May 29, 2009
Project: Cedar Chemical Company Project Number 013636

Mr. Ryan Benefield, P.E.
Arkansas Department of Environmental Quality (ADEQ)
5301 Northshore Drive
North Little Rock, Arkansas 72218

Subject: Response to Comments on the Facility Investigation (FI) Report for Former Cedar Chemical Company Facility (April 22, 2009)
EPA ID Number ARD990660649, AFIN 54-00068

Dear Ryan:

On behalf of Exxon Mobil Chemical Company and Helena Chemical Company, AMEC Geomatrix, Inc., (AMEC) is pleased to provide the Arkansas Department of Environmental Quality (ADEQ) with our response to the above-referenced letter. For clarity, the ADEQ comments are reproduced in *italics*, and our response follows immediately after each comment. A final revised copy of the changed sheets will be submitted once the ADEQ has reviewed, commented and/or approved this response, and all remaining issues have been resolved.

RESPONSE TO COMMENTS

ADEQ Item # 1 – Historical Data Comparison for the Perched Zone – it is stated that "Section 4 of the FIR indicates historical data comparisons were made on the alluvial aquifer presented in Table 11. Were any historical data comparisons made on the perched aquifer?

Response to Item # 1:

As discussed in Section 4.2.3 of the FI report, historical data comparisons were made for compounds that have historically been detected in the Alluvial Aquifer. Historical data comparisons were not made for compounds in the Perched Zone. Because of the limited body of historical data available for Perched Zone wells, AMEC did not believe that the comparison would be as meaningful as the Alluvial Aquifer comparison performed in the FI. In order to respond to the agency's query on this issue, however, we have identified the following Perched Zone wells where sufficient historical data were present to allow such a comparison. These wells are

- 1MW-3 located at the active surface water impoundments;
- 2MW-1 and 2MW-2 located near the former surface impoundments;
- EMW-1 and EMW-4 located in the main parking lot; and
- EMW-6B located in the southeast corner of the facility.

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The historical comparison was performed for the COCs 1,2-dichloroethane (1,2-DCA), 1,2-dichlorobenzene (1,2-DCB), dinoseb, propanil, acetone, chloroform and benzene. Trend versus time plots are provided in Attachment 1 of this response. As shown on the trend plots, since 1993, maximum concentrations of these constituents have declined in all of these Perched Zone wells; many that were present at concentrations above 1000 ug/l have now declined to non-detect.

Although the body of data available for the Perched Zone is not sufficient to support a rigorous analysis, the trends observed in these wells are consistent with the declining trends discussed in the FI for the Alluvial Aquifer. The most likely explanation is the termination of on-going releases. In general, these trends indicate contaminant levels and contaminant mass in the Perched Zone and Alluvial Aquifer have declined significantly since operations concluded at the Facility in 2002.

ADEQ Item #2 – Where is the historical data listed in Table 11 referenced from?

Response to Item # 2:

The data on Table 11 was taken from the Current Conditions Report dated November 2007 and from the FI report dated February 2009. Data presented in the Current Conditions Report was taken from the following sources:

- *Phase I Facility Investigation Report Cedar Chemical Corporation* – 1993, EnSafe
- *Phase II Facility Investigation Report Cedar Chemical Corporation* – 1995, EnSafe
- *Phase III Facility Investigation Report Cedar Chemical Corporation* – 1996, EnSafe.

The Table has been revised to include a reference and is included in Attachment 2

ADEQ Item #3 – Appendix F wells number 1 and 2 appear to be improperly located on the well location map. Well number 2 appears to be on Cedar property and well number 1 is located north of the Norac property.

Response to Item #3:

The original domestic well review was performed by Banks Information Solutions (Banks) of Austin, Texas. Bank's report placed the known wells according to the latitude and longitude provided in the State of Arkansas Reports on Water Well Construction and Pump Installation (State Water Well Reports) and these locations were presented on Figure 5 of the FI Report. To address the ADEQ comment, a field reconnaissance of the well locations was performed and the coordinates for all of the wells were rechecked. This reconnaissance confirmed the ADEQ's observation that the locations based on the State Water Well Reports are incorrect. Based on the new coordinate information Well Number 1 is actually located on the Syrgis property. Well Number 2 is located northwest of the Cedar Chemical Facility on a property owned by a Mr. Mauldin and referred to on East Arkansas Title Maps as property 625-794.

The well on this property is documented as owned by Allen Hargraves. The location of Well Number 6 was corrected, moving from the southeast corner of the Blackhawk property to the northwest corner of that property. As documented in the FI Report, all of the well owners were previously contacted during the FI work, with the exception of Mr. Stephens (well number 10), who was notified of groundwater conditions on his property as a part of earlier investigations.

Figure 5 has been revised and is included in this response.

ADEQ Item #4 – Figure 2 – Suspected Source Areas does not include the former surface water ponds and the current waste water treatment ponds that were mentioned in the report.

Response to Item # 4:

Figure 2 has been revised to include these areas, and is provided in this response.

ADEQ Item #5 – Page 20, 3rd paragraph states that 4-chloroaniline was detected within the drum vault at concentrations ranging from 4.0 to 11.0 mg/kg. Table 6 indicates 4-chloroaniline was detected from 5.0 t0 11.0 mg/kg. Please correct either the narrative or Table 6.

Response to Item #5:

The table is correct. The text has been revised to state the correct information and the corrected text is included in Attachment 3 of this response.

A revised FI Report addressing these comments will be submitted to ADEQ within 10 days following ADEQ's final approval of these comments.

Sincerely yours,
AMEC Geomatrix, Inc.

