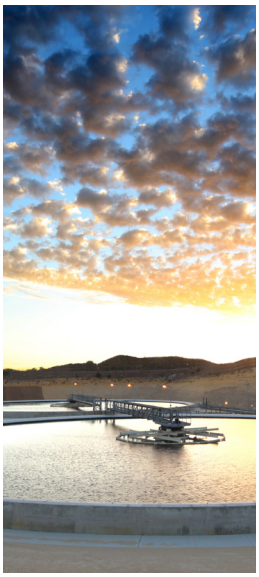
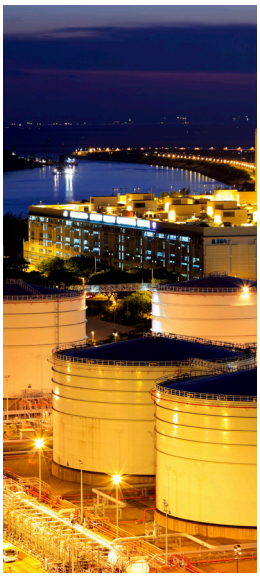
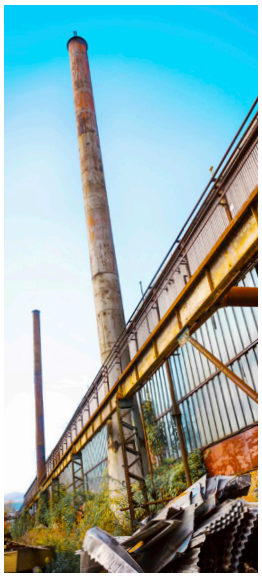
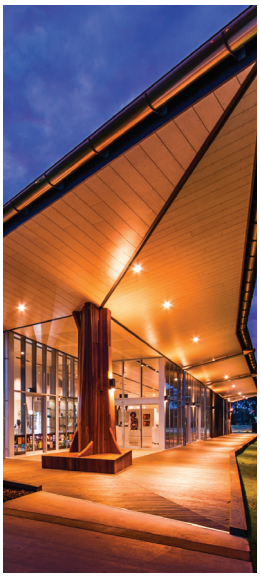


Remedial Investigation Report

Operable Unit 5

RUCO Polymer Corporation Site, Hicksville, NY (Site #130004)

651 Colby Drive Waterloo Ontario N2V 1C2

081618 | D22102 | 403 | Report No 1 | February 12 2016

Certification

I, Robert G. Adams, PE am currently a registered professional engineer licensed by the State of New York. Based on my review of this report and upon inquiry of the persons involved in coordinating, implementing and observing the remedial investigative (RI) activities performed at the RUCO Polymer Corporation Site ("the Site") during the period between February 2013 and January 2016 and summarized herein, I certify that these activities were implemented in substantial conformance with Operable Unit 5 of the New York State Department of Environmental Conservation- (NYSDEC) Order on Consent and Administrative Settlement Index #A1-0799-12-10 and the approved Soil Vapor Investigation Work Plan – Revision 2 (Work Plan) dated July 24, 2013, including updates to the Work Plan dated October 2, 2014 and November 12, 2015, and the Work Plan modifications and clarifications described in this RI report and approved by the NYSDEC.

I certify that the data submitted to the NYSDEC in support of this Remedial Investigation Report, Operable Unit 5, demonstrate that the investigative requirements set forth in the Work Plan, Work Plan updates and modifications, and applicable statutes and regulations and Orders have been achieved in general accordance with the timeframes established in these documents and agreement with the NYSDEC.

I certify that all documents generated in support of this report have been submitted in accordance with the Division of Environmental Remediation's (DER's) electronic submission protocols.

I certify that to the best of my knowledge, all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Robert G. Adams, P.E., am certifying as the Owner's Designated Representative for the Site.

Robert G. Adams

Robert G. Adams, P.E.
NYS PE License 064918

02/12/16
Date

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1. Introduction

1.1 Purpose of Report

This report presents the results of a soil vapor investigation to identify the current potential for off-site migration of soil vapor from the former RUCO Polymer Corporation Site (Site) in Hicksville, New York. The assessment and potential remediation of off-site soil vapor has been designated as Operable Unit 5 (OU5) by the New York State Department of Environmental Conservation (NYSDEC) and is subject to NYSDEC Order on Consent and Administrative Settlement (Order), Index #A1-0799-12-10, effective September 30, 2013. The respondents to the Order were Bayer MaterialScience LLC (now known as Covestro LLC) and Occidental Chemical Corporation (OCC). The investigation was performed in accordance with:

1. The Soil Vapor Investigation Work Plan - Revision No. 2 (Work Plan) dated July 24, 2013 (approved by the NYSDEC on August 7, 2013).
2. Updates to the Work Plan dated October 2, 2014 (approved October 10, 2014) and November 12, 2015, (approved November 12, 2015) (included in Appendix A).

The Order was recorded with the Nassau County Clerk's Office on November 1, 2013. A copy of the recordation and the requisite certifications were provided to the NYSDEC on November 4, 2013 by Covestro.

1.2 Report Organization

This report consists of the following sections:

1. Introduction
2. Historical Information
3. Probe Installation and Sampling
4. Evaluation of Soil Vapor Results
5. Conclusions and Recommendations

2. Historical Information

2.1 Site History and Description

The Site is the former location of a chemical manufacturing facility that was located in an industrialized section of Hicksville, Long Island, New York (Figure 2.1) that also contains a number of other remedial action sites. When operations ceased in 2002, the Site consisted of four buildings used for the manufacture and storage of chemical products (Plants 1, 2, 3, and the Pilot Plant) and an administration building (Figure 2.2). The remainder of the 14-acre Site contained parking areas, chemical storage tanks, recharge basins (sumps) and small ancillary structures. The buildings and facilities have since been removed in conjunction with the planned remedial activities. Remedial activities have occurred under several operable units (e.g., OU1, OU2, OU3, and OU4) in compliance with other Orders which were established in connection with the investigation activities.

Commerce Street and adjacent industrial development comprise the 880-foot northern site boundary. Along the Site's 1,000-foot eastern side is a large warehouse building formerly-owned by Northrop. A small portion of undeveloped land abuts the Site's 250-foot southern property boundary. Two active tracks of the Long Island Railroad (LIRR) parallel the Site's 940-foot southwestern property boundary. The Site is bounded on the 270-foot western boundary by New South Road. The Site is enclosed by a chain-link fence, which completely encompasses the Site. The area surrounding the Site is comprised of an industrial corridor and residential complexes.

Operations at the Site began in 1945 and continued until 2002. While the facility was still operational, OCC completed on-site soil and groundwater assessment and remediation of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) operable units OU1 and OU2 under United States Environmental Protection Agency (USEPA) oversight. These actions were approved by USEPA in letters dated September 28, 2007 and March 12, 1993, respectively. In 2004, Bayer MaterialScience LLC began RCRA facility closure and corrective and remedial actions, and actions to comply with the requirements due to Site’s status as an Inactive Hazardous Waste Site under NYSDEC oversight and a December 2002 Order on Consent. Closure of the Site under RCRA authority and NYSDEC oversight included removal of on-site buildings and the performance of several interim remedial actions at the Site from 2005 through 2009. A NYSDEC Order on Consent, Index #A1-0781-11-11, Site # 130004 i.e., OU-4), which was executed on June 21, 2012 , created OU4 to address on-site soils and on-site soil vapors not addressed by previous OUs, RCRA interim remedial actions, or actions to comply with the remedial requirements of an Inactive Hazardous Waste Site. Remedial action for OU4 was completed in May 2015 by Covestro (the current owner of the Site) and a Final Engineering Report is currently in preparation.

2.2 Historic Investigative/Remedial Activities

2.2.1 Introduction

Numerous activities have occurred at the Site since 2004 that have reduced the concentrations of on-site volatile organic compounds (VOCs). The following sections summarize relevant information from soil and soil vapor investigations and remediation activities performed to date. There are no known remaining areas of soil with elevated concentrations of VOCs on the Site.

2.2.2 Soil Investigations

Under NYSDEC's RCRA program and the remedial actions undertaken due to designation as an Inactive Hazardous Waste Site, the vadose zone soils across the Site were extensively investigated through a series of comprehensive assessments completed between 2004 and 2009. Other than five locations in the vicinity of former Plant 1 where PCE concentrations ranged from 0.05 to 1 mg/kg, the total VOC concentrations were either less than 0.05 mg/kg or were non-detect across the remainder of the Site. Given that more than 450 sample locations have been tested, it is not expected that there are any residual sources of VOCs that remain in soil on the Site. The localized areas of elevated concentrations of PCE and TCE, shown on Figures 2.3 and 2.4 respectively, were removed in 2009.

In addition, a multiphase site-wide delineation/verification sampling program was implemented in 2013/2014 to determine the vertical and horizontal extent of additional soil requiring excavation and off-site disposal to complete the OU-4 remedy. No additional soil with elevated VOC concentrations was found.

2.2.3 Soil Vapor Investigations

Soil vapor samples were first collected in 1989 during the CERCLA Remedial Investigation at 55 locations across the entire Site (except for areas covered by pavement or buildings at the time). Soil vapor field screening was performed using a photoionization detector (PID) and confirmatory soil vapor analysis for site-related VOCs, including TCE, PCE, trans-1,2- dichloroethene, and vinyl chloride was performed using portable gas chromatography. Based on the analytical results, PCE was the only VOC detected in the soil vapor samples, and then only in two sampling locations; one location southeast of Plant 1 and one location northwest of Plant 2. Details of this soil vapor sampling program are presented in the Remedial Investigation Report (Leggette, Brashears & Graham, Inc., revised August 1992).

Between September 2008 and August 2009, soil vapor samples were collected from 28 on-site sampling locations (locations SG-1 through SG-28, shown on Figure 2.5). The sampling locations were approved by NYSDEC and the New York State Department of Health (NYSDOH) and selected to provide coverage across the Site, including areas within/near the footprints of the former plant buildings and the various paved areas. Several samples were also collected along the entire property boundary to measure the soil vapors adjacent to neighboring properties. The results of the soil vapor sampling were presented in the reports submitted in 2007 through 2009. The results indicate that elevated VOC concentrations were present in the middle of the Site, primarily in the location of former Plant 1. This finding is consistent with the results of the soil sampling program. Also consistent with the VOC concentrations in the soil, the highest soil vapor concentrations were those for PCE and TCE. Figures 2.5 and 2.6 show the historical soil vapor concentrations for PCE and TCE respectively, and as can be seen on the figures, the elevated concentrations of PCE and TCE are centered in the former VOC source area in the soils beneath the former Plant 1 area that were removed between May and August 2009.

With regard to the prior soil vapor samples that were collected from along the property boundaries, the following conditions were identified:

- There were no exceedances of the NYSDOH Indoor Air Guideline Values along the north property boundary.
- There was one location (SG-21) with a PCE concentration of 430 µg/m³ and TCE concentration of 170 µg/m^3 near the southwest corner of the Site. However, follow-up sampling at four additional locations around this location identified no VOC concentrations greater than the NYSDOH Indoor Air Guideline Values at these four locations, confirming that the one identified location is isolated and of limited areal extent.
- There was one other location with elevated VOC concentrations (at SG-11 the PCE concentration was 3,000 µg/m^3 and the TCE concentration was 32 µg/m^3) along the southwest property boundary proximal to the former Plant 1 source area.
- The sampling on the eastern property boundary did identify some locations of elevated VOC concentrations with the highest VOC concentration being PCE at 8,100 µg/m³.

In April 2011, a supplemental soil vapor investigation was conducted beneath and inside the neighboring warehouse located to the east of the Site. This investigation determined that while soil vapors were detected in some of the sub-slab areas beneath the building, no soil vapors were detected at actionable levels within the indoor air when compared to the NYSDOH Indoor Air Guideline Values of 30 µg/m³ for PCE and 5 µg/m³ for TCE. Some of the sub-slab soil vapor

concentrations were higher than those observed on the Site (with the highest VOC concentration being PCE at 32,000 µg/m³ vs. the highest east property boundary on-site concentration of 8,100 µg/m³). The results of this supplemental investigation were submitted to the NYSDEC in the report entitled "Vapor Intrusion Investigation Summary Report" (August 2011).

The results of these investigations have been provided to NYSDEC and NYSDOH. Sections 3 and 4 of this RI Report describe the additional investigations performed as part of OU5 to assess soil vapor conditions along the boundaries of the Site and the potential for off-site soil vapor migration.

2.2.4 Remedial Actions and Other Relevant Factors

Since the start of the on-site soil vapor assessment in 2007, several activities have been performed that have reduced on-site VOC concentrations in soils and reduced the potential for the presence of off-site vapor related to the Site. The significant activities that have taken place include the following:

- In 2006, the former building foundations and floor slabs on the Site were removed and, in the process, some of the pavement areas were broken up by the heavy equipment and some of the pavement was removed. The removal of the floor slabs and disturbance/removal of the pavement opened the pathway for soil vapor release to the atmosphere and for replenishment of clean air into the soil. The exposed soil is also subject to diurnal and seasonal variations in temperature and pressure that promotes vertical movement of soil vapor. The 2009 soil vapor samples were collected only 3 years after the removal of the relatively impervious cover layer across large areas of the Site. Ten years have now passed and it is expected that the soil vapor concentrations will have decreased since the time of the last on-site sampling event in the area of elevated VOC concentrations (i.e., 2009).
- In 2009, the only known pockets of elevated VOC-impacted soil were removed from the Site based on over 450 soil samples that were analyzed for VOCs. The 2009 remedial action removed approximately 1,450 cubic yards of soil primarily impacted with PCBs and the VOCs PCE and TCE. Removal of this material eliminated the only known locations of elevated VOCs in soil that could be contributing to soil vapors. This removal action had a significant effect on soil vapor concentrations and substantially eliminated the generation of new soil vapors. With the source removed, residual soil vapor concentrations in the surrounding areas will continue to dissipate and new soil vapor generation potential will have been minimalized.
- In 2009, a number of soil excavation projects were completed, primarily for PCBs. The opening of excavations to remove these soils promoted soil vapor movement in the immediate vicinity of the excavations. The degree of enhanced soil vapor movement depends on the size of the excavation, the duration for which the excavation remains open, and the fluctuations in the atmospheric conditions (wind, barometric pressure, temperature, etc.). Since the removal action, the subsurface conditions have had seven years to stabilize and therefore soil vapor concentrations should have reduced since that time. Between 2013 and 2015, 16,780 cubic yards of additional soil contaminated with PCBs, PAHs, arsenic, and/or cadmium were excavated. The excavated areas were backfilled with soil and a soil cover was placed over the backfill. The removal of the soil further enhanced the pathway for soil vapor release to the atmosphere. Also, the soil backfill and cover provide a permeable pathway for the continued migration of soil vapor to the atmosphere. The activities described above would have and continue to contribute to the reduction of on-site soil vapor concentrations and the potential for off-site soil vapor migration.

3. Soil Vapor Probe Installation and Sample Collection

3.1 Investigative Plan

The Work Plan provided for a phased implementation approach. The phased approach began with a set of on-site and off-site probes being installed and samples collected to determine the current conditions across the Site, more particularly along the property boundaries and to the east of the commercial building located east of the Site (Phase 1). Based on the results of the Phase 1 samples, appropriate locations for sampling on adjacent properties to the west/southwest were selected (Phase 2) in conjunction with the NYSDEC. The off-site sampling stations were selected to be adjacent to on-Site locations that exhibited the highest (Phase 1) soil vapor concentrations, thereby biasing the off-Site sampling stations in the area of highest probabilities of detecting soil vapor emanating from the Site.

At the conclusion of each phase of sampling, and prior to issuance of reports, the NYSDEC and NYSDOH received the final soil vapor analytical data and figures showing the sampling locations in monthly progress reports.

The details of the investigative program are as follows:

3.1.1 Access Agreements/Permits

Access Agreements/Permits obtained in support of the investigation were:

1. Simone Development Company, LLC for the commercial building located adjacent to the east property boundary of the Site for probes VP-20, VP-21, VP-22, VP-46, and VP-47.
2. The Town of Oyster Bay for probes VP-41 and VP-42.
3. The LIRR for probes VP-43, VP-44, and VP-45.

3.1.2 Phase I

Fourteen vadose zone soil vapor probes were installed by Aquifer Drilling & Testing (ADT) on November 25 and 26, 2013 along the perimeter of the Site at the locations shown on Figure 3.1. The probes were sampled between December 9 and 11, 2013. The locations are spaced approximately 150 feet apart along the eastern and southwestern property boundaries. To the extent practical, the sampling locations matched those locations that were sampled in 2009 to help confirm that the passage of time and the completed on-site remediation work resulted in improvement in soil vapor conditions. Consistent with the 2009 investigation, the probes were installed with a screened interval that is 5.0 to 5.5 feet below ground surface (ft bgs).

Three soil vapor probes (i.e., VP-17, VP-18, and VP-19) were installed in the previously identified high soil concentration areas in the interior of the Site to help assess the changes that occurred as a result of the on-site remediation work. The locations of these three sampling points are also shown on Figure 3.1.

Pairs of soil vapor probes (i.e., VP-4/VP-5 and VP-12/VP-13) were installed at two of the perimeter locations to help assess the potential for off-site migration of soil vapors. One of the probes was installed immediately adjacent to the Site boundary and the other probe was installed 20 feet

inward, perpendicular to the Site boundary. Comparison of the results obtained at each probe pair helped assess whether there is a concentration gradient leading onto the adjacent neighboring properties off-site. The locations of these probe pairs are shown on Figure 3.1.

Three vertical pairs of probes (i.e., VP-1/VP-30, VP-7/VP-31 and VP-11/VP-32) were installed to help assess the concentration gradients with depth. The shallow soil vapor probe of each pair was installed at a depth of 5.0 to 5.5 ft bgs to match the zone measured at all of the other probe locations. The deeper soil vapor probe was installed and screened to collect samples from a depth of 15 to 15.5 ft bgs. The locations of these deep probes are shown on Figure 3.1.

Three soil vapor probes (i.e., VP-20, VP-21, and VP-22) were installed at off-site locations to the east of the commercial building bordering the east Site boundary. The locations of these probes are shown on Figure 3.1.

3.1.3 Phase 2

Based on the results of the Phase 1 samples, additional off-site sample locations were selected from areas adjacent to the on-Site sample locations that exhibited elevated soil vapor concentrations. Six off-site sample locations were to be installed and sampled at the locations described below:

- Three off-site samples on the commercial properties to the southwest of the Long Island Rail Road (LIRR) property (i.e., VP-43, VP-44, and VP-45)
- Three off-site samples along New South Road between the Site and the residential neighborhood (i.e., VP-40, VP-41, and VP-42)

Pursuant to discussions held with the NYSDEC and its approval, the following modifications were made to the Phase 2 probe locations:

1. VP-40, to be located west of probe pair VP-1/VP-30, was determined not to be needed since both the PCE and TCE concentrations in VP-1/VP-30 were less than their respective NYSDOH Indoor Air Guideline Value.
2. VP-46 was installed south of VP-9 due to the elevated PCE concentrations in VP-9.
3. VP-47 was installed east of VP-21 due to the elevated PCE concentrations in VP-21.

Attempts to obtain access permission from the private property owners on which it was proposed to install probes VP-43, VP-44, and VP-45 were unsuccessful. To advance the investigation it was agreed during the conference call of September 28, 2014 with the NYSDEC to install and sample the four off-site probe locations for which access permission had been obtained (i.e., VP-41, VP-42, VP-46, and VP-47). In addition, select Phase 1 probes, whose removal had been necessitated to complete the OU-4 corrective measures, were to be sampled and then removed. An updated soil vapor investigation Work Plan and schedule were submitted to the NYSDEC on October 2, 2014 and approved on October 9, 2014. The four Phase 2 probes were installed by ADT on October 23, 2014. Also, eight Phase I probes were sampled and abandoned between October 22 and 23, 2014. The four newly installed Phase 2 probes and an additional eight Phase 1 probes were sampled between November 10 and 11, 2014. The remaining Phase 1 probes, except VP-1/VP-30, were abandoned during this sampling event.

Since attempts to obtain access permission for probe locations VP-43, VP-44, and VP-45 were not successful, it was decided with NYSDEC concurrence in January 2015, to move the locations

slightly northeast along the southwest boundary of the LIRR property. A request for access was submitted to the LIRR on January 20, 2015. An updated access request with additional information was submitted on March 18, 2015. LIRR personnel visited the area on May 21, 2015 and, based on the visit, requested additional information. The additional information was submitted on June 1, 2015 and a LIRR Letter of No Objection was received on June 26, 2015. The next step in obtaining access permission was to arrange insurances acceptable to the LIRR. This was completed by October 30, 2015. The LIRR notified GHD on December 14, 2015 that LIRR staff would be available on December 21, 2015 to perform the underground locates and observe probe installation and sampling. Since it was anticipated that the probes would be installed and sampled on the same day, a modification of the sample collection procedure was requested on November 12, 2015 and approved by the NYSDEC on the same day (see copy of correspondence in Appendix A). The three LIRR probes were installed on December 21 and all seven Phase 2 probes and three Phase 1 probes were sampled between December 21 and 22, 2015.

Details for the Phase 1 and Phase 2 probes are provided in Table 3.1.

3.2 Probe Installation and Sampling Procedures and Protocols

Before installation of the soil vapor probes began, a field survey crew identified the proposed sampling locations. Each final sampling location was then recorded utilizing latitude/longitude GPS coordinates and marked using a flagged, wooden stake. The coordinates are provided in Table 3.1.

