

Annual Summary Report: 2006 Monitored Natural Attenuation

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Purpose

This technical memorandum summarizes analytical data for the monitored natural attenuation (MNA) groundwater sampling events conducted in May and October 2006 at The Hoover Company property located at 101 East Maple Street, North Canton, Ohio (Figure 1).

The two main lines of evidence used to evaluate the data collected are:

- The demonstration of meaningful trends of a decrease in the contaminant mass over time at appropriate monitoring points.
- The demonstration of active natural attenuation at the site based on geochemical data.

Evaluation of the two main lines of evidence is based on guidance provided in *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* (USEPA, 1988).

The MNA network of monitoring wells (MW) and piezometer is shown in Figure 1, and includes:

- MW-8 (Upgradient)
- MW-16S (Cross-gradient)
- PZ-11 (Cross-gradient)
- MW-18S (Plume Center-On-site)
- MW-28S (Plume Center-On-site)
- MW-29S (Plume Center-Off-site)
- MW-25S (Downgradient)
- MW-26S (Downgradient)
- MW-27S (Downgradient)
- MW-31S (Cross-gradient with PZ-11)

Groundwater Flow and LNAPL Measurements

Static groundwater elevations and thicknesses of light non-aqueous phase liquids (LNAPL) measured in May and October 2006 are presented in Table 1. Depth to groundwater ranged from 2.65 feet (MW-8) to 13.22 below top of casing (TOC) (MW-31S) in May, and from 3.61 feet (MW-8) to 13.85 feet (MW-31S) below TOC in October. Light non-aqueous phase liquid (LNAPL) was detected in MW-28 at 0.91 feet thick (May 2006) and 2.01 feet thick (October 2006).

Figures 2 and 3 present groundwater elevation contours and flow direction based on data collected during the May and October 2006 sampling events, respectively. The groundwater surface elevation for MW-28 was corrected for the presence of LNAPL prior to completing the groundwater flow map. Based on groundwater elevation data collected, the groundwater flow direction was determined to be to the west, which is consistent with previous data.

Target Analyte List

The target analyte list (TAL) for groundwater samples include the following chlorinated volatile organic compounds (CVOCs):

- 1,1,1-Trichloroethane (1,1,1-TCA)
- 1,1,2-Trichloroethane (1,1,2-TCA)
- Tetrachloroethene (PCE)
- Trichlorethene (TCE)
- Cis-1,2-dichloroethene (cis-1,2-DCE)
- Trans-1,2-dichloroethene (trans-1,2-DCE)
- 1,1-Dichloroethane (1,1-DCA)
- 1,2-Dichloroethane (1,2-DCA)
- 1,1-Dichloroethene (1,1-DCE)
- Carbon tetrachloride
- Methylene chloride
- Vinyl chloride (VC)

Analytical Results

Figure 4 illustrates the distribution of CVOC concentrations within the MNA monitoring well network.

Concentration trends for compounds detected above the laboratory reporting limit (LRL) since 2001 within the core of the plume (MW-18S and MW-28S) and the downgradient perimeter of the plume (MW-29S) are shown in Figures 5 through 7. The analytical data trends indicate that:

- CVOC concentration trends within the core of the plume remain relatively stable. Overall concentrations of degradation compounds (cis-1,2-DCE and VC) in monitoring well MW-18S are higher than the parent compounds (PCE and/or TCE). Degradation of CVOC in MW-28S is indicated by the relatively lower concentrations of PCE, and higher concentrations of the daughter products (TCE, cis-1,2-DCE, and VC).
- Degradation of PCE and TCE near the downgradient edge of the plume is reflected in samples collected from MW-29S. CVOC concentration trends show that both PCE and TCE concentrations (reported below the LRL) have been degraded to mostly cis-1,2-DCE. VC concentrations were reported below the LRL in the last two sampling events (May and October 2006).
- VC, detected within the core of the plume, is also indicative of the degradation trend of the PCE and/or TCE. VC is anticipated to degrade aerobically as subsurface conditions favor aerobic degradation processes.

- Analytical data for samples collected from downgradient monitoring wells (MW-26S and MW-27S) indicate that concentrations of CVOCs are below the laboratory method detection limit. Based on this data, it appears that the plume is stable.
- Sampling locations (PZ-11 and MW-31S) outside the southern perimeter of the plume indicate that concentrations of CVOCs are below laboratory method detection limits and that the plume does not appear to be expanding in this direction.

Analytical results for samples collected during the 2006 monitored natural attenuation are summarized in Table 2

Natural Attenuation Parameter Analysis

Natural attenuation parameters measured during sampling or submitted for laboratory analysis include:

- Dissolved oxygen (DO)
- Nitrate and nitrite
- Dissolved and total manganese, iron, and arsenic
- Sulfate and sulfide
- Methane
- Carbon dioxide (CO₂)
- Hardness
- Alkalinity
- Total organic carbon (TOC)
- Biological oxygen demand (BOD)
- Chemical oxygen demand (COD)
- Chloride
- Total Phosphorus
- Total Dissolved Solids (TDS)
- Total Suspended Solids
- Temperature
- Turbidity
- pH
- Oxidation-Reduction Potential (ORP)

The predominance of anaerobic subsurface conditions within the core of the plume is supported by the geochemical data collected during the May and October 2006 sampling events. Concentration trends of anaerobic degradation indicator parameters are presented in Figures 8 through 10. Table 3 presents a summary of MNA parameters at each monitoring well within the MNA network.

Dissolved oxygen concentrations were significantly lower within the core of the plume, which is indicative of an anaerobic subsurface environment (See Figures 4 and 8). Negative oxidation-reduction potential readings predominate within the core of the plume as opposed to the downgradient and lateral directions (see Figure 4 and 9). Methane was only detected within the center of the plume (see Figures 4 and 10). Concentrations of methane detected within the core of the plume are indicative of the methanogenic process associated with anaerobic environments.

In an anaerobic environment, the main attenuation mechanism for chlorinated solvents is biological reductive dechlorination. The general degradation pathway is PCE to TCE to cis-1,2-DCE to VC under anaerobic conditions. Degradation of CVOCs is evidenced in MW-28S by the elevated concentrations of cis-1,2-DCE and VC as a result of the dechlorination of PCE and TCE. Near the downgradient edge of the plume (MS-29S), the continued degradation trend of CVOCs is evidenced by the presence of cis-1,2-DCE, resulting from the continued dechlorination of PCE and TCE.

Downgradient of and laterally away from the core of the plume, subsurface conditions are more aerobic. Aerobic conditions are indicated by general lack of methane, positive oxidation-reduction potential readings, and an overall increasing trend in dissolved oxygen concentrations in groundwater (see Figure 4). Concentrations of CVOCs in samples collected downgradient and outside the plume (MW-25S, MW-26S and MW-27S) were reported below the laboratory reporting limit. Vinyl chloride, resulting from the degradation of PCE and/or TCE, has been degraded as a result of aerobic processes.

Data Summary and Conclusions

Analytical data indicate that:

- There is strong evidence that anaerobic degradation processes exist within the core of the plume, changing to aerobic conditions downgradient and laterally away from it.
- Analytical data indicate that PCE and/or TCE are being degraded within the core of the plume, evidenced by a decrease in concentrations and the increasing trend in concentrations of daughter products.
- Cis-1,2-DCE and vinyl chloride are being degraded downgradient and laterally away from the core of the plume.
- The plume remains stable and confined within the Ordinance area.

References

U.S. Environmental Protection Agency (USEPA). 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water. EPA/600/R-98/128. September.

