



US Army Corps of Engineers

Building P-2140 Remedial Action Completion and Site Closure Report

**Fort Drum Installation Restoration
Program
Fort Drum, New York**

March 6, 2018

Contract No.: W912DR-12-D-0007
Delivery Order No.: 0003

Prepared For:

**U.S. ARMY CORPS OF ENGINEERS BALTIMORE
DISTRICT**

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Baltimore, Maryland 21201-2536

Prepared By:

PIKA-MP JV LLC
12723 Capricorn Drive, Suite 500
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A handwritten signature in blue ink, appearing to read "AV", is positioned above a horizontal line.

Andy Vitolins, PG
JV Project Manager

A handwritten signature in blue ink, appearing to read "Cullen M. Flanders", is positioned above a horizontal line.

Cullen Flanders, PE
Technical Expert

**Area 2140 Remedial Action
Completion and Site Closure
Report**
Installation Restoration Program
Fort Drum, New York

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GP14DRUM.RCSC

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Acronyms and Abbreviations

AS	Air Sparging
bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
COCs	Contaminants of Concern
DER	Division of Environmental Remediation
DER-10	DER Technical Guidance for Site Investigation and Remediation
EA	EA Engineering, Science, and Technology
ft	feet
lbs	pounds
IRP	Installation Restoration Program
LNAPL	Light Non-Aqueous Phase Liquid
MAES	Multiple Award Environmental Services
NYSDEC	New York State Department of Environmental Conservation
PID	Photoionization Detector
Plexus	Plexus Scientific Corporation
ppmv	Parts Per Million by Volume
TMB	Trimethylbenzene
US	United States
USACE	United States Army Corps of Engineers



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Executive Summary

This report provides a comprehensive review of the environmental data collected at Building P-2140 at Fort Drum, New York from 2014 to 2017. The report summarizes the progress of the remedial program and current conditions at the site. The required lines of evidence needed to achieve regulatory closure as outlined in the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER)-10 "Technical Guidance for Site Investigation and Remediation" (2010) are also presented. This report is comprised of elements that evaluate the environmental program at Building P-2140 and include:

- Historical review of the remedial program to date;
- An evaluation of groundwater concentrations and extent of contamination; and
- Time series and statistical evaluation of contaminant data trends.

Based on this evaluation, the Army has determined that the remedial program at Building P-2140 has satisfied the DER-10 requirements for no further remedial action or monitoring in accordance with DER -10 subsections 6.4(c)3 and 4.



Building P-2140 Remedial Action Completion and Site Closure Report

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1. Introduction

The PIKA - MP JV, LLC¹ (hereinafter referred to as the JV) has prepared this Remedial Action Completion and Site Closure Report to document that the requirements of DER -10 subsection 6.4(c)3 have been met at Building P-2140 (FTD-091). The work was completed as part of the Installation Restoration Program (IRP) at Fort Drum, New York. This work was conducted under United States (US) Army Corps of Engineers (USACE) Baltimore District, Multiple Award Environmental Services (MAES) contract, Award No. W912DR-12-D-0007, Delivery Order 0003.

¹ The PIKA-MP JV LLC Joint Venture is comprised of PIKA International, Inc. and its mentor Arcadis U.S. Inc.



2. Site Description

Fort Drum encompasses approximately 168 square miles and is located approximately 10 miles northeast of Watertown, 80 miles north of Syracuse, and 25 miles southeast of the United States and Canadian border (Figure 2-1). Fort Drum occupies a large portion of northeastern Jefferson County, a portion of western Lewis County, and abuts the southern edge of St. Lawrence County.

The AAFES Station (Building P-2140) is an active retail gasoline station located south of Gasoline Alley at the corner of Nash Boulevard and First Street West (Figure 2-1). Five gasoline underground storage tanks (USTs) located southeast of the pump islands were removed in 1993 along with a small quantity of associated gasoline-contaminated soil. The only inhabited structure is the convenience store. The store is scheduled for demolition in the next year and there are no plans to redevelop the site following demolition. No known environmental receptors are present at this location. Potential human receptors may include people using and working at the convenience store prior to demolition.



3. Historic Groundwater Conditions and Contaminants of Concern

Based on available soil boring logs, the geology in the source area (Building P-2140) is mainly sandy lacustrine deposits 45 feet or greater in thickness. The unconsolidated deposits consist of medium to fine sand with varying amounts of silt (trace to little) (EA, 2003). The silt content increases with depth. Soil boring data collected down-gradient of the source area indicate that the thickness of the overlying sandy deposits decreases in this area (20 to 25 feet thick) (EA 2003). The water table typically ranges from 20 to 30 feet below ground surface (bgs) within the source area, with groundwater flowing generally to the southeast. Based on groundwater velocity estimates during previous investigations (Plexus, 2013), the hydraulic conductivity for this Area is estimated to be approximately 1.6 feet per day (ft/day).

Table 3-1 documents the historical groundwater analytical data. The constituents of concern (COCs) were determined to be benzene, toluene, ethylbenzene and xylene (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB) and 1,3,5- TMB. Figure 3-1 illustrates the total dissolved phase volatile organic compound (VOC) concentration in the July 2014. Light Non-Aqueous Phase Liquid (LNAPL) was last detected in several monitoring wells (e.g., MW02, MW04, and MW05) during the initial site investigations performed by EA in 1994 and 1995. However, measurable product was not detected during the operation of the DPE system from 2002 through 2006, and subsequent quarterly monitoring that was conducted through 2014 (Plexus 2014).



4. Remedial History

Several remedial actions were implemented historically to address impacts within the Building P-2140 area. A dual phase extraction (DPE) treatment system began operation on 30 January 2002 in the former UST area. The objective of the DPE system was to address LNAPL and residual soil contamination in the source area.

To enhance the performance of the DPE system, an air sparge (AS) system was installed in 2006. Sixteen AS wells, associated underground piping, and retrofitting the existing trailer with AS equipment were completed between November 2005 and February 2006.

In August 2009, a mobile ozone aquifer AS system, including seven injection points were installed near monitoring well MW02. The injection points were installed to depths ranging between 25 to 30 feet bgs. The DPE/AS system was deactivated on 22 December 2009 in preparation for ozone injection activities. The ozone treatment unit began operation on 22 December 2009 and ran through May 2010 when the ozone generator circuit board failed. The system was then switched to air sparge only. The ozone system was taken completely off line in June 2010 for system repairs and upgrades.

To continue active treatment of the contaminants during the ozone system's downtime, the existing DPE/AS system was reactivated. On 24 September 2010, the ozone injection system was mobilized back to the site and reactivated. Because of mechanical system failures and electrical issues, the mobile ozone system was removed from the site in September 2011. In December 2011, a five-month nutrient application in conjunction with DPE/AS system operations was completed. The nutrient application did not significantly reduce residual dissolved phase concentrations. Following the nutrient application trial, a new ozone unit was installed and operated at the Site until September 2013.

Between February and July 2014, a pilot study utilizing augmented anaerobic bioremediation was implemented at the Site. However, the pilot study did not reduce the elevated dissolved phase concentrations observed within the source area.

In 2015, Arcadis evaluated the condition of the existing remedial equipment and noted the DPE/AS system previously used at the site was in working condition. The system was then repurposed as an AS and soil vapor extraction (SVE) system and optimized to more effectively address the source mass.



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In May of 2015, Arcadis started the AS/SVE system utilizing existing wells. Based on performance monitoring, Arcadis optimized the system by installing five new AS wells and one new SVE well. Arcadis also modified the system to allow the air sparging blower to be pulsed.

In 2016, Arcadis continued focusing the sparging effort, including connecting the existing ozone wells (OZ1 through OZ3, and OZ5 through OZ7) to the AS system. Figure 4-1 documents the Arcadis AS/SVE system layout.

From May 2015 through the end of operation in November 2016, the SVE system recovered 2,450 lbs of vapor phase VOCs. SVE effluent photoionization detector (PID) concentrations dropped from 190 parts per million by volume (ppmv) to less than 10 ppmv. With AS system operating, monitoring well headspace PID concentrations dropped from greater than 9,999 ppmv to non-detect. Based on this data, the AS/SVE system was shut down in November of 2016 to initiate closure monitoring. Soil vapor extraction system operation data including a graphical depiction of the hydrocarbon mass recovery indicating recent asymptotic conditions, is documented in Figure 4-2.

Rebound monitoring was conducted following system deactivation from November 2016 through October 2017. This monitoring consisted of scheduled basewide monitoring events and additional sampling of wells in areas of concern to confirm that additional active remediation was not required.



5. Current Groundwater Conditions, Data Trends and Evaluations

Table 3-1 documents significant decreasing dissolved phase COC concentration from April 2014 to the present. Figure 3-1 depicts the groundwater data prior to AS/SVE operation in 2014. Figures 5-1 and 5-2 illustrates the most recent (Fall 2017) dissolved total BTEX plume. The following are representative of the remedial achievements across the site:

Well ID	2014 Total VOC Concentration (ug/L)	October 2017 Total VOC Concentration (ug/L)
MW05	15,589	515
MW07	23,307	Non-Detect
MW37	17,033	18

Comparing Figure 5-1 to Figure 3-1 shows that the remedial efforts have removed the residual source mass at the site. Figures 5-3, 5-4, and 5-5 illustrate the decreasing dissolved phase constituent concentration trends observed in the groundwater samples collected from MW02, MW05, and MW06, respectively.

Figure 5-1 also presents the distance from the monitoring wells to the down gradient property boundary. The distance between MW13 (furthest down gradient well from the source area monitoring remedial performance) and the property boundary is about 300 feet. Utilizing the October 2017 data, the JV calibrated a Quick Domenico advective transport model² to evaluate the potential distance dissolved benzene, toluene, xylene, 1,2,4-TMB, and 1,3,5-TMB may travel from the well detecting elevated dissolved phase concentration before attenuating to the groundwater standard.

² www.elibrary.dep.state.pa.us/.../Get/Document-49262/Quick_Domenico.xls



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The following inputs were used for the model:

Input	Value	Source
October 2017 elevated COC concentrations above standards	= 0.009 mg/L = 0.0094 mg/L = 0.205 mg/L = 0.050 mg/L = 0.043 mg/L	benzene in MW12 toluene in MW02 xylene in MW05 1,2,4 TMB in MW05 1,3,5 TMB in MW05
Longitudinal (Ax), transverse (Ay), and vertical (Az) dispersivities	Ax = 100 ft Ay = 1 ft Az = 0.001 ft	Per Quick Domenico user manual ³ , value of Ax = 0.1x where x is the distance to property boundary, which is about 100 ft
Calibrated degradation rate to correspond with the monitoring well data (lambda)	0.025 day ⁻¹ 0.01 day ⁻¹ 0.018 day ⁻¹ 0.001 day ⁻¹ 0.026 day ⁻¹	benzene toluene xylene 1,2,4 TMB 1,3,5 TMB
Source width/thickness	Input does not affect output. Input used to adjust calibration table units	
Hydraulic conductivity	16 ft/day	EA 1999 – hydraulic conductivity testing not conducted in 2140 area, but the 2140 soils are similar to other IRP areas where EA conducted hydraulic conductivity testing.
Hydraulic gradient	0.035 ft/ft	Plexus 2013
Porosity (dec. frac.)	0.3	Assumed for porous media
Soil bulk density	1.7 g/cm ³	Recommended assumed value
Organic carbon partitioning coefficient (Koc) ⁴	58 L/kg 130 L/kg 350 L/kg 2,200 L/kg 660 L/kg	benzene toluene xylene 1,2,4 TMB 1,3,5 TMB
Fraction of organic carbon (foc)	0.001	Recommended assumed value
Time	30 years (10,957 days)	Conservative time frame

As documented in the table, the monitoring well with the highest dissolved phase concentration for each constituent was selected as the source concentration. Two down gradient wells were also utilized for the centerline concentrations. The transport

³http://files.dep.state.pa.us/EnvironmentalCleanupBrownfields/LandRecyclingProgram/LandRecyclingProgramPortalFiles/GuidanceTechTools/QD_manual_v3b%2002-28-2014.pdf

⁴ <http://www.dep.pa.gov/Pages/search.aspx?searchBox=number%20please>



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degradation rate (λ) was adjusted until the model was calibrated to match the concentrations from the October 2017 analytical data which are considered conservative compared to the previous sampling events. As documented by Figures 5-6, 5-8, 5-10, 5-12, and 5-14, the calibrated models for each of the constituents are representative of the field conditions (i.e. the graphs of field data and model output are similar). Using the calibrated models, Arcadis estimated the 5, 10, and 15-year constituent concentrations at 50, 150, and 300 feet down gradient of the source well. Figure 5-7, 5-9, 5-11, 5-13, and 5-15 document that benzene, toluene, and xylene are not going to migrate more than 50, 50, and 150 feet down gradient of the source well above the applicable groundwater standard, respectively. Figures 5-13 and 5-15 document the neither of the TMB constituents are going to migrate downgradient more than 50 feet from the source well.

Considering that this model assumes the source concentrations remains constant and that the analytical data shows the source concentrations are reducing, the actual distance that the constituents are expected to migrate down gradient of the source wells is expected to be significantly less than the modeling results.



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6. Conclusions

The existing site condition is an active gas station. Potable water is supplied to the station. Concentrations of the COCs in soil and groundwater do not pose a vapor inhalation risk. Constituent concentration levels are stable and decreasing in all monitoring well(s). Conservative modeling documents that existing dissolved phase constituent concentrations are not going to migrate within 200 feet of the property boundary at concentrations greater than the applicable groundwater standards.

All requirements of DER -10 subsection 6.2.2(c)4 are, therefore, satisfied, and it is recommended that: no additional remedial action or monitoring is required, the remedial structures and equipment can be removed from the site, and the NYSDEC spill case of this site be closed.



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7. References

EA, 1999. Comprehensive Contaminant Assessment Report, Volume II, Areas 1195, 1295, 1395, and 1495, Gasoline Alley, Fort Drum, New York.

Plexus, 2013. Bioaugmentation Pilot Study Remedial Action Work Plan, AAFES Station Site, Building P-2140, Fort Drum, NY. October 2013

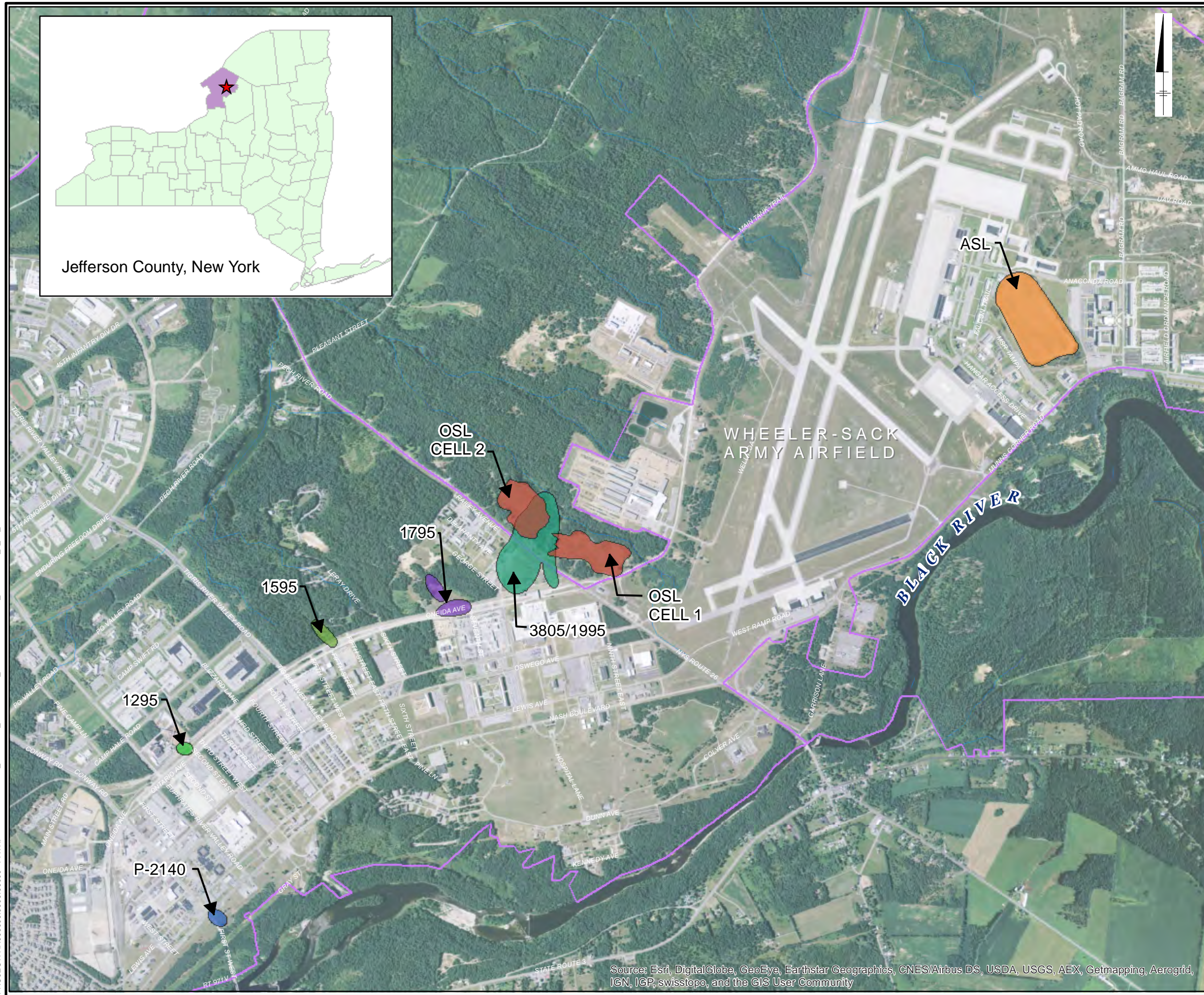
NYSDEC. 2010. Division of Environmental Remediation (DER-10: Technical Guidance for Site Investigation and Remediation.

