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TECHNICAL MEMORANDUM RESULTS OF JANUARY 2001 QUARTERLY GROUNDWATER
MONITORING AT RICHARDS GEBUR AIR FORCE BASE KANSAS CITY MO
5/8/2001
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Results of January 2001 Quarterly Groundwater Monitoring at Richards-Gebaur Air Force Base

PREPARED FOR: Air Force Base Realignment and Closure (BRAC) Cleanup Team (BCT)

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DATE: May 8, 2001

This technical memorandum summarizes the analytical results for the quarterly groundwater monitoring (QGM) conducted between January 24 and January 31, 2001 at Richards-Gebaur Air Force Base (AFB), Kansas City, Missouri. The January results are compared with the findings from the two previous groundwater monitoring events which occurred between June and August 2000 and in October 2000 to better understand the nature and extent of the groundwater contamination at the Base.

Introduction

The QGM program was established at Richards-Gebaur AFB based on the results of the 1999 Basewide Remedial Investigation (RI) and 2000 RI Addendum. Consequently, QGM takes place at five sites where concentrations of chlorinated volatile organic compounds (VOCs) in groundwater are known to exceed the conservative Tier 1 Screening Levels that were set forth in the RI (generally equivalent to federal maximum contaminant levels). The five sites are:

- CS 004, UST 620A
- SS 003, Oil Saturated Area
- SS 006, Hazardous Material Storage Area
- SS 009, Fire Valve Area
- ST 005, POL Yard

From the five sites, 58 monitoring wells were selected for the January 2001 QGM program. Results from the first QGM are discussed in the *Draft RI Report* (CH2M HILL, 2000). Results from the October 2000 QGM are discussed in the *Results of October 2000 Quarterly Groundwater Monitoring at Richards-Gebaur Air Force Base* (CH2M HILL, 2001). Findings of the January 2001 QGM are presented below. Subsequent groundwater monitoring events are scheduled for April 2001, July 2001, and October 2001. The monitoring well network from the five sites is summarized in Table 1.

The objectives of the quarterly groundwater monitoring at Richards-Gebaur AFB are as follows:

- assess whether the existing monitoring well network sufficiently delineates the groundwater contamination
- evaluate temporal trends of chemicals of concern (COCs) in groundwater.

Methodology

Standard field methodologies for groundwater sample collection – as established for the Basewide RI - were followed during the quarterly groundwater event. Detailed field procedure information is provided in the *October 1999 Basewide Remedial Investigation / Feasibility Study (RI/FS) Work Plan and the April 2000 Basewide RI Work Plan Addendum*.

Groundwater samples were analyzed for VOCs via USEPA Method SW8260B. The analytical work was performed by PEL Laboratories, Tampa Bay, Florida. Analytical results for six monitoring wells were reported on a 24-hour turnaround time. The remaining analytical results were reporting on a standard 21-day turnaround time. Data were validated per methods outlined in the October 1999 *Richards-Gebaur Air Force Base (AFB) Basewide RI/FS Work Plan* (CH2M HILL, 1999).

Natural attenuation (NA) parameters were not evaluated during this QGM but will be assessed as part of the April QGM event

Results

The following paragraphs summarize the VOC analytical results from the January 2001 QGM on a site-by-site basis. Detections of VOCs in groundwater at the five sites are shown in Table 2. The results are compared against corresponding Tier I Screening Levels established for the Basewide RI project. Compounds exceeding Tier I Screening Levels in groundwater are summarized in Table 3. The January 2001 QGM results are also compared with the data from the two previous groundwater monitoring events to evaluate the temporal trends of COC concentrations in groundwater.

CS 004 – UST 620A

Sixteen groundwater wells at CS 004 were sampled as part of the January 2001 QGM (see Table 1). The January 2001 results indicate that VOCs exceeded their corresponding Tier I Screening Levels in two nested pairs of shallow/deep wells, MW-001(S)/MW-008(D) and MW-003(S)/MW-007(D), one shallow well, MW-016(S), and one deep well, MW-006(D). The distribution of VOC exceedences at CS 004 is depicted in Figure 1, and the temporal trends of COCs in groundwater for select wells are presented in Figure 2.

- **Trichloethene (TCE)**

TCE was detected in one deep well MW-006 at a concentration exceeding the Tier I Screening Level of 5 ppb. Well MW-006(D) was sampled during the first QGM but not the second QGM. The January 2001 TCE concentration at this well was the same as that measured in June 2000.

- **Cis-1,2-dichloroethene (DCE)**

Cis-1,2-DCE was detected in one shallow well, MW-003(S), at a concentration above its corresponding Tier 1 Screening Level of 70 ppb. The concentration of cis-1,2-DCE at MW-003(S) was 220 ppb in January 2001, slightly lower than the reported data from the first and second QGM. Although detected in wells MW-007(D), MW-001(S), and MW-008(D) in October 2000, cis-1,2-DCE concentrations for these three wells did not exceed 70 ppb.

- *Vinyl chloride*

As in previous QGM events, vinyl chloride was found in five out of sixteen wells at the site at concentrations above its corresponding Screening Level of 2 ppb. The vinyl chloride concentrations in these wells are consistent with previous QGM findings.

SS 003 – Oil Saturated Area

Eight groundwater wells at SS 003 were sampled during the January 2001 QGM (see Table 1). The results indicated that TCE was the only VOC that was detected above Tier I Screening Levels. This result was consistent with the June and October 2000 QGM results.

- *TCE*

TCE was detected at concentrations exceeding its Tier 1 Screening Level in four wells: MW-004, MW-006, MW-007, and MW-008 (see Figure 3). In general, TCE concentrations in MW-004 and MW-008 were slightly higher than those measured in October 2000. On the other hand, TCE concentrations in well MW-006 and MW-007 were slightly lower than those reported in October 2000. Temporal trends of TCE in groundwater at SS 003 from June 2000 to January 2001 are presented in Figure 4.

- *Cis-1,2-DCE*

The chemical was detected, but at concentrations below its Tier 1 Screening Level of 70 ppb.

- *Vinyl chloride*

The chemical was detected, but at concentrations below its Tier 1 Screening Level of 2 ppb.

SS 006 – Hazardous Material Storage Area

Twelve groundwater wells at SS 006 were sampled in January 2001 (see Table 1). Three VOCs – TCE, cis-1,2-DCE, and vinyl chloride – were detected at concentrations above their corresponding Tier I Screening Levels. The locations of wells at SS 006 with VOC concentrations exceeding applicable Tier 1 Screening Levels are presented in Figure 5. Temporal trends of COC concentrations for select wells at SS 006 are presented in Figure 6.

- *TCE*

TCE was detected above its Tier I Screening Level in eight wells: MW-005, MW-009, MW-010, MW-011, MW-012, MW-014, MW-015, and MW-018. It appears that concentrations of TCE in wells MW-005, MW-009, MW-010, and MW-015 have increased slightly since October 2000, although the TCE concentration in MW-018, located at the south boundary of the site, has remained the same since October 2000. TCE concentrations at wells MW-011 and MW-012 were slightly higher than those measured in June 2000 (note - these two wells were sampled during the June 2000 QGM but not October 2000 QGM). Well MW-014 was sampled for the first time during the January 2001 QGM, as it was reported dry during the first two QGM events. The concentration of TCE at well MW-014 was 48 ppb; exceeding its corresponding Tier I Screening Level of 5 ppb.

- *Cis-1,2-DCE*

Cis-1,2-DCE was detected in wells MW-010 and MW-012 at concentrations exceeding its Tier I Screening Level of 70 ppb. The concentration of cis-1,2-DCE at MW-010 was 140 ppb, slightly lower than the reported level of 150 ppb in October 2000. The concentration of cis-1,2-DCE at MW-012 was slightly higher than the reported level in June 2000. Well MW-012 was not sampled during the October 2000 QGM.

- ***Vinyl chloride***

Vinyl chloride was detected in wells MW-005 and MW-010 at concentrations above its Tier I Screening Level of 2 ppb. The concentration of vinyl chloride at MW-010 was 18 ppb, slightly higher than the reported concentration of 12 ppb in October 2000. Vinyl chloride was detected again in MW-005, but at a concentration of 2.1 ppb, slightly above the Tier I Screening Level.

SS 009 – Fire Valve Area

Six groundwater wells were sampled at SS 009 in January 2001 (see Table 1). The QGM results show that five VOCs were detected in well MW-003 at concentrations exceeding Tier 1 Screening Levels (Figure 7), and that the remaining wells were free of COCs at concentrations above Tier 1 Screening Levels. The five VOCs are TCE, 1,1-DCE, cis-1,2-DCE, tetrachloroethene (PCE), and vinyl chloride. Results from the January 2001 QGM show generally lower concentrations than those detected during the June and October 2000 QGM. Temporal trends of COC concentrations in groundwater at SS 009 are presented in Figure 8.

- ***TCE***

TCE was detected at 22 ppb on in MW-003, exceeding its Tier I Screening Level of 5 ppb.

- ***Cis-1,2-DCE***

Cis-1,2-DCE was detected at 140 ppb in MW-003, exceeding its Tier I Screening Level of 70 ppb.

- ***Vinyl chloride***

Vinyl chloride was detected at 6.3 ppb in MW -003, exceeding its Tier I Screening Level of 2 ppb.

- ***1,1 – DCE***

The 1,1-DCE concentration in this well was 46 ppb, exceeding its Tier I Screening Level of 7 ppb.

- ***PCE***

The PCE concentration in this well was 15 ppb, exceeding its Tier I Screening Level of 5 ppb.

ST 005 – POL Storage Area

Sixteen groundwater wells were sampled at ST 005 in January 2001 (see Table 1). As in the June and October 2000 QGM events, TCE was the only VOC detected at concentrations exceeding applicable Tier 1 Screening Levels. TCE was found in 7 of the 16 wells. The distribution of TCE at ST 005 is shown in Figure 9 and temporal trends of TCE concentrations in groundwater for select wells are presented in Figure 10. Note that cis 1,2-DCE was detected in several wells at the site, but at concentrations below its Tier 1 Screening Level of 70 ppb.

