



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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September 28, 2021

Matt Dahl
PES Environmental
210 Fourth Avenue, Suite 1310
Seattle, WA 98121

Re: Opinion on Proposed Cleanup of the following Site:

Site Name: Normandy Park PCE
Site Address: 17817, 17825, and 17835 1st Avenue South, Normandy Park, Washington
Cleanup Site ID: 3214
Facility/Site ID: 4181060
VCP Project ID: NW 1873

Dear Matt Dahl:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Normandy Park PCE facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW.

Issue Presented and Opinion

Upon completion of the proposed cleanup, will further remedial action likely be necessary to clean up contamination at the Site?

NO. Ecology has determined that, upon completion of your proposed cleanup, no further remedial action will likely be necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70A.305 RCW, and its implementing regulations, Chapter 173-340 WAC (collectively “substantive requirements of MTCA”). The analysis is provided as follows.

Description of the Site

This opinion applies to the only Site described as follows. The Site is defined by the nature and extent of contamination associated with the following releases:

- Tetrachloroethene into the soil, groundwater, and air.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Final Site Remediation Progress Summary – Harris/Manhattan Village Shopping Center – Normandy Park, Washington by ERM-West and dated January 5, 2011
2. Site Status Summary – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated August 15, 2014
3. Status Report – October 2016 through April 2017 – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated July 19, 2017
4. Status Report – May 2017 through October 2017 – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated January 17, 2018
5. Remedial Action Work Plan and Status Report Submittals – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated May 8, 2018
6. Status Report – November 2017 through December 2018 – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated July 2, 2019
7. Status Report – 2019 – Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by ERM Environmental and dated May 29, 2020
8. Remedial Action Work Plan Addendum No. 1 - Manhattan Village Shopping Center and Harris Properties – Normandy Park, Washington by PES Environmental and dated June 29, 2021

A number of these documents are accessible in electronic form from the Site webpage <https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=321>. The complete records are stored in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Visit our [Public Records Request page](#)¹, to submit a public records request or get more information about the process. If you require assistance with this process, you may contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or 360-407-6040.

¹ <https://ecology.wa.gov/Footer/Public-records-requests>

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that, upon completion of your proposed cleanup, **no further remedial action** will likely be necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A**.

In 1999, two groundwater monitoring wells were sampled twice, in April and December, and the samples analyzed for tetrachloroethene. All four concentrations exceeded the MTCA Method A standard.

In 2000, the same two wells were sampled three times, in April, August, and November, and the samples analyzed for tetrachloroethene. Five of six concentrations exceeded the MTCA Method A standard.

In 2001, the same two wells were sampled four times, in March, June, September, and December, and the samples analyzed for tetrachloroethene. Five of eight concentrations exceeded the MTCA Method A standard.

In 2002, the same two wells were sampled four times, in March, June, September, and December, and the samples analyzed for tetrachloroethene. All eight concentrations exceeded the MTCA Method A standard.

In 2003, the same two wells were sampled twice, in March and September, and the samples analyzed for tetrachloroethene. Three of four concentrations exceeded the MTCA Method A standard.

In 2004, the same two wells were sampled twice, in March and September, and the samples analyzed for tetrachloroethene. Two of four concentrations, both from the same well, exceeded the MTCA Method A standard.

In April of 2007, four additional groundwater wells were installed on site. Both the new and existing monitoring wells were sampled and analyzed for tetrachloroethene. All six concentrations exceeded the MTCA Method A standard.

In April of 2008, twenty groundwater wells on site were sampled and analyzed for tetrachloroethene, trichloroethene, cis 1,2-dichloroethene, chloroform, and bromodichloromethane. Bromodichloromethane was detected in one of twenty samples, with a concentration below the MTCA Method B standard. Chloroform was detected in seventeen of twenty samples, with all concentrations below the MTCA Method B standard. Cis 1,2-dichloroethene was detected in one of twenty samples, with a concentration below the MTCA Method B standard. Trichloroethene was detected in two of twenty samples, with both concentrations below the MTCA Method A standard. Tetrachloroethene was detected in nineteen of twenty groundwater samples, with ten of nineteen concentrations exceeding the MTCA Method A standard. Five grab groundwater samples were collected from five soil borings and analyzed for the same analytes. Bromodichloromethane, cis 1,2-dichloroethene, and trichloroethene were not detected in any of the five samples. Chloroform was detected in three of five samples, with all three concentrations below the MTCA Method B standard. Tetrachloroethene was detected in four of five grab groundwater samples, with one of four concentrations exceeding the MTCA Method A standard. Nine groundwater samples were analyzed for dissolved metals – arsenic, chromium, iron, and manganese. Arsenic was not detected in any of the nine groundwater samples. Chromium was detected in one of nine samples and iron was detected in one of nine (different) samples. Both concentrations were below their respective MTCA Method A standards. Manganese was detected in three of nine groundwater samples, with all three concentrations below the MTCA Method A standard.

In May of 2008, three air samples, two indoors and one outdoors, were collected and analyzed for 1,1-dichloroethene, methylene chloride, 1,1,1-trichloroethane, and trichlorofluoromethane. While one or more analytes were detected in each of the air samples, none of the concentrations exceeded State standards.

In March of 2010, seven groundwater wells were sampled and the samples analyzed for tetrachloroethene, trichloroethene, cis 1,2-dichloroethene, chloroform, and bromodichloromethane. Bromodichloromethane, chloroform, cis 1,2-dichloroethene, and trichloroethene were not detected in any of the seven samples. Tetrachloroethene was detected in six of seven samples, with four of six concentrations exceeding the MTCA Method A standard.

In November of 2010, sixteen groundwater wells were sampled and the samples analyzed for tetrachloroethene, trichloroethene, cis 1,2-dichloroethene, chloroform, and bromodichloromethane. Bromodichloromethane, chloroform, cis 1,2-dichloroethene, and trichloroethene were not detected in any of the sixteen samples. Tetrachloroethene was detected in twelve of sixteen samples, with seven of twelve concentrations exceeding the MTCA Method A standard. Thirteen wells were analyzed for dissolved metals – iron, manganese, and potassium. Iron and manganese were not detected in any of the samples. Potassium was detected in all of the samples, with concentrations ranging from 1,400 – 2,300 µg/l

In February of 2011, two additional groundwater monitoring wells were installed on site. Samples were collected from the two wells and analyzed for chloroform, cis 1,2-dichloroethene, trichloroethene, and tetrachloroethene. Chloroform, cis 1,2-dichloroethene, and trichloroethene were not detected in either sample while tetrachloroethene was detected in both samples, with both concentrations exceeding the MTCA Method A standard.

In April of 2012, forty-one groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in twenty-three of forty-one samples, with seventeen of twenty-three concentrations exceeding the MTCA Method A standard.

In May of 2013, one additional groundwater monitoring well was installed on site. Groundwater samples were collected from it and twenty-one existing wells and analyzed for tetrachloroethene. Tetrachloroethene was detected in eighteen of twenty-two samples, with nine of eighteen concentrations exceeding the MTCA Method A standard.

In April of 2014, eight groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in seven of eight samples, with one of seven concentrations exceeding the MTCA Method A standard.

In December of 2016, eleven groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in five of eleven samples, with two of five concentrations exceeding the MTCA Method A standard.

In March of 2017, twenty-six groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in seventeen of twenty-six samples, with eight of seventeen concentrations exceeding the MTCA Method A standard.

In July of 2017, sixteen groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in nine of sixteen samples, with two of nine concentrations exceeding the MTCA Method A standard.

In October of 2017, thirty groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in twenty-three of thirty samples, with seven of twenty-three concentrations exceeding the MTCA Method A standard.

In January of 2018, ten groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in all ten groundwater samples, with seven of ten concentrations exceeding the MTCA Method A standard.

In April of 2018, thirty groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in twenty-four of thirty groundwater samples, with eight of twenty-four concentrations exceeding the MTCA Method A standard. Fifteen soil borings were installed on site, with two to six soil samples per boring being collected and analyzed for tetrachloroethene. Tetrachloroethene was detected in twenty-eight of forty-eight soil samples, with twenty-four of twenty-eight concentrations exceeding the MTCA Method A standard. Groundwater grab samples were collected from eight of the soil borings and analyzed for tetrachloroethene. Tetrachloroethene was detected in all eight grab samples, with seven of eight concentrations exceeding the MTCA Method A standard. Meta, ortho, and para xylenes were detected in the one sample with tetrachloroethene concentration below the MTCA Method A standard. The meta, ortho, and para xylene concentrations were also below the MTCA Method A standard.

In July of 2018, ten groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in all ten groundwater samples, with eight of ten concentrations exceeding the MTCA Method A standard.

In October of 2018, twenty-eight groundwater monitoring wells were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was detected in sixteen of twenty-eight samples, with seven of sixteen concentrations exceeding the MTCA Method A standard.

