



September 14, 2017

Mr. Heath Smith
EPA On-Scene Coordinator
U.S. Environmental Protection Agency, Region 7
212 Little Bussen Drive
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**Subject: Vapor Intrusion Assessment
Second Quarterly Sampling Event – November/December 2016 and Third Quarterly
Sampling Event – March 2017
Sporlan Valve Plant #1 Site, Washington, Missouri
EPA SEMS ID: MON000703541
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0150
Task Monitor: Heath Smith, EPA On-Scene Coordinator**

Dear Mr. Smith:

Tetra Tech, Inc. is submitting the enclosed Vapor Intrusion Assessment report regarding the above-referenced site. If you have any questions or comments regarding this submittal, please contact the Project Manager at (314) 517-6798.

Sincerely,

A handwritten signature in black ink that reads 'D. David Kinroth'.

Dave Kinroth, CHMM
START Project Manager

A handwritten signature in blue ink that reads 'Ted Faile'.

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

**VAPOR INTRUSION ASSESSMENT
SECOND QUARTERLY SAMPLING EVENT – NOVEMBER/DECEMBER 2016 AND
THIRD QUARTERLY SAMPLING EVENT – MARCH 2017
SPORLAN VALVE PLANT #1 SITE
WASHINGTON, MISSOURI**

EPA SEMS ID: MON000703541

**Superfund Technical Assessment and Response Team (START)
Contract No. EP-S7-13-06, Task Order 0150**

Prepared For:

U.S. Environmental Protection Agency
Region 7
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September 14, 2017

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1.0 INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under Contract Number EP-S7-13-06, Task Order 0150, to conduct a vapor intrusion assessment (VIA) of the Sporlan Valve Plant #1 site (the site) in Washington, Missouri.

This VIA accorded with EPA Office of Solid Waste and Emergency Response (OSWER) Publication 9200.2-154 – Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015). The purpose of this VIA was to determine if volatile organic compounds (VOC) in groundwater, particularly trichloroethene (TCE) and related chlorinated VOCs, may present a threat to human health via vapor intrusion (VI) into residences within the site vicinity. The scope of the VIA included review of information provided by EPA and the Missouri Department of Natural Resources (MDNR), compilation and evaluation of potential targets, and collection of samples for laboratory analysis.

The site was entered into the Superfund Enterprise Management System (SEMS), which contains the same information as the retired Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, as Identification Number MON000703541 (EPA 2017).

2.0 BACKGROUND INFORMATION

The site's location, history, geology/hydrogeology, and relevant previous investigations are discussed below.

2.1 SITE LOCATION AND DESCRIPTION

The site currently consists of an unoccupied 4-acre parcel at 611 E. Seventh Street near downtown Washington, Franklin County, Missouri (see Figure 1 in Appendix A). The site includes a groundwater contamination plume that has migrated beyond the property boundaries. The full extent of this plume has not been delineated, but based on groundwater monitoring results, it is known to extend to the south toward Eighth Street and to the east toward MacArthur Street, beneath residential structures. VI sampling by MDNR in 2015 identified concentrations of TCE that exceeded indoor air screening levels at three residences. Also, sub-slab concentrations of TCE vapors exceeded screening levels at four residences (EPA 2016a).

Approximate geographic coordinates at the center of the site are 38.551900 degrees (°) north latitude and 91.006680° west longitude. The unoccupied parcel is in the northeast quarter of the southeast quarter of Section 22, Township 44 North, Range 1 West, as depicted on the 7.5-minute quadrangle map for Washington West, Franklin County, Missouri (MDNR 2016).

2.2 SITE HISTORY

From 1939 until approximately 2005, the site was the location of the Sporlan Valve Plant #1, where valves for the refrigeration industry were produced. The property is now owned by SV Land LLC and is a vacant 4-acre parcel surrounded by a residential neighborhood. Prior to its demolition in 2011, an 80,000-square-foot brick building on a concrete slab stood at the site. The building was constructed in 1939, with continuous expansion through 1968. Operations at the plant included plating, degreasing, machining, brazing, assembling, and testing. Degreasing operations included use of the chlorinated solvent TCE.

Over the course of the facility's manufacturing history, three aboveground storage tanks (AST), ranging in size from 200 to 2,000 gallons, were used to store TCE for the plant's degreasing processes. The 2,000-gallon AST was north of the former manufacturing building and positioned on a concrete pad with no secondary containment. Three underground storage tanks (UST) used to store fuel oil were also present at the site. The fuel oil USTs ranged in size from 2,000 to 10,000 gallons.

An unknown amount of TCE was released from the former valve factory for an unknown period of time. Existing monitoring well data indicate migration of TCE-contaminated shallow groundwater to the south and east, downgradient of the site (EPA 2016a).

The Sporlan Valve Company was acquired by Parker Hannifin Corporation of Cleveland, Ohio, via merger in October 2004 (*St. Louis Business Journal* [STLBJ] 2004). The plant continued to operate at the 611 E. Seventh Street location until approximately 2005. Exact date of plant closure is unknown (EPA 2016a).

2.3 GEOLOGY AND HYDROGEOLOGY

According to the U.S. Department of Agriculture (USDA) soil survey of Franklin County, Missouri, soils at the site are characterized as Menfro silt loam, consisting of well-drained, silty/silty-clayey loams formed on loess (USDA 2016).

Information regarding the stratigraphy and hydrogeology of the site was provided by the Missouri Geological Survey (MGS) in a 2014 Geohydrologic Summary report. Depth to bedrock varies from a few feet along the northern property boundary to nearly 50 feet south of Eighth Street. Residuum consists of clay, chert, and sand derived from the weathered sedimentary bedrock. A series of Ordovician and Cambrian-age dolomite formations underlie the residuum in the vicinity of the site, and together form the approximately 1,000-foot-thick Ozark Aquifer (Tetra Tech 2016).

In February 2015, depth to groundwater at the site varied between 7.86 and 15.15 feet below ground surface (bgs) (Environ 2015). Therefore, at times, the groundwater surface may be within a few feet of basements at houses along Seventh Street. Slug test data acquired from monitoring wells at the site in 2007 showed a range of hydraulic conductivity between 1.02×10^{-5} and 3.71×10^{-5} centimeters per second (cm/sec). Hydraulic conductivity of the Ozark Aquifer ranges from 1×10^{-3} to 1×10^{-4} cm/sec. All registered wells within 4 miles of the site (301 wells) are reportedly completed in the Ozark Aquifer. The Ozark Aquifer is underlain by the St. Francois confining unit, a series of alternating shale and dolomite formations that form an effective barrier to downward groundwater movement (MDNR 2016).

No site-specific groundwater flow data regarding the Ozark Aquifer are available. Regional estimates of groundwater flow direction based on well data vary from northwest to the northeast. The Missouri River valley is a hydraulic boundary and discharge zone for the Ozark Aquifer near the site. Groundwater flow direction within this aquifer is likely influenced locally by pumping wells and proximity to the Missouri River (Tetra Tech 2016).

2.4 PREVIOUS INVESTIGATIONS

The following section describes activities and sample results associated with previous investigations at the site, along with relevant data from off-site investigations that detected contamination potentially associated with the site.

Phase I Environmental Site Assessment – 2003

A Phase I Environmental Site Assessment commissioned by Parker Hannifin Corporation was completed by SECOR International, Inc. (SECOR) on August 15, 2003. The Phase I report identified multiple recognized environmental conditions (REC) to the site. Eight ASTs were identified at the site. Five ASTs were associated with the wastewater treatment area, and ranged from 100- to 3,000-gallon capacities. The other three ASTs held TCE for degreasing processes at the facility, and ranged from 200- to 2,000-gallon capacities. The 2,000-gallon TCE AST was outside near the wastewater treatment area, positioned on a concrete pad with no secondary containment (thus posing a REC). The other two TCE ASTs were within the building. Three fuel oil USTs of unknown age and construction were also present; because the USTs lacked leak detection monitoring systems, SECOR also identified this as a REC. Based on these issues and other conditions, SECOR recommended further investigation of the property (SECOR 2003).

Phase II Limited Soil Investigation – 2004

SECOR completed a Phase II Limited Soil Investigation commissioned by Parker Hannifin Corporation in 2004. Nine soil borings were advanced to 8 to 20 feet bgs or to bedrock, whichever was encountered first, along the perimeter of the (now demolished) factory building. The investigation identified TCE concentrations as high as 739 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in soil near the 2,000-gallon TCE AST outside the facility. The Phase II report concluded that soil and groundwater beneath the site appeared to have been impacted by historical site activities (SECOR 2004).

Soil Gas Survey – 2006

W.L. Gore and Associates, Inc. conducted a subsurface vapor survey (soil gas mass level survey) in 2006. Forty passive vapor sampling devices were installed beneath the factory floor in areas where subsurface contamination was suspected. Results of the survey provided information regarding relative mass of TCE and associated breakdown compounds beneath the floor. Chlorinated compounds were detected in soil gas at high mass levels, with TCE and dichloroethene (DCE) most prevalent. Elevated levels of total petroleum hydrocarbons (TPH) were also detected. Source areas and well-defined soil gas plumes were

identified below the former factory. The report recommended additional soil gas sampling, because the survey had not delineated the full extent of the source areas (EPA 2016a).

Phase III Supplemental Investigation – 2012

In 2012, Ramboll Environ US Corporation (Ramboll Environ) completed a Phase III Supplemental Investigation commissioned by the Sporlan Valve Company. Objectives of the Phase III were to investigate potential source areas via soil sampling along a test trench, and to delineate the approximate extent of TCE impacts on soil within the identified source area(s) via sampling of test pits. Laboratory data indicated presence of the following contaminants: TCE, DCE, methylene chloride, tetrachloroethene (PCE), 1,1,2-trichloroethane (TCA), and vinyl chloride (VC). TCE was detected in all surface soil samples at concentrations ranging from 66.2 to 2,710 µg/kg. TCE was detected in all subsurface samples at concentrations ranging from 36.8 to 9,390 µg/kg (EPA 2016a).

Investigations under Oversight of the Missouri Brownfields Voluntary Cleanup Program (BVCP) – 2008 through 2015

The site was accepted into the Missouri BVCP on January 9, 2008. The BVCP oversaw installation of 12 permanent monitoring wells by the potentially responsible party (PRP)—five on the former Sporlan Valve Company property and seven east and south of the property. Monitoring well depths ranged from 10 to 45 feet bgs. Multiple rounds of groundwater sampling occurred between 2009 and 2015. Maximum TCE concentration detected was 12,100 micrograms per liter (µg/L) in 2009, in a well (MW-3) on the former Sporlan Valve Company property just north of Seventh Street. TCE concentration in the farthest downgradient well (MW-11) increased steadily from 76 µg/L in 2009 to 194 µg/L in 2015.

The BVCP also oversaw installation of sub-slab soil gas monitoring ports at four residences along Seventh Street. By 2015, eight rounds of sub-slab sampling had occurred at each of the four residences. In October 2012, TCE was detected in sub-slab vapors at 760 micrograms per cubic meter (µg/m³) below one of the homes. No indoor air sampling occurred during these rounds of VI sampling.

In 2011, the valve manufacturing building and foundation slab were demolished, and the site was cleared of most demolition debris.

In 2012, the three heating oil USTs were removed from the site. A release of heating oil was discovered beneath a 10,000-gallon UST, requiring removal and off-site disposal of 67 tons of petroleum-contaminated soil.

In April 2015, the PRP withdrew the site from participation in the BVCP (EPA 2016a).

MDNR Site Inspection/Removal Site Evaluation – 2015

In July 2015, MDNR conducted a Site Inspection (SI)/Removal Site Evaluation (RSE) that included VI sampling. MDNR collected samples of indoor air, crawlspace air or sub-slab soil gas, and sump water at 12 residences downgradient of the site. Analytical data from this sampling, along with previous sub-slab results acquired during enrollment of the site in the BVCP, indicated levels of TCE exceeding health-based screening levels in indoor air and/or sub-slab vapors overlying the TCE-contaminated shallow groundwater. Concentrations of TCE were found to exceed indoor air screening levels at three residential properties. A maximum of 3.9 $\mu\text{g}/\text{m}^3$ was detected in indoor air at a residence along Seventh Street. Concentrations of TCE were found to exceed sub-slab vapor screening levels at four residential properties. A maximum concentration of 820 $\mu\text{g}/\text{m}^3$ was detected in sub-slab soil gas at a property north of Eighth Street (MDNR 2016).

Following MDNR's receipt of VI sampling results, documenting presence of TCE at levels exceeding MDNR's and EPA's health-based screening levels, the site was referred by MDNR to EPA for removal action consideration on August 20, 2015 (EPA 2016a).

EPA Vapor Intrusion Sampling Analysis – 2015

Based on the information provided to EPA from the 2015 MDNR SI/RSE, EPA determined that a complete subsurface VI to indoor air exposure pathway existed at one property. The report acknowledged that periodic monitoring had not occurred at properties assessed for VI; quarterly VI monitoring was recommended at targeted residential properties, along with sampling to enable completion of plume delineation (horizontal and vertical extents).

MDNR's 2015 SI/RSE, along with EPA's review of other available data, resulted in installation of sub-slab depressurization vapor mitigation systems (VMS) at two residences (Property Identifications [ID] 153 and 176) conducted by contractors hired by Ramboll Environ on behalf of the PRP. The full extent of groundwater contamination in this residential area, and possible inhalation exposures resulting from VI from the contaminated shallow groundwater, remained unknown (EPA 2016a).

Enforcement Actions – 2016

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) both contain provisions that support and encourage early actions to mitigate actual and potential threats to human health associated with VI. According to EPA Office of Solid Waste and Emergency Response (OSWER) Publication 9200.2-154 – Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015), for sites not on the National Priorities List (NPL), EPA may use its removal authority under CERCLA to undertake early action to mitigate VI threats. Under this authority, EPA issued a Unilateral Administrative Order for Removal Action (UAO, or Order) to SV Land LLC, requiring removal action to abate imminent and substantial endangerment to the public health or welfare or the environment that may be presented by actual or threatened release of hazardous substances at or from the site. Under this Order, SV Land LLC retained the services of an environmental consulting contractor, Ramboll Environ, to oversee installation of VMSs in selected homes within a designated inclusion zone around the site perimeter, for preemptive mitigation of potential for VI into those structures. Initially, this activity was planned to focus on the 11 properties nearest the south site perimeter along East Seventh Street (Property IDs 145 to 155, as indicated on Figures 2 and 3 in Appendix A). Performance sampling of indoor air at these properties 30 days after the VMSs had been installed was also required. These activities began in fall 2016.

In conjunction with the enforcement action, EPA tasked Tetra Tech START to conduct VI sampling as part of an Integrated Site Assessment (ISA), to assess additional residences around the site perimeter beyond the PRP's initial property inclusion zone. The remainder of this report discusses these investigative efforts and summarizes the sampling results.

