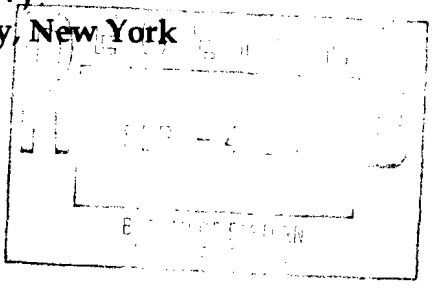
CDM

SITE CHARACTERIZATION REPORT
OPERABLE UNIT 4 PHASE 3 OFF-SITE VAPOR INTRUSION EVALUATION
New Cassel Industrial Area
(Site No. 1-30-043-A, B, C, F, K, N and V)
North Hempstead and Westbury, Nassau County, New York



Prepared for

New York State Department of Environmental Conservation
Investigation and Design Engineering Services
Standby Contract No. D004437
Work Assignment No. D004437-31

Prepared by

Camp Dresser & McKee Inc.
Raritan Plaza I, Raritan Center
Edison, New Jersey

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Acronyms

AS	air sparging
ASP	Analytical Services Protocol
bgs	below ground surface
CDM	Camp Dresser & McKee Inc.
Co	Company
CPP	Citizen Participation Plan
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
FS	Feasibility Study
GAC	granulated active carbon
GPS	global positioning unit
HASP	Health and Safety Plan
IMC	IMC Magnetics Inc.
Inc.	Incorporated
IRM	Interim Remedial Measure
NCDOH	Nassau County Department of Health
NCIA	New Cassel Industrial Area
NY	New York
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PCE	Tetrachloroethene
PID	photoionization detector
PSA	preliminary site assessment
QAPP	quality assurance project plan
RI	Remedial Investigation
ROD	Record of Decision
SIM	selected ion monitoring
SVE	soil vapor extraction
TCA	trichloroethane
TCE	trichloroethene
µg/L	microgram per Liter
µg/m^3	micrograms per cubic meters
UGA	upper glacial aquifer
VOC	volatile organic compound
WA	work assignment
WC	W.T. Clark High School

Section 1
Introduction

This Site Characterization Report for the New Cassel Industrial Area (NCIA) Operable Unit (OU) 4, Phase 3 Off-site Vapor Intrusion Evaluation was prepared by Camp Dresser & McKee Inc. (CDM) for the New York State Department of Environmental Conservation (NYSDEC) under the Engineering Services for Investigation and Design, Standby Contract No. D004437, Work Assignment (WA) No. 31. This report details the results of the field investigation conducted in accordance with the NYSDEC-approved Final Work Plan dated October 30, 2008. The Work Plan was developed in accordance with the *"Standby Contract Work Assignment No. D004437-31, Soil Vapor Intrusion Investigation at the New Cassel Industrial Area Sites (Site No.:1-30-043A, B, C, F, K, N and V)"*.

The objective of this WA is to determine if VOCs are present in the sub-slab vapor and indoor air at several residences, the Town of Hempstead Water Department Facility, and the W.T. Clarke High School. The vapor intrusion investigation is designed to determine if vapor intrusion poses a potential threat to human health and the environment at the selected locations.

The Work Plan and this Site Characterization Report are consistent with the *"Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006"* and the *"Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002"*.

This report is comprised of the following sections:

- **Section 1 - Introduction**
  This section presents the site description and history, including the location, operational and remedial history, geology and hydrogeology, as well as the project objectives.

- **Section 2 - Site Investigation**
  This section provides a general overview of the investigation procedures and any variations to the approved Quality Assurance Project Plan (QAPP). These variations are noted for their potential to influence analytical results or field measurements.

- **Section 3 - Analytical Results**
  This section presents and evaluates the analytical results of the vapor intrusion investigation conducted at the site. Results have been compared to the applicable New York State environmental standards.

- **Section 4 -Conclusions and Recommendations**
  This section presents the conclusions based upon the analytical results of the site investigation and presents recommendations for potential future work.

1.1 Site Description and Background

1.1.1 Location

NCIA is located in the town of North Hempstead, Nassau County, New York (NY) (Figure 1-1). NCIA is heavily developed and covers approximately 170 acres which are bound by the Long Island Railroad to the north, Frost Street to the east, Old Country Road to the south, and Grand Boulevard to the southwest. NCIA and the surrounding areas, in general, are comprised of several light industrial and commercial properties intermixed with private residences located to the north and south. Hempstead Bay is located approximately 6 miles southwest of the site and the nearest water supply well, the Bowling Green Well Field, is approximately 1,800 feet southeast of the NCIA.

The 16 residential properties, Town of Hempstead Water Department Facility, and the W.T. Clarke High School designated for vapor intrusion sampling are located in the neighboring town of Westbury, NY. The area surrounding these 18 locations is a mix of commercial and residential properties.

1.1.2 Operational and Remedial History

Documents describing existing conditions, history and past land use practices were provided to CDM by NYSDEC. The information in these documents was used to provide a general description of the sites and historical/remedial activities conducted. The following NYSDEC provided background documents were utilized:

- OU 4 Phase 1 and 2 Vapor Intrusion Investigation, 2007. Work Assignment #D00490-40, New Cassel, Site No. 1-30-043A-V. O'Brien and Gere.
- Work Plan, 2006. New Cassel Operable Unit 4, Site No.1-30-043A-V, Vapor Intrusion Investigation, Work Assignment #D00490-40.
- Record of Decision, 2003. New Cassel Industrial Area Site, Town of North Hempstead, Nassau County, New York, Offsite Groundwater South of the New Cassel Industrial Area Operable Unit No. 3.
- Record of Decision, 2002. Tishcon Corporation at 29 New York Avenue Site, Town of North Hempstead, Nassau County, New York, Site Number 1-30-043V.
- Record of Decision, 2000. Atlas Graphics Site, Town of North Hempstead, Nassau County, Site Number 1-30-043B Operable Unit-01 On-Site Soil and Groundwater.
- Record of Decision, 2000. IMC Magnetics Site, Town of North Hempstead, Nassau County, Site Number 1-30-043A Operable Unit-02 On-Site Groundwater.

- Remedial Investigation/Feasibility Study Report, Volume 1, 2000. New Cassel Industrial Area Offsite Groundwater, Town of North Hempstead, Nassau County.
- Record of Decision, 1998. Tishcon Corporation Site at 125 State Street, Westbury (V), North Hempstead (T) New Cassel Industrial Area, Nassau County, New York, Site Number 1-30-043C.
- Record of Decision, 1997. Former Tishcon Corporation Site, Westbury, North Hempstead, New Cassel Industrial Area, Nassau County, New York, Site Number 1-30-043F.
- Multisite Preliminary Site Assessment (PSA) Report, 1996. New Cassel Industrial Area Site, North Hempstead, Nassau County.
- Environmental Investigation, 750 Summa Avenue Westbury, New York. 1996.
- Summary Report on New Cassel Industrial Area, Site ID#130043, 1995.

The following subsections describe the NCIA as well as the surrounding residential and commercial area, and provide a brief overview of operational and remedial activities conducted.

1.1.2.1 New Cassel Industrial Area

The NCIA was first developed during the early 1950s and is home to approximately 200 industrial and commercial businesses. Business practices associated with past light industrial activities within the area have resulted in extensive volatile organic compound (VOC) contamination of groundwater in the vicinity of the site. Previous investigations conducted within the area indicated that multiple parties were responsible for the contamination resulting in individual "sites." To address this, NYSDEC classified the entire industrial area as a hazardous waste site in 1998 and it is collectively referred to as the NCIA (LM&S 1996; NYSDEC 2003).

The following paragraphs summarize the operational and remedial history of NCIA's Sites A, B, C, F, K, N, and V, shown on Figure 1-1. Several of the sites have been classified in the past as either Class 2 or Class 4 status by NYSDEC. A site is classified under Class 2 status when hazardous waste presents a significant threat to public health and/or the environment and action is required. A site is classified under Class 4 status when it has been properly closed but requires continued site management, consisting of operation and maintenance, and monitoring.

Site A - 570 Main Street

Site A is located at 570 Main Street and is approximately over two acres in size. From the early 1950s until 1992, the site was occupied by IMC Magnetics Inc (IMC), a manufacturer of induction motors, fans, blowers, stepper motors and other rotating machinery. In 1995 the site was given a Class 2 Registry status by NYSDEC due to the presence of onsite contaminated soils and groundwater. Primary contaminants

consisted of chlorinated hydrocarbons, petroleum hydrocarbons and metals; however, further investigations revealed the presence of chlorinated VOCs. Subsequently, to remediate site soil contamination identified during a 1996 Remedial Investigation (RI), IMC installed and operated a soil vapor extraction (SVE) system. In addition, an RI/Feasibility Study (FS) conducted at the site confirmed the presence of a chlorinated VOC groundwater plume. To address the groundwater contamination, in-situ oxidation using hydrogen peroxide injection was selected as the remedy. Treatment began in December 2001 and was still ongoing upon completion of the October 2003, Record of Decision (ROD) for OU 3 (NYSDEC 2003).

Site B - 567 Main Street

Site B is located at 567 Main Street and is approximately one acre in size. In 1950 a warehouse was constructed onsite for use as a construction vehicle storage facility. Warehouse operations ceased in 1977, and the property was sold to Atlas Graphics Inc., a photo engraving manufacturing operation. The operation used a reported 312 gallons per year of trichloroethene (TCE). At the time of purchase, the building was connected to a cesspool for its sanitary waste disposal. In 1977, a discharge of approximately 50 gallons of TCE to the cesspool was documented. Investigations conducted on site showed elevated levels of TCE in both soil and groundwater, and in 1995 the site was assigned a Class 2 status by NYSDEC. In February 2000, a ROD was issued for the site selecting air sparging/soil vapor extraction (AS/SVE) as the remedy to address the contaminated soils and groundwater. The system was constructed in October 2000 followed by initial treatment activities in November 2000 (NYSDEC 2003).

Site C - 125 State Street

Site C is located at 125 State Street and is approximately one acre in size. From 1984 to 1996 the site was occupied by the Tishcon Corporation (Tishcon). Manufacturing operations at Tishcon consisted primarily of the production of dietary supplements and vitamin products via a dry blending process. From 1985 to 1993, methylene chloride, 1,1,1-trichloroethane (1,1,1-TCA) and methanol were used in tablet coating processes conducted at the facility. As part of operating procedures, equipment was rinsed in a driveway fitted with several storm drains. An investigation conducted by the Nassau County Department of Health (NCDOH) indicated the presence of chlorinated VOCs and metals in four storm drains at the site, and requested that contaminated material be removed from storm drains and a distribution box on the property in August 1993. The site was placed on the Registry in 1995 and issued a Class 2 status. The excavation and restoration of contaminated areas was completed as part of an Interim Remedial Measure (IRM) in October 1997. A ROD for the site was issued in January 1998, and required the excavation and restoration of remaining contaminated source areas. Excavation and disposal of the material was conducted in early 1999, and the site was reclassified by NYSDEC to a Class 4 ranking in March of 2000 (NYSDEC 2003).

Site F - 68 Kinkel Street

Site F is located at 68 Kinkel Street and is approximately one-quarter of an acre in size. From 1982 to 1983, Tishcon conducted operations at the site which involved the encapsulation of materials. It was reported that during these processes, 1,650 gallons of TCE as well as 8,000 gallons of methylene chloride and 3,000 gallons of shellac were used. The site was added to the NYSDEC Registry under Class 2 status in 1995. A State Superfund investigation was completed in July 1996, and in January 1997, a ROD requiring no action was issued. The site was delisted from the Registry in December of 1997 (NYSDEC 2003).

Site K - 62 Kinkel Street

Site K is located at 62 Kinkel Street, west of the intersection of Old Country Road and the Wantagh State Parkway. The LAKA Tool and Stamping Company (Co), Incorporated (Inc.), occupied and conducted metals stamping at the site from 1971 to 1978. LAKA Industries, Inc., the parent company, operated the site from 1979 to 1984 as a machine shop specializing in tools, dies and precision stamping; both companies used TCE and lubricating oils as part of their operating procedures. In 1996, the site was issued a Class 2 status. Subsequently, a RI/FS was conducted to define the nature and extent of contamination at the site. Results of the RI/FS confirmed the presence of soil contamination in the vicinity of an onsite cesspool and an area located in a catch basin found downgradient of the site. To address the soil contamination, the NYSDEC issued a ROD in February 2000, followed by the excavation of contaminated soils in May 2001; however, remedial activities did not address groundwater contamination (NYSDEC 2003).

Site N - 750 Summa Avenue

Site N is located at 750 Summa Avenue and is currently occupied by EZ-EM, a company that specializes in imaging and diagnostics for treating gastrointestinal diseases. EZ-EM along with other parties owned the property since 1982. Prior to EZ-EM ownership, Micro Industries, a machine shop occupied the site from 1971 to 1982. From 1968 to 1971 Advance Food Service Equipment Manufacturing occupied the site as a stainless steel kitchen equipment supplier. Advance Food Service stored and used 1,1,1-TCA and other solvents during their occupancy. In 1978, the NCDOH required a floor drain near a vat used for degreasing operations be sealed as sludges sampled from a dry-well contained levels 1,1,1-TCA. In 1985, the vat was removed from the site. Degreaser sludges containing a mixture of 1,1,1-TCA and waste oil were stored in drums in the rear of the facility according to records from 1978. The site was classified on the Registry as a Class 4 ranking (LM&S 1996; NYPIRG website).

Site V - 29 New York Avenue

Site V is located at 29 New York Avenue and is approximately one acre in size. The site was developed in 1952, and was used to manufacture electronic equipment until the late 1970s. From 1979 to 1991 Tishcon occupied the site until it was sold to Equity 1 Associates in 1991. In 1995 the site was issued a Class 2 status on the Registry as part of the Tishcon Brooklyn Ave site. A 1996 study investigating soils/sediments collected from onsite catch basins showed levels of 1,1,1-TCA-related compounds

above cleanup criteria. Based on these results, the NYSDEC listed the Tishcon 29 New York Ave site as a separate Class 2 site on the Registry in March 1998. In December 1999, a RI was completed and results were presented to the NYSDEC followed by the removal of contaminated materials from an onsite cesspool in August 2000. Based on the results of that investigation a no further action ROD was signed in March 2002, and the site was delisted from the Registry later that year (NYSDEC 2003).

1.1.2.2 Lawler, Matusky, and Skelly Engineers LLP 2000 RI/FS

Several state funded remedial investigations at the NCIA were conducted from 1995 to through January 2000. In September of 2000, Lawler, Matusky, and Skelly Engineers LLP completed a RI/FS report which summarized all the groundwater data collected during the various remedial investigations. The activities conducted during the RI include the following: installation of four shallow monitoring wells and sampling at fifteen hydropunch locations downgradient of NCIA in the summer of 1996, followed by five rounds of monitoring well sampling. The first round, completed in the summer of 1996, consisted of sampling 37 existing wells and the 4 newly installed shallow wells. The second round, completed in the summer of 1997, consisted of sampling at eleven hydropunch locations south of Old County Road as well as the 41 monitoring wells from the first round. The third and fourth rounds, completed in the spring and summer 1999, consisted of sampling four Bowling Green early warning wells (previously installed and sampled in July of 1998) and the 41 existing monitoring wells. Total VOCs concentrations in the third and fourth rounds ranged from non-detect to 29,230 micrograms per Liter (µg/L). The final round, completed during January of 2000, consisted of sampling the four Bowling Green early warning wells and 22 existing monitoring wells. Total VOCs concentrations in the final round ranged from non-detect to 27,339 µg/L.

Analytical results obtained from the five rounds of groundwater sampling showed concentrations of VOCs exceeding Class GA groundwater standards for PCE, 1,1,1-TCA, and their breakdown products. The results of the RI in combination with operational history analysis concluded that past activities at the various sites within the NCIA has resulted in significant off-site groundwater contamination. A total of three groundwater plumes were identified as contributing to the off-site VOC contamination. One plume was identified in the central section of NCIA, one plume in the eastern portion of NCIA, and one plume in the western section. The three groundwater plumes are concluded to be affecting both the Upper Glacial Aquifer (UGA) and the upper zones of the Magothy Aquifer.

Lawler, Matusky, and Skelly Engineers LLP presented 11 alternatives in the September 2000 RI/FS Report. Each alternative did not include remedies for subsurface soil and potential sources since these matrices are part of NYSDEC's On-Site Remedial Program.

Following the RI/FS, NYSDEC continued to monitor the four Bowling Green early warning wells on a quarterly basis. In addition, eight monitoring wells were installed to the southwest of the Bowling Green production wells in October 2001, and a 300

foot deep monitoring well was installed in July of 2002. These nine monitoring wells were also continually monitored on a quarterly basis.

1.1.2.3 NYSDEC October 2003 Record of Decision

In October of 2003, NYSDEC in consultation with New York State Department of Health (NYSDOH) presented a ROD for the selected remedy for OU 3 which consists of off-site groundwater primarily located to the south of the NCIA. NYSDEC selected full plume remediation of upper and deep portions of the aquifer (to 225 feet below ground surface (bgs)) with in-well vapor stripping/localized vapor treatment as the remedy.

Under this remedy, the groundwater contaminant plume is treated in-situ using a series of groundwater circulation wells (also known as in-well stripping systems), see Appendix F for a schematic diagram. The circulation well system creates in-situ vertical groundwater circulation cells by drawing groundwater from an aquifer formation through one screen section of a double-screen well and discharging it through the second screen section. A blower is used to achieve upward groundwater flow and bubbling air within the cell which drives aerated water out of the upper well screen. The groundwater circulation allows the air to capture the VOC contamination which is then removed by a vacuum blower and directed through a granulated active carbon (GAC) filtration system.

A 225 foot vapor stripping well with ancillary systems was installed foremost for the purpose of a pilot study. Following the pilot study three additional 225 foot vapor stripping wells, four 200 foot vapor stripping wells, and three 140 foot vapor stripping wells, including the ancillary systems, will be installed.

A long term groundwater monitoring program is also part of the ROD. Nine newly installed monitoring wells downgradient of Old Country Road and thirteen existing wells will be conducted quarterly for the first two years and periodically thereafter. Continued monitoring will also be conducted at the two existing Bowling Green Water District supply wells. Operation and maintenance of the treatment system and monitoring activities will take place until the remediation goals are achieved.

1.1.2.4 O'Brien and Gere's OU 4 Phase 1 and 2 Off-site Vapor Intrusion Investigation

In 2006, NYSDEC tasked O'Brien and Gere with the first vapor intrusion investigation for this Site to assess whether vapor phase contaminants migrating in groundwater or the vadose zone from the NCIA were volatilizing and entering structures in an area surrounding the NCIA. The investigation was divided into two phases which are summarized below.

Phase 1 Investigation

The Phase 1 Investigation was conducted from August 11 through September 22, 2006. During this time period, two soil vapor probes were installed at 38 locations for a total of 76 soil vapor sampling ports. The sampling ports were located at building

foundation depth (approximately 8 feet bgs) and 6 to 10 feet above the water table (approximately 29 to 45 feet bgs). The water table was determined periodically by measuring the depth to water from nearby monitoring wells or drilling to 50 feet bgs and conducting a water level measurement. The soil vapor samples were collected with 1-Liter Summa canisters with a 2-hour regulator. Tracer gas tests were also performed at several soil vapor ports to ensure the quality of the bentonite seal.

Results from the Phase 1 Investigation showed chlorinated and non-chlorinated hydrocarbons at elevated levels. PCE concentrations ranged from 2.85 to 1,086 micrograms per cubic meters ($\mu g/m^3$). Three soil vapor samples exceeded the New York State air guideline for PCE (100 $\mu g/m^3$). Trichloroethene (TCE) concentrations ranged from non-detect to 363 $\mu g/m^3$. Seven soil vapor samples exceeded the New York State guideline for TCE (5 $\mu g/m^3$). Benzene concentrations ranged from 2.3 to 182 $\mu g/m^3$. Based on the results of the Phase 1 Investigation the NYSDEC and NYSDOH proposed additional soil vapor sampling of residences and public buildings within the area. A table presenting the analytical results of the Phase 1 Investigation is provided in Appendix A of the Work Plan.

Phase 2 Investigation

The Phase 2 Investigation was conducted on September 14, 2007. Six indoor air samples were collected within the W.T. Clarke High School to determine the hazard of VOC exposure to students. Three canisters were deployed in the basement and three were deployed on the first floor of the high school to accurately delineate the soil vapor intrusion pathway. The first floor samples were collected at approximately four feet above the floor surface to gain an accurate reading of the breathing zone. In addition, an ambient air summa canister was placed outdoors between the middle school and the athletic fields approximately five feet above the ground surface. O'Brien and Gere noted that the placements of the canisters were not among any objects or materials that would impact the analytical results.

Results from the Phase 2 Investigation showed detections of chlorinated and non-chlorinated hydrocarbons. PCE concentrations ranged from non-detect to 2.28 $\mu g/m^3$. TCE concentrations ranged from non-detect to 3.71 $\mu g/m^3$. Methylene chloride concentrations ranged from 0.671 to 1.91 $\mu g/m^3$. Carbon tetrachloride concentrations ranged from non-detect to 0.831 $\mu g/m^3$. Benzene concentrations ranged from 0.390 to 1.95 $\mu g/m^3$. Toluene concentrations ranged from 2.95 to 8.24 $\mu g/m^3$. Lastly, m&p-xylene concentrations ranged from 1.68 to 4.55 $\mu g/m^3$. The results of the Phase 2 Investigation are presented in Appendix A of the Work Plan.

Vapor intrusion sampling at sixteen additional residences, the water department, and high school were included in the Phase 2 scope of work; however, the sampling was not completed due to the conclusion of the heating season. The investigation of these sampling locations was integrated into the Work Plan.

1.1.2.5 CDM 2008 Soil Vapor Intrusion Investigation

In March of 2008, CDM conducted a Soil Vapor Intrusion Investigation which included soil vapor and groundwater sampling at five direct push locations at each of the seven sites (Site A, B, C, F, K, N, & V) of the NCIA. Soil vapor samples were collected from each of the five direct push locations at three depth intervals, at foundation depth (approximately 8 feet bgs), 25 feet bgs, and two feet above the groundwater table (approximately 45 feet bgs), for VOC analysis. Outdoor (ambient) air samples were collected each day of soil vapor sampling to represent the outdoor air quality surrounding the structure. Groundwater samples were also collected from co-located boreholes adjacent to the soil vapor sample locations at the surface of the groundwater table, estimated at 48 feet bgs, for VOC analysis.

The results of the investigation identified several potential source areas contributing to the PCE and 1,1,1-TCA groundwater plume migrating from NCIA. The site characterization report completed by CDM proposes mitigation of those source areas as well as additional sampling after mitigation is complete to ensure all source areas were identified and properly addressed.

1.2 Site Geology and Hydrogeology

The off-site area is located above the UGA which consists of Upper Pleistocene deposits of poorly sorted sand and gravel to approximately 80 feet bgs. Beneath the UGA lies the Magothy aquifer which is comprised of finer sands, silt and small amounts of clay. Previous investigations have indicated that the Magothy formation may sometimes be found at considerable shallower depths (60-80 feet bgs) within the area when compared to other portions of Long Island. Within the NCIA, the UGA and Magothy formations are in direct hydraulic connection as no other hydro-geologic units are found between them; however, clay lenses are often found within the upper portions of the Magothy. Previous investigations conducted onsite indicated that the water table is approximately 48 feet bgs and that groundwater flow is in a southwesterly direction.

1.3 Project Objectives

The objective of this work assignment is to determine if VOCs are present in the sub-slab vapor and indoor air at several residences, the Town of Hempstead Water Department Facility, and the W.T. Clarke High School. The owner names and addresses at the residential locations are being kept confidential in this report and have been provided to NYSDEC separately. The targeted properties are located within the area affected by the groundwater plumes originating in the NCIA and were identified in a previous study (WA #D00490-40) as potential candidates for additional indoor air sampling. The vapor intrusion investigation is designed to determine if vapor intrusion poses a potential threat to human health and the environment at the selected locations. In order to achieve this objective, the following activities were conducted:

- Task 1 - Work Plan Development
  The development of a site specific work plan which included a site specific QAPP and Health and Safety Plan (HASP).

- Task 2 - Citizen Participation Plan (CPP) Mailing List and Fact Sheet
  The addresses of adjacent property owners, local officials, and advocacy groups were determined. CDM also assisted NYSDEC with the preparation of a fact sheet to be distributed to the addresses compiled.

- Task 3 - Phase 3 Off-site Vapor Intrusion Investigation
  The investigation included:
  - Sub-Slab Vapor Sample Collection: collection of sub-slab vapor samples at six residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.
  - Indoor (Basement) Air Sample Collection: collection of indoor (basement) air samples at seven residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.
  - Outdoor (Ambient) Air Sample Collection: collection of outdoor (ambient) air samples at seven residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.
  - Investigative Derived Waste: proper handling of derived waste from the investigation.

- Task 4 - Site Characterization Report
  The field documentation and reporting of the vapor intrusion investigation.

Section 2
Physical Setting

The following subsections describe the environmental conditions of the New Cassel Industrial Area site.

2.1 Regional Geology

A history of coastal submergence and emergence spanning the Cretaceous Period, significant differential erosion during the Cenozoic, and glaciation during the Quaternary is reflected in the present day geology of Long Island. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface. The wedge ranges in thickness from zero feet where it outcrops along the north shore in Queens, up to about 2,000 feet along the south shore barrier islands. A generalized cross section through Nassau County is shown in Figures 2-1 and 2-2.

2.1.1 Basement

Basement is composed of Precambrian to Early Paleozoic igneous or metamorphic consolidated bedrock. Unconformably overlying the basement is a thick succession of Late Cretaceous deposits: the Raritan and overlying Magothy Formations, both of fluvio-deltaic depositional origin. The Upper Cretaceous deposits are unconformably overlain by a veneer of Pliocene and Pleistocene deposits, chiefly of glacial origin.

2.1.2 Cretaceous

Raritan Formation: The Raritan Formation is divided into the basal Lloyd Sand Member and the overlying Raritan Clay Member. The Lloyd Sand rests unconformably on bedrock and is about 150 feet thick in the vicinity of the Site. The top of the Lloyd Sand is found at approximately 200-250 feet below mean sea level (msl). It is composed of white and grey fine to coarse sand and gravel, commonly with a clayey matrix. The contact with the overlying clay member is gradational.

The Raritan Clay Member is composed chiefly of bedded variegated clay and silt, locally containing interbedded sands. Lignite fragments and iron and pyrite nodules are common. The clay member is approximately 100 feet thick in the vicinity of the Site (Smolensky, et al. 1989). The Raritan Clay is the most widespread hydrologic confining layer on Long Island. The Raritan's updip erosional pinchout generally is located subparallel to the northern coast of Nassau County. The clay unit dips gently to the south-southeast.

Matawan Group-Magothy Formation (Magothy): The Magothy unconformably overlies the Raritan; the contact is commonly marked by a change from the solid clays of the Raritan Clay Member to coarse sands and gravels of the basal unit of the Magothy. The dominant Magothy lithology generally is fine to medium quartz sand, interbedded clayey sand with silt, clay, and gravel interbeds or lenses. Interbedded clay is more common towards the top of the formation. The thickness of the Magothy

varies between 100 feet in the vicinity of the Site to over 800 feet beneath the barrier islands.

2.1.3 Cenozoic-Quaternary

After the Cretaceous, deep erosion of the land surface took place as a response to fluctuations in sea level. Sedimentological evidence indicates that sea level falls exposed the entire Atlantic continental margin during the Miocene epoch, which would have promoted rejuvenation and deep incision of rivers and streams across the Coastal Plain. Later deposition of abundant fluvial and glacial clastic deposits during the Pliocene and Quaternary filled these incised buried valleys. The top of the Cretaceous sequence is marked by a highly irregular erosion surface upon which rests deposits of Pleistocene and, in some places, Pliocene age.

Deposits of Pleistocene age mantle the Cretaceous formations. Within the study area, the Pleistocene deposits include three depositional sequences: the fluvial Jameco Gravel and marine Gardiners Clay; and the much more widespread Late Pleistocene glacial deposits of the Wisconsin glacial stage. Undifferentiated gravels and clays described in buried valleys within southern Long Island have been attributed to the Jameco Gravel and Gardiners Clay units. The Jameco Gravel and Gardiners Clay formations are well-defined, mapable stratigraphic units beneath the southern margin of Long Island where they are of hydrogeological significance. These stratigraphic units are not recognized in the vicinity of the Site. The remainder of the Pleistocene succession belongs to the Wisconsin glacial stage Upper Glacial Deposits.

The thickness of the Pleistocene Upper Glacial Deposits in the study area varies but averages 100 feet. The thickness and distribution of the Pleistocene Upper Glacial Deposits were controlled by the older, now buried paleotopography discussed above. The pattern of stream and river valleys that dissected the surface of Long Island during the Cenozoic likely was later modified by Pleistocene overriding ice sheets and meltwater erosion and deposition.

2.2 Regional Hydrogeology

The hydrogeology of Long Island has been well documented over the years by the United States Geological Survey (USGS) and others. Three major aquifers are present on Long Island: the Upper Glacial aquifer (UGA), the Magothy aquifer and the Lloyd aquifer. A generalized cross section through Nassau County is shown in Figures 2-1 and 2-2. Based on the cross section, the Magothy Aquifer is not present in the Site area. Groundwater contours prepared for Nassau County's Groundwater Monitoring Program based on water levels collected in public wells in 2001, 2002, and 2003 indicates that the groundwater in the UGA (water table) in the Site area generally flows to the southwest, but that there may be a northwest component to the groundwater flow. The mapping shows groundwater in the Lloyd aquifer flows more westerly in this area. Mapping conducted by Kilburn and Krulikas suggests that there is a groundwater high in the Site area which may result in radial flow from the Site.

2.2.1 Bedrock

The bedrock in the area has been mapped as the Hartland Formation of Middle Ordovician to Lower Cambrian Age. The bedrock surface generally slopes southeastward from about 350 to 800 feet below sea level except in the northernmost parts of the Oyster Bay area where glacial scouring has created north-northwestward dipping valleys. The formation consists of highly weathered biotite-garnet-schist with low hydraulic conductivity. A thick saprolitic zone 50 to 100 feet thick, consisting of white, yellow, and gray clay, underlies most of the peninsula except in the northernmost part.

