged to be valid, is 100%. The DUSR and associated raw data is provided in Attachment B.

The implemented remedy effectively removed the sources of impacts. Residual contamination in groundwater remains at the site and is attributed to the remaining soil impacts as discussed in Section 4.3.

Purge Water Disposal

On 20 November 2020, waste characterization sampling of the purge water was conducted by Langan. The waste characterization samples were analyzed for VOCs and Resource Conservation and Recovery Act (RCRA) hazardous characteristics. Prior to offsite disposal, investigation and waste characterization data for the purge water was provided to the disposal facility, Dale Transfer Corporation of West Babylon, New York, for approval. One drum of purge water was disposed of on 28 January 2021. Drummed purge water was transported to Dale Transfer Corporation by AARCO Environmental Services, Corp. Waste characterization analytical data and disposal documentation of the purge water is provided in Appendix F.

4.2.2 Periodic Vapor Mitigation System Monitoring and Indoor Air Sampling

Inspections of the system components were completed in November 2020 and December 2020.

SSDS Inspection

Inspection of all system components and field screening of the sub-slab soil vapor was conducted on 18 November 2020 and during the sampling event on 1 December 2020. All five blowers were operational during the inspections.

System performance was evaluated by collecting:

- Vacuum readings from the system vacuum gauges (System #1 through System #5);
- Vacuum and flow readings using a TSI 9515 VelociCalc at the 18 riser sample ports (SP 1-1 through SP 5-4);
- PID readings using an RKI Instruments PID capable of detecting VOCs at the 18 riser sample ports (SP 1-1 through SP 5-4)
- Vacuum readings using a TSI 9515 VelociCalc at the 14 vacuum monitoring points (T-1 through T-14); and,
- PID readings using an RKI Instruments PID capable of detecting VOCs at the 14 vacuum monitoring points (T-1 through T-14).

System vacuum gauge reading results ranged from -21 to -3 inches water during the November 2020 inspection and from -21 to -5.5 inches water during the December 2020 inspection. Vacuum readings at the riser sample ports ranged from less than -15 to -1.332 inches water during the November 2020 inspection and from -21 to -2.474 inches water during the December 2020 inspection. Riser sample ports SP 5-1 and SP 5-2 were behind new sheet rock and could not be accessed during either inspection. These locations will be exposed for future inspections. PID readings ranged from 0.0 to 0.3 ppm during the November 2020 inspection and from 0.0 to 0.4 ppm during the December 2020 inspection. Flow readings at the riser sample ports ranged from 6.88 to 89.44 CFM during the November 2020 inspection and from 6.57 to 94.83 during the December 2020 inspection.

Vacuum readings at the sub slab vacuum test ports ranged from -0.528 to -0.004 inches water during the November 2020 inspection and from -0.427 to -0.004 inches water during the December 2020 inspection. A vacuum condition was not identified at T-2 or T-10 during the November 2020 inspection, although vacuum was observed at both locations (-0.013 inches water at T-2 and -0.014 inches water at T-10) during the December 2020 inspection below the -0.004 inches water threshold identified in the SMP. It should be noted that PID readings ranged from 0.0 to 95.7 ppm during the November 2020 inspection and from 0.0 to 0.5 ppm during the December 2020 inspection. A PID reading could not be obtained from T-1 during the November 2020 inspection due to a flow error on the PID unit, although a PID reading was obtained during the December 2020 inspection. Elevated PID readings were identified at T-3 (41.6 ppm) and T-4 (95.7 ppm) during the November 2020 inspection although these elevated PID readings were not identified during the December 2020 inspection (0.5 ppm at T-3 and 0.4 ppm at T-4). A copy of the active SSDS inspection checklist and field data is provided in Appendix C.

The field screening results indicate that vacuum has been achieved in the subsurface within the design specification at all but two locations and low level VOCs are present beneath the slab.

It should be noted that riser sample port SP 5-3 is labeled as SP 5-4 in the field and SP 5-4 is labeled as SP 5-2 in the field. These labels will be updated during the next inspection event to match the as-built drawings. Field measurements provided in Appendix C match the as-built drawing.

Indoor Air Sampling

Prior to sample collection, Langan conducted a building chemical product inventory in the basement and first floor as per the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion sampling protocols. The items identified in the building chemical product inventory as well as the building in general were screened using a RKI Instruments PID. A copy of the inventory is provided in Appendix C.

Following the inspection, field screening and completion of the product inventory, six indoor air samples were collected. The indoor air samples (IA-1 through IA-6) were collected using Summa canisters placed in the basement or first floor of the tenant spaces in accordance with the SMP. Summa canisters were deployed in the basement of the dry cleaners (IA-2), the first floor and basement of the vacant (formerly identified as Pearle Vision or Optical Academy) tenant space (IA-5 and IA-6 respectively), the first floor and basement of Super Smiles (IA-3 and IA-4 respectively), and the basement of Stand-Up MRI (IA-1). All commercial spaces from which samples were collected are occupied during normal working hours. Quality assurance/quality control (QA/QC) included collection of a duplicate sample (at the IA-2 location) and one ambient air sample from the exterior of the building.

All indoor air and ambient air samples were collected in accordance with the NYSDOH October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Samples were collected in laboratory-cleaned and certified evacuated 6-L stainless steel Summa canisters with flow control regulators supplied by the laboratory. The regulators were set to collect each sample over a 8-hour sampling period (a flow-rate of <12.5-ml per minute) as per United States Environmental Protection Agency (USEPA) / Interstate Technology and Regulatory Council (ITRC) soil vapor sampling guidance. Each sample was numbered and recorded in a field log book. Samples were transferred to the laboratory immediately after field sampling was completed, and stored below a maximum room temperature of 30° Celsius. Chain-of-custody forms were utilized to document custody for the acquisition, possession, and analysis. All samples were submitted under chain of custody to York. Samples were laboratory analyzed for VOCs via the USEPA TO-15 Method. A copy of the Summa canister log is provided in Appendix C.

Indoor Air Analytical Results

The indoor air analytical results were compared to the NYSDOH Matrices A, B, and C of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion. A summary of analytical results are presented in Table 3 and are shown on Figure 6. Historical VOC data for indoor air is provided in Appendix D and Figure 6. The data usability summary report (DUSR) and laboratory analytical report for the annual sampling event is included as Attachment B.

Analytical results for carbon tetrachloride and TCE in indoor air were compared to the NYSDOH Vapor Intrusion Decision Matrix A. Carbon tetrachloride (0.32 μg/m³ to 0.96 μg/m³) was detected above the minimum Matrix A indoor air threshold of 0.2 μg/m³ at all indoor air locations sampled. Carbon tetrachloride was also detected above the NYSDOH Matrix A Indoor Air threshold in the ambient air sample collected at a similar concentration of the indoor air samples (0.49 µg/m³). TCE (0.4 µg/m³ to 8.3 µg/m³) was detected above the minimum Matrix A indoor air threshold of 0.2 µg/m³ at all indoor air locations sampled. TCE was not detected in the ambient air sample collected.

Analytical results for methylene chloride and PCE in indoor air were compared to the NYSDOH Vapor Intrusion Decision Matrix B. Methylene chloride (10 µg/m³ to 64 µg/m³) was detected above the minimum Matrix B indoor air threshold of 3 µg/m³ at all indoor air locations sampled. Methylene chloride was also detected above the NYSDOH Matrix B Indoor Air threshold in the ambient air sample collected at a similar concentration of the indoor air samples (55 µg/m³). PCE (4.5 µg/m³) was detected above the minimum Matrix B indoor air threshold of 3 µg/m³ at IA-2 in the basement of the dry cleaners. PCE was not detected above the minimum Matrix B indoor air threshold in any other indoor air samples collected or the ambient air sample collected. Indoor air results letters were distributed to on-Site tenants on 8 July 2021 and are provided in Appendix A.

Data validation was completed for all post remediation indoor air analytical results which included verification of sample results, verification of the identification of sample results, and recalculation of 10% of all sample results. Following data validation, a DUSR was prepared for all samples (and related QA/QC samples) collected during the indoor air sampling event. The DUSR presents the results of the data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. All data are considered usable, as qualified. In addition, completeness, defined as the percentage of analytical results that are judged to be valid, is 100%. The DUSR and associated raw data is provided in Attachment B.

According to results provided above, monitoring and mitigation is required, which is being addressed via operation of the SSDS and annual sampling in accordance with the SMP. Indoor air exceedances are likely due to the ongoing operations of the dry cleaning facility as discussed in Section 4.3.

4.2.3 Annual Composite Cover System Inspection

The annual visual inspection of the site composite cover system were completed on 18 November 2020. Conditions of the basement slab, foundation walls, first floor concrete slab, outdoor paving/sidewalks, and asphalt paved parking area within the BCP Site boundary were inspected for quality and integrity.

Cracks to asphalt and concrete were observed in the exterior areas of the BCP Site, although the cracks did not observe to breach the subsurface. Additionally, evidence of cracks sealed/repaired with asphalt were observed at some exterior area. Cracks observed in the asphalt/concrete exterior will be repaired to prevent subsurface exposure and the repairs will be documented in the PRR for the next reporting period. No other damages and/or breaches to the remaining portions of the composite cover system were identified during the annual inspection event.

The detailed composite cover system inspection report and photo log are included in Appendix G.

4.2.4 Annual Site-Wide Inspection

The annual site-wide inspections was conducted on 18 November 2020 per the requirements of the SMP. In addition to the soil cover system discussed above, the inspections consisted of spot inspections of all ECs including the on-Site groundwater monitoring wells and the aboveground portions of SSDS. All IC/EC components inspected were in compliance with the SMP. The completed site-wide inspection form and photo log is included in Appendix G.

4.3 Comparisons with Remedial Objectives

Remedial action objectives (RAOs) were identified in the RAWP for the protection and public health and the environmental. Soil RAOs are being addressed via the presence of the composite cover system including the building slab and asphalt paved areas. RAOs for soil vapor are being addressed via an active sub-slab depressurization system. RAOs for groundwater were addressed by the injection of potassium permanganate during the remedial action and continue to be via institutional controls preventing use of groundwater as a source for potable water and annual groundwater monitoring during the 2019 to 2021 reporting period.

As described in Section 4.2.1 above, the groundwater monitoring analytical results revealed the continued presence of residual impacts in groundwater at the site at concentrations below those identified pre-remediation. Benzene and vinyl chloride were identified at source area well MW-2, and no other VOCs were identified above the SGVs at any other monitoring well location. The implemented remedy effectively removed the sources of impacts. The concentrations of specific VOCs remain above the SGVs; however, concentrations have reduced substantially to within less than one order of magnitude of the SGVs.

Residual contamination in groundwater remains at the site and is attributed to the remaining soil impacts. Groundwater monitoring will continue annually at MW-2, MW-3, MW-4, MW-8, and MW-10 to assess trends in remaining groundwater concentrations as identified in the SMP.

As described in Section 4.2.2, the vacuum being produced by the SSDS is sufficient to effectively mitigate potential vapor intrusion concerns at the site, with the exception of two locations where a vacuum condition was not observed during the November 2020 inspection. Although a vacuum condition was not identified at the two locations during the November 2020 inspection, vacuum was observed at both locations during the December 2020 inspection below the -0.004 inches water threshold identified in the SMP.

As described in Section 4.2.2 above, the indoor air analytical results revealed the presence of some VOCs in indoor air; however, With the exception of carbon tetrachloride, methylene chloride, and TCE at all indoor air locations and PCE at one indoor location within the dry cleaners, the indoor air concentrations were below the NYSDOH October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices A, B, and C thresholds requiring further mitigation. The carbon tetrachloride, methylene chloride, TCE, and PCE results detected in indoor air would require monitoring and/or mitigation, although carbon tetrachloride and methylene chloride were also detected above the DOH guidance values in the ambient air sample collected. Based on these findings and the absence of these compounds in groundwater,detections of carbon tetrachloride and methylene chloride in indoor air are attributed to ambient sources. Additional samples, including soil vapor samples, will be collected during the 2021-2022 heating season to further evaluate indoor air and subsurface conditions. Analytical results of this sampling event will be provided in the 2021-2022 PRR.

Although the concentrations of PCE remain above the NYSDOH minimum guidance value in the basement of the dry cleaners, concentrations have reduced substantially to within less than one order of magnitude of the NYSDOH guidance value and less than two orders of magnitude of the historic analytical results. Additionally, the most recent round of soil vapor sampling in 2018, which consisted of the collection of two soil vapor samples, revealed non-detect PCE at one sampling location and PCE detected below the minimum NYSDOH Matrix B soil vapor threshold at the other sampling location. TCE results within all tenant spaces sampled were identified above the NYSDOH minimum guidance value, although the most recent rounds of soil vapor sampling in 2018 revealed non-detect concentrations of TCE at the two sampling locations. As such, the implemented remedy effectively removed the sources of subsurface impacts and the elevated concentrations of TCE and PCE in indoor air are likely attributed to recent (as of August 2020) active dry cleaning operations previously conducted on the Site. It should be noted that the samples were collected in December 2020 and the PCE dry cleaning machinery was decommissioned in September 2020. As such, a significant amount of time between decommissioning and sampling had not passed to assess the presence of TCE and PCE subsequent to the cessation of operation. Methylene chloride results within all tenant spaces sampled and the ambient air sample were identified above the NYSDOH minimum guidance value, although the most recent rounds of soil vapor sampling in 2018 revealed non-detect concentrations at both sampling locations. Methylene chloride concentrations are not indicative of subsurface conditions. Indoor and ambient air concentrations are generally ubiquitous throughout the site.

Mitigation is being addressed via active SSDS operations and monitoring is occurring on an annual basis. Based on these findings, continued operation of the active SSDS is sufficient to mitigate any potential subsurface impacts to the building indoor air quality.

As described in Section 4.2.3 above, cracks to the composite cover system were observed in the exterior areas of the BCP site, although the cracks did not observed to breach the subsurface. Cracks observed in the asphalt/concrete exterior will be repaired to prevent subsurface exposure and the repairs will be documented in the PRR for the next reporting period.

4.4 Monitoring Deficiencies

Monitoring activities for the 2019 to 2021 reporting period fully complied with the SMP Monitoring Plan, with the exception of the collection of field readings at riser sample ports SP 5-1 and SP 5-2 as these locations were behind new sheet rock and could not be accessed during this reporting period. These locations will be exposed for future inspections.

4.5 Conclusions and Recommendations

No recommendations are required at this time.

5.0 O&M PLAN COMPLIANCE REPORT

5.1 O&M Plan Components

The components of the O&M Plan are as follows:

- Site composite cover system maintenance;
- Active SSDS operation and maintenance;

The OM&M Plans for the cap and the SSDS are provided in Appendix J of the SMP, which is provided in Appendix B of this report.

5.2 Completed O&M Activities

5.2.1 Site Composite Cover System Maintenance

Per the SMP, if cracking and/or other damage is observed to the concrete slab, the crack should be repaired immediately with crack sealant. Any other signs of concrete distress or damage should be addressed immediately by a concrete specialist. Spalling and any other surface damage should be repaired with concrete resurfacer. The slab should be resealed on a regular basis as recommended by a masonry expert or as indicated through the inspection process.

Any cracks observed in the asphalt or concrete pavement should be repaired immediately with patching material and sealed. If bigger areas need repair, such as pot holes, tack coat should be applied to the edges where the new material meets the old material. Any areas that are larger than what can be fixed via a patch, must be paved by a paving contractor to general industry specifications. A minimum of 4-inches of asphalt and 6-inches of concrete should be maintained at any time. Asphalt pavement should be sealed on a regular basis or as recommended by a paving professional or as indicated through the inspection process.

If asphalt areas are in need of more extensive repairs and milling of the existing asphalt is required, milling should not penetrate the entire asphalt layer. Only the top 2-inches should be removed during any milling process. Milling and subsequent asphalt installation should only be completed by a paving specialist. Tack coat should be applied to all areas where the asphalt will meet another surface.

The visual inspections of the foundation walls, basement slab, and first floor slabs revealed no areas were cracked or damaged. Cracks were observed in the exterior areas of the BCP site, although the cracks did not observed to breach the subsurface. Cracks observed in the asphalt/concrete pavement be repaired to prevent subsurface exposure and the repairs will be documented in the PRR for the next reporting period.

No additional maintenance activities other than those discussed above are required at this time.

5.2.2 Active SSDS Construction and Maintenance

The portions of the SSDS risers and sub slab components that were accessible for inspection appeared to be in good condition. No additional maintenance activities are required at this time.

It should be noted that riser sample port SP 5-3 is labeled as SP 5-4 in the field and SP 5-4 is labeled as SP 5-2 in the field. These labels will be updated during the next inspection event to match the as-built drawings. Additionally, riser sample ports SP 5-1 and SP 5-2 were behind new sheet rock and could not be accessed during either inspection. These locations will be exposed for future inspections.

Although not a part of the provided O&M Plans in the SMP, the ten remaining permanent groundwater monitoring wells were inspected and appeared to be in good condition.

5.3 O&M Deficiencies

Overall, as of 2021, the site composite cover system, active SSDS, and groundwater monitoring wells appeared to be in good condition, with exception of two riser sample ports identified behind sheet rock. Riser sample ports SP 5-1 and SP 5-2 were determined to be behind new sheet rock and could not be accessed during either inspection. These locations will be exposed for future inspections. No additional maintenance is required at this time.

5.4 Conclusions and Recommendations

No recommendations are required at this time.

6.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS

6.1 SMP Compliance

Each component of the SMP, including the IC/EC Plan, Monitoring Plan, and O&M Plan, was in compliance for the 2019 to 2021 reporting period.

6.2 Remedy Performance Evaluation

6.2.1 Composite Cover System

Conditions of the onsite building foundations, sidewalks, and parking areas were inspected for quality and integrity. The site-wide composite cover system was confirmed to be intact, except for cracks observed in the within the exterior areas of the BCP Site. As noted in Section 4.2.3, repairs will be completed and will be documented in the PRR for the next reporting period. The site-wide composite cover system continues to be effective in protecting public health and the environment.

6.2.2 Active SSDS

As discussed in Section 4.3, with the exception of carbon tetrachloride, methylene chloride, and TCE at all indoor air locations and PCE at one indoor location within the dry cleaners, the indoor air concentrations were detected below the NYSDOH October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices A, B, and C thresholds requiring further mitigation. The carbon tetrachloride and methylene chloride exceedances are likely due to ambient sources and the TCE and PCE results are likely due to recent (as of August 2020) dry cleaning operations previously conducted on the Site. Based on historic soil vapor analytical results, the implemented remedy effectively removed the sources of subsurface impacts. Mitigation is being addressed via active SSDS operations and monitoring is occurring on an annual basis. Based on these findings, continued operation of the active SSDS is sufficient to mitigate any potential impacts from the sub-surface to the building indoor air quality. Additionally, the vacuum being produced by the SSDS is sufficient to effectively mitigate potential vapor intrusion concerns at the site, with the exception of two locations where a vacuum condition was not observed during the November 2020 inspection. Indoor air monitoring will continue annually in accordance with the SMP unless otherwise required by NYSDEC.

6.2.3 Groundwater Monitoring

Site-wide groundwater monitoring was implemented per the SMP. Based on the groundwater sampling results, residual contamination in groundwater remains at the site and is attributed to residual soil impacts. Based on the analytical results for the monitoring wells present at the site, groundwater contamination is stable. Groundwater monitoring will continue annually at MW-2, MW-3, MW-4, MW-8, and MW-10 to assess trends in remaining groundwater concentrations as identified in the SMP.

6.2.4 IC Components

All ICs were maintained during the 2019 to 2021 reporting period, and the environmental easement on the site remains in place.

6.3 Future Submittals

Groundwater sampling activities will be continued at an annual frequency.

Inspections/monitoring of the composite cover system and monitoring well network/aboveground groundwater treatment infrastructure will continue on an annual basis.

Inspections/monitoring of the active SSDS will be completed at the frequency identified in the SMP unless otherwise required by NYSDEC.

Forms and other information generated during regular monitoring events and inspections will be submitted at the time of the annual Periodic Review Report, as specified in the Reporting Plan of the NYSDEC-approved SMP.

7.0 CERTIFICATION OF IC/ECS

7.1 IC/EC Certification Form

The completed IC/EC Certification Form is presented in Appendix H.

7.2 IC/EC Certification

I, Ronald Boyer, am currently a registered professional engineer licensed by the State of New York.

I certify that the ICs/ECs are in place and effective and are performing as designed.

I certify that nothing has occurred that would impair the ability of the controls to protect the public health and environment and that nothing has occurred that would constitute a violation or failure to comply with any operation and maintenance plan for such controls.

I certify that all use restrictions, institutional controls, engineering controls, and all operation and maintenance requirements applicable to the site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded. A site Management Plan has been submitted by the applicant for the continual and proper operation, maintenance, and monitoring of all engineering controls employed at the site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by the Department.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

085831-1	8/19/2021	Ronald D. Boyer
New York State Professional Engineer No.	Date	Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

TABLES

Table 1
Periodic Review Report
Groundwater Measurements

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176
Langan Project No.: 100901401

Well	Top of Casing Elevation (ft)	Depth to Product (ft btoc)	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft)	PID Reading (ppm)
MW-1	26.72	---	12.45	14.27	0.0
MW-2	26.71	---	12.00	14.71	0.7
MW-3	25.39	---	10.75	14.64	0.0
MW-4	27.23	---	10.48	16.75	0.0
MW-5	25.95	---	8.62	17.33	0.3
MW-7	26.41	---	11.79	14.62	0.0
MW-8	23.21	---	9.31	13.90	0.0
MW-9	23.91	---	10.71	13.20	0.1
MW-10	24.22	---	11.34	12.88	0.0
MW-11	25.38	---	10.83	14.55	0.0

Notes:
All elevations are provided in NAVD88.

Table 2
Periodic Review Report
Groundwater Sample Analytical Results Summary

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDEC	MW-2		MW-2		MW-3		MW-4		MW-8		MW-10	
Sample ID	SGVs	003_MW-2		004_DUP-1		005_MW-3		006_MW-4		001_MW-8		002_MW-10	
Laboratory ID		20K1106-03		20K1106-04		20K1106-05		20K1106-06		20K1106-01		20K1106-02	
Sample Date		11/24/2020		11/24/2020		11/24/2020		11/24/2020		11/24/2020		11/24/2020	
Volatile Organic Compounds (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,1-Trichloroethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,2,2-Tetrachloroethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	5	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,2-Trichloroethane	1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloropropene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,3-Trichlorobenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,3-Trichloropropane	0.04	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U
1,2,4-Trichlorobenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,4-Trimethylbenzene	5	0.2	U	0.46	J	0.2	U	0.2	U	0.2	U	0.2	U
1,2-Dibromo-3-Chloropropane	0.04	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U
1,2-Dibromoethane (Ethylene Dibromide)	0.0006	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U	*0.2*	U
1,2-Dichlorobenzene	3	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2-Dichloroethane	0.6	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2-Dichloropropane	1	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3,5-Trimethylbenzene (Mesitylene)	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dichlorobenzene	3	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dichloropropane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,4-Dichlorobenzene	3	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,4-Dioxane (P-Dioxane)	~	40	U	40	UJ	40	UJ	40	U	40	U	40	U
2,2-Dichloropropane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-Chlorotoluene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-Hexanone	50	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-Chlorotoluene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Acetone	50	1	U	2.25		1.55	U	1	U	1	U	1	U
Acrolein	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Acrylonitrile	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Benzene	1	**5.77**		**3.69**		0.2	U	0.2	U	0.2	U	0.2	U
Bromobenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromochloromethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromodichloromethane	50	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromoform	50	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromomethane	5	0.2	UJ	0.2	UJ	0.2	UJ	0.2	UJ	0.2	UJ	0.2	UJ
Carbon Disulfide	60	0.39	J	0.36	J	0.2	U	0.2	U	0.2	U	0.2	U
Carbon Tetrachloride	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chlorobenzene	5	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chloroethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chloroform	7	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chloromethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cis-1,2-Dichloroethene	5	3.85	J	2.36	J	1.12		0.2	U	0.2	U	0.2	U
Cis-1,3-Dichloropropene	0.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cyclohexane	~	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	UJ	0.2	UJ
Dibromochloromethane	50	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Dibromomethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Dichlorodifluoromethane	5	0.2	U	0.2	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U
Ethylbenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Hexachlorobutadiene	0.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Isopropylbenzene (Cumene)	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
M,P-Xylene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl Acetate	~	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Methyl Ethyl Ketone (2-Butanone)	50	1.29	JB	1.32	JB	0.89	JB	0.68	U	0.89	JB	0.75	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Methylcyclohexane	~	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Methylene Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U
n-Butylbenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
n-Propylbenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
o-Xylene (1,2-Dimethylbenzene)	5	0.2	UJ	0.22	J	0.2	U	0.2	U	0.2	U	0.2	U
p-Cymene (p-Isopropyltoluene)	~	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Sec-Butylbenzene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Styrene	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
T-Butylbenzene	5	0.2	UJ	0.2	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U
Tert-Butyl Alcohol	~	1.47	J	2.54	J	1.81	J	0.5	U	0.5	U	0.5	U
Tert-Butyl Methyl Ether	10	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Tetrachloroethene (PCE)	5	0.36	J	0.39	J	0.2	UJ	0.2	U	0.2	U	0.2	U
Toluene	5	0.28	J	0.22	J	0.2	U	0.2	U	0.2	U	0.2	U
Total Xylenes	5	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Trans-1,2-Dichloroethene	5	0.28	J	0.29	J	0.2	U	0.2	U	0.2	U	0.2	U
Trans-1,3-Dichloropropene	0.4	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene (TCE)	5	0.3	J	0.3	J	0.2	U	0.2	U	0.2	U	0.2	U
Trichlorofluoromethane	5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl Acetate	~	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl Chloride	2	**8.79**	J	**4.26**	J	0.76		0.2	U	0.2	U	0.2	U
Total BTEX	~	6.05		3.91		ND		ND		ND		ND	
Total CVOCs	~	13.3		7.31		1.88		ND		ND		ND	
Total VOCs	~	22.8		18.7		4.58		ND		0.89		ND	

Notes:
1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules and Regulations (NYCRR) Part 703.5 and the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs").
2. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
3. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
4. Total VOCs = sum of detected volatile organic compounds (VOC)
5. Detected analytical results above NYSDEC SGVs are bolded and shaded.
6. Sample 004_DUP-1 is a duplicate sample of 003_MW-2.
7. ~ = Regulatory limit for this analyte does not exist
8. µg/l = micrograms per liter
9. ND = Not detected

Qualifiers:
B = The analyte was found in the associated analysis batch blank.
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