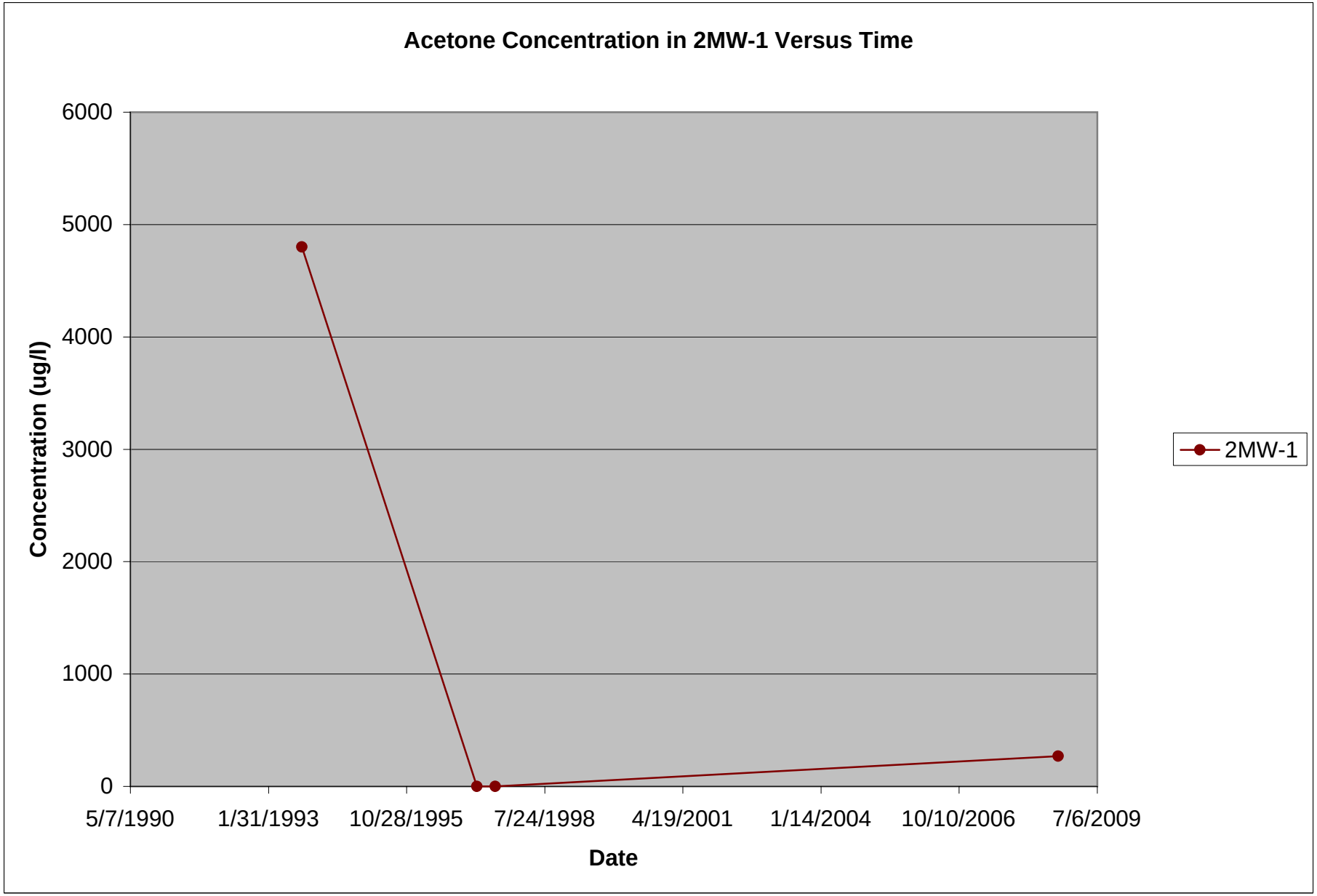
Kelly Beck, P.G.
Sr. Project Manager

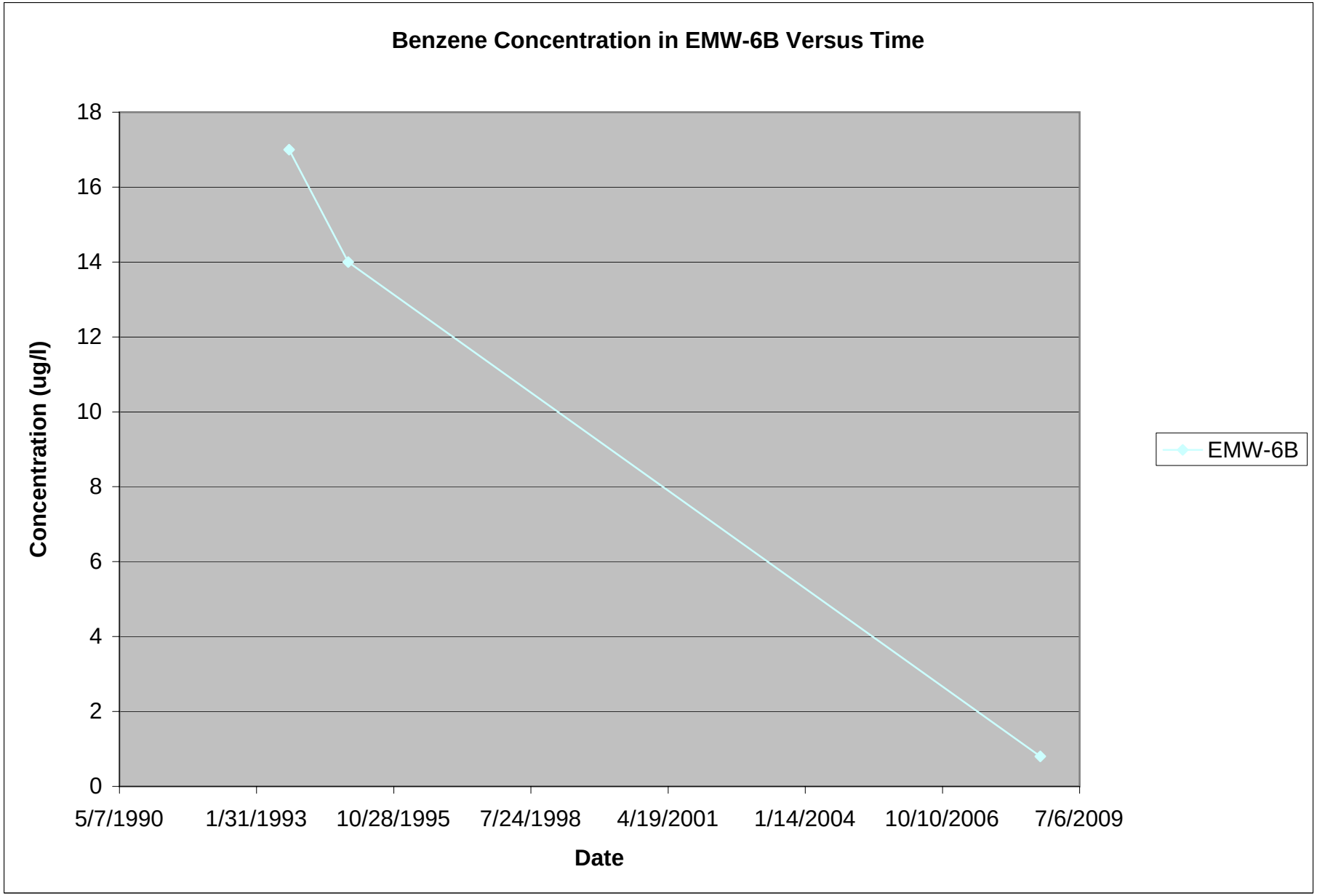
Enclosure: Revised FI Information

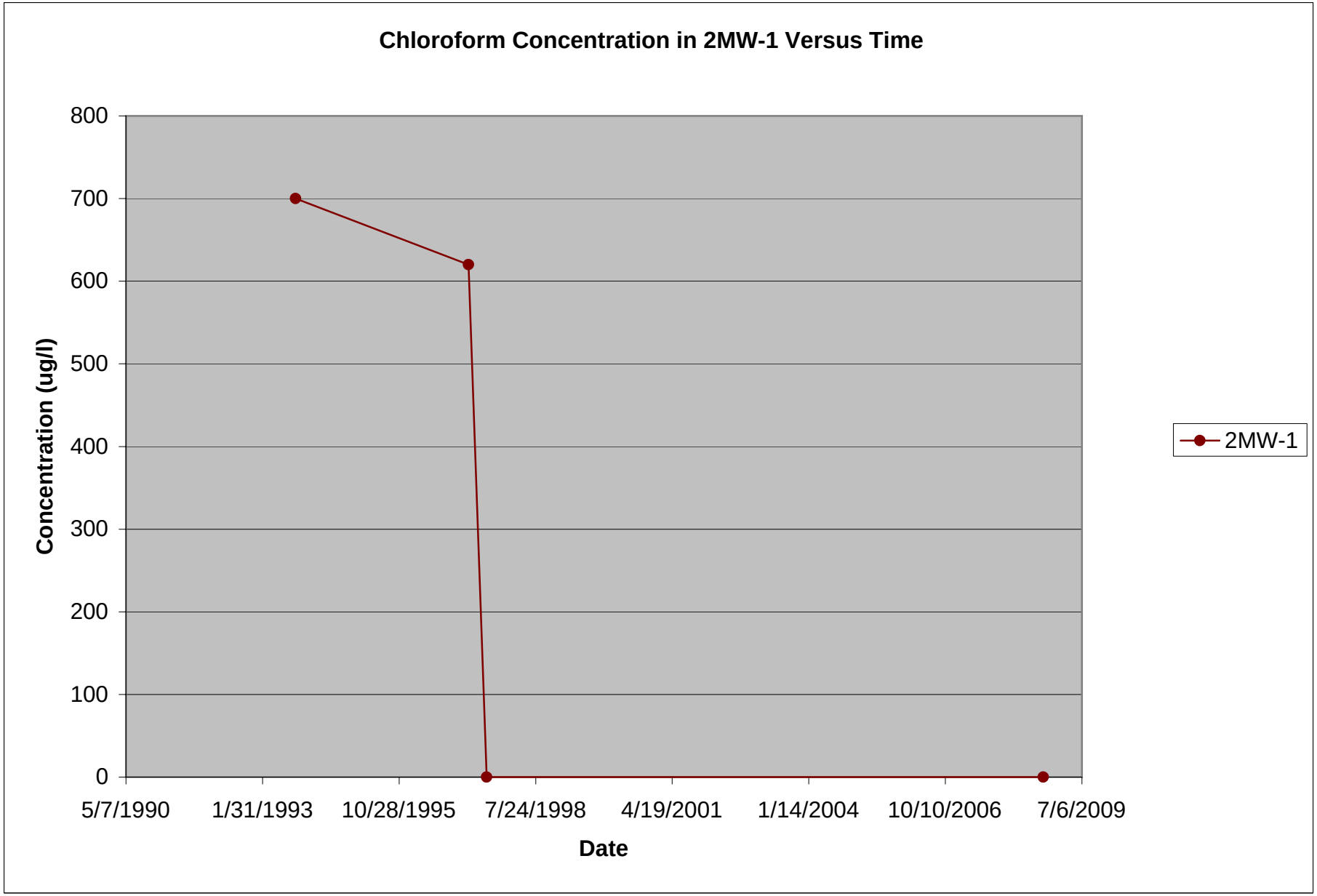
cc: Dave Roberson (DeMaximis, Inc. 2203 TImberloch Place, Suite 2132, The Woodlands, TX 77380
Ed Brister (Helena Chemical Co., 225 Schilling Blvd., Suite 300, Collierville, TN 38017)
Steve Walker (Terra Environmental Services, Inc., 5215 W. Laurel Street, Suite 110, Tampa FL. 33607)
Dave Backus (EnSafe., 5724 Summer Trees Drive, Memphis TN 38134)
Allan Gates (Mitchell Williams Selig Gates & Woodyard, PLLC, 425 West Capitol Ave, Suite 1800, Little Rock, Arkansas.72201-3525)

