Superfund Program Proposed Plan

North Penn Area 7 Superfund Site
Operable Unit 4 - Vapor Intrusion

Lansdale Borough, Upper Gwynedd Township, and North Wales Borough, Montgomery County, Pennsylvania

July 2018

I. INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Proposed Plan (Proposed Plan) to present EPA's Preferred Alternative (Preferred Alternative) for remedial action for Operable Unit 4 (OU4) – Vapor Intrusion (VI) at the North Penn Area 7 Superfund Site (Site) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). The Site is located in Lansdale Borough, Upper Gwynedd Township, and North Wales Borough, Montgomery County, Pennsylvania (Figure 1). EPA is the lead agency and the Pennsylvania Department of Environmental Protection (PADEP) is the support agency for this Superfund Site. This Proposed Plan summarizes information that can be found in greater detail in the OU4 Remedial Investigation (RI) Report and other documents relied on to develop the Preferred Alternative. These documents can be found in the Administrative Record file for the Site, which is available for public review at the locations listed in Section X of this Proposed Plan.

Dates to Remember:

July 16, 2018 – August 16, 2018
Public Comment period on the Proposed Plan.

July 26, 2018
Public meeting, 6:30 p.m.
Location: Upper Gwynedd Township Municipal Building
Administrative Record file is at https://semspub.epa.gov/src/collections/03/AR/PAD002498632

The National Superfund Database Identification Number of the Site is PAD002498632. The geographic coordinates of the approximate center of the Site are 40.221256 degrees north latitude and -75.285534 degrees west longitude.

EPA's Preferred Alternative for OU4 VI is **No Action**. VI is the migration of volatile chemicals from contaminated groundwater or soil into an overlying building, similar to radon gas seeping into buildings. After completing an extensive air sampling program and reviewing the air sampling results, EPA performed risk calculations that concluded that VI at the Site does not pose an unacceptable risk to human health. An unacceptable exposure to hazardous substances via VI is not present; therefore, a remedial action for OU4 to ensure protection of human health is not required.

This Proposed Plan performs the following:

- Describes the Site and the Site investigations;
- Identifies EPA's proposed No Action Preferred Alternative for OU4 and explains why EPA prefers it;
- Solicits public review of and comment on the proposed Preferred Alternative for OU4; and
- Refers interested parties to the OU4 RI Report and other Site-related documents contained in the Administrative Record file for the Site.

This Proposed Plan is being issued as part of EPA's public participation requirements under Section 117(a) of CERCLA, 42 U.S.C. § 9617(a), commonly known as Superfund, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430(f)(2). EPA, in consultation with PADEP, will select a final remedy for the Site in an OU4 Record of Decision (ROD) after reviewing and considering written and oral comments on the Proposed Plan submitted during a 30-day public comment period. Public comments will be summarized, and addressed in the Responsiveness Summary of the OU4 ROD. EPA encourages the public to review the documents that make up the Administrative Record to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there. See Section X of this Proposed Plan for the locations of the Administrative Record file.

Interested parties may submit comments on the Proposed Plan during the public comment period which begins on July 16, 2018, and closes on August 16, 2018. On July 26, 2018, EPA will hold a public meeting to discuss the proposed No Action Preferred Alternative. The public meeting will be held at Upper Gwynedd Township Municipal Building**.**

EPA, in consultation with PADEP, may modify the proposed Preferred Alternative set forth in this Proposed Plan or develop another alternative based on public comments or new information. Written and oral comments on this Proposed Plan may be submitted to the following EPA personnel:

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II. SITE BACKGROUND

A. Physical Characteristics and Land Use

The Site, encompassing approximately 650 acres, is located in Lansdale Borough, North Wales Borough, and Upper Gwynedd Township in Montgomery County, Pennsylvania (Figure 1). Based on data from the 2010 U.S. Census, the population of Upper Gwynedd Township is estimated to be 15,552; the population of the Borough of Lansdale is estimated to be 16,269; and the population of the Borough of North Wales is estimated to be 3,229. Both the Site and surrounding areas are heavily developed; land use is predominantly industrial and residential with some small commercial areas.

Historically, the area was the location of several light industrial and commercial businesses which included various electronics manufacturing and degreasing operations. EPA has identified five former manufacturing facilities as the sources of soil and groundwater contamination. The former manufacturing facilities are located within an area approximately aligning with Church Road to the West, Wissahickon Avenue to the East, and North Sumneytown Pike to the South, and are referenced by both their address and the name of the former owner in Figure 2. The contamination from these source areas includes solvents and other materials used by the former manufacturing facilities, including, but not limited to, trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1,1-trichloroethane (1,1,1-TCA, and also known as methyl chloroform), methylene chloride, carbon tetrachloride, and trichlorofluoromethane (also known as Freon-11).

In 1979, the North Penn Water Authority (NPWA) detected TCE in several municipal supply wells. Subsequently, NPWA, EPA and the Wissahickon Valley Watershed Association conducted additional investigations of nearby industrial and residential wells that were contaminated with these chemicals. The results indicated multiple sources of the contamination in the groundwater.

Potable water is supplied to the area where the Site is located by both the NPWA and the North Wales Water Authority (NWWA). The NPWA has municipal supply wells located within 1,200 feet of the Site. The NWWA receives most of its water from the Delaware River; however, the NWWA owns one supply well within the area of the Site. In addition, several private wells have been identified within the Site and have been sampled by EPA as part of the Operable Unit 3 (OU3) groundwater RI.

B. History of Activities that Led to Contamination

The disposal practices, spills, and leaks at the former manufacturing facilities were identified as the sources of the contamination. These industrial practices contaminated the groundwater in the vicinity of the properties with volatile organic compounds (VOCs). Ultimately seven wells, including two NPWA public water supply wells south of the Site and five production wells at the

former Ford Electronics and Refrigeration, LLC facility at 1190 Church Road, were shut down and abandoned as a result of the groundwater contamination that was discovered.

EPA added the Site to the National Priorities List (NPL) on March 31, 1989, based on environmental studies that identified contamination of soil and groundwater by VOCs including TCE, PCE, carbon tetrachloride, methylene chloride, and vinyl chloride (VC).

This Proposed Plan addresses VI at the Site, identified as OU4. VI generally occurs when VOCs from contaminated groundwater plumes or soil migrate into an overlying building, similar to radon gas.

III. SITE CHARACTERISTICS

A. Hydrology

The Site is located within the Piedmont Physiographic Province of Pennsylvania. Bedrock consists of the Triassic Basin Formation, including the Brunswick Formation, which consists primarily of interbedded red shale, siltstone, and fine-grained sandstone, underlain by the Lockatong Formation, which is comprised primarily of gray to black shale. Overburden is predominantly comprised of red-brown to brown silty clays to clayey silts. Land and drainage in the area generally slopes to the southeast. The region is drained primarily by Wissahickon Creek and its tributaries, which flow southward to the Schuylkill River and ultimately drains into the Delaware River. The northwest portion of the Site is drained by Towamencin Creek and its tributaries.

Storm sewer drains along the western side of Wissahickon Avenue receive runoff from adjacent areas of the Site and from the road. Surface water from the majority of the Site ultimately flows, via the storm sewer system, into Wissahickon Creek.

Topography is generally flat to gently undulating with elevations ranging from 325 feet above mean sea level (msl) to 390 above msl. Undeveloped portions of the Site consist of mowed turf grass associated with commercial and residential dwellings, forests, and open fields; however, the latter two are limited in size and are mostly restricted to utility rights-of-way and riparian areas associated with the Towamencin and Wissahickon Creeks.

The U.S. Geological Survey (USGS) monitored groundwater levels in wells in the area of Wissahickon Creek for the period between December 2000 and September 2002. The USGS produced comprehensive reports on the hydrogeology in the vicinity of the Site that are available on the USGS web site https://pubs.er.usgs.gov/search, search term: “North Penn Area 7” and also referenced in the Administrative Record Docket for the Site.

B. Regional Hydrogeology

The Brunswick and Lockatong Formations underlying the Site have little primary permeability. Virtually all groundwater movement occurs through intersecting fracture sets. Vertical joints occurring in many of the rock units are primary pathways through which groundwater moves. The intergranular porosity of the rocks is believed to be too low to allow significant movement of groundwater.

The Brunswick Formation has been extensively developed for groundwater supplies. It has been reported that wells capable of yielding tens to hundreds of gallons per minute (gpm) have been completed throughout much of the formation, generally at depths of 200 feet to 500 feet.

The Site is characterized by complex hydrogeology. The hydrogeological complexity includes a fractured-bedrock aquifer with strongly developed preferred directions of groundwater flow, potential groundwater discharge boundaries within the area, variability of recharge to the water table due to paving and other development, and a number of groundwater-pumping centers with complicated and uncertain discharge histories. The Site hydrogeology is an important component of the conceptual site model (CSM) for VI, because the distribution of VOCs is largely driven by the influences of groundwater flow.

As described in the USGS reports, the general groundwater gradient in all zones is toward the southwest, which is coincident with the strike of the bedrock. The vertical gradients vary greatly from weak downward or weak upward to very strongly downward and very strongly upward. However, in general, upward vertical gradients were observed on the west side of Church Road and downward vertical gradients were observed on the east side of Church Road.

Early studies of the groundwater by EPA indicated pumping of supply wells in and near the Site may have lowered the water levels in some wells in the area. A large groundwater surface depression, due to withdrawal, occurs at the Merck & Co. Inc., facility located at 770 Sumneytown Pike in West Point, Pennsylvania, immediately southwest of the Site.

As stated in the USGS report, results of aquifer tests performed at wells in and near Lansdale, Pennsylvania suggest that groundwater occurs in discrete zones, probably associated with fractures or bedding plane openings. The vertical conductivity between discrete zones appeared to be very low, and the highest hydraulic conductivities were seen in the horizontal direction. The most productive water bearing zones were observed, generally, between 60 feet below ground surface (bgs) and 480 feet bgs.

As part of the OU3 groundwater RI, water levels in monitoring wells were measured to develop potentiometric surface maps. The OU3 RI monitoring wells and the water supply wells were categorized into Upper Bedrock Zone, Middle Bedrock Zone, Lower Bedrock Zone, and Lowest Bedrock Zone wells based on the elevations of the open intervals above mean sea level (amsl). The Bedrock Zones are the following:

- Upper Bedrock Zone well – greater than 270 feet amsl;
- Middle Bedrock Zone well – between 200 feet amsl and 270 feet amsl
- Lower Bedrock Zone well – between 100 feet amsl and 200 feet amsl; and

● Lowest Bedrock Zone well – below 100 feet amsl.

The depth of the contaminated groundwater zone in the upper bedrock throughout the Site is approximately 20 to 50 feet below the surface (270 to 300 feet amsl).

IV. SCOPE AND ROLE OF OPERABLE UNIT

A. Operable Units (OUs) Description and History

Many NPL sites are large and complicated and are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called Operable Units or OUs.