The methods for collecting soil vapor and ambient air samples are detailed in the Standard Operating Procedures (SOPs) provided in Attachments 1 and 2 of the Work Plan, respectively. The NYSDOH's Guidance was followed in the development of these SOPs. In accordance with the NYSDOH's Guidance, samples were collected at depths greater than 5 feet to reduce the likelihood of atmospheric air being introduced into the samples. The samples were collected from 5.0 to 5.5 ft bgs and 15.0 to 15.5 ft bgs (except for VP-41 located within the New South Road ROW at which an underground utility was encountered at 4.8 ft bgs), The sampling interval at each location was limited to 6 inches to reduce potential sample dilution that could otherwise occur across a larger interval. Clearance of underground utilities for all locations except VP-43, VP-44, and VP-45, were performed by ADT prior to probe installation. The clearances for probe locations VP-43, VP-44, and VP-45 were performed by the LIRR.

At all soil vapor sampling locations, except VP-43, VP-44, and VP-45, a Geoprobe® rig was used to advance an assembly consisting of interconnected 4-foot lengths of 1.25"-diameter steel probe rod, affixed with an expendable point holder and expendable point at the downhole end, to the desired sampling depth (5.5/15.5 ft bgs). Hydrated bentonite was used to seal the annular space (if any) between the steel rod and borehole wall to isolate the subsurface interval from the atmospheric air. After the target depth was reached, the expendable point was disengaged by hydraulically retracting the steel probe rods upwards approximately 0.5 feet to create a void in the subsurface soil for soil vapor collection. A high-density polyethylene (HDPE) or fluoropolymer sample delivery tube (3/16" or 1/4" inside diameter) with an attached Post-Run-Tubing (PRT) threaded adapter was lowered through the 1.25"-diameter steel rod and threaded into the expendable point holder. Digital photos were -taken to document the soil gas probe installations.

Due to the potential presence of underground utilities in the areas of VP-43, VP-44, and VP-45, boreholes (approximately 3 inches diameter) were drilled to a depth of 5.5 ft bgs using an air knife. Once the borehole was drilled, a 1-inch temporary PVC pipe was advanced down the hole to ensure that it did not collapse. The soil vapor probe was then inserted inside the temporary pipe to

the required depth (5.5 ft bgs). Once the soil vapor probe was installed, the PVC pipe was removed and the borehole backfilled to 2 ft bgs with #2 sand. The remainder of the borehole was backfilled with granular bentonite, which was then hydrated. The probe was completed with the installation of a 4-inch diameter well cover encased in concrete.

The probes, except VP-43, VP-44 and VP-45, were allowed to rest for approximately 2 weeks before the initial sample collection. Probes VP-43, VP-44 and VP-45, since they were installed and sampled on the same day, were allowed to rest as long as practical (approximately 2 hours) before the start of purging. An initial gas draw (purging) was performed immediately prior to sampling. At the ground surface, the sample delivery tube was attached to an air sampling pump, and a minimum of one volume was evacuated from the sampling system. An electronic flow sensor was used to measure pump flow rate (not to exceed 100 milliliters per minute [mL/min] during purging activities), and the desired volume was purged based on pumping duration. After one full purge volume (equivalent to 1 1/2 times the volume inside the sampling line) had been expelled from the sampling system, the pump was disconnected and a PID equipped with a 10.6 electron volt lamp was attached to the tubing to measure approximate total organic vapor levels. A Swagelock™ valve was closed prior to disconnecting the pump and connecting the PID to prevent atmospheric air from entering the tubing.

Sample collection and analysis were conducted in accordance with USEPA Compendium Method TO-15, titled "Determination of VOCs in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)" and the USEPA Method TO-15 Standard Operating Procedure. At each sampling location, a pre-cleaned stainless-steel canister (a 6-liter SUMMA® canister) with an attached flow regulator was connected to the sample tubing and slowly opened to collect the soil vapor sample. Batch-certified-clean canisters were provided by the laboratory with an initial vacuum of at least 26 inches of mercury. Flow regulators were pre-set to draw soil vapor at a flow rate of 200 mL/min. Each soil vapor sample was collected over an approximately 30-minute period. When the canister vacuum reached approximately 2 inches of mercury, the valve on the canister was closed, leaving a vacuum in the canister as a means for the laboratory to verify the canister did not leak while in transit. The canister vacuum readings prior to sampling, with all the connections and leak checks completed and at the end of sampling, are provided in Table 4.1. As shown in Table 4.1, all but 2 of the 54 recorded canister vacuum readings after sample collection were greater than 2 psi.

A tracer gas (helium) was used in connection with the soil vapor sampling to provide a means to evaluate whether the soil vapor samples were diluted by surface air. A 5-gallon plastic pail was placed over the soil vapor sampling location, and hydrated bentonite was used to create a seal between the pail and the ground surface and for penetration of the downhole tooling (at the top of the pail) to create a containment unit within the pail. Prior to sampling, helium was introduced into the pail through a fitting on the side of the pail to create a minimum 50 percent helium content level within the pail. The helium levels in the purge gas and in the pail (prior to and immediately after sampling) were measured using a gas detector. The helium concentrations measured in the field are provided in Table 4.1. In the event that the helium meter measured a helium content within the sampling assembly of greater than 10 percent of the helium content measured within the containment unit (e.g., 5 percent for 50 percent helium in the containment unit), the soil gas probe was considered to permit significant leakage such that the collected soil gas sample would be considered not reliable or representative of soil gas concentrations. In such cases, the sample would be recollected following appropriate remedial steps to eliminate surface air inclusion in the sample. No such instances occurred during the sampling events.

Upwind ambient air samples were collected during the collection of the samples in October and November 2014. Consistent with the soil vapor sampling approach, the air sampling involved the use of a pre-cleaned 6-liter SUMMA® canister with an attached flow regulator. However, the regulator for the soil vapor sampling was adjusted by the laboratory to provide uniform sample collection over an approximate 8-hour sampling period.

The ambient air samples and soil vapor samples for the December 2013 and October/November 2014 samples were submitted to TestAmerica Laboratories, Inc. located in Knoxville, Tennessee for laboratory analysis for VOCs. The December 2015 samples were submitted to Spectrum Analytical, Inc. located in North Kingston, Rhode Island. The samples were analyzed for the complete VOC TO-15 analyte list in accordance with USEPA Compendium Method TO-15. The December 2013 and December 2015 soil vapor samples were also analyzed for helium to determine if surface air infiltration had occurred. TestAmerica and Spectrum are certified in the State of New York to perform air sample analyses.

The QA/QC review of the results and the Electronic Data Deliverables (in NYSDEC format) (EDDs) prior to December 2015 have been previously provided. The QA/QC review for the December 2015 results is provided in Appendix B and the EDD is provided on the enclosed CD.

4. Evaluation of Soil Vapor Results

4.1 December 2013 Phase I Results

The December 2013 results are provided in Table 4.2.

PCE and TCE results from the December 2013 sample event are shown on Figures 2.5 and 2.6, respectively. For comparison purposes, the NYSDOH Indoor Air Guideline Values of 30 µg/m^3 for PCE and 5 µg/m^3 for TCE are also shown on Figures 2.5 and 2.6.

In addition, the PCE and TCE results from the 2007 through 2011 soil vapor/sub-slab vapor sampling are also shown for comparison purposes on Figures 2.5 and 2.6, respectively. Vinyl Chloride Monomer (VCM) was not detected in any of the Phase 1 samples and in only one of the 2007 through 2011 samples. Thus, no figure is provided for VCM.

Review of the Summa canister pressures confirm that all of the canisters, except one, had retained a small negative pressure upon arrival at the laboratory and therefore met the requirements of the Work Plan sampling procedure. The remaining canister had a small positive pressure of 0.6 psi. Also, helium concentrations in the samples were all less than 10 percent of the measured helium concentration in the shroud during sample collection (see Table 4.1). Thus, the sample results are deemed representative of soil gas concentrations.

The Phase 1 December 2013 sampling event included seven locations where the 2013 sample probe locations were in close proximity to previous sample probe locations, allowing for a direct comparison of soil vapor concentrations. At four of these locations, where the previous PCE concentrations were elevated, the 2013 PCE concentrations were lower than the 2009 PCE sampling results. Specifically, at probe pair SG-1/VP-19 in the interior of the property and SG-13/VP-9 along the south Site boundary (Figure 2.5), the PCE concentrations decreased from 22,000 µg/m³ to 10,600 µg/m³ and from 3,700 to 780 µg/m³, respectively, between 2009 and 2013. At the two other paired set of probes with elevated 2009 PCE concentrations (SG-15/VP-14

approximately midway along the east Site boundary and SG-27/VP-10 in the southeast corner of the Site), the PCE concentrations decreased from 1,600 to 500 µg/m³ and 1,800 to 430 µg/m³, respectively, over this same time period. At the three remaining sets of paired probes (SG-12/VP-8, SG-16/VP-16, and SG-25/VP-2), the PCE concentrations were comparatively low in 2009 and remained low in the 2013 samples (all less than 110 µg/m³).

The TCE concentrations in two of the seven sets of paired probe locations show a similar downward trend as that exhibited by the PCE concentrations. Most notably, the TCE concentration at location SG-1/VP-19 in the interior of the Site, decreased from 2,900 to 715 µg/m³ between 2009 and 2013. Similarly, the TCE concentration at location SG-15/VP-14 along the east Site boundary, decreased from 190 to 72 µg/m³. At the remaining five paired probe locations where the TCE concentrations were already low (all less than 10 µg/m³), the TCE concentrations remained relatively unchanged between 2009 and 2013.

Phase 1 of this soil vapor investigation also included the installation of two horizontally nested probes that were installed as probe pairs located approximately 50 feet apart. The two pairs of probes were located at VP-4/VP-5 along the southwest Site boundary and at VP-12/VP-13 along the eastern Site boundary. The purpose of the horizontally nested probe pairs was to measure the soil vapor concentrations gradients approaching the Site boundary.

The PCE concentrations at both of the Site boundaries decreased as the boundary was approached. Along the southwest Site boundary, the PCE concentration decreased from 1,600 to 1,100 µg/m³ within the 50-foot distance between the two sample locations. Similarly, along the eastern Site boundary, the concentration decreased from 2,200 to100 µg/m³. For TCE, the concentrations approaching the Site y boundary stayed the same (16 µg/m³ at VP-4 compared to 14 µg/m³ at VP-5 along the southwest boundary) but showed a reduction from 86 to 4 µg/m³ between VP-12 and VP-13 along the eastern Site boundary.

Phase 1 of the soil vapor investigation also included the installation of three vertically nested probe sets to evaluate the concentration gradient with depth. The paired probe nests are locations: VP-1/VP-30 (west corner of Site); VP-7/VP-31 (southwest Site boundary); and VP-11/VP-32 (east side of Site) as shown on Figure 3.1. One probe from each pair was screened from 5 to 5.5 ft bgs and the other was screened at a depth of 15 to 15.5 ft bgs. Well pair VP-1/VP-30 is located near New South Road in an area where previous soil vapor testing has shown low concentration of PCE and non-detect to low concentrations of TCE. Consistent with previous results for this area, PCE concentrations at both depths (VP-1/VP-30) were low and no TCE was detected. At the other two probe pair locations, the PCE concentrations were elevated with the deeper probe's screened interval having PCE concentrations that were higher than the shallow sampling interval (e.g., 3,800 vs 910 µg/m³ at VP-7/VP-31 at the southern Site boundary and 54,000 vs 22,000 µg/m³ at VP-11/VP-32 near the eastern Site boundary).

For TCE, two of the vertically nested probe pairs had non-detect concentrations in all four probes. For the third probe pair, VP-11/VP-32 near the eastern Site boundary, the TCE concentrations were elevated. Again, the deeper probe of the pair had the higher TCE concentration (4,800 vs 1,200 µg/m³).

The sample data from along the eastern Site boundary show the following trends. The PCE concentrations in the probes installed on the Site adjacent to the eastern Site boundary (i.e., VP-10 through VP-16) are either lower than or equivalent to those measured in 2009. Furthermore,

consistent with the trend observed in 2011, all these probes have lower concentrations than the sub-slab vapor concentrations previously measured beneath the building to the east of the Site.

Similarly, the PCE concentrations in the probes installed to the east of the existing building on the neighboring property east of the Site (i.e., VP-20, 21, and 22) are also lower than the sub-slab vapor concentrations previously measured beneath that building. The PCE concentrations in these new off-Site probes are also lower than the concentrations measured on the Site.

Consistent with the historic data, the TCE concentrations along the east Site boundary and on the property to the east of the Site are significantly lower than the PCE concentrations.

The data collected during the December 2013 Phase 1 soil vapor investigation allows for assessment of potential trends in PCE and TCE concentrations in soil vapor at and near the Site. These include:

1. Where PCE/TCE concentrations in soil vapor were previously reported to be low in 2009, the concentrations remain low, indicating that the extent of soil vapor impacts is not increasing.
2. Where PCE/TCE concentrations in soil vapor were reported to be relatively high in the samples collected in 2009, the latest concentrations of these compounds were lower indicating that soil vapor concentrations have and are expected to continue to decrease over time.
3. PCE/TCE concentrations detected along the eastern Site boundary were less than the sub-slab PCE/TCE concentration in samples collected under the building east of the Site, as were PCE/TCE concentrations in soil vapor samples collected east of the building.

4.2 October and November 2014 Results

Review of the Summa canister pressures confirm that all of the canisters had retained a small negative pressure upon arrival at the laboratory and therefore met the requirements of the Work Plan sampling procedure. Helium concentrations in the samples were inadvertently not analyzed for the October and November 2014 samples. However all of the helium concentrations measured in the purge gas were 0.0 parts per million (ppm) except for one concentration of 0.2 ppm. Thus, the sample results are deemed representative of soil gas concentrations.

Background ambient air samples were collected on October 23 and November 11, 2014. The results of these samples are provided in Table 4.2. As shown in Table 4.2, no VOCs were detected in either of the ambient air samples.

The PCE concentrations in the on-site soil gas probes resampled in October and November 2014 increased in nine probes (i.e., VP-2, VP-4, VP-6, VP-8, VP-9, VP-10, VP-11/VP-32, and VP-13) and decreased in six probes (i.e., VP-3, VP-5, VP-7/VP-31, VP-12, and VP-14) compared to the December 2013 results. The increases and decreases were spatially randomly distributed.

The TCE concentrations in these probes remained either non-detect or low level with a maximum concentration of 57 µg/m^3 in VP-12. One exception was VP-11/VP-32 which had TCE concentrations of 1,800 and 4,800 µg/m^3, respectively.

The PCE concentration in the two off-site probes installed along New South Road (i.e., VP-41 and VP-42) were 2,100 and 2,900 µg/m^3, respectively. These elevated concentrations are not consistent with the lower concentrations detected in probes VP-1 (non-detect) and VP-2 (410 µg/m^3), which are located on-Site along the west Site boundary in close proximity to VP-41 and VP-42.

The PCE concentration in the off-site probe installed south of the Site (i.e., VP-46) was 530 µg/m³. This concentration is lower than the adjacent on-site probe VP-9 with a PCE concentration of 950 µg/m³.

The PCE concentration in the two eastern probes located east of the off-site building (i.e., VP-21 and VP-47) were 2,600 and 130 µg/m³, respectively. Probe VP-47 is located approximately 120 feet east of VP-21. Thus, there is a significant decrease in PCE concentrations over a relatively short distance in the eastward direction moving away from the Site.

The TCE concentrations in VP-21, VP-41, VP-42, and VP-47 were all non-detect. The only detected TCE was in VP-46 at 7.7 µg/m³, which is only slightly greater than the NYSDOH Indoor Air Guideline Value of 5 µg/m³.

4.3 December 2015 Results

Review of the Summa canister pressures confirm that all of the canisters, except one, had retained a small negative pressure upon arrival at the laboratory and therefore met the requirements of the Work Plan sampling procedure. The remaining canister had a small positive pressure of 0.5 psi. Also, helium concentrations in the samples were all non-detect. Thus, the sample results are deemed representative of soil gas concentrations.

The PCE concentrations in the five locations southeast of the LIRR ranged from non-detect to 70 µg/m^3 with only one location (i.e., VP-45) having a concentration greater than the indoor air guideline value of 30 µg/m^3. Of particular note is that the PCE concentrations in the probes closest to the residential area (i.e., VP-41 and VP-42) along New South Road have decreased from 2,100/2,900 in November 2014 to 3/4 µg/m^3 in December 2015, respectively.

The PCE concentrations in the on-site probe nest VP-1/VP-30 decreased to non-detect, both of which are less than the PCE indoor air guideline value.

The PCE concentrations in the three probes to the east on the Simone property have significantly decreased but remain greater than the indoor air guideline value at VP-21 and VP-46. The reductions are as follows:

Well	November 2014 Result	December 2015 Result
VP-21	2,800 µg/m^3	510 µg/m^3
VP-46	530 µg/m^3	380 µg/m^3
VP-47	130 µg/m^3	12 µg/m^3

It is noted that the PCE concentration in the farthest probe to the east (i.e., VP-47) is now below the NYSDOH Indoor Air Guideline Value of 30 µg/m^3.

In summary:

1. The December 2015 PCE concentrations in the seven probes previously sampled in October/November 2014 have decreased significantly.
2. The only December 2015 locations with PCE concentrations greater than the indoor air guideline value are VP-45 and two on the Simone property (i.e., VP-21 and VP-46). It is noted

that VP-45 is located approximately 50 feet from the nearest building, which is a commercial building.

The December 2015 TCE concentrations in the five locations southwest of the Site are non-detect. Of particular note is that the TCE concentrations in the probes closest to the residential area (i.e., VP-41 and VP-42) have decreased from 51/71 to ND/ND µg/m^3, respectively.

The TCE concentrations in the on-site probe nest VP-1/VP-30 remain non-detect.

The TCE concentrations in the three probes on the Simone property range from non-detect to 43 µg/m^3 with only the VP-47 probe having a TCE concentration greater than the NYSDOH Indoor Air Guideline Value of 5 µg/m^3. The TCE concentration in VP-47 increased from 26 to 43 µg/m^3 between November 2014 and December 2015.

In summary:

1. The December 2015 TCE concentrations in the probes sampled have remained non-detect or have decreased significantly except for VP-47 which increased (even though PCE concentrations decreased).
2. The only December location with a TCE concentration greater than the indoor air guideline value was VP-47 (i.e., 43 µg/m^3).

5. Conclusions and Recommendations

The following conclusions and recommendations are based on the evaluation of the soil vapor sample analytical results.

5.1 Conclusion

Based on the investigations and assessments performed, the following conclusions have been formulated with regard to off-site soil vapor migration:

1. The soil vapor assessment results show that the identification and removal of on-site sources of soil vapor completed for the RCRA interim remedial actions and the OU4 response action and remedial actions to address the Inactive Hazardous Waste Site status have reduced soil vapor concentrations associated with the Site and the potential for off-site migration of soil vapor.
2. The PCE concentrations are decreasing significantly with time. In December 2015, the only off-site locations with PCE concentrations greater than the NYSDOH Indoor Air Guideline Value of 30 µg/m^3 were VP-45 located southwest of the Site and VP-21 and VP-47 located east of the Site.
3. Although the PCE indoor air guideline value is 30 µg/m^3 and the soil vapor concentration in VP-45 is 70 µg/m^3, it is expected that this soil vapor concentration will not result in indoor air exceedances associated with the Site. The main reason for this is that concentrations sourced on-site have and will continue to decrease as distance from the Site increases. In addition, soil vapor concentrations are reduced when calculating indoor air values. Using EPA's own screening level guidance confirms this. An example of such reduction is the USEPA Vapor Intrusion Screening Level (VISL) calculator which uses a factor of 10 to reduce soil gas targets to indoor air targets. Considering the anticipated continuing decrease in concentrations with increasing distance from the Site and the barrier effect of the structure components on the

migration of soil gas to indoor air (i.e., the USEPA VISL factor of 10), it is anticipated that PCE concentrations within the building will be less than the Indoor Air Guideline Value. Thus, the PCE concentration of 70 µg/m^3 in VP-45 will not result in unacceptable PCE concentrations in the building closest to VP-45.

4. The off-site TCE concentrations remain at a very low level and decreased between 2014 and 2015, except for VP-47. In December 2015, the only off-site location with a TCE concentration greater than the NYSDOH Indoor Air Guideline Value of 5 µg/m^3 was VP-47 (43 µg/m^3).
5. No exceedances of NYSDOH Indoor Air Guideline Values for PCE and TCE were detected in the April 2011 indoor air samples collected within the warehouse immediately east of the Site.
6. Since no exceedances of Indoor Air Guideline Values were detected in the April 2011 indoor air samples, and PCE and TCE soil vapor concentrations are decreasing, indoor air in the warehouse is expected to remain protective of human health.
7. Based on the December 2015 PCE and TCE results in VP-41 and VP-42 (i.e., the two probes located closest to the residential area), which were less than NYSDOH Indoor Air Guideline Values, there is no residential vapor intrusion risk attributable to the Site.
8. The soil vapor investigations completed for OU5 have provided the information necessary to complete the evaluation of the potential for off-site soil vapor migration associated with the Site.

5.2 Recommendations

Based on the investigations and assessments performed, the following recommendation has been formulated with regard to off-site soil vapor:

- No further assessment or remediation for OU5 is required.