2.2.2 Lloyd Aquifer

The Lloyd Sand Member of the Raritan Formation of the Late Cretaceous Age overlies the saprolitic bedrock surface and is Long Island's deepest aquifer. The Lloyd sand was deposited as a series of braided streams and deltaic deposits consisting of white and pale yellow sand with interbedded lenses of gravel and white clay. The aquifer does not outcrop on Long Island and is believed to extend to the north beneath Long Island Sound in eastern Nassau County and in Suffolk County, and offshore to the south, beyond the barrier beaches. The Lloyd aquifer is confined in most places, except where the overlying Raritan clay has been eroded away. The thickness of the Lloyd aquifer varies from zero feet where it is not present along the north shore of Nassau County, to more than 500 feet in the southeastern areas of Nassau County. The average horizontal hydraulic conductivity is reported to be approximately 40 feet per day (ft/day) with a 10:1 vertical anisotropy.

2.2.3 Raritan Clay

Overlying the Lloyd aquifer is the Cretaceous Age clay member of the Raritan Formation, referred to as the Raritan clay. The Raritan clay is the major confining unit on Long Island, ranging between 150 and 250 feet in thickness. Like the Lloyd aquifer, the Raritan clay is absent from areas of northern Queens and northern Nassau County where it had been eroded. The Raritan clay outcrops in parts of Queens, and is believed to be present north of the island beneath Long Island Sound, and south of the island, beneath the barrier islands. This confining unit consists of solid, multicolored, compact clay (gray, white, red, or tan) with interbedded lenses of sand. The average vertical hydraulic conductivity is reported to be approximately 0.001 ft/day.

2.2.4 North Shore Aquifer

The North Shore aquifer consists of a sequence of Pleistocene-age sediments found only in the northwestern, central, and northeastern parts of the study area. The aquifer consists of moderately sorted stratified drift and outwash deposits that infilled the low-lying areas after the partial removal of the Cretaceous deposits and parts of the bedrock (saprolitic zone) by glacial erosion. The deposits consist of poor to moderately sorted brown and olive gray sand, silt, and gravel. It contains subangular to subrounded quartz grains, rock fragments, unstable opaque minerals, and a large

percentage of biotite and muscovite. The North Shore aquifer deposits are referred to locally as the Jameco Gravel.

2.2.5 North Shore Confining Unit

The North Shore confining unit is a sequence of Pleistocene-aged clay and silt deposits that are locally present along the northern shore of Nassau County. The unit consists of marine and postglacial lake deposits including olive brown and olive gray clay and silt deposits with minor lenses containing shells. The unit contains a minor sand unit that is moderately permeable. The presence of the North Shore confining unit in the Site area is questionable.

2.2.6 Upper Glacial Aquifer (UGA)

The UGA is the surficial unit on Long Island and is therefore entirely unconfined. Along the Harbor Hill and Ronkonkoma terminal moraines and parts of the north shore, the unit is composed of till consisting of poorly sorted clay, sand, gravel, and boulders. The till is generally poorly permeable and may contain perched water. The outwash deposits that are found are mainly between, and south of, the moraines. The outwash deposits are moderately to highly permeable, consisting of gray, brown, and yellow fine to very coarse sand and gravel. The UGA ranges up to 600 feet thick, however the saturated thickness is often much lower. The estimated average horizontal hydraulic conductivity generally exceeds 225 ft/day.

2.3 Site-Specific Geology and Hydrogeology

The site is located above the UGA which consists of Upper Pleistocene deposits of poorly sorted sand and gravel to approximately 80 feet bgs. Beneath the UGA lies the Magothy aquifer which is comprised of finer sands, silt and small amounts of clay. Previous investigations have indicated that the Magothy formation may sometimes be found at considerable shallower depths (60-80 ft bgs) within the area when compared to other portions of Long Island. Within the New Cassel Industrial Area, the UGA and Magothy formations are in direct hydraulic connection as no other hydro-geologic units are found between them; however, clay lenses are often found within the upper portions of the Magothy. The soil vapor intrusion investigation conducted onsite indicated that the water table is at 48 feet bgs and that groundwater flow is in a southwesterly direction.

Section 3
Site Investigation

3.1 Vapor Intrusion Investigation

The following subsections describe the scope of work conducted from March 3 to 12, 2009. The investigation procedures were performed in accordance with the Final Work Plan dated October 30, 2008. The vapor intrusion investigation was conducted at seven residential locations (R1, R7, R8, R9, R10, R11, and R14), the Town of Hempstead Water Department Facility (R12), and the W.T. Clark High School (WC) presented on Figure 1-1.

The investigation included:

- Collecting sub-slab vapor samples at six residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.
- Collecting indoor (basement) air samples at seven residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.
- Collecting outdoor (ambient) air samples at seven residences, the Town of Hempstead Water Department Facility, and the W.T. Clark High School.

These samples were collected in accordance with the ***"Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006"*** and the applicable elements, more specifically Section 3.7 of the ***"Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002".***

Originally sixteen residential locations were proposed for vapor sampling during this field investigation. Four out of the seventeen residences (R2, R5, R6 and R17) declined to have their residence sampled. At an additional four out of the seventeen residences (R3, R4, R13 and R15) the field team was unable to contact the owner. A letter stating that attempts were made to contact the resident was left on the door step of each of the four residences by the field team during the commencement of the field investigation. None of the four residences contacted the field team following the letter drop-off. The letter is provided in Appendix A. One of the seventeen residences (R16) canceled the scheduled sampling appointment due to a personal matter.

One field change was implemented during the vapor intrusion investigation. Residence R9 did not have a basement, rather a crawl space located under the residential structure. The crawl space could only be accessed through a small opening in front of the house. The floor of the crawl space was dirt and a concrete slab was not present. Therefore only an indoor (basement) air and outdoor (ambient) air sample was collected from this property. The summa canister for the basement air sample collection was placed inside the crawl space. Pictures of the crawl space are provided in Appendix B. An NYSDOH questionnaire was not filled out for this property since the owner of the residence was not present and the occupants were not capable of

providing the appropriate information. The inability to complete the questionnaire is noted since NYSDOH requires a completed form for each structure participating in a vapor intrusion investigation.

3.1.1 Sub-slab Vapor Sample Collection

Sub-slab vapor samples were collected at six residences (R1, R7, R8, R10, R11, and R14), the Town of Hempstead Water Department Facility, and from three locations within the W. T. Clark High School. A total of ten sub-slab samples were collected plus one duplicate sample.

The sub-slab sample locations were installed as permanent points to facilitate future sampling events. After the slab had been inspected, the location of any subsurface utilities determined, and the ambient air surrounding the proposed sampling location screened with a photoionization detector (PID), a hammer drill was used to advance a boring to a depth of approximately two inches beneath the building slab. A permanent port constructed of stainless steel tubing and fittings was installed in the opening. The annular space between the borehole and the sample tubing was filled and sealed with anchoring cement.

Teflon tubing was connected to the stainless steel sample port and utilized for sample collection. Flow rates for both purging and sample collection were at 0.1 liters per minute to minimize ambient air infiltration during sampling. Approximately three volumes of gas were purged from the subsurface probe. PID readings were observed during purging and the highest reading is presented on Table 2-1.

The end of the tubing was connected directly to the summa canister's regulator intake valve. The sample was then collected with a laboratory-certified summa canister with a dedicated regulator set for 24-hour sample collection. The sub-slab vapor parameters are presented in Table 2-1.

3.1.2 Indoor (Basement) Air Sample Collection

Indoor (basement) air samples were collected in the basement at six residences (R1, R7, R8, R10, R11, and R14), the Town of Hempstead Water Department Facility, and from three locations within the W. T. Clark High School. An indoor sample was also collected inside the crawl space of a residence (R9). A total of eleven indoor air samples were collected plus one duplicate sample.

A NYSDOH Indoor Air Quality Questionnaire and Building Inventory was completed for each structure where indoor air testing was conducted except for residence R9, as mentioned in Section 2.1. NYSDOH questionnaires are provided in Appendix C. Associated photographs of chemicals stored within the buildings are presented in Appendix B.

All indoor air samples were collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister was placed next to the

sub-slab sampling summa canister. The indoor air parameters are presented in Table 2-1.

3.1.3 Outdoor (Ambient) Air Sample Collection

An outdoor (ambient) air sample was collected at each of the nine sampling locations (WC, R1, R7, R8, R9, R10, R11, R12, and R14). The outdoor air sample was collected with a laboratory-certified summa canister regulated for a 24-hour sample collection. The summa canister was placed upwind and in a location that was non-obtrusive for the property owner. The outdoor air sample collected at the W.T. Clark High School was located in the courtyard to avoid tampering by students. The outdoor air parameters are presented in Table 2-1.

3.1.4 Investigative Derived Waste

Sub-slab vapor port dedicated tubing was disposed of as solid waste.

3.1.5 Sample Location

A global positioning unit (GPS) hand-held unit was not utilized to identify the sub-slab sample locations. Instead, sample locations were measured from known points and sketched in the NYSDOH Questionnaire, provided in Appendix C.

3.2 Sample Identification, Laboratory Analysis and Validation

Each sample collected was designated by an alphanumeric code that identifies the type of sampling location, matrix sampled, and the specific sample designation (identifier). Site specific procedures are described in the QAPP.

All samples were analyzed by an NYSDOH-approved Environmental Laboratory Approval Program (ELAP) certified laboratory (Air Toxics). Air samples were analyzed for VOCs using the Environmental Protection Agency (EPA) Method TO-15 Hi/Lo selected ion monitoring (SIM) TCE list. The analysis for vapor samples achieves detection limits of 1 microgram per cubic meter ($\mu g/m^3$) for each compound except for TCE which has a detection limit of 0.25 $\mu g/m^3$. A NYSDEC Analytical Services Protocol (ASP) Category B data deliverable is provided for these analyses.

All samples collected were validated in accordance with the NYSDEC Data Usability Summary Report (DUSR) guidance by a party that is independent of the laboratory which performed the analyses and CDM. A usability analysis was conducted by a qualified data validator (Data Validation Services) and DUSRs are provided in Appendix E.

3.3 Field Documentation and Reporting

Field notebooks were used during all on-site work. The dedicated field notebook was maintained by the field manager overseeing the site activities. A copy of the field log book is provided in Appendix D. In addition to the notebook, field and sampling procedures were photo-documented and included in Appendix B.

Section 4
Analytical Results

This section presents the analytical results for the vapor intrusion sampling conducted as part of this investigation.

4.1 Vapor Intrusion Results

Vapor intrusion samples were collected at 7 residences (R1, R7, R8, R9, R10, R11, and R14), the Town of Hempstead Water Department Facility (R12), and from W.T. Clark High School (WC). Sub-slab vapor, indoor (basement) air, and outdoor (ambient) air samples were collected to determine if vapor intrusion exists at the selected locations.

An ambient air sample was collected each day sub-slab vapor sampling was conducted and was labeled with an "AA" in accordance with the approved Work Plan. The analytical results for the ambient air sample showed several detections but below the NYSDOH Air Guideline Values.

Analytical results for the vapor intrusion investigation are presented in Appendix E and Figure 3-1. Since PCE and its degradation products represent the contaminants of concern at this site, Figure 3-1 focuses on these compounds as a means of correlating their occurrences to the known contamination in the area. The 2006 NYSDOH Vapor Intrusion Guidance indicates that the State of New York does not have any standards, criteria or guidance for subsurface vapors. However, air guideline values were compared to vapor concentrations to determine if exceedances exist. Table 4-1 presents the New York State Guideline Values. New York State Guidelines for methylene chloride, PCE and TCE are 60 $\mu g/m^3$, 100 $\mu g/m^3$, and 5 $\mu g/m^3$, respectively. Tables 4-2 and 4-3 provide the NYSDOH sub-slab/indoor air matrices which were used to determine if further action is necessary at each sampling location.

The vapor concentrations of PCE ranged from non-detect to 15 $\mu g/m^3$. The highest PCE concentration of 15 $\mu g/m^3$ was detected in the sub-slab vapor sample taken at R8. The vapor concentrations of TCE ranged from non-detect to 14 $\mu g/m^3$. The highest TCE concentration of 14 $\mu g/m^3$ was detected in the sub-slab vapor sample collected from residence R7, which when coupled with the detection of .4 $\mu g/m^3$ in the associated indoor air may need additional monitoring in accordance with NYSDOH Matrix 1 (see Table 4-2). The vapor concentrations of 1,1,1- TCA ranged from non-detect to 16 $\mu g/m^3$. The highest 1,1,1-TCA concentration of 16 $\mu g/m^3$ was detected in the indoor air sample collected from residence R10.

Other compounds that were detected were chloroform and methylene chloride. The vapor concentrations of chloroform ranged from non-detect to 81,000 $\mu g/m^3$. The highest chloroform concentration of 81,000 $\mu g/m^3$ was detected in the sub-slab vapor sample from the Town of Hempstead Water Department Facility (R12). Methylene chloride was detected in vapor samples at concentrations ranging from non-detect to 14 $\mu g/m^3$. The maximum methylene chloride concentration of 14 $\mu g/m^3$ was detected in the first indoor air sample collected at W. T. Clarke High School (WC).

4.1 Sub-slab and Indoor Air Investigation

4.1.1 Residence R1

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-1. Methylene chloride, PCE and TCE were detected in the indoor air sample at concentrations of 1.9, 1.5 and 2.1 $\mu g/m^3$, respectively. Methylene chloride was detected in the sub-slab vapor sample at a concentration of 2 $\mu g/m^3$. Methylene chloride and *trans*-1,2-dichloroethene were detected at concentrations of 0.97 and 2 $\mu g/m^3$, respectively in the ambient air sample.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance recommends that reasonable and practical actions be taken to identify sources and reduce exposure to TCE with respect to the indoor air concentration of 1.5 $\mu g/m^3$ and no detection in the sub-slab vapor sample. Soil Vapor/Indoor Air Matrix 2 (Table 4-3) indicates no further action for PCE.

4.1.2 Residence R7

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-7. Methylene chloride and TCE were detected in the indoor air sample at concentrations of 3.5 and 0.4 $\mu g/m^3$, respectively. 1,1,1-TCA, chloroform, *cis*-1-2-dichloroethene, PCE, and TCE were detected in the sub-slab vapor sample at concentrations of 1.1, 23, 14, 2.2 and 14 $\mu g/m^3$, respectively. *Trans*-1,2-dichloroethene was detected in the ambient air sample at a concentration of 3.7 $\mu g/m^3$.

According to the Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance recommends that TCE should be monitored as appropriate with respect to the sub-slab and indoor air concentrations of 14 and 0.4 $\mu g/m^3$, respectively. Soil Vapor/Indoor Air Matrix 2 (Table4-3) indicates no further action for 1,1,1-TCA or PCE.

4.1.3 Residence R8

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-8. PCE was detected in the indoor air sample at a concentration of 1.1 $\mu g/m^3$. 1,1,1-TCA and PCE were detected in the sub-slab vapor sample at concentrations of 2 and 15 $\mu g/m^3$, respectively. *Trans*-1,2-dichloroethene was detected in the ambient air sample at a concentration of 0.8 $\mu g/m^3$.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance indicates no further action since neither TCE nor carbon tetrachloride was detected. Soil Vapor/Indoor Air Matrix 2 (Table 4-3), indicates no further action for 1,1,1-TCA and PCE.

4.1.4 Residence R9

Only an indoor air and an ambient air sample were collected at residence R9. Chlorinated VOCs were not detected in the indoor air and ambient air samples collected at this location. Therefore no further action is recommended at this sampling location.

4.1.5 Residence R10

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-10. 1,1,1-TCA, chloroform, and methylene chloride were detected in indoor air at concentrations of 16, 1.3, and 5.3 µg/m^3, respectively. PCE was detected at a concentration of 4.3 µg/m^3, in the sub-slab vapor sample. 1,1,1-TCA was detected in the ambient air sample at a concentration of 0.39 µg/m^3.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance indicates no further action since neither TCE nor carbon tetrachloride was detected. Soil Vapor/Indoor Air Matrix 2 (Table 4-3), indicates no further action for PCE.

Soil Vapor/Indoor Air Matrix 2 also indicates that reasonable and practical actions be taken to identify source(s) and reduce exposures with respect to the 1,1,1-TCA indoor air concentration of 16 µg/m^3 and no detection in the sub-slab vapor sample.

4.1.6 Residence R11

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-11. TCE was detected in the indoor air sample at a concentration of 0.17 µg/m^3. Chloroform, PCE and TCE were detected in the sub-slab vapor sample at concentrations of 1.1, 6,5, and 0.36 µg/m^3, respectively. *Trans*-1,2-dichloroethene was detected in the ambient air sample at a concentration of 3.8 µg/m^3.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance indicates no further action for TCE. Soil Vapor/Indoor Air Matrix 2 (Table 4-3), indicates no further action for PCE.

4.1.7 Residence R14

A sub-slab vapor, indoor (basement) air and ambient air sample were collected at Residence R-14, located north of the Bowling Green Well Field. The only chemical detected at this site was chloroform at a concentration of 85 µg/m^3 in the sub-slab vapor sample. NYSDOH guidance does not provide any guidelines for chloroform.

4.1.8 Town of Hempstead Water Department Facility R12

A sub-slab soil, indoor (basement) air and ambient air sample and duplicate sample of each were collected at the Town of Hempstead Water Department Facility (R12). Chloroform and TCE were detected in the indoor air sample at concentrations of 150 and 0.23 µg/m^3, respectively. Chloroform was detected at a concentration of 81,000 µg/m^3 in the sub-slab vapor sample.

An ambient air sample was collected at R12. Vinyl chloride was detected in the ambient air sample at a concentration of 0.36 µg/m^3.Chloroform was detected in the duplicate ambient air sample at a concentration of 0.73 µg/m^3.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2) NYSDOH guidance suggests that no further action is needed for TCE. NYSDOH guidance does not provide any guidelines for chloroform.

4.1.9 W.T. Clark High School (WC)

Three sub-slab vapor samples, two indoor (basement) air samples, and one ambient air sample were collected at W.T. Clark High School (WC). Methylene chloride was detected in indoor air sample 1 (WC-BA1) at a concentration of 14 $\mu g/m^3$. 1,1,1-TCA and methylene chloride were detected in indoor air sample 2 (WC-BA2) at concentrations of 1.3 and 1.7 $\mu g/m^3$, respectively. Chloroform was detected in sub-slab vapor sample 1 (WC-SB1) at a concentration of 5.3 $\mu g/m^3$. Chloroform and TCE were detected in sub-slab vapor sample 2 (WC-SB2) at concentrations of 2 and 0.22 $\mu g/m^3$, respectively. PCE and TCE were detected in sub-slab vapor sample 3 (WC-SB3) at concentrations of 1.2 and 0.31 $\mu g/m^3$, respectively.

According to Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance indicates no further action for TCE. Soil Vapor/Indoor Air Matrix 2 (Table 4-3), indicates no further action for PCE and 1,1,1-TCA.

Section 5
Conclusions and Recommendations

This section presents the conclusions and recommendations which are based upon the analytical results from the off-site vapor intrusion investigation conducted for NYSDEC.

5.1 Conclusions

Chlorinated VOCs were detected at low levels in all off-site locations sampled with the exception of off-site residence R9, located southeast of the NCIA. In general, the sub-slab vapor samples contained slightly higher chlorinated VOC concentrations than the indoor air samples, with the exception of the indoor air sample taken at R10, located directly south of R9. A slightly elevated concentration of 1,1,1-TCA was detected in the indoor air sample from R10, but not in the sub-slab vapor sample, which according to the NYSDOH's Soil Vapor/Indoor Air Matrix 2 (Table 4-3) could indicate that the concentration detected in the indoor air sample is likely due to indoor and/or outdoor sources rather than soil vapor intrusion. 1,1,1-TCA was not detected in the ambient (outdoor) air sample, indicating that the source most likely originated indoors. The NYSDOH indoor air quality questionnaire for R10 (Appendix C) indicated that carpet adhesives were used at this location, a potential source of 1,1,1-TCA.

NYSDOH's Soil Vapor/Indoor Air Matrix 1 (Table 4-2) indicated that the concentration of TCE detected in the indoor air sample at R1, and no detection in the sub-slab sample, is also likely due to indoor and/or outdoor sources rather than soil vapor intrusion. TCE was not detected in the ambient (outdoor) air sample, indicating that the source most likely originated indoors. The NYSDOH indoor air quality questionnaire for R1 (Appendix C) indicated that the wooden floor inside the residence has been stained recently. TCE could have been an ingredient in either the stain compound itself or in a stain remover and/or cleaner used prior to the wood stain treatment.

According to the Soil Vapor/Indoor Air Matrix 1 (Table 4-2), NYSDOH Guidance recommends that TCE should be monitored at R7 with respect to the sub-slab and indoor air concentrations of 14 and 0.4 $\mu g/m^3$, respectively. The NYSDOH Guidance states that monitoring is needed to confirm concentrations in the indoor air have not increased due to changes in pressure gradients or to evaluate relevant environmental data.

The majority of the vapor samples collected are within the 1,000 µg/L VOC plume defined during the Phase I and II investigations conducted by O'Brien & Gere (see Figure 3 of Appendix A provided in the Work Plan). A data gap exists between off-site residence locations R1 and R7. The inability to collect samples at six proposed locations (R2, R3, R4, R5, R6 and R15) and a significant area between R6 and R7 not included in the scope of work is contributing to the data gap. The lack of sampling locations proposed by O'Brien and Gere between off-site residences R6 and R7 is most

likely due to the low detections of TCE (ranging from non-detect to 6.43 $\mu g/m^3$) observed during the Phase I and II investigation (see Figure 2 of Appendix A provided in the Work Plan). Off-site residence location R6 however is upgradient of Phase I and II vapor results detecting TCE concentrations ranging from 4.07 to 14.5 $\mu g/m^3$.

It can be concluded that the boundaries of the chlorinated solvent migration from NCIA have been confirmed due to the non-detect and low detections at the remaining sampling locations. Currently, migration of chlorinated solvents from NCIA is bound by R1 to the west, WC to the south, and R12, R11 and R10 to the east. Chloroform was detected in the indoor air and sub-slab vapor samples taken at the Town of Hempstead Water Department Facility at much higher concentrations than what was detected at the NCIA or at other off-site locations. Chloroform is commonly associated with water treatment systems and supply wells. Therefore the detection of the compound at Town of Hempstead Water Department Facility is considered not site related.

5.2 Recommendations

Due to the exceeding concentration of TCE detected at R7, the inability to collect a sample at R6, and the absence of sampling locations between R6 and R7, CDM recommends an additional investigation to properly assess soil vapor intrusion in relation to NCIA. It is suggested that up to ten structures be sampled for sub-slab, indoor, and outdoor air north of W.C., south of NCIA, east of R7, and west of R1, to properly fill the data gaps. It is also recommended that R7 be re-sampled for vapor intrusion to initiate the monitoring at this sample location indicated by Soil Vapor/Indoor Air Matrix 1 (Table 4-2).

TABLES

Table 2-1
Soil Vapor Sampling Parameters
New Cassel Industrial Area Operable Unit 4
North Hempstead Westbury, NY

Sample ID	Date	Time Started	Initial Pressure (inches Hg)	Time Collected	Final Pressure (inches Hg)	Pre-Sample VOC (ppm)	Post-Sample VOC (ppm)
R1							
NCIA4-R1SB-030309	3/3/2009	14:12	-30	14:20	-6	89.2	3
NCIA4-R1BA-030309		14:12	-25	14:20	0	NA	NA
NCIA4-R1AA-030309		14:16	-30	14:30	-5	NA	NA
R7							
NCIA4-R7SB-030309	3/3/2009	11:22	-29	11:22	-2	13	133
NCIA4-R7BA-030309		11:22	-30	11:22	-3	NA	NA
NCIA4-R7AA-030309		11:27	-30	11:20	0	NA	NA
R8							
NCIA4-R8SB-030309	3/3/2009	19:32	-27	19:39	-3	1,751	NA*
NCIA4-R8BA-030309		19:32	-27	19:39	-6.5	NA	NA
NCIA4-R8AA-030309		19:40	-28	19:48	0	NA	NA
R9**							
NCIA4-R9BA-030909	3/9/2009	9:15	-30	9:15	-7	NA	4.7
NCIA4-R9AA-030909		9:15	-30	9:15	0	NA	NA
R10							
NCIA4-R10SB-030909	3/9/2009	13:35	-29	13:35	-12	0.1	13.7
NCIA4-R10BA-030909		13:35	-30	13:35	-4	NA	NA
NCIA4-R10AA-030909		13:42	-30	13:42	-2	NA	NA
R11							
NCIA4-R11SB-030309	3/3/2009	9:58	-29	10:07	-4	0.7	7.6
NCIA4-R11BA-030309		9:58	-30	10:07	-1	NA	NA
NCIA4-R11AA-030309		10:03	-29	10:20	0	NA	NA
R12							
NCIA4-R12SB-030909	3/9/2009	12:23	-30	12:25	-6	0.1	1.6
NCIA4-R12SBD-030909		12:23	-30	12:25	-2		
NCIA4-R12BA-030909		12:25	-30	12:25	-6	2.1	NA
NCIA4-R12BAD-030909		12:25	-28	12:25	-4		
NCIA4-R12AA-030909		12:32	-28	12:32	-2	NA	NA
NCIA4-R12AAD-030909		12:32	-30	12:32	-5		
R14							
NCIA4-R14SB-030509	3/5/2009	9:23	-29	9:23	-12	1	357
NCIA4-R14BA-030509		9:23	-29	9:23	-3	NA	NA
NCIA4-R14AA-030509		9:26	-30	9:18	0	NA	NA
WC							
NCIA4-WCSB1-031109	3/11/2009	11:16	-30	11:18	-7	NA*	
NCIA4-WCBA1-031109		11:16	-30	11:18	-7		
NCIA4-WCSB2-031109		11:05	-30	11:07	-10.5		
NCIA4-WCBA2-031109		11:05	-30	11:07	-10		
NCIA4-WCSB3-031109		10:47	-29	10:50	-4		
NCIA4-WCBA3-031109		10:47	-29	10:50	-5		
NCIA4-WCAA-031109		11:27	-29	11:36	-5		

Notes:

* - The MultiRae was encountering fresh air calibration issues and a VOC screening reading could not be conducted.

** - VOC screening and soil vapor sample was collected from crawl space under residence.

Acronyms:

AA - ambient air
BA - Basement Air
D - duplicate
Hg - mercury
ID - identification
NA - not applicable
NCIA4 - New Cassel Industrial Area Operable Unit 4
ppm - parts per million
R - residential
VOC - volatile organic compound
WC - highschool

Table 4-1
NYSDOH Air Guidelines
New Cassel Industrial Area Operable Unit 4
North Hempstead Westbury, NY

Chemical	Air Guidance Value ($\mu g/m^3$)
methylene chloride (MeCl) (also referred to as dichloromethane)	60
polychlorinated biphenyls (PCBs)	1 *
tetrachlorodibenzo-p-dioxin equivalents (TCDD)	0.00001 *
tetrachloroethene (PCE)	100
trichloroethene (TCE)	5

Notes:
*The guideline is specific to indoor air
Acronyms:
$\mu g/m^3$ - micrograms per meters cubed
Reference:
Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. NYSDOH, October 2006.

Table 4-2
Soil Vapor/Indoor Air Matrix 1
Trichloroethene
October 2006
New Cassel Industrial Area Operable Unit 4
North Hempstead Westbury, NY

	< 0.25	0.25 to < 1	1 to < 5.0	5.0 and above
< 5	1. No further action	2. Take reasonable and practical actions to identify source(s) and reduce exposures	3. Take reasonable and practical actions to identify source(s) and reduce exposures	4. Take reasonable and practical actions to identify source(s) and reduce exposures
5 to < 50	5. No further action	6. MONITOR	7. MONITOR	8. MITIGATE
50 to < 250	9. MONITOR	10. MONITOR / MITIGATE	11. MITIGATE	12. MITIGATE
250 and above	13. MITIGATE	14. MITIGATE	15. MITIGATE	16. MITIGATE

Source:
New York State Department of Health 2006. *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. Soil Vapor/Indoor Air Matrix 1. October.

Table 4-3
Soil Vapor/Indoor Air Matrix 2
Tetrachloroethene and 1,1,1-Trichloroethane
October 2006
New Cassel Industrial Area Operable Unit 4
North Hempstead Westbury, NY

	< 3	3 to < 30	30 to < 100	100 and above
< 100	1. No further action	2. Take reasonable and practical actions to identify source(s) and reduce exposures	3. Take reasonable and practical actions to identify source(s) and reduce exposures	4. Take reasonable and practical actions to identify source(s) and reduce exposures
100 to < 1,000	5. MONITOR	6. MONITOR / MITIGATE	7. MITIGATE	8. MITIGATE
1,000 and above	9. MITIGATE	10. MITIGATE	11. MITIGATE	12. MITIGATE

Source:
New York State Department of Health 2006. *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. Soil Vapor/Indoor Air Matrix 2. October.

