August 12, 2010

Mr. George Heitzman, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7017

Re: **New York State Electric & Gas Plattsburgh Bridge Street Former MGP Site**
Site No. 5-10-016
Index No. DO-0002-9309
Review of Groundwater Monitoring Results and Trend Analysis

Background

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Electric and Gas Corporation (NYSEG) entered into an Order on Consent (D0-0002-9309) on March 30, 1994 (the Order). Under this Order, NYSEG agreed to investigate and remediate 33 former MGP sites in New York State. The remedial investigation (RI) of the Plattsburgh-Bridge Street former MGP site was completed under the Order. The *Remedial Investigation Report (RIR)*, dated January 15, 2004 presented the findings of the RI. In 2001, during the RI, NYSEG conducted an interim remedial measure (IRM) to locate the former gas holder and remove it as well as impacted soil at and near the site. The NYSDEC approved the *RIR* on January 20, 2004 and prepared a *Proposed Remedial Action Plan (PRAP)* for public review and comment. Following the public comment period, the NYSDEC issued its *Record of Decision (ROD)* in March 2004 that outlined the remedial plan for the site. As specified in the *ROD*, NYSEG prepared an *Operation, Maintenance, & Monitoring Plan (OM&M Plan),* which the NYSDEC approved on August 17, 2004.

In accordance with the *OM&M Plan*, NYSEG is required to conduct well inspections, water level measurements, Non-Aqueous Phase Liquid (NAPL) observations, and bedrock groundwater sampling from nine bedrock-monitoring wells (MW-1B, MW-2B, MW-3B, MW-6B, MW-7BS, MW-7BD, MW-9B, MW-10B, and MW-11B) on an annual basis. Monitoring reports were submitted to the NYSDEC after each annual event. Figure 1 depicts the site location and Figure 2 depicts the monitoring well locations along with a potentiometric surface map for the bedrock aquifer from groundwater elevation data collected during the December 2009 sampling event. As indicated in the ROD, the monitoring program and the effectiveness of the remedy can be re-evaluated after the third year. The ROD indicates that the monitoring interval could be extended if site groundwater conditions are improving and the site remedy is physically secure.

URS Corporation-New York (URS) conducted a review of the existing groundwater data for statistical trends and to determine if site groundwater conditions are improving. URS prepared graphs for all nine bedrock monitoring wells displaying concentration versus time for total benzene, toluene, ethylbenzene, and xylenes (BTEX); total polycyclic aromatic hydrocarbons (PAHs); total cyanide; and total phenols. In addition, a Mann-Kendall statistical trend analysis was conducted on the existing data set and the results are summarized on Table 1 and discussed below.

Concentration Versus Time Graphs

The concentrations of analytes were plotted versus time for the nine bedrock monitoring wells, for total BTEX, total PAHs, total cyanide, and total phenols. The graphs are shown in Attachment 1.

MW-1B
Total BTEX: Predominantly benzene. Since 2005 concentrations are consistently less than or equal to NYSDEC groundwater (benzene) criteria of 1 ug/L.
Total PAHs: ND in 2005 and 2006; no data available for 2007-2009.
Total Phenol: ND in 2005 and 2006; no data available for 2007-2009.
Total Cyanide: Consistently ND.

MW-2B
Total BTEX: Total BTEX concentrations are within one order of magnitude from 2002-2009.
Total PAHs: Concentrations vary by 2 orders of magnitude from 2002-2009.
Total Phenol: ND in 2005 and 2009.
Total Cyanide: Consistently ND.

MW-3B
Total BTEX: Increased 2 orders of magnitude from 2002-2009.
Total PAHs: Increased 2 orders of magnitude from 2002-2009; predominantly naphthalene.
Total Phenol: Concentrations vary between ND to 40 ug/L (SCG 1 ug/L).
Total Cyanide: Consistently ND since 2004.

MW-6B
Total BTEX: Increased 3 orders of magnitude from 2002-2009.
Total PAHs: Increased concentrations from 2005 to 2008.
Total Phenol: Concentrations vary between 25 to >225 ug/L.
Total Cyanide: Consistently ND.

MW-7BD
Total BTEX: Concentrations same order of magnitude from 2002-2009.
Total PAHs: Concentrations vary between 2002 and 2009; predominately naphthalene.
Total Phenols: Concentrations vary.
Total Cyanide: Consistently ND.

MW-7BS
Total BTEX: Concentrations decreased one order of magnitude from 2002-2009.
Total PAHs: Concentrations on the same order of magnitude from 2002-2009.
Total Phenols: ND since 2005.
Total Cyanide: ND in 2005-2007 and 2009; below SCG in 2002, 2004 and 2008.

MW-9B
Total BTEX: ND from 2005-2008; below SCGs in 2009.
Total PAHs: Concentrations vary below 5 ug/L; predominantly naphthalene (SCG 10 ug/L).
Total Phenols: Limited data.
Total Cyanide: Data available for 2002 and 2004 only; below SCG.

MW-10B
Total BTEX: ND from 2007-2009.
Total PAHs: Concentrations less than 2 ug/L since 2004; generally ND.
Total Phenols: ND since 2007.
Total Cyanide: Consistently ND.

MW-11B
Total BTEX: Concentrations on same order of magnitude since 2004.
Total PAHs: Concentrations on same order of magnitude since 2005.
Total Phenols: Concentrations vary.
Total Cyanide: Concentrations vary below SCG; ND in 2002, 2005, and 2009.

Mann-Kendal Trend Analysis

The Mann-Kendall test was performed to evaluate the trend for analytes detected above NYSDEC groundwater criteria in the nine bedrock monitoring wells sampled as part of the annual OM&M activities from 2002 to 2009.

The Mann-Kendall test is a non-parametric test for identifying trends in time series data. The test compares the relative magnitudes of sample data. The data values are evaluated as an ordered time series and each data value is compared to all subsequent data values. The initial value of the Mann-Kendall statistic (i.e., S) is assumed to be 0 (i.e., no trend). If a data value from a later time period is higher than a data value from an earlier time period, S is increased by 1. If the data value from a later time period is lower than a data value sampled earlier, S is decreased by 1. The net result of all values yields the final value of S. The non-parametric Mann-Kendall test involves computing a statistic (S), which is the difference between the number of pair-wise slopes that are positive and the number that are negative. The null hypothesis or baseline condition (H_0) for these tests was that there are no temporal trends in the contaminant concentrations. The alternate hypotheses were either:

- contaminant concentrations are increasing over time (H_1), or
- contaminant concentrations are decreasing over time (H_2).

If the Mann-Kendall statistic (S) is a positive value, then evidence of an increasing trend exists in the data. If S is a negative value, then evidence of a decreasing trend exists in the data.

The probability (p) of the S statistic was also calculated and compared to an *a priori* designated significance level (α). If the p-value was smaller than α, then the null hypothesis (the trend was not statistically significant) was rejected. For the purposes of this report, an α of 0.10, corresponding to a significance level of 10 percent, was used.

As shown in Attachment 2, no trend was observed for analytes detected in bedrock monitoring wells: MW-1B, MW-2B, and MW-9B. An upward trend or no trend was observed for analytes detected in bedrock monitoring wells: MW-3B, MW-6B, MW-7BD, and MW-11B. A downward trend or no trend was observed for analytes detected in the following bedrock monitoring wells: MW-7BS and MW-10B.

Summary

- A decreasing trend for total BTEX and total PAHs was observed in groundwater samples collected from onsite well MW-7BS.
- An increasing trend for total BTEX and total PAHs was observed at downgradient well MW-3B and onsite well MW-6B.
- Concentrations have remained the same or had an increasing trend for groundwater samples collected from onsite well MW-7BD and downgradient well MW-11B.
- Concentrations do not indicate a trend for groundwater samples collected from onsite upgradient wells MW-1B, MW-2B, or downgradient well MW-9B.
- Concentrations indicate both a no trend and decreasing trend for upgradient well MW-10B. There have been no SCG exceedances for VOCs, SVOCs, total cyanide or total phenols since 2006.
- Total cyanide concentrations were consistently not detected or detected below the NYSDEC groundwater criteria of 200 ug/L in the monitoring wells.
- Total phenols concentrations were typically detected above the NYSDEC groundwater criteria of 1 ug/L or were not detected, but were detected in both the upgradient as well as the downgradient monitoring wells.

Recommendations

Based upon results of the most recent sampling round, the graphs of analyte concentrations versus time, and the statistical trend analysis completed for the groundwater monitoring results database, URS recommends the following:

1. MW-10B could be eliminated from the monitoring program beginning with the next sampling event.

2. MW-7BS could be eliminated from the monitoring program in the future (if no NAPL is observed) since concentrations indicate a decreasing trend.

3. Analysis for total cyanide and total phenols could be eliminated from the annual monitoring program beginning with the next sampling event.

Sincerely,

URS Corporation-New York

Michael Gutmann
Project Manager

Enc.

Attachment 1 – Concentration vs Time Graphs
Attachment 2 – Mann-Kendall Trend Analysis

cc: Mr. Tracy Blazicek, CHMM, -NYSEG
File – 11176154

ATTACHMENT 1

Concentration vs Time Graphs

ATTACHMENT 2

Mann-Kendall Trend Analysis

GRAPHIC SCALE

0 30 60 90 Feet

SOURCE:
USGS 7 1/2 Minute Series Topographic Map
Plattsburgh, New York 1966

Title: SITE LOCATION MAP

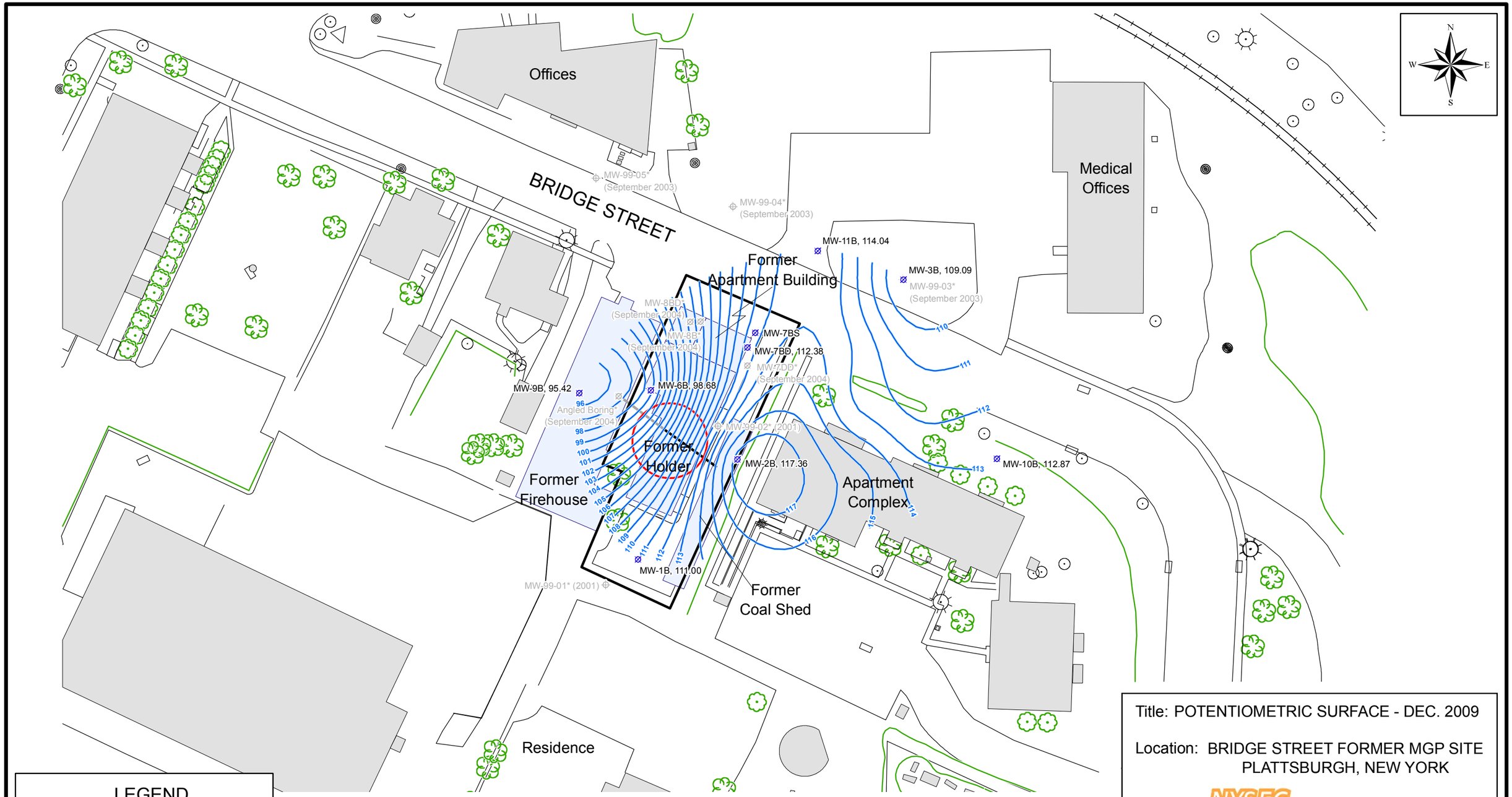
Location: BRIDGE STREET FORMER MGP SITE
PLATTSBURGH, NEW YORK

Client: NYSEG NEW YORK STATE ELECTRIC AND GAS

URS Corporation
28 Corporate Drive, Suite 200
Clifton Park, New York 12065

Drafter:	Date:
DAD	December 2009
Drg. Size:	Job No.:
8.5X11	11176154.00000

FIGURE 1



LEGEND

- Overburden Monitoring Well
- Bedrock Monitoring Well
- Groundwater Contours (FT AMSL)
- Property Boundary (approx.)
- Former Gas Holder
- Former Structures (approx.)
- Buildings
- * - Well Decommissioned

GRAPHIC SCALE

0 25 50 75 Feet

Title: POTENTIOMETRIC SURFACE - DEC. 2009

Location: BRIDGE STREET FORMER MGP SITE
PLATTSBURGH, NEW YORK

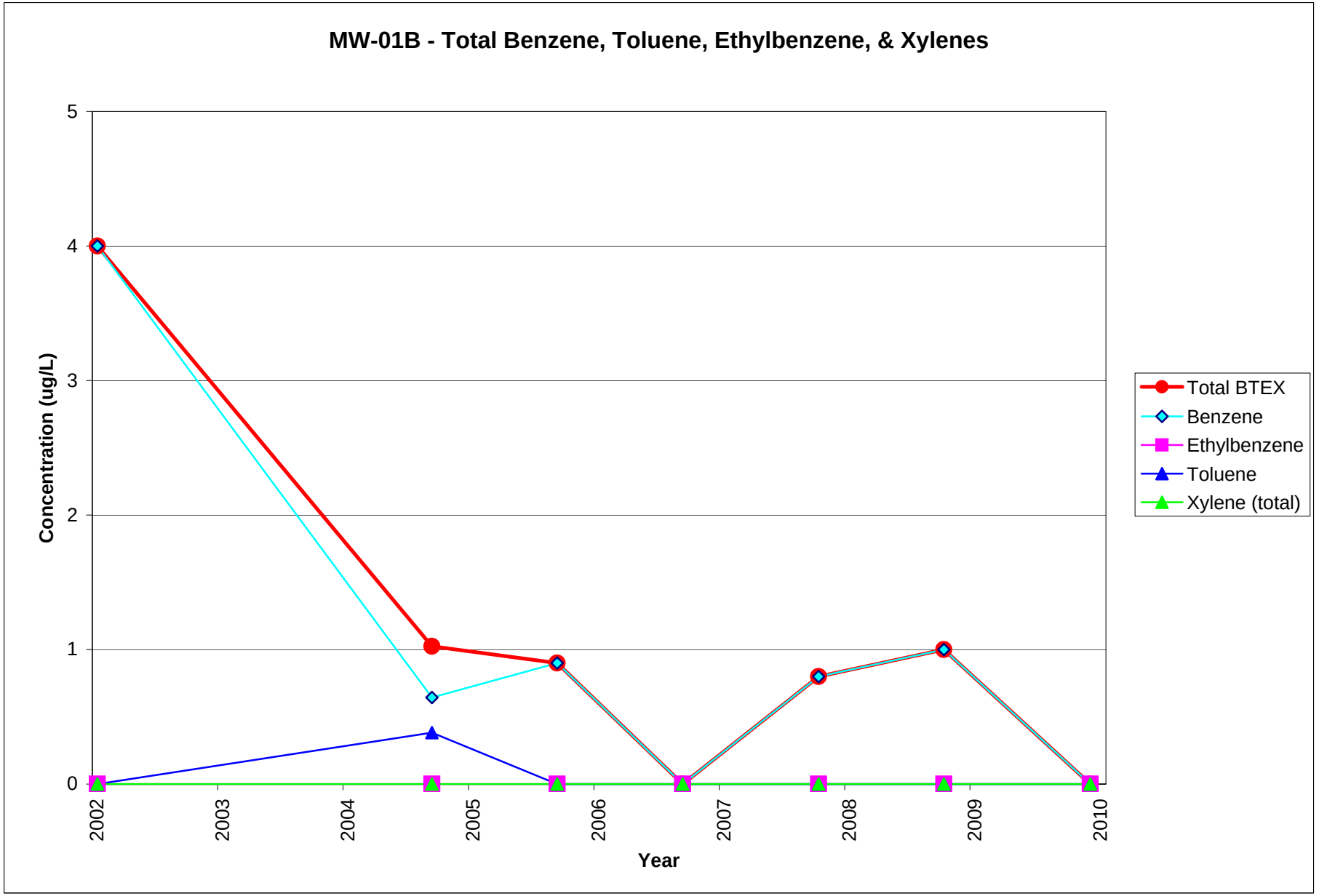
Client: NYSEG NEW YORK STATE ELECTRIC AND GAS