PIKA-MP JV LLC, 2015, Work Plan, Fort Drum Installation Restoration Program, Fort Drum, New York, February 2015.



Figures

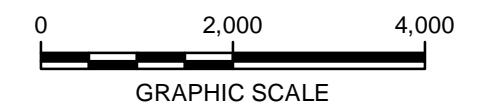
CITY:CHARLOTTE DIV:GROUP:(ENV/GIS) DB:akens LD:S.SUTTON PIC:PM:TM:
PROJECT:XX000000.0000.00000 PATH:Z:\GIS\PROJECTS\ENV\ENVY_FOR\DRUM_IRPMXDCORIF1-2_SITE_PLAN_9_29_2015.mxd



LEGEND

SITE NAME

- 1295
- 1595
- 1795
- 2140
- 3805/1995
- ASL
- OSL
- INSTALLATION AREA



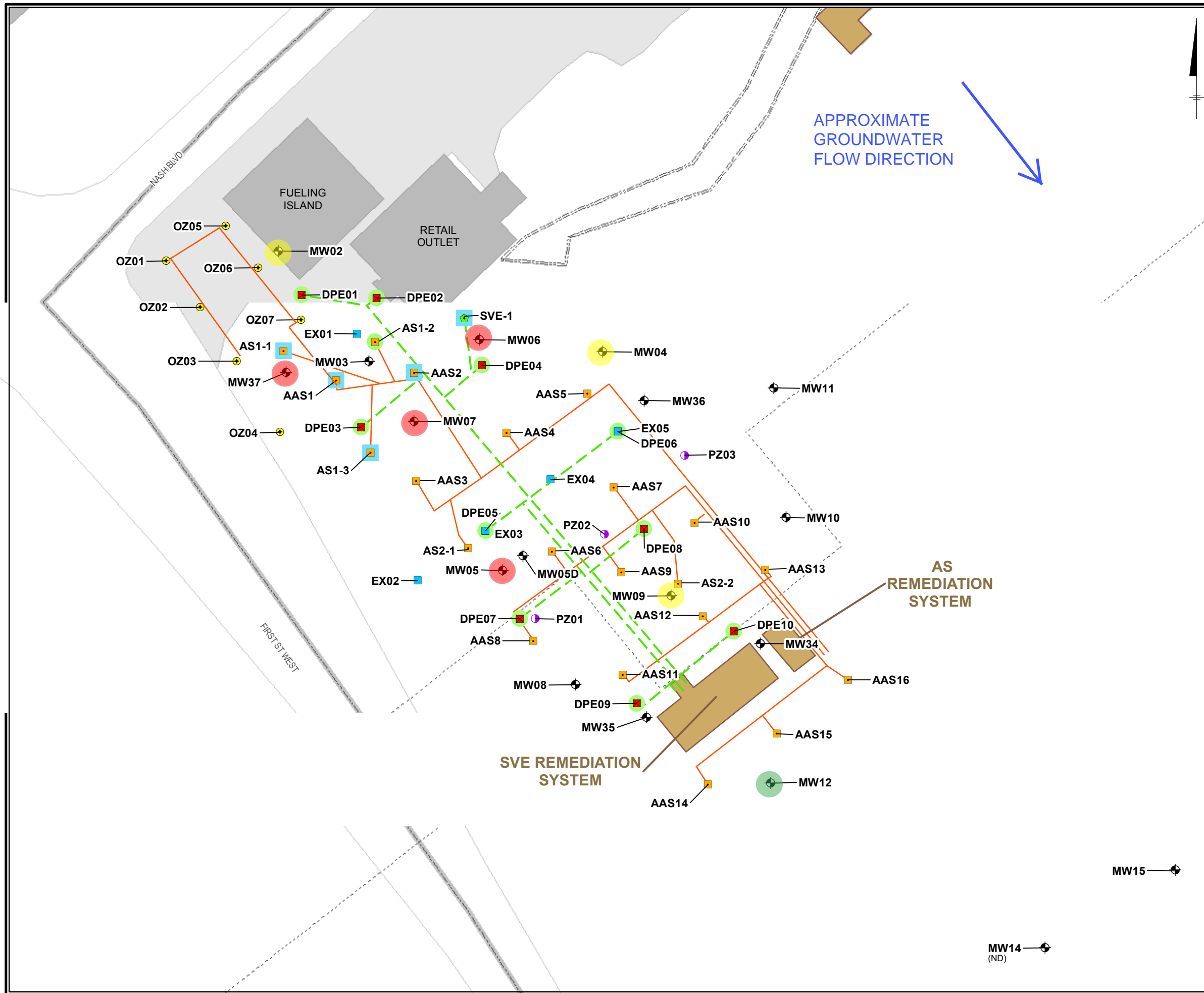
FORT DRUM
FORT DRUM, NEW YORK
REMEDIAL ACTION COMPLETION SITE CLOSURE REPORT

SITE LOCATION MAP



FIGURE
2-1

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

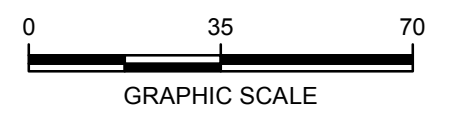


LEGEND

- MONITORING WELL
- AIR SPARGE WELL
- EXTRACTION WELL
- SOIL VAPOR EXTRACTION WELL (FORMER MULTI-PHASE EXTRACTION)
- OZONE WELL CONVERTED TO AIR SPARGE
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- AIR SPARGE WELL (ONLINE)
- SOIL VAPOR EXTRACTION WELL (ONLINE)
- AIR SPARGE LINE
- SOIL VAPOR EXTRACTION LINE
- FENCE LINE
- PAVED ROAD
- REMEDIATION SYSTEM
- BUILDING
- PAVED AREA

TOTAL VOC CONCENTRATIONS

- >1,000 ug/L
- >100 ug/L, <1,000 ug/L
- >10 ug/L, <100 ug/L
- ND, < 10 ug/L



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 FORT DRUM, NEW YORK
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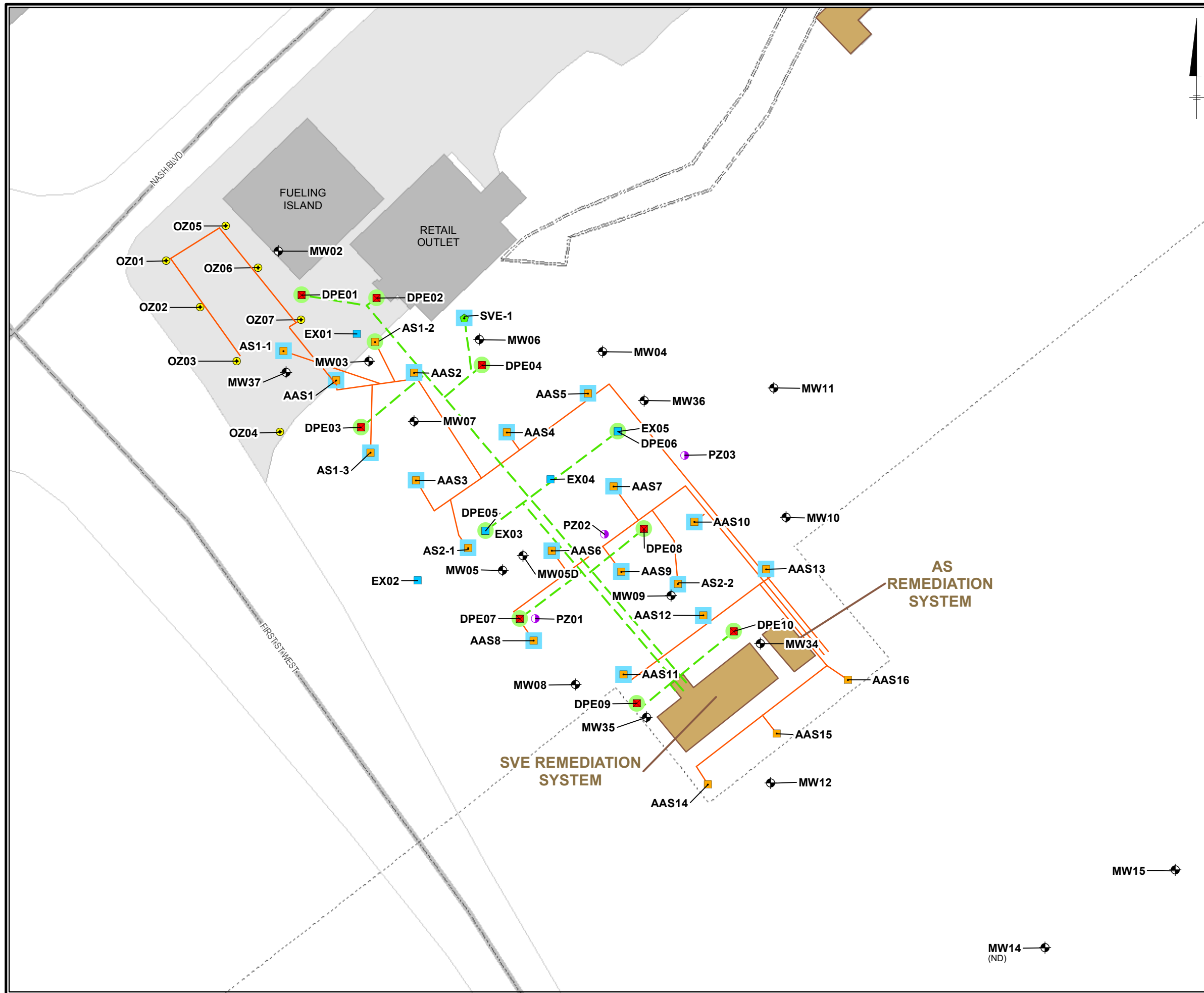
**BUILDING P-2140 FALL
 2014 TOTAL VOC
 CONCENTRATIONS**




FIGURE
3-1

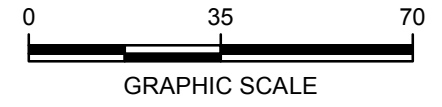
MW15

MW14
(ND)



LEGEND

- MONITORING WELL
- AIR SPARGE WELL
- EXTRACTION WELL
- SOIL VAPOR EXTRACTION WELL (FORMER MULTI-PHASE EXTRACTION)
- OZONE WELL CONVERTED TO AIR SPARGE
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- AIR SPARGE WELL (ONLINE)
- SOIL VAPOR EXTRACTION WELL (ONLINE)
- AIR SPARGE LINE
- SOIL VAPOR EXTRACTION LINE
- FENCE LINE
- PAVED ROAD
- REMEDIATION SYSTEM
- BUILDING
- PAVED AREA