EPA is addressing the Site as four OUs. EPA has identified five former manufacturing facilities as sources of soil and groundwater contamination (Source Area Properties). OU1 involves a soil investigation and cleanup at four Source Area Properties, and OU2 involves a soil investigation and cleanup at the fifth Source Area Property (Spra-Fin, Inc. property). OU3 involves a site-wide groundwater investigation and cleanup. OU4 involves a site-wide VI investigation and is the subject of this Proposed Plan.

The Source Areas Properties that have contributed to contamination of soil and groundwater are referenced by address and by name of the former owner, as several of the businesses at these addresses have been sold or closed (Figure 2). The contamination includes solvents and other materials used by the former manufacturing facilities, including, but not limited to, TCE, PCE, 1,1,1-TCA, methylene chloride, carbon tetrachloride, and trichlorofluoromethane (Freon-11).

The Source Area Properties are as follows:

● 205 Church Road – Former Teleflex, Inc. (Teleflex) (OU1)
● 1180 Church Road – Former Zenith Corporation (Zenith) (OU1)
● 1190 Church Road – Former Ford Electronics and Refrigeration, LLC (Ford) (OU1)
● 351 N. Sumneytown Pike – Former Leeds & Northrup Company (Leeds & Northrup) (OU1)
● 177 Wissahickon Avenue – Former Spra-Fin, Inc. (Spra-Fin) (OU2)

All of the above Source Area Properties are included in OU3 and OU4.

B. OU1 PRP-Lead RI/FS - Soils

OU1 addresses the investigation and potential remediation of surface and subsurface soils at four of the five Source Area Properties that are included in the Site: 1190 Church Road, Lansdale; 1180 Church Road, Lansdale and Upper Gwynedd Township; 205 Church Road, Upper Gwynedd Township; and 351 North Sumneytown Pike, North Wales. The OU1 soil Remedial Investigation/Feasibility Study (OU1 RI/FS) is being conducted by four potentially responsible

parties (PRPs) on their respective properties (or former properties). The soil RI/FS and the cleanup of soils at the fifth property (Spra-Fin) were completed by EPA in 2010 as OU2.

The PRPs have completed the soil RI for the four OU1 Source Area Properties. In 2005, one of the PRPs, Ford Motor Company, completed a soil removal cleanup action on the 1190 Church Road property.

EPA has performed and finalized the Human Health Risk Assessments (HHRAs) for each of the OU1 Source Area Properties, and the PRPs are currently preparing the FS reports for those properties. EPA has also performed and finalized the Screening Level Ecological Risk Assessment (SLERA) of terrestrial habitats and the aquatic habitat Baseline Ecological Risk Assessment (BERA) reports for OU1. When the OU1 RI/FS is completed, EPA will issue a Proposed Plan soliciting public comment on the proposed preferred remedial alternative(s) for cleanup of the soils at the four OU1 Source Area Properties. After consideration of comments, EPA will issue a remedy decision in a ROD for OU1.

The operational histories of the OU1 Source Area Properties are summarized below and may also be found in the OU1 RI included in the Administrative Record.

1. 205 Church Road – Former Teleflex Property - OU1

The 205 Church Road property consists of 23 acres, including two buildings, located along Church Road in Upper Gwynedd Township. The property location is shown on Figure 2. Land use surrounding the property is primarily industrial with some undeveloped areas to the south. Prior to 1956, the property was used for agricultural purposes. In late 1956 to 1957, the property was developed by Teleflex, Inc. (Teleflex) into a manufacturing facility for electronic, mechanical, and pneumatic control devices for the aerospace industry. One of the buildings present on the property was used for offices and manufacturing, and the second building, an outdoor waste water treatment facility, is located adjacent to the office building. Triumph Controls LLC (Triumph) purchased the manufacturing operations from Teleflex on December 31, 1995. Triumph subsequently purchased the property from Teleflex on December 19, 2002, and remains the current owner. Triumph uses the building property for offices and the manufacture of mechanical and electro-mechanical control systems.

During the OU1 RI, a total of 78 samples were collected from 32 soil borings at the 205 Church Road property over three sampling events. The 78 soil samples included 22 surface samples and 56 subsurface samples. All the surface soil samples were analyzed for Target Compound List (TCL) semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals, PCBs, and cyanide. Thirty-four of the subsurface soil samples were analyzed for TCL VOCs, TCL SVOCs, TAL metals, PCBs, and cyanide. The remaining 22 subsurface soil samples were analyzed for Chlorinated VOCs (Cl-VOCs).

Thirteen subsurface samples out of 56 had detections of Cl-VOCs above the EPA Region III risk based concentration (RBC) soil screening levels. Twelve of the 13 detections occurred at 9

borings located adjacent to the former wastewater sump area. Aside from a slight estimated detection of chloroform (1 microgram per kilogram (µg/kg)) in the former Chemical Storage Area, there were no detections of Cl-VOCs above the screening levels in any other area of the property. The detections above the screening levels in the former wastewater sump area were predominantly TCE and ranged from 24 µg/kg to 73,000 µg/kg. The majority of the TCE was detected at the soil-bedrock interface approximately 18 feet bgs. These TCE detections appear to be residual contamination from previously documented releases from the former wastewater sump.

2. 1180 Church Road – Former Zenith Property - OU1

The 1180 Church Road property consists of approximately 52.8 acres of land located along Church Road in both Upper Gwynedd Township and the southern corner of Lansdale Borough (Figure 2). The land use surrounding the property is open land to the west and southwest, industrial areas to the south and east, and residential areas to the north and east.

The OU1 RI reported that the property was originally used as a slate quarry by Lansdale Brick Company. Philco Corporation purchased the property in 1961, and in 1966 constructed the first building for the manufacture of television picture tubes. Zenith purchased the property in 1973 and continued picture tube manufacturing activities for about 18 months, until December 1974 when the plant was closed. In 1983, the facility was sold to the Montgomery County Industrial Authority. Since 2000, the property has included several commercial and manufacturing tenants whose activities included printing, computer system development, photographic development, and office activities.

During the OU1 RI, a total of 30 subsurface soil samples were collected from 18 soil borings at the 1180 Church Road property. Twenty samples were analyzed for TCL SVOCs, TAL metals, PCBs, and cyanide, and ten samples were analyzed for TCL VOCs. Concentrations of Cl-VOCs were detected above the EPA Region III RBC soil screening levels in two samples collected from borings installed in the Former Lagoon Area and the Former Outdoor Drum Storage Area. Ethylene dichloride, or 1,2-dichloroethane (1,2-DCA) was detected at a concentration of 2 µg/kg in one of the borings, and TCE and VC were detected at concentrations of 17 µg/kg and 2 µg/kg, respectively, in the other boring. Nine additional borings were installed in the vicinity of one of the RI monitoring well locations on the property. TCE was detected below the screening level at a concentration of 2 µg/kg in one of the borings.

3. 1190 Church Road - Former Ford Electronics and Refrigeration, LLC (Ford) Property - OU1

The 1190 Church Road property is located in Lansdale Borough (Figure 2). The property was undeveloped until 1942, when the National Union Radio Corporation built a manufacturing plant to support the war effort. From 1947 to 1961, the property was occupied by the Lansdale Tube Company, an entity owned by Philco Corporation. Ford Motor Company acquired Philco Corporation in 1961 and, through a series of transactions, the Ford Electronics and Refrigeration

Corporation (FERCO) became the owner of the 1190 Church Road facility. A number of automotive electronic products (including radios, clocks and control devices) and televisions were manufactured at the facility into the 1980s.

From 1993 (following the demolition of all other buildings and most other structures on the property) to 1997, Building 40-X was the site of an electronics degreasing facility. The six degreasers housed in the building used TCE for cleaning electronic parts. In 1999, FERCO was dissolved and the property was transferred to the Ford Electronics and Refrigeration Limited Liability Corporation. The building was later used as warehouse space by North Penn Electronics.

Soils at Building 40-X were contaminated by VOCs. Some of the VOCs that were detected included VC at a concentration of 13 mg/kg at a depth of 9.5 feet, TCE at a concentration of 3,490 mg/kg, PCE at a concentration of 48.3 mg/kg, carbon tetrachloride at a concentration of 4.92 mg/kg, benzene at a concentration of 2.67 mg/kg, and toluene at a concentration of 269 mg/kg at a depth of 14 feet.

From 2004 through 2005, the property underwent a voluntary cleanup action during which Dewey Commercial, Inc. began construction of a residential and commercial development known as Station Square Apartment homes and shops. During the construction of the new buildings passive vapor mitigation systems were installed to mitigate any potential VI issues. Construction of the development was completed in 2005.

The voluntary cleanup action addressed two soil areas impacted by Cl-VOCs, the former Building 40-X Interior Area and the former Flammable Liquids Storage Area (FLSA). Soil excavations were completed in both of these areas and extended to and into weathered bedrock to a depth of approximately 20 feet bgs.

Following the voluntary cleanup action, an additional sampling event was conducted in May 2005 to provide post-Removal Action soil data from excavated areas for use in the HHRA. Some of these data showed detections of TCE above the EPA Region III RBC soil screening levels; however, these detections are believed to be the result of one or more of the following: clean soil that had been re-impacted as a result of perched groundwater present at the soil-bedrock interface, samples that were collected within impacted weathered bedrock, and/or samples that were collected from minimal amounts of residual soil that are present in the undulations of the upper bedrock surface which could not be removed during excavation. Additional limited soil sampling for the speciation of chromium (i.e., analysis of both total and hexavalent chromium such that trivalent chromium levels could be evaluated) was conducted in 2015 in preparation for the FS.

Over 40,000 tons of soil have been removed from the 1190 Church Road property and disposed of off-site, including 10,000 tons during the 2004 voluntary cleanup action from the Building 40-X Interior and FLSA areas. The 1190 Church Road property has been redeveloped since the completion of the voluntary removal action as mixed commercial/residential uses. As discussed in the Removal Action Final Report for the property, vapor barriers were included in the design

of all occupied buildings. After completion of the OU1 RI/FS, EPA will issue a OU1 Proposed Plan that will evaluate remedial alternatives for soils at the property.

4. 351 North Sumneytown Pike – Former Leeds & Northrup Company Property - OU1

The 351 North Sumneytown Pike property is located in Upper Gwynedd Township at the intersection of Dickerson Road and North Sumneytown Pike (Figure 2). The main property occupies approximately 50 acres and is bounded by North Sumneytown Pike to the south, Beaver Street to the east, Dickerson Road to the west, and Wissahickon Avenue to the north. There is a large corporate facility surrounded by parking areas along with a small motor pool building. Land use surrounding the property includes residential development to the south and east, industrial development to the west, and undeveloped woods to the north.