Tables

TABLE 1

Static Water Levels and LNAPL Measurements - 2006 MNA Evaluation
 The Hoover Company

Well Identifier	Measuring Point Elevation ¹ (ft)	May 2006 Groundwater/LNAPL Measurements				October 2006 Groundwater/LNAPL Measurements				Well Surface Construction
		Measured Depth to Water (ft bmp) Prior to Purging	Measured Groundwater Elevation (ft)	LNAPL Thickness (ft)	Corrected Groundwater Elevation ² (ft)	Measured Depth to Water (ft bmp) Prior to Purging ²	Measured Groundwater Elevation (ft)	LNAPL Thickness (ft)	Corrected Groundwater Elevation ² (ft)	
MW-8	1150.13	2.38	1147.75	--	--	3.61	1146.52	--	--	Flush Mount
MW-16S	1145.08	4.93	1140.15	--	--	5.31	1139.77	--	--	Flush Mount
MW-18S	1140.96	6.13	1134.83	--	--	6.23	1134.73	--	--	Flush Mount
MW-25S	1124.67	NS	NS	--	--	6.51	1118.16	--	--	Flush Mount
MW-26S	1125.15	7.68	1117.47	--	--	8.56	1116.59	--	--	Flush Mount
MW-27S	1120.89	7.63	1113.26	--	--	7.72	1113.17	--	--	Flush Mount
MW-28S	1144.21	5.94	1138.27	0.91	1139.00	7.11	1137.10	2.01	1138.71	Flush Mount
MW-29S	1127.78	5.93	1121.85	--	--	6.33	1121.45	--	--	Flush Mount
MW-31S	1154.42	13.50	1140.92	--	--	13.85	1140.57	--	--	Flush Mount
PZ-11	1147.52	10.02	1137.50	--	--	10.40	1137.12	--	--	Flush Mount

Notes:

1. Measuring Point Elevations are based on Hammontree and Associates' (MW-8) and Gary Philips and Associates' (remainder) survey data and are relative to the National Geodetic Vertical Datum of 1988.
2. Correction is based on an average LNAPL specific gravity of 0.8: $E = G + XT$, where
 E = corrected groundwater elevation (ft)
 G = measured groundwater elevation (ft)
 X = specific gravity of the LNAPL (average of 0.8)
 T = thickness of the LNAPL layer (ft)

NS = Not Sampled; well was not accessible

LNAPL = light non-aqueous phase liquid

ft = feet

bmp = below measuring point (top of riser)

TABLE 2

Summary of Chlorinated Volatile Organic Compound Detections
The Hoover Company

	PCE (ug/L)	TCE (ug/L)	Cis-1,2-DCE (ug/L)	VC (ug/L)
Commercial MCS (ug/L)	18,240	9,700	49,200	920
MW-08				
4/26/2005	1 U	1 U	1 U	0.5 U
11/7/2005	1 U	1 U	1 U	0.5 U
5/30/2006	1 U	1 U	0.5 U	1 U
10/31/2006	1 U	1 U	0.5 U	1 U
MW-16S				
4/26/2005	1 U	1 U	1 U	1 U
11/7/2005	1 U	1 U	1 U	1 U
5/26/2006	1 U	1 U	0.5 U	1 U
10/25/2006	1 U	1 U	0.5 U	1 U
MW-18S				
3/27/2001	500 U	500 U	17,000	4,500
7/13/2001	1,400 U	1,400 U	23,000	5,000
4/26/2002	500 U	500 U	16,000	3,400
10/11/2002	500 U	500 U	15,000	3,100
3/27/2003	500 U	500 U	16,000	3,600
10/9/2003	500 U	500 U	15,000	3,000
5/7/2004	500 U	500 U	17,000	3,400
10/27/2004	500 U	500 U	15,000	2,600
4/25/2005	500 U	500 U	16,000	3,100
11/8/2005	500 U	500 U	12,000	2,200
5/31/2006	500 U	500 U	14,000	2,500
10/24/2006	500 U	500 U	15,000	2,400
MW-28S				
3/27/2001	3,300 U	59,000	91,000	7,000
7/13/2001	NS	NS	NS	NS
4/26/2002	2,500 U	60,000	35,000	4,000
10/11/2002	2,500 U	65,000	47,000	5,300
3/27/2003	500 U	48,000	36,000	4,600
10/9/2003	500 U	51,000	45,000	4,500
5/7/2004	1,000 U	31,000	23,000	2,200
10/29/2004	2,500 U	69,000	47,000	5,100
4/26/2005	1,700 U	39,000	28,000	2,700
11/8/2005	1,400 U	47,000	33,000	3,700
5/26/2006	1,200 U	25,000	18,000	1,500
10/25/2006	1,200 U	38,000	29,000	2,500
MW-31S				
10/28/2004	4.5	1 U	0.89	1 U
4/26/2005	1 U	1 U	0.5 U	1 U
11/7/2005	5.8	1.3	0.57	1 U
5/26/2006	1 U	1 U	0.5 U	1 U
10/24/2006	1 U	1 U	0.5 U	1 U

TABLE 2

Summary of Chlorinated Volatile Organic Compound Detections
 The Hoover Company

	PCE (ug/L)	TCE (ug/L)	Cis-1,2-DCE (ug/L)	VC (ug/L)
Commercial MCS (ug/L)	18,240	9,700	49,200	920
Residential MCS (ug/L)	3,920	1,520	6,020	98
MW-25S				
5/6/2004	1 U	1 U	1.2	1 U
4/25/2005	1 U	1 U	0.5 U	1 U
11/3/2005	1 U	1 U	0.5 U	1 U
5/31/2006	1 U	1 U	0.5 U	1 U
10/23/2006	1 U	1 U	0.5 U	1 U
MW-26S				
4/25/2005	1 U	1 U	0.5 U	1 U
11/3/2005	1 U	1 U	0.5 U	1 U
5/26/2006	1 U	1 U	0.5 U	1 U
10/23/2006	1 U	1 U	0.5 U	1 U
MW-27S				
4/25/2005	1 U	1 U	0.5 U	1 U
11/3/2005	1 U	1 U	0.5 U	1 U
5/22/2006	1 U	1 U	0.5 U	1 U
10/23/2006	1 U	1 U	0.5 U	1 U
MW-29S				
3/27/2001	17 U	17 U	350	33 U
7/13/2001	2.5 U	2.5 U	65	5 U
4/26/2002	50 U	50 U	680	50 U
10/11/2002	15 U	15 U	300	15 U
3/27/2003	1 U	1	1.1	1 U
10/9/2003	1.1	1.1	1.4	1 U
5/6/2004	20 U	20 U	670	20 U
10/27/2004	5 U	5 U	190	5 U
4/25/2005	8 U	8 U	200	8
11/3/2005	17 U	17 U	510	17
5/22/2006	29 U	29 U	770	29 U
10/23/2006	8.3 U	8.3 U	350	8.3 U

TABLE 2

Summary of Chlorinated Volatile Organic Compound Detections
 The Hoover Company

	PCE (ug/L)	TCE (ug/L)	Cis-1,2-DCE (ug/L)	VC (ug/L)
Commercial MCS (ug/L)	18,240	9,700	49,200	920
PZ-11				
3/27/2001	1 U	1.5	2.1	2 U
7/13/2001	NS	NS	NS	NS
4/26/2002	1 U	1 U	1.2	1 U
10/11/2002	1 U	1.2	1.9	1 U
3/27/2003	1.1	1 U	1 U	1 U
10/9/2003	1.4	1.1	1 U	1 U
5/7/2004	1 U	1 U	0.89	1 U
11/23/2004	1 U	1.2	1.4	1 U
4/26/2005	1 U	1.1	1.1	1 U
11/7/2005	1 U	1.1	1.1	1 U
5/26/2006	1 U	1.2	1	1 U
10/24/2006	1 U	1.1	1	1

Notes:

Bold concentrations are above the media cleanup standard (MCS)

"PCE" = Tetrachloroethene

"TCE" = Trichloroethene

"Cis-1,2-DCE" = Cis-1,2-Dichloroethene

"VC" = Vinyl Chloride

"U" means the concentration was below the reporting limit.

NS = not sampled

"Commercial MCS" represents the Media Cleanup Standard (10^{-6} risk or HQ = 1) calculated based on commercial land-use assumptions for the groundwater to indoor air pathway.

"Residential MCS" represents the Media Cleanup Standard (10^{-6} risk or HQ = 1) calculated based on residential land-use assumptions for the groundwater to indoor air pathway.

Bolded concentrations indicate the concentration is above the applicable MCS.