FIGURES

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Legend

- New Cassel Industrial Area Sites
- Proposed Sampling Location

N

0 275 550

Feet

CDM

Figure 1-1
Site Location Map
New Cassel Industrial Area Sites
Residential and Public Properties
North Hempstead and Westbury, New York

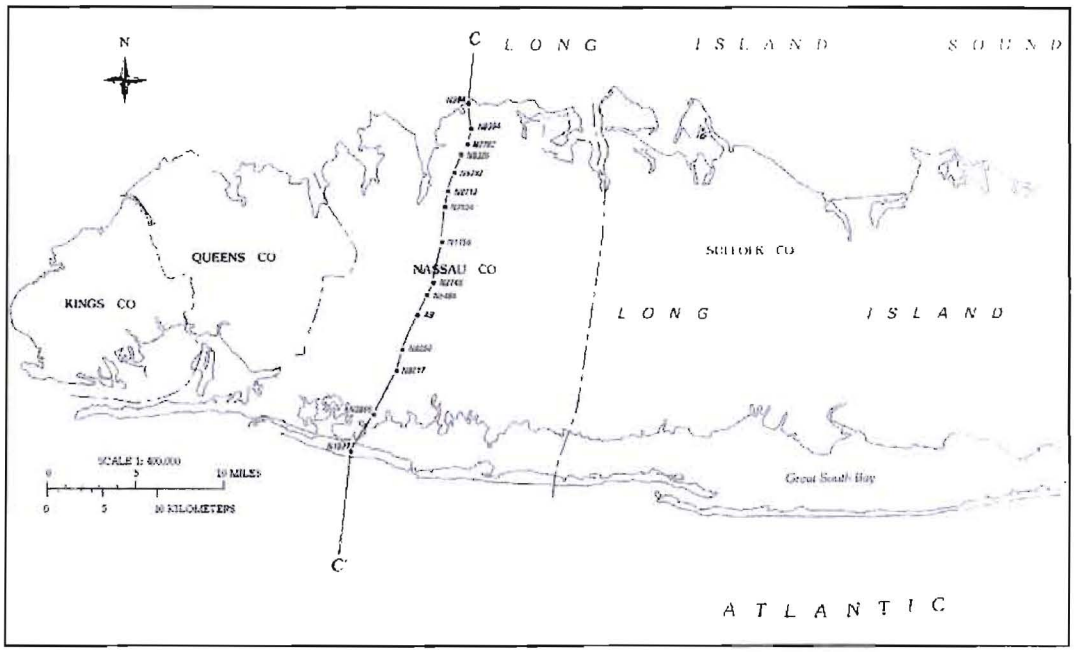
System	Series	Age	Stratigraphic Unit		Hydrostratigraphic Unit
QUATERNARY	Holocene	Postglacial	Holocene (recent) deposits		Upper glacial aquifer
	Pleistocene	Wisconsin (upper Pleistocene)	Upper Pleistocene deposits		
			"20-foot" clay		"20-foot" clay
			Upper Pleistocene deposits		Upper glacial aquifer
			unconformity		
		Sangamon	Gardiners Clay		Gardiners Clay
			unconformity		
		Pre-Sangamon	Jameco Gravel[1]		Jameco aquifer[1]
		Pre-Sangamon	Reworked Matawan-Magothy channel deposits		Upper glacial or Magothy aquifer
unconformity					
CRETACEOUS	Upper Cretaceous		Monmouth Group		Monmouth greensand
			unconformity		
			Matawan Group-Magothy Formation, undifferentiated		Magothy aquifer
			unconformity		
			Raritan Formation	Unnamed clay member	Raritan confining unit
				Lloyd Sand Member	Lloyd aquifer
unconformity					
Paleozoic (or) Precambrian			Bedrock		Relatively impermeable bedrock

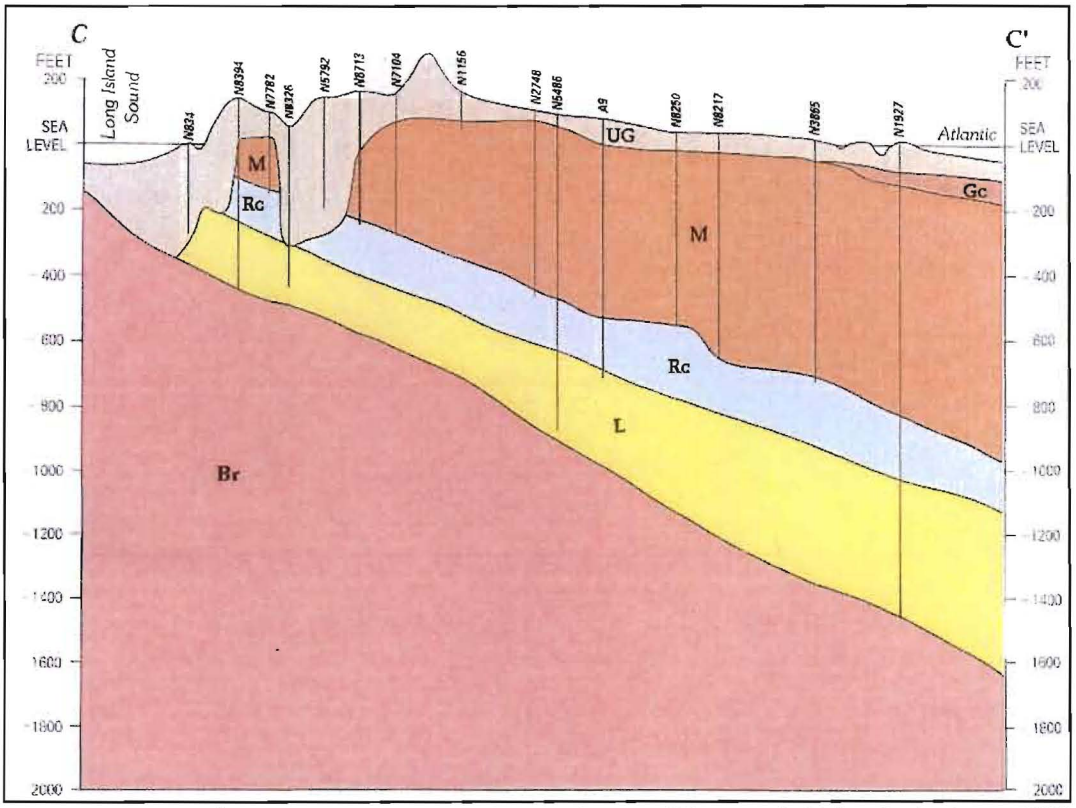
[1]Present in Nassau County Only

adapted from Krulikas (1987)

Figure 2-1
Generalized Regional Stratigraphy
New Cassel Industrial Area
North Hempstead, New York

CDM





(Br = bedrock; L = Lloyd; Rc = Raritan clay; M = Magothy; Gc = Gardiners clay; UG = upper glacial; from Smolensky et al, 1989).

Figure 2-2
Generalized North-South Cross Section through Nassau County
New Cassel Industrial Area
North Hempstead, New York

CDM

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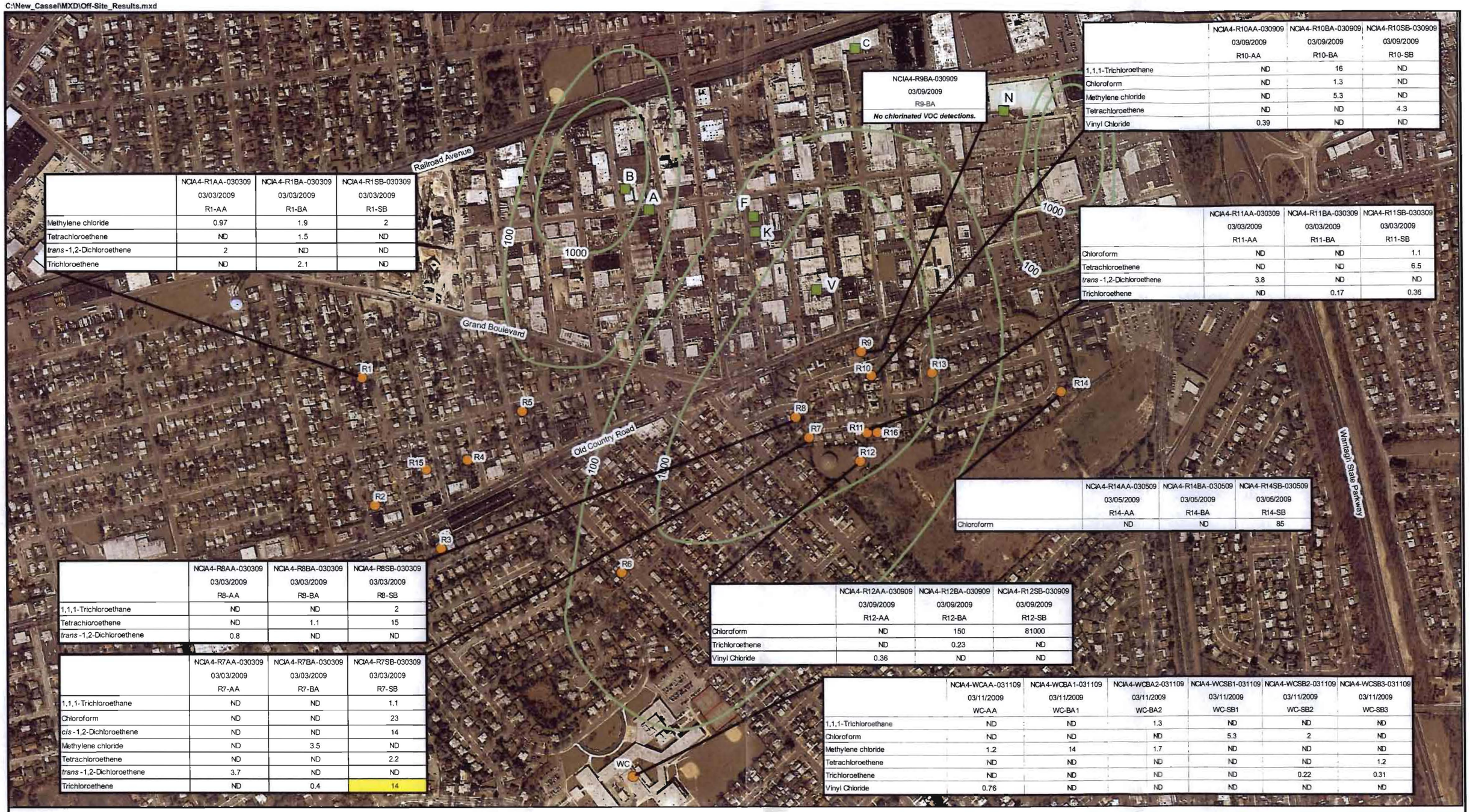


	NCIA4-R1AA-030309 03/03/2009 R1-AA	NCIA4-R1BA-030309 03/03/2009 R1-BA	NCIA4-R1SB-030309 03/03/2009 R1-SB
Methylene chloride	0.97	1.9	2
Tetrachloroethene	ND	1.5	ND
trans -1,2-Dichloroethene	2	ND	ND
Trichloroethene	ND	2.1	ND

	NCIA4-R8AA-030309 03/03/2009 R8-AA	NCIA4-R8BA-030309 03/03/2009 R8-BA	NCIA4-R8SB-030309 03/03/2009 R8-SB
1,1,1-Trichloroethane	ND	ND	2
Tetrachloroethene	ND	1.1	15
trans -1,2-Dichloroethene	0.8	ND	ND

	NCIA4-R7AA-030309 03/03/2009 R7-AA	NCIA4-R7BA-030309 03/03/2009 R7-BA	NCIA4-R7SB-030309 03/03/2009 R7-SB
1,1,1-Trichloroethane	ND	ND	1.1
Chloroform	ND	ND	23
cis -1,2-Dichloroethene	ND	ND	14
Methylene chloride	ND	3.5	ND
Tetrachloroethene	ND	ND	2.2
trans -1,2-Dichloroethene	3.7	ND	ND
Trichloroethene	ND	0.4	14

NCIA4-R9BA-030909
03/09/2009
R9-BA
No chlorinated VOC detections.

	NCIA4-R10AA-030909 03/09/2009 R10-AA	NCIA4-R10BA-030909 03/09/2009 R10-BA	NCIA4-R10SB-030909 03/09/2009 R10-SB
1,1,1-Trichloroethane	ND	16	ND
Chloroform	ND	1.3	ND
Methylene chloride	ND	5.3	ND
Tetrachloroethene	ND	ND	4.3
Vinyl Chloride	0.39	ND	ND

	NCIA4-R11AA-030309 03/03/2009 R11-AA	NCIA4-R11BA-030309 03/03/2009 R11-BA	NCIA4-R11SB-030309 03/03/2009 R11-SB
Chloroform	ND	ND	1.1
Tetrachloroethene	ND	ND	6.5
trans -1,2-Dichloroethene	3.8	ND	ND
Trichloroethene	ND	0.17	0.36

	NCIA4-R14AA-030509 03/05/2009 R14-AA	NCIA4-R14BA-030509 03/05/2009 R14-BA	NCIA4-R14SB-030509 03/05/2009 R14-SB
Chloroform	ND	ND	85

	NCIA4-R12AA-030909 03/09/2009 R12-AA	NCIA4-R12BA-030909 03/09/2009 R12-BA	NCIA4-R12SB-030909 03/09/2009 R12-SB
Chloroform	ND	150	81000
Trichloroethene	ND	0.23	ND
Vinyl Chloride	0.36	ND	ND

	NCIA4-WCAA-031109 03/11/2009 WC-AA	NCIA4-WCBA1-031109 03/11/2009 WC-BA1	NCIA4-WCBA2-031109 03/11/2009 WC-BA2	NCIA4-WCSB1-031109 03/11/2009 WC-SB1	NCIA4-WCSB2-031109 03/11/2009 WC-SB2	NCIA4-WCSB3-031109 03/11/2009 WC-SB3
1,1,1-Trichloroethane	ND	ND	1.3	ND	ND	ND
Chloroform	ND	ND	ND	5.3	2	ND
Methylene chloride	1.2	14	1.7	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	1.2
Trichloroethene	ND	ND	ND	ND	0.22	0.31
Vinyl Chloride	0.76	ND	ND	ND	ND	ND

New Cassel Industrial Area Sites

Sampling Location

VOC Isopleths (µg/L)
(from O'Brien & Gere
Phase I&II Report, November 2007)

Notes:
All units in µg/m3.
ND = Non-detect
AA = Ambient Air Sample
BA = Indoor Air (Basement) Sample
SB = Sub-slab Vapor Sample

- Subslab vapor concentration exceeds 5 µg/m3;
NYSDOH Matrix 1 indicates Monitoring may be required

N

0 275 550
Feet

CDM

Figure 4-1
Soil Vapor Chlorinated VOC Detections
New Cassel Industrial Area Sites
Residential and Public Properties
North Hempstead and Westbury, New York

APPENDIX A

LETTER FOR UNSCHEDULED RESIDENT

CDM

125 Maiden Lane, 5th Floor
New York, New York 10038

Dear Current Resident,

The New York State Department of Environmental Conservation (NYSDEC), in cooperation with the New York State Department of Health (NYSDOH), is requesting your permission to sample your home for soil vapor intrusion related to the New Cassel Industrial Area (NCIA) sites' groundwater plume that is located south of the NCIA.

Thus far, several attempts were made to schedule an appointment for your residence. The field team will only be in the area to sample your home during the first and second week of March 2009. Please contact the Field Manger, Melissa Koberle, if you would like to participate. Her phone number is 610-739-0994.

Investigations to date indicate that groundwater and soil vapor from the NCIA sites has been contaminated with volatile organic compounds related to past disposal practices within the NCIA. Groundwater and soil vapor contamination has also been identified off-site south of the NCIA. The selected remedy for the Off-site Groundwater South of the New Cassel Industrial Area is currently being designed under the NYSDEC State Superfund program.

If you have any questions or concerns please feel free to contact either Mrs. Jacquelyn Nealon of NYSDOH at 1-800-458-1158, extension 27880 or Mr. Joseph Jones of NYSDEC at 518-402-9621.

Thanks in advance for your cooperation,

Melissa Koberle

Field Manager

APPENDIX B

FIELD INVESTIGATION PHOTOLOG

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R8 – Inventory of Solvents (enamel, paint, etc.)

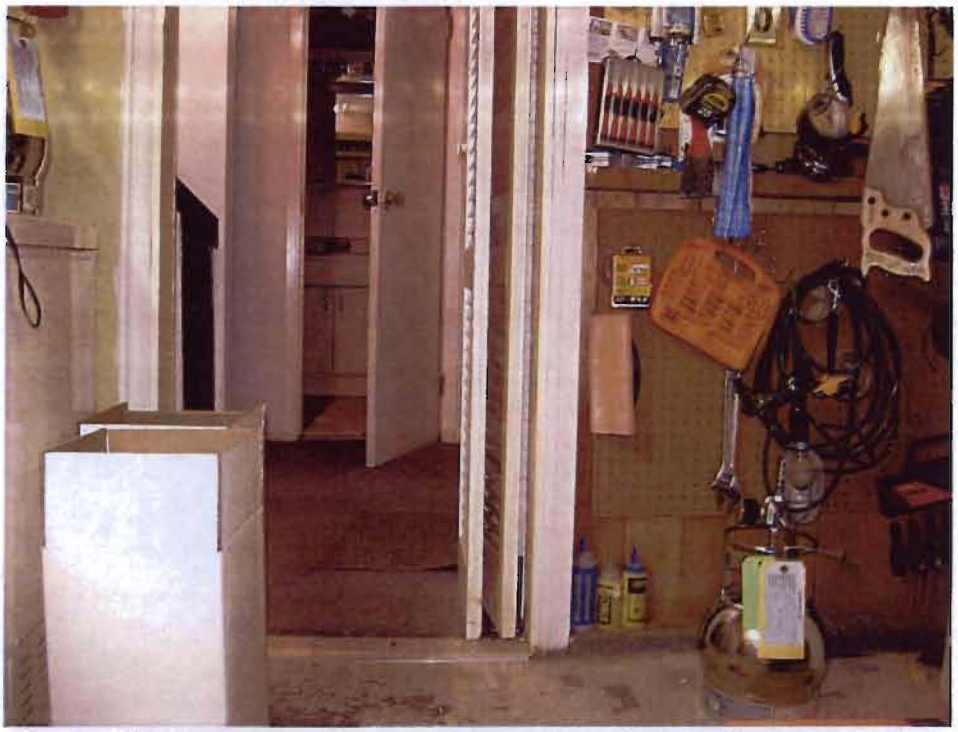
R8 – Inventory of Solvents (detergent, dust guster, bleach, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R8 – Sampling Location in Basement (in laundry room, cement filled dry well)

R8 – Inventory of Solvents (brake fluid, 5W-30, antifreeze, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog



R11 – Sampling Location in Basement (laundry room and work room, floor drain behind oil burner)

R11 – Inventory of Solvents (pesticide, glue, odor neutralizer, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R1 – Inventory of Solvents (bleach, wood stain, etc.)

R1 – Inventory of Solvents (detergents, softner, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R1 – Sampling Location in Basement (near laundry room)

R1 – Inventory of Solvents (paint, finisher, detergent, latex cleaner, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R7 – Sampling Location in Basement (work bench and laundry room)

R7 – Inventory of Solvents (gloss, stains, chrome polish, paint, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R14 – Sump – Dry (storage room to left of sub-slab location)

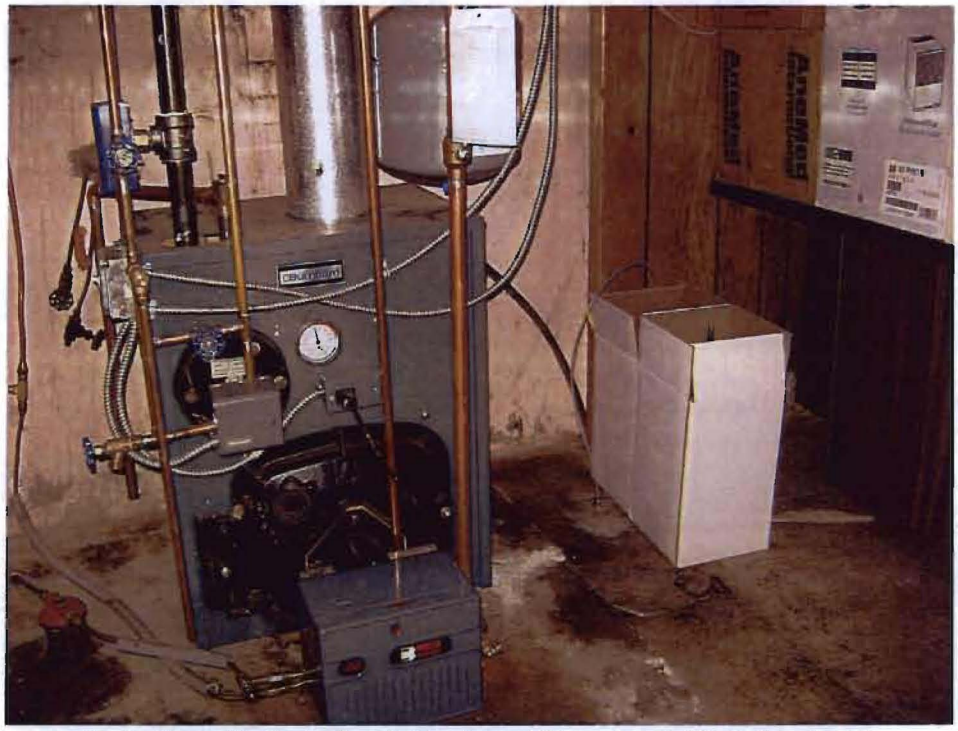
R14 – Open Drain with Rocks – Dry (in same room to the left of sub-slab location)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

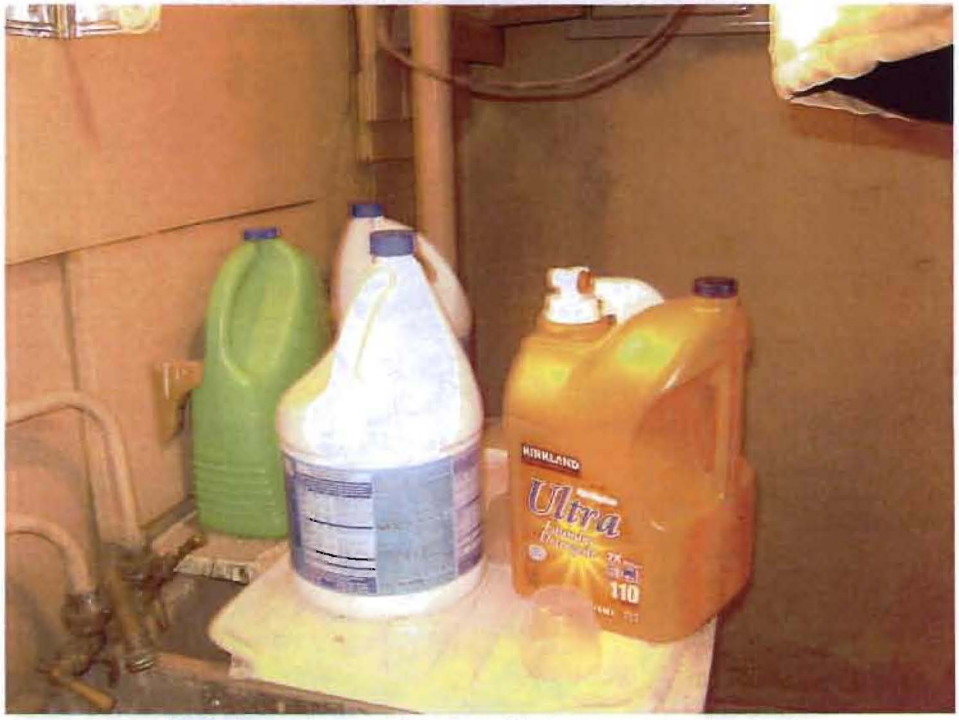
R14 – Inventory of Solvents (water-proofing, paint, primer, wallpaper stripper, etc.)

R14 – Open Floor - Dirt (storage room to the left of sub-slab location)

NCIA4 – Off-site Soil Vapor Investigation
Photolog



R14 – Sampling Location in Basement (storage and laundry room)



R14 – Inventory of Solvents (detergent, bleach, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R11 – Inventory of Solvents (tile sealer, caulk, joint compound, paint, etc.)

R11 – Inventory of Solvents (paints, glue, WD-40, concrete crack seal, etc.)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R9 – Inside Crawl Space (no slab, all dirt)

WC – Sampling Location SB1

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R9 – Crawl Space Underneath Residence (no basement)

R9 – Sampling Canister Inside Crawl Space

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R12 – Duplicate Setup

R12 – Basement (drain in adjacent room, generator (oil odor) and 55 gallon drum with chlorine on first floor)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

R10 – Sampling Location in Basement (laundry room adjacent, work room with paint, carpet protector, degreaser, stain remover, rust remover, oxi-cleaner, etc. in room other side of basement)

R12 – Sampling Location in Water Department Basement

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Adjacent Room to SB1

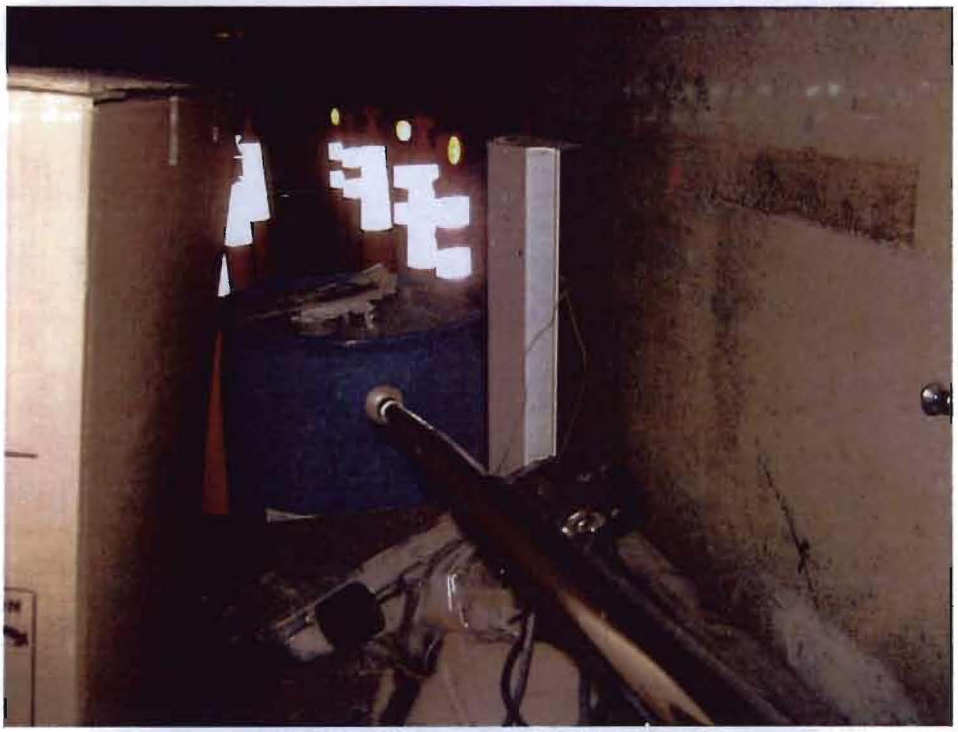
WC – Adjacent Room to SB1 (motor oil, 20W-20, cigarette butts, etc.

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Storage Room Adjacent to SB1 (propylene glycol, floor finish, solventless cleaner, CaCl pellets, etc.)

WC – Adjacent Room to SB1 (powdered bleach)

NCIA4 – Off-site Soil Vapor Investigation
Photolog



WC – 55 gallon drum – unknown (SB1)

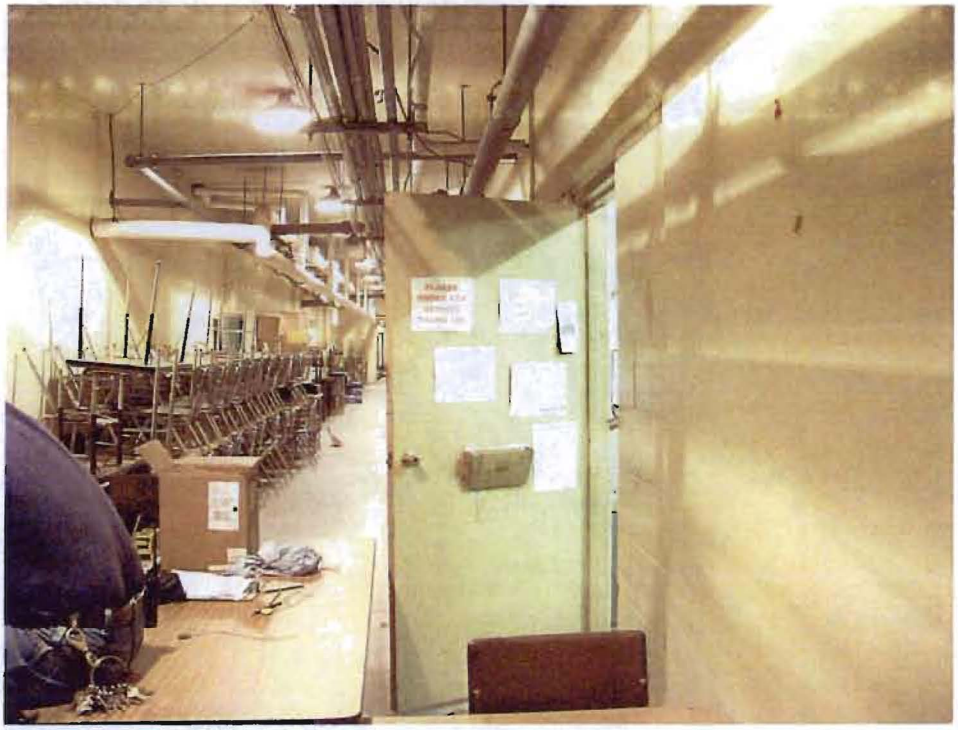
WC – another 55 gallon drum – unknown (SB1)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Inventory of Solvents (SB1)

WC – Oil Tank (SB1)

NCIA4 – Off-site Soil Vapor Investigation
Photolog



WC – Sampling Location of SB2 (white-out, disinfectant spray, and white board cleaner in side room)

WC – Sampling Location of SB3 (near ladies and mens locker room)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Sidewalks in Dirt Hallways (half of basement)

WC – Side Rooms of the Dirt Hallways (half of basement)

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Adjacent Room to SB1 (#140 super-shine all, solventless cleaner, etc.)