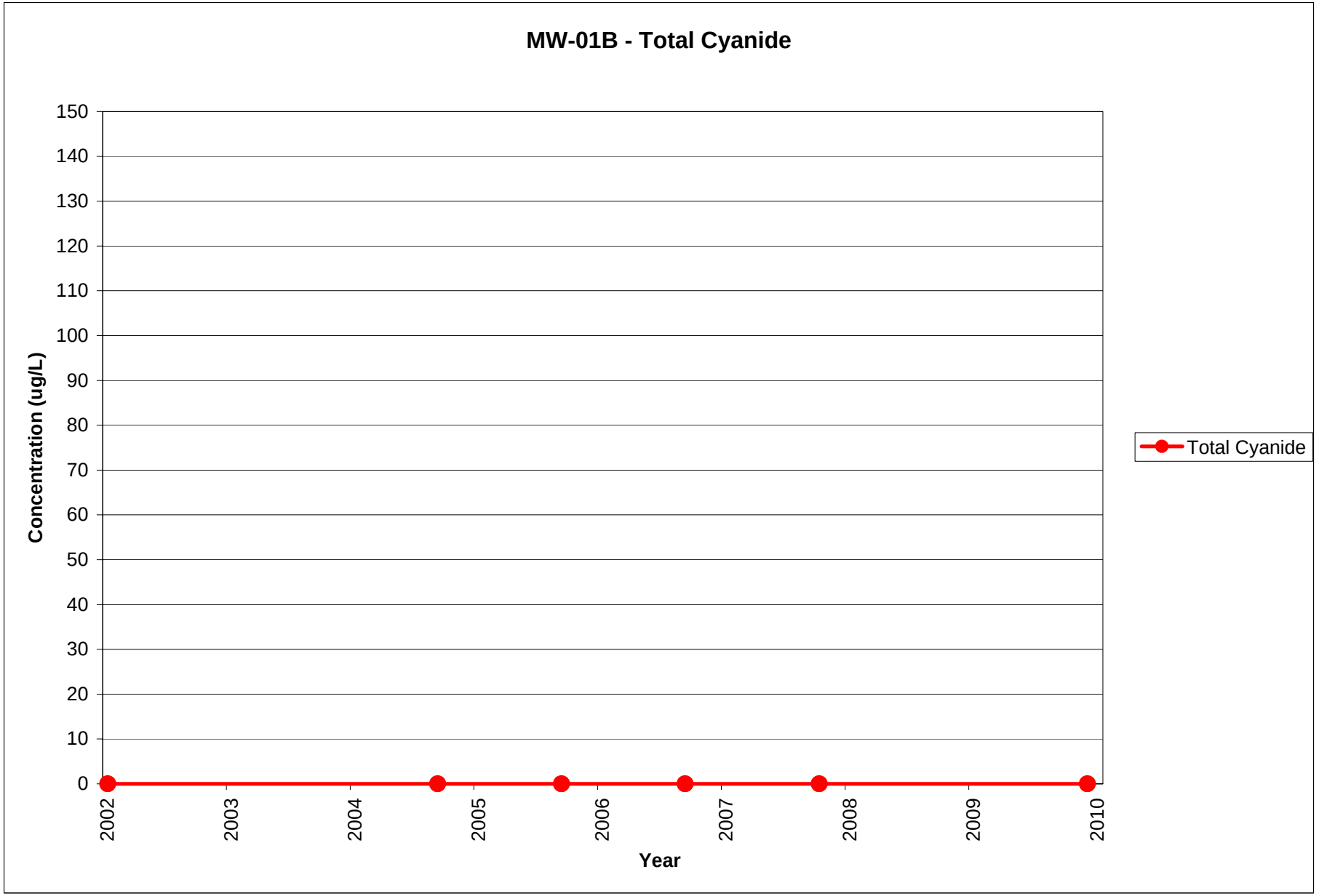
URS Corporation
28 Corporate Drive, Suite 200
Clifton Park, New York 12065

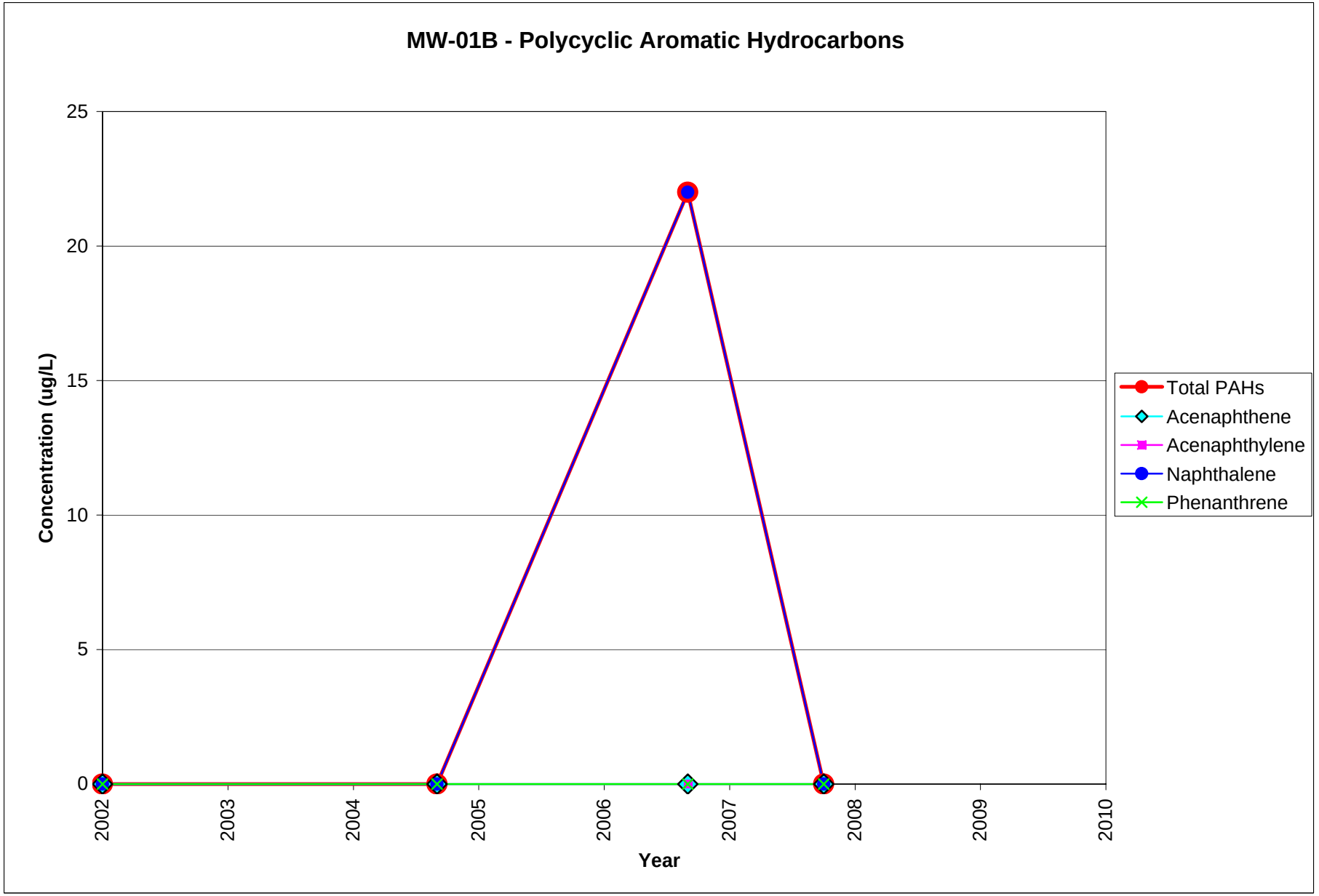
Drafter:	Date:
Drg. Size: 11x17	Job No.: 11175784.10000

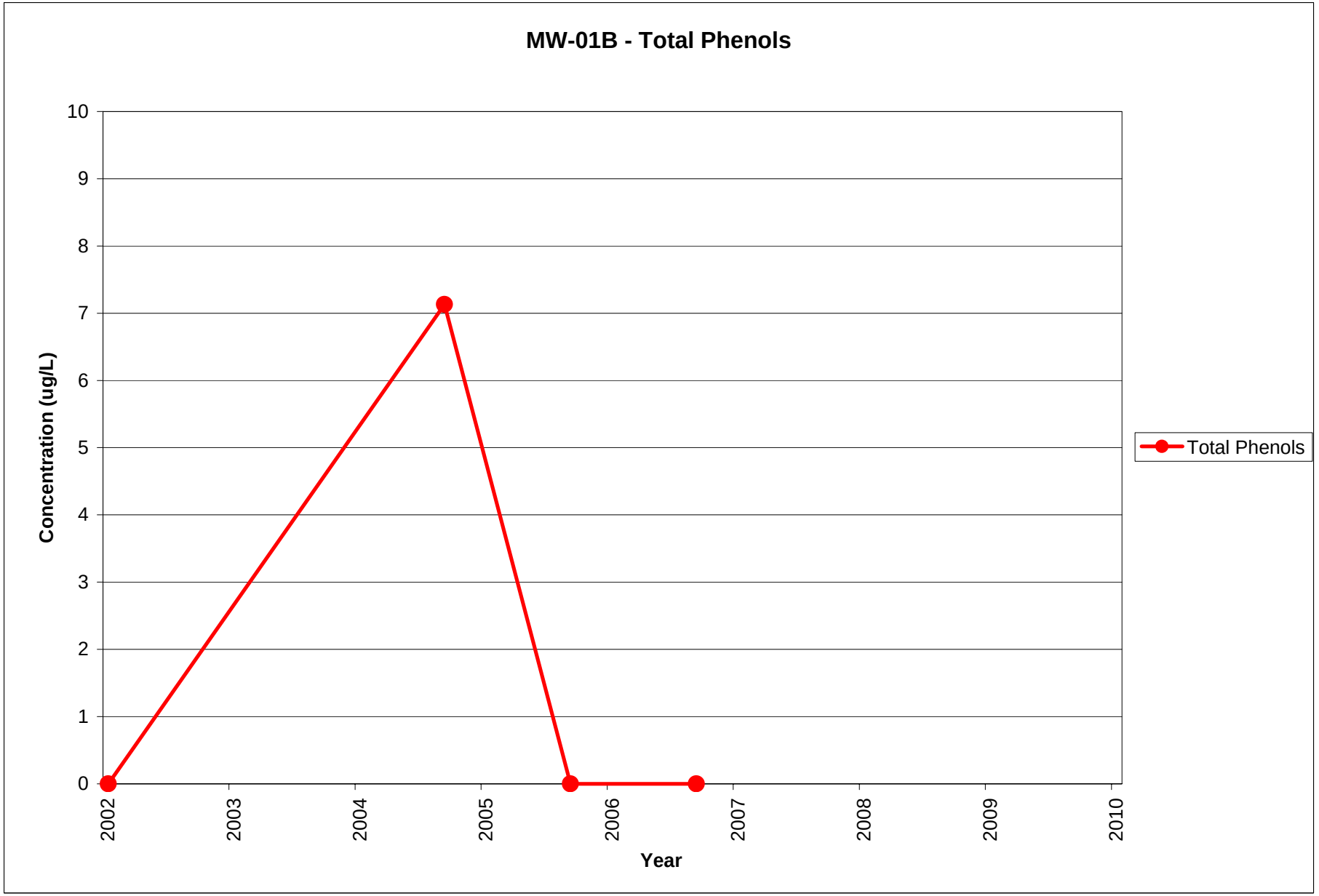
FIGURE 2

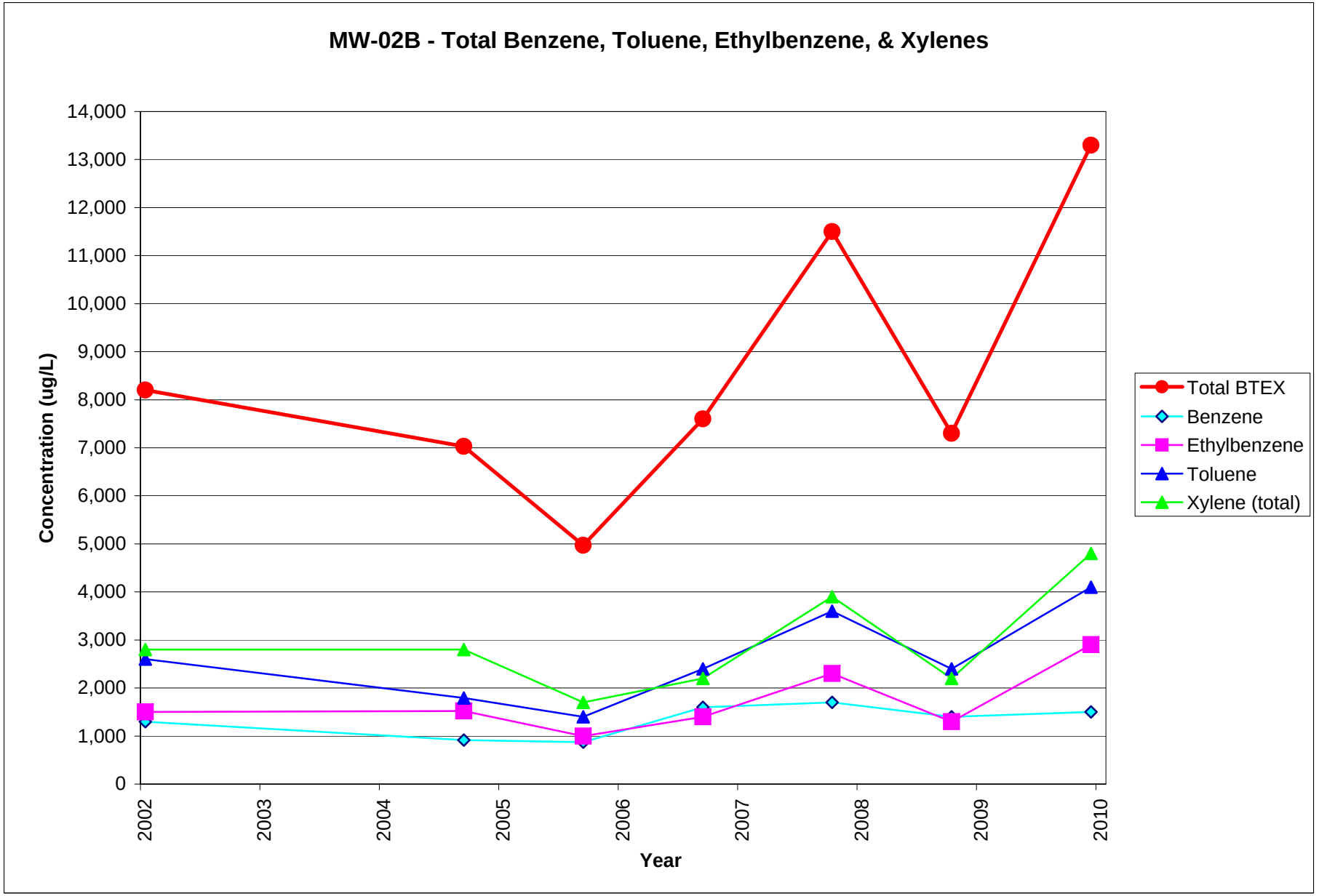
I:\11175784\DB\GIS\GW CONTOURS 0912.mxd 7/23/2010 BJF