TABLE 3
Natural Attenuation Parameter Results
The Hoover Company

Well ID	MW-18S				MW-28S				MW-29S				MW-25S			
	May-06		Oct-06		May-06		Oct-06		May-06		Oct-06		Apr-06		Oct-06	
	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
Alkalinity	280000 =		230000 =		400000 =		400000 =		190000 =		150000 =		170000 =		170000 =	
Arsenic (total)	10.6 =		11.6 =		10 U		10 U		10 U		10 U		10 U		10 U	
Biological Oxygen Demand	3200 U		2500 =		2000 U		2000 U		2000 U		2000 U		2000 U		2000 U	
Carbon Dioxide	110000 =		120000 =		14000 =		21000 =		57000 =		57000 =		32000 =		32000 =	
Chemical Oxygen Demand	62000 =		110000 =		110000 =		110000 =		68000 U		91000 J; =		20000 =		20000 U	
Chloride	536000 =		484000 =		188000 =		221000 =		976000 =		540000 =		398000 =		320000 =	
Hardness	590000 =		660000 =		370000 =		450000 =		510000 =		380000 =		230000 =		270000 =	
Iron (total)	38700 =		41800 =		1290 =		924 =		100 U		100 U		100 U		224 =	
Manganese (total)	978 =		1020 =		470 =		824 =		15 U		15 U		15 U		15 U	
Methane	350 =		360 =		2100 =		1600 =		1 U		1 U		1 U		1 U	
Nitrate	100 U		100 U		100 U		100 UJ		2190 =		2270 =		6390 =		6290 =	
Nitrite	500 UG		500 UG		100 U		100 UJ		455 UG		200 UG		100 U		100 U	
Total Phosphorous	660 =		590 =		100 U		240 =		100 U		100 U		100 U		100 U	
Sulfate	116000 =		108000 =		27400 =		79500 =		182000 =		130000 =		45500 =		37000 =	
Sulfide	1000 U		1000 U		1000 U		1000 U		1000 U		1000 U		1000 U		1000 U	
Total Dissolved Solids	1200000 =		1600000 =		690000 =		760000 =		2000000 =		1200000 =		870000 =		790000 =	
Total Organic Carbon	11000 =		10000 =		21000 =		16000 =		1900 =		1600 =		1000 U		1000 U	
Total Suspended Solids	78000 =		50000 =		5000 =		7000 =		4000 U		6000 =		4000 U		4000 U	
Dissolved Oxygen (DO)	0.20 mg/L		0.29 mg/L		0.56 mg/L		0.40 mg/L		4.28 mg/L		2.66 mg/L		3.30 mg/L		1.91 mg/L	
pH	8.45 unitless		6.67 unitless		7.41 unitless		7.48 unitless		6.44 unitless		6.44 unitless		6.59 unitless		6.58 unitless	
Temperature	12.29 °C		15.54 °C		12.41 °C		13.97 °C		14.31 °C		16.19 °C		15.74 °C		15.80 °C	
Oxygen Reduction Potential (ORP)	-76 mV		-80 mV		-117 mV		-119 mV		135 mV		86 mV		216 mV		165 mV	

All units in micrograms per liter, unless noted otherwise.
 "=" : concentration equal to or exceeds reporting limits.
 "U" : concentration was below the reporting limit.
 "G" : elevated reporting limit due to matrix interference.
 "UJ" : not detected above an estimated qualification limit.
 "J" : estimated value.
 "JH" : estimated value, biased high.
 "JL" : estimated value, biased low.

Average values of last 3 stabilization parameters from field logs.

TABLE 3
Natural Attenuation Parameter Results
The Hoover Company

Well ID	MW-26S				MW-27S				MW-08				MW-16S				PZ-11			
	Apr-06		Nov-06		Apr-06		Nov-06		Apr-05		Nov-06		Apr-05		Nov-06		Apr-05		Nov-06	
	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
Alkalinity	87000 =		140000 =		240000 =		200000 =		240000 =		260000 =		68000 =		120000 =		5000 U		210000 =	
Arsenic (total)	10 U		10 U		10 U		10 U		10 U		10 U		10 U		10 =		10 U		10 U	
Biological Oxygen Demand	2000 U		2000 U		2000 U		2000 U		2000 U		2000 U		2000 U		2000 U		2000 U		2000 U	
Carbon Dioxide	39000 =		79000 =		16000 =		20000 =		=		84000 =		60000 =		78000 =		16000 =		18000 =	
Chemical Oxygen Demand	20000 U		20000 U		32000 =		50000 =		20000 U		20000 U		20000 U		22000 =		110000 =		200000 =	
Chloride	121000 =		124000 =		2020000 =		1880000 =		5500 =		7430 =		245000 =		190000 =		20000 U		3260000 =	
Hardness	130000 U		190000 =		950000 =		1200000 =		290000 =		410000 =		180000 =		92000 =		630000 =		580000 =	
Iron (total)	208 =		100 U		1660 =		1990 =		100 U		100 U		235 =		345 U		2210 =		389 =	
Manganese (total)	15 U		25.1 =		700 =		807 =		15 U		844 =		15.6 =		15 U		222 =		179 =	
Methane	1 U		1 U		1 U		1 U		1 U		1.7 =		1 U		1 U		1 U		1 U	
Nitrate	200 =		110 =		100 U		2000 UG		1910 =		1120 =		2830 =		4010 JL =		3290 =		2370 =	
Nitrite	100 U		100 U		840 UG		2000 UG		100 U		100 U		100 U		100 UJ		500 UG		2000 UG	
Total Phosphorous	100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U	
Sulfate	64200 =		53700 =		170000 =		140000 =		17800 =		156000 =		45800 =		88500 =		167000 =		173000 =	
Sulfide	1000 U		1000 U		1000 U		1000 U		1000 U		1000 U		1000 =		1000 U		1000 U		1000 U	
Total Dissolved Solids	400000 =		440000 =		3600000 =		3500000 =		340000 =		550000 =		630000 =		520000 =		5700000 =		5600000 =	
Total Organic Carbon	1700 =		1000 =		1200 =		1000 U		2800 =		7300 =		1400 =		1500 =		1000 =		1000 U	
Total Suspended Solids	4000 =		4000 U		4000 =		6000 =		4000 U		6000 =		4000 U		4000 U		6000 =		14000 =	
Dissolved Oxygen (DO)	4.80 mg/L		2.78 mg/L		0.21 mg/L		0.50 mg/L		8.44 mg/L		0.71 mg/L		3.20 mg/L		3.63 mg/L		0.63 mg/L		1.01 mg/L	
pH	6.19 unitless		6.29 unitless		6.84 unitless		6.97 unitless		11.56 unitless		6.74 unitless		6.89 unitless		6.028.00 unitless		6.81 unitless		7.06 unitless	
Temperature	11.53 °C		13.91 °C		13.73 °C		15.64 °C		13.79 °C		13.96 °C		11.31 °C		14.38 °C		15.11 °C		16.75 °C	
Oxygen Reduction Potential (ORP)	221 mV		144 mV		-27 mV		-33 mV		119 mV		236 mV		153 mV		209 mV		219 mV		92 mV	

