7428 Rockville Road | Indianapolis, IN 46214 | 317.347.1111 office | 317.347.9326 fax

September 24, 2018

Ms. Carolyn Bury
Project Manager
Corrective Action Section 2
Remediation and Re-use Branch
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: **Vapor Intrusion Investigation – Exterior Soil Gas Sampling Work Plan**
Franklin Power Products, Inc./Amphenol Corporation
Administrative Order on Consent, Docket # R8H-5-99-002
EPA ID # IND 044 587 848
980 Hurricane Road
Franklin, Indiana 46131

Dear Ms. Bury:

In accordance with the United States Environmental Protection Agency (USEPA) letter dated August 30, 2018, Industrial Waste Management Consulting Group, LLC (IWM Consulting), on behalf of the "Performing Respondent", Amphenol Corporation (Amphenol), is submitting this *Vapor Intrusion Investigation - Exterior Soil Gas Sampling Work Plan* (Work Plan). The Work Plan outlines the proposed work activities relating to investigating soil gas within the granular bedding of existing sanitary sewer lines and nearby adjacent native soils located in the public right-of-ways (ROWs) within the Study Area. The Study Area includes portions of streets that are near and downgradient of the Former Amphenol facility located at 980 Hurricane Road, Franklin, IN (Site), including Hurricane Road, Upper Shelbyville Road, Hamilton Avenue, Forsythe Street, Glendale Drive, and Ross Court. The objectives of the proposed work activities are as follows:

- Determine, through sampling and analysis of soil gas samples, if any offsite sanitary sewer line bedding materials are acting as preferential pathways for the transport of vapor phase volatile organic compounds (VOCs);
- Determine, through sampling and analysis of soil gas samples, if native soils within the ROW (between the sewer line and adjacent residences) exhibit the presence of vapor phase VOCs at concentrations above the applicable USEPA Regional Screening Levels. This information will assist in evaluating the potential for migration of vapor phase VOCs into adjacent residential structures; and
- Data from the vapor intrusion (VI) investigation will be used to inform next steps, including the need to expand the Study Area or to conduct additional VI sampling activities (paired sub-slab and indoor air) at one (1) or more residential structures within the Study Area.

Although it is understood that the USEPA has requested additional work as part of the August 30, 2018 letter, additional sampling activities are not being proposed as part of this Work Plan. Those

activities were discussed in previous work plans submitted to the USEPA. However, as discussed recently with the USEPA and with your concurrence, IWM Consulting and Amphenol would like to complete the proposed work activities as quickly as possible in order to expeditiously evaluate this potential vapor intrusion pathway. Consequently, this Work Plan is being submitted independently from the other work plans.

This Work Plan outlines the proposed methodology and sampling activities that will be utilized during the Work Plan implementation activities. A preliminary study area map is provided as **Figure 1**, which displays the location of the Site and features in the vicinity of the Site. A site map is provided as **Figure 2**, which displays pertinent site features and the locations of nearby residences and sanitary sewer utility corridors. Maps displaying the locations of sewer line breaks, cracks, changes in sewer line construction material, and the proposed exterior soil gas sampling locations have been included as **Figure 3** through **Figure 7**.

Proposed Exterior Soil Gas Sampling Activities

IWM Consulting proposes to obtain up to twenty (23) individual grab exterior soil gas vapor samples (plus 2 duplicate samples) as part of this investigation. Six (6) soil gas samples are proposed to be obtained from the backfill material immediately above or adjacent to existing sanitary sewer lines and up to seventeen (17) soil gas samples are proposed to be obtained from the native soil located within the public ROWs in the Study Area. Prior to soil gas point installation activities, public utilities will be notified and a private utility locating company will be contracted to individually clear each boring location.

Exterior soil gas native soil sampling points will be installed using direct push methods. Exterior soil gas sanitary sewer backfill material sampling points will be installed either using direct push or hand auger methods. The boreholes located over the sanitary sewer lines will be advanced until it is determined that the boreholes are within the sanitary sewer backfill material. The boreholes located in native soil will be advanced approximately six (6) feet below ground surface (bgs), which corresponds with the approximate depth of basements in the Study Area. A six-inch stainless-steel screen implant attached to ¼-inch Teflon™ or Nyaflow® tubing will be lowered into the borehole, and the tubing will be extended to the surface. A sand pack consisting of #5 washed quartz sand will be placed around the implant screen in the open borehole and sand will be poured to approximately six inches above the screen. The remaining annular space will be filled with hydrated benseal to surface grade. Immediately after installation, the sand pack volume will be calculated and three (3) sand pack air volumes will be purged using a four-gas meter or a SKC air sampling pump to develop the soil gas sampling point. The volume of gas purged will be measured by collecting the purge gas into a 1-Liter Tedlar bag. To ensure that the collected soil gas sample will be representative of subsurface vapor conditions, leak testing will be performed during the initial purging of the sampling screen and attached tubing. Leak testing will utilize a helium tracer gas and will be performed at each point in general accordance with methods presented in *Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluation,* ASTM Standard D7663-11.