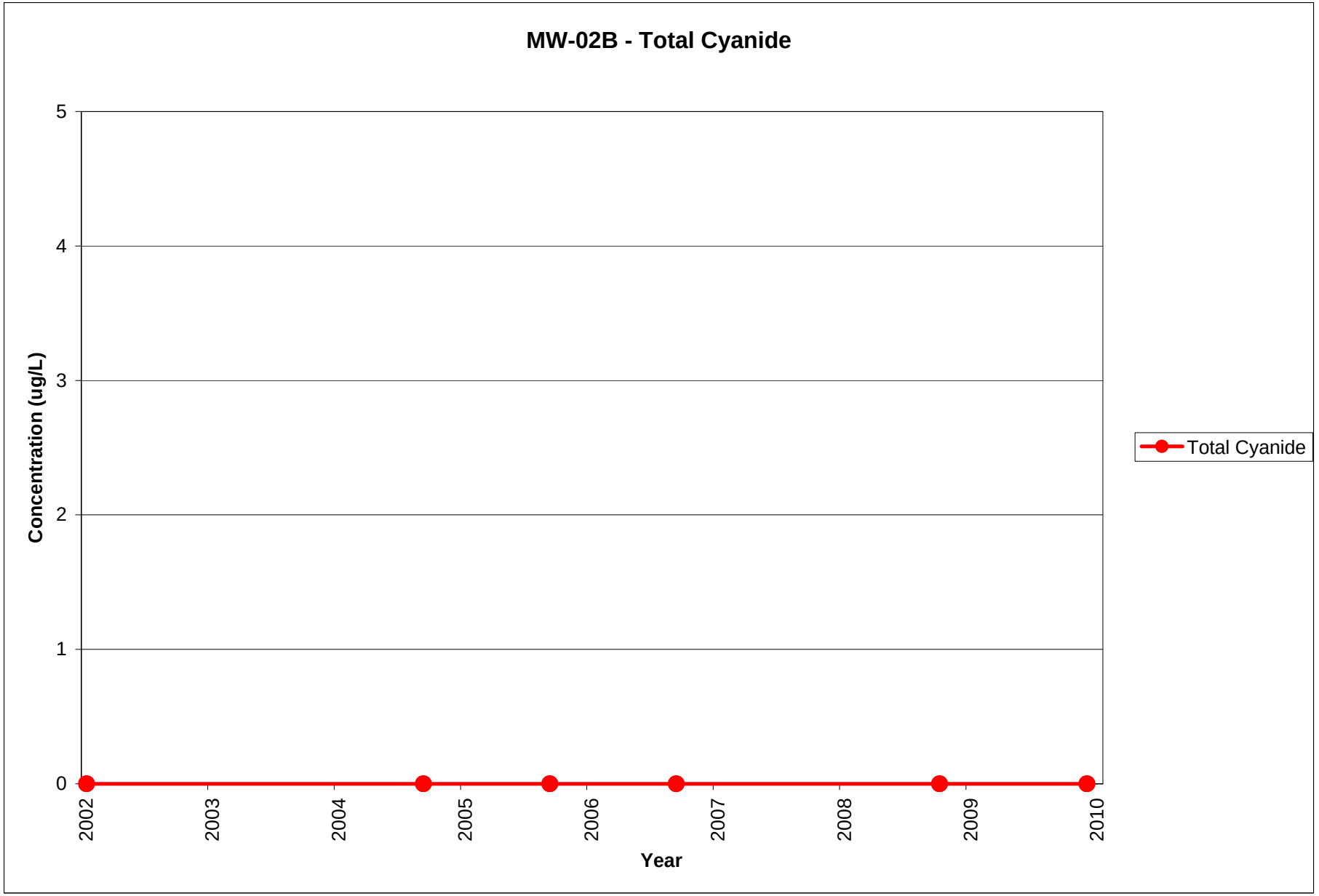

MW-01B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

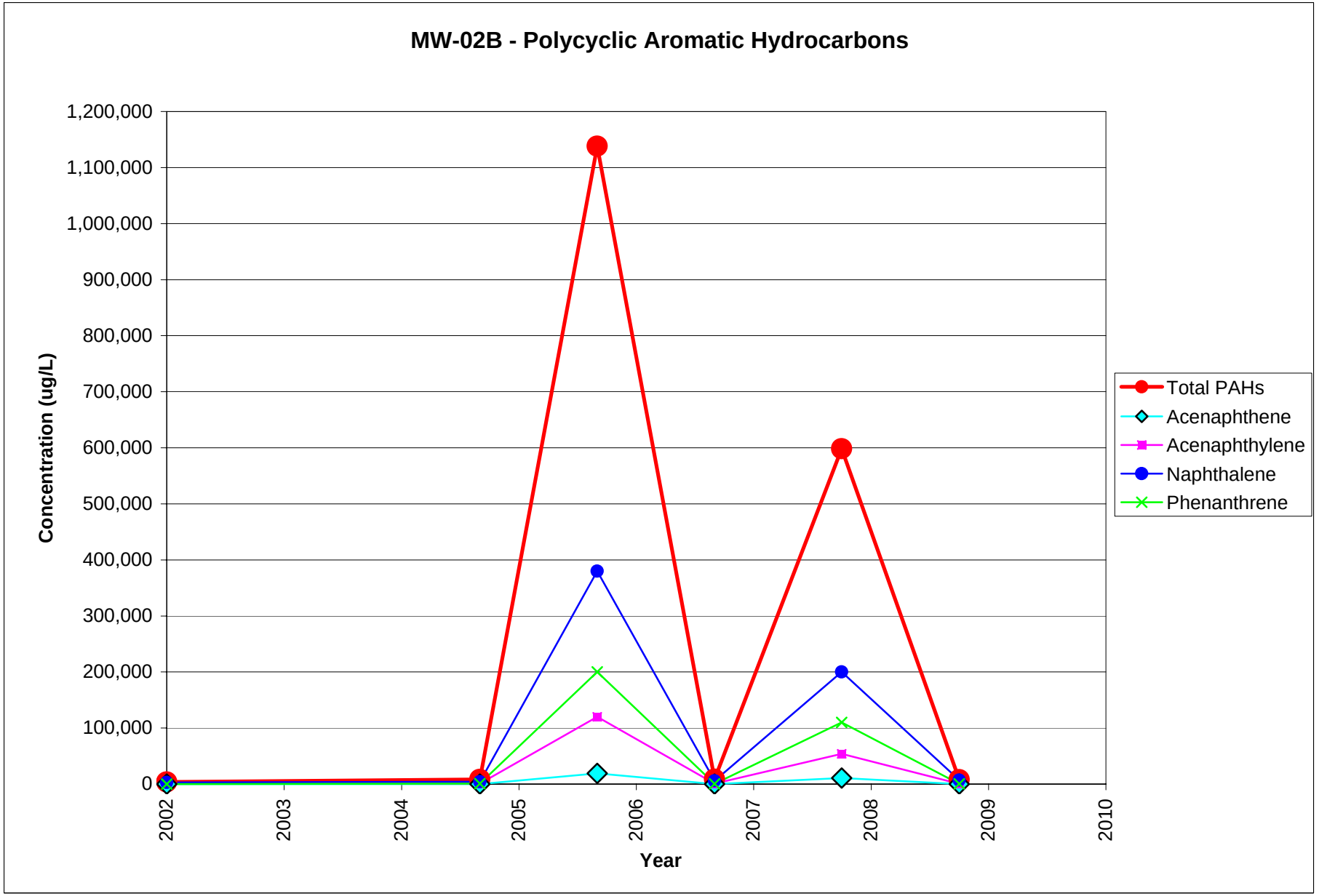

MW-01B - Total Cyanide
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Concentration (ug/L)
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

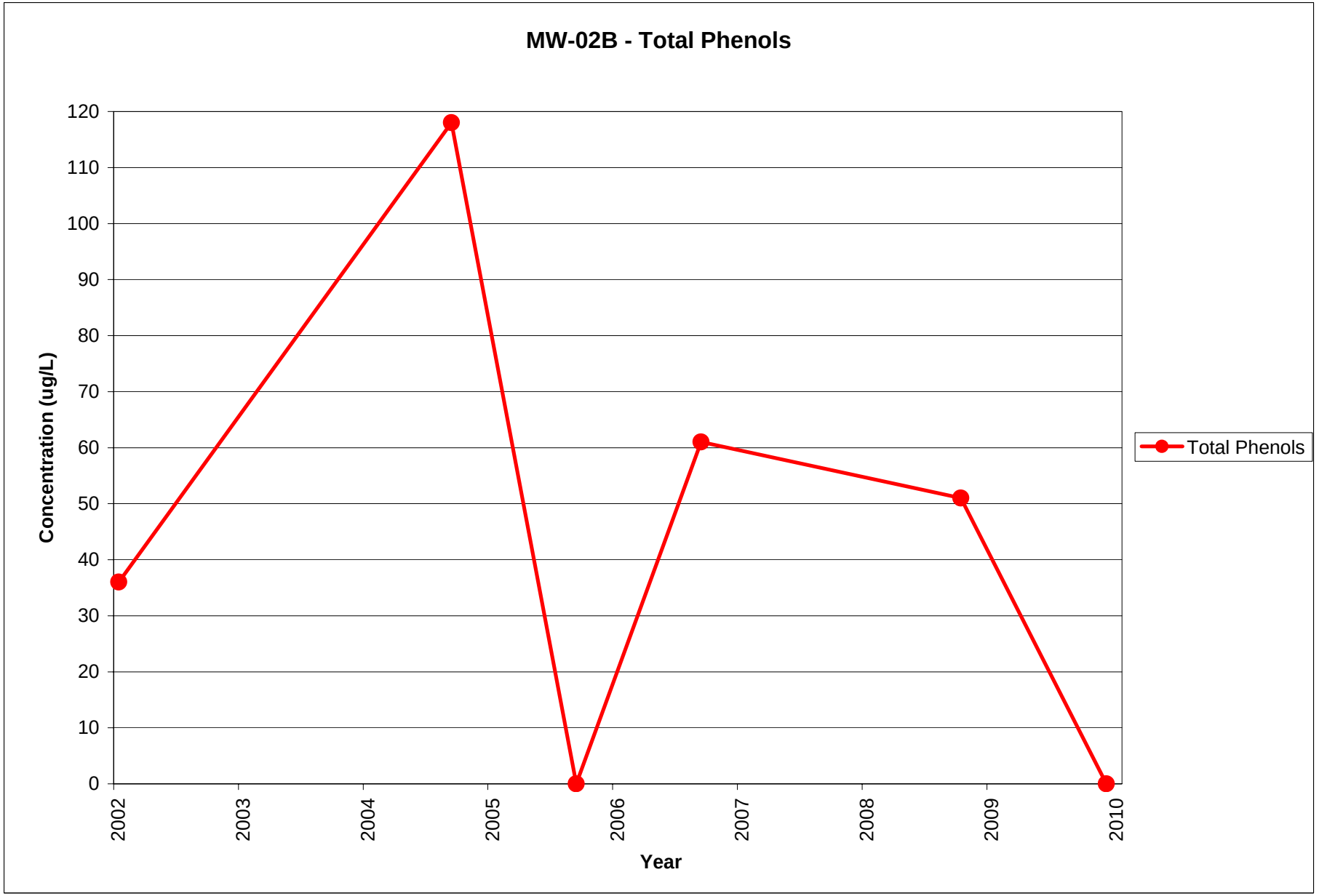

MW-01B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

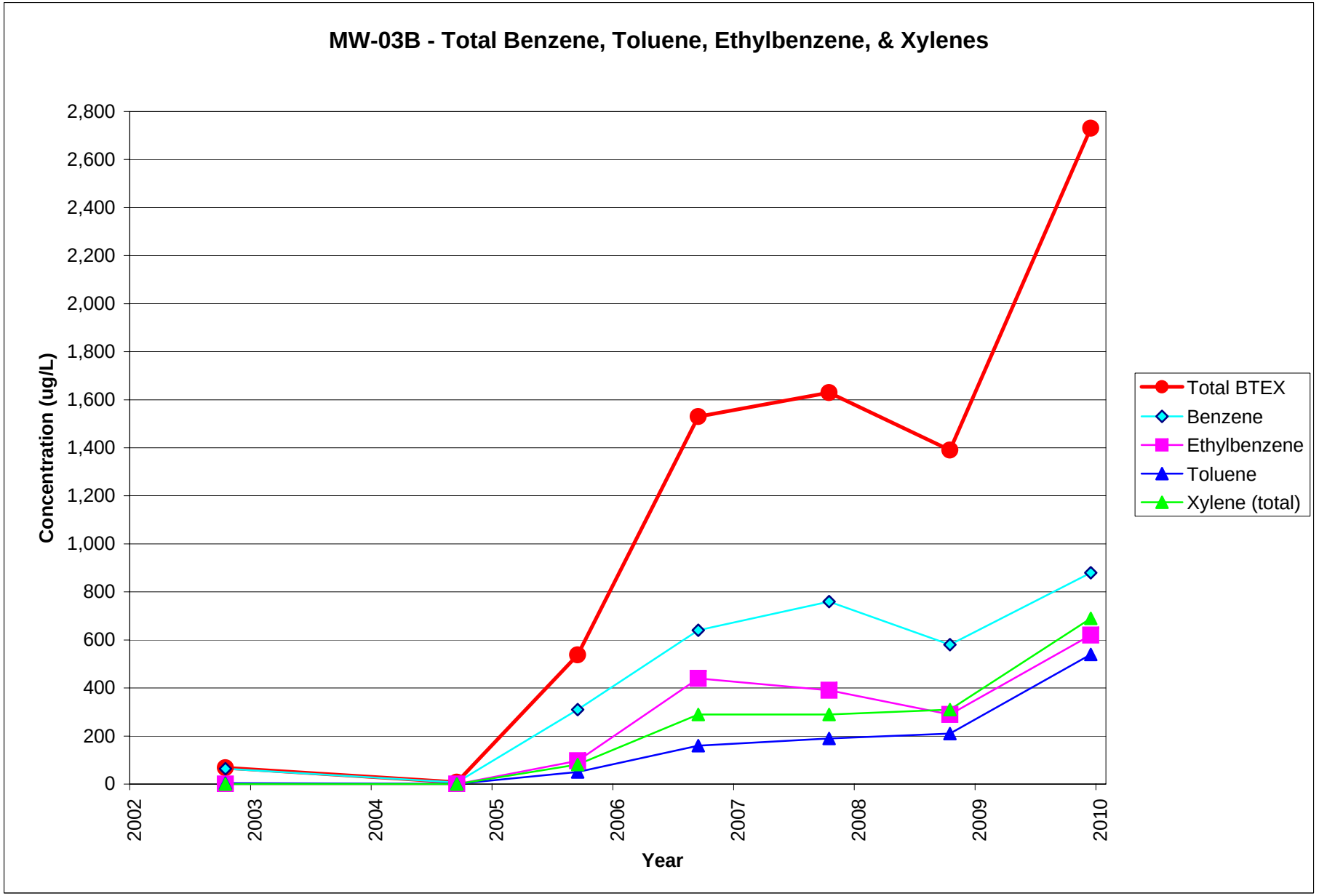

MW-01B - Total Phenols
Concentration (ug/L)
10
9
8
7
6
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

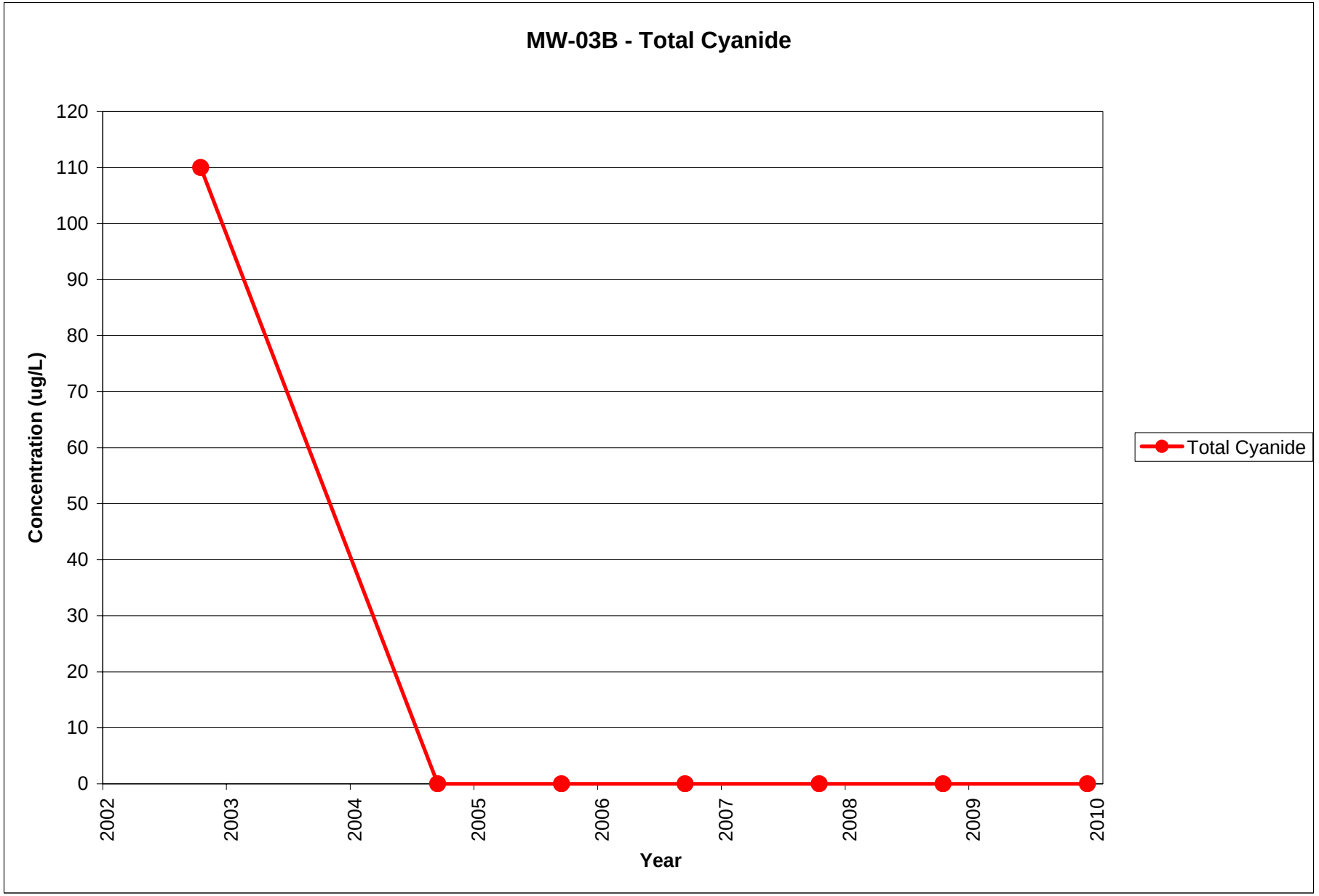

MW-02B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

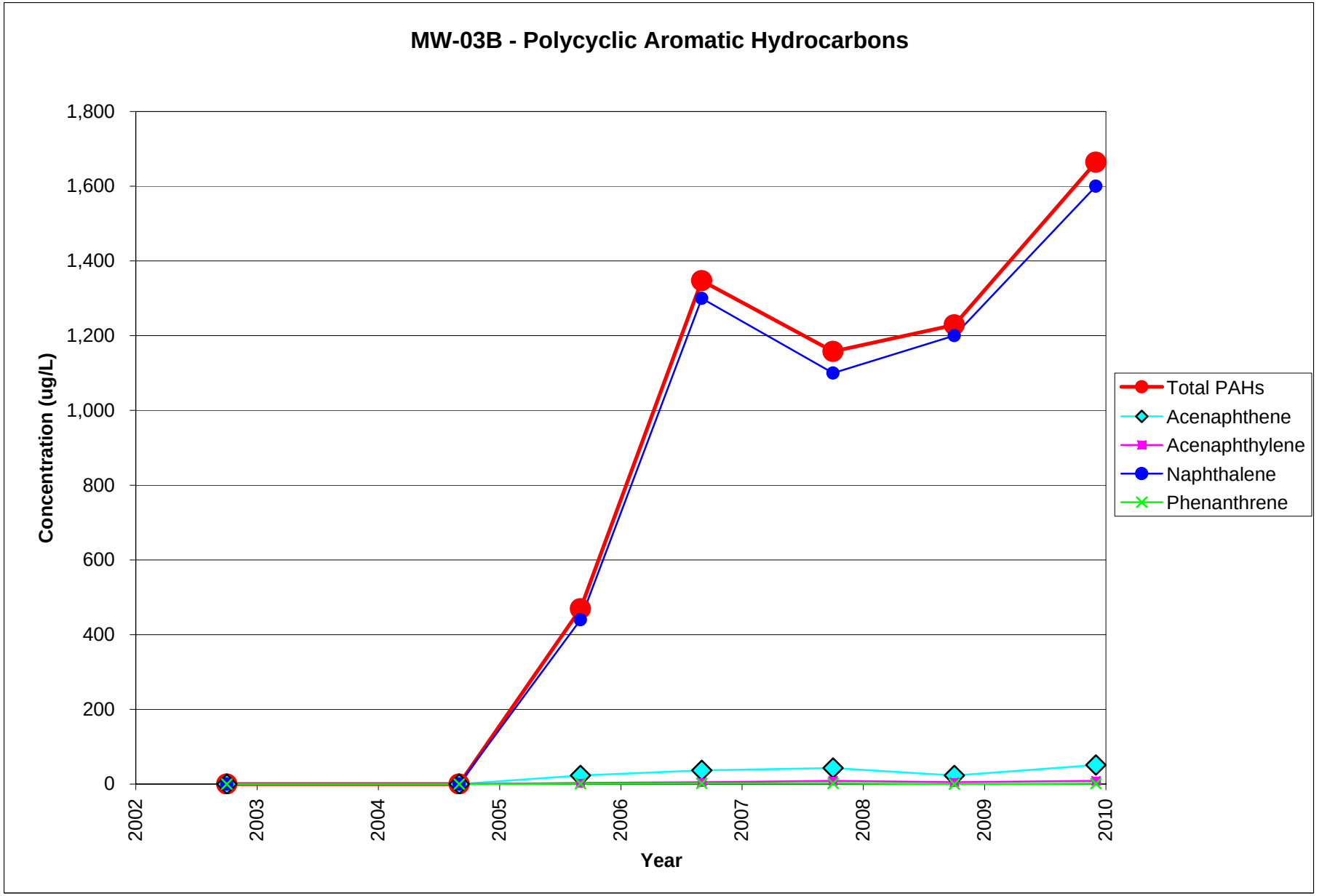

MW-02B - Total Cyanide
Concentration (ug/L)
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