In March of 2019, two additional groundwater monitoring wells were installed on site. Three soil samples were collected from each well and analyzed for tetrachloroethene. Tetrachloroethene was detected in three of six soil samples, with one concentration exceeding the MTCA Method A standard. One groundwater sample was collected from each well and analyzed for tetrachloroethene. Tetrachloroethene was detected in both groundwater samples, with both concentrations exceeding the MTCA Method A standard.

In May of 2019, groundwater samples were collected from three existing wells and analyzed for tetrachloroethene. Tetrachloroethene was detected in all three samples, with one of three concentrations exceeding the MTCA Method A standard.

In October of 2019, two additional groundwater monitoring wells were installed on site. Four soil samples were collected from one well and two soil samples from the other and analyzed for tetrachloroethene. Tetrachloroethene was detected in two of four samples in one case and one of two samples in the other, with two of four concentrations in one case and one of two concentrations in the other exceeding the MTCA Method A standard. Groundwater samples were collected from the two new wells and thirteen existing wells and analyzed for tetrachloroethene. Tetrachloroethene was detected in twelve of fifteen samples, with seven of

twelve concentrations exceeding the MTCA Method A standard. Tetrachloroethene was not detected in either of the two new wells.

In December of 2019, the two wells installed in October were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was not detected in either sample.

In June of 2020, monitoring wells MW-17 and MW-20 were sampled and the samples analyzed for tetrachloroethene. Tetrachloroethene was not detected in MW-20 but was detected, with a concentration exceeding the MTCA Method A standard, in MW-17.

In late August-early September of 2020, six soil borings to be used as part of a soil vapor extraction system were installed on site. Three to four soil samples were collected from each boring and analyzed for volatile organic compounds. Tetrachloroethene was detected in fifteen of twenty soil samples, with nine of fifteen concentrations exceeding the MTCA Method A standard. Trichloroethene and cis 1,2-dichloroethene were detected in one soil sample with 1,2,3-trichlorobenzene and hexachlorobutadiene detected in a second soil sample. All four concentrations did not exceed State standards.

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In mid-September of 2020, fifteen shallow soil borings were installed on site as part of a soil vapor extraction system. One to two soil samples were collected from each boring and analyzed for volatile organic compounds. Tetrachloroethene was detected in two of nineteen soil samples, with both concentrations exceeding the MTCA Method A standard. Each detection was from a separate boring and each was the shallowest sample from that boring. No other volatile organic compounds were detected.

In January of 2021, twelve additional shallow soil borings were installed on site as part of a soil vapor extraction system. One soil sample from each well was collected and analyzed for volatile organic compounds. Tetrachloroethene was detected in one soil sample, with a concentration exceeding the MTCA Method A standard. No other volatile organic compounds were detected.

In May of 2021, one monitoring well, DC-7, was sampled and the sample analyzed for tetrachloroethene. Tetrachloroethene was detected with a concentration exceeding the MTCA Method A standard.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site meet the substantive requirements of MTCA.

Soil

Tetrachloroethene – 0.05 mg/Kg

Trichloroethene – 0.03 mg/Kg

Cis-1,2-dichloroethene – 160 mg/Kg

Trans-1,2-dichloroethene – 1,600 mg/Kg

Vinyl chloride – 0.67 mg/Kg

Groundwater

Tetrachloroethene – 5 µg/l

Trichloroethene – 5 µg/l

Cis – 1,2-dichloroethene – 16 µg/l

Trans 1,2-dichloroethene – 160 µg/l

Vinyl chloride – 0.2 µg/l

A standard horizontal point of compliance, the property boundary, was used for soil contamination.

A standard vertical point of compliance, fifteen feet, for soils was established in the soils throughout the site from the ground surface to fifteen feet below the ground surface. Fifteen feet is protective for direct contact with the contaminated soil.

A standard vertical point of compliance, from the uppermost level of the saturated zone to the lowest depth that could potentially be affected, was used for groundwater contamination.

3. Selection of cleanup action.

Ecology has determined the cleanup action you propose for the Site meets the substantive requirements of MTCA.

In the early 1970s, the septic tank and drain field for the Manhattan Village Shopping Center was removed.

In 1999, a nine well soil vapor extraction system was installed and operated until mid-2000. (report not available).

In 2006, the septic tank and thirty-seven tons of contaminated soil and concrete were excavated from the Harris property and taken off-site. Confirmation sampling had no exceedances of contaminants of concern.

In 2009, a ten well vapor extraction system was installed and operated until 2014.

In 2016, the existing vapor extraction system was expanded to include twenty-two extraction wells and thirty-one air sparging wells and has been in operation since the expansion.

You are proposing the following additional actions:

Soil – placement of a restrictive environmental covenant on those parts of the two properties that are contaminated above State standards.

Groundwater – placement of a permeable reactive barrier on the north side of the Harris property and placement of a restrictive environmental covenant on groundwater use on the Harris property. Continued monitoring of groundwater on the Harris property and downgradient to monitor the performance of the permeable reactive barrier.

Soil vapor – continued operation of the existing soil vapor extraction system to prevent intrusion of contaminated vapors into structures.

The methods selected above meet the minimum requirements for cleanup actions by providing a permanent solution, immediate restoration time frame, provides for confirmation monitoring, and protects human health and the environment.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion does not:

- Resolve or alter a person's liability to the state
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70A.305.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you proposed will be substantially equivalent. Courts make that determination.

See RCW 70A.305.080 and WAC 173-340-545.

3. Opinion is limited to proposed cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the Voluntary Cleanup Program (VCP).

4. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. See RCW 70A.305.170.

Contact Information

Thank you for choosing to clean up the Site under the VCP. As you conduct your cleanup, please do not hesitate to request additional services. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our webpage ². If you have any questions about this opinion, please contact me by phone at 360.407.7223 or e-mail at chritopher.maurer@ecy.wa.gov.

Sincerely,

Christopher Maurer

Christopher Maurer, P.E.
HQ - Toxics Cleanup Program

Enclosure: A – Site Description and Diagrams

cc: Harry Grant, Fox Rothschild L.L.P

² <https://www.ecy.wa.gov/vcp>

Enclosure A

Description and Diagrams of the Site

Harris Family Properties

312304-9229 - POR OF N 1/2 OF SE 1/4 OF NE 1/4 OF NE 1/4 BEG NXN OF SLY MGN OF SW 178TH ST & WLY MGN OF 1ST AVE S TH N 89-26-45 W ALG SD SLY MGN S TH W ALG SD SLY MGN OF SW 178TH ST E LN OF WESTVIEW TOWNHOUSES CONDO TH S ALG SD E LN 288 FT M/L TO S LN SD SUBD TH E ALG SD S LN TO W MGN OF 1ST AVE S TH N ALG SD MGN TO POB