Table 3
Periodic Review Report
Indoor Air Analytical Results Summary

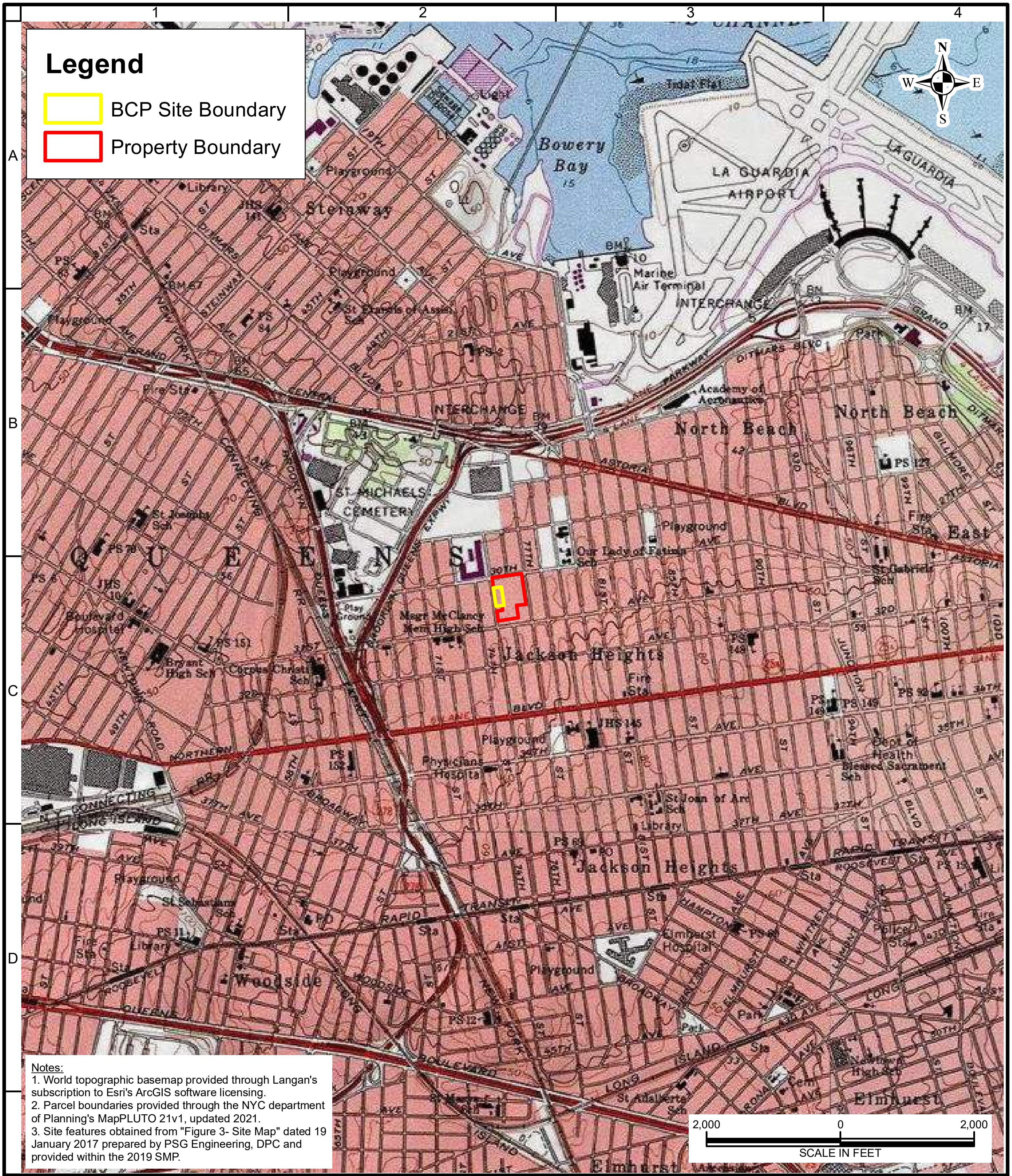
Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDOH Decision Matrices Minimum Concentrations	AMBIENT-1		IA-1		IA-2		IA-2		IA-3		IA-4		IA-5		IA-6	
Sample ID		014_AMBIENT-1		011_IA-1		012_IA-2		013_DUP-1		015_IA-3		016_IA-4		017_IA-5		018_IA-6	
Laboratory ID		20L0059-08		20L0059-01		20L0059-02		20L0059-07		20L0059-03		20L0059-04		20L0059-05		20L0059-06	
Sample Date		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020	
Sample Type		AA		IA		IA		IA		IA		IA		IA		IA	
Sample Location		Exterior of Building		Basement of Stand-Up MRI		Basement of Drycleaners		Basement of Drycleaners		First Floor of Super Smiles		Basement of Super Smiles		First Floor of Vacant Tenant Space		Basement of Vacant Tenant Space	
Volatile Organic Compounds (µg/m³)																	
1,1,1,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,1-Trichloroethane	3	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1,2,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.66	U	0.8	U	0.96	D	0.66	U	0.63	U	0.71	U	0.59	D	0.66	D
1,1,2-Trichloroethane	~	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,1-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
1,2,4-Trichlorobenzene	~	0.64	U	0.78	U	0.66	U	0.64	U	0.61	U	0.69	U	0.57	U	0.64	U
1,2,4-Trimethylbenzene	~	0.59	D	4.4	D	1.8	D	1.6	D	1.1	D	0.5	D	3	D	1.1	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.66	U	0.81	U	0.69	U	0.66	U	0.63	U	0.71	U	0.59	U	0.66	U
1,2-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,2-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,2-Dichloropropane	~	0.4	UJ	0.48	UJ	0.41	UJ	0.4	UJ	0.38	UJ	0.43	UJ	0.35	UJ	0.4	UJ
1,2-Dichlorotetrafluoroethane	~	0.6	U	0.73	U	0.62	U	0.6	U	0.57	U	0.65	U	0.54	U	0.6	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.42	U	1.5	D	0.62	D	0.55	D	0.48	D	0.46	U	0.98	D	0.42	D
1,3-Butadiene	~	0.57	U	0.7	U	0.59	U	0.57	U	0.55	U	0.62	U	0.51	U	0.57	U
1,3-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,3-Dichloropropane	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
1,4-Dichlorobenzene	~	0.52	U	0.63	U	0.54	D	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,4-Dioxane (P-Dioxane)	~	0.62	U	0.76	U	0.64	U	0.62	U	0.59	U	0.67	U	0.55	U	0.62	U
2-Hexanone	~	0.7	U	0.86	U	0.73	U	0.7	U	0.67	U	0.76	U	0.63	U	0.7	U
4-Ethyltoluene	~	0.55	D	4.5	D	1.7	D	1.6	D	1.1	D	0.46	D	3	D	1.1	D
Acetone	~	18	D	240	D	36	J	26	J	18	D	32	D	42	D	44	D
Acrylonitrile	~	0.19	U	0.23	U	0.19	U	0.19	U	0.18	U	0.2	U	0.17	U	0.19	U
Allyl Chloride (3-Chloropropene)	~	1.3	U	1.6	U	1.4	U	1.3	U	1.3	U	1.5	U	1.2	U	1.3	U
Benzene	~	1	D	1	D	1.5	J	0.58	J	0.81	D	0.77	D	0.93	D	0.82	D
Benzyl Chloride	~	0.45	U	0.54	U	0.46	U	0.45	U	0.43	U	0.48	U	0.4	U	0.45	U
Bromodichloromethane	~	0.58	U	0.7	U	0.6	U	0.58	U	0.55	U	0.62	U	0.51	U	0.58	U
Bromoethene	~	0.38	U	0.46	U	0.39	U	0.38	U	0.36	U	0.41	U	0.34	U	0.38	U
Bromoform	~	0.89	U	1.1	U	0.92	U	0.89	U	0.85	U	0.96	U	0.79	U	0.89	U
Bromomethane	~	0.33	U	0.41	U	7.3	J	0.33	UJ	0.32	U	0.36	U	0.3	U	0.33	U
Carbon Disulfide	~	0.46	J	0.33	U	0.28	U	0.27	U	0.26	J	0.32	J	0.36	J	0.35	J
Carbon Tetrachloride	0.2	**0.49**	J	**0.59**	J	**0.96**	J	**0.32**	J	**0.62**	J	**0.64**	J	**0.63**	J	**0.7**	J
Chlorobenzene	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
Chloroethane	~	0.23	U	0.28	U	0.24	U	0.23	U	0.22	U	0.25	U	0.2	U	0.23	U
Chloroform	~	0.42	U	0.77	D	0.44	U	0.42	U	1.5	D	1	D	0.82	D	1	D
Chloromethane	~	0.76	D	0.89	D	1.7	J	0.36	J	0.87	D	0.88	D	0.98	D	0.89	D
Cis-1,2-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
Cis-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Cyclohexane	~	0.3	U	1.2	D	0.62	D	0.56	D	0.68	D	0.32	U	0.58	D	0.38	D
Dibromochloromethane	~	0.73	U	0.89	U	0.76	U	0.73	U	0.7	U	0.79	U	0.65	U	0.73	U
Dichlorodifluoromethane	~	2.1	D	2.7	D	3.7	J	1.3	J	2.6	D	2.6	D	2.5	D	3.1	D
Ethyl Acetate	~	0.65	D	8.8	D	2.9	J	0.84	J	2.6	D	3.4	D	2.1	D	2.4	D
Ethylbenzene	~	0.37	U	0.64	D	1.2	J	0.45	J	0.46	D	0.4	U	0.5	D	0.41	D
Hexachlorobutadiene	~	0.92	U	1.1	U	0.95	U	0.92	U	0.88	U	0.99	U	0.82	U	0.92	U
Isopropanol	~	9.3	D	89	D	380	J	92	J	630	J	520	J	410	J	200	J
M,P-Xylene	~	1.3	D	2.5	D	4.1	J	1.5	J	2.4	D	0.93	D	1.6	D	1.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.66	D	6.4	D	2.1	J	1.3	J	0.99	D	1.1	D	7.8	D	4.4	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.35	UJ	0.43	UJ	1.5	J	0.6	J	0.34	UJ	0.38	UJ	0.91	J	0.63	J
Methyl Methacrylate	~	3.5	D	7.3	D	1.2	J	4.6	J	6.1	D	70	D	2.7	D	3.8	D
Methylene Chloride	3	**55**	D	**20**	D	**10**	J	**43**	J	**30**	D	**49**	D	**11**	D	**64**	D
n-Heptane	~	0.46	D	3.4	D	1.4	J	0.74	J	1.1	D	0.46	D	0.82	D	0.6	D
n-Hexane	~	0.82	D	1.4	D	2.1	D	1.1	D	1.9	D	0.69	D	1.1	D	0.82	D
o-Xylene (1,2-Dimethylbenzene)	~	0.45	D	1.1	D	1.4	J	0.63	J	0.89	D	0.4	U	0.73	D	0.6	D
Propylene	~	0.15	U	0.18	U	0.15	U	0.15	U	0.14	U	0.16	U	0.13	U	0.15	U
Styrene	~	0.37	U	0.45	U	0.5	D	0.37	U	0.35	U	0.4	U	0.78	D	0.4	D
Tert-Butyl Methyl Ether	~	0.31	U	0.38	U	0.32	U	0.31	U	0.3	U	0.33	U	0.28	U	0.31	U
Tetrachloroethene (PCE)	3	0.58	D	1.3	D	**4.5**	J	1.4	J	0.56	U	0.63	U	2.1	D	1	D
Tetrahydrofuran	~	0.51	U	0.62	U	0.53	U	0.51	U	0.48	U	0.55	U	1.3	D	1.4	D
Toluene	~	2.3	D	60	D	12	J	2.6	J	3.1	D	2.5	D	3.3	D	2.5	D
Trans-1,2-Dichloroethene	~	0.34	U	0.42	U	0.35	U	0.34	U	0.33	U	0.37	U	0.3	U	0.34	U
Trans-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Trichloroethene (TCE)	0.2	0.12	U	**3.5**	D	**4.5**	J	**8.3**	J	**0.35**	D	**0.4**	D	**13**	D	**2.4**	D
Trichlorofluoromethane	~	1.3	D	1.8	D	2.5	J	0.97	J	2.1	D	2.1	D	1.9	D	3	D
Vinyl Acetate	~	0.3	U	0.37	U	0.31	U	0.3	U	0.29	U	0.33	U	0.27	U	0.3	U
Vinyl Chloride	0.2	0.11	U	0.13	U	0.11	U	0.11	U	0.11	U	0.12	U	0.098	U	0.11	U
Total BTEX	~	5.05		65.24		20.2		5.76		7.66		4.2		7.06		5.73	
Total CVOCs	~	56.07		25.39		19.96		53.02		30.97		50.04		26.73		68.1	
Total VOCs	~	100		465		489		193		710		690		518		344	

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
4. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
5. Total VOCs = sum of detected volatile organic compounds (VOC)
6. Detected analytical results above the NYSDOH Decision Matrices Minimum Concentrations sample are bolded and shaded.
7. Sample 013_DUP-1 is a duplicate of parent sample 012_IA-2.
8. ~ = Regulatory limit for this analyte does not exist
9. µg/m³ = micrograms per cubic meter
10. AA = Ambient Air
11. IA = Indoor Air

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.
D = The concentration reported is a result of a diluted sample.

FIGURES



LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project	Drawing Title	Project No.	Figure
JACKSON HEIGHTS SHOPPING CENTER 75-11 31ST AVENUE **BCP Site No.: C241176** JACKSON HEIGHTS QUEENS COUNTY NEW YORK	SITE LOCATION MAP	100901401 Date: 6/3/2021 Scale: 1 " = 2,000 ' Drawn By: IHB Submission Date:	1

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 1 - Site Location Map.mxd Date: 6/3/2021 User: ibaker Time: 10:56:44 AM

Legend

- Property Boundary
- Tenant Spaces
- BCP Site Boundary
- Drain
- Storm Water Catch Basin
- Storm Water Dry Well
- Sump Pit
- Monitoring Well Location
- Abandoned Monitoring Well

100 0 100
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 3- Site Map" dated 19 January 2017 and "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

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Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
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Project	Drawing Title	Project No.	Figure
JACKSON HEIGHTS SHOPPING CENTER 75-11 31ST AVENUE **BCP Site No.: C241176** JACKSON HEIGHTS QUEENS COUNTY NEW YORK	SITE PLAN	100901401 Date: 6/3/2021 Scale: 1 " = 100 ' Drawn By: IHB Submission Date:	2

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 2 - Site Planv2.mxd Date: 6/3/2021 User: ibaker Time: 12:58:36 PM

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 14 - Composite Cover System Map" dated 5 January 2018 prepared by PSG Engineering, DPC and provided within the 2019 SMP.

LANGAN

300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

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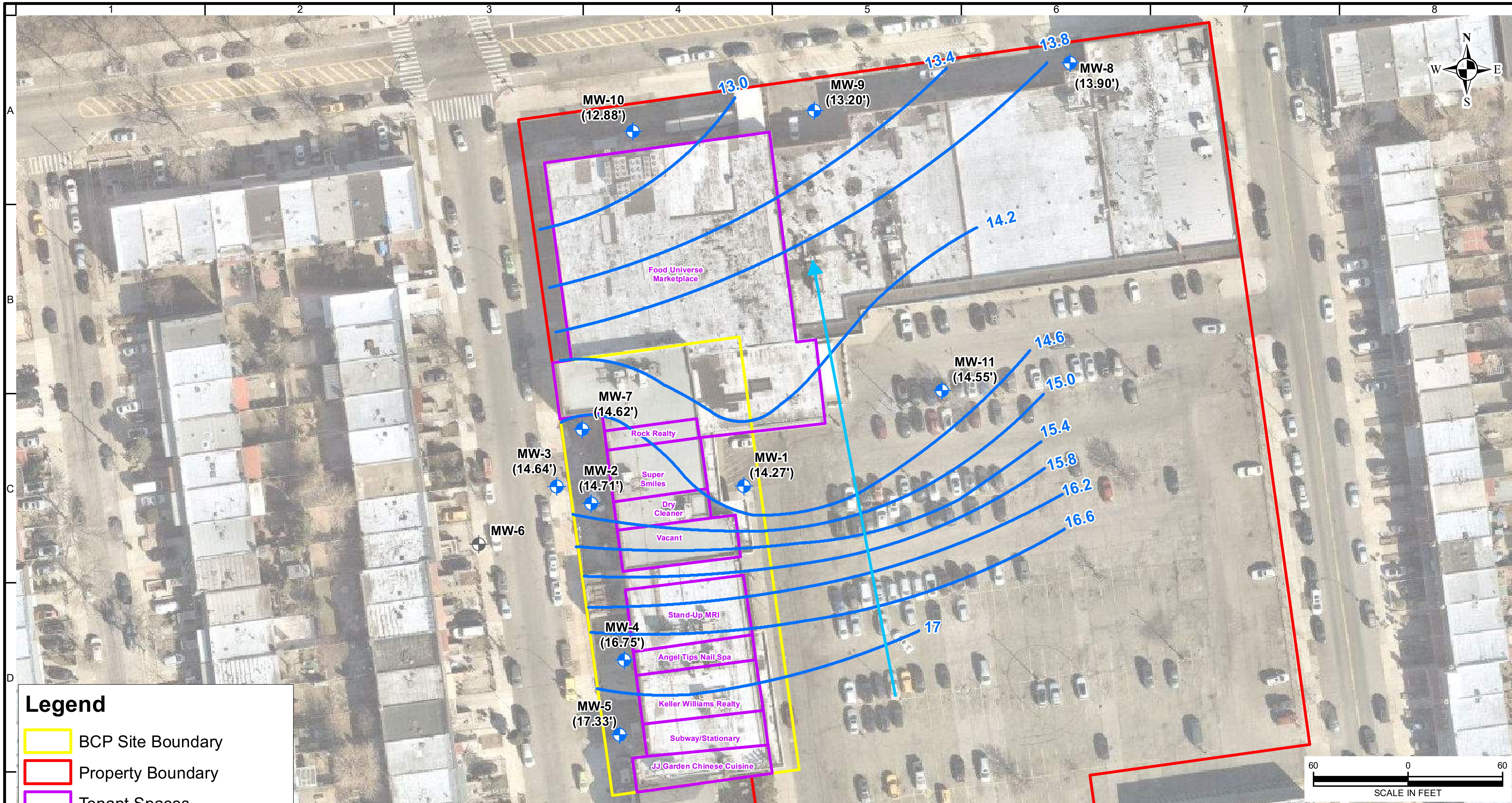
Project	Drawing Title	Project No.	Figure
JACKSON HEIGHTS SHOPPING CENTER 75-11 31ST AVENUE **BCP Site No.: C241176** JACKSON HEIGHTS QUEENS COUNTY NEW YORK	CURRENT COVER SYSTEM MAP (11/18/2020)	100901401	3
		Date: 6/3/2021	
		Scale: 1 " = 40 '	
		Drawn By: IHB	
		Submission Date:	

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 3 - Current Cover System Map.mxd Date: 6/3/2021 User: aruane Time: 4:45:44 PM



Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Groundwater Contour
- Groundwater Flow Direction
- Monitoring Well Location
- Abandoned Monitoring Well

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Elevations shown are in feet North American Vertical Datum of 1988 (NAVD88)

LANGAN

300 Kimball Drive
Parsippany, NJ 07054
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Project

JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE

BCP Site No.: C241176

JACKSON HEIGHTS

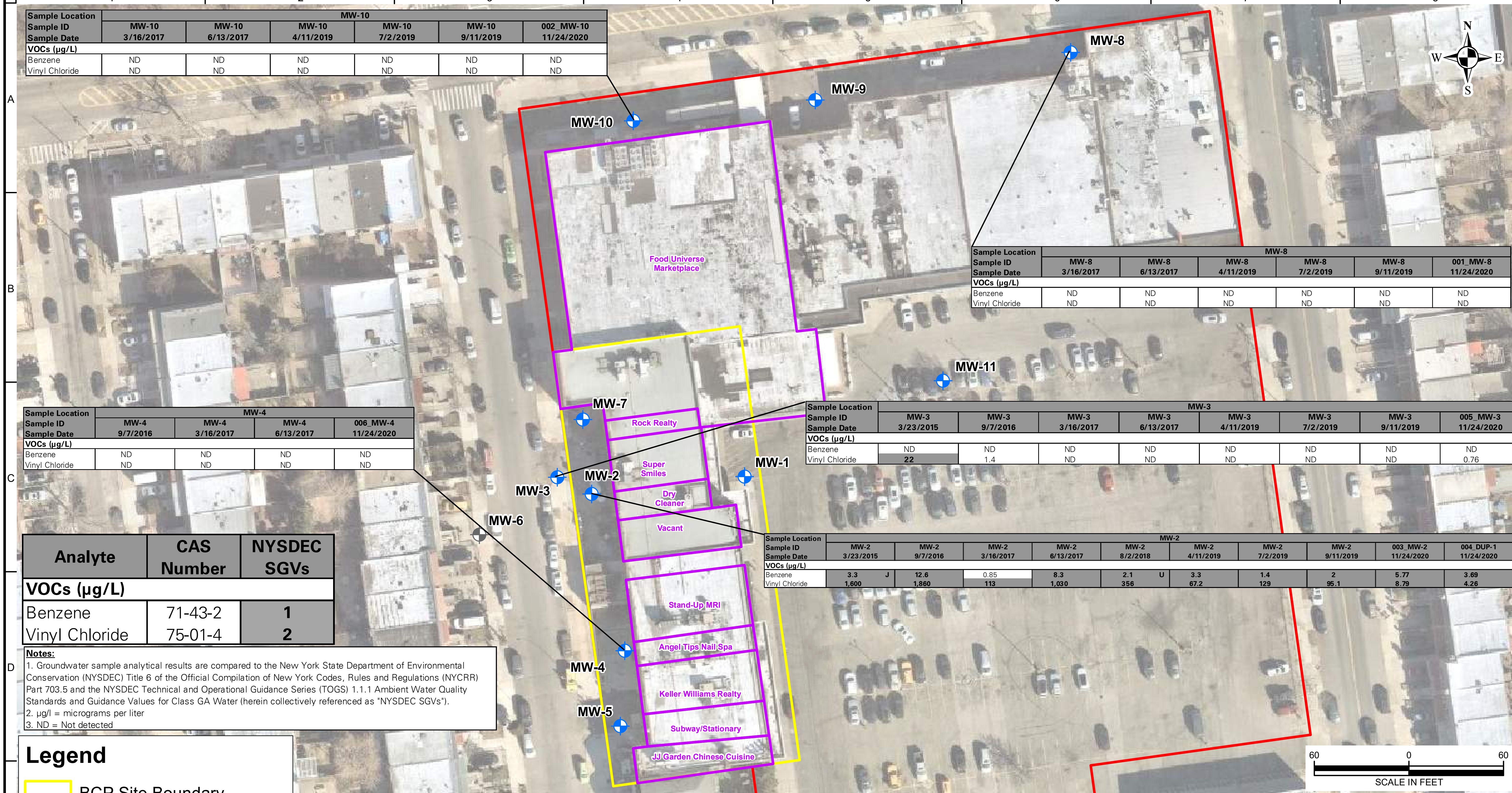
QUEENS COUNTY NEW YORK

Drawing Title

POTENTIOMETRIC SURFACE MAP

Project No.	100901401
Date	6/3/2021
Scale	1 " = 60 '
Drawn By	IHB
Submission Date	
Figure	4

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 4 - Potentiometric Surface Map.mxd Date: 6/3/2021 User: aruane Time: 4:46:03 PM



Sample Location	MW-10					
Sample ID	MW-10	MW-10	MW-10	MW-10	MW-10	002_MW-10
Sample Date	3/16/2017	6/13/2017	4/11/2019	7/2/2019	9/11/2019	11/24/2020
VOCs (µg/L)						
Benzene	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND

Sample Location	MW-8					
Sample ID	MW-8	MW-8	MW-8	MW-8	MW-8	001_MW-8
Sample Date	3/16/2017	6/13/2017	4/11/2019	7/2/2019	9/11/2019	11/24/2020
VOCs (µg/L)						
Benzene	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND

Sample Location	MW-4			
Sample ID	MW-4	MW-4	MW-4	006_MW-4
Sample Date	9/7/2016	3/16/2017	6/13/2017	11/24/2020
VOCs (µg/L)				
Benzene	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND

Sample Location	MW-3							
Sample ID	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	005_MW-3
Sample Date	3/23/2015	9/7/2016	3/16/2017	6/13/2017	4/11/2019	7/2/2019	9/11/2019	11/24/2020
VOCs (µg/L)								
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	**22**	1.4	ND	ND	ND	ND	ND	0.76

Sample Location	MW-2									
Sample ID	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	003_MW-2	004_DUP-1
Sample Date	3/23/2015	9/7/2016	3/16/2017	6/13/2017	8/2/2018	4/11/2019	7/2/2019	9/11/2019	11/24/2020	11/24/2020
VOCs (µg/L)										
Benzene	**3.3 J**	**12.6**	0.85	**8.3**	**2.1 U**	**3.3**	**1.4**	**2**	**5.77**	**3.69**
Vinyl Chloride	**1,600**	**1,860**	**113**	**1,030**	**356**	**67.2**	**129**	**95.1**	**8.79**	**4.26**

Analyte	CAS Number	NYSDEC SGVs
VOCs (µg/L)		
Benzene	71-43-2	**1**
Vinyl Chloride	75-01-4	**2**

Notes:
1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 of the Official Compilation of New York Codes, Rules and Regulations (NYCRR) Part 703.5 and the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water (herein collectively referenced as "NYSDEC SGVs").
2. µg/l = micrograms per liter
3. ND = Not detected

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Monitoring Well Location
- Abandoned Monitoring Well

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.