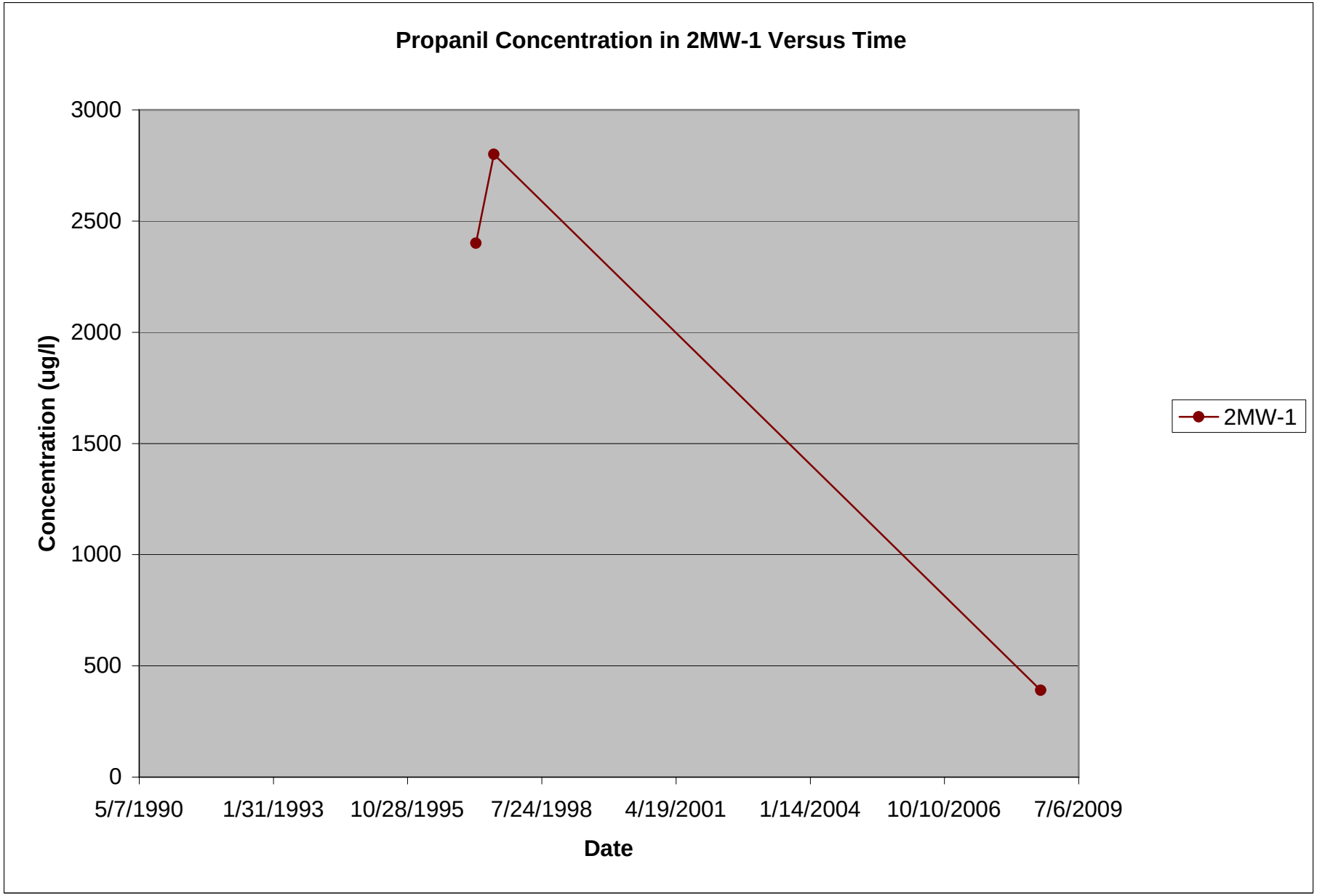
Attachment 1

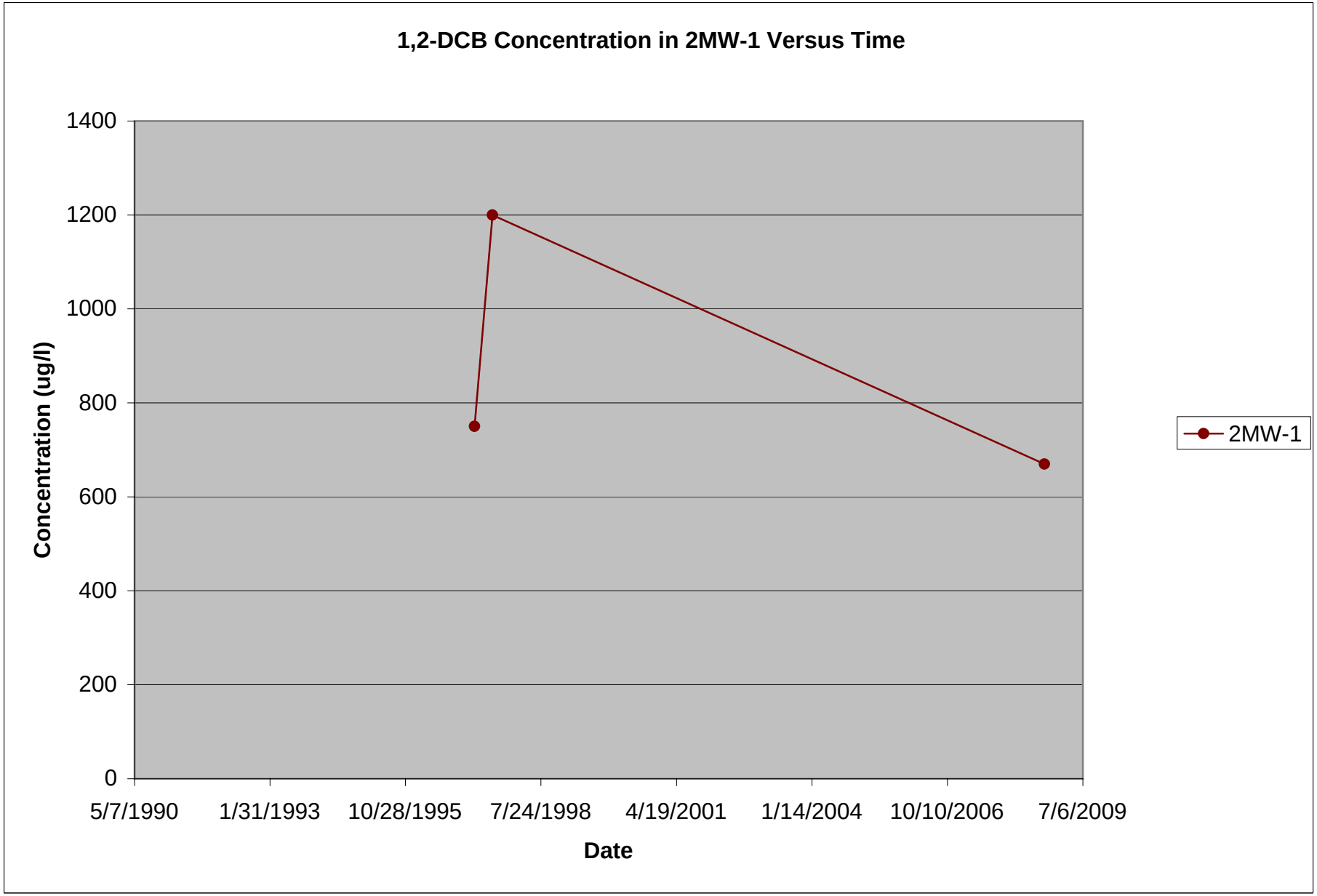
Trend Plots

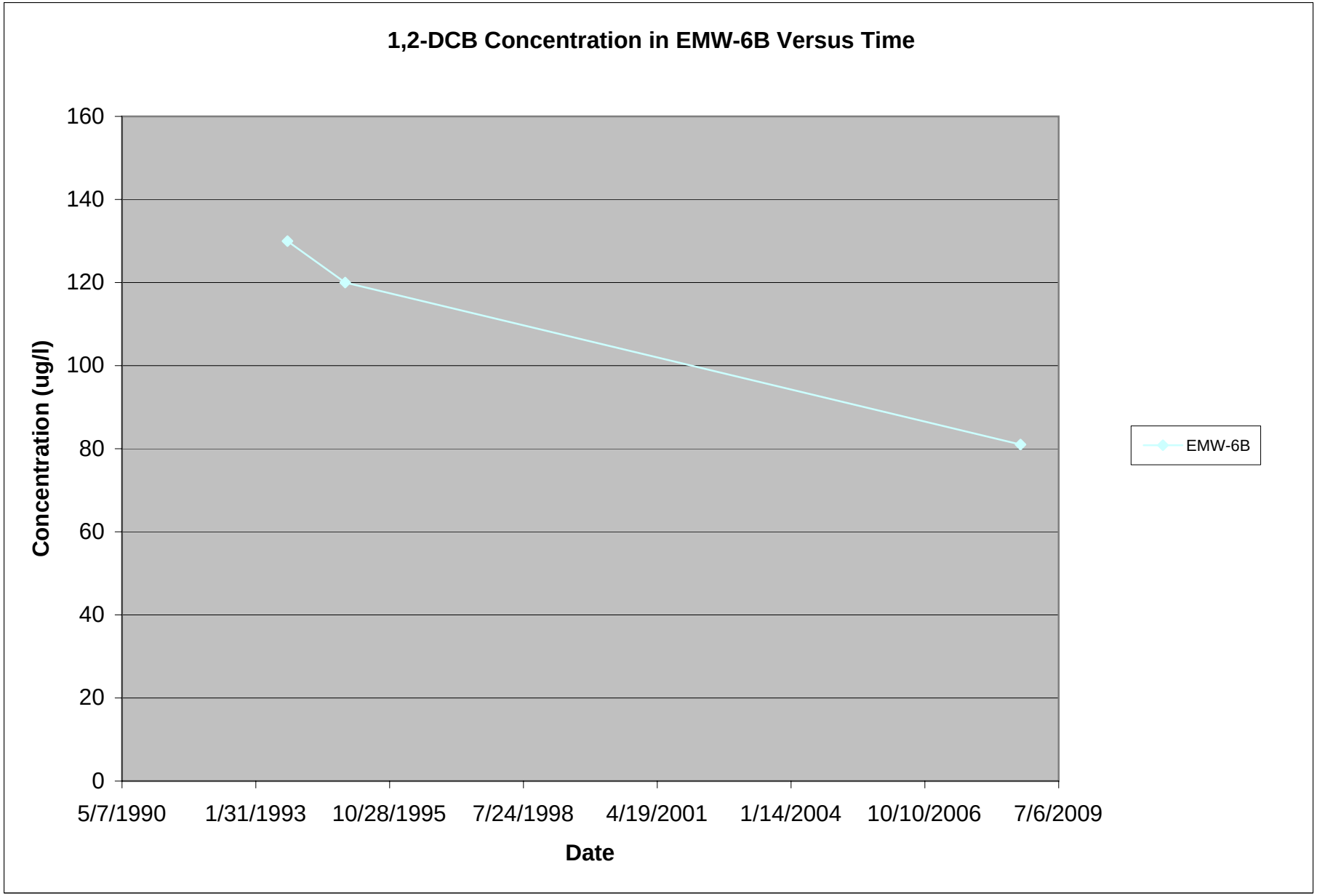

Acetone Concentration in 2MW-1 Versus Time
6000
5000
4000
3000
2000
1000