- ***TCE***

Several differences in the QGM results can be seen between October 2000 and January 2001. First, TCE concentrations in the four wells at the center of the groundwater contaminated zone (MW-003, MW-010, MW-012, and MW-014) appear to have decreased since October 2000. Secondly, the TCE concentrations in deep well MW-013 was below the Tier 1 Screening Level of 5 ppb, as compared to a TCE concentration of 13 ppb in October 2000. Thirdly, the TCE concentration at well MW-018 has decreased from 1,200 ppb in October 2000 to 420 ppb in January 2001. Well MW-018 is located upgradient of the TCE contaminated zone at the site

and is located on property that belongs to the Kansas City Aviation Department (KCAD). Also, the distribution of TCE at the three perimeter wells MW-020, MW-021, and MW-022 has changed since October 2000. The TCE concentration at well MW-020 has slightly increased since October 2000. Well MW-021 was found to be free of TCE concentrations above Screening Levels, compared to TCE concentration of 6.9 ppb in October 2000. The TCE concentration at well MW-022 has slightly decreased since October 2000.

Conclusions

Based on the findings from the January 2001 QGM and the previous results summarized in "Results of October 2000 Quarterly Groundwater Monitoring at Richards-Gebaur Air Force Base", the following conclusions may be made regarding the occurrence and distribution of VOCs in groundwater at Richards-Gebaur AFB:

- **CS 004**

The COCs at this site are TCE, cis-1,2-DCE, and vinyl chloride. The concentrations of COCs detected in January 2001 are generally consistent with the previous QGM findings. The monitoring well network appears to adequately delineate VOCs in groundwater at the site.

- **SS 003**

TCE is the primary COC at the site. Concentrations of TCE in groundwater in January 2001 were consistent over the past two years, indicating that groundwater contamination at the site is limited to the area west of Building 704. As in previous year, no significant levels of degradation byproducts of TCE were found at this site. The monitoring well network appears to adequately delineate VOCs in groundwater at the site.

- **SS 006**

The COCs at this site are TCE, cis-1,2-DCE, and vinyl chloride. In general, the concentrations of COCs appear fairly consistent over the time. Three downgradient perimeter wells, MW-14, MW-15, and MW-18 showed TCE concentrations above the 5 ppb screening level, indicating that further delineation downgradient was required (consequently two additional wells, MW-19 and MW-20, were installed in February 2001 and will be sampled during future QGM events.

- **SS 009**

The COCs at this site consist of TCE, cis-1,2-DCE, vinyl chloride, PCE, and 1,1-DCE. The January 2001 results were consistent with the results of the past two QGM events. The monitoring well network appears to adequately delineate VOCs in groundwater at the site.

- **ST 005**

TCE is the primary COC at this site, and has consistently been detected above its 5 ppb screening level in several onsite wells. The main area of contamination appears to lie northeast of former Facility 959. In general, TCE concentrations within this area have decreased; however, the TCE concentration at well MW-020 (S), to the east of the contamination zone, has slightly increased from less than 5 ppb to 24 ppb. In general, the monitoring well network appears to adequately delineate VOCs in groundwater at the site.

Table 1: Quarterly Groundwater Monitoring Wells at Richards-Gebaur AFB

CS 004 (UST 620 A)	SS 003 (Oil Saturated Area)	SS 006 (Hazardous Material Storage Area)	SS 009 (Fire Valve Area)	ST 005 (POL Storage Yard)
MW-001(S) / MW-008(D) MW-002(S)	MW-001 MW-003	MW-005 MW-008	MW-002(S) MW-003(S)	MW-003 (S) / MW-010(D) MW-011(D) / MW-012(S)
MW-003(S) / MW-007(D) MW-004 (D)	MW-004 MW-005	MW-009 MW-010	MW-005(S) MW-006(D)	MW-013(D) / MW-014(S) MW-015(D) / MW-016(S)
MW-005(S) MW-006(D)	MW-006 MW-007	MW-011 MW-012	MW-008(D) MW-010(D)	MW-017(D) / MW-018(S) MW-019 (S)
MW-009(S) / MW-010(D) MW-011 (D)	MW-008 MW-002 (CS 002)	MW-013 MW-014		MW-020 (S) MW-021 (S)
MW-012(S) MW-013(S)		MW-015 MW-016		MW-022 (S) MW-023 (S)
MW-014(S) MW-015 (D) MW-016(S)		MW-017 MW-018 MW-001 (AOC 001)		MW-1207 (S)

Note: S = Shallow; D = Deep

Table 2: Compounds Detected in Groundwater, January 2001 Quarterly Monitoring Event

Site	Media	Location	Sample Date	Detected Concentration	Analyte	Units
AOC-001	WATER	AC01-MW01	01/24/2001	0.46 F	Toluene	UG/L
CS-002	WATER	CS02-MW02R	01/30/2001	0.53 F	Toluene	UG/L
	WATER	CS02-MW02R	01/30/2001	4	Trichloroethene	UG/L
CS-004	WATER	CS04-MW01	01/25/2001	0.62	Benzene	UG/L
	WATER	CS04-MW01	01/25/2001	68	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW01	01/25/2001	0.57 F	Toluene	UG/L
	WATER	CS04-MW01	01/25/2001	4.8	Trans-1,2-Dichloroethene	UG/L
	WATER	CS04-MW01	01/25/2001	0.3 F	Trichloroethene	UG/L
	WATER	CS04-MW01	01/25/2001	12	Vinyl chloride	UG/L
	WATER	CS04-MW02	01/25/2001	1.1 F	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW02	01/25/2001	1.3	Toluene	UG/L
	WATER	CS04-MW02	01/25/2001	0.7 F	Trichloroethene	UG/L
	WATER	CS04-MW03	01/26/2001	220	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW03	01/26/2001	0.39 F	Toluene	UG/L
	WATER	CS04-MW03	01/26/2001	28	Trans-1,2-Dichloroethene	UG/L
	WATER	CS04-MW03	01/26/2001	2.6	Trichloroethene	UG/L
	WATER	CS04-MW03	01/26/2001	23	Vinyl chloride	UG/L
	WATER	CS04-MW04	01/25/2001	0.49 F	Toluene	UG/L
	WATER	CS04-MW05	01/25/2001	0.68 F	Toluene	UG/L
	WATER	CS04-MW06	01/25/2001	6.4	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW06	01/25/2001	0.64 F	Toluene	UG/L
	WATER	CS04-MW06	01/25/2001	23	Trichloroethene	UG/L
	WATER	CS04-MW07	01/26/2001	61	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW07	01/26/2001	0.67 F	Toluene	UG/L
	WATER	CS04-MW07	01/26/2001	8.4	Trans-1,2-Dichloroethene	UG/L
	WATER	CS04-MW07	01/26/2001	4.8	Trichloroethene	UG/L
	WATER	CS04-MW07	01/26/2001	9.3	Vinyl chloride	UG/L
	WATER	CS04-MW08	01/26/2001	0.57	Benzene	UG/L
	WATER	CS04-MW08	01/26/2001	70	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW08	01/26/2001	0.41 F	Toluene	UG/L
	WATER	CS04-MW08	01/26/2001	5.1	Trans-1,2-Dichloroethene	UG/L
	WATER	CS04-MW08	01/26/2001	16	Vinyl chloride	UG/L
	WATER	CS04-MW09	01/25/2001	3.7	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW09	01/25/2001	0.47 F	Toluene	UG/L
	WATER	CS04-MW09	01/25/2001	0.6 F	Trichloroethene	UG/L
	WATER	CS04-MW09	01/25/2001	0.62 F	Vinyl chloride	UG/L
	WATER	CS04-MW10	01/25/2001	2.7	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW10	01/25/2001	0.4 F	Toluene	UG/L
	WATER	CS04-MW10	01/25/2001	0.3 F	Trichloroethene	UG/L
	WATER	CS04-MW10	01/25/2001	0.39 F	Vinyl chloride	UG/L
	WATER	CS04-MW11	01/25/2001	0.41	Benzene	UG/L
	WATER	CS04-MW11	01/25/2001	0.56 F	Cis-1,2-Dichloroethene	UG/L
	WATER	CS04-MW11	01/25/2001	0.64 F	Toluene	UG/L

U-flagged and R-flagged data are not included in this table

Qualifier Description

J = The analyte was positively identified, the quantitation is an estimate

F = The analyte was positively identified but the associated numerical value is below the reporting limit (RL)

B = The analyte was found in an associated blank, as well as in the sample

M = A matrix effect was present.

Site	Media	Location	Sample Date	Detected Concentration	Analyte	Units	
CS-004	WATER	CS04-MW11	01/25/2001	0.56 F	Vinyl chloride	UG/L	
	WATER	CS04-MW12	01/25/2001	0.52 F	Cis-1,2-Dichloroethene	UG/L	
	WATER	CS04-MW12	01/25/2001	0.58 F	Cis-1,2-Dichloroethene	UG/L	
	WATER	CS04-MW12	01/25/2001	0.46 F	Toluene	UG/L	
	WATER	CS04-MW12	01/25/2001	0.8 F	Toluene	UG/L	
	WATER	CS04-MW12	01/25/2001	0.54 F	Vinyl chloride	UG/L	
	WATER	CS04-MW12	01/25/2001	0.53 F	Vinyl chloride	UG/L	
	WATER	CS04-MW13	01/24/2001	0.52 F	Toluene	UG/L	
	WATER	CS04-MW14	01/25/2001	0.24 F	Benzene	UG/L	
	WATER	CS04-MW14	01/25/2001	0.85 F	Toluene	UG/L	
	WATER	CS04-MW15	01/25/2001	0.46 F	Chloromethane	UG/L	
	WATER	CS04-MW15	01/25/2001	0.47 F	Toluene	UG/L	
	WATER	CS04-MW16	01/26/2001	0.79	Benzene	UG/L	
	WATER	CS04-MW16	01/26/2001	14	Cis-1,2-Dichloroethene	UG/L	
	WATER	CS04-MW16	01/26/2001	0.35 F	Toluene	UG/L	
	WATER	CS04-MW16	01/26/2001	5.8	Trans-1,2-Dichloroethene	UG/L	
	WATER	CS04-MW16	01/26/2001	13	Vinyl chloride	UG/L	
	SS-003	WATER	SS03-MW01	01/30/2001	3	Cis-1,2-Dichloroethene	UG/L
		WATER	SS03-MW01	01/30/2001	0.55 F	Toluene	UG/L
		WATER	SS03-MW03	01/31/2001	1.8	Cis-1,2-Dichloroethene	UG/L
WATER		SS03-MW03	01/31/2001	2.7	Trichloroethene	UG/L	
WATER		SS03-MW04	01/30/2001	8.6	Cis-1,2-Dichloroethene	UG/L	
WATER		SS03-MW04	01/30/2001	0.52 F	Toluene	UG/L	
WATER		SS03-MW04	01/30/2001	0.33 F	Trans-1,2-Dichloroethene	UG/L	
WATER		SS03-MW04	01/30/2001	72	Trichloroethene	UG/L	
WATER		SS03-MW05	01/30/2001	0.48 F	Toluene	UG/L	
WATER		SS03-MW06	01/24/2001	0.59 F	Carbon tetrachloride	UG/L	
WATER		SS03-MW06	01/24/2001	5.7	Chloroform	UG/L	
WATER		SS03-MW06	01/24/2001	7	Cis-1,2-Dichloroethene	UG/L	
WATER		SS03-MW06	01/24/2001	0.46 F	Toluene	UG/L	
WATER		SS03-MW06	01/24/2001	14	Trichloroethene	UG/L	
WATER		SS03-MW07	01/30/2001	0.3 F	Benzene	UG/L	
WATER		SS03-MW07	01/30/2001	0.3 F	Chloroethane	UG/L	
WATER		SS03-MW07	01/30/2001	29	Cis-1,2-Dichloroethene	UG/L	
WATER		SS03-MW07	01/30/2001	0.45 F	Toluene	UG/L	
WATER		SS03-MW07	01/30/2001	20	Trichloroethene	UG/L	
WATER		SS03-MW07	01/30/2001	0.78 F	Vinyl chloride	UG/L	
WATER		SS03-MW07	01/30/2001	0.29 F	Benzene	UG/L	
WATER		SS03-MW07	01/30/2001	0.4 F	Chloroethane	UG/L	
WATER		SS03-MW07	01/30/2001	28	Cis-1,2-Dichloroethene	UG/L	
WATER		SS03-MW07	01/30/2001	0.55 F	Toluene	UG/L	
WATER		SS03-MW07	01/30/2001	18	Trichloroethene	UG/L	
WATER		SS03-MW07	01/30/2001	0.79 F	Vinyl chloride	UG/L	
WATER		SS03-MW08	01/30/2001	0.88 F	Cis-1,2-Dichloroethene	UG/L	
WATER		SS03-MW08	01/30/2001	0.51 F	Toluene	UG/L	
WATER		SS03-MW08	01/30/2001	6.8	Trichloroethene	UG/L	

