LMS/PIN/N01669

Pinellas County, Florida, Site Environmental Restoration Project

Data Report for Pinellas Board of Public Instruction Property

November 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

This page intentionally left blank

LMS/PIN/N01669

Pinellas County, Florida, Site Environmental Restoration Project

Data Report for Pinellas Board of Public Instruction Property

November 2011

This page intentionally left blank

Contents

Executive Summary iii
1.0 Introduction 1
2.0 Sampling Methodology 1
3.0 Plume Delineation Results 1
4.0 Proposed Plume Delineation 3

Figures

Figure 1. Property Location Map 4
Figure 2. Vinyl Chloride Plume 5
Figure 3. 1,4-Dioxane Plume 6
Figure 4. Proposed Temporary Sampling Points at 11111 Belcher Road 7

Tables

Table 1. Results for Analytes that Exceeded CTLs 8
Table 2. Summary of Data for Other Detected Analytes 18

Appendix

Appendix A Contaminant Plume Cross-Sections

This page intentionally left blank

Executive Summary

This document reports the results of plume delineation work conducted on the Young - Rainey Science, Technology, and Research Center (STAR Center), on the Belcher Road right-of-way adjacent to the east edge of the STAR Center, and on property owned by the Pinellas Board of Public Instruction located at 11111 Belcher Road. This work was conducted May 9–May 23, June 13–June 29, and August 30–September 9, 2011. A direct-push drill rig was used to collect 464 groundwater samples from 59 temporary sampling points. At each location, groundwater samples were collected from depth intervals approximately every 4 feet (ft) starting at 8 ft below land surface (bls) and continuing to the bottom of the surficial aquifer at about 32–36 ft bls.

The results from analysis of the groundwater samples demonstrated that the contaminant plume extends from the STAR Center under Belcher Road onto the property at 11111 Belcher Road. On that property, vinyl chloride was measured at a maximum concentration of 91 micrograms per liter (µg/L) (the cleanup target level is 1 µg/L) and 1,4-dioxane was measured at a maximum concentration of 160 µg/L (cleanup target level is 3.2 µg/L).

The purpose of this delineation work was to determine if the contaminant plume extended off site and onto 11111 Belcher Road. Now that contamination has been confirmed, additional plume delineation, as described in this report, will be conducted on that property to determine the extent of the contamination.

This page intentionally left blank

1.0 Introduction

This document reports the results of plume delineation work conducted on the Young - Rainey Science, Technology, and Research Center (STAR Center), on the Belcher Road right-of-way adjacent to the east edge of the STAR Center, and on property owned by the Pinellas Board of Public Instruction located at 11111 Belcher Road (Figure 1). This work was conducted May 9–May 23, June 13–June 29, and August 30–September 9, 2011. This work was conducted according to the *Work Plan for Delineation of the Eastern Plume at the Building 100 Area*.

2.0 Sampling Methodology

The plume delineation work was conducted with a direct-push (Geoprobe) drill rig using a Waterloo-type sampling tip to collect groundwater samples from 31 locations along the eastern and southern edges of Building 100, 14 locations adjacent to the eastern edge of the STAR Center property, and 14 locations at 11111 Belcher Road (Figure 2). Sampling points were spaced approximately 20 feet (ft) apart.

At each location, groundwater samples were collected approximately every 4 ft depth interval starting at 8 ft below land surface (bls) and continuing to the bottom of the surficial aquifer at about 32–36 ft bls. A total of 464 groundwater samples were collected, including 27 duplicate samples. Several equipment blanks and trip blanks were also collected.

All groundwater samples were collected using the procedures defined in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. At each sampling interval, groundwater was purged through the Waterloo-type sampling tip with a peristaltic pump. Standard field parameters (such as specific conductance) were measured, and purging continued until formation water was entering the pump, at which time a groundwater sample was collected. The process was then repeated at the next sampling interval. All samples were analyzed for volatile organic compounds by TestAmerica-Denver using U.S. Environmental Protection Agency SW-846 Method 8260b. Samples for analysis of 1,4-dioxane were collected only at the 20, 24, and 28 ft bls intervals, and they were analyzed using Method 8260b in the Selected Ion Monitoring (SIM) mode.

3.0 Plume Delineation Results

The results for analytes with concentrations that exceeded their cleanup target levels (CTLs) are listed in Table 1. Several other analytes were detected at concentrations that did not exceed their CTLs; these data are summarized in Table 2.

The detailed delineation defined a plume consisting mainly of vinyl chloride (VC) and 1,4-dioxane that extends from under the eastern edge of Building 100 past the eastern property boundary, beneath Belcher Road, and onto 11111 Belcher Road (Figures 2 and 3). In addition, delineation along the southern edge of Building 100 defined a distinct southern plume consisting mainly of VC, *cis*-1,2-dichloroethene (cDCE), 1,1-dichloroethene (1,1-DCE), and trichloroethene (TCE).

These two plumes most likely have different contaminant source areas, based on (1) the location and direction of movement of the plumes; (2) differences in TCE, cDCE, and 1,1-DCE concentrations; and (3) differences in 1,4-dioxane concentration (maximums of 13 micrograms per liter [µg/L] in the south plume and 440 µg/L in the east plume). Although the downgradient plumes are distinct, the two plumes appear to be mixed under Building 100, based on consistent detections of VC, cDCE, trans-1,2-dichloroethene, and 1,4-dioxane across the entire southeast edge of the building (Table 1). As documented in historical reports, there is potential for multiple source areas under the building in the form of possible leaks from waste drains, so it is possible that more than two plumes exist under the building.

In the east plume, VC was detected at maximum concentrations of 940 µg/L at the eastern edge of Building 100, 260 µg/L at the western edge of Belcher Road, and 91 µg/L at 11111 Belcher Road (the VC CTL is 10 µg/L on site and 1 µg/L off site). The maximum concentrations of 1,4-dioxane at these same locations were 440 µg/L, 370 µg/L, and 160 µg/L, respectively (the 1,4-dioxane CTL is 32 µg/L on site and 3.2 µg/L off site). The extent of the plume on 11111 Belcher Road was not determined during this delineation event; additional delineation is proposed in Section 4.

1,1-dichloroethane is not a contaminant of potential concern for the Building 100 Area, but this analyte was detected fairly consistently during the delineation work (Table 1). The concentration of 1,1-dichloroethane did not exceed the on-site CTL, but did slightly exceed the off-site CTL on the west side of Belcher Road and at 11111 Belcher Road.

As indicated by the delineation results, the east plume turns to the northeast under Belcher Road before it enters 11111 Belcher Road. This northeastern movement most likely is a result of a local hydraulic barrier formed by the large pond at 11111 Belcher Road. Historical groundwater and surface water level data suggest that the pond water level is consistently higher than the groundwater levels to the west. Groundwater flow direction is generally to the southeast at the Building 100 Area, but this hydraulic barrier appears to be significant enough to deflect the flow to the northeast. In terms of plume movement to the southeast off the STAR Center, results from nearby monitoring wells (12-0550 and -0551; 21-0502 and -0503; Figure 2) suggest that the east plume does not extend to the southeast.

Collection of groundwater samples at every 4 ft vertical interval from near the top of the water table to the bottom of the surficial aquifer resulted in very good definition of the vertical extent of the plume (Table 1). Appendix A contains several plume cross-section figures.

In the east plume, the highest VC concentrations were measured at 24 to 28 ft bls at the eastern edge of the building and at the eastern property boundary, and at 20 ft bls at 11111 Belcher Road. VC was measured at low concentrations in shallow samples (8 and 12 ft bls) near Building 100, but was not found in shallow samples farther east in the plume.

When the *Work Plan for Delineation of the Eastern Plume at the Building 100 Area* was written, analysis for 1,4-dioxane was not included because there was no evidence from monitoring wells that this contaminant was present at elevated concentrations. However, in March 2011, 1,4-dioxane was measured at 43 µg/L in well PIN12-0540 near the eastern property boundary, in excess of the poor water quality CTL of 32 µg/L. This well is one of three wells at the same

location, and is screened at 20-30 ft bls. The shallow well at this location (PIN12-0539) did not contain detectable 1,4-dioxane, and the deeper well (PIN12-0548) contained 1,4-dioxane at 1.4 µg/L. Therefore, sampling for 1,4-dioxane during the plume delineation work was added only at the 20, 24, and 28 ft bls intervals. But, as can be seen in the data in Table 1, 1,4-dioxane was found at elevated concentrations during the plume delineation work, so this limited sampling approach resulted in the vertical extent of the 1,4-dioxane plume not being determined at some locations.