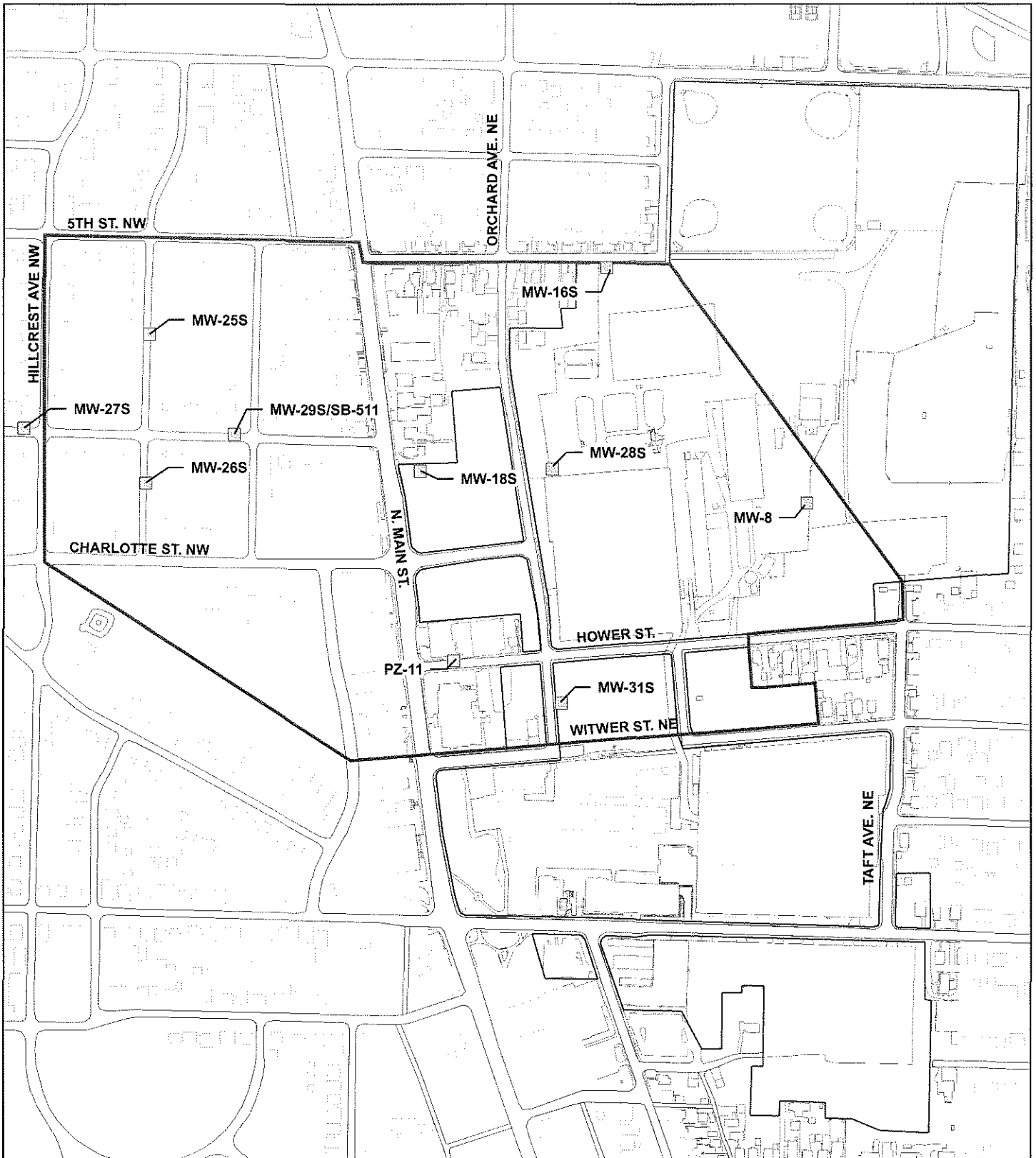
All units in micrograms per liter, unless noted at
 "=" : concentration equal to or exceeds reporting
 "U" : concentration was below the reporting lim
 "G" : elevated reporting limit due to matrix interf
 "UJ" : not detected above an estimated quatitat
 "J" : estimated value.
 "JH" : estimated value, biased high.
 "JL" : estimated value, biased low.
 Average values of last 3 stabilization parameter

TABLE 3
Natural Attenuation Parameter Results
The Hoover Company



Well ID	MW-31S			
	May-05		Nov-06	
	Conc	Qual	Conc	Qual
Parameter				
Alkalinity	23000 =		20000 JH; =	
Arsenic (total)	10 U		10 U	
Biological Oxygen Demand	2000 U		2000 U	
Carbon Dioxide	34000 =		45000 =	
Chemical Oxygen Demand	20000 U		63000 =	
Chloride	1150000 =		1230000 =	
Hardness	590000 =		540000 =	
Iron (total)	422 =		408 =	
Manganese (total)	66.5 =		143 =	
Methane	1 U		1 U	
Nitrate	4440 =		3470 =	
Nitrite	2000 UG		500 UG	
Total Phosphorous	100 U		100 U	
Sulfate	153000 =		140000 =	
Sulfide	1000 U		1000 U	
Total Dissolved Solids	2600000 =		2300000 =	
Total Organic Carbon	1000 U		1000 U	
Total Suspended Solids	7000 =		10000 =	
Dissolved Oxygen (DO)	7.60 mg/L		6.81 mg/L	
pH	5.78 unitless		5.84 unitless	
Temperature	13.10 °C		15.45 °C	
Oxygen Reduction Potential (ORP)	242 mV		219 mV	

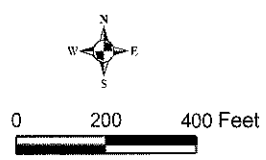
All units in micrograms per liter, unless noted at
 "=" : concentration equal to or exceeds reporting
 "U" : concentration was below the reporting lim
 "G" : elevated reporting limit due to matrix interf
 "UJ" : not detected above an estimated qualitat
 "J" : estimated value.
 "JH" : estimated value, biased high,
 "JL" : estimated value, biased low.
 Average values of last 3 stabilization parameter

Figures



LEGEND

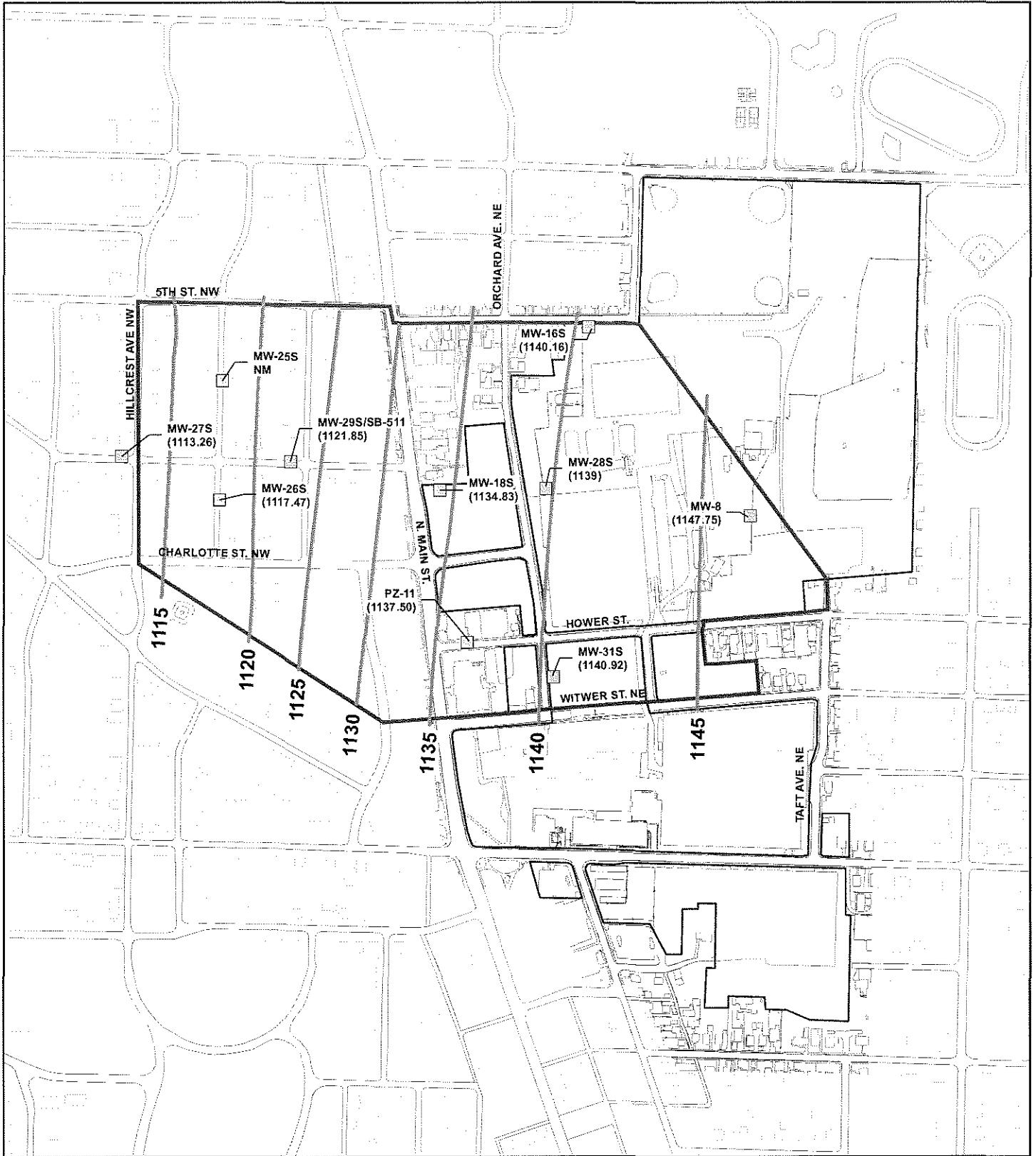
-  Boundaries of the Ordinance Area
-  2000 Property Boundary



A north arrow is positioned above a scale bar. The scale bar is marked with 0, 200, and 400 Feet.