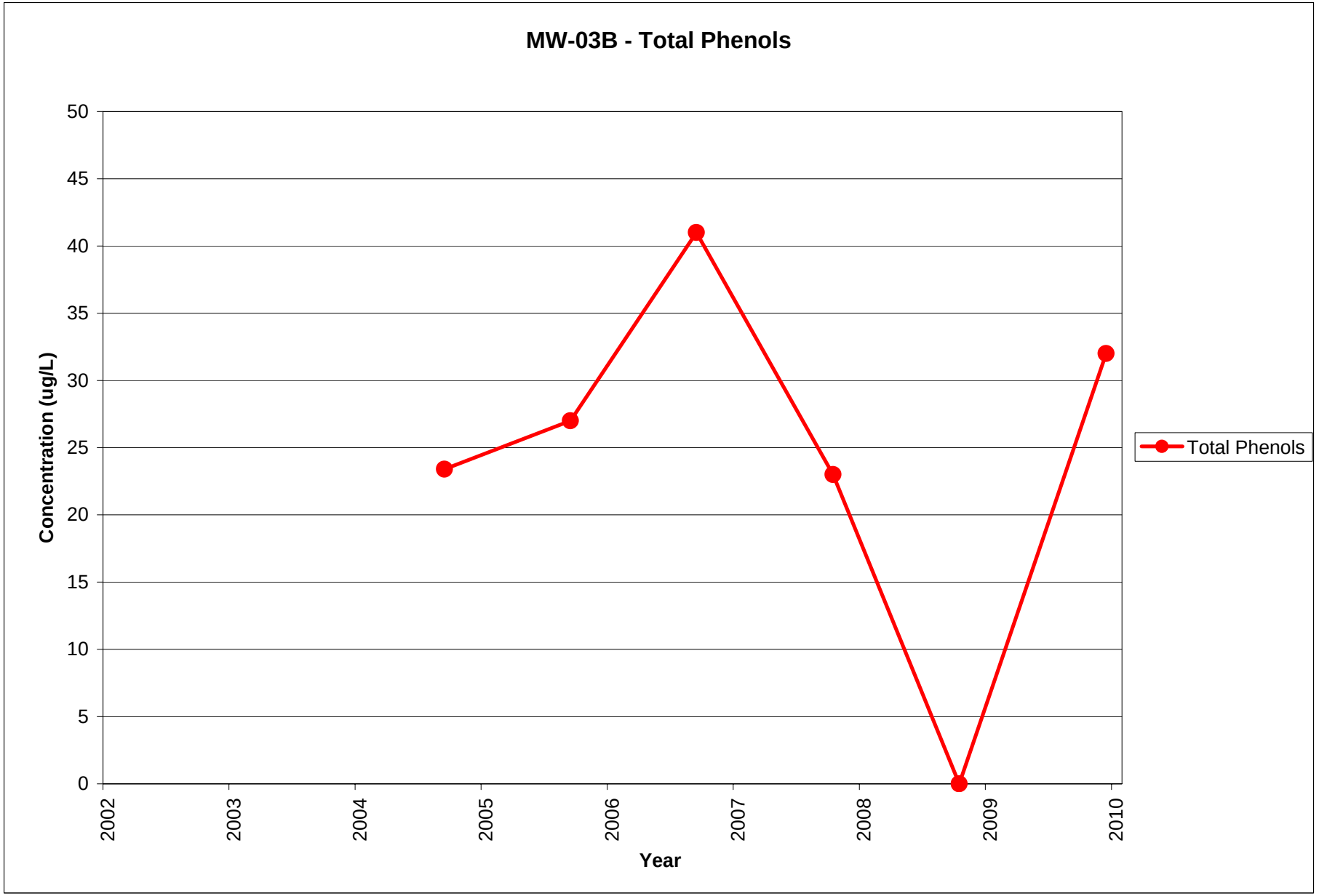

MW-02B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

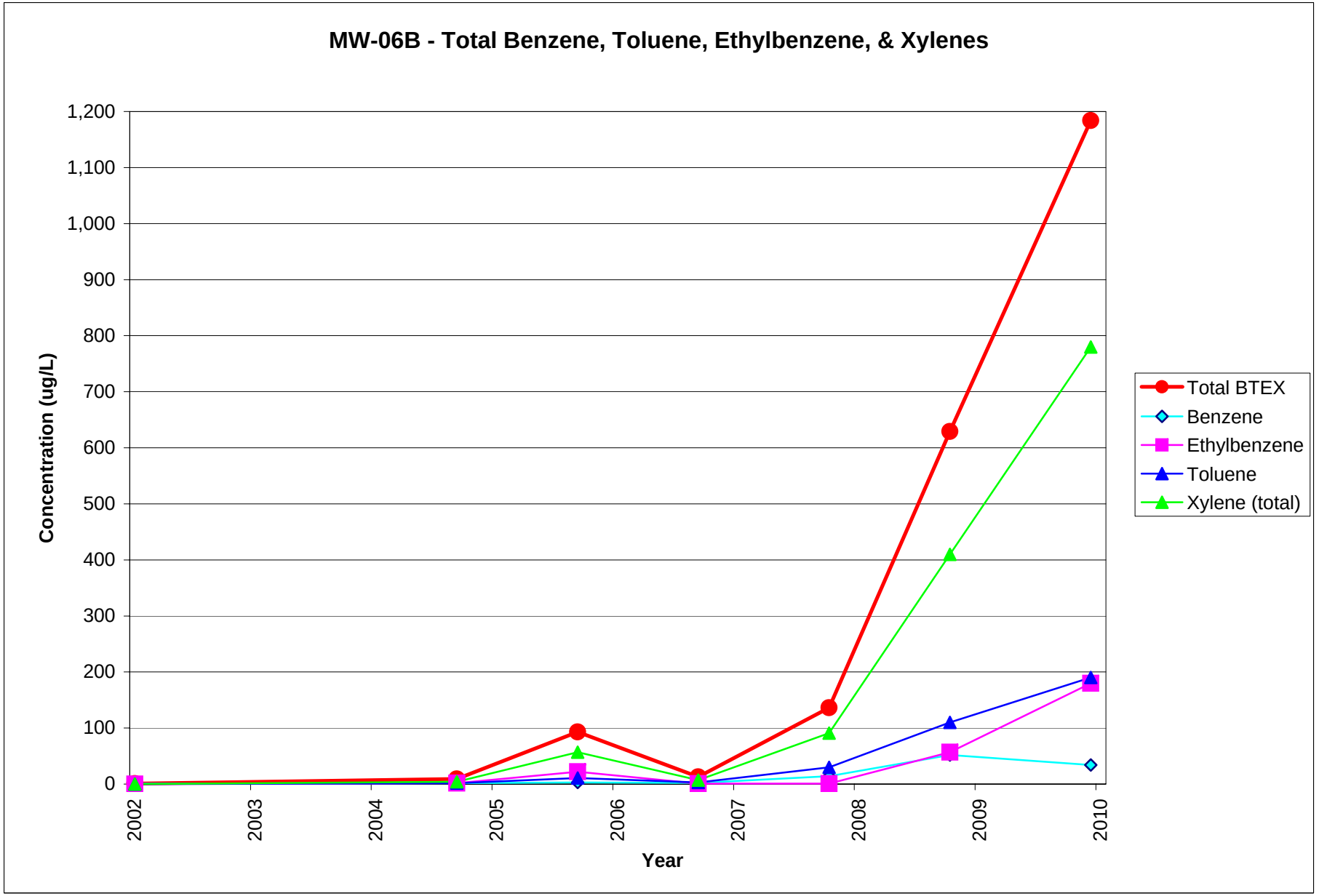

MW-02B - Total Phenols
Concentration (ug/L)
120
110
100
90
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

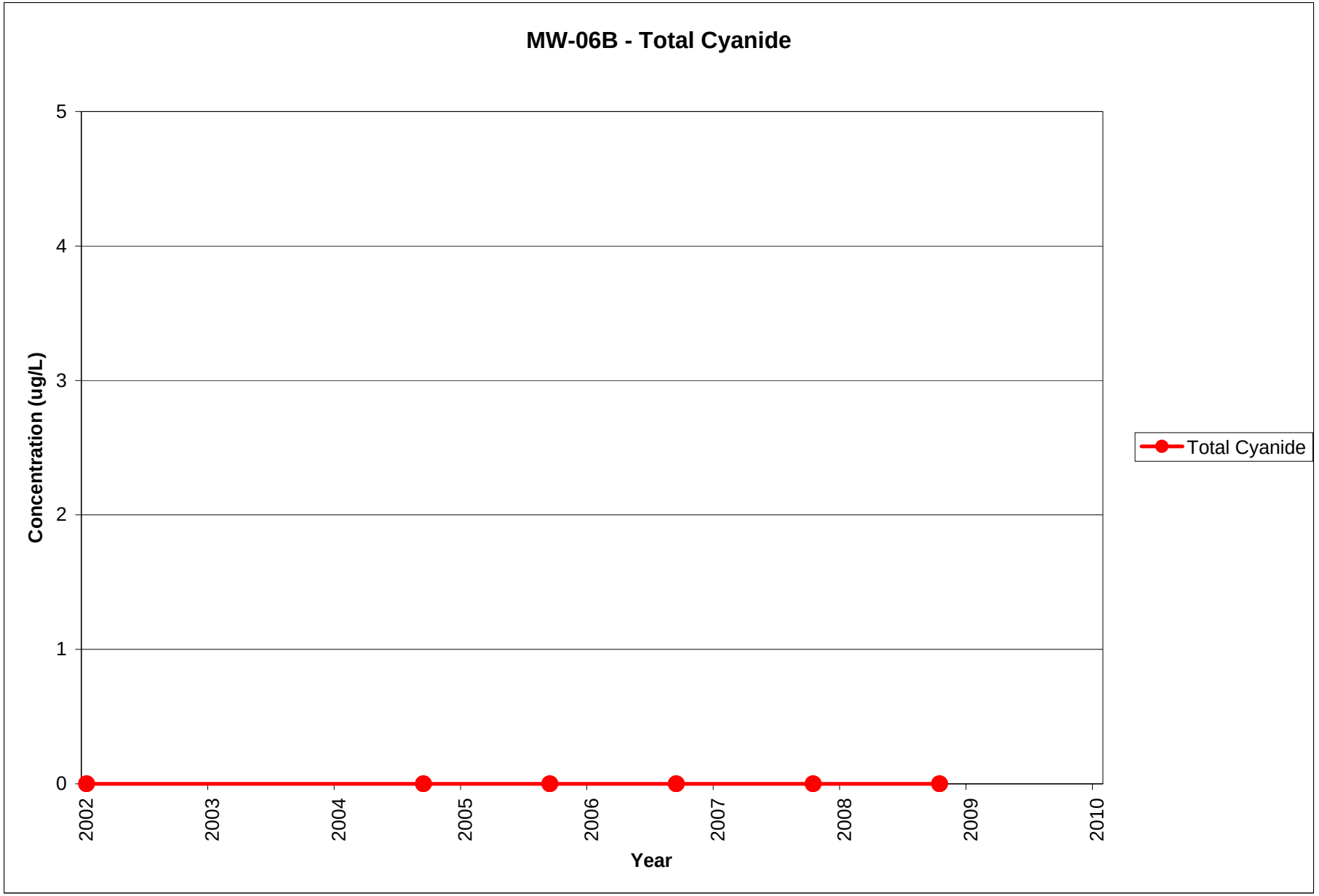

MW-03B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

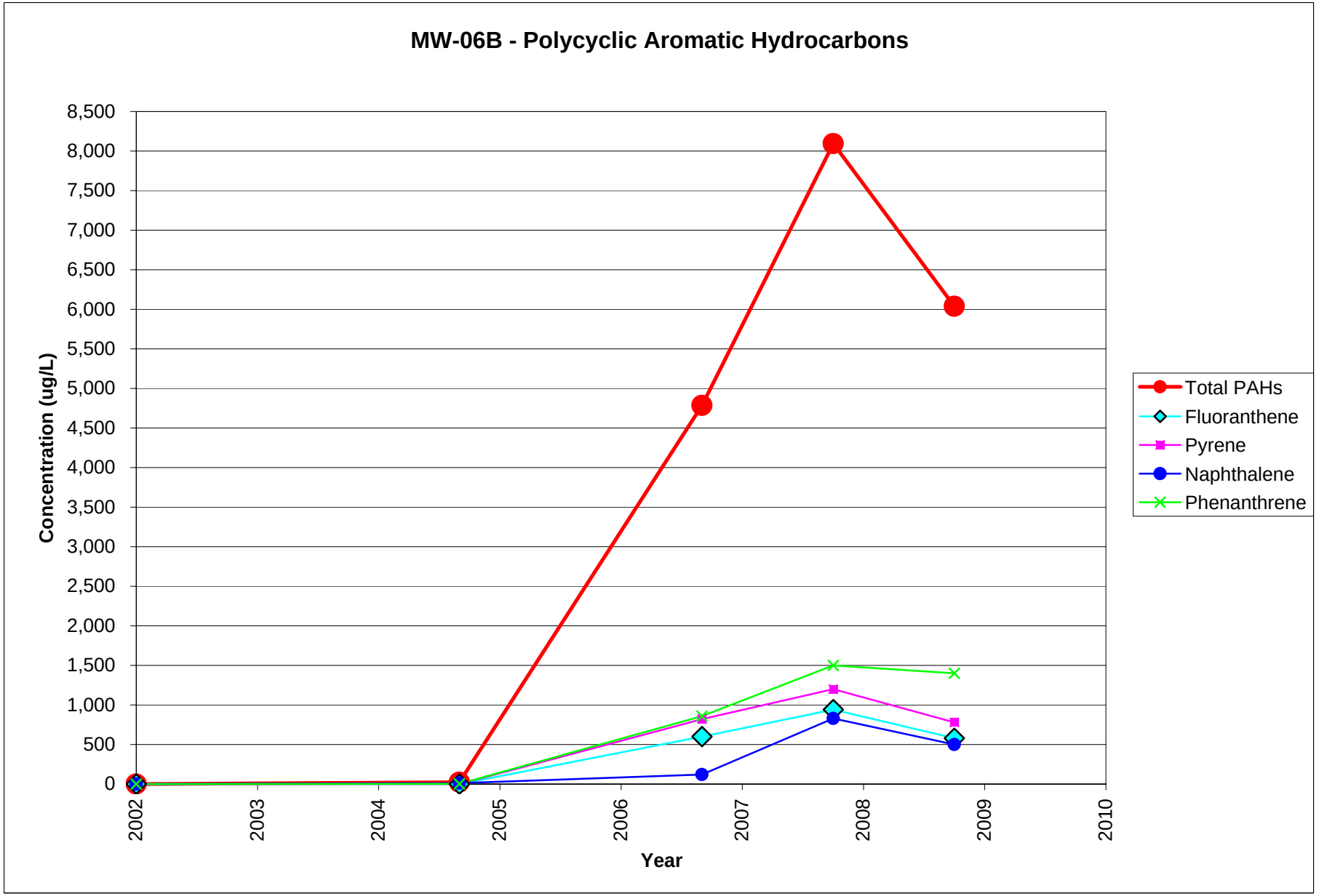

MW-03B - Total Cyanide
120
110
100
90
80
70
60
50
40
30
20
10
0
Concentration (ug/L)
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