Each location will be sampled a minimum of 24 hours after installation and subsequent purging to allow for equilibration of soil gas vapor. Prior to soil gas sample collection, the integrity of the sample tubing, canister, and fittings in the sample train will be tested by conducting a negative pressure test using a pressure gauge. A negative pressure will be induced within the sample train and observed for 60 seconds for any pressure changes. If no change to the pressure is observed in the sampling trains, they will be considered intact and sampling activities will commence. If a change to the pressure is observed in the sampling train, then the sampling train will be evaluated for leaks and repaired. Prior to sample collection, the internal volume of the sampling apparatus will be determined, including the implant screen and the tubing, but excluding the sample container volume and the sand pack volume. This dead volume of air will be purged prior to sample collection. Approximately three times the dead volume of air will be purged prior to sampling using the methods previously discussed.

IWM Consulting will obtain all of the grab exterior soil gas vapor samples in individually certified clean, laboratory provided stainless steel 1-liter summa canisters. All of the summa canisters will be equipped with 10-minute flow regulators (~100 milliliters per minute (mL/minute) flow rate) and the samples will be obtained over an approximate 10-minute period of time. The applicable Standard Operating Procedures (SOPs) which will be followed by IWM Consulting during the exterior soil gas vapor sampling activities are provided as **Attachment A**.

All of the samples will be labeled in the field utilizing the sample tags attached to the summa canisters by the laboratory. Information included on the sample labels includes the sample ID, sample date, sample time, and the requested analysis. A site-specific chain-of-custody (COC) will also be completed and includes all of the pertinent sampling information (i.e. sample ID, sample date, sample start and end time, initial and final field pressure readings, summa canister ID, flow controller ID, and the requested analysis).

All of the samples collected will be submitted under COC control to Pace Analytical Services, LLC (Pace) located in Minneapolis, Minnesota for laboratory analysis of shortlist VOCs using analytical Method TO-15. The shortlist VOCs include the following compounds: vinyl chloride (VC), trans 1,2-dichloroethene (trans-1,2 DCE), 1,1-dichloroethane (1,1-DCA), cis 1,2 dichloroethene (cis 1,2-DCE), 1,2 dichloroethane (1,2 DCA), methylene chloride, 1,1,1-trichloroethane (1,1,1 TCA), trichloroethylene (TCE), and tetrachloroethylene (PCE). The samples will be analyzed using a combination of EPA Method TO-15 and EPA Method TO-15 SIM. Specifically, EPA Method TO-15 SIM will be utilized when analyzing for VC, 1,2-DCA, and TCE in order to meet the most stringent USEPA Regional Screening Levels. An expedited turnaround time will be requested from the laboratory and the results of the sampling event are anticipated to be received within 2-3 working days from the date the samples are received at the laboratory.

For Quality Assurance/Quality Control (QA/QC) purposes, one (1) field duplicate sample will be collected at a rate of one (1) sample per every twenty (20) confirmatory samples and will be analyzed for the same analytical parameters. All of the summa canisters will also be individually certified clean by the laboratory using a combination of EPA Method TO-15 and TO-15 SIM. The duplicate sample will be attached to the parent sample with a tee fitting (ensuring only one common air intake). Both

the parent sample and duplicate sample will have their own individual flow regulator set for the sampling period but the start and end time for these samples will be the same. The laboratory will provide Level IV QA/QC documentation.

Pertinent information such as laboratory certifications, a table summarizing the corresponding method detection and reporting limits for Pace, and a copy of the Pace COC which will be utilized during the work activities were previously submitted to the USEPA as part of the Ambient Air Investigation Work Plan submitted on July 25, 2018 and are not being resubmitted as part of this Work Plan.

Reporting

Preliminary results (copy of the laboratory report) will be supplied to representatives from the USEPA as soon as possible once the information has been received and reviewed. A brief letter report will also be generated and submitted to the USEPA within approximately 2 to 4-weeks of receiving the third party validated analytical results. The soil gas analytical results will be compared to USEPA published Residential Vapor Intrusion Screening Levels (VISLs) dated May 2018 for Target Sub-Slab and Near Source Soil Gas Concentrations, using both the carcinogenic target cancer risk of 10E-06 and the non-carcinogenic hazard quotient of 1.