Figure 1
Monitoring Wells
and Ordinance Area Boundaries
The Hoover Company, North Canton, Ohio

NOTE: Basemap derived from aerial orthographic photos taken January 17, 2000.
File Path: E:\Hoover_Company\GIS\MapDocs\Figure01_MW_BedrockBorings_Ordinance.mxd, Date: 09 08. 2006 1:17:02 PM, User: JHANSEN1



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- Boundaries of the Ordinance Area
- 2000 Property Boundary
- Groundwater Contour
- NM Not Measured

Elevations in feet above mean sea level.

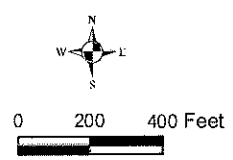
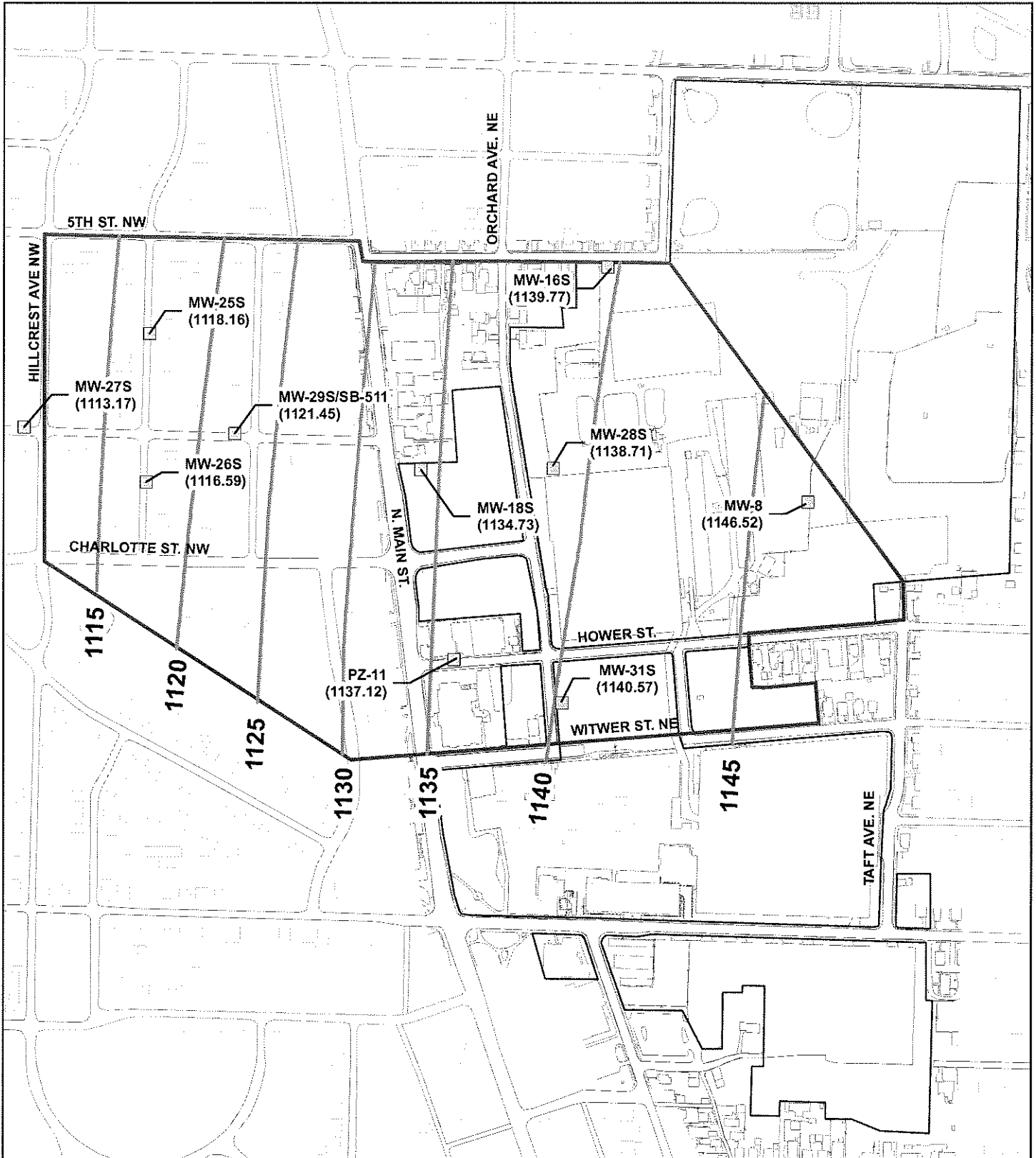





Figure 2
 May 2006 Potentiometric Map
 The Hoover Company, North Canton, Ohio

NOTE: Basemap derived from aerial orthographic photos taken January 17, 2000.



LEGEND

-  Boundaries of the Ordinance Area
-  2000 Property Boundary
-  Groundwater Contour
- Elevations in feet above mean sea level.

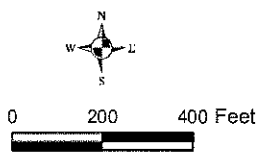
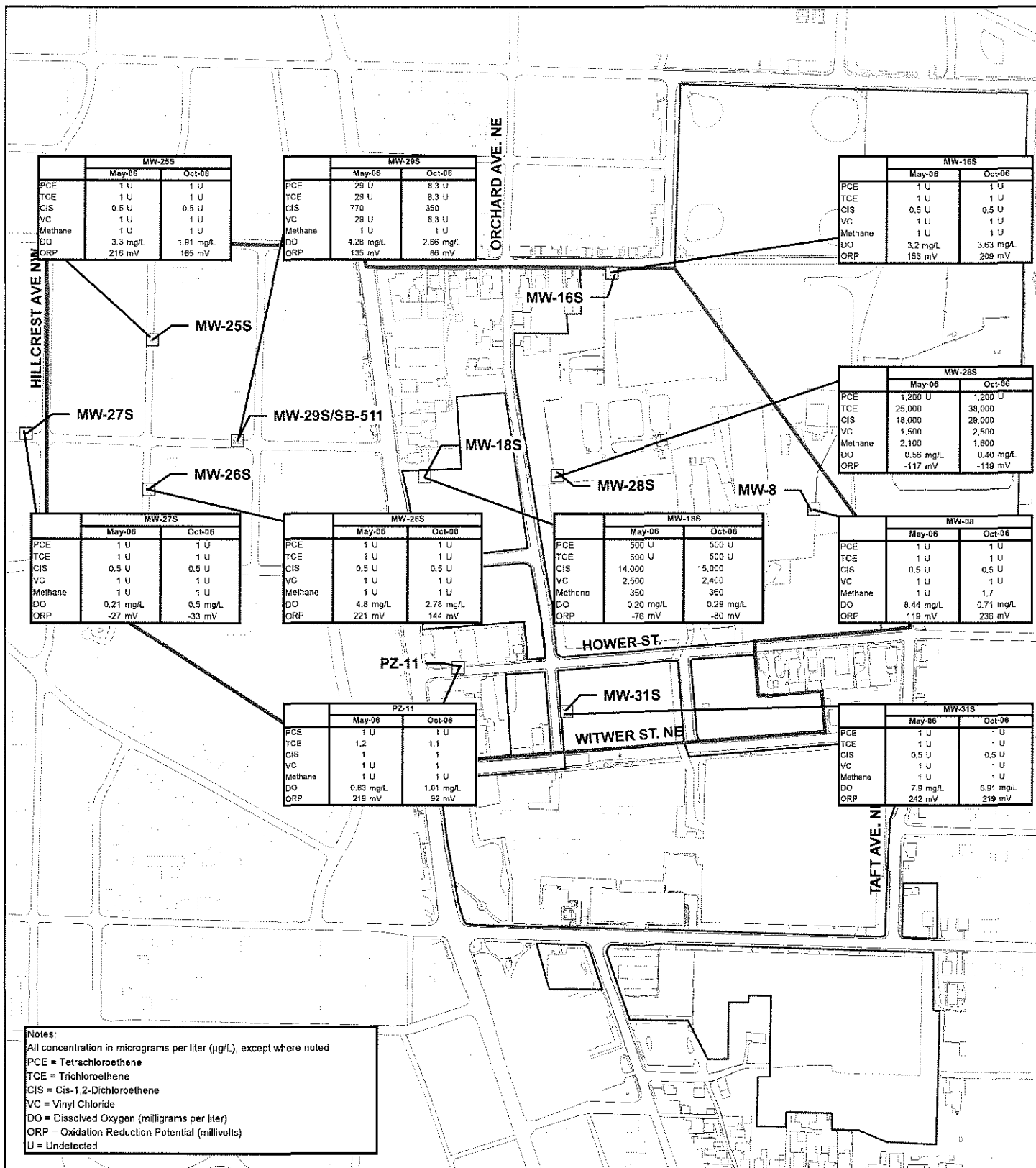


Figure 3
 October 2006 Potentiometric Map
 The Hoover Company, North Canton, Ohio

NOTE: Basemap derived from aerial orthographic photos taken January 17, 2000.