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

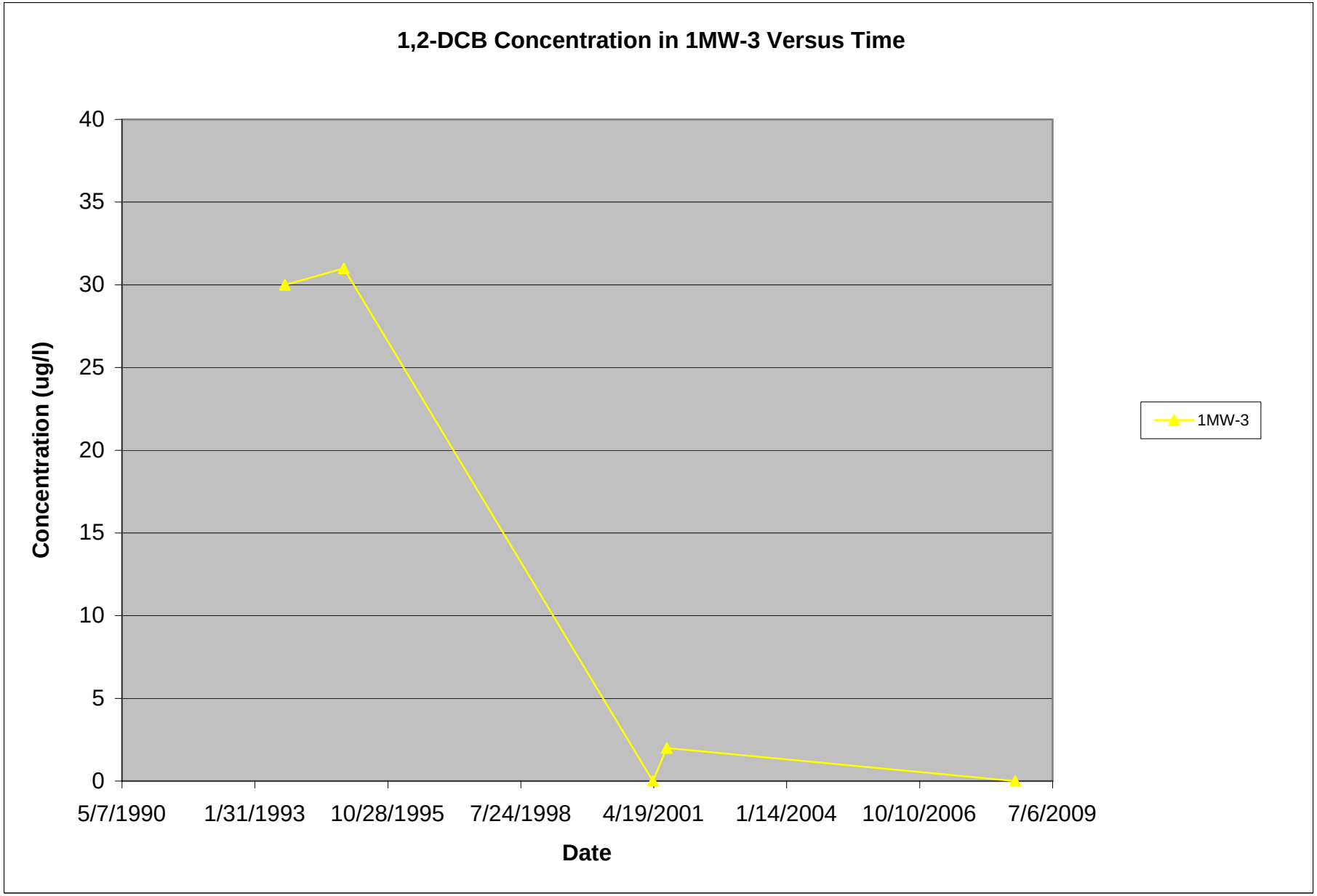

Benzene Concentration in EMW-6B Versus Time
Concentration (ug/l)
18
16
14
12
10
8
6
4
2
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
EMW-6B