The letter report will summarize the sampling activities and results and this information will assist in developing future offsite investigation Work Plan(s). The analytical results will be validated by a third party and the validation will be included within the letter report being submitted to the USEPA. A copy of the applicable USEPA VISLs (shortened to be Site specific) is provided as **Attachment B**.

IWM Consulting will implement the proposed work activities as quickly as possible upon receiving USEPA approval of this Work Plan. IWM Consulting anticipates installing the soil gas probes on September 28, 2018 and initiating soil gas sampling on October 1, 2018. Please do not hesitate to contact the undersigned with questions or if you need additional information regarding this submittal.

Sincerely,

IWM CONSULTING GROUP, LLC

Christopher D. Parks, LPG #2169
Senior Project Manager

Bradley E. Gentry, LPG #2165
Vice President/Brownfield Coordinator

cc: Mr. Joseph Bianchi, Amphenol (electronic only)
Bhooma Sundar, U.S. EPA Region 5, RRB CAS2 (electronic only)
Conor Neal, U.S. EPA Region 5, RRB CAS2 (electronic only)

Attachments

Figures

N

FORMER ARVIN MERITOR FACILITY

BUDGET TRUCK RENTAL

HURRICANE ROAD

CROP PRODUCTION SERVICES PREMIER AG

FORMER AMPHENOL FACILITY

AGRICULTURAL FIELD

UPPER SHELBYVILLE ROAD

SYSTEM BUILDING

RESIDENCES

CHURCH

HAMILTON AVENUE

COMMERCIAL

FORMER WARRIOR OIL RECYCLING

COMMERCIAL

NORTH FORSYTHE STREET

GLENDALE DRIVE

AGRICULTURAL FIELD

RESIDENTIAL NEIGHBORHOOD

RADWELL INTERNATIONAL

RESIDENTIAL NEIGHBORHOOD

ROSS COURT

FORMER FRANKLIN POWER PRODUCTS

HURRICANE CREEK

RESIDENTIAL NEIGHBORHOOD

LEGEND

PROPERTY LINE (APPROXIMATE)

PRELIMINARY STUDY AREA BOUNDARY

0' 200'

SCALE IN FEET

DRAWN BY: L. STRUM

DATE: 9/27/99

REVISED: 09/10/2018

HWPA #111291-01

DWG. NO. 111291S1

FIGURE 1
PRELIMINARY STUDY AREA MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

iWM CONSULTING GROUP


MW-26
BUILDING
PAVEMENT
PARKING
MW-27
MW-3
MW-21
RW-4
MW-28
MW-23
MW-29
EQUIPMENT BUILDING
MW-22
MW-24
IT-1A
RW-3
UPPER SHELBYVILLE ROAD
CHURCH
MW-25
RW-2
RW-1
MW-30
HAMILTON AVENUE
IT-2
MW-35
IT-3
N. FORSYTHE STREET
GLENDALE DRIVE
AGRICULTURAL F
AST AREA
MW-34
COMMERCIAL PROPERTY
AST
MW-31
RADWELL INTERNATIONAL
ROSS COURT
MW-33
MW-32
HURRICANE CREEK
RESIDENTIAL AREA
LEGEND
ABANDONED MONITORING WELL
MONITORING WELL
RECOVERY WELL
SANITARY SEWER MANHOLE
STORM SEWER MANHOLE
PROPERTY LINE (APPROXIMATE)
STORM SEWER
SANITARY SEWER
O/H POWER
RESIDENTIAL HOME
* DETACHED GARAGES & SHEDS NOT SHOWN
NON-RESIDENTIAL STRUCTURE
PRIMARY BUILDING WALLS
0'
150'
SCALE IN FEET
DRAWN BY: L. STRUM
DATE: 9/27/99
REVISED: 09/19/2018
HWPA #111291-01
DWG. NO. 111291S1
FIGURE 2
SITE MAP
FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA
iWM
CONSULTING GROUP

MW-26

N

BUILDING

PARKING

AGRICULTURAL FIELD

250130
(4.42')

(VCP)

FORMER PLATING ROOM

SLAB ONLY
(FORMER BLDG.)