The south plume at the southern edge of Building 100 is narrow and relatively deep, with the highest concentrations of contaminants detected at 28 to 32 ft bls. This narrow plume could indicate the existence of a preferential flow pathway, particularly given that (1) the south plume farther downgradient remains narrow and (2) higher hydraulic conductivity has been measured in the south plume at recovery well RW03 near the southern property boundary.

4.0 Proposed Plume Delineation

This section discusses additional delineation to define the extent of the plume at 11111 Belcher Road, as proposed in the *Work Plan for Delineation of the Eastern Plume at the Building 100 Area*. Figure 4 shows the estimated locations of 31 additional delineation points. The exact number and location of delineation points will be determined later.

At each point, a direct-push rig with a Waterloo-type tip will be used to collect groundwater samples at eight depths in the surficial aquifer. The eight samples will be collected at 4 ft intervals, starting at approximately 8 ft bls, near the top of the saturated zone, to approximately 36 ft bls, at the base of the surficial aquifer. These samples will be analyzed for volatile organic compounds by TestAmerica-Denver using U.S. Environmental Protection Agency SW-846 Method 8260b. Samples for analysis of 1,4-dioxane were collected only at the 20, 24, and 28 ft bls intervals, and they were analyzed using Method 8260 SIM.

An additional phase of delineation could be required if the plume extends past the delineation points shown in Figure 4.

After the plume is defined on this property, several permanent continuous multichannel tubing (CMT) monitoring wells will be installed to provide long-term monitoring points. Each CMT well will have three channels that are screened at approximately 9–18, 20–29, and 31–40 ft bls intervals in the surficial aquifer.