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Parsippany, NJ 07054
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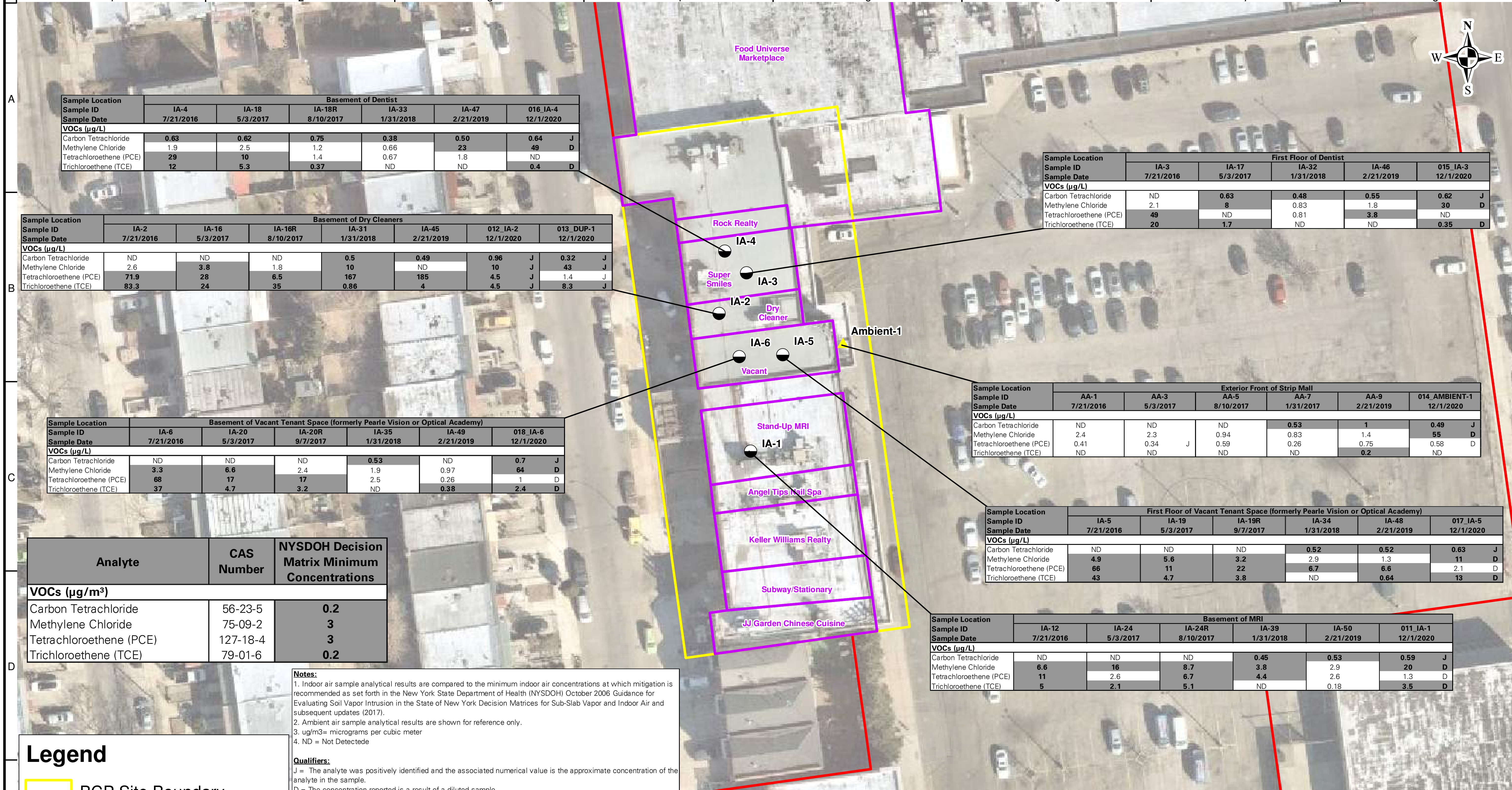
Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
GROUNDWATER ANALYTICAL RESULTS

Project No.	Figure
100901401	5
Date: 8/19/2021	
Scale: 1 " = 60 '	
Drawn By: IHB	
Submission Date	

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 5 - Groundwater Analytical Results 105.mxd Date: 8/19/2021 User: ibaker Time: 2:01:35 PM



Sample Location	Basement of Dentist					
Sample ID	IA-4	IA-18	IA-18R	IA-33	IA-47	016_IA-4
Sample Date	7/21/2016	5/3/2017	8/10/2017	1/31/2018	2/21/2019	12/1/2020
VOCs (µg/L)						
Carbon Tetrachloride	0.63	0.62	0.75	0.38	0.50	0.64 J
Methylene Chloride	1.9	2.5	1.2	0.66	23	49 D
Tetrachloroethene (PCE)	29	10	1.4	0.67	1.8	ND
Trichloroethene (TCE)	12	5.3	0.37	ND	ND	0.4 D

Sample Location	Basement of Dry Cleaners						
Sample ID	IA-2	IA-16	IA-16R	IA-31	IA-45	012_IA-2	013_DUP-1
Sample Date	7/21/2016	5/3/2017	8/10/2017	1/31/2018	2/21/2019	12/1/2020	12/1/2020
VOCs (µg/L)							
Carbon Tetrachloride	ND	ND	ND	0.5	0.49	0.96 J	0.32 J
Methylene Chloride	2.6	3.8	1.8	10	ND	10 J	43 J
Tetrachloroethene (PCE)	71.9	28	6.5	167	185	4.5 J	1.4 J
Trichloroethene (TCE)	83.3	24	35	0.86	4	4.5 J	8.3 J

Sample Location	First Floor of Dentist				
Sample ID	IA-3	IA-17	IA-32	IA-46	015_IA-3
Sample Date	7/21/2016	5/3/2017	1/31/2018	2/21/2019	12/1/2020
VOCs (µg/L)					
Carbon Tetrachloride	ND	0.63	0.48	0.55	0.62 J
Methylene Chloride	2.1	8	0.83	1.8	30 D
Tetrachloroethene (PCE)	49	ND	0.81	3.8	ND
Trichloroethene (TCE)	20	1.7	ND	ND	0.35 D

Sample Location	Exterior Front of Strip Mall					
Sample ID	AA-1	AA-3	AA-5	AA-7	AA-9	014_AMBIENT-1
Sample Date	7/21/2016	5/3/2017	8/10/2017	1/31/2017	2/21/2019	12/1/2020
VOCs (µg/L)						
Carbon Tetrachloride	ND	ND	ND	0.53	1	0.49 J
Methylene Chloride	2.4	2.3	0.94	0.83	1.4	55 D
Tetrachloroethene (PCE)	0.41	0.34 J	0.59	0.26	0.75	0.58 D
Trichloroethene (TCE)	ND	ND	ND	ND	0.2	ND

Sample Location	Basement of Vacant Tenant Space (formerly Pearle Vision or Optical Academy)					
Sample ID	IA-6	IA-20	IA-20R	IA-35	IA-49	018_IA-6
Sample Date	7/21/2016	5/3/2017	9/7/2017	1/31/2018	2/21/2019	12/1/2020
VOCs (µg/L)						
Carbon Tetrachloride	ND	ND	ND	0.53	ND	0.7 J
Methylene Chloride	3.3	6.6	2.4	1.9	0.97	64 D
Tetrachloroethene (PCE)	68	17	17	2.5	0.26	1 D
Trichloroethene (TCE)	37	4.7	3.2	ND	0.38	2.4 D

Sample Location	First Floor of Vacant Tenant Space (formerly Pearle Vision or Optical Academy)					
Sample ID	IA-5	IA-19	IA-19R	IA-34	IA-48	017_IA-5
Sample Date	7/21/2016	5/3/2017	9/7/2017	1/31/2018	2/21/2019	12/1/2020
VOCs (µg/L)						
Carbon Tetrachloride	ND	ND	ND	0.52	0.52	0.63 J
Methylene Chloride	4.9	5.6	3.2	2.9	1.3	11 D
Tetrachloroethene (PCE)	66	11	22	6.7	6.6	2.1 D
Trichloroethene (TCE)	43	4.7	3.8	ND	0.64	13 D

Sample Location	Basement of MRI					
Sample ID	IA-12	IA-24	IA-24R	IA-39	IA-50	011_IA-1
Sample Date	7/21/2016	5/3/2017	8/10/2017	1/31/2018	2/21/2019	12/1/2020
VOCs (µg/L)						
Carbon Tetrachloride	ND	ND	ND	0.45	0.53	0.59 J
Methylene Chloride	6.6	16	8.7	3.8	2.9	20 D
Tetrachloroethene (PCE)	11	2.6	6.7	4.4	2.6	1.3 D
Trichloroethene (TCE)	5	2.1	5.1	ND	0.18	3.5 D

Analyte	CAS Number	NYSDOH Decision Matrix Minimum Concentrations
VOCs (µg/m³)		
Carbon Tetrachloride	56-23-5	0.2
Methylene Chloride	75-09-2	3
Tetrachloroethene (PCE)	127-18-4	3
Trichloroethene (TCE)	79-01-6	0.2

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. ug/m3= micrograms per cubic meter
4. ND = Not Detectede

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
D = The concentration reported is a result of a diluted sample.

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Ambient Sample Location
- Indoor Air Sample Location

50 0 50
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Sample locations based on field measurements.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
INDOOR AIR ANALYTICAL RESULTS

Project No. 100901401
Date 8/19/2021
Scale 1 " = 50 '
Drawn By IHB
Submission Date
Figure 6

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 6 - Indoor Air Analytical Results.mxd Date: 8/19/2021 User: ibaker Time: 1:26:37 PM

APPENDIX A

Regulatory Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau B
625 Broadway, 12th Floor, Albany, NY 12233-7016
P: (518) 402-9768 I F: (518) 402-9773
www.dec.ny.gov

June 23, 2021

Christopher McMahon, CHMM
LANGAN
300 Kimball Drive
Parsippany, NJ 07054

Re: Comments on Site Management (SM) Periodic Review Report (PRR)
Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, Site No.: C241176

Dear Christopher:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have reviewed the above referenced your Periodic Review Report (PRR) dated June 2021. Based on our review we have following comments

1. Pdf page 14, sub-section-Indoor Air Sampling: Please discuss about the occupancy status of all sampled tenant spaces. Also mention whether indoor air results letters have been sent to the tenants of the spaces sampled. If so, please provide copies of results letters to us. (It is owner's responsibility to inform his tenants about the indoor air results). If not, please send indoor air results to all tenants by July 8, 2021.

2. Groundwater Analytical Results, Figure 5: within the onset data table please include additional column for groundwater results before COC issued to compare the effectiveness of the remedy.

3. Indoor Air Analytical Results, Figure 6: same as above. Within the onset data table please include additional column for indoor air results before COC issued to see the effectiveness of the remedy.

4. Because the SSDS was confirmed to be operational, and considerable work was done on the building to seal up preferential pathways between tenant spaces, it appears that the active dry cleaner continues to be problematic to adjacent tenant spaces, resulting in elevated levels of CVOCs (including TCE) being detected in the indoor air of multiple businesses. TCE was detected above the Air Guideline Value of 2ug/m3 in several samples. Additional discussion/recommendations needed regarding how to improve this condition.

5. The detections of elevated levels of methylene chloride in all samples, including ambient/outdoor is odd and not explained in the PRR. More information is needed

6. Appendix G: IC/EC certification forms are not included. Please include the signed copies of the attached certification forms.

Please submit a revised Periodic Review Report (PRR) by incorporating above comments to the Department on or before July 16, 2021.

If you have any question, please contact me at sxahmed.ahmed@dec.ny.gov. Thanks.

Sincerely

Sadique Ahmed, P.E.
Project Manager
Remedial Bureau B, Section B

ec: Jeff Kay, Allied Jackson Heights, LLC, (jkay@Muss.com)
Gerard Burke
Scarlett McLaughlin, NYSDOH
Julia Kenney, NYSDOH
Angela Martin, NYSDOH

MIKE KIM (917) 560-7500
Greenlawn NY 11740

SEPTEMBER 1, 2020

TO: D.E.C. Region 2
ATT: Mr. Gandhi

RE: HI-STYLE CLEANERS
75-39 31st Ave.
Jackson Heights, NY 11370

REAL STAR
45 lbs.
Model: RS-373
Serial #: 04-C4-218

Above mentioned drycleaning machinery has been cut & junked to:

Gershow Recycling
149 W. 11th Street
Huntington, NY 11746
(631) 385-1200

Sincerely,

Mike Kim
Mike Kim

HI-STYLE CLEANERS

75-39 31st AVE, EAST ELMHURST N.Y 11370 Tel : (718) 803-0181

Date : SEP/15/2020

Department of Environmental Protection
Bureau of Environmental Compliance
Record Dept (9th Fl)
59-17 Junction Blvd Flushing, NY 11373-5108

Re: Termination Notice of the perc dry cleaning machine

To whom it may concern,

Please be advised that the operation of the perc dry cleaning machine as shown below was Terminated on SEP / 01/2020.

Below

Installation Number : PA023495
Manufacturer's name :REAL-STAR
Model number: RS-373 Serial number : 04-C4-218

It is my understanding that this letter is sufficient notification to the DEP concerning my Facility's compliance with the regulation and that nothing further is required of me In this regard

Cordially

OHI-STYLE CLEANERS

Young B Kim (President)

Signature [signature] Date 09-15-2020

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NYD 981 082 704	1/1	800-424-9300	020637612 JJK

5. Generator's Name and Mailing Address: Hi Style Cleaners, 70-39 31st Ave Jackson Heights NY 11370

Generator's Site Address (if different than mailing address)

Generator's Phone: 718 803 0187

6. Transporter 1 Company Name: National Waste Clean — U.S. EPA ID Number: NJD000564906

7. Transporter 2 Company Name: National Waste Clean — U.S. EPA ID Number: NJD000564906

8. Designated Facility Name and Site Address: Exiax Industries, Inc., 6419 Netherhart Rd., Mississauga, Ontario, L5T1C3 Canada — U.S. EPA ID Number:

Facility's Phone: 905-670-7735

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. ~~R.Q. UN2811, Waste Toxic Solid, Organic, n.o.s. (Tetrachloroethylene), 6.1, PGIII~~		DF		P	F001	D039	
X	2. R.Q. UN2810, Waste Toxic Liquid, Organic, n.o.s. (Tetrachloroethylene), 6.1, PGIII	2	DF	60	P	F001	D039	
X	3. ~~R.Q. UN2810, Waste Toxic Liquid, Organic, n.o.s. (Tetrachloroethylene), 6.1, PGIII (Contact Water Only)~~		DF		P	F001	D039	
	4.							

14. Special Handling Instructions and Additional Information

Perc Machine Removed !

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.

I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Young P. Kim — Signature: [signature] — Month 9 Day 04 Year 2020

16. International Shipments ☐ Import to U.S. ☒ Export from U.S. Port of entry/exit: LEWISTON, NY

Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Hong H Kim — Signature: [signature] — Month 9 Day 04 Year 2020

Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H020	H020	H020	

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

NOTICE OF DRY CLEANING EQUIPMENT SHUTDOWN
Perc and/or Alternative Solvent Dry Cleaning Machines

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Complete this form whenever any Perc or Alternative Solvent Dry Cleaning Machine is removed from service. The completed form must be typed or legibly printed and sent by CERTIFIED MAIL RETURN RECEIPT REQUESTED to the NYSDEC Regional office that serves your county. Mailing addresses are shown on page two (2) of this form. Keep a copy of this form for your records.

DEC ID for Dry Cleaning Facility: 2 - 6 3 0 1 - 0 0 5 3 6

(Please report facility information as on NYSDEC Registration or Permit form)	
Facility Name:	HI-STYLE CLEANERS CORP
Facility Address:	75-39 31st AVE
	QUEENS NY 11370
Phone Number:	(718) 803-0181

List below each Perc and Alternative Solvent dry cleaning machine that was taken out of service at your dry cleaning facility.

Machine Manufacturer and Model Name:	Serial Number:	Shutdown Date:	Replacement Machine (if any):
REAL-STAR	04-C4-218	09/01/2020	N/A
RS-373			

In accordance with 6 NYCRR Part 232-1.6(c), I am notifying DEC that I have ceased operating the above dry cleaning machine(s) at the above facility.

Responsible Official:	YOUNG.B.KIM
Title:	PRESIDENT
Signature:	Young B Kim
Date:	09/01/2020

 Form 232-14 (5/07/2018)

Clean Air Supply, Inc.

Clean Air Equipment, Inc.
170 Roosevelt Place, Palisades Park, NJ 07650
Toll Free: 1-800-435-0581, Tel: 201-461-9766
Fax: (201)461-9767

Contract # 2685

Sold To:	Ship To:
Hi-Style Cleaners (HIJH11) 75-39 31st Ave. Jackson Heights, NY 11370	Hi-Style Cleaners (HIJH11) 75-39 31st Ave. Jackson Heights, NY 11370

Phone	Date	Date of Plans	Job#	Archtect	Total
718-803-0181	2020-06-11				27,872.00

Description	Qty	Price	Extension
Wascomat Washer(EX660Clarus 60Lbs soft mount w/steam injector)	1 EA	16,300.00	16,300.00
DRYER(DTD767 67lbs steam w/RV & RMC)	1 EA	6,300.00	6,300.00
Installation	1	3,000.00	3,000.00
*** Equipment Total: 22,600.00			
*** Sales Tax :			2,272.00
Note			
1.NYC permit is not included			

We Propose hereby to furnish material and labor - complete in accordance with above specifications, for the sum of:

_______________ dollars ( )

Payment to be made as follows:

____

and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature

This proposal may be withdrawn by us if not accepted within days.

Acceptance of Proposal

The above prices, specifications and conditions are satisfactory and are hereby accept You are authorized to do the work as specified. Payment will be made as outlined above.

Signature: _______________

Date of Acceptance:

Signature:

Clean Air Supply.Inc.

Clean Air Equipment, Inc.
170 Roosevelt Place, Palisades Park, NJ 07650
Toll Free: 1-800-435-0581, Tel: 201-461-9766
Fax: (201)461-9767

Contract # 2684

Sold To:	Ship To:
Hi-Style Cleaners (HIJH11) 75-39 31st Ave. Jackson Heights, NY 11370	Hi-Style Cleaners (HIJH11) 75-39 31st Ave. Jackson Heights, NY 11370

Phone	Date	Date of Plans	Job#	Archtect	Total
718-803-0181	2020-06-11				34,611.36

Description	Qty	Price	Extension
Miele Wet Cleaning washer(PW818 45lbs soft mounted)	1 EA	16,800.00	16,800.00
Miele Wet Cleaning Dryer(PT8507 55lbs w/steam heated)	1 EA	11,990.00	11,990.00
Installation	1	3,000.00	3,000.00
*** Equipment Total: 28,790.00			
*** Sales Tax :			2,821.36
Note			
1.NYC permit is not included			

We Propose hereby to furnish material and labor - complete in accordance with above specifications, for the sum of:

________________________________ dollars (   )

Payment to be made as follows:

____

and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature This proposal may be withdrawn by us if not accepted within days.

Acceptance of Proposal

The above prices, specifications and conditions are satisfactory and are hereby accept
You are authorized to do the work as specified. Payment will be made as outlined above.

Signature: ____________________

Date of Acceptance:

Signature:

Allyson Kritzer

From:	Allyson Kritzer
Sent:	Thursday, July 8, 2021 5:30 PM
To:	'Ahmed, Sadique (DEC)'
Cc:	Burke, Gerard (DEC); Jeff Kay; Steve Ciambruschini; Christopher McMahon; Karen Nespolini; Ken Konfong; Mark Kostron; McLaughlin, Scarlett E (HEALTH); Martin, Angela L (HEALTH); Kenney, Julia M (HEALTH)
Subject:	RE: Periodic Review Report (PRR). Jackson Heights Shopping Center (Site Code C241176)

Good Evening Sadique,

Below is a link to the indoor air results letter distributed to the tenants on 8 July 2021.

Additionally, are you available either tomorrow 7/9 (anytime between 9 AM and 3 PM) or Monday 7/12 (between 9 and 10 AM or after 4 PM) to discuss the comment letter provided?

Please let us know and thanks in advance,
Allyson

New files have been posted for you at the Langan Client Services site and can be retrieved until 7/18/2021 by clicking on the link below.

https://clients.langan.com/Sharing/filesharing/ViewPosted?transactionHash=739020437

Name	Type	Size
Indoor Air Letter Notifications (2021-07-08).pdf	.pdf	7.63 MB

If you have any questions regarding the use of the Langan Client Services, please contact Langan IT (helpdesk@langan.com).

Allyson Kritzer
Senior Staff Engineer

LANGAN

Direct: 973.560.4289
Mobile: 201.755.6973
File Sharing Link
www.langan.com

Build your career with a premier firm. Join Langan.

From: Ahmed, Sadique (DEC) <sadique.ahmed@dec.ny.gov>
Sent: Wednesday, June 23, 2021 1:03 PM
To: Christopher McMahon <cmcmahon@Langan.com>
Cc: Burke, Gerard (DEC) <gerard.burke@dec.ny.gov>; Jeff Kay <jkay@Muss.com>; Steve Ciambruschini <sciambruschini@Langan.com>; Allyson Kritzer <akritzer@langan.com>; Karen Nespolini <knespolini@Langan.com>; Ken Konfong <KKonfong@Muss.com>; Mark Kostron <Mark@Muss.com>; McLaughlin, Scarlett E (HEALTH) <scarlett.mclaughlin@health.ny.gov>; Martin, Angela L (HEALTH) <Angela.Martin@health.ny.gov>; Kenney, Julia M (HEALTH) <julia.kenney@health.ny.gov>
Subject: RE: Periodic Review Report (PRR). Jackson Heights Shopping Center (Site Code C241176)

Dear Chris,
The NYSDEC and NYSDOH have reviewed the above BCP site related Periodic Review Report (PRR) dated June 2021. Upon review we have some comments which are included in the attached correspondence (Comments on PRR 2021).

IC/EC certification forms are not included in the PRR. Please use the attached IC/EC forms to include in the revised PRR.

Please submit a revised Periodic Review Report by incorporating all comments to the Department by July 16, 2021.

If you have any question please contact me. Thanks.

Sadique Ahmed, P.E.
Professional Engineer 1 (Environmental), Division of Environmental Remediation

New York State Department of Environmental Conservation
Remedial Bureau B, Section B
625 Broadway, 12th Floor, Albany NY 12233-7016
P: (518) 402-9656 | F: (518) 402-9773 | Sadique.ahmed@dec.ny.gov
C: (518) 368 5120
www.dec.ny.gov | | |

From: Christopher McMahon <cmcmahon@Langan.com>
Sent: Friday, June 4, 2021 6:03 PM
To: Ahmed, Sadique (DEC) <sadique.ahmed@dec.ny.gov>
Cc: Burke, Gerard (DEC) <gerard.burke@dec.ny.gov>; Jeff Kay <jkay@Muss.com>; Steve Ciambruschini <sciambruschini@Langan.com>; Allyson Kritzer <akritzer@langan.com>; Karen Nespolini <knespolini@Langan.com>; Ken Konfong <KKonfong@Muss.com>; Mark Kostron <Mark@Muss.com>
Subject: Periodic Review Report (PRR). Jackson Heights Shopping Center (Site Code C241176)

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Good Afternoon Sadique – please use the link below to access the PRR for the above referenced site that is being submitted for the DECs review. Please note, as a copy of the IC/EC form hadn't previously been provided we will re-submit this report with that completed form once you forward it.

https://clients.langan.com/Sharing/filesharing/ViewPosted?transactionHash=1417938023

Name	Type	Size
Jackson Heights Shopping Center PRR DRAFT (2021-06-04).pdf	.pdf	31.03 MB

If you have any questions regarding the use of the Langan Client Services, please contact Langan IT (helpdesk@langan.com).

As always, please feel free to reach out with any questions that you have and we'll look forward to hearing from you.

Regards.

Christopher McMahon, CHMM
Associate

LANGAN

Direct: 973.560.4861
Mobile: 201.218.2339
File Sharing Link
www.langan.com

NEW JERSEY NEW YORK CONNECTICUT MASSACHUSETTS PENNSYLVANIA WASHINGTON, DC
VIRGINIA OHIO FLORIDA TEXAS ARIZONA COLORADO WASHINGTON CALIFORNIA
ATHENS CALGARY DUBAI LONDON PANAMA

Allied Jackson Heights, LLC
118-35 Queens Boulevard
Forest Hills, New York 11375

July 8, 2021

Fedida Dental Spa PLLC
75-45 31st Avenue
Jackson Heights, New York 11370

Re: Indoor Air Testing at 75-11 31st Avenue, Jackson Heights, NY

Dear Tenant,

Allied Jackson Heights, LLC is conducted periodic vapor sampling in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Site Management Plan dated October 2019 at the above-referenced property, including sampling of indoor air. These samples were collected to evaluate the potential for volatile organic compounds (VOCs), such as tetrachloroethene (PCE) and trichloroethene (TCE) from contaminated groundwater and contaminated soils to enter the building and affect the indoor air quality through a process known as soil vapor intrusion (see enclosed Fact Sheet). Degradation products of these compounds, including carbon tetrachloride and methylene chloride, were also evaluated. This environmental work is being conducted under the supervision of the NYSDEC and the New York State Department of Health (NYSDOH).

In November 2016, both PCE and TCE were detected in air beneath the basement slab and within the building. The indoor air levels of PCE and TCE exceeded applicable NYSDOH air guidelines. As a result, a sub-slab depressurization system was installed in March 2017 within certain portions of the building. Subsequent sampling in May 2017 showed that PCE levels had decreased to below applicable NYSDOH air guidelines at that time. Although TCE levels had decreased, they were still above applicable NYSDOH air guidelines at that time. Accordingly, another sampling event was conducted in August 2017. Both PCE and TCE levels were below NYSDOH air guidelines and within background concentrations. To confirm these findings, Allied Jackson Heights, LLC conducted additional sampling in January 2018. Once again, both PCE and TCE levels were below NYSDOH air guidelines and within background concentrations. Allied Jackson Heights, LLC conducted additional sampling in February 2019. PCE was detected within the first floor and in the basement, although these values were below the NYSDOH air guideline values. TCE was non-detect in both the first floor and the basement.

Allied Jackson Heights, LLC conducted additional sampling in December 2020 within the basement and first floor. TCE (0.4 micrograms per meter cubed [$\mu g/m^3$]), carbon tetrachloride (0.64 $\mu g/m^3$), and methylene chloride (49 $\mu g/m^3$) were detected in exceedance of the NYSDOH Guidelines of 0.2 $\mu g/m^3$, 0.2 $\mu g/m^3$, and 3 $\mu g/m^3$, respectively, within the basement. TCE (0.35 $\mu g/m^3$), carbon tetrachloride (0.62 $\mu g/m^3$), and methylene chloride (30 $\mu g/m^3$) were also detected in exceedance of the NYSDOH Guidelines within the first floor. PCE was not detected above the laboratory reporting limit in the basement or first floor. Allied Jackson Heights, LLC will continue to coordinate with NYSDEC and NYSDOH.

Copies of the NYSDOH Fact Sheets for PCE, TCE, carbon tetrachloride, and methylene chloride are enclosed and test results are included in the attached table and figure.

Below is contact information for both the NYSDEC and the NYSDOH should you have any questions regarding this matter.

NYSDEC
Attn: Sadique Ahmed
625 Broadway
Albany, NY 12233-7016
Tel: (518) 402-9656
Sadique.ahmed@dec.ny.gov

NYSDOH
Attn: Ms. Angela Martin
Empire State Plaza, Corning Tower, Rm 1787
Albany, NY 12237
Tel: (518) 402-7860
BEEI@health.ny.gov

Sincerely,

Allied Jackson Heights, LLC

Mark Kostron

SOIL VAPOR INTRUSION

Frequently Asked Questions

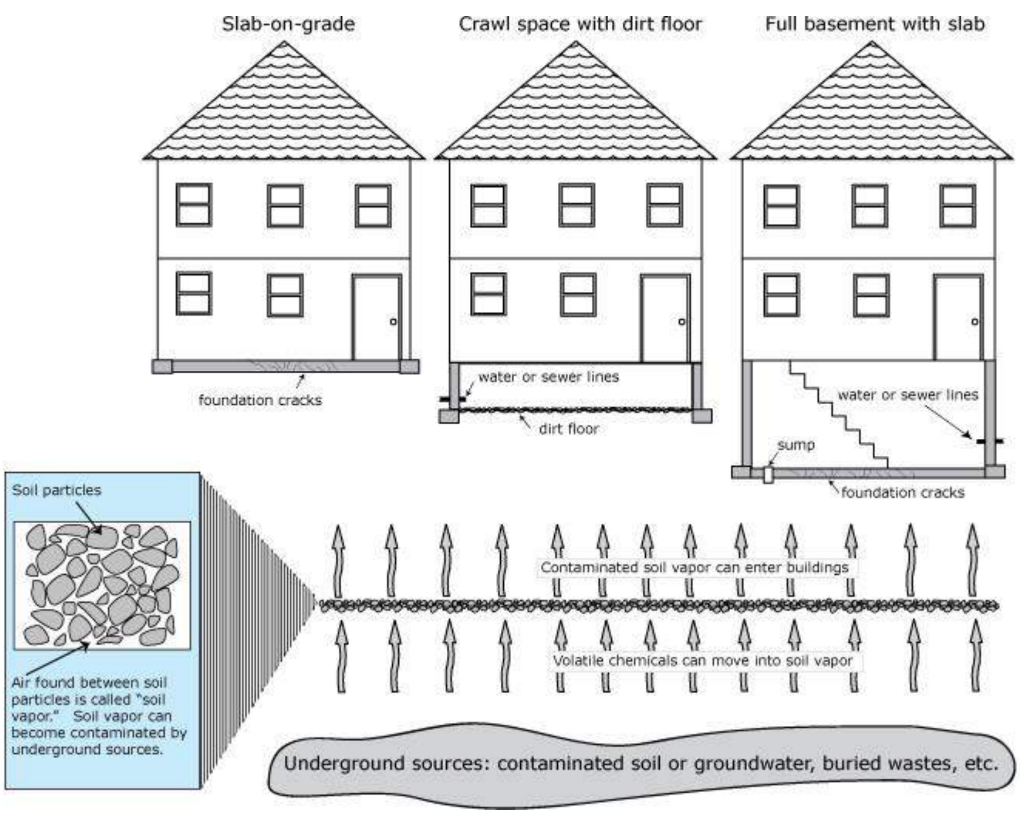
What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, soil vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).



How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when soil vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for soil vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at (518) 402-7880 or 1-800-458-1158 for additional information.

How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

<u>Soil vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

<u>Sub-slab vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

<u>Indoor air samples</u> are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

<u>Outdoor air samples</u> are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the

PID is used to help determine whether products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for soil vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at (518) 402-7880 or 1-800-458-1158.