Leeds & Northrup Company (Leeds & Northrup) purchased the property in 1953, and used this location to manufacture process control instruments. Chlorinated solvents (mainly TCE and 1,1,1-TCA) were used as machine degreasing solvents. The main manufacturing building also contained a process wastewater treatment system that included three sludge dewatering beds. In 1997, Leeds & Northrup sold the property to North Wales Associates, L.P., which then sold it to Merck & Co Inc. (Merck). Merck demolished the former Leeds & Northrup buildings and constructed a large corporate facility on the property.

A total of 28 samples were collected from 8 soil borings at the 351 North Sumneytown Pike property. Of the 28 samples, 24 samples were analyzed for TCL SVOCs, PCBs, TAL metals, and cyanide. Fifteen of these samples were also analyzed for TCL VOCs and four additional samples were analyzed for Cl-VOCs only. TCE was detected above the screening levels at a concentration of 55 µg/kg in one sample collected from a depth of 9.5 feet in a boring located in the Former Solvent Anti-Seize Technology (AST)/Degreaser Area. In addition, 15 historic sample results from 14 borings were evaluated during the RI. TCE was detected above the screening levels at a concentration of 31 µg/kg in one sample collected from a depth of 4.5 feet in a boring located in the former Hazardous Waste Storage Pavilion. Cl-VOCs were either not detected or were detected at concentrations less than the screening levels in all other samples collected and analyzed during the OU1 Soil RI.

C. OU2 EPA-Lead RI/FS - Soils

OU2 addressed the investigation and remediation of soil contamination at the fifth Source Area Property included in the Site, the former Spra-Fin facility located at 177 Wissahickon Avenue.

1. 177 Wissahickon Avenue – Former Spra-Fin - OU2

The former Spra-Fin property is a 1.1-acre property with a 5,584-square foot brick building. It is located at 177 Wissahickon Avenue in Upper Gwynedd Township, as shown on Figure 2. Land use history prior to 1963 is uncertain.

Spra-Fin purchased the property in about 1963 and operated a metal manufacturing and paint-finishing business on the property. The Spra-Fin facility used TCE for the degreasing of metal parts prior to painting. As a result, TCE, chromium, and other hazardous substances were released at the property during operations conducted from approximately 1963 to 2004. EPA conducted the OU2 RI/FS and in 2004 issued the OU2 ROD for the remediation of contaminated soil at the property. In 2010, EPA completed the soils cleanup at the property. The contaminated soils from the property were excavated and properly disposed off-site and the excavation was filled in with clean material. EPA documented the completed OU2 soil cleanup in a Remedial Action Report dated December 6, 2010. The property is privately owned and currently used for storage of trucks and equipment.

D. OU3 EPA-Lead RI/FS - Groundwater

OU3 addresses the contaminated groundwater plumes throughout the Site. As part of the OU3 RI, EPA installed monitoring well clusters at several locations throughout the Site. In addition to the RI wells, EPA sampled existing wells on the Source Area Properties and at businesses and residential locations. Figure 2 indicates the well locations and source areas. EPA completed the OU3 Site-wide groundwater RI in July 2011, and finalized the OU3 HHRA in 2014.

In November 2012, EPA mobilized to the former Teleflex property at 205 Church Road for the installation and development of three new groundwater wells for use in the in-situ bioremediation treatability pilot study associated with the OU3 Feasibility Study (FS). Currently, a pilot study is being conducted at the former Teleflex property at 205 Church Road, and a Site-wide OU3 FS report examining remedial cleanup alternatives is being prepared. When the OU3 RI/FS is completed, EPA will issue a Proposed Plan soliciting public comment on the proposed preferred remedial alternative for cleanup of Site-wide groundwater. After consideration of comments, EPA will issue an OU3 ROD documenting its remedy decision for Site-wide groundwater.

EPA conducted four rounds of comprehensive groundwater sampling in 2000, 2005, 2006, and 2010, as part of the OU3 RI. The fourth round, conducted in 2010, provided data to update the conceptual site model (CSM) for the Site and to provide information for the planning of the OU4 RI for VI. EPA conducted another round of groundwater sampling for OU3 in mid-2016.

The following is a summary of the OU3 groundwater findings from the groundwater sampling data relative to VOCs, specifically PCE and TCE and associated breakdown products. EPA concluded that these Site-related contaminants pose the greatest potential for VI from contaminant migration from the subsurface to structures overlying the contaminant plumes based on the following: their respective toxicity values; the fact that they are the most common contaminants at this Site; and the fact that historically TCE and PCE have been the contaminants

most frequently found in structures when sampling indoor air quality. Residential areas at potential risk for VI at the Site are shown in Figure 3.

Volatile chemicals may include both VOCs and some SVOCs. Figure 4 depicts the migration of volatile chemicals from contaminated soil and groundwater plumes into buildings. Volatile chemicals can enter buildings through cracks in the foundation and openings for utility lines. Atmospheric conditions and building ventilation can also influence VI.

1. Distribution of TCE, PCE, and cis-1,2-DCE in Groundwater Contamination in the Upper Bedrock Zone

The Upper Bedrock Zone is the zone with the greatest potential for migration of VOC contamination from the groundwater into overlying buildings. This shallow groundwater zone throughout the Site occurs approximately 25-50 feet bgs. The groundwater discussion in this Proposed Plan is limited to VOCs with the highest potential for migration from the Upper Bedrock Zone. The areas over the VOC-contaminated groundwater plumes with the greatest potential for migration into overlying buildings were selected as the locations for investigation of possible VI. TCE is the main contaminant of concern due to its history of use at the Site and its toxicity.

a. Distribution of TCE

In the Upper Bedrock Zone, two distinct TCE plumes exist: one to the north of Wissahickon Creek and one to the south of Wissahickon Creek (Figure 3). Within the northern TCE plume, the highest concentrations are centered in three source areas: the former Ford facility property (1190 Church Road) (Well RI-03S with 490 µg/L of TCE); the former Zenith facility property (1180 Church Road) (Well RI-05S with 170 µg/L of TCE); and the former Teleflex facility property (205 Church Road) (Wells FS-1 and FS-2 with 1,300 µg/L and 2,300 µg/L of TCE, respectively). TCE concentrations decrease to the southwest, in the regional downgradient direction (Figure 3), and they appear to be near the Maximum Contaminant Level (MCL) of 5 µg/L, promulgated pursuant to the Safe Drinking Water Act, 42 U.S.C.§300g-1 and codified at 40 C.F.R. §141.61(a), at wells RI-10S and T-12 (both at 3.5 µg/L). TCE concentrations also decrease to the northeast and northwest of the former Teleflex facility property (12 µg/L and 13 µg/L at wells T-6 and T-10, respectively). The 6.9 µg/L of TCE detected at Merck well N1, located about 2,000 feet downgradient of the former Teleflex facility property (depicted on the far western side of Figure 3), appears to be connected to the larger southern TCE plume.

Concentrations in the southern TCE plume in the Upper Bedrock Zone are highest (750 µg/L) at well RI-11S (located near the former Spra-Fin facility property) with concentrations decreasing downgradient (250 µg/L at well R-18 and 110 µg/L at well RI-08S).

b. Distribution of PCE

In the Upper Bedrock Zone north of Wissahickon Creek, the highest PCE concentration is found in the Teleflex source area (23 µg/L at well FS-1), located on the south side of the main building. Concentrations of PCE south of Wissahickon Creek are also relatively low, with the highest concentrations found at well RI-08S (13 µg/L at the Leeds and Northrup source area (351 North Sumneytown Pike)) and well RI-11S (11 µg/L at the Spra-Fin source area (177 Wissahickon Avenue)). The MCL for PCE is 5 µg/L.

c. Distribution of cis-1,2-DCE

Cis-1,2-Dichloroethene (cis-1,2-DCE) is present in the groundwater as a biodegradation product of TCE and PCE, rather than as a primary contaminant. The distribution of cis-1,2-DCE is an important indicator of areas where biodegradation may be occurring naturally in the aquifer. The highest concentrations of cis-1,2-DCE found in the Upper Bedrock Zone north of Wissahickon Creek (well FS-2 at 110 µg/L and well MW-1T at 90 µg/L), are on the south side of the main building in the Teleflex source area. A similar cis-1,2-DCE concentration (86 µg/L) was found in the Zenith source area, where there is a pattern of decreasing concentrations from 33µg/L at well RI-05S, near the building, to 16 µg/L at well RI-13S, 6.4 µg/L at well RI-10S (Container Corporation property at 500 Church Road), and 2.9 µg/L at Merck well N1 (west of the former Teleflex property). The MCL for cis-1,2-DCE is 70 µg/L.

E. OU4 VI RI/FS

OU4 addresses VI resulting from groundwater contamination (Figure 3).

EPA conducted the OU4 RI in phases, concentrating first on areas of greatest potential risk to receptors. The OU4 RI includes three sampling events from 2010 through 2013. The OU4 RI Report was finalized in December 2015, and is part of the Administrative Record.

The soil contamination comprising OU1 and OU2 at the Source Area Properties and the Site-wide groundwater contamination comprising OU3 have been investigated and studied extensively. The results have been documented in various reports that are in the Administrative Record for the Site. EPA has identified VOCs, listed in Table 1, below, that are considered to be Site-related contaminants.

Table 1: North Penn Area 7 Identified Site-Related Volatile Organic Compounds (VOCs)

1,1,1-trichloroethane (1,1,1-TCA, and also known as methyl chloroform)
1,1,2-trichloroethane (1,1,2-TCA)
1,1-dichloroethane (1,1-DCA)
carbon tetrachloride
chloroform
cis-1,2-dichloroethene (cis-1,2-DCE)
methylene chloride
tetrachloroethylene, tetrachloroethene, or perchloroethylene (PCE)

toluene trichloroethylene or trichloroethene (TCE) trichlorofluoromethane (also known as Freon-11) vinyl chloride (VC)

The chemicals identified in Table 1 can potentially migrate through the environment and into the indoor air of structures overlying the subsurface groundwater contamination.

EPA used the extent of the VOC subsurface contaminant groundwater plumes at the Site and the depth to groundwater determined during the OU3 RI and supplemental groundwater sampling events to tentatively select VI sampling locations at buildings that have a relatively higher risk for VI than other areas of the Site. Structures located in areas considered to be at risk for VI were then prioritized for sampling based on the populations using the buildings. EPA prioritized VI sampling at buildings used by sensitive populations (e.g., children) or occupied full-time (e.g. residences) over buildings that are occupied only part-time by working adults (e.g., warehouses or businesses).

The OU4 VI investigation at the Site was conducted in three rounds of sampling, utilizing an iterative approach selecting sampling locations for each of the second and third rounds to confirm previous results or to assess potential sampling locations based on results obtained from each preceding round. In addition to the location of the buildings in relationship to the groundwater plume and risk considerations mentioned above, EPA considered the following additional inputs prior to planning additional rounds of VI sampling: 1) seasonal temperature and precipitation variations; 2) the presence or absence of sub-slab air or indoor air VOCs at nearby buildings; and 3) the availability of property access. Based on these criteria, the OU4 VI investigation included the collection of sub-slab vapor and indoor air samples in 49 buildings.