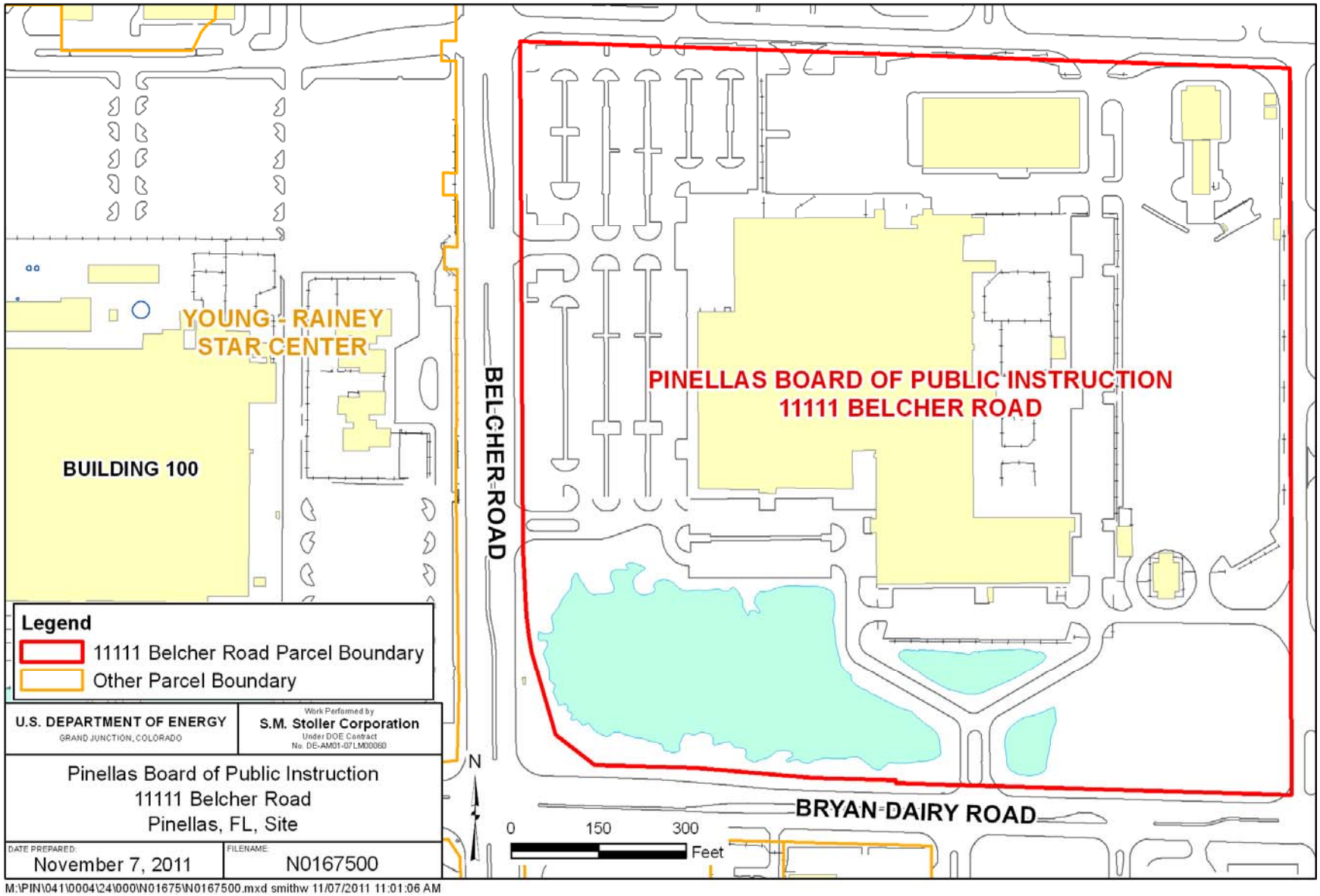


Figure 1. Property Location Map

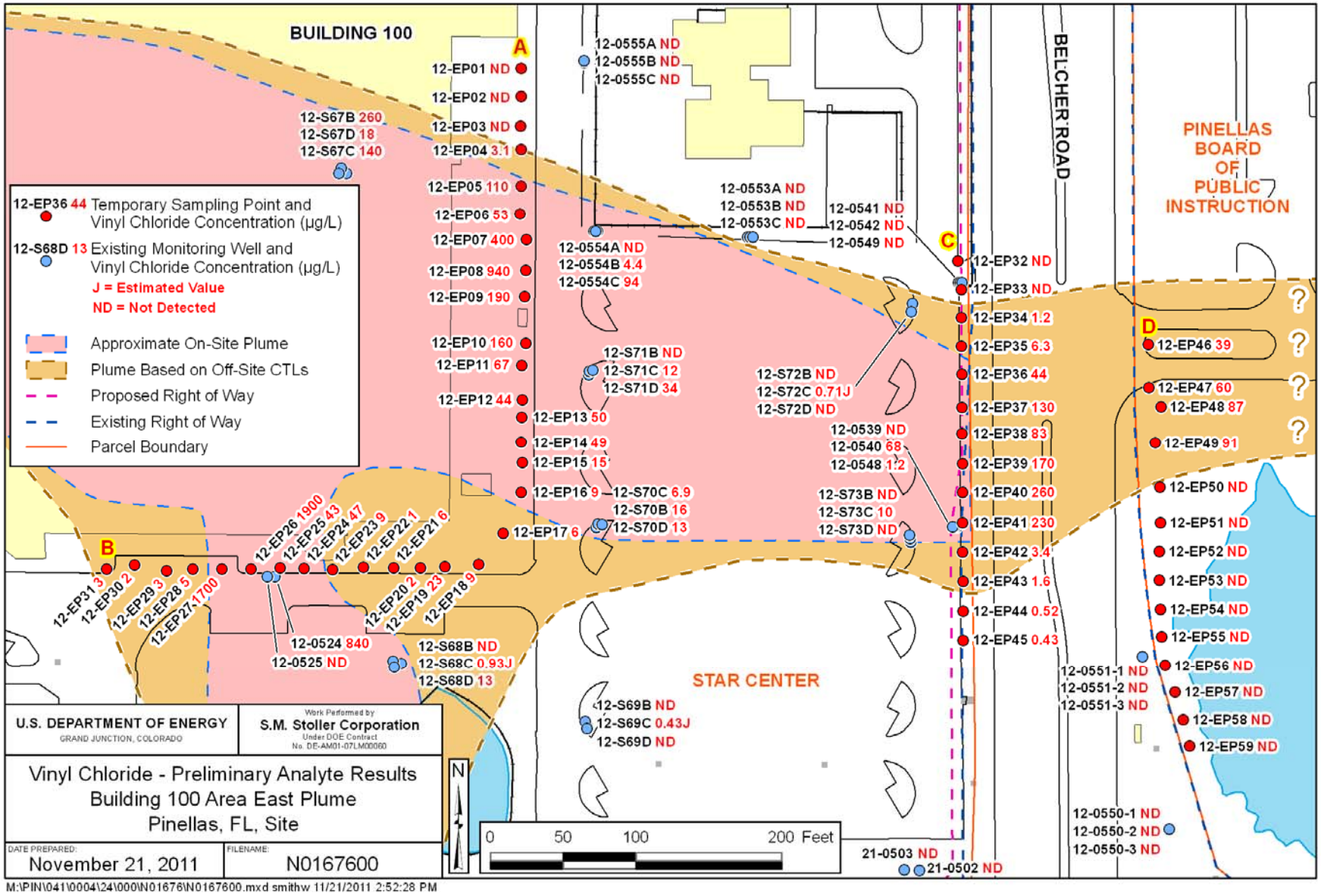


Figure 2. Vinyl Chloride Plume

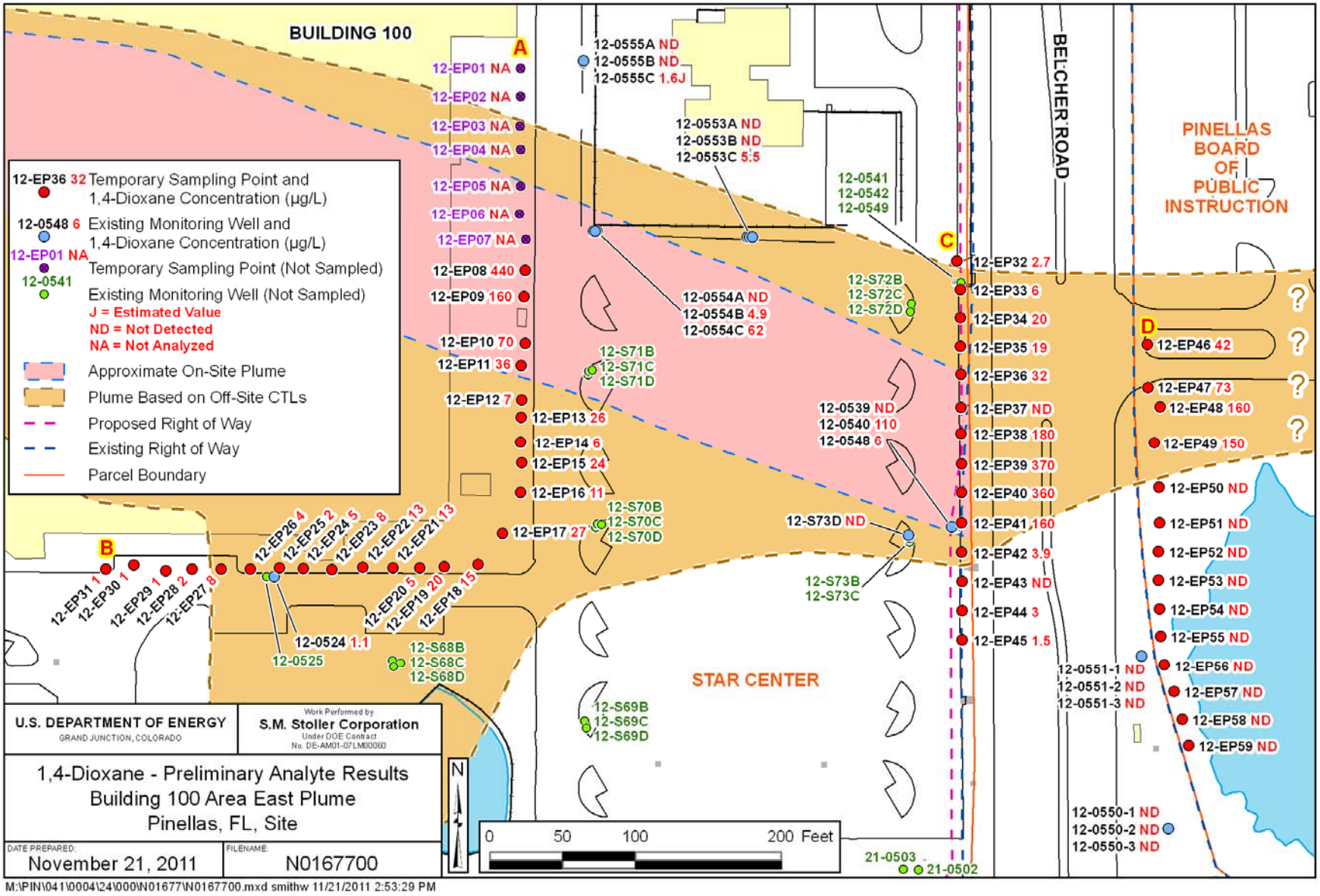


Figure 3. 1,4-Dioxane Plume

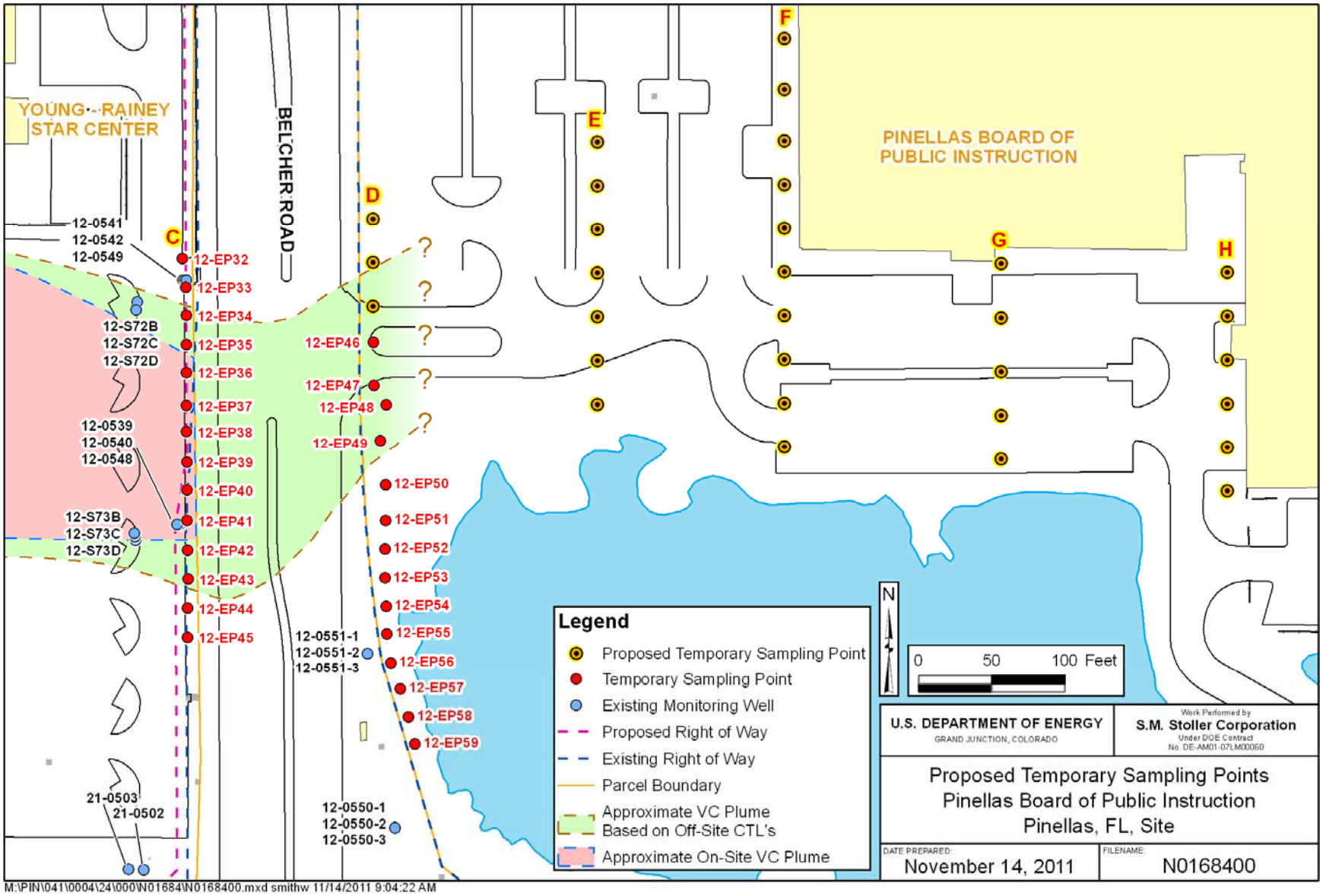


Figure 4. Proposed Temporary Sampling Points at 11111 Belcher Road

Table 1. Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP01	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	-	<0.1	0.74J	<0.23	<0.16	<0.22
	28	-	<0.1	2	<0.23	<0.16	0.25J
	32	-	<0.1	1.7	<0.23	<0.16	0.35J
	36	-	<0.1	0.68J	<0.23	<0.16	0.79J
EP02	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	-	<0.1	<0.15	<0.23	<0.16	<0.22
	28	-	<0.1	0.63J	<0.23	<0.16	<0.22
	32	-	<0.1	1.2	<0.23	<0.16	0.53J
	32 DUP	-	<0.1	0.97J	<0.23	<0.16	0.48J
	36	-	<0.1	0.41J	<0.23	<0.16	0.55J
EP03	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	-	<0.1	0.5J	<0.23	<0.16	<0.22
	24 DUP	-	<0.1	0.48J	<0.23	<0.16	<0.22
	28	-	<0.1	1.2	<0.23	<0.16	0.48J
	32	-	<0.1	2.8	0.42J	<0.16	3.3
	36	-	<0.1	0.49J	<0.23	<0.16	0.65J
EP04	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	-	<0.1	5.1	1.1	<0.16	2.4
	28	-	3.1	7.7	2	<0.16	5.8
	32	-	2.7	6.6	1.8	<0.16	11
EP05	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	-	26	5.5	<0.23	<0.16	36
	28	-	110	16	0.72J	<0.16	110
	28 DUP	-	100	15	0.61J	<0.16	120
	32	-	98	30	4.4	<0.16	80