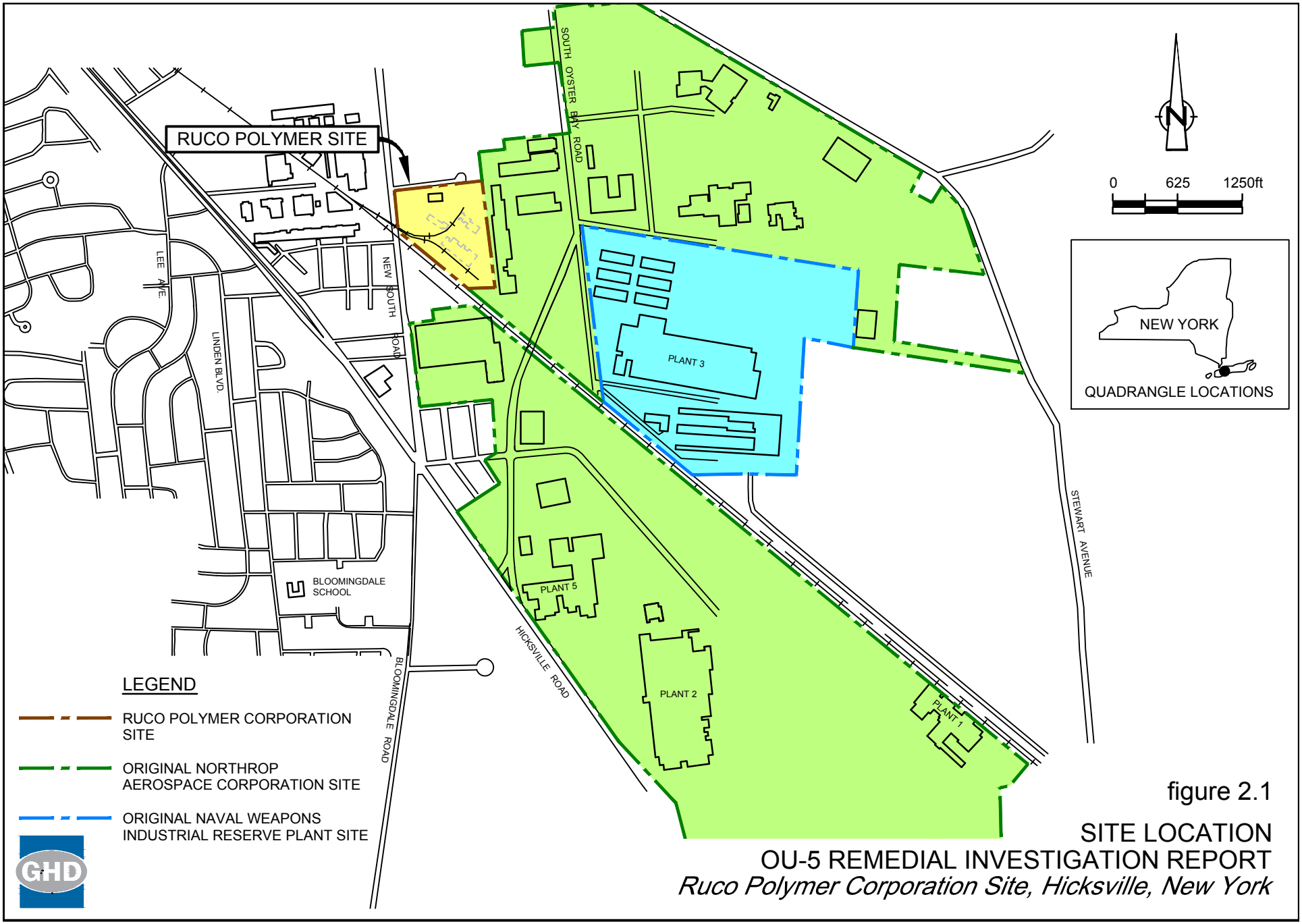

figure 2.1

SITE LOCATION

OU-5 REMEDIAL INVESTIGATION REPORT

Ruco Polymer Corporation Site, Hicksville, New York

81618-D22102(001)GN-WA002 FEB 8/2016

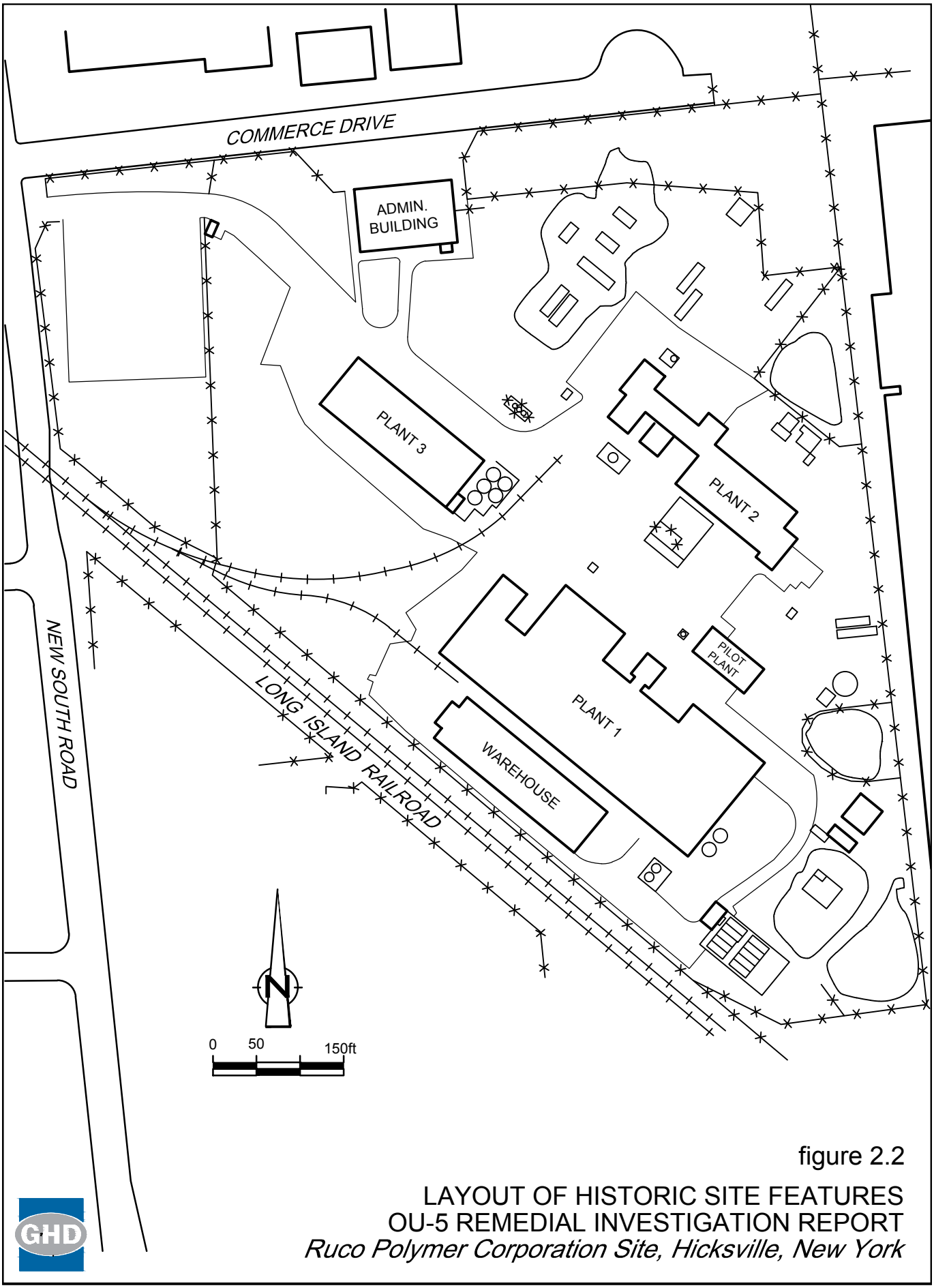

figure 2.2

LAYOUT OF HISTORIC SITE FEATURES
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