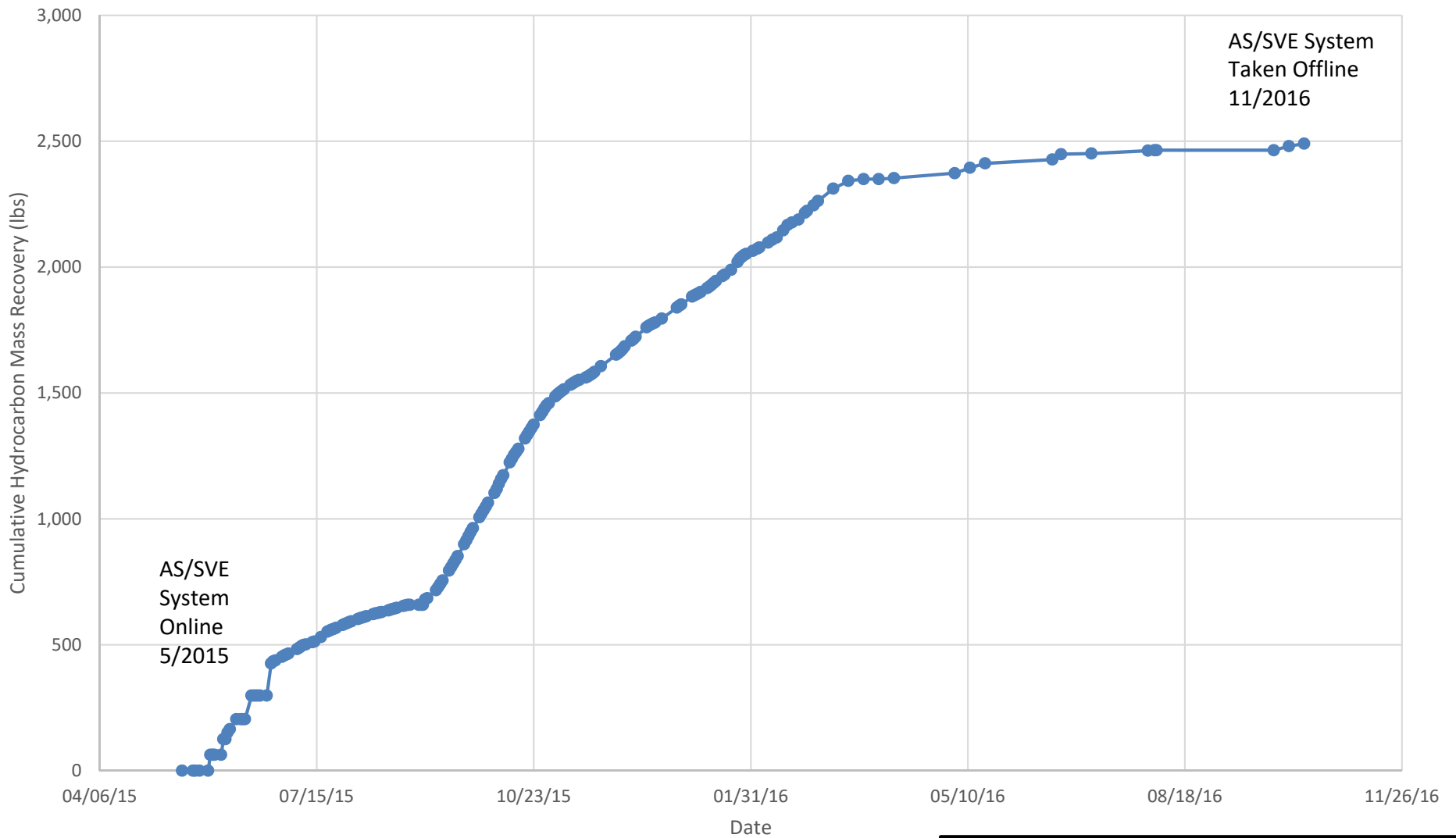


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REMEDIAL ACTION COMPLETION SITE CLOSURE REPORT

AREA P-2140
AS/SVE SYSTEM / EXISTING SITE
CONDITIONS




FIGURE
4-1



AS/SVE System
Taken Offline
11/2016

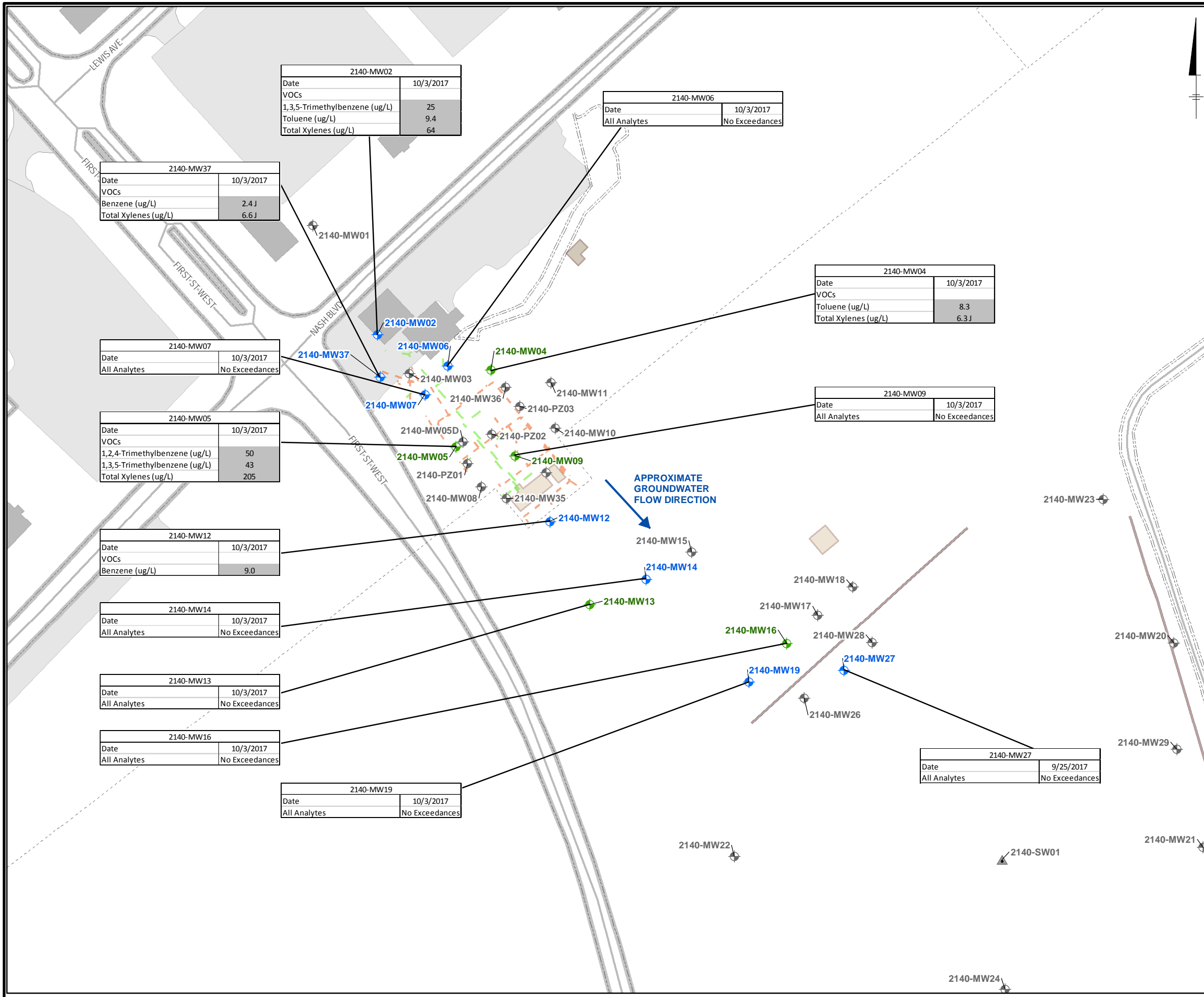
AS/SVE
System
Online
5/2015

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SITE CLOSURE REPORT**

**AREA P-2140
AS/SVE Mass Recovery Versus Time**



FIGURE
4-2

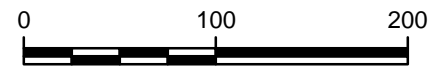


LEGEND

SAMPLING SUMMARY

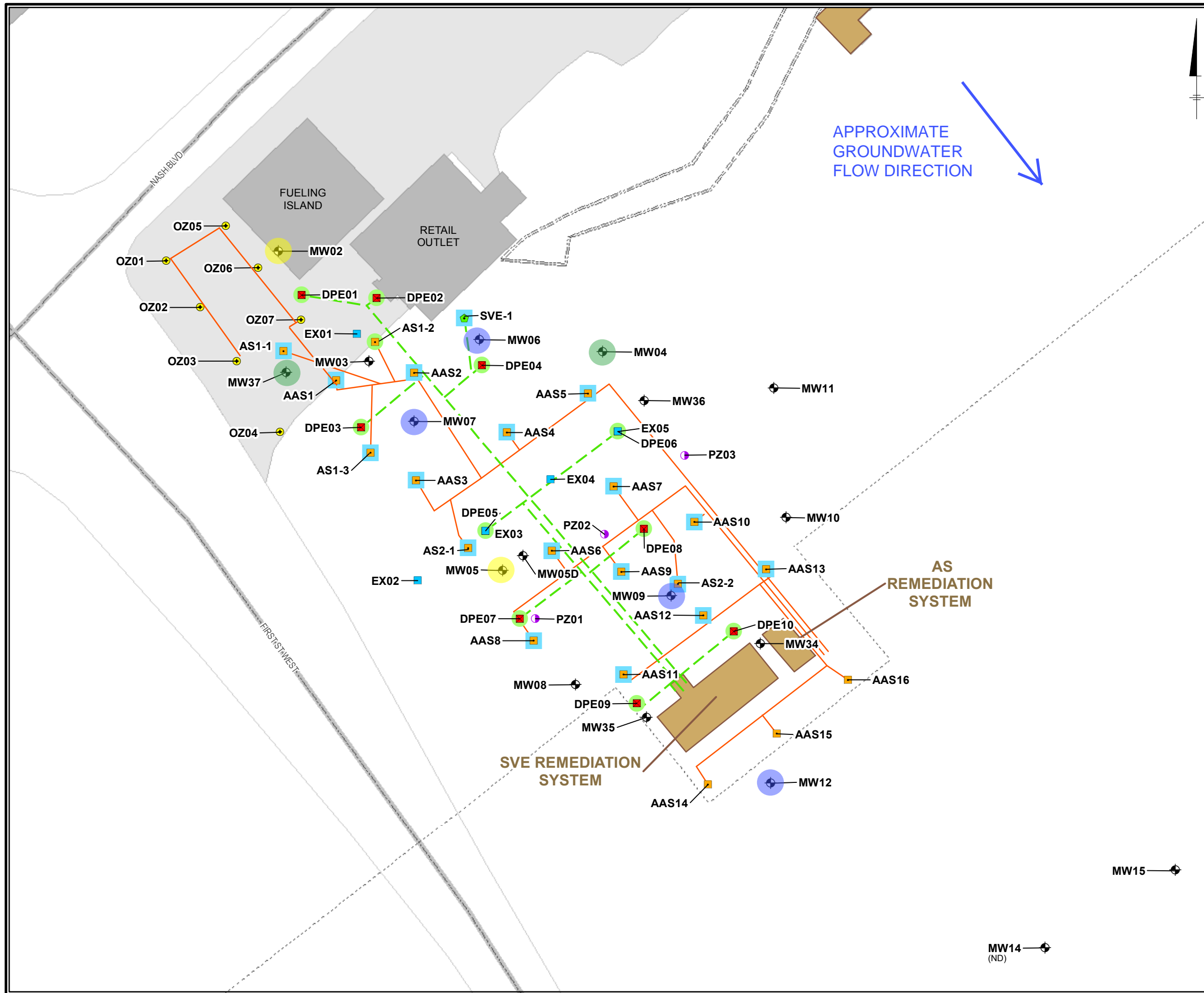
- MW-ANNUAL SAMPLING EVENT
- MW-SEMI-ANNUAL SAMPLING EVENT
- NOT PART OF MONITORING PLAN
- SW-NOT PART OF MONITORING PLAN
- AIR SPARGE LINE
- OZONE SPARGING LINE
- SOIL VAPOR EXTRACTION LINE
- FENCE LINE
- ROAD-PAVED
- ROAD-UNPAVED
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- BUILDING
- REMEDIATION SYSTEM
- DRIVEWAY
- PAVED AREA

NOTES:
 - RESULTS ARE SHOWN IN MICROGRAMS PER LITER (µg/L)
 - HIGHLIGHTED CELLS INDICATED CONCENTRATIONS EXCEEDING NYSDEC CLASS GA STANDARDS
 - BRACKETED VALUES ARE RESULTS OF DUPLICATE SAMPLES.
 NA: NOT ANALYZED.
 U: THE COMPOUND WAS ANALYZED FOR BUT NOT DETECTED. THE ASSOCIATED VALUE IS THE COMPOUND QUANTITATION LIMIT.
 J: THE COMPOUND WAS POSITIVELY IDENTIFIED; HOWEVER, THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION ONLY.
 J-: THE COMPOUND WAS POSITIVELY IDENTIFIED; HOWEVER THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATION THAT MAY BE BIASED LOW.
 D: CONCENTRATION IS A RESULT OF A DILUTION.
 E: CONCENTRATION EXCEEDS CALIBRATION RANGE.



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REMEDIAL ACTION COMPLETION SITE CLOSURE REPORT
BUILDING P-2140
OCTOBER 2017 DISSOLVED PHASE COC CONCENTRATIONS





LEGEND

- MONITORING WELL
- AIR SPARGE WELL
- EXTRACTION WELL
- SOIL VAPOR EXTRACTION WELL (FORMER MULTI-PHASE EXTRACTION)
- OZONE WELL CONVERTED TO AIR SPARGE
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- AIR SPARGE WELL (ONLINE)
- SOIL VAPOR EXTRACTION WELL (ONLINE)
- AIR SPARGE LINE
- SOIL VAPOR EXTRACTION LINE
- FENCE LINE
- PAVED ROAD
- REMEDIATION SYSTEM
- BUILDING
- PAVED AREA

TOTAL VOC CONCENTRATIONS

- >1,000 ug/L
- >100 ug/L, <1,000 ug/L
- >10 ug/L, <100 ug/L
- ND, < 10 ug/L



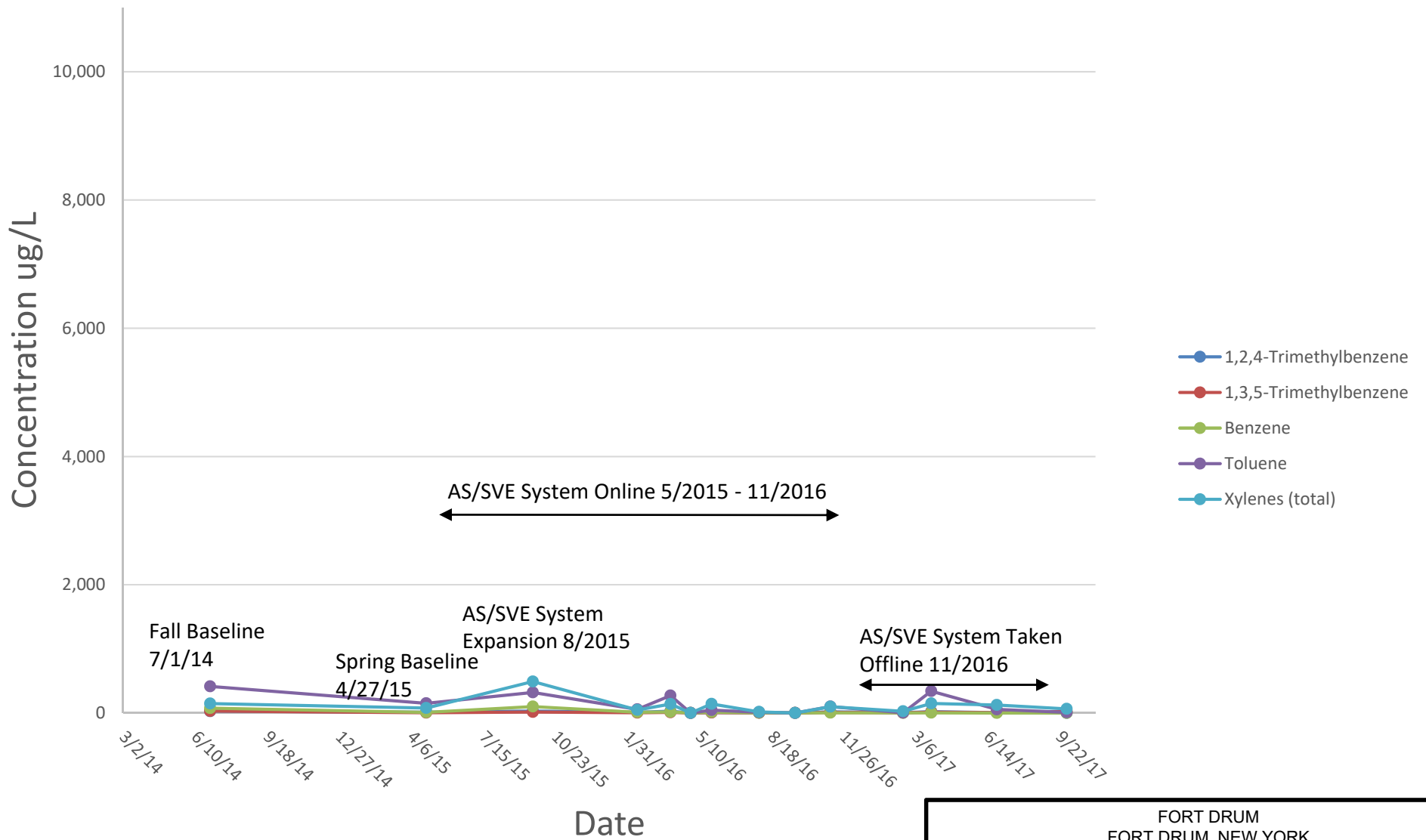
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**BUILDING P-2140 FALL
 2017 TOTAL VOC
 CONCENTRATIONS**

FIGURE
5-2


MW15


MW14 (ND)



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AREA P-2140
MW02 VOC Groundwater Trends 2014-2017






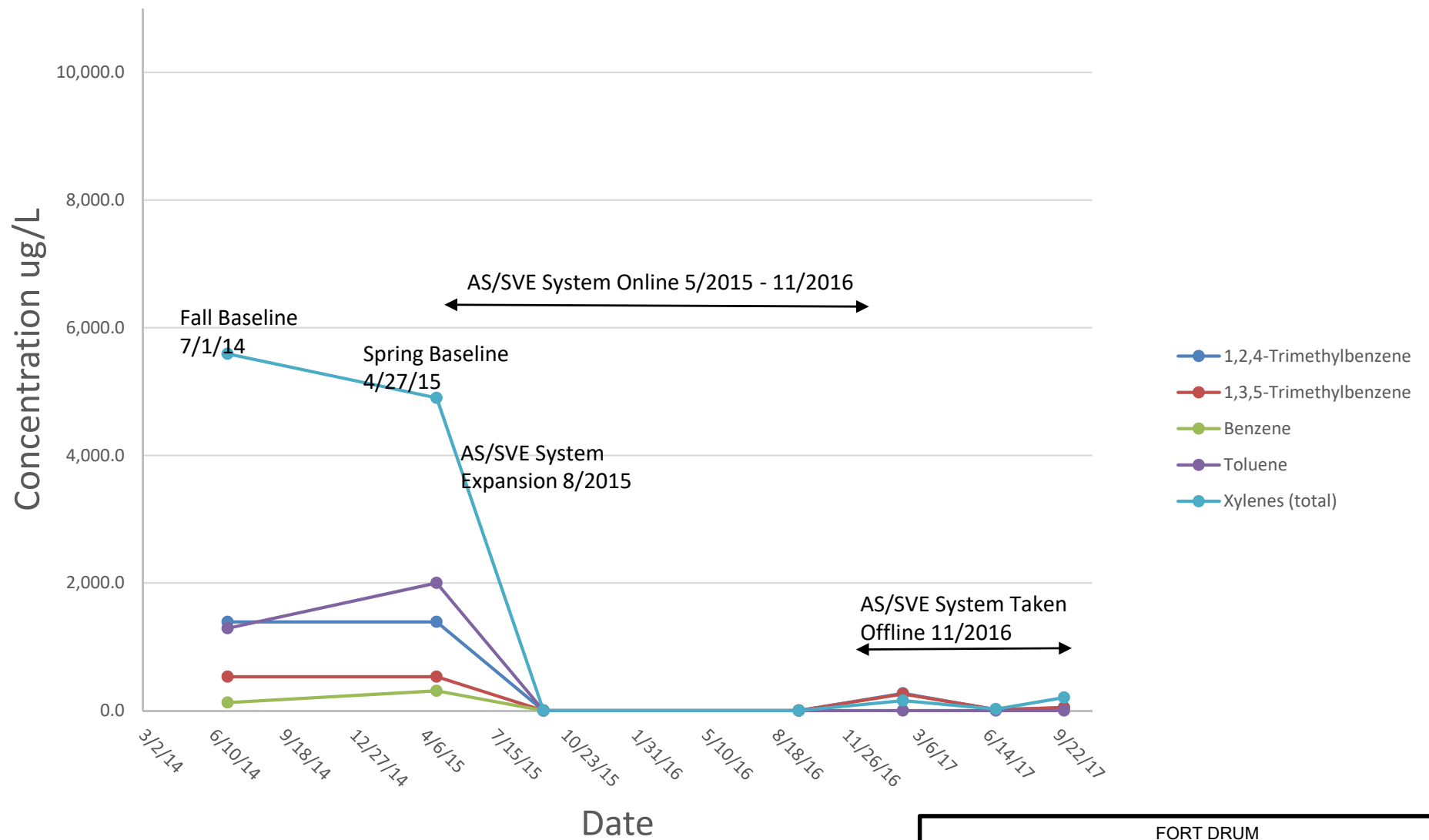


FIGURE
5-3



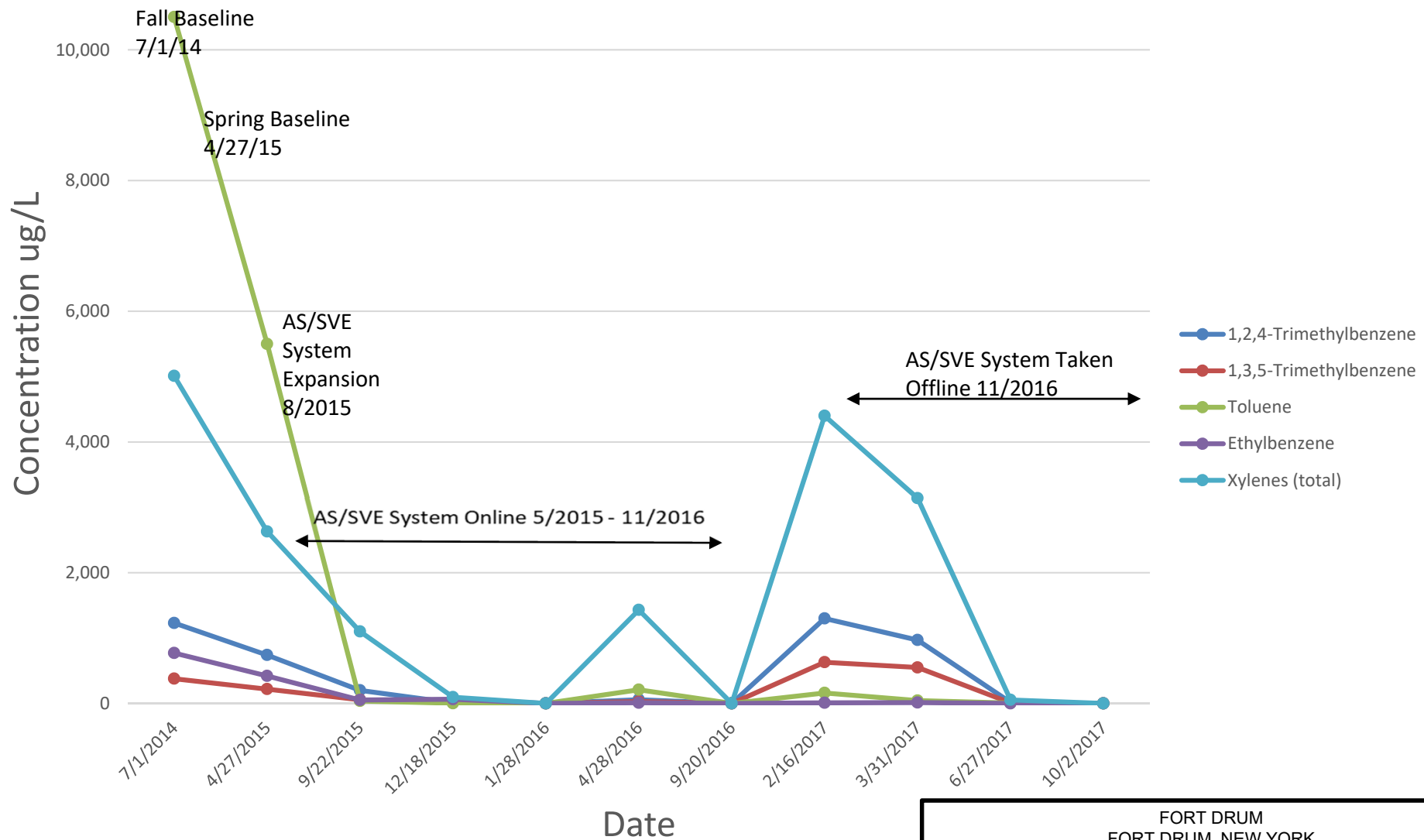
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AREA P-2140
MW05 VOC Groundwater Trends 2014-2017