WC – Adjacent Room to SB1

NCIA4 – Off-site Soil Vapor Investigation
Photolog

WC – Adjacent Room to SB1 (55 gallon drums with transmission fluid label – look empty)

WC – Adjacent Room to SB1

APPENDIX C

NYSDOH INDOOR AIR SAMPLING QUESTIONNAIRE

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: WC _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	(School)	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 4 including bsmt Building age 1953

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	(concrete)	stone	brick
b. Basement type:	full	crawlspace	(slab)	other _____
c. Basement floor:	(concrete)	dirt	stone	other _____
d. Basement floor:	(uncovered)	covered	covered with _____	
e. Concrete floor:	unsealed	(sealed)	sealed with _____	
f. Foundation walls:	(poured)	block	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The basement is:	wet	damp	(dry)	moldy
i. The basement is:	finished	unfinished	(partially finished) → workout/weight room/ lockers	
j. Sump present?	(Y)/N In boiler room			
k. Water in sump?	Y/(N) not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

hallways w/ dirt and cement sidewalks + rooms in bsmt with dirt

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

(Hot air circulation)	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	(Fuel Oil)	Kerosene
Electric	Propane	Solar
Wood	Coal	20,000 gall. outside custodian office

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	(Outdoors)	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	Workout room locker room storage Boiler Room
1st Floor	Classrooms
2nd Floor	Classrooms Library
3rd Floor	Library & Computer Lab
4th Floor	Attic

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage?	(Y) N	
b. Does the garage have a separate heating unit?	Y / N / NA	
c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car)	Y / N / NA	Please specify_____
d. Has the building ever had a fire?	Y / (N)	When?_____
e. Is a kerosene or unvented gas space heater present?	Y / N	Where?_____
f. Is there a workshop or hobby/craft area?	(Y) N	Where & Type? Bsmt near SB-1
g. Is there smoking in the building?	(Y) N	How frequently? Saw cigerette butts in bsmt
h. Have cleaning products been used recently?	(Y) N	When & Type? _____
i. Have cosmetic products been used recently?	(Y) N	When & Type? highschool kids - bathroom

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N
If yes, please describe: paint

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	(Public Water)	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

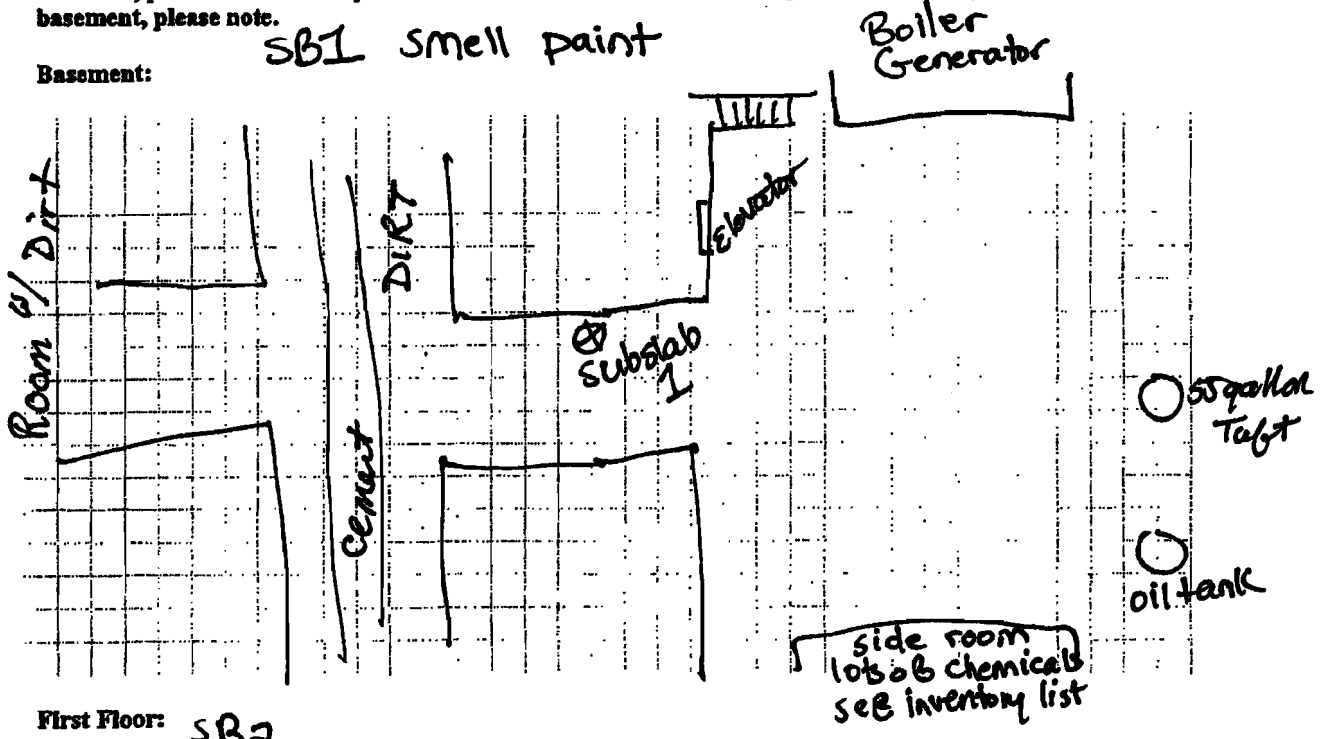
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

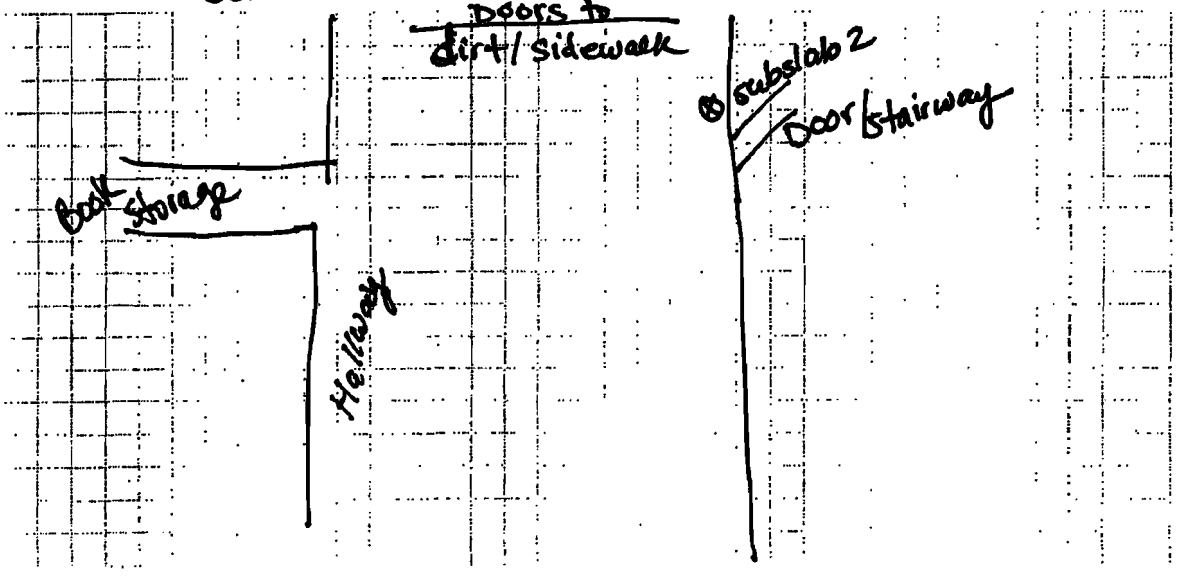
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



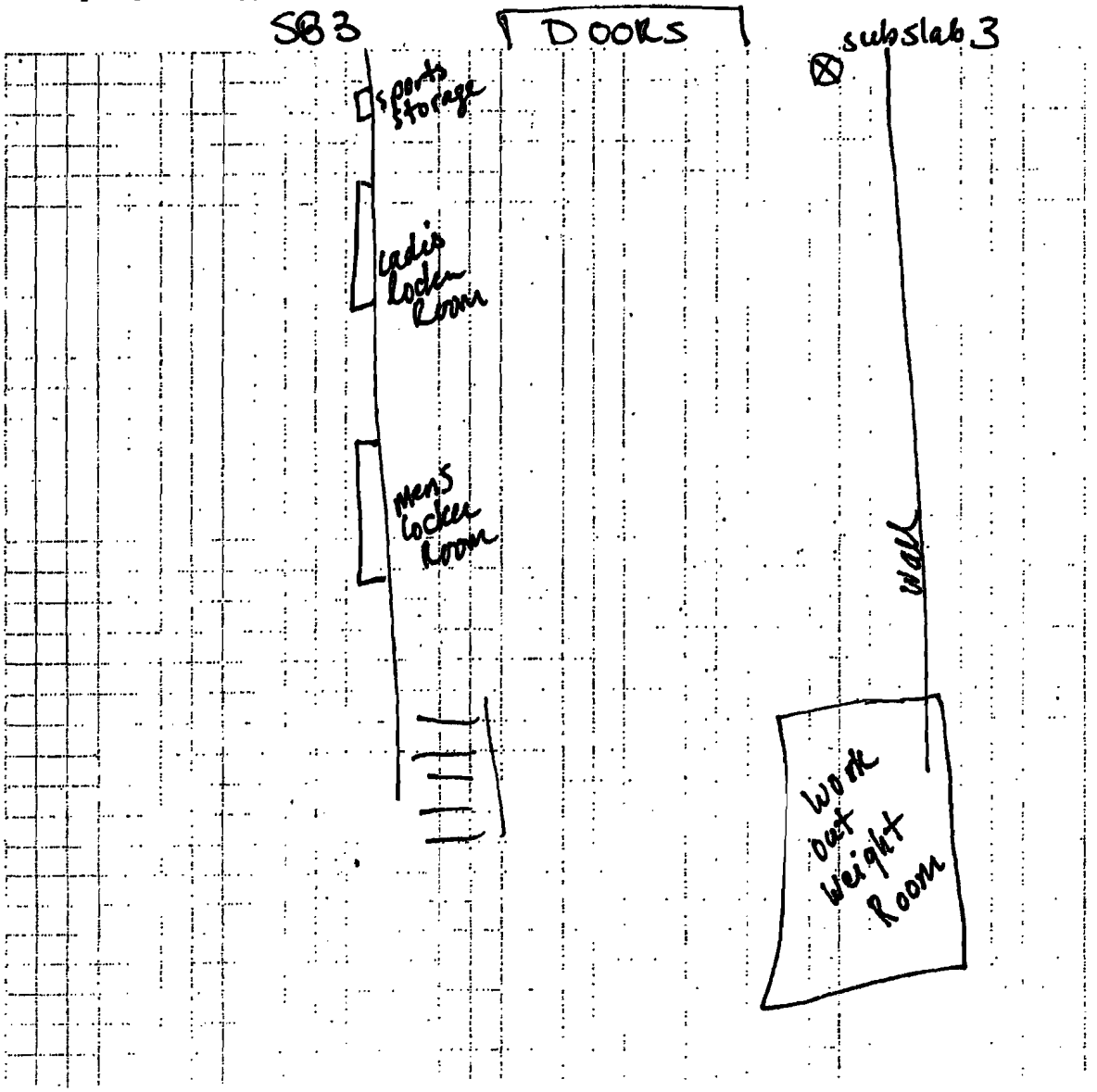
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



Ambient air in Courtyard

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
SB1	air compressor					
	(2) 55 gall drums contents unknown good shape					
	55 gallon drum: Tuff-Skin protective coating					
	oil tank					
	tissues / toilet paper / hand towel boxes					
	in side room: solventless cleaner, #140 super-shine all					
	calcium chloride pellets, proplyene glycol, floor finish,					
	55 gallon drums transmission fluid, motor oil, 20W-20					
	Cigerette butts, powder bleach,					
SB2	White-out spray disinfectant whiteboard cleaner = all in Bookstore					
	hallway just chairs, desks, boxes					
SB3	- nothing in hallway near ladies + mens locker room					

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ _____ First Name: _____

Address: ____ _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

R1

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

(Ranch)	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 2 (Bst 1st) Building age ?

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	(concrete)	stone	brick
b. Basement type:	(full)	crawlspace	(slab)	other _____
c. Basement floor:	(concrete)	dirt	stone	other _____
d. Basement floor:	uncovered	covered	(covered with 75% carpet -)	
e. Concrete floor:	unsealed	(sealed)	sealed with _____	
f. Foundation walls:	(poured)	block	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The basement is:	wet	damp	(dry)	moldy
i. The basement is:	finished	unfinished	(partially finished)	
j. Sump present?	Y / (N)			
k. Water in sump?	Y / (N) not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

(Hot air circulation)	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	(Fuel Oil)	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	(Basement)	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	(Window units)	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	t.v. room laundry
1st Floor	Kitchen bedroom
2nd Floor	
3rd Floor	
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage?	Y / (N)	
b. Does the garage have a separate heating unit?	Y / N / (NA)	
c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car)	Y / N / (NA)	Please specify_____
d. Has the building ever had a fire?	Y / (N)	When?_____
e. Is a kerosene or unvented gas space heater present?	Y (N)	Where?_____
f. Is there a workshop or hobby/craft area?	Y / N	Where & Type?_____
g. Is there smoking in the building?	Y (N)	How frequently?_____
h. Have cleaning products been used recently?	(Y) / N	When & Type?_____
i. Have cosmetic products been used recently?	(Y) / N	When & Type?_____

j. Has painting/staining been done in the last 6 months? (Y) / N Where & When? Wood floor Stain

k. Is there new carpet, drapes or other textiles? Y (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? Y / (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? (Y) / N If yes, where vented? _____

o. Is there a clothes dryer? Y (N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? Wood flooring

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N **Date of Installation:** _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	(Public Water)	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

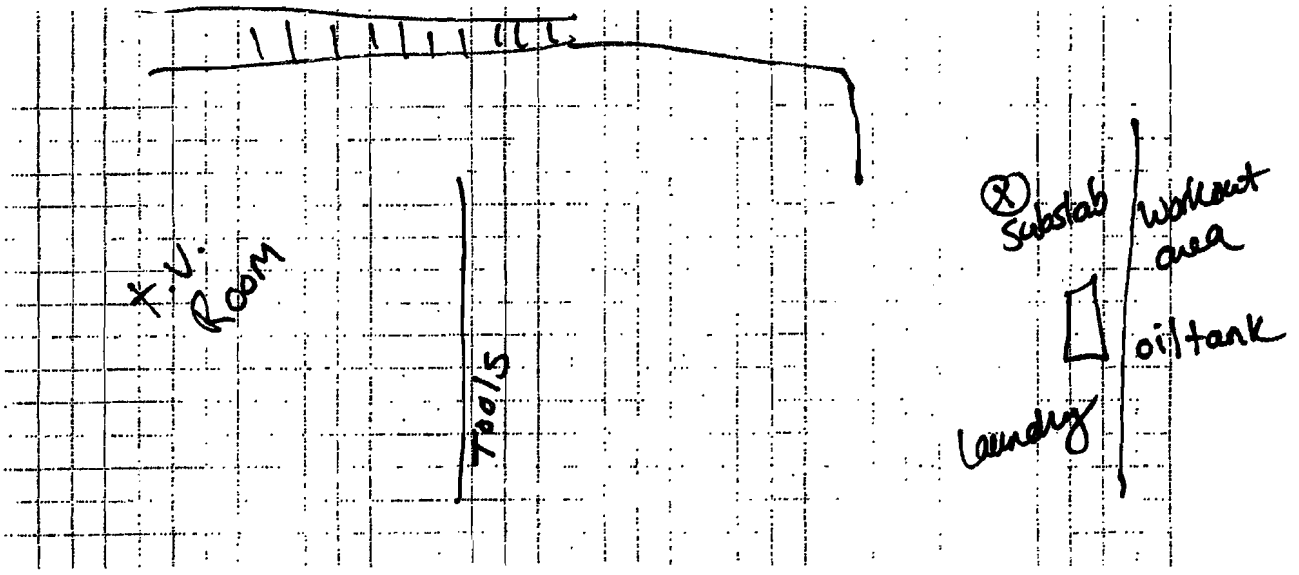
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

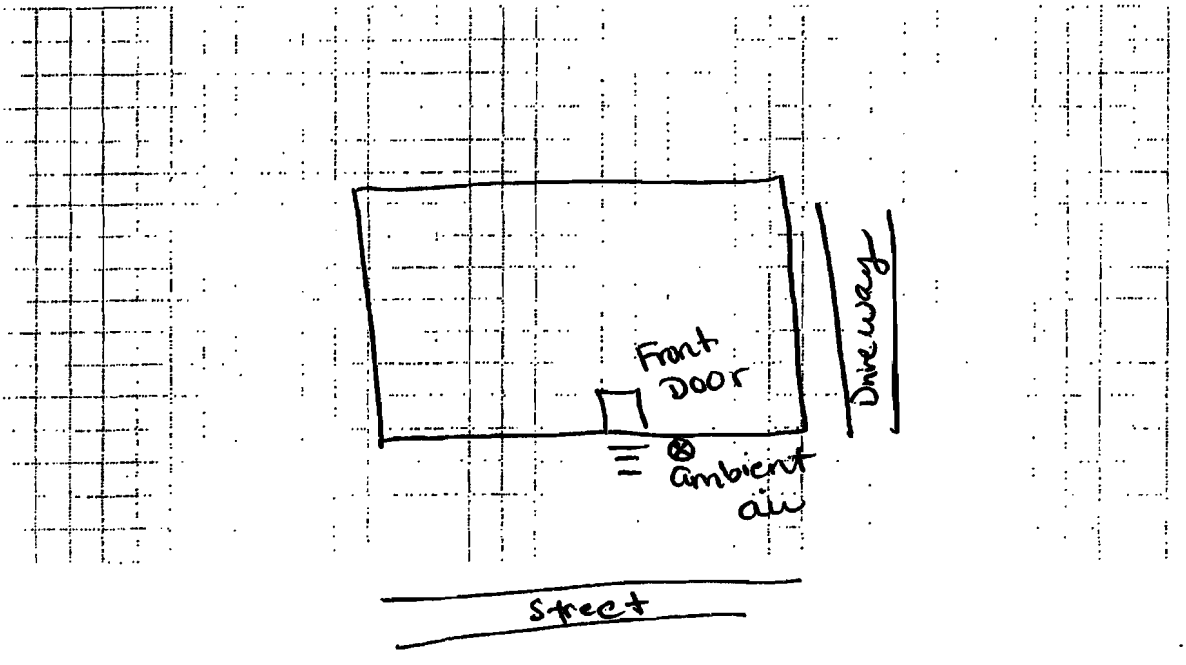
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



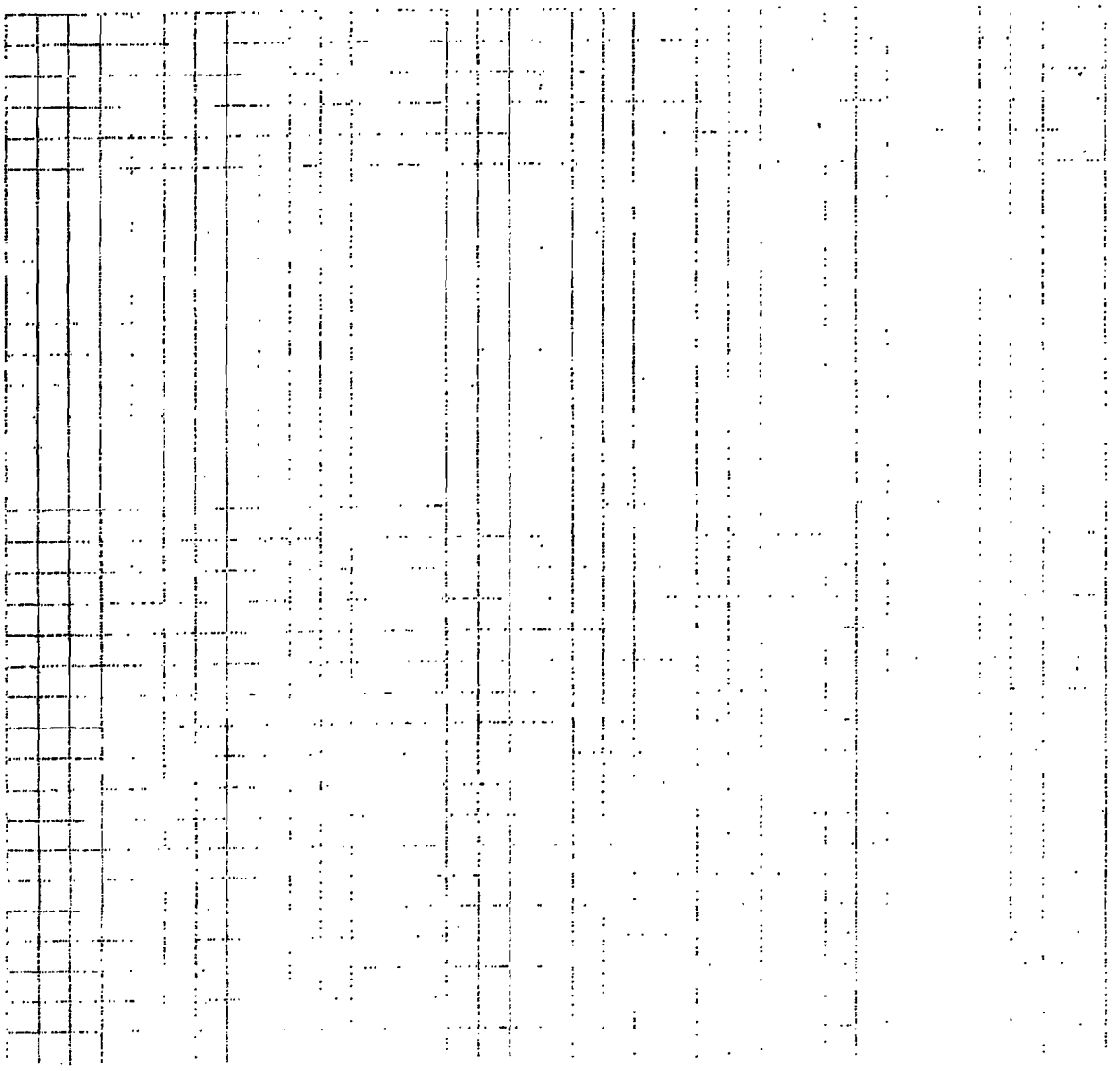
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	Paint					
	laundry detergent					
	finisher					
	bleach					
	latex cleaner					
	sealant					
	wood stain					
	Car wash fluid					
	pledge					
	wood glue					

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

R7

Last Name: _____ First Name: _____

Address: __ __ - - ____ ____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

(Residential)	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

(Ranch)	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 2 Building age_____

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with Carpet 97%	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____ **(feet)**

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: oil

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	laundry, work station
1st Floor	bedroom & kitchen
2nd Floor	
3rd Floor	
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? (Y) / N

b. Does the garage have a separate heating unit? Y / (N) / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) / N / NA
Please specify_____

d. Has the building ever had a fire? Y / (N) When?_____

e. Is a kerosene or unvented gas space heater present? Y (N) Where?_____

f. Is there a workshop or hobby/craft area? (Y) / N Where & Type? _____

g. Is there smoking in the building? Y (N) How frequently? _____

h. Have cleaning products been used recently? (Y) / N When & Type? _____

i. Have cosmetic products been used recently? (Y) / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / (N) Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? (Y) / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / (N) If yes, where vented? _____

o. Is there a clothes dryer? (Y) / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? (Y) / N When & Type? Dursban

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) (No)
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	(Public Water)	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

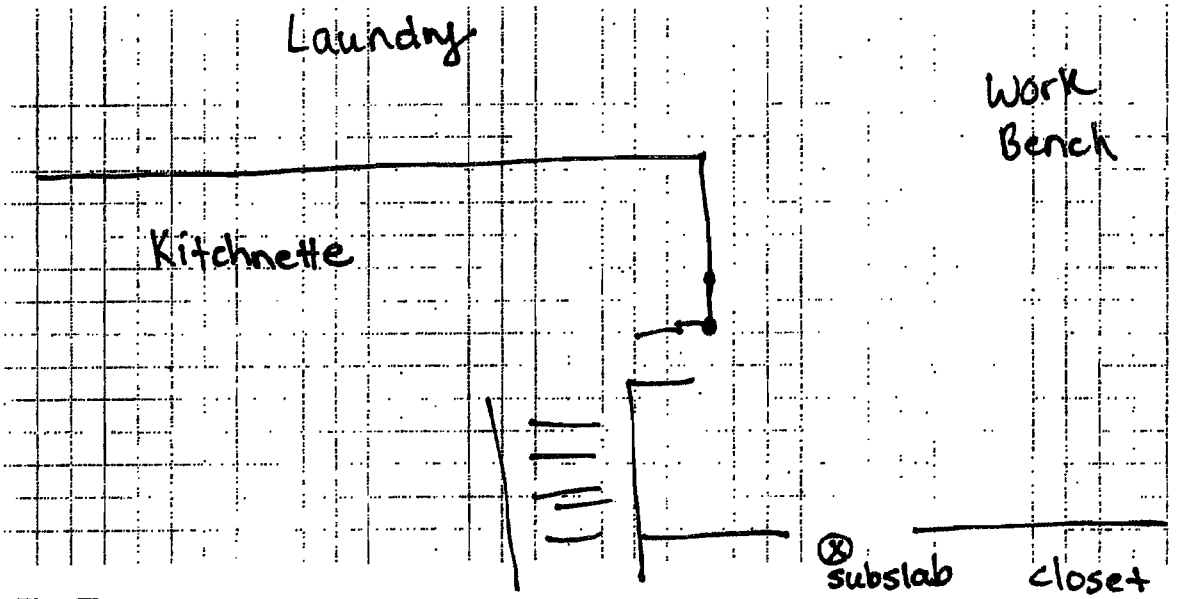
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

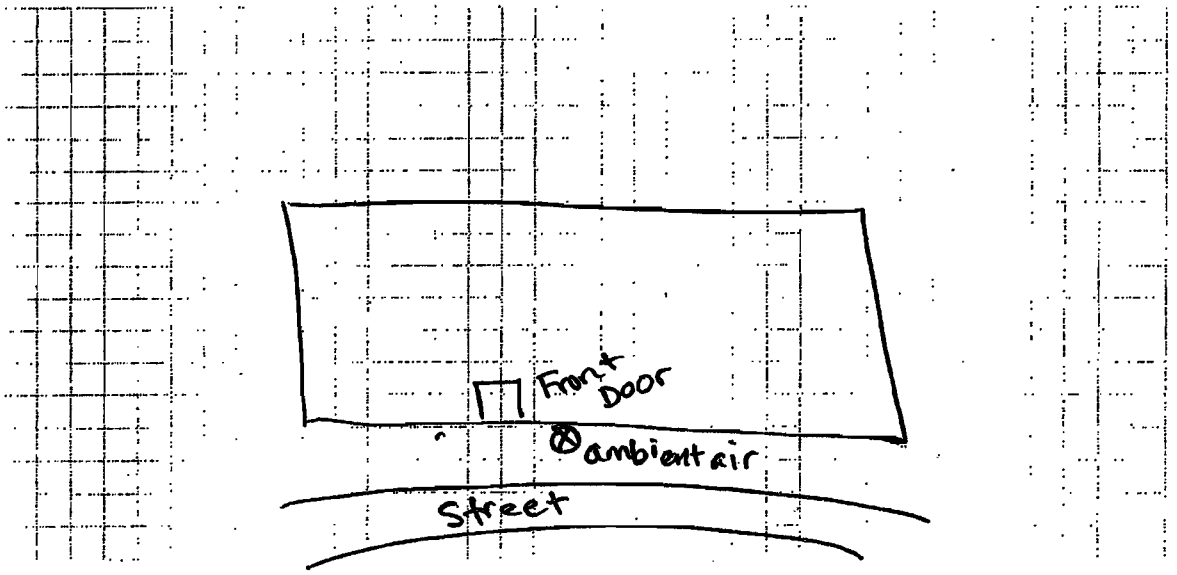
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



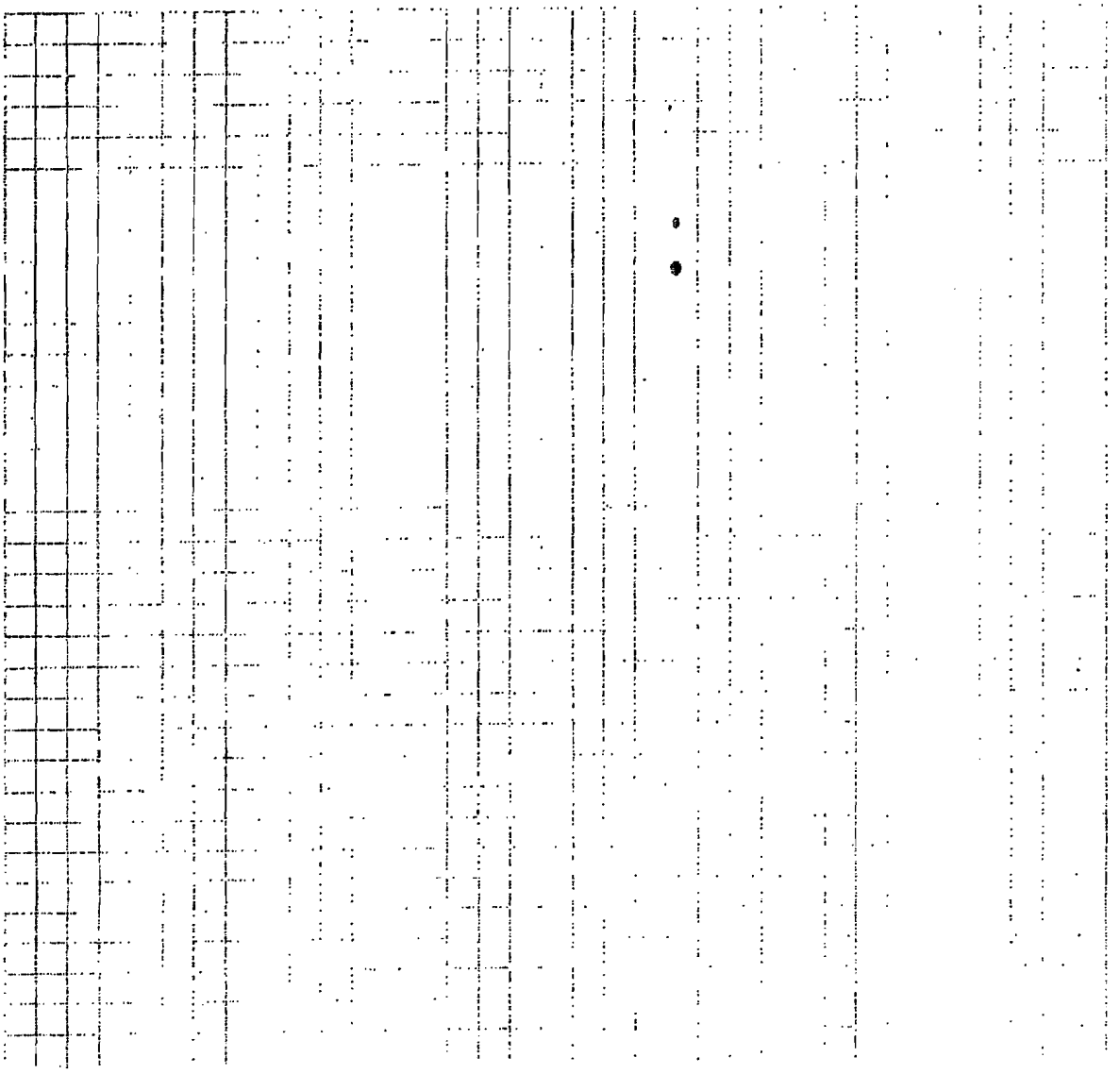
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	gloss					
	stains & seals					
	drain opener					
	grout					
	leak ender 2000					
	chrome polish					

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR - 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