Analytical services were performed during Round 1 and Round 2 by either the EPA Office of Analytical Services and Quality Assurance (OASQA) or through the EPA Contract Laboratory Program (CLP). For the Round 3 sampling event, due to scheduling and air sample canister availability limitations, EPA directed its technical support contractor to contract a laboratory to conduct the analytical services.

All VI air samples were collected in evacuated air canisters and analyzed according to Modified EPA Method TO-15 (EPA/625/R-96/010b; January 1999). Three primary types of VI samples were collected: sub-slab air, indoor air, and ambient air. A sub-slab sample is a soil gas sample taken through holes drilled through a structure's foundation and captures the gas directly underneath the structure's foundation. An indoor air sample is an air sample taken inside the structure, while an ambient air sample is an outdoor air sample. At locations with existing VI mitigation systems, EPA used a modification of the sub-slab air sample, by placing a sample port on the system's vent stack.

1. Sub-Slab Air Samples

Prior to the installation of sub-slab sample ports, a building reconnaissance was conducted to identify the most appropriate sub-slab air sampling locations in the structure. Sub-slab sample ports were installed in areas where access to bare, unimproved concrete floors was available. Places where vapor has an opportunity to enter the building (e.g., cracks, sumps, or edges of slabs) were considered to be preferred sampling locations among these accessible areas. With the exception of locations where VI mitigation systems had previously been installed by others (e.g., radon vents or passive sub-slab venting systems), sub-slab air sample locations were generally spaced at approximately one sample per 333 square feet, with a maximum limit of two sub-slab air sample locations per residence. In schools and daycare centers, sub-slab air samples were collected, if possible, in areas where infants (or more sensitive populations) were cared for. Helium tracer tests were performed at all sub-slab air sampling locations to verify the integrity of the seal at each sub-slab sampling port between the indoor air and the sub-slab air spaces.

2. Indoor Air Samples

Prior to the deployment of indoor air sample canisters, a building reconnaissance was conducted to identify the most appropriate indoor air sampling locations in the structure. Indoor air samples were collected from the lowest floor or basement of a structure, in areas where vapor has an opportunity to enter the building (e.g., cracks, sumps, or edges of slabs). An additional indoor air sample was collected from a second location in an occupied living area of a structure, if appropriate. Locations for indoor air samples in daycare centers, schools, and commercial buildings, which are typically larger than residential buildings, were selected based on the use of the space. Occupied portions of buildings and those areas served by separate heating/cooling zones were targeted.

3. Ambient Air Samples

A sample of the outdoor air was collected from a background location as a control for the air investigation. Each ambient air sample location was selected to be away from any obstructions (i.e., trees, buildings, etc.). An ambient air sample was collected from each area on the day that VI sampling (sub-slab air and indoor air sampling) was conducted. In some cases, one ambient air sample was related to multiple buildings, if the buildings were in close proximity to one another and the buildings were sampled at the same time and for the same duration.

4. VI Sampling Results

This section discusses the results of sub-slab air, indoor air, and ambient air sampling at multiple properties across the Site.

a. VI Screening Levels

The VI sampling analytical results were compared to EPA Regional Screening Levels (RSLs). RSLs are risk-based concentrations of chemical contaminants that are developed by EPA using

risk guidance from EPA's Superfund program. RSLs are considered by EPA to be protective for humans over a lifetime and are used for screening to identify areas, contaminants, and conditions that may require further federal attention at a site. The lower (most conservative) of the Cancer and Non-Cancer RSLs for each chemical was used to evaluate VOC sampling results.

Results from industrial locations, including manufacturing facilities and commercial establishments, were screened against industrial air RSLs. Results from non-industrial locations, including residences, daycare facilities, and recreational facilities, were screened against residential air RSLs. For the purpose of identifying areas for further investigation or action, unattenuated sub-slab air results were screened against RSL values. For purposes of EPA conducting risk assessments of each property sampled, the OU4 RI Report, entitled "*Final Vapor Intrusion Investigation Report for North Penn Area 7 Superfund Site Operable Unit 4"* (CDM Smith, 2015), presented sub-slab air sample detections which were attenuated and screened against the applicable RSLs. The attenuation factor (AF) selected by EPA was 0.1, representing the inhibition of vapor migration across the building slab. The AF is defined as the ratio of indoor air concentration to subsurface concentration, and is used as a measure of the decrease in concentration that occurs during vapor migration and may vary with space and time. In EPA's OSWER "Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils", November 2002 (Draft Subsurface Vapor Intrusion Guidance), the default AFs for subslab, deep soil gas (> 5 feet below floor level), and groundwater were 0.1, 0.01, and 0.001, respectively. Accordingly, if a compound in indoor air was present entirely from VI, not background, then the indoor levels would equal one tenth, or 0.1, of subslab levels, one hundredth, or 0.01, of deep soil-gas levels, and one thousandth, or 0.001 of groundwater levels – after accounting for vapor partitioning from groundwater.

The analytical data from the VI investigation are in the OU4 RI Report in the Administrative Record.

The sampling results for the VOCs that are the focus of the OU4 RI Report for VI are compared to contaminants of concern (COCs) from groundwater (OU3) and the residential and industrial RSLs, as appropriate.

b. VI Air Sampling Results

The VI air sampling results are grouped by the following three rounds of VI sample collection:

- Round 1 conducted in the late winter/early spring of 2011;
- Round 2 conducted in the summer of 2012; and
- Round 3 conducted in the late winter/early spring of 2013.

For each round of VI sampling, the discussion includes the building types sampled, the VOCs detected, and the detections exceeding RSLs.

In total, VI samples were collected from 49 buildings in the three rounds of VI sampling. In some cases, buildings were sampled in two rounds.

(1) Round 1

(a) Round 1 – VI Sample Results and EPA Screening Evaluation/Risk Evaluation

Round 1 of the VI sampling occurred in the late winter/early spring from February to April 2011. During this initial round, a total of 109 VI samples were collected from 24 buildings. The samples included sub-slab, indoor and ambient air samples. The samples were analyzed for 58 VOCs.

Results from residential buildings or buildings with sensitive population groups (e.g., children) were screened against residential RSLs. Results from other buildings (e.g., commercial and industrial settings) were screened against industrial RSLs.

(b) Round 1 – Risk Evaluation

For locations exceeding RSLs, EPA performed a HHRA. Both the carcinogenic risk (CR) and Hazard Index (HI) (non-carcinogenic risk) were calculated. In Round 1, no unacceptable CR or HI values were present; therefore, a response action, such as installation of a VI mitigation system, was not triggered. The HHRA calculations are included in the Administrative Record.

(c) Round 1 - Building Type and Use Overview

The majority of the Round 1 buildings sampled (17 of 24 buildings) were residential. Ten buildings were single-family residences, and seven were apartment buildings. The remaining buildings sampled during Round 1 included three commercial buildings and four daycare centers.

The buildings that were sampled during Round 1 for VI were constructed differently. The type of construction, and whether the building had a basement or crawl space, or was constructed slab on grade, impacted the VI pathway and sampling approach. Following the convention of EPA's VI database, ("Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings", EPA 530-R-10-002, March 16, 2012), building foundations were classified as basement, crawlspace, or slab on grade. In some cases, buildings contained a combination of foundation types. In such cases, buildings were classified based on the foundation type that accounted for the majority of the building's footprint. In Round 1, most building foundations were slab on grade (14) or basement (9), while one building foundation was classified as a majority crawlspace.

The seven apartment buildings sampled during Round 1 (Properties with sample numbers beginning with SS03, SS09, SS13, SS14, SS19, SS22 and SS27) are part of an apartment complex located along Church Road designated as the "SS" location. The apartment complex

consists of 25 apartment buildings and multiple commercial buildings. The buildings are generally three stories tall and contain one bedroom, two-bedroom, and three-bedroom apartments. They were constructed on slab on grade, with a vapor barrier installed beneath the slab of each building. A passive vapor extraction system, consisting of a series of interconnected pipes, was installed when the buildings were constructed to mitigate potential VI in each apartment building. The evacuated vapor discharges to the outside air at the roof line of each apartment building. Sub-slab air samples were collected at these buildings by accessing the vapor evacuation piping within the heating, ventilation, and air conditioning (HVAC) utility rooms. Sample results from these residential apartment properties were screened against residential RSLs.

The ten single-family homes sampled during Round 1 (Properties with sample numbers beginning with BR01, BR02, DR01, DR02, DR03, DR04, KR01, MD01, MD02, and MD03) were located in the eastern and western portions of the middle of the Site. Vapor samples were generally collected from the basement or lowest inhabited floor of each house. These locations varied in age, construction type (slab on grade, full basement, partial basement, split-level, and crawlspace), and basement finish (finished and unfinished basements). In the sample locations, it was observed that unfinished basement space was commonly used as laundry or storage space, while finished basement space was commonly used for living area activities (e.g., play room or television room). Sample results from these residential single-family properties were screened against residential RSLs.

The three commercial/industrial properties sampled during Round 1 (Properties with sample numbers beginning with PPS, PPM, and PPB) are all located within the former Zenith facility at 1180 Church Road. The structure is occupied by multiple tenants. Two tenants located on the southern side of the facility (those occupying Property PPM and Property PPS) provided EPA with access for VI sampling. Property PPM consists of office spaces and an assembly area on the ground floor in the southeastern corner of the building. Property PPS consists of office spaces and a warehouse on the ground floor in the southwestern corner of the building. Portions of Properties PPM and PPS were constructed on slab on grade. Property PPB is the basement area beneath portions of Properties PPM and PPS. This location is not leased, but is managed by the building owner. The building owner provided EPA with access for the VI sampling. The basement has a concrete floor. Sample results from these commercial/industrial properties were screened against industrial RSLs.

The four daycare centers sampled during Round 1 (Properties with sample numbers beginning with DR05, DR06, SP01, and WA01) are located in the northern and southern portions of the Site. These four buildings are all slab on grade construction. Each facility is a daycare and education center for children which operates during typical daytime working hours. Typically, these buildings consist of many rooms. Sample results from these daycare centers and schools were screened against residential RSLs due to the sensitive population group.

(d) Round 1 - Analytical Results

When the Round 1 sub-slab, indoor, and ambient air sample results were compared against residential RSLs, the following five compounds were detected at concentrations exceeding the residential RSLs: carbon tetrachloride, chloroform, PCE, TCE, and VC. None of the sample results compared to industrial RSLs contained any VOCs at concentrations exceeding the industrial RSLs. More information regarding the five compounds with detected concentrations that exceeded residential RSLs during the Round 1 sampling is provided below.