MW-3

MW-21

(6.42')
250120

(VCP)

(6.14')
250110

UPPER SHELBYVILLE ROAD

V-28

MW-23

EQUIPMENT
BUILDING

MW-24

MW-22
SS-NORTH (15.08')

RW-3

IT-1A

NEW

OLD

CHURCH

MW-25

RW-5

RW-2

RW-1

MW-30

MW-12R
(14.60') SS-SOUTH

250056

250055

LTON AVENUE

(9.35')
250090

(PVC)

SS-EAST
(12.32')

250100
(4.58')

IT-2

MW-35

IT-3

(VCP)

(VCP)

LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
  (SEWER MAIN INVERT DEPTH AT MANHOLE IN FEET)

- PROPERTY LINE (APPROXIMATE)
- STORM SEWER
- SANITARY SEWER
- O/H POWER

- RESIDENTIAL HOME
  * DETACHED GARAGES & SHEDS NOT SHOWN
- NON-RESIDENTIAL STRUCTURE
- PRIMARY BUILDING WALLS

(VCP) VITREOUS CLAY PIPE

- SEWER LINE BREAK
- SEWER LINE CRACK
- SEWER MATERIAL CHANGE

* SEWER INFORMATION OBTAINED FROM 2015 SEWER VIDEO LOG FOR FRANKLIN DPW.

- PROPOSED SOIL GAS SAMPLING POINT
- PROPOSED SOIL GAS SEWER BACKFILL SAMPLING POINT

0' 60'
SCALE IN FEET

DRAWN BY: L. STRUM
DATE: 9/27/99
REVISED: 09/21/2018
HWPA #111291-01
DWG. NO. 111291S1

FIGURE 3
NORTHEASTERN SEWER
LAYOUT MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

IWM CONSULTING GROUP

CHURCH

N

W-25

RW-2

RW-1

MW-30

250056

(PVC)

(9.35')
250090

SS-EAST 1
(12.32')

(VCP)

250100
(4.58')

IT-3

MW-35

IT-2

SS-EAST 2
(10.52')

(VCP)

(8.74')
250080

GLENDALE DRIVE

(VCP)

(6.71')
250072

(VCP)

(VCP)

(PVC)

INFILTRATION EVIDENCE

250071
(7.08')

(VCP)

250070
(7.48')

(VCP)

60

LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
  (SEWER MAIN INVERT DEPTH AT MANHOLE IN FEET)

- PROPERTY LINE (APPROXIMATE)
- STORM SEWER
- SANITARY SEWER
- O/H POWER

- RESIDENTIAL HOME
  * DETACHED GARAGES & SHEDS NOT SHOWN
- NON-RESIDENTIAL STRUCTURE
- PRIMARY BUILDING WALLS

- (VCP) VITREOUS CLAY PIPE
- SEWER LINE BREAK
- SEWER LINE CRACK
- SEWER MATERIAL CHANGE

* SEWER INFORMATION OBTAINED FROM 2015 SEWER VIDEO LOG FOR FRANKLIN DPW.

- PROPOSED SOIL GAS SAMPLING POINT
- PROPOSED SOIL GAS SEWER BACKFILL SAMPLING POINT

0' 60'
SCALE IN FEET

DRAWN BY: L. STRUM
DATE: 9/27/99
REVISED: 09/21/2018
HWPA #111291-01
DWG. NO. 111291S1

FIGURE 4
GLENDALE DRIVE SEWER LAYOUT MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

iWM CONSULTING GROUP

N

N. FORSYTHE STREET

250020 (8.91')

250030 (10.05')

250040 (10.16')

(VCP)

MW-32

ROSS COURT

(6.84') 250041

250060

MW-33

(5.82') 250042

250043 (3.84')

(PVC)

HURRICANE CREEK

RESIDENTIAL A

LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
  (SEWER MAIN INVERT DEPTH AT MANHOLE IN FEET)

- PROPERTY LINE (APPROXIMATE)
- STORM SEWER
- SANITARY SEWER
- O/H POWER

- RESIDENTIAL HOME
  * DETACHED GARAGES & SHEDS NOT SHOWN
- NON-RESIDENTIAL STRUCTURE
- PRIMARY BUILDING WALLS

(VCP) VITREOUS CLAY PIPE

- SEWER LINE BREAK
- SEWER LINE CRACK
- SEWER MATERIAL CHANGE

* SEWER INFORMATION OBTAINED FROM 2015 SEWER VIDEO LOG FOR FRANKLIN DPW.