3.0 VAPOR INTRUSION INVESTIGATIVE EFFORTS

Section 3.0 discusses field sampling and associated quality assurance (QA)/quality control (QC) activities at the site during the second and third quarterly VIA sampling efforts, conducted by Tetra Tech START on behalf of EPA Region 7 in November/December 2016 and March 2017, respectively. Field sampling and QA/QC activities at the site during the first quarterly VIA sampling effort in August 2016 are discussed in a previously prepared report dated March 22, 2017 (Tetra Tech 2017). The general objective of the VIA was to determine whether any threats to human health exist due to inhalation of indoor air contaminants originating from a subsurface source. A site-specific Quality Assurance Project Plan (QAPP) in support of the VIA activities had been prepared previously (by EPA), and had been approved by EPA on October 5, 2015. Field activities accorded with the approved QAPP, except where noted in this report. For the second quarterly sampling event, START Members Dave Kinroth, Ann Marie Pohlman, and Jenna Pratt conducted indoor/outdoor air and sub-slab soil gas sampling from November 7 through December 6, 2016. Field activities included collection of 19 sub-slab soil gas samples, 1 crawlspace air sample, 37 indoor air samples, and 1 outdoor ambient air sample. For the third quarterly sampling event, START Members Dave Kinroth and Ann Marie Pohlman conducted indoor/outdoor air and sub-slab soil gas sampling on March 8, 9, 15, and 16, 2017. Field activities included collection of 11 sub-slab soil gas samples, 17 indoor air samples, and 2 outdoor ambient air samples.

Second Quarterly Sampling Activities November/December 2016

Properties sampled during the first quarterly sampling event in August 2016 that were resampled during the second quarterly event included property IDs 118, 130, 131, 175, 177, 178, 182, 186, 192, 193, 194, and 195. Six new properties entered into the quarterly sampling program for the second quarterly event included property IDs 120, 121, 165, 179, 181, and 213 (see Figure 2 in Appendix A for a depiction of these property locations). Three properties sampled during the first quarterly event in August 2016 (property IDs: 117, 124, and 144) were determined eligible for VMS installation by the PRP's contractor, and were eliminated from the second quarterly event.

Nineteen sub-slab soil gas samples, including one duplicate sample, were collected at residences near the site perimeter during the second quarterly sampling event. For each sub-slab soil gas sample, a sampling port was installed by drilling a hole through the concrete basement floor or other accessible portion of the foundation by use of a rotary hammer drill and concrete bit. A stainless steel tube with a 0.25-inch-diameter threaded Swagelok® fitting was then connected to disposable, 0.25-inch-diameter polyethylene tubing and lowered into the hole. The annulus around the stainless steel tube was sealed with hydraulic

cement, and then a Swagelok® fitting was attached to the top of the tubing to allow connection to an evacuated Summa canister. The hydraulic cement was allowed to cure for a minimum of 24 hours before sampling, and a leak test was performed by use of helium gas and a handheld helium detector (in accordance with EPA Region 7 Standard Operating Procedure [SOP] 2318.07A – Vapor Intrusion Port Installation and Sampling) to ensure that the Summa canister was drawing air only from under the slab and not air from inside the basement. The Summa canister was fitted with a flow regulator to enable collection of sub-slab vapors over a continuous 24-hour period. One property (Property ID 182) had a crawlspace under the home (no basement); at that residence, a Summa canister fitted with a flow regulator was lowered into the crawlspace for collection of a 24-hour sample.

Thirty-seven indoor air samples, including one duplicate, were collected at residences within the site vicinity. These samples were collected within active living spaces. For the indoor air sampling, Summa canisters were also fitted with passive flow regulating devices to enable collection of air samples for a continuous 24-hour period. All Summa sampling accorded with EPA Region 7 SOP 4231.1704 – Summa Canister Sampling. In addition, one sample was collected at an outdoor (ambient air) location over a 24-hour period to assess potential ambient air contribution of site-related contaminants to indoor air samples. Table 1 summarizes the November/December 2016 sample locations, which are also shown on Figure 2 in Appendix A.

TABLE 1
SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLES
NOVEMBER/DECEMBER 2016
SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI

Property ID	Sample No.	Sample Address	Sample Location	Sample Type
118	118-1	██████████	Sub-slab	Soil gas
118	118-2	██████████	Basement	Indoor air
118	118-3	██████████	1 st Floor	Indoor air
120	120-1	██████████	Cellar Area	Indoor air
120	120-2	██████████	Laundry Room	Indoor air
120	120-3	██████████	Living Room	Indoor air
121	121-1	██████████	Sub-slab (east)	Soil gas
121	121-2	██████████	Sub-slab (southwest)	Soil gas
121	121-3	██████████	Basement	Indoor air
121	121-4	██████████	Dining Room	Indoor air
130	130-1	██████ ████	Sub-slab	Soil gas
130	130-2	██████ ████	Basement	Indoor air
130	130-3	██████ ████	Kitchen	Indoor air

TABLE 1 (Continued)

SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLES
 NOVEMBER/DECEMBER 2016
 SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI

Property ID	Sample No.	Sample Address	Sample Location	Sample Type
131	131-1	█████ ███	Sub-slab	Soil gas
131	131-2	█████ ███	Basement	Indoor air
131	131-3	█████ ███	Kitchen	Indoor air
165	165-1	██████████	Sub-slab	Soil gas
165	165-2	██████████	Basement	Indoor air
165	165-3	██████████	Living Area	Indoor air
175	175-1	█████ ███	Sub-slab	Soil gas
175	175-2	█████ ███	Basement	Indoor air
175	175-3	█████ ███	1 st Floor	Indoor air
177	177-1	█████ ███	Sub-slab	Soil gas
177	177-2	█████ ███	Basement	Indoor air
177	177-2D	█████ ███	Basement (duplicate)	Indoor air
177	177-3	█████ ███	1 st Floor	Indoor air
178	178-1	█████ ███	Sub-slab	Soil gas
178	178-2	█████ ███	Basement	Indoor air
178	178-3	█████ ███	1 st Floor	Indoor air
179	179-1	█████ ███	Sub-slab	Soil gas
179	179-2	█████ ███	Basement	Indoor air
179	179-3	█████ ███	Living Room	Indoor air
181	181-1	█████ ███	Sub-slab	Soil gas
181	181-1D	█████ ███	Sub-slab (duplicate)	Soil gas
181	181-2	█████ ███	Basement	Indoor air
181	181-3	█████ ███	Kitchen/Living Area	Indoor air
182	182-1	█████ ███	Crawlspace	Crawlspace
182	182-2	█████ ███	1 st Floor	Indoor air
186	186-1	█████ ███	Sub-slab	Soil gas
186	186-2	█████ ███	Basement	Indoor air
186	186-3	█████ ███	Kitchen	Indoor air
192	192-1	█████ ███	Sub-slab	Soil gas
192	192-2	█████ ███	Basement	Indoor air
192	192-3	█████ ███	1 st Floor	Indoor air
192	192-4	█████ ███	Backyard	Outdoor – ambient air
193	193-1	█████ ███	Sub-slab (west)	Soil gas
193	193-2	█████ ███	Sub-slab (east)	Soil gas
193	193-3	█████ ███	Basement	Indoor air
193	193-4	█████ ███	Kitchen	Indoor air
194	194-1	█████ ███	Sub-slab	Soil gas
194	194-2	█████ ███	Basement	Indoor air
194	194-3	█████ ███	1 st Floor	Indoor air
195	195-1	█████ ███	Sub-slab	Soil gas
195	195-2	█████ ███	Basement	Indoor air
195	195-3	█████ ███	Kitchen	Indoor air

TABLE 1 (Continued)

**SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLES
NOVEMBER/DECEMBER 2016
SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI**

Property ID	Sample No.	Sample Address	Sample Location	Sample Type
213	213-1	██████████	Sub-slab	Soil gas
213	213-2	██████████	Basement	Indoor air
213	213-3	██████████	Living Area	Indoor air

Notes:

ID Identification

Samples collected under Analytical Services Request (ASR) 7280 were delivered by FedEx to the EPA Region 7 laboratory in Kansas City, Kansas, between November 10 and December 7, 2016. Standard turnaround times were requested for all samples. All samples were analyzed for the following chlorinated VOCs: TCE, PCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, and VC. In addition, analyses for the VOCs benzene, toluene, ethylbenzene, and xylenes (BTEX) were requested by EPA for the second quarterly round of VIA sampling due to previous presence of at least one leaking fuel oil UST at the site.

Third Quarterly Sampling Activities March 2017

Only eight properties were sampled in the March 2017 event, including property IDs 121, 130, 131, 132, 165, 186, 195, and 213. Property ID 132 was a newly included sampling location during this event. Eleven properties from the second quarterly event were omitted from the third event, including property IDs 118, 120, 175, 177, 178, 179, 181, 182, 192, 193, and 194. EPA decided to eliminate these properties during the third quarterly sampling event either because the sub-slab and/or indoor air action level for TCE had been exceeded at a property, and thus the property had been scheduled for VMS installation by the PRP's contractor, or a property was under consideration for inclusion in the EPA-designated pre-emptive mitigation inclusion zone based on proximity to known affected properties (i.e. within approximately 100 feet of a previously known VIA action level exceedance or contaminated monitoring well).

Eleven sub-slab soil gas samples, including two duplicate samples, were collected at residences near the site perimeter during the third quarterly sampling event. Seventeen indoor air samples, including one duplicate, were collected at residences within the site vicinity. In addition, two samples were collected at outdoor (ambient air) locations over a 24-hour period to assess potential ambient air contribution of site-related contaminants to indoor air samples. All samples were collected as described above for the previous event. Table 2 summarizes the March 2017 sample locations, which are also shown on Figure 3 in Appendix A.

TABLE 2
SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLES
MARCH 2017
SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI

Property ID	Sample No.	Sample Address	Sample Location	Sample Type
121	121-1	[REDACTED]	Sub-slab (east)	Soil gas
121	121-2	[REDACTED]	Sub-slab (southwest)	Soil gas
121	121-3	[REDACTED]	Basement	Indoor air
121	121-4	[REDACTED]	Dining Room	Indoor air
130	130-1	[REDACTED]	Sub-slab	Soil gas
130	130-2	[REDACTED]	Basement	Indoor air
130	130-3	[REDACTED]	Kitchen	Indoor air
131	131-1	[REDACTED]	Sub-slab	Soil gas
131	131-2	[REDACTED]	Basement	Indoor air
131	131-2D	[REDACTED]	Basement (duplicate)	Indoor air
131	131-3	[REDACTED]	Kitchen	Indoor air
132	132-1	[REDACTED]	Sub-slab	Soil gas
132	132-1D	[REDACTED]	Sub-slab (duplicate)	Soil gas
132	132-2	[REDACTED]	Basement	Indoor air
132	132-3	[REDACTED]	Kitchen	Indoor air
165	165-1	[REDACTED]	Sub-slab	Soil gas
165	165-1D	[REDACTED]	Sub-slab (duplicate)	Soil gas
165	165-2	[REDACTED]	Basement	Indoor air
165	165-3	[REDACTED]	Living Area	Indoor air
186	186-1	[REDACTED]	Sub-slab	Soil gas
186	186-2	[REDACTED]	Basement	Indoor air
186	186-3	[REDACTED]	Kitchen	Indoor air
186	186-4	[REDACTED]	Sidyard	Outdoor – ambient air
195	195-1	[REDACTED]	Sub-slab	Soil gas
195	195-2	[REDACTED]	Basement	Indoor air
195	195-3	[REDACTED]	Kitchen	Indoor air
213	213-1	[REDACTED]	Sub-slab	Soil gas
213	213-2	[REDACTED]	Basement	Indoor air
213	213-3	[REDACTED]	Living Area	Indoor air
213	213-4	[REDACTED]	Backyard	Outdoor – ambient air

Notes:

ID Identification

Samples collected under ASR 7368 were delivered by FedEx to the EPA Region 7 laboratory in Kansas City, Kansas, on March 10 and 17, 2017. Standard turnaround times were requested for all samples. All samples were analyzed for the following chlorinated VOCs: TCE, PCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, and VC. Toluene, ethylbenzene, and xylenes, part of the analytical suite for previous sampling, were eliminated from the list of analytes, as requested by the EPA On-Scene Coordinator (OSC).

4.0 ANALYTICAL DATA SUMMARY

Section 4.0 summarizes analytical data from samples collected during November/December 2016 and March 2017 VIA sampling (second and third quarters, respectively). Summary tables of analytical results from second and third quarterly events are in Appendix B and C, respectively. Data from properties included in the first quarterly sampling event of August 2017 also are listed in the summary tables for comparison purposes. Complete laboratory data packages for ASRs 7280 and 7368 are in Appendix D.

4.1 REMOVAL ASSESSMENT CRITERIA

Screening levels and action levels for indoor air were based on EPA Regional Screening Levels (RSL) for residential settings (EPA 2016b). Analytical data from indoor air samples were compared to those levels. The purpose of RSLs is to provide generic (non site-specific) screening values for initial evaluation of sites. These are developed according to risk assessment guidance from the EPA Superfund program. The values are considered protective for humans (including sensitive populations) over a lifetime. Generally, at sites where contaminant concentrations are below the RSLs, no further action or study under Superfund is warranted. Action levels (concentrations at which mitigation or cleanup measures are considered warranted) were determined by EPA Region 7 toxicologists. Sub-slab soil gas screening levels and action levels were derived by EPA Region 7 toxicologists by use of the Vapor Intrusion Screening Level (VISL) Calculator (EPA 2014). Table 3 lists those levels:

TABLE 3
SCREENING AND ACTION LEVELS
SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI

Contaminant of Concern	Residential Screening Level ¹ (µg/m ³)	Residential Action Level ² (µg/m ³)
Indoor Air		
Benzene	0.36	3.6
Ethylbenzene	1.1	NE
1,1-dichloroethene (DCE)	21	210
1,2-DCE	NE	NE
Tetrachloroethene (PCE)	4.2	NE
Toluene	520	NE
Trichloroethene (TCE)	0.20	2.0
Vinyl Chloride (VC)	0.17	1.7
Xylenes, Total	10	NE
Sub-slab Soil Gas³		
Benzene	12	120
Ethylbenzene	36.7	NE
1,1-dichloroethene (DCE)	700	7,000

TABLE 3 (Continued)

**SCREENING AND ACTION LEVELS
SPORLAN VALVE PLANT #1 SITE, WASHINGTON, MISSOURI**

Contaminant of Concern	Residential Screening Level¹ (µg/m³)	Residential Action Level² (µg/m³)
1,2-DCE	NE	NE
Tetrachloroethene (PCE)	140	NE
Toluene	17,333	NE
Trichloroethene (TCE)	6.7	67
Vinyl Chloride (VC)	5.7	57
Xylenes, Total	333.3	NE

Notes:

¹ Residential Screening Levels were obtained from EPA's May 2016 Residential Air Regional Screening Levels, based on the lower of a 1×10^{-6} excess lifetime cancer risk or a non-cancer hazard quotient of 0.1.

² Residential Action Levels were obtained from EPA's May 2016 Residential Air Regional Screening Levels, based on the lower of a 1×10^{-5} excess lifetime cancer risk or a non-cancer hazard quotient of 1.

³ Sub-slab soil gas screening and action levels were calculated by use of an attenuation factor of 0.03.

NE Screening level or action level not established for this compound

µg/m³ Micrograms per cubic meter

The OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015) suggests using multiple lines of evidence to assess the vapor intrusion pathway for a site. Analytical results from the properties sampled by EPA and START were evaluated according to the following scenario criteria:

Scenario 1 – Results from all sub-slab soil gas and indoor air samples are below recommended action levels. The residential property likely has undergone no VI impact from a release.