R8

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

(Residential)	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

(Ranch)	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors bsmt, 1st Fl. (2) Building age @ 1958

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. **AIRFLOW**

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with tile carpet 95%
e. Concrete floor:	unsealed	sealed	sealed with _____
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished
j. Sump present?	Y (N)			
k. Water in sump?	Y (N) not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

drywell cemented shut

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	laundry tv room
1st Floor	Kitchen bedroom
2nd Floor	
3rd Floor	
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage?	Y / (N)	3rd Bedroom
b. Does the garage have a separate heating unit?	Y / N / (NA)	
c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car)	Y / N / (NA)	Please specify_____
d. Has the building ever had a fire?	Y / (N)	When?_____
e. Is a kerosene or unvented gas space heater present?	Y / (N)	Where?_____
f. Is there a workshop or hobby/craft area?	(Y) / N	Where & Type? Bsmt
g. Is there smoking in the building?	Y / (N)	How frequently?_____
h. Have cleaning products been used recently?	(Y) / N	When & Type?_____
i. Have cosmetic products been used recently?	(Y) / N	When & Type?_____

j. Has painting/staining been done in the last 6 months? (Y) N Where & When? Bsmt

k. Is there new carpet, drapes or other textiles? Y (N) Where & When? _____

l. Have air fresheners been used recently? (Y) N When & Type? _____

m. Is there a kitchen exhaust fan? Y (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? (Y) / N If yes, where vented? _____

o. Is there a clothes dryer? (Y) / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y (N) **Date of Installation:** _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	(Public Water)	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

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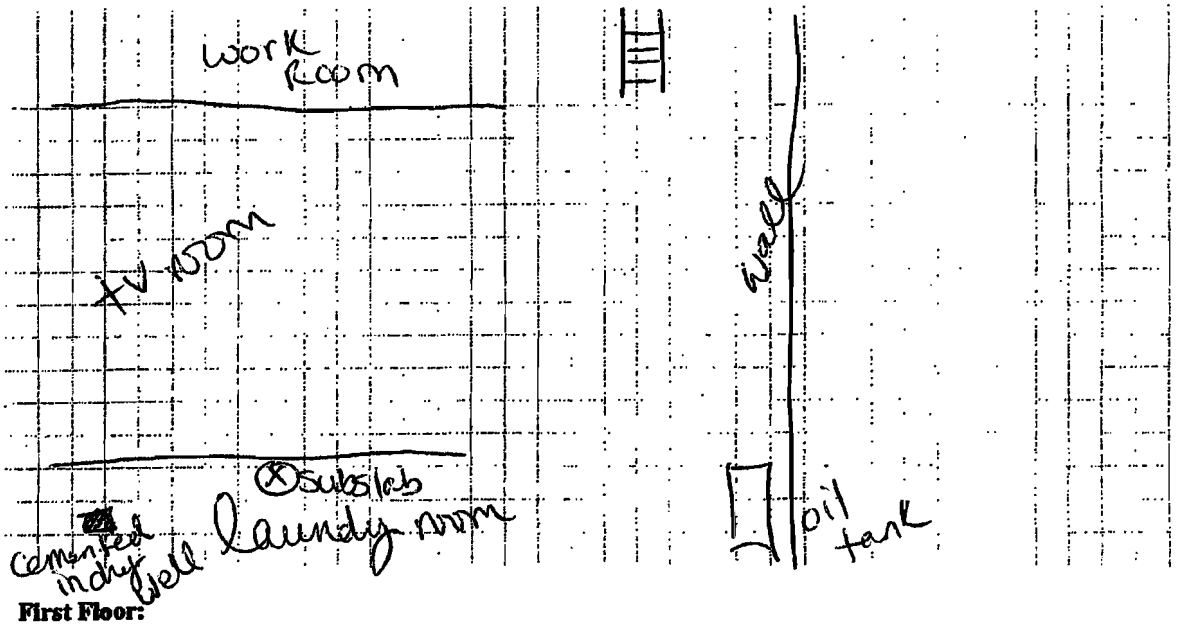
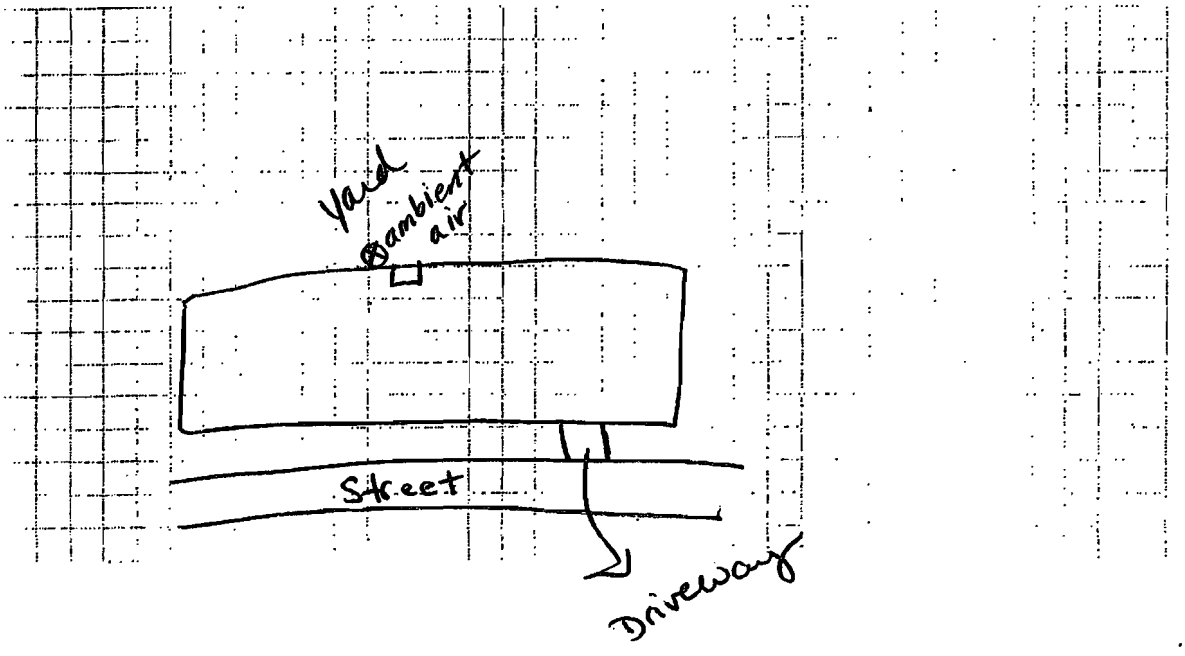
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



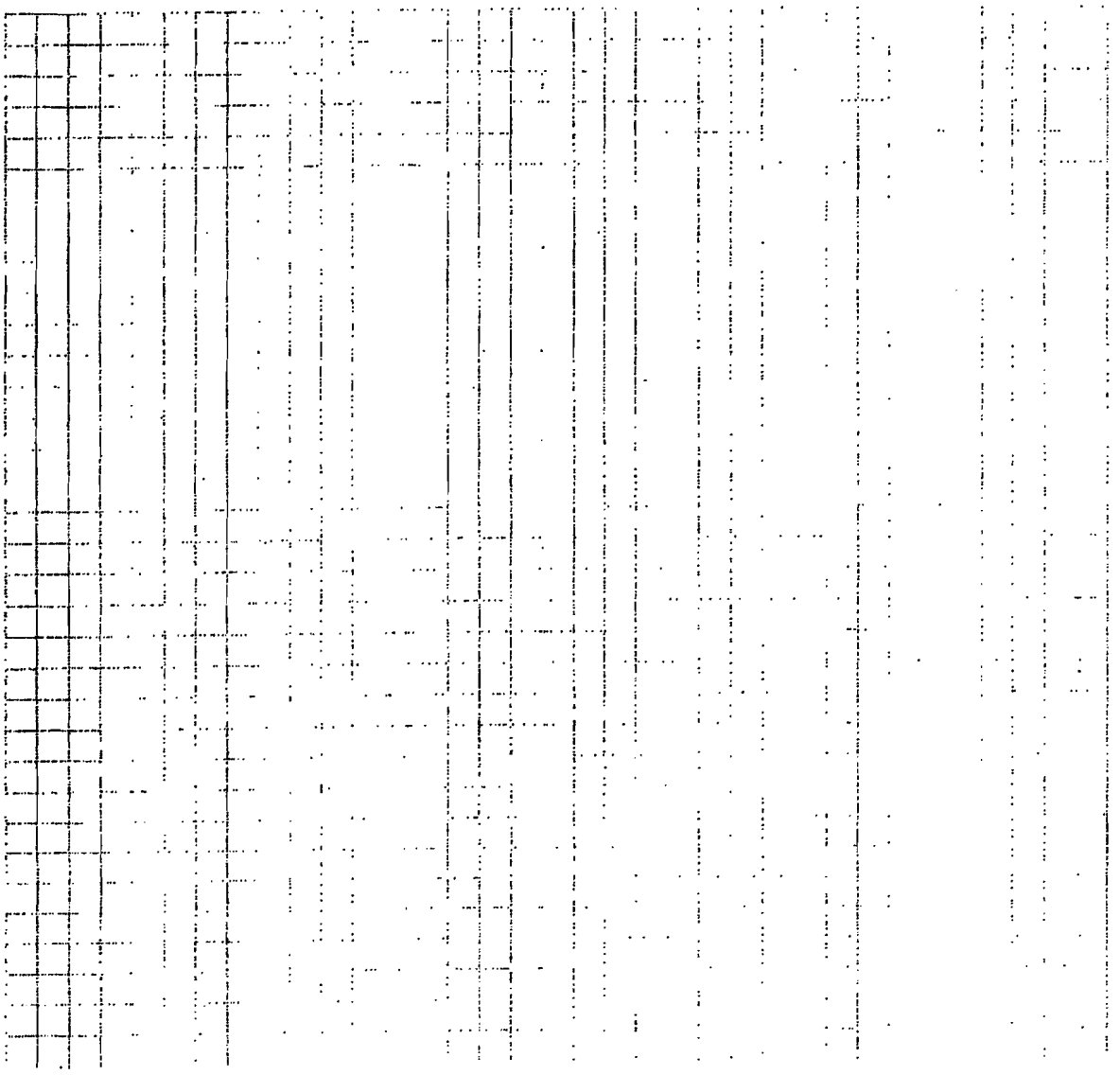
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
	Oxy clean					
	bleach					
	laundry detergent					
	Softener					
	Dust Buster					
	Enamel					
	Paint					
	Brake fluid					
	5W-30					
	10W-30					
	antifreeze					
	Joint Compd					
	Spot Remover					

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ ___ First Name: _____

Address: _____ _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

(Residential) School Commercial/Multi-use
Industrial Church Other: _____

R10

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	(Colonial)
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 3 w/ basement Building age 1952

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with Carpet & tile	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable	taken out		

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / (N)

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	family room Storage
1st Floor	Kitchen living room bedroom
2nd Floor	" " "
3rd Floor	
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / (N)

b. Does the garage have a separate heating unit? Y / N / (NA)

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / (NA) Please specify_____

d. Has the building ever had a fire? Y (N) When?_____

e. Is a kerosene or unvented gas space heater present? Y (N) Where?_____

f. Is there a workshop or hobby/craft area? (Y) N Where & Type?_____

g. Is there smoking in the building? Y (N) How frequently?_____

h. Have cleaning products been used recently? (Y) N When & Type?_____

i. Have cosmetic products been used recently? (Y) N When & Type?_____

j. Has painting/staining been done in the last 6 months? (Y) / N Where & When? upstairs

k. Is there new carpet, drapes or other textiles? (Y) / N Where & When? upstairs

l. Have air fresheners been used recently? (Y) / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? (Y) / N If yes, where vented? _____

o. Is there a clothes dryer? (Y) / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? adhesives - carpet store

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) — No
Yes, use dry-cleaning infrequently (monthly or less) — Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / (N) **Date of Installation:** _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	~~Public Water~~	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

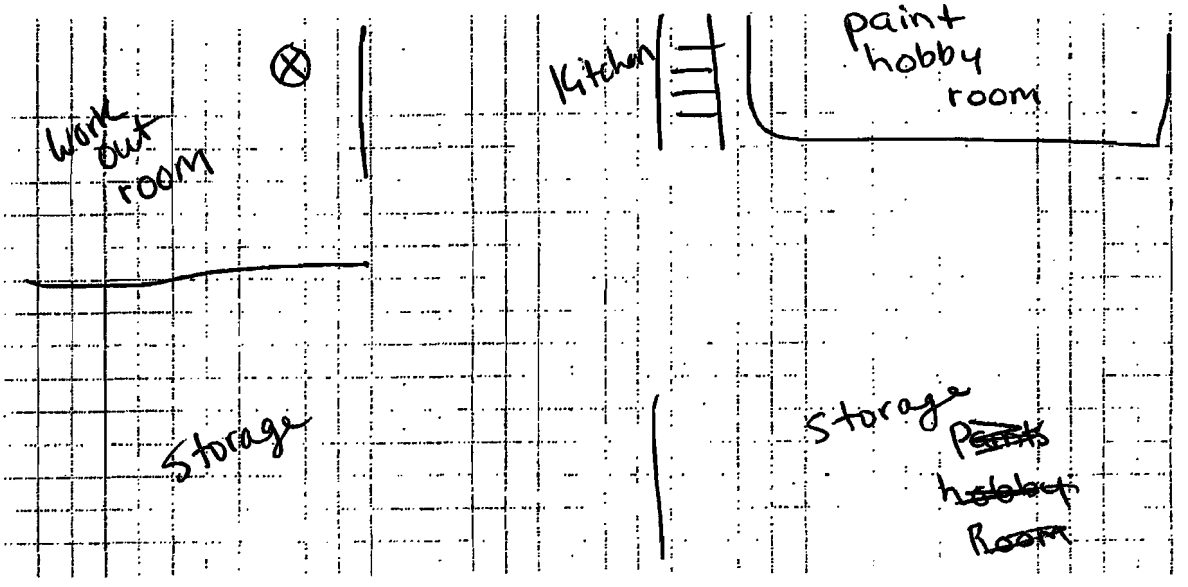
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

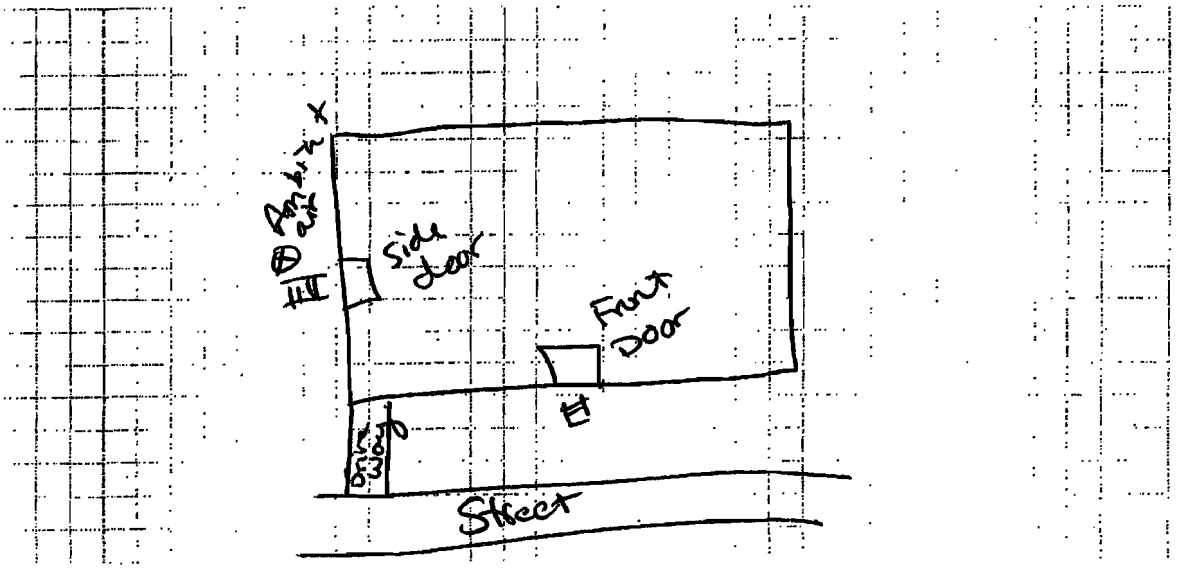
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



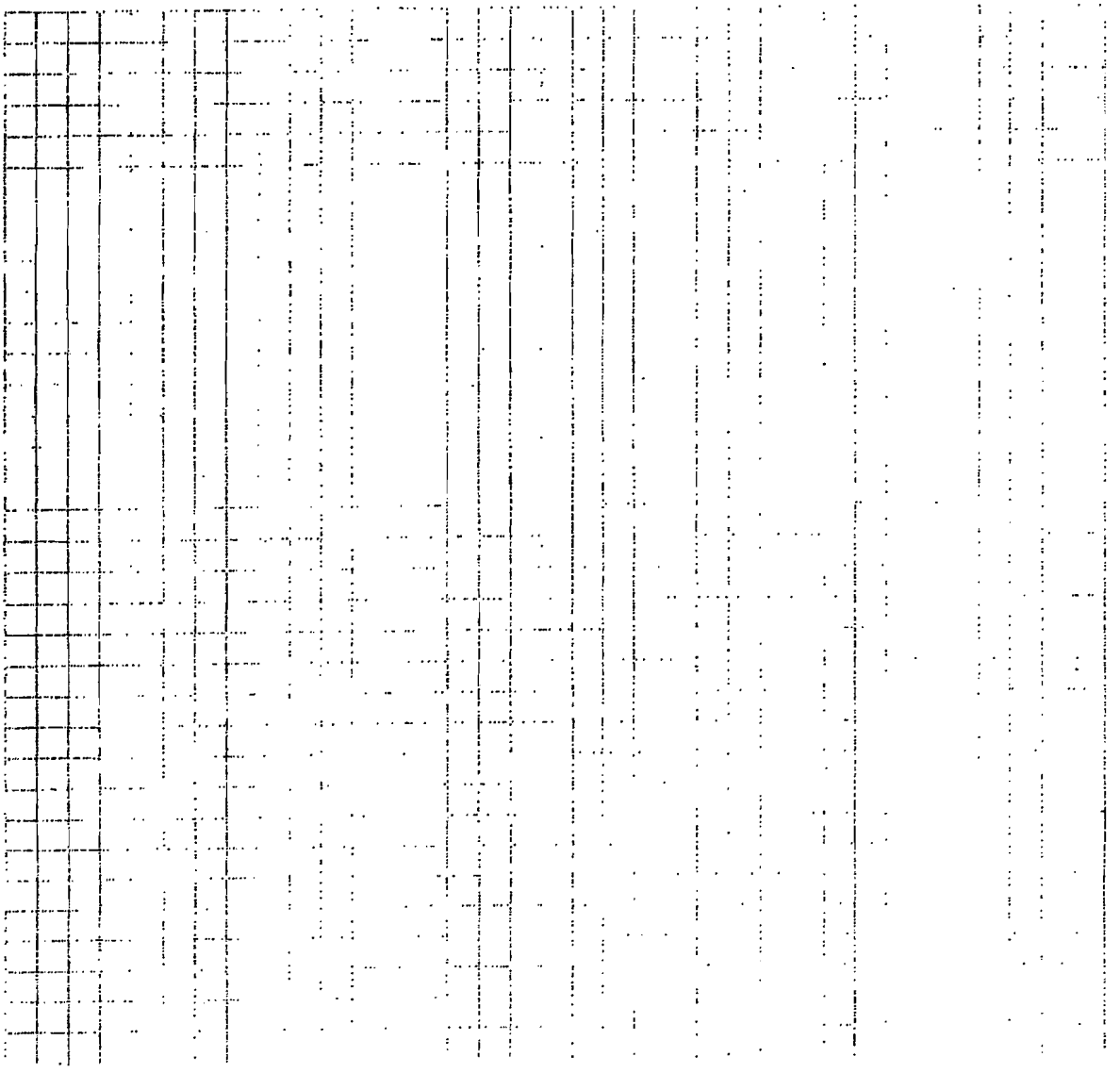
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	Paint					
	Carpet protector					
	degreaser					
	stain remover					
	Rust remover					
	Oxi-clean					

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: (Y) / N

Last Name: _____First Name: _____

Address: _____

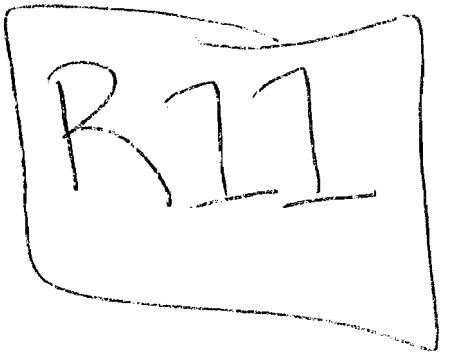
County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

(Residential) School Commercial/Multi-use
Industrial Church Other: _____



If the property is residential, type? (Circle appropriate response)

(Ranch)	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? 2 fl.

If the property is commercial, type?

Business Type(s) N

Does it include residences (i.e., multi-use)? Y / N If yes, how many?_____

Other characteristics:

Number of floors 2 (bsmt + FF) Building age 1952

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. **AIRFLOW**

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors N/A

open drain in bsmt near wall and oil burner

Airflow near source

Outdoor air infiltration

Infiltration into air ducts

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	(concrete)	stone	brick
b. Basement type:	(full)	crawlspace	(slab)	other _____
c. Basement floor:	(concrete)	dirt	stone	other _____
d. Basement floor:	uncovered	covered	(covered with carpet 95%)	
e. Concrete floor:	(unsealed)	sealed	sealed with _____	
f. Foundation walls:	(poured)	block	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The basement is:	wet	damp	(dry)	moldy
i. The basement is:	finished	unfinished	(partially finished)	
j. Sump present?	(Y / N) floor drain			
k. Water in sump?	Y / (N) / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

floor drain see pg. 2

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

(Hot air circulation)	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	(Fuel Oil)	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: oil

Boiler/furnace located in:	(Basement)	Outdoors	Main Floor	Other_____
Air conditioning:	(Central Air)	Window units	Open Windows	None

Are there air distribution ducts present? Y / (N)

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	t.v. room
1st Floor	Kitchen / living rm. / 2 bedroom
2nd Floor	
3rd Floor	
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage?	(Y) N	
b. Does the garage have a separate heating unit?	Y / (N) NA	
c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car)	Y / (N) NA	Please specify_____
d. Has the building ever had a fire?	Y / (N)	When?_____
e. Is a kerosene or unvented gas space heater present?	Y / (N)	Where?_____
f. Is there a workshop or hobby/craft area?	(Y) / N	Where & Type? Bsmt
g. Is there smoking in the building?	Y / (N)	How frequently?_____
h. Have cleaning products been used recently?	(Y) / N	When & Type? _____
i. Have cosmetic products been used recently?	(Y) / N	When & Type? _____

j. Has painting/staining been done in the last 6 months? (Y) / N Where & When? Week & half primer bsmt hallway

k. Is there new carpet, drapes or other textiles? Y / (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? (Y) / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? (Y) / N If yes, where vented? _____

o. Is there a clothes dryer? (Y) / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y (N) When & Type? _____

Are there odors in the building? Y (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / (N)
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) — No
Yes, use dry-cleaning infrequently (monthly or less) — Unknown
Yes, work at a dry-cleaning service — no dry cleaning

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	(Public Water)	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	(Public Sewer)	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

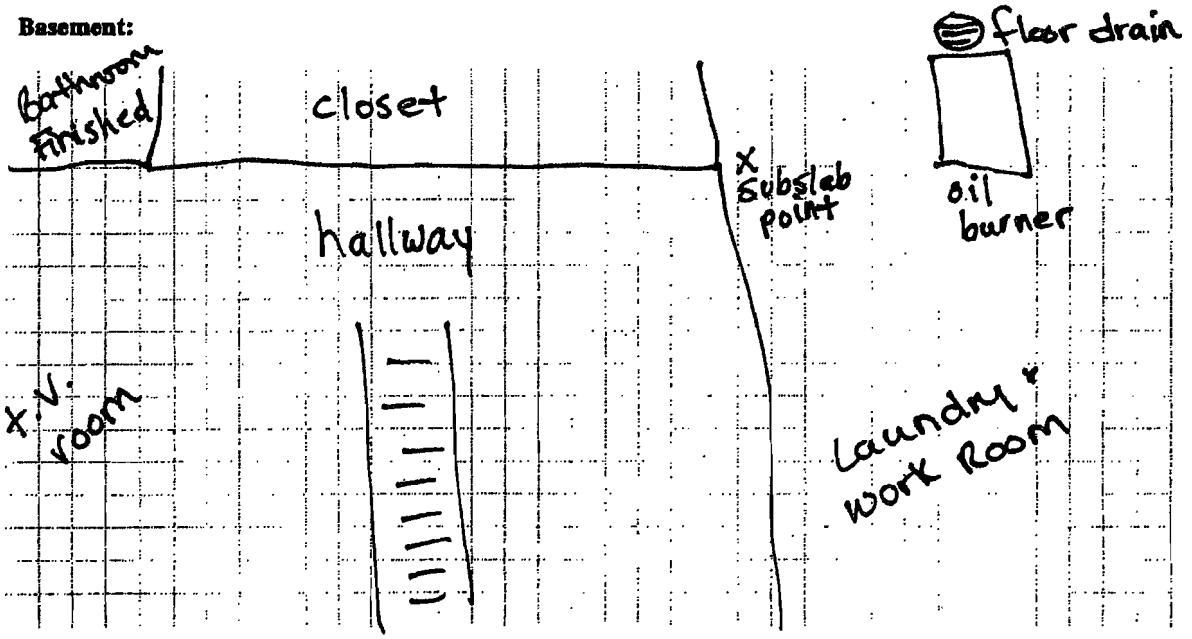
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

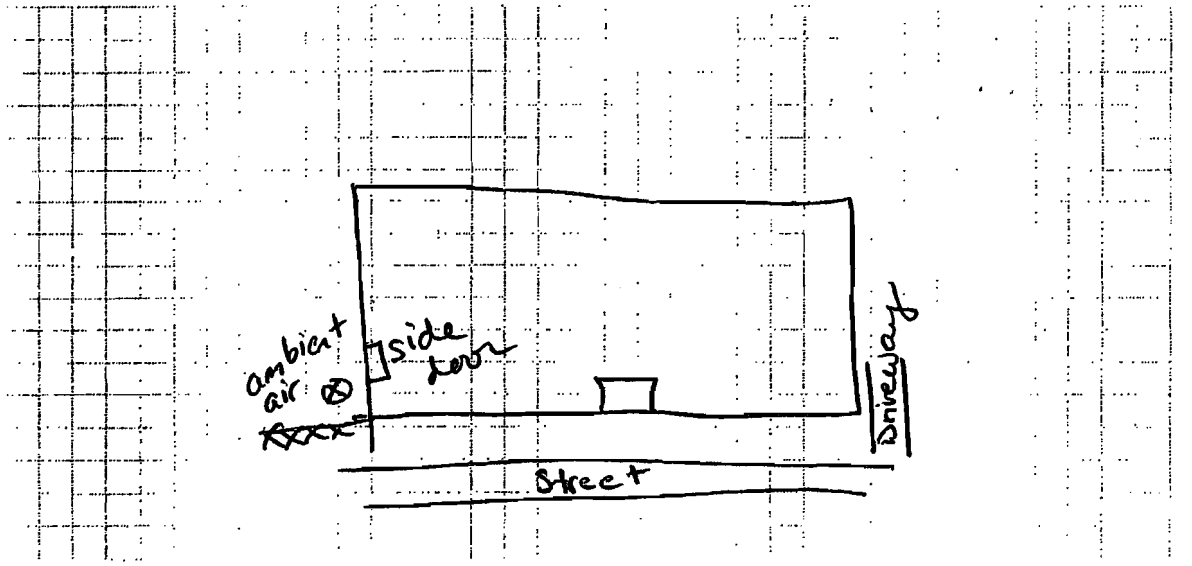
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



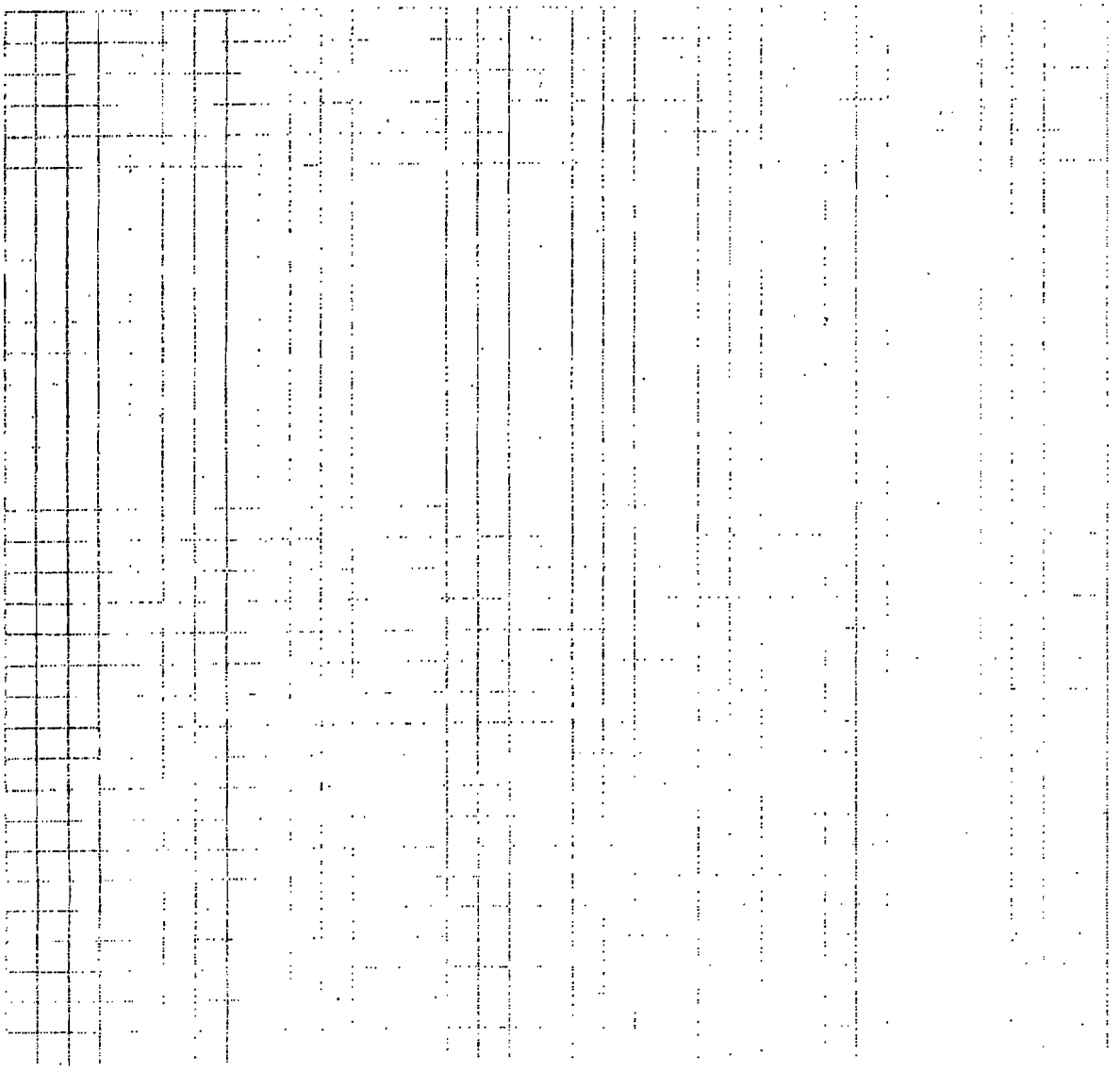
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	Elmer Glue		GOOD			
	Odor Neutralizer Spray					
	Farm + Implement		KRYLON			
	Grout + Tile Sealer					
	Rust-Protective	Enamel				
	Paints					
	Caulk					
	Joint Compound					
	Latex Enamel					
	Silicon Rubber	Sealant				
	Finish					
	Gorilla Glue					
	Clear Gloss					
	WD-40					
	Gray Concrete	Crack	Seal			
	Cleaner	Bathroom	Cabinet			

* Describe the condition of the product containers as **Unopened (UO), Used (U), or Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

R12

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
(Industrial)	Church	Other: Water Department Town of Hempstead

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other: One story building, Basement w/ multiple levels

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) Water Department

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 1 Building age ?

