

# **REMEDIAL ACTION IMPLEMENTATION REPORT**

# HARBORVIEW CLEANERS 134 EAST GRAND AVENUE PORT WASHINGTON, WISCONSIN BRRTS# 02-46-548092

September 12, 2018

Prepared For:

Harborview Cleaners 134 East Grand Avenue Port Washington, WI 53074

Prepared By:

EnviroForensics, LLC N16 W23390 Stone Ridge Drive, Suite G Waukesha, WI 53188 Phone: (262) 290-4001 <u>www.enviroforensics.com</u>

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Brian Kappen, PG Project Manager

Rob Hoverman, PG Senior Project Manager



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#### CERTIFICATIONS

I, Andrew Horwath, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Director of Engineering and Remediation Services, PE No. E-43831-6

Signature, title and P.E. number

P.E. stamp

I, Brian Kappen, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Signature and title

Project Manager

\_9/12/2018\_

Date

i



### 1.0 BACKGROUND

EnviroForensics, LLC (EnviroForensics) has prepared this Remedial Action Implementation Report (Report) on behalf of Harborview Cleaners (Harborview) for the facility located at 134 East Grand Avenue in Port Washington, Wisconsin (Site). The location of the site is shown on **Figure 1**. This Report follows guidelines for documentation of remedial actions set forth in Wisconsin Administrative Code (WAC) Chapter NR 724 rule and other associated State of Wisconsin Chapter NR 700 series rules.

This Report follows submittal of the Remediation Action Design Report, dated June 12, 2018, which described a plan for implementation of soil vapor extraction (SVE) to address contaminated soil and soil gas resulting from release(s) of tetrachloroethene (PCE) in the vicinity of the Site building. This Report describes the installation of the SVE system; operation, maintenance, and monitoring plans; and initial performance monitoring data.

# 1.1 Site Description

The Site is improved with a single-story commercial building approximately 1,300 square feet in size that was constructed in the 1930s or 1940s. Reportedly the building was occupied by a gas station until approximately 1970 when it was converted to a dry cleaning operation. The building is concrete slab on grade with the remainder of the property being a paved asphalt driveway and parking area. The Site is bound by East Grand Avenue to the south, a commercial building to the west, a mixed use commercial and residential building to the north, and North Franklin Street to the east. The Site layout is presented as **Figure 2**.



#### 2.0 SOIL VAPOR EXTRACTION SYSTEM CONSTRUCTION

The SVE system consists four (4) extraction wells, underground conveyance piping, and mechanical equipment and controls. The system is designed to remove contaminant mass from vadose zone soil. The following sections describe the construction of the SVE system.

#### 2.1 Deviations from Design Plan

Three (3) extraction wells designated SVE-2, SVE-3, and SVE-4 were installed with 3-foot long screens to focus vapor extraction from the native silty clay rather than the sand fill present immediately beneath the floor slab. The target screen interval referenced in the Design Report was 6 to 9 feet below ground surface (bgs); however, the borings for SVE-3 and SVE-4 met refusal at approximately 8 feet bgs and 7 feet bgs, respectively. Therefore, the screen intervals for SVE-3 and SVE-4 are 5 to 8 feet bgs and 4 to 7 feet bgs, respectively. Pre-existing extraction well SVE-1 was installed in January 2017 for pilot testing purposes. The screened interval of SVE-1 is 4 to 9 feet bgs.

#### 2.2 Extraction Well and Conveyance Piping Installation

EnviroForensics directed the installation of the extraction wells and subsurface conveyance piping from August 10-14, 2017. In addition to SVE-1 which was installed for the pilot test, three (3) additional extraction wells were installed beneath the floor slab of the Site building. The additional extraction wells, designated SVE-2 through SVE-4, were installed using vacuum excavation methods due to limited access in the Site building. The diameter of each boring varied from approximately 10 to 14 inches. All extraction wells were constructed of 4-inch diameter schedule 40 PVC with three feet of 0.020-inch slot PVC screen. As described in the previous section, the extraction well depths vary from 7 to 9 feet bgs. The annular space around the wells was filled with coarse sand to the top of the screened intervals, followed by layers of hydrated bentonite chips and cement-bentonite grout. The wellheads are protected at the surface with 12-inch diameter flush-mount vaults set in concrete. Typical extraction well construction details are depicted on **Figure 3**.

The extraction wells are connected to the SVE blower and associated equipment with individual conveyance lines. Conveyance piping consists of 4-inch diameter schedule 40 PVC that was installed in shallow trenches excavated by hand and backfilled with the existing sand that is encountered beneath the floor slab. The conveyance lines connect to a manifold inside the SVE



equipment enclosure. Each line has a separate butterfly valve and vacuum gauge at the manifold. The layout of the system is shown on **Figure 4**.

### 2.3 Mechanical Components

The results of the SVE pilot test conducted during January 2017 indicated an effective vapor capture radius of influence (ROI) of 40 feet for an applied vacuum of 10 inches of mercury (in Hg) in SVE-1. The full-scale SVE system design parameters are as follows:

- Maximum operating vacuum of 10 in Hg;
- Total extraction rate of 450 actual cubic feet per minute (ACFM);
- ROI of 40 feet for SVE-1, and 20 feet for SVE-2, SVE-3, and SVE-4.

The system was constructed by Fliteway Technologies, Inc., of Cudahy, Wisconsin according to specifications provided by EnviroForensics engineers. The equipment is housed within a custom steel enclosure designed to fit in a designated space on the south side of the Site building. A dedicated 208/120 volt, 3-phase electrical service was installed to power the system. The primary SVE mechanical equipment and controls consist of the following:

- 25 HP 1,770 rpm electric motor;
- Gardner Denver tri-lobe positive displacement blower;
- Variable frequency drive (VFD);
- Human-machine interface /Programmable logic controller unit;
- 117-gallon air-water separator tank; and
- 1.5 horsepower progressive cavity transfer pump.

Recovered vapors and condensate first go through the air-water separator tank. After the water and vapor have been separated, the SVE effluent is discharged to the atmosphere. Water will be containerized in drums or plastic totes, characterized for profiling, and transported off-site for disposal. If needed, water may be discharged to the sanitary sewer under a permit obtained through the City of Port Washington. A process and instrumentation diagram is presented on **Figure 5**.



#### 3.0 OPERATION, MAINTENANCE, AND MONITORING

Operation and maintenance activities are conducted by EnviroForensics personnel to:

- Maximize system efficiency and contaminant mass removal rates;
- Maintain the mechanical equipment in good working order; and
- Collect data to track system performance and determine a timeframe for shutdown.

The SVE system is designed to operate continuously. Extraction wells can be individually disconnected from service by closing the butterfly valve installed on the conveyance piping manifold. This design allows operators to target specific areas and/or depths as the remediation progresses to maximize efficiency. Operational changes are made as needed during the maintenance visits described below. Certain system parameters are also accessible remotely via a cellular-based internet connection. The status of the blower and transfer pump can be observed, and the VFD setting can be adjusted, which in turn changes the system vacuum and effluent temperature.

### 3.1 Maintenance Activities

Routine maintenance activities performed monthly include the following:

- Service the blower as recommended by the manufacturer;
- Record operational parameters and vapor concentrations to evaluate efficiency:
  - System runtime;
  - System vacuum;
  - Individual conveyance line vacuum;
  - Inlet air filter differential pressure;
  - Vacuum at wellheads and monitoring points;
  - o Flow rate;
  - Effluent temperature; and
  - Water flow totalizer.

Additional maintenance visits may be required to address system shutdowns or operational issues. EnviroForensics has prepared an Operation, Maintenance, and Monitoring Plan (OM&M Plan) that details the operation and maintenance procedures. The OM&M Plan is provided as **Appendix A**.



### 3.2 Performance Monitoring

The effectiveness of the SVE system is evaluated periodically by monitoring the subsurface vacuum influence and concentration of chlorinated volatile organic compounds (CVOCs) in the vapor effluent. These activities are summarized below.

Subsurface vacuum influence will be measured periodically to evaluate magnitude of vacuum and confirm the ROI around each extraction well. Measurements are collected from the two (2) dedicated vacuum monitoring points in the Site building (VP-1 and VP-2); four (4) monitoring wells (MW-1 though MW-4) as appropriate; and four (4) sub-slab ports in the adjoining building to the north. Measurements will be collected using a hand-held digital manometer and recorded on the field form included with the OM&M Plan.