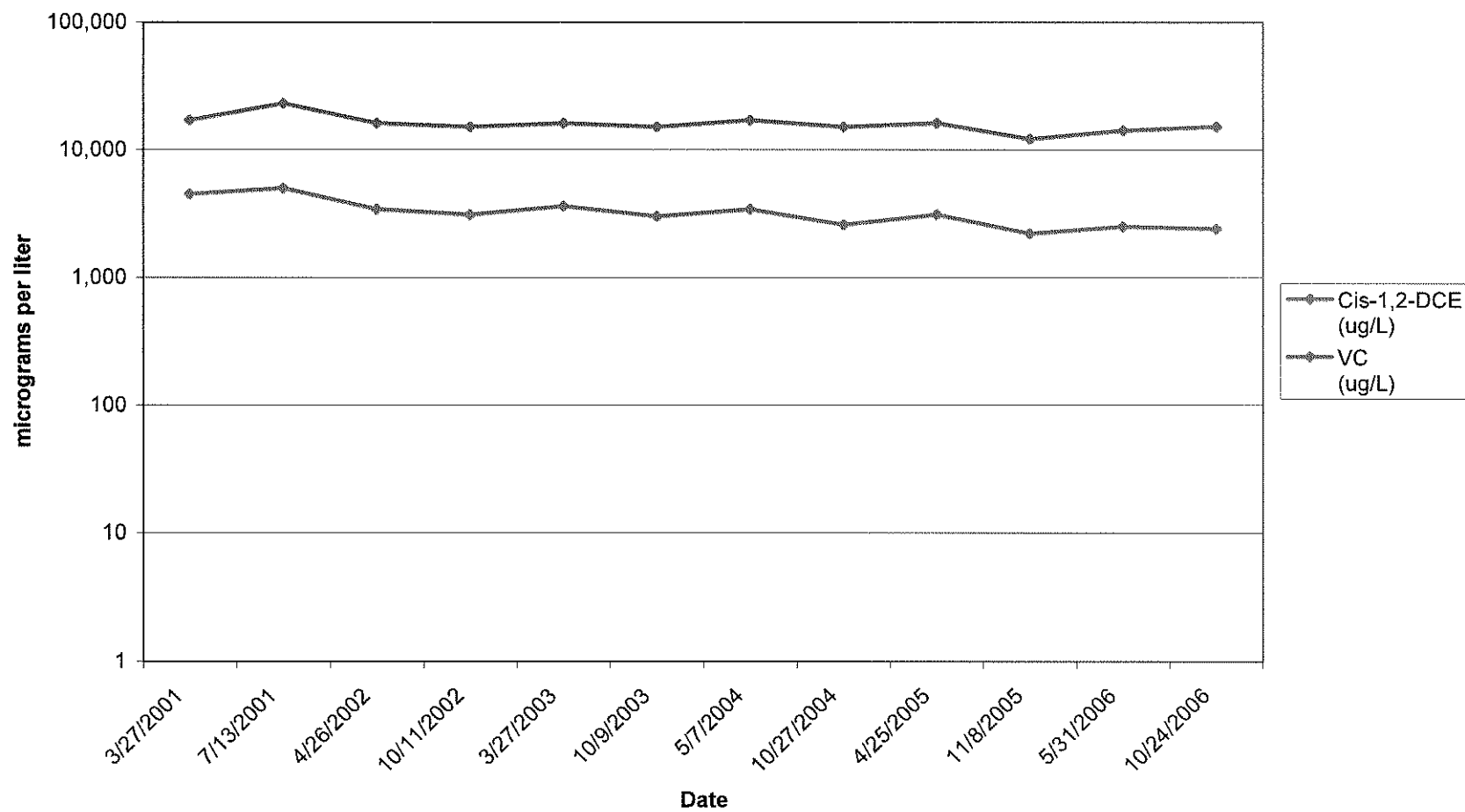


NOTE: Basemap derived from aerial orthographic photos taken January 17, 2000.

File Path: E:\Hoover_Company\GIS\MapDocs\Figure04_2006_GW_VOCAMap.mxd, Date: 02/09/2007, User: MPETERSH

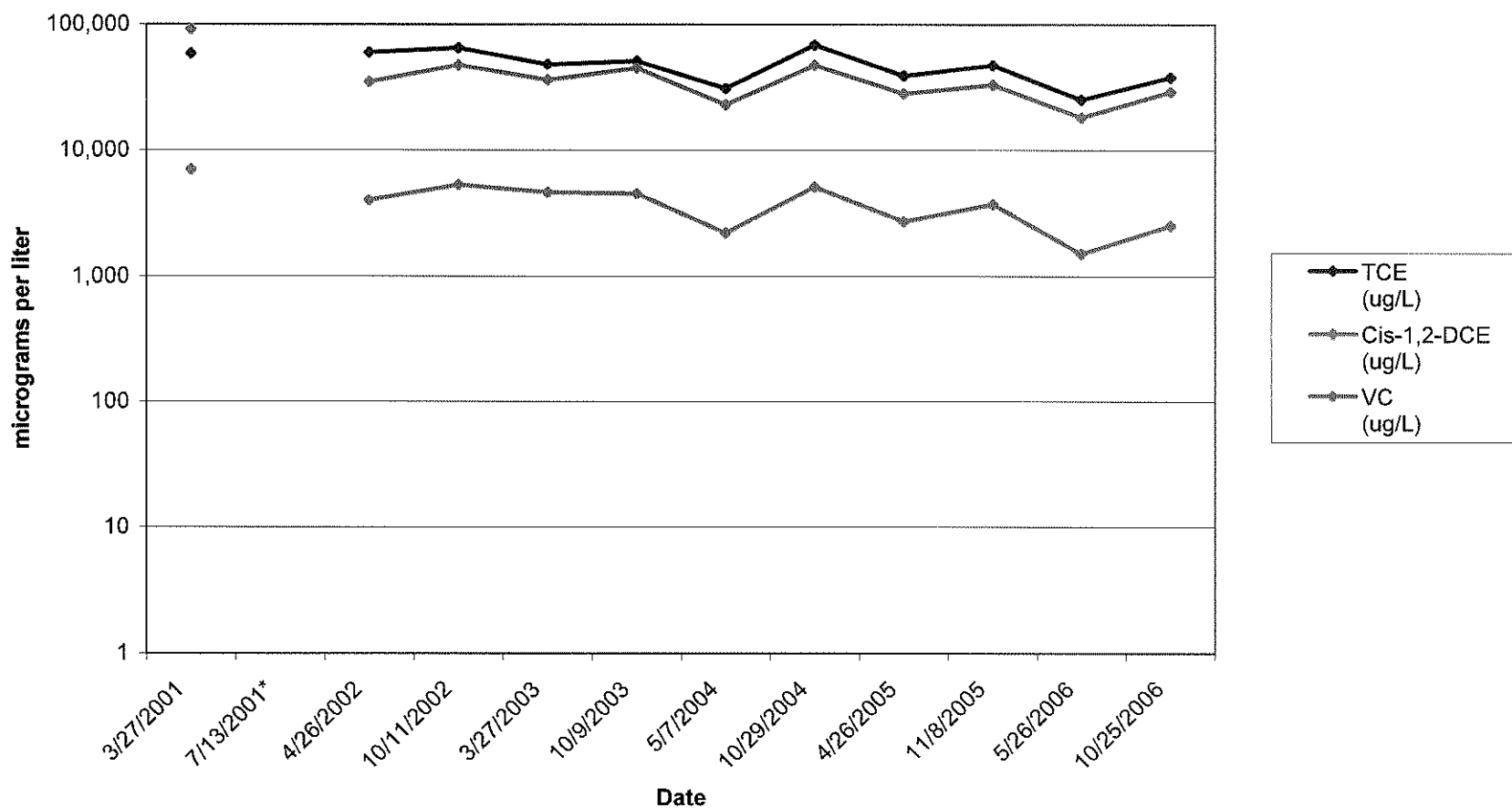
CH2MHILL

FIGURE 5
MW-18S Concentration Trends
(Core)



Note:
Tetrachloroethylene and Trichloroethylene were reported below the laboratory reporting limit.