- PROPOSED SOIL GAS SAMPLING POINT
- PROPOSED SOIL GAS SEWER BACKFILL SAMPLING POINT

0' 60'
SCALE IN FEET

DRAWN BY: L. STRUM
DATE: 9/27/99
REVISED: 09/21/2018
HWPA #111291-01
DWG. NO. 111291S1

FIGURE 5
ROSS COURT SEWER LAYOUT MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

iWM CONSULTING GROUP

FORMER WARRIOR OIL

AST AREA

INDY STORE

COMMERCIAL PROPERTY

AST

250054 (6.03') (VCP)

250053B (7.35') (VCP)

250053 (8.03') (VCP)

250052 (9.38') (VCP)

250051 (9.20') (VCP)

N. FORSYTHE STREET

MW-31

MW-34

HAMILTON AVENUE

250055

MW-12R (14.60') SS-SOUTH

250056

RW-2

IT-2

LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- (SEWER MAIN INVERT DEPTH AT MANHOLE IN FEET)
- PROPERTY LINE (APPROXIMATE)
- STORM SEWER
- SANITARY SEWER
- O/H POWER
- RESIDENTIAL HOME
  * DETACHED GARAGES & SHEDS NOT SHOWN
- NON-RESIDENTIAL STRUCTURE
- PRIMARY BUILDING WALLS
- (VCP) VITREOUS CLAY PIPE
- SEWER LINE BREAK
- SEWER LINE CRACK
- SEWER MATERIAL CHANGE
  * SEWER INFORMATION OBTAINED FROM 2015 SEWER VIDEO LOG FOR FRANKLIN DPW.
- PROPOSED SOIL GAS SAMPLING POINT
- PROPOSED SOIL GAS SEWER BACKFILL SAMPLING POINT