Recommendation is for quarterly sampling for a minimum of four sampling events. Fourteen of the properties sampled during the November/December 2016 VIA sampling event met this criterion (Property IDs 118, 120, 121, 130, 131, 165, 175, 177, 178, 182, 186, 192, 195, and 213). All eight properties sampled during the March 2017 VIA sampling event met this criterion (Property IDs 121, 130, 131, 132, 165, 186, 195, and 213).

Scenario 2 – Concentrations of an analyte from all sub-slab soil gas samples are below the recommended action level, and a result for that analyte from an indoor air sample is above the recommended action level. An indoor contaminant source may exist at the residence. Recommendations are that the owner attempt identification (and removal) of indoor sources, and that quarterly sampling continues for a minimum of four sampling events. Two of the properties sampled during the November/December 2016 VIA sampling event met this criterion (Property IDs 193 and 194). No properties met this criterion during the March 2017 sampling effort.

Scenario 3 – Results from sub-slab soil gas and indoor air samples are both above recommended action levels. This satisfies multiple lines of evidence criteria and indicates a completed VI exposure pathway; the property is recommended for VMS installation by the PRP’s contractor. One property sampled during the November/December 2016 VIA sampling event met this criterion (Property ID 181). No properties met this criterion during the March 2017 sampling effort.

Scenario 4 – Concentration of an analyte from a sub-slab soil gas sample is above the recommended action level, and results for that analyte from all indoor air samples are below the recommended action level. Threat of future VI into the residence exists and qualifies the property for removal action. The property is recommended for VMS installation. One property met this criterion (Property ID 179) during the November/December 2016 sampling effort. No properties met this criterion during the March 2017 sampling effort.

4.2 PROPERTY-SPECIFIC DATA EVALUATIONS

The following discussion summarizes analytical VI data obtained at each property. Based on the preceding criteria, each property qualifies for either a removal action, which requires installation of a VMS, or continued quarterly sampling.

Property ID 118 – During the November/December 2016 sampling event, the sub-slab soil gas sample contained TCE at 4.0 µg/m³, below the screening and action levels. TCE was not detected in the indoor air samples. The basement and first-floor indoor air samples exceeded screening levels for benzene and ethylbenzene of 0.36 µg/m³ and 1.1 µg/m³, respectively. Highest concentrations of benzene and ethylbenzene were in the first-floor sample, at 2.7 and 2.2 µg/m³, respectively. These results indicate a likely indoor source of benzene and ethylbenzene. This property is next to Property ID 117, where TCE exceeded the sub-slab soil gas action level and a VMS was installed. The designated preemptive mitigation inclusion zone for VMS-eligible properties had been expanded to include properties within an approximate 100-foot step-out zone from TCE-impacted properties. Therefore, this property was already scheduled for VIA sampling by the PRP; however, START was unaware of the expanded inclusion zone at the time of the second quarterly sampling. The property was deemed eligible for preemptive VMS installation by the PRP, which occurred on November 16, 2016. Performance sampling occurred approximately 30 days later. No further sampling on behalf of EPA is currently planned.

Property ID 120 – During the November/December 2016 sampling event, the sub-slab soil gas sample could not be collected due to saturated soil conditions under the slab. A sample of indoor air was collected within the cellar, which has a connected crawl-space. TCE was not detected in the indoor air samples, including the sample from the cellar. Samples from the cellar, laundry room, and living room exceeded screening levels for benzene. The highest concentration of benzene was in the cellar sample, at 1.3 $\mu\text{g}/\text{m}^3$. This property is next to Property ID 124, where TCE exceeded the sub-slab soil gas action level and a VMS was installed. The designated preemptive mitigation inclusion zone for VMS-eligible properties had been expanded to include properties within an approximate 100-foot step-out zone from TCE-impacted properties. Therefore, this property was deemed eligible for preemptive VMS installation by the PRP, which occurred on March 15, 2017. Performance sampling was scheduled to occur approximately 30 days later. No further sampling on behalf of EPA is currently planned.

Property ID 121 – During the November/December 2016 sampling event, the sub-slab soil gas samples (sub-slab east and sub-slab southwest) were both non-detect for TCE at < 0.58 and <0.46 $\mu\text{g}/\text{m}^3$, respectively, both below the screening level. TCE was not detected in the indoor air samples. Basement and dining room indoor air samples exceeded the screening level for benzene, both at 1.4 $\mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

During the March 2017 sampling event, the sub-slab soil gas samples (sub-slab east and sub-slab southwest) were both non-detect for TCE at < 0.27 $\mu\text{g}/\text{m}^3$, both below the screening level. TCE was not detected in the indoor air samples. The basement and dining room indoor air samples exceeded the screening level for benzene, with the highest concentration at 1.2 $\mu\text{g}/\text{m}^3$ in the basement indoor air sample. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 130 – During the November/December 2016 sampling event, the sub-slab soil gas sample exceeded the screening level for TCE. TCE was detected at 7.2 $\mu\text{g}/\text{m}^3$, above the screening level of 6.7 $\mu\text{g}/\text{m}^3$ and below the action level of 67 $\mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and kitchen indoor air samples exceeded the screening level for benzene, detected at 1.3 and 1.4 $\mu\text{g}/\text{m}^3$, respectively. Benzene was not detected in the sub-slab soil gas sample above the screening level. Ethylbenzene was detected in the basement and kitchen indoor air samples above the screening level.

at 2.7 and 6.0 $\mu\text{g}/\text{m}^3$, respectively. Xylenes were detected in the basement and kitchen indoor air samples above the screening level of 10 $\mu\text{g}/\text{m}^3$, at 15.2 and 31.9 $\mu\text{g}/\text{m}^3$, respectively. These results indicate a likely indoor source of benzene, ethylbenzene, and xylenes. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

For the March 2017 sampling event, the sub-slab soil gas sample contained TCE at 2.1 $\mu\text{g}/\text{m}^3$, below the screening level. TCE was not detected in the indoor air samples. The basement and kitchen indoor air samples exceeded the screening level for benzene, with the highest concentration at 1.7 $\mu\text{g}/\text{m}^3$ in the kitchen air sample. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 131 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at < 1.0 $\mu\text{g}/\text{m}^3$. TCE was detected in the kitchen indoor air sample at 0.88 $\mu\text{g}/\text{m}^3$, above the screening level of 0.2 $\mu\text{g}/\text{m}^3$, but below the action level of 2.0 $\mu\text{g}/\text{m}^3$. The basement and kitchen indoor air samples exceeded the screening level for ethylbenzene at 3.8 and 4.1 $\mu\text{g}/\text{m}^3$, respectively. The basement and kitchen indoor air samples also exceeded the screening levels for PCE (4.2 $\mu\text{g}/\text{m}^3$), benzene, and xylenes. The kitchen sample contained the highest concentrations, except for benzene. PCE was detected at 7.6 $\mu\text{g}/\text{m}^3$ and xylenes at 17.5 $\mu\text{g}/\text{m}^3$ in the kitchen sample. Highest concentration of benzene was detected at 1.4 $\mu\text{g}/\text{m}^3$ in the basement sample. These results indicate a likely indoor source of PCE, benzene, ethylbenzene, and xylenes. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

During the March 2017 sampling event, the sub-slab soil gas sample contained TCE at 19 $\mu\text{g}/\text{m}^3$, below the action level, but above the screening level. TCE was detected in all of the indoor air samples above the screening level, with the highest concentration detected at 0.67 $\mu\text{g}/\text{m}^3$ in the basement sample. The indoor air screening level for TCE is 0.2 $\mu\text{g}/\text{m}^3$. PCE was detected above the screening level in the kitchen indoor air sample at 4.8 $\mu\text{g}/\text{m}^3$. The basement, basement duplicate, and kitchen indoor air samples exceeded the screening level for benzene, with the highest concentration at 1.3 $\mu\text{g}/\text{m}^3$ in the basement indoor air sample. These results indicate a likely indoor source of benzene. Toluene, ethylbenzene, and xylenes (part of the analytical suite for previous sampling) had been removed from the list of analytes, per EPA's request. Although the action level for TCE was not exceeded in the sub-slab soil gas sample, the

level detected was almost three times above the screening level. Because no action level was exceeded in the sub-slab soil gas sample or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 132 – During the March 2017 sampling event, the sub-slab and sub-slab duplicate soil gas samples were non-detect for TCE, both at $< 0.27 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and kitchen indoor air samples exceeded the screening level for benzene. The kitchen indoor air sample contained the highest benzene concentration at $2.2 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 144 – The property was not sampled in November/December 2016 or March 2017. This property is next to Property ID 117, where TCE exceeded the sub-slab soil gas action level and a VMS was installed. Due to this scenario, the PRP expanded the designated inclusion zone for VMS to properties within approximately 100 feet of a TCE-impacted property for preemptive mitigation of potential for VI into those structures. Therefore, this property was deemed eligible for preemptive VMS installation by the PRP, which occurred on November 2, 2016. Performance sampling was scheduled to occur approximately 30 days later. No further sampling on behalf of EPA is currently planned.

Property ID 165 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.55 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and living area indoor air samples exceeded the screening level for benzene, both at $1.0 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 175 – During the March 2017 sampling event, the sub-slab and sub-slab duplicate soil gas samples were non-detect for TCE, both at $< 0.27 \mu\text{g}/\text{m}^3$. TCE exceeded the screening level in the basement indoor air sample at $0.39 \mu\text{g}/\text{m}^3$. The basement and living area indoor air samples exceeded the screening level for benzene, with highest concentration at $1.4 \mu\text{g}/\text{m}^3$ in the basement sample. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 175 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.28 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The

basement and kitchen indoor air samples exceeded the screening level for benzene. The basement indoor air sample contained the highest benzene concentration at $0.76 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. Therefore, EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 177 – During the November/December 2016 sampling event, the sub-slab soil gas sample contained TCE at $0.33 \mu\text{g}/\text{m}^3$, below the screening level. TCE exceeded the screening level in the basement duplicate indoor air sample at $0.36 \mu\text{g}/\text{m}^3$. The basement, basement duplicate, and first-floor indoor air samples exceeded the screening levels for benzene and ethylbenzene. The basement and first-floor indoor air samples contained the highest benzene concentrations, both at $2.3 \mu\text{g}/\text{m}^3$. The first-floor indoor air sample contained the highest ethylbenzene concentration at $1.5 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene and ethylbenzene. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 178 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.47 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and first-floor indoor air samples exceeded the screening level for benzene. The first-floor indoor air sample contained the highest benzene concentration at $1.0 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 179 – During the November/December 2016 sampling event, the sub-slab soil gas sample exceeded the action level for TCE. TCE was detected at $2,100 \mu\text{g}/\text{m}^3$, above the action level of $67 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and living room indoor air samples exceeded the screening level for benzene, detected at 1.7 and $1.5 \mu\text{g}/\text{m}^3$, respectively. Ethylbenzene was detected in the living room indoor air sample above the screening level at $1.1 \mu\text{g}/\text{m}^3$. Benzene and ethylbenzene were not detected in the sub-slab soil gas sample above the screening levels of 12 and $36.7 \mu\text{g}/\text{m}^3$, respectively, indicating a likely indoor source. Because the action level for TCE was

exceeded in the sub-slab soil gas sample, the property was deemed eligible for preemptive VMS installation by the PRP, which occurred on February 16, 2017. Performance sampling was scheduled to occur approximately 30 days later. No further sampling on behalf of EPA is currently planned.

Property ID 181 – **The sub-slab soil gas sample and indoor air samples exceeded the action level for TCE.** TCE was detected at 4,800 and 4,700 $\mu\text{g}/\text{m}^3$ in the sub-slab soil gas and duplicate samples, respectively. TCE was detected in both the basement and kitchen indoor air samples at 6.7 and 4.0 $\mu\text{g}/\text{m}^3$, respectively. The action level for indoor air is 2 $\mu\text{g}/\text{m}^3$. PCE was also elevated in the sub-slab sample at 44 and 42 $\mu\text{g}/\text{m}^3$, but below the screening level of 140 $\mu\text{g}/\text{m}^3$. Elevated PCE levels could indicate that degradation of TCE is occurring. The basement and kitchen indoor air samples exceeded the screening level for benzene, detected at 1.5 and 2.1 $\mu\text{g}/\text{m}^3$, respectively. Ethylbenzene was detected in both indoor air samples above the screening level reported in both samples at 1.6 $\mu\text{g}/\text{m}^3$. PCE was detected in the kitchen indoor air sample at 5.2 $\mu\text{g}/\text{m}^3$, which exceeded the indoor air screening level of 4.2 $\mu\text{g}/\text{m}^3$. Benzene, ethylbenzene, and PCE were not detected in the sub-slab soil gas samples above the screening levels of 12, 36.7, and 140 $\mu\text{g}/\text{m}^3$, respectively, indicating a potential indoor source; however, PCE in the indoor air could be due to degradation of TCE from the subsurface source. Because the action level for TCE was exceeded in both sub-slab soil gas and indoor air samples, this satisfies multiple lines of evidence criteria and indicates a completed VI exposure pathway; the property was eligible for VMS installation by the PRP's contractor, which occurred on February 15, 2017. Performance sampling was scheduled to occur approximately 30 days later. No further sampling on behalf of EPA is currently planned.