Samples of the SVE system air emissions are collected from a port in the exhaust stack and analyzed for CVOCs to track mass removal and to determine operational changes to optimize system performance. Performance monitoring is conducted in accordance with the following emissions testing schedule required under WAC Chapter 419.07:

- Once each day for the first three (3) days of system operation;
- Weekly for the next three (3) weeks; and
- Monthly thereafter.

A commissioning and testing phase was completed to confirm that system emissions are below permitting thresholds and ambient air standards. The permitting thresholds that apply to SVE systems (WAC Chapters NR 406 and 407, respectively) are as follows:

- Total volatile organic compound (VOC) limit of 5.7 pounds per hour (lb/hr).
- PCE limits of 9.11 lb/hr and 301 pounds per year (lb/yr).

The system was started up on August 13, 2018. The first three (3) effluent samples were collected after 2 hours, 26 hours, and 50 hours of operation, respectively. During that time, balancing and testing of the system in various extraction well configurations was conducted, which resulted in fluctuating concentrations in the effluent samples. The highest VOC emission rate at system startup was approximately 0.02 pounds per hour, which is well below the hourly emission limit. It is also anticipated that annual PCE emissions will be below the 301 lb/yr limit; however, the emission rate will be closely tracked to ensure compliance. The laboratory reports associated with system commissioning are included in **Appendix B**.



Outdoor air samples were also collected during system startup to confirm that emissions do not affect air quality at the Site or adjacent properties. Samples "6348-SVE-OA-E" and "6348-SVE-OA-W" were collected from the roof of the Site building east of the exhaust stack, and along the east wall of the neighboring building to the west, respectively. The air samples were collected in 6-liter vacuum canisters over a 24-hour period during the first full day of system operation. The wind direction was generally from the north during the first half of the sampling period, and from the east during the second half of the sampling period.

PCE was detected in samples 6348-SVE-OA-E and 6348-SVE-OA-W at concentrations of 6.65 and 98.7 micrograms per cubic meter ( $\mu$ g/m<sup>3</sup>), respectively. No other compounds of concern were detected in the outdoor air samples. The ambient air standard for PCE established in WAC Chapter NR 445 is an average of 4,069  $\mu$ g/m<sup>3</sup> over a 24 hour period. The PCE concentrations in the outdoor air samples were well below this standard, indicating that emissions controls are not required. The laboratory report is included in **Appendix B**.

### 3.3 Progress Reporting

Semi-annual remediation progress reports will be submitted to WDNR, as required, using the Remediation Site Operation, Maintenance, Monitoring & Optimization Report (WDNR Form 4400-194). The reports will include information on the SVE system operational configuration, concentration trends and cumulative contaminant removal, and groundwater treatment performance monitoring data. Tables, figures, charts and other required attachments will be provided. The reporting periods will be January 1 through June 30, and July 1 through December 31. The progress reports will be submitted by July 31 and January 31 for each reporting period, respectively.



#### 4.0 CLOSURE STRATEGY AND CONTINUING OBLIGATIONS

The closure strategy for the Site consists of in-situ remediation of impacts in the vadose zone using the active remedial action described in this report, followed by the implementation of institutional controls if needed. Residual soil and groundwater contamination with concentrations above soil to groundwater residual contaminant levels and enforcement standards, respectively, may remain in isolated areas after remediation is deemed to be complete.

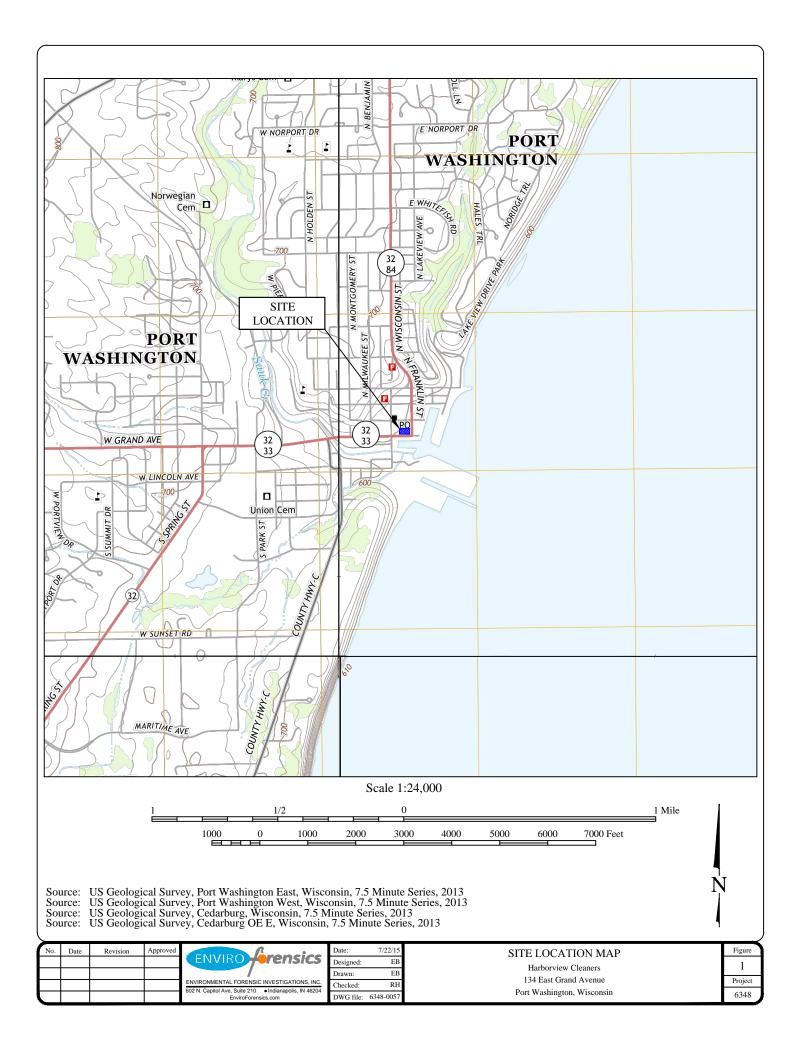
The following continuing obligations may be required for case closure:

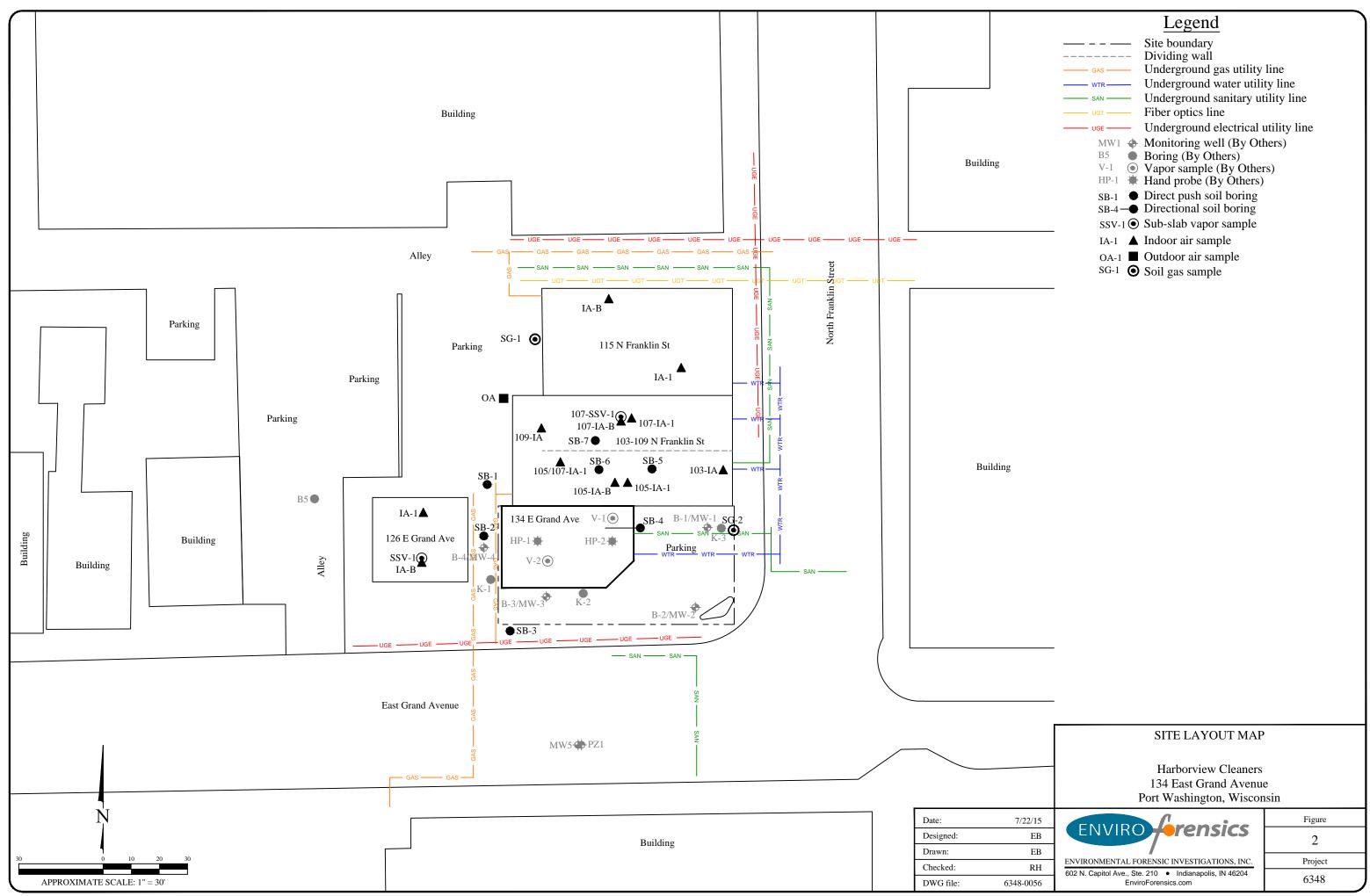
- Designating the existing building and asphalt parking areas as a soil cover to prevent exposure to residual soil contamination and obstruct the soil to groundwater migration pathway. This will require long-term inspection and maintenance of the soil cover as a post-closure continuing obligation.
- Depending on the effectiveness of the SVE system, possible continued operation and maintenance of the engineering control (i.e., the existing sub-slab depressurization system) in the adjoining 103-109 N. Franklin Street building.

The estimated duration of the remedial actions is 2 to 3 years, including performance monitoring and reporting. The time frame for case closure will depend on regulatory concurrence with achieving remedial objectives and any requirements for additional monitoring.