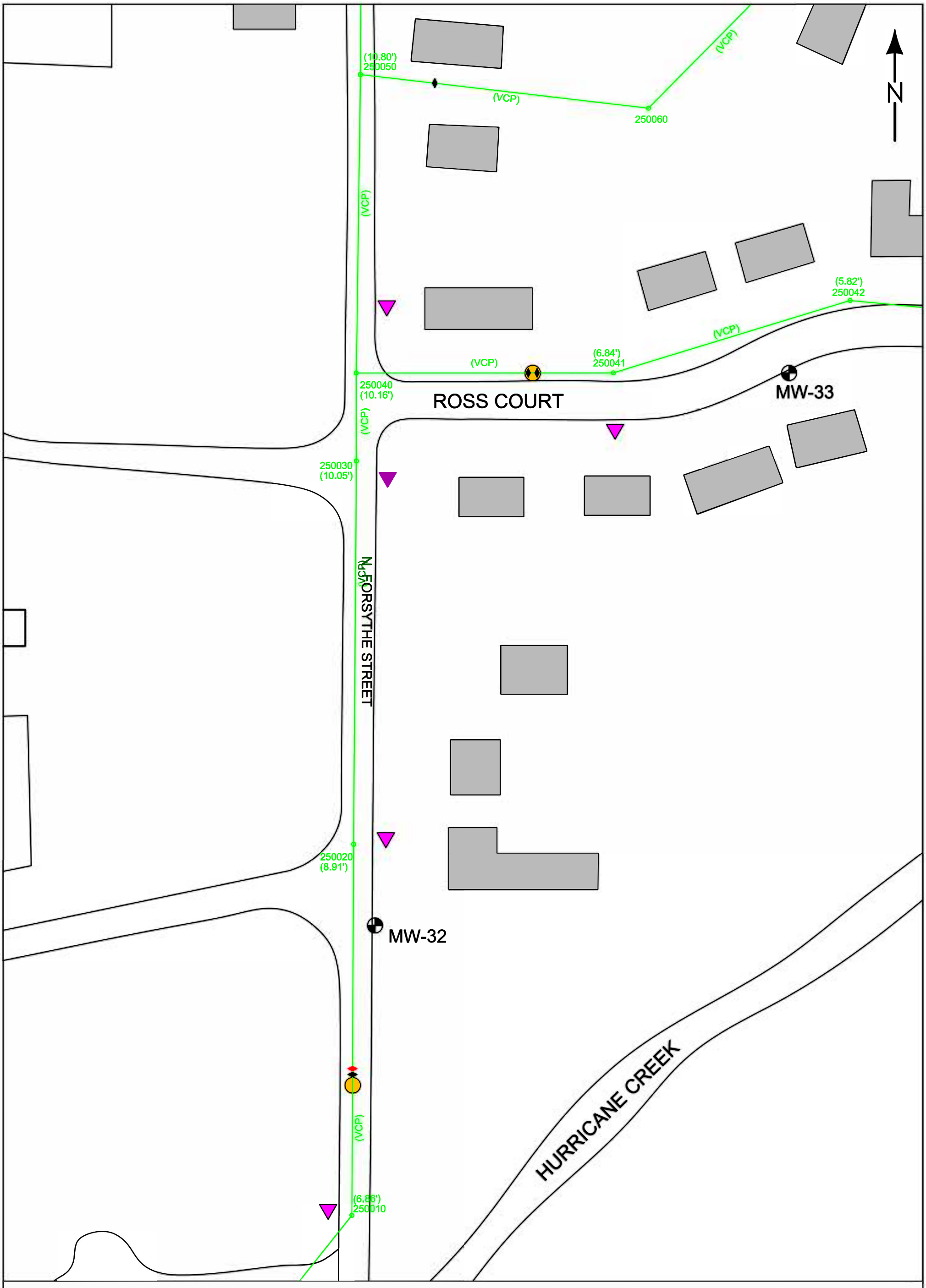
0' 60'
SCALE IN FEET

DRAWN BY: L. STRUM	
DATE: 9/27/99	
REVISED: 09/21/2018	
HWPA #111291-01	
DWG. NO. 111291S1	

FIGURE 6
NORTHWESTERN SEWER
LAYOUT MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

IWM CONSULTING GROUP



LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- (SEWER MAIN INVERT DEPTH AT MANHOLE IN FEET)
- PROPERTY LINE (APPROXIMATE)
- STORM SEWER
- SANITARY SEWER
- O/H POWER
- RESIDENTIAL HOME
  * DETACHED GARAGES & SHEDS NOT SHOWN
- NON-RESIDENTIAL STRUCTURE
- PRIMARY BUILDING WALLS
- (VCP) VITREOUS CLAY PIPE
- SEWER LINE BREAK
- SEWER LINE CRACK
- SEWER MATERIAL CHANGE
  * SEWER INFORMATION OBTAINED FROM 2015 SEWER VIDEO LOG FOR FRANKLIN DPW.
- PROPOSED SOIL GAS SAMPLING POINT
- PROPOSED SOIL GAS SEWER BACKFILL SAMPLING POINT

0' 60'
SCALE IN FEET

DRAWN BY: L. STRUM
DATE: 9/27/99
REVISED: 09/21/2018
HWPA #111291-01
DWG. NO. 111291S1

FIGURE 7
SOUTHERN FORSYTHE STREET SEWER LAYOUT MAP

FORMER AMPHENOL RFI/CMS
980 HURRICANE ROAD
FRANKLIN, INDIANA

IWM CONSULTING GROUP

Attachments

Attachment A

IWM Consulting SOPs

SOP Group E
Standard Operating Procedures
For Exterior Soil Gas Sampling Activities

TABLE OF CONTENTS

SOP Group E
Standard Operating Procedures
For Exterior Soil Gas Sampling Activities

Introduction

This standard operating procedure (SOP) sets forth the criteria and guidelines used to obtain exterior soil gas samples for analysis of volatile organic compounds (VOCs). All soil gas samples will be collected using summa canister sampling kits provided by the contract laboratory.

When evaluating the vapor intrusion exposure pathway, potential sampling methods and locations include exterior soil gas sampling (SGe), which is typically only done if access to the interior of a structure is not possible or if the site is classified as a "low risk" site during the initial site evaluation process. When performing these sampling activities under the direction of a regulatory agency, the sampling methods and locations should be discussed and approved by the regulatory project manager prior to implementing the work activities.

In general, 1-liter stainless steel summa canisters are utilized when obtaining grab SGe samples. Grab SGe samples are typically obtained over a 10-minute period of time from permanent exterior soil gas sampling points. However, dependent on the site-specific sampling requirements, SGe samples can generally be obtained over extended periods of time (between 8 and 24-hours) via 6-liter stainless steel summa canisters from permanent exterior soil gas sampling points. Extended timeframe SGe samples obtained from permanent exterior soil gas sampling points adjacent to a commercial/industrial structure are typically obtained over an 8-hour timeframe and SGe samples obtained from permanent exterior soil gas sampling points adjacent to residential structures are obtained over a 24-hour timeframe.

The Air Sampling Field Data Sheet provided in **Appendix A** should be completed when conducting the sampling activities.

SOP E.1 Exterior Soil Gas Sampling

Exterior soil gas samples will be submitted to the contract laboratory for TO-15 laboratory analysis. The recommended sample container is a 1-liter summa canister equipped with a flow regulator calibrated to a sampling rate of 100 mL/minute. This will equate to a total sampling time of 10 minutes. If conducting extended timeframe sampling, the recommended sample container is a 6-liter summa canister equipped with a flow regulator calibrated to a 8-hour (~12.5 mL/minute) or 24-hour (4.16 mL/minute) sampling rate. The sampling and screening procedures shall include the following:

1. It is recommended that the exterior soil gas sampling points have a small diameter (2-inches or less is preferred) and be installed using direct-push

methods, which minimize disturbance of surrounding soils. However, based on the location of borings to utilities, hand auger methods may be used to install the sampling points.