FIGURE 6
MW-28S Concentration Trends
(Core)

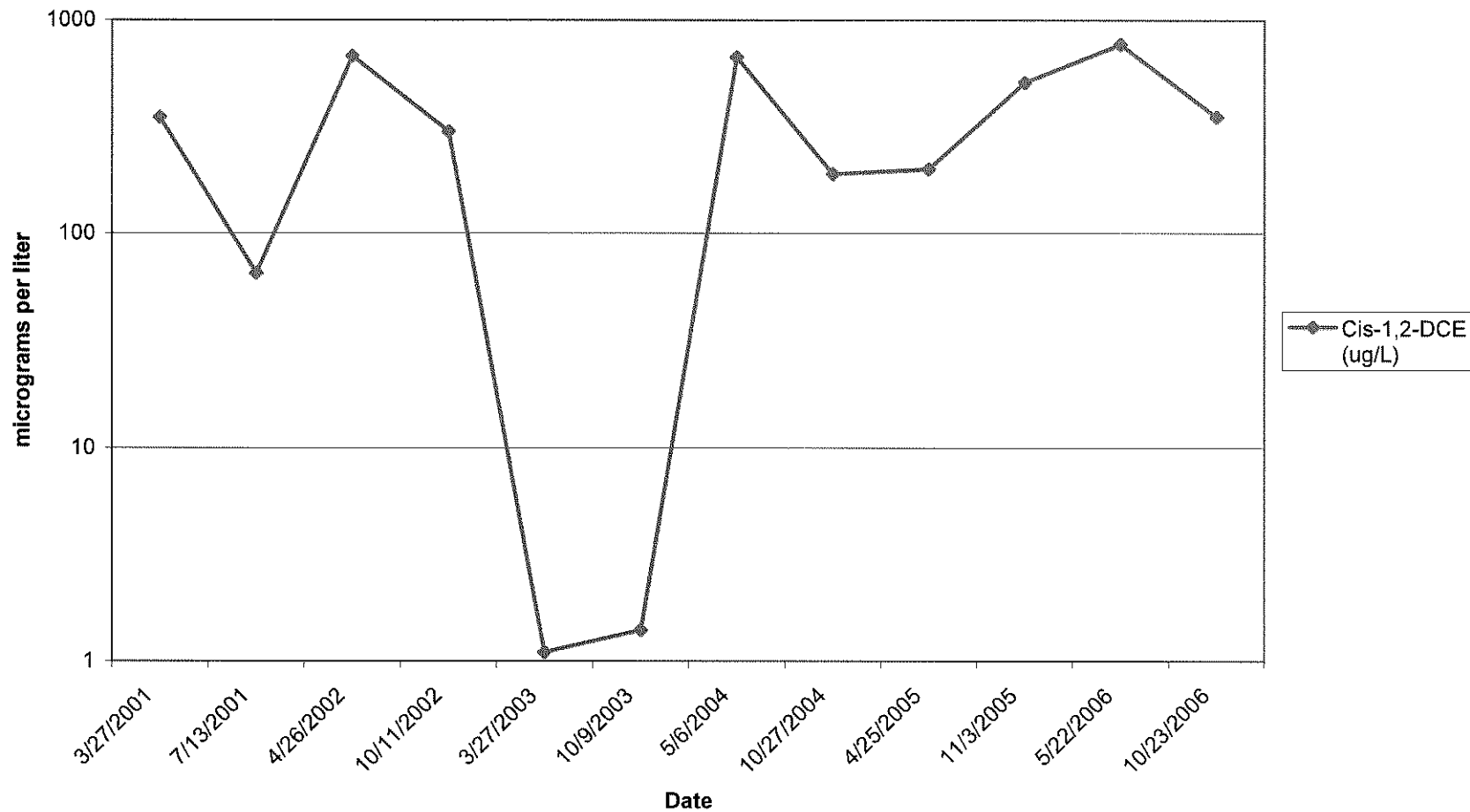


Note:

* Not Sampled

Tetrachloroethylene was reported below the laboratory method reporting limit.

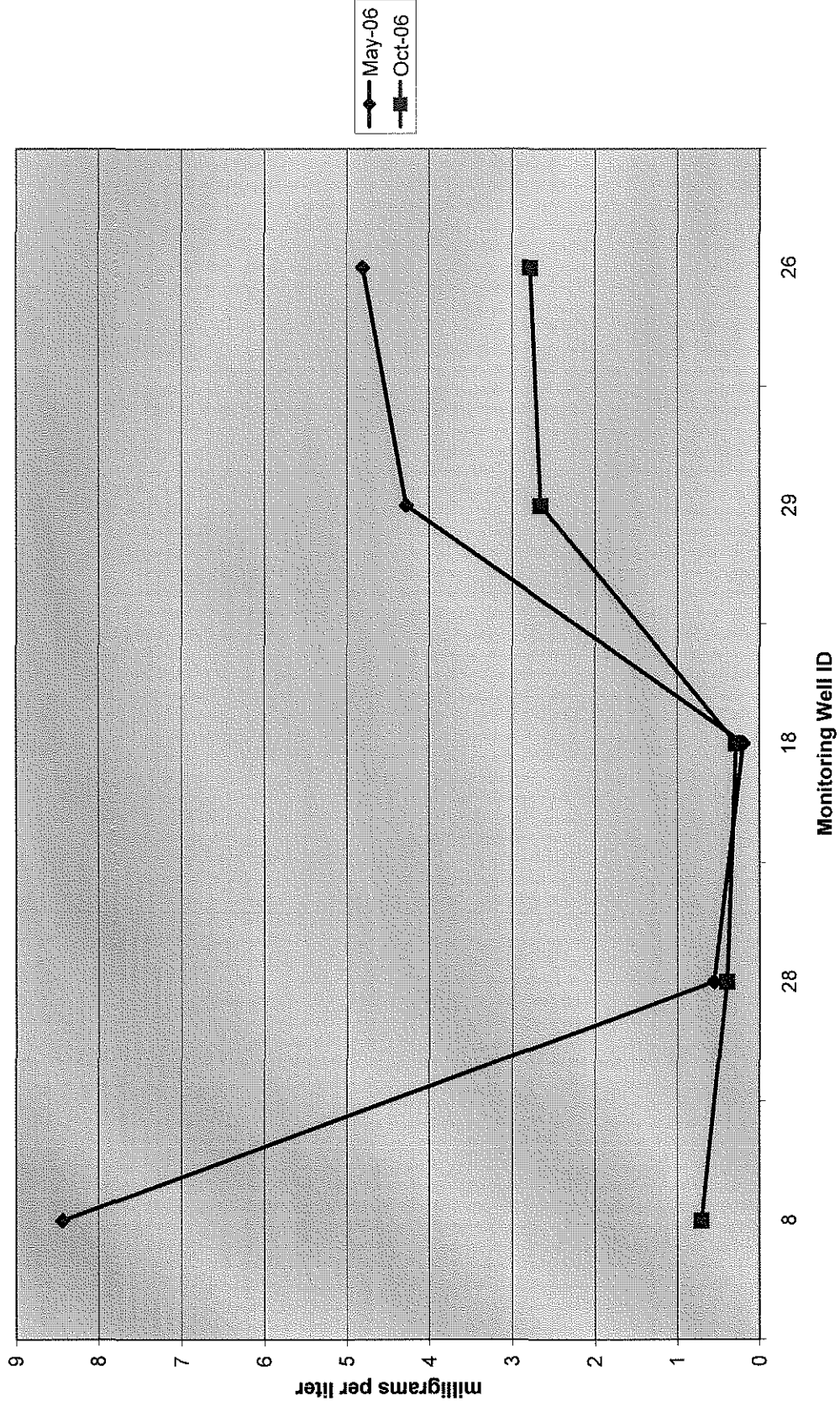
FIGURE 7
MW-29S Concentration Trends
(Downgradient Edge of Plume)