Property ID 182 – **During the November/December 2016 sampling event, the crawlspace sample contained TCE at 0.28 $\mu\text{g}/\text{m}^3$, below the screening level.** TCE was not detected in the indoor air sample. The first-floor indoor air sample exceeded the screening level for benzene, detected at 1.4 $\mu\text{g}/\text{m}^3$. This result indicates a likely indoor source of benzene. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 186 – **During the November/December 2016 sampling event, the sub-slab soil gas sample contained TCE at 1.6 $\mu\text{g}/\text{m}^3$, below the screening level.** TCE was not detected in the indoor air samples. The basement and kitchen indoor air samples exceeded the screening level for benzene. The kitchen indoor air sample contained the highest benzene concentration at 2.0 $\mu\text{g}/\text{m}^3$. These results indicate

a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

During the March 2017 sampling event, the sub-slab soil gas sample contained TCE at 0.63 $\mu\text{g}/\text{m}^3$, below the screening level. TCE was detected above the screening level in both indoor air samples, at 0.35 $\mu\text{g}/\text{m}^3$ in the basement and 0.29 $\mu\text{g}/\text{m}^3$ in the kitchen. Benzene was detected above the screening level in both indoor air samples, both at 1.5 $\mu\text{g}/\text{m}^3$. Toluene, ethylbenzene, and xylenes (part of the analytical suite for previous sampling) were removed from the list of analytes, per EPA's request. An outdoor ambient air sample collected at this property was non-detect for TCE at $< 0.27 \mu\text{g}/\text{m}^3$. Benzene was detected in the outdoor sample above the screening level at 1.2 $\mu\text{g}/\text{m}^3$ —likely due to exhaust from vehicular traffic. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 192 – During the November/December 2016 sampling event, the sub-slab soil gas sample contained TCE at 0.41 $\mu\text{g}/\text{m}^3$, below the screening level. TCE was not detected in the indoor air samples. The basement and first-floor indoor air samples exceeded the screening level for benzene. Highest concentration was detected in the first-floor air sample at 1.4 $\mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene. An outdoor ambient air sample at this property was non-detect for TCE at $< 0.27 \mu\text{g}/\text{m}^3$. Benzene was detected in the outdoor sample above the screening level at 1.2 $\mu\text{g}/\text{m}^3$ —likely due to exhaust from vehicular traffic. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. Also, the property is near monitoring well (MW) MW-11, where groundwater has been impacted by TCE. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 193 – During the November/December 2016 sampling event, the east and west sub-slab soil gas samples were non-detect for TCE, both at $< 1.4 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The kitchen indoor air sample exceeded the action level for benzene at 4.7 $\mu\text{g}/\text{m}^3$. The kitchen indoor air sample also exceeded the screening levels for ethylbenzene and xylenes, detected at 4.9 and 21.9 $\mu\text{g}/\text{m}^3$, respectively. In addition, the basement indoor air sample exceeded the screening levels for VC (0.17 $\mu\text{g}/\text{m}^3$), benzene, and ethylbenzene, detected at 0.19, 2.0, and 1.8 $\mu\text{g}/\text{m}^3$, respectively. Based on these results, an indoor source of VC and BTEX is suspected. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. Also, the property is near MW-11, where

groundwater has been impacted by TCE. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 194 – During the November/December 2016 sampling event, the sub-slab soil gas sample contained TCE at $0.36 \mu\text{g}/\text{m}^3$, below the screening level. TCE was non-detect in the indoor air samples as well. The basement indoor air sample exceeded the screening level for benzene, detected at $2.2 \mu\text{g}/\text{m}^3$. The first-floor indoor air sample exceeded the action level for benzene, detected at $5.4 \mu\text{g}/\text{m}^3$. Also, the first-floor indoor air sample exceeded the screening level for ethylbenzene, detected at $1.5 \mu\text{g}/\text{m}^3$. Based on these results, an indoor source of benzene and ethylbenzene is suspected. EPA subsequently determined that this property was within the expanded designated inclusion zone for VMS eligibility due to its location within approximately 100 feet of a TCE-impacted property. Also, the property is near MW-11, where groundwater has been impacted by TCE. EPA directed START to exclude sampling at this property in March 2017. No further sampling on behalf of EPA was planned at that time.

Property ID 195 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.27 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and first-floor indoor air samples exceeded the screening level for benzene. The kitchen indoor air sample contained the highest benzene concentration at $0.83 \mu\text{g}/\text{m}^3$. In addition, the kitchen indoor air sample exceeded the screening level for ethylbenzene, detected at $1.4 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene and ethylbenzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

During the March 2017 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.27 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. Benzene was detected above the screening level in both indoor air samples, with the highest concentration in the basement sample at $1.3 \mu\text{g}/\text{m}^3$. Toluene, ethylbenzene, and xylenes (part of the analytical suite for previous sampling) were removed from the list of analytes, per EPA's request. These results indicate a likely indoor source of benzene. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

Property ID 213 – During the November/December 2016 sampling event, the sub-slab soil gas sample was non-detect for TCE at $< 0.60 \mu\text{g}/\text{m}^3$. TCE was not detected in the indoor air samples. The basement and living area indoor air samples exceeded screening levels for benzene and ethylbenzene. The living area indoor air sample contained the highest benzene concentration at $2.2 \mu\text{g}/\text{m}^3$. The living area

indoor air sample also contained the highest ethylbenzene concentration at $2.3 \mu\text{g}/\text{m}^3$. In addition, the first-floor living area exceeded the screening level for xylenes, detected at $10 \mu\text{g}/\text{m}^3$. These results indicate a likely indoor source of benzene, ethylbenzene, and xylenes. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

During the March 2017 sampling event, the sub-slab soil gas sample contained TCE at $0.63 \mu\text{g}/\text{m}^3$, below the screening level. TCE was detected above the screening level in both indoor air samples, at $0.71 \mu\text{g}/\text{m}^3$ in the basement and $0.46 \mu\text{g}/\text{m}^3$ in the living area. Benzene was detected above the screening level in both indoor air samples, with the highest concentration in the living area sample at $1.3 \mu\text{g}/\text{m}^3$. Toluene, ethylbenzene, and xylenes (part of the analytical suite for previous sampling) were removed from the list of analytes, per EPA's request. An outdoor ambient air sample at this property was non-detect for TCE at $< 0.27 \mu\text{g}/\text{m}^3$. Benzene was detected in the outdoor sample at $0.86 \mu\text{g}/\text{m}^3$, below the screening level. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

5.0 SUMMARY AND CONCLUSIONS

The Sporlan Valve Plant #1 site, at 611 E. Seventh Street, consists of an unoccupied 4-acre parcel near downtown Washington, Franklin County, Missouri. From 1939 until approximately 2005, the site was the location of the Sporlan Valve Plant #1, where valves for the refrigeration industry were produced. Operations at the plant included plating, degreasing, machining, brazing, assembling, and testing. Degreasing operations included use of the chlorinated solvent TCE. The site also includes a TCE-contaminated groundwater plume that has migrated beyond the property boundaries. The property is now owned by SV Land LLC, and is surrounded by a residential neighborhood.

The full extent of the TCE plume has not yet been delineated, but based on groundwater monitoring results, it is known to extend to the south toward Eighth Street and to the east toward MacArthur Street, beneath residential structures. VI sampling conducted in 2015 by MDNR as part of an SI/RSE identified concentrations of TCE that exceeded indoor air screening levels at three residential properties. During that sampling event, sub-slab soil gas concentrations of TCE exceeding screening levels were identified at four residential properties. MDNR subsequently referred the site to EPA Region 7 for removal action consideration in August 2015.

EPA reviewed available data from the 2015 MDNR SI/RSE and other sources, and determined that a complete subsurface VI to indoor air exposure pathway existed at one property. The report acknowledged that quarterly monitoring had not occurred at properties assessed for VI, and recommended quarterly VI monitoring at targeted residential properties and completion of plume delineation (horizontal and vertical extents). The review also resulted in installation of sub-slab depressurization VMSs by a PRP contractor at two impacted residences (Property IDs 153 and 176).

In July 2016, under CERCLA authority, EPA issued a UAO to SV Land LLC, requiring removal action to abate real and potential endangerment to the public and environment from release of hazardous substances at the site. Under the Order, SV Land LLC retained the services of Ramboll Environ to oversee installation of VMSs in selected homes around the site perimeter within a Tier 1 inclusion zone. Initially, this activity was planned to focus on the 11 properties nearest to the south site perimeter along East Seventh Street (Property IDs 145 to 155). Performance sampling of indoor air at these properties 30 days after the VMSs had been installed was also required. These activities began in fall 2016.

In conjunction with the enforcement action, EPA tasked Tetra Tech START to conduct quarterly VI sampling as part of an ISA to assess additional residences around the site perimeter, beyond the PRP's

initial Tier 1 inclusion zone. The first quarterly sampling occurred in August 2016; results from that sampling effort were summarized in a previous report.

Second Quarterly Sampling Summary

Tetra Tech START conducted the second quarterly VI sampling at selected residences in November/December 2016, when sub-slab soil gas, crawlspace air, indoor air, and outdoor ambient air samples were collected at 18 residences on East Sixth Street, East Eighth Street, and MacArthur Street. All samples were analyzed by the EPA Region 7 laboratory for TCE, PCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, VC, and BTEX.

TCE was detected above the sub-slab soil gas action level of 67 $\mu\text{g}/\text{m}^3$ at two properties (Property IDs 179 and 181), at 2,100 and 4,800 $\mu\text{g}/\text{m}^3$, respectively. At one property, a complete VI exposure pathway for TCE was identified; a potentially complete VI exposure pathway for TCE was identified at the other property. Both of those properties were deemed eligible for VMS installation by the PRP. The systems were installed at both properties in February 2017. Followup performance sampling of indoor air at these properties was conducted by the PRP contractor. No TCE was detected in the followup indoor air samples at property ID 179. TCE was detected in the followup indoor air samples at property ID 181 above the screening level—but at concentrations significantly reduced since installation of the VMS, and below the action level. No further sampling on behalf of EPA is planned at these two properties.

At one property (Property ID 144), no follow-up (second) quarterly sampling occurred due to its location within the expanded inclusion zone for VMS eligibility within approximately 100 feet from a TCE-impacted property. Also, a VMS had been installed at this property by a PRP contractor, and performance sampling was scheduled. No further sampling on behalf of EPA is planned here.

At nine properties (Property IDs 118, 120, 175, 177, 178, 182, 192, 193, and 194), sub-slab soil gas, crawlspace, or cellar air samples all contained TCE below the screening level. No follow-up (third) quarterly sampling is planned by START at these properties due to their locations within the expanded inclusion zone (within 100 feet from TCE-impacted properties) and/or proximities to a TCE-impacted monitoring well.

PCE was detected above the screening level in two indoor air samples at Property ID 131. In addition, BTEX compounds were detected. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events. No other chlorinated VOCs were detected above an indoor air screening level. At one property

(Property ID 130), TCE was detected above the sub-slab screening level, but below the action level. In addition, BTEX was detected in the sub-slab sample but below screening levels. BTEX concentrations above the screening levels were present in the indoor air samples, and thus an indoor contaminant source of BTEX was suspected; the property is recommended for continued quarterly sampling for a minimum of four events.

BTEX was also detected in numerous other samples. Benzene was detected at or above the indoor air screening level of $0.36 \mu\text{g}/\text{m}^3$ in 39 samples at all 18 properties, ranging from 0.67 to $5.4 \mu\text{g}/\text{m}^3$. Two samples contained benzene above the indoor air action level of $3.6 \mu\text{g}/\text{m}^3$. Toluene was detected at all properties ranging from 2 to $26 \mu\text{g}/\text{m}^3$, but below the indoor air screening level of $520 \mu\text{g}/\text{m}^3$.

Ethylbenzene was detected in 18 samples at 10 properties at or above the indoor air screening level of $1.1 \mu\text{g}/\text{m}^3$, ranging from 1.1 to $6.0 \mu\text{g}/\text{m}^3$. Total xylenes were detected at or above the indoor air screening level of $10 \mu\text{g}/\text{m}^3$ in six samples at four properties, ranging from 10 to $31.9 \mu\text{g}/\text{m}^3$. BTEX was not detected above screening levels in any of the sub-slab samples collected during this sampling effort, indicating an indoor air contaminant source at each of those properties.

Third Quarterly Sampling Summary

Tetra Tech START conducted the third quarterly VI sampling at selected residences in March 2017. Sub-slab soil gas, indoor air, and outdoor ambient air samples were collected during this effort at eight residences on East Sixth Street, East Eighth Street, and MacArthur Street. All samples were analyzed by the EPA Region 7 laboratory for TCE, PCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, VC, and benzene. Toluene, ethylbenzene, and xylenes (part of the analytical suite for previous sampling) were removed from the list of requested analytes for the third quarterly sampling effort, per EPA's request.

TCE was not detected above the sub-slab soil gas action level at any of the properties. TCE was detected in three sub-slab samples at three properties, but below the screening level. TCE was detected in five indoor air samples at three properties above the screening level. PCE was detected in five sub-slab samples at five properties, but below the screening level. No other chlorinated VOCs were detected.

At one property (Property ID 131), sub-slab TCE was detected at $19 \mu\text{g}/\text{m}^3$, above the sub-slab screening level of $6.7 \mu\text{g}/\text{m}^3$. TCE was detected above the screening level in all indoor air samples collected at that property, with the highest concentration detected at $0.67 \mu\text{g}/\text{m}^3$ in the basement air sample. The indoor air screening level for TCE is $0.2 \mu\text{g}/\text{m}^3$. Also, PCE was detected in the kitchen indoor air sample above the screening level at $4.8 \mu\text{g}/\text{m}^3$. The basement, basement duplicate, and kitchen indoor air samples also

exceeded the screening level for benzene, with the highest concentration at 1.3 $\mu\text{g}/\text{m}^3$ in the basement indoor air sample. These results indicated a likely indoor source of benzene. Although the action level for TCE was not exceeded in the sub-slab soil gas sample, the level detected was almost three times above the screening level. Because no action level was exceeded in the sub-slab soil gas or indoor air samples, the property is recommended for continued quarterly sampling for a minimum of four events.

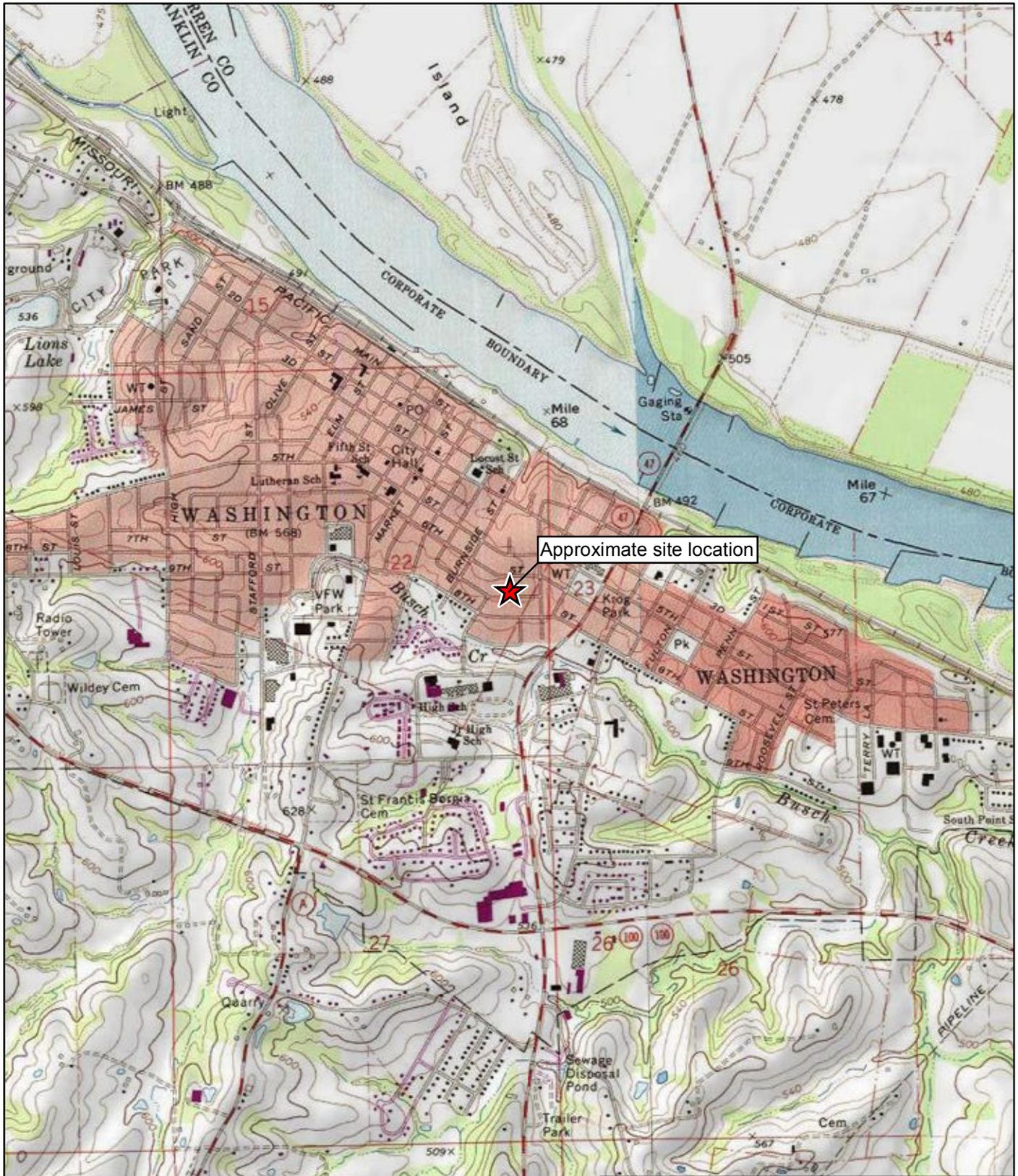
In addition, benzene was detected in numerous samples. Benzene was detected at or above the indoor air screening level of 0.36 $\mu\text{g}/\text{m}^3$ in 17 samples at all eight properties, ranging from 0.71 to 2.2 $\mu\text{g}/\text{m}^3$. No samples contained benzene above the indoor air action level of 3.6 $\mu\text{g}/\text{m}^3$. Benzene was not detected above the screening level in any of the sub-slab samples collected during this sampling effort, indicating an indoor air contaminant source at each of those properties.