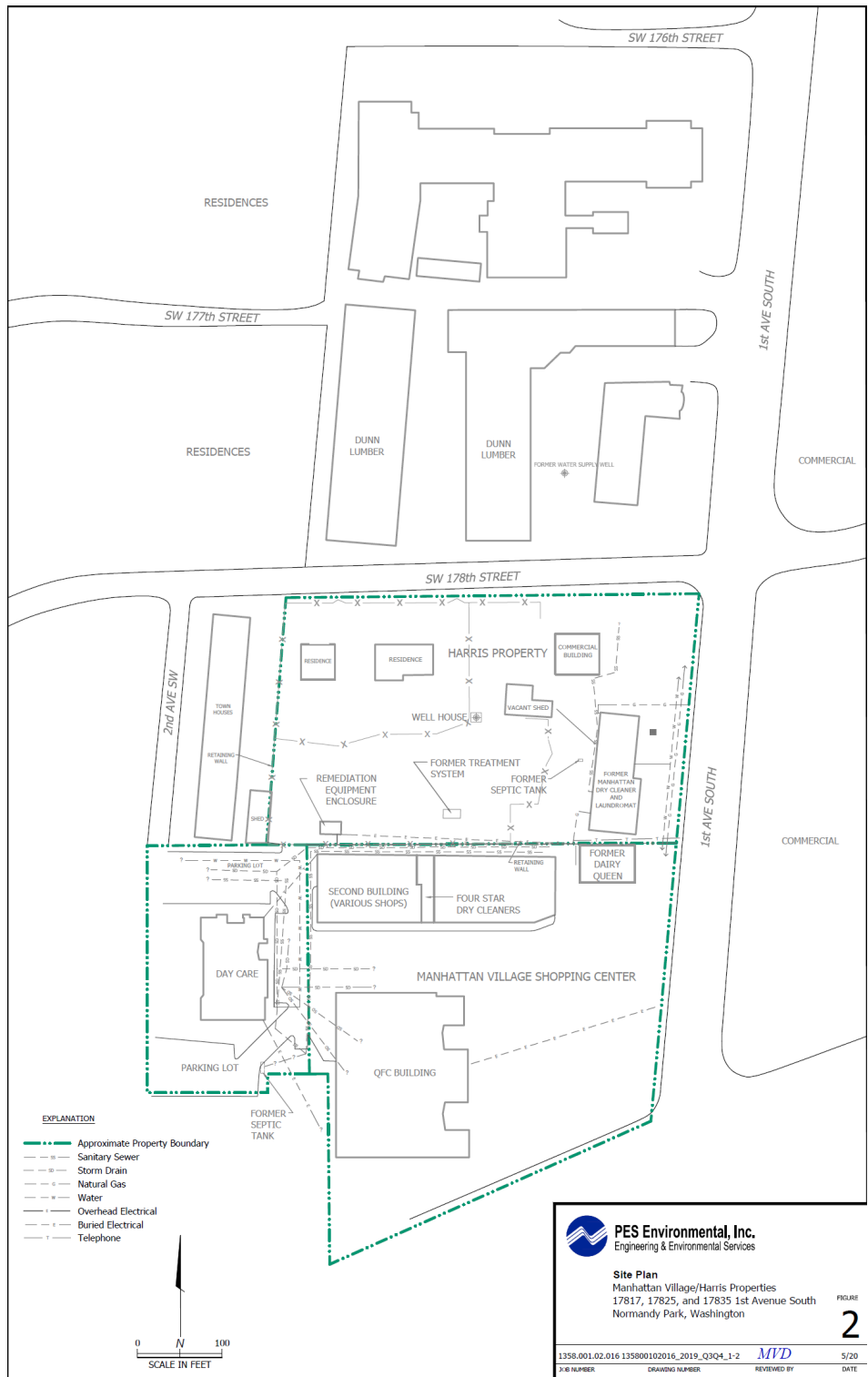
Manhattan Village Shopping Center

312304-9091 PARCEL B OF NORMANDY PARK LOT LINE ADJUSTMENT NO NP 00-004 RECORDING NO 20010123001962 BEING A PORTION OF E 1/2 OF NE 1/4 LY NLY OF SW NORMANDY ROAD AND ELY OF PLAT MANHATTAN VIEW AND PLAT RAY BELL ADDITION AND SLY OF SW 178TH ST



Subject Property Location Map
 Manhattan Village/Harris Properties
 17817, 17825, and 17835 1st Avenue South
 Normandy Park, Washington

FIGURE
1



PES Environmental, Inc.
Engineering & Environmental Services

Site Plan
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
2

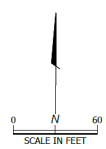
1358.001.02.016 135800102016_2019_Q3Q4_1-2 MVD
DRAWING NUMBER REVIEWED BY DATE



Note:
 1. SCS operated a 9 well interim SVE system between October 1999 and July 2000. The former SVE system and wells have been decommissioned.

EXPLANATION

- Approximate Property Boundary
- MW-12 ☉ Shallow Monitoring Well
- DC-16 ☉ Deep Monitoring Well
- AS-1 ▼ Air Sparge Well
- SVE-1 ● Soil Vapor Extraction Well
- VES-3 ☉ Decommissioned Soil Vapor Extraction Well (SCS, 1999)
- VMP-1 ☉ Vapor Monitoring Probe

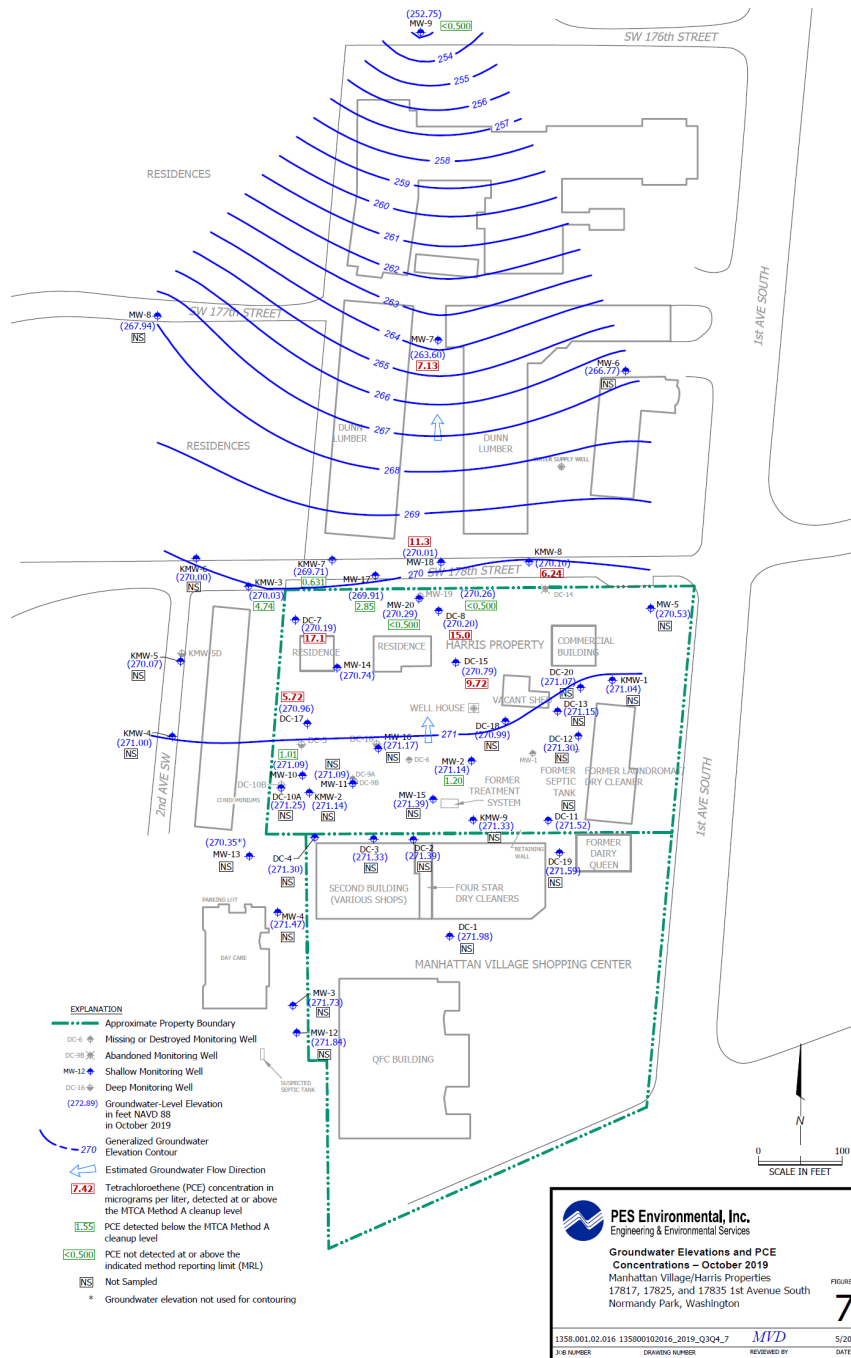


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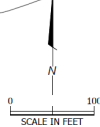
Existing Remediation Well Locations
 Manhattan Village/Harris Properties
 17817, 17825, and 17835 1st Avenue South
 Normandy Park, Washington

FIGURE **3**

1358L.001.02.016 1358P0102016_2019_Q3Q4_3 MVD 5/20
 X/B NUMBER DRAWING NUMBER REVIEWED BY DATE



- EXPLANATION**
- Approximate Property Boundary
 - DC-6 Missing or Destroyed Monitoring Well
 - DC-9B Abandoned Monitoring Well
 - MW-12 Shallow Monitoring Well
 - DC-16 Deep Monitoring Well
 - (272.89) Groundwater-Level Elevation in feet NAVD 88 in October 2019
 - 270 Generalized Groundwater Elevation Contour
 - Estimated Groundwater Flow Direction
 - 7.42 Tetrachloroethene (PCE) concentration in micrograms per liter, detected at or above the MTCA Method A cleanup level
 - 0.55 PCE detected below the MTCA Method A cleanup level
 - <0.500 PCE not detected at or above the indicated method reporting limit (MRL)
 - NS Not Sampled
 - * Groundwater elevation not used for contouring