U-flagged and R-flagged data are not included in this table.

Qualifier Description

J = The analyte was positively identified, the quantitation is an estimate

F = The analyte was positively identified but the associated numerical value is below the reporting limit (RL)

B = The analyte was found in an associated blank, as well as in the sample

M = A matrix effect was present.

Site	Media	Location	Sample Date	Detected Concentration	Analyte	Units
SS-006						
	WATER	SS06-MW05	01/26/2001	0.58	Chlorobenzene	UG/L
	WATER	SS06-MW05	01/26/2001	39	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW05	01/26/2001	0.44 F	Toluene	UG/L
	WATER	SS06-MW05	01/26/2001	2.6	Trans-1,2-Dichloroethene	UG/L
	WATER	SS06-MW05	01/26/2001	400	Trichloroethene	UG/L
	WATER	SS06-MW05	01/26/2001	2.1	Vinyl chloride	UG/L
	WATER	SS06-MW08	01/26/2001	0.73 F	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW08	01/26/2001	0.51 F	Toluene	UG/L
	WATER	SS06-MW08	01/26/2001	0.7 F	Trichloroethene	UG/L
	WATER	SS06-MW09	01/26/2001	0.65	Benzene	UG/L
	WATER	SS06-MW09	01/26/2001	16	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW09	01/26/2001	0.54 F	Toluene	UG/L
	WATER	SS06-MW09	01/26/2001	81	Trichloroethene	UG/L
	WATER	SS06-MW09	01/26/2001	2	Vinyl chloride	UG/L
	WATER	SS06-MW10	01/26/2001	0.7	1,1-Dichloroethane	UG/L
	WATER	SS06-MW10	01/26/2001	0.56 F	1,1-Dichloroethene	UG/L
	WATER	SS06-MW10	01/26/2001	0.13 F	1,2-Dichlorobenzene	UG/L
	WATER	SS06-MW10	01/26/2001	0.27 F	Benzene	UG/L
	WATER	SS06-MW10	01/26/2001	140	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW10	01/26/2001	0.38 F	Toluene	UG/L
	WATER	SS06-MW10	01/26/2001	9.8	Trans-1,2-Dichloroethene	UG/L
	WATER	SS06-MW10	01/26/2001	240	Trichloroethene	UG/L
	WATER	SS06-MW10	01/26/2001	18	Vinyl chloride	UG/L
	WATER	SS06-MW11	01/26/2001	52	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW11	01/26/2001	0.62 F	Toluene	UG/L
	WATER	SS06-MW11	01/26/2001	4.1	Trans-1,2-Dichloroethene	UG/L
	WATER	SS06-MW11	01/26/2001	81	Trichloroethene	UG/L
	WATER	SS06-MW12	01/26/2001	0.4 F	1,1-Dichloroethene	UG/L
	WATER	SS06-MW12	01/26/2001	0.18 F	1,4-Dichlorobenzene	UG/L
	WATER	SS06-MW12	01/26/2001	71	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW12	01/26/2001	0.35 F	Toluene	UG/L
	WATER	SS06-MW12	01/26/2001	8.1	Trans-1,2-Dichloroethene	UG/L
	WATER	SS06-MW12	01/26/2001	95	Trichloroethene	UG/L
	WATER	SS06-MW12	01/26/2001	0.95 F	Vinyl chloride	UG/L
	WATER	SS06-MW14	01/24/2001	4.4	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW14	01/24/2001	0.4 F	Toluene	UG/L
	WATER	SS06-MW14	01/24/2001	48	Trichloroethene	UG/L
	WATER	SS06-MW15	01/24/2001	0.15 F	Chloroform	UG/L
	WATER	SS06-MW15	01/24/2001	3.3	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW15	01/24/2001	0.51 F	Toluene	UG/L
	WATER	SS06-MW15	01/24/2001	93	Trichloroethene	UG/L
	WATER	SS06-MW16	01/26/2001	0.49 F	Toluene	UG/L
	WATER	SS06-MW17	01/26/2001	0.34 F	Toluene	UG/L
	WATER	SS06-MW18	01/26/2001	30	Cis-1,2-Dichloroethene	UG/L
	WATER	SS06-MW18	01/26/2001	0.43 F	Toluene	UG/L
	WATER	SS06-MW18	01/26/2001	0.24 F	Trans-1,2-Dichloroethene	UG/L
	WATER	SS06-MW18	01/26/2001	15	Trichloroethene	UG/L

U-flagged and R-flagged data are not included in this table

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B = The analyte was found in an associated blank, as well as in the sample.

M = A matrix effect was present.

Site	Media	Location	Sample Date	Detected Concentration	Analyte	Units
SS-006	WATER	SS06-MW18	01/26/2001	17	Trichloroethene	UG/L
SS-009	WATER	SS09-MW02	01/23/2001	0.61 F	Toluene	UG/L
	WATER	SS09-MW02	01/23/2001	0.84 F	Toluene	UG/L
	WATER	SS09-MW03	01/23/2001	55	1,1-Dichloroethane	UG/L
	WATER	SS09-MW03	01/23/2001	46	1,1-Dichloroethane	UG/L
	WATER	SS09-MW03	01/23/2001	1.9	Benzene	UG/L
	WATER	SS09-MW03	01/23/2001	140	Cis-1,2-Dichloroethene	UG/L
	WATER	SS09-MW03	01/23/2001	15	Tetrachloroethylene	UG/L
	WATER	SS09-MW03	01/23/2001	1.1	Toluene	UG/L
	WATER	SS09-MW03	01/23/2001	22	Trichloroethene	UG/L
	WATER	SS09-MW03	01/23/2001	6.3	Vinyl chloride	UG/L
	WATER	SS09-MW05	01/23/2001	0.87	1,1-Dichloroethane	UG/L
	WATER	SS09-MW05	01/23/2001	0.82 F	Cis-1,2-Dichloroethene	UG/L
	WATER	SS09-MW05	01/23/2001	2.7	Tetrachloroethylene	UG/L
	WATER	SS09-MW05	01/23/2001	0.69 F	Toluene	UG/L
	WATER	SS09-MW05	01/23/2001	0.9 F	Trichloroethene	UG/L
	WATER	SS09-MW06	01/23/2001	1.1 F	Cis-1,2-Dichloroethene	UG/L
	WATER	SS09-MW06	01/23/2001	0.45 F	Toluene	UG/L
	WATER	SS09-MW08	01/23/2001	0.36 F	Toluene	UG/L
	WATER	SS09-MW10	01/23/2001	0.82 F	Toluene	UG/L
ST-005	WATER	ST05-MW010	01/31/2001	0.32 F	Benzene	UG/L
	WATER	ST05-MW010	01/31/2001	6.9	Trichloroethene	UG/L
	WATER	ST05-MW010	01/31/2001	3.2	Trichlorofluoromethane	UG/L
	WATER	ST05-MW011	01/31/2001	0.4 F	Trichloroethene	UG/L
	WATER	ST05-MW012	01/31/2001	39	Trichloroethene	UG/L
	WATER	ST05-MW012	01/31/2001	13	Trichlorofluoromethane	UG/L
	WATER	ST05-MW013	01/31/2001	4.6	Trichloroethene	UG/L
	WATER	ST05-MW013	01/31/2001	0.7 F	Trichlorofluoromethane	UG/L
	WATER	ST05-MW014	01/31/2001	2.6	Cis-1,2-Dichloroethene	UG/L
	WATER	ST05-MW014	01/31/2001	46	Trichloroethene	UG/L
	WATER	ST05-MW014	01/31/2001	13	Trichlorofluoromethane	UG/L
	WATER	ST05-MW016	01/31/2001	1.5	Trichloroethene	UG/L
	WATER	ST05-MW016	01/31/2001	2.1	Trichloroethene	UG/L
	WATER	ST05-MW016	01/31/2001	3.3	Trichlorofluoromethane	UG/L
	WATER	ST05-MW018	01/24/2001	0.54 F	1,1-Dichloroethene	UG/L
	WATER	ST05-MW018	01/24/2001	0.27 F	Benzene	UG/L
	WATER	ST05-MW018	01/24/2001	1.2	Chloroform	UG/L
	WATER	ST05-MW018	01/24/2001	0.49 F	Cis-1,2-Dichloroethene	UG/L
	WATER	ST05-MW018	01/24/2001	0.45 F	Toluene	UG/L
	WATER	ST05-MW018	01/24/2001	420	Trichloroethene	UG/L
	WATER	ST05-MW018	01/24/2001	220	Trichlorofluoromethane	UG/L
	WATER	ST05-MW019	01/31/2001	0.2 F	1,3,5-Tmethylbenzene	UG/L
	WATER	ST05-MW019	01/31/2001	3.9	1-Methylethylbenzene (Cumene)	UG/L
	WATER	ST05-MW019	01/31/2001	0.51	Benzene	UG/L
	WATER	ST05-MW019	01/31/2001	4.3	Ethylbenzene	UG/L