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP06	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	0.9J
	16	-	<0.1	<0.15	<0.23	<0.16	0.75J
	20	-	7.8	1.7	<0.23	<0.16	4.2
	24	-	44	8.6	<0.23	<0.16	48
	28	-	53	20	0.83J	<0.16	64
	32	-	53	26	1.4	<0.16	55
	36	-	9.2	4.3	0.34J	<0.16	11
EP07	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	6.7	0.6J	<0.23	<0.16	1.3
	20	-	51	3.4	<0.23	<0.16	6.4
	24	-	360	110	2.1	<0.16	97
	28	-	400	59	0.85J	<0.16	85
	28 DUP	-	410	52	0.7J	<0.16	86
	32	-	9.2	6.6	<0.23	<0.16	4.1
EP08	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	8.2	2.3	<0.23	<0.16	0.51J
	20	150	150	22	<0.23	<0.16	11
	24	180	360	41	<0.23	<0.16	3.2
	28	440	940	100	1.1	<0.16	46
	36	-	13	7.8	<0.23	<0.16	1.5
EP09	8	-	0.58J	<0.15	<0.23	<0.16	<0.22
	12	-	29	2.6	<0.23	<0.16	0.82J
	16	-	160	12	<0.23	<0.16	4.2
	24	160	190	23	<0.23	<0.16	2.2
	24 DUP	150	190	20	<0.23	<0.16	2
	28	68	120	38	0.49J	<0.16	5.1
	32	-	57	28	<0.23	<0.16	3
	36	-	4.7	3.3	<0.23	<0.16	<0.22
EP10	8	-	6.9	2.4	<0.23	<0.16	<0.22
	12	-	110	38	0.53J	<0.16	5
	16	-	160	41	0.5J	<0.16	4.4
	24	18	60	7.2	0.26J	<0.16	5.9J
	24 DUP	-	56	8	<0.23	<0.16	7.3
	28	70	110	29	0.41J	<0.16	5.9
	32	-	46	25	0.46J	<0.16	2.1
	36	-	6.6	4.2	<0.23	<0.16	0.41J
EP11	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	28	13	<0.23	<0.16	1.9
	16	-	54	12	<0.23	<0.16	3.4
	20	29	45	19	<0.23	<0.16	3.7
	24	12J	25J	7.2	<0.23	<0.16	5.1
	24 DUP	6.4	<0.1	6.6	<0.23	<0.16	4.7
	28	36	67	19	0.38J	<0.16	7.3
	32	-	18	18	<0.23	<0.16	2.8
	36	-	5.6	4.8	<0.23	<0.16	0.63J

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP12	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	39	24	0.29J	<0.16	5.6
	16	-	44	18	0.26J	<0.16	<0.22
	20	3.6	41	27	0.27J	<0.16	6.6
	24	6.1	12	4.7	<0.23	<0.16	3.4
	28	6.6	2.2	1.8	<0.23	<0.16	5.9
	32	-	25	13	<0.23	<0.16	4.3
	36	-	1.8	0.93J	<0.23	<0.16	0.59J
EP13	8	-	<0.1	0.94J	<0.23	<0.16	0.31J
	12	-	47	29	0.6J	<0.16	7.1
	16	-	35	15	0.25J	<0.16	4.9
	20	26	50	17	0.24J	<0.16	7.1
	24	6.4	18	2.4	<0.23	<0.16	4.5
	24 DUP	-	16	2.5	<0.23	<0.16	4.6
	28	7	1.8	0.29J	<0.23	<0.16	6.8
	32	-	17	8.4	<0.23	<0.16	3.6
	36	-	2.9	0.62J	<0.23	<0.16	0.26J
EP14	8	-	<0.1	0.6J	<0.23	<0.16	<0.22
	12	-	48	34	0.61J	<0.16	7.1
	16	-	49	17	0.27J	<0.16	5.8
	24	6.4	40	5.9	<0.23	<0.16	7
	28	4.8	11	8	<0.23	<0.16	6.6
	32	-	22	8	<0.23	<0.16	2.8
	36	-	2.7	1.4	<0.23	<0.16	0.44J
EP15	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	6.5	7	<0.23	<0.16	2.5
	16	-	12	4.3	<0.23	<0.16	1.5
	24	24	15	2.5	<0.23	<0.16	4.1
	24 DUP	-	14	2.7	<0.23	<0.16	4.4
	28	9.7	13	4	<0.23	<0.16	7
	32	-	6.8	13	<0.23	<0.16	1.6
	36	-	1.6	1.5	<0.23	<0.16	0.34J
EP16	8	-	<0.1	0.7J	<0.23	<0.16	<0.22
	12	-	3.6	4.4	<0.23	<0.16	1.4
	16	-	2	0.72J	<0.23	<0.16	0.37J
	20	11	9.3	5.5	<0.23	<0.16	5.2
	24	5	6.3	0.99J	<0.23	<0.16	4.7
	28	4.3	9.4	16	0.27J	<0.16	7.8
	32	-	4.6	8.9	<0.23	<0.16	2.2
	36	-	0.52J	1.1	<0.23	<0.16	0.23J
EP17	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	1	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	16J	0.46J	<0.15	<0.23	<0.16	5.5
	24 DUP	27	0.46J	<0.15	<0.23	<0.16	6
	28	10	6.1	8.5	<0.23	<0.16	7.4
	32	-	2.4	12	<0.23	<0.16	0.91J
	36	-	<0.1	2.3	<0.23	<0.16	0.38J

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP18	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	2	0.96J	1.7	<0.23	<0.16	1.4
	28	15	8.9	8.6	<0.23	<0.16	6.2
	32	-	1	5.6	<0.23	<0.16	0.42J
	36	-	<0.1	1.9	<0.23	<0.16	<0.22
EP19	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.36J	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	20	1.3J	0.74J	<0.23	<0.16	2
	24 DUP	-	2.9	1	<0.23	<0.16	3
	28	7.1	23	9.7	<0.23	<0.16	11
	32	-	1.5	0.69J	<0.23	<0.16	0.71J
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP20	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	2.3	<0.1	<0.15	<0.23	<0.16	<0.22
	24	4.4	1.8	0.35J	<0.23	<0.16	3
	28	5.4	1.2	0.88J	<0.23	<0.16	1.6
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP21	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.26J	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	13J	3.9	<0.15	<0.23	<0.16	3.9
	28	11	5.8	0.16J	<0.23	<0.16	4.2
	32	-	1.3	<0.15	<0.23	<0.16	0.79J
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP22	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.29J	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	1.9J	<0.1	<0.15	<0.23	<0.16	<0.22
	24	13	<0.1	<0.15	<0.23	<0.16	0.3J
	24 DUP	17	<0.1	<0.15	<0.23	<0.16	0.27J
	28	9.4	0.64J	<0.15	<0.23	<0.16	0.89J
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP23	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.36J	<0.23	<0.16	<0.22
	16	-	<0.1	0.19J	<0.23	<0.16	<0.22
	24	3.1	3.2	<0.15	<0.23	<0.16	2.8
	28	8.4	2.4	2.2	<0.23	<0.16	4.7
	32	-	9.1	7.4	<0.23	<0.16	0.33J
	36	-	1.7	0.97J	<0.23	<0.16	<0.22