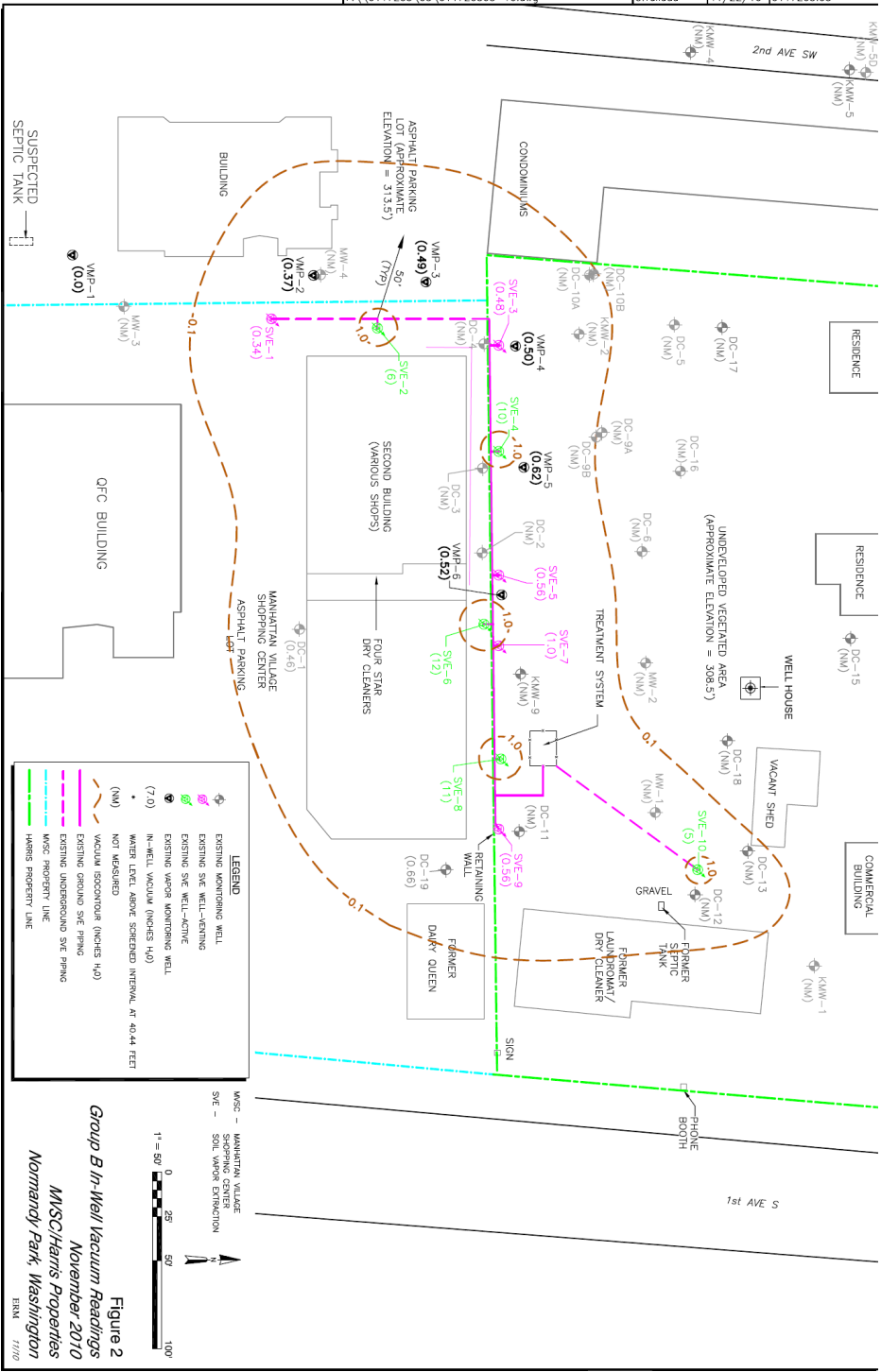


PES Environmental, Inc.
 Engineering & Environmental Services

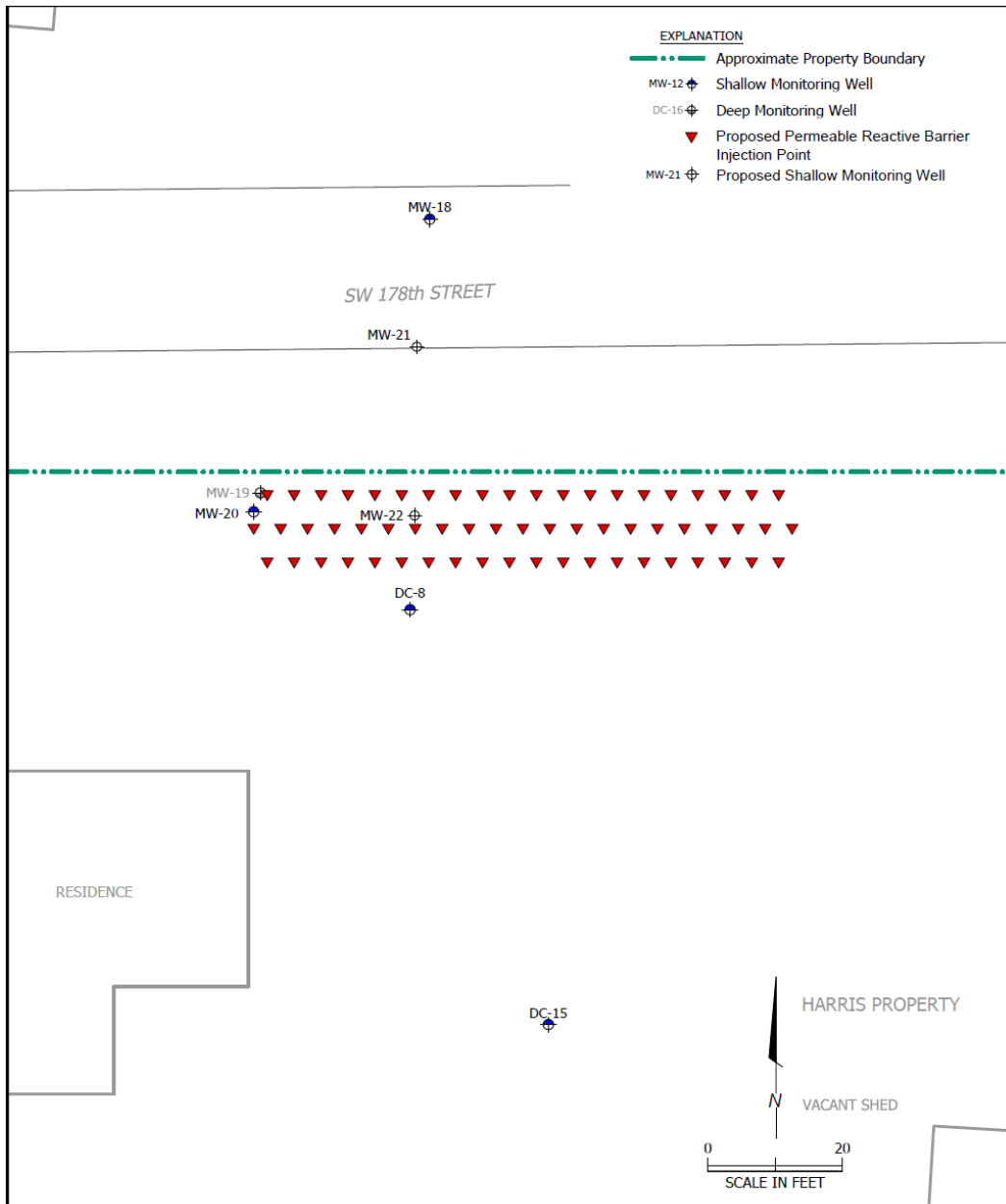
Groundwater Elevations and PCE Concentrations - October 2019
 Manhattan Village/Harris Properties
 17817, 17825, and 17835 1st Avenue South
 Normandy Park, Washington