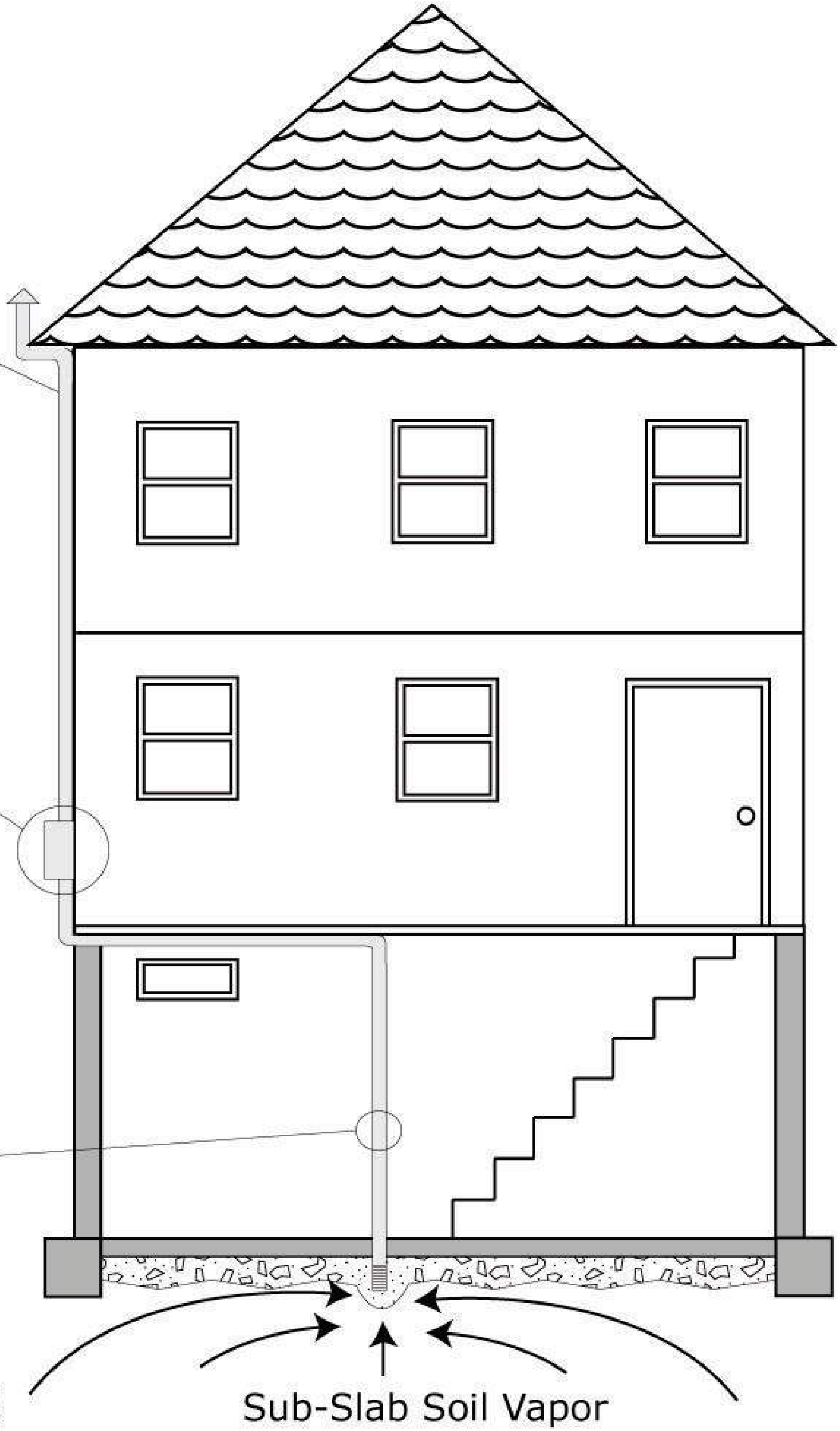
Sub-Slab Depressurization System

(commonly called a radon mitigation system)

The vent pipe is routed up the side of the structure to a location above the roof line.

A fan is used to draw soil vapor from beneath the slab.

A liquid gauge, or manometer is used to verify that the system is operating properly



A sub-slab depressurization system vents contaminated soil vapor before it enters a structure. The fan draws vapor from beneath the building outside to the roof line where it is released to the outside air.

New York State Department of Health
Tenant Notification Fact Sheet for Tetrachloroethene (Perc)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Tetrachloroethene (Perc)

Tetrachloroethene (also known as perchloroethylene or Perc) is a man-made volatile organic chemical that is widely used in the dry-cleaning of fabrics, including clothes, and in manufacturing other chemicals. It was also used for degreasing metal parts and in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors.

Sources of Perc in Indoor Air

Household products containing Perc could be a possible source for Perc in indoor air. Perc also may evaporate from dry-cleaned clothes or dry-cleaning operations into indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Perc may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Perc has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of Perc in indoor and outdoor air. Levels of Perc in the indoor air of homes and office settings and in outdoor air are expected to be below 10 micrograms per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

An association exists between exposure of people in the workplace to high levels of Perc in air and certain forms of cancer. Perc causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, the studies of humans and in animals do not prove that Perc causes cancer in people, but are highly suggestive that there may be an increased risk for cancer in people who are exposed to Perc (particularly at high concentrations) over long periods of time

People exposed to high levels of Perc in air had nervous system effects and slight changes to their liver and kidneys. Some studies show a slightly increased risk for some types of reproductive effects among workers (including dry-cleaning workers) exposed to Perc and other chemicals. The reproductive effects associated with exposure included increased risks for spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by Perc and not by some other factor or factors. Exposure to high levels of Perc has caused liver and kidney damage in laboratory animals and effects on the nervous system. Taken together, the human and animal studies indicate that human exposure to high levels of Perc causes effects on the nervous system, and suggest that human exposure to high levels of Perc may increase the risk for liver and kidney toxicity.

NYS DOH Air Guideline

The NYS DOH guideline for Perc in air is 30 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people

are continuously exposed to Perc in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of Perc.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce Perc exposure. Reasonable and practical actions should be taken to reduce Perc exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 30 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. The NYS DOH recommends taking immediate action to reduce exposure when an air level is ten times or more higher than the guideline (that is, when the air level is 300 mcg/m^3 or higher).

Ways to Limit Exposure to Perc in Indoor Air

In all cases, the specific actions to limit exposure to Perc in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of Perc and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of Perc entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring Perc in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on Perc, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants.

If you have further questions about Perc and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
December, 2013

New York State Department of Health
Tenant Notification Fact Sheet for Trichloroethene (TCE)

This fact sheet is provided to fulfill New York State Department of Health (NYSDOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m^3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a

health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

NYSDOH Air Guideline

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3.

Ways to Limit Exposure to TCE in Indoor Air

In all cases, the specific recommended actions to limit exposure to TCE in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of TCE and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of TCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that evaporates into indoor air.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods

recommended by the NYSDOH for measuring TCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at levels below 1 mcg/m^3.

Additional Information

Additional information on TCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYSDOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about TCE and the information in this fact sheet, please call the NYSDOH at 1-518-402-7800 or 1-800-458-1158, e-mail to ceheduc@health.state.ny.us, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

Updated August 2015

New York State Department of Health
Tenant Notification Fact Sheet for Carbon Tetrachloride

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Carbon Tetrachloride

Carbon tetrachloride is a man-made volatile organic chemical that was used as a household spot remover, an industrial degreasing agent, in dry cleaning, in fire extinguishers, and as a grain fumigant to kill insects. Most of these uses have been discontinued. Carbon tetrachloride was also used to make refrigerants and propellants for aerosol cans, but this use has declined in recent years because of the effects of many refrigerants and aerosol propellants on the earth's ozone layer.

Sources of Carbon Tetrachloride in Indoor Air

Household products containing carbon tetrachloride could be a possible source for carbon tetrachloride in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Carbon tetrachloride may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Carbon tetrachloride has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of carbon tetrachloride in indoor and outdoor air. Levels of carbon tetrachloride in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of carbon tetrachloride in humans following long-term exposure. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system, liver and kidney damage. Exposure to high concentrations of carbon tetrachloride damages the liver, kidney, nervous system and male reproductive system in laboratory animals. Carbon tetrachloride causes cancer in laboratory animals exposed at high levels over their lifetimes. Whether or not carbon tetrachloride causes cancer in humans is unknown. Taken together, the human and animal studies suggest that long term human exposure to carbon tetrachloride (particularly at high levels) may increase the risk for cancer and for liver, kidney and nervous system toxicity.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for carbon tetrachloride in air. However, NYS DOH guidance for carbon tetrachloride and other air contaminants is that reasonable and practical actions should be taken to reduce exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The carbon tetrachloride exposure levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to Carbon Tetrachloride in Indoor Air

In all cases, the specific actions to limit exposure to carbon tetrachloride in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of carbon tetrachloride and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of carbon tetrachloride entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring carbon tetrachloride in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on carbon tetrachloride, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about carbon tetrachloride and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

New York State Department of Health
Tenant Notification Fact Sheet for Dichloromethane

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Dichloromethane

Dichloromethane (also known as methylene chloride) is a colorless and volatile liquid chemical that has a mild, sweet odor. It is used as an industrial and laboratory solvent, as a paint stripper, and in the manufacture of photographic film. Dichloromethane is also found in aerosol products, adhesives, spray paints, automotive cleaners, and varnish removers.

Sources of Dichloromethane in Indoor Air

Household products containing dichloromethane are a possible source for dichloromethane in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Dichloromethane may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Dichloromethane has also been found in outdoor air near facilities where it is being produced or used, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of dichloromethane in indoor and outdoor air. Levels of dichloromethane are typically around 5 micrograms per cubic meter (mcg/m^3) in the indoor air of homes and offices, but may be somewhat higher as dichloromethane is commonly used in many paint strippers and adhesive products. Levels in outdoor air are expected to be less than 5 mcg/m^3.

Health Risks Associated with Exposure

People exposed to high levels of dichloromethane in air for short periods of time had adverse effects on the central nervous system, including dizziness, headache, lightheadedness, confusion, incoordination, drowsiness, prickling or tinkling sensations, and decreased scores on tests that evaluate nervous system function. Long term exposure to high levels of dichloromethane damages the liver and kidneys of laboratory animals. Taken together, the human and animal studies indicate that human exposure to high levels of dichloromethane causes adverse effects on the nervous system, and suggest that long term human exposure to dichloromethane may increase the risk for liver and kidney toxicity.

Studies of long-term human exposure to dichloromethane in the workplace had weaknesses that limited their ability to detect an increased incidence of cancer due to the chemical. Therefore, whether or not dichloromethane cause cancer in humans is unknown. Dichloromethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, data from the human and animal studies suggest that long-term human exposure to dichloromethane could increase the risk for cancer.

NYS DOH Air Guideline

The NYS DOH guideline for dichloromethane in air is 60 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people are continuously exposed to dichloromethane in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of dichloromethane.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce dichloromethane exposure. Reasonable and practical actions should be taken to reduce dichloromethane exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 60 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline.

Ways to Limit Exposure to Dichloromethane in Indoor Air

In all cases, the specific actions to limit exposure to dichloromethane in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of dichloromethane and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of dichloromethane entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring dichloromethane in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on dichloromethane, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about dichloromethane and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

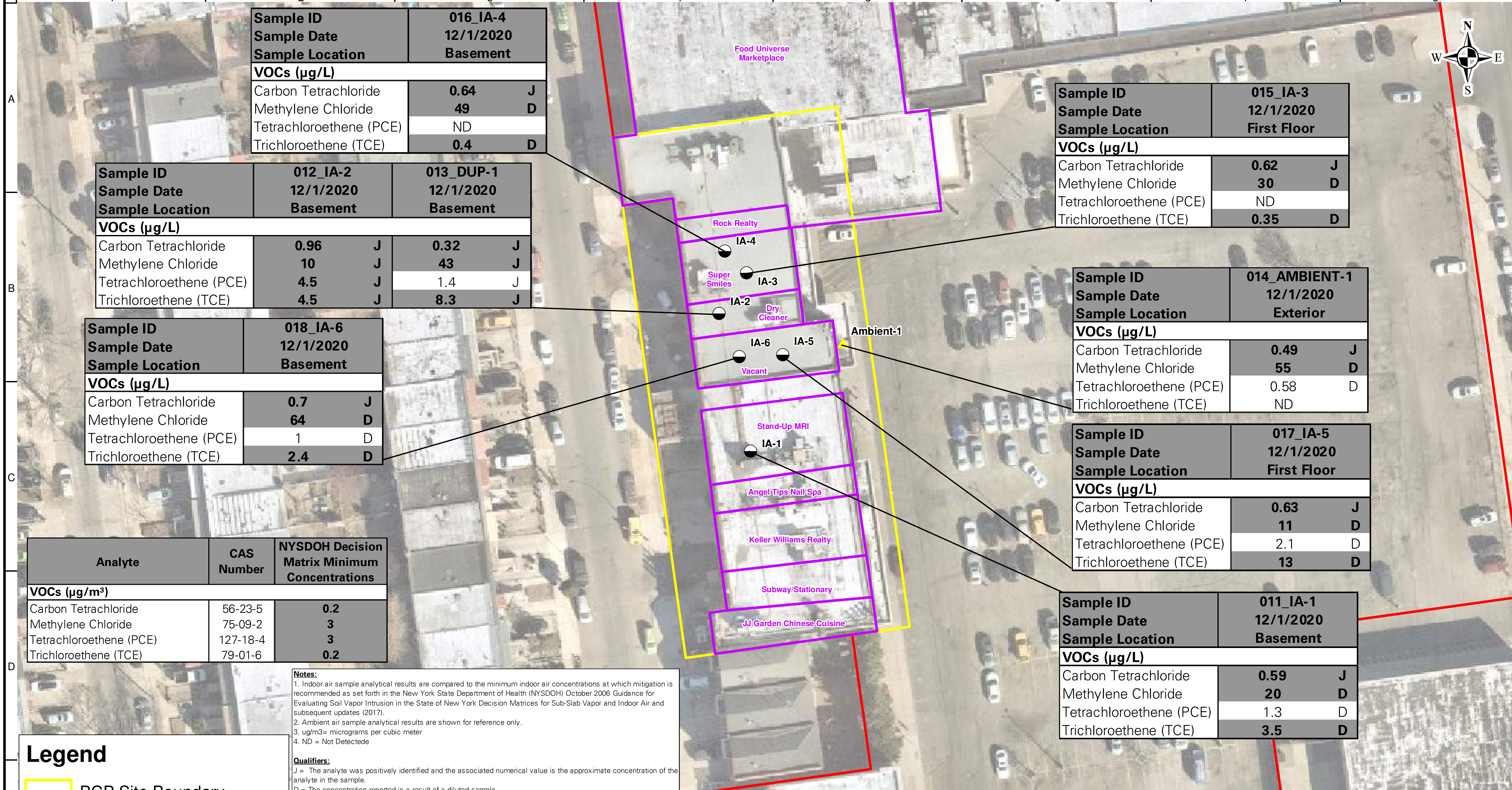
Table 3
Periodic Review Report
Indoor Air Analytical Results Summary

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDOH Decision Matrices Minimum Concentrations	AMBIENT-1		IA-1		IA-2		IA-2		IA-3		IA-4		IA-5		IA-6	
Sample ID		014_AMBIENT-1		011_IA-1		012_IA-2		013_DUP-1		015_IA-3		016_IA-4		017_IA-5		018_IA-6	
Laboratory ID		20L0059-08		20L0059-01		20L0059-02		20L0059-07		20L0059-03		20L0059-04		20L0059-05		20L0059-06	
Sample Date		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020	
Sample Type		AA		IA		IA		IA		IA		IA		IA		IA	
Sample Location		Exterior of Building		Basement of Stand-Up MRI		Basement of Drycleaners		Basement of Drycleaners		First Floor of Super Smiles		Basement of Super Smiles		First Floor of Vacant Tenant Space		Basement of Vacant Tenant Space	
Volatile Organic Compounds (µg/m³)																	
1,1,1,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,1-Trichloroethane	3	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1,2,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.66	U	0.8	U	0.96	D	0.66	U	0.63	U	0.71	U	0.59	D	0.66	D
1,1,2-Trichloroethane	~	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,1-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
1,2,4-Trichlorobenzene	~	0.64	U	0.78	U	0.66	U	0.64	U	0.61	U	0.69	U	0.57	U	0.64	U
1,2,4-Trimethylbenzene	~	0.59	D	4.4	D	1.8	D	1.6	D	1.1	D	0.5	D	3	D	1.1	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.66	U	0.81	U	0.69	U	0.66	U	0.63	U	0.71	U	0.59	U	0.66	U
1,2-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,2-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,2-Dichloropropane	~	0.4	UJ	0.48	UJ	0.41	UJ	0.4	UJ	0.38	UJ	0.43	UJ	0.35	UJ	0.4	UJ
1,2-Dichlorotetrafluoroethane	~	0.6	U	0.73	U	0.62	U	0.6	U	0.57	U	0.65	U	0.54	U	0.6	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.42	U	1.5	D	0.62	D	0.55	D	0.48	D	0.46	U	0.98	D	0.42	D
1,3-Butadiene	~	0.57	U	0.7	U	0.59	U	0.57	U	0.55	U	0.62	U	0.51	U	0.57	U
1,3-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,3-Dichloropropane	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
1,4-Dichlorobenzene	~	0.52	U	0.63	U	0.54	D	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,4-Dioxane (P-Dioxane)	~	0.62	U	0.76	U	0.64	U	0.62	U	0.59	U	0.67	U	0.55	U	0.62	U
2-Hexanone	~	0.7	U	0.86	U	0.73	U	0.7	U	0.67	U	0.76	U	0.63	U	0.7	U
4-Ethyltoluene	~	0.55	D	4.5	D	1.7	D	1.6	D	1.1	D	0.46	D	3	D	1.1	D
Acetone	~	18	D	240	D	36	J	26	J	18	D	32	D	42	D	44	D
Acrylonitrile	~	0.19	U	0.23	U	0.19	U	0.19	U	0.18	U	0.2	U	0.17	U	0.19	U
Allyl Chloride (3-Chloropropene)	~	1.3	U	1.6	U	1.4	U	1.3	U	1.3	U	1.5	U	1.2	U	1.3	U
Benzene	~	1	D	1	D	1.5	J	0.58	J	0.81	D	0.77	D	0.93	D	0.82	D
Benzyl Chloride	~	0.45	U	0.54	U	0.46	U	0.45	U	0.43	U	0.48	U	0.4	U	0.45	U
Bromodichloromethane	~	0.58	U	0.7	U	0.6	U	0.58	U	0.55	U	0.62	U	0.51	U	0.58	U
Bromoethene	~	0.38	U	0.46	U	0.39	U	0.38	U	0.36	U	0.41	U	0.34	U	0.38	U
Bromoform	~	0.89	U	1.1	U	0.92	U	0.89	U	0.85	U	0.96	U	0.79	U	0.89	U
Bromomethane	~	0.33	U	0.41	U	7.3	J	0.33	UJ	0.32	U	0.36	U	0.3	U	0.33	U
Carbon Disulfide	~	0.46	J	0.33	U	0.28	U	0.27	U	0.26	J	0.32	J	0.36	J	0.35	J
Carbon Tetrachloride	0.2	**0.49**	J	**0.59**	J	**0.96**	J	**0.32**	J	**0.62**	J	**0.64**	J	**0.63**	J	**0.7**	J
Chlorobenzene	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
Chloroethane	~	0.23	U	0.28	U	0.24	U	0.23	U	0.22	U	0.25	U	0.2	U	0.23	U
Chloroform	~	0.42	U	0.77	D	0.44	U	0.42	U	1.5	D	1	D	0.82	D	1	D
Chloromethane	~	0.76	D	0.89	D	1.7	J	0.36	J	0.87	D	0.88	D	0.98	D	0.89	D
Cis-1,2-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
Cis-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Cyclohexane	~	0.3	U	1.2	D	0.62	D	0.56	D	0.68	D	0.32	U	0.58	D	0.38	D
Dibromochloromethane	~	0.73	U	0.89	U	0.76	U	0.73	U	0.7	U	0.79	U	0.65	U	0.73	U
Dichlorodifluoromethane	~	2.1	D	2.7	D	3.7	J	1.3	J	2.6	D	2.6	D	2.5	D	3.1	D
Ethyl Acetate	~	0.65	D	8.8	D	2.9	J	0.84	J	2.6	D	3.4	D	2.1	D	2.4	D
Ethylbenzene	~	0.37	U	0.64	D	1.2	J	0.45	J	0.46	D	0.4	U	0.5	D	0.41	D
Hexachlorobutadiene	~	0.92	U	1.1	U	0.95	U	0.92	U	0.88	U	0.99	U	0.82	U	0.92	U
Isopropanol	~	9.3	D	89	D	380	J	92	J	630	J	520	J	410	J	200	J
M,P-Xylene	~	1.3	D	2.5	D	4.1	J	1.5	J	2.4	D	0.93	D	1.6	D	1.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.66	D	6.4	D	2.1	J	1.3	J	0.99	D	1.1	D	7.8	D	4.4	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.35	UJ	0.43	UJ	1.5	J	0.6	J	0.34	UJ	0.38	UJ	0.91	J	0.63	J
Methyl Methacrylate	~	3.5	D	7.3	D	1.2	J	4.6	J	6.1	D	70	D	2.7	D	3.8	D
Methylene Chloride	3	**55**	D	**20**	D	**10**	J	**43**	J	**30**	D	**49**	D	**11**	D	**64**	D
n-Heptane	~	0.46	D	3.4	D	1.4	J	0.74	J	1.1	D	0.46	D	0.82	D	0.6	D
n-Hexane	~	0.82	D	1.4	D	2.1	D	1.1	D	1.9	D	0.69	D	1.1	D	0.82	D
o-Xylene (1,2-Dimethylbenzene)	~	0.45	D	1.1	D	1.4	J	0.63	J	0.89	D	0.4	U	0.73	D	0.6	D
Propylene	~	0.15	U	0.18	U	0.15	U	0.15	U	0.14	U	0.16	U	0.13	U	0.15	U
Styrene	~	0.37	U	0.45	U	0.5	D	0.37	U	0.35	U	0.4	U	0.78	D	0.4	D
Tert-Butyl Methyl Ether	~	0.31	U	0.38	U	0.32	U	0.31	U	0.3	U	0.33	U	0.28	U	0.31	U
Tetrachloroethene (PCE)	3	0.58	D	1.3	D	**4.5**	J	1.4	J	0.56	D	0.63	U	2.1	D	1	D
Tetrahydrofuran	~	0.51	U	0.62	U	0.53	U	0.51	U	0.48	U	0.55	U	1.3	D	1.4	D
Toluene	~	2.3	D	60	D	12	J	2.6	J	3.1	D	2.5	D	3.3	D	2.5	D
Trans-1,2-Dichloroethene	~	0.34	U	0.42	U	0.35	U	0.34	U	0.33	U	0.37	U	0.3	U	0.34	U
Trans-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Trichloroethene (TCE)	0.2	0.12	U	**3.5**	D	**4.5**	J	**8.3**	J	**0.35**	D	**0.4**	D	**13**	D	**2.4**	D
Trichlorofluoromethane	~	1.3	D	1.8	D	2.5	J	0.97	J	2.1	D	2.1	D	1.9	D	3	D
Vinyl Acetate	~	0.3	U	0.37	U	0.31	U	0.3	U	0.29	U	0.33	U	0.27	U	0.3	U
Vinyl Chloride	0.2	0.11	U	0.13	U	0.11	U	0.11	U	0.11	U	0.12	U	0.098	U	0.11	U
Total BTEX	~	5.05		65.24		20.2		5.76		7.66		4.2		7.06		5.73	
Total CVOCs	~	56.07		25.39		19.96		53.02		30.97		50.04		26.73		68.1	
Total VOCs	~	100		465		489		193		710		690		518		344	

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
4. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
5. Total VOCs = sum of detected volatile organic compounds (VOC)
6. Detected analytical results above the NYSDOH Decision Matrices Minimum Concentrations sample are bolded and shaded.
7. Sample 013_DUP-1 is a duplicate of parent sample 012_IA-2.
8. ~ = Regulatory limit for this analyte does not exist
9. µg/m³ = micrograms per cubic meter
10. AA = Ambient Air
11. IA = Indoor Air

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.
D = The concentration reported is a result of a diluted sample.



Sample ID	016_IA-4	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.64	J
Methylene Chloride	49	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.4	D

Sample ID	012_IA-2		013_DUP-1	
Sample Date	12/1/2020		12/1/2020	
Sample Location	Basement		Basement	
VOCs (µg/L)				
Carbon Tetrachloride	0.96	J	0.32	J
Methylene Chloride	10	J	43	J
Tetrachloroethene (PCE)	4.5	J	1.4	J
Trichloroethene (TCE)	4.5	J	8.3	J

Sample ID	018_IA-6	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.7	J
Methylene Chloride	64	D
Tetrachloroethene (PCE)	1	D
Trichloroethene (TCE)	2.4	D

Sample ID	015_IA-3	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.62	J
Methylene Chloride	30	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.35	D

Sample ID	014_AMBIENT-1	
Sample Date	12/1/2020	
Sample Location	Exterior	
VOCs (µg/L)		
Carbon Tetrachloride	0.49	J
Methylene Chloride	55	D
Tetrachloroethene (PCE)	0.58	D
Trichloroethene (TCE)	ND	

Sample ID	017_IA-5	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.63	J
Methylene Chloride	11	D
Tetrachloroethene (PCE)	2.1	D
Trichloroethene (TCE)	13	D

Sample ID	011_IA-1	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.59	J
Methylene Chloride	20	D
Tetrachloroethene (PCE)	1.3	D
Trichloroethene (TCE)	3.5	D

Analyte	CAS Number	NYSDOH Decision Matrix Minimum Concentrations
VOCs (µg/m³)		
Carbon Tetrachloride	56-23-5	0.2
Methylene Chloride	75-09-2	3
Tetrachloroethene (PCE)	127-18-4	3
Trichloroethene (TCE)	79-01-6	0.2

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. ug/m3= micrograms per cubic meter
4. ND = Not Detectede

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
D = The concentration reported is a result of a diluted sample.

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Ambient Sample Location
- Indoor Air Sample Location

50 0 50
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Sample locations based on field measurements.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
INDOOR AIR ANALYTICAL RESULTS

Project No. 100901401
Date 6/3/2021
Scale 1 " = 50 '
Drawn By IHB
Submission Date
Figure 6

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 6 - Indoor Air Analytical Results.mxd Date: 6/3/2021 User: aruane Time: 4:46:29 PM

Allied Jackson Heights, LLC
118-35 Queens Boulevard
Forest Hills, NY 11375

July 8, 2021

Chai Care
75-11 31st Avenue
Jackson Heights, New York 11370

Re: Indoor Air Testing at 75-11 31st Avenue, Jackson Heights, NY

Dear Tenant,

Allied Jackson Heights, LLC is conducted periodic vapor sampling in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Site Management Plan dated October 2019 at the above-referenced property, including sampling of indoor air. These samples were collected to evaluate the potential for volatile organic compounds (VOCs), such as tetrachloroethene (PCE) and trichloroethene (TCE) from contaminated groundwater and contaminated soils to enter the building and affect the indoor air quality through a process known as soil vapor intrusion (see enclosed Fact Sheet). Degradation products of these compounds, including carbon tetrachloride and methylene chloride, were also evaluated. This environmental work is being conducted under the supervision of the NYSDEC and the New York State Department of Health (NYSDOH).

In November 2016, both PCE and TCE were detected in air beneath the basement slab and within the building. The indoor air levels of PCE and TCE exceeded applicable NYSDOH air guidelines. As a result, a sub-slab depressurization system was installed within certain portions of the building. Subsequent sampling in May and September 2017 showed that PCE levels had decreased to below applicable NYSDOH air guidelines. Although TCE levels had decreased in May and September 2017, they were still above the air guideline for TCE in May and September 2017. Allied Jackson Heights, LLC conducted additional sampling in January 2018. Both PCE and TCE levels were below NYSDOH air guidelines and within background concentrations. Allied Jackson Heights, LLC conducted additional sampling in February 2019. PCE and TCE were detected above the laboratory reporting limit, but below NYSDOH air guidelines within the first floor and the basement

Allied Jackson Heights, LLC conducted additional sampling in December 2020 within the basement and first floor. TCE (2.4 micrograms per meter cubed [$\mu g/m^3$]), carbon tetrachloride (0.2 $\mu g/m^3$), and methylene chloride (64 $\mu g/m^3$) were detected in exceedance of the NYSDOH Guidelines of 0.2 $\mu g/m^3$, 0.2 $\mu g/m^3$, and 3 $\mu g/m^3$, respectively, within the basement. TCE (13 $\mu g/m^3$), carbon tetrachloride (0.63 $\mu g/m^3$), and methylene chloride (11 $\mu g/m^3$) were also detected in exceedance of the NYSDOH Guidelines within the first floor. PCE was detected above the laboratory reporting limit, but not above the NYSDOH guideline in both the basement and first floor. Allied Jackson Heights, LLC will continue to coordinate with NYSDEC and NYSDOH.

Copies of the NYSDOH Fact Sheets for PCE, TCE, carbon tetrachloride, and methylene chloride are enclosed and test results are included in the attached table and figure.

Below is contact information for both the NYSDEC and the NYSDOH should you have any questions regarding this matter.