FIGURE
5-4



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REMEDIAL ACTION COMPLETION
SITE CLOSURE REPORT

AREA P-2140
MW06 VOC Groundwater Trends 2014-2017





FIGURE
5-5

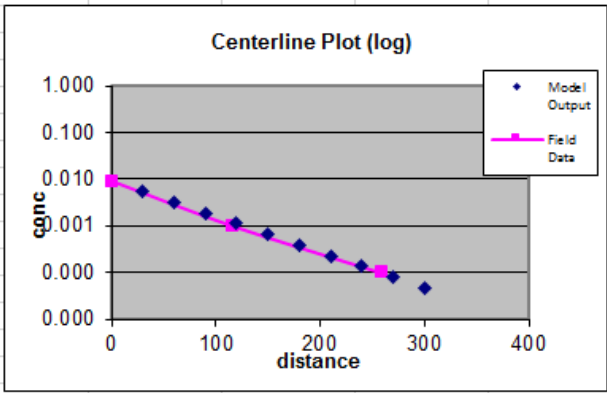
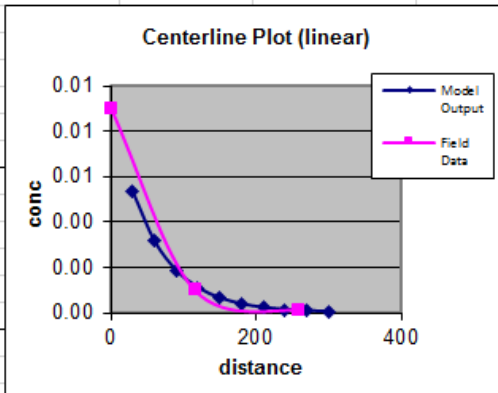
ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION, 1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

Project:	2140						
Date:	12/14/2017	Prepared by:	Cullen Flanders				
		Contaminant:	Benzene				
SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft)	LAMBDA	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days) (days)
	0.009	1.00E+00	1.00E-01	1.00E-03	0.025	100	10
				day-1			10957
Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm ³)	KOC	Frac. Org. Carb.	Retardation (R)	V (=K [*] i/n [*] R) (ft/day)
1.60E+01	0.035	0.3	1.7	58	1.00E-03	1.328666667	1.40491721

NEW QUICK_DOMENICO.XLS

SPREADSHEET APPLICATION OF "AN ANALYTICAL MODEL FOR MULTIDIMENSIONAL TRANSPORT OF A DECAYING CONTAMINANT SPECIES" P.A. Domenico (1987) Modified to Include Retardation

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
Conc. At		x(ft)	y(ft)
at		1	300
		10957 days =	
			0.000 mg/l



AREAL MODEL		CALCULATION DOMAIN											
Length (ft)		300											
Width (ft)		60											
		30	60	90	120	150	180	210	240	270	300		
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-30	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data:	Centerline C Concentration	0.009	0.001	0.0001									
	Distance from Source	0	116	259									

Note:

1. Model is based on the groundwater monitoring data collected in October 2017.
2. Model uses data from MW-12
3. The model is calibrated based on actual data from the site to determine the constituent degradation rate (lambda).
4. Model indicates that in 30 years (10,957 days) the contaminant will not migrate beyond the property boundary (300 feet).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
**Benzene - Quick Domenico Advective
 Transport Model (30 years/300 ft)**

		FIGURE 5-6
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50 Feet

150 Feet

300 Feet

5 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	1825 days =		0.004
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	1825 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	1825 days =		0.000
			mg/l

10 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	3652 days =		0.004
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	3652 days =		0.000
			mg/l

30 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	10957 days =		0.004
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	10957 days =		0.000
			mg/l

Note:

1. Variations of the model were run and results are presented for varying lengths from the impacted monitoring well (50, 150, and 300 feet) and times (5, 10, and 30 years).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
**Benzene - Quick Domenico Advective
 Transport Model (Variations)**



FIGURE

5-7

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION, 1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

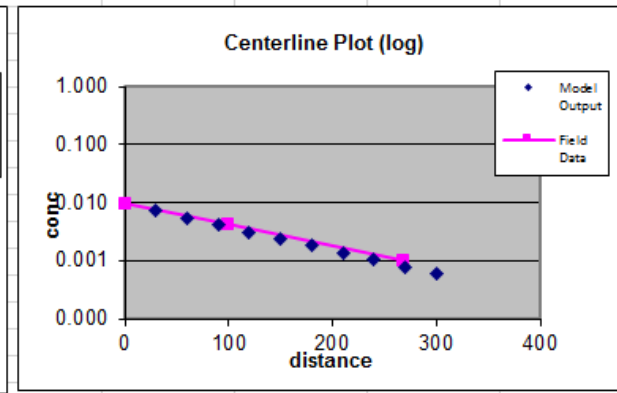
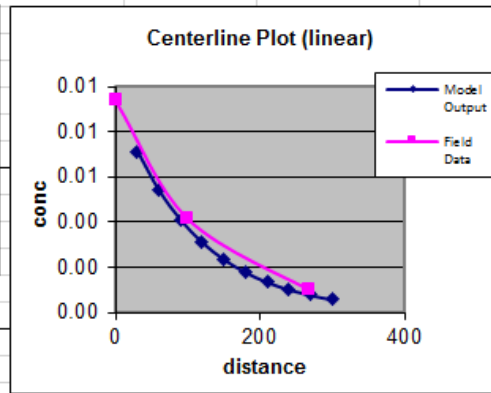
Project: 2140
 Date: 2/7/2018 Prepared by: Cullen Flanders
 Contaminant: Toluene

NEW QUICK_DOMENICO.XLS
 SPREADSHEET APPLICATION OF
 "AN ANALYTICAL MODEL FOR
 MULTIDIMENSIONAL TRANSPORT OF A
 DECAYING CONTAMINANT SPECIES"
 P.A. Domenico (1987)
 Modified to Include Retardation

SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft)	LAMBDA	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days)
0.0094	1.00E+00	1.00E-01	>=.001	day-1	100	10	10957

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm ³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.60E+01	0.035	0.3	1.7	130	1.00E-03	1.736666667	1.074856046

Point Concentration		
x(ft)	y(ft)	z(ft)
1	300	0
Conc. At		
at	10957 days =	0.000 mg/l



	AREAL MODEL		CALCULATION DOMAIN									
	Length (ft)	Width (ft)	30	60	90	120	150	180	210	240	270	300
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.007	0.005	0.004	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001
0	0.007	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
-30	0.007	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
-60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data:	Centerline C Concentration		0.0094	0.00415	0.001							
	Distance from Source		0	100	268							

Note:

1. Model is based on the groundwater monitoring data collected in October 2017.
2. Model uses data from MW-02
3. The model is calibrated based on actual data from the site to determine the constituent degradation rate (lambda).
4. Model indicates that in 30 years (10,957 days) the contaminant will not migrate beyond the property boundary (300 feet).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
**Toluene - Quick Domenico Advective
 Transport Model (30 years/300 ft)**



50 Feet

150 Feet

300 Feet

5 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	1825 days =		0.005
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	1825 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	1825 days =		0.000
			mg/l

10 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	3652 days =		0.005
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	3652 days =		0.000
			mg/l

30 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	10957 days =		0.005
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	10957 days =		0.000
			mg/l

Note:

1. Variations of the model were run and results are presented for varying lengths from the impacted monitoring well (50, 150, and 300 feet) and times (5, 10, and 30 years).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
**Toluene - Quick Domenico Advective
 Transport Model (Variations)**



FIGURE

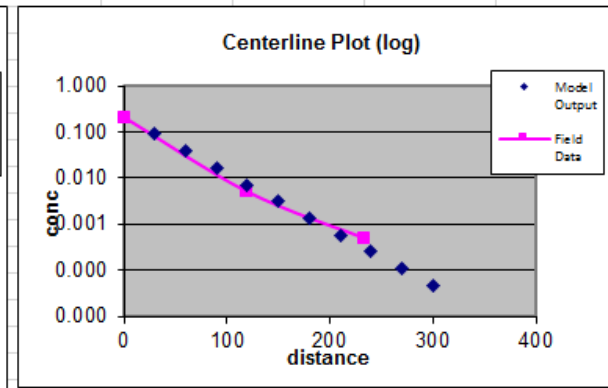
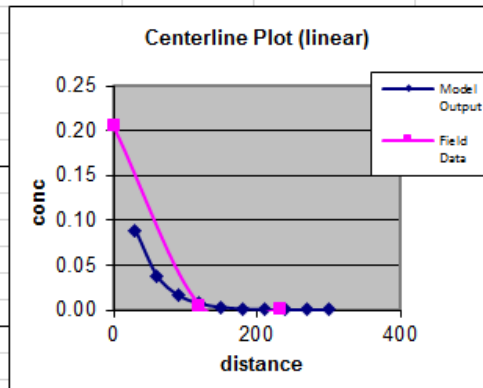
5-9

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION, 1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

Project:	2140						
Date:	2/7/2018	Prepared by:	Cullen Flanders				
		Contaminant:	Xylenes				
SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft)	LAMBDA	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days) (days)
0.205	1.00E+00	1.00E-01	1.00E-03	0.018	100	10	10957
Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K[*]i/n[*]R) (ft/day)
1.60E+01	0.035	0.3	1.7	350	1.00E-03	2.983333333	0.625698324

NEW QUICK_DOMENICO.XLS
 SPREADSHEET APPLICATION OF
 "AN ANALYTICAL MODEL FOR
 MULTIDIMENSIONAL TRANSPORT OF A
 DECAYING CONTAMINANT SPECIES"
 P.A. Domenico (1987)
 Modified to Include Retardation

Point Concentration		
x(ft)	y(ft)	z(ft)
1	300	0
x(ft)		y(ft)
1		300
Conc. At	at	0.000
	10957 days =	mg/l



	AREAL MODEL	CALCULATION DOMAIN																	
	Length (ft)	300																	
	Width (ft)	60																	
	30	60	90	120	150	180	210	240	270	300									
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
30	0.089	0.038	0.017	0.007	0.003	0.001	0.001	0.000	0.000	0.000									
0	0.089	0.038	0.017	0.007	0.003	0.001	0.001	0.000	0.000	0.000									
-30	0.089	0.038	0.017	0.007	0.003	0.001	0.001	0.000	0.000	0.000									
-60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
Field Data:	Centerline C Concentration																		
	Distance from Source																		
			0.205	0.005	0.0005														
			0	120	233														

Note:

1. Model is based on the groundwater monitoring data collected in October 2017.
2. Model uses data from MW-05
3. The model is calibrated based on actual data from the site to determine the constituent degradation rate (lambda).
4. Model indicates that in 30 years (10,957 days) the contaminant will not migrate beyond the property boundary (300 feet).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
**Xylenes - Quick Domenico Advective
 Transport Model (30 years/300 ft)**




FIGURE
5-10

50 Feet

150 Feet

300 Feet

5 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	1825 days =		0.100
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	1825 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	1825 days =		0.000
			mg/l

10 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	3652 days =		0.100
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	3652 days =		0.000
			mg/l

30 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	10957 days =		0.100
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	10957 days =		0.000
			mg/l

Note:

1. Variations of the model were run and results are presented for varying lengths from the impacted monitoring well (50, 150, and 300 feet) and times (5, 10, and 30 years).

FORT DRUM
FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
SITE CLOSURE REPORT**

AREA P-2140
**Xylenes - Quick Domenico Advective
Transport Model (Variations)**



FIGURE

5-11

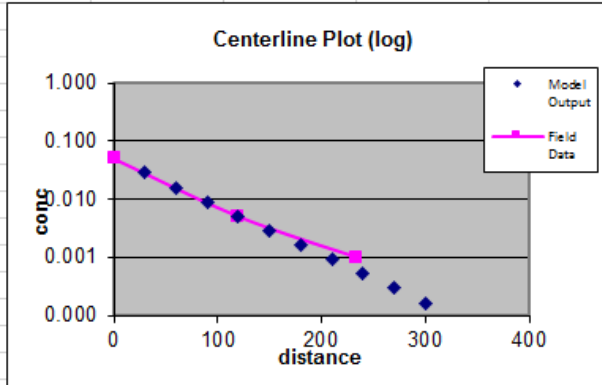
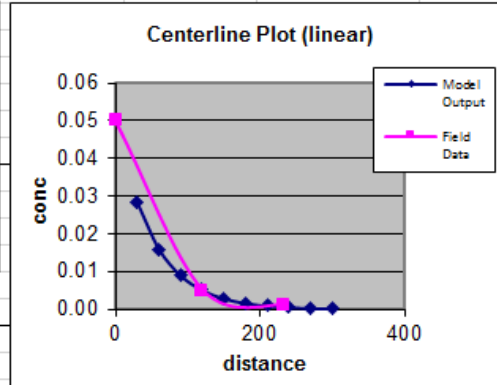
ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION, 1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

Project:	2140						
Date:	2/7/2018	Prepared by:	Cullen Flanders				
		Contaminant:	1,2,4-Trimethylbenzene				
SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft)	LAMBDA	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days) (days)
	0.05	1.00E+00	1.00E-01	1.00E-03	0.001	60	10
			>=.001	day-1			
Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm ³)	KOC	Frac. Org. Carb.	Retardation (R)	V (=K*i/n*R) (ft/day)
1.60E+01	0.013	0.3	1.7	2200	1.00E-03	13.46666667	0.051485149

NEW QUICK_DOMENICO.XLS

SPREADSHEET APPLICATION OF "AN ANALYTICAL MODEL FOR MULTIDIMENSIONAL TRANSPORT OF A DECAYING CONTAMINANT SPECIES" P.A. Domenico (1987) Modified to Include Retardation

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
Conc. At		x(ft)	y(ft)
at		1	300
		days =	
		10957	
		0.000 mg/l	



AREAL MODEL	CALCULATION DOMAIN											
	Length (ft)	300										
Width (ft)	60											
	30	60	90	120	150	180	210	240	270	300		
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.014	0.008	0.004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
0	0.028	0.016	0.009	0.005	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000
-30	0.014	0.008	0.004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data:	Centerline C Concentration			0.05	0.005	0.001						
	Distance from Source			0	120	233						

Note:

1. Model is based on the groundwater monitoring data collected in October 2017.
2. Model uses data from MW-05
3. The model is calibrated based on actual data from the site to determine the constituent degradation rate (lambda).
4. Model indicates that in 30 years (10,957 days) the contaminant will not migrate beyond the property boundary (300 feet).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
1,2,4 Trimethylbenzene - Quick Domenico
Advective Transport Model (30 years/300 ft)



50 Feet

150 Feet

300 Feet

5 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	1825 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	1825 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	1825 days =		0.000
			mg/l

10 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	3652 days =		0.000
			mg/l

30 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	10957 days =		0.000
			mg/l

Note:

1. Variations of the model were run and results are presented for varying lengths from the impacted monitoring well (50, 150, and 300 feet) and times (5, 10, and 30 years).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
1,2,4 Trimethylbenzene - Quick Domenico
Advective Transport Model (Variations)



FIGURE

5-13

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION, 1ST ORDER DECAY and RETARDATION - WITH CALIBRATION TOOL