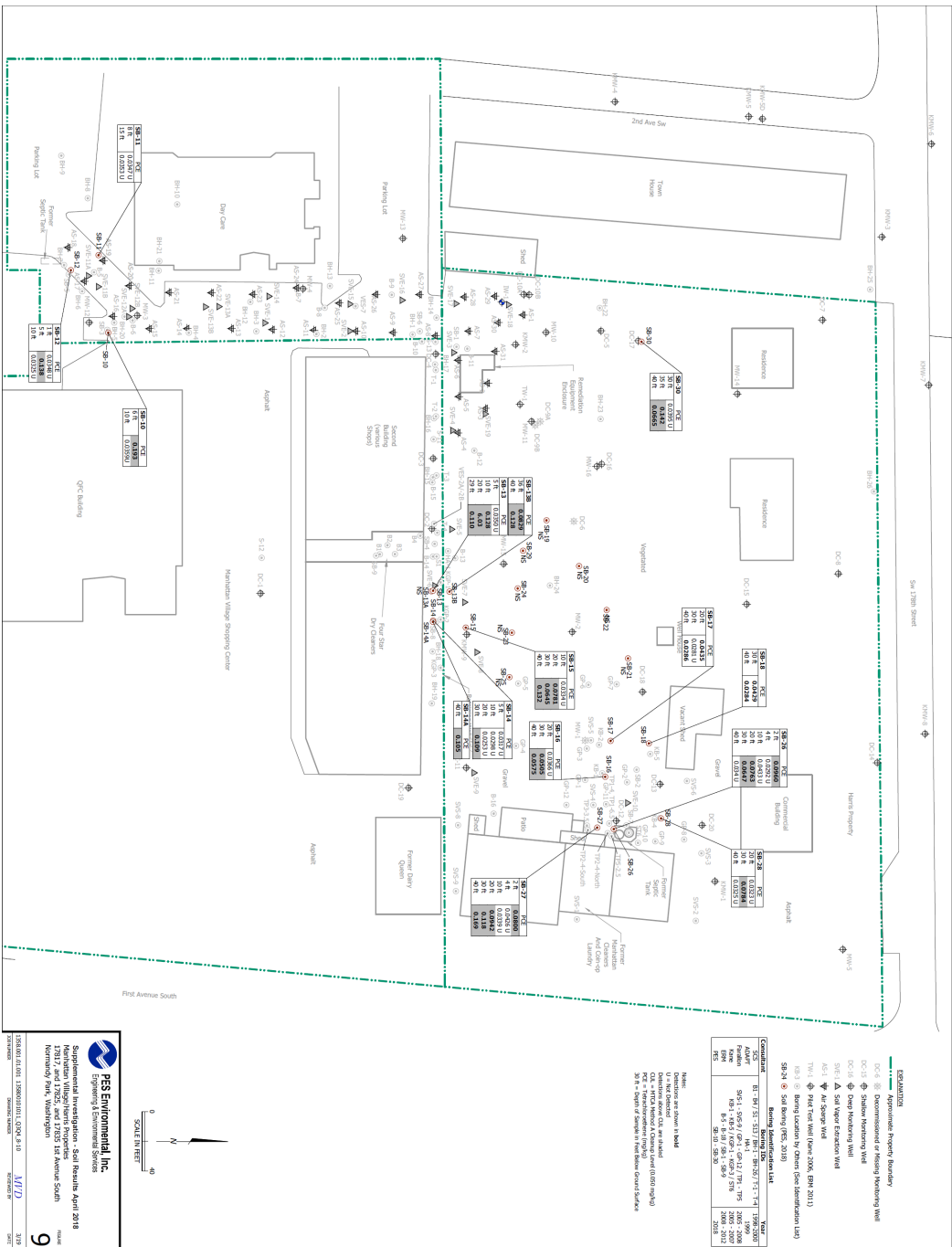
FIGURE **7**

1358.001.02.016 135800102016_2019_Q3Q4_7 MVD 5/20
 3/8 NUMBER DRAWING NUMBER REVIEWED BY DATE



15K4
11/22





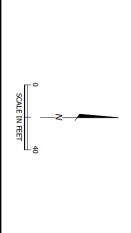
Legend

- 150-foot Buffer
- Apparent Property Boundary
- DC-1 - Commissioned or Missing Monitoring Well
- DC-2 - Station Monitoring Well
- DC-3 - Deep Monitoring Well
- SW-1 - Soil Vapor Extraction Well
- AS-1 - Air Strip Well
- TV-1 - Plant Test Well (Case 2006, EPA 2011)
- BE-1 - Boring location by owner (see identification list)
- BE-2 - Soil Boring (see 2010 identification list)

Notes:

- Disturbance shown in bold
- Disturbance shown in italics
- Disturbance shown in bold and italics
- DC-1 - Commissioned or Missing Monitoring Well
- DC-2 - Station Monitoring Well
- DC-3 - Deep Monitoring Well
- SW-1 - Soil Vapor Extraction Well
- AS-1 - Air Strip Well
- TV-1 - Plant Test Well (Case 2006, EPA 2011)
- BE-1 - Boring location by owner (see identification list)
- BE-2 - Soil Boring (see 2010 identification list)

Well ID	Well Type	Well Depth (ft)	Well Diameter (in)	Well Status	Well Construction
DC-1	Commissioned or Missing Monitoring Well	10	4	DC-1	Concrete
DC-2	Station Monitoring Well	10	4	DC-2	Concrete
DC-3	Deep Monitoring Well	10	4	DC-3	Concrete
SW-1	Soil Vapor Extraction Well	10	4	SW-1	Concrete
AS-1	Air Strip Well	10	4	AS-1	Concrete
TV-1	Plant Test Well (Case 2006, EPA 2011)	10	4	TV-1	Concrete
BE-1	Boring location by owner (see identification list)	10	4	BE-1	Concrete
BE-2	Soil Boring (see 2010 identification list)	10	4	BE-2	Concrete



PES Environmental, Inc.
 Engineering & Environmental Services
 Supplemental Investigation - Soil Results April 2018
 1001 15th Avenue South, Suite 200
 Normandy Park, Washington 98147
 206.885.1100
 206.885.1101
 206.885.1102
 206.885.1103
 206.885.1104
 206.885.1105
 206.885.1106
 206.885.1107
 206.885.1108
 206.885.1109
 206.885.1110
 206.885.1111
 206.885.1112
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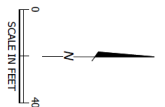
EXPLANATION

- Approximate Property Boundary
- DC-6 ☒ Decommissioned or Missing Monitoring Well
- DC-15 ☒ Shallow Monitoring Well
- DC-16 ☒ Deep Monitoring Well
- SVE-1 ▲ Soil Vapor Extraction Well
- AS-1 ▼ Air Sample Well
- TM-1 ☒ Pitot Test Well (Kane 2006, ERM 2011)
- RB-3 ☒ Boring Location by Others (See Identification List)
- SB-24 ☒ Soil Boring (PES, 2018)

Boring Identification List

Consultant	Boring IDs	Year
SES	BI-7, BI-7/S1, S13, BI-1, BI-26, T-1, T-4	1998-2000
ADAPT	HA-1	1999
Fieldwork	HA-1	2006
Keane	SVE-1, SVE-9 / GC-1, GC-12 / TR-1, TR-5	2005 - 2007
ERM	KB-1, KB-5 / KC-1, KC-3 / ST-5	2008 - 2012
PES	B-5 - B-18 / SB-1 - SB-9	2008 - 2012
	SB-10 - SB-30	2018

Notes:
 Detections are shown in **bold**
 Detections above CCL are shaded
 CCL = MTRCA Method A Cleanup Level (5 µg/l)
 PCE = Tetrachloroethene (µg/l)
 30" = Depth of Sample in feet below Ground Surface

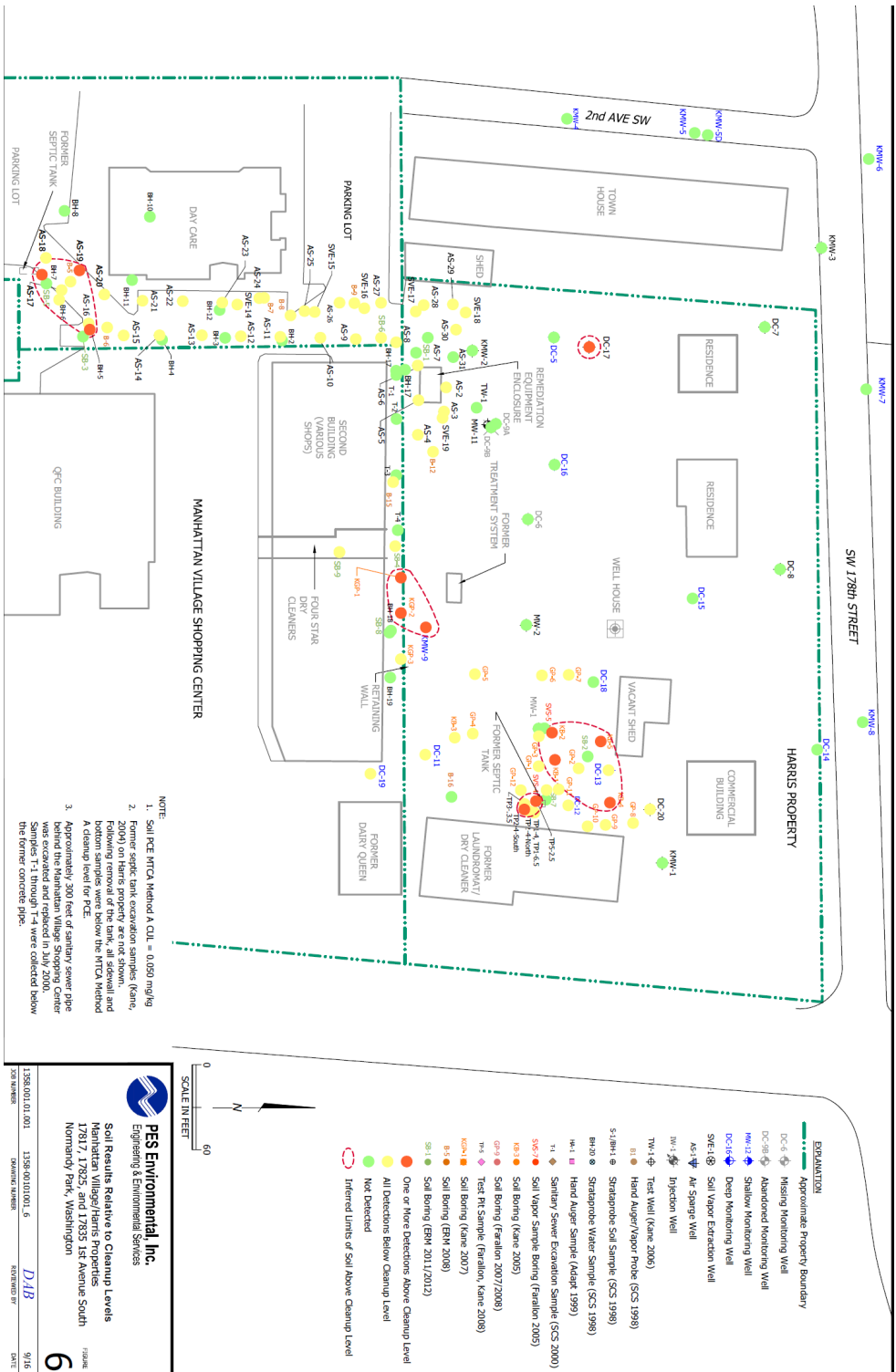


Note: The original version of this figure includes color-designated features. A black and white copy of the figure may not accurately represent the information originally presented.