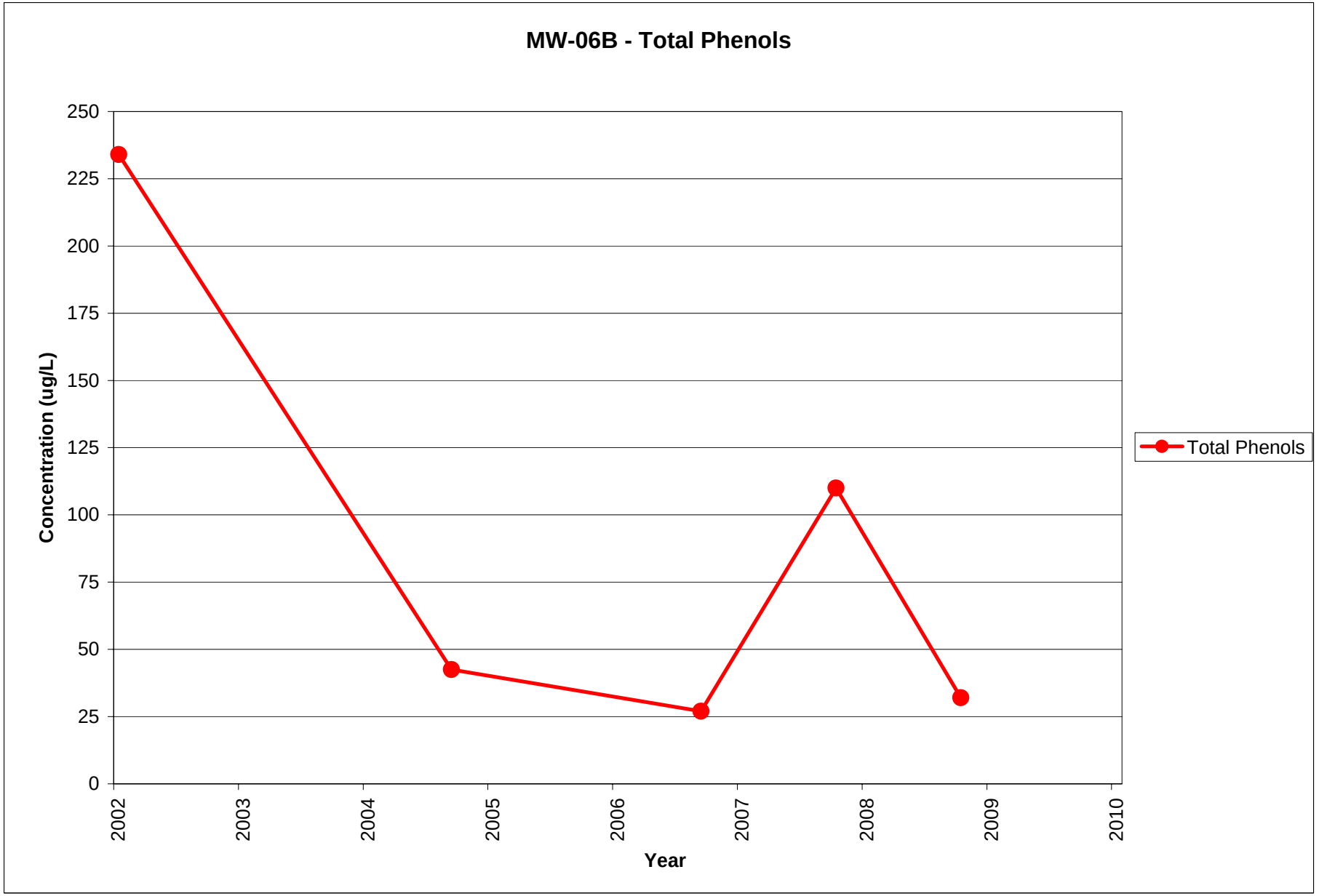

MW-03B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

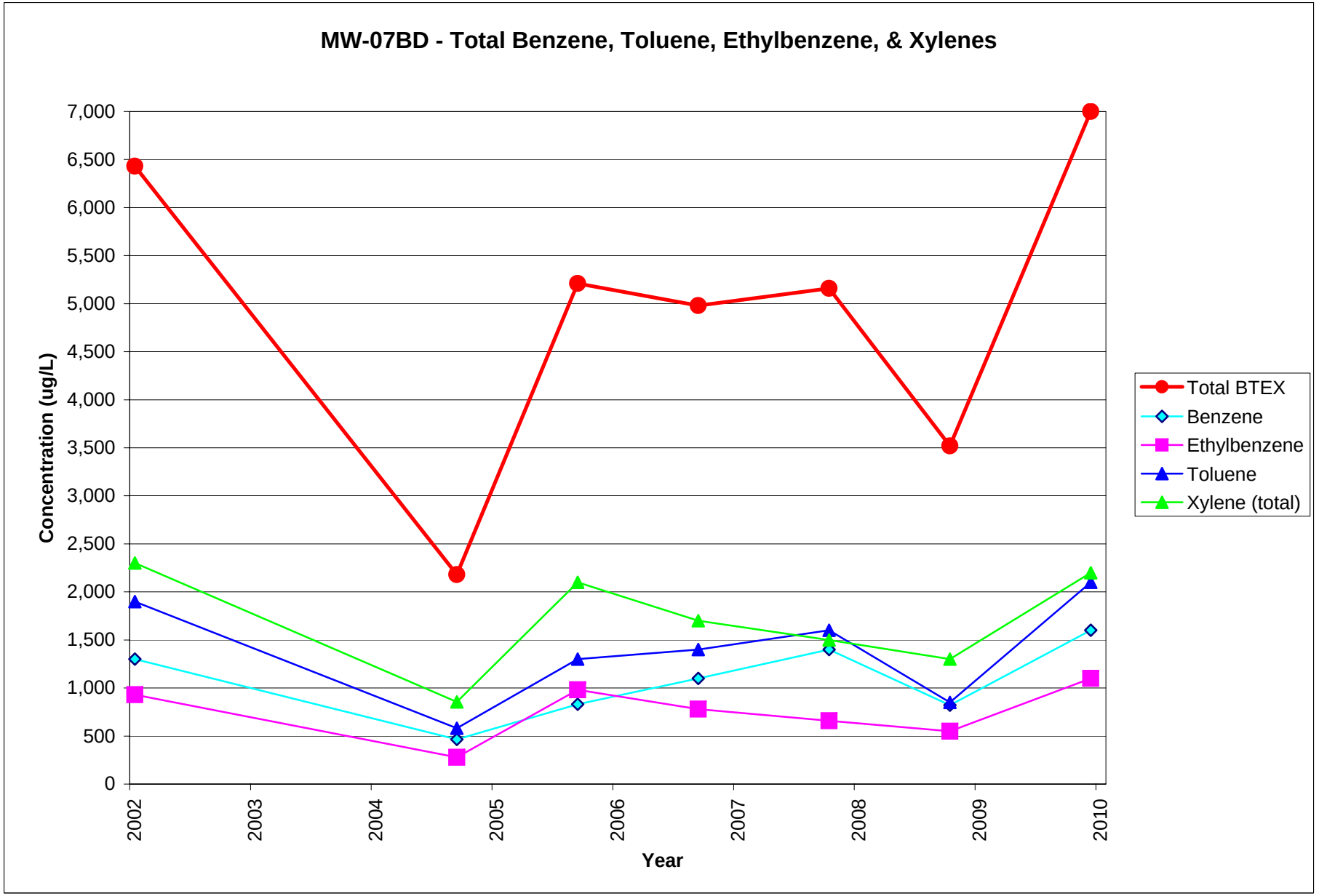

MW-03B - Total Phenols
Concentration (ug/L)
50
45
40
35
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

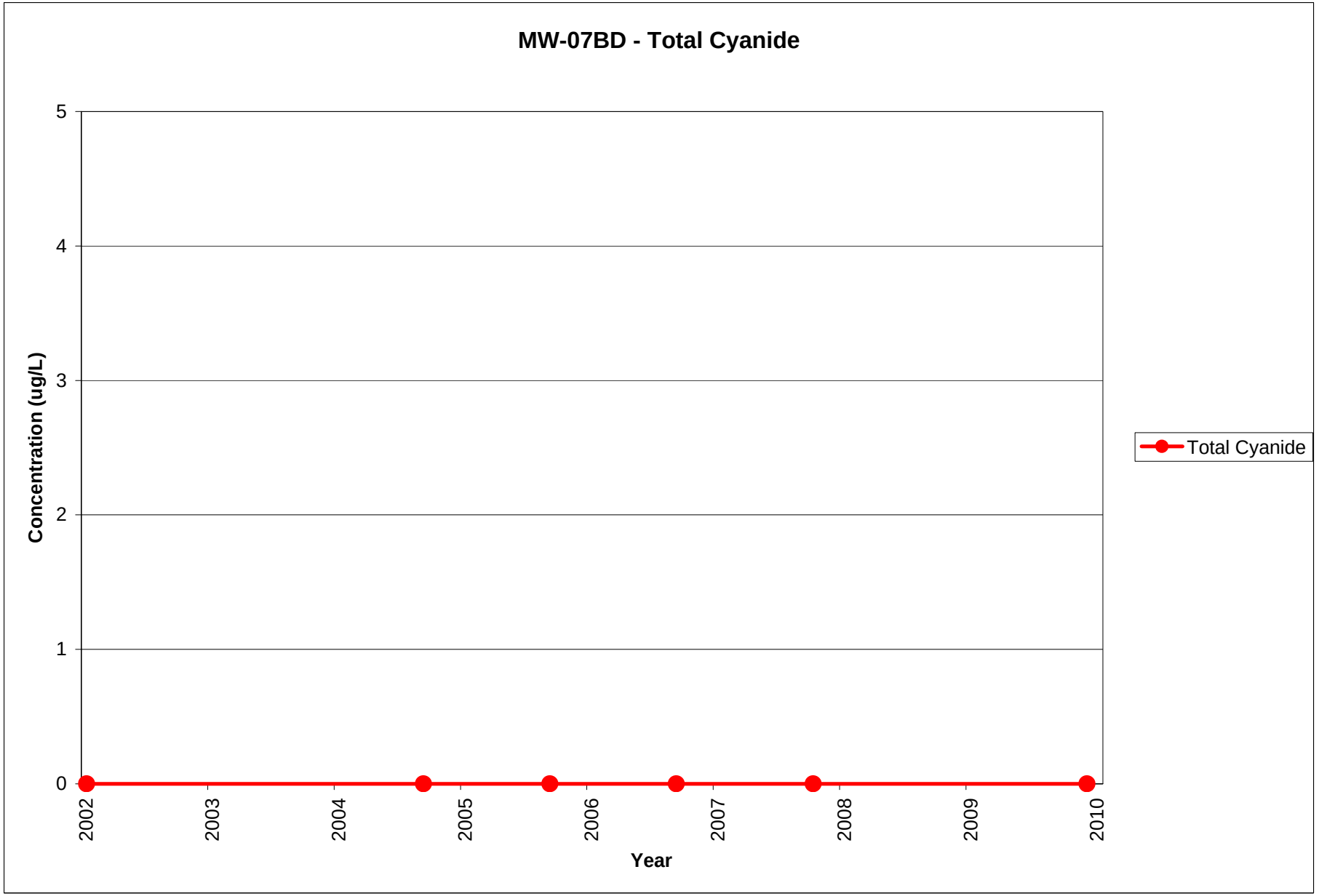

MW-06B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

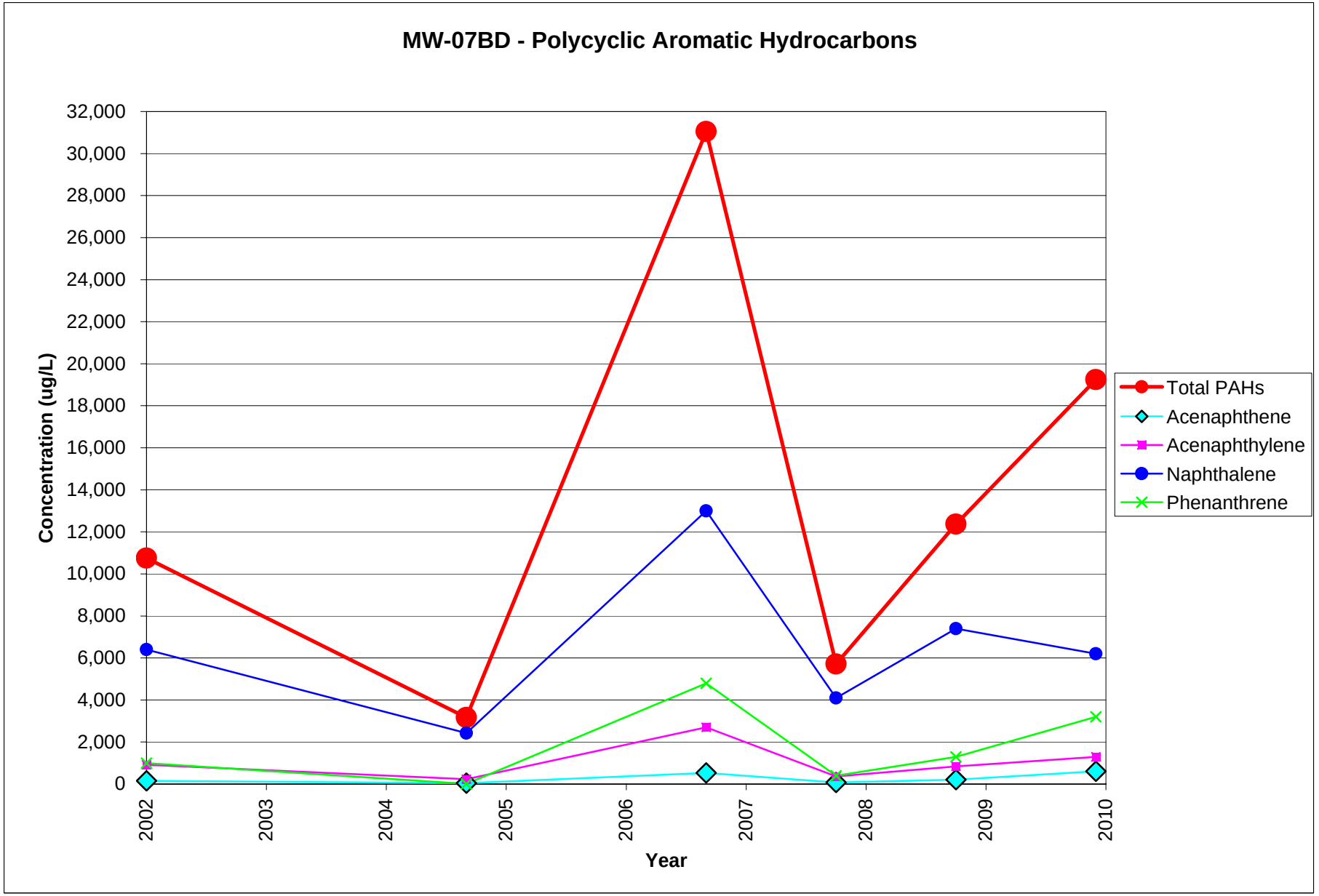

MW-06B - Total Cyanide
Concentration (ug/L)
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

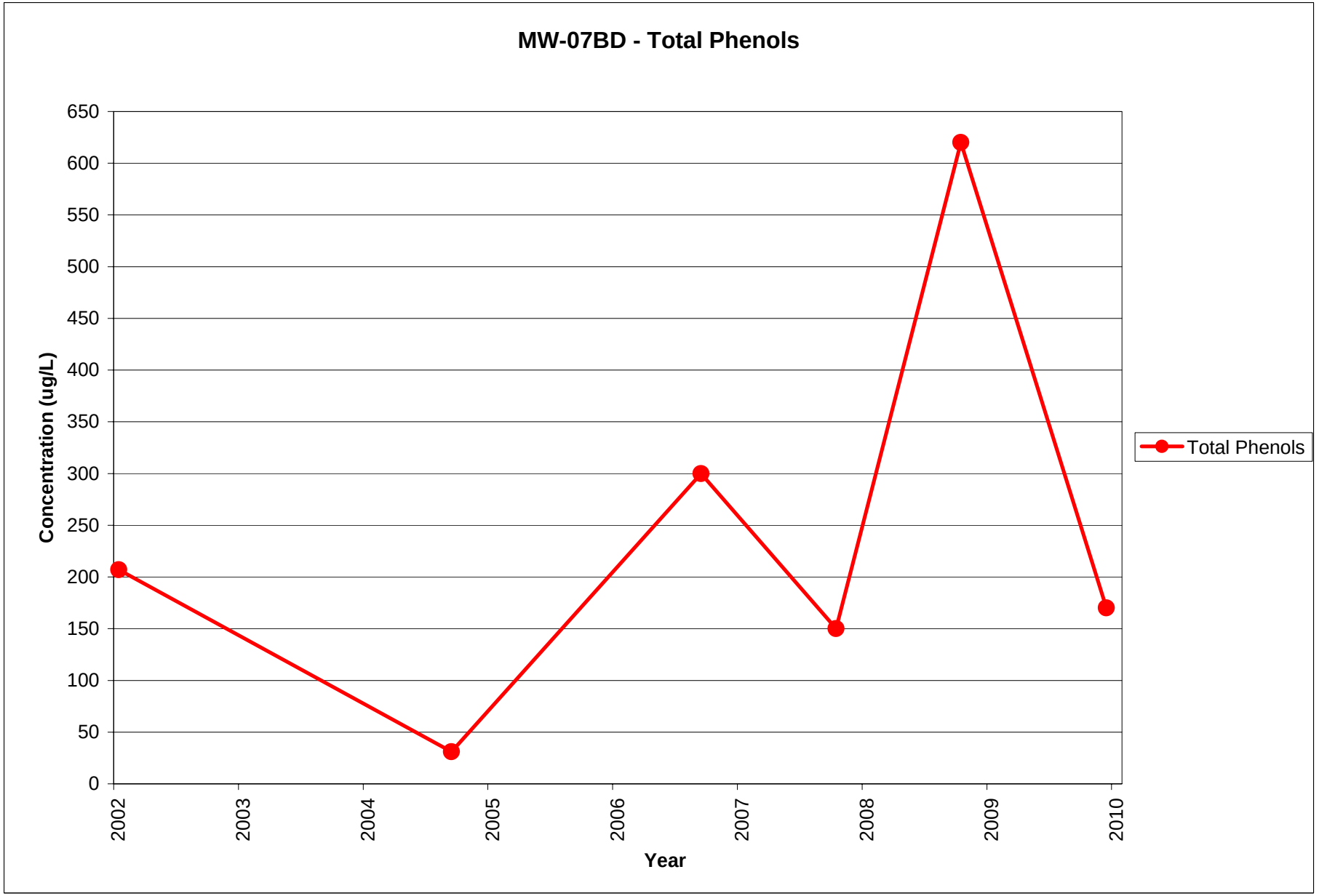

MW-06B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Fluoranthene
Pyrene
Naphthalene
Phenanthrene