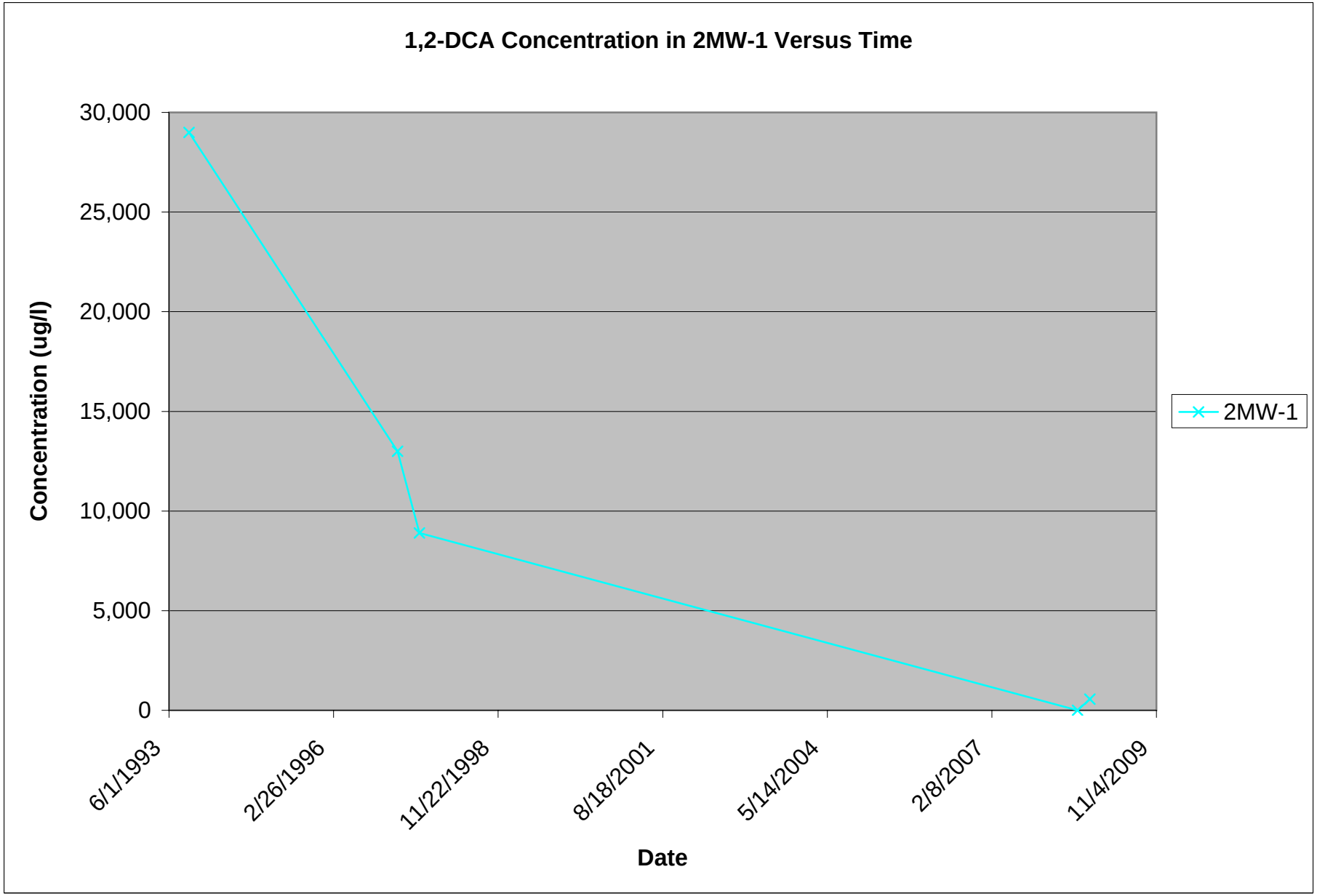

Chloroform Concentration in 2MW-1 Versus Time
800
700
600
500
400
300
200
100
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

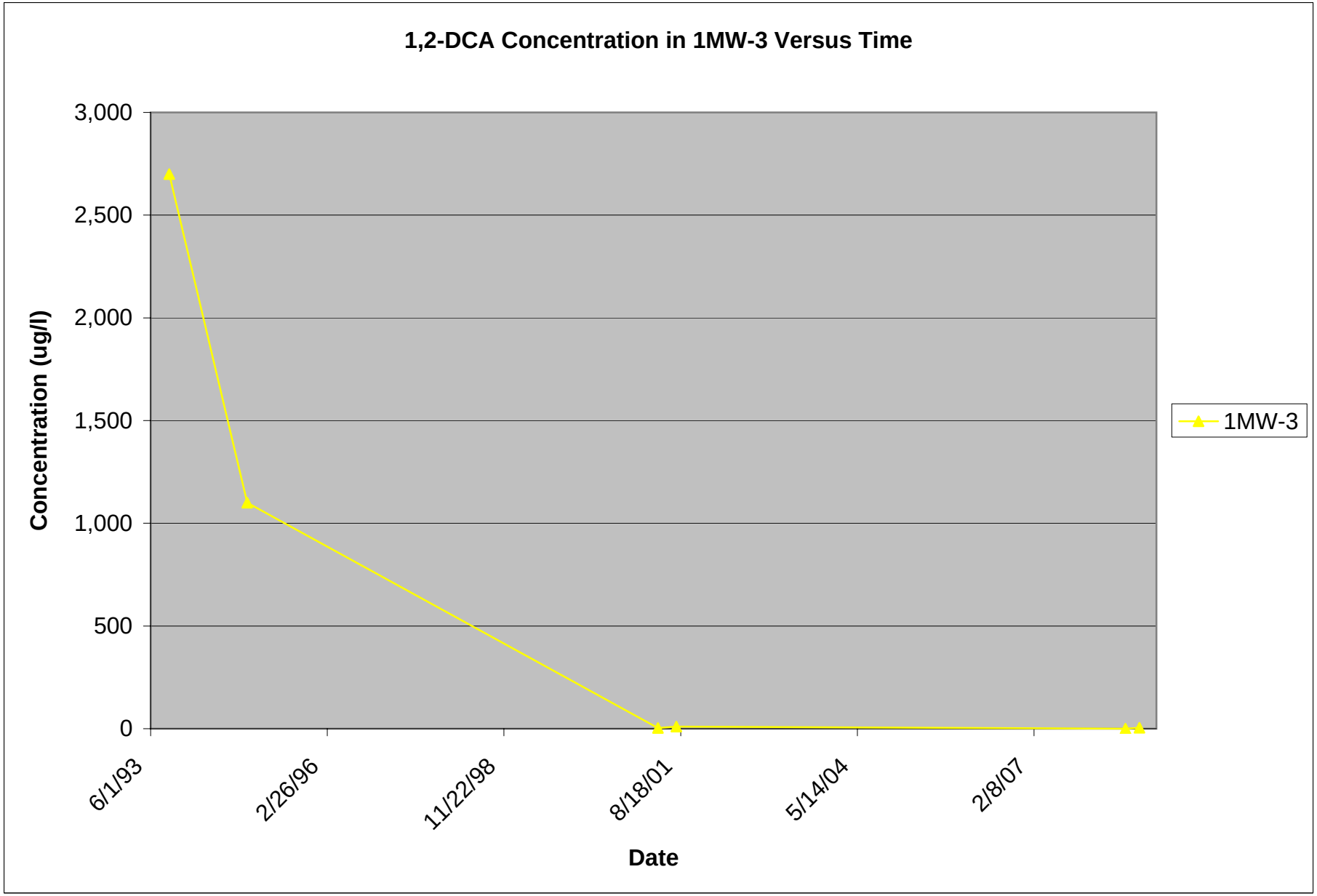

Propanil Concentration in 2MW-1 Versus Time
3000
2500
2000
1500
1000
500
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

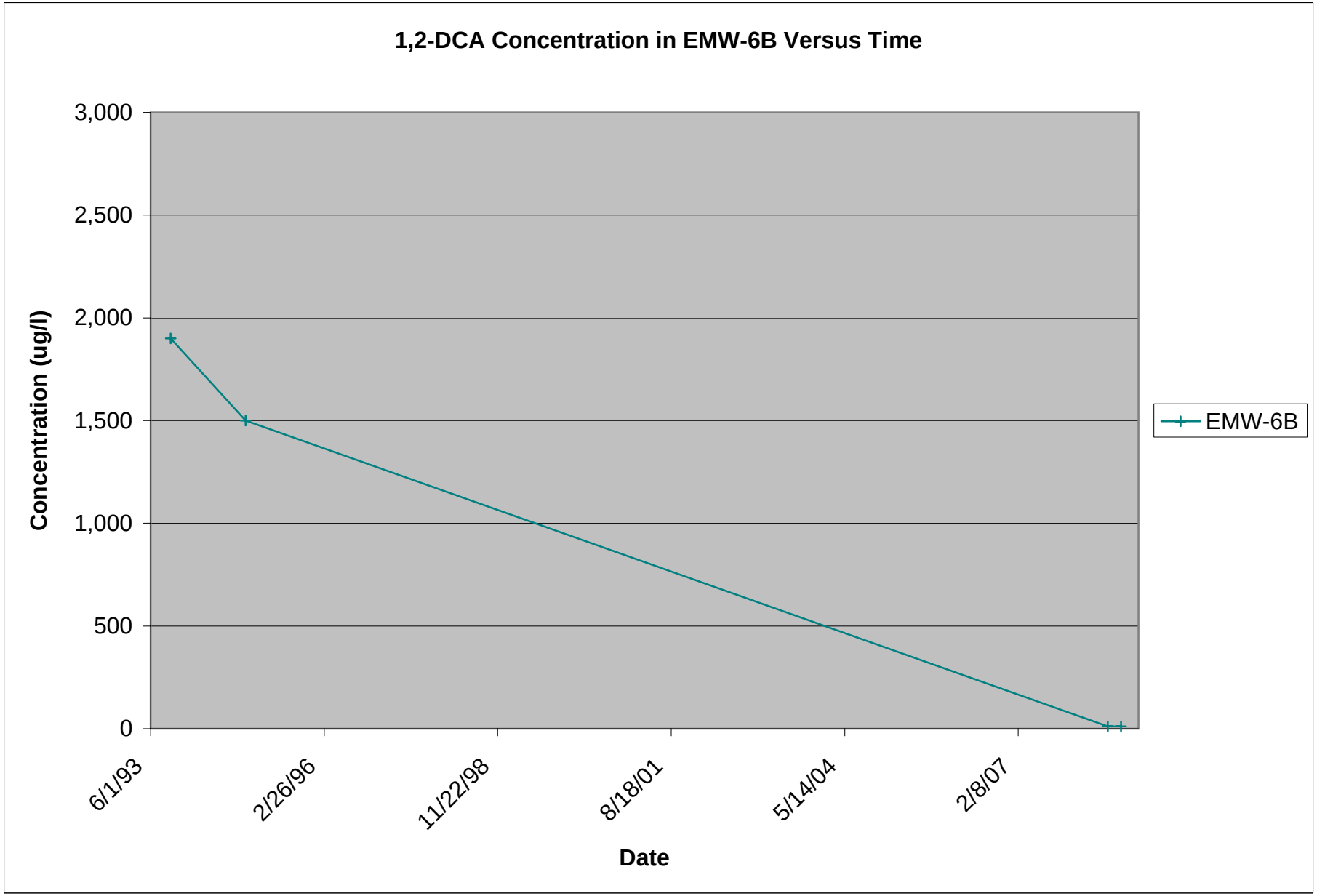

1,2-DCB Concentration in 2MW-1 Versus Time
Concentration (ug/l)
1400
1200
1000
800
600
400
200
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