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	(concrete)	stone	brick
b. Basement type:	full	crawlspace	(slab)	other _____
c. Basement floor:	(concrete)	dirt	stone	other _____
d. Basement floor:	(uncovered)	covered	covered with _____	
e. Concrete floor:	unsealed	(sealed)	sealed with _____	
f. Foundation walls:	(poured)	block	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The basement is:	wet	damp	(dry)	moldy
i. The basement is:	finished	(unfinished)	partially finished	
j. Sump present?	(Y) N			
k. Water in sump?	(Y) N / not applicable			

→ wet in sumps

Basement/Lowest level depth below grade: 10 (feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

Sump & dry well

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

(Hot air circulation)	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	(Fuel Oil)	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	(Outdoors)	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	(None)

Are there air distribution ducts present? Y/(N)

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y/(N)

b. Does the garage have a separate heating unit? Y/(N)/NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y/(N)/NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y/(N) Where?_____

f. Is there a workshop or hobby/craft area? Y/(N) Where & Type? Chlorine 260 gall drums in adjoining bldg area

g. Is there smoking in the building? Y/(N) How frequently?_____

h. Have cleaning products been used recently? Y/(N) When & Type?_____

i. Have cosmetic products been used recently? Y/(N) When & Type?_____

j. Has painting/staining been done in the last 6 months? Y (N) Where & When? _____

k. Is there new carpet, drapes or other textiles? Y (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? Y / (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / (N) If yes, where vented? _____

o. Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? generator room in bldg. w/ oil smell

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown NA
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: NA

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

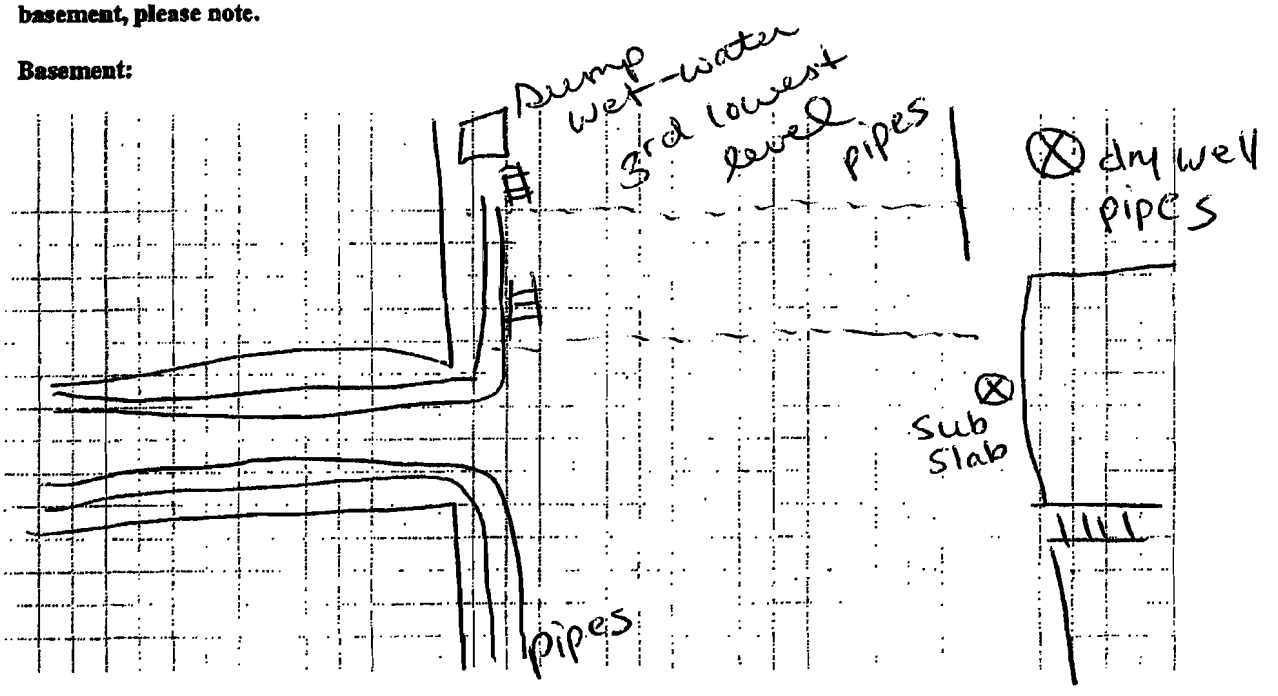
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

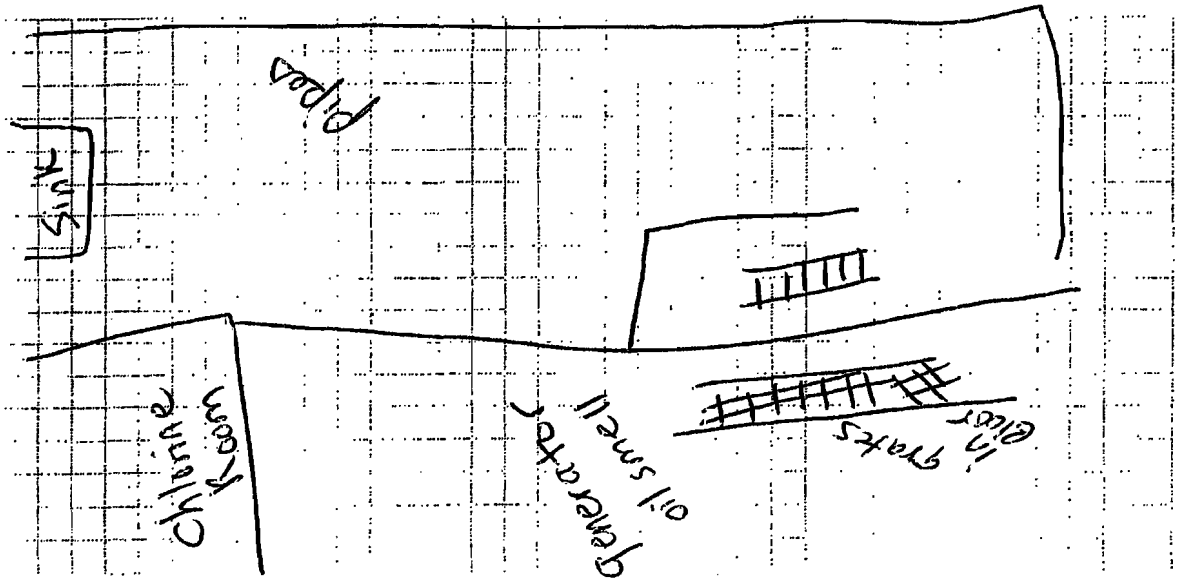
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



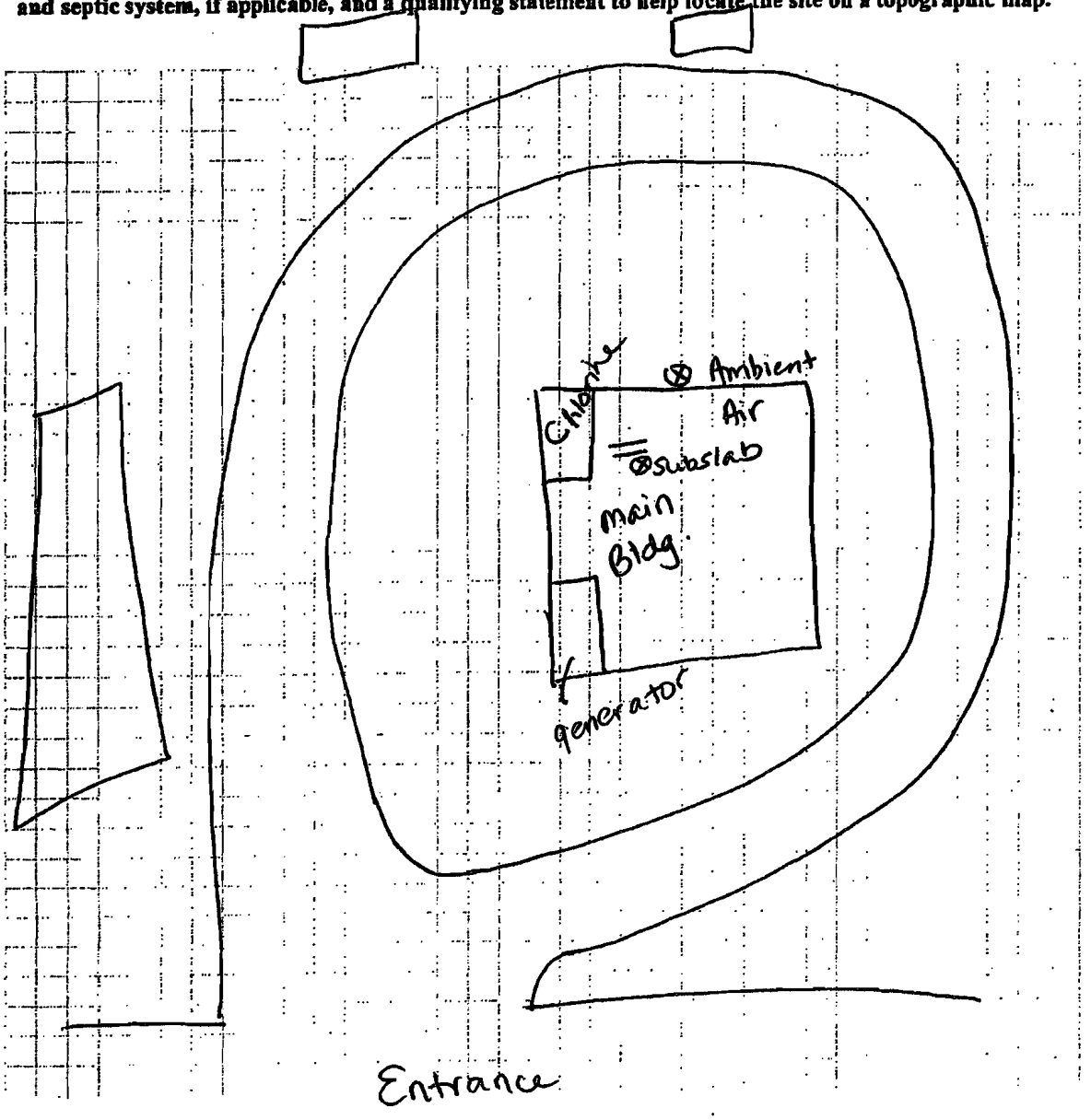
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	55 gallon drum with chlorine stored on first floor - smell chlorine In generator room smelled like oil, oil tank is located outside of the facility.					

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

R14

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

(Residential)	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	(Colonial)
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors 4 Building age 1950's

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with tile 90%	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y (N) not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

opening in floors along wall - see plot
sump (dry)

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	laundry / storage going to finish
1st Floor	living room / dining room / kitchen
2nd Floor	3rd bed 2 bath
3rd Floor	Den
4th Floor	

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? (Y) / N

b. Does the garage have a separate heating unit? Y / (N) / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) / N / NA
Please specify_____

d. Has the building ever had a fire? Y / (N) When?_____

e. Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

f. Is there a workshop or hobby/craft area? Y / (N) Where & Type? _____

g. Is there smoking in the building? Y / (N) How frequently? _____

h. Have cleaning products been used recently? (Y) / N When & Type? _____

i. Have cosmetic products been used recently? (Y) / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

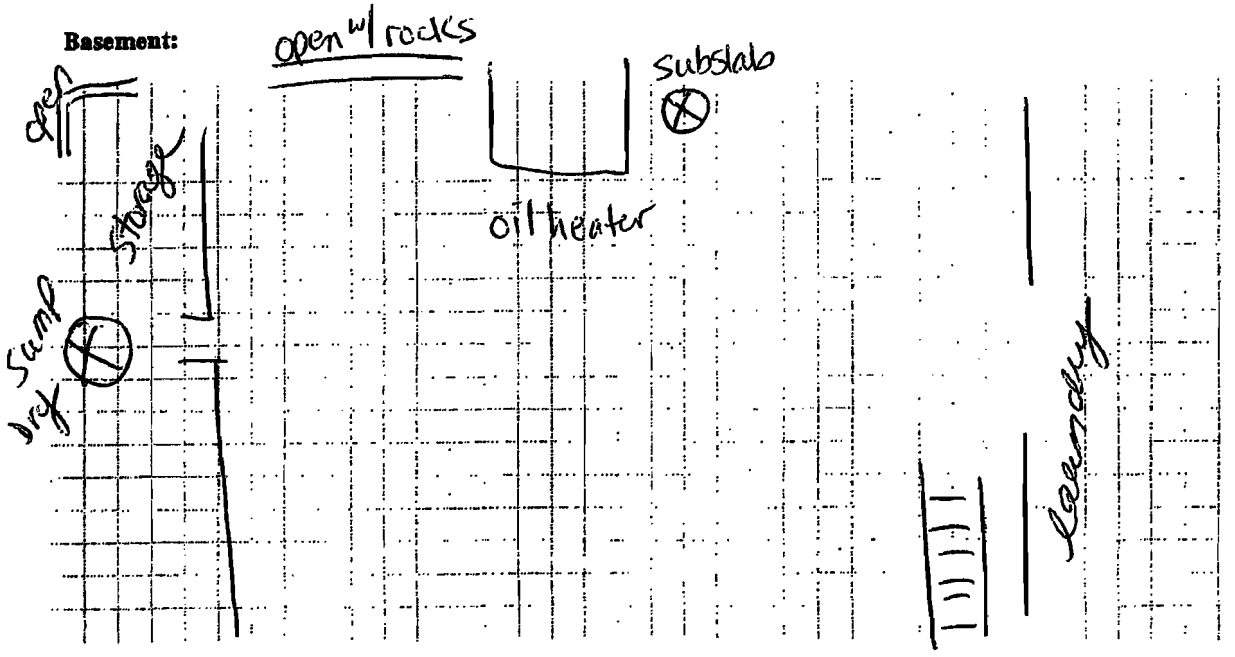
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

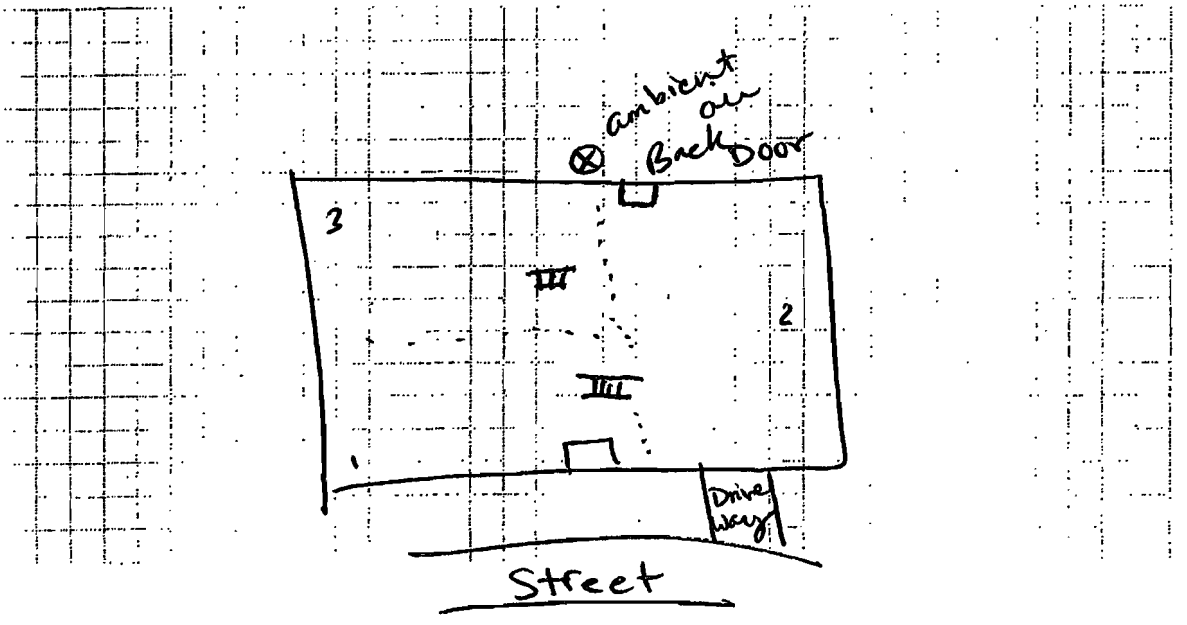
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



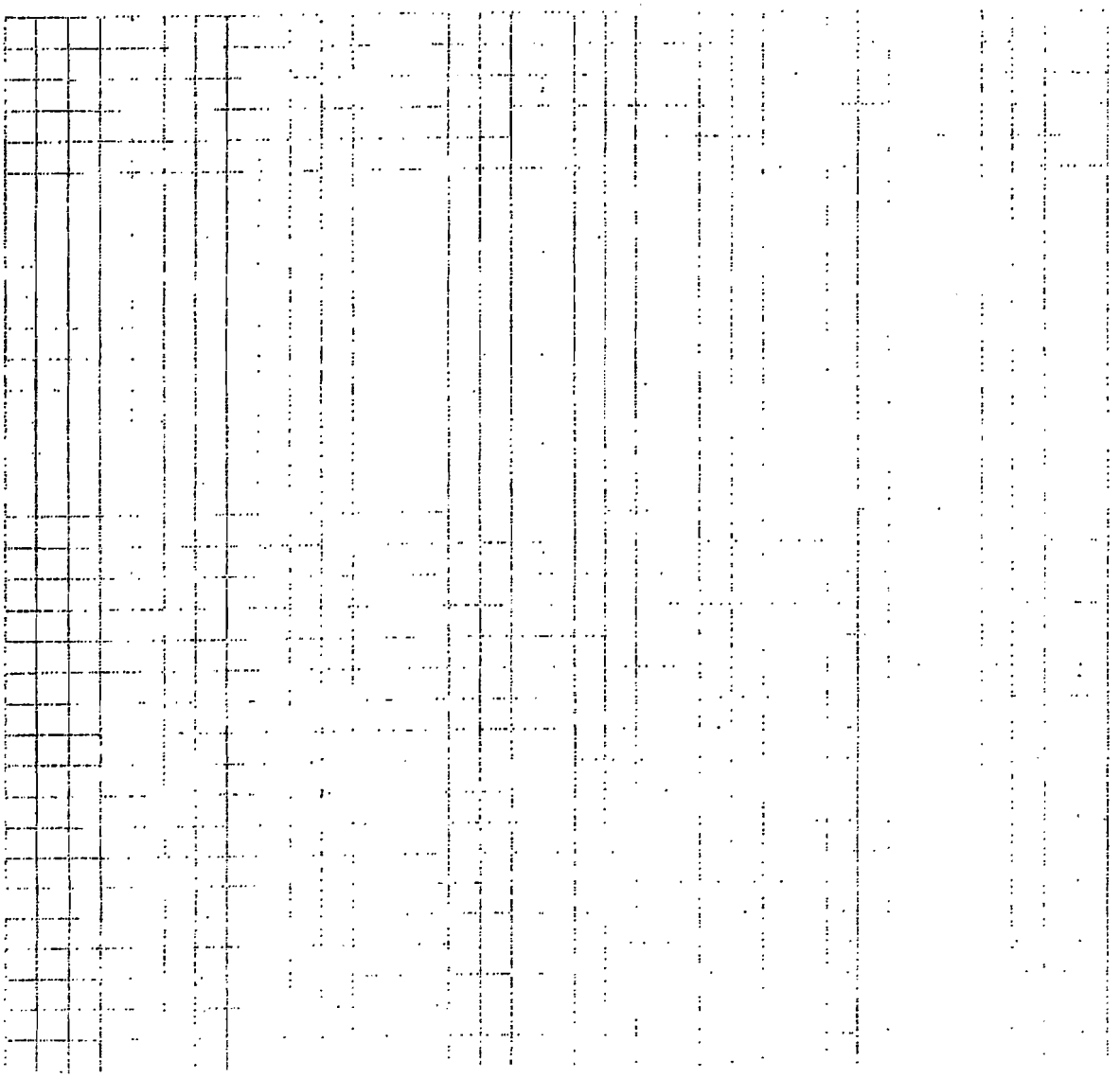
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N
	Water proofing wood					
	Latex paint					
	wood finish					
	primer / sealer					
	wood dough					
	wall paper stripper					
	Crayola paint					
	thin-set mortar					
	bleach					
	laundry detergent					
	softner					
	Silicon spray	lubricant				

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

APPENDIX D

FIELD INVESTIGATION LOGBOOK

3/3/09 New Cassel Residential Soil Vapor (mk)

8[30] Mel Koberle (MK) and Pat Connelly (PC) - CDM onsite - mobilizing, health & safety, calibrate multiRae: O_2: 20.9 CO: 48 ppm CH_4: (LEL): 49 ppm H_2S: 25 ppm isobutylene: 100 ppm SN# meter: 074016 Fire 5 gas Lot # 008738 11/17/09 expiration isobutylene: 100 ppm Lot # 829401D Expiration Oct. 20, 2010 ~ PASS mk

9[00] Crew arrive at 2570 Aster Place [R11]
Installed sub-slab port, collect 1A, SB, AA samples. See log for canister + flow meter + ID #'s. VOC - 0.7 ppm

958	NCIA4-R11	#SB-030309	sub slab
958	NCIA4-R11	BA-030309	Bsmt indoor air
100[03]	NCIA4-R11	AA-030309	ambient air

initial pressures see log — mek
Also completed NYSDOH survey
10[12] Crew leaves R11 — mek
to go get batteries for camera.
1042 Crew at 2536 Aster Place South [R7]

11[22]	NCIA4-R7	SB-030309	
	NCIA4-R7	BA-030309	
11[27]	NCIA4-R7	AA-030309	

See log for canister / flow # VOC 13 ppm
— mek 3.3.09

3/3/09 New Cassel Residential Soil Vapor (mk) 7

Also completed NYSDOH Questionaire and took pictures — mek →
11[35] Crew drove to 9 out facility on Iris Place. Water Dpt owned. No one there at facility calling Water Dpt. (516) 794-8181 or 558-1900 Called and left information for the commissioner and set up an appointment tommorow for 8:15 am. Also called Patrick Pizo Director of Facilities of the school and left message with Sandy the Secretary — mek
1157 At 8 Barrington St. Knocking on door Made an appointment for 13[00] on thursday
12[03] Resident does not speak english a friend was there who I explained the situation too, still resident wants someone who can speak english for 11 Dayton St. — mek
12[09] At 9 Elton St. talked to tenant and got landlord # 516-263-1879 Contact: Luis — mek
Called Luis and gave him info. on Sampling - Luis is going to call landlord and call me back
3/3/09
— mek

12[24] Went to 2583 Hyacinth st dropped off letter - no one home
12[33] Went to 926 Westbury - not home - nanny was home. Family gets home @ 7pm. Going to come back this evening
13[30] Crew at 35 Carelton Street R1
14[12] NCIA4-R1 SB-030309
NCIA4-R1 BA-030309
14[16] NCIA4-R1 AA-030309
See log for canister 1 flow#. VOC 89.2 ppm 89.2 ppm — mel
14[30] Talked to Sandy, got approval for sampling at school. Talked to Dan Head Custodian scheduled for next week wednesday / thursday —
15[30] Crew will run errands, check in hotel, check e-mail, call lab, update residential schedule for PM.
19[30] At 2516 Rose Place R8
19[32] NCIA4-R8 SB-030309
NCIA4-R8BA-030309 VOC 1.5 ppm
19 NCIA4-R8AA-030309
Completed ~~NCDOH~~ Questionaire and took NYSDOH pictures
— Mel 3/3/09

9[30] Crew mobilizing - calibrating MultiRae: see pg. 6 for SN# & Lot#
VOC (Isobutylene): 100ppm LEL: 49ppm
H_2S: 25ppm O_2: 20.9 CO: 50 ppm
10[00] At R11 picking up canisters
10[07] Closed SB & BA canisters VOC 7.6 ppm / See log for pressure readings
10[20] Closed AA canister — mel
10[30] Crew going to Staples for sample packing material —
11[20] At R7 picking up canisters VOC 133 ppm
11[45] Went to 926 Westbury Drive R3 to drop off letter. Gave to man in house who claims he does not live there — mel
Crew packing samples, checking e-mails, and lunch —
14[15] Went to R1 pick up canisters see log for pressure readings & info.
14[20] Closed SB/BA canisters VOC -
14[30] Closed AA canister
15[00] Mel Koberle offsite. Pat Comelly Staying to collect canister at R8
@ 1960 — mel 3/4/09
— Mel

10 New Cassel Residential
8/4/09 Soil Vapor (mk)

Recap: (mk)
1939 Collected SB & BA canisters at R8 | 1948 Collected AA. See log sheet for pressures and equipment #s
Note: Could not get end VOC reading since mini Rae lamp was out - MK going to call pine

mk

3/4/09

11 New Cassel Residential
8/5/09 Soil Vapor (mk)

810 Crew met in hotel parking lot - mobilizing - Calibrate miniRae: H_2S: 24 ppm CO: 49 ppm O_2: 20.9 LEL: 49 ppm VOC (isobutylene): pg. 6 for SN # Lot # — mk
830 At 26 B4 Hyacinth R14
923 NCIA4-R14SB-030509
NCIA4-R14BA-030509
926 NCIA4-R14AA-030509
See log for canister/flow# & pressure. VOC reading was 1.0 ppm. Residence had sump (dry) and open areas along wall see NYSDOH Questionaire
940 Crew heads to Fed Ex to drop off canister samples and pick up more
1000 Jackyelyn Neelan NYSDOH called Andrew Umreiko R16 not available for today's appointment at 11am. Not available till after March 22nd.
1020 Crew going to 8 Barrington St to see if we can sample before 1300 since our 1100 canceled. - Don't have phone number for the 8 Barrington — mk

mk 3/5/09

New Cassel Residential

3/5/09 Soil Vapor (mel)

- Resident at 8 Barrington not home going to have to wait till 13[00] when Crew scheduled appointment 13[00] Went to 8 Barrington. The woman's (person who answered door on tuesday) Son answered door and was not aware of appointment. I explained to him the situation. He went inside/ came out said his brother told him it was already done- I explained it wasn't since I'm the only person doing the sampling. He said he would have to call back is brother-so I gave him the CDM letter and told him to call me if he wanted to participate.
13[30] Crew heading out.

mell

3/5/09

New Cassel Residential (mel)

3/6/09 Soil Vapor

8[20] Crew onsite - mobilizing - calibrate mini-Rae: see pg. 6 for SN. Lot #'s CO - 49 H_2S - 250 LEL - 50 O_2 - 20.9 Isobutylene - 97.2ppm
9[15] At [R14] picking up canisters
9[18] Collect AA canister — mel
9[23] Collect SB & BA canisters VOC - 357ppm. See log for pressure numbers & canister/flow number
9[35] Crew to FedEx to ship samples and pickup canisters — mel
10[30] Crew offsite - no other appointments today due to two cancellations yesterday

mell

3/6/09

1 14

New Cassel Residential

3/9/09 Soil Vapor (MB)

- 830 Crew onsite: MK & PC.
Calibrating mini-Rae, see pg. 6
SN & Cal #'s. CO - 49 LEL - 50
O_2 - 20.9 H_2S - 25 Isobutylene: 100 ppm
- mobilizing for the day
841 Heading over to 2571 Foster R9
900 R9 does not have basement - only crawl space - opening in front of house - all dirt - no slab - going to leave a canister inside crawl space - take picture also collect one outside crawl space
Residence is home for mental health patients and/or halfway house.
1050 Head over to Iris Place Water Department Facility R
of the Town of Hempstead
waiting for personnel to open gate (facility made an appointment last week
1106 Called water department for access
1122 Dpt of water personnel onsite - open facility Dave onsite. 1st drilled in smaller bldg. onsite. - slab was too thick. Then drilled in large, main building - got through slab - installed port - collected duplicate

New Cassel Residential

3/9/09 Soil Vapor (MB)

Strong chlorine odor and oil smell in generator room in building on main floor - see NYSDOH questionaire
1223 NCIA4-R12SB-030909
DUP - NCIA4-R12SBD-030909
1225 NCIA4-R12BA-030909
DUP NCIA4-R12BAD-030909
1232 NCIA4-R12AA-030909
DUP NCIA4-R12AAD-030909
See log for pressure, canister, flow # details. VOC - 0.1 ppm
1300 At 1093 Iris Place R10
Note R9 canister samples:
915 NCIA4-R9BA-030909 in crawl space
NCIA4-R9AA-030909 outdoor
Back to R10 — MB
1335 NCIA4-R10BA-030909
1342 NCIA4-R10AA-030909
1335 NCIA4-R10SB-030909
See log for pressure & canister / flow #
VOC reading after purge: 0.1 ppm
1345 Crew leaving R10
Crew reorganizing car, do inventory.
go to FedEx, call lab — MB
1450 Crew off site 3/9/09