NYSDEC	NYSDOH
Attn: Sadique Ahmed	Attn: Ms. Angela Martin
625 Broadway	Empire State Plaza, Corning Tower, Rm 1787
Albany, NY 12233-7016	Albany, NY 12237
Tel: (518) 402-9656	Tel: (518) 402-7860
Sadique.ahmed@dec.ny.gov	BEEI@health.ny.gov

Sincerely,

Allied Jackson Heights, LLC

Mark Kostron

SOIL VAPOR INTRUSION

Frequently Asked Questions

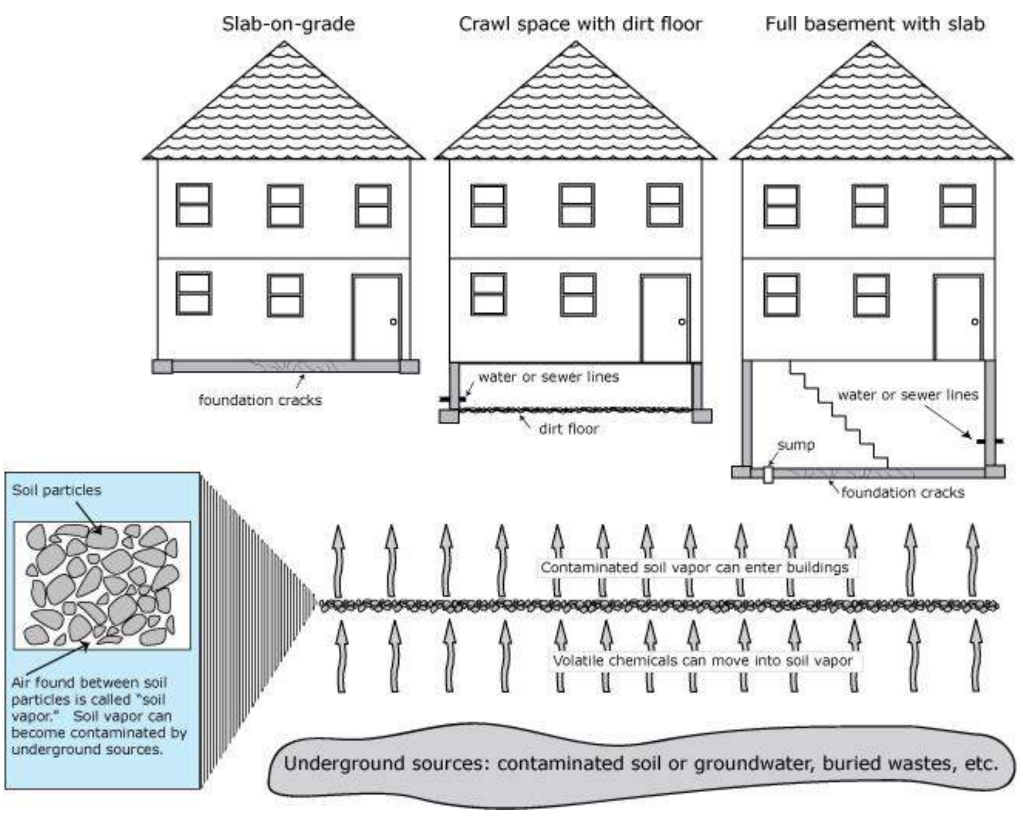
What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, soil vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).



How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when soil vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for soil vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at (518) 402-7880 or 1-800-458-1158 for additional information.

How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

Soil vapor samples are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

Sub-slab vapor samples are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

Indoor air samples are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

Outdoor air samples are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the

PID is used to help determine whether products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for soil vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at (518) 402-7880 or 1-800-458-1158.

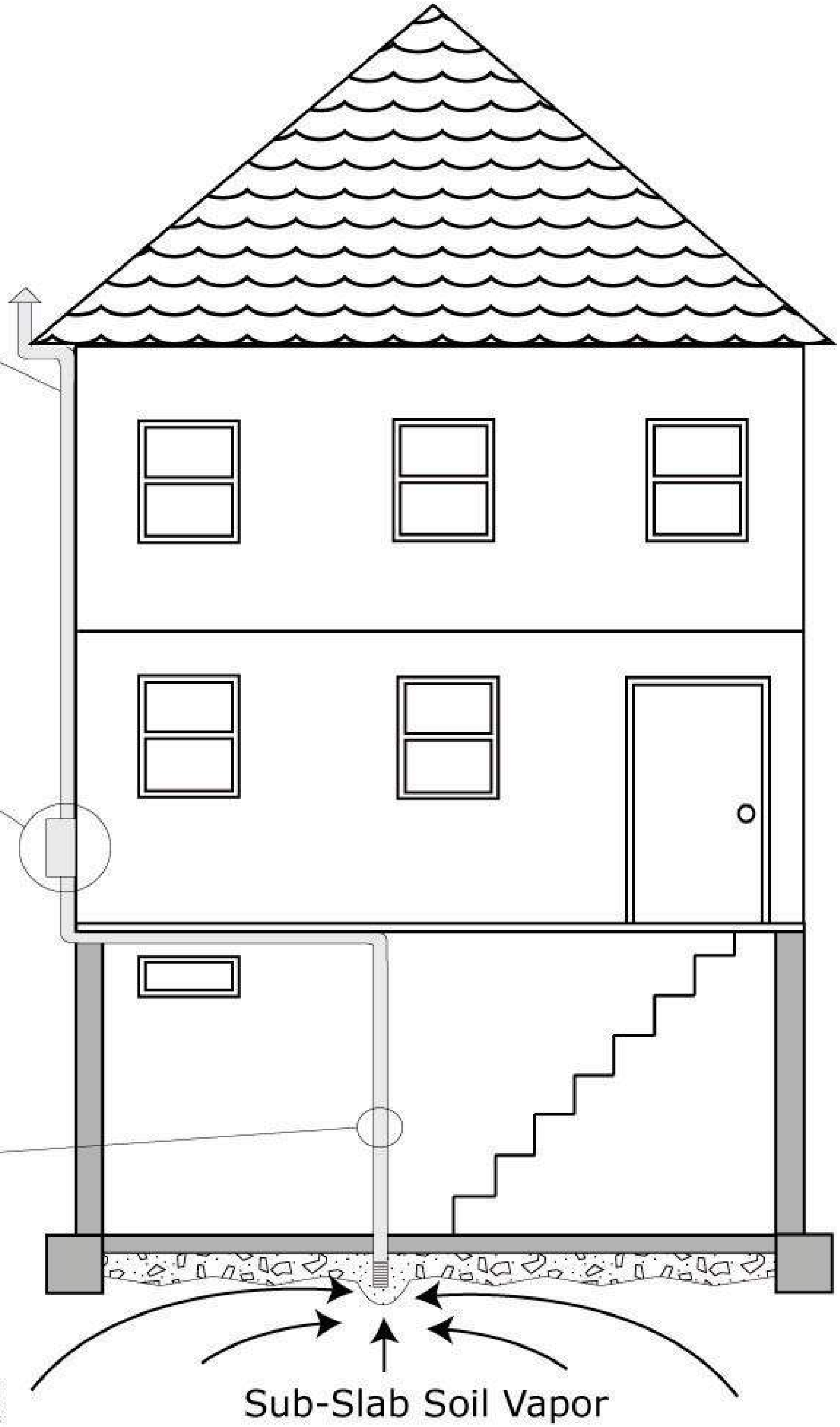
Sub-Slab Depressurization System

(commonly called a radon mitigation system)

The vent pipe is routed up the side of the structure to a location above the roof line.

A fan is used to draw soil vapor from beneath the slab.

A liquid gauge, or manometer is used to verify that the system is operating properly



A sub-slab depressurization system vents contaminated soil vapor before it enters a structure. The fan draws vapor from beneath the building outside to the roof line where it is released to the outside air.

New York State Department of Health
Tenant Notification Fact Sheet for Tetrachloroethene (Perc)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Tetrachloroethene (Perc)

Tetrachloroethene (also known as perchloroethylene or Perc) is a man-made volatile organic chemical that is widely used in the dry-cleaning of fabrics, including clothes, and in manufacturing other chemicals. It was also used for degreasing metal parts and in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors.

Sources of Perc in Indoor Air

Household products containing Perc could be a possible source for Perc in indoor air. Perc also may evaporate from dry-cleaned clothes or dry-cleaning operations into indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Perc may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Perc has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of Perc in indoor and outdoor air. Levels of Perc in the indoor air of homes and office settings and in outdoor air are expected to be below 10 micrograms per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

An association exists between exposure of people in the workplace to high levels of Perc in air and certain forms of cancer. Perc causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, the studies of humans and in animals do not prove that Perc causes cancer in people, but are highly suggestive that there may be an increased risk for cancer in people who are exposed to Perc (particularly at high concentrations) over long periods of time

People exposed to high levels of Perc in air had nervous system effects and slight changes to their liver and kidneys. Some studies show a slightly increased risk for some types of reproductive effects among workers (including dry-cleaning workers) exposed to Perc and other chemicals. The reproductive effects associated with exposure included increased risks for spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by Perc and not by some other factor or factors. Exposure to high levels of Perc has caused liver and kidney damage in laboratory animals and effects on the nervous system. Taken together, the human and animal studies indicate that human exposure to high levels of Perc causes effects on the nervous system, and suggest that human exposure to high levels of Perc may increase the risk for liver and kidney toxicity.

NYS DOH Air Guideline

The NYS DOH guideline for Perc in air is 30 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people

are continuously exposed to Perc in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of Perc.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce Perc exposure. Reasonable and practical actions should be taken to reduce Perc exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 30 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. The NYS DOH recommends taking immediate action to reduce exposure when an air level is ten times or more higher than the guideline (that is, when the air level is 300 mcg/m^3 or higher).

Ways to Limit Exposure to Perc in Indoor Air

In all cases, the specific actions to limit exposure to Perc in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of Perc and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of Perc entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring Perc in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on Perc, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants.

If you have further questions about Perc and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
December, 2013

New York State Department of Health
Tenant Notification Fact Sheet for Trichloroethene (TCE)

This fact sheet is provided to fulfill New York State Department of Health (NYSDOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m^3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a

health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

NYSDOH Air Guideline

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3.

Ways to Limit Exposure to TCE in Indoor Air

In all cases, the specific recommended actions to limit exposure to TCE in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of TCE and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of TCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that evaporates into indoor air.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods

recommended by the NYSDOH for measuring TCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at levels below 1 mcg/m^3.

Additional Information

Additional information on TCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYSDOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about TCE and the information in this fact sheet, please call the NYSDOH at 1-518-402-7800 or 1-800-458-1158, e-mail to ceheduc@health.state.ny.us, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

Updated August 2015

New York State Department of Health
Tenant Notification Fact Sheet for Carbon Tetrachloride

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Carbon Tetrachloride

Carbon tetrachloride is a man-made volatile organic chemical that was used as a household spot remover, an industrial degreasing agent, in dry cleaning, in fire extinguishers, and as a grain fumigant to kill insects. Most of these uses have been discontinued. Carbon tetrachloride was also used to make refrigerants and propellants for aerosol cans, but this use has declined in recent years because of the effects of many refrigerants and aerosol propellants on the earth's ozone layer.

Sources of Carbon Tetrachloride in Indoor Air

Household products containing carbon tetrachloride could be a possible source for carbon tetrachloride in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Carbon tetrachloride may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Carbon tetrachloride has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of carbon tetrachloride in indoor and outdoor air. Levels of carbon tetrachloride in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of carbon tetrachloride in humans following long-term exposure. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system, liver and kidney damage. Exposure to high concentrations of carbon tetrachloride damages the liver, kidney, nervous system and male reproductive system in laboratory animals. Carbon tetrachloride causes cancer in laboratory animals exposed at high levels over their lifetimes. Whether or not carbon tetrachloride causes cancer in humans is unknown. Taken together, the human and animal studies suggest that long term human exposure to carbon tetrachloride (particularly at high levels) may increase the risk for cancer and for liver, kidney and nervous system toxicity.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for carbon tetrachloride in air. However, NYS DOH guidance for carbon tetrachloride and other air contaminants is that reasonable and practical actions should be taken to reduce exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The carbon tetrachloride exposure levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to Carbon Tetrachloride in Indoor Air

In all cases, the specific actions to limit exposure to carbon tetrachloride in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of carbon tetrachloride and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of carbon tetrachloride entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring carbon tetrachloride in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on carbon tetrachloride, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about carbon tetrachloride and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

New York State Department of Health
Tenant Notification Fact Sheet for Dichloromethane

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Dichloromethane

Dichloromethane (also known as methylene chloride) is a colorless and volatile liquid chemical that has a mild, sweet odor. It is used as an industrial and laboratory solvent, as a paint stripper, and in the manufacture of photographic film. Dichloromethane is also found in aerosol products, adhesives, spray paints, automotive cleaners, and varnish removers.

Sources of Dichloromethane in Indoor Air

Household products containing dichloromethane are a possible source for dichloromethane in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Dichloromethane may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Dichloromethane has also been found in outdoor air near facilities where it is being produced or used, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of dichloromethane in indoor and outdoor air. Levels of dichloromethane are typically around 5 micrograms per cubic meter (mcg/m^3) in the indoor air of homes and offices, but may be somewhat higher as dichloromethane is commonly used in many paint strippers and adhesive products. Levels in outdoor air are expected to be less than 5 mcg/m^3.

Health Risks Associated with Exposure

People exposed to high levels of dichloromethane in air for short periods of time had adverse effects on the central nervous system, including dizziness, headache, lightheadedness, confusion, incoordination, drowsiness, prickling or tinkling sensations, and decreased scores on tests that evaluate nervous system function. Long term exposure to high levels of dichloromethane damages the liver and kidneys of laboratory animals. Taken together, the human and animal studies indicate that human exposure to high levels of dichloromethane causes adverse effects on the nervous system, and suggest that long term human exposure to dichloromethane may increase the risk for liver and kidney toxicity.

Studies of long-term human exposure to dichloromethane in the workplace had weaknesses that limited their ability to detect an increased incidence of cancer due to the chemical. Therefore, whether or not dichloromethane cause cancer in humans is unknown. Dichloromethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, data from the human and animal studies suggest that long-term human exposure to dichloromethane could increase the risk for cancer.

NYS DOH Air Guideline

The NYS DOH guideline for dichloromethane in air is 60 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people are continuously exposed to dichloromethane in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of dichloromethane.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce dichloromethane exposure. Reasonable and practical actions should be taken to reduce dichloromethane exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 60 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline.

Ways to Limit Exposure to Dichloromethane in Indoor Air

In all cases, the specific actions to limit exposure to dichloromethane in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of dichloromethane and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of dichloromethane entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring dichloromethane in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on dichloromethane, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about dichloromethane and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

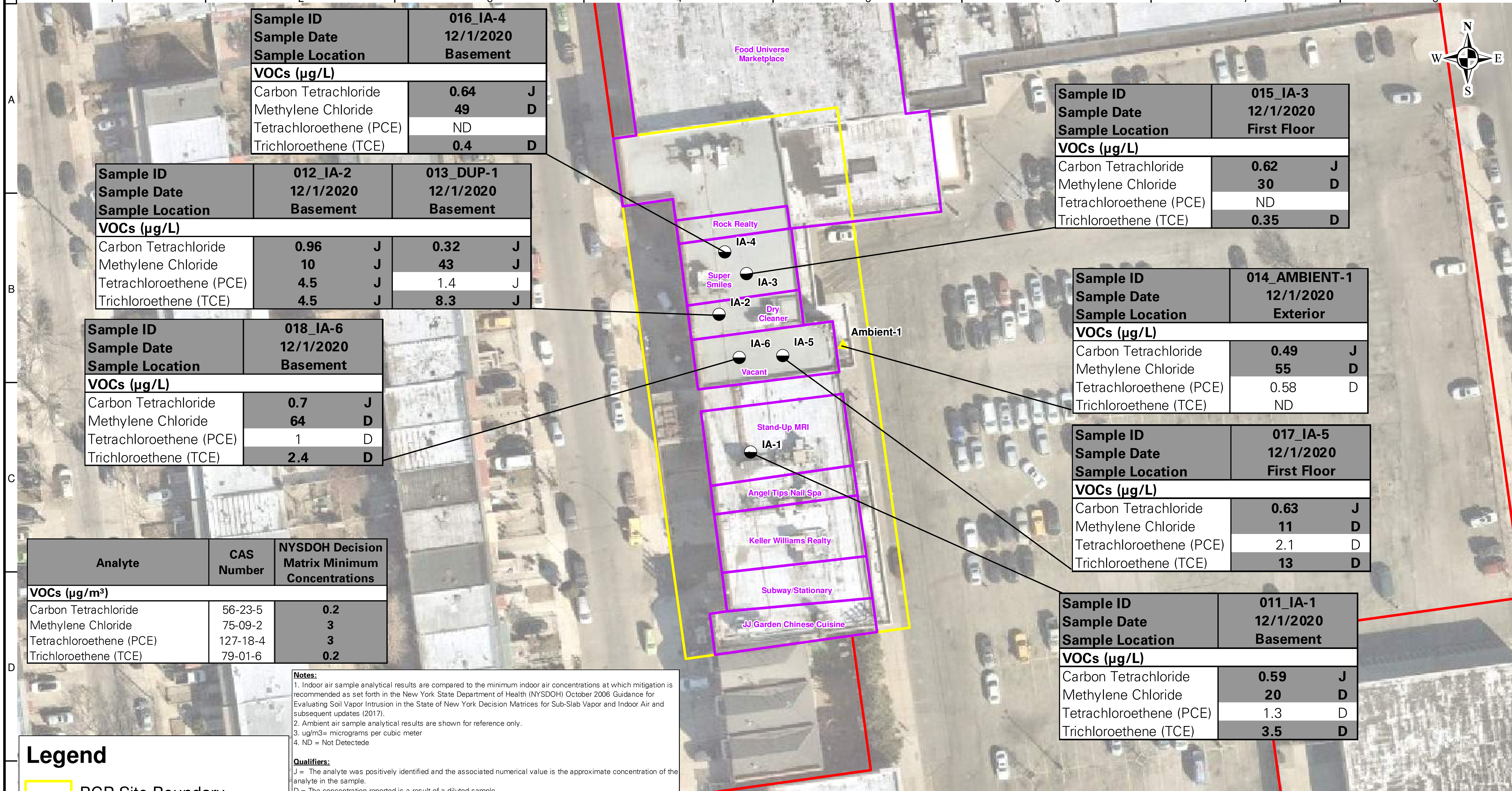
Table 3
Periodic Review Report
Indoor Air Analytical Results Summary

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDOH Decision Matrices Minimum Concentrations	AMBIENT-1		IA-1		IA-2		IA-2		IA-3		IA-4		IA-5		IA-6	
Sample ID		014_AMBIENT-1		011_IA-1		012_IA-2		013_DUP-1		015_IA-3		016_IA-4		017_IA-5		018_IA-6	
Laboratory ID		20L0059-08		20L0059-01		20L0059-02		20L0059-07		20L0059-03		20L0059-04		20L0059-05		20L0059-06	
Sample Date		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020	
Sample Type		AA		IA		IA		IA		IA		IA		IA		IA	
Sample Location		Exterior of Building		Basement of Stand-Up MRI		Basement of Drycleaners		Basement of Drycleaners		First Floor of Super Smiles		Basement of Super Smiles		First Floor of Vacant Tenant Space		Basement of Vacant Tenant Space	
Volatile Organic Compounds (µg/m³)																	
1,1,1,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,1-Trichloroethane	3	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1,2,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.66	U	0.8	U	0.96	D	0.66	U	0.63	U	0.71	U	0.59	D	0.66	D
1,1,2-Trichloroethane	~	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,1-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
1,2,4-Trichlorobenzene	~	0.64	U	0.78	U	0.66	U	0.64	U	0.61	U	0.69	U	0.57	U	0.64	U
1,2,4-Trimethylbenzene	~	0.59	D	4.4	D	1.8	D	1.6	D	1.1	D	0.5	D	3	D	1.1	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.66	U	0.81	U	0.69	U	0.66	U	0.63	U	0.71	U	0.59	U	0.66	U
1,2-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,2-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,2-Dichloropropane	~	0.4	UJ	0.48	UJ	0.41	UJ	0.4	UJ	0.38	UJ	0.43	UJ	0.35	UJ	0.4	UJ
1,2-Dichlorotetrafluoroethane	~	0.6	U	0.73	U	0.62	U	0.6	U	0.57	U	0.65	U	0.54	U	0.6	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.42	U	1.5	D	0.62	D	0.55	D	0.48	D	0.46	U	0.98	D	0.42	D
1,3-Butadiene	~	0.57	U	0.7	U	0.59	U	0.57	U	0.55	U	0.62	U	0.51	U	0.57	U
1,3-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,3-Dichloropropane	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
1,4-Dichlorobenzene	~	0.52	U	0.63	U	0.54	D	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,4-Dioxane (P-Dioxane)	~	0.62	U	0.76	U	0.64	U	0.62	U	0.59	U	0.67	U	0.55	U	0.62	U
2-Hexanone	~	0.7	U	0.86	U	0.73	U	0.7	U	0.67	U	0.76	U	0.63	U	0.7	U
4-Ethyltoluene	~	0.55	D	4.5	D	1.7	D	1.6	D	1.1	D	0.46	D	3	D	1.1	D
Acetone	~	18	D	240	D	36	J	26	J	18	D	32	D	42	D	44	D
Acrylonitrile	~	0.19	U	0.23	U	0.19	U	0.19	U	0.18	U	0.2	U	0.17	U	0.19	U
Allyl Chloride (3-Chloropropene)	~	1.3	U	1.6	U	1.4	U	1.3	U	1.3	U	1.5	U	1.2	U	1.3	U
Benzene	~	1	D	1	D	1.5	J	0.58	J	0.81	D	0.77	D	0.93	D	0.82	D
Benzyl Chloride	~	0.45	U	0.54	U	0.46	U	0.45	U	0.43	U	0.48	U	0.4	U	0.45	U
Bromodichloromethane	~	0.58	U	0.7	U	0.6	U	0.58	U	0.55	U	0.62	U	0.51	U	0.58	U
Bromoethene	~	0.38	U	0.46	U	0.39	U	0.38	U	0.36	U	0.41	U	0.34	U	0.38	U
Bromoform	~	0.89	U	1.1	U	0.92	U	0.89	U	0.85	U	0.96	U	0.79	U	0.89	U
Bromomethane	~	0.33	U	0.41	U	7.3	J	0.33	UJ	0.32	U	0.36	U	0.3	U	0.33	U
Carbon Disulfide	~	0.46	J	0.33	U	0.28	U	0.27	U	0.26	J	0.32	J	0.36	J	0.35	J
Carbon Tetrachloride	0.2	**0.49**	J	**0.59**	J	**0.96**	J	**0.32**	J	**0.62**	J	**0.64**	J	**0.63**	J	**0.7**	J
Chlorobenzene	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
Chloroethane	~	0.23	U	0.28	U	0.24	U	0.23	U	0.22	U	0.25	U	0.2	U	0.23	U
Chloroform	~	0.42	U	0.77	D	0.44	U	0.42	U	1.5	D	1	D	0.82	D	1	D
Chloromethane	~	0.76	D	0.89	D	1.7	J	0.36	J	0.87	D	0.88	D	0.98	D	0.89	D
Cis-1,2-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
Cis-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Cyclohexane	~	0.3	U	1.2	D	0.62	D	0.56	D	0.68	D	0.32	U	0.58	D	0.38	D
Dibromochloromethane	~	0.73	U	0.89	U	0.76	U	0.73	U	0.7	U	0.79	U	0.65	U	0.73	U
Dichlorodifluoromethane	~	2.1	D	2.7	D	3.7	J	1.3	J	2.6	D	2.6	D	2.5	D	3.1	D
Ethyl Acetate	~	0.65	D	8.8	D	2.9	J	0.84	J	2.6	D	3.4	D	2.1	D	2.4	D
Ethylbenzene	~	0.37	U	0.64	D	1.2	J	0.45	J	0.46	D	0.4	U	0.5	D	0.41	D
Hexachlorobutadiene	~	0.92	U	1.1	U	0.95	U	0.92	U	0.88	U	0.99	U	0.82	U	0.92	U
Isopropanol	~	9.3	D	89	D	380	J	92	J	630	J	520	J	410	J	200	J
M,P-Xylene	~	1.3	D	2.5	D	4.1	J	1.5	J	2.4	D	0.93	D	1.6	D	1.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.66	D	6.4	D	2.1	J	1.3	J	0.99	D	1.1	D	7.8	D	4.4	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.35	UJ	0.43	UJ	1.5	J	0.6	J	0.34	UJ	0.38	UJ	0.91	J	0.63	J
Methyl Methacrylate	~	3.5	D	7.3	D	1.2	J	4.6	J	6.1	D	70	D	2.7	D	3.8	D
Methylene Chloride	3	**55**	D	**20**	D	**10**	J	**43**	J	**30**	D	**49**	D	**11**	D	**64**	D
n-Heptane	~	0.46	D	3.4	D	1.4	J	0.74	J	1.1	D	0.46	D	0.82	D	0.6	D
n-Hexane	~	0.82	D	1.4	D	2.1	D	1.1	D	1.9	D	0.69	D	1.1	D	0.82	D
o-Xylene (1,2-Dimethylbenzene)	~	0.45	D	1.1	D	1.4	J	0.63	J	0.89	D	0.4	U	0.73	D	0.6	D
Propylene	~	0.15	U	0.18	U	0.15	U	0.15	U	0.14	U	0.16	U	0.13	U	0.15	U
Styrene	~	0.37	U	0.45	U	0.5	D	0.37	U	0.35	U	0.4	U	0.78	D	0.4	D
Tert-Butyl Methyl Ether	~	0.31	U	0.38	U	0.32	U	0.31	U	0.3	U	0.33	U	0.28	U	0.31	U
Tetrachloroethene (PCE)	3	0.58	D	1.3	D	**4.5**	J	1.4	J	0.56	U	0.63	U	2.1	D	1	D
Tetrahydrofuran	~	0.51	U	0.62	U	0.53	U	0.51	U	0.48	U	0.55	U	1.3	D	1.4	D
Toluene	~	2.3	D	60	D	12	J	2.6	J	3.1	D	2.5	D	3.3	D	2.5	D
Trans-1,2-Dichloroethene	~	0.34	U	0.42	U	0.35	U	0.34	U	0.33	U	0.37	U	0.3	U	0.34	U
Trans-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Trichloroethene (TCE)	0.2	0.12	U	**3.5**	D	**4.5**	J	**8.3**	J	**0.35**	D	**0.4**	D	**13**	D	**2.4**	D
Trichlorofluoromethane	~	1.3	D	1.8	D	2.5	J	0.97	J	2.1	D	2.1	D	1.9	D	3	D
Vinyl Acetate	~	0.3	U	0.37	U	0.31	U	0.3	U	0.29	U	0.33	U	0.27	U	0.3	U
Vinyl Chloride	0.2	0.11	U	0.13	U	0.11	U	0.11	U	0.11	U	0.12	U	0.098	U	0.11	U
Total BTEX	~	5.05		65.24		20.2		5.76		7.66		4.2		7.06		5.73	
Total CVOCs	~	56.07		25.39		19.96		53.02		30.97		50.04		26.73		68.1	
Total VOCs	~	100		465		489		193		710		690		518		344	

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
4. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
5. Total VOCs = sum of detected volatile organic compounds (VOC)
6. Detected analytical results above the NYSDOH Decision Matrices Minimum Concentrations sample are bolded and shaded.
7. Sample 013_DUP-1 is a duplicate of parent sample 012_IA-2.
8. ~ = Regulatory limit for this analyte does not exist
9. µg/m³ = micrograms per cubic meter
10. AA = Ambient Air
11. IA = Indoor Air

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.
D = The concentration reported is a result of a diluted sample.