2. Sampling points will be installed within offsite sanitary sewer line bedding material to determine if it is acting as preferential pathways for the transport of vapor phase VOCs. Additionally, sampling points will be installed in native soils within the ROW (between the sewer line and adjacent residences) to determine if native soils are acting as preferential pathways for the transport of vapor phase VOCs. This information will assist in evaluating the potential for migration of vapor phase VOCs into adjacent residential structures

3. The sampling points located in native soil should be installed to a depth of approximately 6 feet below ground surface since SGe samples obtained from depths less than 5 feet risk drawing ambient air from the surface into the sample. The sampling points installed over the sewer lines will be installed to the depth where the backfill material surrounding the sewer line is first encountered to avoid damaging the sewer line.

4. The contract laboratory will provide certified clean summa canister sampling kits which will include a 1-liter summa canister, sampling inlet line with fittings, filter, and flow regulator (set for approximately ten minutes for 1-liter canisters). All the equipment in the sampling kit will be tagged with matching serial numbers provided by the laboratory.

5. Prior to initiating the sampling activities and utilizing the laboratory provided summa canisters, the vacuum of each summa canister and the leak integrity of the canister and regulator should be checked via the "shut-in test" by opening the valve of the summa canister while the cap is still on the sampling port of the summa canister then closing the valve. The observed vacuum on the canister vacuum gauge should exhibit no change after 1 minute. If the observed vacuum changes, the cap, connection fittings, and/or regulator will be re-tightened, then if necessary, reseated, tightened, and retested. Additionally, the observed vacuum should be within 4-inches of mercury from the lab recorded vacuum prior to shipment from the laboratory. The laboratory will provide the user of the summa canisters the lab recorded vacuum for each canister and if there is >4-inches of mercury difference, the integrity of the summa canister is questionable, and the summa canister cannot be utilized for the sampling activities.

6. Prior to initiating the sampling activities and utilizing the laboratory provided sampling train and sampling tubing, a leak test of the sampling set-up should be performed. Attach the Teflon™ or Nyaflow® tubing to the canister regulator with the provided Swagelok ferrules and attach a medium length piece of Tygon tubing to the Teflon™ or Nyaflow® tubing and to a hand-held vacuum pump with a pressure gauge and stopcock. Induce a vacuum of at least 15-inches of mercury on the sample sampling set-up with the stopcock open and then close

the stopcock. The observed vacuum on the pressure gauge should exhibit no change after 1 minute. If the observed vacuum changes, tighten the Swagelok connection for the canister regulator and Teflon™ or Nyaflow® tubing and retest. If the observed vacuum does not change, the sampling set-up is tight and the Tygon tubing will be cut short for subsequent sampling. **Do not remove or adjust the remaining sampling train after the sampling train has been verified tight.**

7. Prior to initiating the sample collection phase of the sampling event, approximately three (3) times the "dead volume" of air within the sampling point, sampling tubing, and sand pack (for permanent sampling points only) should be slowly (100 to 200 mL/minute) purged from each sampling point. Generally, one (1) volume of air from a permanent sampling point sand pack is approximately 780 mL, and one (1) volume of air from sampling tubing is approximately 5 mL per foot of tubing. The air can be purged using an SKC AirChek® sampler set at a rate of 0.1 liters per minute, an RKI GX-6000 multi-gas PID monitor (or equivalent), or from a graduated syringe. The purged air will be removed from each sampling point and discharged into the atmosphere. The purge rates and volumes will be measured and recorded. The lower explosive limit (LEL) and O_2 will be measured and recorded if using the RKI GX-6000 multi-gas PID monitor.

8. In order to allow subsurface vapors to equilibrate following installation and purging, it is recommended to wait at least 24 to 48 hours for permanent sampling points before initiating sampling activities.

9. It is also recommended to wait at last 72 hours following a significant precipitation event (>1-inches) before initiating sampling activities.

10. Prior to sample collection the appropriate information will be completed on the Air Sampling Field Data Sheet provided in **Appendix A**. The canister will be equipped with a pre-determined time flow regulator and connected to the sampling point via a short piece of Tygon tubing and Teflon™ or Nyaflow® tubing. The summa canister and flow regulator will be opened and the pressure differential will cause the air sample to enter the canister at the pre-determined flow rate. The vacuum applied by the summa canister during the sampling events should be as low as possible (preferably between 10 and 50-inches of water). The sampling activities are complete when the vacuum on the summa canister is between 3 and 5-inches of mercury or the pre-determined timeframe is reached, whichever occurs first. Care should be taken as to not allow the vacuum to reach zero.