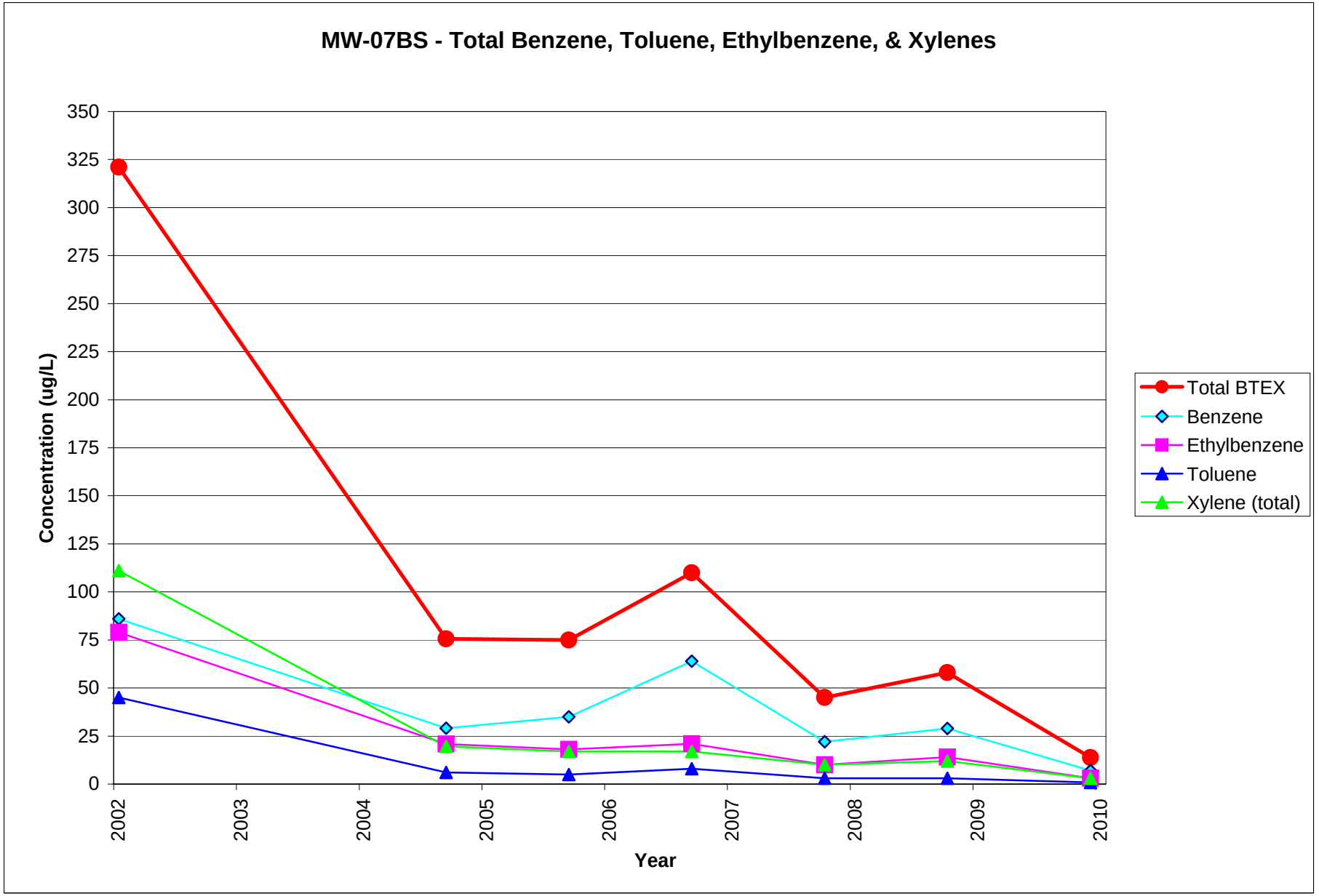

MW-06B - Total Phenols
250
225
200
175
150
125
100
75
50
25
0
Concentration (ug/L)
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

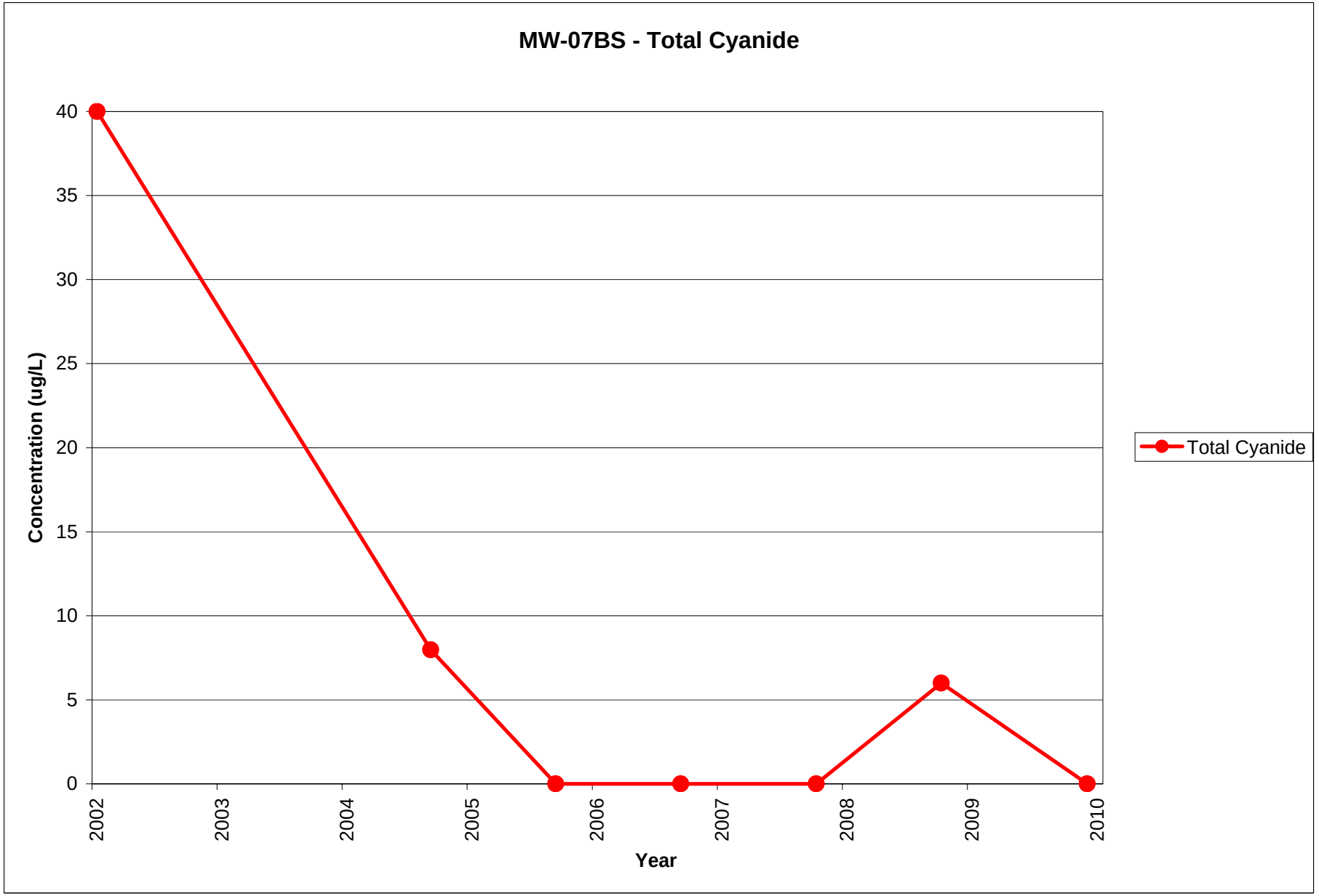

MW-07BD - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

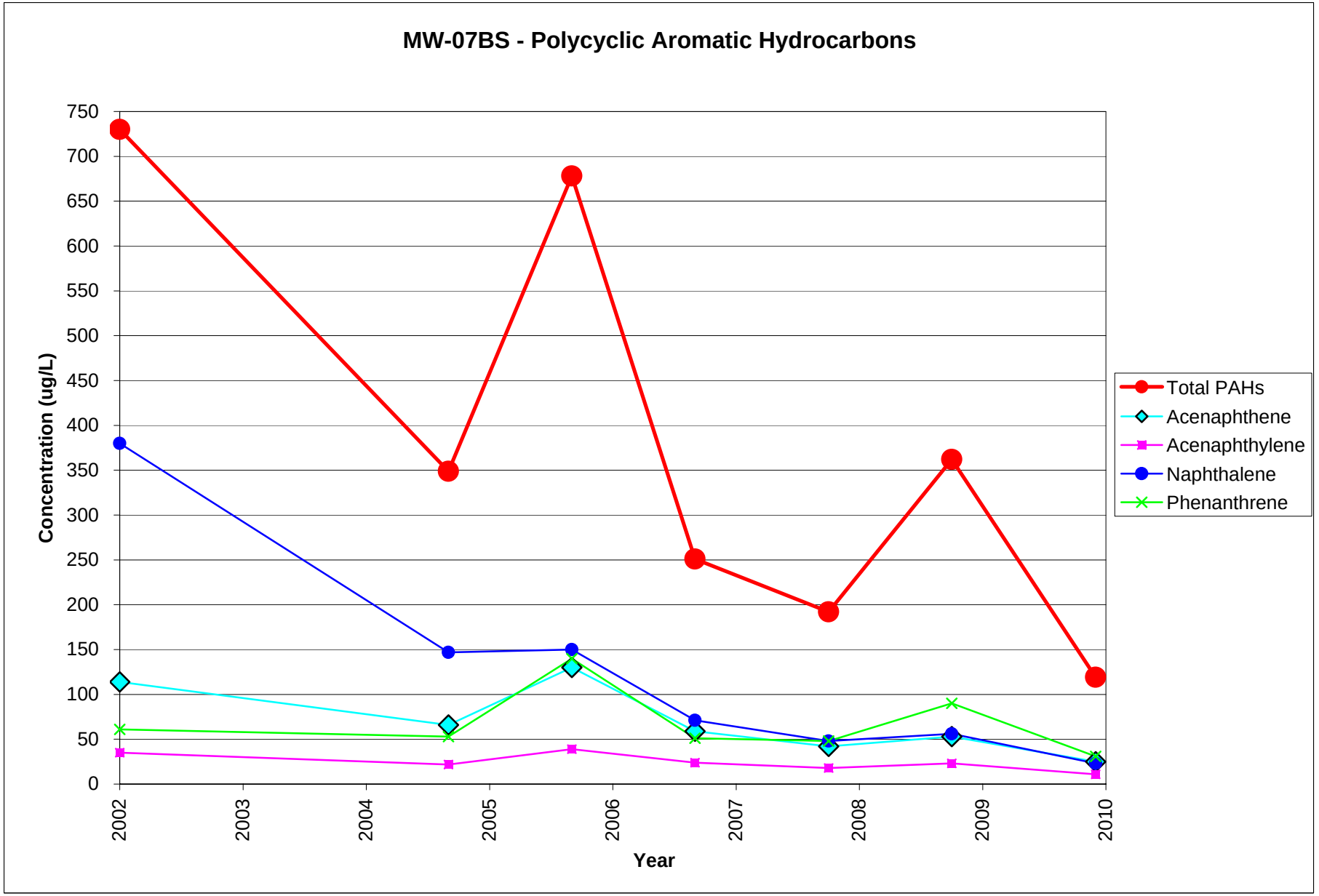

MW-07BD - Total Cyanide
Concentration (ug/L)
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

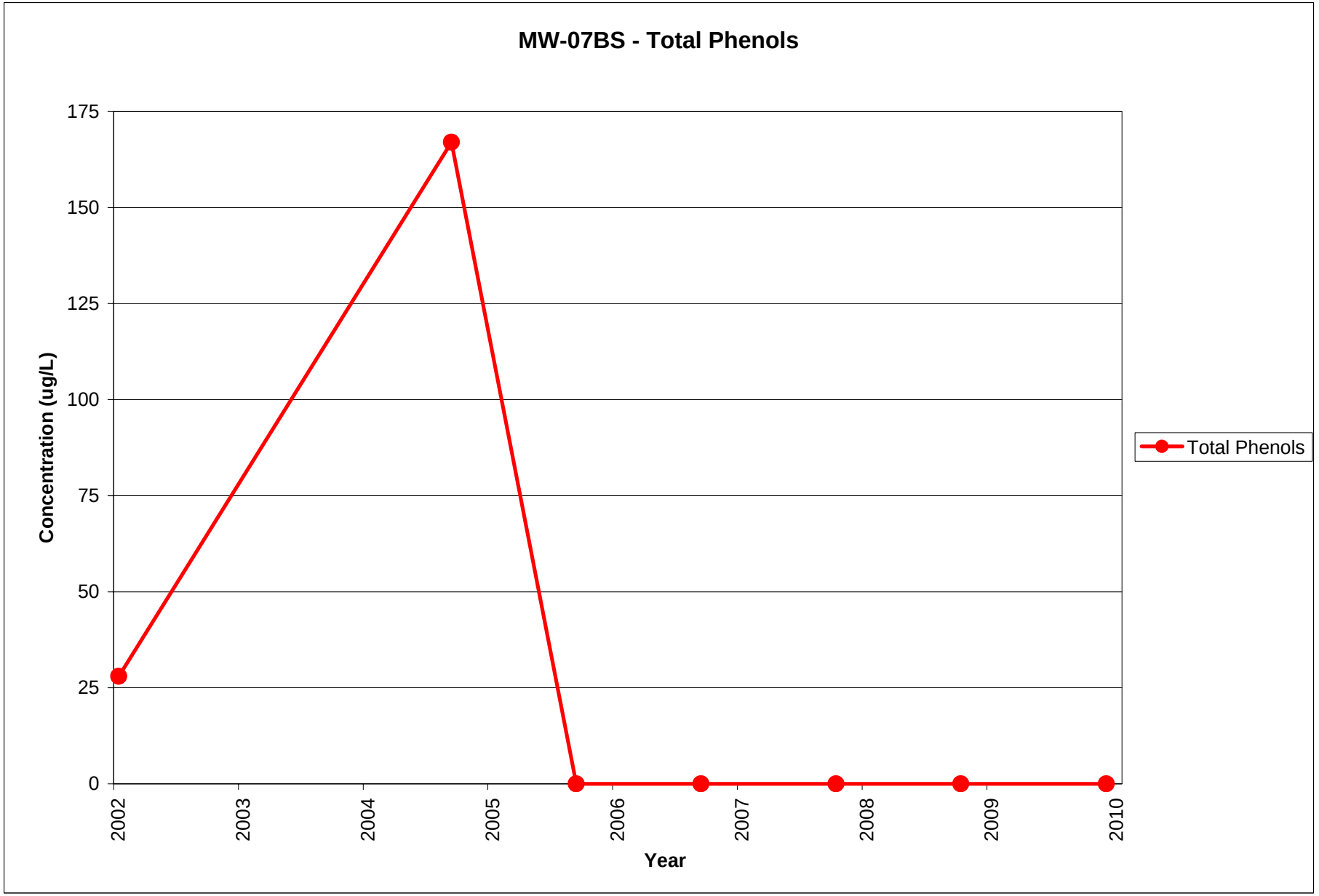

MW-07BD - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
32,000
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

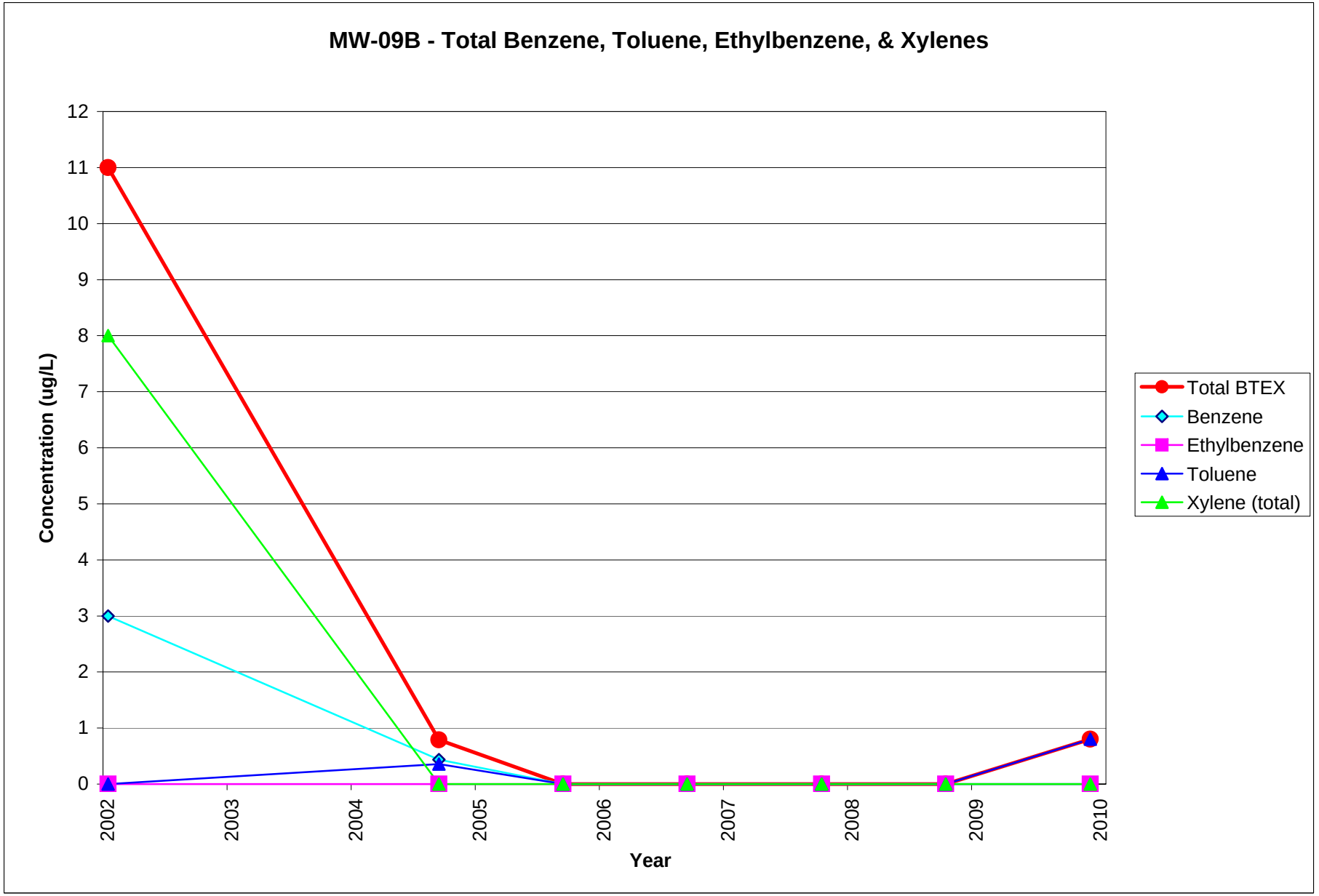

MW-07BD - Total Phenols
650
600
550
500
450
400
350
300
250
200
150
100
50
0
Concentration (ug/L)
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