Sample ID	016_IA-4	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.64	J
Methylene Chloride	49	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.4	D

Sample ID	012_IA-2		013_DUP-1	
Sample Date	12/1/2020		12/1/2020	
Sample Location	Basement		Basement	
VOCs (µg/L)				
Carbon Tetrachloride	0.96	J	0.32	J
Methylene Chloride	10	J	43	J
Tetrachloroethene (PCE)	4.5	J	1.4	J
Trichloroethene (TCE)	4.5	J	8.3	J

Sample ID	018_IA-6	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.7	J
Methylene Chloride	64	D
Tetrachloroethene (PCE)	1	D
Trichloroethene (TCE)	2.4	D

Sample ID	015_IA-3	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.62	J
Methylene Chloride	30	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.35	D

Sample ID	014_AMBIENT-1	
Sample Date	12/1/2020	
Sample Location	Exterior	
VOCs (µg/L)		
Carbon Tetrachloride	0.49	J
Methylene Chloride	55	D
Tetrachloroethene (PCE)	0.58	D
Trichloroethene (TCE)	ND	

Sample ID	017_IA-5	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.63	J
Methylene Chloride	11	D
Tetrachloroethene (PCE)	2.1	D
Trichloroethene (TCE)	13	D

Sample ID	011_IA-1	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.59	J
Methylene Chloride	20	D
Tetrachloroethene (PCE)	1.3	D
Trichloroethene (TCE)	3.5	D

Analyte	CAS Number	NYSDOH Decision Matrix Minimum Concentrations
VOCs (µg/m³)		
Carbon Tetrachloride	56-23-5	0.2
Methylene Chloride	75-09-2	3
Tetrachloroethene (PCE)	127-18-4	3
Trichloroethene (TCE)	79-01-6	0.2

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. ug/m3= micrograms per cubic meter
4. ND = Not Detectede

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
D = The concentration reported is a result of a diluted sample.

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Ambient Sample Location
- Indoor Air Sample Location

50 0 50
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Sample locations based on field measurements.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
INDOOR AIR ANALYTICAL RESULTS

Project No.	100901401
Date	6/3/2021
Scale	1 " = 50 '
Drawn By	IHB
Submission Date	
Figure	6

Allied Jackson Heights, LLC
118-35 Queens Boulevard
Forest Hills, New York 11375

July 8, 2021

Hi-Style Cleaners
75-11 31st Avenue
Jackson Heights, New York 11370

Re: Indoor Air Testing at 75-11 31st Avenue, Jackson Heights, NY

Dear Tenant,

Allied Jackson Heights, LLC conducted periodic vapor sampling in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Site Management Plan dated October 2019 at the above-referenced property, including sampling of indoor air. These samples were collected to evaluate the potential for volatile organic compounds (VOCs), such as tetrachloroethene (PCE) and trichloroethene (TCE) from contaminated groundwater and contaminated soils to enter the building and affect the indoor air quality through a process known as soil vapor intrusion (see enclosed Fact Sheet). Degradation products of these compounds, including carbon tetrachloride and methylene chloride, were also evaluated. This environmental work is being conducted under the supervision of the NYSDEC and the New York State Department of Health (NYSDOH).

In November 2016, both PCE and TCE were detected in air beneath the basement slab and within the building. The indoor air levels of PCE and TCE exceeded applicable NYSDOH air guidelines. As a result, a sub-slab depressurization system was installed in March 2017 within certain portions of the building. Subsequent sampling in May 2017 showed that PCE levels had decreased to below applicable NYSDOH air guidelines. Although TCE levels had decreased, they were still above applicable NYSDOH air guidelines at that time. Accordingly, another sampling event was conducted in August 2017. PCE and methylene chloride were detected at concentrations that exceeded their respective NYSDOH air guidelines on the first floor of your tenant space. TCE in the basement and first floor was still above the NYSDOH Immediate Action Level. Allied Jackson Heights, LLC conducted additional sampling in January 2018. Although TCE levels were below NYSDOH air guidelines and within background concentrations, PCE was detected in the first floor and the basement at concentrations that exceeded the NYSDOH Guideline. Allied Jackson Heights, LLC conducted additional sampling in February 2019 of the basement only. PCE and TCE were detected above the NYSDOH Guidelines.

Allied Jackson Heights, LLC conducted additional sampling in December 2020 within the basement only. PCE (4.5 micrograms per meter cubed [$\mu g/m^3$]), TCE (4.5 $\mu g/m^3$), carbon tetrachloride (0.96 $\mu g/m^3$), and methylene chloride (10 $\mu g/m^3$) were detected in exceedance of the NYSDOH Guidelines of 3 $\mu g/m^3$, 0.2 $\mu g/m^3$, 0.2 $\mu g/m^3$, and 3 $\mu g/m^3$, respectively. Allied Jackson Heights, LLC will continue to coordinate with NYSDEC and NYSDOH.

Copies of the NYSDOH Fact Sheets for PCE, TCE, carbon tetrachloride, and methylene chloride are enclosed and test results are included in the attached table and figure.

Below is contact information for both the NYSDEC and the NYSDOH should you have any questions regarding this matter.

NYSDEC
Attn: Sadique Ahmed
625 Broadway
Albany, NY 12233-7016
Tel: (518) 402-9656
Sadique.ahmed@dec.ny.gov

NYSDOH
Attn: Ms. Angela Martin
Empire State Plaza, Corning Tower, Rm 1787
Albany, NY 12237
Tel: (518) 402-7860
BEEI@health.ny.gov

Sincerely,

Allied Jackson Heights, LLC

Mark Kostron

SOIL VAPOR INTRUSION

Frequently Asked Questions

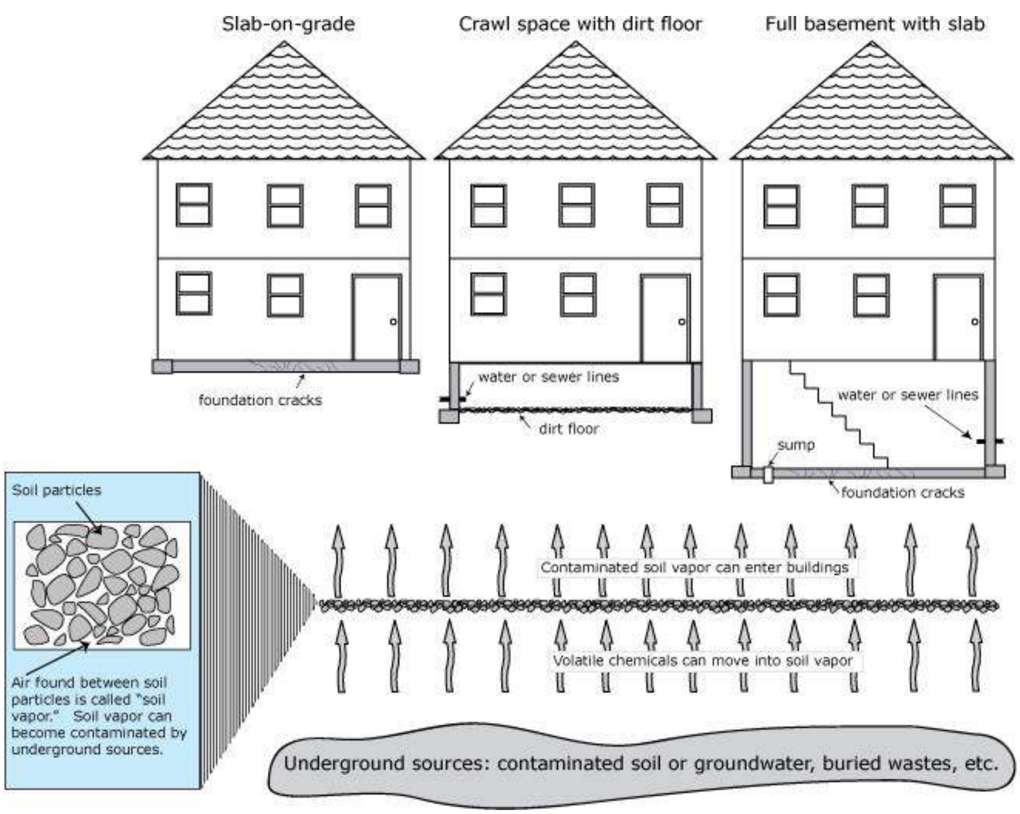
What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, soil vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).



How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when soil vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for soil vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at (518) 402-7880 or 1-800-458-1158 for additional information.

How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

<u>Soil vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

<u>Sub-slab vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

<u>Indoor air samples</u> are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

<u>Outdoor air samples</u> are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the

PID is used to help determine whether products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for soil vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at (518) 402-7880 or 1-800-458-1158.

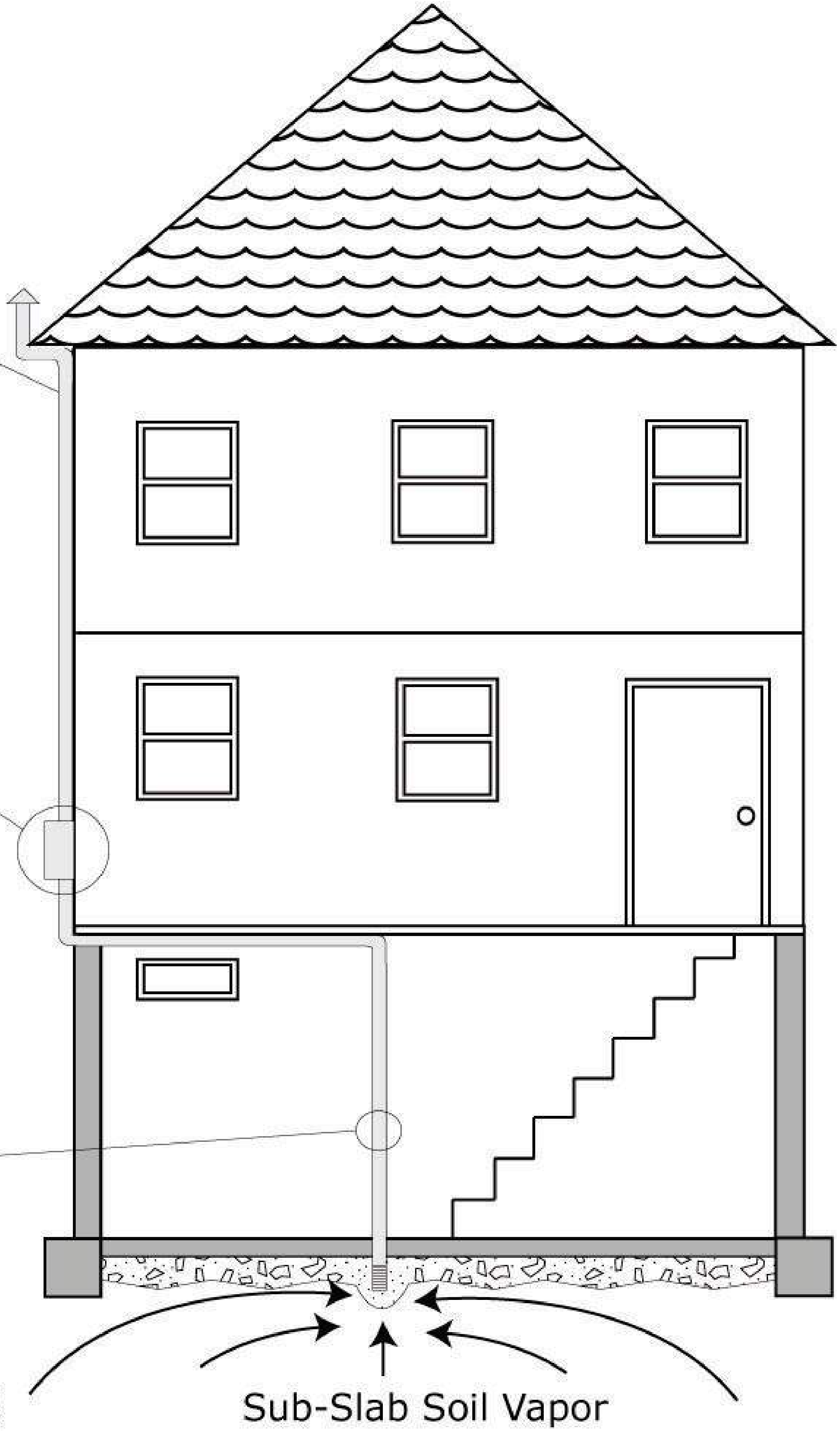
Sub-Slab Depressurization System

(commonly called a radon mitigation system)

The vent pipe is routed up the side of the structure to a location above the roof line.

A fan is used to draw soil vapor from beneath the slab.

A liquid gauge, or manometer is used to verify that the system is operating properly



A sub-slab depressurization system vents contaminated soil vapor before it enters a structure. The fan draws vapor from beneath the building outside to the roof line where it is released to the outside air.

New York State Department of Health
Tenant Notification Fact Sheet for Tetrachloroethene (Perc)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Tetrachloroethene (Perc)

Tetrachloroethene (also known as perchloroethylene or Perc) is a man-made volatile organic chemical that is widely used in the dry-cleaning of fabrics, including clothes, and in manufacturing other chemicals. It was also used for degreasing metal parts and in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors.

Sources of Perc in Indoor Air

Household products containing Perc could be a possible source for Perc in indoor air. Perc also may evaporate from dry-cleaned clothes or dry-cleaning operations into indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Perc may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Perc has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of Perc in indoor and outdoor air. Levels of Perc in the indoor air of homes and office settings and in outdoor air are expected to be below 10 micrograms per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

An association exists between exposure of people in the workplace to high levels of Perc in air and certain forms of cancer. Perc causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, the studies of humans and in animals do not prove that Perc causes cancer in people, but are highly suggestive that there may be an increased risk for cancer in people who are exposed to Perc (particularly at high concentrations) over long periods of time

People exposed to high levels of Perc in air had nervous system effects and slight changes to their liver and kidneys. Some studies show a slightly increased risk for some types of reproductive effects among workers (including dry-cleaning workers) exposed to Perc and other chemicals. The reproductive effects associated with exposure included increased risks for spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by Perc and not by some other factor or factors. Exposure to high levels of Perc has caused liver and kidney damage in laboratory animals and effects on the nervous system. Taken together, the human and animal studies indicate that human exposure to high levels of Perc causes effects on the nervous system, and suggest that human exposure to high levels of Perc may increase the risk for liver and kidney toxicity.

NYS DOH Air Guideline

The NYS DOH guideline for Perc in air is 30 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people

are continuously exposed to Perc in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of Perc.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce Perc exposure. Reasonable and practical actions should be taken to reduce Perc exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 30 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. The NYS DOH recommends taking immediate action to reduce exposure when an air level is ten times or more higher than the guideline (that is, when the air level is 300 mcg/m^3 or higher).

Ways to Limit Exposure to Perc in Indoor Air

In all cases, the specific actions to limit exposure to Perc in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of Perc and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of Perc entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring Perc in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on Perc, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants.

If you have further questions about Perc and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
December, 2013

New York State Department of Health
Tenant Notification Fact Sheet for Trichloroethene (TCE)

This fact sheet is provided to fulfill New York State Department of Health (NYSDOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m^3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a

health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

NYSDOH Air Guideline

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3.

Ways to Limit Exposure to TCE in Indoor Air

In all cases, the specific recommended actions to limit exposure to TCE in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of TCE and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of TCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that evaporates into indoor air.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods

recommended by the NYSDOH for measuring TCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at levels below 1 mcg/m^3.

Additional Information

Additional information on TCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYSDOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about TCE and the information in this fact sheet, please call the NYSDOH at 1-518-402-7800 or 1-800-458-1158, e-mail to ceheduc@health.state.ny.us, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

Updated August 2015

New York State Department of Health
Tenant Notification Fact Sheet for Carbon Tetrachloride

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Carbon Tetrachloride

Carbon tetrachloride is a man-made volatile organic chemical that was used as a household spot remover, an industrial degreasing agent, in dry cleaning, in fire extinguishers, and as a grain fumigant to kill insects. Most of these uses have been discontinued. Carbon tetrachloride was also used to make refrigerants and propellants for aerosol cans, but this use has declined in recent years because of the effects of many refrigerants and aerosol propellants on the earth's ozone layer.

Sources of Carbon Tetrachloride in Indoor Air

Household products containing carbon tetrachloride could be a possible source for carbon tetrachloride in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Carbon tetrachloride may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Carbon tetrachloride has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of carbon tetrachloride in indoor and outdoor air. Levels of carbon tetrachloride in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of carbon tetrachloride in humans following long-term exposure. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system, liver and kidney damage. Exposure to high concentrations of carbon tetrachloride damages the liver, kidney, nervous system and male reproductive system in laboratory animals. Carbon tetrachloride causes cancer in laboratory animals exposed at high levels over their lifetimes. Whether or not carbon tetrachloride causes cancer in humans is unknown. Taken together, the human and animal studies suggest that long term human exposure to carbon tetrachloride (particularly at high levels) may increase the risk for cancer and for liver, kidney and nervous system toxicity.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for carbon tetrachloride in air. However, NYS DOH guidance for carbon tetrachloride and other air contaminants is that reasonable and practical actions should be taken to reduce exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The carbon tetrachloride exposure levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to Carbon Tetrachloride in Indoor Air

In all cases, the specific actions to limit exposure to carbon tetrachloride in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of carbon tetrachloride and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of carbon tetrachloride entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring carbon tetrachloride in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on carbon tetrachloride, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about carbon tetrachloride and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

New York State Department of Health
Tenant Notification Fact Sheet for Dichloromethane

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Dichloromethane

Dichloromethane (also known as methylene chloride) is a colorless and volatile liquid chemical that has a mild, sweet odor. It is used as an industrial and laboratory solvent, as a paint stripper, and in the manufacture of photographic film. Dichloromethane is also found in aerosol products, adhesives, spray paints, automotive cleaners, and varnish removers.

Sources of Dichloromethane in Indoor Air

Household products containing dichloromethane are a possible source for dichloromethane in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Dichloromethane may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Dichloromethane has also been found in outdoor air near facilities where it is being produced or used, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of dichloromethane in indoor and outdoor air. Levels of dichloromethane are typically around 5 micrograms per cubic meter (mcg/m^3) in the indoor air of homes and offices, but may be somewhat higher as dichloromethane is commonly used in many paint strippers and adhesive products. Levels in outdoor air are expected to be less than 5 mcg/m^3.

Health Risks Associated with Exposure

People exposed to high levels of dichloromethane in air for short periods of time had adverse effects on the central nervous system, including dizziness, headache, lightheadedness, confusion, incoordination, drowsiness, prickling or tinkling sensations, and decreased scores on tests that evaluate nervous system function. Long term exposure to high levels of dichloromethane damages the liver and kidneys of laboratory animals. Taken together, the human and animal studies indicate that human exposure to high levels of dichloromethane causes adverse effects on the nervous system, and suggest that long term human exposure to dichloromethane may increase the risk for liver and kidney toxicity.

Studies of long-term human exposure to dichloromethane in the workplace had weaknesses that limited their ability to detect an increased incidence of cancer due to the chemical. Therefore, whether or not dichloromethane cause cancer in humans is unknown. Dichloromethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, data from the human and animal studies suggest that long-term human exposure to dichloromethane could increase the risk for cancer.

NYS DOH Air Guideline

The NYS DOH guideline for dichloromethane in air is 60 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people are continuously exposed to dichloromethane in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of dichloromethane.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce dichloromethane exposure. Reasonable and practical actions should be taken to reduce dichloromethane exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 60 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline.

Ways to Limit Exposure to Dichloromethane in Indoor Air

In all cases, the specific actions to limit exposure to dichloromethane in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of dichloromethane and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of dichloromethane entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring dichloromethane in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on dichloromethane, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about dichloromethane and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

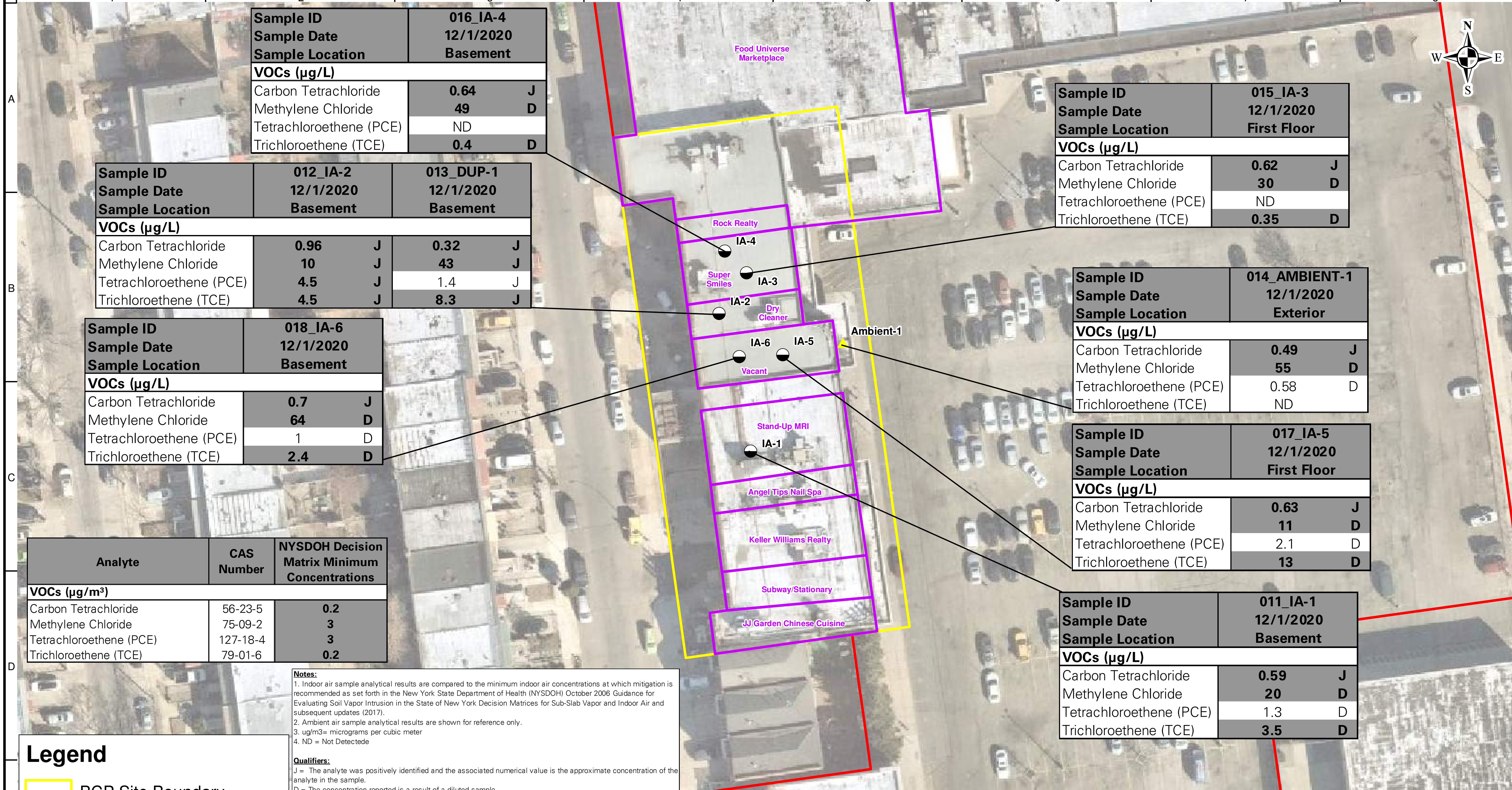
Table 3
Periodic Review Report
Indoor Air Analytical Results Summary

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDOH Decision Matrices Minimum Concentrations	AMBIENT-1		IA-1		IA-2		IA-2		IA-3		IA-4		IA-5		IA-6	
Sample ID		014_AMBIENT-1		011_IA-1		012_IA-2		013_DUP-1		015_IA-3		016_IA-4		017_IA-5		018_IA-6	
Laboratory ID		20L0059-08		20L0059-01		20L0059-02		20L0059-07		20L0059-03		20L0059-04		20L0059-05		20L0059-06	
Sample Date		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020	
Sample Type		AA		IA		IA		IA		IA		IA		IA		IA	
Sample Location		Exterior of Building		Basement of Stand-Up MRI		Basement of Drycleaners		Basement of Drycleaners		First Floor of Super Smiles		Basement of Super Smiles		First Floor of Vacant Tenant Space		Basement of Vacant Tenant Space	
Volatile Organic Compounds (µg/m³)																	
1,1,1,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,1-Trichloroethane	3	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1,2,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.66	U	0.8	U	0.96	D	0.66	U	0.63	U	0.71	U	0.59	D	0.66	D
1,1,2-Trichloroethane	~	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,1-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
1,2,4-Trichlorobenzene	~	0.64	U	0.78	U	0.66	U	0.64	U	0.61	U	0.69	U	0.57	U	0.64	U
1,2,4-Trimethylbenzene	~	0.59	D	4.4	D	1.8	D	1.6	D	1.1	D	0.5	D	3	D	1.1	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.66	U	0.81	U	0.69	U	0.66	U	0.63	U	0.71	U	0.59	U	0.66	U
1,2-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,2-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,2-Dichloropropane	~	0.4	UJ	0.48	UJ	0.41	UJ	0.4	UJ	0.38	UJ	0.43	UJ	0.35	UJ	0.4	UJ
1,2-Dichlorotetrafluoroethane	~	0.6	U	0.73	U	0.62	U	0.6	U	0.57	U	0.65	U	0.54	U	0.6	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.42	U	1.5	D	0.62	D	0.55	D	0.48	D	0.46	U	0.98	D	0.42	D
1,3-Butadiene	~	0.57	U	0.7	U	0.59	U	0.57	U	0.55	U	0.62	U	0.51	U	0.57	U
1,3-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,3-Dichloropropane	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
1,4-Dichlorobenzene	~	0.52	U	0.63	U	0.54	D	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,4-Dioxane (P-Dioxane)	~	0.62	U	0.76	U	0.64	U	0.62	U	0.59	U	0.67	U	0.55	U	0.62	U
2-Hexanone	~	0.7	U	0.86	U	0.73	U	0.7	U	0.67	U	0.76	U	0.63	U	0.7	U
4-Ethyltoluene	~	0.55	D	4.5	D	1.7	D	1.6	D	1.1	D	0.46	D	3	D	1.1	D
Acetone	~	18	D	240	D	36	J	26	J	18	D	32	D	42	D	44	D
Acrylonitrile	~	0.19	U	0.23	U	0.19	U	0.19	U	0.18	U	0.2	U	0.17	U	0.19	U
Allyl Chloride (3-Chloropropene)	~	1.3	U	1.6	U	1.4	U	1.3	U	1.3	U	1.5	U	1.2	U	1.3	U
Benzene	~	1	D	1	D	1.5	J	0.58	J	0.81	D	0.77	D	0.93	D	0.82	D
Benzyl Chloride	~	0.45	U	0.54	U	0.46	U	0.45	U	0.43	U	0.48	U	0.4	U	0.45	U
Bromodichloromethane	~	0.58	U	0.7	U	0.6	U	0.58	U	0.55	U	0.62	U	0.51	U	0.58	U
Bromoethene	~	0.38	U	0.46	U	0.39	U	0.38	U	0.36	U	0.41	U	0.34	U	0.38	U
Bromoform	~	0.89	U	1.1	U	0.92	U	0.89	U	0.85	U	0.96	U	0.79	U	0.89	U
Bromomethane	~	0.33	U	0.41	U	7.3	J	0.33	UJ	0.32	U	0.36	U	0.3	U	0.33	U
Carbon Disulfide	~	0.46	J	0.33	U	0.28	U	0.27	U	0.26	J	0.32	J	0.36	J	0.35	J
Carbon Tetrachloride	0.2	**0.49**	J	**0.59**	J	**0.96**	J	**0.32**	J	**0.62**	J	**0.64**	J	**0.63**	J	**0.7**	J
Chlorobenzene	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
Chloroethane	~	0.23	U	0.28	U	0.24	U	0.23	U	0.22	U	0.25	U	0.2	U	0.23	U
Chloroform	~	0.42	U	0.77	D	0.44	U	0.42	U	1.5	D	1	D	0.82	D	1	D
Chloromethane	~	0.76	D	0.89	D	1.7	J	0.36	J	0.87	D	0.88	D	0.98	D	0.89	D
Cis-1,2-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
Cis-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Cyclohexane	~	0.3	U	1.2	D	0.62	D	0.56	D	0.68	D	0.32	U	0.58	D	0.38	D
Dibromochloromethane	~	0.73	U	0.89	U	0.76	U	0.73	U	0.7	U	0.79	U	0.65	U	0.73	U
Dichlorodifluoromethane	~	2.1	D	2.7	D	3.7	J	1.3	J	2.6	D	2.6	D	2.5	D	3.1	D
Ethyl Acetate	~	0.65	D	8.8	D	2.9	J	0.84	J	2.6	D	3.4	D	2.1	D	2.4	D
Ethylbenzene	~	0.37	U	0.64	D	1.2	J	0.45	J	0.46	D	0.4	U	0.5	D	0.41	D
Hexachlorobutadiene	~	0.92	U	1.1	U	0.95	U	0.92	U	0.88	U	0.99	U	0.82	U	0.92	U
Isopropanol	~	9.3	D	89	D	380	J	92	J	630	J	520	J	410	J	200	J
M,P-Xylene	~	1.3	D	2.5	D	4.1	J	1.5	J	2.4	D	0.93	D	1.6	D	1.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.66	D	6.4	D	2.1	J	1.3	J	0.99	D	1.1	D	7.8	D	4.4	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.35	UJ	0.43	UJ	1.5	J	0.6	J	0.34	UJ	0.38	UJ	0.91	J	0.63	J
Methyl Methacrylate	~	3.5	D	7.3	D	1.2	J	4.6	J	6.1	D	70	D	2.7	D	3.8	D
Methylene Chloride	3	**55**	D	**20**	D	**10**	J	**43**	J	**30**	D	**49**	D	**11**	D	**64**	D
n-Heptane	~	0.46	D	3.4	D	1.4	J	0.74	J	1.1	D	0.46	D	0.82	D	0.6	D
n-Hexane	~	0.82	D	1.4	D	2.1	D	1.1	D	1.9	D	0.69	D	1.1	D	0.82	D
o-Xylene (1,2-Dimethylbenzene)	~	0.45	D	1.1	D	1.4	J	0.63	J	0.89	D	0.4	U	0.73	D	0.6	D
Propylene	~	0.15	U	0.18	U	0.15	U	0.15	U	0.14	U	0.16	U	0.13	U	0.15	U
Styrene	~	0.37	U	0.45	U	0.5	D	0.37	U	0.35	U	0.4	U	0.78	D	0.4	D
Tert-Butyl Methyl Ether	~	0.31	U	0.38	U	0.32	U	0.31	U	0.3	U	0.33	U	0.28	U	0.31	U
Tetrachloroethene (PCE)	3	0.58	D	1.3	D	**4.5**	J	1.4	J	0.56	U	0.63	U	2.1	D	1	D
Tetrahydrofuran	~	0.51	U	0.62	U	0.53	U	0.51	U	0.48	U	0.55	U	1.3	D	1.4	D
Toluene	~	2.3	D	60	D	12	J	2.6	J	3.1	D	2.5	D	3.3	D	2.5	D
Trans-1,2-Dichloroethene	~	0.34	U	0.42	U	0.35	U	0.34	U	0.33	U	0.37	U	0.3	U	0.34	U
Trans-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Trichloroethene (TCE)	0.2	0.12	U	**3.5**	D	**4.5**	J	**8.3**	J	**0.35**	D	**0.4**	D	**13**	D	**2.4**	D
Trichlorofluoromethane	~	1.3	D	1.8	D	2.5	J	0.97	J	2.1	D	2.1	D	1.9	D	3	D
Vinyl Acetate	~	0.3	U	0.37	U	0.31	U	0.3	U	0.29	U	0.33	U	0.27	U	0.3	U
Vinyl Chloride	0.2	0.11	U	0.13	U	0.11	U	0.11	U	0.11	U	0.12	U	0.098	U	0.11	U
Total BTEX	~	5.05		65.24		20.2		5.76		7.66		4.2		7.06		5.73	
Total CVOCs	~	56.07		25.39		19.96		53.02		30.97		50.04		26.73		68.1	
Total VOCs	~	100		465		489		193		710		690		518		344	