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP24	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.54J	<0.23	<0.16	<0.22
	16	-	0.37J	1.3	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	1.6	1.5	<0.23	<0.16	0.81J
	24 DUP	5.2	1.6	1.6	<0.23	<0.16	0.9J
	28	2.8J	27	46	<0.23	<0.16	<0.22
	32	-	47	39	<0.23	<0.16	<0.22
	36	-	8.3	6.8	<0.23	<0.16	<0.22
EP25	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.34J	<0.23	<0.16	<0.22
	16	-	0.5J	2	<0.23	<0.16	<0.22
	24	1.6J	15	13	<0.23	<0.16	2
	28	1.1J	43	35	<0.23	<0.16	<0.22
	32	-	39	25	<0.23	<0.16	<0.22
	36	-	7.2	8.8	<0.23	<0.16	<0.22
EP26	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.74J	<0.23	<0.16	<0.22
	16	-	0.94J	0.84J	<0.23	<0.16	<0.22
	24	4.2	760	5900	280	470	<4.4
	24 DUP	3.9	670	5900	240	430	<4.4
	28	1.1J	920	1800	88	140	<2.2
	32	-	1900	2000	91	63	<2.2
	36	-	170	350	23	34	<0.22
EP27	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	1.1	<0.23	<0.16	<0.22
	16	-	2.7	1.3	<0.23	<0.16	0.62J
	24	1.3J	130	680	22	21	0.88J
	28	8.5	1700	11000	520	1200	<8.8
	32	-	910	820	87	320	<0.44
	36	-	60	120	17	82	<0.22
EP28	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	0.69J	<0.23	<0.16	<0.22
	16	-	1.1	1.2	<0.23	<0.16	0.56J
	20	0.68J	3.3	<0.15	<0.23	<0.16	0.57J
	24	1.7J	1.1	<0.15	<0.23	<0.16	0.7J
	24 DUP	-	1.2	<0.15	<0.23	<0.16	0.72J
	28	1.6J	1.7	0.38J	<0.23	<0.16	<0.22
	32	-	5.1	<0.15	<0.23	<0.16	<0.22
EP29	8	-	0.6J	0.57J	<0.23	<0.16	<0.22
	12	-	<0.1	1	<0.23	<0.16	<0.22
	16	-	0.39J	2.4	<0.23	<0.16	<0.22
	20	<0.64	0.38J	2.1	<0.23	<0.16	<0.22
	24	<0.64	<0.1	0.72J	<0.23	<0.16	<0.22
	28	1.4J	3.4	<0.15	<0.23	<0.16	0.5J
	32	-	0.34J	<0.15	<0.23	<0.16	<0.22

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP30	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	0.9J	<0.23	<0.16	<0.22
	20	0.84J	<0.1	1.1	<0.23	<0.16	<0.22
	24	<0.64	<0.1	0.6J	<0.23	<0.16	<0.22
	28	<0.64	0.79J	0.41J	<0.23	<0.16	0.37J
	28 DUP	-	0.72J	0.38J	<0.23	<0.16	0.35J
	32	-	2.2	<0.15	<0.23	<0.16	0.42J
EP31	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	0.41J	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	0.83J	<0.1	0.51J	<0.23	<0.16	<0.22
	28	0.71J	1.4	0.34J	<0.23	<0.16	0.73J
	32	-	3.1	<0.15	<0.23	<0.16	0.6J
	36	-	1.2	<0.15	<0.23	<0.16	<0.22
EP32	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	1.8J	<0.1	<0.15	<0.23	<0.16	<0.22
	24	2.7	<0.1	0.32J	<0.23	<0.16	0.37J
	28	<0.64	<0.1	0.18J	<0.23	<0.16	0.25J
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP33	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	0.25J
	20	<0.64	<0.1	0.37J	<0.23	<0.16	0.31J
	24	6	<0.1	0.68J	<0.23	<0.16	1
EP34	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	2.7	<0.1	0.82J	0.29J	<0.16	0.85J
	24	13	0.57J	2.7	0.84J	<0.16	3.2
	24 DUP	-	0.98J	3.2	0.86J	<0.16	4.2
	28	20	1.2	1.8	0.61J	<0.16	3.4
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP35	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	24	18	6.3	4.8	1.1	<0.16	8.8
	28	19	3.8	2.1	0.53J	<0.16	4.1
	32	-	<0.1	0.36J	<0.23	<0.16	0.58J
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP36	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	12	1.3	<0.23	<0.16	5.4
	24	32	38	7.9	0.73J	<0.16	27
	24 DUP	-	23	8.4	0.76J	<0.16	28
	28	<0.64	44	8	1	<0.16	22
	32	-	1.6	0.38J	<0.23	<0.16	0.85J
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP37	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	18	4.5	0.41J	<0.16	13
	24	<0.64	130	34	4.1	<0.64	110
	28	<0.64	50	12	1.2	<0.16	30
	32	-	3	0.78J	<0.23	<0.16	1.8
EP38	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	43	47	11	0.79J	<0.16	25
	24	180	83	27	1.8	<0.16	75
	24 DUP	-	91	25	1.4	<0.16	66
	28	88	27	20	1.2	<0.16	33
	32	-	2.8	2	0.31J	<0.16	3.3
	36	-	1.1	0.77J	<0.23	<0.16	1.3
EP39	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	0.46J	<0.15	<0.23	<0.16	<0.22
	20	31	32	5.2	0.29J	<0.16	7.4
	24	370	170	38	1.2	<0.16	70
	28	77	21	11	0.35J	<0.16	10
	32	-	3.2	1.6	<0.23	<0.16	1.8
	36	-	1.1	0.53J	<0.23	<0.16	0.62J
EP40	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	140	50	16	0.32J	<0.16	21
	24	360	260	53	<2.3	<1.6	38
	24 DUP	-	250	58	1.2	<0.16	48
	28	45	16	5.7	<0.23	<0.16	2.9
	32	-	3.1	2.4	<0.23	<0.16	0.64J
	36	-	4.2	1.3	<0.23	<0.16	0.69J
EP41	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	6.3	15	0.24J	<0.23	<0.16	0.66J
	24	160	230	42	1.1	<0.16	24
	28	12	32	0.89J	<0.23	<0.16	2

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP42	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	3.9	2.9	<0.15	<0.23	<0.16	0.37J
	28	2.1	3.4	0.72J	<0.23	<0.16	<0.22
	32	-	0.21J	0.2J	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP43	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	0.85J	0.87J	<0.23	<0.16	<0.22
	24	<0.64	1.6	2.4	<0.23	<0.16	<0.22
	28	<0.64	0.17J	0.62J	<0.23	<0.16	<0.22
	28 DUP	-	<0.1	0.47J	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP44	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	2.6	0.44J	1.4	<0.23	<0.16	<0.22
	24	3	0.52J	2.8	<0.23	<0.16	0.23J
	28	<0.64	<0.1	0.28J	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP45	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	0.29J	<0.23	<0.16	<0.22
	24	1.5J	0.43J	2.1	<0.23	<0.16	<0.22
	24 DUP	-	0.5J	2.3	<0.23	<0.16	<0.22
	28	<0.64	<0.1	0.58J	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP46	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	42	39	14	3.5	<0.16	32
	24	1.5J	<0.2	0.39J	<0.46	<0.32	0.76J
	28	<0.64	<0.2	<0.3	<0.46	<0.32	<0.44
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP47	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	45	7.9	1.3	<0.16	41
	20	73J	60J	23J	3.6J	<0.16	57J
	20 DUP	-	47J	17J	3	<0.16	50
	24	26	24	6.9	1.1	<0.16	18
	28	<0.64	1.5	0.44J	<0.23	<0.16	1.1
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP48	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	0.61J	<0.15	<0.23	<0.16	0.68J
	20	160	87	26	3.4	<0.16	76
	24	34	21	7.2	1.1	<0.16	16
	28	0.64J	1.4	0.64J	<0.23	<0.16	1.2
	32	-	0.52J	0.21J	<0.23	<0.16	0.45J
EP49	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	35	7.2	0.9J	<0.16	32
	20	150	91	36	4.9	<0.16	87
	24	11	9	3.3	0.53J	<0.16	7
	24 DUP	12	8.4	3.3	0.49J	<0.16	6.5
	28	<0.64	0.59J	0.25J	<0.23	<0.16	0.49J
	32	-	0.4J	0.17J	<0.23	<0.16	0.35J
	36	-	0.3J	<0.15	<0.23	<0.16	0.23J
EP50	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP51	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24 DUP	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.4	<0.6	<0.92	<0.64	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP52	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP53	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	0.92J	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28 DUP	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
	36	-	<0.1	<0.15	<0.23	<0.16	<0.22

Table 1 (continued). Results for Analytes that Exceeded CTLs
Concentrations in µg/L