U-flagged and R-flagged data are not included in this table

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M = A matrix effect was present

Site	Media	Location	Sample Date	Detected Concentration	Analyte	Units
ST-005						
	WATER	ST05-MW019	01/31/2001	3.5	n-Butylbenzene	UG/L
	WATER	ST05-MW019	01/31/2001	4	N-Propylbenzene	UG/L
	WATER	ST05-MW019	01/31/2001	0.79	Naphthalene	UG/L
	WATER	ST05-MW019	01/31/2001	1.2	p-Isopropyltoluene	UG/L
	WATER	ST05-MW019	01/31/2001	2.7	sec-Butylbenzene	UG/L
	WATER	ST05-MW019	01/31/2001	0.47	tert-Butylbenzene	UG/L
	WATER	ST05-MW020	01/31/2001	0.41	1,1-Dichloroethene	UG/L
	WATER	ST05-MW020	01/31/2001	0.68	1-Methylethylbenzene (Cumene)	UG/L
	WATER	ST05-MW020	01/31/2001	0.47	Benzene	UG/L
	WATER	ST05-MW020	01/31/2001	56	Cis-1,2-Dichloroethene	UG/L
	WATER	ST05-MW020	01/31/2001	0.31	p-Isopropyltoluene	UG/L
	WATER	ST05-MW020	01/31/2001	0.63	sec-Butylbenzene	UG/L
	WATER	ST05-MW020	01/31/2001	24	Trichloroethene	UG/L
	WATER	ST05-MW021	01/31/2001	4.3	Trichloroethene	UG/L
	WATER	ST05-MW021	01/31/2001	5.1	Trichlorofluoromethane	UG/L
	WATER	ST05-MW022	01/31/2001	5.2	Trichloroethene	UG/L
	WATER	ST05-MW023	01/31/2001	0.7	Trichloroethene	UG/L
	WATER	ST05-MW03	01/31/2001	0.59	Chloroform	UG/L
	WATER	ST05-MW03	01/31/2001	0.6	Cis-1,2-Dichloroethene	UG/L
	WATER	ST05-MW03	01/31/2001	120	Trichloroethene	UG/L
	WATER	ST05-MW03	01/31/2001	130	Trichlorofluoromethane	UG/L

U-flagged and R-flagged data are not included in this table.

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Table 3: Compounds Exceeding Tier 1 Screening Levels in Groundwater, January 2001 Quarterly Monitoring Event

Site	Media	Location	Sample Date	Units	Analyte	Detected Concentration	Screening Level
CS-004							
	WATER	CS04-MW03	01/26/2001	UG/L	Cis-1,2-Dichloroethene	220	70
	WATER	CS04-MW06	01/25/2001	UG/L	Trichloroethene	23	5
	WATER	CS04-MW03	01/26/2001	UG/L	Vinyl chloride	23	2
	WATER	CS04-MW08	01/26/2001	UG/L	Vinyl chloride	16	2
	WATER	CS04-MW16	01/26/2001	UG/L	Vinyl chloride	13	2
	WATER	CS04-MW01	01/25/2001	UG/L	Vinyl chloride	12	2
	WATER	CS04-MW07	01/26/2001	UG/L	Vinyl chloride	9.3	2
SS-003							
	WATER	SS03-MW04	01/30/2001	UG/L	Trichloroethene	72	5
	WATER	SS03-MW07	01/30/2001	UG/L	Trichloroethene	20	5
	WATER	SS03-MW07	01/30/2001	UG/L	Trichloroethene	18	5
	WATER	SS03-MW06	01/24/2001	UG/L	Trichloroethene	14	5
	WATER	SS03-MW08	01/30/2001	UG/L	Trichloroethene	6.8	5
SS-006							
	WATER	SS06-MW10	01/26/2001	UG/L	Cis-1,2-Dichloroethene	140	70
	WATER	SS06-MW12	01/26/2001	UG/L	Cis-1,2-Dichloroethene	71	70
	WATER	SS06-MW05	01/26/2001	UG/L	Trichloroethene	400	5
	WATER	SS06-MW10	01/26/2001	UG/L	Trichloroethene	240	5
	WATER	SS06-MW12	01/26/2001	UG/L	Trichloroethene	95	5
	WATER	SS06-MW15	01/24/2001	UG/L	Trichloroethene	93	5
	WATER	SS06-MW09	01/26/2001	UG/L	Trichloroethene	81	5
	WATER	SS06-MW11	01/26/2001	UG/L	Trichloroethene	81	5
	WATER	SS06-MW14	01/24/2001	UG/L	Trichloroethene	48	5
	WATER	SS06-MW18	01/26/2001	UG/L	Trichloroethene	17	5
	WATER	SS06-MW18	01/26/2001	UG/L	Trichloroethene	15	5
	WATER	SS06-MW10	01/26/2001	UG/L	Vinyl chloride	18	2
	WATER	SS06-MW05	01/26/2001	UG/L	Vinyl chloride	2.1	2
SS-009							
	WATER	SS09-MW03	01/23/2001	UG/L	1,1-Dichloroethene	46	7
	WATER	SS09-MW03	01/23/2001	UG/L	Cis-1,2-Dichloroethene	140	70
	WATER	SS09-MW03	01/23/2001	UG/L	Tetrachloroethylene	15	5
	WATER	SS09-MW03	01/23/2001	UG/L	Trichloroethene	22	5

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M = A matrix effect was present.

Site	Media	Location	Sample Date	Units	Analyte	Detected Concentration	Screening Level
<hr/>							
SS-009							
	WATER	SS09-MW03	01/23/2001	UG/L	Vinyl chloride	6.3	2
ST-005							
	WATER	ST05-MW018	01/24/2001	UG/L	Trichloroethene	420	5
	WATER	ST05-MW03	01/31/2001	UG/L	Trichloroethene	120	5
	WATER	ST05-MW014	01/31/2001	UG/L	Trichloroethene	46	5
	WATER	ST05-MW012	01/31/2001	UG/L	Trichloroethene	39	5
	WATER	ST05-MW020	01/31/2001	UG/L	Trichloroethene	24	5
	WATER	ST05-MW010	01/31/2001	UG/L	Trichloroethene	6.9	5
	WATER	ST05-MW022	01/31/2001	UG/L	Trichloroethene	5.2	5

Qualifier Description

J = The analyte was positively identified, the quantitation is an estimate.

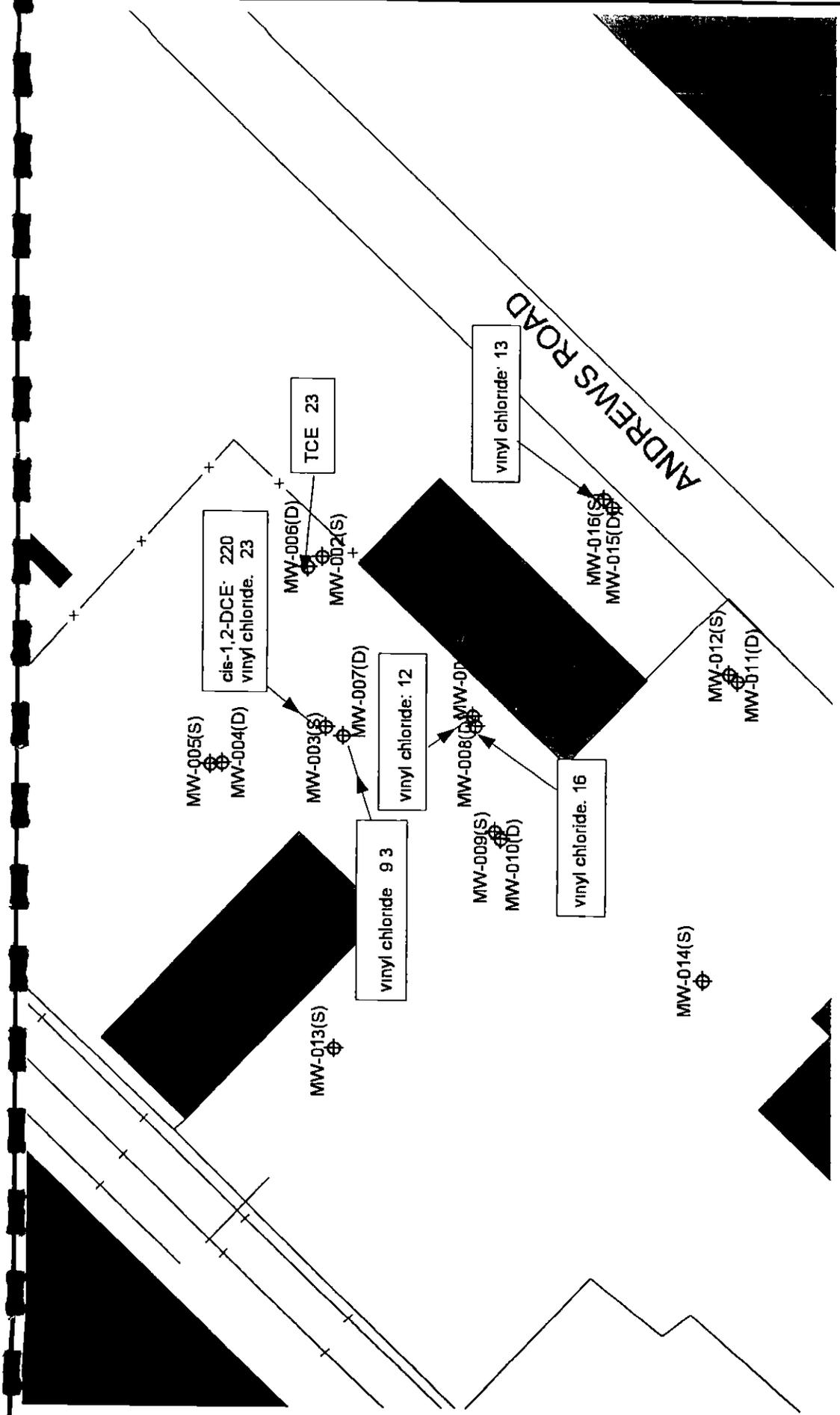
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March 13, 2001