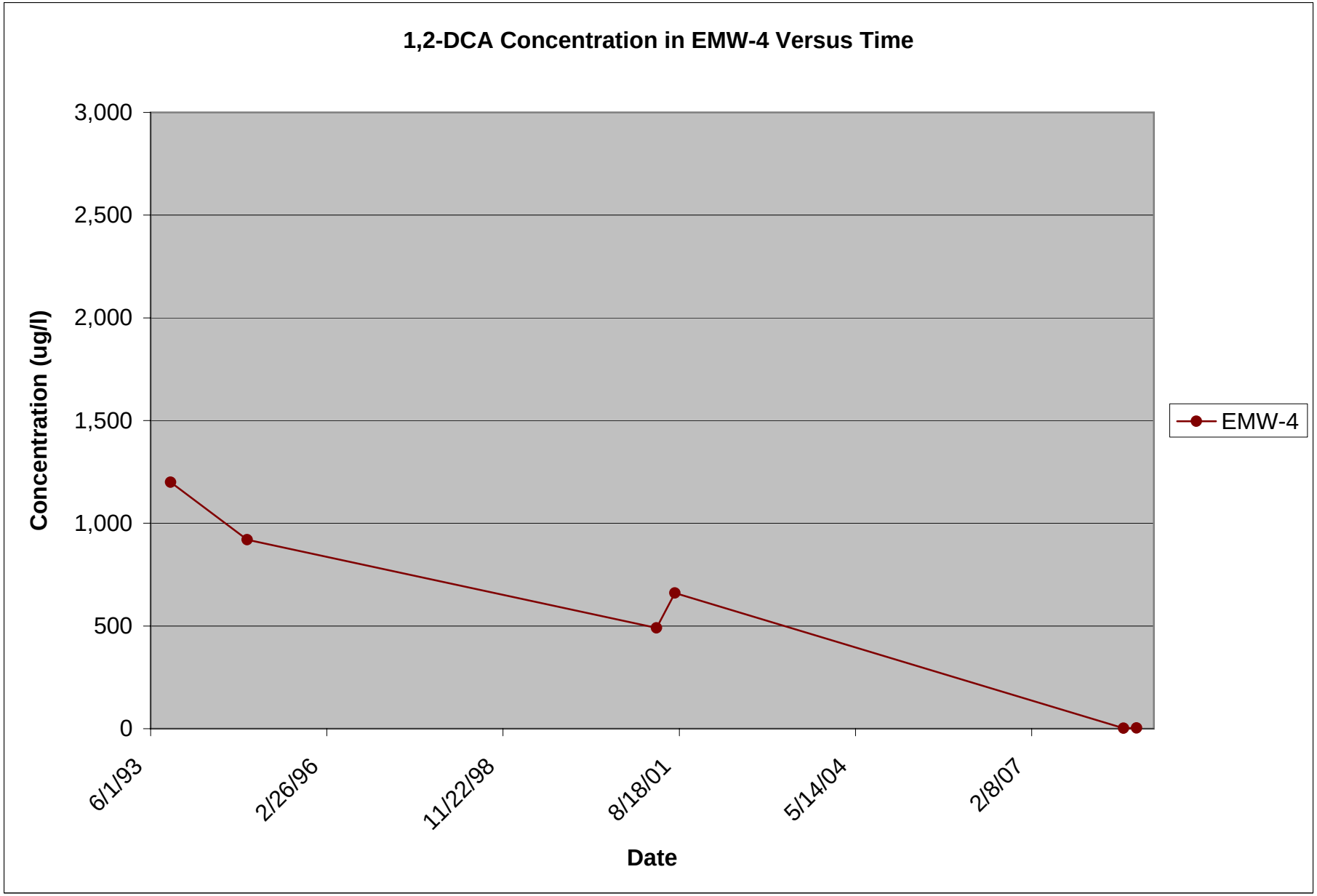

1,2-DCB Concentration in EMW-6B Versus Time
Concentration (ug/l)
160
140
120
100
80
60
40
20
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
EMW-6B

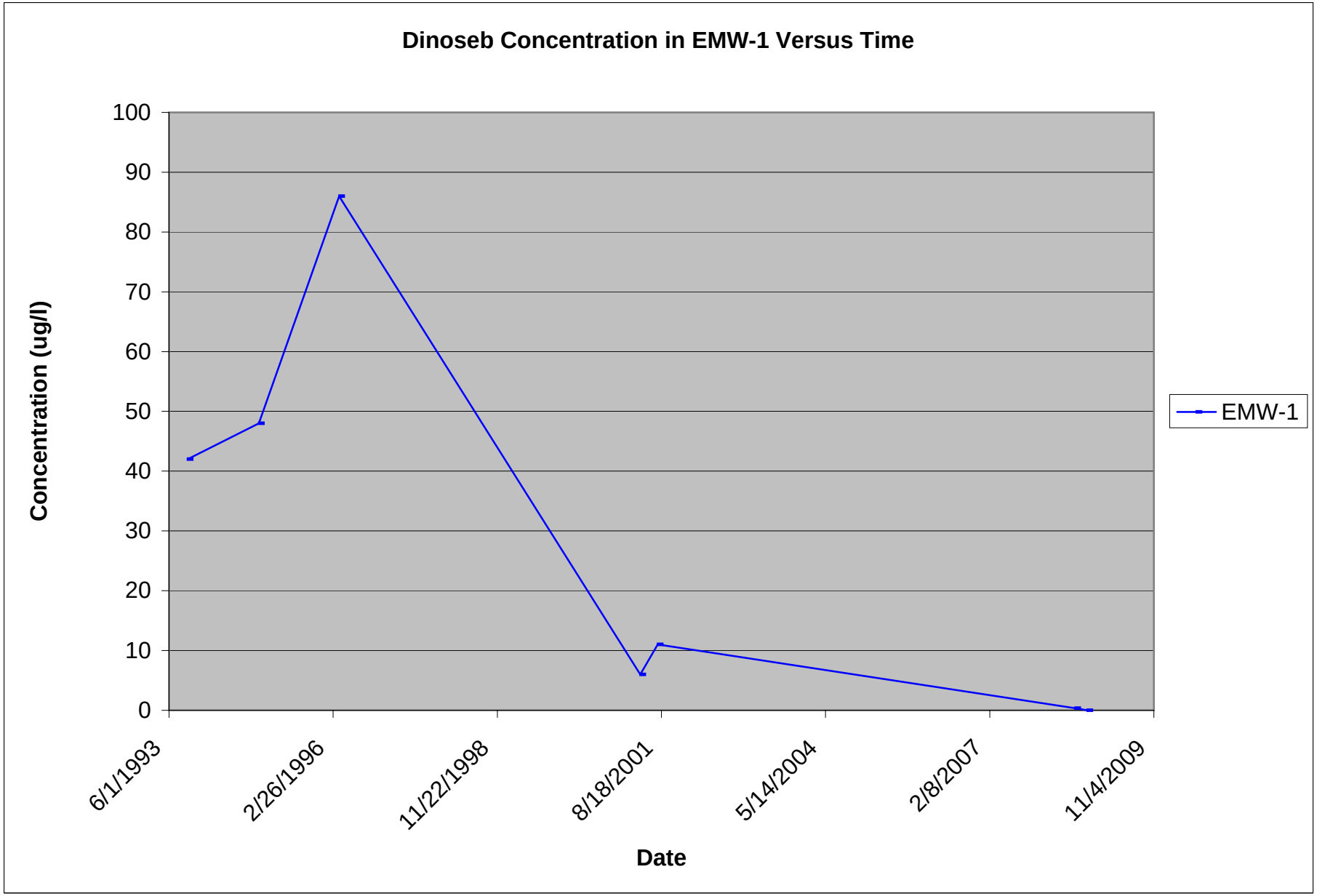

1,2-DCB Concentration in 1MW-3 Versus Time
Concentration (ug/l)
40
35
30
25
20
15
10
5
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
1MW-3