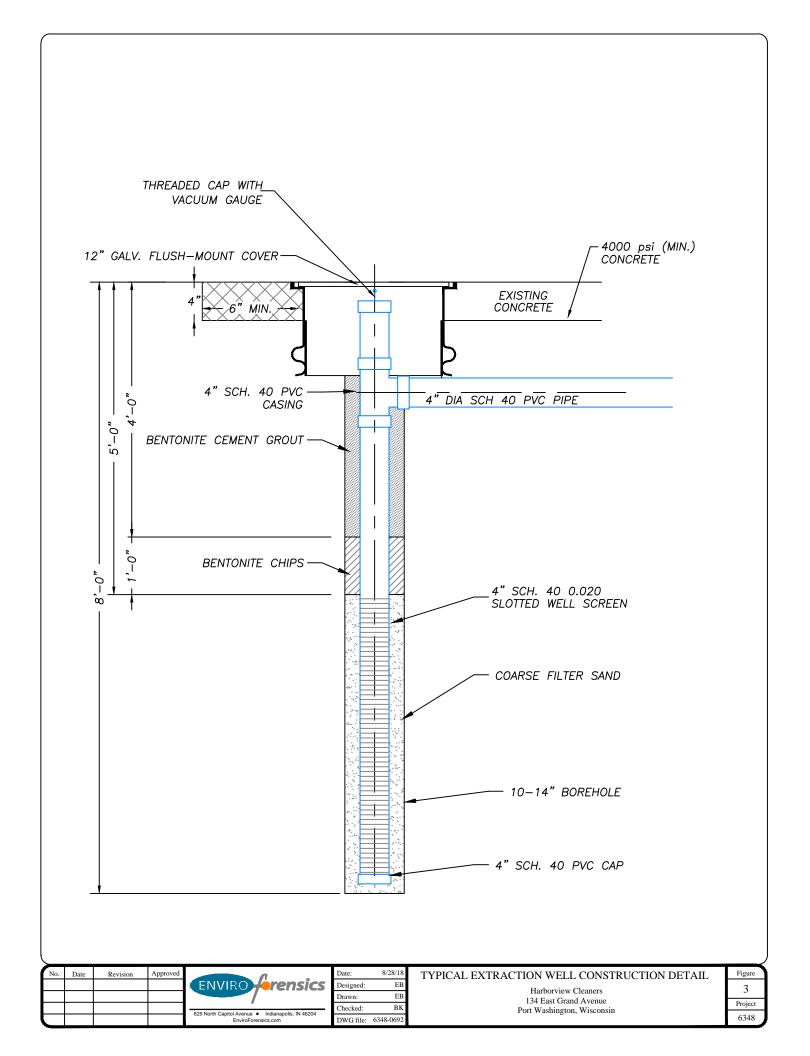


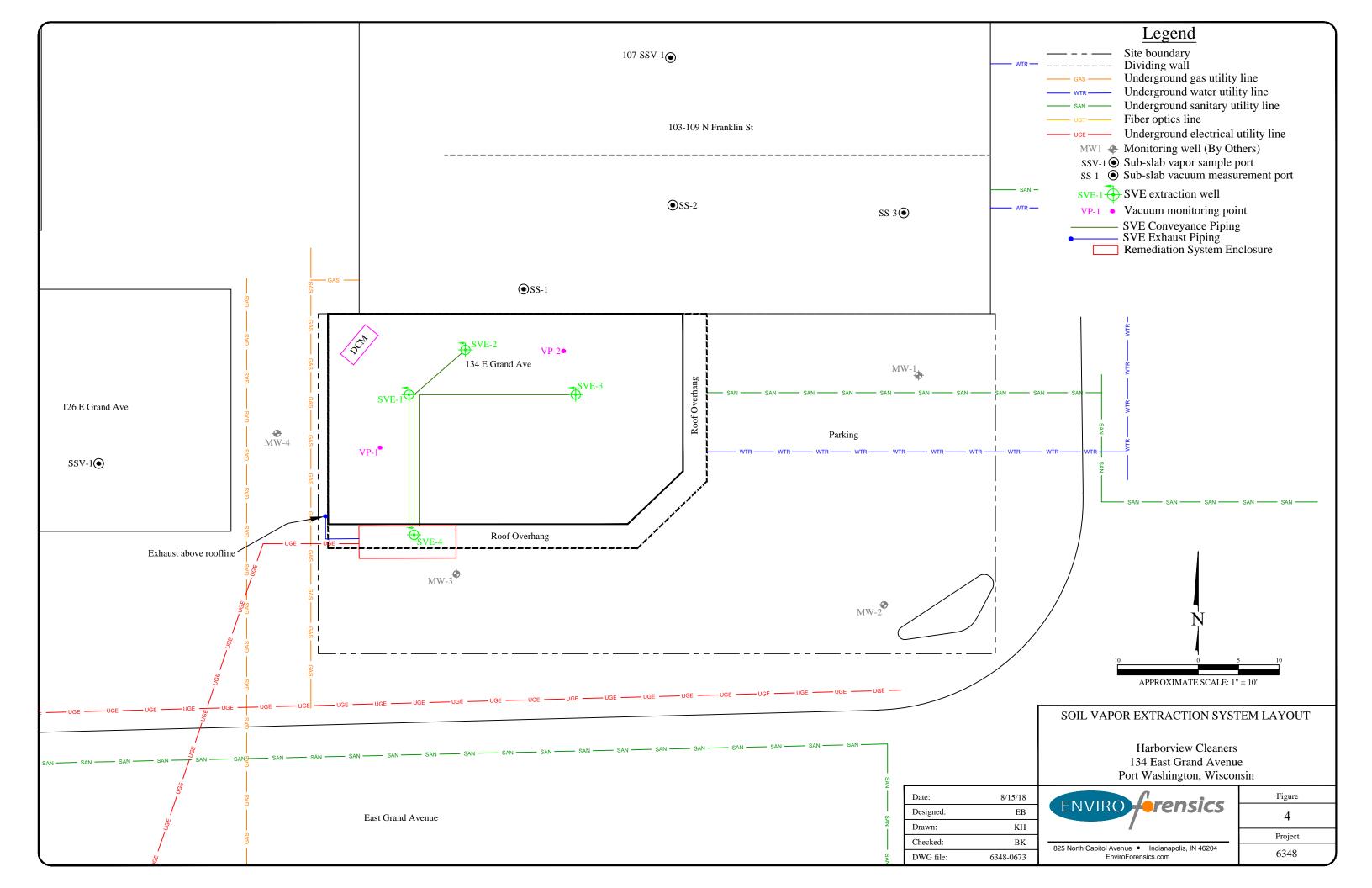
FIGURES

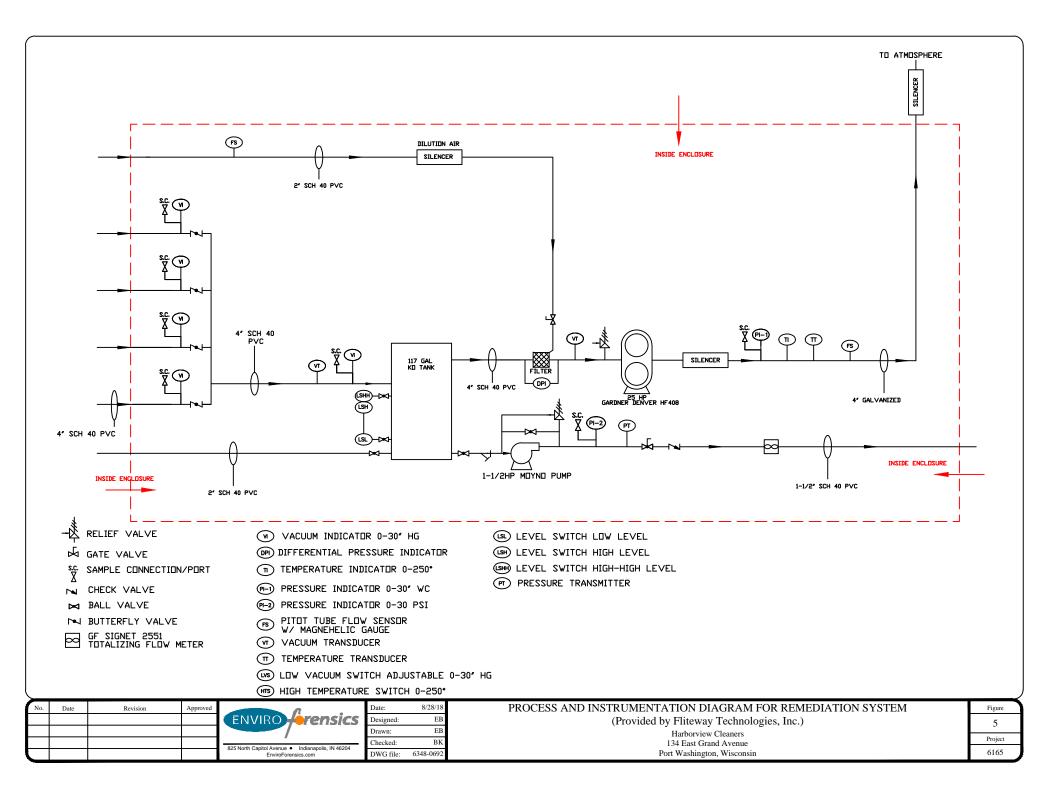




	Site boundary Dividing wall
——— GAS ———	Underground gas utility line
WTR	Underground water utility line
SAN	Underground sanitary utility line
UGT	Fiber optics line
UGE	Underground electrical utility line
MW1 🔶	Monitoring well (By Others)
B5 🌔	Boring (By Others)
	Vapor sample (By Others)
	Hand probe (By Others)
SB-1 ●	Direct push soil boring
SB-4	Directional soil boring
SSV-1 🖲	Sub-slab vapor sample
IA-1 🔺	Indoor air sample
OA-1	Outdoor air sample
SG-1 🗿	Soil gas sample









# APPENDIX A

# SVE SYSTEM OPERATION, MAINTENANCE, AND MONITORING PLAN



# SOIL VAPOR EXTRACTION SYSTEM OPERATION, MAINTENANCE, AND MONITORING PLAN

# HARBORVIEW CLEANERS 134 EAST GRAND AVENUE PORT WASHINGTON, WISCONSIN BRRTS# 02-46-548092

September 11, 2018

Prepared For:

Harborview Cleaners 134 East Grand Avenue Port Washington, WI 53074

Prepared By:

EnviroForensics, LLC N16 W23390 Stone Ridge Drive, Suite G Waukesha, WI 53188 Phone: (262) 290-4001 <u>www.enviroforensics.com</u>



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#### FIGURES

A1	Soil Vapor Extraction System Layout
A2	Typical Extraction Well Construction Detail
A3	Process and Instrumentation Diagram for Remediation System

### ATTACHMENTS

A1 SVE System Operation and Maintenance Log



### 1.0 INTRODUCTION

A soil vapor extraction (SVE) system has been installed at the Harborview Cleaners facility located at 134 East Grand Avenue in Port Washington, Wisconsin (Site). The system is designed to remove tetrachloroethene (PCE) and associated vapors from the vadose zone in the unconsolidated sediment. Proper operation and maintenance of the SVE system is necessary to document remedial progress and to optimize system performance. This Operation and Maintenance plan (O&M Plan) has been prepared in accordance with Wisconsin Administrative Code (WAC) Chapter NR 724.

#### **1.1 Site Information and Contacts**

Property Information: County: Ozaukee PLSS Location: NW ¼ of SE ¼ of Sec. 28, T11N, R22E WTM Coords: X=692555, Y=326080 Parcel ID Number: 16-098-25-11-006

Property Owner Information: Owner Name: Bathke Loving Trust F/B/O Barbara Bahr Address: 134 East Grand Ave, Port Washington, WI 53074 Contacts: Barb Bahr Telephone: (262) 284-2370 E-mail Address: bahrbie@live.com

Consultant Information: Company Name: EnviroForensics, LLC Address: N16W23390 Stone Ridge Drive, Suite G, Waukesha, WI 53188 Contacts: Rob Hoverman - Senior Project Manager/ Brian Kappen – Project Manager Telephone: (262) 290-4001 E-mail Address: <u>rhoverman@enviroforensics.com</u>/ <u>bkappen@enviroforensics.com</u>

SVE System Manufacturer: Company Name: Fliteway Technologies, Inc. Address: 2129 E. Birchwood Ave, Cudahy, WI 53110 Phone: 414-483-5600 System ID: Q14772R3

WDNR Project Manager: Mr. John Feeney Address: 1155 Pilgrim Road, Plymouth, WI 53073 Telephone: (920) 893-8523 Email: johnm.feeney@wisconsin.gov



#### 2.0 SYSTEM DESCRIPTION

#### 2.1 Extraction Wells and Conveyance Piping

The SVE system consists of four (4) extraction wells screened in unconsolidated sediment. Subsurface conveyance piping connects the extraction wells to a vacuum blower and associated equipment and controls housed inside a climate-controlled steel enclosure positioned along the south wall of the Site building. The extraction wells are constructed of 4-inch diameter Schedule 40 PVC pipe and 0.020-inch slot screen. The screened intervals in feet below ground surface (bgs) of the SVE well are variable based on location and subsurface limitations as follows:

	Screen Interval
Well ID	(feet bgs)
SVE-1	4 - 9
SVE-2	6 - 9
SVE-3	5 - 8
SVE-4	4 - 7

The extraction wells are connected to the SVE blower and associated equipment with individual conveyance lines. Conveyance lines consists of 4-inch diameter PVC pipe installed in shallow trenches immediately beneath the building floor slab. The conveyance lines connect to a manifold inside the SVE equipment enclosure. The extraction well locations and conveyance piping layout are depicted on **Figure A1**. Individual butterfly valves, vacuum gauges, and sample ports for each conveyance line are installed at the manifold. The wellheads are protected at the surface with 12-inch diameter flush-mount vaults set in concrete. A typical SVE well construction diagram is depicted on **Figure A2**.