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CH2MHILL **FIGURE 1**

CS 004 - UST 620 A
 COCs > Tier I Screening Levels
 (January, 2001)
 Richards - Gebaur AFB, Kansas City, MO

LEGEND

- ⊕ Monitoring Well Location
- Vinyl chloride 12
- 5620
- Chemical Concentration in ppb
- Building Number
- Existing Building and Structure

80 0 80 160 Feet

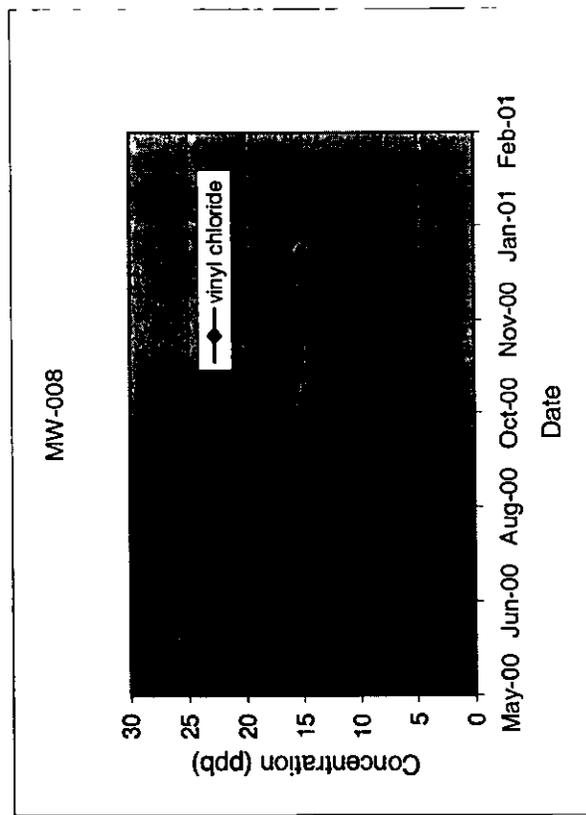
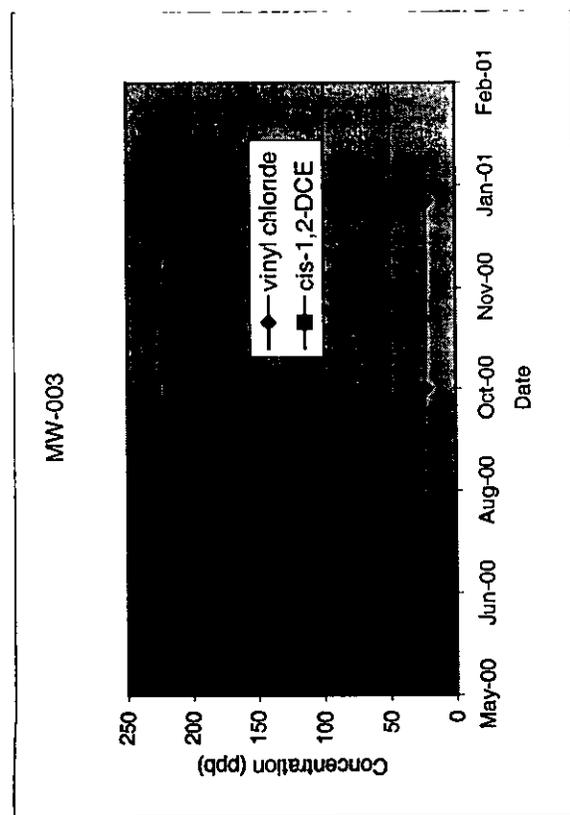
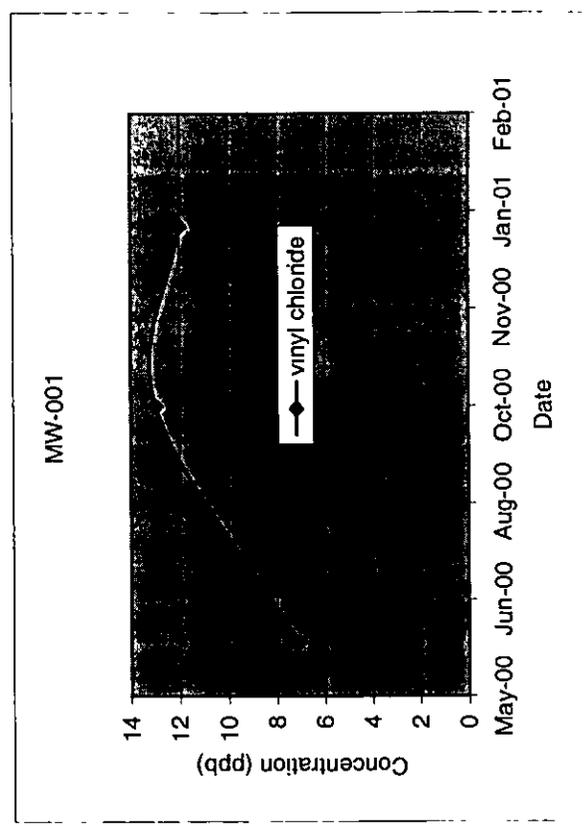
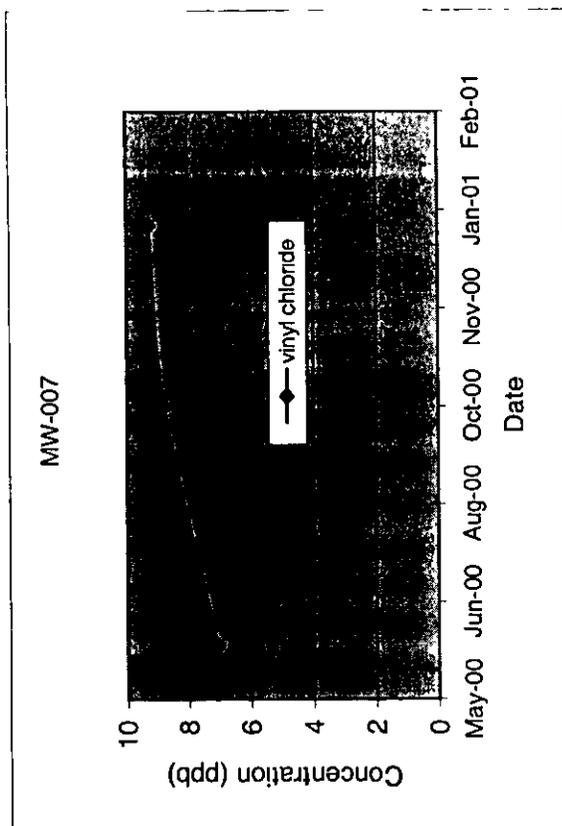


Figure 2: Temporal Trends of COCs in Groundwater at CS 004

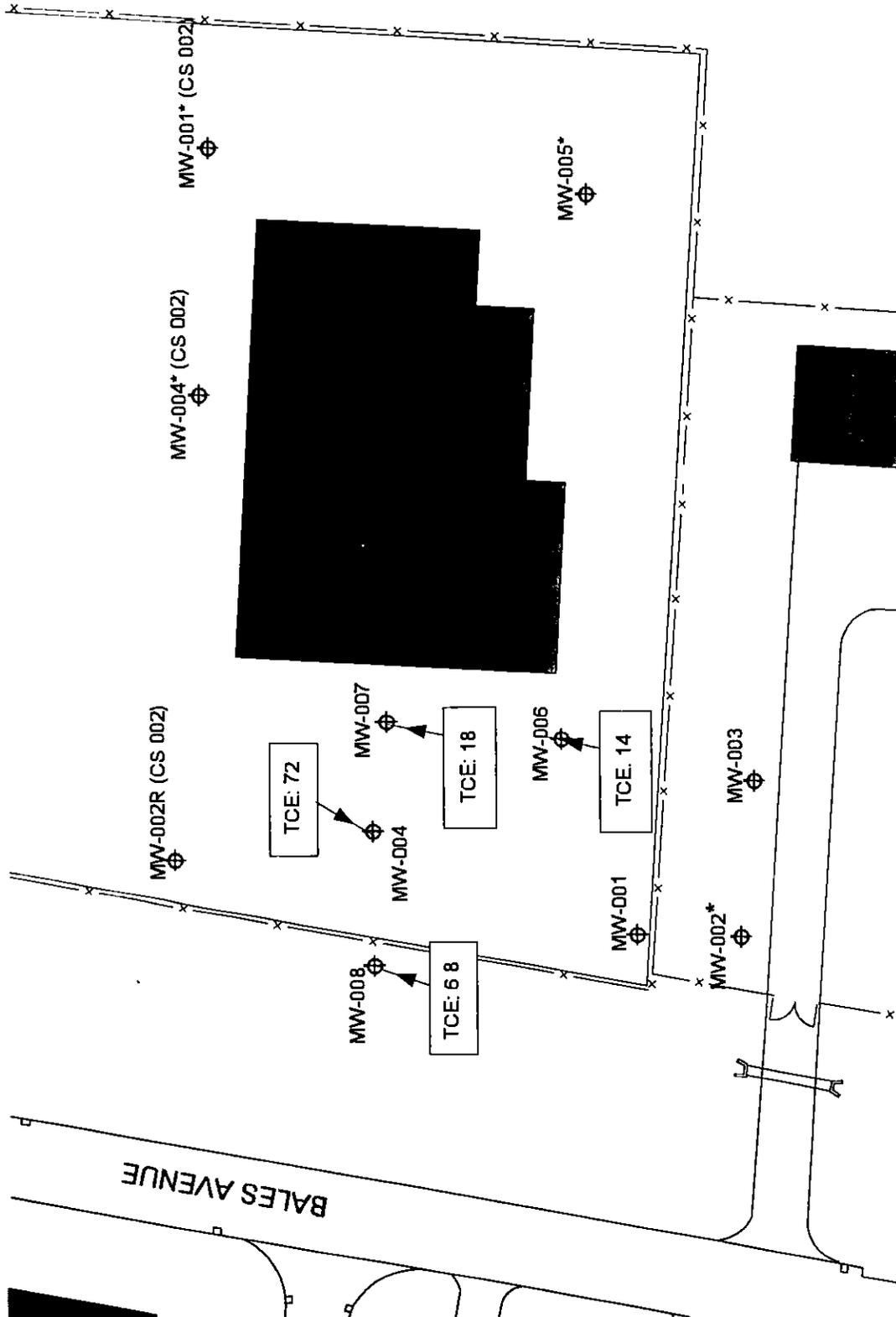


FIGURE 3

SS 003 - Oil Saturated Area
 COC > Tier I Screening Level
 (January, 2001)