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
4. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
5. Total VOCs = sum of detected volatile organic compounds (VOC)
6. Detected analytical results above the NYSDOH Decision Matrices Minimum Concentrations sample are bolded and shaded.
7. Sample 013_DUP-1 is a duplicate of parent sample 012_IA-2.
8. ~ = Regulatory limit for this analyte does not exist
9. µg/m³ = micrograms per cubic meter
10. AA = Ambient Air
11. IA = Indoor Air

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.
D = The concentration reported is a result of a diluted sample.



Sample ID	016_IA-4	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.64	J
Methylene Chloride	49	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.4	D

Sample ID	015_IA-3	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.62	J
Methylene Chloride	30	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.35	D

Sample ID	012_IA-2		013_DUP-1	
Sample Date	12/1/2020		12/1/2020	
Sample Location	Basement		Basement	
VOCs (µg/L)				
Carbon Tetrachloride	0.96	J	0.32	J
Methylene Chloride	10	J	43	J
Tetrachloroethene (PCE)	4.5	J	1.4	J
Trichloroethene (TCE)	4.5	J	8.3	J

Sample ID	014_AMBIENT-1	
Sample Date	12/1/2020	
Sample Location	Exterior	
VOCs (µg/L)		
Carbon Tetrachloride	0.49	J
Methylene Chloride	55	D
Tetrachloroethene (PCE)	0.58	D
Trichloroethene (TCE)	ND	

Sample ID	018_IA-6	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.7	J
Methylene Chloride	64	D
Tetrachloroethene (PCE)	1	D
Trichloroethene (TCE)	2.4	D

Sample ID	017_IA-5	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.63	J
Methylene Chloride	11	D
Tetrachloroethene (PCE)	2.1	D
Trichloroethene (TCE)	13	D

Analyte	CAS Number	NYSDOH Decision Matrix Minimum Concentrations
VOCs (µg/m³)		
Carbon Tetrachloride	56-23-5	0.2
Methylene Chloride	75-09-2	3
Tetrachloroethene (PCE)	127-18-4	3
Trichloroethene (TCE)	79-01-6	0.2

Sample ID	011_IA-1	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.59	J
Methylene Chloride	20	D
Tetrachloroethene (PCE)	1.3	D
Trichloroethene (TCE)	3.5	D

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. ug/m3= micrograms per cubic meter
4. ND = Not Detectede

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
D = The concentration reported is a result of a diluted sample.

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Ambient Sample Location
- Indoor Air Sample Location

50 0 50
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Sample locations based on field measurements.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
INDOOR AIR ANALYTICAL RESULTS

Project No.	100901401
Date	6/3/2021
Scale	1 " = 50 '
Drawn By	IHB
Submission Date	
Figure	6

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 6 - Indoor Air Analytical Results.mxd Date: 6/3/2021 User: aruane Time: 4:46:29 PM

Allied Jackson Heights, LLC
118-35 Queens Boulevard
Forest Hills, New York 11375

July 8, 2021

Stand-Up MRI
75-11 31st Avenue
Jackson Heights, New York 11370

Re: Indoor Air Testing at 75-11 31st Avenue, Jackson Heights, NY

Dear Tenant,

Allied Jackson Heights, LLC is conducted periodic vapor sampling in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Site Management Plan dated October 2019 at the above-referenced property, including sampling of indoor air. These samples were collected to evaluate the potential for volatile organic compounds (VOCs), such as tetrachloroethene (PCE) and trichloroethene (TCE) from contaminated groundwater and contaminated soils to enter the building and affect the indoor air quality through a process known as soil vapor intrusion (see enclosed Fact Sheet). Degradation products of these compounds, including carbon tetrachloride and methylene chloride, were also evaluated. This environmental work is being conducted under the supervision of the NYSDEC and the New York State Department of Health (NYSDOH).

In November 2016, both PCE and TCE were detected in air beneath the basement slab and within the building. The indoor air levels of PCE and TCE exceeded applicable NYSDOH air guidelines. As a result, a sub-slab depressurization system was installed within certain portions of the building. Subsequent sampling in May 2017 showed that PCE levels decreased to below applicable NYSDOH air guidelines. Although TCE levels had decreased, they were still above applicable NYSDOH air guidelines at that time. Accordingly, another sampling event was conducted in August 2017. TCE was detected above the NYSDOH air guideline in the basement. Allied Jackson Heights, LLC conducted additional sampling in January 2018. Both PCE and TCE levels were below NYSDOH air guidelines and within background concentrations. Allied Jackson Heights, LLC conducted additional sampling in February 2019 in the basement only. PCE and TCE were detected above the laboratory reporting limit, but below NYSDOH air guidelines.

Allied Jackson Heights, LLC conducted additional sampling in December 2020 within the basement. TCE (3.5 micrograms per meter cubed [$\mu g/m^3$]), carbon tetrachloride (0.59 $\mu g/m^3$), and methylene chloride (20 $\mu g/m^3$) were detected in exceedance of the NYSDOH Guidelines of 0.2 $\mu g/m^3$, 0.2 $\mu g/m^3$, and 3 $\mu g/m^3$, respectively. PCE was detected above the laboratory reporting limit, but below the NYSDOH air guideline. Allied Jackson Heights, LLC will continue to coordinate with NYSDEC and NYSDOH.

Copies of the NYSDOH Fact Sheets for PCE, TCE, carbon tetrachloride, and methylene chloride are enclosed and test results are included in the attached table and figure.

Below is contact information for both the NYSDEC and the NYSDOH should you have any questions regarding this matter.

NYSDEC
Attn: Sadique Ahmed
625 Broadway
Albany, NY 12233-7016
Tel: (518) 402-9656
Sadique.ahmed@dec.ny.gov

NYSDOH
Attn: Ms. Angela Martin
Empire State Plaza, Corning Tower, Rm 1787
Albany, NY 12237
Tel: (518) 402-7860
BEEI@health.ny.gov

Sincerely,

Allied Jackson Heights, LLC

Mark Kostron

SOIL VAPOR INTRUSION

Frequently Asked Questions

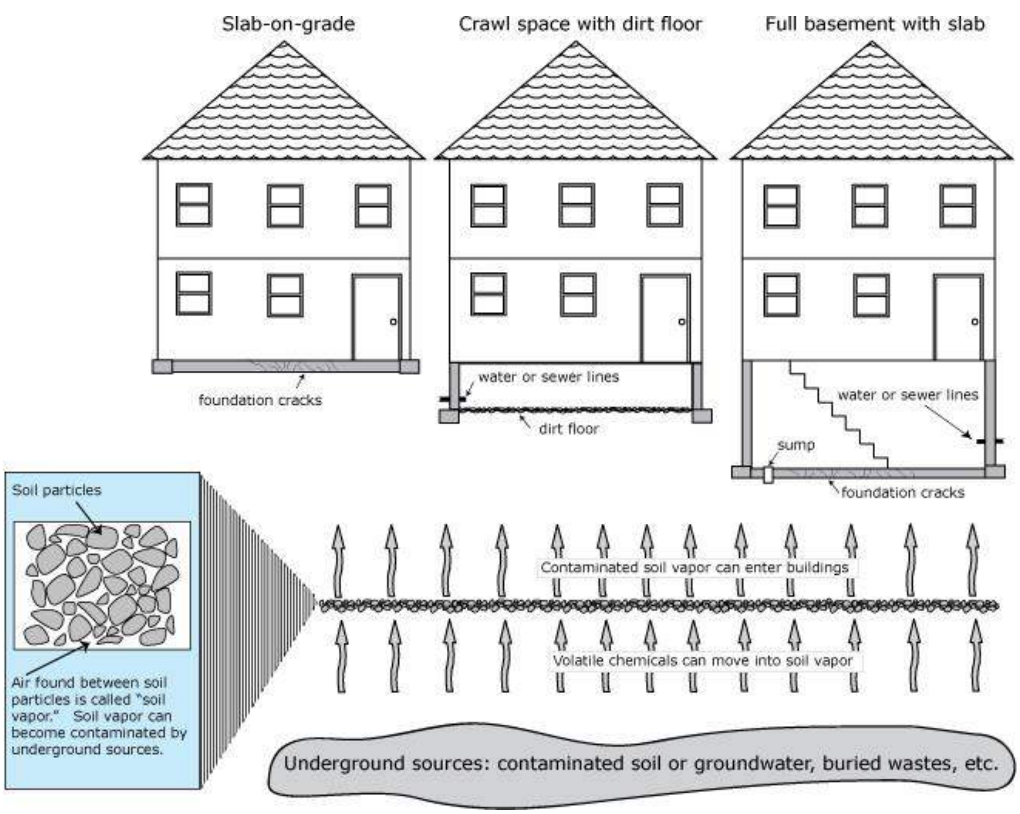
What is soil vapor intrusion?

The phrase "soil vapor intrusion" refers to the process by which volatile chemicals move from a subsurface source into the indoor air of overlying buildings.

Soil vapor, or soil gas, is the air found in the pore spaces between soil particles. Because of a difference in pressure, soil vapor enters buildings through cracks in slabs or basement floors and walls, and through openings around sump pumps or where pipes and electrical wires go through the foundation. Heating, ventilation or air-conditioning systems may create a negative pressure that can draw soil vapor into the building. This intrusion is similar to how radon gas seeps into buildings.

Soil vapor can become contaminated when chemicals evaporate from subsurface sources and enter the soil vapor. Chemicals that readily evaporate are called "volatile chemicals." Volatile chemicals include volatile organic compounds (VOCs). Subsurface sources of volatile chemicals may include contaminated soil and groundwater, or buried wastes. If soil vapor is contaminated, and enters a building as described above, indoor air quality may be affected.

When contaminated vapors are present in the zone directly next to or under the foundation of the building, soil vapor intrusion is possible. Soil vapor can enter a building whether it is old or new, or whether it has a basement, a crawl space, or is on a slab (as illustrated in the figure).



How am I exposed to chemicals through soil vapor intrusion?

Humans can be exposed to soil vapor contaminated with volatile chemicals when vapors from beneath a building are drawn through cracks and openings in the foundation and mix with the indoor air. Inhalation is the route of exposure, or the manner in which the volatile chemicals actually enter the body, once in the indoor air.

Current exposures are when soil vapor intrusion is documented in an occupied building. *Potential* exposures are when volatile chemicals are present, or are accumulating, in the vapor phase beneath a building, but have not affected indoor air quality. Potential exposures also exist when there is a chance that contaminated soil vapors may move to existing buildings not currently affected or when there is a chance that new buildings can be built over existing subsurface vapor contamination. Both current and potential exposures are considered when evaluating soil vapor intrusion at a site that has documented subsurface sources of volatile chemicals.

In general, exposure to a volatile chemical does not necessarily mean that health effects will occur. Whether or not a person experiences health effects depends on several factors, including inhalation exposure, the length of exposure (short-term or acute versus long-term or chronic), the frequency of exposure, the toxicity of the volatile chemical, and the individual's sensitivity to the chemical.

What types of chemicals associated with environmental contamination may be entering my home via soil vapor intrusion?

Volatile organic compounds, or VOCs, are the most likely group of chemicals found in soil vapor, and which can move through the soil and enter buildings. Solvents used for dry cleaning, degreasing and other industrial purposes (e.g., tetrachloroethene, trichloroethene, 1,1,1-trichloroethane and Freon 113) are examples of VOCs. Examples of petroleum-related VOCs from petroleum spills are benzene, toluene, ethyl benzene, xylenes, styrene, hexane and trimethylbenzenes.

Is contaminated soil vapor the only source of volatile chemicals in my indoor air?

No. Volatile chemicals are also found in many household products. Paints, paint strippers and thinners, mineral spirits, glues, solvents, cigarette smoke, aerosol sprays, mothballs, air fresheners, new carpeting or furniture, hobby supplies, lubricants, stored fuels, refrigerants and recently dry-cleaned clothing all contain VOCs. Household products are often more of a source of VOCs in indoor air in homes than contaminated soil vapor.

Indoor air may also become affected when outdoor air containing volatile chemicals enters your home. Volatile chemicals are present in outdoor air due to their widespread use. Gasoline stations, dry cleaners, and other commercial/industrial facilities are important sources of VOCs to outdoor air.

What should I expect if soil vapor intrusion is a concern near my home?

If you live near a site that has documented soil, groundwater and/or soil vapor contaminated with volatile chemicals, you should expect that the potential for soil vapor intrusion is being, or has been, investigated. You may be contacted by the site owner or others working on the cleanup with information about the project. Your cooperation and consent would be requested before any testing/sampling would be done on your property. You may ask the person contacting you any questions about the work being done. You can also contact the NYSDOH's project manager for the site at (518) 402-7880 or 1-800-458-1158 for additional information.

How is soil vapor intrusion investigated at sites contaminated with volatile chemicals?

The process of investigating soil vapor intrusion typically requires more than one set of samples to determine the extent of vapor contamination. Furthermore, four types of environmental samples are collected: soil vapor samples, sub-slab vapor samples, indoor air samples and outdoor air (sometimes referred to as "ambient air") samples.

<u>Soil vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil in a given area. They are often collected before sub-slab vapor and/or indoor air samples to help identify buildings or groups of buildings that need to be sampled. Soil vapor samples are used to determine the *potential* for human exposures. *Soil vapor* samples are not the same as *soil* samples.

<u>Sub-slab vapor samples</u> are collected to characterize the nature and extent of vapor contamination in the soil immediately beneath a building with basement foundations or a slab. Sub-slab vapor results are used to determine the potential for *current* and *future* human exposures. For example, an exposure could occur in the future if cracks develop in the building's foundation or changes in the operation of the building's heating, ventilation or air-conditioning system are made that make the movement of contaminated soil vapor into the building possible.

<u>Indoor air samples</u> are collected to characterize the nature and extent of air contamination within a building. Indoor air sample results help to evaluate whether there are *current* human exposures. They are also compared to sub-slab vapor and outdoor air results to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).

<u>Outdoor air samples</u> are collected to characterize site-specific background air conditions. Outdoor air results are used to evaluate the extent to which outdoor sources, such as automobiles, lawn mowers, oil storage tanks, gasoline stations, commercial/industrial facilities, and so forth, may be affecting indoor air quality.

What should I expect if indoor air samples are collected in my home?

You should expect the following:

- Indoor air samples are generally collected from the lowest-level space in a building, typically a basement, during the heating season. Indoor air samples may also be collected from the first floor of living space. Indoor air is believed to represent the greatest exposure potential with respect to soil vapor intrusion.
- Sub-slab vapor and outdoor air samples are usually collected at the same time as indoor air samples to help determine where volatile chemicals may be coming from (indoor sources, outdoor sources, and/or beneath the building).
- More limited sampling may be performed outside of the heating season. For example, sub-slab vapor samples without indoor air or outdoor air samples may be collected to identify buildings and areas where comprehensive sampling is needed during the heating season.
- An indoor air quality questionnaire and building inventory will be completed. The questionnaire includes a summary of the building's construction characteristics; the building's heating, ventilation and air-conditioning system operations; and potential indoor and outdoor sources of volatile chemicals. The building inventory describes products present in the building that might contain volatile chemicals. In addition, we take monitoring readings from a real-time organic vapor meter (also known as a photoionization detector or PID). The PID is an instrument that detects many VOCs in the air. When indoor air samples are collected, the

PID is used to help determine whether products containing VOCs might be contributing to levels that are detected in the indoor air.

What happens if soil vapor contamination or soil vapor intrusion is identified during investigation of a site?

Depending on the investigation results, additional sampling, monitoring or mitigation actions may be recommended. Additional sampling may be performed to determine the extent of soil vapor contamination and to verify questionable results. Monitoring (sampling on a recurring basis) is typically conducted if there is a significant potential for soil vapor intrusion to occur should building conditions change. Mitigation steps are taken to minimize exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation, adjusting the building's heating, ventilation and air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors, or installing a sub-slab depressurization system beneath the building.

What is a sub-slab depressurization system?

A sub-slab depressurization system, much like a radon mitigation system, essentially prevents vapors beneath a slab from entering a building. A low amount of suction is applied below the foundation of the building and the vapors are vented to the outside (see illustration). The system uses minimal electricity and should not noticeably affect heating and cooling efficiency. This mitigation system also essentially prevents radon from entering a building, an added health benefit. The party responsible for cleaning up the source of the soil vapor contamination is usually responsible for paying for the installation of this system. If no responsible party is available, New York State will install the system. Once the contamination is cleaned up, the system should no longer be needed. In areas where radon is a problem, the NYSDOH recommends that these systems remain in place permanently.

What else can I do to improve my indoor air quality?

Household products and other factors, such as mold growth, carbon monoxide, and radon, can degrade the quality of air in your home. Consider the following tips to improve indoor air quality:

- Be aware of household products that contain VOCs. Do not buy more chemicals than you need at a time.
- Store unused chemicals in tightly-sealed containers in a well-ventilated location, preferably away from the living space in your home.
- Keep your home properly ventilated. Keeping it too air-tight may promote build up of chemicals in the air, as well as mold growth due to the build up of moisture.
- Fix all leaks promptly, as well as other moisture problems that encourage mold growth.
- Make sure your heating system, hot water, dryer and fireplaces are properly vented and in good condition. Have your furnace or boiler checked annually by a professional.
- Test your home for radon; take actions to reduce radon levels if needed.
- Install carbon monoxide detectors in your home; take immediate actions to reduce carbon monoxide levels if needed.

Where can I get more information?

For additional information about soil vapor intrusion, contact the NYSDOH's Bureau of Environmental Exposure Investigation at (518) 402-7880 or 1-800-458-1158.

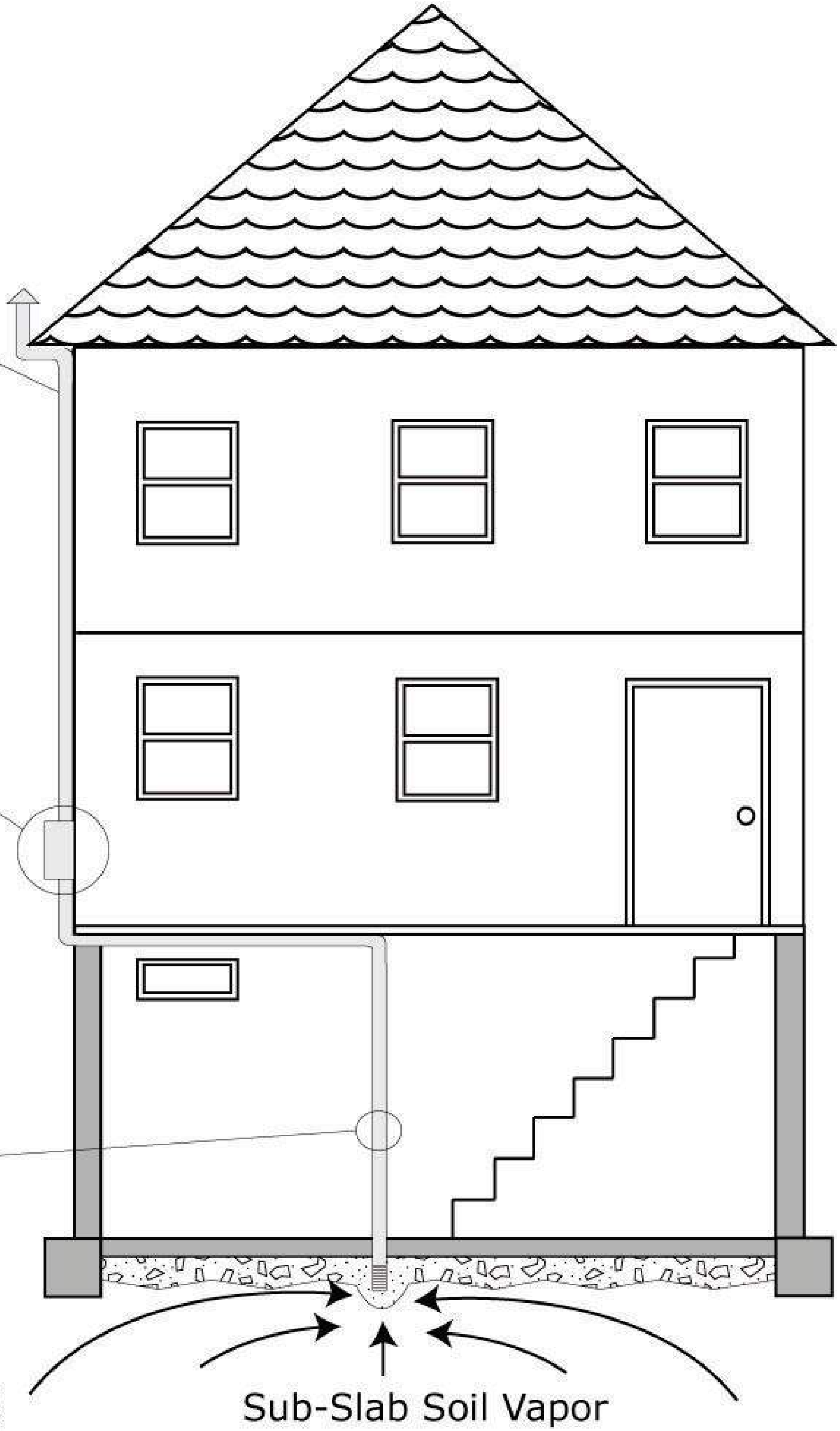
Sub-Slab Depressurization System

(commonly called a radon mitigation system)

The vent pipe is routed up the side of the structure to a location above the roof line.

A fan is used to draw soil vapor from beneath the slab.

A liquid gauge, or manometer is used to verify that the system is operating properly



A sub-slab depressurization system vents contaminated soil vapor before it enters a structure. The fan draws vapor from beneath the building outside to the roof line where it is released to the outside air.

New York State Department of Health
Tenant Notification Fact Sheet for Tetrachloroethene (Perc)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Tetrachloroethene (Perc)

Tetrachloroethene (also known as perchloroethylene or Perc) is a man-made volatile organic chemical that is widely used in the dry-cleaning of fabrics, including clothes, and in manufacturing other chemicals. It was also used for degreasing metal parts and in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors.

Sources of Perc in Indoor Air

Household products containing Perc could be a possible source for Perc in indoor air. Perc also may evaporate from dry-cleaned clothes or dry-cleaning operations into indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Perc may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Perc has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of Perc in indoor and outdoor air. Levels of Perc in the indoor air of homes and office settings and in outdoor air are expected to be below 10 micrograms per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

An association exists between exposure of people in the workplace to high levels of Perc in air and certain forms of cancer. Perc causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, the studies of humans and in animals do not prove that Perc causes cancer in people, but are highly suggestive that there may be an increased risk for cancer in people who are exposed to Perc (particularly at high concentrations) over long periods of time

People exposed to high levels of Perc in air had nervous system effects and slight changes to their liver and kidneys. Some studies show a slightly increased risk for some types of reproductive effects among workers (including dry-cleaning workers) exposed to Perc and other chemicals. The reproductive effects associated with exposure included increased risks for spontaneous abortion, menstrual and sperm disorders, and reduced fertility. The data suggest, but do not prove, that the effects were caused by Perc and not by some other factor or factors. Exposure to high levels of Perc has caused liver and kidney damage in laboratory animals and effects on the nervous system. Taken together, the human and animal studies indicate that human exposure to high levels of Perc causes effects on the nervous system, and suggest that human exposure to high levels of Perc may increase the risk for liver and kidney toxicity.

NYS DOH Air Guideline

The NYS DOH guideline for Perc in air is 30 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people

are continuously exposed to Perc in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of Perc.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce Perc exposure. Reasonable and practical actions should be taken to reduce Perc exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 30 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline. The NYS DOH recommends taking immediate action to reduce exposure when an air level is ten times or more higher than the guideline (that is, when the air level is 300 mcg/m^3 or higher).

Ways to Limit Exposure to Perc in Indoor Air

In all cases, the specific actions to limit exposure to Perc in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of Perc and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of Perc entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring Perc in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on Perc, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants.

If you have further questions about Perc and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
December, 2013

New York State Department of Health
Tenant Notification Fact Sheet for Trichloroethene (TCE)

This fact sheet is provided to fulfill New York State Department of Health (NYSDOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m^3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a

health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

NYSDOH Air Guideline

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3.

Ways to Limit Exposure to TCE in Indoor Air

In all cases, the specific recommended actions to limit exposure to TCE in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of TCE and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of TCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that evaporates into indoor air.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods

recommended by the NYSDOH for measuring TCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at levels below 1 mcg/m^3.