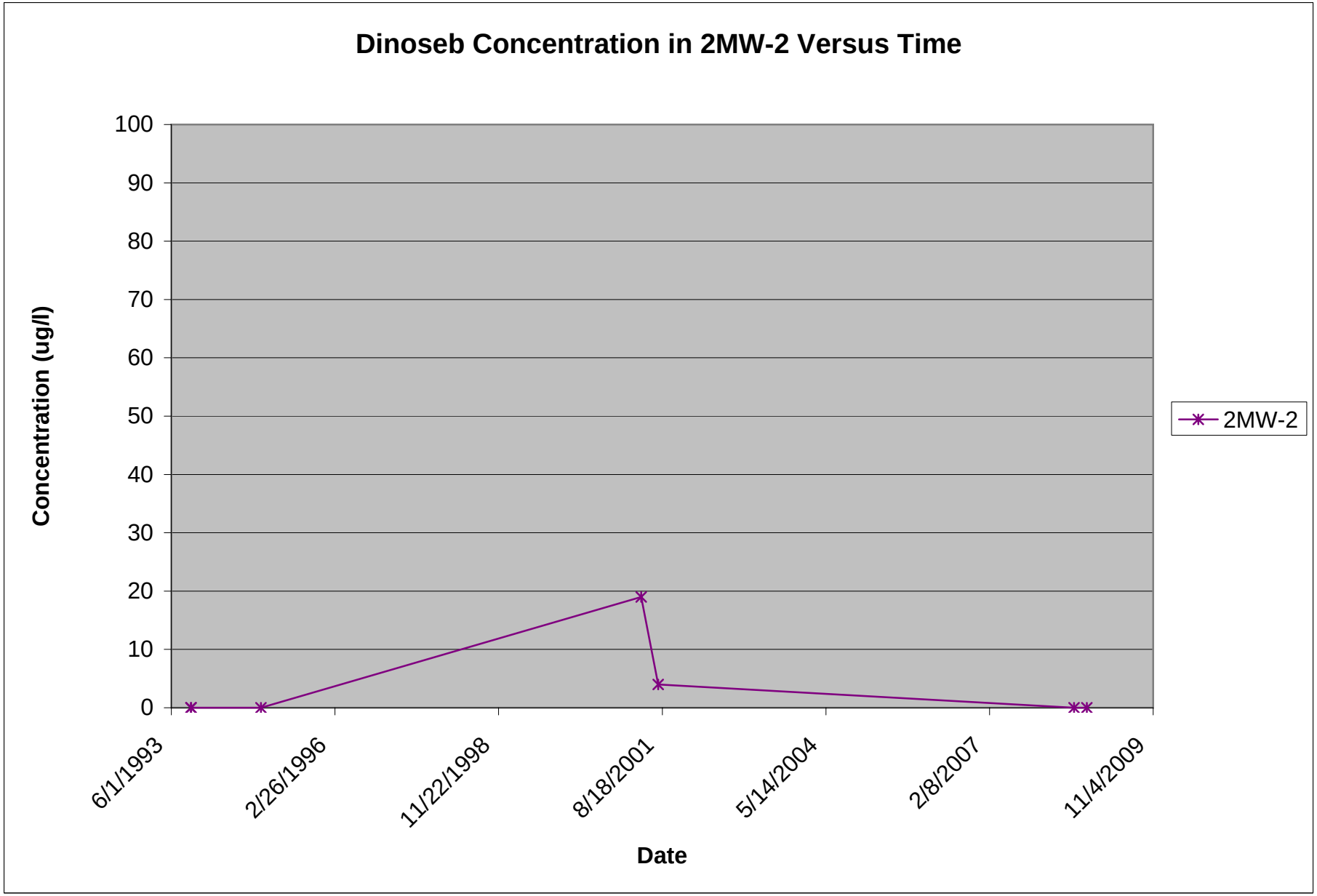

1,2-DCA Concentration in 2MW-1 Versus Time
Concentration (ug/l)
30,000
25,000
20,000
15,000
10,000
5,000
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
2MW-1


1,2-DCA Concentration in 1MW-3 Versus Time
Concentration (ug/l)
3,000
2,500
2,000
1,500
1,000
500
0
6/1/93
2/26/96
11/22/98
8/18/01
5/14/04
2/8/07
Date
1MW-3


1,2-DCA Concentration in EMW-6B Versus Time
3,000
2,500
2,000
1,500
1,000
500
0
Concentration (ug/l)
6/1/93
2/26/96
11/22/98
8/18/01
5/14/04
2/8/07
Date
EMW-6B


1,2-DCA Concentration in EMW-4 Versus Time
Concentration (ug/l)
3,000
2,500
2,000
1,500
1,000
500
0
6/1/93
2/26/96
11/22/98
8/18/01
5/14/04
2/8/07
Date
EMW-4


Dinoseb Concentration in EMW-1 Versus Time
Concentration (ug/l)
100
90
80
70
60
50
40
30
20
10
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
EMW-1


Dinoseb Concentration in 2MW-2 Versus Time
Concentration (ug/l)
100
90
80
70
60
50
40
30
20
10
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
2MW-2

Attachment 2

Table 11

Table 11
Historical Comparison of Detections in Groundwater
Alluvial Aquifer
Cedar Chemical Corporation
Helena-West Helena, Arkansas

CCR[1]		FI[2] (Sept. 08 Data)	
Analyte	**Maximum observed concentration (ug/l)**	**Analyte**	**Maximum observed concentration (ug/l)**
Pesticides/Polychlorinated Biphenyls		**Pesticides/Polychlorinated Biphenyls**	
4,4'-DDT	0.074	~~4,4' DDT~~	
4,4'-DDD		4,4'-DDD	0.041 J
Aldrin		Aldrin	0.053 J
Alpha-BHC	0.07	alpha-BHC	0.01
alpha-Chlordane		alpha-Chlordane	0.0098
Aroclor-1016	0.07	~~Aroclor-1016~~	
beta-BHC		beta-BHC	0.046 J
Dieldrin	0.03	~~Dieldrin~~	
Dinoseb	980	Dinoseb	27
Endrin		Endrin	0.0081
gamma-BHC (Lindane)	0.2	gamma-BHC (Lindane)	0.059 J
Heptachlor	0.2	Heptachlor	0.076 J
Heptachlor epoxide		Heptachlor epoxide	0.098 J
Methoxychlor	0.13	Methoxychlor	0.018
Semivolatile Organic Compounds		**Semivolatile Organic Compounds**	
1,2-Dichlorobenzene	6800	1,2-Dichlorobenzene	1100
1,2-Dichloropropane	0.018	1,2-Dichloropropane	2.1
1,3-Dichlorobenzene	310	1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	11	1,4-Dichlorobenzene	0.96 J
2,4-Dichlorophenol	57	2,4-Dichlorophenol	39
2,6-Dinitrotoluene	13	~~2,6-Dinitrotoluene~~	
2-Chloronaphthalene	13	2-Chloronaphthalene	13
2-Chlorophenol	110	2-Chlorophenol	3.6 J
2-Butanone (MEK)		2-Butanone (MEK)	3.7 J
2-Methylphenol (o-Cresol)	1200	2-Methylphenol (o-Cresol)	41
2-Hexanone		2-Hexanone	13
4-Chloroaniline	8700	4-Chloroaniline	2100 J
4-Methylphenol (p-Cresol)	660	3-Methylphenol & 4-Methylphenol	3.5 J
4-Methyl-2-Pentanone (MIBK)	2500	4-Methyl-2-pentanone (MIBK)	1.2
4-Nitrophenol	250	~~4-Nitrophenol~~	
Benzoic acid	1400	~~Benzoic acid~~	
Benzyl alcohol	110	~~Benzyl alcohol~~	
bis(2-Chloroethyl)ether	180	bis(2-Chloroethyl) ether	41
bis(2-Ethylhexyl)phthalate (BEHP)	31	bis(2-Ethylhexyl)phthalate (BEHP)	300
Carbon disulfide		Carbon disulfide	1.1
Diethylphthalate	1	~~Diethylphthalate~~	
Dimethylphthalate	6.3	~~Dimethylphthalate~~	
Di-n-butylphthalate	6.3	Di-n-butyl phthalate	1.8 J
Fluoranthene	980	~~Fluoranthene~~	
Isophorone	350	Isophorone	1.3 J
Naphthalene	6	~~Naphthalene~~	
Nitrobenzene	4	~~Nitrobenzene~~	
N-Nitroso-di-n-propylamine	740	~~N-Nitroso-di-n-propylamine~~	
Phenol	3200	Phenol	5.4 J
Propanil	700	Propanil	49
Volatile Organic Compounds		**Volatile Organic Compounds**	
1,1,2-Trichloroethene		1,1,2-Trichloroethene	0.53 J
1,1,2-Trichloroethane	27	~~1,1,2-Trichloroethane~~	
1,2,4-Trichlorobenzene		1,2,4-Trichlorobenzene	5.7 J
1,1-Dichloroethane	1.4	1,1-Dichloroethene	1.3
1,2-Dichloroethane	92000	1,2-Dichloroethane	19000
1,2-Dichloropropane	43	~~1,2-Dichloropropane~~	
3,4-Dichloroaniline		3,4-Dichloroaniline	17000
Acetone	2000	~~Acetone~~	
Aniline		Aniline	18
Benzene	810	Benzene	21
Bromodichloromethane	6.1	~~Bromodichloromethane~~	
Bromoform	11	~~Bromoform~~	
Chlorobenzene	470	Chlorobenzene	310
Chloroethane	170	Chloroethane	11
Chloroform	340	Chloroform	0.43
Chloromethane	55	Chloromethane	1.7 J
Ethylbenzene	2000	Ethylbenzene	2.4
Methylene chloride	2000	Methylene chloride	0.8 J
o-Xylene	2000	o-Xylene	0.49
Toluene	760000	Toluene	0.71 J
trans-1,2-Dichloroethene	32	~~trans-1,2-Dichloroethene~~	
Trichloroethene	10	~~Trichloroethene~~	
Vinyl acetate	10	~~Vinyl acetate~~	
Vinyl chloride	40	Vinyl chloride	10