6.0 REFERENCES

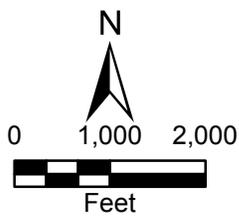
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APPENDIX A

FIGURES



Approximate site location



Sporlan Valve Plant 1 Site
 611 East Seventh Street
 Washington, Missouri

Figure 1
 Site Location Map



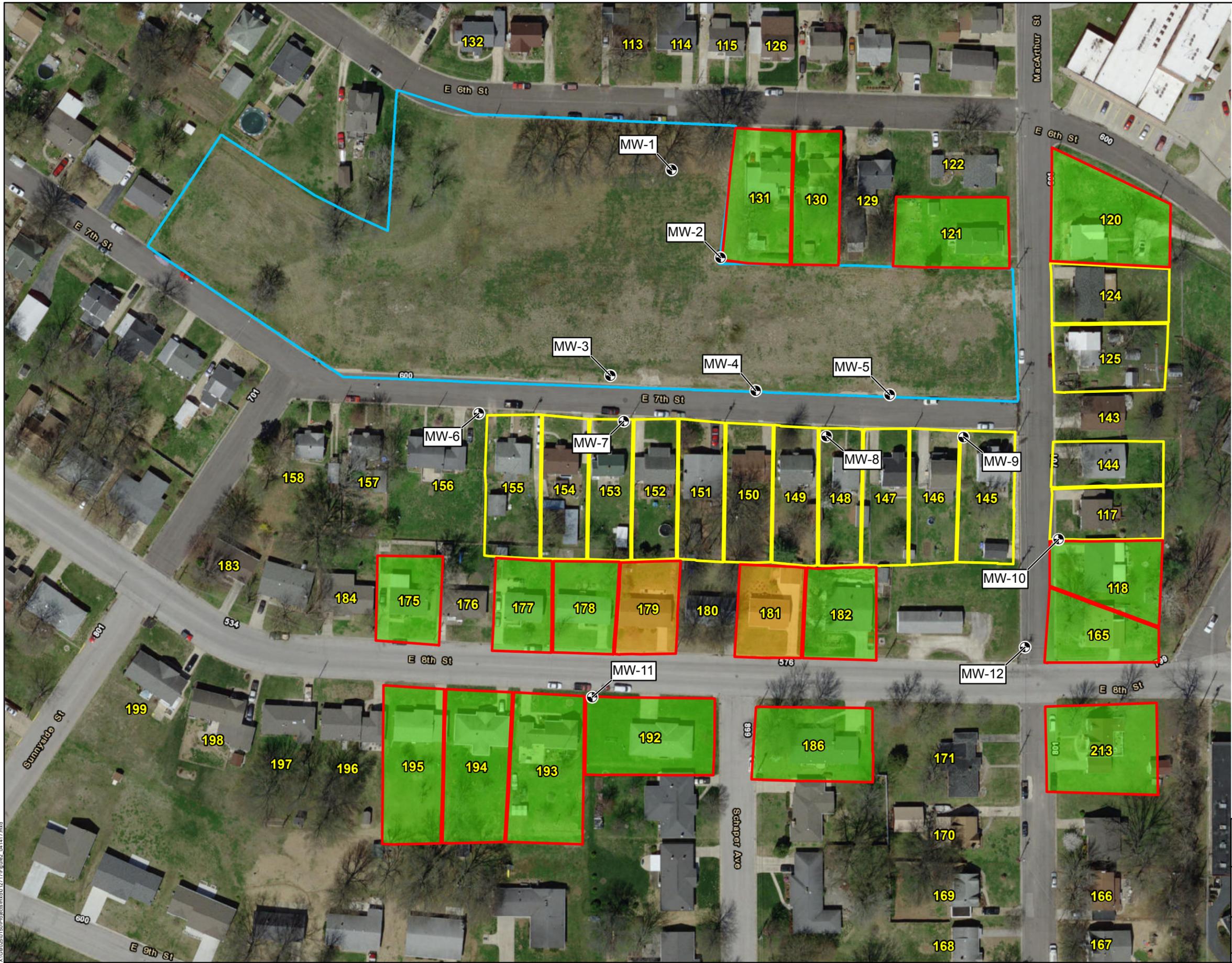
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Source: USGS 7.5 Minute Topo Quad: Washington East, MO, 1972; Washington West, MO, 1973

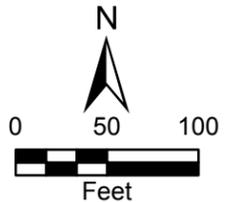
Date: 7/7/2016

Drawn By: Clayton Hayes

Project No: X9025.16.0150.000



- Legend**
- Monitoring well location
 - Property included in the VI assessment sampling program as of November/December 2016
 - Property sampled in November/December 2016 where sub-slab TCE vapors exceeded the action level, warranting VMS installation
 - Property sampled November/December 2016
 - Property where VMS has been installed, or is planned to be installed by the PRP
 - Sporlan Valve Site property boundary
 - 125** Property location identification
 - PRP Potentially responsible party
 - TCE Trichloroethene
 - VI Vapor Intrusion
 - VMS Vapor mitigation system



Source: ESRI, ArcGIS Online Maps, World Imagery, 2015

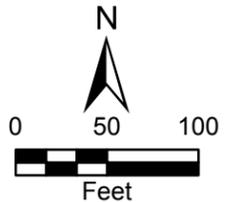
Sporlan Valve Plant #1 Site
 611 East Seventh Street
 Washington, Missouri
Figure 2
 Site Layout and Sampling Locations Map
 November/December 2016



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- Legend**
-  Monitoring well location
 -  Property included in the VI assessment sampling program as of March 2017
 -  Property removed from EPA sampling program and included in VMS inclusion zone
 -  Property sampled in March 2017 where sub-slab and indoor TCE vapors exceeded 3 times the screening levels
 -  Property sampled March 2017
 -  Property where VMS has been installed, or is planned to be installed by the PRP
 -  Sporlan Valve Site property boundary
 - 125** Property location identification
 - EPA U.S. Environmental Protection Agency
 - PRP Potentially responsible party
 - TCE Trichloroethene
 - VI Vapor Intrusion
 - VMS Vapor mitigation system



Source: ESRI, ArcGIS Online Maps, World Imagery, 2015

Sporlan Valve Plant #1 Site
 611 East Seventh Street
 Washington, Missouri

Figure 3
 Site Layout and Sampling Locations Map
 March 2017



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APPENDIX B

**SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLE RESULTS SUMMARY
TABLE FOR NOVEMBER/DECEMBER 2016 SAMPLING EVENT**

Vapor Intrusion (VI) Assessment Sample Results Summary – Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 1 of 8)

Property ID 120 - [REDACTED]											
Sampling Date 12/06/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
120-1	Cellar Area IA	< 0.32	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	3.8	< 0.88	< 2.68
120-2	Laundry Room IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.98	2.0	< 0.88	< 2.68
120-3	Living Room IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.79	1.4	< 0.88	< 2.68
Property ID 121 - [REDACTED]											
Sampling Date 11/30/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
121-1	Subslab East	< 0.58	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.1	5.7	< 0.88	3.49
121-2	Subslab Southwest	< 0.46	0.35	< 0.20	< 0.20	< 0.20	< 0.13	1.0	12	0.92	4.0
121-3	Basement IA	< 0.35	< 0.34	< 0.20	< 0.20	< 0.20	0.14	1.4	5.0	< 0.88	2.98
121-4	Dining Room IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.4	6.7	0.89	3.37
Property ID 165 - [REDACTED]											
Sampling Date 12/01/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
165-1	Subslab	< 0.55	1.2	< 0.20	< 0.20	< 0.20	< 0.13	0.82	4.1	0.98	5.3
165-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.0	4.6	< 0.88	< 2.68
165-3	Living Area IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.0	6.1	< 0.88	2.69
Property ID 179 - [REDACTED]											
Sampling Date 11/12/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
179-1	Subslab	2,100	6.7	< 0.20	< 0.20	36	< 0.13	2.3	16	2.7	12.8
179-2	Basement IA	< 1.2	0.37	< 0.20	< 0.20	0.22	0.18	1.7	4.7	< 0.88	3.1
179-3	Living Room IA	< 0.66	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.5	7.5	1.1	4.4
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 2 of 8)

Property ID 181 - [REDACTED]											
Sampling Date 11/08/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
181-1	Subslab	4,800	44	< 0.20	0.21	0.59	< 0.13	0.85	2.9	2.8	15.4
181-1D	Subslab Dup	4,700	42	< 0.20	0.21	0.60	< 0.13	0.88	3.2	3.2	16.9
181-2	Basement IA	6.7	0.80	< 0.20	< 0.20	< 0.20	< 0.13	1.5	6.6	1.6	6.3
181-3	Kitchen/Living Area IA	4.0	5.2	< 0.20	< 0.20	< 0.20	< 0.13	2.1	31	1.6	4.9
Property ID 213 - [REDACTED]											
Sampling Date 11/30/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
213-1	Subslab	< 0.60	4.8	< 0.20	< 0.20	< 0.20	< 0.13	0.90	25	1.6	8.7
213-2	Basement IA	< 0.30	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	21	1.2	4.9
213-3	Living Area IA	< 0.28	0.46	< 0.20	< 0.20	< 0.20	< 0.13	2.2	25	2.3	10
Property ID 118 - [REDACTED]											
Sampling Date 08/06/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
118-1	Subslab	2.4	4.5	< 0.16	< 0.16	< 0.16	< 0.16	0.76	6.6	3.2	17
118-2	Basement IA	< 0.16	0.2	< 0.16	< 0.16	< 0.16	< 0.16	2.1	31	1.9	5.5
118-3	1st Floor IA	< 0.17	0.21	< 0.17	< 0.17	< 0.17	< 0.17	2.4	34	1.8	5.2
118-3D	1st Floor IA Dup	< 0.15	0.21	< 0.15	< 0.15	< 0.15	< 0.15	2.1	32	1.8	5.1
Sampling Date 11/08/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
118-1	Subslab	4.0	5.6	< 0.20	< 0.20	< 0.20	< 0.13	0.50	3.7	3.9	21
118-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	2.5	21	2.1	7.2
118-3	1st Floor IA	< 0.27	0.38	< 0.20	< 0.20	< 0.20	< 0.13	2.7	25	2.2	7.5
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 3 of 8)

Property ID 130 - [REDACTED]											
Sampling Date 08/06/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
130-1	Subslab	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	1.6	20	< 2.0	3.7
130-2	Basement IA	0.29	0.14	< 0.13	< 0.13	< 0.13	< 0.13	1.9	23	1.5	5.3
130-3	Kitchen IA	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	1.6	20	< 1.6	3.6
Sampling Date 12/06/ 2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
130-1	Subslab	7.2	4.2	< 0.20	< 0.20	< 0.20	< 0.13	0.27	1.6	< 0.88	5.5
130-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	17	2.7	15.2
130-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.4	27	6.0	31.9
Property ID 131 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
131-1	Subslab	0.78	18	< 0.49	< 0.49	< 0.49	< 0.49	11	54	18	76
131-2	Basement IA	< 0.17	28	0.43	< 0.17	< 0.17	< 0.17	1.4	76	13	55
131-3	Kitchen IA	< 0.18	31	0.58	< 0.18	< 0.18	< 0.18	1.5	73	15	62
131-4	Backyard OA	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	0.45	1.2	< 0.75	< 0.75
Sampling Date 12/02/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
131-1	Subslab	< 1.0	4.7	< 0.20	< 0.20	< 0.20	< 0.13	1.4	27	2.4	10.4
131-2	Basement IA	< 0.81	7.0	< 0.20	< 0.20	< 0.20	< 0.13	1.4	24	3.8	16.1
131-3	Kitchen IA	0.88	7.6	< 0.20	< 0.20	< 0.20	< 0.13	0.81	26	4.1	17.5
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

DCE = Dichloroethene

IA = Indoor air sample

NE = Not established

Dup = Duplicate sample

PCE = Tetrachloroethene also known as perchloroethene

TCE = Trichloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 4 of 8)

Property ID 175 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
175-1*	Subslab	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
175-2	Basement IA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	0.7	6.9	1.4	4.2
175-3	1st Floor IA	< 0.12	2.6	< 0.12	< 0.12	< 0.12	< 0.12	0.64	6.5	1.3	4.1
Sampling Date 11/12/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
175-1	Subslab	< 0.28	0.77	< 0.20	< 0.20	< 0.20	< 0.13	0.77	1.4	< 0.88	< 2.68
175-2	Basement IA	< 0.27	1.2	< 0.20	< 0.20	< 0.20	< 0.13	0.76	4.4	< 0.88	< 2.68
175-3	1st Floor IA	< 0.27	, 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.70	5.7	< 0.88	< 2.68
Property ID 177 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
177-1	Subslab	< 0.14	21	< 0.14	< 0.14	< 0.14	< 0.14	0.74	13	4.6	21.8
177-2	Basement IA	2.4	4.6	0.15	< 0.14	< 0.14	< 0.14	1.7	60	2.2	7.8
177-3	1st Floor IA	< 0.15	4.7	< 0.15	< 0.15	< 0.15	< 0.15	1.5	51	1.8	6
Sampling Date 11/08/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
177-1	Subslab	0.33	21	< 0.20	< 0.20	< 0.20	< 0.13	0.48	3.9	3.0	17.3
177-2	Basement IA	< 0.41	2.2	< 0.20	< 0.20	< 0.20	< 0.13	2.3	58	1.2	3.9
177-2D	Basement Dup	0.36	2.2	< 0.20	< 0.20	< 0.20	< 0.13	2.2	59	1.3	4.2
177-3	1st Floor IA	< 0.33	2.2	< 0.20	< 0.20	< 0.20	< 0.13	2.3	39	1.5	4.9
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

* Sample # 175-1 - Subslab sample was not collected due to saturated soil conditions under the slab; NC=Not Collected

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

OA = Outdoor air

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 5 of 8)