PES Environmental, Inc.
 Engineering & Environmental Services

Supplemental Investigation - Groundwater
 Results April 2018
 Meridian Village/Harris Properties
 17031 and 17033, and 17033 1st Avenue South
 Normandy Park, Washington

PROJECT NUMBER: 1358.001.01.001.1358901011.0004.8-10
 SCALE NUMBER: 1:100
 REVISED BY: MTD
 DATE: 3/19



- NOTE:
1. Soil PCE MTCM Method A CUL = 0.050 mg/kg
 2. Former septic tank excavation samples (Kane, 2004) on Harris property are not shown. Following removal of the tank, all sidewall and bottom samples were collected below the MTCM Method A cleanup level for PCE.
 3. Approximately 200 feet of sanitary sewer pipe was excavated and replaced in July 2000. Samples T-1 through T-4 were collected below the former concrete pipe.

PES Environmental, Inc.
 Engineering & Environmental Services

Soil Results Relative to Cleanup Levels
 Manhattan Villages/Islands Properties
 17817, 17825, and 17855 1st Avenue South
 Normandy Park, Washington

FIGURE
6

1/28/2010 01.001 1/28/2010 01.001 6
 DRAWING NUMBER DATE

DJB
 ENGINEER DATE

9/16
 DATE

- EXAMINATION**
- Approximate Property Boundary
 - DC-6 Missing Monitoring Well
 - DC-9B Abandoned Monitoring Well
 - NM-12 Shallow Monitoring Well
 - DC-16-D Deep Monitoring Well
 - SR-18B Soil Vapor Extraction Well
 - AS-17A Air Sparge Well
 - TM-1 Injection Well
 - TM-1B Test Well (Kane 2006)
 - 81 Hand Auger/Vapor Probe (SCS 1998)
 - 5.1.98H-1 Strataprobe Soil Sample (SCS 1998)
 - 8M-20 Strataprobe Water Sample (SCS 1998)
 - HM-1 Hand Auger Sample (Adapt 1999)
 - T-1 Sanitary Sewer Excavation Sample (SCS 2000)
 - SR-7-D Soil Vapor Sample Boring (Frazier 2005)
 - SR-7-D Soil Boring (Frazier 2005)
 - 8.3.1 Soil Boring (Kane 2005)
 - 8.3.1 Soil Boring (Frazier 2007/2008)
 - TM-1 Test Pit Sample (Frazier, Kane 2005)
 - 8.3.1 Soil Boring (Kane 2007)
 - 8.3.1 Soil Boring (ERM 2008)
 - 8.3.1 Soil Boring (ERM 2011/2012)
 - 8.3.1 One or More Detections Above Cleanup Level
 - All Detections Below Cleanup Level
 - ND Not Detected
 - Inferred Limits of Soil Above Cleanup Level

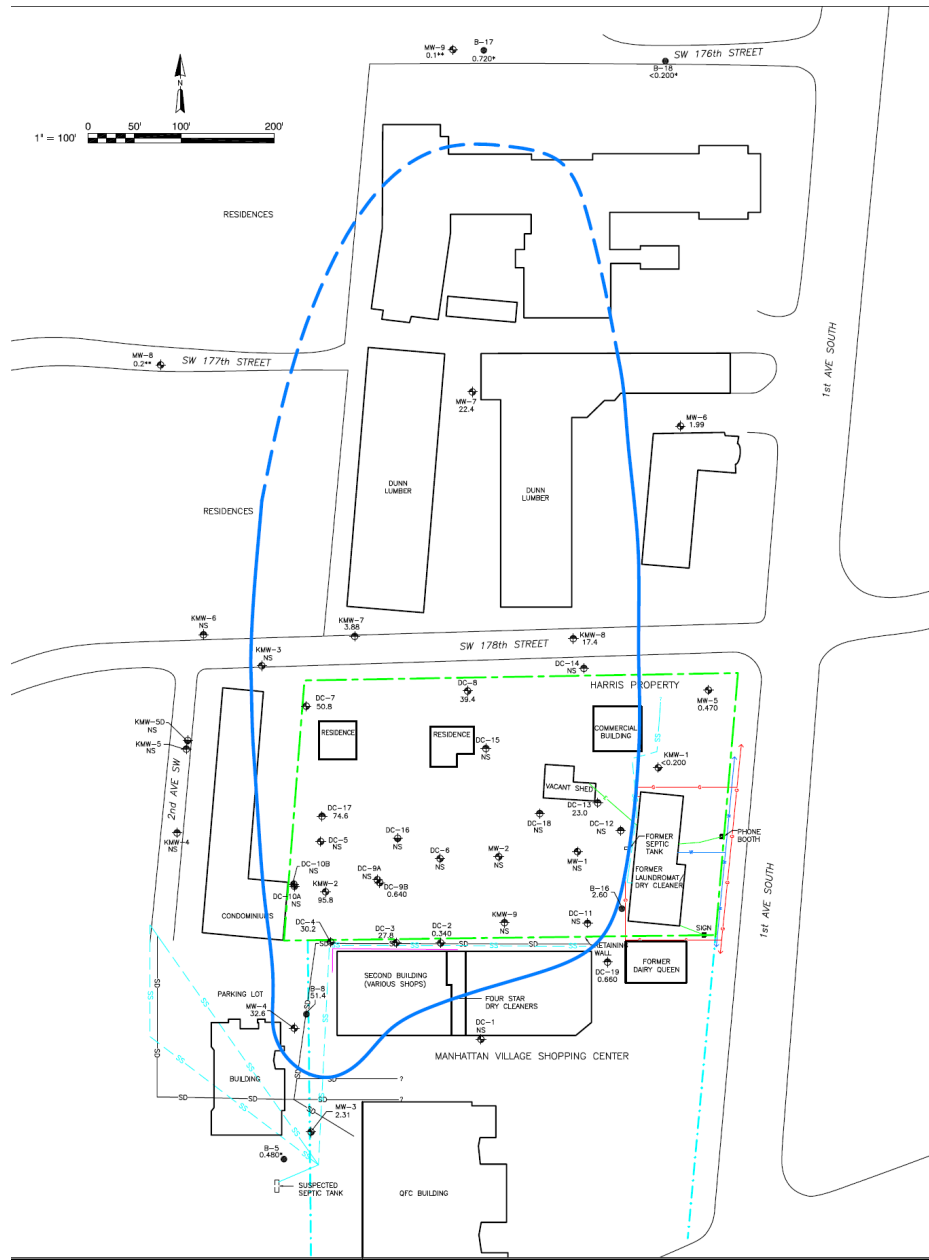


sp:\0075720\Normandy Park\00\007572000-19.dwg, Layout1

- LEGEND**
- Existing Soil Boring
 - Soil Boring, Completed 2008
 - 38.4 PCE Concentration (µg/kg)
 - 27.8 PCE Concentration Above the Cleanup Standard (50 µg/kg)
 - Inferred Impacted Soil Boundary, April 2008 Data
 - Inferred Impacted Soil Boundary, April 2005 Data
 - Approximate Harris Property Boundary
 - Approximate Manhattan Village Shopping Center Property Boundary
 - Underground Electrical Utility
 - Underground Natural Gas Utility
 - Underground Sewer Utility
 - Underground Storm Drain Utility
 - Underground Water Utility