Location	Depth (ft bls)	1,4-Dioxane	Vinyl chloride	*cis*-1,2-Dichloroethene	1,1-Dichloroethene	Trichloroethene	1,1-Dichloroethane
On-Site CTL:		**32**	**10**	**700**	**70**	**30**	**700**
Off-site CTL:		**3.2**	**1**	**70**	**7**	**3**	**70**
EP54	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	0.33J	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP55	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP56	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24 DUP	-	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP57	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24 DUP	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP58	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22
EP59	8	-	<0.1	<0.15	<0.23	<0.16	<0.22
	12	-	<0.1	<0.15	<0.23	<0.16	<0.22
	16	-	<0.1	<0.15	<0.23	<0.16	<0.22
	20	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	24	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	28	<0.64	<0.1	<0.15	<0.23	<0.16	<0.22
	32	-	<0.1	<0.15	<0.23	<0.16	<0.22

- = not detected
DUP = duplicate sample

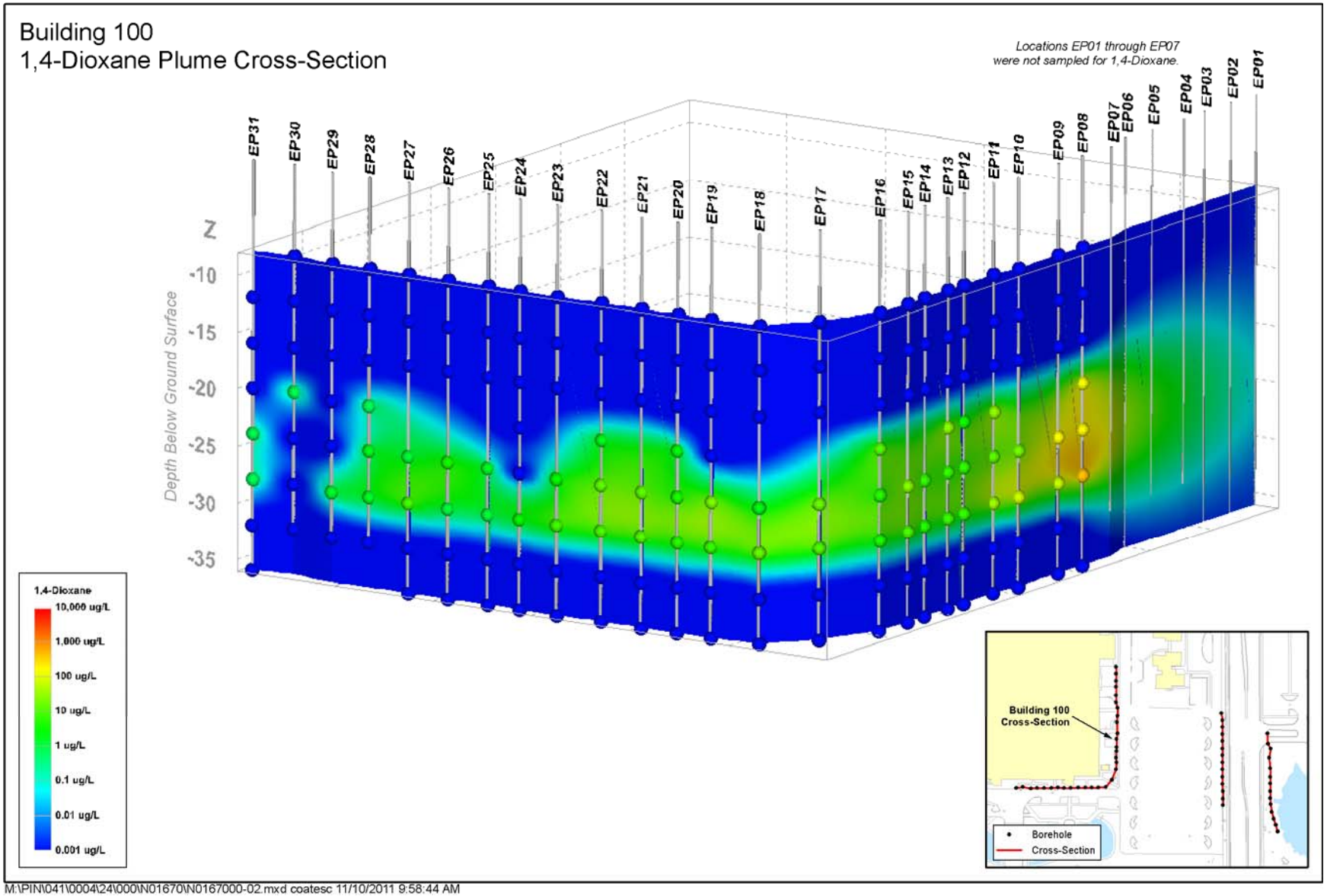
Table 2. Summary of Data for Other Detected Analytes

Detected Analyte	Maximum Detected Concentration (µg/L)	Location	Depth (ft bls)
1,2,4-Trimethylbenzene	0.39J	EP48	20
2,2-Dichloropropane	0.19J	EP43	28
Acetone	31	EP11	36
Benzene	0.88J	EP25	28
Carbon Disulfide	1.5J	EP02	32
Chloroethane	0.52J	EP13	24
Chloromethane	0.55J	EP14	16
Ethylbenzene	1.1	EP12	36
Methylene chloride	1.7J	EP27	24
Naphthalene	0.69J	EP46	12
Toluene	2.3	EP17	8
Total Xylenes	0.48J	EP48	20
trans-1,2-Dichloroethene	69	EP27	28