Carbon tetrachloride was detected in 105 sample results (96.3 percent). The highest detection was found at Property DR03, which is located approximately one-quarter mile from the former Spra-Fin facility property at 177 Wissahickon Avenue. Concentrations of carbon tetrachloride ranged from not detected to 1.5 micrograms per cubic meter (μg/m³) in an indoor air sample from a residential building. When the sample results with carbon tetrachloride detections were screened against the RSLs, 93.1 percent exceeded the residential RSL for carbon tetrachloride (0.41 μg/m³), and none of the sample results exceeded the industrial RSL for carbon tetrachloride (2 μg/m³). The frequency of detection is likely due to carbon tetrachloride being commonly detected in ambient air samples taken from outside the buildings.

Chloroform was detected in 55 sample results (50.5 percent). Chloroform is a common laboratory contaminant, and many of these detections are believed to be related to lab practices. When the sample results with chloroform detections were screened against the RSLs, 53.5 percent exceeded the residential RSL for chloroform (0.11 μg/m³), and none of the sample results exceeded the industrial RSL for chloroform (0.53 μg/m³). Concentrations of chloroform greater than or equal to ten times the residential RSL (i.e., greater than or equal to 1.1 μg/m³) were detected in indoor air samples collected at Property MD03 and Property DR03 (1.2 μg/m³ and 2.3 μg/m³, respectively), which are both located near the former Spra-Fin facility property. In addition, concentrations of chloroform greater than or equal to ten times the residential RSL (i.e., greater than or equal to 1.1 μg/m³) were detected in sub-slab air samples collected at two buildings (Property MD03 and Property SS19) and two daycare centers (Property SP01 and Property WA01).

PCE was detected in 39 sample results (35.8 percent). When the sample results with PCE detections were screened against the residential RSL for PCE (4.2 μg/m³), 4.0 percent exceeded the RSL. There were no PCE detections among the industrial properties sampled. PCE concentrations in Round 1 samples ranged from not detected to 22 μg/m³. Three residential indoor air sample results at Property DR02 and Property MD01, which are located near the intersection of Dickerson Road and Wissahickon Avenue, exceeded the residential RSL for PCE. Property MD01 is on the opposite side of the SEPTA commuter rail line. The highest concentration of PCE in an indoor air sample at Property DR02 was 4.8 μg/m³. The concentrations of PCE in the indoor air samples at Property MD01 were 17 μg/m³ and 22 μg/m³. The sub-slab air sample with the highest concentration of PCE collected during Round 1 (4.2 μg/m³) was found at Property SS22, which is on the former Ford facility property at 1190 Church Road.

TCE was detected in 21 sample results (19.3 percent). When the sample results with TCE detections were screened against the RSLs, 17.8 percent exceeded the residential RSL for TCE

(0.21 µg/m³), and none of the sample results exceeded the industrial RSL for TCE (0.88 µg/m³). TCE concentrations ranged from not detected to 11 µg/m³ in a sub-slab air sample from Property WA01. Property WA01 is located immediately downgradient (south) of the former Ford facility property. An indoor air sample in that building also exceeded the residential RSL for TCE.

VC was detected in four sample results (3.7 percent). When the sample results with VC detections were screened against the RSLs, 3 percent exceeded the residential RSL for VC (0.16 µg/m³), and none of the sample results exceeded the industrial RSL for VC (2.8 µg/m³). Both sample results that exceeded the residential RSL for VC (collected at Property DR02 and Property KR01) were from sub-slab air samples. Property DR02 and Property KR01 are located on opposite sides of the Site, with Property DR02 located one quarter mile to the west of the former Spra-Fin facility property and Property KR01 located just south of the Container Corporation building located at 500 Church Rd, North Wales, PA.

In summary, during the Round 1 sampling, carbon tetrachloride was frequently detected at concentrations exceeding its residential RSL in indoor air samples, but it was also commonly detected in the outdoor ambient air samples. The highest concentrations of carbon tetrachloride and chloroform were found on the south side of Wissahickon Creek. TCE and PCE concentrations exceeding the residential RSLs were found in several indoor air samples. The highest concentrations of TCE and PCE were found around the former Zenith facility property, the former Ford facility property, and the former Spra-Fin facility property. VC detections were sporadic, and the concentrations were quite low. VC is more likely to be coming from a sub-slab source, but the low frequency of VC detection and the low concentrations being detected suggest that VC is not of primary concern when considering exposure.

(2) Round 2

(a) Round 2 – Sample Results and EPA Screening Evaluation/Risk Evaluation

Round 2 VI sampling occurred in the summer in July and August 2012. Samples were collected from 15 buildings, resulting in the analysis of 49 samples. Samples were analyzed using the Modified EPA Method TO-15 (EPA/625/R-96/010b; January 1999) to identify concentrations of 58 VOCs.

All 49 sample results from Round 2 were from residential buildings or buildings with sensitive populations (e.g., children) and were compared against residential RSLs. No buildings used for commercial purposes were sampled during Round 2.

(b) Round 2 - Risk Evaluation

For locations exceeding RSLs, EPA performed a risk assessment. Both CR and HI were calculated. In Round 2, no unacceptable CR or HI values were present; therefore, a response action, such as installation of a VI mitigation system, was not triggered. The HHRA calculations are included in the Administrative Record.

(c) **Round 2 - Building Type and Use Overview**

VI samples were collected from in and around 15 buildings during Round 2. Nearly all buildings sampled (14) were residential dwellings. Three single-family dwellings and 11 apartment buildings were sampled along with one commercial building.

Buildings were classified based on the foundation type that accounted for the majority of the building footprint. In Round 2, most building foundations were basement (14), while one building foundation was classified as a majority slab on grade.

The 11 apartment buildings sampled during Round 2 are part of an apartment complex located along Church Road in the southwestern portion of the Site. The apartment complex consists of 20 buildings. Each building consists of three connected duplex-like sections. The buildings are two stories tall and generally contain one-bedroom and two-bedroom apartments. The basements, typically used for boiler rooms, laundry, and storage, also contain sumps and sump pumps The VI samples were collected from the basements of the apartment buildings. Sample results from these apartment buildings were screened against residential RSLs.

The three single-family dwellings (Properties AR01, DR02, and MD01) sampled during Round 2 are all generally located in the southern portion of the Site. Two of these homes (Property DR02 and Property MD01) were sampled in Round 1 and then re-sampled in Round 2. Samples were generally collected from the basement or lowest inhabited floor of each house. Basements were both finished and unfinished. The unfinished basement space was commonly used as laundry or storage space, while finished basement space was commonly used for living area activities (e.g., play room or television room). Sample results from these homes were screened against residential RSLs.

The commercial property sampled during Round 2 (Property CR01) is a former industrial building that has been converted to a worship and community center where daycare services are provided. Sample results from this community center were screened against residential RSLs due to the sensitive population group.

(d) **Round 2 - Analytical Results**

In the Round 2 sampling, four compounds were detected at concentrations exceeding the residential RSL: carbon tetrachloride, chloroform, PCE, and TCE. All sample results from Round 2 were screened against residential RSLs.

Carbon tetrachloride was detected in four residential sample results. Carbon tetrachloride exceeded the residential RSL (0.41 µg/m^3) in all samples in which it was detected. Concentrations ranged from not detected to 0.5 µg/m^3 in an indoor air sample from Property DR02.

Chloroform was detected in 17 sample results. Generally, the reported values were close to 1 µg/m³. Chloroform is a common laboratory contaminant, and many of these detections are believed to be related to lab practices. Chloroform exceeded the residential RSL (0.11 µg/m³) in all samples in which it was detected. Concentrations ranged from not detected to 15.4 µg/m³ in an indoor air sample from Property DR02. In general, the highest concentrations in indoor air samples were detected at Property DR02 and Property MD01, which are located near the former Spra-Fin facility property. Sample DR02-IA1-070212 had a chloroform concentration of 15.4 µg/m³, and sample MD01-IA3-070212 had a concentration of 2.3 µg/m³. The concentration of chloroform in Round 2 indoor air is consistent with results from Round 1 sampling. The sub-slab air sample with the highest concentration of chloroform collected during Round 2 VI sampling was found at Property DR02 (10.0 µg/m³).

PCE was detected in seven sample results (14.3 percent). Two sample results (4.1 percent) exceeded the residential RSL for PCE (4.2 µg/m³). PCE concentrations ranged from not detected to 13.8 µg/m³ in an indoor air sample from Property PBA02. PCE was not detected in any sub-slab air samples collected during Round 2. An ambient air sample from Property MD01 near the former Spra-Fin facility property had a PCE concentration of 6 µg/m³.

TCE was detected in seven sample results (14.3 percent). TCE exceeded the residential RSL for TCE (0.21 µg/m³) in all samples in which it was detected, including four indoor air samples. TCE concentrations ranged from not detected to 14.8 µg/m³ in indoor air samples collected at Property PBA02. Other indoor air samples where concentrations exceeded the RSL for TCE include: Property PBA12 (14.4 µg/m³), Property PBA14 (3.5 µg/m³), and Property PBA20 (0.44 µg/m³). The sub-slab air sample with the highest concentration of TCE was found at Property PBA04 (1.4 µg/m³). The ambient air sample from Property MD01 near the former Spra-Fin facility had a TCE concentration of 5.2 µg/m³.

In summary, TCE and PCE were the primary VOCs detected during Round 2 VI sampling at the Site. VOC concentrations exceeding the residential RSLs were found in several indoor air samples. The highest concentrations of TCE and PCE were found in the PBA apartment buildings. The highest ambient air concentrations of TCE and PCE were detected outside of Property MD01, near the former Spra-Fin facility property. Carbon tetrachloride and chloroform were also detected at concentrations exceeding their respective residential RSLs in indoor air samples. The highest concentrations of chloroform were found in indoor air samples near the former Spra-Fin facility property. As mentioned above, chloroform is a common laboratory contaminant, and many of these detections are believed to be related to lab practices.

(3) Round 3

(a) Round 3 – Sample Results and EPA Screening Evaluation/Risk Evaluation

Round 3 VI sampling occurred in the late winter/early spring from March to April 2013. Air samples were collected from 18 buildings, resulting in the analysis of 110 samples. Samples were analyzed using the Modified EPA Method TO-15 (EPA/625/R-96/010b; January 1999) to

identify concentrations of 58 VOCs. Results from Round 3 VI sampling in residential buildings or buildings with sensitive population groups (e.g., children) were screened against residential RSLs. Results from Round 3 VI sampling in other buildings (e.g., commercial and industrial settings) were screened against industrial RSLs. In total, 58 sample results were screened against residential RSLs, and 52 sample results were screened against industrial RSLs.

(b) Round 3 - Risk Evaluation

For locations exceeding RSLs, EPA performed a risk assessment. Both CR and HI were calculated. In Round 3, no unacceptable CR or HI values were present; therefore, a response action, such as installation of a VI mitigation system, was not triggered. The HHRA calculations are included in the Administrative Record.