81618-D22102(001)GN-WA001 FEB 8/2016

figure 2.3

PCE SOIL CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

GHD

81618-D22102(001)GN-WA003 FEB 8/2016

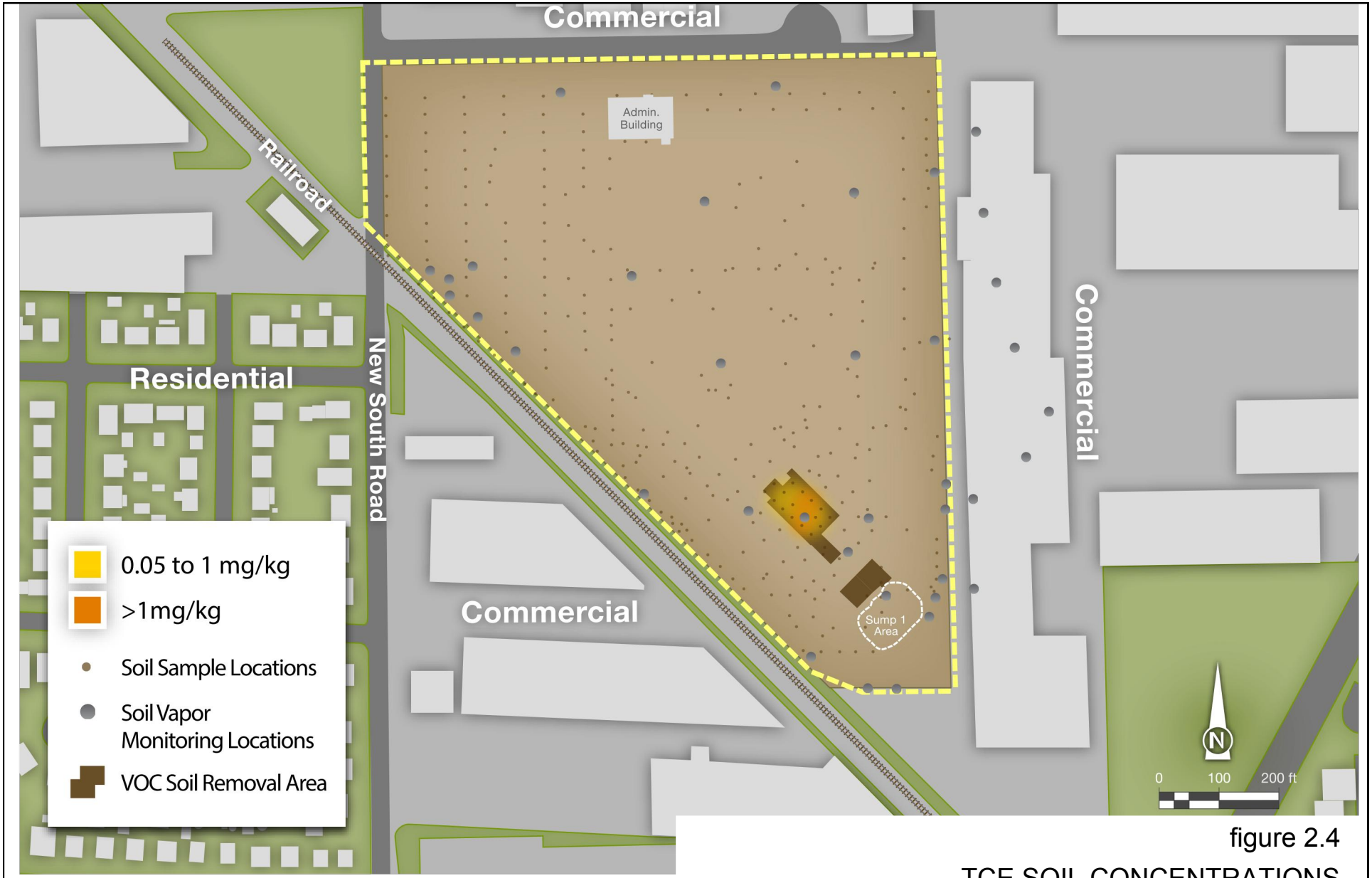

figure 2.4

TCE SOIL CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

GHD

81618-D22102(001)GN-WA004 FEB 8/2016

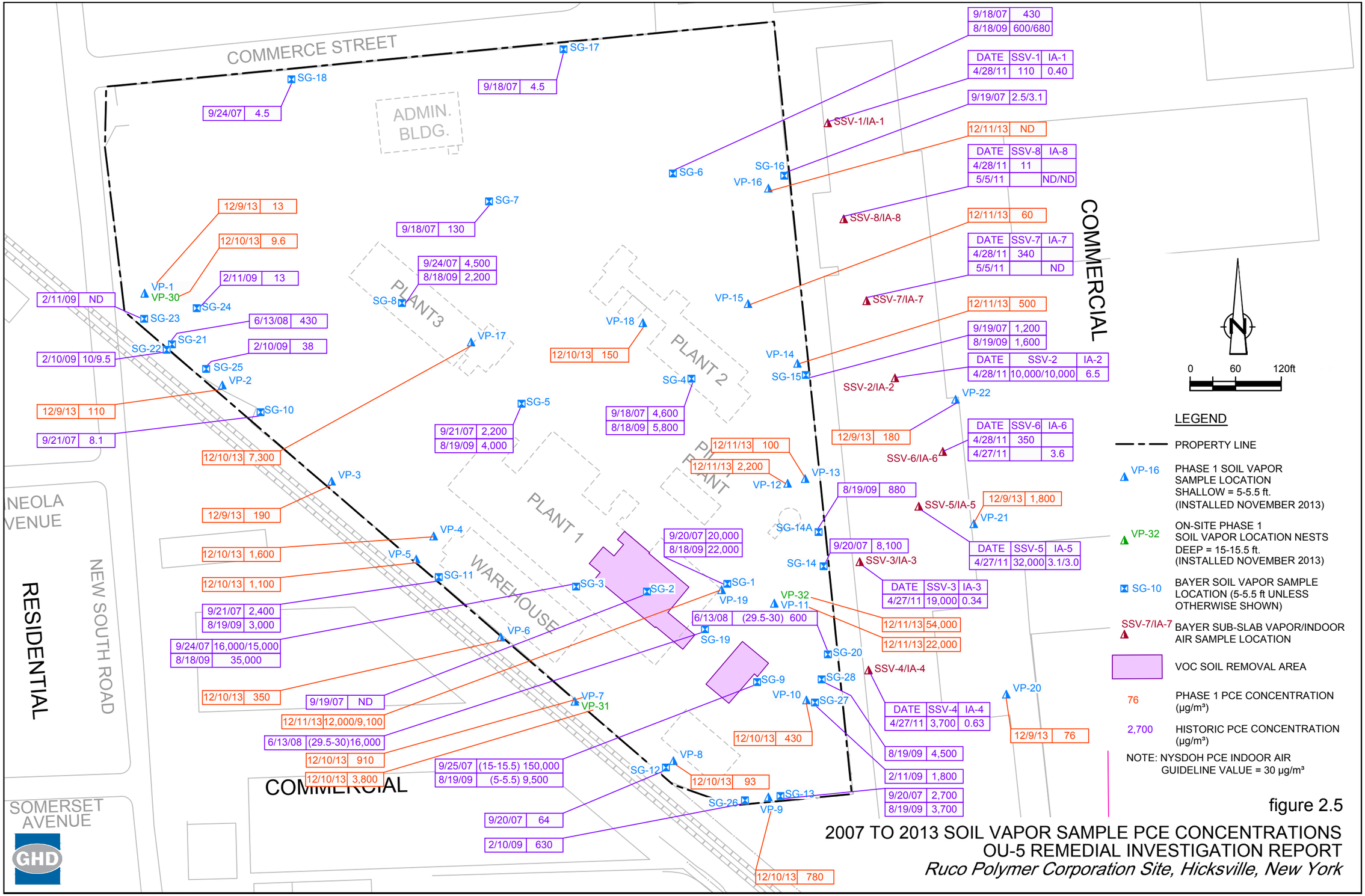

figure 2.5

2007 TO 2013 SOIL VAPOR SAMPLE PCE CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

GHD

81618-D22102(001)GN-WA005 FEB 8/2016

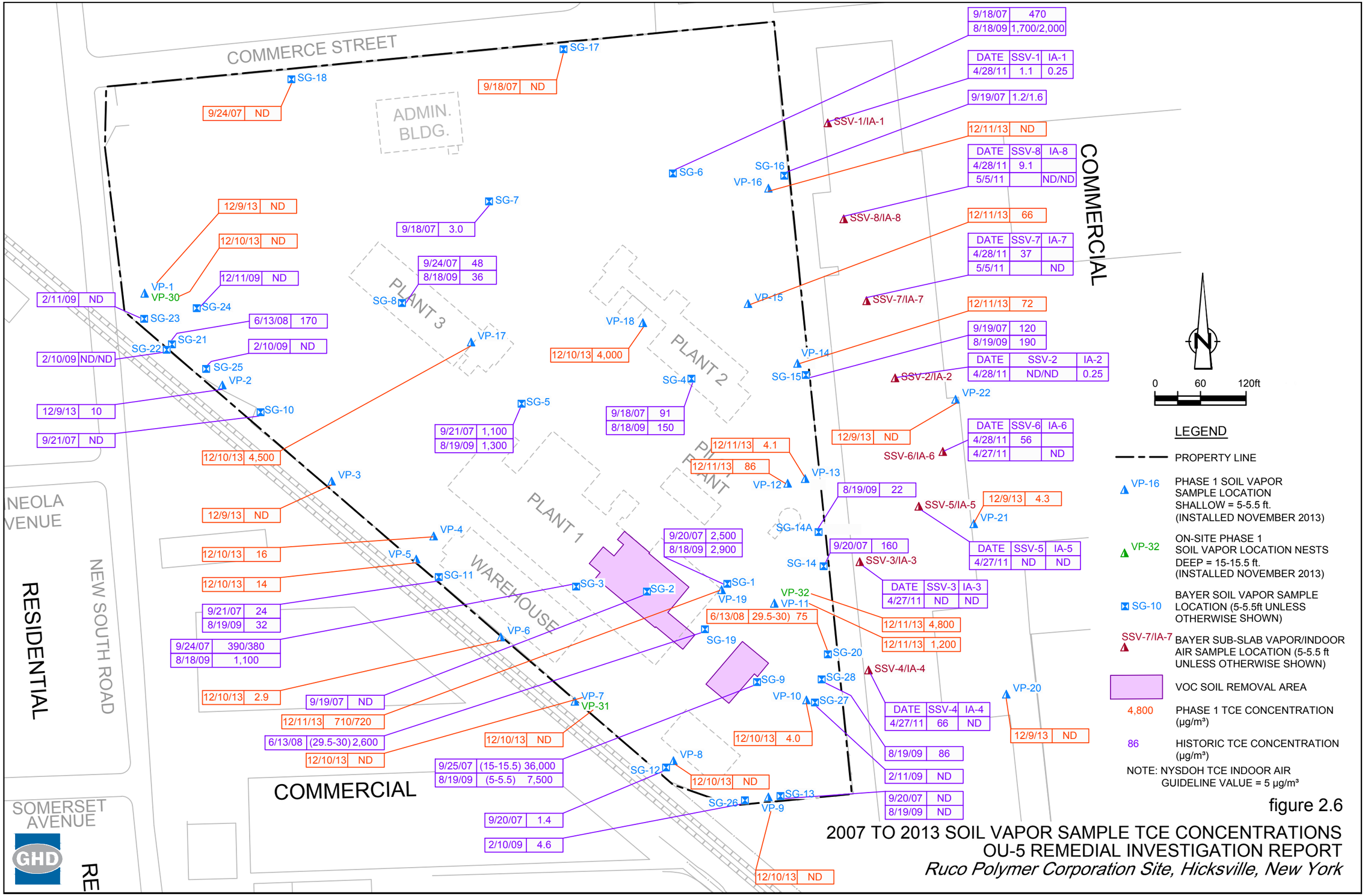

figure 2.6

2007 TO 2013 SOIL VAPOR SAMPLE TCE CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

GHD

81618-D22102(001)GN-WA006 FEB 8/2016

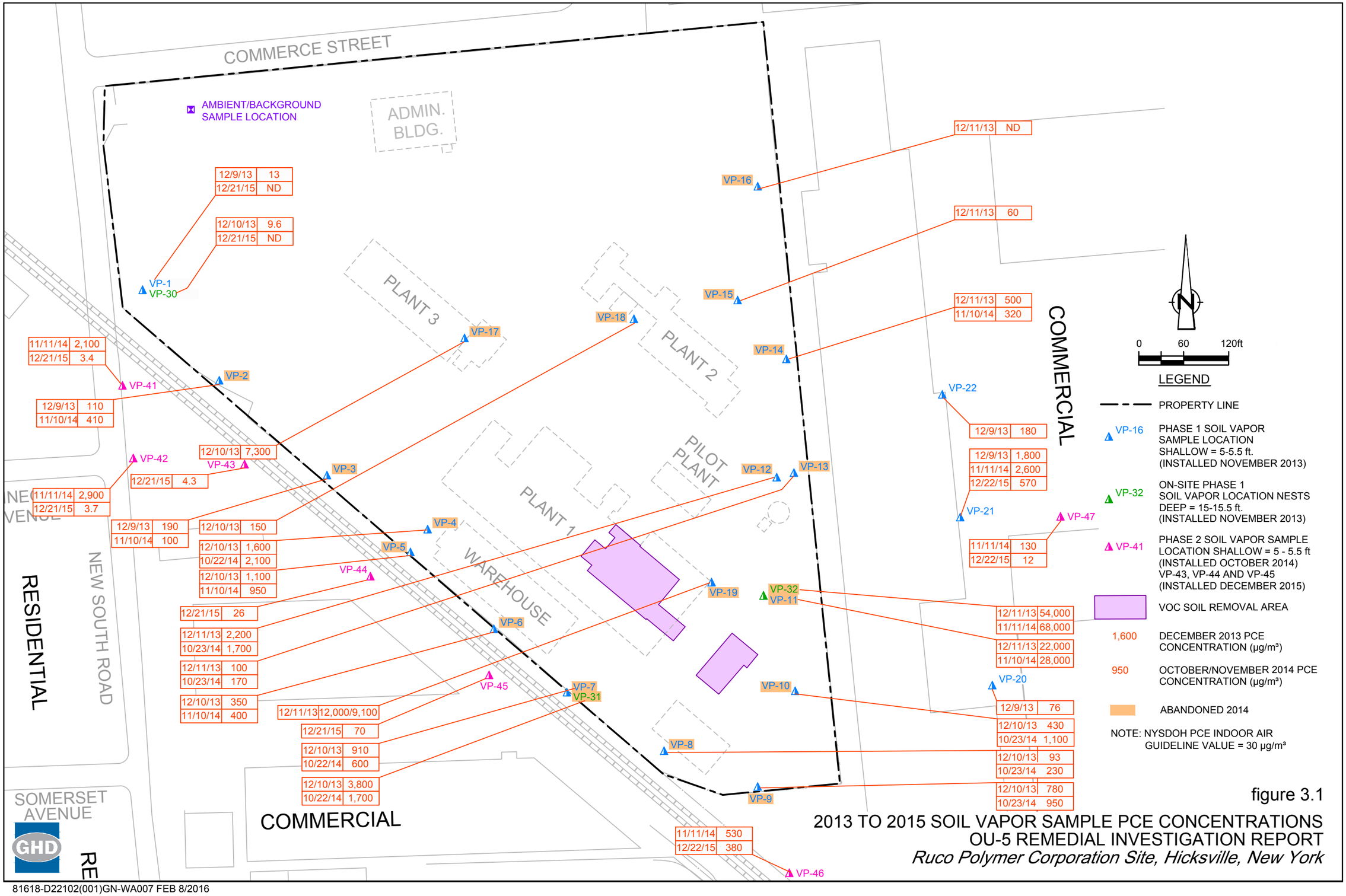

figure 3.1

2013 TO 2015 SOIL VAPOR SAMPLE PCE CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

81618-D22102(001)GN-WA007 FEB 8/2016

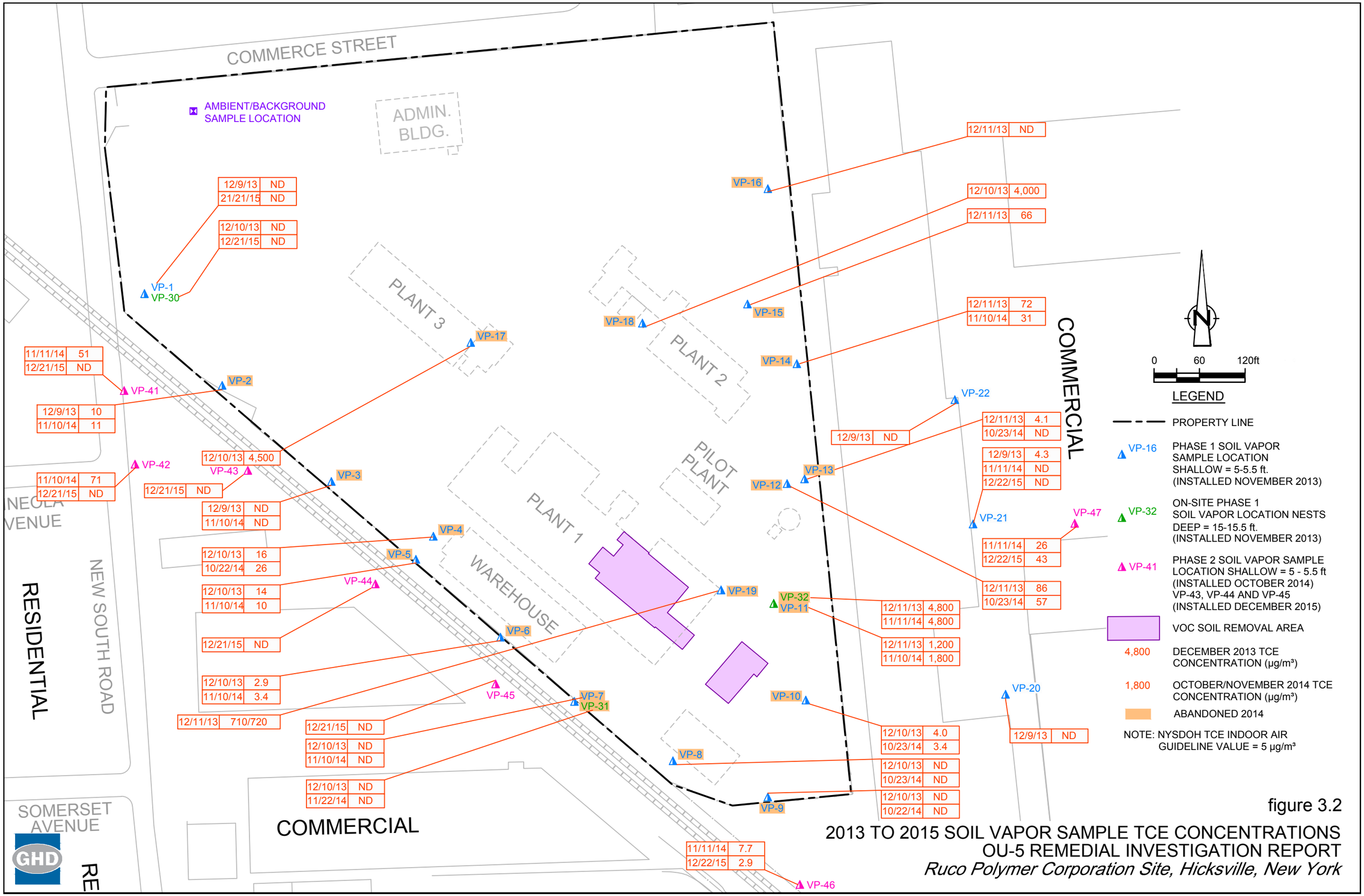

figure 3.2

2013 TO 2015 SOIL VAPOR SAMPLE TCE CONCENTRATIONS
OU-5 REMEDIAL INVESTIGATION REPORT
Ruco Polymer Corporation Site, Hicksville, New York

GHD

81618-D22102(001)GN-WA008 FEB 8/2016

Table 2.1

Chronology of Operable Unit 5 Activities
RUCO Polymer Facility
Hicksville, NY

Activity	Start Date	End Date
Work Plan	January 2013	August 7, 2013
Order on Consent		September 30, 2013
Recording of Notice of Order on Consent		November 1, 2013
Simone Access Agreement (Phase I)	September 2013	November 13, 2013
Phase 1 Probe Installation	November 25, 2013	November 26, 2013
Phase 1 Probe Sampling	December 9, 2013	December 11, 2013
Evaluation of Phase 1 Result	December 11, 2013	February 5, 2014
Response to NYSDEC Comments on Phase 1 Evaluation	April 1, 2014	April 25, 2014
Simone Access Agreement (Phase 2)	May 1, 2014	June 25, 2014
Town of Oyster Bay Access Request (Phase 2)	May 21, 2014	October 23, 2014
American Compresses Gases Access Request (Phase 2)	May 1, 2014	Denied June 11, 2014
Getlan Associates Access Request (Phase 2)	May 1, 2014	January 20, 2015 (Not granted)
Updated Work Plan	September 26, 2014	October 2, 2014
Install 4 Phase 2 Probes	October 23, 2014	October 23, 2014
Sample 8 Phase 1	October 22, 2014	October 23, 2014
Sample 8 Phase 1 and 4 Phase 2 Probes	November 10, 2014	November 11, 2014
Abandon Phase 1 Probes (Except VP-1/VP-31 pair)	October 22, 2014	November 11, 2014
October/November Results to NYSDEC		January 7, 2015
LIRR Access Request (Phase 2)	January 20, 2015	

Table 2.1

Chronology of Operable Unit 5 Activities
RUCO Polymer Facility
Hicksville, NY

Activity	Start Date	End Date
Updated LIRR Access Request (Phase 2)	March 18, 2015	
Visit to LIRR Property		May 21, 2015
Updated Request to LIRR		June 1, 2015
LIRR Letter of No Objection Received		June 26, 2015
Acceptable Insurance	June 26, 2015	
Provided to LIRR		October 30, 2015
Arrange for LIRR Staff	October 30, 2015	December 14, 2015
Revision to Sample Collection Procedure	November 12, 2015	November 12, 2015
Install LIRR Phase 2 Probes	December 21, 2015	December 21, 2015
Sample 11 Phase 2 Probes and 3 Phase 1 Probes	December 21, 2015	December 22, 2015

Table 3.1

Soil Vapor Probe Details

Probe ID	Screened Interval (ft bgs)	Latitude	Longitude	Installed
VP-1	5.0-5.5	N 45.4720009	W 73 30.3470001	
VP-2	5.0-5.5	N 45.4520004	W 73 30.3249992	
VP-3	5.0-5.5	N 45.4309994	W 73 30.2940008	
VP-4	5.0-5.5	N 45.4190005	W 73 30.2649995	
VP-5	5.0-5.5	N 45.41N 007	W 73 30.2700007	
VP-6	5.0-5.5	N 45.3970003	W 73 30.2460009	
VP-7	5.0-5.5	N 45.3830001	W 73 30.2250001	
VP-8	5.0-5.5	N 45.3700006	W 73 30.1969988	
VP-9	5.0-5.5	N 45.3620003	W 73 30.1699999	
VP-10	5.0-5.5	N 45.3830000	W 73 30.1589991	
VP-11	5.0-5.5	N 45.N N 004	W 73 30.1679989	
VP-12	5.0-5.5	N 45.4300006	W 73 30.1639993	
VP-13	5.0-5.5	N 45.4310001	W 73 30.1589998	
VP-14	5.0-5.5	N 45.4560002	W 73 30.1610003	
VP-15	5.0-5.5	N 45.4690003	W 73 30.1750002	
VP-16	5.0-5.5	N 45.49N 004	W 73 30.1690004	
VP-17	5.0-5.5	N 45.4609997	W 73 30.2540007	
VP-18	5.0-5.5	N 45.4649994	W 73 30.2050003	
VP-19	5.0-5.5	N 45.N 70000	W 73 30.1830003	
VP-20	5.0-5.5	N 45.38N 000	W 73 30.1020001	
VP-21	5.0-5.5	N 45.4210000	W 73 30.1109989	
VP-22	5.0-5.5	N 45.4480009	W 73 30.1159989	
VP-30	5.0-5.5	N 45.4720009	W 73 30.3470001	
VP-31	15.0-15.5	N 45.3830001	W 73 30.2250001	
VP-32	15.0-15.5	N 45.N N 004	W 73 30.1679989	
VP-33	15.0-15.5			
VP-41	4.3-4.8[(1)]	N 40.45.451	W 73.30.353	October 23, 2014
VP-42	5.0-5.5	N 40.45.435	W 73.30.350	October 23, 2014
VP-43	5.0-5.5	N 40 45.432	W 73 30.320	December 21, 2015
VP-44	5.0-5.5	N 40 45.410	W 73 30.285	December 21, 2015
VP-45	5.0-5.5	N 40 45.387	W 73 30.250	December 21, 2015
VP-46	5.0-5.5	N 40.45.421	W 73.30.161	October 23, 2014
VP-47	5.0-5.5	N 40.45.421	W 73.30.082	October 23, 2014

Notes:

(1) Underground Utility encountered at 4.8 ft bgs.

Table 4.1

Soil Vapor Sample Collection Field Parameters
RUCO Polymer Facility,
Hicksville NY

Probe	Sample Date	Canister	Vacuum (psi)	Shroud Helium (%)		Purge Gas Helium (ppm)		Sample Helium (%)
		Initial	After Sample Collection	Start	End	Start	End	
	Background 10/23/14	30.0	5.0					
	Upgradient 11/11/14	30.0	0.2					
VP-1	12/09/13	29.0	5.0	NR	41	NR	NR	0.18U
	12/21/15	29.0	2.0	88	63	NR	NR	U
VP-2	12/9/2013	28.0	5.0	NR	NR	NR	0.0	0.18U
	11/10/2014	31.0	5.0	60	59.2	NR	0.0	NA
VP-3	12/9/2013	30.0	5.0	NR	47	NR	NR	0.18U
	11/10/2014	29.0	0.0	52.3	52.7	NR	NR	NA
VP-4	12/10/2013	30.0	4.0	NR	(1)	NR	0.0	0.17U
	10/22/2014	30.0	5.0	54	48	NR	0.0	NA
VP-5	12/10/2013	25.0	4.5	(1)	(1)	NR	0.0	0.19
	11/10/2014	31.0	5.0	50	52.4	NR	0.0	
VP-6	12/18/2013	30.0	5.0	NR	17.3	NR	NR	0.18U
	11/10/2014	29.0	4.0	50	NR	NR	NR	NA
VP-7	12/18/2013	30.0	5.0	NR	NR	NR	0.0	0.18U
	10/22/2014	30.0	3.0	56.2	52.7	NR	0.0	NA
VP-8	12/18/2013	30.0	2.0	NR	4.5	250	250	0.18U
	10/23/2014	NR	NR	51	54.5	0.0	0.0	NA
VP-9	12/10/2013	30.0	5.0	NR	9.6	950	NR	0.17U
	10/23/2014	NR	3.0	56.8	54.4	0.0	0.0	NA
VP-10	12/10/2013	30.0	5.0	NR	18.6	220U	NR	0.18U
	10/23/2014	NR	NR	51.8	56.3	0.0	0.0	NA
VP-11	12/11/2013	30.0	5.0	NR	NR	NR	NR	0.10U
	11/10/2014	30.0	2.5	54.3	49.3	0.2	0.2	NA
VP-12	12/11/2013	29.0	2.0	NR	13.1	NR	NR	0.17U
	10/23/2014				59.2	0.0	0.0	NA
VP-13	12/11/2013	30.0	4.0		4.5	25	NR	0.17U
	10/23/2014			59.1	NR	0.0	0.0	NA
VP-14	12/11/2013	30.0	5.0	NR	16.0	0.0	0.0	0.18
	11/10/2014	30.0	4.0	50	54.8	NR	0.0	NA
VP-15	12/11/2013	29.0	5.0	NR	27.7	0.0	0.0	0.18U
VP-16	12/11/2013	29.0	4.0	NR	3.7	NR	NR	0.23
VP-17	12/10/2013	30.0	4.0	NR	8.7	0.0	0.0	0.17U
VP-18	12/10/2013	29.0	5.0	NR	44.9	0.0	0.0	0.18U
VP-19	12/11/2013	30.0	4.0	NR	53.2	0.0	0.0	0.34
	12/11/2013	27.5	3.0	NR	53.2	0.0	0.0	0.16U

Table 4.1

Soil Vapor Sample Collection Field Parameters
RUCO Polymer Facility,
Hicksville NY

Probe	Sample Date	Canister	Vacuum (psi)	Shroud Helium (%)		Purge Gas Helium (ppm)		Sample Helium (%)
		Initial	After Sample Collection	Start	End	Start	End	
VP-20	12/9/2013	21.5	5.0	NR	19.5	NR	NR	0.19U
VP-21	12/9/2013	29.0	5.0	NR	9.5	NR	0.0	0.16U
	11/11/2014	31.0	4.0	NR	50.4	NR	0.0	NA
	12/22/2015	29.0	2.0	70	52	NR	NR	U
VP-22	12/9/2013	29.0	5.0	NR	50.0	0.0	NR	0.19U
VP-30	12/18/2013	30.0	5.0	NR	41	NR	NR	0.18U
	12/21/2015	30.0	4.0	70	52	NR	NR	U
VP-31	12/18/2013	30.0	2.0	NR	4.5	NR	NR	0.17U
	10/22/2014	30.0	3.0	62	51.1	NR	0.0	NA
VP-32	12/11/2013	28.0	3.0	NR	6.7	NR	NR	0.16U
	11/11/2014	30.0	3.5	54.2	50.6	NR	NR	NA
VP-41	11/11/2014	30.0	2.0	54.2	54.6	NR	NR	NA
	12/21/2015	22.0	2.0	72	53	NR	NR	U
VP-42	11/11/2014	30.0	2.5	60.2	76.2	NR	NR	NA
	12/21/2015	27.0	2.0	58	51	NR	NR	U
VP-43	12/21/2015	29.0	3.0	65	58	NR	NR	U
VP-44	12/21/2015	30.0	3.0	63	55	NR	NR	U
VP-45	12/21/2015	27.0	3.0	58	57	NR	NR	U
VP-46	11/11/2014	30.0	3.5	NR	53.9	NR	0.0	NA
	12/22/2015	29.0	2.0	54	58	NR	NR	U
VP-47	11/11/2014	30.0	3.5	NR	56.1	NR	0.0	NA
	12/22/2015	30.0	2.0	63	60	NR	NR	U

Notes:

(1) Unable to obtain helium reading in shroud

Greater than 10% of shroud helium concentration

NR Not Recorded

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		Ambient Air	Background	VP-1	VP-1	VP-2	VP-2
Sample ID:		SG-81618-111114-RR-007	SG-81618-102214-RR-001	SG-81618-120913-RR005	SG-81618-122115-RR-005	SG-81618-120913-RR004	SG-81618-111014-RR-002
Sample Date:		11/11/2014	10/23/2014	12/9/2013	12/21/2015	12/9/2013	11/10/2014
Parameters	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	55 U	4.4 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	5.5 U	5.5 U	69 U	5.5 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	55 U	4.4 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	41 U	3.2 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	40 U	3.2 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	30 U	30 U	74 U	30 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	49 U	50	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	6.1 U	6.1 U	77 U	6.1 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	60 U	4.8 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	40 U	3.2 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	3.7 U	3.7 U	46 U	3.7 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	5.6 U	5.6 U	70 U	5.6 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	49 U	9.0	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	3.5 U	3.5 U	22 U	3.5 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	60 U	4.8 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	60 U	4.8 U	4.8 U
1,4-Dioxane	µg/m^3	7.2 U	7.2 U	7.2 UJ	36 U	7.2 UJ	7.2 U
2,2,4-Trimethylpentane	µg/m^3	7.5 U	7.5 U	7.5 U		7.5 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	12 U	12 U	330	12 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	8.3 U	8.3 U		8.3 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	8.2 U	8.2 U	130	8.2 U	8.2 U
4-Ethyl toluene	µg/m^3	7.9 U	7.9 U	7.9 U	49 U	7.9 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	8.2 U	8.2 U	41 U	8.2 U	8.2 U
Acetone	µg/m^3	48 U	48 U	48 U	1300	48 U	48 U
Allyl chloride	µg/m^3	2.5 U	2.5 U	2.5 U		2.5 U	2.5 U
Benzene	µg/m^3	2.6 U	2.6 U	2.6 U	32 U	2.6 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	5.4 U	5.4 U	67 U	5.4 U	5.4 U
Bromoform	µg/m^3	8.3 U	8.3 U	8.3 U	100 U	8.3 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	3.1 U	3.1 U		3.1 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		Ambient Air	Background	VP-1	VP-1	VP-2	VP-2
Sample ID:		SG-81618-111114-RR-007	SG-81618-102214-RR-001	SG-81618-120913-RR005	SG-81618-122115-RR-005	SG-81618-120913-RR004	SG-81618-111014-RR-002
Sample Date:		11/11/2014	10/23/2014	12/9/2013	12/21/2015	12/9/2013	11/10/2014
Parameters	**Units**						
Carbon disulfide	µg/m^3	6.2 U	6.2 U	6.2 U	31 U	6.2 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	5.0 U	5.0 U	63 U	5.0 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	3.7 U	3.7 U	46 U	3.7 U	3.7 U
Chloroethane	µg/m^3	2.1 U	2.1 U	2.1 U	26 U	2.1 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	3.9 U	3.9 U	49 U	3.9 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	4.1 U	4.1 U	21 U	4.1 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	40 U	3.2 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	45 U	3.6 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	5.5 U	5.5 U	34 U	5.5 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	6.8 U	6.8 U	85 U	6.8 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	4.0 U	4.0 U	49 U	4.0 U	4.0 U
Ethylbenzene	µg/m^3	3.5 U	3.5 U	4.1	43 U	3.5 U	3.5 U
Helium	µg/m^3			0.18 U	U	0.18 U	
Hexachlorobutadiene	µg/m^3	8.5 U	8.5 U	8.5 U	110 U	8.5 U	8.5 U
Hexane	µg/m^3	7.0 U	7.0 U	7.0 U	18 J	7.0 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	20 U	20 U	31	20 U	20 U
m&p-Xylenes	µg/m^3	3.5 U	3.5 U	18	87 U	3.5 U	3.5 U
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	14 U	14 U	36 U	14 U	14 U
Methylene chloride	µg/m^3	6.9 U	6.9 U	6.9 U	35 U	6.9 U	6.9 U
N-Heptane	µg/m^3	6.6 U	6.6 U	6.6 U	41 U	6.6 U	6.6 U
o-Xylene	µg/m^3	3.5 U	3.5 U	4.6	43 U	3.5 U	3.5 U
Styrene	µg/m^3	3.4 U	3.4 U	3.4 U	43 U	3.4 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	24 U	24 U		24 U	24 U
Tetrachloroethene	µg/m^3	5.4 U	5.4 U	13	68 U	110	410
Tetrahydrofuran	µg/m^3	12 U	12 U	12 U	29 U	12 U	12 U
Toluene	µg/m^3	4.5 U	4.5 U	9.0	38 U	34	4.5 U
trans-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	40 U	3.2 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	45 U	3.6 U	3.6 U
Trichloroethene	µg/m^3	2.1 U	2.1 U	2.1 U	54 U	10	11
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	4.5 U	4.5 U	56 U	4.5 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	6.1 U	6.1 U	77 U	6.1 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	3.5 U	3.5 U		3.5 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	2.0 U	2.0 U	26 U	2.0 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-3**	**VP-3**	**VP-4**	**VP-4**	**VP-5**
Sample ID:		**SG-81618-120913-RR007**	**SG-81618-111014-RR-001**	**SG-81618-121013-RR008**	**SG-81618-102214-RR-002**	**SG-81618-121013-RR006**
Sample Date:		**12/9/2013**	**11/10/2014**	**12/10/2013**	**10/22/2014**	**12/10/2013**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	4.4 U	4.4 U	8.7 U	11 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	5.5 U	11 U	14 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	4.4 U	8.7 U	11 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	3.2 U	6.5 U	8.1 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	3.2 U	6.3 U	7.9 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	30 U	59 U	74 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	7.9 U	9.8 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	6.1 U	12 U	15 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	9.6 U	12 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	3.2 U	6.5 U	8.1 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	3.7 U	7.4 U	9.2 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	5.6 U	11 U	14 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	7.9 U	9.8 U	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	3.5 U	7.1 U	8.8 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	9.6 U	12 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	9.6 U	12 U	4.8 U
1,4-Dioxane	µg/m^3	65 J	7.2 U	14 U	18 U	7.2 U
2,2,4-Trimethylpentane	µg/m^3	7.5 U	7.5 U	15 U	19 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	12 U	24 U	29 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	8.3 U	17 U	21 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	8.2 U	16 U	20 U	8.2 U
4-Ethyl toluene	µg/m^3	7.9 U	7.9 U	16 U	20 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	8.2 U	16 U	20 U	8.2 U
Acetone	µg/m^3	48 U	48 U	95 U	120 U	48 U
Allyl chloride	µg/m^3	2.5 U	2.5 U	5.0 U	6.3 U	2.5 U
Benzene	µg/m^3	2.6 U	2.6 U	5.1 U	6.4 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	5.4 U	11 U	13 U	5.4 U
Bromoform	µg/m^3	8.3 U	8.3 U	17 U	21 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	3.1 U	6.2 U	7.8 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-3**	**VP-3**	**VP-4**	**VP-4**	**VP-5**
Sample ID:		**SG-81618-120913-RR007**	**SG-81618-111014-RR-001**	**SG-81618-121013-RR008**	**SG-81618-102214-RR-002**	**SG-81618-121013-RR006**
Sample Date:		**12/9/2013**	**11/10/2014**	**12/10/2013**	**10/22/2014**	**12/10/2013**
Parameters	**Units**					
Carbon disulfide	µg/m^3	28	6.2 U	12 U	16 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	5.0 U	10 U	13 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	3.7 U	7.4 U	9.2 U	3.7 U
Chloroethane	µg/m^3	2.1 U	2.1 U	4.2 U	5.3 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	3.9 U	7.8 U	9.8 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	4.1 U	8.3 U	10 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	6.3 U	7.9 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	7.3 U	9.1 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	5.5 U	11 U	14 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	6.8 U	14 U	17 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	4.0 U	7.9 U	9.9 U	4.0 U
Ethylbenzene	µg/m^3	3.5 U	3.5 U	6.9 U	8.7 U	3.5 U
Helium	µg/m^3	0.18 U		0.17 U		0.19
Hexachlorobutadiene	µg/m^3	8.5 U	8.5 U	17 U	21 U	8.5 U
Hexane	µg/m^3	7.0 U	7.0 U	14 U	18 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	20 U	39 U	49 U	20 U
m&p-Xylenes	µg/m^3	14	3.5 U	6.9 U	8.7 U	3.7
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	14 U	29 U	36 U	14 U
Methylene chloride	µg/m^3	6.9 U	6.9 U	14 U	17 U	6.9 U
N-Heptane	µg/m^3	6.6 U	6.6 U	13 U	16 U	6.6 U
o-Xylene	µg/m^3	3.6	3.5 U	6.9 U	8.7 U	3.5 U
Styrene	µg/m^3	3.4 U	3.4 U	6.8 U	8.5 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	24 U	49 U	61 U	24 U
Tetrachloroethene	µg/m^3	190	100	1600	2100	1100
Tetrahydrofuran	µg/m^3	12 U	12 U	24 U	29 U	12 U
Toluene	µg/m^3	8.0	4.5 U	9.0 U	11 U	4.5 U
trans-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	6.3 U	7.9 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	7.3 U	9.1 U	3.6 U
Trichloroethene	µg/m^3	2.1 U	2.1 U	16	26	14
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	4.5 U	9.0 U	11 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	6.1 U	12 U	15 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	3.5 U	7.0 U	8.7 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	2.0 U	4.1 U	5.1 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-5**	**VP-6**	**VP-6**	**VP-7**	**VP-7**
Sample ID:		**SG-81618-111014-RR-004**	**SG-81618-121013-RR011**	**SG-81618-111014-RR-003**	**SG-81618-121013-RR013**	**SG-81618-102214-RR-003**
Sample Date:		**11/10/2014**	**12/10/2013**	**11/10/2014**	**12/10/2013**	**10/22/2014**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	11 U	4.4 U	4.4 U	8.7 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	14 U	5.5 U	5.5 U	11 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	11 U	4.4 U	4.4 U	8.7 U	4.4 U
1,1-Dichloroethane	µg/m^3	8.1 U	3.2 U	3.2 U	6.5 U	3.2 U
1,1-Dichloroethene	µg/m^3	7.9 U	3.2 U	3.2 U	6.3 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	74 U	30 U	30 U	59 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	9.8 U	3.9 U	3.9 U	7.9 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	15 U	6.1 U	6.1 U	12 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	12 U	4.8 U	4.8 U	9.6 U	4.8 U
1,2-Dichloroethane	µg/m^3	8.1 U	3.2 U	3.2 U	6.5 U	3.2 U
1,2-Dichloropropane	µg/m^3	9.2 U	3.7 U	3.7 U	7.4 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	14 U	5.6 U	5.6 U	11 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	9.8 U	3.9 U	3.9 U	7.9 U	3.9 U
1,3-Butadiene	µg/m^3	8.8 U	3.5 U	3.5 U	7.1 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	12 U	4.8 U	4.8 U	9.6 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	12 U	4.8 U	4.8 U	9.6 U	4.8 U
1,4-Dioxane	µg/m^3	18 U	7.2 UJ	7.2 U	14 UJ	7.2 U
2,2,4-Trimethylpentane	µg/m^3	19 U	7.5 U	7.5 U	15 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	29 U	12 U	12 U	24 U	160
2-Chlorotoluene	µg/m^3	21 U	8.3 U	8.3 U	17 U	8.3 U
2-Hexanone	µg/m^3	20 U	8.2 U	8.2 U	16 U	93
4-Ethyl toluene	µg/m^3	20 U	7.9 U	7.9 U	16 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	20 U	8.2 U	8.2 U	16 U	8.2 U
Acetone	µg/m^3	120 U	48 U	52	95 U	390
Allyl chloride	µg/m^3	6.3 U	2.5 U	2.5 U	5.0 U	2.5 U
Benzene	µg/m^3	6.4 U	2.6 U	2.6 U	5.1 U	2.6 U
Bromodichloromethane	µg/m^3	13 U	5.4 U	5.4 U	11 U	5.4 U
Bromoform	µg/m^3	21 U	8.3 U	8.3 U	17 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	7.8 U	3.1 U	3.1 U	6.2 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-5**	**VP-6**	**VP-6**	**VP-7**	**VP-7**
Sample ID:		**SG-81618-111014-RR-004**	**SG-81618-121013-RR011**	**SG-81618-111014-RR-003**	**SG-81618-121013-RR013**	**SG-81618-102214-RR-003**
Sample Date:		**11/10/2014**	**12/10/2013**	**11/10/2014**	**12/10/2013**	**10/22/2014**
Parameters	**Units**					
Carbon disulfide	µg/m^3	16 U	7.4	6.2 U	12 U	6.2 U
Carbon tetrachloride	µg/m^3	13 U	5.0 U	5.0 U	10 U	5.0 U
Chlorobenzene	µg/m^3	9.2 U	3.7 U	3.7 U	7.4 U	3.7 U
Chloroethane	µg/m^3	5.3 U	2.1 U	2.1 U	4.2 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	9.8 U	3.9 U	3.9 U	7.8 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	10 U	4.1 U	4.1 U	8.3 U	8.6
cis-1,2-Dichloroethene	µg/m^3	7.9 U	3.2 U	3.2 U	6.3 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	9.1 U	3.6 U	3.6 U	7.3 U	3.6 U
Cyclohexane	µg/m^3	14 U	5.5 U	5.5 U	11 U	5.5 U
Dibromochloromethane	µg/m^3	17 U	6.8 U	6.8 U	14 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	9.9 U	4.1	4.0 U	7.9 U	4.0 U
Ethylbenzene	µg/m^3	8.7 U	4.0	3.5 U	6.9 U	3.5 U
Helium	µg/m^3		0.18 U		0.18 U	
Hexachlorobutadiene	µg/m^3	21 U	8.5 U	8.5 U	17 U	8.5 U
Hexane	µg/m^3	18 U	7.0 U	7.0 U	14 U	7.0 U
Isopropyl alcohol	µg/m^3	49 U	20 U	20 U	39 U	20 U
m&p-Xylenes	µg/m^3	8.7 U	16	3.5 U	17	3.5 U
Methyl tert butyl ether (MTBE)	µg/m^3	36 U	14 U	14 U	29 U	14 U
Methylene chloride	µg/m^3	17 U	6.9 U	6.9 U	14 U	6.9 U
N-Heptane	µg/m^3	16 U	6.6 U	6.6 U	13 U	6.6 U
o-Xylene	µg/m^3	8.7 U	5.6	3.5 U	6.9 U	3.5 U
Styrene	µg/m^3	8.5 U	3.4 U	3.4 U	6.8 U	3.4 U
tert-Butyl alcohol	µg/m^3	61 U	24 U	24 U	49 U	24 U
Tetrachloroethene	µg/m^3	950	350	400	910	600
Tetrahydrofuran	µg/m^3	29 U	12 U	12 U	24 U	12 U
Toluene	µg/m^3	11 U	8.4	4.5 U	17	4.5 U
trans-1,2-Dichloroethene	µg/m^3	7.9 U	3.2 U	3.2 U	6.3 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	9.1 U	3.6 U	3.6 U	7.3 U	3.6 U
Trichloroethene	µg/m^3	9.8	2.9	3.4	4.3 U	2.1 U
Trichlorofluoromethane (CFC-11)	µg/m^3	11 U	4.5 U	4.5 U	9.0 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	15 U	6.1 U	6.1 U	12 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	8.7 U	3.5 U	3.5 U	7.0 U	3.5 U
Vinyl chloride	µg/m^3	5.1 U	2.0 U	2.0 U	4.1 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-8**	**VP-8**	**VP-9**	**VP-9**	**VP-10**
Sample ID:		**SG-81618-121013-RR017**	**SG-81618-102314-RR-005**	**SG-81618-121013-RR019**	**SG-81618-102314-RR-006**	**SG-81618-121013-RR021**
Sample Date:		**12/10/2013**	**10/23/2014**	**12/10/2013**	**10/23/2014**	**12/10/2013**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	30 U	30 U	30 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,4-Dioxane	µg/m^3	7.2 UJ	7.2 U	7.2 UJ	7.2 U	7.2 UJ
2,2,4-Trimethylpentane	µg/m^3	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	12 U	12 U	12 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	8.2 U	11	8.2 U	8.2 U
4-Ethyl toluene	µg/m^3	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	8.2 U	15	8.2 U	8.2 U
Acetone	µg/m^3	48 U	48 U	48 U	48 U	48 U
Allyl chloride	µg/m^3	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzene	µg/m^3	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
Bromoform	µg/m^3	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-8**	**VP-8**	**VP-9**	**VP-9**	**VP-10**
Sample ID:		**SG-81618-121013-RR017**	**SG-81618-102314-RR-005**	**SG-81618-121013-RR019**	**SG-81618-102314-RR-006**	**SG-81618-121013-RR021**
Sample Date:		**12/10/2013**	**10/23/2014**	**12/10/2013**	**10/23/2014**	**12/10/2013**
Parameters	**Units**					
Carbon disulfide	µg/m^3	6.7	6.2 U	6.2 U	6.2 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Chloroethane	µg/m^3	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Ethylbenzene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Helium	µg/m^3	0.18 U		0.17 U		0.18 U
Hexachlorobutadiene	µg/m^3	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U
Hexane	µg/m^3	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	20 U	20 U	20 U	20 U
m&p-Xylenes	µg/m^3	5.4	3.5 U	10	3.5 U	3.5
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	14 U	14 U	14 U	14 U
Methylene chloride	µg/m^3	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U
N-Heptane	µg/m^3	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U
o-Xylene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Styrene	µg/m^3	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	24 U	24 U	24 U	24 U
Tetrachloroethene	µg/m^3	93	230	780	950	430
Tetrahydrofuran	µg/m^3	12 U	12 U	12 U	12 U	12 U
Toluene	µg/m^3	4.8	4.5 U	6.2	4.5 U	8.1
trans-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Trichloroethene	µg/m^3	2.1 U	2.1 U	2.1 U	2.1 U	4.0
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-10**	**VP-11**	**VP-11**	**VP-12**	**VP-12**	**VP-13**
Sample ID:		**SG-81618-102314-RR-007**	**SG-81618-121113-RR029**	**SG-81618-111014-RR-005**	**SG-81618-121113-RR027**	**SG-81618-102314-RR-008**	**SG-81618-121113-RR025**
Sample Date:		**10/23/2014**	**12/11/2013**	**11/10/2014**	**12/11/2013**	**10/23/2014**	**12/11/2013**
Parameters	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m^3	4.4 U	96 U	190 U	8.7 U	11 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	120 U	240 U	11 U	14 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	96 U	190 U	8.7 U	11 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	71 U	140 U	6.5 U	8.1 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	70 U	140 U	6.3 U	7.9 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	650 U	1300 U	59 U	74 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	87 U	170 U	7.9 U	9.8 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	140 U	270 U	12 U	15 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	110 U	210 U	9.6 U	12 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	71 U	140 U	6.5 U	8.1 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	81 U	160 U	7.4 U	9.2 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	120 U	240 U	11 U	14 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	87 U	170 U	7.9 U	9.8 U	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	78 U	150 U	7.1 U	8.8 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	110 U	210 U	9.6 U	12 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	110 U	210 U	9.6 U	12 U	4.8 U
1,4-Dioxane	µg/m^3	7.2 U	160 U	310 U	14 UJ	18 U	7.2 UJ
2,2,4-Trimethylpentane	µg/m^3	7.5 U	160 U	320 U	15 U	19 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	260 U	510 U	24 U	29 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	180 U	360 U	17 U	21 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	180 U	360 U	16 U	20 U	8.5
4-Ethyl toluene	µg/m^3	7.9 U	170 U	340 U	16 U	20 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	180 U	360 U	16 U	20 U	12
Acetone	µg/m^3	48 U	1000 U	2100 U	95 U	120 U	48 U
Allyl chloride	µg/m^3	2.5 U	55 U	110 U	5.0 U	6.3 U	2.5 U
Benzene	µg/m^3	2.6 U	56 U	110 U	5.1 U	6.4 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	120 U	230 U	11 U	13 U	5.4 U
Bromoform	µg/m^3	8.3 U	180 U	360 U	17 U	21 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	68 U	140 U	6.2 U	7.8 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		VP-10	VP-11	VP-11	VP-12	VP-12	VP-13
Sample ID:		SG-81618-102314-RR-007	SG-81618-121113-RR029	SG-81618-111014-RR-005	SG-81618-121113-RR027	SG-81618-102314-RR-008	SG-81618-121113-RR025
Sample Date:		10/23/2014	12/11/2013	11/10/2014	12/11/2013	10/23/2014	12/11/2013
Parameters	**Units**						
Carbon disulfide	µg/m^3	6.2 U	140 U	270 U	12 U	16 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	110 U	220 U	10 U	13 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	81 U	160 U	7.4 U	9.2 U	3.7 U
Chloroethane	µg/m^3	2.1 U	46 U	92 U	4.2 U	5.3 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	86 U	170 U	7.8 U	9.8 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	91 U	180 U	8.3 U	10 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	450	540	6.3 U	7.9 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	80 U	160 U	7.3 U	9.1 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	120 U	240 U	11 U	14 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	150 U	300 U	14 U	17 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	87 U	170 U	7.9 U	9.9 U	4.0 U
Ethylbenzene	µg/m^3	3.5 U	76 U	150 U	6.9 U	8.7 U	3.5 U
Helium	µg/m^3		0.18 U		0.17 U		0.17 U
Hexachlorobutadiene	µg/m^3	8.5 U	190 U	370 U	17 U	21 U	8.5 U
Hexane	µg/m^3	7.0 U	160 U	310 U	14 U	18 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	430 U	850 U	39 U	49 U	20 U
m&p-Xylenes	µg/m^3	3.5 U	76 U	150 U	9.8	8.7 U	8.5
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	320 U	630 U	29 U	36 U	14 U
Methylene chloride	µg/m^3	6.9 U	150 U	300 U	14 U	17 U	6.9 U
N-Heptane	µg/m^3	6.6 U	140 U	290 U	13 U	16 U	6.6 U
o-Xylene	µg/m^3	3.5 U	76 U	150 U	6.9 U	8.7 U	3.5 U
Styrene	µg/m^3	3.4 U	75 U	150 U	6.8 U	8.5 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	530 U	1100 U	49 U	61 U	24 U
Tetrachloroethene	µg/m^3	1100	22000	28000	2200	1700	100
Tetrahydrofuran	µg/m^3	12 U	260 U	510 U	24 U	29 U	12 U
Toluene	µg/m^3	4.5 U	99 U	200 U	9.0 U	11 U	4.4
trans-1,2-Dichloroethene	µg/m^3	3.2 U	70 U	140 U	6.3 U	7.9 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	80 U	160 U	7.3 U	9.1 U	3.6 U
Trichloroethene	µg/m^3	3.4	1200	1800	86	57	4.1
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	99 U	200 U	9.0 U	11 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	130 U	270 U	12 U	15 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	77 U	150 U	7.0 U	8.7 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	45 U	89 U	4.1 U	5.1 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-13**	**VP-14**	**VP-14**	**VP-15**	**VP-16**
Sample ID:		**SG-81618-102314-RR-009**	**SG-81618-121113-RR016**	**SG-81618-111014-RR-006**	**SG-81618-121113-RR014**	**SG-81618-121113-RR023**
Sample Date:		**10/23/2014**	**12/11/2013**	**11/10/2014**	**12/11/2013**	**12/11/2013**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	30 U	30 U	30 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
1,4-Dioxane	µg/m^3	7.2 U	7.2 UJ	7.2 U	7.2 UJ	7.2 UJ
2,2,4-Trimethylpentane	µg/m^3	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	12 U	12 U	12 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	8.2 U	8.2 U	8.2 U	8.2 U
4-Ethyl toluene	µg/m^3	7.9 U	7.9 U	7.9 U	7.9 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	23	8.2 U	8.2 U	8.2 U
Acetone	µg/m^3	48 U	48 U	48 U	48 U	48 U
Allyl chloride	µg/m^3	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzene	µg/m^3	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
Bromoform	µg/m^3	8.3 U	8.3 U	8.3 U	8.3 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-13**	**VP-14**	**VP-14**	**VP-15**	**VP-16**
Sample ID:		**SG-81618-102314-RR-009**	**SG-81618-121113-RR016**	**SG-81618-111014-RR-006**	**SG-81618-121113-RR014**	**SG-81618-121113-RR023**
Sample Date:		**10/23/2014**	**12/11/2013**	**11/10/2014**	**12/11/2013**	**12/11/2013**
Parameters	**Units**					
Carbon disulfide	µg/m^3	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Chloroethane	µg/m^3	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Ethylbenzene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Helium	µg/m^3		0.18		0.18 U	0.23
Hexachlorobutadiene	µg/m^3	8.5 U	8.5 U	8.5 U	8.5 U	8.5 U
Hexane	µg/m^3	7.0 U	7.0 U	7.0 U	7.0 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	20 U	20 U	20 U	20 U
m&p-Xylenes	µg/m^3	3.5 U	6.8	3.5 U	4.3	3.5 U
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	14 U	14 U	14 U	14 U
Methylene chloride	µg/m^3	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U
N-Heptane	µg/m^3	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U
o-Xylene	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Styrene	µg/m^3	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	24 U	24 U	24 U	24 U
Tetrachloroethene	µg/m^3	170	500	320	60	5.4 U
Tetrahydrofuran	µg/m^3	12 U	12 U	12 U	12 U	12 U
Toluene	µg/m^3	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
trans-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Trichloroethene	µg/m^3	2.1 U	72	31	66	2.1 U
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-17**	**VP-18**	**VP-19**	**VP-19**
Sample ID:		**SG-81618-121013-RR010**	**SG-81618-121013-RR012**	**SG-81618-121113-RR018**	**SG-81618-121113-RR020**
Sample Date:		**12/10/2013**	**12/10/2013**	**12/11/2013**	**12/11/2013**
Parameters	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/m^3	35 U	22 U	17 U	22 U
1,1,2,2-Tetrachloroethane	µg/m^3	44 U	27 U	22 U	27 U
1,1,2-Trichloroethane	µg/m^3	35 U	22 U	17 U	22 U
1,1-Dichloroethane	µg/m^3	26 U	16 U	13 U	16 U
1,1-Dichloroethene	µg/m^3	25 U	16 U	13 U	16 U
1,2,4-Trichlorobenzene	µg/m^3	240 U	150 U	120 U	150 U
1,2,4-Trimethylbenzene	µg/m^3	31 U	20 U	16 U	20 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	49 U	31 U	25 U	31 U
1,2-Dichlorobenzene	µg/m^3	38 U	24 U	19 U	24 U
1,2-Dichloroethane	µg/m^3	26 U	16 U	13 U	16 U
1,2-Dichloropropane	µg/m^3	30 U	18 U	15 U	18 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	45 U	28 U	22 U	28 U
1,3,5-Trimethylbenzene	µg/m^3	31 U	20 U	16 U	20 U
1,3-Butadiene	µg/m^3	28 U	18 U	14 U	18 U
1,3-Dichlorobenzene	µg/m^3	38 U	24 U	19 U	24 U
1,4-Dichlorobenzene	µg/m^3	38 U	24 U	19 U	24 U
1,4-Dioxane	µg/m^3	58 U	36 U	29 U	36 U
2,2,4-Trimethylpentane	µg/m^3	60 U	37 U	30 U	37 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	94 U	59 U	47 U	59 U
2-Chlorotoluene	µg/m^3	66 U	41 U	33 U	41 U
2-Hexanone	µg/m^3	65 U	41 U	33 U	41 U
4-Ethyl toluene	µg/m^3	63 U	39 U	31 U	39 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	65 U	41 U	33 U	41 U
Acetone	µg/m^3	380 U	240 U	190 U	240 U
Allyl chloride	µg/m^3	20 U	13 U	10 U	13 U
Benzene	µg/m^3	20 U	13 U	10 U	13 U
Bromodichloromethane	µg/m^3	43 U	27 U	21 U	27 U
Bromoform	µg/m^3	66 U	41 U	33 U	41 U
Bromomethane (Methyl bromide)	µg/m^3	25 U	16 U	12 U	16 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-17**	**VP-18**	**VP-19**	**VP-19**
Sample ID:		**SG-81618-121013-RR010**	**SG-81618-121013-RR012**	**SG-81618-121113-RR018**	**SG-81618-121113-RR020**
Sample Date:		**12/10/2013**	**12/10/2013**	**12/11/2013**	**12/11/2013**
Parameters	**Units**				
Carbon disulfide	µg/m^3	50 U	31 U	25 U	31 U
Carbon tetrachloride	µg/m^3	40 U	25 U	20 U	25 U
Chlorobenzene	µg/m^3	29 U	18 U	15 U	18 U
Chloroethane	µg/m^3	17 U	11 U	8.4 U	11 U
Chloroform (Trichloromethane)	µg/m^3	31 U	20 U	16 U	20 U
Chloromethane (Methyl chloride)	µg/m^3	33 U	21 U	17 U	21 U
cis-1,2-Dichloroethene	µg/m^3	70	68	100	110
cis-1,3-Dichloropropene	µg/m^3	29 U	18 U	15 U	18 U
Cyclohexane	µg/m^3	44 U	28 U	22 U	28 U
Dibromochloromethane	µg/m^3	54 U	34 U	27 U	34 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	32 U	20 U	16 U	20 U
Ethylbenzene	µg/m^3	28 U	17 U	14 U	17 U
Helium	µg/m^3	0.17 U	0.18 U	0.34	0.16 U
Hexachlorobutadiene	µg/m^3	68 U	43 U	34 U	43 U
Hexane	µg/m^3	56 U	35 U	28 U	35 U
Isopropyl alcohol	µg/m^3	160 U	98 U	79 U	98 U
m&p-Xylenes	µg/m^3	28 U	17 U	14 U	17 U
Methyl tert butyl ether (MTBE)	µg/m^3	120 U	72 U	58 U	72 U
Methylene chloride	µg/m^3	55 U	35 U	28 U	35 U
N-Heptane	µg/m^3	52 U	33 U	26 U	33 U
o-Xylene	µg/m^3	28 U	17 U	14 U	17 U
Styrene	µg/m^3	27 U	17 U	14 U	17 U
tert-Butyl alcohol	µg/m^3	190 U	120 U	97 U	120 U
Tetrachloroethene	µg/m^3	7300	150	12000	9100
Tetrahydrofuran	µg/m^3	94 U	59 U	47 U	59 U
Toluene	µg/m^3	36 U	23 U	18 U	23 U
trans-1,2-Dichloroethene	µg/m^3	25 U	16 U	13 U	16 U
trans-1,3-Dichloropropene	µg/m^3	29 U	18 U	15 U	18 U
Trichloroethene	µg/m^3	4500	4000	710	720
Trichlorofluoromethane (CFC-11)	µg/m^3	36 U	22 U	18 U	22 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	49 U	31 U	25 U	31 U
Vinyl bromide (Bromoethene)	µg/m^3	28 U	17 U	14 U	17 U
Vinyl chloride	µg/m^3	16 U	10 U	8.2 U	10 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-20**	**VP-21**	**VP-21**	**VP-21**	**VP-22**	**VP-30**
Sample ID:		**SG-81618-120913-RR003**	**SG-81618-120913-RR002**	**SG-81618-111114-AB-008**	**SG-81618-122215-RR-009**	**SG-81618-120913-RR001**	**SG-81618-121013-RR009**
Sample Date:		**12/9/2013**	**12/9/2013**	**11/11/2014**	**12/22/2015**	**12/9/2013**	**12/10/2013**
Parameters	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m^3	4.4 U	4.4 U	20 U	5.5 U	22	4.4 U
1,1,2,2-Tetrachloroethane	µg/m^3	5.5 U	5.5 U	25 U	6.9 U	5.5 U	5.5 U
1,1,2-Trichloroethane	µg/m^3	4.4 U	4.4 U	20 U	5.5 U	4.4 U	4.4 U
1,1-Dichloroethane	µg/m^3	3.2 U	3.2 U	15 U	4.1 U	3.2 U	3.2 U
1,1-Dichloroethene	µg/m^3	3.2 U	3.2 U	14 U	4.0 U	3.2 U	3.2 U
1,2,4-Trichlorobenzene	µg/m^3	30 U	30 U	130 U	7.4 UJ	30 U	30 U
1,2,4-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	18 U	4.9 U	3.9 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	6.1 U	6.1 U	28 U	7.7 U	6.1 U	6.1 U
1,2-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	22 U	6.0 U	4.8 U	4.8 U
1,2-Dichloroethane	µg/m^3	3.2 U	3.2 U	15 U	5.1 U	3.2 U	3.2 U
1,2-Dichloropropane	µg/m^3	3.7 U	3.7 U	17 U	4.6 U	3.7 U	3.7 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	5.6 U	5.6 U	25 U	7.0 U	5.6 U	5.6 U
1,3,5-Trimethylbenzene	µg/m^3	3.9 U	3.9 U	18 U	4.9 U	3.9 U	3.9 U
1,3-Butadiene	µg/m^3	3.5 U	3.5 U	16 U	2.2 U	3.5 U	3.5 U
1,3-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	22 U	6.0 U	4.8 U	4.8 U
1,4-Dichlorobenzene	µg/m^3	4.8 U	4.8 U	22 U	6.0 U	4.8 U	4.8 U
1,4-Dioxane	µg/m^3	7.2 UJ	7.2 UJ	33 U	3.6 U	7.2 UJ	7.2 UJ
2,2,4-Trimethylpentane	µg/m^3	7.5 U	7.5 U	34 U		7.5 U	7.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	12 U	12 U	54 U	6.0	12 U	12 U
2-Chlorotoluene	µg/m^3	8.3 U	8.3 U	38 U		8.3 U	8.3 U
2-Hexanone	µg/m^3	8.2 U	8.2 U	37 U	4.1 U	8.2 U	8.2 U
4-Ethyl toluene	µg/m^3	7.9 U	7.9 U	36 U	4.9 U	7.9 U	7.9 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	8.2 U	8.2 U	37 U	4.1 U	8.2 U	8.2 U
Acetone	µg/m^3	48 U	48 U	220 U	38	48 U	48 U
Allyl chloride	µg/m^3	2.5 U	2.5 U	11 U		2.5 U	2.5 U
Benzene	µg/m^3	2.6 U	2.6 U	12 U	3.2 U	2.6 U	2.6 U
Bromodichloromethane	µg/m^3	5.4 U	5.4 U	24 U	6.7 U	5.4 U	5.4 U
Bromoform	µg/m^3	8.3 U	8.3 U	38 U	10 U	8.3 U	8.3 U
Bromomethane (Methyl bromide)	µg/m^3	3.1 U	3.1 U	14 U		3.1 U	3.1 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-20**	**VP-21**	**VP-21**	**VP-21**	**VP-22**	**VP-30**
Sample ID:		**SG-81618-120913-RR003**	**SG-81618-120913-RR002**	**SG-81618-111114-AB-008**	**SG-81618-122215-RR-009**	**SG-81618-120913-RR001**	**SG-81618-121013-RR009**
Sample Date:		**12/9/2013**	**12/9/2013**	**11/11/2014**	**12/22/2015**	**12/9/2013**	**12/10/2013**
Parameters	**Units**						
Carbon disulfide	µg/m^3	6.2 U	6.2 U	28 U	3.1 U	6.2 U	6.2 U
Carbon tetrachloride	µg/m^3	5.0 U	5.0 U	23 U	6.3 U	5.0 U	5.0 U
Chlorobenzene	µg/m^3	3.7 U	3.7 U	17 U	4.6 U	3.7 U	3.7 U
Chloroethane	µg/m^3	2.1 U	2.1 U	9.6 U	2.6 U	2.1 U	2.1 U
Chloroform (Trichloromethane)	µg/m^3	3.9 U	3.9 U	18 U	4.9 U	3.9 U	3.9 U
Chloromethane (Methyl chloride)	µg/m^3	4.1 U	4.1 U	19 U	2.1 U	4.1 U	4.1 U
cis-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	14 U	4.0 U	3.2 U	3.2 U
cis-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	17 U	4.5 U	3.6 U	3.6 U
Cyclohexane	µg/m^3	5.5 U	5.5 U	25 U	3.4 U	5.5 U	5.5 U
Dibromochloromethane	µg/m^3	6.8 U	6.8 U	31 U	8.5 U	6.8 U	6.8 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	4.0 U	4.0 U	18 U	3.3 J	4.6	4.0 U
Ethylbenzene	µg/m^3	3.5 U	3.5 U	16 U	4.3 U	3.5 U	7.3
Helium	µg/m^3	0.19 U	0.16 U		U	0.19 U	0.18 U
Hexachlorobutadiene	µg/m^3	8.5 U	8.5 U	39 U	11 U	8.5 U	8.5 U
Hexane	µg/m^3	7.0 U	7.0 U	32 U	12	7.0 U	7.0 U
Isopropyl alcohol	µg/m^3	20 U	20 U	89 U	7.2	20 U	20 U
m&p-Xylenes	µg/m^3	11	6.9	16 U	8.7U	3.5 U	28
Methyl tert butyl ether (MTBE)	µg/m^3	14 U	14 U	66 U	3.6 U	14 U	14 U
Methylene chloride	µg/m^3	6.9 U	9.6	32 U	3.5 U	6.9 U	6.9 U
N-Heptane	µg/m^3	6.6 U	6.6 U	30 U	4.1 U	6.6 U	6.6 U
o-Xylene	µg/m^3	3.5 U	3.5 U	16 U	4.3 U	3.5 U	9.1
Styrene	µg/m^3	3.4 U	3.4 U	15 U	4.3 U	3.4 U	3.4 U
tert-Butyl alcohol	µg/m^3	24 U	24 U	110 U		24 U	24 U
Tetrachloroethene	µg/m^3	76	1800	2600	510	180	9.6
Tetrahydrofuran	µg/m^3	12 U	12 U	54 U	3.0 U	12 U	12 U
Toluene	µg/m^3	6.5	5.4	21 U	3.8 U	4.5 U	17
trans-1,2-Dichloroethene	µg/m^3	3.2 U	3.2 U	14 U	4.0 U	3.2 U	3.2 U
trans-1,3-Dichloropropene	µg/m^3	3.6 U	3.6 U	17 U	4.5 U	3.6 U	3.6 U
Trichloroethene	µg/m^3	2.1 U	4.3	9.8 U	5.4 U	2.1 U	2.1 U
Trichlorofluoromethane (CFC-11)	µg/m^3	4.5 U	4.5 U	20 U	5.6 U	4.5 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	6.1 U	6.1 U	28 U	7.7 U	6.1 U	6.1 U
Vinyl bromide (Bromoethene)	µg/m^3	3.5 U	3.5 U	16 U		3.5 U	3.5 U
Vinyl chloride	µg/m^3	2.0 U	2.0 U	9.3 U	2.6 U	2.0 U	2.0 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-30**	**VP-31**	**VP-31**	**VP-32**	**VP-32**
Sample ID:		**SG-81618-122115-RR-007**	**SG-81618-121013-RR015**	**SG-81618-102214-RR-004**	**SG-81618-121113-RR031**	**SG-81618-111114-RR-009**
Sample Date:		**12/21/2015**	**12/10/2013**	**10/22/2014**	**12/11/2013**	**11/11/2014**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	2.7 U	8.7 U	8.7 U	160 U	630 U
1,1,2,2-Tetrachloroethane	µg/m^3	3.4 U	11 U	11 U	200 U	790 U
1,1,2-Trichloroethane	µg/m^3	2.7 U	8.7 U	8.7 U	160 U	630 U
1,1-Dichloroethane	µg/m^3	2.0 U	6.4 U	6.5 U	120 U	470 U
1,1-Dichloroethene	µg/m^3	2.0 U	6.3 U	6.3 U	110 U	460 U
1,2,4-Trichlorobenzene	µg/m^3	3.7 UJ	59 U	59 U	1100 U	4300 U
1,2,4-Trimethylbenzene	µg/m^3	2.5 U	7.8 U	7.9 U	140 U	570 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	3.8 U	12 U	12 U	220 U	890 U
1,2-Dichlorobenzene	µg/m^3	3.0 U	9.6 U	9.6 U	170 U	690 U
1,2-Dichloroethane	µg/m^3	2.0 U	6.4 U	6.5 U	120 U	470 U
1,2-Dichloropropane	µg/m^3	2.3 U	7.4 U	7.4 U	130 U	530 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	3.5 U	11 U	11 U	200 U	810 U
1,3,5-Trimethylbenzene	µg/m^3	2.5 U	7.8 U	7.9 U	140 U	570 U
1,3-Butadiene	µg/m^3	1.1 U	7.0 U	7.1 U	130 U	510 U
1,3-Dichlorobenzene	µg/m^3	3.0 U	9.6 U	9.6 U	170 U	690 U
1,4-Dichlorobenzene	µg/m^3	3.0 U	9.6 U	9.6 U	170 U	690 U
1,4-Dioxane	µg/m^3	1.8 U	14 U	14 U	260 U	1000 U
2,2,4-Trimethylpentane	µg/m^3		15 U	15 U	270 U	1100 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	1.2 J	23 U	24 U	420 U	1700 U
2-Chlorotoluene	µg/m^3		16 U	17 U	300 U	1200 U
2-Hexanone	µg/m^3	2.1 U	16 U	16 U	290 U	1200 U
4-Ethyl toluene	µg/m^3	2.5 U	16 U	16 U	280 U	1100 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	2.1 U	16 U	16 U	290 U	1200 U
Acetone	µg/m^3	8.9	94 U	95 U	1700 U	6800 U
Allyl chloride	µg/m^3		5.0 U	5.0 U	90 U	360 U
Benzene	µg/m^3	1.1 J	5.1 U	5.1 U	92 U	370 U
Bromodichloromethane	µg/m^3	3.4 U	11 U	11 U	190 U	770 U
Bromoform	µg/m^3	5.2 U	16 U	17 U	300 U	1200 U
Bromomethane (Methyl bromide)	µg/m^3		6.2 U	6.2 U	110 U	450 U