Property ID 178 - [REDACTED]											
Sampling Date 08/05/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
178-1	Subslab	0.3	2.7	< 0.18	< 0.18	0.27	< 0.18	0.92	16	8.9	42
178-2	Basement IA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	1.4	4.3	< 0.78	1.3
178-3	1st Floor IA	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	1.5	4.5	< 0.92	1.3
Sampling Date 11/12/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
178-1	Subslab	< 0.47	1.6	< 0.20	< 0.20	< 0.20	< 0.13	0.51	3.0	1.8	10.3
178-2	Basement IA	< 0.28	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.82	3.6	< 0.88	< 2.68
178-3	1st Floor IA	< 0.29	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.0	12	< 0.88	3.11
Property ID 182 - [REDACTED]											
Sampling Date 08/03/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
182-1	Crawlspace	< 0.15	2.4	< 0.15	< 0.15	< 0.15	< 0.15	8.7	50	8.6	38
182-2	1st Floor IA	< 0.12	3	0.13	< 0.12	< 0.12	< 0.12	8	47	8.1	35.4
182-3	Backyard OA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	0.4	0.9	< 0.79	< 0.79
Sampling Date 11/08/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
182-1	Crawlspace	0.28	0.89	< 0.20	< 0.20	< 0.20	< 0.13	1.2	5.9	0.89	3.26
182-2	1st Floor IA	< 0.27	1.6	< 0.20	< 0.20	< 0.20	< 0.13	1.4	9.7	0.94	3.5
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 6 of 8)

Property ID 186 - [REDACTED]											
Sampling Date 08/06/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
186-1	Subslab	< 0.13	1.3	< 0.13	< 0.13	< 0.13	< 0.13	1.5	9.7	3.5	18.2
186-2	Basement IA	0.18	0.62	< 0.17	< 0.17	0.19	< 0.17	3.2	18	2.4	11.4
186-2D	Basement Dup	< 0.22	0.37	< 0.22	< 0.22	< 0.22	< 0.22	3.3	17	2.4	10.8
186-3	Kitchen IA	11	0.29	< 0.13	< 0.13	0.15	< 0.13	3.2	16	2.3	11
Sampling Date 12/02/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
186-1	Subslab	1.6	1.7	27	< 0.20	< 0.20	0.76	0.61	2.9	1.6	9.6
186-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.1	5.3	< 0.88	< 2.68
186-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	2.0	6.8	< 0.88	3.08
Property ID 192 - [REDACTED]											
Sampling Date 08/13/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
192-1	Subslab	0.4	1.3	< 0.12	< 0.12	< 0.12	< 0.12	1.4	16	4.1	21.5
192-2	Basement IA	< 0.16	0.7	< 0.16	< 0.16	< 0.16	< 0.16	0.95	10	1.6	5.3
192-3	1st Floor IA	< 0.16	0.71	< 0.16	< 0.16	< 0.16	< 0.16	1	18	3.1	9.6
Sampling Date 11/08/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
192-1	Subslab	0.41	9.8	< 0.20	< 0.20	< 0.20	< 0.13	0.45	5.3	5.2	25.4
192-2	Basement IA	< 0.27	0.46	< 0.20	< 0.20	< 0.20	< 0.13	1.2	3.1	< 0.88	< 2.68
192-3	1st Floor IA	< 0.27	1.0	< 0.20	< 0.20	< 0.20	< 0.13	1.4	4.7	< 0.88	2.69
192-4	Backyard OA	< 0.27	0.41	< 0.20	< 0.20	< 0.20	< 0.13	1.2	2.9	< 0.88	< 2.68
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 7 of 8)

Property ID 193 - [REDACTED]											
Sampling Date 08/03/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
193-1	Subslab West	0.56	2.3	< 0.17	< 0.17	< 0.17	< 0.17	2.7	31	8.4	37.8
193-2	Subslab East	0.4	2.9	< 0.16	< 0.16	< 0.16	< 0.16	2.2	28	9.7	42
193-3	Basement IA	3	2.5	0.34	< 0.18	< 0.18	0.18	17	170	18	82
193-4	Kitchen IA	2.4	2.5	0.32	< 0.16	< 0.16	< 0.16	20	170	19	86
Sampling Date 12/01/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
193-1	Subslab West	< 1.4	0.45	< 0.20	< 0.20	0.22	< 0.13	2.1	21	2.2	10.2
193-2	Subslab East	< 1.8	0.50	< 0.20	< 0.20	0.26	< 0.13	2.0	20	2.1	9.8
193-3	Basement IA	< 2.0	0.54	< 0.20	< 0.20	0.31	0.19	2.0	20	1.8	8.5
193-4	Kitchen IA	< 1.1	0.80	< 0.20	< 0.20	0.21	< 0.13	4.7	34	4.9	21.9
Property ID 194 - [REDACTED]											
Sampling Date 08/13/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
194-1	Subslab	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 12	< 12	< 12
194-2	Basement IA	< 0.13	0.54	< 0.13	< 0.13	< 0.13	< 0.13	9.7	22	3	11.1
194-3	1st Floor IA	< 0.13	0.52	< 0.13	< 0.13	< 0.13	< 0.13	7.5	19	2.5	9.1
194-4	Backyard OA	< 0.16	0.16	< 0.16	< 0.16	< 0.16	< 0.16	0.43	1.3	< 0.79	< 0.79
Sampling Date 12/02/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
194-1	Subslab	0.36	0.83	< 0.20	< 0.20	< 0.20	< 0.13	0.25	0.92	< 0.88	< 2.68
194-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	2.2	4.8	< 0.88	< 2.68
194-3	1st Floor IA	< 0.27	0.35	< 0.20	< 0.20	< 0.20	< 0.13	5.4	15	1.5	5.0
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November/December 2016 (Page 8 of 8)

Property ID 195 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
195-1	Subslab	< 0.15	4.7	< 0.15	< 0.15	< 0.15	< 0.15	0.35	5.7	4.3	20.4
195-1D	Subslab Dup	< 0.14	4.6	< 0.14	< 0.14	< 0.14	< 0.14	0.39	7.5	4.1	19.4
195-2	Basement IA	0.47	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	0.67	3.4	0.94	2.92
195-3	Kitchen IA	0.19	0.18	< 0.13	< 0.13	< 0.13	< 0.13	0.85	4.8	1.3	4.98
Sampling Date 11/12/2016		Chemical Constituent Concentrations in micrograms per cubic meter (µg/m ³)									
Sample #	Location	TCE	PCE	1,1 DCE	trans -1,2 DCE	cis -1,2 DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
195-1	Subslab	< 0.27	3.8	< 0.20	< 0.20	< 0.20	< 0.13	0.41	1.7	1.7	9.7
195-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.69	2.0	< 0.88	3.24
195-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.83	3.9	1.4	6.0
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample results in light blue shaded cells exceed the screening level; pink shaded cells exceed the action level

Sample result with < symbol in the cell indicates compound was not present above the minimum detection level (MDL), or non-detect (ND)

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene also known as perchloroethene

VC = Vinyl chloride

APPENDIX C

**SUB-SLAB SOIL GAS, INDOOR AIR, AND AMBIENT AIR SAMPLE RESULTS SUMMARY
TABLE FOR MARCH 2017 SAMPLING EVENT**

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 1 of 7)

Vapor Intrusion (VI) Assessment Sample Results for Property ID 132 - [REDACTED]											
Sampling Date 03/16/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
132-1	Subslab	< 0.27	0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.33	NA	NA	NA
132-1D	Subslab Dup	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.30	NA	NA	NA
132-2	Basement IA	< 0.27	0.58	< 0.20	< 0.20	< 0.20	< 0.13	1.6	NA	NA	NA
132-3	Kitchen IA	< 0.27	0.73	< 0.20	< 0.20	< 0.20	< 0.13	2.2	NA	NA	NA
Property ID 121 - [REDACTED]											
Sampling Date 11/30/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
121-1	Subslab East	< 0.58	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.1	5.7	< 0.88	3.49
121-2	Subslab Southwest	< 0.46	0.35	< 0.20	< 0.20	< 0.20	< 0.13	1.0	12	0.92	4.0
121-3	Basement IA	< 0.35	< 0.34	< 0.20	< 0.20	< 0.20	0.14	1.4	5.0	< 0.88	2.98
121-4	Dining Room IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.4	6.7	0.89	3.37
Sampling Date 03/09/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
121-1	Subslab East	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.96	NA	NA	NA
121-2	Subslab Southwest	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.2	NA	NA	NA
121-3	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.2	NA	NA	NA
121-4	Dining Room IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.1	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

NA=Not analyzed

OA=Outdoor air

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

VC = Vinyl chloride

µg/m³ = Micrograms per cubic meter

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 2 of 7)

Property ID 130 - [REDACTED]											
Sampling Date 08/06/2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
130-1	Subslab	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	< 0.41	1.6	20	< 2.0	3.7
130-2	Basement IA	0.29	0.14	< 0.13	< 0.13	< 0.13	< 0.13	1.9	23	1.5	5.3
130-3	Kitchen IA	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	1.6	20	< 1.6	3.6
Sampling Date 12/06/ 2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
130-1	Subslab	7.2	4.2	< 0.20	< 0.20	< 0.20	< 0.13	0.27	1.6	< 0.88	5.5
130-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	17	2.7	15.2
130-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.4	27	6.0	31.9
Sampling Date 03/16/ 2017		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
130-1	Subslab	2.1	4.7	< 0.20	< 0.20	< 0.20	< 0.13	0.40	NA	NA	NA
130-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.6	NA	NA	NA
130-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.7	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

Subslab = Soil gas sample from under the basement floor slab

IA = Indoor air sample

Dup = Duplicate sample

TCE = Trichloroethene

NA=Not analyzed

OA=Outdoor air

DCE = Dichloroethene

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

VC = Vinyl chloride

µg/m³ = Micrograms per cubic meter

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 3 of 7)

Property ID 131 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
131-1	Subslab	0.78	18	< 0.49	< 0.49	< 0.49	< 0.49	11	54	18	76
131-2	Basement IA	< 0.17	28	0.43	< 0.17	< 0.17	< 0.17	1.4	76	13	55
131-3	Kitchen IA	< 0.18	31	0.58	< 0.18	< 0.18	< 0.18	1.5	73	15	62
131-4	Backyard OA	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	0.45	1.2	< 0.75	< 0.75
Sampling Date 12/02/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
131-1	Subslab	< 1.0	4.7	< 0.20	< 0.20	< 0.20	< 0.13	1.4	27	2.4	10.4
131-2	Basement IA	< 0.81	7.0	< 0.20	< 0.20	< 0.20	< 0.13	1.4	24	3.8	16.1
131-3	Kitchen IA	0.88	7.6	< 0.20	< 0.20	< 0.20	< 0.13	0.81	26	4.1	17.5
Sampling Date 03/16/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
131-1	Subslab	19	1.5	< 0.20	< 0.20	< 0.20	< 0.13	0.32	NA	NA	NA
131-2	Basement IA	0.67	4.1	< 0.20	< 0.20	< 0.20	< 0.13	1.3	NA	NA	NA
131-2D	Basement Dup	0.66	3.9	< 0.20	< 0.20	< 0.20	< 0.13	1.2	NA	NA	NA
131-3	Kitchen IA	0.62	4.8	< 0.20	< 0.20	< 0.20	< 0.13	1.2	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

Subslab = Soil gas sample from under the basement floor slab

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TCE = Trichloroethene

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PCE = Tetrachloroethene, also known as perchloroethene

VC = Vinyl chloride

µg/m³ = Micrograms per cubic meter

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 4 of 7)

Property ID 165 - [REDACTED]											
Sampling Date 12/01/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
165-1	Subslab	< 0.55	1.2	< 0.20	< 0.20	< 0.20	< 0.13	0.82	4.1	0.98	5.3
165-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.0	4.6	< 0.88	< 2.68
165-3	Living Area IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.0	6.1	< 0.88	2.69
Sampling Date 03/09/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
165-1	Subslab	< 0.27	1.1	< 0.20	< 0.20	< 0.20	< 0.13	0.46	NA	NA	NA
165-1D	Subslab Dup	< 0.27	1.1	< 0.20	< 0.20	< 0.20	< 0.13	0.48	NA	NA	NA
165-2	Basement IA	0.39	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.4	NA	NA	NA
165-3	Living Area IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

Subslab = Soil gas sample from under the basement floor slab

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PCE = Tetrachloroethene, also known as perchloroethene

VC = Vinyl chloride

µg/m³ = Micrograms per cubic meter

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 5 of 7)

Property ID 186 - [REDACTED]											
Sampling Date 08/06/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
186-1	Subslab	< 0.13	1.3	< 0.13	< 0.13	< 0.13	< 0.13	1.5	9.7	3.5	18.2
186-2	Basement IA	0.18	0.62	< 0.17	< 0.17	0.19	< 0.17	3.2	18	2.4	11.4
186-2D	Basement Dup	< 0.22	0.37	< 0.22	< 0.22	< 0.22	< 0.22	3.3	17	2.4	10.8
186-3	Kitchen IA	11	0.29	< 0.13	< 0.13	0.15	< 0.13	3.2	16	2.3	11
Sampling Date 12/02/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
186-1	Subslab	1.6	1.7	27	< 0.20	< 0.20	0.76	0.61	2.9	1.6	9.6
186-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.1	5.3	< 0.88	< 2.68
186-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	2.0	6.8	< 0.88	3.08
Sampling Date 03/16/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
186-1	Subslab	0.63	3.5	< 0.20	< 0.20	< 0.20	< 0.13	0.42	NA	NA	NA
186-2	Basement IA	0.35	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.5	NA	NA	NA
186-3	Kitchen IA	0.29	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.5	NA	NA	NA
186-4	Sideyard OA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.2	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

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Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 6 of 7)

Property ID 195 - [REDACTED]											
Sampling Date 08/04/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
195-1	Subslab	< 0.15	4.7	< 0.15	< 0.15	< 0.15	< 0.15	0.35	5.7	4.3	20.4
195-1D	Subslab Dup	< 0.14	4.6	< 0.14	< 0.14	< 0.14	< 0.14	0.39	7.5	4.1	19.4
195-2	Basement IA	0.47	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	0.67	3.4	0.94	2.92
195-3	Kitchen IA	0.19	0.18	< 0.13	< 0.13	< 0.13	< 0.13	0.85	4.8	1.3	4.98
Sampling Date 11/12/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
195-1	Subslab	< 0.27	3.8	< 0.20	< 0.20	< 0.20	< 0.13	0.41	1.7	1.7	9.7
195-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.69	2.0	< 0.88	3.24
195-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.83	3.9	1.4	6.0
Sampling Date 03/09/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
195-1	Subslab	< 0.27	1.8	< 0.20	< 0.20	< 0.20	< 0.13	0.17	NA	NA	NA
195-2	Basement IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	NA	NA	NA
195-3	Kitchen IA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.99	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

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µg/m³ = Micrograms per cubic meter

Vapor Intrusion (VI) Assessment Sample Results Summary - Sporlan Valve Plant #1 Site, Washington, MO March 2017 (Page 7 of 7)

Property ID 213 - [REDACTED]											
Sampling Date 11/30/2016		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
213-1	Subslab	< 0.60	4.8	< 0.20	< 0.20	< 0.20	< 0.13	0.90	25	1.6	8.7
213-2	Basement IA	< 0.30	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	21	1.2	4.9
213-3	Living Area IA	< 0.28	0.46	< 0.20	< 0.20	< 0.20	< 0.13	2.2	25	2.3	10
Sampling Date 03/09/2017		Chemical Constituent Concentrations (µg/m ³)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
213-1	Subslab	0.63	0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.75	NA	NA	NA
213-2	Basement IA	0.71	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.71	NA	NA	NA
213-3	Living Area IA	0.46	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	1.3	NA	NA	NA
213-4	Backyard OA	< 0.27	< 0.34	< 0.20	< 0.20	< 0.20	< 0.13	0.86	NA	NA	NA
Subslab Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3
Subslab Action Level		67	NE	7,000	NE	NE	57	120	NE	NE	NE
Indoor Air Screening Level		0.2	4.2	21	NE	NE	0.17	0.36	520	1.1	10
Indoor Air Action Level		2	NE	210	NE	NE	1.7	3.6	NE	NE	NE

Notes:

Sample result in light blue-shaded cell exceeds the screening level; result in pink-shaded cell exceeds the action level.