(c) Round 3 - Building Type and Use Overview

VI samples were collected from in and around 18 buildings during Round 3. The majority of the buildings sampled (11) were residential buildings. Of the residential buildings sampled, five were single-family homes and six were apartment buildings. The remaining seven buildings sampled during Round 3 were commercial properties.

The buildings that were sampled during Round 3 for VI were constructed differently. The building foundations were classified as basement, crawlspace, or slab on grade. In some cases, buildings contained a combination of foundation types. In such cases, buildings were classified based on which foundation type accounted for the majority of the building's footprint. In Round 3, most building foundations were slab on grade (eight) or basement (seven), while three building foundations were classified as a crawlspace.

The six apartment buildings are located in an apartment complex (designated as Property PBA) along Church Road in the southwestern portion of the Site. These buildings were sampled in Round 2 and resampled in Round 3 because of the concentrations of PCE and TCE detected in the Round 2 samples. Sample results from these apartment buildings were compared against residential RSLs.

The five single-family dwellings (Properties CR02, CR03, CR04, CR05, and CR09) sampled during Round 3 are also located along Church Road in the southwestern portion of the Site. These homes were constructed in the 1950s and are very similar in construction, with living space located above a crawl space. In some cases, samples representative of sub-slab air conditions were collected from the crawlspace. In other cases, sub-slab air samples were collected from unfinished basements or garages. Sample results from these homes were screened against residential RSLs.

The seven commercial properties (Properties CR06, CR07, CR08, DR07, LL01, WA02, and WA03) sampled during Round 3 have a variety of uses. Two properties are a mix of manufacturing and office space (Property CR06 and Property WA03); two properties are retail and office space (Property CR07 and Property CR08); two properties are warehouses with some

office space (Property LL01 and Property WA02); and one property is a gymnastics center (Property DR07). Sample results from these commercial properties, except Property DR07, were screened against industrial RSLs due to their function as a work place. Sample results from Property DR07 were screened against residential RSLs due to the sensitive population (i.e., children) that uses the building.

(d) **Round 3 - Analytical Results**

VOCs that exceeded screening levels included 1,1,2-Trichloroethane (1,1,2-TCA), carbon tetrachloride, chloroform, methylene chloride, PCE, TCE, and VC. Complete Round 3 VI analytical results are included in the Administrative Record.

1,1,2-TCA was detected in nine sample results (8.2 percent). When the sample results with 1,1,2-TCA detections were screened against the RSLs, seven sample results exceeded the residential RSL for 1,1,2-TCA (0.021 µg/m³), and two sample results exceeded the industrial RSL for 1,1,2-TCA (0.088 µg/m³). The 1,1,2-TCA concentrations ranged up to 0.7 J µg/m³ (the "J" qualifier indicates an estimated concentration). Six of the exceedances were indoor air samples collected at five buildings (Properties PBA02, PBA03, PBA12, DR07, and WA02). The indoor air sample with the highest 1,1,2-TCA concentration (0.5 µg/m³) was from Property DR07; however, it was only slightly higher than the ambient air sample from that property, which had a 1,1,2-TCA concentration of 0.4 µg/m³. The sub-slab air sample with the highest 1,1,2- TCA concentration (0.7 µg/m³) was also from Property DR07.

Chloroform was detected in 60 sample results (54.5 percent). When the sample results with chloroform detections were screened against the RSLs, 38 samples (65.5 percent) exceeded the residential RSL for chloroform (0.11 µg/m³), and seven samples (13.5 percent) exceeded the industrial RSL for chloroform (0.53 µg/m³). Concentrations ranged from not detected to 4 µg/m³, found in a sub-slab air sample from the gymnastics center (Property DR07).

Methylene chloride was detected in all sample results (100 percent). When the sample results with methylene chloride detections were screened against the RSLs, only one sample (1.7 percent) exceeded the residential RSL for methylene chloride (63 µg/m³), and three samples (5.8 percent) exceeded the industrial RSL for methylene chloride (260 µg/m³). The three industrial RSL exceedances were from indoor air samples collected on two different dates at Property WA03, a manufacturing facility. The methylene chloride concentrations ranged between 2,400 µg/m³ and 6,600 µg/m³. The three indoor air samples were collected in a facility where methylene chloride is used to degrease equipment; therefore, these detections are more likely to be highly concentrated due to their proximity to the production areas of the facility. Methylene chloride was also detected above the residential RSL in indoor air at 110 µg/m³ at residential Property CR03; however, this detection is more likely from an indoor source than from VI because other nearby locations do not have similarly high methylene chloride detections in indoor air.

PCE was detected in 56 sample results (50.9 percent). When the sample results with PCE detections were screened against the RSLs, none of the sample results exceeded the residential

RSL for PCE (4.2 µg/m³), and five of the sample results exceeded the industrial RSL for PCE (18 µg/m³). Concentrations of PCE ranged from not detected to 60.4 µg/m³ in one indoor air sample from industrial Property CR06, the former Teleflex facility. Three other indoor air samples from that building also exceeded the industrial RSL for PCE. The PCE concentrations in these indoor air samples ranged from 25.8 µg/m³ to 60.4 µg/m³. The sub-slab air sample with the highest PCE concentration (24.4 µg/m³) was also from Property CR06, the former Teleflex facility. PCE concentrations were also somewhat elevated at Property WA03, which is located near the former Ford facility property. The highest PCE concentration detected in sub-slab air at Property WA03 was 6 µg/m³. Indoor air PCE concentrations at Property WA03 were 2 µg/m³ at several sampling locations.

TCE was detected in 46 sample results (41.8 percent). When the sample results with TCE detections were screened against the RSLs, 15 samples (25.9 percent) exceeded the residential RSL for TCE (0.21 µg/m³), and nine samples (17.3 percent) exceeded the industrial RSL for TCE (0.88 µg/m³). Concentrations of TCE ranged from not detected to 120 µg/m³ in a sub-slab air sample from industrial Property WA02 located northeast of the former Teleflex facility property. Included in the residential RSL exceedances are seven indoor air samples from the gymnastics center (Property DR07), with concentrations from 0.3 µg/m³ to 3.0 µg/m3; two indoor air samples from apartment building Property PBA02 (0.3 µg/m³); and one indoor air sample each from apartment building Property PBA03 (0.3 µg/m³) and Property PBA12 (0.3 µg/m³). One indoor air sample (1.61 µg/m³) exceeded the industrial RSL at Property CR06, which is the former Teleflex facility. The sub-slab air samples with the highest TCE concentrations were detected at industrial Property WA02 (120 µg/m³ and 19.9 µg/m³) and industrial Property CR06 (17.2 µg/m³). Property DR07 also had three sub-slab air TCE detections between 0.9 µg/m³ and 1 µg/m³.

VC was detected in ten sample results (9.1 percent). When the sample results with VC detections were screened against the RSLs, seven samples (12.1 percent) exceeded the residential RSL for VC (0.16 µg/m³), and none of the sample results exceeded the industrial RSL for VC (2.8 µg/m³). Concentrations of VC ranged from not detected to 0.3 µg/m³. The maximum concentration (0.3 µg/m^3) was detected in three samples, including both indoor air and sub-slab air samples, from Property DR07. Of the remaining four samples that exceeded the residential RSL, three were sub-slab air samples, and one was an ambient air sample.

In summary, during the Round 3 sampling, concentrations exceeding the residential and industrial RSLs were found in several indoor air samples. The highest concentrations of TCE and PCE were found around the former Ford facility (Station Square Apartments). Carbon tetrachloride has been commonly detected in the outdoor ambient air samples suggesting a strong background presence. Chloroform was detected at concentrations exceeding the residential RSL in indoor air samples. VC and 1,1,2-TCA were also detected at levels exceeding their respective RSLs, but these compounds were not commonly detected.

The highest concentrations of chloroform were found south of Wissahickon Creek, and the highest concentrations of benzene (not a COC at the Site) were found north of Wissahickon Creek. Methylene chloride detections above industrial RSLs were related to current

manufacturing operations. The only methylene chloride detections above the industrial RSL were at Property WA03, where methylene chloride is used in the industrial processes.

(4) Summary of Rounds 1, 2, and 3 - Air Sampling Results

VI sampling was conducted at the Site in three rounds. Round 1 occurred in late winter/early spring (from February to April 2011), Round 2 occurred in summer (from July to August 2012), and Round 3 occurred in late winter/early spring (from March to April 2013). In total, 268 VI samples were collected and analyzed. The 208 VI samples collected from residential locations or locations where children were present were compared against residential RSLs. The 60 samples collected from other locations, including commercial and industrial properties, were compared against industrial RSLs.

Samples were collected from a variety of building types. In total, 16 single-family residential buildings, 18 residential apartment buildings, 10 commercial or industrial establishments, and 5 educational or religious institutions (i.e., school, daycare, or worship center) were sampled. VI sampling was conducted at 23 buildings with foundations primarily consisting of slab on grade, 22 buildings with foundations primarily consisting of basements, and 4 buildings with foundations primarily consisting of crawlspace.

The most commonly detected VOCs are methyl ethyl ketone (MEK) (not a COC at the Site), benzene (not a COC at the site), carbon tetrachloride, methylene chloride, and toluene. Since they have been detected at a very high frequency in the ambient air samples, a background presence in the area is probable. Most of the detections in ambient air for these VOCs were low (less than 1 $\mu g/m^3$).

Chloroform had nearly identical frequencies of detection in indoor air and sub-slab air. The chloroform detections may therefore be from indoor or sub-slab sources, or both. The chloroform detections are likely due to laboratory contamination. The less frequently detected VOCs after chloroform (at just below 50 percent of samples) included PCE, TCE, 1,1,1-TCA, cis-1,2-DCE, 1,1-Dichloroethane (1,1-DCA), VC, and 1,1,2-TCA.

The OU4 VI RI for the Site used multiple lines of evidence across three rounds of VI sampling in two different seasons and over three years. Sampling was conducted during winter and summer in an effort to examine designated locations under varying conditions. Several locations were sampled in multiple rounds to either compare seasonality or to confirm previous results. Results were compared to RSLs, appropriate human health risk assessment calculations were performed when sampling results exceeded RSLs, and CR and HI risks were assessed. In all locations sampled and assessed, an unacceptable risk was not present. In all cases the CR and HI values were within the acceptable risk range.

V. SUMMARY OF SITE RISKS

As part of the OU4 RI, a human health risk assessment (HHRA) was performed to identify the current and potential future risks to human health that could result from exposure to the hazardous substances associated with the VI at the Site. A risk assessment provides the basis for taking action and identifies the contaminants, media, and exposure pathways that need to be addressed by the remedial action at the Site. The OU4 risk assessment performed for the Site evaluated the potential risks from exposure to contamination found in Site VI.

A. Human Health Risks

Unacceptable risks to human health are not present for OU4 VI at the Site. The results of the OU4 HHRA did not identify unacceptable risks to human health due to hazardous substances via VI at the Site.