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-30**	**VP-31**	**VP-31**	**VP-32**	**VP-32**
Sample ID:		**SG-81618-122115-RR-007**	**SG-81618-121013-RR015**	**SG-81618-102214-RR-004**	**SG-81618-121113-RR031**	**SG-81618-111114-RR-009**
Sample Date:		**12/21/2015**	**12/10/2013**	**10/22/2014**	**12/11/2013**	**11/11/2014**
Parameters	**Units**					
Carbon disulfide	µg/m^3	1.6 U	14	12 U	220 U	900 U
Carbon tetrachloride	µg/m^3	3.2 U	10 U	10 U	180 U	720 U
Chlorobenzene	µg/m^3	2.3 U	7.3 U	7.4 U	130 U	530 U
Chloroethane	µg/m^3	1.3 U	4.2 U	4.2 U	76 U	300 U
Chloroform (Trichloromethane)	µg/m^3	2.4 U	7.8 U	7.8 U	140 U	560 U
Chloromethane (Methyl chloride)	µg/m^3	1.0 U	8.2 U	8.3 U	150 U	590 U
cis-1,2-Dichloroethene	µg/m^3	2.0 U	6.3 U	6.3 U	2800	2000
cis-1,3-Dichloropropene	µg/m^3	2.3 U	7.2 U	7.3 U	130 U	520 U
Cyclohexane	µg/m^3	1.7 U	11 U	11 U	200 U	790 U
Dibromochloromethane	µg/m^3	4.3 U	14 U	14 U	250 U	980 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	3.5	7.9 U	7.9 U	140 U	570 U
Ethylbenzene	µg/m^3	2.2 U	7.1	6.9 U	120 U	500 U
Helium	µg/m^3	U	0.17 U		0.16 U	
Hexachlorobutadiene	µg/m^3	5.3 U	17 U	17 U	310 U	1200 U
Hexane	µg/m^3	2.4	14 U	14 U	250 U	1000 U
Isopropyl alcohol	µg/m^3	0.93 J	39 U	39 U	710 U	2800 U
m&p-Xylenes	µg/m^3	4.3 U	26	6.9 U	120 U	500 U
Methyl tert butyl ether (MTBE)	µg/m^3	1.8 U	29 U	29 U	520 U	2100 U
Methylene chloride	µg/m^3	1.7 U	14 U	14 U	250 U	1000 U
N-Heptane	µg/m^3	2.1 U	13 U	13 U	240 U	940 U
o-Xylene	µg/m^3	2.2 U	7.1	6.9 U	120 U	500 U
Styrene	µg/m^3	2.1 U	6.8 U	6.8 U	120 U	490 U
tert-Butyl alcohol	µg/m^3		48 U	49 U	870 U	3500 U
Tetrachloroethene	µg/m^3	3.4 U	3800	1700	54000	68000
Tetrahydrofuran	µg/m^3	1.5 U	23 U	24 U	420 U	1700 U
Toluene	µg/m^3	1.4 J	23	9.0 U	160 U	650 U
trans-1,2-Dichloroethene	µg/m^3	2.0 U	6.3 U	6.3 U	110 U	460 U
trans-1,3-Dichloropropene	µg/m^3	2.3 U	7.2 U	7.3 U	130 U	520 U
Trichloroethene	µg/m^3	2.7 U	4.3 U	4.3 U	4800	4800
Trichlorofluoromethane (CFC-11)	µg/m^3	1.8 J	8.9 U	9.0 U	160 U	650 U
Trifluorotrichloroethane (Freon 113)	µg/m^3	3.8 U	12 U	12 U	220 U	880 U
Vinyl bromide (Bromoethene)	µg/m^3		7.0 U	7.0 U	130 U	500 U
Vinyl chloride	µg/m^3	1.3 U	4.1 U	4.1 U	74 U	290 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-41**	**VP-41**	**VP-42**	**VP-42**	**VP-43**	**VP-44**
Sample ID:		**SG-81618-111114-RR-013**	**SG-81618-122115-RR-003**	**SG-81618-111114-RR-011**	**SG-81618-122115-RR-001**	**SG-81618-122115-SD-002**	**SG-81618-122115-SD-004**
Sample Date:		**11/11/2014**	**12/21/2015**	**11/11/2014**	**12/21/2015**	**12/21/2015**	**12/21/2015**
Parameters	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m^3	20 U	5.5 U	19 U	5.5 U	2.7 U	2.7 U
1,1,2,2-Tetrachloroethane	µg/m^3	25 U	6.9 U	24 U	6.9 U	3.4 U	3.4 U
1,1,2-Trichloroethane	µg/m^3	20 U	5.5 U	19 U	5.5 U	2.7 U	2.7 U
1,1-Dichloroethane	µg/m^3	15 U	4.0 U	14 U	4.1 U	2.0 U	2.0 U
1,1-Dichloroethene	µg/m^3	14 U	4.0 U	14 U	4.0 U	2.0 U	2.0 U
1,2,4-Trichlorobenzene	µg/m^3	130 U	7.4 UJ	130 U	7.4 UJ	3.7 UJ	3.7 UJ
1,2,4-Trimethylbenzene	µg/m^3	18 U	4.9 U	18 U	4.9 U	2.5 U	5.7
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	28 U	7.7 U	27 U	7.7 U	3.8 U	3.8 U
1,2-Dichlorobenzene	µg/m^3	22 U	6.0 U	21 U	6.0 U	3.0 U	3.0 U
1,2-Dichloroethane	µg/m^3	15 U	4.1 U	14 U	4.1 U	2.0 U	2.0 U
1,2-Dichloropropane	µg/m^3	17 U	4.6 U	16 U	4.6 U	2.3 U	2.3 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	25 U	7.0 U	25 U	7.0 U	3.5 U	3.5 U
1,3,5-Trimethylbenzene	µg/m^3	18 U	4.9 U	18 U	4.9 U	2.5 U	2.1 J
1,3-Butadiene	µg/m^3	16 U	2.2 U	16 U	2.2 U	1.1 U	1.1 U
1,3-Dichlorobenzene	µg/m^3	22 U	6.0 U	21 U	6.0 U	3.0 U	3.0 U
1,4-Dichlorobenzene	µg/m^3	22 U	6.0 U	21 U	6.0 U	3.0 U	3.0 U
1,4-Dioxane	µg/m^3	33 U	3.6 U	32 U	3.6 U	1.8 U	1.8 U
2,2,4-Trimethylpentane	µg/m^3	34 U		33 U			
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	54 U	10	52 U	1.9 J	2.2	3.2
2-Chlorotoluene	µg/m^3	38 U		37 U			
2-Hexanone	µg/m^3	37 U	4.1 U	36 U	4.1 U	2.1 U	2.1 U
4-Ethyl toluene	µg/m^3	36 U	4.9 U	35 U	4.9 U	2.5 U	2.5 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	37 U	4.1 U	36 U	4.1 U	2.1 U	2.1 U
Acetone	µg/m^3	220 U	97	210 U	110	19	24
Allyl chloride	µg/m^3	11 U		11 U			
Benzene	µg/m^3	12 U	3.2 U	11 U	3.2 U	1.6 U	2.4
Bromodichloromethane	µg/m^3	24 U	6.7 U	24 U	6.7 U	3.4 U	3.4 U
Bromoform	µg/m^3	38 U	10 UJ	37 U	10 UJ	5.2 U	5.2 U
Bromomethane (Methyl bromide)	µg/m^3	14 U		14 U			