Richards - Gebaur AFB, Kansas City, MO



LEGEND

- ⊕ Monitoring Well Location
- TCE: 14 Chemical Concentration in ppb
- P704 Building Number
- █ Existing Building and Structure
- * Well Not Sampled

Best Available Copy

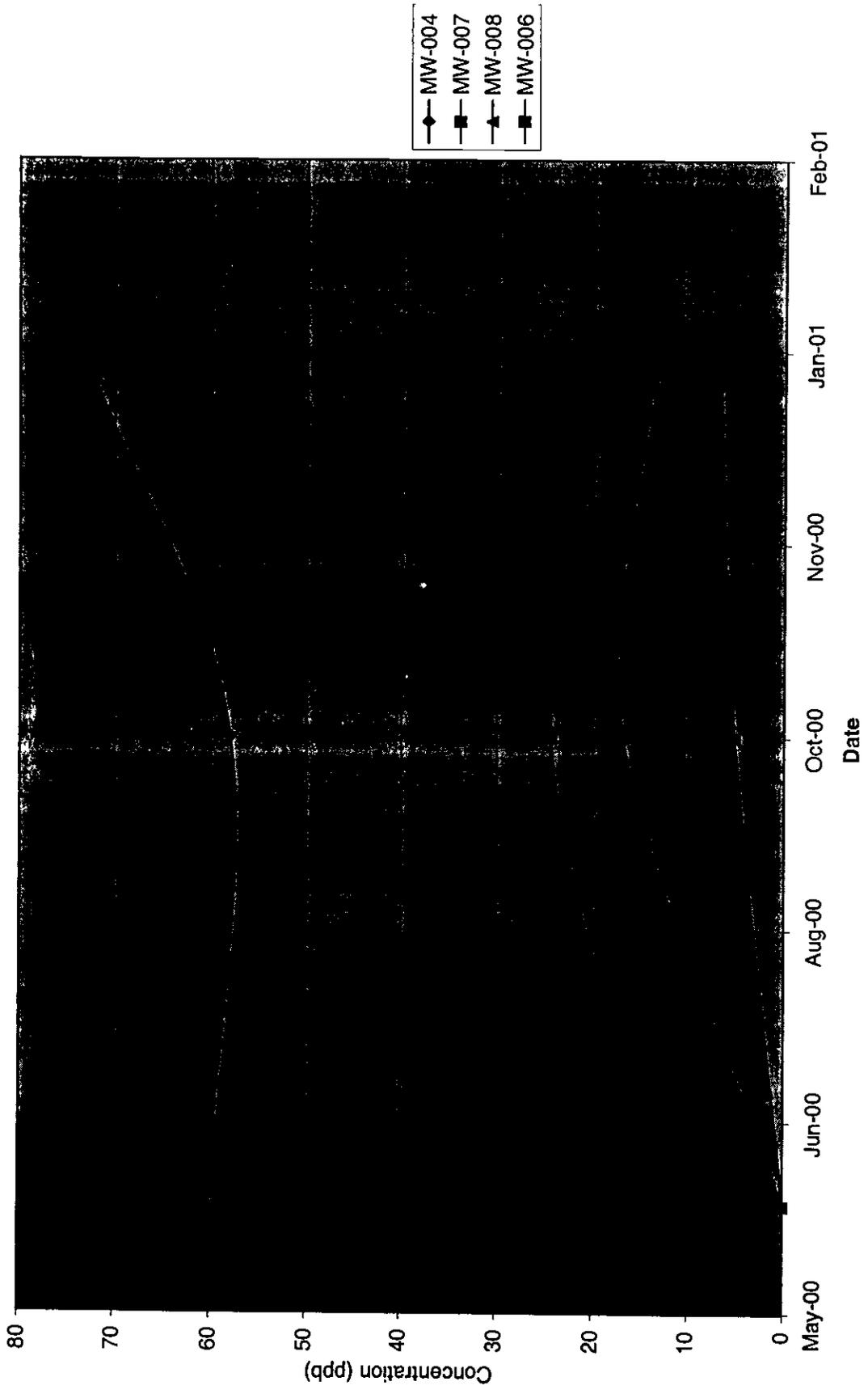
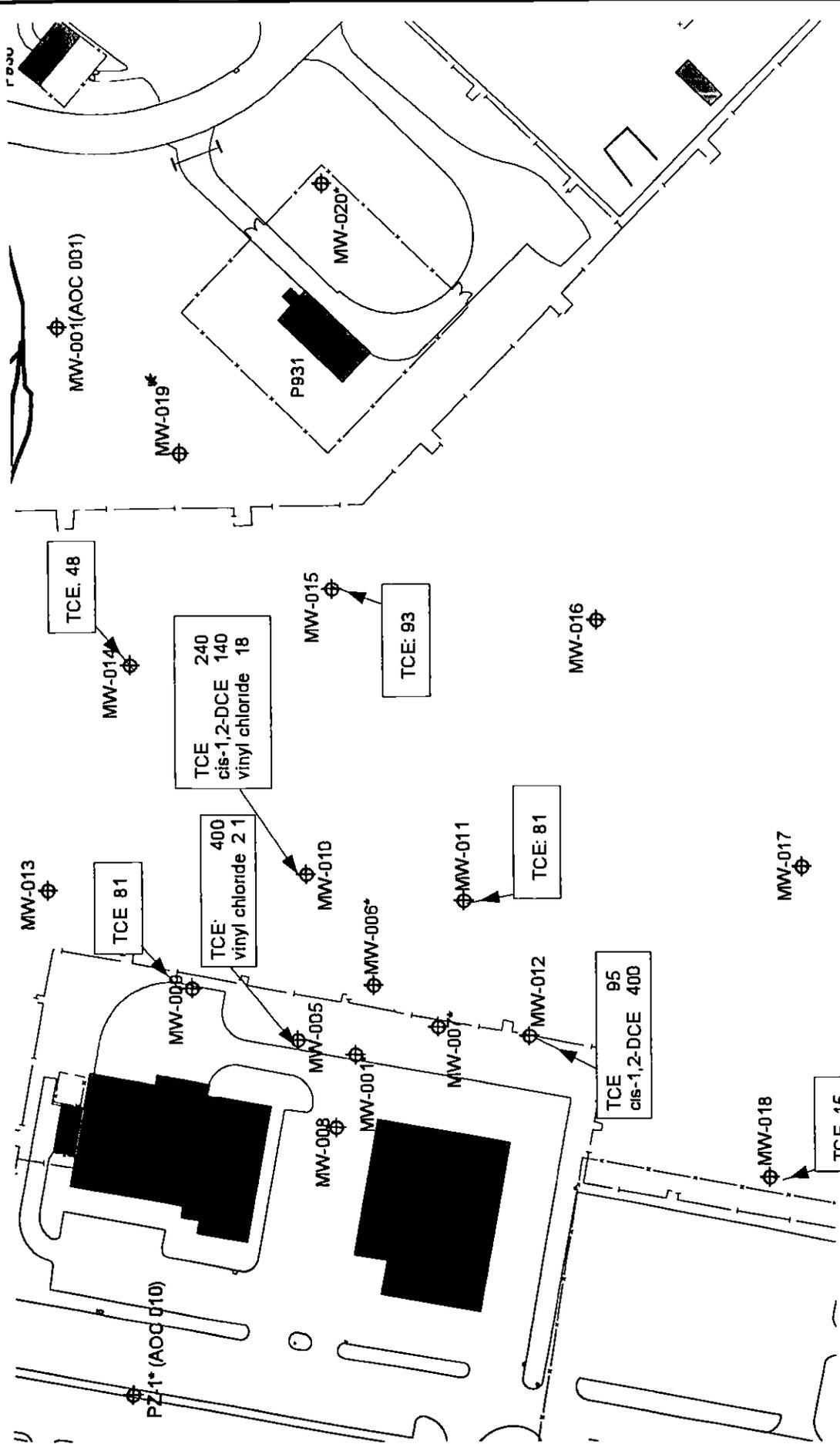


Figure 4: Temporal Trends of TCE in Groundwater at SS 003



CH2MHILL **FIGURE 5**

SS 006 - Hazardous Material Storage Area
 COCs > Tier I Screening Levels
 (January, 2001)
 Richards - Gebaur AFB, Kansas City, MO

LEGEND

- ⊕ Monitoring Well Location
- TCE: 81 Chemical Concentration in ppb
- P930 Building Number
- █ Existing Building and Structure
- * Well Not Sampled