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VC = Vinyl chloride

µg/m³ = Micrograms per cubic meter

APPENDIX D

ANALYTICAL RESULTS FOR ASRS 7280 AND 7368

**United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101**

Date: 01/30/2017

Subject: Transmittal of Sample Analysis Results for ASR #: 7280

Project ID: HSB7A800

Project Description: Sporlan Valve Company

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: J. Heath Smith
SUPR/AERR/RRSS

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: J. Heath Smith**Org:** SUPR/AERR/R
RSS**Phone:** 636-326-4726**Project ID:** HSB7A800**Project Desc:** Sporlan Valve Company**Location:** Washington**State:** Missouri**Program:** Superfund**Site Name:** SPORLAN VALVE COMPANY - Site
Evaluation/Disposition**Site ID:** B7A8 **Site OU:** 00**GPRA PRC:** 303DD2**Purpose:** Site Cleanup Support

Plant #1 site VI assessment sampling round 2.

Per THankins' email dated 9/15/16 for ASR #7257: New work is in support of a removal assessment. PRC=303DC6 & this is not a brownfields site & cleared the 303DC6 with the EPA PM (HS).

Per THankin's email dated 10/6/16: Site now 303DD2.

Explanation of Codes, Units and Qualifiers used on this report**Sample QC Codes:** QC Codes identify the type of sample for quality control purpose.**Units:** Specific units in which results are reported.

___ = Field Sample

ug/m3 = Micrograms per Cubic Meter

FB = Field Blank

FD = Field Duplicate

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

U = The analyte was not detected at or above the reporting limit.

J = The identification of the analyte is acceptable; the reported value is an estimate.

ASR Number: 7280**Sample Information Summary****01/30/2017****Project ID: HSB7A800****Project Desc: Sporlan Valve Company**

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 - ___		Air	SVP1-SS-20161108-181-1		11/07/2016	13:48	11/08/2016	13:01	11/10/2016
1 - FD		Air	SVP1-SS-20161108-181-1D		11/07/2016	13:48	11/08/2016	13:01	11/10/2016
2 - ___		Air	SVP1-IA-20161108-181-2		11/07/2016	13:49	11/08/2016	13:00	11/10/2016
3 - ___		Air	SVP1-IA-20161108-181-3		11/07/2016	13:52	11/08/2016	13:04	11/10/2016
4 - ___		Air	SVP1-CS-20161108-182-1		11/07/2016	14:03	11/08/2016	12:50	11/10/2016
5 - ___		Air	SVP1-IA-20161108-182-2		11/07/2016	14:04	11/08/2016	12:51	11/10/2016
6 - ___		Air	SVP1-SS-20161108-118-1		11/07/2016	15:20	11/08/2016	14:10	11/10/2016
7 - ___		Air	SVP1-IA-20161108-118-2		11/07/2016	15:21	11/08/2016	14:12	11/10/2016
8 - ___		Air	SVP1-IA-20161108-118-3		11/07/2016	15:22	11/08/2016	14:13	11/10/2016
9 - ___		Air	SVP1-SS-20161108-192-1		11/07/2016	15:53	11/08/2016	14:32	11/10/2016
10 - ___		Air	SVP1-IA-20161108-192-2		11/07/2016	15:54	11/08/2016	14:33	11/10/2016
11 - ___		Air	SVP1-IA-20161108-192-3		11/07/2016	15:56	11/08/2016	14:36	11/10/2016
12 - ___		Air	SVP1-OA-20161108-192-4		11/07/2016	15:59	11/08/2016	14:37	11/10/2016
13 - ___		Air	SVP1-SS-20161108-177-1		11/07/2016	16:24	11/08/2016	15:09	11/10/2016
14 - ___		Air	SVP1-IA-20161108-177-2		11/07/2016	16:22	11/08/2016	15:11	11/10/2016
14 - FD		Air	SVP1-IA-20161108-177-2D		11/07/2016	16:22	11/08/2016	15:11	11/10/2016
15 - ___		Air	SVP1-IA-20161108-177-3		11/07/2016	16:20	11/08/2016	15:13	11/10/2016
16 - ___		Air	SVP1-SS-20161112-178-1		11/11/2016	09:29	11/12/2016	08:51	11/15/2016
17 - ___		Air	SVP1-IA-20161112-178-2		11/11/2016	09:31	11/12/2016	08:53	11/15/2016
18 - ___		Air	SVP1-IA-20161112-178-3		11/11/2016	09:32	11/12/2016	08:54	11/15/2016
19 - ___		Air	SVP1-SS-20161112-179-1		11/11/2016	10:54	11/12/2016	09:20	11/15/2016
20 - ___		Air	SVP1-IA-20161112-179-2		11/11/2016	10:55	11/12/2016	09:22	11/15/2016
21 - ___		Air	SVP1-IA-20161112-179-3		11/11/2016	11:15	11/12/2016	09:26	11/15/2016
22 - ___		Air	SVP1-SS-20161112-175-1		11/11/2016	12:00	11/12/2016	11:16	11/15/2016
23 - ___		Air	SVP1-IA-20161112-175-2		11/11/2016	12:01	11/12/2016	11:19	11/15/2016
24 - ___		Air	SVP1-IA-20161112-175-3		11/11/2016	12:02	11/12/2016	11:20	11/15/2016
25 - ___		Air	SVP1-SS-20161112-195-1		11/11/2016	13:43	11/12/2016	11:23	11/15/2016
26 - ___		Air	SVP1-IA-20161112-195-2		11/11/2016	13:47	11/12/2016	11:26	11/15/2016
27 - ___		Air	SVP1-IA-20161112-195-3		11/11/2016	13:52	11/12/2016	11:27	11/15/2016
28 - ___		Air	SVP1-SS-20161130-121-1		11/29/2016	09:23	11/30/2016	08:51	12/02/2016
29 - ___		Air	SVP1-SS-20161130-121-2		11/29/2016	09:25	11/30/2016	08:54	12/02/2016
30 - ___		Air	SVP1-SS-20161130-121-3		11/29/2016	09:26	11/30/2016	08:57	12/02/2016
31 - ___		Air	SVP1-SS-20161130-121-4		11/29/2016	09:28	11/30/2016	09:00	12/02/2016
32 - ___		Air	SVP1-SS-20161130-213-1		11/29/2016	11:00	11/30/2016	10:51	12/02/2016
33 - ___		Air	SVP1-IA-20161130-213-2		11/29/2016	11:02	11/30/2016	10:53	12/02/2016
34 - ___		Air	SVP1-IA-20161130-213-3		11/29/2016	11:05	11/30/2016	10:55	12/02/2016
35 - ___		Air	SVP1-SS-20161201-165-1		11/30/2016	11:45	12/01/2016	11:25	12/02/2016
36 - ___		Air	SVP1-IA-20161201-165-2		11/30/2016	11:46	12/01/2016	11:26	12/02/2016
37 - ___		Air	SVP1-IA-20161201-165-3		11/30/2016	11:52	12/01/2016	11:28	12/02/2016
38 - ___		Air	SVP1-SS-20161201-193-1		11/30/2016	14:04	12/01/2016	13:30	12/02/2016
39 - ___		Air	SVP1-SS-20161201-193-2		11/30/2016	14:06	12/01/2016	13:31	12/02/2016
40 - ___		Air	SVP1-IA-20161201-193-3		11/30/2016	14:07	12/01/2016	13:32	12/02/2016
41 - ___		Air	SVP1-IA-20161201-193-4		11/30/2016	14:08	12/01/2016	13:34	12/02/2016
42 - ___		Air	SVP1-SS-20161202-131-1		12/01/2016	09:22	12/02/2016	08:25	12/07/2016

ASR Number: 7280

Sample Information Summary

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
43 - ___		Air	SVP1-IA-20161202-131-2		12/01/2016	09:24	12/02/2016	08:27	12/07/2016
44 - ___		Air	SVP1-IA-20161202-131-3		12/01/2016	09:20	12/02/2016	08:28	12/07/2016
45 - ___		Air	SVP1-SS-20161202-194-1		12/01/2016	10:11	12/02/2016	09:51	12/07/2016
46 - ___		Air	SVP1-IA-20161202-194-2		12/01/2016	10:12	12/02/2016	09:52	12/07/2016
47 - ___		Air	SVP1-IA-20161202-194-3		12/01/2016	10:13	12/02/2016	09:53	12/07/2016
48 - ___		Air	SVP1-SS-20161202-186-1		12/01/2016	12:13	12/02/2016	11:29	12/07/2016
49 - ___		Air	SVP1-IA-20161202-186-2		12/01/2016	12:13	12/02/2016	11:30	12/07/2016
50 - ___		Air	SVP1-IA-20161202-186-3		12/01/2016	12:15	12/02/2016	11:32	12/07/2016
51 - ___		Air	SVP1-SS-20161205-130-1		12/05/2016	06:42	12/06/2016	06:28	12/07/2016
52 - ___		Air	SVP1-IA-20161205-130-2		12/05/2016	06:43	12/06/2016	06:29	12/07/2016
53 - ___		Air	SVP1-IA-20161205-130-3		12/05/2016	06:55	12/06/2016	06:31	12/07/2016
54 - ___		Air	SVP1-IA-20161205-120-1		12/05/2016	08:12	12/06/2016	07:52	12/07/2016
55 - ___		Air	SVP1-IA-20161205-120-2		12/05/2016	08:03	12/06/2016	07:52	12/07/2016
56 - ___		Air	SVP1-IA-20161205-120-3		12/05/2016	08:08	12/06/2016	07:51	12/07/2016
57 - FB		Air	SVP1-FB-20161205-000-0		12/06/2016	08:04			12/07/2016

Analysis Comments About Results For This Analysis

1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3230.4H

Samples:	1-__	1-FD	2-__	3-__	4-__	5-__	6-__
	7-__	8-__	9-__	10-__	11-__	12-__	13-__
	14-__	14-FD	15-__	16-__	17-__	18-__	19-__
	20-__	21-__	22-__	23-__	24-__	25-__	26-__
	27-__	28-__	29-__	30-__	31-__	32-__	33-__
	34-__	35-__	36-__	37-__	38-__	39-__	40-__
	41-__	42-__	43-__	44-__	45-__	46-__	47-__
	48-__	49-__	50-__	51-__	52-__	53-__	54-__
	55-__	56-__	57-FB				

Comments:

Vinyl Chloride (87%, 88 - 116%) was UJ-coded in samples 7280-(1 - 4, 6 - 13) and 7280-1-FD. The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analyte in the laboratory control sample. The actual reporting limit for this analyte may be higher than the reported value.

Vinyl Chloride was J-coded in sample 7280-5. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to the low recovery of the analyte in the laboratory control sample. The concentration may be higher than the reported value.

1,1-Dichloroethene (83%, 84 - 113%) was UJ-coded in samples 7280-(1 - 13) and 7280-1-FD. The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analyte in the laboratory control sample. The actual reporting limit for this analyte may be higher than the reported value.

1,1-Dichloroethene (82%, 84 - 113%) was UJ-coded in samples 7280-(14 - 29) and 7280-14-FD. The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analyte in the laboratory control sample. The actual reporting limit for this analyte may be higher than the reported value.

1,1-Dichloroethene (82%, 84 - 113%) was UJ-coded in samples 7280-(30 - 43). The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analyte in the laboratory control sample. The actual reporting limit for this analyte may be higher than the reported value.

1,1-Dichloroethene (81%, 84 - 113%) was UJ-coded in samples 7280-(44 - 47, 49). The analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analyte in the laboratory control sample. The actual reporting limit for this analyte may be higher than the reported value.

Analysis Comments About Results For This Analysis

value.

1,1-Dichloroethene was J-coded in sample 7280-48. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to the low recovery of the analyte in the laboratory control sample. The concentration may be higher than the reported value.

Vinyl Chloride (83%, 88 - 116%) and 1,1-Dichloroethene (79%, 84 - 113%) were UJ-coded in samples 7280-(50 - 56) and 7280-57-FB. The analytes were not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analytes in the laboratory control sample. The actual reporting limit for these analytes may be higher than the reported value.

Slight Trichloroethene contamination (0.36 µg/m³) was found in the laboratory method blank. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: 7280-14 (0.41 µg/m³), 7280-14-FD (0.36 µg/m³), 7280-15 (0.33 µg/m³), 7280-16 (0.47 µg/m³), 7280-17 (0.28 µg/m³), 7280-18 (0.29 µg/m³), 7280-20 (1.2 µg/m³), 7280-21 (0.66 µg/m³), 7280-22 (0.28 µg/m³), 7280-28 (0.58 µg/m³), and 7280-29 (0.46 µg/m³).

Slight Trichloroethene contamination (0.29 µg/m³) was found in the laboratory method blank. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: 7280-30 (0.35 µg/m³), 7280-32 (0.60 µg/m³), 7280-33 (0.30 µg/m³), 7280-34 (0.28 µg/m³), 7280-35 (0.55 µg/m³), 7280-38 (1.4 µg/m³), 7280-39 (1.8 µg/m³), 7280-40 (2.0 µg/m³), 7280-41 (1.1 µg/m³), 7280-42 (1.0 µg/m³), and 7280-43 (0.81 µg/m³).

Slight Trichloroethene contamination (0.39 µg/m³) was found in the laboratory method blank. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Sample affected was: 7280-54 (0.32 µg/m³).