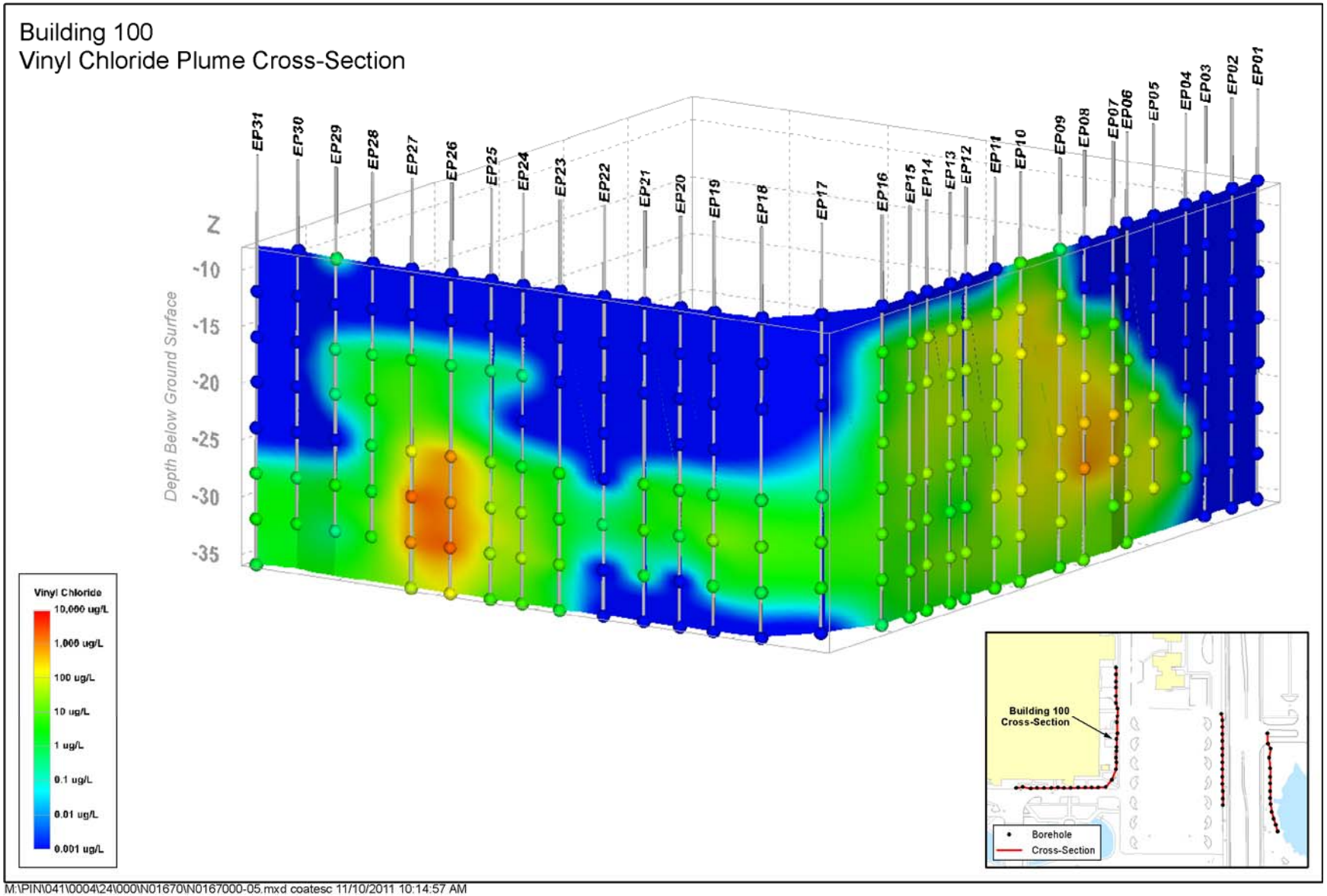
Appendix A

Contaminant Plume Cross-Sections

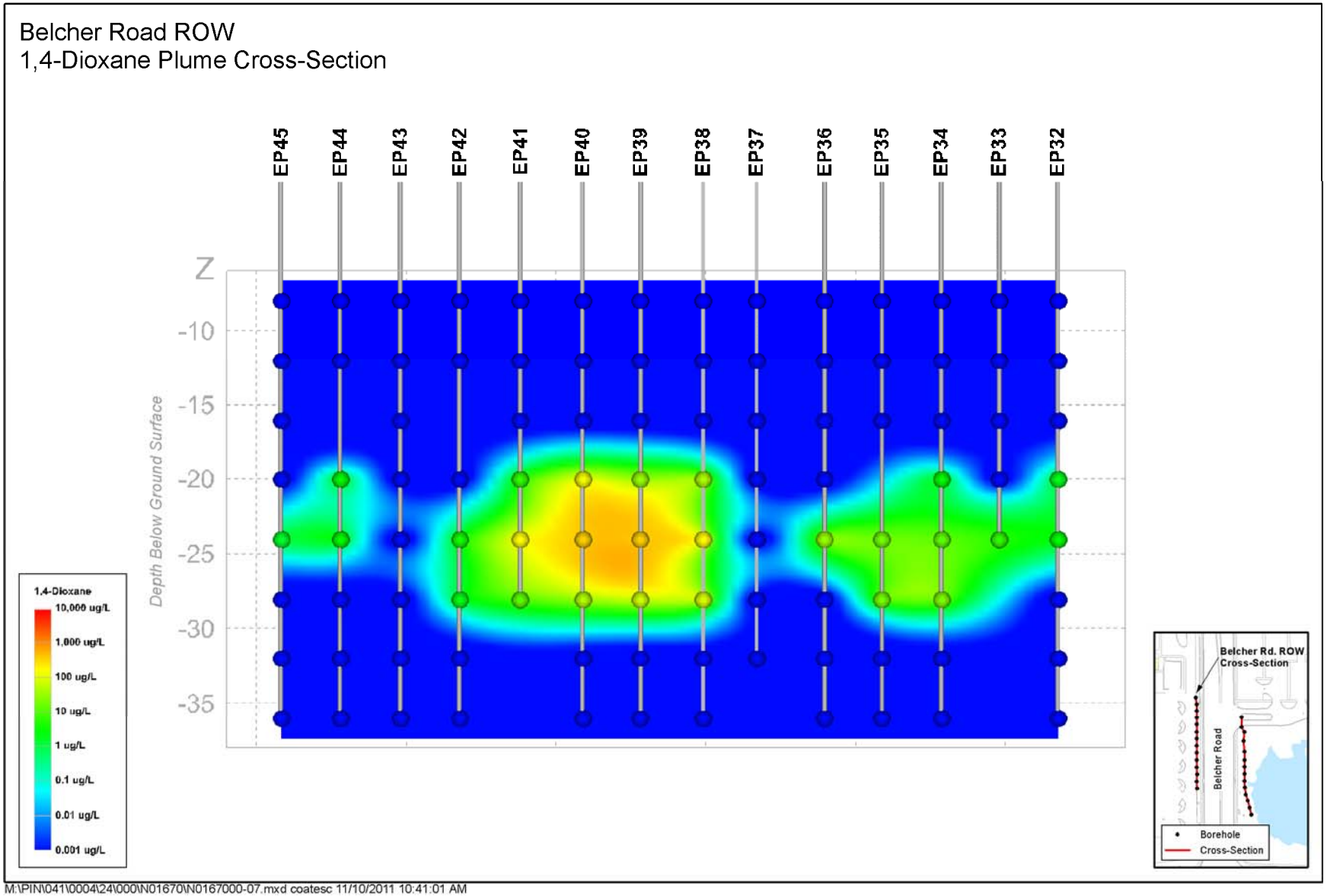
This page intentionally left blank

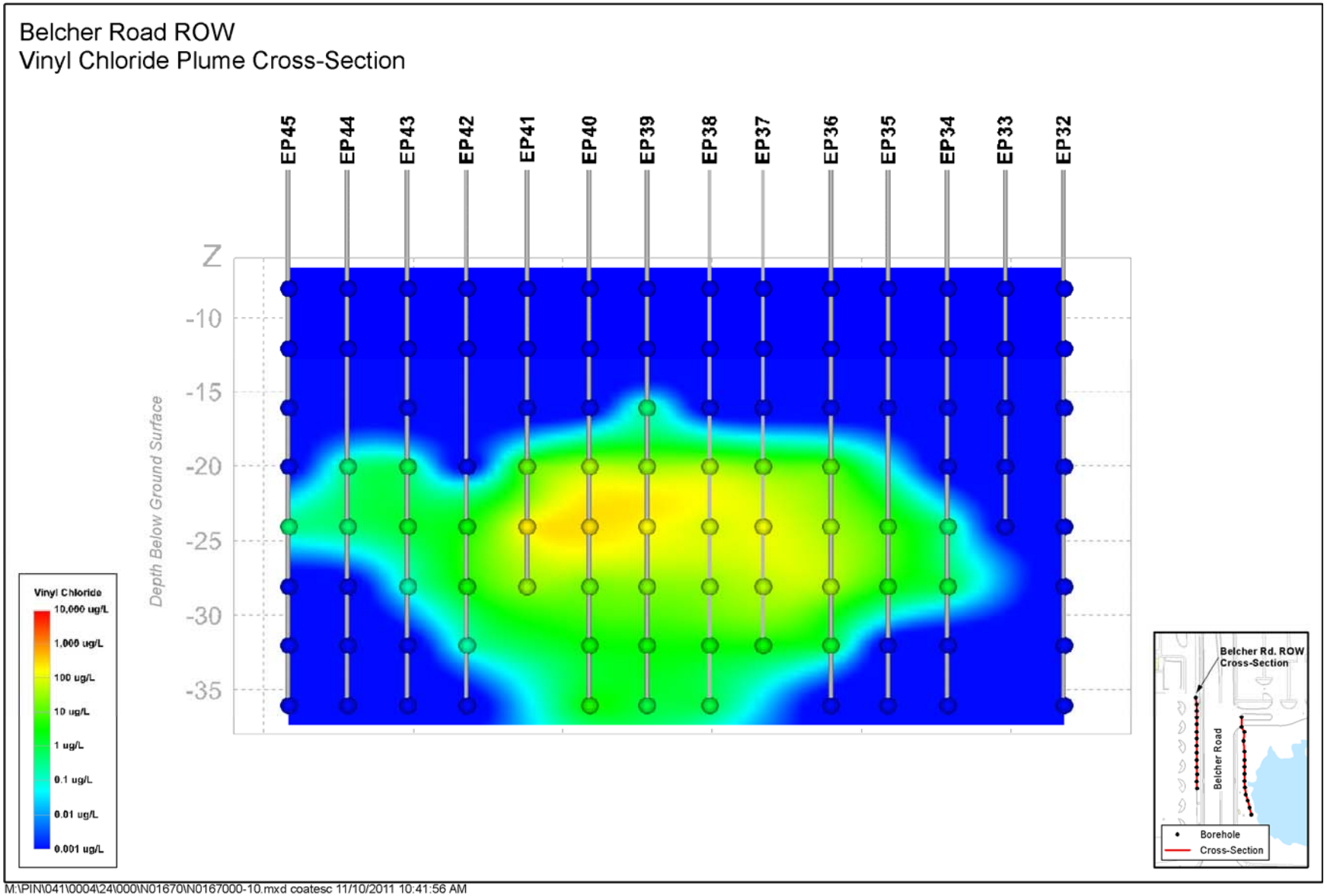


M:\PIN\041\0004\24\000\N01670\N0167000-02.mxd coatesc 11/10/2011 9:58:44 AM

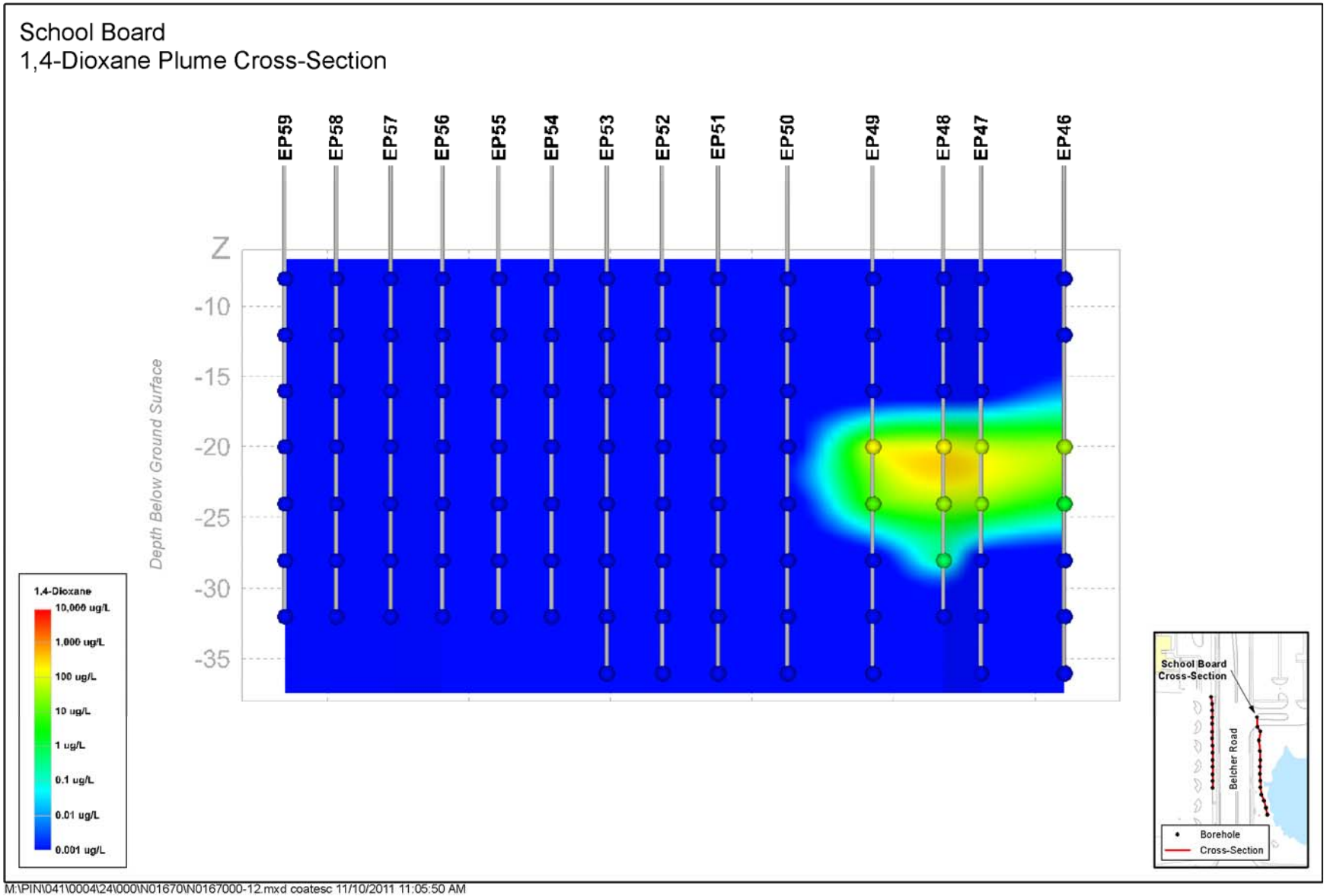


M:\PIN\041\0004\24\000\N01670\N0167000-05.mxd coatesc 11/10/2011 10:14:57 AM

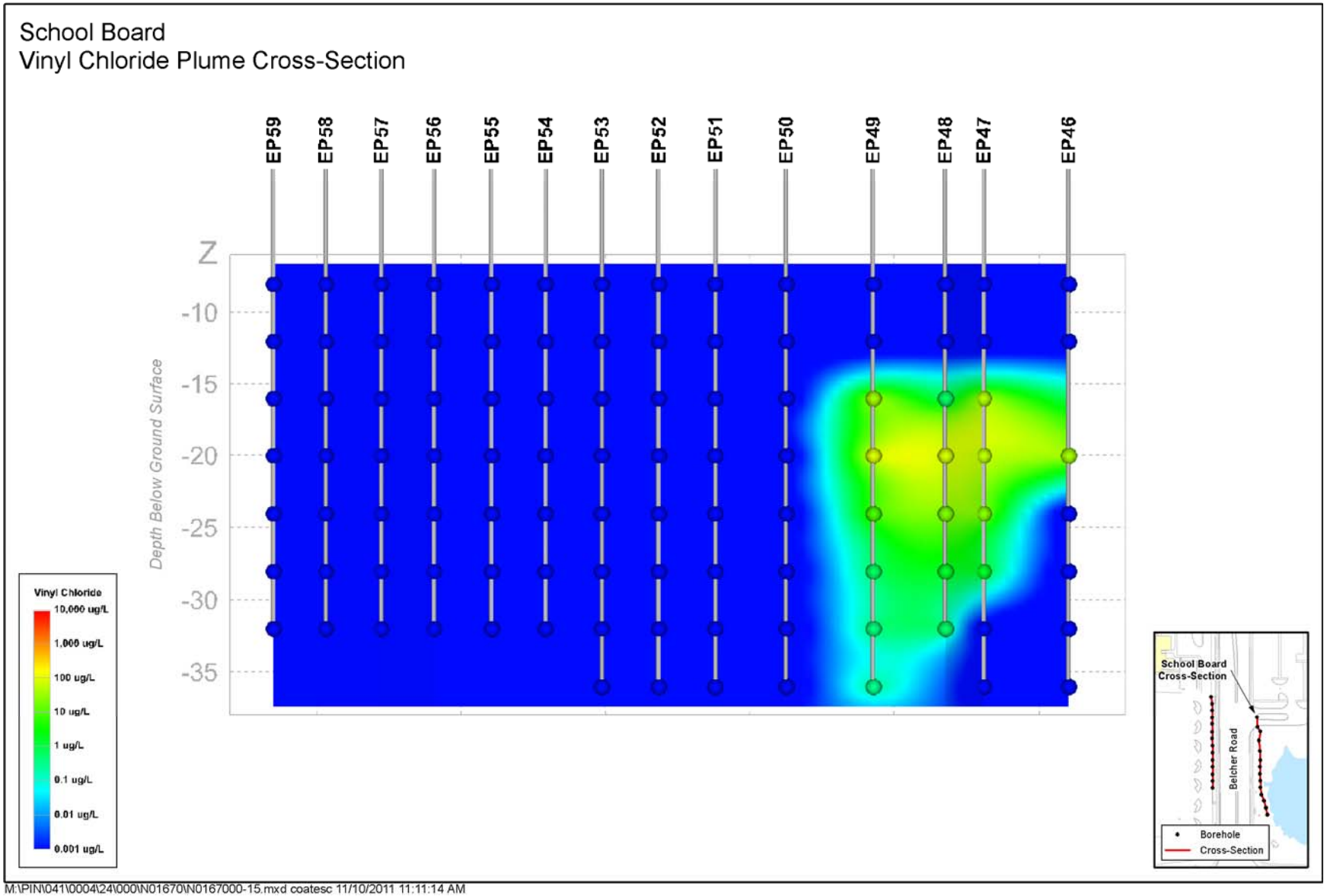

Belcher Road ROW
1,4-Dioxane Plume Cross-Section
EP45
EP44
EP43
EP42
EP41
EP40
EP39
EP38
EP37
EP36
EP35
EP34
EP33
EP32
Z
-10
-15
-20
-25
-30
-35
Depth Below Ground Surface
1,4-Dioxane
10,000 ug/L
1,000 ug/L
100 ug/L
10 ug/L
1 ug/L
0.1 ug/L
0.01 ug/L
0.001 ug/L
Belcher Rd. ROW Cross-Section
Belcher Road
Borehole
Cross-Section
M:\PIN\041\0004\24\000\N01670\N0167000-07.mxd coatesc 11/10/2011 10:41:01 AM



M:\PIN\041\0004\24\000\N01670\N0167000-10.mxd coatesc 11/10/2011 10:41:56 AM



M:\PIN\041\0004\24\000\N01670\N0167000-12.mxd coatesc 11/10/2011 11:05:50 AM



M:\PIN\041\0004\24\000\N01670\N0167000-15.mxd coatesc 11/10/2011 11:11:14 AM