Consistent with EPA Region III guidance, risk-based screening was performed to identify contaminants of potential concern (COPCs) in air samples (sub-slab and indoor) which required further evaluation during the HHRA.

The NCP establishes a range of acceptable cancer risk for Superfund sites from one in ten thousand to one in one million additional cancer cases, expressed in scientific notation as 1E-04 to 1E-06, over a lifetime exposure to site-related contaminants. The risk found from the 3 rounds of sampling fell between 1E-05 and 1E-07 which is within or lower than the acceptable cancer risk range.

Additionally, chemicals that are ingested, inhaled or absorbed through the skin may present non-cancer risks to different organs of the human body. The non-carcinogenic risks, or toxic effects, are expressed as a Hazard Quotient calculated for the effect of each COPC on each target human organ; the cumulative risk is expressed as a Hazard Index (HI). If an HI is less than one (1.0), then exposure to site conditions is not expected to result in adverse effects during a lifetime or part of

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund human health risk assessment estimates the baseline risk. This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a Superfund site, EPA undertakes a four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, EPA looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help EPA to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a reasonable maximum exposure (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a 1 in 10,000 chance. In other words, for every 10,000 people exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected, given the background cancer rate. For non-cancer adverse health effects, EPA calculates a hazard index. The key concept here is that a threshold level (measured usually as a hazard index of less than 1) exists below which non-cancer adverse health effects are no longer predicted.

In Step 4, EPA determines whether site risks are great enough to cause health problems for people at or near the Superfund site. The results of the three previous steps are combined, evaluated and summarized. EPA adds up the potential risks from the individual contaminants and exposure pathways and calculates a total site risk.

a lifetime. The NCP establishes an HI exceeding one (1.0) as an unacceptable non-carcinogenic risk. The risks found from the three rounds of sampling fell below the HI of 1.0.

Contaminants of concern (COCs) are determined by taking COPCs and performing a site specific risk analysis for each COPC and each pathway to indicate areas of current or potential future risk that exceed EPA's acceptable risk level of E-04 to E-06 for carcinogens or exceed an HI of 1 for non-carcinogens.

VI. REMEDIAL ACTION OBJECTIVES

None: Unacceptable risks due to VI are not present at the Site; therefore, there are no Remedial Action Objectives (RAOs) established for VI for OU4.

VII. SUMMARY OF REMEDIAL ALTERNATIVES

None: Unacceptable risks due to VI are not present for OU4; therefore, no remedial alternatives were developed.

VIII. EVALUATION OF ALTERNATIVES

None: Unacceptable risks due to VI are not present for OU4; therefore, an evaluation of remedial alternatives was not performed.

IX. PREFERRED ALTERNATIVE

VI at the Site does not present any unacceptable risks to human health; therefore, the Preferred Alternative for OU4 at the North Penn Area 7 Site is No Action. Under the proposed No Action alternative for OU4, no further environmental investigation, monitoring, evaluations, or remedial measures would be required for VI at the Site. The Preferred Alternative is based on current information and can change in response to public comment or new information.

PADEP, the support agency, will submit any comments it has on the Proposed Plan during the public comment period.

X. COMMUNITY PARTICIPATION

Pursuant to Section 300.430(f)(3)(i) of the NCP, 40 C.F.R. § 300.430(f)(3)(i), EPA is soliciting input from the community on the OU4 Preferred Alternative at the Site. To assure that the community's concerns are being addressed, a public comment period on this Proposed Plan will open on July 16, 2018, and close on August 16, 2018. During this time, the public is encouraged to submit comments on the Proposed Plan to the EPA. Submit written or oral comments to Amanda Miles, Lavar Thomas or Mark Conaron at the address listed below. A public meeting to

discuss the Proposed Plan will be held on July 26, 2018, at 6:30 p.m. at Upper Gwynedd Township Municipal Building. If you have any questions about the public meeting, contact Amanda Miles, Lavar Thomas or Mark Conaron at the address or telephone numbers listed below.

EPA, in consultation with PADEP, will select a final remedy for the Site after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with PADEP, may modify the Preferred Alternative or develop another alternative based on public comments or new information. EPA will summarize and respond to comments received from the public in a Responsiveness Summary included when EPA, in consultation with PADEP, issues the OU4 ROD, which is the document that presents the selected remedy for VI.

The Administrative Record file, which includes background documents regarding the Site, the OU4 RI Report, and other information that EPA relied on in recommending the Preferred Alternative, as well as a copy of this Proposed Plan, is available to the public at the information repository located at the EPA Region III offices in Philadelphia, Pennsylvania (see address, below), and at the following location:

Lansdale Public Library
301 Vine Street
Lansdale, Pennsylvania 19446
Telephone (215) 855-3228
Monday to Thursday, 10:00 a.m. to 9:00 p.m.
Friday, 10:00 a.m. to 6 p.m.
Saturday, 10:00 a.m. to 3 p.m.

An electronic version of the Administrative Record File for the Site can also be found online at https://semspub.epa.gov/src/collections/03/AR/PAD002498632 (For documents relating to OU4, select the link for Remedial - OU4.)

All comments submitted must be postmarked by August 16, 2018.

For further information on the North Penn Area 7 Site or to submit comments on the Proposed Plan, please contact:

Mark Conaron (3HS22)
Remedial Project Manager
215-814-3307
conaron.mark@epa.gov

Amanda Miles (3HS52)
Community Involvement Coordinator
215-814-5557
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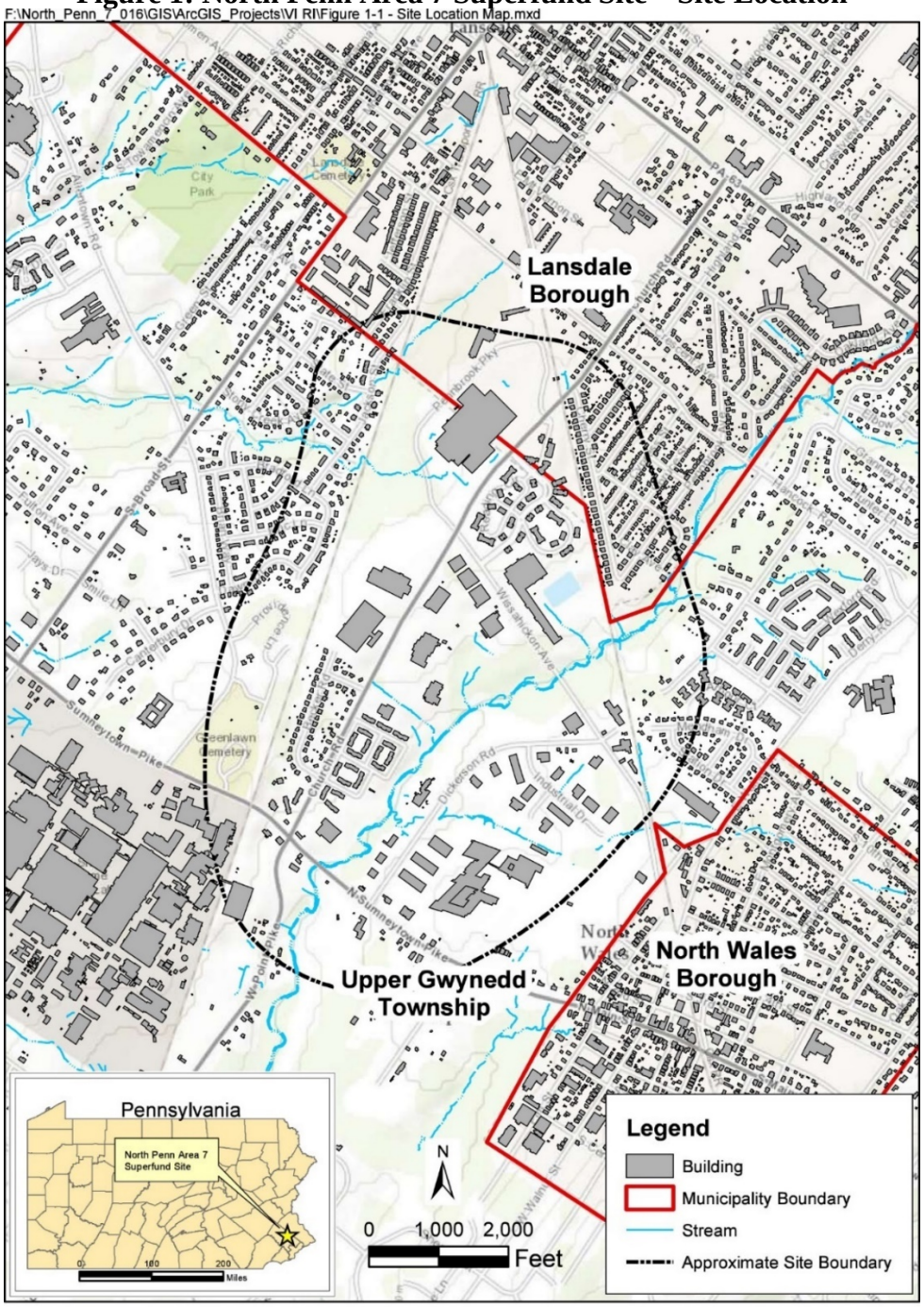
Lavar Thomas (3HS52)
Community Involvement Coordinator
215-814-5535
thomas.lavar@epa.gov

U.S. EPA
Hazardous Site Cleanup Division
1650 Arch Street
Philadelphia, PA 19103-2029