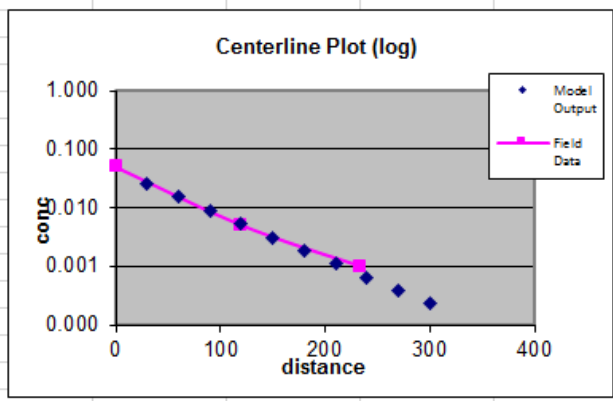
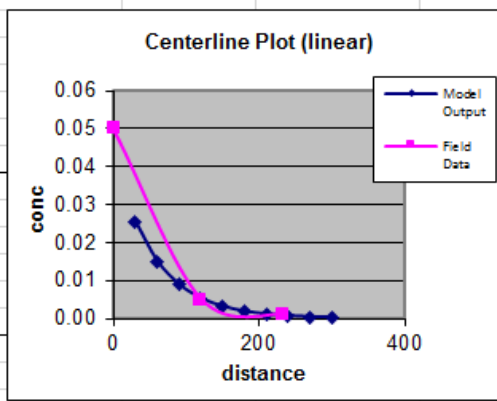
Project: 2140
 Date: 2/7/2018 Prepared by: Cullen Flanders
 Contaminant: 1,3,5-Trimethylbenzene

NEW QUICK_DOMENICO.XLS
 SPREADSHEET APPLICATION OF
 "AN ANALYTICAL MODEL FOR
 MULTIDIMENSIONAL TRANSPORT OF A
 DECAYING CONTAMINANT SPECIES"
 P.A. Domenico (1987)
 Modified to Include Retardation

SOURCE CONC (MG/L)	Ax (ft)	Ay (ft)	Az (ft)	LAMBDA	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)	Time (days)
0.043	1.00E+00	1.00E-01	1.00E-03	0.0026	60	10	10957

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm ³)	KOC	Frac. Org. Carb.	Retardation (R)	V (=K*i/n*R) (ft/day)
1.60E+01	0.013	0.3	1.7	660	1.00E-03	4.74	0.146272855

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
Conc. At		x(ft)	y(ft)
at		1	300
		z(ft)	
		0	
		days =	
		10957	
		mg/l	
		0.000	



	AREAL MODEL		CALCULATION DOMAIN									
	Length (ft)	Width (ft)	30	60	90	120	150	180	210	240	270	300
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.013	0.008	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000
0	0.025	0.015	0.009	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000
-30	0.013	0.008	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000
-60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data:	Centerline C Concentration		0.05	0.005	0.001							
	Distance from Source		0	120	233							

- Note:
1. Model is based on the groundwater monitoring data collected in October 2017.
 2. Model uses data from MW-05
 3. The model is calibrated based on actual data from the site to determine the constituent degradation rate (lambda).
 4. Model indicates that in 30 years (10,957 days) the contaminant will not migrate beyond the property boundary (300 feet).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
1,3,5 Trimethylbenzene - Quick Domenico
Advective Transport Model (30 years/300 ft)



50 Feet

150 Feet

300 Feet

5 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	1826 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	1826 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	1826 days =		0.000
			mg/l

10 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	3652 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	3652 days =		0.000
			mg/l

30 Years

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	50	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	50	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	150	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	150	0
at	10957 days =		0.000
			mg/l

Point Concentration			
x(ft)	y(ft)	z(ft)	
1	300	0	
	x(ft)	y(ft)	z(ft)
Conc. At	1	300	0
at	10957 days =		0.000
			mg/l

Note:

1. Variations of the model were run and results are presented for varying lengths from the impacted monitoring well (50, 150, and 300 feet) and times (5, 10, and 30 years).

FORT DRUM
 FORT DRUM, NEW YORK
**REMEDIAL ACTION COMPLETION
 SITE CLOSURE REPORT**

AREA P-2140
1,3,5 Trimethylbenzene - Quick Domenico
Advective Transport Model (Variations)



FIGURE

5-15



Tables

Table 3-1
Summary of GW Sample Analytical Results

Location ID: Date Collected:	CAS Number	NYSDEC TOGS 1.1 Water Guidance Values	Units	2140-MW04 07/31/14	2140-MW04 09/21/15	2140-MW04 10/07/15	2140-MW04 09/20/16	2140-MW04 02/16/17	2140-MW04 06/27/17	2140-MW04 10/03/17	2140-MW05 07/31/14	2140-MW05 04/27/15	2140-MW05 08/10/15	2140-MW05 09/23/15	2140-MW05 09/20/16	2140-MW05 02/15/17	2140-MW05 03/30/17	2140-MW05 06/27/17	2140-MW05 10/03/17
Volatiles Organics																			
1,1,1,2-Tetrachloroethane	630-20-6	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,1-Trichloroethane	71-55-6	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-Tetrachloroethane	79-34-5	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-Trichloroethane	79-00-5	1	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	0.72 J	<5.0	<5.0	<5.0
1,1-Dichloroethane	75-34-3	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethene	75-35-4	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloropropene	563-58-6	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,3-Trichlorobenzene	87-61-6	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,3-Trichloropropane	96-18-4	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trichlorobenzene	120-82-1	5	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	95-63-6	5	ug/L	121	0.43 J	<5.0	<5.0	1.6 J	7.4	0.46 J	1,390	NA	NA	<5.0	<5.0	270 D	100	13	50
1,2-Dibromo-3-chloropropane	96-12-8	0.04	ug/L	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane	106-93-4	0.0006	ug/L	<2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<20	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	95-50-1	3	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethane	107-06-2	0.6	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloroethene, Total	540-59-0	--	ug/L	<1	NA	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	1	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene	108-67-8	5	ug/L	45.7	0.70 J	<5.0	<5.0	0.84 J	3.6 J	3.5 J	531	NA	NA	<5.0	<5.0	260 D	180	18	43
1,3-Dichlorobenzene	541-73-1	3	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-Dichloropropane	142-28-9	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene	106-46-7	3	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2,2-Dichloropropane	594-20-7	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Butanone (MEK)	78-93-3	50	ug/L	14.8	<10	<10	<10	<10	2.2 J	<10	<100	NA	NA	<10	<10	2.3 J	1.7 J	<10	<10
2-Chlorotoluene	95-49-8	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Chlorotoluene	106-43-4	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-Pentanone	108-10-1	--	ug/L	<5	<10	<10	<10	<10	<10	<10	<50	NA	NA	<10	<10	<10	<10	<10	<10
Acetone	67-64-1	50	ug/L	53.4	1.4 J	<10	<10	3.4 J	5.1 J	<10	75.5 J	NA	NA	2.8 J	<10	5.3 J	3.1 J	3.0 J	<10
Benzene	71-43-2	1	ug/L	<1	<5.0	<5.0	<5.0	0.67 J	<5.0	<5.0	126	310	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromobenzene	108-86-1	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromochloromethane	74-97-5	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromodichloromethane	75-27-4	50	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromoform	75-25-2	50	ug/L	<4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<40	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	74-83-9	5	ug/L	<2	<5.0 J	<5.0	<5.0	<5.0	<5.0	<5.0	<20	NA	NA	<5.0 J	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon Disulfide	75-15-0	60	ug/L	<2	<10	<10	<10	<10	<10	<10	<20	NA	NA	<10	<10	<10	<10	0.22 BJ	<10
Carbon Tetrachloride	56-23-5	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CFC-11	75-69-4	5	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CFC-12	75-71-8	5	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorobenzene	108-90-7	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chlorodibromomethane	124-48-1	50	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroethane	75-00-3	5	ug/L	<1	<5.0	<5.0	<5.0	0.48 J	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	67-66-3	7	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloromethane	74-87-3	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	0.27 J	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	156-59-2	5	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-Dichloropropene	10061-01-5	0.4	ug/L	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cymene (p-Isopropyltoluene)	99-87-6	5	ug/L	1.2 J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.7 J	NA	NA	<5.0	<5.0	3.3 J	1.9 J	0.80 J	0.76 J
Dibromomethane	74-95-3	--	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dichloromethane	75-09-2	5	ug/L	<2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<20	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Diethyl ether	60-29-7	--	ug/L	<5	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	5	ug/L	3.7	0.21 J	<5.0	<5.0	0.57 J	3.4 J	<5.0	598	410	<5.0	<5.0	10	5.8	2.2 J	1.9 J	
Hexachloro-1,3-butadiene	87-68-3	0.5	ug/L	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isopropylbenzene	98-82-8	5	ug/L	8.8	<5.0	<5.0	<5.0	<5.0	0.69 J	<5.0	43.1	NA	NA	<5.0	<5.0	4.7 J	6.4	1.4 J	0.91 J
m&p-Xylenes	ARC-mpXyl	--	ug/L	23.4	2.9 J	<5.0	<5.0	3.7 J	25	2.2 J	3,890	3,400	<5.0	<5.0	<5.0	120	34	5.5	75
Methyl N-Butyl Ketone (2-Hexanone)	591-78-6	50	ug/L	<5	<10	<10	<10	<10	<10	<10	<50	NA	NA	<10	<10	<10	<10	<10	<10
Methyl-tert-butylether	1634-04-4	10	ug/L	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene	91-20-3	10	ug/L	7.4	<5.0	<5.0	<5.0	0.84 J	1.2 J	0.24 J	243	NA	NA	<0.48	<5.0	48	23	3.4 J	4.8 J
N-Butylbenzene	104-51-8	5	ug/L	2.2 J	<5.0	<5.0	<5.0	<5.0	0.24 J	<5.0	6.1 J	NA	NA	<5.0	<5.0	<5.0	3.1 J	<5.0	<5.0
N-Propylbenzene	103-65-1	5																	



Appendix A

P-2140 Air Sparging System Performance Data

Date	System Operating Upon Arrival	If System not operational, then why?	Air Sparge Motor Runtime (hrs)	Percent Operational (%)	Air Sparge Blower Inlet Vacuum (in. w.c.)	Heat Exchanger Inlet Temperature (F)	Heat Exchanger Inlet Pressure (psi)	Heat Exchanger Outlet Temperature (F)	Heat Exchanger Outlet Pressure (psi)	Heat Exchanger Differential Pressure (in. w.c. or fpm)	Air Flow Rate (scfm)	Control Valve Percent Open (%)	Bleed Air Percent Open (%)	General Notes
5/14/2015 17:30:00	NO	System Startup	NM	--	NM	170	11	90	9	3	120	NM	NM	Startup AS and SVE
5/19/2015 15:44:00	NO	Overheating issue, heat exchange not operating efficiently	OFF	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
5/20/2015 10:55:00	NO	Overheating issue, heat exchange not operating efficiently, cleaned	OFF	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
5/22/2015 08:58:00	YES		3,667.0	--	NM	185	11.5	113	6.5	NM	NM	100	30	
5/26/2015 09:00:00	YES		3,741.9	78.0%	12	130	NM	85	10	NM	NM	100	30	Heat exchanger plugged, cleaned
5/27/2015 08:55:00	YES		3,764.6	94.9%	8	190	12	100	8.5	NM	NM	100	30	
5/28/2015 09:16:00	YES		3,787.9	95.7%	11	175	11.5	82	10.5	NM	NM	100	30	
5/29/2015 09:10:00	YES		3,810.1	92.9%	NM	185	11.5	97	9	NM	NM	100	30	
6/01/2015 10:25:00	YES		3,883.3	99.9%	NM	168	11	76	11	NM	NM	100	30	
6/02/2015 09:07:00	YES		3,906.2	100.9%	NM	167	11	74	11	NM	NM	100	30	
6/03/2015 09:05:00	YES		3,929.9	98.9%	11	170	11	80	10	NM	NM	100	30	
6/04/2015 09:30:00	YES		3,954.4	100.3%	NM	180	11	94	9	NM	NM	100	30	
6/05/2015 09:38:00	YES		3,978.6	100.3%	NM	180	11	90	9.5	NM	NM	100	30	
6/08/2015 09:33:00	YES		4,050.3	99.7%	20	180	11	92	9	NM	NM	100	30	
6/10/2015 09:21:00	YES		4,098.1	100.0%	8	214	14.5	100	12.5	NM	NM	100	0	
6/11/2015 10:57:00	YES		4,122.1	93.7%	10	180	11	90	10	3.6	130	100	0	
6/12/2015 09:29:00	YES		4,145.6	104.3%	13	175	10.5	90	10	3.6	129	100	0	
6/15/2015 08:37:00	YES	shut system down for duration of drilling operations	4,216.7	100.0%	18	160	8.5	85	8	4	132	100	0	
6/16/2015 09:00:00	NO	offline for drilling	4,216.7	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6/17/2015 09:00:00	NO	offline for drilling	4,216.7	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6/18/2015 09:00:00	NO	offline for drilling	4,216.7	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6/19/2015 09:00:00	NO	offline for drilling	4,216.7	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6/22/2015 09:00:00	NO	offline for drilling	4,216.7	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
6/24/2015 09:10:00	YES		4,218.1	2.9%	16	170	10	87	9	4	135	100	0	
6/25/2015 09:30:00	YES		4,240.2	90.8%	18	172	10	93	8	4	135	100	0	
6/26/2015 09:30:00	YES		4,264.1	99.6%	20	172	10	92	9	4	135	100	0	
6/27/2015 09:35:00	YES		4,288.1	99.7%	25	170	10	86	9.5	4	135	100	0	
6/30/2015 09:15:00	YES		4,360.7	101.3%	33	172	10	93	9	4	135	100	0	
7/01/2015 08:33:00	YES		4,384.0	100.0%	42	173	10	88	9	4	135	100	0	
7/02/2015 08:49:00	YES		4,408.3	100.1%	44	170	10.5	90	9.5	4	137	100	0	
7/06/2015 09:31:00	YES		4,505.2	100.2%	51	178	10	98	9	4	135	100	0	
7/07/2015 09:30:00	NO	brought back online at 14:56 after troubleshooting	4,509.2	16.7%	NM	184	13	105	11	3.2	127	100	0	
7/08/2015 09:15:00	NO	Down upon arrival and restarted	4,509.8	2.5%	15	100	13.5	65	15	1.4	91	100	0	
7/09/2015 09:23:00	YES		4,534.1	100.7%	18	170	10	87	9	2.2	100	100	0	
7/10/2015 09:55:00	YES		4,558.9	101.1%	17	170	9.5	91	8	2.1	97	100	0	
7/13/2015 08:49:00	YES		4,629.8	100.0%	18	167	9	94	8	2.2	99	100	0	
7/14/2015 09:13:00	YES		4,654.2	100.0%	18	168	8.5	92	8.5	2.2	97	100	0	
7/17/2015 09:01:00	NO		4,709.9	77.6%	20	110	9	70	10	1.6	88	100	0	
7/20/2015 09:16:00	YES		4,781.9	99.7%	20	165	8.5	93	7.5	1.65	85	100	0	
7/21/2015 09:28:00	YES		4,805.5	97.5%	20	161	8.2	88	8	1.7	86	100	0	
7/22/2015 09:47:00	YES		4,829.8	99.9%	20	158	9	84	8	1.7	87	100	0	
7/23/2015 08:20:00	YES		4,852.3	99.8%	20	158	8	85	8	1.9	90	100	0	
7/24/2015 09:14:00	YES		4,877.1	99.6%	21	157	8	88	8	1.9	90	100	0	
7/27/2015 08:54:00	YES		4,947.7	98.5%	20	164	8	93	8	1.7	85	100	0	
7/28/2015 09:28:00	YES		4,968.4	84.3%	21	162	8	95	7.5	1.7	85	100	0	
7/29/2015 09:40:00	YES		4,993.2	102.5%	21	164	8	97	7	1.9	90	100	0	
7/30/2015 09:30:00	YES		5,016.4	97.3%	21	157	8	86	8	1.8	88	100	0	