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		VP-41	VP-41	VP-42	VP-42	VP-43	VP-44
Sample ID:		SG-81618-111114-RR-013	SG-81618-122115-RR-003	SG-81618-111114-RR-011	SG-81618-122115-RR-001	SG-81618-122115-SD-002	SG-81618-122115-SD-004
Sample Date:		11/11/2014	12/21/2015	11/11/2014	12/21/2015	12/21/2015	12/21/2015
Parameters	**Units**						
Carbon disulfide	µg/m^3	28 U	3.1 U	28 U	3.1 U	1.6 U	1.4 J
Carbon tetrachloride	µg/m^3	23 U	6.3 U	22 U	6.3 U	3.2 U	3.2 U
Chlorobenzene	µg/m^3	17 U	4.6 U	16 U	4.6 U	2.3 U	2.3 U
Chloroethane	µg/m^3	9.6 U	2.6 U	9.4 U	2.6 U	1.3 U	1.3 U
Chloroform (Trichloromethane)	µg/m^3	18 U	4.9 U	17 U	4.9 U	2.4 U	2.4 U
Chloromethane (Methyl chloride)	µg/m^3	19 U	1.2 J	18 U	2.1 U	1.0 U	1.0
cis-1,2-Dichloroethene	µg/m^3	14 U	4.0 U	14 U	4.0 U	2.0 U	2.0 U
cis-1,3-Dichloropropene	µg/m^3	17 U	4.5 U	16 U	4.5 U	2.3 U	2.3 U
Cyclohexane	µg/m^3	25 U	3.4 U	25 U	3.4 U	1.7 U	1.5 J
Dibromochloromethane	µg/m^3	31 U	8.5 U	30 U	8.5 U	4.3 U	4.3 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	18 U	3.1 J	18 U	2.9 J	3.1	3.0
Ethylbenzene	µg/m^3	16 U	4.3 U	15 U	4.3 U	2.2 U	2.1 J
Helium	µg/m^3		U		U	U	U
Hexachlorobutadiene	µg/m^3	39 U	11 U	38 U	11 U	5.3 U	5.3 U
Hexane	µg/m^3	32 U	7.5	31 U	7.1	2.6	3.7
Isopropyl alcohol	µg/m^3	89 U	4.6	88 U	9.4	1.5	1.3
m&p-Xylenes	µg/m^3	16 U	8.7 U	15 U	8.7 U	3.0 J	8.9
Methyl tert butyl ether (MTBE)	µg/m^3	66 U	3.6 U	64 U	3.6 U	1.8 U	1.8 U
Methylene chloride	µg/m^3	32 U	2.2 J	31 U	2.3 J	1.7 U	1.7 U
N-Heptane	µg/m^3	30 U	4.1 U	29 U	4.1 U	2.1 U	2.1 U
o-Xylene	µg/m^3	16 U	4.3 U	15 U	4.3 U	1.2 J	4.3
Styrene	µg/m^3	15 U	4.3 U	15 U	4.3 U	2.1 U	2.1 U
tert-Butyl alcohol	µg/m^3	110 U		110 U			
Tetrachloroethene	µg/m^3	2100	3.4 J	2900	3.7 J	4.3	26
Tetrahydrofuran	µg/m^3	54 U	1.2 J	52 U	3.0 U	1.5 U	1.5 U
Toluene	µg/m^3	21 U	3.2 J	20 U	1.8 J	1.3 J	3.1
trans-1,2-Dichloroethene	µg/m^3	14 U	4.0 U	14 U	4.0 U	2.0 U	2.0 U
trans-1,3-Dichloropropene	µg/m^3	17 U	4.5 U	16 U	4.5 U	2.3 U	2.3 U
Trichloroethene	µg/m^3	51	5.4 U	71	5.4 U	2.7 U	2.7 U
Trichlorofluoromethane (CFC-11)	µg/m^3	20 U	5.6 U	20 U	5.6 U	1.7 J	1.6 J
Trifluorotrichloroethane (Freon 113)	µg/m^3	28 U	7.7 U	27 U	7.7 U	3.8 U	3.8 U
Vinyl bromide (Bromoethene)	µg/m^3	16 U		16 U			
Vinyl chloride	µg/m^3	9.3 U	2.6 U	9.1 U	2.6 U	1.3 U	1.3 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-45**	**VP-46**	**VP-46**	**VP-47**	**VP-47**
Sample ID:		**SG-81618-122115-SD-006**	**SG-81618-111114-AB-012**	**SG-81618-122215-RR-010**	**SG-81618-111114-AB-010**	**SG-81618-122215-SD-008**
Sample Date:		**12/21/2015**	**11/11/2014**	**12/22/2015**	**11/11/2014**	**12/22/2015**
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m^3	2.7 U	4.4 U	5.5 U	7.0	5.8
1,1,2,2-Tetrachloroethane	µg/m^3	3.4 U	5.5 U	6.9 U	5.5 U	3.4 U
1,1,2-Trichloroethane	µg/m^3	2.7 U	4.4 U	5.5 U	4.4 U	2.7 U
1,1-Dichloroethane	µg/m^3	2.0 U	3.2 U	4.1 U	3.2 U	2.0 U
1,1-Dichloroethene	µg/m^3	2.0 U	3.2 U	4.0 U	3.2 U	2.0 U
1,2,4-Trichlorobenzene	µg/m^3	3.7 UJ	30 U	7.4 UJ	30 U	3.7 UJ
1,2,4-Trimethylbenzene	µg/m^3	7.9	3.9 U	4.9 U	3.9 U	2.5 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m^3	3.8 U	6.1 U	7.7 U	6.1 U	3.8 U
1,2-Dichlorobenzene	µg/m^3	3.0 U	4.8 U	6.0 U	4.8 U	3.0 U
1,2-Dichloroethane	µg/m^3	2.0 U	3.2 U	4.1 U	3.2 U	2.0 U
1,2-Dichloropropane	µg/m^3	2.3 U	3.7 U	4.6 U	3.7 U	2.3 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m^3	3.5 U	5.6 U	7.0 U	5.6 U	3.5 U
1,3,5-Trimethylbenzene	µg/m^3	2.0 J	3.9 U	4.9 U	3.9 U	2.5 U
1,3-Butadiene	µg/m^3	1.1 U	3.5 U	2.2 U	3.5 U	1.1 U
1,3-Dichlorobenzene	µg/m^3	3.0 U	4.8 U	6.0 U	4.8 U	3.0 U
1,4-Dichlorobenzene	µg/m^3	3.0 U	4.8 U	6.0 U	4.8 U	3.0 U
1,4-Dioxane	µg/m^3	1.8 U	7.2 U	3.6 U	7.2 U	1.8 U
2,2,4-Trimethylpentane	µg/m^3		7.5 U		7.5 U	
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m^3	3.0	12 U	3.0 U	12 U	6.6
2-Chlorotoluene	µg/m^3		8.3 U		8.3 U	
2-Hexanone	µg/m^3	2.1 U	8.2 U	4.1 U	8.2 U	2.1 U
4-Ethyl toluene	µg/m^3	1.8 J	7.9 U	4.9 U	7.9 U	2.5 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m^3	2.1 U	8.2 U	4.1 U	8.2 U	2.1 U
Acetone	µg/m^3	21	48 U	16	48 U	41
Allyl chloride	µg/m^3		2.5 U		2.5 U	
Benzene	µg/m^3	1.3 J	2.6 U	3.2 U	2.6 U	3.2
Bromodichloromethane	µg/m^3	3.4 U	5.4 U	6.7 U	5.4 U	3.4 U
Bromoform	µg/m^3	5.2 U	8.3 U	10 U	8.3 U	5.2 U
Bromomethane (Methyl bromide)	µg/m^3		3.1 U		3.1 U	

Table 4.2

Soil Vapor Analytical Results Summary
December 2013 to December 2015
Covestro/Glenn Springs Holdings, Inc.
Hicksville, NY

Sample Location:		**VP-45**	**VP-46**	**VP-46**	**VP-47**	**VP-47**
Sample ID:		**SG-81618-122115-SD-006**	**SG-81618-111114-AB-012**	**SG-81618-122215-RR-010**	**SG-81618-111114-AB-010**	**SG-81618-122215-SD-008**
Sample Date:		**12/21/2015**	**11/11/2014**	**12/22/2015**	**11/11/2014**	**12/22/2015**
Parameters	**Units**					
Carbon disulfide	µg/m^3	1.4 J	15	3.1 U	32	1.6 U
Carbon tetrachloride	µg/m^3	3.2 U	6.5	2.9 J	5.0 U	3.2 U
Chlorobenzene	µg/m^3	2.3 U	3.7 U	4.6 U	3.7 U	2.3 U
Chloroethane	µg/m^3	1.3 U	2.1 U	2.6 U	2.1 U	1.3 U
Chloroform (Trichloromethane)	µg/m^3	2.4 U	3.9 U	4.9 U	3.9 U	2.4 U
Chloromethane (Methyl chloride)	µg/m^3	1.0 U	4.1 U	2.1 U	4.1 U	1.0 U
cis-1,2-Dichloroethene	µg/m^3	2.0 U	3.2 U	4.0 U	3.2 U	2.0 U
cis-1,3-Dichloropropene	µg/m^3	2.3 U	3.6 U	4.5 U	3.6 U	2.3 U
Cyclohexane	µg/m^3	1.5 J	5.5 U	3.4 U	5.5 U	1.7 U
Dibromochloromethane	µg/m^3	4.3 U	6.8 U	8.5 U	6.8 U	4.3 U
Dichlorodifluoromethane (CFC-12)	µg/m^3	3.2	4.0 U	3.4 J	4.2	5.6
Ethylbenzene	µg/m^3	2.5	3.5 U	4.3 U	3.5 U	2.2 U
Helium	µg/m^3	U		U		U
Hexachlorobutadiene	µg/m^3	5.3 U	8.5 U	11 U	8.5 U	5.3 U
Hexane	µg/m^3	3.2	7.0 U	3.7	7.0 U	2.0
Isopropyl alcohol	µg/m^3	2.2	20 U	1.7 J	20 U	1.2 U
m&p-Xylenes	µg/m^3	11	4.0	8.7 U	3.5 U	4.3 U
Methyl tert butyl ether (MTBE)	µg/m^3	1.8 U	14 U	3.6 U	14 U	1.8 U
Methylene chloride	µg/m^3	1.7 U	6.9 U	3.5 U	6.9 U	1.1 J
N-Heptane	µg/m^3	2.1 U	6.6 U	4.1 U	6.6 U	2.1 U
o-Xylene	µg/m^3	4.9	3.5 U	4.3 U	3.5 U	2.2 U
Styrene	µg/m^3	2.1 U	3.4 U	4.3 U	3.4 U	2.1 U
tert-Butyl alcohol	µg/m^3		24 U		24 U	
Tetrachloroethene	µg/m^3	70	530	380	130	12
Tetrahydrofuran	µg/m^3	0.91 J	12 U	3.0 U	12 U	1.5 U
Toluene	µg/m^3	2.3	4.5 U	3.8 U	4.5 U	1.4 J
trans-1,2-Dichloroethene	µg/m^3	2.0 U	3.2 U	4.0 U	3.2 U	2.0 U
trans-1,3-Dichloropropene	µg/m^3	2.3 U	3.6 U	4.5 U	3.6 U	2.3 U
Trichloroethene	µg/m^3	2.7 U	7.7	2.9 J	26	43
Trichlorofluoromethane (CFC-11)	µg/m^3	1.7 J	4.5 U	5.6 U	4.5 U	2.1 J
Trifluorotrichloroethane (Freon 113)	µg/m^3	3.8 U	6.1 U	7.7 U	6.1 U	3.8 U
Vinyl bromide (Bromoethene)	µg/m^3		3.5 U		3.5 U	
Vinyl chloride	µg/m^3	1.3 U	2.0 U	2.6 U	2.0 U	1.3 U

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.

Appendices

Appendix A
NYSDEC Correspondence

CONESTOGA-ROVERS & ASSOCIATES

651 Colby Drive, Waterloo, Ontario, N2V 1C2
Telephone: (519) 884-0510 Fax: (519) 884-0525
www.CRAworld.com

October 2, 2014 Reference No. 081618

Mr. Stephen Scharf
New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
Bureau of Solid Waste and Corrective Action
625 Broadway
Albany, NY 12233 7015

Dear Mr. Scharf:

Re: Installation of Phase 2 Soil Vapor Probes
Sampling of Phase 1 and Phase 2 Soil Vapor Probes
Hicksville Operable Unit 5 (OU-5)

This letter has been prepared to memorialize the discussions of the conference call held among the NYSDEC, Bayer, GSH, and CRA on September 26, 2014. This letter updates the Soil Vapor Investigation Work Plan – Revision No. 2 dated July 24, 2013 and approved by the NYSDEC on August 7, 2013.

Phase 1 Probes

Some of the Phase 1 probes will need to be removed during implementation of the final corrective measures for Operable Unit 4 (OU-4). The 15 Phase 1 probes listed in Table 1 and shown on Figure 1 will be sampled prior to their removal to obtain a second set of soil vapor analytical results. The Phase 1 probes to be sampled were selected based on the following:

- On-site perimeter probes with elevated PCE concentrations (i.e., > 100 µg/m^3) to evaluate chemical trends with time
- Phase 1 probes adjacent to Phase 2 probes to evaluate concentration trends with increasing distance from the site
- No interior probes were selected since the trends with time in the interior probes are anticipated to be similar to those of the perimter probes

The Phase 1 probes will be sampled as close as practical to the time when the Phase 2 probe samples are collected.

CONESTOGA-ROVERS & ASSOCIATES

October 2, 2014 Reference No. 081618

Phase 2 Probes

The four Phase 2 probes for which access has been obtained are VP-41, VP-42, VP-46, and VP-47. These probes will be installed as soon as practical. The probe locations are shown on Figure 1. Soil gas samples will be collected from the Phase 2 probes approximately 2 weeks after they are installed. Efforts will continue to be made to obtain access to install and sample soil vapor probes VP-44 and VP-45.

Updated Schedule

The probes are tentatively scheduled to be installed the week of October 20, 2014 and sampled during the week of November 3, 2014. Preliminary laboratory results for the soil vapor sampling activities will be available approximately 3 to 4 weeks after sampling. A final soil vapor investigation report, including the items listed in the July 24, 2014 Work Plan, will be submitted to the NYSDEC/NYSDOH approximately 6 weeks after receipt of the final analytical data from the laboratory.

Please do not hesitate to contact Scott Krall of Bayer at 412-777-5568 or Roger Smith of GSH at 687-972-7516 if you have any questions or require additional information.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Klaus Schmidtke

Klaus Schmidtke, Ph.D., P. Eng.

KS/mg/17
Encl.

cc: Thomas Taccone, USEPA
Mark Fisher, The ELM Group
Roger Smith, GSH
Scott Krall, Bayer

HOOKER-RUCO SITE

COMMERCE STREET

ADMIN. BLDG.

PLANT 3

PLANT 2

PLANT 1

WAREHOUSE

COMMERCIAL

COMMERCIAL

RESIDENTIAL

NEW SOUTH ROAD

NEOLA AVENUE

SOMERSET AVENUE

0 60 120ft

SG-18 9/24/07 4.5

SG-17 9/18/07 4.5

SG-6 8/18/09 600/680

SSV-1/IA-1

DATE	SSV-1	IA-1
4/28/11	110	0.40

9/19/07 2.5/3.1

12/11/13 ND

SG-16

VP-16

SSV-8/IA-8

DATE	SSV-8	IA-8
4/28/11	11	
5/5/11		ND/ND

12/11/13 60

SG-7 9/18/07 130

12/9/13 13

12/10/13 9.6

2/11/09 13

VP-1 VP-30

SG-24

9/24/07 4,500

8/18/09 2,200

SG-8

VP-15

SSV-7/IA-7

DATE	SSV-7	IA-7
4/28/11	340	
5/5/11		ND

12/11/13 500

2/11/09 ND

SG-23

6/13/08 430

SG-22

SG-21

2/10/09 38

SG-25

2/10/09 10/9.5

VP-41

VP-2

VP-17

VP-18

12/10/13 150

SG-4

9/19/07 1,200

8/19/09 1,600

VP-14

SG-15

SSV-2/IA-2

DATE	SSV-2	IA-2
4/28/11	10,000/10,000	6.5

VP-22

12/9/13 180

SSV-6/IA-6

DATE	SSV-6	IA-6
4/28/11	350	
4/27/11		3.6

12/9/13 110

SG-10

9/21/07 8.1

VP-42

12/10/13 7,300

SG-5 9/21/07 2,200 8/19/09 4,000

12/11/13 100

12/11/13 2,200

VP-13

VP-12

8/19/09 880

SSV-5/IA-5

12/9/13 1,800

VP-21

VP-47

(ACCESS DENIED) VP-43

12/9/13 190

VP-3

SG-14A

9/20/07 8,100

SSV-3/IA-3

DATE	SSV-5	IA-5
4/27/11	32,000	3.1/3.0

SG-14

VP-4

12/10/13 1,600

VP-5

12/10/13 1,100

VP-44 (ACCESS NOT OBTAINED)

SG-11

SG-3

SG-2

9/20/07 20,000

8/18/09 22,000

SG-1

VP-19

VP-32 VP-11

6/13/08 (29.5-30) 600

12/11/13 54,000

12/11/13 22,000

DATE	SSV-3	IA-3
4/27/11	19,000	0.34

9/21/07 2,400

8/19/09 3,000

9/24/07 16,000/15,000

8/18/09 35,000

VP-6

SG-19

SG-20

SSV-4/IA-4

12/10/13 350

9/19/07 ND

VP-7 VP-31

SG-9

SG-28

VP-10

SG-27

VP-20

DATE	SSV-4	IA-4
4/27/11	3,700	0.63

12/11/13 12,000/9,100

6/13/08 (29.5-30)16,000

VP-45 (ACCESS NOT OBTAINED)

12/10/13 910

12/10/13 3,800

9/25/07 (15-15.5) 150,000

8/19/09 (5-5.5) 9,500

12/10/13 430

12/9/13 76

8/19/09 4,500

2/11/09 1,800

VP-8

SG-12

12/10/13 93

SG-26

SG-13

VP-9

9/20/07 2,700

8/19/09 3,700

9/20/07 64

2/10/09 630

VP-46

12/10/13 780

LEGEND

- PROPERTY LINE
- VP-16 — PHASE 1 SOIL VAPOR SAMPLE LOCATION SHALLOW = 5-5.5 ft. (INSTALLED NOVEMBER 2013)
- VP-32 — ON-SITE PHASE 1 SOIL VAPOR LOCATION NESTS DEEP = 15-15.5 ft. (INSTALLED NOVEMBER 2013)
- SG-10 — BAYER SOIL VAPOR SAMPLE LOCATION (5-5.5 ft UNLESS OTHERWISE SHOWN)
- SSV-7/IA-7 — BAYER SUB-SLAB VAPOR/INDOOR AIR SAMPLE LOCATION
- VP-44 — PROPOSED OFF-SITE PHASE 2 SOIL VAPOR SAMPLE LOCATION
- VOC SOIL REMOVAL AREA
- 76 — PHASE 1 PCE CONCENTRATION (µg/m³)
- 2,700 — HISTORIC PCE CONCENTRATION (µg/m³)
- PROBE TO BE SAMPLED IN 2014

NOTE: NYSDOH PCE INDOOR AIR GUIDELINE VALUE = 30 µg/m³

figure 1

2007 TO 2013 SOIL VAPOR SAMPLE PCE CONCENTRATIONS

Hooker Ruco Site, Hicksville, New York

81618-D22102(SCHA017)GN-WA001 SEP 30/2014

TABLE 1

SOIL VAPOR PROBES TO BE SAMPLED/ANALYZED
OU-5, HICKSVILLE, NY

Phase 1 Probe	***Phase 2 Probe***
VP-2	VP-41
VP-3	VP-42
VP-4	
VP-5	
VP-6	
VP-7	
VP-9	VP-46
VP-10	
VP-11	
VP-12	
VP-13	
VP-14	
VP-21	VP-47
VP-31	
VP-32	

Notes:

(1) Phase 2 Probes are listed beside adjacent Phase 1 probes.

Schmidtke, Klaus

From: Scharf, Steven (DEC) <steven.scharf@dec.ny.gov>
Sent: Thursday, November 12, 2015 10:44 AM
To: Schmidtke, Klaus
Cc: tim.troutman@covestro.com; Roger_Smith@oxy.com; Swartwout, John (DEC)
Subject: RE: Timing of Soil Vapor Sample Collection, Hicksville OU5 ~COR-081618~

Klaus,

You are good to go as detailed in your message below. Please keep me posted on the progress.