NOTE

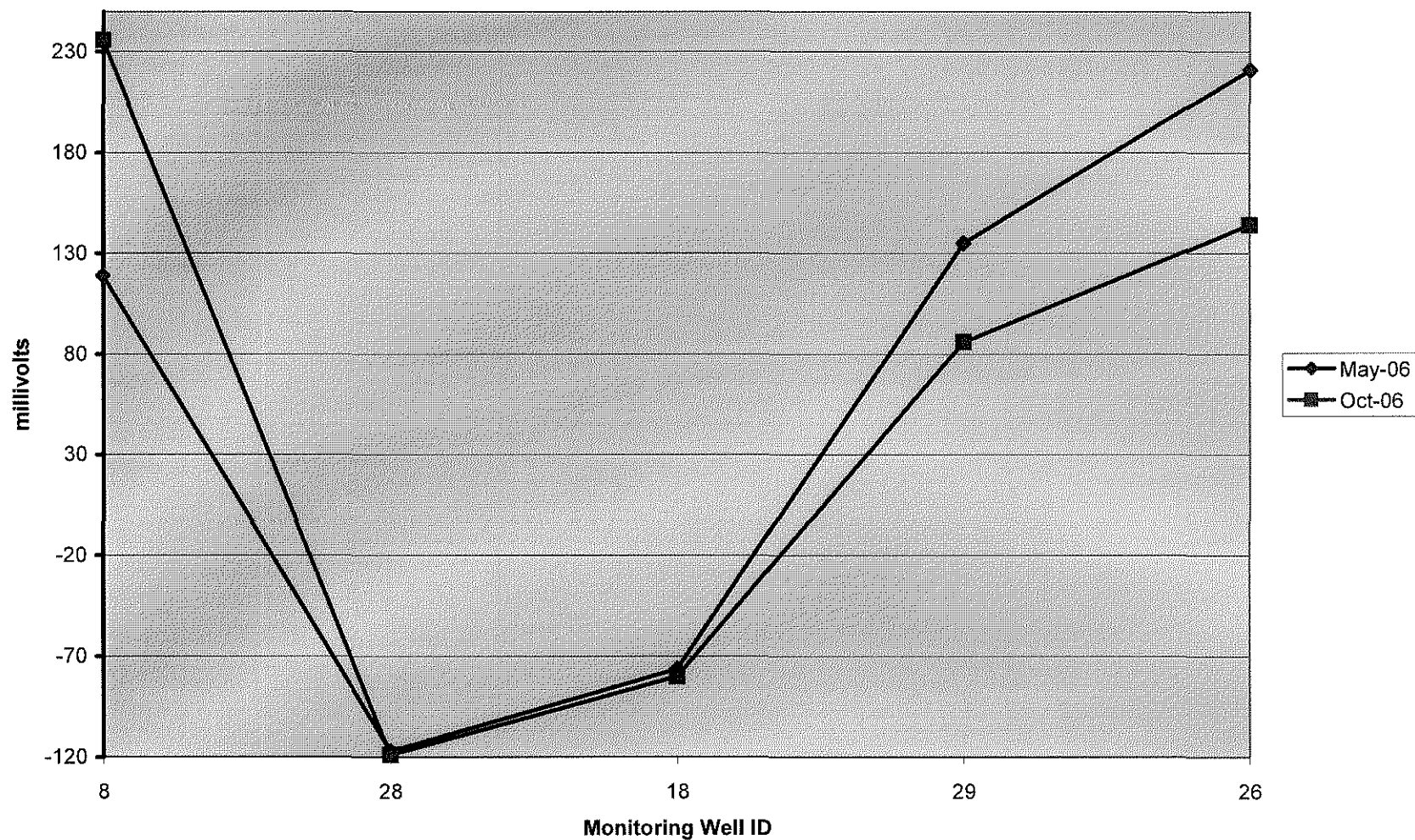
Tetrachloroethylene and Trichloroethylene were reported at or below the laboratory method detection limit [LRL]. Vinyl chloride was reported above LRL in April and November 2005 (8 and 17 micrograms per liter, respectively).

Figure 8 - Dissolved Oxygen Trends



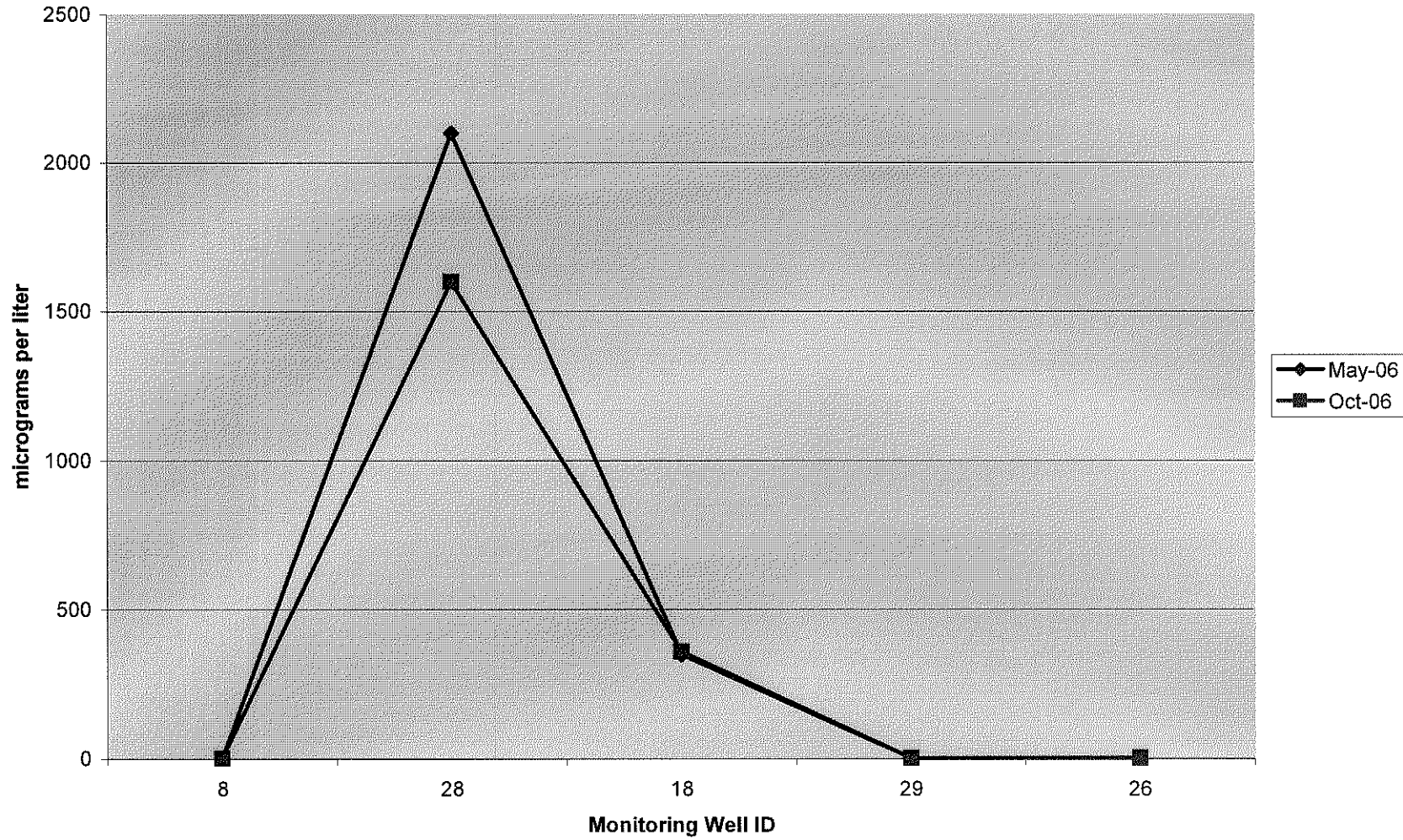
NOTE: Wells follow axis of the plume from upgradient (left) to downgradient (right)

Figure 9 - Oxidation Reduction Potential Trend



NOTE: Wells follow axis of the plume from upgradient (left) to downgradient (right)

Figure 10 - MethaneTrends



NOTE: Wells follow axis of plume from upgradient (left) to downgradient (right)