#### 2.2 Mechanical Components

The mechanical system consists of the following components:

- 25 HP 1,770 rpm electric motor;
- Gardner Denver tri-lobe positive displacement blower;
- Variable frequency drive (VFD);
- Human-machine interface (HMI)/Programmable logic controller unit;
- 117-gallon air-water separator tank; and
- 1.5 horsepower progressive cavity transfer pump.

The components are contained in a trailer-mounted enclosure measuring approximately 10 feet long by 5 feet wide. The equipment is housed within a custom steel enclosure designed to fit in a designated space on the south side of the Site building. A dedicated 208/120 volt, 3-phase electrical service was installed by We Energies to power the system. The electrical meter is



located on the west side of the enclosure. The vacuum blower exhaust stack extends out the side of the enclosure to a height of 14 feet above ground surface. Exhaust samples are collected from a port in the stack downstream from the vacuum blower. A system process and instrumentation diagram is presented on **Figure A3**.

#### 3.0 OPERATION AND MAINTENANCE

Operation and maintenance activities are conducted by EnviroForensics personnel to:

- Maximize system efficiency and contaminant mass removal rates;
- Maintain the mechanical equipment in good working order; and
- Collect data to track system performance and determine a timeframe for shutdown.

#### 3.1 System Operation

The SVE system is designed to operate continuously. Vapor removal from any of the four (4) SVE wells can be restricted or disconnected from service by adjusting the butterfly at the manifold. This design allows the operators to target specific areas and/or depths as the remediation progresses to maximize efficiency. Operational changes are made as needed during the maintenance visits described below.

The rotational speed of the vacuum blower is controlled by a VFD mounted in the control cabinet. The VFD can be adjusted and programmed via the touchscreen HMI. The operating speed can range from 30 to 60 hertz (Hz). Refer to the System Operation Manual located inside the control cabinet for detailed information on operating the VFD.

The system controls are also accessible remotely via a cellular-based internet connection. The system can be stopped and started; vacuum, effluent temperature, and alarms can be observed; and VFD settings can be adjusted without visiting the Site. Contact the project manager for remote access instructions and credentials.

#### 3.2 System Maintenance and Monitoring

Samples of the SVE system emissions are collected from a port in the exhaust stack downstream of the blower to calculate mass removal rates and cumulative mass removed; and to determine operational changes to optimize system performance. The samples are analyzed for VOCs by EPA test method TO-15. Performance monitoring is conducted in accordance with the following emissions testing schedule required under WAC Chapter 419.07:

- Once each day for the first 3 days of system operation;
- Weekly for the next 3 weeks; and
- Monthly thereafter.



Long-term maintenance activities will be performed monthly and include the following:

- Adjusting the operational configuration of the system (i.e., open or close manifold valves);
- Addressing system shutdowns or operational issues;
- Inspection and replacement of the inlet air filter;
- Manage disposal of water;
- Routine maintenance of the vacuum pump in accordance with manufacturer recommendations, including oil replacement; and
- Recording operational parameters according to the table below:

Parameter	Method	Frequency
System runtime	Control panel meter	Monthly
System vacuum (max 10 in Hg)	Gauge reading	Monthly
Conveyance line vacuums	Gauge readings	Monthly
Inlet filter differential pressure	Gauge reading	Monthly
Flow rate	Gauge reading	Monthly
Influent/effluent temperatures	Gauge readings	Monthly
Wellhead vacuum	Hand-held digital manometer	As needed
Vacuum at monitoring points	Hand-held digital manometer	As needed

O&M information is recorded on the form presented in **Attachment A1**. SVE wellhead and monitoring point locations are depicted on **Figure A1**. Monitoring points consist of:

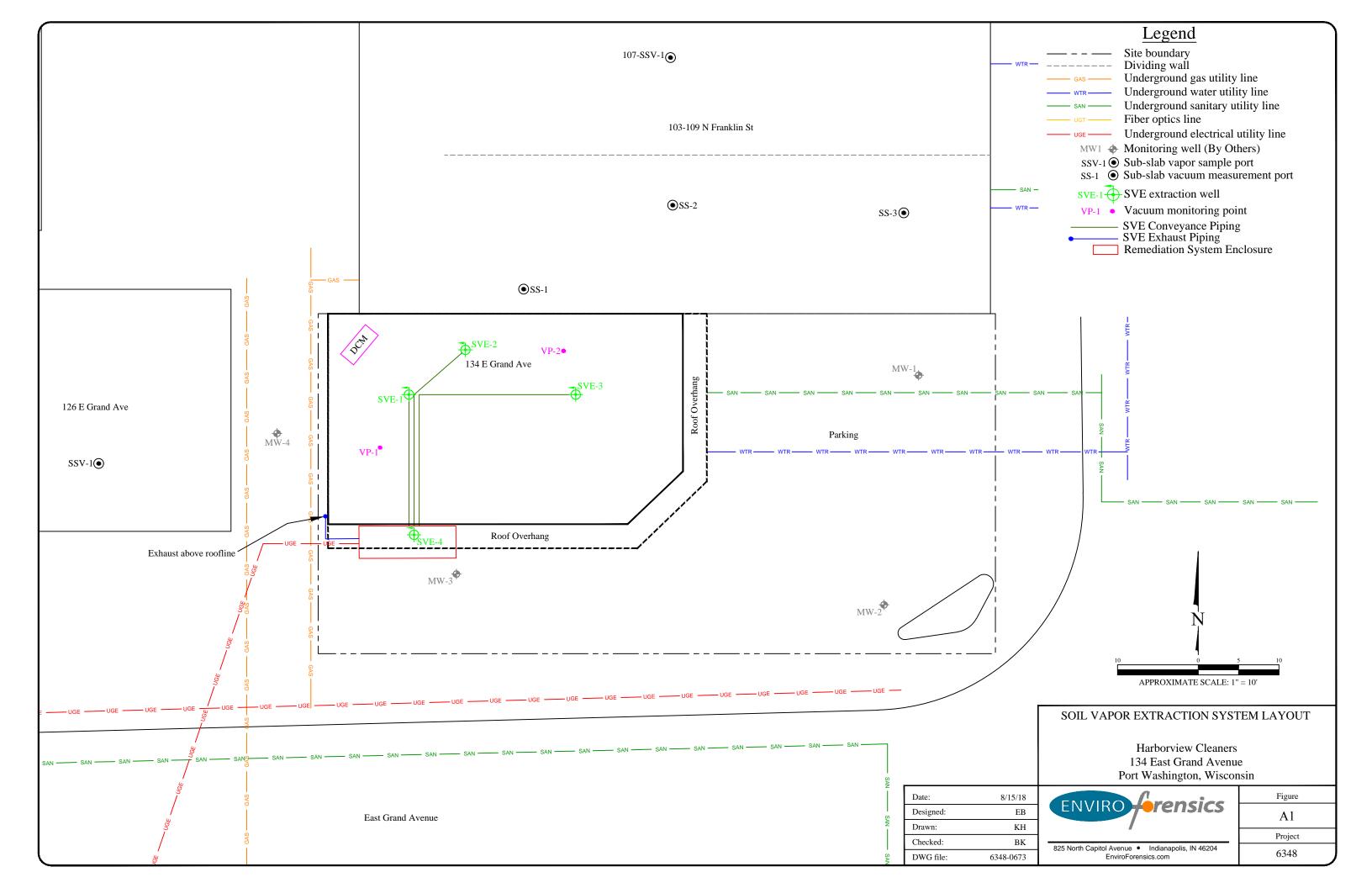
- Monitoring wells MW-1 through MW-4 (provided part of the screen is not submerged). The wells are constructed of 2-inch diameter PVC;
- Vapor monitoring points VP-1 and VP-2. The monitoring points are constructed of 1inch diameter PVC, screened from 4-9 feet bgs and 3-8 feet bgs, respectively; and
- Sub-slab vapor monitoring points in the basement of the neighboring building, designated SS-1 though SS-3, and 107-SSV-1. These are permanent Vapor Pins® inserted in small-diameter holes drilled through the concrete floor slab.