Figure 1: North Penn Area 7 Superfund Site – Site Location



CDM Smith

North Penn Area 7 Superfund Site, OU4
North Wales, Pennsylvania

Figure 1-1
Site Location Map

Figure 2: North Penn Area 7 Superfund Site - Source Areas and Well Locations

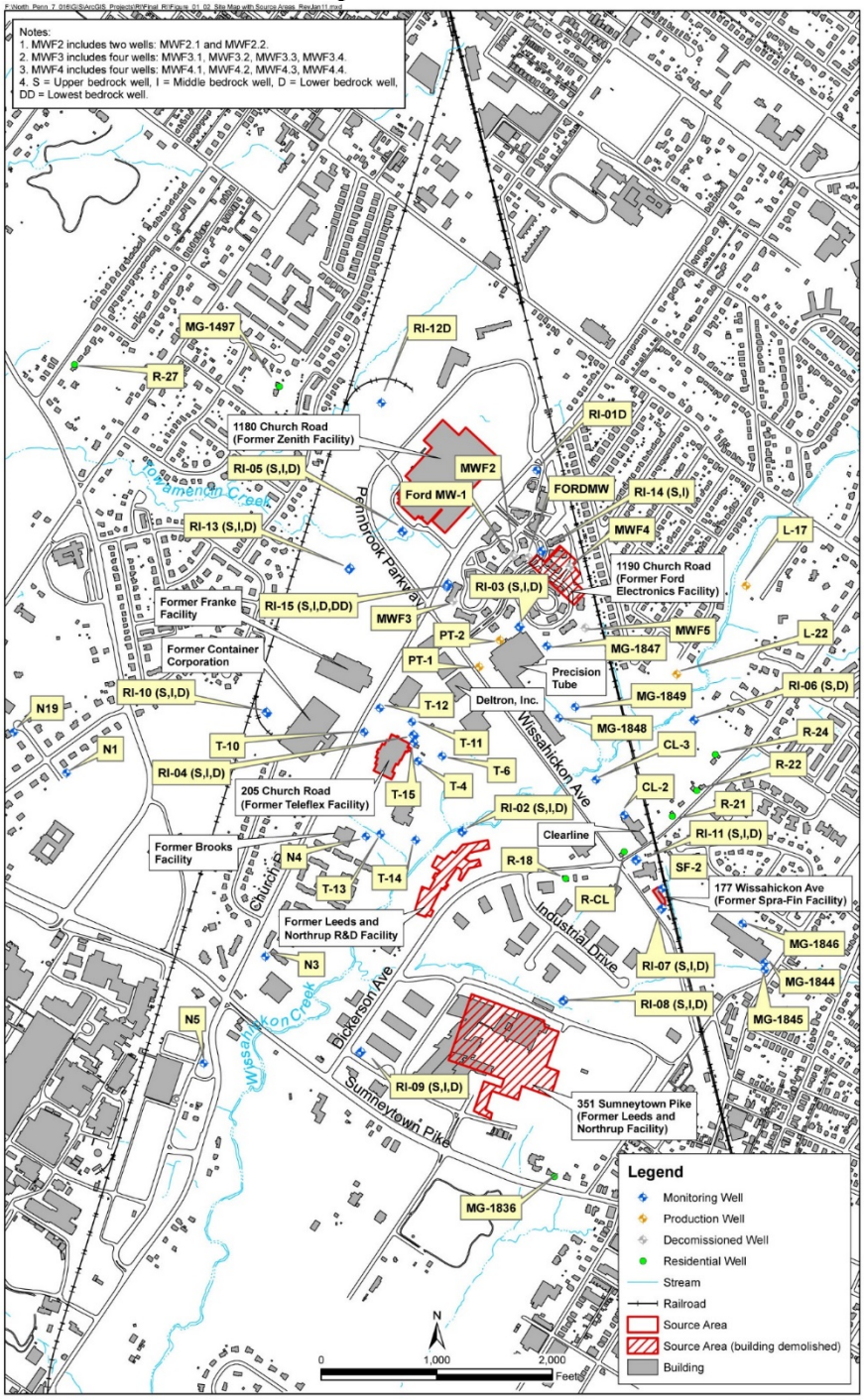
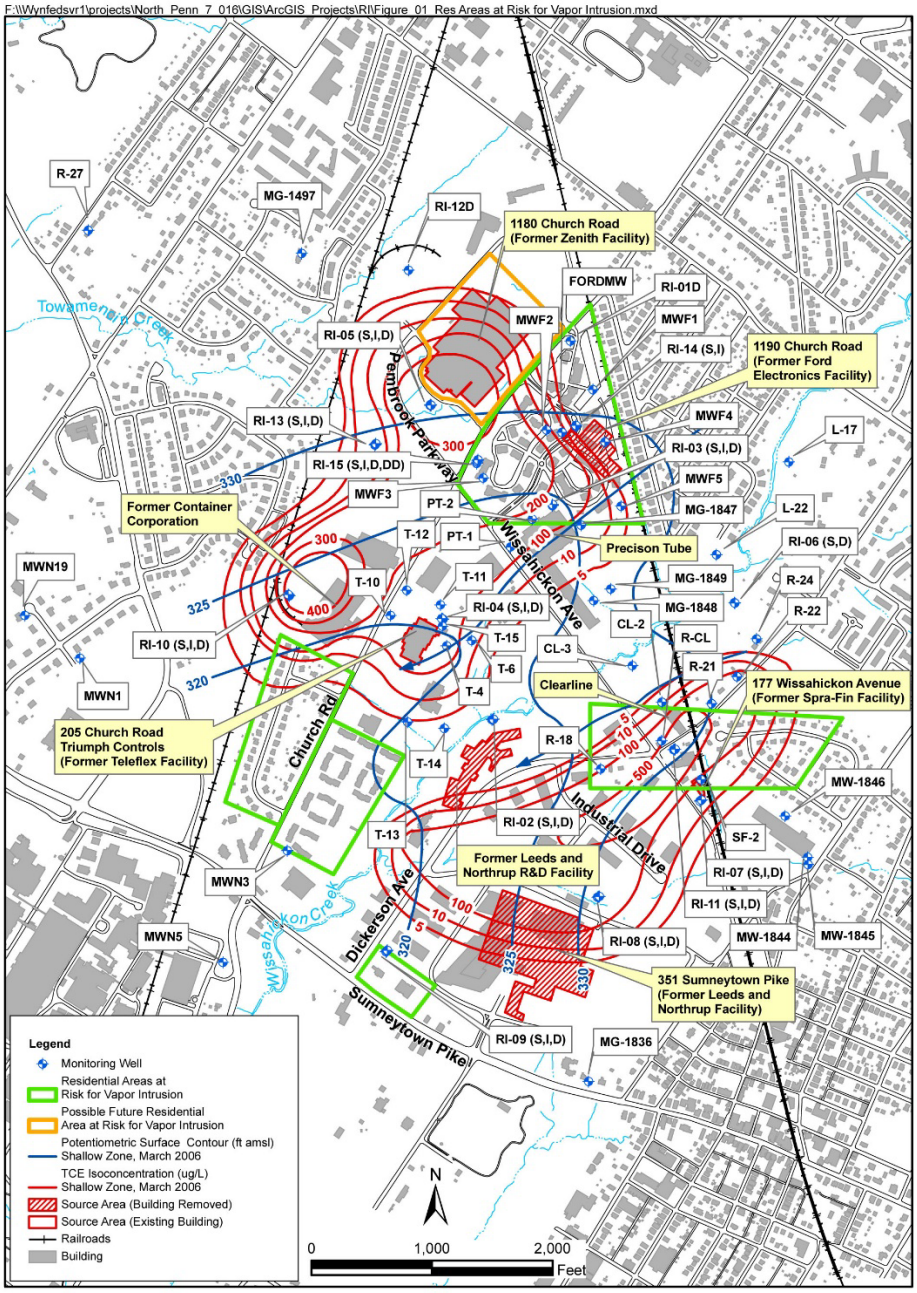


Figure 3: North Penn Area 7 Superfund Site - Residential Areas at Potential Risk for Vapor Intrusion

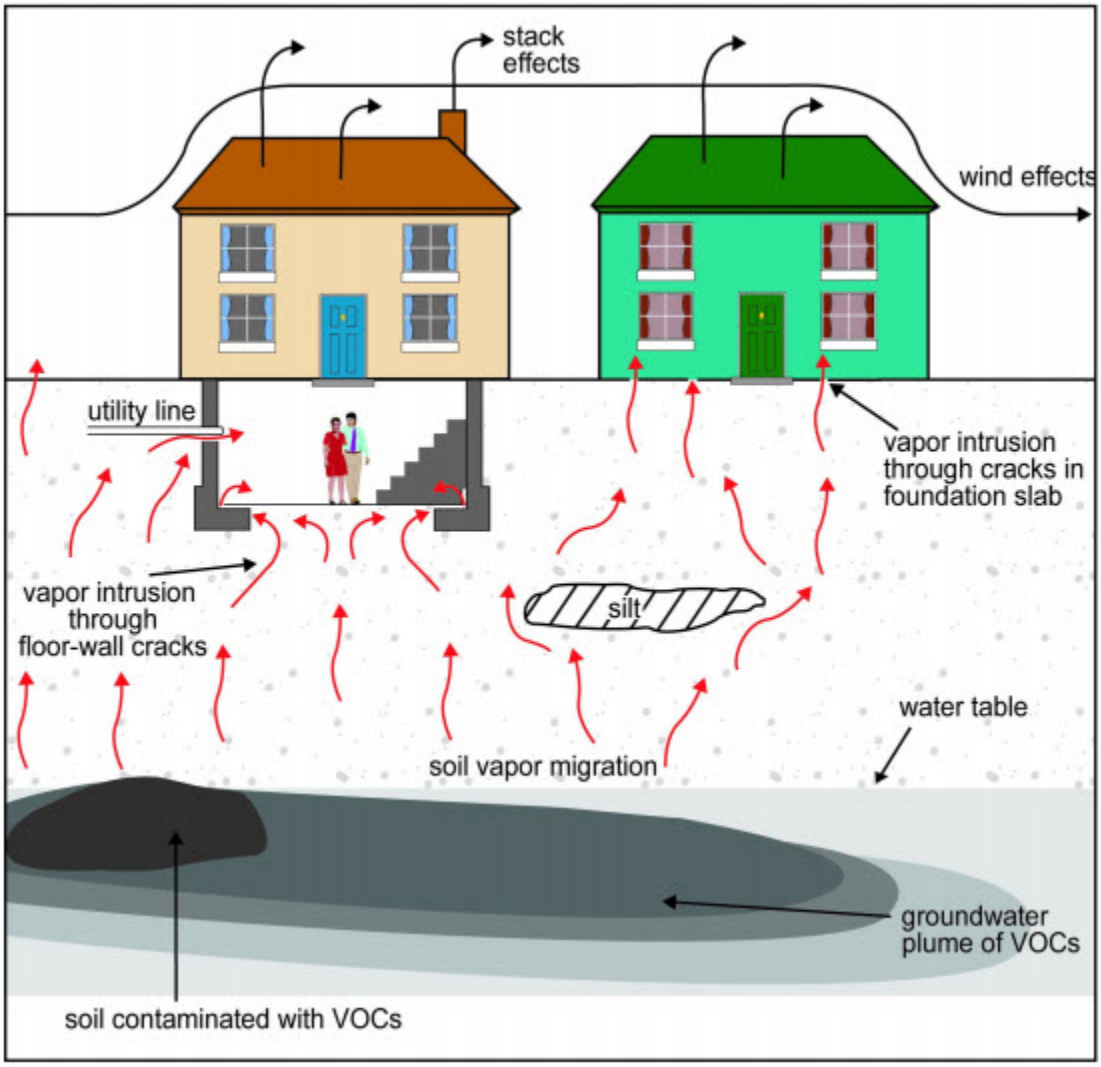


CDM

North Penn Area 7 OU3 Superfund Site
North Wales, Pennsylvania

Figure 1
Residential Areas at Potential Risk for Vapor Intrusion

Figure 4: Conceptualization of Migration of Soil Vapors to Indoor Air



(Figure Source: EPA)