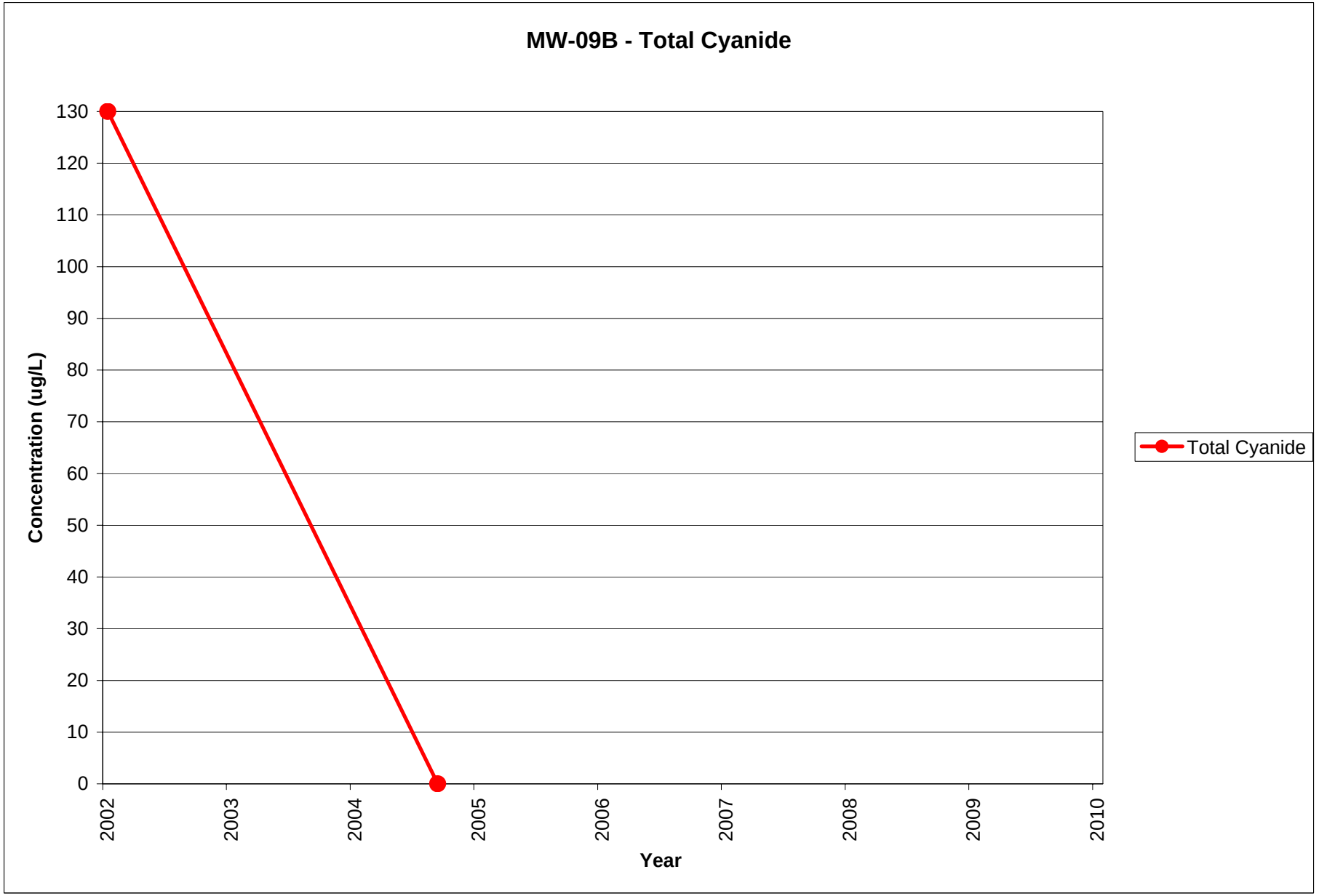

MW-07BS - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
350
325
300
275
250
225
200
175
150
125
100
75
50
25
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

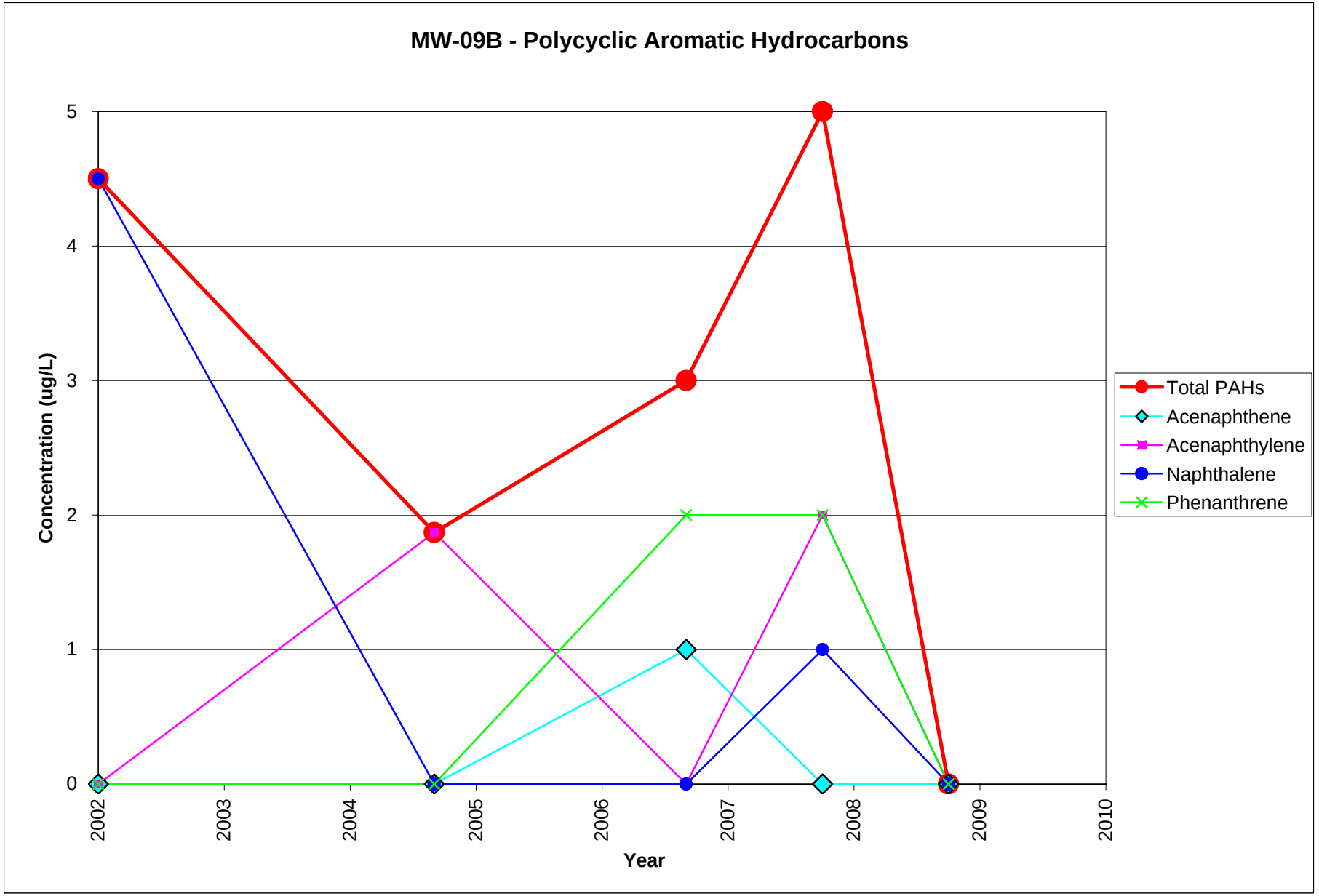

MW-07BS - Total Cyanide
Concentration (ug/L)
40
35
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

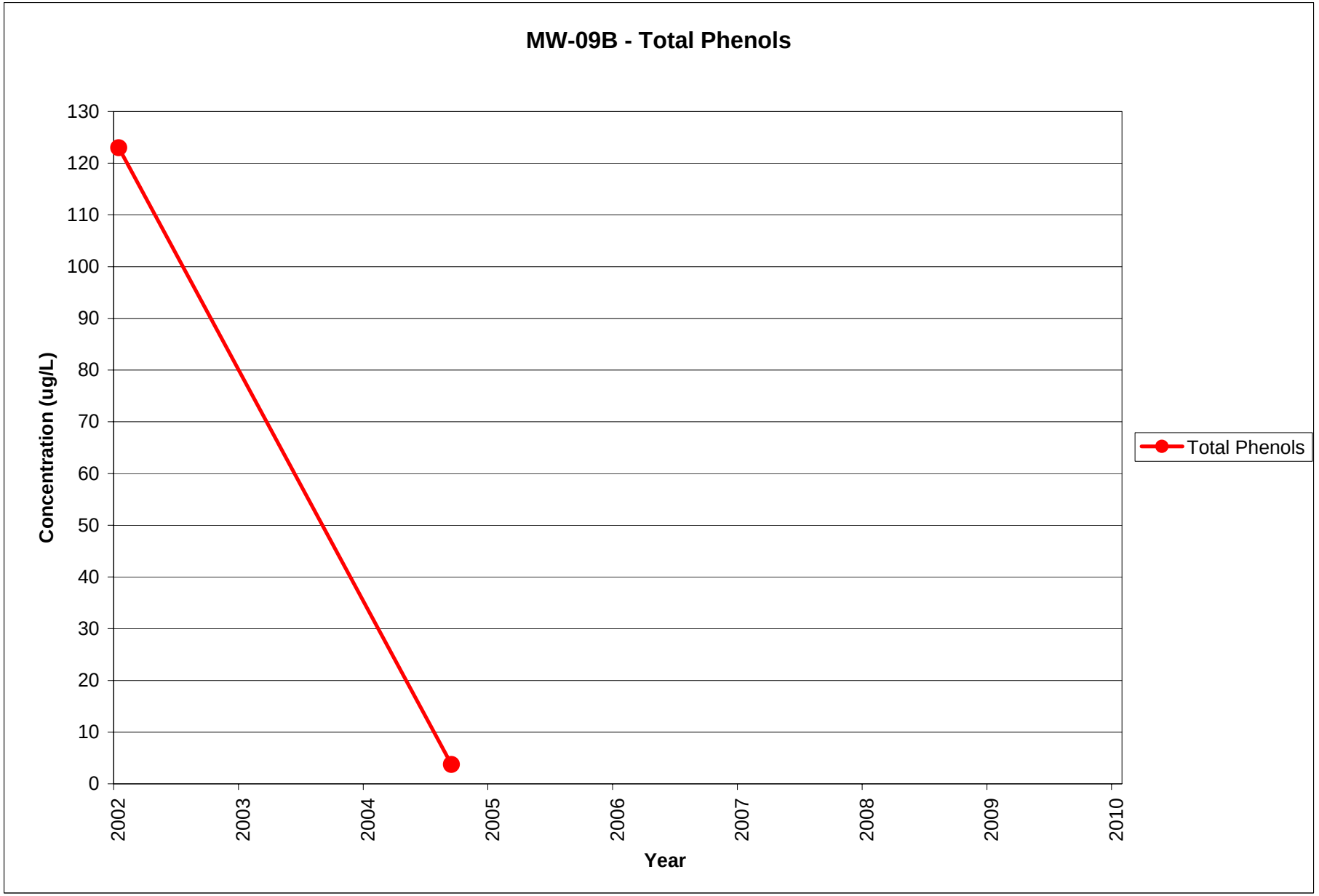

MW-07BS - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

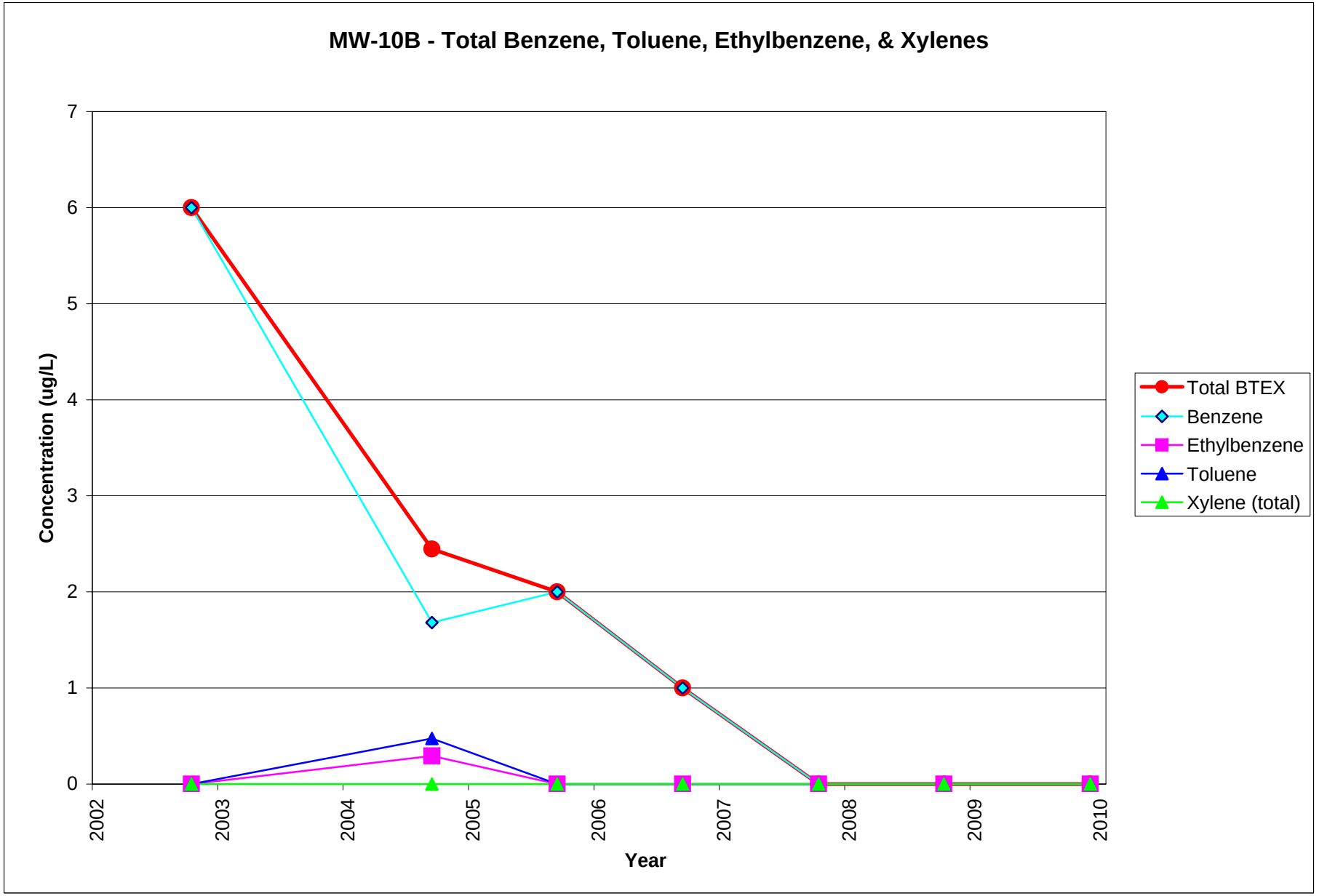

MW-07BS - Total Phenols
175
150
125
100
75
50
25
0
Concentration (ug/L)
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