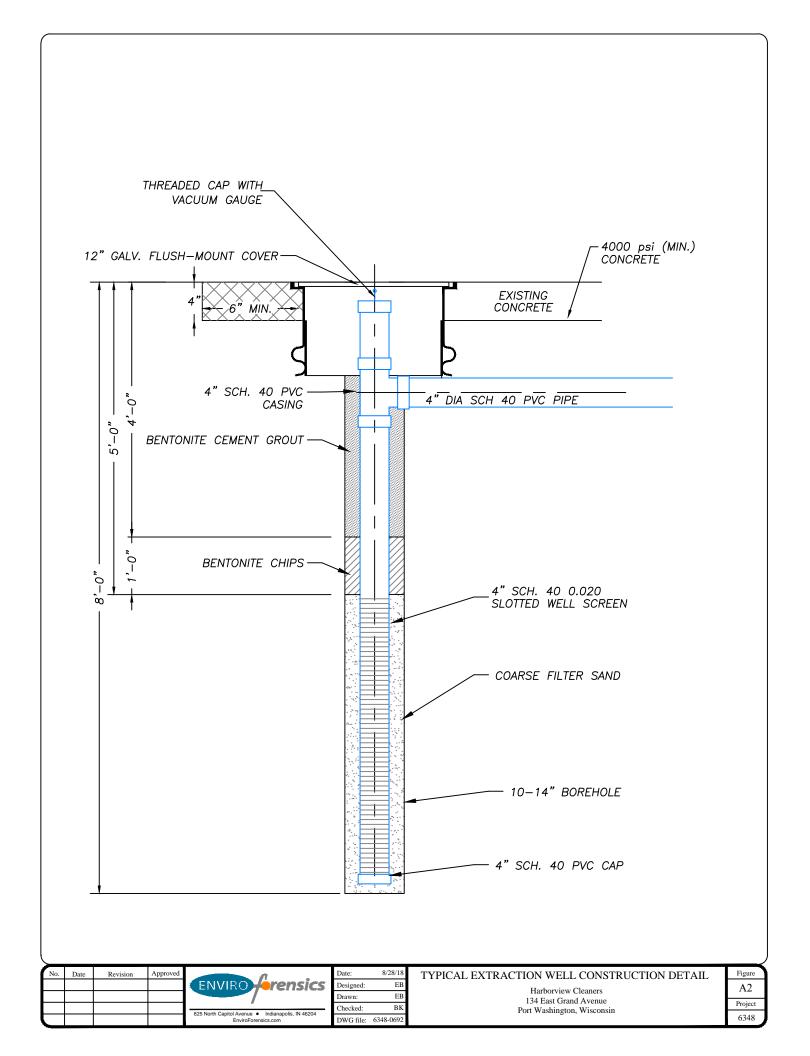
### 4.0 **REPORTING**

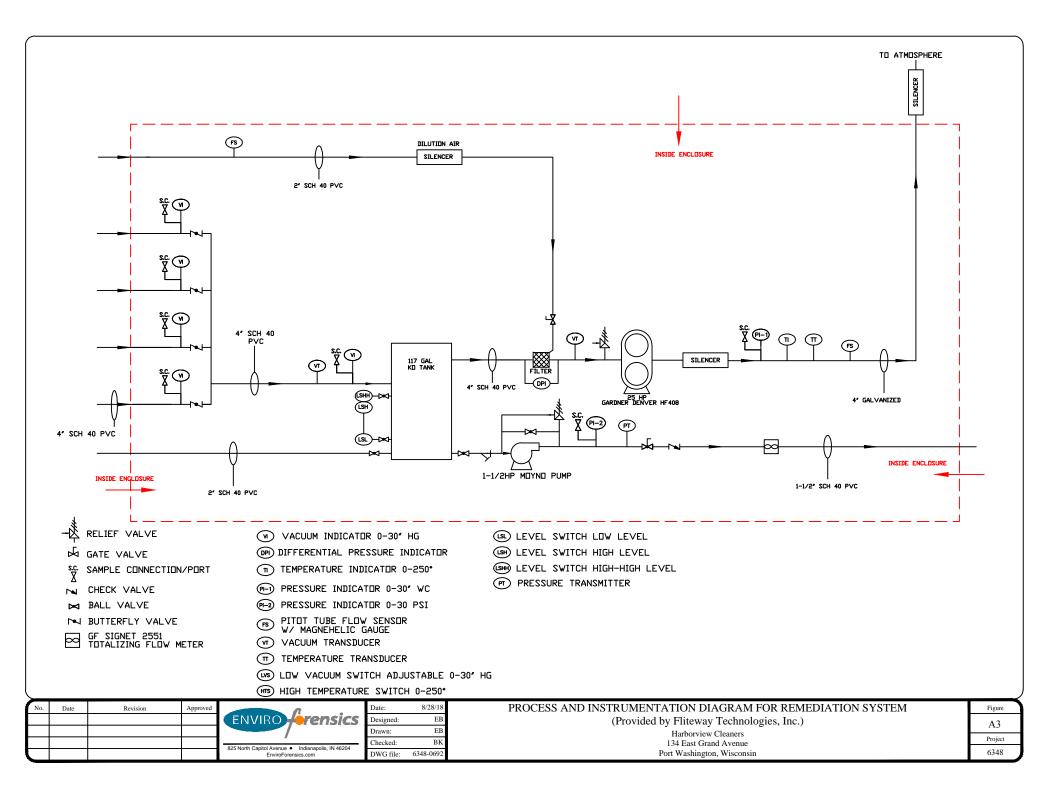
Semi-annual remediation progress reports will be submitted to WDNR, as required, using the Remediation Site Operation, Maintenance, Monitoring & Optimization Report (WDNR Form 4400-194). The reports will include information on operational configuration during the reporting period, figures, tables, and graphs showing time versus contaminant removal and cumulative contaminant removal. The reporting periods each year are from January 1 to June 30 and July 1 to December 31. The deadline for submittal of progress reports is 30 days after the end of each reporting period.



FIGURES









# ATTACHMENT A1

# SVE System Operation and Maintenance Log

# **6348 SVE SYSTEM OPERATION**

Harborview Cleaners, Port Washington, WI

		0,50	em status:		ii C	JII, Explain:			
	SYSTEM ST	TATUS		Ambient Temp	erature and We	ather:			
					-	Vacuum			
	Time (hh:mm)	System Runtime (xxx.x hours)	VFD Setting (Hz)	System	Line-1	Line-2 (in Hg)	Line-3	Line-4	Effluent Pressure (in H <sub>2</sub> O)
IN									
	KO Totalizer (gallons)	Influent Air Temp (degrees F)	Effluent Temp (degrees F)	Discharge P (in H <sub>2</sub> 0)	Dilution P (in H <sub>2</sub> 0)	Motor Grease	Blower Oil (c-checked, r-replaced	Discharge Filter	Inlet Air Filter (in H <sub>2</sub> O)
IN									
	EXTRACTIO	ON WELLS	(in Hg)		Check if not tak	ken:			
	SVE-1		SVE-2		SVE-3		SVE-4		
		ING POINTS	(in H <sub>2</sub> 0)		Check if not tak				
	MW-1			SS-1			VP-1		
	MW-2			SS-2			VP-2		
	MW-3			SS-3					
	MW-4			107-SSV-1					
	SAMPLE C	OLLECTION			Check if not tak	ken:			
	Sample Lo	cation			I	Initial Press	sure		
	-	t Time of Samp	le			Final Press	ure		
	Canister ID	)				Start Time			
	Flow Contr	roller ID				End Time			
	Extraction C	Open at Time of S	Sample			VFD Setting	g at Time of	Sample	
	SYSTEM ST	TATUS		Ambient Temp	erature and We	ather:			
						Vacuum			Effluent
	Time (hh:mm)	System Runtime (xxx.x hours)	VFD Setting (Hz)	System	Line-1	Line-2 (in Hg)	Line-3	Line-4	Pressure (in H <sub>2</sub> O)
OUT									
	KO Totalizer (gallons)	Influent Air Temp (degrees F)	Effluent Temp (degrees F)	Discharge P (in H <sub>2</sub> 0)	Dilution P (in H <sub>2</sub> 0)	Motor Grease	Blower Oil (c-checked, r-replaced	Discharge Filter	Inlet Air Filter (in H <sub>2</sub> O)
OUT									

NOTES

Check if photo was taken at arrival and departure of VFD

Date:

System Status

If Off Evolution



# **APPENDIX B**

# SVE SYSTEM COMMISSIONING LABORATORY REPORTS



EnvisionAir 1441 Sadlier Circle West Drive Indianapolis, IN 46239 Ph: 317-351-0885 Fax: 317-351-0882 www.envision-air.com

Mr. Brian Kappen Enviroforensics N16 W. 23390 Stone Ridge Dr Suite G Waukesha, WI 53188

August 23, 2018

EnvisionAir Project Number: 2018-517 Client Project Name: 6348

Dear Mr. Kappen,

Please find the attached analytical report for the samples received August 17, 2018. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. EnvisionAir looks forward to working with you on your next project.