P-2140 Air Sparging System Performance Data

Date	System Operating Upon Arrival	If System not operational, then why?	Air Sparge Motor Runtime (hrs)	Percent Operational (%)	Air Sparge Blower Inlet Vacuum (in. w.c.)	Heat Exchanger Inlet Temperature (F)	Heat Exchanger Inlet Pressure (psi)	Heat Exchanger Outlet Temperature (F)	Heat Exchanger Outlet Pressure (psi)	Heat Exchanger Differential Pressure (in. w.c. or fpm)	Air Flow Rate (scfm)	Control Valve Percent Open (%)	Bleed Air Percent Open (%)	General Notes
7/31/2015 09:25:00	YES		5,041.3	104.1%	21	155	8	85	8.5	1.8	88	100	0	
8/03/2015 08:26:00	YES		5,114.0	102.4%	21	154	8	86	8	2.8	110	100	0	
8/04/2015 09:40:00	YES		5,139.2	99.9%	22	152	8	84	8	1.9	91	100	0	
8/05/2015 08:42:00	YES		5,162.5	101.2%	22	147	8	78	9	1.9	91	100	0	
8/06/2015 09:53:00	YES		5,188.0	101.3%	22	150	8	80	8.5	1.8	88	100	0	
8/07/2015 09:15:00	YES		5,211.7	101.4%	22	148	8	80	9	1.9	91	100	0	
8/10/2015 09:54:00	YES		5,284.9	100.8%	22	156	9.5	90	7.5	4	136	100	0	
8/11/2015 10:38:00	YES		5,310.1	101.9%	24	170	10.5	90	10.5	7,500	164	100	0	
8/12/2015 09:34:00	YES		5,333.2	100.7%	24	170	12	85	10.5	3.9	139	100	0	
8/13/2015 10:40:00	YES		5,361.0	110.8%	23	174	10	94	9.5	7,600	166	100	0	
8/14/2015 09:05:00	YES		5,381.1	89.7%	23	171	11.5	92	9.5	7,800	170	100	0	
8/17/2015 09:42:00	YES		5,453.6	99.8%	23	176	10	99	9	7,800	170	100	0	
8/18/2015 09:38:00	YES		5,477.5	99.9%	23	178	10	100	8	3,800	83	100	0	
8/19/2015 09:54:00	YES		5,501.7	99.7%	23	177	10	100	9	7,800	170	100	0	
8/20/2015 10:00:00	YES		5,525.6	99.2%	23	174	10	96	9	7,800	170	100	0	
8/21/2015 08:45:00	YES		5,548.4	100.2%	24	164	10.5	85	10.5	7,800	170	100	0	
8/24/2015 10:26:00	YES		5,620.8	98.3%	24	172	10	95	9	7,800	170	100	0	
8/25/2015 10:35:00	YES		5,644.7	99.0%	24	170	10	92	9	7,800	170	100	0	
8/26/2015 09:09:00	YES		5,666.9	98.4%	29	160	10	82	10.5	8,000	175	100	0	
8/27/2015 10:02:00	NO	Temporarily down due to new well connections.	5,670.1	12.9%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
8/28/2015 01:36:00	NO	Down due to new well connections	5,670.1	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
8/31/2015 11:05:00	NO	Down due to new well hookups.	5,670.1	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9/01/2015 02:46:00	NO	Down awaiting final well head reducer placement, which will happen tomorrow.	5,670.1	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9/02/2015 02:48:00	NO	Down for final connections of new wells	5,670.1	0.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9/03/2015 02:20:00	YES		5,670.1	--	24	178	11	90	10.5	6,200	135	100	5	Hour meter not working
9/04/2015 09:47:00	YES		5,670.1	--	25	150	8	84	8.5	7,000	153	100	5	
9/08/2015 08:45:00	YES		5,670.1	--	25	149	7.5	88	8	8,350	182	100	0	
9/09/2015 10:16:00	YES		5,670.1	--	25	162	8	100	7	4,250	93	100	0	
9/10/2015 10:17:00	YES		5,670.1	--	25	146	8	80	9	8,400	183	100	0	
9/11/2015 11:27:00	YES		5,670.1	--	25	152	7.5	90	7	8,200	179	100	0	
9/14/2015 10:49:00	YES		5,670.1	--	25	138	7.5	77	9	8,250	180	100	0	
9/15/2015 10:10:00	YES		5,670.1	--	25	144	7.5	84	7.5	8,350	182	100	0	
9/16/2015 10:15:00	YES		5,670.1	--	25	148	7	88	7	8,250	180	100	0	
9/17/2015 08:51:00	YES		5,670.1	--	25	142	7.5	82	8	8,250	180	100	0	
9/18/2015 08:29:00	YES		5,670.1	--	26	138	7.5	78	8.5	8,250	180	100	0	
9/21/2015 10:15:00	YES		5,670.1	--	26	142	7	80	7.5	8,350	182	100	0	
9/22/2015 09:15:00	NO	System shut down for sampling event.	5,670.1	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
9/23/2015 09:16:00	NO	AS down due to sampling event.	5,670.1	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Hour meter fixed
9/24/2015 09:41:00	YES		5,689.6	79.9%	26	128	7	75	7	5,650	123	100	12	AS was turned back on 9-23-15 @ 1430hrs w/bleed air at 25% open reduced to 12% open.
9/25/2015 09:32:00	YES		5,713.6	100.6%	26	134	8	75	9	8,500	185	100	0	
9/28/2015 10:00:00	YES		5,786.5	100.6%	27	146	8	85	8	8,250	180	100	0	
9/29/2015 09:30:00	YES		5,810.2	100.9%	26	150	8	86	7.5	8,200	179	100	0	
9/30/2015 10:46:00	YES		5,836.1	102.5%	26	140	8	68	9.5	8,650	189	100	0	
10/01/2015 09:31:00	YES		5,859.2	101.5%	26	131	8	64	9.5	8,850	193	100	0	
10/02/2015 11:38:00	YES		5,885.4	100.3%	27	133	7.5	70	8.5	9,000	196	100	0	

P-2140 Air Sparging System Performance Data

Date	System Operating Upon Arrival	If System not operational, then why?	Air Sparge Motor Runtime (hrs)	Percent Operational (%)	Air Sparge Blower Inlet Vacuum (in. w.c.)	Heat Exchanger Inlet Temperature (F)	Heat Exchanger Inlet Pressure (psi)	Heat Exchanger Outlet Temperature (F)	Heat Exchanger Outlet Pressure (psi)	Heat Exchanger Differential Pressure (in. w.c. or fpm)	Air Flow Rate (scfm)	Control Valve Percent Open (%)	Bleed Air Percent Open (%)	General Notes
10/05/2015 12:22:00	YES		5,958.4	100.4%	26	142	7.5	85	7.5	9,300	203	100	0	
10/06/2015 10:56:00	YES		5,981.2	101.0%	27	138	7	76	7.5	9,200	201	100	0	
10/07/2015 10:09:00	YES		6,004.4	99.9%	27	141	7.5	80	8	9,200	201	100	0	
10/08/2015 11:16:00	YES		6,029.9	101.5%	27	137	7.5	76	8	9,200	201	100	0	
10/09/2015 09:31:00	YES		6,052.2	100.2%	27	141	7.5	79	7.5	9,200	201	100	0	
10/12/2015 09:31:00	YES		6,077.7	35.4%	27	132	9	78	8	8,200	179	100	10	
10/13/2015 10:39:00	YES		6,101.8	95.9%	27	140	8	73	9.5	8,950	195	100	0	
10/14/2015 02:20:00	YES		6,129.8	178.5%	27	141	8	72	9.25	9,000	196	100	0	
10/15/2015 11:25:00	YES		6,150.9	63.8%	27	140	8	75	8.5	9,200	201	100	0	
10/16/2015 09:35:00	YES		6,173.1	100.2%	27	133	8	66	9.5	9,200	201	100	0	
10/19/2015 10:18:00	YES		6,245.8	100.0%	27.5	123	7.5	61	9.25	9,500	207	100	0	
10/20/2015 10:57:00	YES		6,270.5	100.2%	27	140	7	78	7.5	9,200	201	100	0	
10/21/2015 09:00:00	YES		6,292.7	100.7%	27	129	7.5	65	9	9,250	202	100	0	
10/22/2015 09:05:00	YES		6,313.6	86.8%	27	144	7	80	7.5	9,450	206	100	0	
10/23/2015 09:32:00	YES		6,340.6	110.4%	27	124	7	60	9.5	9,750	213	100	0	
10/26/2015 10:00:00	YES		6,413.1	100.0%	28	120	7	60	9	9,700	212	100	0	
10/27/2015 09:30:00	YES		6,419.9	28.9%	28	123	7	60	9	5,750	125	100	0	
10/28/2015 11:50:00	YES		6,421.7	6.8%	28	96	6.5	53	9.5	9,500	207	100	0	
10/29/2015 03:40:00	NO	Cycling.	6,423.7	12.6%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
10/30/2015 11:02:00	YES		6,425.9	7.0%	27	123	7.5	58	9	3.2	119	100	10	
11/02/2015 09:48:00	NO	Cycling	6,433.1	10.2%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/03/2015 11:40:00	YES		6,436.0	11.2%	28	141	8	76	9	2.8	111	100	10	
11/04/2015 10:05:00	NO	Cycling	6,438.0	8.9%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/05/2015 11:20:00	NO	Cycling.	6,440.0	7.9%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/06/2015 09:21:00	YES		6,441.3	5.9%	28	150	8	78	9	2.45	103	100	10	
11/09/2015 09:30:00	YES	Restarted after scheduled base wide power outage	6,444.8	4.9%	28	125	9.5	55	13	2.3	105	100	10	
11/10/2015 09:26:00	YES		6,448.3	14.6%	28	145	9	66	10.5	2.8	113	100	10	
11/11/2015 09:15:00	YES		6,450.3	8.4%	28	146	8.5	67	10	2.6	108	100	10	
11/12/2015 10:20:00	NO	Cycling.	6,455.0	18.7%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/13/2015 10:33:00	YES		6,460.1	21.1%	28	153	10	70	10.5	4.7	149	100	0	
11/16/2015 10:24:00	YES		6,483.6	32.7%	28	155	9.5	76	10	4.8	149	100	0	
11/17/2015 10:54:00	YES		6,492.4	35.9%	28	150	9.5	80	10	4.8	149	100	0	
11/18/2015 03:01:00	NO	Cycling.	6,500.0	47.2%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/19/2015 09:49:00	YES		6,508.9	28.9%	29	156	9	80	9	4.7	145	100	0	
11/20/2015 09:10:00	NO	Cycling.	6,516.0	30.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/23/2015 09:20:00	NO	Cycling.	6,538.0	30.5%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
11/30/2015 11:20:00	YES		6,581.1	25.4%	28	140	9	75	10	4.9	150	100	0	
12/01/2015 10:07:00	NO	Cycling.	6,589.0	34.7%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/02/2015 10:09:00	NO	Cycling.	6,600.0	45.8%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/03/2015 08:55:00	YES	Restarted after 0500hrs power outage.	6,602.0	8.8%	29	96	8.5	54	11	4.8	153	100	0	
12/04/2015 08:51:00	NO	Cycling.	6,608.8	28.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/07/2015 11:57:00	YES		6,629.6	27.7%	4	145	9	80	9.5	5.3	0	100	0	
12/08/2015 09:50:00	YES		6,633.2	16.5%	28	88	7.5	54	10	5.3	0	100	0	
12/09/2015 08:48:00	NO	Cycling.	6,643.4	44.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/14/2015 11:52:00	NO	Cycling.	6,664.2	16.9%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/15/2015 10:12:00	YES		6,664.2	0.0%	28	90	12	52	15	NM	NM	100	0	System was off upon arrival. Electricians put heat trace on SVE system failed restart AS seperatly.
12/16/2015 09:33:00	NO	Cycling.	6,667.7	15.0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/17/2015 11:17:00	YES		6,670.6	11.3%	28	150	9	70	10	4.9	149	100	0	
12/18/2015 09:20:00	NO	Cycling.	6,674.4	17.2%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/21/2015 11:43:00	YES		6,681.3	9.3%	28	140	9	76	9	5	152	100	0	

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Date	System Operating Upon Arrival	If System not operational, then why?	Air Sparge Motor Runtime (hrs)	Percent Operational (%)	Air Sparge Blower Inlet Vacuum (in. w.c.)	Heat Exchanger Inlet Temperature (F)	Heat Exchanger Inlet Pressure (psi)	Heat Exchanger Outlet Temperature (F)	Heat Exchanger Outlet Pressure (psi)	Heat Exchanger Differential Pressure (in. w.c. or fpm)	Air Flow Rate (scfm)	Control Valve Percent Open (%)	Bleed Air Percent Open (%)	General Notes
12/28/2015 10:50:00	NO	Cycling.	6,716.5	21.1%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
12/29/2015 12:36:00	YES		6,724.6	31.4%	30	140	9	64	9.5	5.1	153	100	0	
12/30/2015 09:59:00	NO	Cycling.	6,730.0	25.3%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/04/2016 11:40:00	NO	Cycling.	6,767.6	30.9%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/05/2016 09:58:00	NO	Cycling.	6,773.7	27.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/06/2016 10:09:00	NO	Cycling.	6,776.7	12.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/07/2016 09:35:00	YES		6,779.9	13.7%	30	136	9	82	9	5	152	100	0	
1/08/2016 10:25:00	NO	Cycling.	6,786.2	25.4%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/11/16 09:23:00	YES		6,804.2	25.4%	30	126	9	60	10.5	5	154	100	0	
1/12/16 10:48:00	YES		6,810.7	25.6%	32	131	9	72	9.5	5	153	100	0	
1/13/16 09:37:00	YES		6,812.8	9.2%	32	77	7.5	45	11	5	155	100	0	
1/14/16 10:02:00	YES		6,819.2	26.2%	32	110	8	58	10	5	153	100	0	
1/15/16 00:00:00	NO	Cycling.	6,822.6	24.3%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/18/16 08:57:00	NO	Cycling.	6,840.1	21.6%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/19/16 09:48:00	NO	Cycling.	6,846.7	26.6%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/22/16 09:24:00	NO	Cycling.	6,855.1	11.7%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
1/25/16 10:03:00	YES		6,862.5	10.2%	6	124	9	65	11.5	5.2	157	100	0	Vac gauge broken replaced.
1/26/16 10:22:00	NO		--	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Shut down yesterday after insp for a sampling event.
1/27/16 09:31:00	NO		--	--	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Down for sampling event
1/28/16 10:16:00	YES		6,862.6	0.1%	34	70	12.5	42	16.5	5.2	177	100	10	Restarted the AS system at time of insp.
1/29/16 08:59:00	NO	Cycling.	6,865.5	12.8%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
2/01/16 11:28:00	YES		6,873.5	10.7%	33	136	9	75	10	5	152	100	0	
2/03/16 09:34:00	NO	Cycling.	6,877.9	9.5%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
2/04/2016 10:35:00	NO	Cycling.	6,879.4	6.0%	--	--	--	--	--	--	--	--	--	
2/08/2016 09:03:00	NO	Cycling.	--	--	--	--	--	--	--	--	--	--	--	
2/10/2016 12:08:00	NO	Cycling.	6,901.2	15.0%	--	--	--	--	--	--	--	--	--	
2/12/2016 09:05:00	YES		6,907.4	13.8%	28	127	9	67	10.5	4.8	150	100	0	
2/17/2016 11:52:00	YES		6,923.5	13.1%	6	128	9	75	9	5.2	157	100	0	
2/19/2016 08:44:00	YES		6,930.2	14.9%	6	130	9	73	10	5.2	156	100	0	
2/22/2016 09:09:00	YES		6,937.0	9.4%	6	132	9	68	9.5	5.2	156	100	0	Shut system down after insp. for monthly sampling/gauging event.
2/25/2016 11:30:00	NO	Cycling	6,937.1	0.1%	--	--	--	--	--	--	--	--	--	system back on about 0930hrs.
2/26/2016 09:25:00	NO	Cycling	6,941.3	19.2%	--	--	--	--	--	--	--	--	--	
2/29/2016 11:32:00	YES		6,944.0	3.6%	6	108	12	53	16	5.2	169	100	0	Down upon arrival due to base wide power outage, restarted 1122 hrs.
3/02/2016 09:15:00	YES		6,945.7	3.7%	6	122	11	50	15	5.2	164	100	0	Both systems including SVE were down upon arrival, due to high float alarm
3/09/16 10:14:00	YES		6,951.5	3.4%	6	172	10.5	90	10	5	153	100	0	
3/16/16 09:14:00	YES		6,955.6	2.5%	--	88	7	58	9	5.2	155	100	75	Just started up on new cycle.
3/23/2016 08:20:00	YES		6,965.1	5.7%	6	70	8.5	50	9	5.2	163	100	0	
3/30/16 11:21:00	NO		--	--	--	--	--	--	--	--	--	--	--	Down for repairs to SVE.
4/06/16 11:24:00	YES		6,990.0	7.3%	6	126	10	72	11	4.6	151	100	0	
5/04/16 10:21:00	YES		7,006.0	1.9%	6	168	10	90	10	2.8	113	100	10	Opened bleed air for restart
5/11/16 10:24:00	YES		7,016.2	1.2%	6	136	9	86	9	3.5	128	100	5	
5/18/16 10:07:00	YES		7,034.1	5.3%	6	132	7	83	8	2	93	100	10	
6/08/16 10:44:00	YES		7,041.4	1.1%	6	144	9	90	8.5	2.8	113	100	25	
6/22/16 08:45:00	YES		7,067.8	3.1%	6	126	8.5	72	10	2.8	114	100	15	System off upon arrival, not auto restarting on cycling mode.
7/06/2016 08:52:00	NO		7,087.5	2.9%	6	126	8.5	72	10	2.8	114	100	15	
8/01/2016 09:35:00	NO		7,089.0	0.2%	6	125	8	90	8	2.8	113	100	50	
8/04/2016 09:11:00	YES		7,091.8	0.4%	6	152	9.5	90	10	3.4	125	100	10	
8/05/2016 09:00:00	NO		7,091.8	0.0%	6	158	8	92	7.5	2.5	104	100	0	Shutting down for 1 month for GW monitoring
9/28/2016 09:15:00	YES		7,092.8	0.1%	6	148	8.5	75	9	2.8	112	100	25	Restarted awaiting GW monitoring results

P-2140 Air Sparging System Performance Data

Date	System Operating Upon Arrival	If System not operational, then why?	Air Sparge Motor Runtime (hrs)	Percent Operational (%)	Air Sparge Blower Inlet Vacuum (in. w.c.)	Heat Exchanger Inlet Temperature (F)	Heat Exchanger Inlet Pressure (psi)	Heat Exchanger Outlet Temperature (F)	Heat Exchanger Outlet Pressure (psi)	Heat Exchanger Differential Pressure (in. w.c. or fpm)	Air Flow Rate (scfm)	Control Valve Percent Open (%)	Bleed Air Percent Open (%)	General Notes
10/05/2016 08:14:00	NO	cycling	7,092.8	0.0%	-	-	-	-	-	-	-	-	-	In cycle off mode.
10/12/2016 11:33:00	NO		7,098.9	1.8%	6	155	10	84	10	3.8	134	100	15	System deactivated for long term monitoring