Thanks,

Steve

Steven M. Scharf, P.E.
Project Engineer
New York State Dept of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A
625 Broadway 12th Floor
Albany, NY 12233-7015
518-402-9620

From: Schmidtke, Klaus [mailto:Klaus.Schmidtke@ghd.com]
Sent: Thursday, November 12, 2015 9:52 AM
To: Scharf, Steven (DEC)
Cc: tim.troutman@covestro.com; Roger_Smith@oxy.com
Subject: Timing of Soil Vapor Sample Collection, Hicksville OU5 ~COR-081618~

Steven

This email memorializes my understanding of our conversation of this morning regarding the timing of when soil vapor samples can be collected after installation of the soil vapor probes on the LIRR property. It is noted that for the samples collected in 2013 and 2014, there was an approximately 2 week period between probe installation and sample collection.

Taking into consideration that:
- the LIRR requires that LIRR staff be present whenever we are on LIRR property
- the LIRR permit became effective November 9 and provides access only until December 6
- the LIRR needs a two weeks notice prior to access onto their property (i.e., this date would be November 23)
- the LIRR needs to provide staff to perform the underground locates and to provide staff during installation of the probes

the LIRR may not be able to provide staff after probe installation and before the December 6 date during the soil vapor sample collection.

Pursuant to our conversation, you gave permission to sample the wells whenever the LIRR can provide staff, even if this means sampling the wells the same day as installation provided that:
- as much time as possible be allowed between probe installation and sample collection that day
- the wells be purged prior to sample collection.

Please reply with any corrections to my understanding of our conversation and your concurrence.

Regards,
Klaus Schmidtke Ph.D., P. Eng.

GHD
T: 1 519 884 0510 | F: 1 519 884 0525 | Email: klaus.schmidtke@ghd.com | www.ghd.com
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Appendix B
QA/QC Review

Appendix B
QA/QC Review

Memorandum

To:	Klaus Schmidtke	Ref. No.:	081618
From:	Kathy Willy/adh/4	Date:	February 9, 2016

Re: Analytical Results and Full Validation
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

1. Introduction

This document details a validation of analytical results for soil vapor samples collected in support of the LIRR Phase 2 Soil Vapor Probes at the Hicksville site during December 2015. Samples were submitted to Spectrum Analytical, Inc., located in North Kingstown, Rhode Island. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, duplicate data, and recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike (MS) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the document entitled:

i) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review", United States Environmental Protection Agency (USEPA) 540-R-08-01, June 2008

Item i) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

GHD Services Inc.
2055 Niagara Falls Boulevard Niagara Falls New York 14304 USA
T 716 297 6150 F 716 297 2265 W www.ghd.com

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Gas Chromatography/Mass Spectrometer (GC/MS) – Tuning and Mass Calibration (Instrument Performance Check)

3.1 Organic Analyses

Prior to volatile organic compound (VOC) analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the method requires the analysis of specific tuning compound bromofluorobenzene (BFB). The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 24 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout the VOC analysis periods. All tuning criteria were met, indicating that proper optimization of the instrumentation was achieved.

4. Initial Calibration

To quantify VOCs of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

i) All relative response factors (RRFs) must be greater than or equal to 0.05 (0.01 for poor responders).

ii) The percent relative standard deviation (RSD) values must not exceed 20.0 percent (40 percent for poor responders) or a minimum correlation coefficient (R) of 0.995 and minimum coefficient of determination (R^2) of 0.99 if linear and quadratic equation calibration curves, respectively, are used.

The initial calibration data for VOCs were reviewed. All compounds met the above criteria for sensitivity and linearity.

5. Continuing Calibration

To ensure that instrument calibration for VOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 24 hours.

The following criteria were employed to evaluate continuing calibration data:

i) All RRF values must be greater than or equal to 0.05 (0.01 for poor responders)/

ii) Percent difference (%D) values must not exceed 25 percent (40 percent for poor responders).

Calibration standards were analyzed at the required frequency, and the results met the above criteria for instrument sensitivity and stability with the exception of bromoform which showed some variability. A summary of qualified results is presented in Table 4.

6. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

7. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for VOC determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the laboratory criteria.

8. Internal Standards (IS) Analyses

IS data were evaluated for all VOC sample analyses.

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, IS compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the IS responses.

The sample IS results were evaluated against the following criteria:

i) The retention time of the IS must not vary more than ±30 seconds from the associated calibration standard.

ii) IS area counts must not vary by more than -60 percent to +140 percent from the associated calibration standard.

All organic IS recoveries and retention times met the above criteria.

9. Laboratory Control Sample Analyses

LCS and/or laboratory control sample duplicates (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS/LCSD were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS/LCSD contained all compounds of interest. All LCS recoveries and RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision with the exception of some slightly low recoveries for 1,2,4-trichlorobenzene. Associated sample results were qualified as estimated to reflect the implied low bias. A summary of qualified results is presented in Table 5.

10. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the distillation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

MS/MSD analyses were not performed on investigative samples from this sampling event.

11. Field QA/QC Samples

Field QA/QC samples were not collected for this sampling event.

12. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the practical quantitation limit (PQL) but greater than the MDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 2.

13. Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra (if applicable) were evaluated according to the identification criteria established by the methods. The samples identified in Table 1 were reviewed. The organic compounds reported adhered to the specified identification criteria.

14. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable with the specific qualifications noted herein.

Table 1

Sample Collection and Analysis Summary
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters: TO-15	Analysis/Parameters: Helium
SG-81618-122115-RR-005	VP-1	Soil Vapor	12/21/2015	14:40	x	x
SG-81618-122215-RR-009	VP-21	Soil Vapor	12/22/2015	09:14	x	x
SG-81618-122115-RR-007	VP-30	Soil Vapor	12/21/2015	16:40	x	x
SG-81618-122115-RR-003	VP-41	Soil Vapor	12/21/2015	13:45	x	x
SG-81618-122115-RR-001	VP-42	Soil Vapor	12/21/2015	11:55	x	x
SG-81618-122115-SD-002	VP-43	Soil Vapor	12/21/2015	13:00	x	x
SG-81618-122115-SD-004	VP-44	Soil Vapor	12/21/2015	14:20	x	x
SG-81618-122115-SD-006	VP-45	Soil Vapor	12/21/2015	15:25	x	x
SG-81618-122215-RR-010	VP-46	Soil Vapor	12/22/2015	10:42	x	x
SG-81618-122215-SD-008	VP-47	Soil Vapor	12/22/2015	10:05	x	x

Notes:

TO-15 - Toxic Organic Compounds in Air

Table 2

Analytical Results Summary
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Sample Location:		VP-1	VP-21	VP-30	VP-41	VP-42
Sample ID:		SG-81618-122115-RR-005	SG-81618-122215-RR-009	SG-81618-122115-RR-007	SG-81618-122115-RR-003	SG-81618-122115-RR-001
Sample Date:		12/21/2015	12/22/2015	12/21/2015	12/21/2015	12/21/2015
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m3	54.56 U	5.46 U	2.73 U	5.46 U	5.46 U
1,1,2,2-Tetrachloroethane	µg/m3	68.67 U	6.87 U	3.43 U	6.87 U	6.87 U
1,1,2-Trichloroethane	µg/m3	54.56 U	5.46 U	2.73 U	5.46 U	5.46 U
1,1-Dichloroethane	µg/m3	40.49 U	4.05 U	2.02 U	4.05 U	4.05 U
1,1-Dichloroethene	µg/m3	39.67 U	3.97 U	1.98 U	3.97 U	3.97 U
1,2,4-Trichlorobenzene	µg/m3	74.23 UJ	7.42 UJ	3.71 UJ	7.42 UJ	7.42 UJ
1,2,4-Trimethylbenzene	µg/m3	49.16 U	4.92 U	2.46 U	4.92 U	4.92 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m3	76.85 U	7.69 U	3.84 U	7.69 U	7.69 U
1,2-Dichlorobenzene	µg/m3	60.12 U	6.01 U	3.01 U	6.01 U	6.01 U
1,2-Dichloroethane	µg/m3	40.49 U	4.05 U	2.02 U	4.05 U	4.05 U
1,2-Dichloropropane	µg/m3	46.22 U	4.62 U	2.31 U	4.62 U	4.62 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m3	69.90 U	6.99 U	3.49 U	6.99 U	6.99 U
1,3,5-Trimethylbenzene	µg/m3	49.16 U	4.92 U	2.46 U	4.92 U	4.92 U
1,3-Butadiene	µg/m3	22.09 U	2.21 U	1.10 U	2.21 U	2.21 U
1,3-Dichlorobenzene	µg/m3	60.12 U	6.01 U	3.01 U	6.01 U	6.01 U
1,4-Dichlorobenzene	µg/m3	60.12 U	6.01 U	3.01 U	6.01 U	6.01 U
1,4-Dioxane	µg/m3	35.99 U	3.60 U	1.80 U	3.60 U	3.60 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m3	333.22	5.96	1.15 J	10.20	1.89 J
2-Hexanone	µg/m3	133.60	4.10 U	2.05 U	4.10 U	4.10 U
4-Ethyl toluene	µg/m3	49.16 U	4.92 U	2.46 U	4.92 U	4.92 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m3	40.98 U	4.10 U	2.05 U	4.10 U	4.10 U
Acetone	µg/m3	1283.19	37.55	8.91	96.71	107.65
Benzene	µg/m3	31.90 U	3.19 U	1.12 J	3.19 U	3.19 U
Bromodichloromethane	µg/m3	66.99 U	6.70 U	3.35 U	6.70 U	6.70 U
Bromoform	µg/m3	103.35 U	10.34 U	5.17 U	10.34 UJ	10.34 UJ
Carbon disulfide	µg/m3	31.12 U	3.11 U	1.56 U	3.11 U	3.11 U
Carbon tetrachloride	µg/m3	62.90 U	6.29 U	3.15 U	6.29 U	6.29 U
Chlorobenzene	µg/m3	46.05 U	4.61 U	2.30 U	4.61 U	4.61 U
Chloroethane	µg/m3	26.38 U	2.64 U	1.32 U	2.64 U	2.64 U
Chloroform (Trichloromethane)	µg/m3	48.67 U	4.87 U	2.43 U	4.87 U	4.87 U
Chloromethane (Methyl chloride)	µg/m3	20.65 U	2.07 U	1.03 U	1.24 J	2.07 U
cis-1,2-Dichloroethene	µg/m3	39.65 U	3.97 U	1.98 U	3.97 U	3.97 U
cis-1,3-Dichloropropene	µg/m3	45.40 U	4.54 U	2.27 U	4.54 U	4.54 U

Table 2

Analytical Results Summary
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Sample Location:		VP-1	VP-21	VP-30	VP-41	VP-42
Sample ID:		SG-81618-122115-RR-005	SG-81618-122215-RR-009	SG-81618-122115-RR-007	SG-81618-122115-RR-003	SG-81618-122115-RR-001
Sample Date:		12/21/2015	12/22/2015	12/21/2015	12/21/2015	12/21/2015
Parameters	**Units**					
Volatile Organic Compounds-Continued						
Cyclohexane	µg/m3	34.42 U	3.44 U	1.72 U	3.44 U	3.44 U
Dibromochloromethane	µg/m3	85.19 U	8.52 U	4.26 U	8.52 U	8.52 U
Dichlorodifluoromethane (CFC-12)	µg/m3	49.45 U	3.26 J	3.46	3.07 J	2.87 J
Ethylbenzene	µg/m3	43.35 U	4.34 U	2.17 U	4.34 U	4.34 U
Hexachlorobutadiene	µg/m3	106.63 U	10.66 U	5.33 U	10.66 U	10.66 U
Hexane	µg/m3	17.63 J	12.06	2.43	7.54	7.12
Isopropyl alcohol	µg/m3	30.92	7.17	0.93 J	4.56	9.37
m&p-Xylenes	µg/m3	86.71 U	8.67 U	4.34 U	8.67 U	8.67 U
Methyl tert butyl ether (MTBE)	µg/m3	36.07 U	3.61 U	1.80 U	3.61 U	3.61 U
Methylene chloride	µg/m3	34.72 U	3.47 U	1.74 U	2.15 J	2.29 J
N-Heptane	µg/m3	40.98 U	4.10 U	2.05 U	4.10 U	4.10 U
o-Xylene	µg/m3	43.35 U	4.34 U	2.17 U	4.34 U	4.34 U
Styrene	µg/m3	42.54 U	4.25 U	2.13 U	4.25 U	4.25 U
Tetrachloroethene	µg/m3	67.81 U	506.55	3.39 U	3.39 J	3.66 J
Tetrahydrofuran	µg/m3	29.49 U	2.95 U	1.47 U	1.18 J	2.95 U
Toluene	µg/m3	37.63 U	3.76 U	1.43 J	3.24 J	1.81 J
trans-1,2-Dichloroethene	µg/m3	39.65 U	3.97 U	1.98 U	3.97 U	3.97 U
trans-1,3-Dichloropropene	µg/m3	45.40 U	4.54 U	2.27 U	4.54 U	4.54 U
Trichloroethene	µg/m3	53.74 U	5.37 U	2.69 U	5.37 U	5.37 U
Trichlorofluoromethane (CFC-11)	µg/m3	56.20 U	5.62 U	1.80 J	5.62 U	5.62 U
Trifluorotrichloroethane (CFC-113)	µg/m3	76.65 U	7.66 U	3.83 U	7.66 U	7.66 U
Vinyl chloride	µg/m3	25.56 U	2.56 U	1.28 U	2.56 U	2.56 U
General Chemistry						
Helium	%	0.00	0.00	0.00	0.00	0.00

Table 2

Analytical Results Summary
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Sample Location:		VP-43	VP-44	VP-45	VP-46	VP-47
Sample ID:		SG-81618-122115-SD-002	SG-81618-122115-SD-004	SG-81618-122115-SD-006	SG-81618-122215-RR-010	SG-81618-122215-SD-008
Sample Date:		12/21/2015	12/21/2015	12/21/2015	12/22/2015	12/22/2015
Parameters	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/m3	2.73 U	2.73 U	2.73 U	5.46 U	5.84
1,1,2,2-Tetrachloroethane	µg/m3	3.43 U	3.43 U	3.43 U	6.87 U	3.43 U
1,1,2-Trichloroethane	µg/m3	2.73 U	2.73 U	2.73 U	5.46 U	2.73 U
1,1-Dichloroethane	µg/m3	2.02 U	2.02 U	2.02 U	4.05 U	2.02 U
1,1-Dichloroethene	µg/m3	1.98 U	1.98 U	1.98 U	3.97 U	1.98 U
1,2,4-Trichlorobenzene	µg/m3	3.71 UJ	3.71 UJ	3.71 UJ	7.42 UJ	3.71 UJ
1,2,4-Trimethylbenzene	µg/m3	2.46 U	5.70	7.92	4.92 U	2.46 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m3	3.84 U	3.84 U	3.84 U	7.69 U	3.84 U
1,2-Dichlorobenzene	µg/m3	3.01 U	3.01 U	3.01 U	6.01 U	3.01 U
1,2-Dichloroethane	µg/m3	2.02 U	2.02 U	2.02 U	4.05 U	2.02 U
1,2-Dichloropropane	µg/m3	2.31 U	2.31 U	2.31 U	4.62 U	2.31 U
1,2-Dichlorotetrafluoroethane (CFC 114)	µg/m3	3.49 U	3.49 U	3.49 U	6.99 U	3.49 U
1,3,5-Trimethylbenzene	µg/m3	2.46 U	2.06 J	1.97 J	4.92 U	2.46 U
1,3-Butadiene	µg/m3	1.10 U	1.10 U	1.10 U	2.21 U	1.10 U
1,3-Dichlorobenzene	µg/m3	3.01 U	3.01 U	3.01 U	6.01 U	3.01 U
1,4-Dichlorobenzene	µg/m3	3.01 U	3.01 U	3.01 U	6.01 U	3.01 U
1,4-Dioxane	µg/m3	1.80 U	1.80 U	1.80 U	3.60 U	1.80 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m3	2.24	3.24	2.95	2.95 U	6.61
2-Hexanone	µg/m3	2.05 U	2.05 U	2.05 U	4.10 U	2.05 U
4-Ethyl toluene	µg/m3	2.46 U	2.46 U	1.77 J	4.92 U	2.46 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m3	2.05 U	2.05 U	2.05 U	4.10 U	2.05 U
Acetone	µg/m3	19.27	24.48	20.65	15.68	41.11
Benzene	µg/m3	1.60 U	2.39	1.31 J	3.19 U	3.19
Bromodichloromethane	µg/m3	3.35 U	3.35 U	3.35 U	6.70 U	3.35 U
Bromoform	µg/m3	5.17 U	5.17 U	5.17 U	10.34 U	5.17 U
Carbon disulfide	µg/m3	1.56 U	1.37 J	1.37 J	3.11 U	1.56 U
Carbon tetrachloride	µg/m3	3.15 U	3.15 U	3.15 U	2.89 J	3.15 U
Chlorobenzene	µg/m3	2.30 U	2.30 U	2.30 U	4.61 U	2.30 U
Chloroethane	µg/m3	1.32 U	1.32 U	1.32 U	2.64 U	1.32 U
Chloroform (Trichloromethane)	µg/m3	2.43 U	2.43 U	2.43 U	4.87 U	2.43 U
Chloromethane (Methyl chloride)	µg/m3	1.03 U	1.03	1.03 U	2.07 U	1.03 U
cis-1,2-Dichloroethene	µg/m3	1.98 U	1.98 U	1.98 U	3.97 U	1.98 U
cis-1,3-Dichloropropene	µg/m3	2.27 U	2.27 U	2.27 U	4.54 U	2.27 U

Table 2

Analytical Results Summary
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Sample Location:		VP-43	VP-44	VP-45	VP-46	VP-47
Sample ID:		SG-81618-122115-SD-002	SG-81618-122115-SD-004	SG-81618-122115-SD-006	SG-81618-122215-RR-010	SG-81618-122215-SD-008
Sample Date:		12/21/2015	12/21/2015	12/21/2015	12/22/2015	12/22/2015
Parameters	**Units**					
Volatile Organic Compounds-Continued						
Cyclohexane	µg/m3	1.72 U	1.48 J	1.51 J	3.44 U	1.72 U
Dibromochloromethane	µg/m3	4.26 U	4.26 U	4.26 U	8.52 U	4.26 U
Dichlorodifluoromethane (CFC-12)	µg/m3	3.12	3.02	3.16	3.36 J	5.64
Ethylbenzene	µg/m3	2.17 U	2.08 J	2.51	4.34 U	2.17 U
Hexachlorobutadiene	µg/m3	5.33 U	5.33 U	5.33 U	10.66 U	5.33 U
Hexane	µg/m3	2.61	3.74	3.24	3.67	2.04
Isopropyl alcohol	µg/m3	1.52	1.30	2.23	1.67 J	1.23 U
m&p-Xylenes	µg/m3	2.99 J	8.93	10.80	8.67 U	4.34 U
Methyl tert butyl ether (MTBE)	µg/m3	1.80 U	1.80 U	1.80 U	3.61 U	1.80 U
Methylene chloride	µg/m3	1.74 U	1.74 U	1.74 U	3.47 U	1.08 J
N-Heptane	µg/m3	2.05 U	2.05 U	2.05 U	4.10 U	2.05 U
o-Xylene	µg/m3	1.17 J	4.34	4.86	4.34 U	2.17 U
Styrene	µg/m3	2.13 U	2.13 U	2.13 U	4.25 U	2.13 U
Tetrachloroethene	µg/m3	4.34	26.38	69.85	381.10	11.80
Tetrahydrofuran	µg/m3	1.47 U	1.47 U	0.91 J	2.95 U	1.47 U
Toluene	µg/m3	1.28 J	3.12	2.30	3.76 U	1.35 J
trans-1,2-Dichloroethene	µg/m3	1.98 U	1.98 U	1.98 U	3.97 U	1.98 U
trans-1,3-Dichloropropene	µg/m3	2.27 U	2.27 U	2.27 U	4.54 U	2.27 U
Trichloroethene	µg/m3	2.69 U	2.69 U	2.69 U	2.90 J	43.26
Trichlorofluoromethane (CFC-11)	µg/m3	1.69 J	1.63 J	1.69 J	5.62 U	2.14 J
Trifluorotrichloroethane (CFC-113)	µg/m3	3.83 U	3.83 U	3.83 U	7.66 U	3.83 U
Vinyl chloride	µg/m3	1.28 U	1.28 U	1.28 U	2.56 U	1.28 U
General Chemistry						
Helium	%	0.00	0.00	0.00	0.00	0.00

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 3

Analytical Methods and Holding Time Criteria
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Volatile Organic Compounds	TO-15[1]	Air	-	14
Helium	EPA 3C	Air	-	14

Notes:

[1] - "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999

\- - Not applicable

Table 4

Qualified Sample Results Due to Outlying Continuing Calibration Results
LIRR Phase 2 Soil Vapor Probes
Glenn Springs Holdings, Inc.
Hicksville, New York
December 2015

Parameter	Analyte	Calibration Date (mm/dd/yyyy)	RRF	%D	Associated Sample ID	Qualified Result	Units
VOCs	Bromoform	12/28/2015	-	28.1	SG-81618-122115-RR-001	10.34 UJ	µg/m3
					SG-81618-122115-RR-003	10.34 UJ	µg/m3

Notes:

- - Not applicable
%D - Percent difference
RRF - Relative Response Factor
UJ - Not detected; associated reporting limit is estimated
VOCs - Volatile Organic Compounds

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