Yours Sincerely,

Stanty a. Munnicutt

Stanley A Hunnicutt

Project Manager EnvisionAir, LLC



Client Name: ENVIROFORENSICS

Project ID:

ID: 6348

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-517

#### Sample Summary

#### START START Lab Date Time End Date End Time Date Time Initial Field Final Field Received Laboratory Sample Number: Sample Description: Matrix: Collected: Collected: Collected: Received: Received <u>(in. Hg)</u> <u>(in. Hg)</u> <u>(in. Hg)</u> 6348-SVE-EX 8/13/18 8/13/18 8/17/18 18-2073 А 12:03 12:08 11:00 -29 -2 -2 6348-SVE-EX -26 -2 -2 18-2074 А 8/14/18 11:09 8/14/18 11:14 8/17/18 11:00 18-2075 6348-SVE-EX А 8/15/18 15:35 8/15/18 15:40 8/17/18 11:00 -29 -2 -2

#### Canister Pressure / Vacuum

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Client Name:	ENVIROFORENSICS			
Project ID:	6348			
Client Project Manager:	BRIAN KAPPEN			
EnvisionAir Project Number:	2018-517			
Analytical Method: Analytical Batch:	TO-15 082218AIR			
Client Sample ID:	6348-SVE-EX	Sample Collection START Date/Time: Sample Collection END Date/Time:	8/13/18 8/13/18	12:03 12:08
Envision Sample Number: Sample Matrix:	18-2073 AIR	Sample Received Date/Time:	8/17/18	11:00
Compounds cis-1,2-Dichloroethene	<u>Sample Results ug/m³</u> 592	Reporting Limit ug/m <sup>3</sup> 198	<u>Flag</u>	
Tetrachloroethene trans-1,2-Dichloroethene Trichloroethene Vinyl Chloride 4-bromofluorobenzene (surroga Analysis Date/Time: Analyst Initials	<b>12,000</b> < 396 <b>605</b> < 12.8 ate) 101% 8-23-18/02:32 tjg	638 396 10.7 12.8	2	



Client Name:	ENVIROFORENSICS			
Project ID:	6348			
Client Project Manager:	BRIAN KAPPEN			
EnvisionAir Project Number:	2018-517			
Analytical Method: Analytical Batch:	TO-15 082218AIR			
Client Sample ID:	6348-SVE-EX	Sample Collection START Date/Time: Sample Collection END Date/Time:	8/14/18 8/14/18	11:09 11:14
Envision Sample Number: Sample Matrix:	18-2074 AIR	Sample Received Date/Time:	8/17/18	11:00
Compounds cis-1,2-Dichloroethene	<u>Sample Results ug/m³</u> < 198	Reporting Limit ug/m <sup>3</sup> 198	<u>Flag</u>	
Tetrachloroethene trans-1,2-Dichloroethene Trichloroethene Vinyl Chloride 4-bromofluorobenzene (surroga Analysis Date/Time: Analyst Initials	<b>4,840</b> < 396 <b>116</b> < 12.8 ate) 98% 8-23-18/03:47 tjg	128 396 10.7 12.8	1	



Client Name:	ENVIROFORENSICS			
Project ID:	6348			
Client Project Manager:	BRIAN KAPPEN			
EnvisionAir Project Number:	2018-517			
Analytical Method: Analytical Batch:	TO-15 082218AIR			
Client Sample ID:	6348-SVE-EX	Sample Collection START Date/Time: Sample Collection END Date/Time:	8/15/18 8/15/18	15:35 15:40
Envision Sample Number: Sample Matrix:	18-2075 AIR	Sample Received Date/Time:	8/17/18	11:00
Compounds cis-1,2-Dichloroethene Tetrachloroethene trans-1,2-Dichloroethene Trichloroethene Vinyl Chloride 4-bromofluorobenzene (surroga Analysis Date/Time: Analyst Initials	Sample Results ug/m <sup>3</sup> < 198 774 < 396 28.5 < 12.8 te) 93% 8-23-18/05:03 tjg	Reporting Limit ug/m <sup>3</sup> 198 31.9 396 10.7 12.8	<u>Flag</u>	



LCS LCSD

Analytical Report

#### TO-15 Quality Control Data

EnvisionAir Batch Number:	082218AIR		
Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	<u>Flags</u>
cis-1,2-Dichloroethene	< 5	5	
Tetrachloroethene	< 0.47	0.47	
trans-1,2-Dichloroethene	< 10	10	
Trichlorethene	< 0.2	0.2	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	88%		
Analysis Date/Time:	8-22-18/22:44		
Analyst Initials	tjg		
			LCS/D
LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	Conc(ppbv)

LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	Conc(ppbv)	Rec.	Rec.	RPD	Flag
Vinyl Chloride	10.9	8.83	10	109%	88%	21.0%	3
trans-1,2-Dichloroethene	10.3	9.87	10	103%	99%	4.3%	
cis-1,2-Dichloroethene	10.5	9.9	10	105%	99%	5.9%	
Trichloroethene	9.53	9.37	10	95%	94%	1.7%	
Tetrachloroethene	11.5	10.1	10	115%	101%	13.0%	
4-bromofluorobenzene (surrogate)	108%	107%					
Analysis Date/Time:	8-22-18/22:09	8-23-18/06:22					
Analyst Initials	tjg	tjg					



#### Flag Number

3

#### **Comments**

- Reported value is from a 40x dilution. TJG 8/23/18 1 2
  - Reported value is from a 200x dilution. TJG 8/23/18
  - RPD is biased high, but recoveries are within control. TJG 8/23/18

EnvisionAir Proj#: 2018-517 Page \_\_\_\_\_ of \_\_\_\_\_

# **CHAIN OF CUSTODY RECORD**

EnvisionAir | 1441Sadlier Circle West Drive | Indianapolis, IN 46239 | Phone: (317) 351-0885 | Fax: (317) 351-0882

Client: EnviroForcesia	S,LUC	P.O. N	lumber:	2018-11	058									
Address: Suite G- Waukesha	1			r Number:		1	REÇ		D PARAME					
Poport To:	derHeiden	Samp	ed by: K	V B	- 6	164	-3 - 5	/ /	/ / ,					
Phone: 262 · 296 · 400	8 #	QA/Q0	C Required	: (circle if app vel III Le	olicable) Evel IV	neq0	/	/		/ ٦	E	NVI	ISIC	<b>NAIR</b>
Invoice Address:	a. N	Repor	ting Units	needed: (ci n <sup>3</sup> PPBV	rcle) <b>PPMV</b>	1 /	all cist	Port List	//	Soil-Gas:				
Desired TAT: (Please Circle C 1 day 2 days 3 days Std	One) (5 bus. days)	Media typ	e: 1LC = 1 Lite 6LC = 6 Lite TB = Tedia TD = Thern	er Canister er Canister r Bag nal Desorption Tu	be	10	TO.15 MILLIN	In Internet	/	Sub-Slab: □ Indoor-Air: □	Caniste	www.ei <i>r Pressure /</i>	nvision-air.c ' <i>Vacuum</i>	com
Air Sample ID	Media Type (see code above)	Coll. Date (Grab/Comp Start)	Coll. Time (Grab/Comp Start)	Coll. Date (Comp. End)	Coll. Time (Comp. End)				Canister Serial #	Flow Controller Serial #	Initial Field (in. Hg)	Final Field (in. Hg)	Lab Received (in. Hg)	EnvisionAir Sample Number
6348-5VE-Ex	ILC	8/13/18	1203	8/13/18	1208	3 3	ζ		520	0057	-29	-2	-2	18-2073
6348-5UE - Ex	ILC	8/14/18	1109	8/14/18	1114	3	<		83831	0061	-26	-2	-2	18-2074
6348-5VE-EX	ILC	8/15/18	1535	8/15/18	1540		X		83942	0057	-29	-2	-2	18-2075
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BJY