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-MW01	04/23/2015	1:55 P.M.	2	23.94	32.96	--	--	--	--	--
	09/02/2015	9:26 A.M.	2	24.87	32.98	0	--	--	--	--
2140-MW02	04/27/2015	1:15 P.M.	2	24.28	31.29	0.8	1.69%	--	16.9	--
	05/12/2015	8:15 A.M.	2	24.44	31.29	0	300 ppm	0	20.9	-0.033
	05/13/2015	5:50 P.M.	2	--	31.29	--	--	--	--	-2.767
	05/14/2015	8:40 P.M.	2	23.41	31.29	0	--	--	--	-0.506
	05/18/2015	3:10 P.M.	2	24.78	31.29	0	300 ppm	0	20.9	-0.876
	06/11/2015	3:58 P.M.	2	23.8	31.29	0	300 ppm	0	20.9	-0.014
	06/25/2015	1:10 P.M.	2	23.81	31.29	0	300 ppm	0	20.9	-0.012
	06/26/2015	9:10 A.M.	2	--	31.29	0	300 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	2	--	31.29	0.8	300 ppm	0	20.9	-0.357
	09/02/2015	9:31 A.M.	2	25.01	31.29	0	--	--	--	--
	02/25/2016	8:40 A.M.	2	25.62	31.3	0	300 ppm	--	20.9	0.017
	03/16/2016	9:27 A.M.	2	--	--	1.4	--	--	--	-1.145
	03/24/2016	7:35 A.M.	2	--	--	6.9	--	--	--	-0.71
	03/31/2016	7:30 A.M.	2	24.15	31.22	0	300 ppm	--	20.9	0
	04/06/2016	11:44 A.M.	2	--	--	2	--	--	--	-0.394
	05/04/2016	10:11 A.M.	2	--	--	580.4	--	--	--	2.875
	04/14/2016	10:45 A.M.	2	23.98	31.32	--	--	--	--	--
	05/11/2016	10:17 A.M.	2	--	--	169.3	--	--	--	1.73
	05/18/2016	9:58 A.M.	2	--	--	288.6	--	--	--	1.689
	05/27/2016	7:10 A.M.	2	24.15	31.32	0	300 ppm	--	20.9	--
06/08/2016	12:24 A.M.	2	--	--	349.3	--	--	--	1.543	
06/22/2016	9:02 A.M.	2	--	--	42.9	--	--	--	1.53	
07/06/2016	9:10 A.M.	2	--	--	19.1	--	--	--	0.968	
08/01/2016	10:16 A.M.	2	--	--	64.9	--	--	--	2.234	
08/01/2016	9:48 A.M.	2	23.02	31.1	64.9	--	0	20.4	--	
08/04/2016	9:21 A.M.	2	23.42	--	81.9	--	0	20.9	-2.762	
09/22/2016	10:02 A.M.	2	--	--	1.1	2,700 ppm	--	19.6	0.107	
09/28/2016	9:01 A.M.	2	--	--	57.5	--	--	--	2.711	
10/05/2016	7:37 A.M.	2	--	--	2.3	--	--	--	-1.973	
10/12/2016	11:09 A.M.	2	--	--	79.6	--	--	--	4.980	
11/08/2016	7:14 A.M.	2	--	--	97.6	1,800 ppm	0	20.9	2.961	
2140-MW03	04/23/2015	2:00 P.M.	4	27.82	35.7	--	--	--	--	--
	05/12/2015	8:31 A.M.	4	28	35.7	0	300 ppm	0	20.9	0.029
	05/13/2015	5:50 P.M.	4	--	35.7	--	--	--	--	-1.399
	05/13/2015	6:00 P.M.	4	22.68	35.7	0	--	--	--	-0.738
	05/13/2015	6:00 P.M.	4	26.84	35.7	0	--	--	--	-1.269
	05/13/2015	6:00 P.M.	4	24.56	35.7	0	--	--	--	-2.07
	05/13/2015	6:20 P.M.	4	23.49	35.7	492	--	--	--	0.9
	05/14/2015	11:55 A.M.	4	28.32	35.7	0	--	--	--	--
	05/14/2015	2:55 P.M.	4	21.94	35.7	0	--	--	--	--
	05/14/2015	3:05 P.M.	4	25.95	35.7	0	--	--	--	--
	05/14/2015	3:15 P.M.	4	25.35	35.7	0	--	--	--	--
	05/14/2015	3:25 P.M.	4	24.25	35.7	0	--	--	--	--
	05/14/2015	3:35 P.M.	4	23.97	35.7	5	--	--	--	--
	05/14/2015	3:45 P.M.	4	23.63	35.7	54.5	--	--	--	--
	05/14/2015	3:55 P.M.	4	23.25	35.7	3,128	--	--	--	--
	05/14/2015	4:05 P.M.	4	22.87	35.7	4,800	--	--	--	--
	05/14/2015	4:25 P.M.	4	22.32	35.7	3,618	--	--	--	--
	05/14/2015	8:40 P.M.	4	22.7	35.7	3,298	--	--	--	5.259
	05/18/2015	3:00 P.M.	4	27.75	35.7	0.1	300 ppm	0	20.9	-0.169
	06/11/2015	3:50 P.M.	4	--	35.7	15,000	--	--	--	--
	06/25/2015	1:10 P.M.	4	22.81	35.7	59.7	1,100 ppm	0	20.9	2.112
	06/26/2015	9:10 A.M.	4	--	35.7	51.2	800 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	4	--	35.7	152.4	300 ppm	0	20.9	1.245
	09/02/2015	9:49 A.M.	4	28.77	35.3	16.7	--	--	--	--
	01/21/2016	8:00 A.M.	4	18.69	--	0	--	--	--	13.309
	08/04/2016	9:44 A.M.	4	13.5	--	0	--	0	20.9	12.002
09/22/2016	10:13 A.M.	4	--	--	1.1	400 ppm	--	20.9	1.1	
11/7/2016	10:00 A.M.	4	8.81	--	0	300 ppm	0	20.9	11.387	

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-MW04	04/23/2015	2:12 P.M.	2	26.7	35.96	0	300 ppm	--	20.9	--
	05/12/2015	8:36 A.M.	2	26.94	35.96	0	300 ppm	0	20.9	0.018
	05/13/2015	5:50 P.M.	2	--	35.96	--	--	--	--	-1.119
	05/13/2015	6:00 P.M.	2	25.75	35.96	0	--	--	--	2.732
	05/13/2015	6:00 P.M.	2	26.89	35.96	0	--	--	--	-0.119
	05/13/2015	6:20 P.M.	2	24.97	35.96	8	--	--	--	3.8
	05/14/2015	4:45 P.M.	2	21.35	35.96	753	--	--	--	--
	05/14/2015	8:40 P.M.	2	23.81	35.96	8,300	--	--	--	4.3
	05/18/2015	2:30 P.M.	2	27.41	35.96	0	300 ppm	0	20.9	-0.773
	06/11/2015	3:50 P.M.	2	26.38	35.96	15,000	3,800 ppm	0	20.9	4.67
	06/25/2015	1:10 P.M.	2	26.38	35.96	601.2	2,700 ppm	0	20.3	1.71
	06/26/2015	9:10 A.M.	2	--	35.96	374.9	2,700 ppm	--	20.4	--
	07/15/2015	1:45 P.M.	2	--	35.96	557.1	2,100 ppm	0	20.1	1.06
	09/02/2015	10:03 A.M.	2	27.73	35.97	0	--	--	--	--
	01/21/2016	8:00 A.M.	2	27.76	--	695.7	--	--	--	0.121
08/04/2016	10:31 A.M.	2	26.32	--	0	--	0	20.9	0.038	
09/22/2016	10:18 P.M.	2	--	--	1.8	500 ppm	--	20.9	0.085	
11/7/2016	10:00 A.M.	2	25.73	--	17.7	3,000 ppm	0	20.2	1.565	
2140-MW05	04/27/2015	1:55 P.M.	2	27.6	35.92	0	3,400 ppm	--	20.2	--
	05/14/2015	8:40 P.M.	2	24.75	35.92	50	--	--	--	3.65
	08/10/2015	9:55 A.M.	2	27.2	35.95	130.6	1,000 ppm	0	20.9	2.36
	12/17/2015	2:45 P.M.	2	30.7	35.94	13.7	500 ppm	0	20.9	2.138
	08/04/2016	9:22 A.M.	2	11.1	--	0	--	0	20.9	-0.645
	09/22/2016	10:23 P.M.	2	--	--	1.6	400 ppm	--	20.9	0.088
2140-MW05D	04/23/2015	2:40 P.M.	2	28.11	45.78	--	--	--	--	--
	06/11/2015	3:50 P.M.	2	24	45.78	0	300 ppm	0	20.9	2.001
	06/25/2015	1:10 P.M.	2	24.91	45.78	0	300 ppm	0	20.9	0.152
	06/26/2015	9:10 A.M.	2	--	45.78	0.4	400 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	2	--	45.78	0	300 ppm	0	20.9	0.289
	09/02/2015	10:32 A.M.	2	29.78	45.67	0	--	--	--	--
01/21/2016	8:00 A.M.	2	--	--	--	--	--	--	--	
2140-MW05S	05/14/2015	4:45 P.M.	2	23.5	36.94	4,516	--	--	--	--
	06/11/2015	3:50 P.M.	2	23.8	36.94	329.7	800 ppm	0	20.9	15.802
	06/25/2015	1:10 P.M.	2	23.83	36.94	127.8	5,200 ppm	0	20.2	10.06
	06/26/2015	9:10 A.M.	2	--	36.94	329.7	800 ppm	--	20.4	--
	07/15/2015	1:45 P.M.	2	--	36.94	295.5	700 ppm	0	20.9	4.929
	09/02/2015	10:30 A.M.	2	29.42	36.94	5.7	--	--	--	--
	01/21/2016	8:00 A.M.	2	32.03	--	20.8	--	--	--	1.501
11/7/2016	10:00 A.M.	2	15.34	--	0	300 ppm	0	20.9	17	

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-MW06	04/27/2015	8:45 A.M.	2	28.74	42	--	--	--	--	--
	05/12/2015	8:42 A.M.	2	29.03	42	0	300 ppm	0	20.9	0.063
	05/13/2015	5:50 P.M.	2	--	42	--	--	--	--	-6.675
	05/13/2015	6:00 P.M.	2	28.75	42	0	--	--	--	-5.79
	05/13/2015	6:00 P.M.	2	27.01	42	0	--	--	--	-0.954
	05/13/2015	6:20 P.M.	2	25.35	42	2.5	--	--	--	0.12
	05/14/2015	11:55 A.M.	2	29.26	42	0	--	--	--	--
	05/14/2015	2:55 P.M.	2	26.89	42	0	--	--	--	--
	05/14/2015	3:05 P.M.	2	20.9	42	3,018	--	--	--	--
	05/14/2015	3:15 P.M.	2	19.95	42	4.24	--	--	--	--
	05/14/2015	3:25 P.M.	2	19.6	42	32	--	--	--	--
	05/14/2015	3:35 P.M.	2	19.3	42	4,915	--	--	--	--
	05/14/2015	3:45 P.M.	2	18.8	42	4,919	--	--	--	--
	05/14/2015	3:55 P.M.	2	18.65	42	4,796	--	--	--	--
	05/14/2015	4:05 P.M.	2	18.45	42	4,319	--	--	--	--
	05/14/2015	4:25 P.M.	2	18	42	4,228	--	--	--	--
	05/14/2015	8:40 P.M.	2	25.75	42	3,340	--	--	--	20
	05/18/2015	2:40 P.M.	2	29.33	42	0.2	300 ppm	0	20.9	-2.081
	06/11/2015	3:50 P.M.	2	28.82	42	15,000	300 ppm	0	20.9	--
	06/25/2015	1:10 P.M.	2	28.62	42	1,010.10	1,500 ppm	0	20.9	8.917
	06/26/2015	9:10 A.M.	2	--	42	995.4	900 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	2	--	42	727.6	300 ppm	0	20.9	1.028
	08/10/2015	9:03 A.M.	2	28.2	39.62	489.2	300 ppm	0	20.9	0.186
	09/02/2015	10:00 A.M.	2	29.83	39.44	55.5	--	--	--	--
	03/02/2016	9:50 A.M.	2	--	--	397.9	--	--	--	1.2
	03/09/2016	9:04 A.M.	2	--	--	752.7	--	--	--	0.239
	02/25/2016	9:40 A.M.	2	30.95	38.4	594.4	600 ppm	--	20.9	0.019
	03/16/2016	9:22 A.M.	2	--	--	60.2	--	--	--	0.351
	03/24/2016	7:36 A.M.	2	--	--	174.8	--	--	--	-0.137
	04/06/2016	11:37 A.M.	2	--	--	73.7	--	--	--	-0.025
	05/04/2016	10:07 A.M.	2	--	--	316.6	--	--	--	-0.034
	04/14/2016	10:55 A.M.	2	28.72	37.22	--	--	--	--	--
	05/11/2016	10:09 A.M.	2	--	--	4.7	--	--	--	-0.111
	05/18/2016	9:53 A.M.	2	--	--	3.3	--	--	--	0.024
	06/08/2016	12:19 A.M.	2	--	--	0.8	--	--	--	-0.0471
	06/22/2016	8:56 A.M.	2	--	--	0.3	--	--	--	-4.637
	07/06/2016	9:03 A.M.	2	--	--	0	--	--	--	--
	08/01/2016	9:52 A.M.	2	--	--	0	--	--	--	-7.265
	08/04/2016	10:06 A.M.	2	25.53	--	90.5	--	0	19.9	0.637
	09/22/2016	10:28 P.M.	2	--	--	1.3	2,500 ppm	--	20.4	0.112
09/28/2016	8:57 A.M.	2	--	--	1	--	--	--	-5.435	
10/05/2016	8:29 A.M.	2	--	--	2.9	--	--	--	-7.164	
10/12/2016	11:03 A.M.	2	--	--	12.7	--	--	--	5.56	
11/7/2016	10:00 A.M.	2	25.06	--	0	400 ppm	0	20.9	9.752	

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-MW07	04/27/2015	10:00 A.M.	2	28.82	41.65	0	300 ppm	--	20.9	--
	05/12/2015	8:49 A.M.	2	29.11	41.65	0	300 ppm	0	20.9	0.006
	05/13/2015	5:50 P.M.	2	--	41.65	--	--	--	--	-2.912
	05/13/2015	6:00 P.M.	2	24.52	41.65	0	--	--	--	-0.007
	05/13/2015	6:00 P.M.	2	28.17	41.65	0	--	--	--	1.24
	05/13/2015	6:20 P.M.	2	21.8	41.65	2.2	--	--	--	0.028
	05/14/2015	4:45 P.M.	2	19.34	41.65	152	--	--	--	--
	05/14/2015	8:40 P.M.	2	24.43	41.65	9,999	--	--	--	0.003
	05/18/2015	2:50 P.M.	2	26.59	41.65	0.3	300 ppm	0	20.9	-0.005
	06/11/2015	3:50 P.M.	2	29.51	41.65	15,000	300 ppm	0	20.9	--
	06/25/2015	1:10 P.M.	2	29.51	41.65	191.3	1,700 ppm	0	20.9	7.152
	06/26/2015	9:10 A.M.	2	--	41.65	189.5	1,200 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	2	--	41.65	251.7	300 ppm	0	20.9	1.78
	08/10/2015	8:08 A.M.	2	27.5	41.6	202.8	1,100 ppm	0	20.9	4.662
	09/02/2015	9:54 A.M.	2	30.3	41.67	31.8	--	--	--	--
	03/02/2016	9:59 A.M.	2	--	--	41.5	--	--	--	0.09
	03/09/2016	9:06 A.M.	2	--	--	28.6	--	--	--	0.163
	03/16/2016	9:21 A.M.	2	--	--	209.6	--	--	--	-0.271
	03/24/2016	7:36 A.M.	2	--	--	20.4	--	--	--	0.567
	04/06/2016	11:33 A.M.	2	--	--	135.3	--	--	--	-0.5
	05/04/2016	10:09 A.M.	2	--	--	196.7	--	--	--	-0.034
	04/14/2016	11:05 A.M.	2	29.21	41.68	--	--	--	--	--
	05/11/2016	10:13 A.M.	2	--	--	275.6	--	--	--	0.3
	05/18/2016	9:55 A.M.	2	--	--	185.4	--	--	--	0.32
	06/08/2016	12:17 A.M.	2	--	--	8.2	--	--	--	-0.04
	06/22/2016	9:00 A.M.	2	--	--	1.3	--	--	--	-0.029
	07/06/2016	9:07 A.M.	2	--	--	0.4	--	--	--	-0.64
	08/01/2016	9:55 A.M.	2	--	--	0.6	--	--	--	0.08
	08/04/2016	8:51 A.M.	2	21.69	--	9.8	--	0	20.9	0.015
	09/28/2016	9:01 A.M.	2	--	--	1.2	--	--	--	0.018
10/05/2016	8:26 A.M.	2	--	--	11.8	--	--	--	-0.739	
10/12/2016	11:07 A.M.	2	--	--	4	--	--	--	29	
11/7/2016	10:00 A.M.	2	22.11	--	0	400 ppm	0	20.9	0.076	
2140-MW08	04/24/2015	7:00 A.M.	2	27.01	38.19	0.9	300 ppm	--	20.9	--
	06/11/2015	3:50 P.M.	2	28.9	38.19	1.2	300 ppm	0	20.9	0.545
	06/25/2015	1:10 P.M.	2	29.01	38.19	0	300 ppm	0	20.9	0.478
	06/26/2015	9:10 A.M.	2	--	38.19	0	300 ppm	--	20.9	--
	07/15/2015	1:45 P.M.	2	--	38.19	1.7	300 ppm	0	20.9	0.471
	09/02/2015	10:36 A.M.	2	29.14	38.18	0	--	--	--	--
	01/21/2016	8:00 A.M.	2	31.15	--	1.5	--	--	--	-0.163
	11/7/2016	10:00 A.M.	2	26.28	--	0	400 ppm	0	20.9	0.141
	04/28/2015	8:40 A.M.	2	24.68	32.65	0	300 ppm	--	20.9	--
	06/11/2015	3:50 P.M.	2	22.95	32.65	1.9	300 ppm	0	20.9	0.03
06/25/2015	1:10 P.M.	2	26.38	32.65	601.2	2,700 ppm	0	20.3	1.71	
06/25/2015	1:10 P.M.	2	22.95	32.65	4.7	700 ppm	0	20.9	0.007	
06/26/2015	9:10 A.M.	2	--	32.65	1.3	500 ppm	--	20.9	--	
07/15/2015	1:45 P.M.	2	--	32.65	1.8	300 ppm	0	20.9	0.047	
08/07/2015	12:39 P.M.	2	25.2	32.35	0	300 ppm	0	20.9	0.175	
09/02/2015	10:39 A.M.	2	26.15	32.35	0.1	--	--	--	--	
03/09/2016	9:00 A.M.	2	--	--	0.4	--	--	--	0.016	
03/16/2016	9:18 A.M.	2	--	--	0	--	--	--	-0.04	
04/06/2016	11:33 A.M.	2	--	--	0	--	--	--	0	
05/04/2016	10:05 A.M.	2	--	--	0	--	--	--	-0.036	
05/11/2016	10:06 A.M.	2	--	--	0.3	--	--	--	-0.047	
05/18/2016	9:49 A.M.	2	--	--	0	--	--	--	0.066	
06/08/2016	12:15 A.M.	2	--	--	0.5	--	--	--	-0.086	
06/22/2016	8:50 A.M.	2	--	--	0.3	--	--	--	-0.218	
07/06/2016	8:59 A.M.	2	--	--	0	--	--	--	-0.407	
08/01/2016	9:50 A.M.	2	--	--	0	--	--	--	-0.031	
08/04/2016	11:29 A.M.	2	23.01	--	0	--	0	20.9	-0.007	
09/22/2016	10:33 A.M.	2	--	--	1	2,100 ppm	--	20.5	0.016	
09/28/2016	8:53 A.M.	2	--	--	1.1	--	--	--	-0.356	
10/05/2016	8:20 A.M.	2	--	--	2	--	--	--	-0.3	
10/12/2016	10:58 A.M.	2	--	--	2.8	--	--	--	0.018	
11/7/2016	10:00 A.M.	2	22.57	--	0	300 ppm	0	20.9	0.034	