Additional Information

Additional information on TCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYSDOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about TCE and the information in this fact sheet, please call the NYSDOH at 1-518-402-7800 or 1-800-458-1158, e-mail to ceheduc@health.state.ny.us, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

Updated August 2015

New York State Department of Health
Tenant Notification Fact Sheet for Carbon Tetrachloride

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Carbon Tetrachloride

Carbon tetrachloride is a man-made volatile organic chemical that was used as a household spot remover, an industrial degreasing agent, in dry cleaning, in fire extinguishers, and as a grain fumigant to kill insects. Most of these uses have been discontinued. Carbon tetrachloride was also used to make refrigerants and propellants for aerosol cans, but this use has declined in recent years because of the effects of many refrigerants and aerosol propellants on the earth's ozone layer.

Sources of Carbon Tetrachloride in Indoor Air

Household products containing carbon tetrachloride could be a possible source for carbon tetrachloride in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Carbon tetrachloride may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Carbon tetrachloride has also been found at low concentrations in outdoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of carbon tetrachloride in indoor and outdoor air. Levels of carbon tetrachloride in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of carbon tetrachloride in humans following long-term exposure. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system, liver and kidney damage. Exposure to high concentrations of carbon tetrachloride damages the liver, kidney, nervous system and male reproductive system in laboratory animals. Carbon tetrachloride causes cancer in laboratory animals exposed at high levels over their lifetimes. Whether or not carbon tetrachloride causes cancer in humans is unknown. Taken together, the human and animal studies suggest that long term human exposure to carbon tetrachloride (particularly at high levels) may increase the risk for cancer and for liver, kidney and nervous system toxicity.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for carbon tetrachloride in air. However, NYS DOH guidance for carbon tetrachloride and other air contaminants is that reasonable and practical actions should be taken to reduce exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The carbon tetrachloride exposure levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to Carbon Tetrachloride in Indoor Air

In all cases, the specific actions to limit exposure to carbon tetrachloride in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of carbon tetrachloride and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of carbon tetrachloride entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring carbon tetrachloride in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on carbon tetrachloride, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at www.health.state.ny.us/environmental/indoors/air/contaminants/.

If you have further questions about carbon tetrachloride and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

New York State Department of Health
Tenant Notification Fact Sheet for Dichloromethane

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

Dichloromethane

Dichloromethane (also known as methylene chloride) is a colorless and volatile liquid chemical that has a mild, sweet odor. It is used as an industrial and laboratory solvent, as a paint stripper, and in the manufacture of photographic film. Dichloromethane is also found in aerosol products, adhesives, spray paints, automotive cleaners, and varnish removers.

Sources of Dichloromethane in Indoor Air

Household products containing dichloromethane are a possible source for dichloromethane in indoor air. Another source could be evaporation from contaminated well water that is used for household purposes. Dichloromethane may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. Dichloromethane has also been found in outdoor air near facilities where it is being produced or used, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of dichloromethane in indoor and outdoor air. Levels of dichloromethane are typically around 5 micrograms per cubic meter (mcg/m^3) in the indoor air of homes and offices, but may be somewhat higher as dichloromethane is commonly used in many paint strippers and adhesive products. Levels in outdoor air are expected to be less than 5 mcg/m^3.

Health Risks Associated with Exposure

People exposed to high levels of dichloromethane in air for short periods of time had adverse effects on the central nervous system, including dizziness, headache, lightheadedness, confusion, incoordination, drowsiness, prickling or tinkling sensations, and decreased scores on tests that evaluate nervous system function. Long term exposure to high levels of dichloromethane damages the liver and kidneys of laboratory animals. Taken together, the human and animal studies indicate that human exposure to high levels of dichloromethane causes adverse effects on the nervous system, and suggest that long term human exposure to dichloromethane may increase the risk for liver and kidney toxicity.

Studies of long-term human exposure to dichloromethane in the workplace had weaknesses that limited their ability to detect an increased incidence of cancer due to the chemical. Therefore, whether or not dichloromethane cause cancer in humans is unknown. Dichloromethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Overall, data from the human and animal studies suggest that long-term human exposure to dichloromethane could increase the risk for cancer.

NYS DOH Air Guideline

The NYS DOH guideline for dichloromethane in air is 60 mcg/m^3. This level is lower than the levels that have caused health effects in animals and humans. The guideline is based on the assumption that people are continuously exposed to dichloromethane in air all day, every day for as long as a lifetime. This is rarely true for most people who, if exposed, are likely to be exposed for only part of the day and part of their lifetime. In setting this level, the NYS DOH also considered the possibility that certain members of the population (infants, children, the elderly, and those with pre-existing health conditions) may be especially sensitive to the effects of dichloromethane.

The purpose of the guideline is to help guide decisions about the nature of the efforts to reduce dichloromethane exposure. Reasonable and practical actions should be taken to reduce dichloromethane exposure when indoor air levels are above those typically found in indoor air, even when they are below the guideline of 60 mcg/m^3. The urgency to take actions increases as indoor air levels increase, especially when air levels are above the guideline.

Ways to Limit Exposure to Dichloromethane in Indoor Air

In all cases, the specific actions to limit exposure to dichloromethane in indoor air depend on a case-by-case evaluation of the situation. Removing household sources of dichloromethane and maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of dichloromethane entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring dichloromethane in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on dichloromethane, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about dichloromethane and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

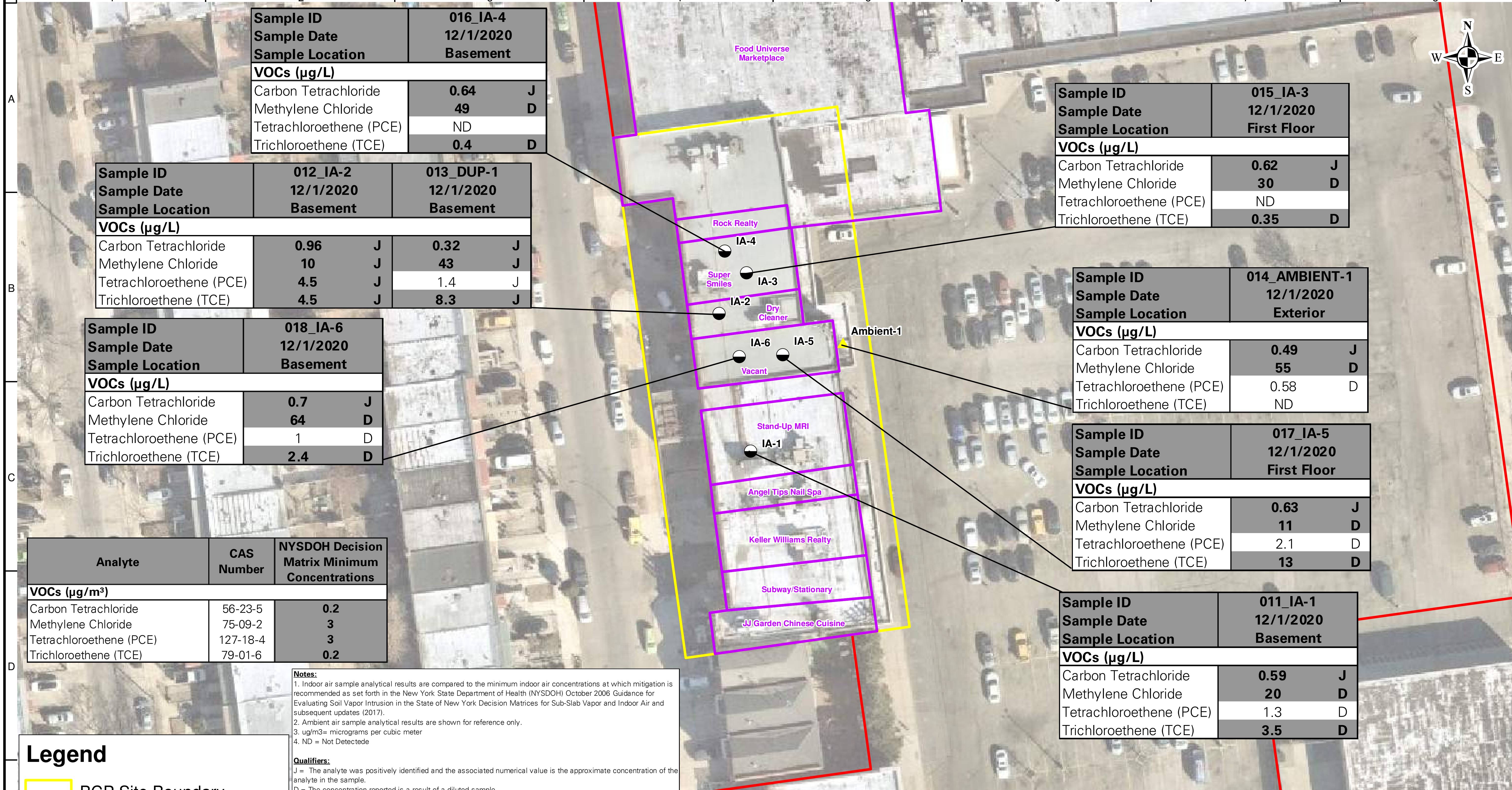
Table 3
Periodic Review Report
Indoor Air Analytical Results Summary

Jackson Heights Shopping Center
75-11 31st Avenue
Jackson Heights, New York
NYSDEC BCP Site No.: C241176

Location	NYSDOH Decision Matrices Minimum Concentrations	AMBIENT-1		IA-1		IA-2		IA-2		IA-3		IA-4		IA-5		IA-6	
Sample ID		014_AMBIENT-1		011_IA-1		012_IA-2		013_DUP-1		015_IA-3		016_IA-4		017_IA-5		018_IA-6	
Laboratory ID		20L0059-08		20L0059-01		20L0059-02		20L0059-07		20L0059-03		20L0059-04		20L0059-05		20L0059-06	
Sample Date		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020		12/1/2020	
Sample Type		AA		IA		IA		IA		IA		IA		IA		IA	
Sample Location		Exterior of Building		Basement of Stand-Up MRI		Basement of Drycleaners		Basement of Drycleaners		First Floor of Super Smiles		Basement of Super Smiles		First Floor of Vacant Tenant Space		Basement of Vacant Tenant Space	
Volatile Organic Compounds (µg/m³)																	
1,1,1,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,1-Trichloroethane	3	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1,2,2-Tetrachloroethane	~	0.59	U	0.72	U	0.61	U	0.59	U	0.56	U	0.64	U	0.53	U	0.59	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	~	0.66	U	0.8	U	0.96	D	0.66	U	0.63	U	0.71	U	0.59	D	0.66	D
1,1,2-Trichloroethane	~	0.47	U	0.57	U	0.49	U	0.47	U	0.45	U	0.51	U	0.42	U	0.47	U
1,1-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,1-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
1,2,4-Trichlorobenzene	~	0.64	U	0.78	U	0.66	U	0.64	U	0.61	U	0.69	U	0.57	U	0.64	U
1,2,4-Trimethylbenzene	~	0.59	D	4.4	D	1.8	D	1.6	D	1.1	D	0.5	D	3	D	1.1	D
1,2-Dibromoethane (Ethylene Dibromide)	~	0.66	U	0.81	U	0.69	U	0.66	U	0.63	U	0.71	U	0.59	U	0.66	U
1,2-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,2-Dichloroethane	~	0.35	U	0.42	U	0.36	U	0.35	U	0.33	U	0.38	U	0.31	U	0.35	U
1,2-Dichloropropane	~	0.4	UJ	0.48	UJ	0.41	UJ	0.4	UJ	0.38	UJ	0.43	UJ	0.35	UJ	0.4	UJ
1,2-Dichlorotetrafluoroethane	~	0.6	U	0.73	U	0.62	U	0.6	U	0.57	U	0.65	U	0.54	U	0.6	U
1,3,5-Trimethylbenzene (Mesitylene)	~	0.42	U	1.5	D	0.62	D	0.55	D	0.48	D	0.46	U	0.98	D	0.42	D
1,3-Butadiene	~	0.57	U	0.7	U	0.59	U	0.57	U	0.55	U	0.62	U	0.51	U	0.57	U
1,3-Dichlorobenzene	~	0.52	U	0.63	U	0.54	U	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,3-Dichloropropane	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
1,4-Dichlorobenzene	~	0.52	U	0.63	U	0.54	D	0.52	U	0.49	U	0.56	U	0.46	U	0.52	U
1,4-Dioxane (P-Dioxane)	~	0.62	U	0.76	U	0.64	U	0.62	U	0.59	U	0.67	U	0.55	U	0.62	U
2-Hexanone	~	0.7	U	0.86	U	0.73	U	0.7	U	0.67	U	0.76	U	0.63	U	0.7	U
4-Ethyltoluene	~	0.55	D	4.5	D	1.7	D	1.6	D	1.1	D	0.46	D	3	D	1.1	D
Acetone	~	18	D	240	D	36	J	26	J	18	D	32	D	42	D	44	D
Acrylonitrile	~	0.19	U	0.23	U	0.19	U	0.19	U	0.18	U	0.2	U	0.17	U	0.19	U
Allyl Chloride (3-Chloropropene)	~	1.3	U	1.6	U	1.4	U	1.3	U	1.3	U	1.5	U	1.2	U	1.3	U
Benzene	~	1	D	1	D	1.5	J	0.58	J	0.81	D	0.77	D	0.93	D	0.82	D
Benzyl Chloride	~	0.45	U	0.54	U	0.46	U	0.45	U	0.43	U	0.48	U	0.4	U	0.45	U
Bromodichloromethane	~	0.58	U	0.7	U	0.6	U	0.58	U	0.55	U	0.62	U	0.51	U	0.58	U
Bromoethene	~	0.38	U	0.46	U	0.39	U	0.38	U	0.36	U	0.41	U	0.34	U	0.38	U
Bromoform	~	0.89	U	1.1	U	0.92	U	0.89	U	0.85	U	0.96	U	0.79	U	0.89	U
Bromomethane	~	0.33	U	0.41	U	7.3	J	0.33	UJ	0.32	U	0.36	U	0.3	U	0.33	U
Carbon Disulfide	~	0.46	J	0.33	U	0.28	U	0.27	U	0.26	J	0.32	J	0.36	J	0.35	J
Carbon Tetrachloride	0.2	**0.49**	J	**0.59**	J	**0.96**	J	**0.32**	J	**0.62**	J	**0.64**	J	**0.63**	J	**0.7**	J
Chlorobenzene	~	0.4	U	0.48	U	0.41	U	0.4	U	0.38	U	0.43	U	0.35	U	0.4	U
Chloroethane	~	0.23	U	0.28	U	0.24	U	0.23	U	0.22	U	0.25	U	0.2	U	0.23	U
Chloroform	~	0.42	U	0.77	D	0.44	U	0.42	U	1.5	D	1	D	0.82	D	1	D
Chloromethane	~	0.76	D	0.89	D	1.7	J	0.36	J	0.87	D	0.88	D	0.98	D	0.89	D
Cis-1,2-Dichloroethene	0.2	0.085	U	0.1	U	0.089	U	0.085	U	0.081	U	0.092	U	0.076	U	0.085	U
Cis-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Cyclohexane	~	0.3	U	1.2	D	0.62	D	0.56	D	0.68	D	0.32	U	0.58	D	0.38	D
Dibromochloromethane	~	0.73	U	0.89	U	0.76	U	0.73	U	0.7	U	0.79	U	0.65	U	0.73	U
Dichlorodifluoromethane	~	2.1	D	2.7	D	3.7	J	1.3	J	2.6	D	2.6	D	2.5	D	3.1	D
Ethyl Acetate	~	0.65	D	8.8	D	2.9	J	0.84	J	2.6	D	3.4	D	2.1	D	2.4	D
Ethylbenzene	~	0.37	U	0.64	D	1.2	J	0.45	J	0.46	D	0.4	U	0.5	D	0.41	D
Hexachlorobutadiene	~	0.92	U	1.1	U	0.95	U	0.92	U	0.88	U	0.99	U	0.82	U	0.92	U
Isopropanol	~	9.3	D	89	D	380	J	92	J	630	J	520	J	410	J	200	J
M,P-Xylene	~	1.3	D	2.5	D	4.1	J	1.5	J	2.4	D	0.93	D	1.6	D	1.4	D
Methyl Ethyl Ketone (2-Butanone)	~	0.66	D	6.4	D	2.1	J	1.3	J	0.99	D	1.1	D	7.8	D	4.4	D
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	~	0.35	UJ	0.43	UJ	1.5	J	0.6	J	0.34	UJ	0.38	UJ	0.91	J	0.63	J
Methyl Methacrylate	~	3.5	D	7.3	D	1.2	J	4.6	J	6.1	D	70	D	2.7	D	3.8	D
Methylene Chloride	3	**55**	D	**20**	D	**10**	J	**43**	J	**30**	D	**49**	D	**11**	D	**64**	D
n-Heptane	~	0.46	D	3.4	D	1.4	J	0.74	J	1.1	D	0.46	D	0.82	D	0.6	D
n-Hexane	~	0.82	D	1.4	D	2.1	D	1.1	D	1.9	D	0.69	D	1.1	D	0.82	D
o-Xylene (1,2-Dimethylbenzene)	~	0.45	D	1.1	D	1.4	J	0.63	J	0.89	D	0.4	U	0.73	D	0.6	D
Propylene	~	0.15	U	0.18	U	0.15	U	0.15	U	0.14	U	0.16	U	0.13	U	0.15	U
Styrene	~	0.37	U	0.45	U	0.5	D	0.37	U	0.35	U	0.4	U	0.78	D	0.4	D
Tert-Butyl Methyl Ether	~	0.31	U	0.38	U	0.32	U	0.31	U	0.3	U	0.33	U	0.28	U	0.31	U
Tetrachloroethene (PCE)	3	0.58	D	1.3	D	**4.5**	J	1.4	J	0.56	D	0.63	D	2.1	D	1	D
Tetrahydrofuran	~	0.51	U	0.62	U	0.53	U	0.51	U	0.48	U	0.55	U	1.3	D	1.4	D
Toluene	~	2.3	D	60	D	12	J	2.6	J	3.1	D	2.5	D	3.3	D	2.5	D
Trans-1,2-Dichloroethene	~	0.34	U	0.42	U	0.35	U	0.34	U	0.33	U	0.37	U	0.3	U	0.34	U
Trans-1,3-Dichloropropene	~	0.39	U	0.48	U	0.41	U	0.39	U	0.37	U	0.42	U	0.35	U	0.39	U
Trichloroethene (TCE)	0.2	0.12	U	**3.5**	D	**4.5**	J	**8.3**	J	**0.35**	D	**0.4**	D	**13**	D	**2.4**	D
Trichlorofluoromethane	~	1.3	D	1.8	D	2.5	J	0.97	J	2.1	D	2.1	D	1.9	D	3	D
Vinyl Acetate	~	0.3	U	0.37	U	0.31	U	0.3	U	0.29	U	0.33	U	0.27	U	0.3	U
Vinyl Chloride	0.2	0.11	U	0.13	U	0.11	U	0.11	U	0.11	U	0.12	U	0.098	U	0.11	U
Total BTEX	~	5.05		65.24		20.2		5.76		7.66		4.2		7.06		5.73	
Total CVOCs	~	56.07		25.39		19.96		53.02		30.97		50.04		26.73		68.1	
Total VOCs	~	100		465		489		193		710		690		518		344	

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. Total BTEX = sum of detected concentrations of benzene, toluene, ethylbenzene, and total xylenes
4. Total CVOCs = sum of detected concentrations of the NYSDOH Matrix A through C chlorinated volatile organic compounds (CVOCs)
5. Total VOCs = sum of detected volatile organic compounds (VOC)
6. Detected analytical results above the NYSDOH Decision Matrices Minimum Concentrations sample are bolded and shaded.
7. Sample 013_DUP-1 is a duplicate of parent sample 012_IA-2.
8. ~ = Regulatory limit for this analyte does not exist
9. µg/m³ = micrograms per cubic meter
10. AA = Ambient Air
11. IA = Indoor Air

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.
U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.
D = The concentration reported is a result of a diluted sample.



Sample ID	016_IA-4	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.64	J
Methylene Chloride	49	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.4	D

Sample ID	012_IA-2		013_DUP-1	
Sample Date	12/1/2020		12/1/2020	
Sample Location	Basement		Basement	
VOCs (µg/L)				
Carbon Tetrachloride	0.96	J	0.32	J
Methylene Chloride	10	J	43	J
Tetrachloroethene (PCE)	4.5	J	1.4	J
Trichloroethene (TCE)	4.5	J	8.3	J

Sample ID	018_IA-6	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.7	J
Methylene Chloride	64	D
Tetrachloroethene (PCE)	1	D
Trichloroethene (TCE)	2.4	D

Sample ID	015_IA-3	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.62	J
Methylene Chloride	30	D
Tetrachloroethene (PCE)	ND	
Trichloroethene (TCE)	0.35	D

Sample ID	014_AMBIENT-1	
Sample Date	12/1/2020	
Sample Location	Exterior	
VOCs (µg/L)		
Carbon Tetrachloride	0.49	J
Methylene Chloride	55	D
Tetrachloroethene (PCE)	0.58	D
Trichloroethene (TCE)	ND	

Sample ID	017_IA-5	
Sample Date	12/1/2020	
Sample Location	First Floor	
VOCs (µg/L)		
Carbon Tetrachloride	0.63	J
Methylene Chloride	11	D
Tetrachloroethene (PCE)	2.1	D
Trichloroethene (TCE)	13	D

Sample ID	011_IA-1	
Sample Date	12/1/2020	
Sample Location	Basement	
VOCs (µg/L)		
Carbon Tetrachloride	0.59	J
Methylene Chloride	20	D
Tetrachloroethene (PCE)	1.3	D
Trichloroethene (TCE)	3.5	D

Analyte	CAS Number	NYSDOH Decision Matrix Minimum Concentrations
VOCs (µg/m³)		
Carbon Tetrachloride	56-23-5	0.2
Methylene Chloride	75-09-2	3
Tetrachloroethene (PCE)	127-18-4	3
Trichloroethene (TCE)	79-01-6	0.2

Notes:
1. Indoor air sample analytical results are compared to the minimum indoor air concentrations at which mitigation is recommended as set forth in the New York State Department of Health (NYSDOH) October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York Decision Matrices for Sub-Slab Vapor and Indoor Air and subsequent updates (2017).
2. Ambient air sample analytical results are shown for reference only.
3. ug/m3= micrograms per cubic meter
4. ND = Not Detectede

Qualifiers:
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
D = The concentration reported is a result of a diluted sample.

Legend

- BCP Site Boundary
- Property Boundary
- Tenant Spaces
- Ambient Sample Location
- Indoor Air Sample Location

50 0 50
SCALE IN FEET

Notes:
1. Parcel boundaries provided through the NYC Department of Planning's MapPLUTO 21v1 parcel dataset, updated 2021.
2. Aerial imagery provided through Langan's subscription to NearMap, imagery dated March 12, 2021.
3. Site features obtained from "Figure 15 - Monitoring Well Network Map" dated 20 March 2017 prepared by PSG Engineering, DPC and provided within the 2019 SMP.
4. Sample locations based on field measurements.

LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com
Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
Langan International LLC
Collectively known as Langan
NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project
JACKSON HEIGHTS SHOPPING CENTER
75-11 31ST AVENUE
BCP Site No.: C241176
JACKSON HEIGHTS
QUEENS COUNTY NEW YORK

Drawing Title
INDOOR AIR ANALYTICAL RESULTS

Project No.	100901401
Date	6/3/2021
Scale	1 " = 50 '
Drawn By	IHB
Submission Date	
Figure	6

Path: \\langan.com\data\PAR\data4\100901401\Project Data\ArcGIS\MXD\Environmental_Figures\2021-06 - PRR\Figure 6 - Indoor Air Analytical Results.mxd Date: 6/3/2021 User: aruane Time: 4:46:29 PM

APPENDIX H

ICEC Certification Form

Enclosure 2
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. **C241176**

Site Name Jackson Heights Shopping Center

Site Address: 75-11 31st Avenue Zip Code: 11370
City/Town: Jackson Heights
County: Queens
Site Acreage: 0.726

Reporting Period: December 18, 2019 to April 18, 2021

		YES	NO
1.	Is the information above correct?	X	☐
	If NO, include handwritten above or on a separate sheet.		
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	X
3.	Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	X
4.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	X
	If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5.	Is the site currently undergoing development?	☐	X

Box 2

		YES	NO
6.	Is the current site use consistent with the use(s) listed below? Commercial and Industrial	X	☐
7.	Are all ICs in place and functioning as designed?	X	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

____ ________________
Signature of Owner, Remedial Party or Designated Representative Date

Box 2A

		YES	NO
8.	Has any new information revealed that assumptions made in the Qualitative Exposure Assessment regarding offsite contamination are no longer valid?	☐	X
	If you answered YES to question 8, include documentation or evidence that documentation has been previously submitted with this certification form.		
9.	Are the assumptions in the Qualitative Exposure Assessment still valid? (The Qualitative Exposure Assessment must be certified every five years)	X	☐
	If you answered NO to question 9, the Periodic Review Report must include an updated Qualitative Exposure Assessment based on the new assumptions.		

SITE NO. C241176 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
Portion of 1124-1	Allied Jackson Heights, LLC	Ground Water Use Restriction Landuse Restriction Building Use Restriction Monitoring Plan Site Management Plan O&M Plan IC/EC Plan

a) An institutional control was imposed in the form of an environmental easement that : (a) requires compliance with the approved site management plan; (b) limits the use of the property to restricted commercial and industrial uses only (c) The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended purpose; (d) requires the property owner to complete and submit a periodic certification to the NYSDEC and (e) all future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;

b) The property owner will provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the NYSDEC, until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with NYSDEC-approved modifications; (b) allow the NYSDEC access to the site; and (c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the SMP unless otherwise approved by the NYSDEC.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
Portion of 1124-1	Vapor Mitigation Cover System Monitoring Wells

a) Cover System (engineering control) installed to prevent exposure from remaining contamination in soil/fill at the Site. This cover system is comprised of a minimum of 6 inches of concrete building slab, approximately 6-inches of concrete sidewalk, and 4-inches of asphalt pavement.

b) An SSDS consisting of five (5) mitigation systems and 18 suction points to depressurize the building area of concern. The system was designed to depressurize and encompass the following

Parcel	Engineering Control

tenant spaces: the Chinese restaurant, the Subway restaurant, the stationary store, the former hair/nail salon, the Stand-Up MRI, the Optical Academy, the dry cleaner, the dentist's office, and Rock Realty. Blowers were installed on the exterior rear (western) wall (8 feet above grade using wall mounts) of the building for the system. The blowers' exhausts would run vertically up the wall and terminate 12 inches above the roofline and 10 feet from all doors, windows, intakes and passive relief vents.

c) all engineering controls must be operated and maintained as specified in the NYSDEC-approved Site Management Plan (SMP). No engineering and institutional controls may be discontinued without a NYSDEC-approved amendment or extinguishment of the Environmental Easement;

d) periodic inspections of the Site, certifications of institutional & engineering controls and site usage of controlled property, and site-management reporting to the Department must be conducted in accordance with the NYSDEC-approved SMP;

e) Operation, Monitoring and Maintenance (OM&M) of the Sub Slab Depressurization System must be performed in a manner specified in the NYSDEC-approved Site Management Plan.

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the Engineering Control certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
X	☐

2. For each Engineering control listed in Box 4, I certify by checking "YES" below that all of the following statements are true:

   (a) The Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
X	☐

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

____ Signature of Owner, Remedial Party or Designated Representative

_______________ Date

IC CERTIFICATIONS
SITE NO. C241176

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I MARK KOSTRON at Allied Jackson Heights, LLC 118-35 Queens Boulevard, Forest Hills, NY 11375,
print name print business address

am certifying as Owner's representative (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

[signature] 8/18/21

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification Date

EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Ronald D. Boyer (print name) at Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 300 Kimball Drive, Parsippany, NJ 07054 (print business address),

am certifying as a Professional Engineer for the Allied Jackson Heights, LLC (Owner or Remedial Party)

Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification

Stamp (Required for PE)

Date: 8/19/2021