EnvisionAir 1441 Sadlier Circle West Drive Indianapolis, IN 46239 Ph: 317-351-0885 Fax: 317-351-0882 www.envision-air.com

Mr. Brian Kappen Enviroforensics N16 W. 23390 Stone Ridge Dr Suite G Waukesha, WI 53188

August 20, 2018

EnvisionAir Project Number: 2018-516 Client Project Name: 6348

Dear Mr. Kappen,

Please find the attached analytical report for the samples received August 17, 2018. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. EnvisionAir looks forward to working with you on your next project.

Yours Sincerely,

Stanty a. Munnicutt

Stanley A Hunnicutt

Project Manager EnvisionAir, LLC



Client Name: ENVIROFORENSICS

Project ID: 6348

Client Project Manager: BRIAN KAPPEN

EnvisionAir Project Number: 2018-516

Sample Summary

			START Date	START Time	End Date	End Time	Date	Time	Initial Field	Final Field	Lab Received
Laboratory Sample Number:	Sample Description:	Matrix:	Collected:	Collected:	Collected:	Collected:	Received:	Received	<u>(in. Hg)</u>	<u>(in. Hg)</u>	<u>(in. Hg)</u>
18-2071	6348-SVE-OA-E	А	8/13/18	12:23	8/14/18	11:35	8/17/18	11:00	-29	-5	-5
18-2072	6348-SVE-OA-W	А	8/13/18	12:19	8/14/18	11:33	8/17/18	11:00	-30	-1	-1

Canister Pressure / Vacuum



Client Name:	ENVIROFORENSICS			
Project ID:	6348			
Client Project Manager:	BRIAN KAPPEN			
EnvisionAir Project Number:	2018-516			
Analytical Method: Analytical Batch:	TO-15 082018AIR			
Client Sample ID:	6348-SVE-OA-E	Sample Collection START Date/Time:	8/13/18 8/14/18	12:23 11:35
Envision Sample Number: Sample Matrix:	18-2071 AIR	Sample Collection END Date/Time: Sample Received Date/Time:	8/17/18	11:00
<u>Compounds</u> cis-1,2-Dichloroethene Tetrachloroethene trans-1,2-Dichloroethene Trichloroethene Vinyl Chloride 4-bromofluorobenzene (surrogat Analysis Date/Time: Analyst Initials	Sample Results ug/m <sup>3</sup> < 19.8 6.65 < 39.6 < 1.07 < 1.28 re) 105% 8-20-18/12:12 tjg	Reporting Limit ug/m <sup>3</sup> 19.8 3.19 39.6 1.07 1.28	<u>Flag</u>	



Client Name:	ENVIROFORENSICS			
Project ID:	6348			
Client Project Manager:	BRIAN KAPPEN			
EnvisionAir Project Number:	2018-516			
Analytical Method: Analytical Batch:	TO-15 082018AIR			
Client Sample ID:	6348-SVE-OA-W	Sample Collection START Date/Time: Sample Collection END Date/Time:	8/13/18 8/14/18	12:19 11:33
Envision Sample Number: Sample Matrix:	18-2072 AIR	Sample Received Date/Time:	8/17/18	11:00
Compounds cis-1,2-Dichloroethene Tetrachloroethene trans-1,2-Dichloroethene Trichloroethene Vinyl Chloride 4-bromofluorobenzene (surroga Analysis Date/Time: Analyst Initials	Sample Results ug/m <sup>3</sup> < 19.8 98.7 < 39.6 < 1.07 < 1.28 te) 100% 8-20-18/12:51 tjg	Reporting Limit ug/m <sup>3</sup> 19.8 3.19 39.6 1.07 1.28	<u>Flag</u>	



Analytical Report

#### **TO-15 Quality Control Data**

EnvisionAir Batch Number:	082018AIR			
Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	<u>Flags</u>	
cis-1,2-Dichloroethene	< 5	5		
Tetrachloroethene	< 0.47	0.47		
trans-1,2-Dichloroethene	< 10	10		
Trichlorethene	< 0.2	0.2		
Vinyl Chloride	< 0.5	0.5		
4-bromofluorobenzene (surrogate)	86%			
Analysis Date/Time:	8-20-18/11:34			
Analyst Initials	tjg			
			LCS/D	L
LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	Conc(ppbv)	Re
Vinyl Chloride	8.92	8.97	10	89
trans 1.2 Dishlaraathana	10.2	10.4	10	10

			LCS/D	LCS	LCSD		
LCS/LCSD	LCS Results (ppbv)	LCSD Results (ppbv)	Conc(ppbv)	Rec.	Rec.	<u>RPD</u>	Flag
Vinyl Chloride	8.92	8.97	10	89%	90%	0.6%	
trans-1,2-Dichloroethene	10.2	10.4	10	102%	104%	1.9%	
cis-1,2-Dichloroethene	9.44	9.5	10	94%	95%	0.6%	
Trichloroethene	9.78	8.94	10	98%	89%	9.0%	
Tetrachloroethene	8.65	8.95	10	87%	90%	3.4%	
4-bromofluorobenzene (surrogate)	99%	101%					
Analysis Date/Time:	8-20-18/08:59	8-20-18/09:41					
Analyst Initials	tjg	tjg					



EnvisionAir 1441 Sadlier Circle West Drive Indianapolis, IN 46239 Ph: 317-351-0885 Fax: 317-351-0882 www.envision-air.com

Flag Number

**Comments** 

EnvisionAir Proj#: 2018-516 Page \_\_\_\_ of \_\_\_\_ BCM

# **CHAIN OF CUSTODY RECORD**

EnvisionAir | 1441Sadlier Circle West Drive | Indianapolis, IN 46239 | Phone: (317) 351-0885 | Fax: (317) 351-0882

Client: EnviraForensics	, LLC	P.O. N	Number: 7	018-10	58		DEQUE						
Report N16WZ3390 Sta Address: SUIZE G Walkesha, W	one Ridge		t Name or 348	r Number:		]	REQUES	TED PARAME					
Report To:		Samp	led by: K	V	5.5	1	/	//				CIC	
Phone: 262-298.40	01	QA/Q0	C Required	: (circle if app rel III Le	vel IV		//		/ 1	E	VVI	SIC	<b>NAIR</b>
Invoice Address:		Repor	ting Units	needed: (cir n <sup>3</sup> PPBV	rcle) <b>PPMV</b>		Por List		Soil-Gas:				
Desired TAT: (Please Circle One 1 day 2 days) 3 days Std (5 B, ENDER Day Mon	e) 5 bus. days day 8/20		e: 1LC = 1 Lite 6LC = 6 Lite TB = Tedla TD = Thern	r Canister	be	10.15	70.15 MILLIN		Sub-Slab: □ Indoor-Air:≯≦	Caniste	www.er	vision-air.c <i>Vacuum</i>	com
Air Sample ID	Media Type (see code above)	Coll. Date (Grab/Comp Start)	Coll. Time (Grab/Comp Start)	Coll. Date (Comp. End)	Coll. Time (Comp. End)			Canister Serial #	Flow Controller Serial #	Initial Field (in. Hg)	Final Field (in. Hg)	Lab Received (in. Hg)	EnvisionAir Sample Number
6348- 5VE-0A-E	6LC	8/13/18	1223	8/14/18	1135	×		B2011	02218	-29	-5	-5	18-2071
6348- SVE - OR-W	6LC	8/13/18	1219	8/14/18	1133	<	51	16100	07438	- 30	-1	-1	18-2072
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