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-MW10	04/24/2015	7:00 A.M.	2	23.05	33.7	0	300 ppm	--	20.9	--
	06/11/2015	3:50 P.M.	2	23.14	33.7	0.4	300 ppm	0	20.9	2.601
	06/25/2015	1:10 P.M.	2	23.01	33.7	0	700 ppm	0	20.9	2.417
	06/26/2015	9:10 A.M.	2	--	33.7	0	500 ppm	--	20.5	--
	07/15/2015	1:45 P.M.	2	--	33.7	0	400 ppm	0	20.3	1.465
	09/02/2015	10:13 A.M.	2	24.72	33.79	0	--	--	--	--
	01/21/2016	8:00 A.M.	2	25.08	--	0	--	--	--	-0.012
	11/7/2016	10:00 A.M.	2	22.64	--	0	4,600 ppm	0	20.9	0.841
2140-MW11	04/23/2015	2:33 P.M.	2	23.18	34.7	--	--	--	--	--
	06/11/2015	3:50 P.M.	2	22.48	34.7	15,000	300 ppm	0	20.9	1.101
	06/25/2015	1:10 P.M.	2	--	34.7	1,012.30	4,200 ppm	0	19.3	0.008
	06/26/2015	9:10 A.M.	2	--	34.7	858.4	4,200 ppm	--	19.6	--
	07/15/2015	1:45 P.M.	2	--	34.7	412.5	300 ppm	0	19.8	0.007
	09/02/2015	10:10 A.M.	2	24.21	34.71	0	--	--	--	--
	10/08/2015	12:00 P.M.	2	--	34.71	0	--	--	--	--
	01/21/2016	8:00 A.M.	2	24.67	--	0	--	--	--	-0.111
	09/22/2016	10:38 P.M.	2	--	--	0.9	2,700 ppm	--	20.5	0.026
	11/7/2016	10:00 A.M.	2	23.51	--	0	400 ppm	0	20.9	0.135
	2140-MW12	04/28/2015	1:05 P.M.	4	19.15	33.85	0	900 ppm	--	20.9
08/10/2015		12:35 P.M.	4	21.21	33.78	0	300 ppm	0	20.9	0.012
09/02/2015		12:01 P.M.	4	21.7	33.89	0	--	--	--	--
02/23/2016		8:55 A.M.	4	20.81	33.89	0	400 ppm	--	20.9	0
04/14/2016		12:30 P.M.	4	19.45	33.88	--	--	--	--	--
2140-MW13	04/24/2015	7:00 A.M.	4	7.35	19.12	0	400 ppm	--	20.9	--
	09/02/2015	12:05 P.M.	4	9.89	18.86	0	--	--	--	--
2140-MW14	04/28/2015	12:10 P.M.	4	8.49	19.83	0	500 ppm	--	20.9	--
	09/02/2015	12:09 P.M.	4	10.97	19.8	0	--	--	--	--
2140-MW15	04/14/2016	12:45 P.M.	4	8.82	19.83	--	--	--	--	--
	04/24/2015	7:00 A.M.	4	9.37	19.2	--	--	--	--	--
2140-MW16	09/02/2015	12:12 A.M.	4	11.82	19.14	0.6	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.36	16.9	0	400 ppm	--	20.9	--
2140-MW17	09/02/2015	12:43 P.M.	4	8.58	16.91	0	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.48	17.17	--	--	--	--	--
2140-MW18	09/02/2015	12:20 A.M.	4	8.7	17.11	0.1	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.06	17.13	--	--	--	--	--
2140-MW19	09/02/2015	12:18 A.M.	4	8.28	17.14	0	--	--	--	--
	04/28/2015	10:50 A.M.	4	7.64	17.04	0	500 ppm	--	20.9	--
	09/02/2015	12:35 P.M.	4	9.75	17.04	0.4	--	--	--	--
2140-MW20	04/14/2016	12:05 P.M.	4	7.78	16.93	--	--	--	--	--
	04/24/2015	7:00 A.M.	4	5.8	14.15	--	--	--	--	--
	09/02/2015	12:52 A.M.	4	7.43	13.91	3.7	--	--	--	--
2140-MW21	04/24/2015	7:00 A.M.	4	6.48	16.96	--	--	--	--	--
	09/02/2015	1:05 P.M.	4	7.59	16.89	11.5	--	--	--	--
2140-MW22	04/24/2015	7:00 A.M.	4	13.75	20.27	--	--	--	--	--
	09/02/2015	12:38 A.M.	4	15.69	20.26	0	--	--	--	--
2140-MW23	04/24/2015	7:00 A.M.	4	8.03	16.45	--	--	--	--	--
	09/02/2015	12:47 A.M.	4	9.6	16.46	0	--	--	--	--
2140-MW24	04/24/2015	7:00 A.M.	4	7.86	16.45	--	--	--	--	--
	09/02/2015	1:14 P.M.	4	10.08	8.24	--	--	--	--	--
2140-MW25	04/24/2015	7:00 A.M.	4	5.36	16.79	--	--	--	--	--
	09/02/2015	1:20 P.M.	4	--	16.74	1.1	--	--	--	--
2140-MW26	04/24/2015	7:00 A.M.	4	10.39	16.42	--	--	--	--	--
	09/02/2015	12:32 A.M.	4	12.48	16.46	0.3	--	--	--	--
2140-MW27	04/28/2015	9:55 A.M.	4	9.12	15.66	0	500 ppm	--	20.9	--
	09/02/2015	12:29 P.M.	4	11.05	15.69	216.6	--	--	--	--
	10/08/2015	12:00 P.M.	4	--	15.69	0	--	--	--	--
2140-MW28	04/14/2016	12:20 P.M.	4	9.25	15.71	--	--	--	--	--
	04/24/2015	7:00 A.M.	4	8.12	15.38	--	--	--	--	--
2140-MW29	09/02/2015	12:26 A.M.	4	10.11	15.39	3.1	--	--	--	--
	04/24/2015	7:00 A.M.	4	4.4	16	--	--	--	--	--
2140-MW30	09/02/2015	12:59 A.M.	4	5.9	16.6	0.5	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.98	16.24	--	--	--	--	--
2140-MW31	09/02/2015	12:55 A.M.	4	8.25	16.05	0	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.58	15.76	--	--	--	--	--
2140-MW32	09/02/2015	1:02 P.M.	4	8	15.81	0.2	--	--	--	--
	04/24/2015	7:00 A.M.	4	6.75	16.08	--	--	--	--	--
	09/02/2015	1:10 P.M.	4	15.83	16.11	4.1	--	--	--	--

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)	
2140-MW34	04/24/2015	7:00 A.M.	2	24.38	31.59	0	400 ppm	--	20.9	--	
	06/11/2015	3:50 P.M.	2	23.4	31.59	0	300 ppm	0	20.9	0.212	
	06/25/2015	1:10 P.M.	2	24.02	31.59	0	300 ppm	0	20.9	0.164	
	06/26/2015	9:10 A.M.	2	--	31.59	0	300 ppm	--	20.9	--	
	07/15/2015	1:45 P.M.	2	--	31.59	0	300 ppm	0	20.9	0.512	
	01/21/2016	8:00 A.M.	2	--	--	--	--	--	--	--	
	11/7/2016	10:00 A.M.	2	23.85	--	0	300 ppm	0	20.9	-0.016	
2140-MW35	04/24/2015	7:00 A.M.	2	22.88	33.14	0	300 ppm	--	20.9	--	
	06/11/2015	3:50 P.M.	2	23.55	33.14	0	300ppm	0	20.9	0.009	
	06/25/2015	1:10 P.M.	2	24.01	33.14	0	1,000 ppm	0	20.9	0.176	
	06/26/2015	9:10 A.M.	2	--	33.14	0	800 ppm	--	20.9	--	
	07/15/2015	1:45 P.M.	2	--	33.14	0	300 ppm	0	20.9	0.512	
	07/15/2015	1:45 P.M.	2	--	33.14	0	300 ppm	0	20.9	0.007	
	09/02/2015	10:42 A.M.	2	25.58	33.16	0	--	--	--	--	
	1/21/2016	8:00 AM	2	--	--	--	--	--	--	--	
	09/22/2016	10:43 A.M.	2	--	--	0.8	3,300 ppm	--	20.5	0.027	
	11/7/2016	10:00 A.M.	2	24.65	--	0	400 ppm	0	20.9	-0.169	
	04/23/2015	2:30 P.M.	2	24	32.5	0	300 ppm	--	20.9	--	
2140-MW36	05/14/2015	5:50 P.M.	2	24.56	32.5	0	--	--	--	--	
	06/11/2015	3:50 P.M.	2	23.55	32.5	3.9	300 ppm	0	20.9	4.1	
	06/25/2015	1:10 P.M.	2	23.59	32.5	507.8	2,600 ppm	0	20	4.201	
	06/26/2015	9:10 A.M.	2	--	32.5	381.9	2,100 ppm	--	20.2	--	
	07/15/2015	1:45 P.M.	2	--	32.5	9.3	300 ppm	0	20.9	1.028	
	09/02/2015	10:08 A.M.	2	25.43	32.44	4.5	--	--	--	--	
	1/21/2016	8:00 AM	2	--	--	--	--	--	--	--	
	08/04/2016	10:07 A.M.	2	22.1	--	0	--	0	20.9	-0.12	
	09/22/2016	10:48 A.M.	2	--	--	1	9,900 ppm	--	0.027	18.5	
	11/7/2016	10:00 A.M.	2	21.47	--	0	700 ppm	0	20.9	1.759	
	04/27/2015	12:10 P.M.	2	25.2	34.52	--	--	--	--	--	
	2140-MW37	06/11/2015	3:50 P.M.	2	24.63	34.52	454.2	300 ppm	0	20.9	1.39
		06/25/2015	1:10 P.M.	2	24.67	34.52	131.9	1,100 ppm	0	20.9	1.371
06/26/2015		9:10 A.M.	2	--	34.52	131.7	800 ppm	--	20.9	--	
07/15/2015		1:45 P.M.	2	--	34.52	431.2	300 ppm	0	20.9	1.128	
08/10/2015		10:57 A.M.	2	24.15	34.11	0	300 ppm	0	20.9	0.234	
09/02/2015		9:43 A.M.	2	26.25	34.2	1.8	--	--	--	--	
10/08/2015		12:00 P.M.	2	--	34.2	88.7	--	--	--	--	
12/18/2015		7:30 AM	2	21	34.19	3.4	300 ppm	0	20.9	0.178	
1/21/2016		8:00 AM	2	--	--	--	--	--	--	--	
04/14/2016		10:30 A.M.	2	25.2	34.2	--	--	--	--	--	
08/04/2016		9:34 A.M.	2	19.69	--	1.7	--	0	20.9	-5.757	
09/22/2016		10:53 A.M.	2	--	--	0.9	900 ppm	--	20.9	0.052	
11/7/2016		10:00 A.M.	2	13.63	--	5.1	2,400 ppm	0	20.9	3.067	
2140-OZ-2		06/11/2015	3:50 P.M.	--	--	--	2.5	--	--	--	--
2140-OZ-3	06/11/2015	3:50 P.M.	--	--	--	115	--	--	--	--	
2140-OZ-6	06/11/2015	3:50 P.M.	--	--	--	9	--	--	--	--	
2140-OZ-7	06/11/2015	3:50 P.M.	--	--	--	15,000	--	--	--	--	
2140-PZ01	04/24/2015	7:00 A.M.	2	24.84	25.6	--	--	--	--	--	
	05/14/2015	5:50 P.M.	2	24.09	25.6	0	--	--	--	--	
	05/18/2015	2:00 P.M.	2	25.49	25.6	0.1	300 ppm	0	20.9	0.036	
	06/11/2015	3:50 P.M.	2	23.5	25.6	49.3	800 ppm	0	20.9	15.582	
	06/25/2015	1:10 P.M.	2	23.48	25.6	0	400 ppm	0	20.9	2.317	
	06/26/2015	9:10 A.M.	2	--	25.6	0.1	400 ppm	--	20.9	--	
	07/15/2015	1:45 P.M.	2	--	25.6	0	300 ppm	0	20.9	27.92	
	09/02/2015	10:26 A.M.	2	Dry	25.49	0	--	--	--	--	
	1/21/2016	8:00 AM	2	NM	25.42	0.4	--	--	--	0.009	
	08/04/2016	11:33 A.M.	2	--	--	0	--	0	20.9	1.51	
	11/7/2016	10:00 A.M.	2	21.97	--	0	400 ppm	0	20.9	4.588	
2140-PZ02	04/23/2015	2:00 P.M.	2	Dry	24.62	--	--	--	--	--	
	05/14/2015	5:50 P.M.	2	24.18	24.65	9,999	--	--	--	--	
	05/14/2015	8:40 P.M.	2	23.41	24.65	0	--	--	--	-0.173	
	05/18/2015	2:10 P.M.	2	Dry	24.65	0	300 ppm	0	20.9	-0.222	
	06/11/2015	3:50 P.M.	2	23.6	24.65	808.9	1,400 ppm	0	20.9	13.6	
	06/25/2015	1:10 P.M.	2	23.63	24.65	36.1	1,800 ppm	0	20.9	4.165	
	06/26/2015	9:10 A.M.	2	--	24.65	7.1	1,300 ppm	--	20.9	--	
	07/15/2015	1:45 P.M.	2	--	24.65	7.3	400 ppm	0	20.1	0.285	
	09/02/2015	10:17 A.M.	2	Dry	24.67	1.5	--	--	--	--	
	1/21/2016	8:00 AM	2	NM	24.71	0.3	--	--	--	-0.159	
	08/04/2016	11:19 A.M.	2	24.25	--	0	--	0	20.9	0.873	
11/7/2016	10:00 A.M.	2	24.54	--	0	2,400 ppm	0	20.9	3.835		

P-2140 Individual Monitoring Well Influence Data

Well ID	Date	Time	Well Diameter (in)	Depth to Water (ft)	Depth to Bottom (ft)	Headspace PID Concentration (ppmv)	Headspace CO2 Concentration (ppm or %)	Headspace LEL (%)	Headspace Oxygen Concentration (%)	Headspace Pressure (in. w.c.)
2140-PZ03	04/23/2015	2:36 P.M.	2	24.95	28.37	--	--	--	--	--
	05/18/2015	2:20 P.M.	2	24.98	28.37	0	300 ppm	0	20.9	-1.285
	06/11/2015	3:50 P.M.	2	22.75	28.37	15,000	900 ppm	0	20.9	4.512
	06/25/2015	1:10 P.M.	2	22.81	28.37	508.7	2,600 ppm	0	20.2	2.741
	06/26/2015	9:10 A.M.	2	--	28.37	57.1	1,300 ppm	--	20.5	--
	07/15/2015	1:45 P.M.	2	--	28.37	12.2	300 ppm	0	20.9	1.716
	09/02/2015	10:15 A.M.	2	26.18	28.15	0	--	--	--	--
	1/21/2016	8:00 AM	2	26.93	--	0.0	--	--	--	-1.227
	08/04/2016	10:11 P.M.	2	22.72	--	0	--	0	20.9	0.122
	11/7/2016	10:00 A.M.	2	23.65	--	0	1,300 ppm	0	20.9	7.141
SVE-1	07/15/2015	1:45 P.M.	--	--	--	519.1	300 ppm	0	20.9	0
	10/08/2015	12:00 P.M.	--	--	--	0	--	--	--	--
	01/21/2016	8:00 A.M.	--	--	--	--	--	--	--	--
WCH-1	06/11/2015	3:50 P.M.	--	--	--	405	--	--	--	--