16 New Cassel Residential (MW)
3/10/09 Soil Vapor sampling

8:30 Crew MK + PC onsite
mobilizing - calibrating mini/Multi Rae
pg. 6 for details: CO - 50 H_2S - 25
O_2 - 20.9 LEL - 50 Isobutylene - 99.3 ppm
9:15 Pickup AA + BA canisters at R9
crawl space. See log for pressure
readings / canister / flow #. VOC inside
crawl space - 4.7 ppm — mw
9:30 Crew has down time until pick
up at 12:15. Going to internet cafe to
Check e-mail + reorganize — mw
11:45 Called Water Dpt. to meet us at
facility at around noonish
12:08 At facility - Dave opened gate
12:32 & 8 Pickup SB dup SBD, BA and
dup BAD canisters End VOC 1.6 ppm
Ambient VOC was 2.1 ppm. Located
below generator room - oil odor
12:32 Pickup AA and dup AAD canister
look at log for pressure, canister, + flow
numbers + readings — mw
13:20 At R10 canister pick up
13:35 Pickup SB + BA Canisters
End VOC - 13.7 ppm

3/10/09

New Cassel Residential (MW) 17
3/10/09 Soil Vapor

13:42 Pickup AA Canister
See log for pressure, canister /
flow #'s + readings
13:45 Crew to FedEx to drop off
samples + pick up flowmeters
14:30 Crew leaving site

mw
3/10/09

8[00] Crew MK + PC onsite - mobilizing
Calibrate PID/MultiRae - pg to esc SN,
Lot, + calibration info: CO-50 LEL-49
H_2S-24 O_2-20.9 Isobutylene-103
8[28] Crew at [WC] W.T. Clark Highschool
at 740 Edgewood Drive. Joe Jones of
NYSDEC onsite as well. Going to office
to page the head custodian Dan.
9[00] Finished drilling [SB1] - in basement
under reading lab and rooms 210/211) VOC-0
208/209) in hallway. Adjoining hallways
are cement with dirt - took pictures
9[15] Took inventory and pictures
9[25] Joe Jones NYSDEC offsite
10[00] Completeing [SB2] - in basement under
JR. library and JR. office VOC - 44.4 ppm
Took pictures and inventory -
10[11] At [SB3] drilling port adjacent to
exit doors outside hallway of ladies
locker room in basement VOC-0.0
Note: Joe Jones asked to look in O'Brien +
Gere's indoor air sampling report for hot spot
areas. The highest basement and 1st floor
hits were located in areas w/ sidewalk and

MK 3/11/09

dirt - cannot collect subslab here
Note: ladies locker room smells of perfume
10[42] At [SB3] setting up canisters +
purge three dead air volumes
10[47] NCIA4-WCSB3-031109 VOC-0.0 ppm
10[47] NCIA4-WCBA3-031109
see log for pressure / canister / flow #
11[00] At [SB2] setting up / purge VOC-0
10[05] NCIA4-WCSB2-031109
NCIA4-WCSBA2-031109
see log for pressure / canister / flow in/o.
11[10] At ~~SB1~~ [SB1] setting up / purge VOC-
11[16] NCIA4-WCSB1-031109
NCIA4-WCB1-031109
see log for pressure / canister / flow in/o. VOC
11[20] Setting up AA in courtyard
11[27] NCIA4-WCAA-031109
see log for pressure / canister / flow in/o.
11[30] Crew leaving school
12[00] Crew offsite

MK 3/11/09

New Carsel Residential

3/12/09 Soil Vapor (mk)

1000 MK + PC onsite - mobilizing

Calibrating MiniRae pg. 6 for Calibration

Lot # SN# CO-50 H_2S-25

LEL- 49 O_2-20.9 Isobutylene Span

Error. Tried shutting instrument off to recalibrate. Still have Span error Unable to record end VOC readings

1040 Crew at [WC]

1050 Collect [SB3] and [BA3] samples see log for pressure readings

1107 Collect [SB2] and [BA2] samples see log for pressure readings

1115 SB2 Rear fitting w/ tubing Cannot get out of port - needed to pull out port going to reinstall port when done collecting samples

1119 Collected [SB1] [BA1] samples see log for pressure readings

1125 Put in new [SB2] port

1136 Collected [AA] sample from Courtyard see log for pressure

1140 Packing up [WC]

1200 Crew leaving site to Edison Warehouse to demob 3/12/09

Mell

APPENDIX E

ANALYTICAL RESULTS SUMMARY TABLES

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R10AA-030909		NCIA4-R10BA-030909	
		sample_date:	03/09/2009		03/09/2009	
		sys_loc_code:	R10-AA		R10-BA	
cas_rn	chemical_name	result_unit				
71-55-6	1,1,1-Trichloroethane	µg/m3	0.73	U	16	
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	0.92	U	1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1	U	1.1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.73	U	0.8	U
75-34-3	1,1-Dichloroethane	µg/m3	0.54	U	0.59	U
75-35-4	1,1-Dichloroethene	µg/m3	0.53	U	0.58	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	5	U	5.4	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.66	U	7.4	
106-93-4	1,2-Dibromoethane	µg/m3	1	U	1.1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	0.94	U	1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.8	U	0.88	U
107-06-2	1,2-Dichloroethane	µg/m3	0.54	U	0.59	U
78-87-5	1,2-Dichloropropane	µg/m3	0.62	U	0.67	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.66	U	1.8	
106-99-0	1,3-Butadiene	µg/m3	0.3	U	0.32	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.8	U	0.88	U
106-46-7	1,4-Dichlorobenzene	µg/m3	0.8	U	0.88	U
123-91-1	1,4-Dioxane	µg/m3	0.48	U	0.53	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.1	U	5.6	
78-93-3	2-Butanone	µg/m3	4.1		2.1	
591-78-6	2-Hexanone	µg/m3	2.7	U	3	U
67-63-0	2-Propanol	µg/m3	36		14	
622-96-8	4-Ethyltoluene	µg/m3	0.66	U	6.4	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.55	U	0.6	U
67-64-1	Acetone	µg/m3	31		45	
107-05-1	Allyl Chloride	µg/m3	2.1	U	2.3	U
71-43-2	Benzene	µg/m3	0.82		6.2	
100-44-7	Benzyl Chloride	µg/m3	0.69	U	0.76	U
75-27-4	Bromodichloromethane	µg/m3	0.9	U	0.98	U
75-25-2	Bromoform	µg/m3	1.4	U	1.5	U
74-83-9	Bromomethane	µg/m3	0.52	U	0.57	U
75-15-0	Carbon Disulfide	µg/m3	2.1	U	2.3	U
56-23-5	Carbon tetrachloride	µg/m3	0.84	U	0.92	U
108-90-7	Chlorobenzene	µg/m3	0.62	U	0.67	U
75-00-3	Chloroethane	µg/m3	0.35	U	0.38	U
67-66-3	Chloroform	µg/m3	0.65	U	1.3	
74-87-3	Chloromethane	µg/m3	1.3		0.8	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.53	U	0.58	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.61	U	0.66	U
110-82-7	Cyclohexane	µg/m3	0.46	U	2.8	
124-48-1	Dibromochloromethane	µg/m3	1.1	U	1.2	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.9		1.8	
64-17-5	Ethanol	µg/m3	120	EJ	150	EJ
100-41-4	Ethylbenzene	µg/m3	0.58	U	6.4	
87-68-3	Hexachlorobutadiene	µg/m3	7.1	U	7.8	U
110-54-3	Hexane	µg/m3	0.76		20	
98-82-8	Isopropylbenzene	µg/m3	0.66	U	0.72	U
179601-23-1	m,p-Xylene	µg/m3	0.95		24	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.48	U	0.53	U
75-09-2	Methylene chloride	µg/m3	0.93	U	5.3	
142-82-5	n-Heptane	µg/m3	0.55	U	5.9	
103-65-1	N-Propylbenzene	µg/m3	0.66	U	1.4	
95-47-6	o-Xylene	µg/m3	0.58	U	7.3	
100-42-5	Styrene	µg/m3	0.57	U	0.62	U
127-18-4	Tetrachloroethene	µg/m3	0.91	U	0.99	U
109-99-9	Tetrahydrofuran	µg/m3	2	U	2.2	U
108-88-3	Toluene	µg/m3	2.4		57	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.53	U	0.58	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.61	U	0.66	U
79-01-6	Trichloroethene	µg/m3	0.14	U	0.16	U
75-69-4	Trichlorofluoromethane	µg/m3	1		1.6	
75-01-4	Vinyl Chloride	µg/m3	0.39		0.37	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R10SB-030909		NCIA4-R11AA-030309		NCIA4-R11BA-030309	
		sample_date:	03/09/2009		03/03/2009		03/03/2009	
		sys_loc_code:	R10-SB		R11-AA		R11-BA	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	1.2	U	0.71	U	0.81	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	1.5	U	0.89	U	1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1.7	U	1	U	1.1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	1.2	U	0.71	U	0.81	U
75-34-3	1,1-Dichloroethane	µg/m3	0.88	U	0.53	U	0.6	U
75-35-4	1,1-Dichloroethene	µg/m3	0.86	U	0.52	U	0.59	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	8	U	4.8	U	5.5	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	1.1	U	2.6		2.8	
106-93-4	1,2-Dibromoethane	µg/m3	1.7	U	1	U	1.1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	1.5	U	0.91	U	1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	1.3	U	0.78	U	0.9	U
107-06-2	1,2-Dichloroethane	µg/m3	0.88	U	0.53	U	0.6	U
78-87-5	1,2-Dichloropropane	µg/m3	1	U	0.6	U	0.69	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	1.1	U	0.72		0.78	
106-99-0	1,3-Butadiene	µg/m3	0.48	U	0.29	U	0.62	
541-73-1	1,3-Dichlorobenzene	µg/m3	1.3	U	1.6		0.9	U
106-46-7	1,4-Dichlorobenzene	µg/m3	1.3	U	1.2		0.9	U
123-91-1	1,4-Dioxane	µg/m3	0.78	U	0.47	U	0.54	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	5.1	U	8.9		3.5	U
78-93-3	2-Butanone	µg/m3	2.6		4.4		2	
591-78-6	2-Hexanone	µg/m3	4.4	U	2.7	U	3	U
67-63-0	2-Propanol	µg/m3	2.7	U	69		12	
622-96-8	4-Ethyltoluene	µg/m3	1.1	U	2.4		2.4	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.89	U	0.53	U	0.61	U
67-64-1	Acetone	µg/m3	12		31		35	
107-05-1	Allyl Chloride	µg/m3	3.4	U	2	U	2.3	U
71-43-2	Benzene	µg/m3	0.69	U	2.5		2.1	
100-44-7	Benzyl Chloride	µg/m3	1.1	U	0.67	U	0.77	U
75-27-4	Bromodichloromethane	µg/m3	1.4	U	0.87	U	1	U
75-25-2	Bromoform	µg/m3	2.2	U	1.3	U	1.5	U
74-83-9	Bromomethane	µg/m3	0.84	U	0.5	U	0.58	U
75-15-0	Carbon Disulfide	µg/m3	3.4	U	2	U	2.3	U
56-23-5	Carbon tetrachloride	µg/m3	1.4	U	0.82	U	0.94	U
108-90-7	Chlorobenzene	µg/m3	1	U	0.6	U	0.68	U
75-00-3	Chloroethane	µg/m3	0.57	U	0.34	U	0.39	U
67-66-3	Chloroform	µg/m3	1	U	0.63	U	0.73	U
74-87-3	Chloromethane	µg/m3	0.45	U	3		1.6	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.86	U	0.52	U	0.59	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.98	U	0.59	U	0.68	U
110-82-7	Cyclohexane	µg/m3	0.75	U	1		0.51	U
124-48-1	Dibromochloromethane	µg/m3	1.8	U	1.1	U	1.3	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.9		1.9		2.1	
64-17-5	Ethanol	µg/m3	6.2		140	EJ	280	EJ
100-41-4	Ethylbenzene	µg/m3	0.94	U	1.8		2	
87-68-3	Hexachlorobutadiene	µg/m3	12	U	6.9	U	7.9	U
110-54-3	Hexane	µg/m3	0.76	U	5.1		2.2	
98-82-8	Isopropylbenzene	µg/m3	1.1	U	0.64	U	0.73	U
179601-23-1	m,p-Xylene	µg/m3	0.94	U	6.7		6.8	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.78	U	0.47	U	0.54	U
75-09-2	Methylene chloride	µg/m3	1.5	U	0.9	U	1	U
142-82-5	n-Heptane	µg/m3	0.89	U	2.2		4.2	
103-65-1	N-Propylbenzene	µg/m3	1.1	U	0.64	U	0.73	U
95-47-6	o-Xylene	µg/m3	0.94	U	2.8		2.4	
100-42-5	Styrene	µg/m3	0.92	U	0.55	U	0.63	U
127-18-4	Tetrachloroethene	µg/m3	4.3		0.88	U	1	U
109-99-9	Tetrahydrofuran	µg/m3	3.2	U	1.9	U	2.2	U
108-88-3	Toluene	µg/m3	0.93		10		15	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.86	U	3.8		0.59	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.98	U	0.59	U	0.68	U
79-01-6	Trichloroethene	µg/m3	0.23	U	0.14	U	0.17	
75-69-4	Trichlorofluoromethane	µg/m3	1.4		0.9		1.2	
75-01-4	Vinyl Chloride	µg/m3	0.55	U	0.33	U	0.38	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R11SB-030309		NCIA4-R12AA-030909		NCIA4-R12AAD-030909	
		sample_date:	03/03/2009		03/09/2009		03/09/2009	
		sys_loc_code:	R11-SB		R12-AA		R12-AA	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	0.75	U	0.76	U	0.78	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	0.95	U	0.95	U	0.99	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1	U	1.1	U	1.1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.75	U	0.76	U	0.78	U
75-34-3	1,1-Dichloroethane	µg/m3	0.56	U	0.56	U	0.58	U
75-35-4	1,1-Dichloroethene	µg/m3	0.55	U	0.55	U	0.57	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	5.1	U	5.2	U	5.3	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	1.8		0.68	U	1	
106-93-4	1,2-Dibromoethane	µg/m3	1.1	U	1.1	U	1.1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	0.96	U	0.97	U	1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.83	U	0.84	U	0.86	U
107-06-2	1,2-Dichloroethane	µg/m3	0.56	U	0.56	U	0.58	U
78-87-5	1,2-Dichloropropane	µg/m3	0.64	U	0.64	U	0.66	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.68	U	0.68	U	0.71	U
106-99-0	1,3-Butadiene	µg/m3	0.3	U	0.31	U	0.32	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.83	U	0.84	U	0.86	U
106-46-7	1,4-Dichlorobenzene	µg/m3	1.2		0.84	U	0.86	U
123-91-1	1,4-Dioxane	µg/m3	0.5	U	0.5	U	0.52	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.2	U	3.2	U	3.4	U
78-93-3	2-Butanone	µg/m3	1.6		2.9		1.9	
591-78-6	2-Hexanone	µg/m3	2.8	U	2.8	U	2.9	U
67-63-0	2-Propanol	µg/m3	3		42		56	
622-96-8	4-Ethyltoluene	µg/m3	1.1		0.68	U	0.79	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.56	U	0.57	U	0.59	U
67-64-1	Acetone	µg/m3	20		24		15	
107-05-1	Allyl Chloride	µg/m3	2.2	U	2.2	U	2.2	U
71-43-2	Benzene	µg/m3	0.5		0.69		0.64	
100-44-7	Benzyl Chloride	µg/m3	0.71	U	0.72	U	0.74	U
75-27-4	Bromodichloromethane	µg/m3	0.92	U	0.93	U	0.96	U
75-25-2	Bromoform	µg/m3	1.4	U	1.4	U	1.5	U
74-83-9	Bromomethane	µg/m3	0.54	U	0.54	U	0.56	U
75-15-0	Carbon Disulfide	µg/m3	2.1	U	2.2	U	2.2	U
56-23-5	Carbon tetrachloride	µg/m3	0.87	U	0.87	U	0.91	U
108-90-7	Chlorobenzene	µg/m3	0.64	U	0.64	U	0.66	U
75-00-3	Chloroethane	µg/m3	0.36	U	0.37	U	0.38	U
67-66-3	Chloroform	µg/m3	1.1		0.96	U	0.73	
74-87-3	Chloromethane	µg/m3	0.28	U	1.7		2	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.55	U	0.55	U	0.57	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.63	U	0.63	U	0.65	U
110-82-7	Cyclohexane	µg/m3	0.48	U	0.48	U	0.5	U
124-48-1	Dibromochloromethane	µg/m3	1.2	U	1.2	U	1.2	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.6		1.9		2.1	
64-17-5	Ethanol	µg/m3	14	J	120	EJ	130	EJ
100-41-4	Ethylbenzene	µg/m3	0.66		0.6	U	0.62	U
87-68-3	Hexachlorobutadiene	µg/m3	7.4	U	7.4	U	7.7	U
110-54-3	Hexane	µg/m3	0.52		0.57		0.51	U
98-82-8	Isopropylbenzene	µg/m3	0.68	U	0.68	U	0.71	U
179601-23-1	m,p-Xylene	µg/m3	2.3		0.79		1.1	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.65		0.5	U	0.52	U
75-09-2	Methylene chloride	µg/m3	0.96	U	0.96	U	1	U
142-82-5	n-Heptane	µg/m3	0.56	U	0.57	U	0.59	U
103-65-1	N-Propylbenzene	µg/m3	0.68	U	0.68	U	0.71	U
95-47-6	o-Xylene	µg/m3	1.2		0.6	U	0.62	U
100-42-5	Styrene	µg/m3	0.59	U	0.59	U	0.61	U
127-18-4	Tetrachloroethene	µg/m3	6.5		0.94	U	0.98	U
109-99-9	Tetrahydrofuran	µg/m3	2	U	2	U	2.1	U
108-88-3	Toluene	µg/m3	110		2		3.7	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.55	U	0.55	U	0.57	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.63	U	0.63	U	0.65	U
79-01-6	Trichloroethene	µg/m3	0.36		0.15	U	0.15	U
75-69-4	Trichlorofluoromethane	µg/m3	1.7		1.1		1.1	
75-01-4	Vinyl Chloride	µg/m3	0.35	U	0.36		0.37	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R12BA-030909		NCIA4-R12BAD-030909		NCIA4-R12SB-030909		NCIA4-R12SBD-030909	
		sample_date:	03/09/2009		03/09/2009		03/09/2009		03/09/2009	
		sys_loc_code:	R12-BA		R12-BA		R12-SB		R12-SB	
cas_rn	chemical_name	result_unit								
71-55-6	1,1,1-Trichloroethane	µg/m3	0.84	U	0.84	U	430	U	380	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	1.1	U	1.1	U	540	U	480	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1.2	U	1.2	U	600	U	540	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.84	U	0.84	U	430	U	380	U
75-34-3	1,1-Dichloroethane	µg/m3	0.63	U	0.63	U	320	U	280	U
75-35-4	1,1-Dichloroethene	µg/m3	0.61	U	0.61	U	310	U	280	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	5.8	U	5.8	U	2300	U	2100	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.76	U	0.76	U	390	U	350	U
106-93-4	1,2-Dibromoethane	µg/m3	1.2	U	1.2	U	610	U	540	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	1.1	U	1.1	U	550	U	490	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.93	U	0.93	U	470	U	420	U
107-06-2	1,2-Dichloroethane	µg/m3	0.63	U	0.63	U	320	U	280	U
78-87-5	1,2-Dichloropropane	µg/m3	0.72	U	0.72	U	360	U	320	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.76	U	0.76	U	390	U	350	U
106-99-0	1,3-Butadiene	µg/m3	0.34	U	0.34	U	170	U	160	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.93	U	0.93	U	480	U	420	U
106-46-7	1,4-Dichlorobenzene	µg/m3	0.93	U	0.93	U	480	U	420	U
123-91-1	1,4-Dioxane	µg/m3	0.56	U	0.56	U	1100	U	1000	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.6	U	3.6	U	370	U	330	U
78-93-3	2-Butanone	µg/m3	0.96		1.1		230	U	210	U
591-78-6	2-Hexanone	µg/m3	3.2	U	3.2	U	1300	U	1200	U
67-63-0	2-Propanol	µg/m3	1.9	U	1.9	U	780	U	690	U
622-96-8	4-Ethyltoluene	µg/m3	0.76	U	0.76	U	390	U	350	U
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.63	U	0.63	U	320	U	290	U
67-64-1	Acetone	µg/m3	8.6		10		750	U	670	U
107-05-1	Allyl Chloride	µg/m3	2.4	U	2.4	U	990	U	880	U
71-43-2	Benzene	µg/m3	1		1.3		250	U	220	U
100-44-7	Benzyl Chloride	µg/m3	0.8	U	0.8	U	410	U	360	U
75-27-4	Bromodichloromethane	µg/m3	1	U	1.1		530	U	470	U
75-25-2	Bromoform	µg/m3	1.6	U	1.6	U	820	U	730	U
74-83-9	Bromomethane	µg/m3	0.6	U	0.6	U	310	UJ	270	UJ
75-15-0	Carbon Disulfide	µg/m3	2.4	U	2.4	U	250	U	220	U
56-23-5	Carbon tetrachloride	µg/m3	0.98	U	0.98	U	500	U	440	U
108-90-7	Chlorobenzene	µg/m3	0.71	U	0.71	U	360	U	320	U
75-00-3	Chloroethane	µg/m3	0.74		0.6		210	U	190	U
67-66-3	Chloroform	µg/m3	150		170		81000		80000	
74-87-3	Chloromethane	µg/m3	1.2		1.6		650	U	580	U
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.61	U	0.61	U	310	U	280	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.7	U	0.7	U	360	U	320	U
110-82-7	Cyclohexane	µg/m3	1.1		0.99		270	U	240	U
124-48-1	Dibromochloromethane	µg/m3	1.3	U	1.3	U	670	U	600	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.9		2		390	U	350	U
64-17-5	Ethanol	µg/m3	7.5		9.4		600	U	530	U
100-41-4	Ethylbenzene	µg/m3	0.67	U	0.67	U	340	U	310	U
87-68-3	Hexachlorobutadiene	µg/m3	8.3	U	8.3	U	3400	U	3000	U
110-54-3	Hexane	µg/m3	1.4		1.5		280	U	250	U
98-82-8	Isopropylbenzene	µg/m3	0.76	U	0.76	U	390	U	350	U
179601-23-1	m,p-Xylene	µg/m3	1.6		1.8		340	U	310	U
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.56	U	0.56	U	280	U	250	U
75-09-2	Methylene chloride	µg/m3	1.1	U	1.1	U	270	U	240	U
142-82-5	n-Heptane	µg/m3	1.2		1.6		320	U	290	U
103-65-1	N-Propylbenzene	µg/m3	0.76	U	0.76	U	390	U	350	U
95-47-6	o-Xylene	µg/m3	0.67	U	0.71		340	U	310	U
100-42-5	Styrene	µg/m3	0.66	U	0.66	U	340	U	300	U
127-18-4	Tetrachloroethene	µg/m3	1	U	1	U	540	U	480	U
109-99-9	Tetrahydrofuran	µg/m3	2.3	U	2.3	U	230	U	210	U
108-88-3	Toluene	µg/m3	3.2		3.4		300	U	260	U
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.61	U	0.61	U	310	U	280	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.7	U	0.7	U	360	U	320	U
79-01-6	Trichloroethene	µg/m3	0.23		0.24		420	U	380	U
75-69-4	Trichlorofluoromethane	µg/m3	1.1		1.2		440	U	400	U
75-01-4	Vinyl Chloride	µg/m3	0.4	U	0.4	U	200	U	180	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R14AA-030509		NCIA4-R14BA-030509		NCIA4-R14SB-030509		NCIA4-R1AA-030309	
		sample_date:	03/05/2009		03/05/2009		03/05/2009		03/03/2009	
		sys_loc_code:	R14-AA		R14-BA		R14-SB		R1-AA	
cas_rn	chemical_name	result_unit								
71-55-6	1,1,1-Trichloroethane	µg/m3	0.69	U	0.81	U	1.2	U	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	0.87	U	1	U	1.5	U	0.94	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	0.97	U	1.1	U	1.7	U	1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.69	U	0.81	U	1.2	U	0.75	U
75-34-3	1,1-Dichloroethane	µg/m3	0.51	U	0.6	U	0.9	U	0.55	U
75-35-4	1,1-Dichloroethene	µg/m3	0.5	U	0.59	U	0.88	U	0.54	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	4.7	U	5.5	U	8.3	U	5.1	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	1.4		0.73	U	1.1	U	2.7	
106-93-4	1,2-Dibromoethane	µg/m3	0.98	U	1.1	U	1.7	U	1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	0.89	U	1	U	1.6	U	0.96	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.76	U	0.9	U	1.3	U	0.82	U
107-06-2	1,2-Dichloroethane	µg/m3	0.51	U	0.6	U	0.9	U	0.55	U
78-87-5	1,2-Dichloropropane	µg/m3	0.59	U	0.69	U	1	U	0.63	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.62	U	0.73	U	1.1	U	0.88	
106-99-0	1,3-Butadiene	µg/m3	0.28	U	0.44		0.49	U	1.5	
541-73-1	1,3-Dichlorobenzene	µg/m3	1.3		0.9	U	1.3	U	1.1	
106-46-7	1,4-Dichlorobenzene	µg/m3	0.76	U	0.9	U	1.3	U	1.2	
123-91-1	1,4-Dioxane	µg/m3	0.46	U	0.54	U	0.8	U	0.49	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3	U	3.5	U	5.2	U	15	
78-93-3	2-Butanone	µg/m3	7		5		1.1		2.7	
591-78-6	2-Hexanone	µg/m3	2.6	U	3	U	4.6	U	2.8	U
67-63-0	2-Propanol	µg/m3	110		10		2.7	U	67	
622-96-8	4-Ethyltoluene	µg/m3	1.2		0.73	U	1.1	U	2.9	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.55		0.61	U	0.91	U	0.56	U
67-64-1	Acetone	µg/m3	51		22		6.4		20	
107-05-1	Allyl Chloride	µg/m3	2	U	2.3	U	3.5	U	2.1	U
71-43-2	Benzene	µg/m3	1.7		1.3		0.71	U	4	
100-44-7	Benzyl Chloride	µg/m3	0.66	U	0.77	U	1.2	U	0.71	U
75-27-4	Bromodichloromethane	µg/m3	0.85	U	1	U	1.5	U	0.92	U
75-25-2	Bromoform	µg/m3	1.3	U	1.5	U	2.3	U	1.4	U
74-83-9	Bromomethane	µg/m3	0.52		0.58	U	0.87	U	0.53	U
75-15-0	Carbon Disulfide	µg/m3	2	U	2.3	U	3.5	U	7.8	
56-23-5	Carbon tetrachloride	µg/m3	0.8	U	0.94	U	1.4	U	0.86	U
108-90-7	Chlorobenzene	µg/m3	0.58	U	0.68	U	1	U	0.63	U
75-00-3	Chloroethane	µg/m3	0.36		0.39	U	0.59	U	0.36	U
67-66-3	Chloroform	µg/m3	0.62	U	0.73	U	85		0.67	U
74-87-3	Chloromethane	µg/m3	10		1.5		0.46	U	2	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.5	U	0.59	U	0.88	U	0.54	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.58	U	0.68	U	1	U	0.62	U
110-82-7	Cyclohexane	µg/m3	0.44	U	0.51	U	0.77	U	2.9	
124-48-1	Dibromochloromethane	µg/m3	1.1	U	1.3	U	1.9	U	1.2	U
75-71-8	Dichlorodifluoromethane	µg/m3	2.4		2.4		2.2		2	
64-17-5	Ethanol	µg/m3	210	E	71		3.1	J	120	EJ
100-41-4	Ethylbenzene	µg/m3	0.7		0.65	U	0.97	U	2.1	
87-68-3	Hexachlorobutadiene	µg/m3	6.8	U	7.9	U	12	U	7.3	U
110-54-3	Hexane	µg/m3	1.3		1.4		0.78	U	8.2	
98-82-8	Isopropylbenzene	µg/m3	0.62	U	0.73	U	1.1	U	0.67	J
179601-23-1	m,p-Xylene	µg/m3	2.2		0.92		0.97	U	8.6	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.46	U	0.54	U	0.8	U	0.49	U
75-09-2	Methylene chloride	µg/m3	0.88	U	1	U	1.5	U	0.97	
142-82-5	n-Heptane	µg/m3	0.78		0.95		0.91	U	4.9	
103-65-1	N-Propylbenzene	µg/m3	0.62	U	0.73	U	1.1	U	0.8	
95-47-6	o-Xylene	µg/m3	0.99		0.65	U	0.97	U	3	
100-42-5	Styrene	µg/m3	0.54	U	0.63	U	0.95	U	0.58	U
127-18-4	Tetrachloroethene	µg/m3	0.86	U	1	U	1.5	U	0.93	U
109-99-9	Tetrahydrofuran	µg/m3	1.9	U	2.2	U	3.3	U	2	U
108-88-3	Toluene	µg/m3	3.3		6.8		1.4		12	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.5	U	0.59	U	0.88	U	2	
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.58	U	0.68	U	1	U	0.62	U
79-01-6	Trichloroethene	µg/m3	0.14	U	0.16	U	0.24	U	0.15	U
75-69-4	Trichlorofluoromethane	µg/m3	1.4		1.4		1.5		0.95	
75-01-4	Vinyl Chloride	µg/m3	0.32	U	0.38	U	0.57	U	0.35	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R1BA-030309		NCIA4-R1SB-030309		NCIA4-R7AA-030309		NCIA4-R7BA-030309	
		sample_date:	03/03/2009		03/03/2009		03/03/2009		03/03/2009	
		sys_loc_code:	R1-BA		R1-SB		R7-AA		R7-BA	
cas_rn	chemical_name	result_unit								
71-55-6	1,1,1-Trichloroethane	µg/m3	0.71	U	0.87	U	0.66	U	0.78	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	0.9	U	1.1	U	0.84	U	0.99	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1	U	1.2	U	0.94	U	1.1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.71	U	0.87	U	0.66	U	0.78	U
75-34-3	1,1-Dichloroethane	µg/m3	0.53	U	0.65	U	0.49	U	0.58	U
75-35-4	1,1-Dichloroethene	µg/m3	0.52	U	0.63	U	0.48	U	0.57	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	25		5.9	U	4.5	U	5.3	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	2.3		2.1		0.6	U	0.71	U
106-93-4	1,2-Dibromoethane	µg/m3	1	U	1.2	U	0.94	U	1.1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	0.92	U	1.1	U	0.85	U	1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	38		0.96	U	0.73	U	0.86	U
107-06-2	1,2-Dichloroethane	µg/m3	0.53	U	0.65	U	0.49	U	0.58	U
78-87-5	1,2-Dichloropropane	µg/m3	0.6	U	0.74	U	0.56	U	0.66	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.83		0.93		0.6	U	0.71	U
106-99-0	1,3-Butadiene	µg/m3	0.44		0.43		0.27	U	0.32	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.79	U	0.96	U	0.73	U	0.86	U
106-46-7	1,4-Dichlorobenzene	µg/m3	0.79	U	0.96	U	0.73	U	0.86	U
123-91-1	1,4-Dioxane	µg/m3	0.47	U	0.58	U	0.44	U	0.52	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3	U	3.7	U	9.5		3.4	U
78-93-3	2-Butanone	µg/m3	1.2		17		2.2		2.7	
591-78-6	2-Hexanone	µg/m3	2.7	U	3.3	U	2.5	U	2.9	U
67-63-0	2-Propanol	µg/m3	4.2		7.1		41		2.1	
622-96-8	4-Ethyltoluene	µg/m3	2.9		2.9		0.67		0.71	U
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.54	U	0.66	U	0.5	U	0.59	U
67-64-1	Acetone	µg/m3	12		68		25		14	
107-05-1	Allyl Chloride	µg/m3	2	U	2.5	U	1.9	U	2.2	U
71-43-2	Benzene	µg/m3	1.2		1.5		2.4		1.4	
100-44-7	Benzyl Chloride	µg/m3	0.68	U	0.83	U	0.63	U	0.74	U
75-27-4	Bromodichloromethane	µg/m3	0.88	U	1.1	U	0.82	U	0.96	U
75-25-2	Bromoform	µg/m3	1.4	U	1.6	U	1.3	U	1.5	U
74-83-9	Bromomethane	µg/m3	0.51	U	0.62	U	0.47	U	0.56	U
75-15-0	Carbon Disulfide	µg/m3	2	U	2.5	U	1.9	U	2.2	U
56-23-5	Carbon tetrachloride	µg/m3	0.82	U	1	U	0.77	U	0.91	U
108-90-7	Chlorobenzene	µg/m3	0.6	U	0.74	U	0.56	U	0.66	U
75-00-3	Chloroethane	µg/m3	0.34	U	0.42	U	0.32	U	0.38	U
67-66-3	Chloroform	µg/m3	0.64	U	0.78	U	0.6	U	0.7	U
74-87-3	Chloromethane	µg/m3	1		0.9		2		1	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.52	U	0.63	U	0.48	U	0.57	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.59	U	0.73	U	0.55	U	0.65	U
110-82-7	Cyclohexane	µg/m3	0.45	U	0.55	U	1		0.5	U
124-48-1	Dibromochloromethane	µg/m3	1.1	U	1.4	U	1	U	1.2	U
75-71-8	Dichlorodifluoromethane	µg/m3	2.1		2		2		2.2	
64-17-5	Ethanol	µg/m3	62	J	78	J	88	J	53	J
100-41-4	Ethylbenzene	µg/m3	4.9		0.74		1.1		0.79	
87-68-3	Hexachlorobutadiene	µg/m3	7	U	8.5	U	6.5	U	7.7	U
110-54-3	Hexane	µg/m3	0.84		1		4.9		2.1	
98-82-8	Isopropylbenzene	µg/m3	0.64	U	0.79	U	0.6	U	0.71	U
179601-23-1	m,p-Xylene	µg/m3	21		2		3.5		2.5	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.47	U	0.58	U	0.44	U	0.52	U
75-09-2	Methylene chloride	µg/m3	1.9		2		0.85	U	3.5	
142-82-5	n-Heptane	µg/m3	0.54	U	1.1		2		1.1	
103-65-1	N-Propylbenzene	µg/m3	0.64	U	0.79	U	0.6	U	0.71	U
95-47-6	o-Xylene	µg/m3	5.6		1		1.2		0.77	
100-42-5	Styrene	µg/m3	0.56	U	0.68	U	0.52	U	0.61	U
127-18-4	Tetrachloroethene	µg/m3	1.5		1.1	U	0.83	U	0.98	U
109-99-9	Tetrahydrofuran	µg/m3	1.9	U	2.4	U	1.8	U	2.1	U
108-88-3	Toluene	µg/m3	4		4.3		8.3		7.9	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.52	U	0.63	U	3.7		0.57	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.59	U	0.73	U	0.55	U	0.65	U
79-01-6	Trichloroethene	µg/m3	2.1		0.17	U	0.13	U	0.4	
75-69-4	Trichlorofluoromethane	µg/m3	1.3		1.3		0.78		1.4	
75-01-4	Vinyl Chloride	µg/m3	0.33	U	0.41	U	0.31	U	0.37	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R7SB-030309		NCIA4-R8AA-030309		NCIA4-R8BA-030309	
		sample_date:	03/03/2009		03/03/2009		03/03/2009	
		sys_loc_code:	R7-SB		R8-AA		R8-BA	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	1.1		0.72	U	0.87	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	0.94	U	0.91	U	1.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1	U	1	U	1.2	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.75	U	0.72	U	0.87	U
75-34-3	1,1-Dichloroethane	µg/m3	0.55	U	0.54	U	0.65	U
75-35-4	1,1-Dichloroethene	µg/m3	0.54	U	0.53	U	0.63	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	5.1	U	4.9	U	5.9	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.67	U	2.8		2	
106-93-4	1,2-Dibromoethane	µg/m3	1	U	1	U	1.2	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	0.96	U	0.93	U	1.1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.82	U	0.8	U	0.96	U
107-06-2	1,2-Dichloroethane	µg/m3	0.55	U	0.54	U	0.65	U
78-87-5	1,2-Dichloropropane	µg/m3	0.63	U	0.61	U	0.74	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.67	U	0.79		0.79	U
106-99-0	1,3-Butadiene	µg/m3	0.3	U	0.29	U	0.35	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.82	U	1.6		0.96	U
106-46-7	1,4-Dichlorobenzene	µg/m3	0.82	U	1.3		0.96	U
123-91-1	1,4-Dioxane	µg/m3	0.49	U	0.48	U	0.58	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.2	U	6.8		3.7	U
78-93-3	2-Butanone	µg/m3	1.8		2.2		7.5	
591-78-6	2-Hexanone	µg/m3	2.8	U	2.7	U	3.3	U
67-63-0	2-Propanol	µg/m3	1.7	U	86		10	
622-96-8	4-Ethyltoluene	µg/m3	0.67	U	2.5		1.7	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.56	U	0.54	U	0.66	U
67-64-1	Acetone	µg/m3	7.8		17		21	
107-05-1	Allyl Chloride	µg/m3	2.1	U	2.1	U	2.5	U
71-43-2	Benzene	µg/m3	0.44	U	1.6		1.6	
100-44-7	Benzyl Chloride	µg/m3	0.71	U	0.69	U	0.83	U
75-27-4	Bromodichloromethane	µg/m3	0.92	U	0.89	U	1.1	U
75-25-2	Bromoform	µg/m3	1.4	U	1.4	U	1.6	U
74-83-9	Bromomethane	µg/m3	0.53	U	0.52	U	0.62	U
75-15-0	Carbon Disulfide	µg/m3	2.1	U	2.1	U	8	
56-23-5	Carbon tetrachloride	µg/m3	0.86	U	0.84	U	1	U
108-90-7	Chlorobenzene	µg/m3	0.63	U	0.61	U	0.74	U
75-00-3	Chloroethane	µg/m3	0.36	U	0.35	U	0.42	U
67-66-3	Chloroform	µg/m3	23		0.65	U	0.78	U
74-87-3	Chloromethane	µg/m3	0.28	J	3.6		1	
156-59-2	cis-1,2-Dichloroethene	µg/m3	14		0.53	U	0.63	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.62	U	0.6	U	0.73	U
110-82-7	Cyclohexane	µg/m3	0.47	U	0.85		1.2	
124-48-1	Dibromochloromethane	µg/m3	1.2	U	1.1	U	1.4	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.6		1.9		2.1	
64-17-5	Ethanol	µg/m3	6.4	J	140	EJ	100	J
100-41-4	Ethylbenzene	µg/m3	0.59	U	1.7		1.5	
87-68-3	Hexachlorobutadiene	µg/m3	7.3	U	7.1	U	8.5	U
110-54-3	Hexane	µg/m3	0.57		2.3		2.6	
98-82-8	Isopropylbenzene	µg/m3	0.67	U	0.65	U	0.79	U
179601-23-1	m,p-Xylene	µg/m3	0.59	U	6.5		4.6	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.49	U	0.48	U	0.58	U
75-09-2	Methylene chloride	µg/m3	0.95	U	0.92	U	1.1	U
142-82-5	n-Heptane	µg/m3	0.56	U	1.6		1.6	
103-65-1	N-Propylbenzene	µg/m3	0.67	U	0.65	U	0.79	U
95-47-6	o-Xylene	µg/m3	0.59	U	2.6		1.4	
100-42-5	Styrene	µg/m3	0.58	U	0.57	U	0.68	U
127-18-4	Tetrachloroethene	µg/m3	2.2		0.9	U	1.1	
109-99-9	Tetrahydrofuran	µg/m3	2	U	2	U	2.4	U
108-88-3	Toluene	µg/m3	24		8.7		5.4	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.54	U	0.8		0.63	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.62	U	0.6	U	0.73	U
79-01-6	Trichloroethene	µg/m3	14		0.14	U	0.17	U
75-69-4	Trichlorofluoromethane	µg/m3	1.4		0.97		1.2	
75-01-4	Vinyl Chloride	µg/m3	0.35	U	0.34	U	0.41	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-R8SB-030309		NCIA4-R9BA-030909		NCIA4-WCAA-031109	
		sample_date:	03/03/2009		03/09/2009		03/11/2009	
		sys_loc_code:	R8-SB		R9-BA		WC-AA	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	2		0.86	U	0.78	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	1	U	1.1	U	0.99	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1.2	U	1.2	U	1.1	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.83	U	0.86	U	0.78	U
75-34-3	1,1-Dichloroethane	µg/m3	0.62	U	0.64	U	0.58	U
75-35-4	1,1-Dichloroethene	µg/m3	0.6	U	0.63	U	0.57	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	5.6	U	5.9	U	5.3	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.75	U	0.78	U	0.71	U
106-93-4	1,2-Dibromoethane	µg/m3	1.2	U	1.2	U	1.1	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	1.1	U	1.1	U	1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	0.91	U	0.95	U	0.86	U
107-06-2	1,2-Dichloroethane	µg/m3	0.62	U	0.64	U	0.58	U
78-87-5	1,2-Dichloropropane	µg/m3	0.7	U	0.73	U	0.66	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.75	U	0.78	U	0.71	U
106-99-0	1,3-Butadiene	µg/m3	0.34	U	0.35	U	0.32	U
541-73-1	1,3-Dichlorobenzene	µg/m3	0.91	U	0.95	U	0.86	U
106-46-7	1,4-Dichlorobenzene	µg/m3	0.91	U	0.95	U	0.86	U
123-91-1	1,4-Dioxane	µg/m3	0.55	U	0.57	U	0.52	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.6	U	3.7	U	3.4	U
78-93-3	2-Butanone	µg/m3	2.3		1.2		3.1	
591-78-6	2-Hexanone	µg/m3	3.1	U	3.2	U	2.9	U
67-63-0	2-Propanol	µg/m3	2.8		1.9	U	32	
622-96-8	4-Ethyltoluene	µg/m3	0.75	U	0.78	U	0.71	U
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.62	U	0.65	U	0.59	U
67-64-1	Acetone	µg/m3	19		12		30	
107-05-1	Allyl Chloride	µg/m3	2.4	U	2.5	U	2.2	U
71-43-2	Benzene	µg/m3	0.48	U	0.77		0.49	
100-44-7	Benzyl Chloride	µg/m3	0.79	U	0.82	U	0.74	U
75-27-4	Bromodichloromethane	µg/m3	1	U	1	U	0.96	U
75-25-2	Bromoform	µg/m3	1.6	U	1.6	U	1.5	U
74-83-9	Bromomethane	µg/m3	0.59	U	0.61	U	0.56	U
75-15-0	Carbon Disulfide	µg/m3	2.4	U	2.5	U	2.2	U
56-23-5	Carbon tetrachloride	µg/m3	0.96	U	0.99	U	0.91	U
108-90-7	Chlorobenzene	µg/m3	0.7	U	0.73	U	0.66	U
75-00-3	Chloroethane	µg/m3	0.4	U	0.42	U	0.38	U
67-66-3	Chloroform	µg/m3	0.74	U	0.77	U	0.7	U
74-87-3	Chloromethane	µg/m3	0.31	U	0.82		1.2	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.6	U	0.63	U	0.57	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.69	U	0.72	U	0.65	U
110-82-7	Cyclohexane	µg/m3	0.52	U	0.54	U	0.5	U
124-48-1	Dibromochloromethane	µg/m3	1.3	U	1.3	U	1.2	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.4		2.1		2.2	
64-17-5	Ethanol	µg/m3	5.2	J	5.2		170	E
100-41-4	Ethylbenzene	µg/m3	0.66	U	0.69	U	0.62	U
87-68-3	Hexachlorobutadiene	µg/m3	8.1	U	8.4	U	7.7	U
110-54-3	Hexane	µg/m3	0.54	U	0.56	U	0.71	
98-82-8	Isopropylbenzene	µg/m3	0.75	U	0.78	U	0.71	U
179601-23-1	m,p-Xylene	µg/m3	0.66	U	0.87		1	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.55	U	0.57	U	0.52	U
75-09-2	Methylene chloride	µg/m3	1	U	1.1	U	1.2	
142-82-5	n-Heptane	µg/m3	0.62	U	0.65	U	0.59	U
103-65-1	N-Propylbenzene	µg/m3	0.75	U	0.78	U	0.71	U
95-47-6	o-Xylene	µg/m3	0.66	U	0.69	U	0.62	U
100-42-5	Styrene	µg/m3	0.65	U	0.67	U	0.61	U
127-18-4	Tetrachloroethene	µg/m3	15		1.1	U	0.98	U
109-99-9	Tetrahydrofuran	µg/m3	2.2	U	2.3	U	2.1	U
108-88-3	Toluene	µg/m3	0.57	U	3.5		1.8	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.6	U	0.63	U	0.57	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.69	U	0.72	U	0.65	U
79-01-6	Trichloroethene	µg/m3	0.16	U	0.17	U	0.15	U
75-69-4	Trichlorofluoromethane	µg/m3	1.4		1.1		1.2	
75-01-4	Vinyl Chloride	µg/m3	0.39	U	0.4	U	0.76	