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	1-__	1-FD	2-__	3-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.85	0.88	1.5	2.1
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.59	0.60	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.21	0.21	0.20 U	0.20 U
Ethyl Benzene	ug/m3	2.8	3.2	1.6	1.6
Tetrachloroethene	ug/m3	44	42	0.80	5.2
Toluene	ug/m3	2.9	3.2	6.6	31
Trichloroethene	ug/m3	4800	4700	6.7	4.0
Vinyl Chloride	ug/m3	0.13 UJ	0.13 UJ	0.13 UJ	0.13 UJ
m and/or p-Xylene	ug/m3	11	12	4.7	3.6
o-Xylene	ug/m3	4.4	4.9	1.6	1.3

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	4-__	5-__	6-__	7-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.2	1.4	0.50	2.5
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.89	0.94	3.9	2.1
Tetrachloroethene	ug/m3	0.89	1.6	5.6	0.34 U
Toluene	ug/m3	5.9	9.7	3.7	21
Trichloroethene	ug/m3	0.28	0.27 U	4.0	0.27 U
Vinyl Chloride	ug/m3	0.13 UJ	0.13 J	0.13 UJ	0.13 UJ
m and/or p-Xylene	ug/m3	2.3	2.4	15	5.1
o-Xylene	ug/m3	0.96	1.1	6.0	2.1

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	8-__	9-__	10-__	11-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	2.7	0.45	1.2	1.4
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	2.2	5.2	0.88 U	0.88 U
Tetrachloroethene	ug/m3	0.38	9.8	0.46	1.0
Toluene	ug/m3	25	5.3	3.1	4.7
Trichloroethene	ug/m3	0.27 U	0.41	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 UJ	0.13 UJ	0.13 UJ	0.13 UJ
m and/or p-Xylene	ug/m3	5.3	18	1.8 U	1.9
o-Xylene	ug/m3	2.2	7.4	0.88 U	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	12-__	13-__	14-__	14-FD
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.2	0.48	2.3	2.2
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.88 U	3.0	1.2	1.3
Tetrachloroethene	ug/m3	0.41	21	2.2	2.2
Toluene	ug/m3	2.9	3.9	58	59
Trichloroethene	ug/m3	0.27 U	0.33	0.41 U	0.36
Vinyl Chloride	ug/m3	0.13 UJ	0.13 UJ	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	1.8 U	12	2.8	3.1
o-Xylene	ug/m3	0.88 U	5.3	1.1	1.1

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	15-__	16-__	17-__	18-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	2.3	0.51	0.82	1.0
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	1.5	1.8	0.88 U	0.88 U
Tetrachloroethene	ug/m3	2.2	1.6	0.34 U	0.34 U
Toluene	ug/m3	39	3.0	3.6	12
Trichloroethene	ug/m3	0.33 U	0.47 U	0.28 U	0.29 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	3.6	7.2	1.8 U	2.2
o-Xylene	ug/m3	1.3	3.1	0.88 U	0.91

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	19-__	20-__	21-__	22-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	2.3	1.7	1.5	0.77
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	36	0.22	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	2.7	0.88 U	1.1	0.88 U
Tetrachloroethene	ug/m3	6.7	0.37	0.34 U	0.77
Toluene	ug/m3	16	4.7	7.5	1.4
Trichloroethene	ug/m3	2100	1.2 U	0.66 U	0.28 U
Vinyl Chloride	ug/m3	0.13 U	0.18	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	9.0	2.1	3.1	1.8 U
o-Xylene	ug/m3	3.8	1.0	1.3	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

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Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	23-__	24-__	25-__	26-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.76	0.70	0.41	0.69
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.88 U	0.88 U	1.7	0.88 U
Tetrachloroethene	ug/m3	1.2	0.82	3.8	0.34 U
Toluene	ug/m3	4.4	5.7	1.7	2.0
Trichloroethene	ug/m3	0.27 U	0.27 U	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	1.8 U	1.8 U	6.7	2.3
o-Xylene	ug/m3	0.88 U	0.88 U	3.0	0.94

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RLAB Approved Sample Analysis Results

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Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	27-__	28-__	29-__	30-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.83	1.1	1.0	1.4
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	1.4	0.88 U	0.92	0.88 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U	0.35	0.34 U
Toluene	ug/m3	3.9	5.7	12	5.0
Trichloroethene	ug/m3	0.27 U	0.58 U	0.46 U	0.35 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.14
m and/or p-Xylene	ug/m3	4.4	2.5	2.8	2.1
o-Xylene	ug/m3	1.6	0.99	1.2	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

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Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	31-__	32-__	33-__	34-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.4	0.90	1.3	2.2
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.89	1.6	1.2	2.3
Tetrachloroethene	ug/m3	0.34 U	4.8	0.34 U	0.46
Toluene	ug/m3	6.7	25	21	25
Trichloroethene	ug/m3	0.27 U	0.60 U	0.30 U	0.28 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	2.4	5.6	3.6	7.2
o-Xylene	ug/m3	0.97	3.1	1.3	2.8

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RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	35-__	36-__	37-__	38-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.82	1.0	1.0	2.1
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.22
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.98	0.88 U	0.88 U	2.2
Tetrachloroethene	ug/m3	1.2	0.34 U	0.34 U	0.45
Toluene	ug/m3	4.1	4.6	6.1	21
Trichloroethene	ug/m3	0.55 U	0.27 U	0.27 U	1.4 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	3.5	1.8 U	1.9	7.5
o-Xylene	ug/m3	1.8	0.88 U	0.88 U	2.7

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RLAB Approved Sample Analysis Results

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Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	39-__	40-__	41-__	42-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	2.0	2.0	4.7	1.4
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.26	0.31	0.21	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	2.1	1.8	4.9	2.4
Tetrachloroethene	ug/m3	0.50	0.54	0.80	4.7
Toluene	ug/m3	20	20	34	27
Trichloroethene	ug/m3	1.8 U	2.0 U	1.1 U	1.0 U
Vinyl Chloride	ug/m3	0.13 U	0.19	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	7.2	6.2	16	7.1
o-Xylene	ug/m3	2.6	2.3	5.9	3.3

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RLAB Approved Sample Analysis Results

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Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	43-__	44-__	45-__	46-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.4	0.81	0.25	2.2
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	3.8	4.1	0.88 U	0.88 U
Tetrachloroethene	ug/m3	7.0	7.6	0.83	0.34 U
Toluene	ug/m3	24	26	0.92	4.8
Trichloroethene	ug/m3	0.81 U	0.88	0.36	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U
m and/or p-Xylene	ug/m3	12	13	1.8 U	1.8 U
o-Xylene	ug/m3	4.1	4.5	0.88 U	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	47-__	48-__	49-__	50-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	5.4	0.61	1.1	2.0
1,1-Dichloroethene	ug/m3	0.20 UJ	27 J	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	1.5	1.6	0.88 U	0.88 U
Tetrachloroethene	ug/m3	0.35	1.7	0.34 U	0.34 U
Toluene	ug/m3	15	2.9	5.3	6.8
Trichloroethene	ug/m3	0.27 U	1.6	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.76	0.13 U	0.13 UJ
m and/or p-Xylene	ug/m3	3.9	6.3	1.8 U	2.2
o-Xylene	ug/m3	1.1	3.3	0.88 U	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	51-__	52-__	53-__	54-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.27	1.3	1.4	1.3
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.88 U	2.7	6.0	0.88 U
Tetrachloroethene	ug/m3	4.2	0.34 U	0.34 U	0.34 U
Toluene	ug/m3	1.6	17	27	3.8
Trichloroethene	ug/m3	7.2	0.27 U	0.27 U	0.32 U
Vinyl Chloride	ug/m3	0.13 UJ	0.13 UJ	0.13 UJ	0.13 UJ
m and/or p-Xylene	ug/m3	3.5	11	23	1.8 U
o-Xylene	ug/m3	2.0	4.2	8.9	0.88 U

ASR Number: 7280

RLAB Approved Sample Analysis Results

01/30/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	55-__	56-__	57-FB
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS				
Benzene	ug/m3	0.98	0.79	0.16 U
1,1-Dichloroethene	ug/m3	0.20 UJ	0.20 UJ	0.20 UJ
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U
Ethyl Benzene	ug/m3	0.88 U	0.88 U	0.88 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U	0.34 U
Toluene	ug/m3	2.0	1.4	0.76 U
Trichloroethene	ug/m3	0.27 U	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 UJ	0.13 UJ	0.13 UJ
m and/or p-Xylene	ug/m3	1.8 U	1.8 U	1.8 U
o-Xylene	ug/m3	0.88 U	0.88 U	0.88 U

**United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101**

Date: 04/04/2017

Subject: Transmittal of Sample Analysis Results for ASR #: 7368

Project ID: HSB7A800

Project Description: Sporlan Valve Company

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: J. Heath Smith
SUPR/AERR/RRSS

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: J. Heath Smith**Org:** SUPR/AERR/R
RSS**Phone:** 636-326-4726**Project ID:** HSB7A800**Project Desc:** Sporlan Valve Company**Location:** Washington**State:** Missouri**Program:** Superfund**Site Name:** SPORLAN VALVE COMPANY - Site
Evaluation/Disposition**Site ID:** B7A8 **Site OU:** 00**GPRA PRC:** 303DD2**Purpose:** Site Cleanup Support

Plant #1 site VI assessment sampling round 3.

Explanation of Codes, Units and Qualifiers used on this report**Sample QC Codes:** QC Codes identify the type of
sample for quality control purpose.**Units:** Specific units in which results are
reported.

___ = Field Sample

ug/m3 = Micrograms per Cubic Meter

FD = Field Duplicate

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information
on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

U = The analyte was not detected at or above the reporting limit.

ASR Number: 7368

Sample Information Summary

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 - ___		Air	SVP1-SS-20170308-165-1		03/08/2017	08:57	03/09/2017	08:34	03/10/2017
1 - FD		Air	SVP1-SS-20170308-165-1		03/08/2017	08:57	03/09/2017	08:34	03/10/2017
2 - ___		Air	SVP1-IA-20170308-165-2		03/08/2017	08:58	03/09/2017	08:37	03/10/2017
3 - ___		Air	SVP1-IA-20170308-165-3		03/08/2017	08:59	03/09/2017	08:38	03/10/2017
4 - ___		Air	SVP1-SS-20170308-195-1		03/08/2017	09:26	03/09/2017	09:22	03/10/2017
5 - ___		Air	SVP1-IA-20170308-195-2		03/08/2017	09:34	03/09/2017	09:23	03/10/2017
6 - ___		Air	SVP1-IA-20170308-195-3		03/08/2017	09:30	03/09/2017	09:24	03/10/2017
7 - ___		Air	SVP1-SS-20170308-121-1		03/08/2017	10:34	03/09/2017	10:08	03/10/2017
8 - ___		Air	SVP1-SS-20170308-121-2		03/08/2017	10:33	03/09/2017	10:09	03/10/2017
9 - ___		Air	SVP1-IA-20170308-121-3		03/08/2017	10:35	03/09/2017	10:09	03/10/2017
10 - ___		Air	SVP1-IA-20170308-121-4		03/08/2017	10:36	03/09/2017	10:10	03/10/2017
11 - ___		Air	SVP1-SS-20170308-213-1		03/08/2017	13:59	03/09/2017	13:48	03/10/2017
12 - ___		Air	SVP1-IA-20170308-213-2		03/08/2017	14:01	03/09/2017	13:50	03/10/2017
13 - ___		Air	SVP1-IA-20170308-213-3		03/08/2017	14:02	03/09/2017	13:51	03/10/2017
14 - ___		Air	SVP1-OA-20170308-213-4		03/08/2017	14:10	03/09/2017	13:30	03/10/2017
15 - ___		Air	SVP1-SS-20170315-130-1		03/15/2017	06:31	03/16/2017	06:24	03/20/2017
16 - ___		Air	SVP1-IA-20170315-130-2		03/15/2017	06:32	03/16/2017	06:30	03/20/2017
17 - ___		Air	SVP1-IA-20170315-130-3		03/15/2017	06:32	03/16/2017	06:36	03/20/2017
18 - ___		Air	SVP1-SS-20170315-131-1		03/15/2017	08:35	03/16/2017	07:15	03/20/2017
19 - ___		Air	SVP1-IA-20170315-131-2		03/15/2017	08:36	03/16/2017	07:18	03/20/2017
19 - FD		Air	SVP1-IA-20170315-131-2		03/15/2017	08:36	03/16/2017	07:18	03/20/2017
20 - ___		Air	SVP1-IA-20170315-131-3		03/15/2017	08:38	03/16/2017	07:19	03/20/2017
21 - ___		Air	SVP1-SS-20170315-132-1		03/15/2017	08:04	03/16/2017	08:05	03/20/2017
21 - FD		Air	SVP1-SS-20170315-132-1		03/15/2017	08:04	03/16/2017	08:05	03/20/2017
22 - ___		Air	SVP1-IA-20170315-132-2		03/15/2017	08:05	03/16/2017	08:06	03/20/2017
23 - ___		Air	SVP1-IA-20170315-132-3		03/15/2017	08:05	03/16/2017	08:08	03/20/2017
24 - ___		Air	SVP1-SS-20170315-186-1		03/15/2017	12:32	03/16/2017	12:47	03/20/2017
25 - ___		Air	SVP1-IA-20170315-186-2		03/15/2017	12:32	03/16/2017	12:48	03/20/2017
26 - ___		Air	SVP1-IA-20170315-186-3		03/15/2017	12:33	03/16/2017	12:49	03/20/2017
27 - ___		Air	SVP1-OA-20170315-186-4		03/15/2017	12:35	03/16/2017	12:49	03/20/2017

Analysis Comments About Results For This Analysis

1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3230.4H

Samples: 1-__ 1-FD 2-__ 3-__ 4-__ 5-__ 6-__
7-__ 8-__ 9-__ 10-__ 11-__ 12-__ 13-__
14-__ 15-__ 16-__ 17-__ 18-__ 19-__ 19-FD
20-__ 21-__ 21-FD 22-__ 23-__ 24-__ 25-__
26-__ 27-__

Comments:

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	1-__	1-FD	2-__	3-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.46	0.48	1.4	1.3
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	1.1	1.1	0.34 U	0.34 U
Trichloroethene	ug/m3	0.27 U	0.27 U	0.39	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	4-__	5-__	6-__	7-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.17	1.3	0.99	0.96
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	1.8	0.34 U	0.34 U	0.34 U
Trichloroethene	ug/m3	0.27 U	0.27 U	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	8-__	9-__	10-__	11-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.2	1.2	1.1	0.75
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U	0.34 U	0.34
Trichloroethene	ug/m3	0.27 U	0.27 U	0.27 U	0.63
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	12-__	13-__	14-__	15-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.71	1.3	0.86	0.40
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U	0.34 U	4.7
Trichloroethene	ug/m3	0.71	0.46	0.27 U	2.1
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	16-__	17-__	18-__	19-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.6	1.7	0.32	1.3
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U	1.5	4.1
Trichloroethene	ug/m3	0.27 U	0.27 U	19	0.67
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	19-FD	20-__	21-__	21-FD
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.2	1.2	0.33	0.30
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	3.9	4.8	0.34	0.34 U
Trichloroethene	ug/m3	0.66	0.62	0.27 U	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	22-__	23-__	24-__	25-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.6	2.2	0.42	1.5
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	ug/m3	0.58	0.73	3.5	0.34 U
Trichloroethene	ug/m3	0.27 U	0.27 U	0.63	0.35
Vinyl Chloride	ug/m3	0.13 U	0.13 U	0.13 U	0.13 U

ASR Number: 7368

RLAB Approved Sample Analysis Results

04/04/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	26-__	27-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS			
Benzene	ug/m3	1.5	1.2
1,1-Dichloroethene	ug/m3	0.20 U	0.20 U
cis-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U
trans-1,2-Dichloroethene	ug/m3	0.20 U	0.20 U
Tetrachloroethene	ug/m3	0.34 U	0.34 U
Trichloroethene	ug/m3	0.29	0.27 U
Vinyl Chloride	ug/m3	0.13 U	0.13 U