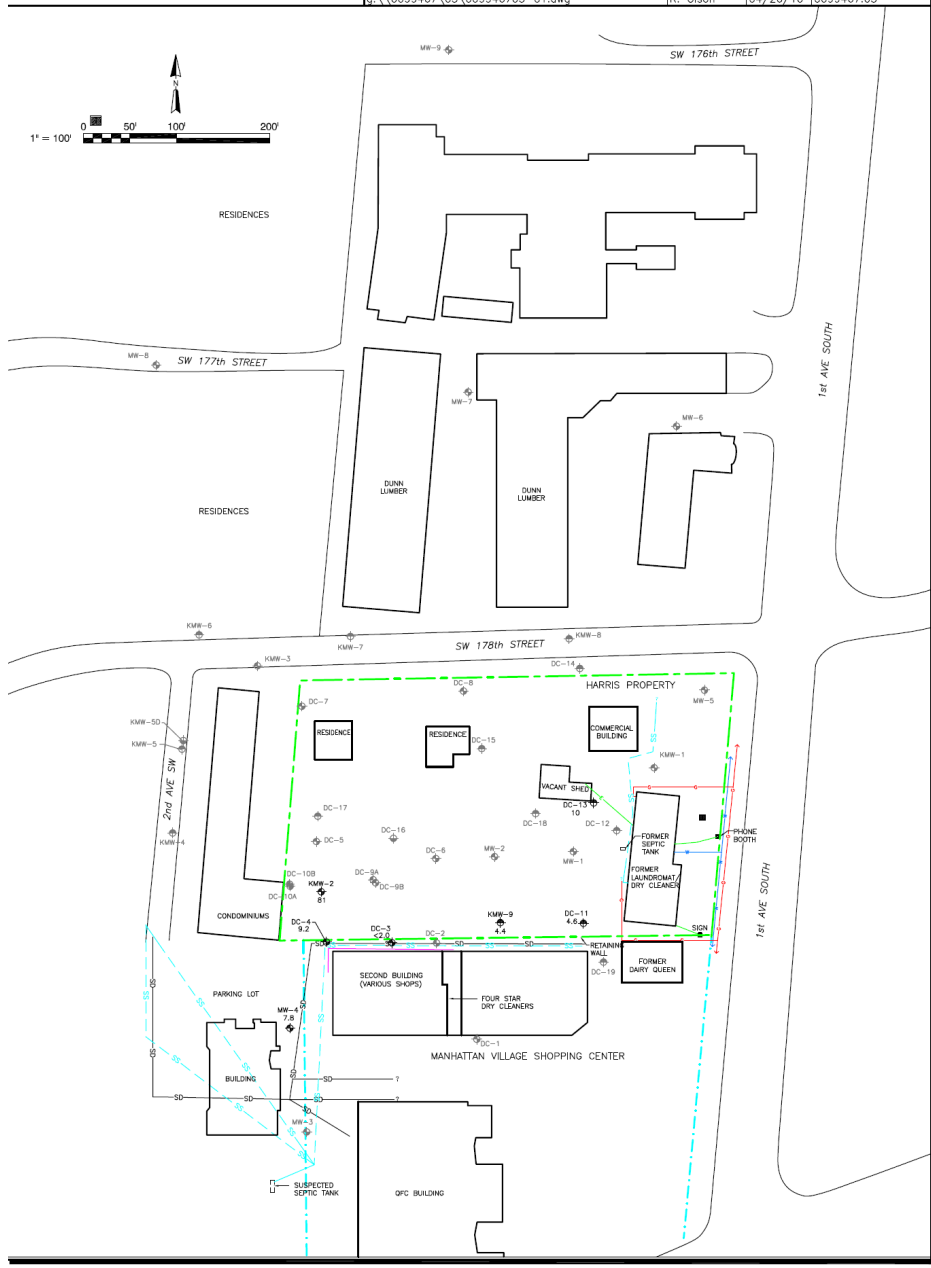
Figure 4
Tetrachloroethene in Soil
MVSC/Harris Properties
Normandy Park, Washington

ERM 11/08



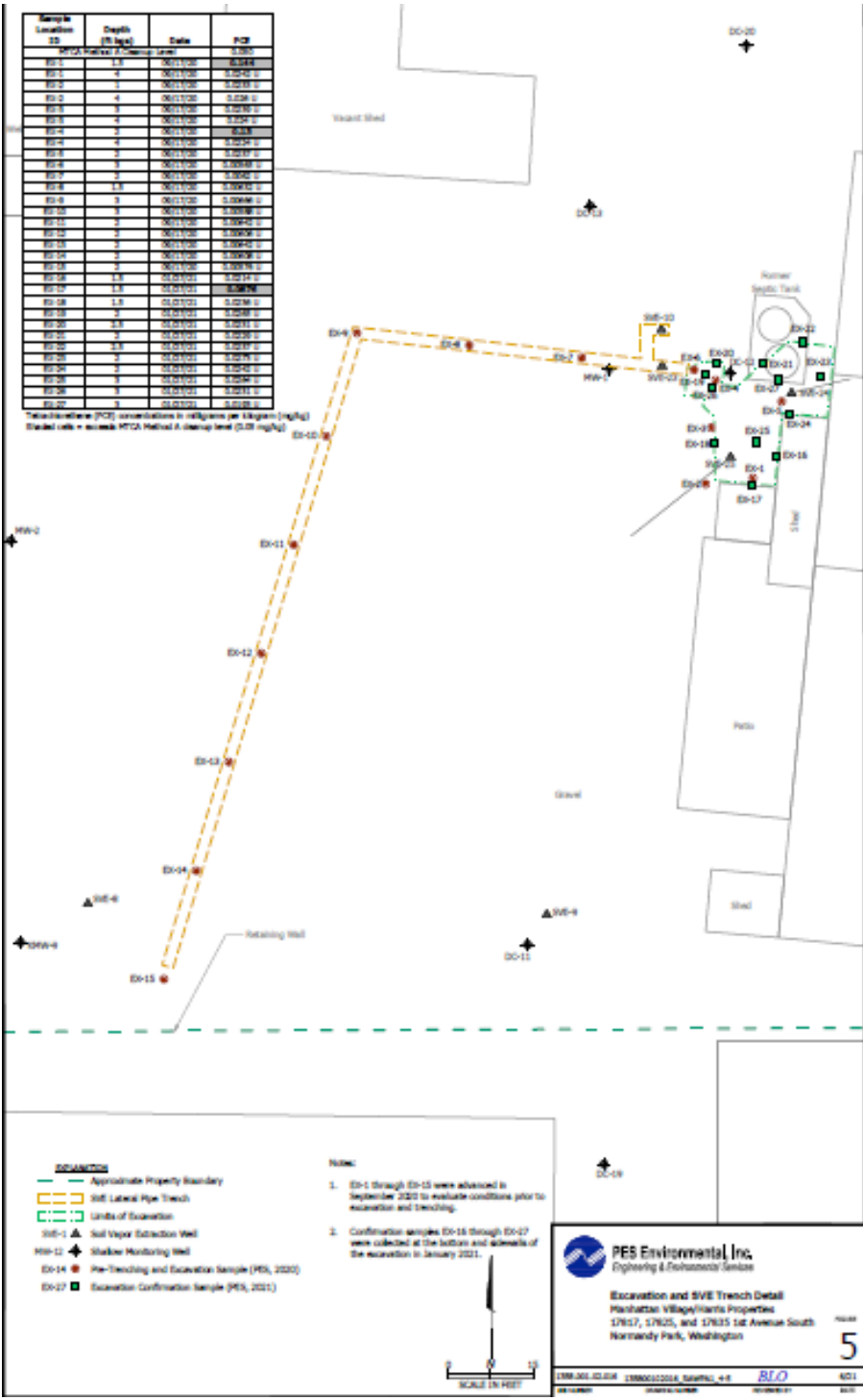
LEGEND	
◆	Monitoring Well
◆	Shallow Monitoring Well
◆	Deep Monitoring Well
●	Soil Boring
50.8	PCE Concentration (µg/L)
NS	Not Sampled
*	Grab Groundwater Sample Collected From Soil Boring in March 2008
**	Groundwater Sample Collected in August 2008
— (Blue dashed)	Inferred Area of PCE Above Cleanup Standard (5 µg/L)
— (Green dashed)	Approximate Harris Property Boundary
— (Cyan dashed)	Approximate Manhattan Village Shopping Center Property Boundary
— (Green solid)	Underground Electrical Utility
— (Red solid)	Underground Natural Gas Utility
— (Cyan solid)	Underground Sewer Utility
— (Grey solid)	Underground Storm Drain Utility
— (Blue solid)	Underground Water Utility

Figure 5
*Tetrachloroethene in Groundwater
 MVSC/Harris Properties
 Normandy Park, Washington*



LEGEND	
◆	Monitoring Well
◆	Shallow Monitoring Well
◆	Deep Monitoring Well
50.8	PCE Concentration (µg/L)
Grayed symbols	were not sampled.
■	Storm Water Catch Basin
---	Approximate Harris Property Boundary
---	Approximate Manhattan Village Shopping Center Property Boundary
---	Underground Electrical Utility
---	Underground Natural Gas Utility
---	Underground Sewer Utility
---	Underground Storm Drain Utility
---	Underground Water Utility

Figure 3
PCE in Groundwater - March 2010
MVSC/Harris Properties
Normandy Park, Washington