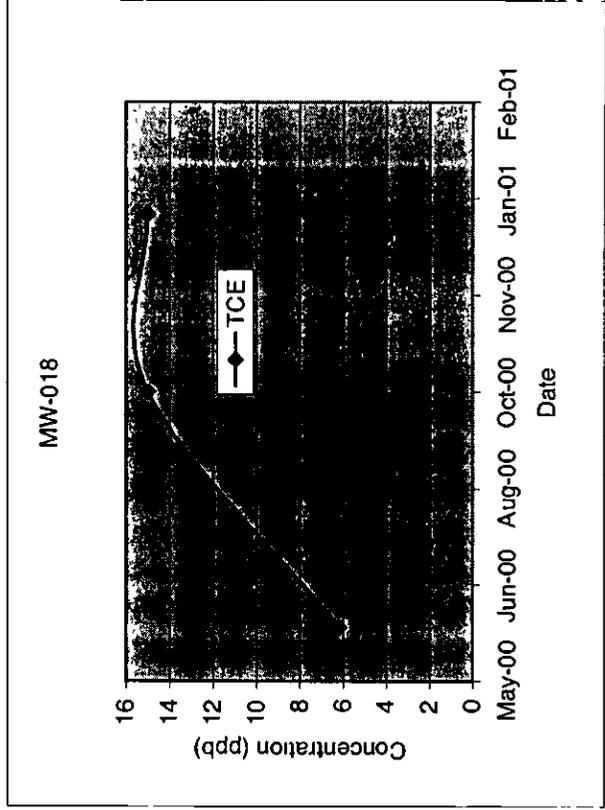
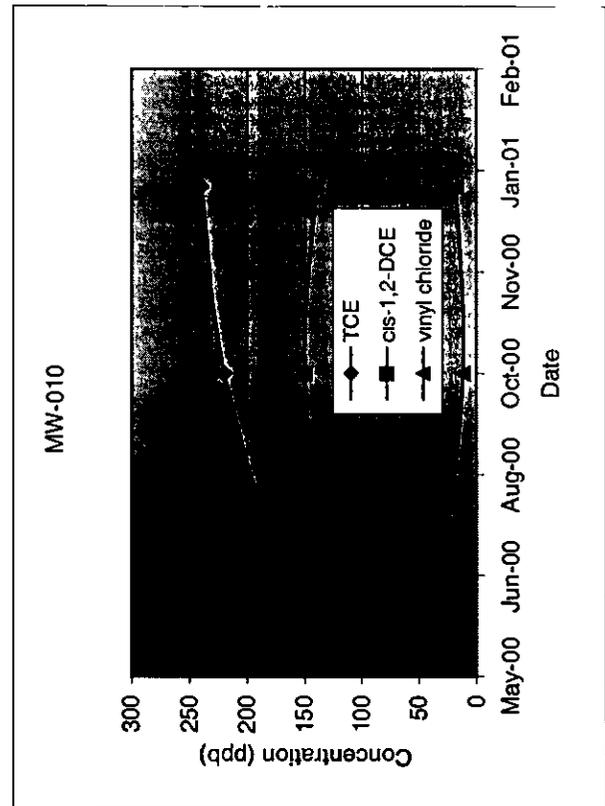
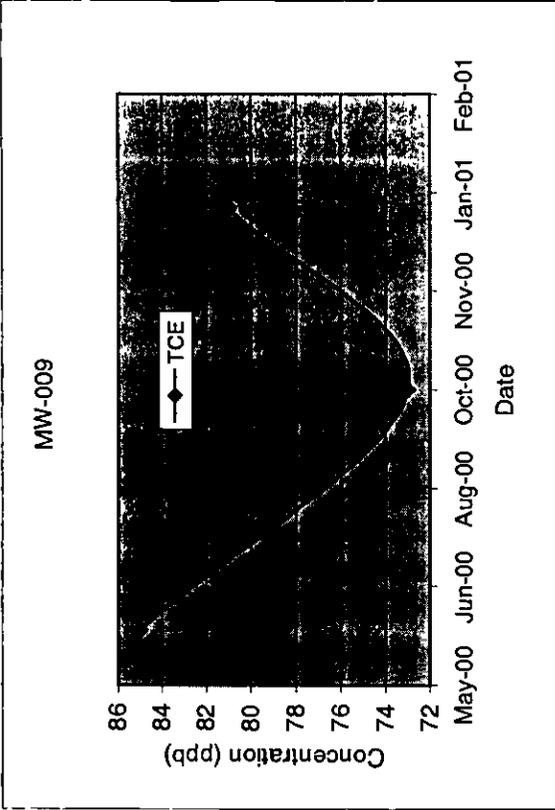
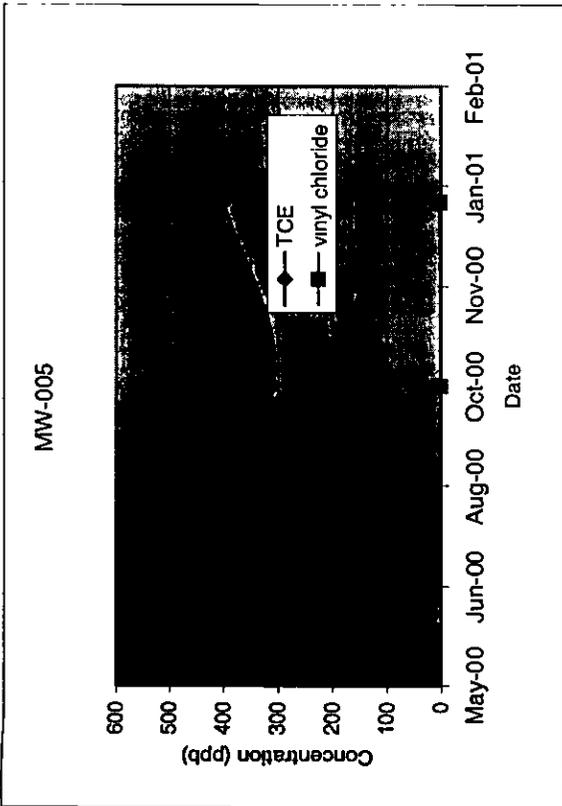
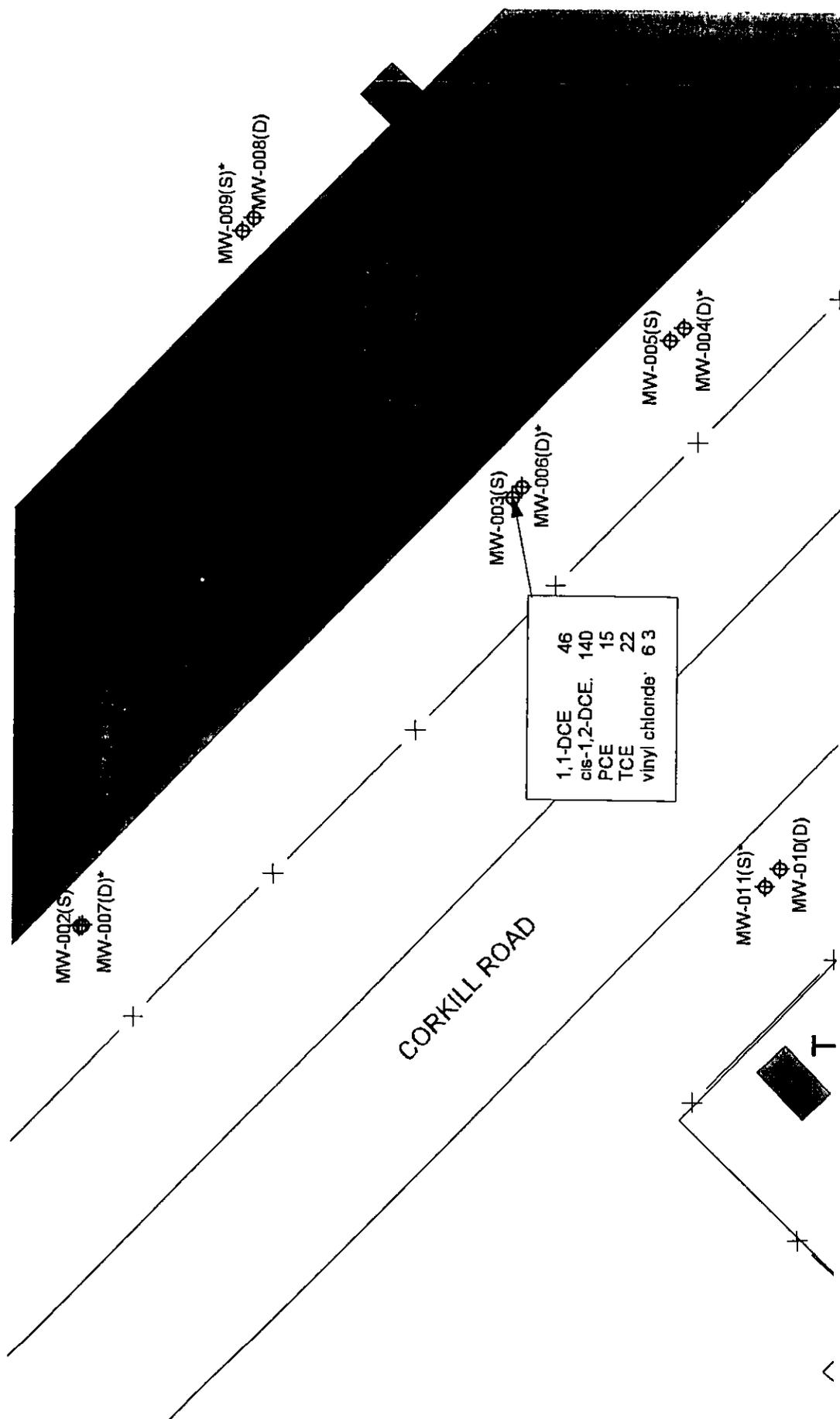
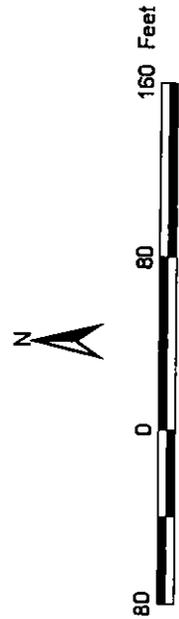


Figure 6: Temporal Trends of COCs in Groundwater at SS 006



CH2MHILL **FIGURE 7**

SS 009 - Fire Valve Area
 COCs > Tier I Screening Levels
 (January, 2001)
 Richards - Gebaur AFB, Kansas City, MO



- LEGEND**
- Monitoring Well Location
 - Chemical Concentration in ppb
 - Building Number
 - Existing Building and Structure
 - Well Not Sampled