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-WCBA1-031109		NCIA4-WCBA2-031109		NCIA4-WCBA3-031109	
		sample_date:	03/11/2009		03/11/2009		03/11/2009	
		sys_loc_code:	WC-BA1		WC-BA2		WC-BA3	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	0.92	U	1.3		0.86	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	1.2	U	1.3	U	1.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1.3	U	1.4	U	1.2	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.92	U	1	U	0.86	U
75-34-3	1,1-Dichloroethane	µg/m3	0.68	U	0.76	U	0.64	U
75-35-4	1,1-Dichloroethene	µg/m3	0.67	U	0.74	U	0.63	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	6.2	U	6.9	U	5.9	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.82	U	0.92	U	0.78	U
106-93-4	1,2-Dibromoethane	µg/m3	1.3	U	1.4	U	1.2	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	1.2	U	1.3	U	1.1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	7.7		1.1	U	0.95	U
107-06-2	1,2-Dichloroethane	µg/m3	0.68	U	0.76	U	0.64	U
78-87-5	1,2-Dichloropropane	µg/m3	0.78	U	0.86	U	0.73	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.82	U	0.92	U	0.78	U
106-99-0	1,3-Butadiene	µg/m3	0.37	U	0.41	U	0.35	U
541-73-1	1,3-Dichlorobenzene	µg/m3	1	U	1.1	U	0.95	U
106-46-7	1,4-Dichlorobenzene	µg/m3	1	U	1.1	U	0.95	U
123-91-1	1,4-Dioxane	µg/m3	0.6	U	0.67	U	0.57	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	3.9	U	4.4	U	3.7	U
78-93-3	2-Butanone	µg/m3	14		5.4		1	
591-78-6	2-Hexanone	µg/m3	3.4	U	3.8	U	3.2	U
67-63-0	2-Propanol	µg/m3	2.1	U	16		6.7	
622-96-8	4-Ethyltoluene	µg/m3	0.82	U	0.92	U	0.78	U
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.69	U	1.6		0.65	U
67-64-1	Acetone	µg/m3	15		28		10	
107-05-1	Allyl Chloride	µg/m3	2.6	U	2.9	U	2.5	U
71-43-2	Benzene	µg/m3	1.2		0.76		0.65	
100-44-7	Benzyl Chloride	µg/m3	0.87	U	0.97	U	0.82	U
75-27-4	Bromodichloromethane	µg/m3	1.1	U	1.2	U	1	U
75-25-2	Bromoform	µg/m3	1.7	U	1.9	U	1.6	U
74-83-9	Bromomethane	µg/m3	0.65	U	0.73	U	0.61	U
75-15-0	Carbon Disulfide	µg/m3	2.6	U	2.9	U	2.5	U
56-23-5	Carbon tetrachloride	µg/m3	1	U	1.2	U	0.99	U
108-90-7	Chlorobenzene	µg/m3	0.77	U	0.86	U	0.73	U
75-00-3	Chloroethane	µg/m3	0.44	U	0.49	U	0.42	U
67-66-3	Chloroform	µg/m3	0.82	U	0.91	U	0.77	U
74-87-3	Chloromethane	µg/m3	0.97		0.84		1	
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.67	U	0.74	U	0.63	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.76	U	0.85	U	0.72	U
110-82-7	Cyclohexane	µg/m3	1.6		0.64	U	0.54	U
124-48-1	Dibromochloromethane	µg/m3	1.4	U	1.6	U	1.3	U
75-71-8	Dichlorodifluoromethane	µg/m3	2.3		2.3		3.5	
64-17-5	Ethanol	µg/m3	6.5	J	50	J	160	E
100-41-4	Ethylbenzene	µg/m3	1.3		0.81	U	0.69	U
87-68-3	Hexachlorobutadiene	µg/m3	9	U	10	U	8.4	U
110-54-3	Hexane	µg/m3	2		0.66	U	0.56	U
98-82-8	Isopropylbenzene	µg/m3	0.82	U	0.92	U	0.78	U
179601-23-1	m,p-Xylene	µg/m3	3.9		0.81	U	0.69	U
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.6	U	0.67	U	0.57	U
75-09-2	Methylene chloride	µg/m3	14		1.7		1.1	U
142-82-5	n-Heptane	µg/m3	8.2		0.77	UJ	0.65	U
103-65-1	N-Propylbenzene	µg/m3	0.82	U	0.92	U	0.78	U
95-47-6	o-Xylene	µg/m3	1.2		0.81	U	0.69	U
100-42-5	Styrene	µg/m3	0.72	U	0.8	U	0.67	U
127-18-4	Tetrachloroethene	µg/m3	1.1	U	1.3	U	1.1	U
109-99-9	Tetrahydrofuran	µg/m3	2.5	U	2.8	U	2.3	U
108-88-3	Toluene	µg/m3	110		2.8		2.2	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.67	U	0.74	U	0.63	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.76	U	0.85	U	0.72	U
79-01-6	Trichloroethene	µg/m3	0.18	U	0.2	U	0.17	U
75-69-4	Trichlorofluoromethane	µg/m3	1.4		5.3		4.8	
75-01-4	Vinyl Chloride	µg/m3	0.43	U	0.48	U	0.4	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

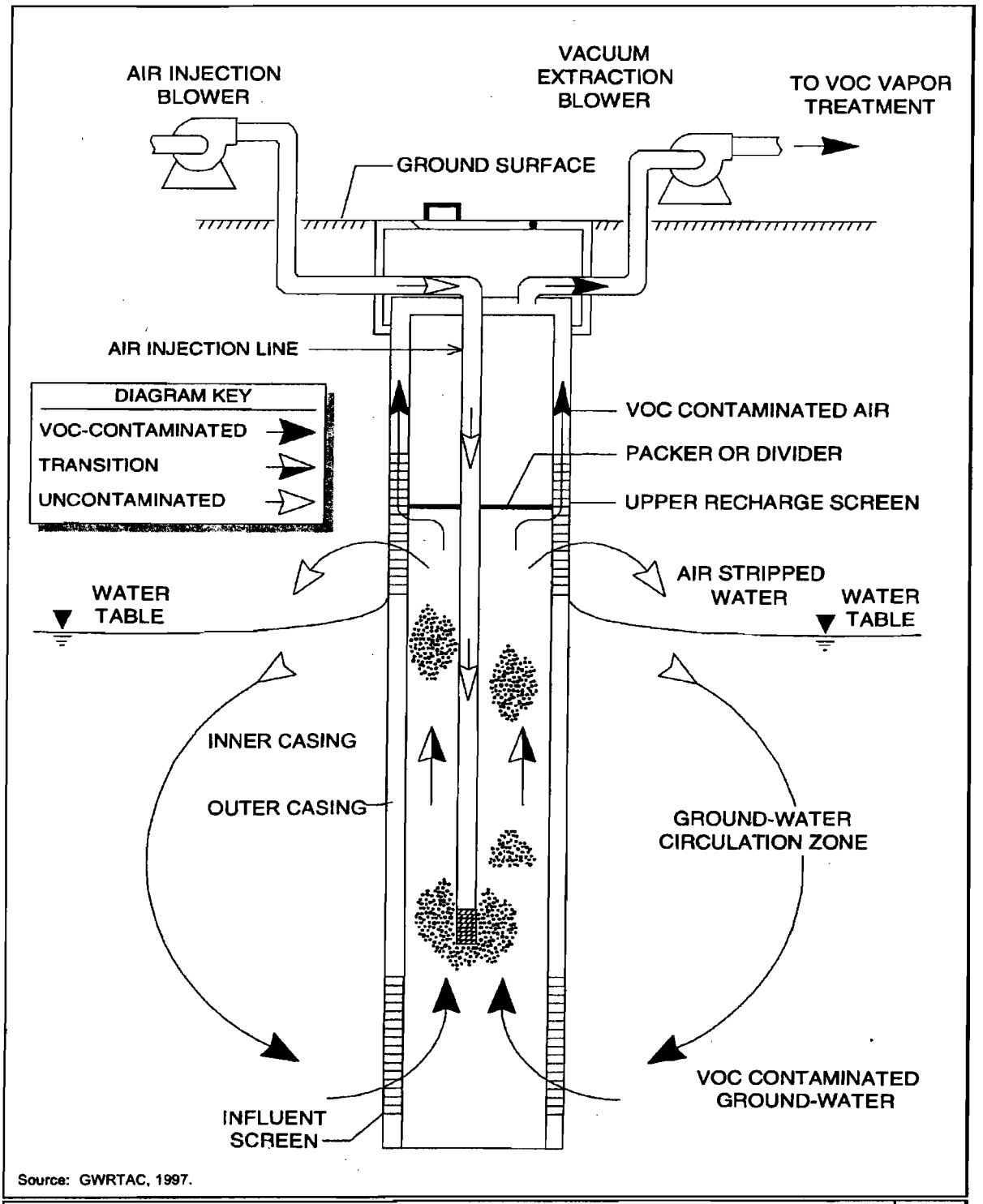
Appendix E
Soil Vapor Analytical Results
New Cassel Industrial Area Operable Unit 4
North Hempstead and Westbury, New York

		sys_sample_code:	NCIA4-WCSB1-031109		NCIA4-WCSB2-031109		NCIA4-WCSB3-031109	
		sample_date:	03/11/2009		03/11/2009		03/11/2009	
		sys_loc_code:	WC-SB1		WC-SB2		WC-SB3	
cas_rn	chemical_name	result_unit						
71-55-6	1,1,1-Trichloroethane	µg/m3	0.93	U	1.1	U	0.84	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/m3	1.2	U	1.4	U	1.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	1.3	U	1.5	U	1.2	U
79-00-5	1,1,2-Trichloroethane	µg/m3	0.93	U	1.1	U	0.84	U
75-34-3	1,1-Dichloroethane	µg/m3	0.69	U	0.81	U	0.63	U
75-35-4	1,1-Dichloroethene	µg/m3	0.68	U	0.8	U	0.61	U
120-82-1	1,2,4-Trichlorobenzene	µg/m3	6.3	U	7.4	U	5.8	U
95-63-6	1,2,4-Trimethylbenzene	µg/m3	0.84	U	0.99	U	1.4	
106-93-4	1,2-Dibromoethane	µg/m3	1.3	U	1.5	U	1.2	U
76-14-2	1,2-dichloro-1,1,2,2-tetrafluoroethane	µg/m3	1.2	U	1.4	U	1.1	U
95-50-1	1,2-Dichlorobenzene	µg/m3	15		1.2	U	0.93	U
107-06-2	1,2-Dichloroethane	µg/m3	0.69	U	0.81	U	0.63	U
78-87-5	1,2-Dichloropropane	µg/m3	0.79	U	0.93	U	0.72	U
108-67-8	1,3,5-Trimethylbenzene	µg/m3	0.84	U	0.99	U	0.76	U
106-99-0	1,3-Butadiene	µg/m3	0.38	U	0.44	U	0.34	U
541-73-1	1,3-Dichlorobenzene	µg/m3	1	U	1.2	U	0.93	U
106-46-7	1,4-Dichlorobenzene	µg/m3	1.1		1.2	U	0.93	U
123-91-1	1,4-Dioxane	µg/m3	0.62	U	0.72	U	0.56	U
540-84-1	2,2,4-Trimethylpentane	µg/m3	4	U	4.7	U	3.6	U
78-93-3	2-Butanone	µg/m3	1.1		0.98		1.2	
591-78-6	2-Hexanone	µg/m3	3.5	U	4.1	U	3.2	U
67-63-0	2-Propanol	µg/m3	2.1	U	2.5	U	1.9	U
622-96-8	4-Ethyltoluene	µg/m3	0.84	U	0.99	U	1.2	
108-10-1	4-Methyl-2-Pentanone	µg/m3	0.7	U	0.82	U	0.63	U
67-64-1	Acetone	µg/m3	8.7		5.5		12	
107-05-1	Allyl Chloride	µg/m3	2.7	U	3.1	U	2.4	U
71-43-2	Benzene	µg/m3	0.55	U	0.64	U	2.2	
100-44-7	Benzyl Chloride	µg/m3	0.88	U	1	U	0.8	U
75-27-4	Bromodichloromethane	µg/m3	1.1	U	1.3	U	1	U
75-25-2	Bromoform	µg/m3	1.8	U	2.1	U	1.6	U
74-83-9	Bromomethane	µg/m3	0.66	U	0.78	U	0.6	U
75-15-0	Carbon Disulfide	µg/m3	4.4		3.1	U	2.4	U
56-23-5	Carbon tetrachloride	µg/m3	1.1	U	1.3	U	0.98	U
108-90-7	Chlorobenzene	µg/m3	0.79	U	0.92	U	0.71	U
75-00-3	Chloroethane	µg/m3	0.45	U	0.53	U	0.51	
67-66-3	Chloroform	µg/m3	5.3		2		0.76	U
74-87-3	Chloromethane	µg/m3	0.49		0.42	U	0.32	U
156-59-2	cis-1,2-Dichloroethene	µg/m3	0.68	U	0.8	U	0.61	U
10061-01-5	cis-1,3-Dichloropropene	µg/m3	0.78	U	0.91	U	0.7	U
110-82-7	Cyclohexane	µg/m3	0.59	U	0.69	U	0.53	U
124-48-1	Dibromochloromethane	µg/m3	1.4	U	1.7	U	1.3	U
75-71-8	Dichlorodifluoromethane	µg/m3	1.9		2.1		2	
64-17-5	Ethanol	µg/m3	1.6	UJ	2.8	J	4.6	
100-41-4	Ethylbenzene	µg/m3	0.74	U	0.87	U	0.84	
87-68-3	Hexachlorobutadiene	µg/m3	9.1	U	11	U	8.3	U
110-54-3	Hexane	µg/m3	0.6	U	0.71	U	0.55	U
98-82-8	Isopropylbenzene	µg/m3	0.84	U	0.99	U	0.76	U
179601-23-1	m,p-Xylene	µg/m3	0.74	U	0.87	U	2.9	
1634-04-4	Methyl t-Butyl Ether	µg/m3	0.62	U	0.72	U	0.56	U
75-09-2	Methylene chloride	µg/m3	1.2	U	1.4	U	1.1	U
142-82-5	n-Heptane	µg/m3	0.7	U	0.82	U	0.64	U
103-65-1	N-Propylbenzene	µg/m3	0.84	U	0.99	U	0.76	U
95-47-6	o-Xylene	µg/m3	0.74	U	0.87	U	0.85	
100-42-5	Styrene	µg/m3	0.73	U	0.86	U	0.66	U
127-18-4	Tetrachloroethene	µg/m3	1.2	U	1.4	U	1.2	
109-99-9	Tetrahydrofuran	µg/m3	2.5	U	3	U	2.3	U
108-88-3	Toluene	µg/m3	4.1		19		3.9	
156-60-5	trans-1,2-Dichloroethene	µg/m3	0.68	U	0.8	U	0.61	U
10061-02-6	trans-1,3-Dichloropropene	µg/m3	0.78	U	0.91	U	0.7	U
79-01-6	Trichloroethene	µg/m3	0.18	U	0.22		0.31	
75-69-4	Trichlorofluoromethane	µg/m3	1.7		1.9		1.7	
75-01-4	Vinyl Chloride	µg/m3	0.44	U	0.51	U	0.4	U

Notes:
AA - Ambient air
BA - Basement
SB - Sub-slab
µg/m3 - micrograms per meter squared
U - Not detected
E - Tentatively identified
J - Estimated concentration

APPENDIX F

NYSDEC October 2003 ROD, In-Well Vapor Stripping Process Figure



Source: GWRTAC, 1997.

In-Well Vapor Stripping Process **New Cassel Industrial Area** **Figure 12**