~~analyte:~~ Detected in CCR but not in FI
analyte: Detected in FI but not in CCR
compound that has decreased in maximum concentration in the FI
[1]CCR Data is from the Current Conditions Report, dated November 2007.
[2]FI Data is from the Facility Investigation Report, dated February 2009.

Attachment 3

Text Change

Volatile and Semi-Volatile Organic Constituents

The VOCs and SVOCs observed in soils include scattered low detections of acetone and methylene chloride. These compounds have historically been observed in trip and field blanks. This observation, and experience at other sites would suggest that at least some of the detections of these compounds in soil are likely artifacts of sampling and/or analytical procedures. Despite this, concentrations in certain soil samples and in Perched Zone groundwater are too high to be explained as laboratory or sampling artifacts, and both these compounds were believed to have been utilized at the Facility. Acetone and methylene chloride are therefore included as COCs for the Facility.

Organochlorine Pesticides in Soils

Organochlorine pesticides, (aldrin, alpha-BHC, beta-BHC, chlordane, dieldrin, endrin, gamma-BHC [lindane], methoxychlor) were detected in surface and subsurface soils throughout the facility at locations in the Process Areas, in backfill from samples collected within the Drum Vault, and in a few background samples above a regulatory standard.

Backfill samples collected from two locations within the Drum Vault contained only one pesticide, 4-chloroaniline. The concentration of this COC ranged from 5.0 to 11 mg/kg. The water sample collected from Test Hole #1 in the Drum Vault contained several pesticides and herbicides. These included 4-chloroaniline (47000 ug/l), dinoseb (350 ug/l), and propanil (2800 ug/l). Soil and water analytical results from the Drum Vault are presented in Tables 6 and 7.

Metals in Soils

Soils were analyzed for a range of metals at most of the DPT locations. These were compared to values observed in background sampling locations. In general, metal concentrations observed in on-site soils were consistent with the ranges observed in off-site soils that are not believed to be affected by historical Facility operations.

One exception would be the detections of arsenic observed in soils from DPT-3, DPT-10 (near former Process Unit 3) and DPT-30, near the Facility Maintenance Building. The observed arsenic concentrations (ranging from 32.3 to 128 mg/kg) although relatively low, are well above observed background concentrations. This suggests there may have been minor localized releases of an arsenic source material in these areas. It is also possible, however, that these may be a relict of routine pesticide application around building exteriors at the Facility.

Figures

EXPLANATION

Suspected Sources Area

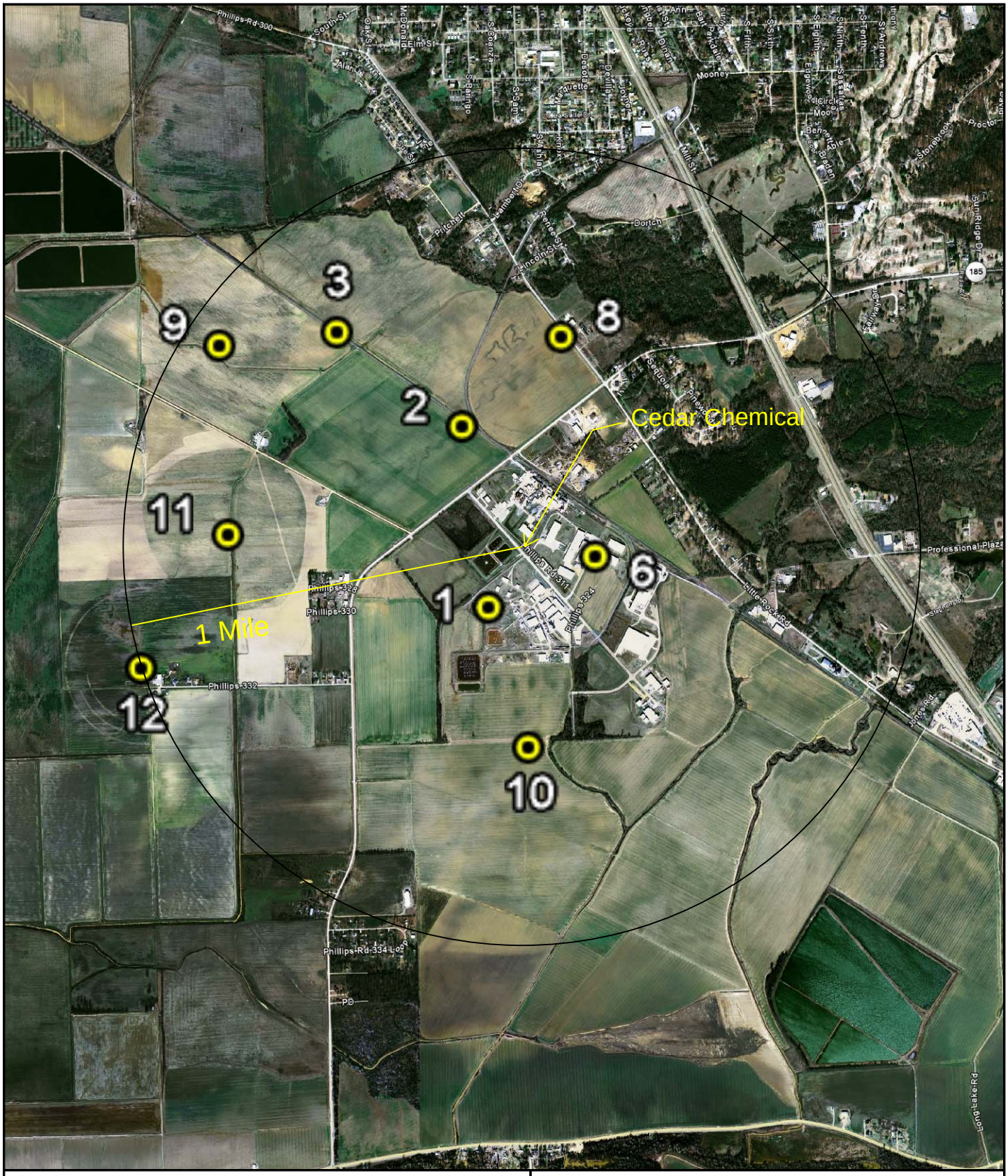
0 75 150
Approximate Scale in Feet

Suspected Source Areas

Cedar Chemical
Helena - West Helena, Arkansas

By: MLS	Date: 1/5/09	Project No. 13636
AMEC Geomatrix		Figure 2

Plot Date: 05/26/09 - 9:26am, Plotted by: mike.schofield
Drawing Path: I:\13636 - Arkansas Helena-West Helena\FIGURES\, Drawing Name: Source Locations.dwg



SOURCES: Ground verification performed by EnSafe on 5/6/09 and 5/8/09, Google Earth Pro

0 1800

APPROXIMATE SCALE IN FEET

Domestic Well Locations
Within a One-Mile Radius

Cedar Chemical
Helena-West Helena, Arkansas

AMEC Geomatrix | Project 13636 | Figure 5

I:\13636 - Arkansas Helena-West Helena\2007 CCR\FINAL FIGURES\ FIG 1 Site Location Map\FIG 1.dwg