Best Available Copy

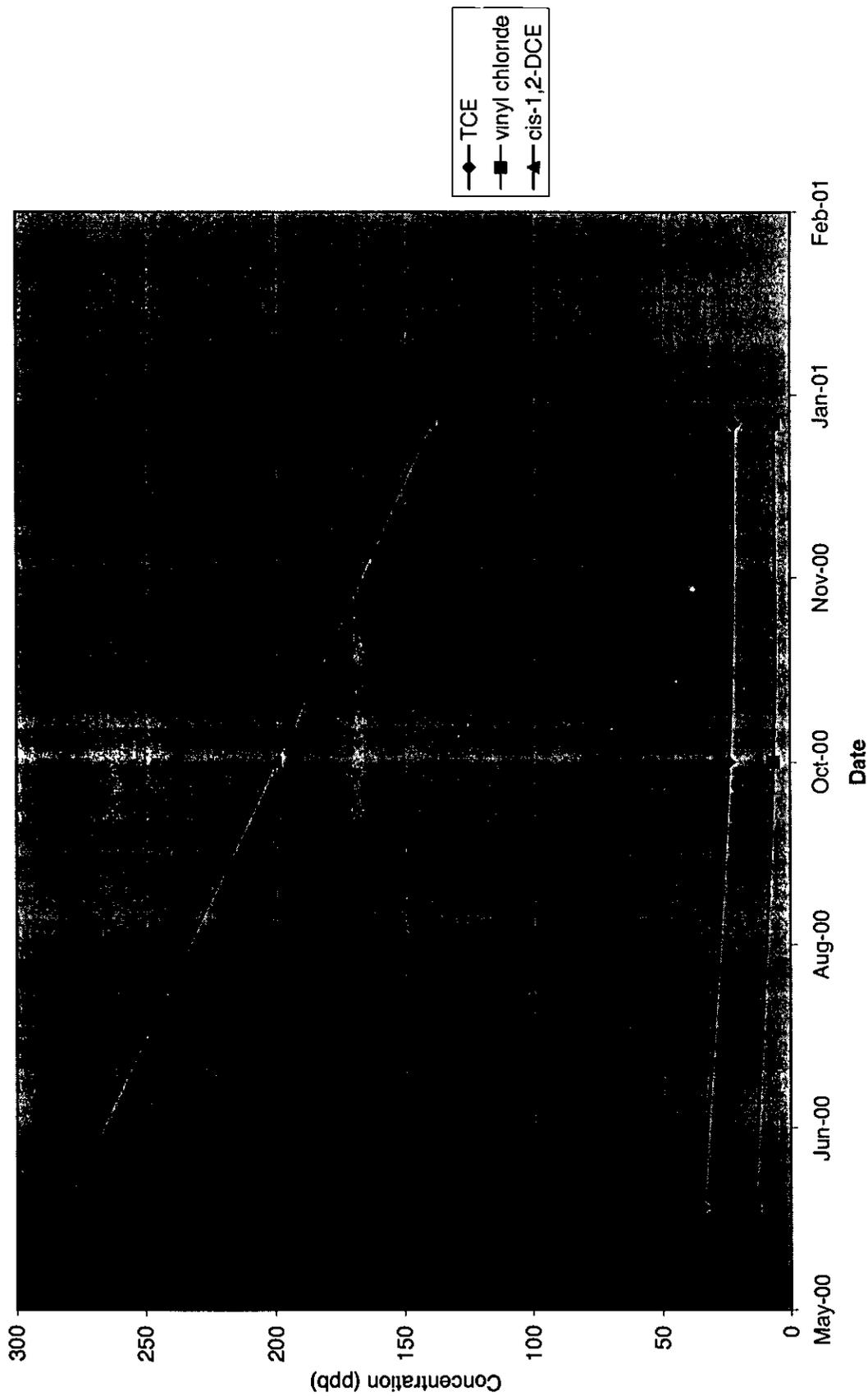


Figure 8: Temporal Trends of COCs in Groundwater at SS 009, MW-003

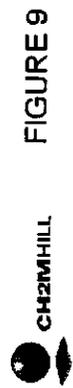
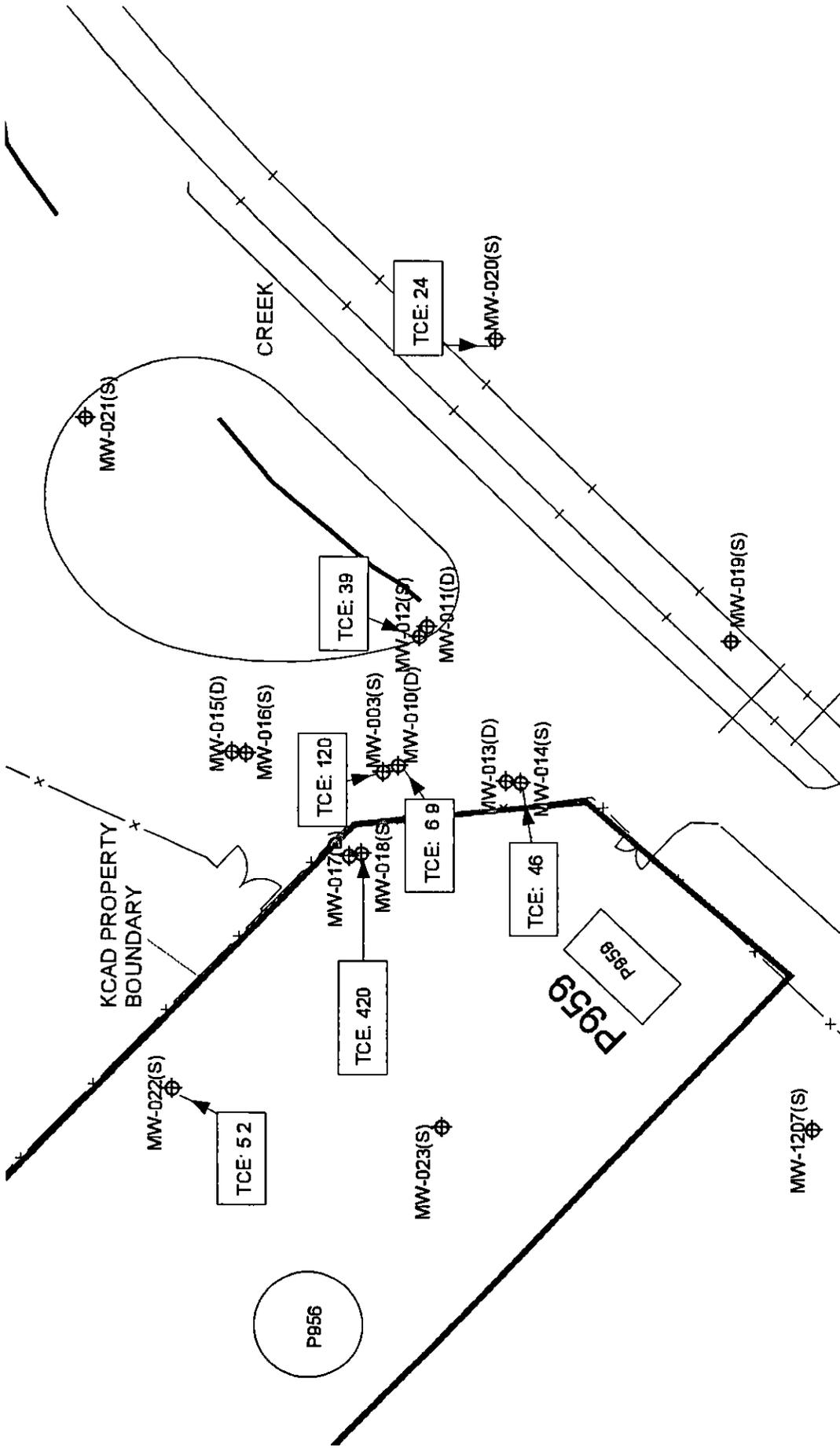


FIGURE 9

ST 005 - POL Storage Yard
 COC > Tier I Screening Level
 (January, 2001)

Richards - Gebaur AFB, Kansas City, MO



LEGEND

- Monitoring Well Location
- Chemical Concentration in ppb
- Building Number
- Demolished Building or Structure

Best Available Copy

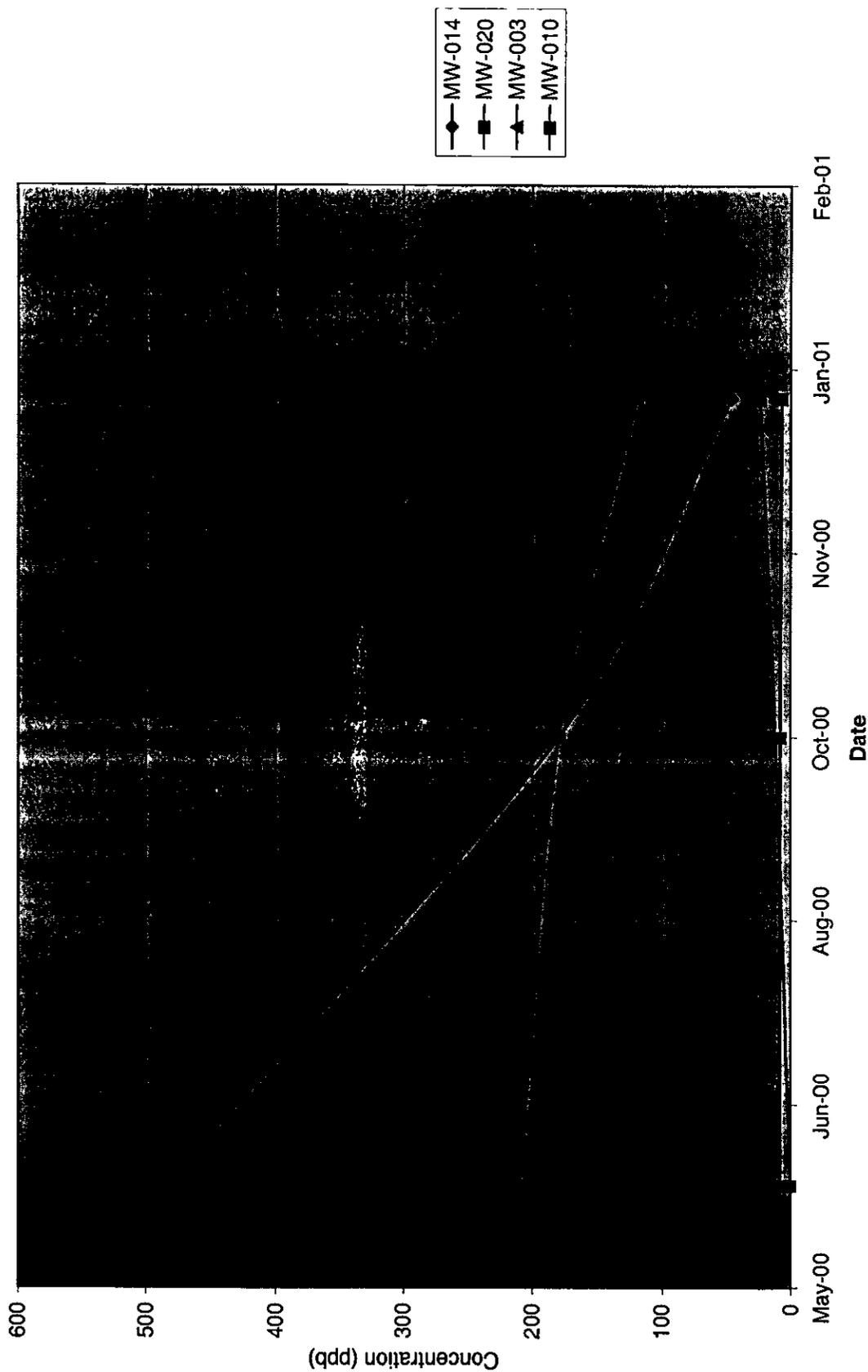


Figure 10: Temporal Trends of TCE in Groundwater at ST 005