Sample Location ID	Depth (ft bgs)	Date	PCB
MCA Method A Cleanup Level			0.000
Ew-1	1.5	10/1/2020	0.004
Ew-2	2	10/1/2020	0.002 U
Ew-3	3	10/1/2020	0.003 U
Ew-4	4	10/1/2020	0.006 U
Ew-5	5	10/1/2020	0.003 U
Ew-6	6	10/1/2020	0.004 U
Ew-7	7	10/1/2020	0.003 U
Ew-8	8	10/1/2020	0.002 U
Ew-9	9	10/1/2020	0.004 U
Ew-10	10	10/1/2020	0.002 U
Ew-11	11	10/1/2020	0.002 U
Ew-12	12	10/1/2020	0.002 U
Ew-13	13	10/1/2020	0.002 U
Ew-14	14	10/1/2020	0.002 U
Ew-15	15	10/1/2020	0.002 U
Ew-16	16	10/1/2020	0.002 U
Ew-17	17	10/1/2020	0.002 U
Ew-18	18	10/1/2020	0.002 U
Ew-19	19	10/1/2020	0.002 U
Ew-20	20	10/1/2020	0.002 U
Ew-21	21	10/1/2020	0.002 U
Ew-22	22	10/1/2020	0.002 U
Ew-23	23	10/1/2020	0.002 U
Ew-24	24	10/1/2020	0.002 U
Ew-25	25	10/1/2020	0.002 U
Ew-26	26	10/1/2020	0.002 U
Ew-27	27	10/1/2020	0.002 U
Ew-28	28	10/1/2020	0.002 U
Ew-29	29	10/1/2020	0.002 U
Ew-30	30	10/1/2020	0.002 U
Ew-31	31	10/1/2020	0.002 U
Ew-32	32	10/1/2020	0.002 U
Ew-33	33	10/1/2020	0.002 U
Ew-34	34	10/1/2020	0.002 U
Ew-35	35	10/1/2020	0.002 U
Ew-36	36	10/1/2020	0.002 U
Ew-37	37	10/1/2020	0.002 U
Ew-38	38	10/1/2020	0.002 U
Ew-39	39	10/1/2020	0.002 U
Ew-40	40	10/1/2020	0.002 U
Ew-41	41	10/1/2020	0.002 U
Ew-42	42	10/1/2020	0.002 U
Ew-43	43	10/1/2020	0.002 U
Ew-44	44	10/1/2020	0.002 U
Ew-45	45	10/1/2020	0.002 U
Ew-46	46	10/1/2020	0.002 U
Ew-47	47	10/1/2020	0.002 U
Ew-48	48	10/1/2020	0.002 U
Ew-49	49	10/1/2020	0.002 U
Ew-50	50	10/1/2020	0.002 U

Threshold values (PCB concentrations in milligrams per kilogram) (mg/kg)
 Shaded cells = exceed MCA Method A cleanup level (0.01 mg/kg)

- BOUNDARIES**
- Approximate Property Boundary
 - SVE Lateral Pipe Trench
 - Limits of Excavation
- WELLS**
- MW-1 ▲ Soil Vapor Extraction Well
 - MW-12 ◆ Shallow Monitoring Well
 - Ew-14 ● Pre-Trenching and Excavation Sample (PES, 2020)
 - Ew-17 ■ Excavation Confirmation Sample (ECS, 2021)

- Notes:**
- Ew-1 through Ew-10 were advanced in September 2020 to evaluate conditions prior to excavation and trenching.
 - Confirmation samples Ew-16 through Ew-27 were collected at the bottom and sidewalls of the excavation in January 2021.

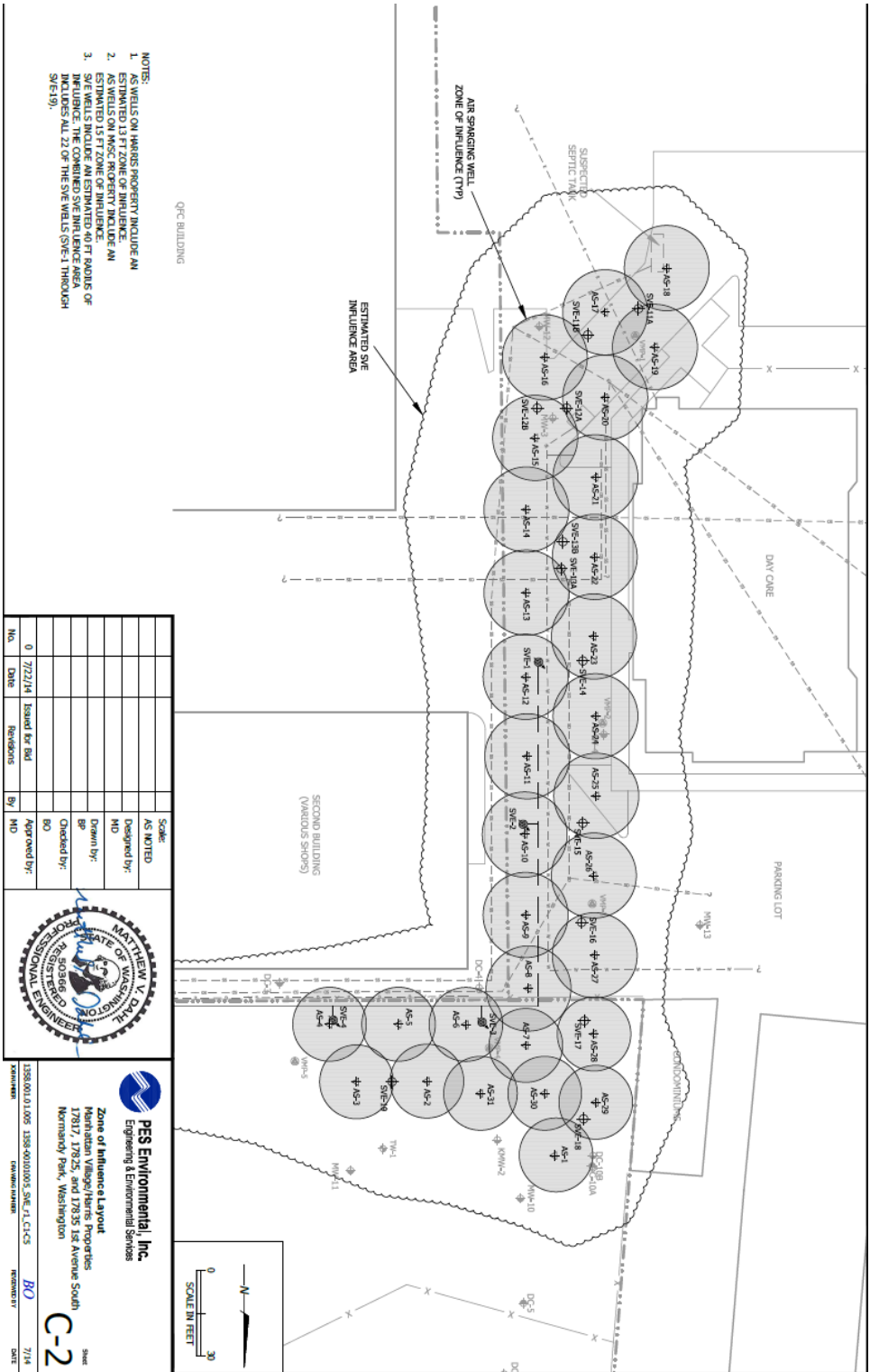
PES Environmental Inc.
 Engineering & Forensics Services

Excavation and SVE Trench Detail
 Manhattan Village/Parsons Properties
 17617, 17625, and 17625 1st Avenue South
 Normandy Park, Washington

Scale: 1" = 10' 0"

Sheet **5**

1/28/2021 10:00 AM 1/28/2021 10:00 AM 1/28/2021 10:00 AM



- NOTES:
1. WELLS ON HARRIS PROPERTY INCLUDE AM
 2. ESTIMATED 13 FT ZONE OF INFLUENCE.
 3. AS WELLS ON MASC PROPERTY INCLUDE AM
 4. ESTIMATED 15 FT ZONE OF INFLUENCE.
 5. WELLS INCLUDE AN ESTIMATED 10 FT ZONE OF INFLUENCE.
 6. WELLS INCLUDE AN ESTIMATED 15 FT ZONE OF INFLUENCE.
 7. WELLS INCLUDE AN ESTIMATED 22 FT ZONE OF INFLUENCE.
 8. WELLS INCLUDE AN ESTIMATED 25 FT ZONE OF INFLUENCE.
 9. WELLS INCLUDE AN ESTIMATED 30 FT ZONE OF INFLUENCE.
 10. WELLS INCLUDE AN ESTIMATED 35 FT ZONE OF INFLUENCE.
 11. WELLS INCLUDE AN ESTIMATED 40 FT ZONE OF INFLUENCE.
 12. WELLS INCLUDE AN ESTIMATED 45 FT ZONE OF INFLUENCE.
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 14. WELLS INCLUDE AN ESTIMATED 55 FT ZONE OF INFLUENCE.
 15. WELLS INCLUDE AN ESTIMATED 60 FT ZONE OF INFLUENCE.
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 99. WELLS INCLUDE AN ESTIMATED 480 FT ZONE OF INFLUENCE.
 100. WELLS INCLUDE AN ESTIMATED 485 FT ZONE OF INFLUENCE.

NO.	DATE	ISSUED FOR	BY	APPROVED BY:
0	7/22/14	Issued for Bld	MD	MD
		Revisions		

Scale: AS NOTED

Designed by: MD

Drawn by: BP

Checked by: BO

Approved by: MD

PES Environmental, Inc.
Engineering & Environmental Services

Zone of Influence Layout
Harrington/Travis Properties
1747 1/2 SE 1st Avenue South
Normandy Park, Washington

Sheet: **C-2**

DATE: 7/14

REVISION BY: BO

REVISION DATE: 7/14