11. Upon completion of the sampling time, shut off the flow regulator and record the appropriate information on the Air Sampling Field Data Form. Remove the sampling suite from the summa canister and ship the sampling kit back to the

contract laboratory following typical chain of custody protocols. Confirm that the sampling kit serial numbers all match prior to delivery to the laboratory.

12. Be certain to record the initial and final canister pressures, start and stop times for canister filling, and appropriate canister pressure checks during sampling

Appendix A

Air Sampling Field Data Sheet

Air Sampling Data Sheet

VI Sampling Event Date: ______________________________

Project: ______________________________

Building Site Address: ______________________________

Weather Conditions: ______________________________

Building HVAC Status: ______________________________

Sampling Personnel: ______________________________

Sample ID	Sampling Location	Sampling Time		Vacuum (in Hg)		Canister Details	
		Start		Initial		Canister ID #	
		End		Final		Flow Controller #	

Canister Pressure Check

Time							
Vacuum (in Hg)							

Sample Type: Soil-Gas ____ Sub-Slab ____ Indoor ____ Ambient ____ Other ____ **Timeframe:** 24-Hr ____ 8-Hr ____ Grab ____ **Canister Type:** 6L Summa ____ 1L Summa ____ Other ______________

Notes: ______________________________ **Sample Height / Depth (ft.):** ______________ **Analytical Method:** TO-15 ____ TO-15 SIM ____ Shortlist ______________

Sample ID	Sampling Location	Sampling Time		Vacuum (in Hg)		Canister Details	
		Start		Initial		Canister ID #	
		End		Final		Flow Controller #	

Canister Pressure Check

Time							
Vacuum (in Hg)							

Sample Type: Soil-Gas ____ Sub-Slab ____ Indoor ____ Ambient ____ Other ____ **Timeframe:** 24-Hr ____ 8-Hr ____ Grab ____ **Canister Type:** 6L Summa ____ 1L Summa ____ Other ______________

Notes: ______________________________ **Sample Height / Depth (ft.):** ______________ **Analytical Method:** TO-15 ____ TO-15 SIM ____ Shortlist ______________

Sample ID	Sampling Location	Sampling Time		Vacuum (in Hg)		Canister Details	
		Start		Initial		Canister ID #	
		End		Final		Flow Controller #	

Canister Pressure Check

Time							
Vacuum (in Hg)							

Sample Type: Soil-Gas ____ Sub-Slab ____ Indoor ____ Ambient ____ Other ____ **Timeframe:** 24-Hr ____ 8-Hr ____ Grab ____ **Canister Type:** 6L Summa ____ 1L Summa ____ Other ______________

Notes: ______________________________ **Sample Height / Depth (ft.):** ______________ **Analytical Method:** TO-15 ____ TO-15 SIM ____ Shortlist ______________

Attachment B

Applicable USEPA Residential Vapor Intrusion Screening Levels
(Site specific shortlist only)

Attachment B
Applicable USEPA Residential Vapor Intrusion Screening Levels
Former Amphenol Facility
EPA ID # IND 044 587 848
Franklin, IN 46131

EPA Regional Screening Levels (µg/m^3)		Parameters
Target Sub-Slab and Near Source Soil Gas Concentrations		
Cancer (Target Cancer Risk = 10E-6)	Non-Cancer (non-carcinogenic hazard quotient of 1)	
59	N/A	1,1 dichloroethane
3.6	243	1,2 dichloroethane
N/A	N/A	Cis 1,2 dichloroethene
N/A	N/A	Trans 1,2 dichloroethene
3,400	21,000	Methylene chloride
360	1,400	Tetrachloroethylene (PCE)
N/A	170,000	1,1,1 trichloroethane
16	70	Trichlorethylene (TCE)
5.6	3,333	Vinyl Chloride
N/A	N/A	Total VOCs

Notes:

1. All samples will be collected by IWM Consulting personnel and analyzed at Pace Analytical Services, LLC located in Minneapolis, MN.
2. All VOCs to be analyzed using EPA Method TO-15 except for TCE, 1,2 DCA, and Vinyl Chloride, which will be analyzed using EPA Method TO-15 SIM.
3. All results in µg/m^3.
4. N/A: not applicable (risk-based screening levels have not been developed).
5. EPA Regional Screening Levels correspond to the published USEPA Residential Vapor Intrusion Screening Levels (VISL), updated May 2018.
6. Non-cancer screening levels for Target Sub-Slab and Near Source Soil Gas were calculated using the generic attenuation factor of 0.03 per *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air dated June 2015 (Appendix A, Section A.3.4).*