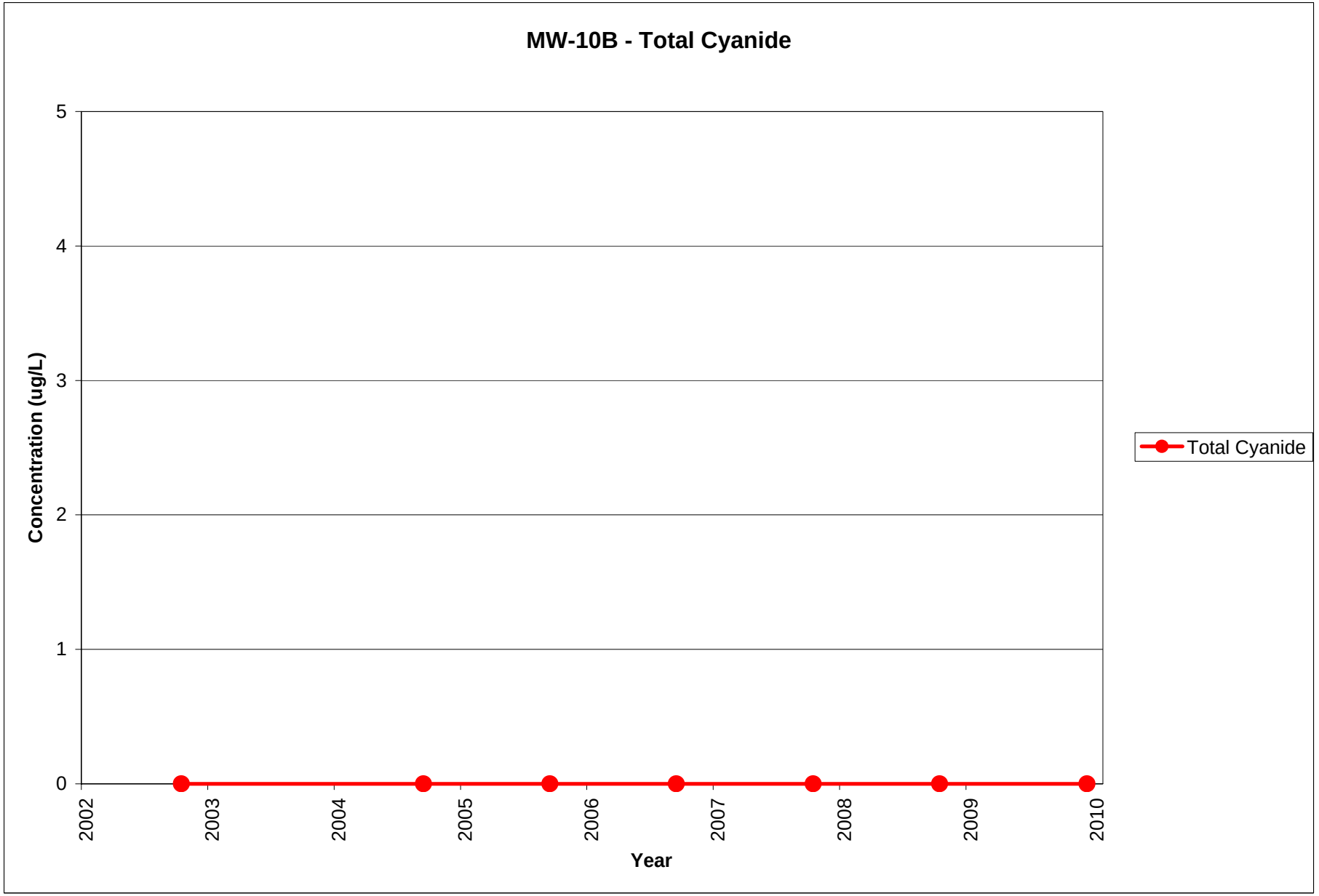

MW-09B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
12
11
10
9
8
7
6
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

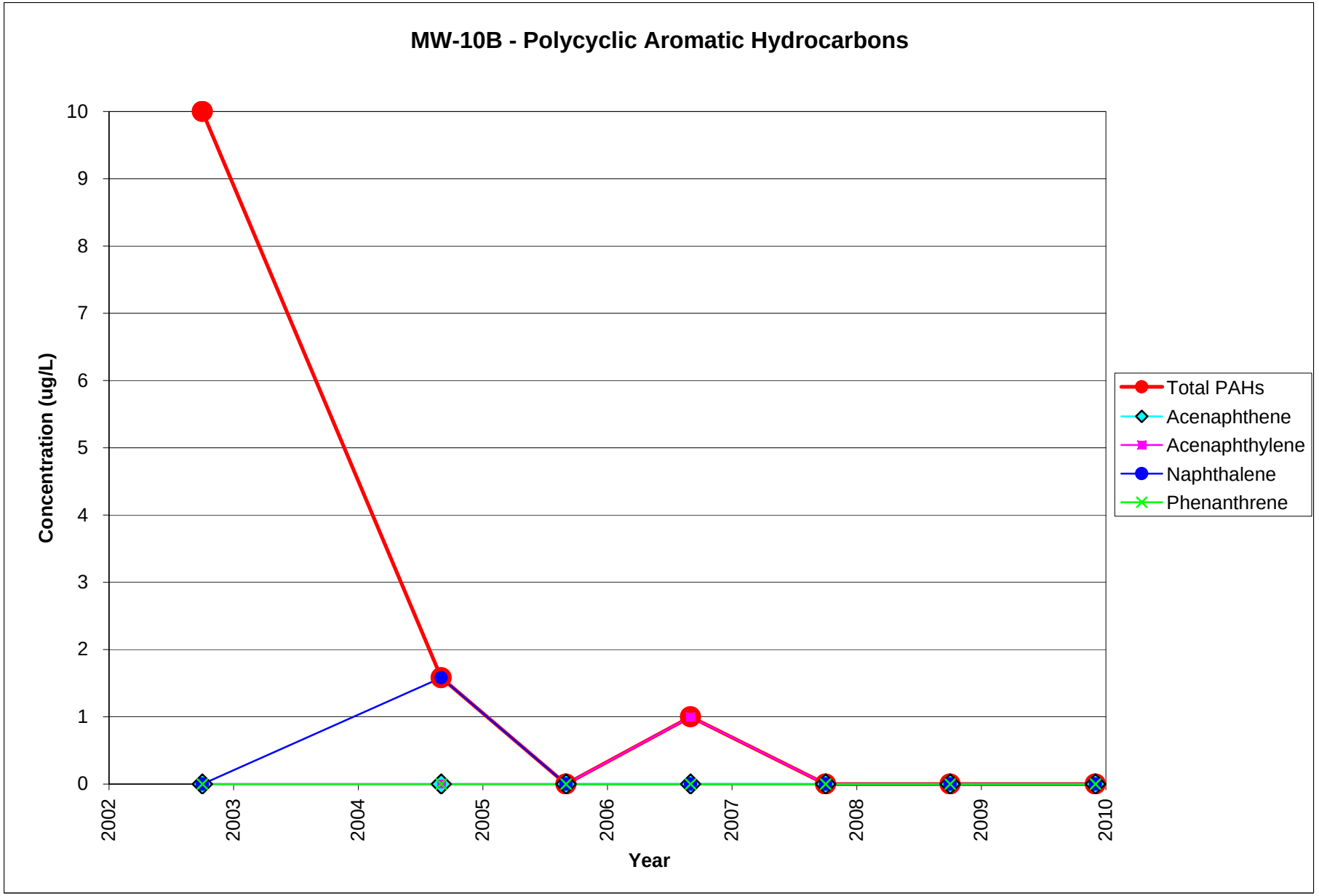

MW-09B - Total Cyanide
Concentration (ug/L)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

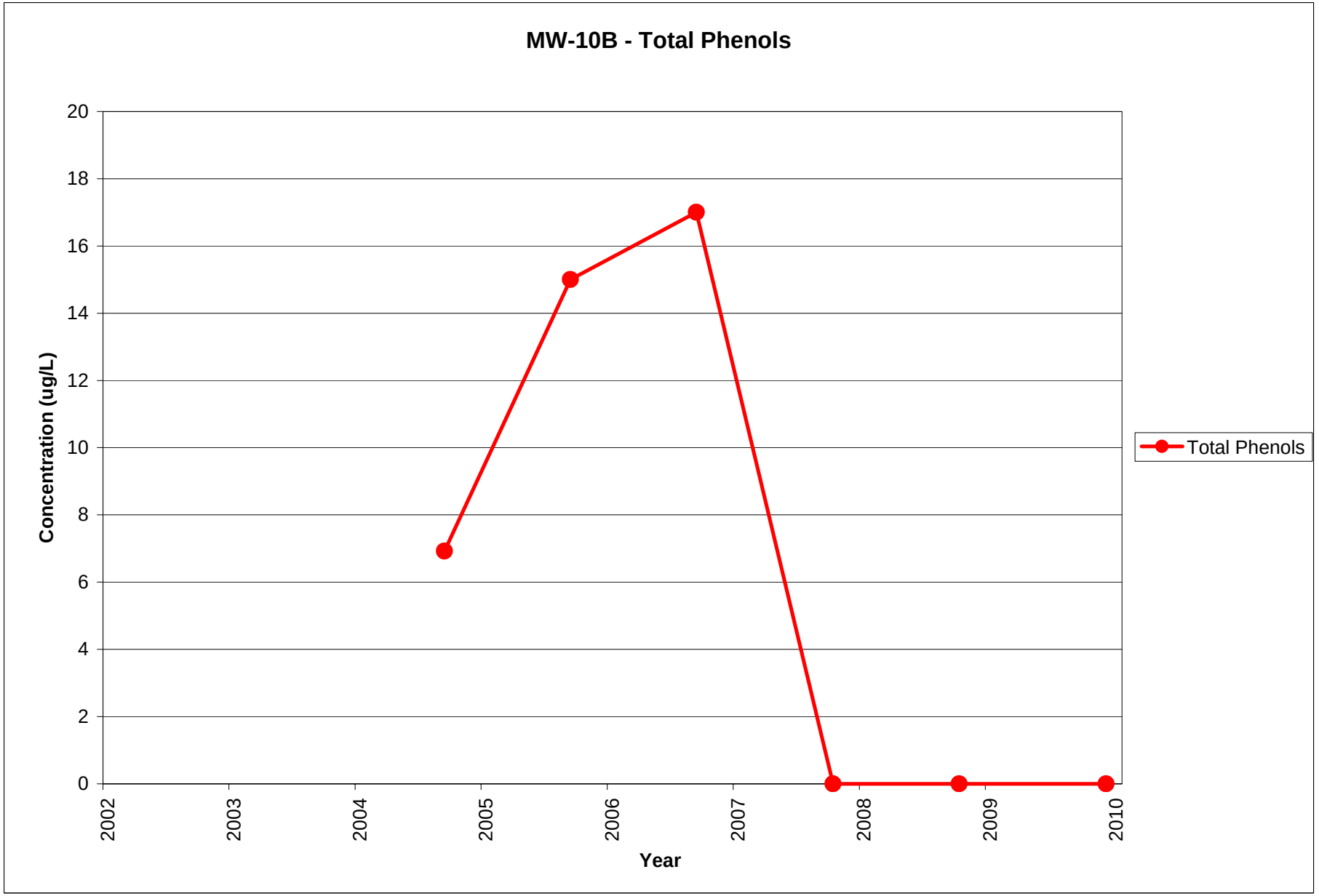

MW-09B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
0
1
2
3
4
5
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene

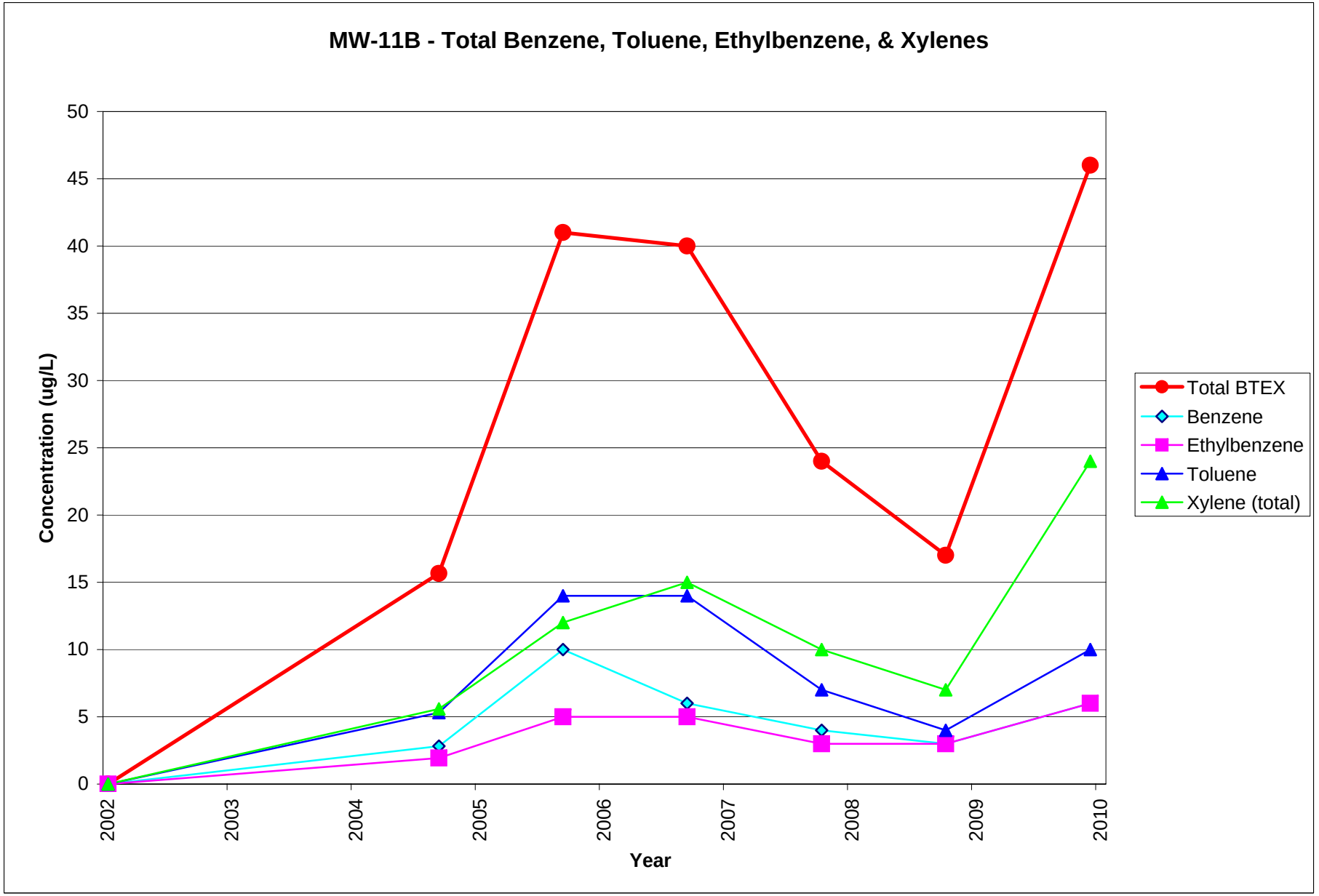

MW-09B - Total Phenols
Concentration (ug/L)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

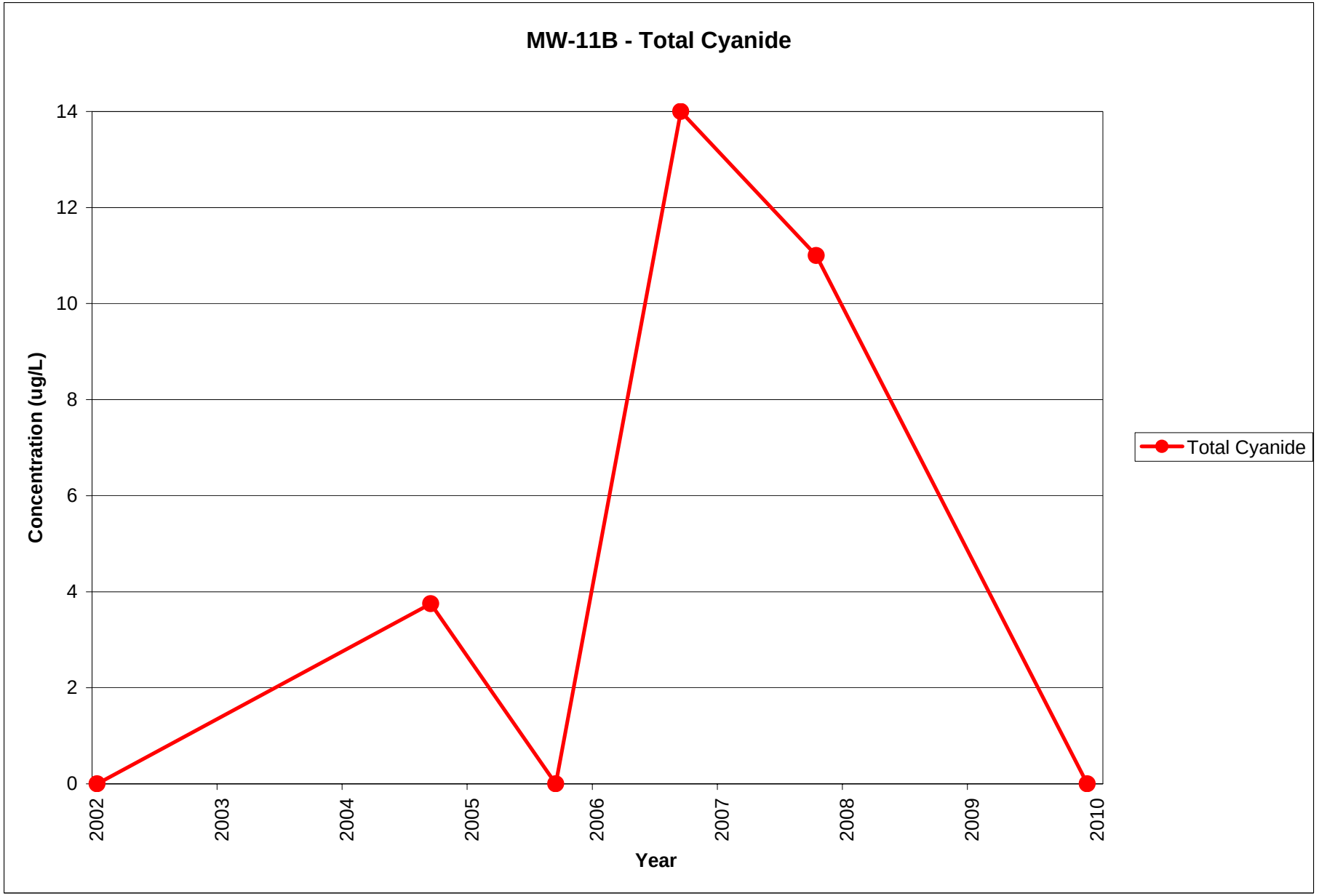

MW-10B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
0
1
2
3
4
5
6
7
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)

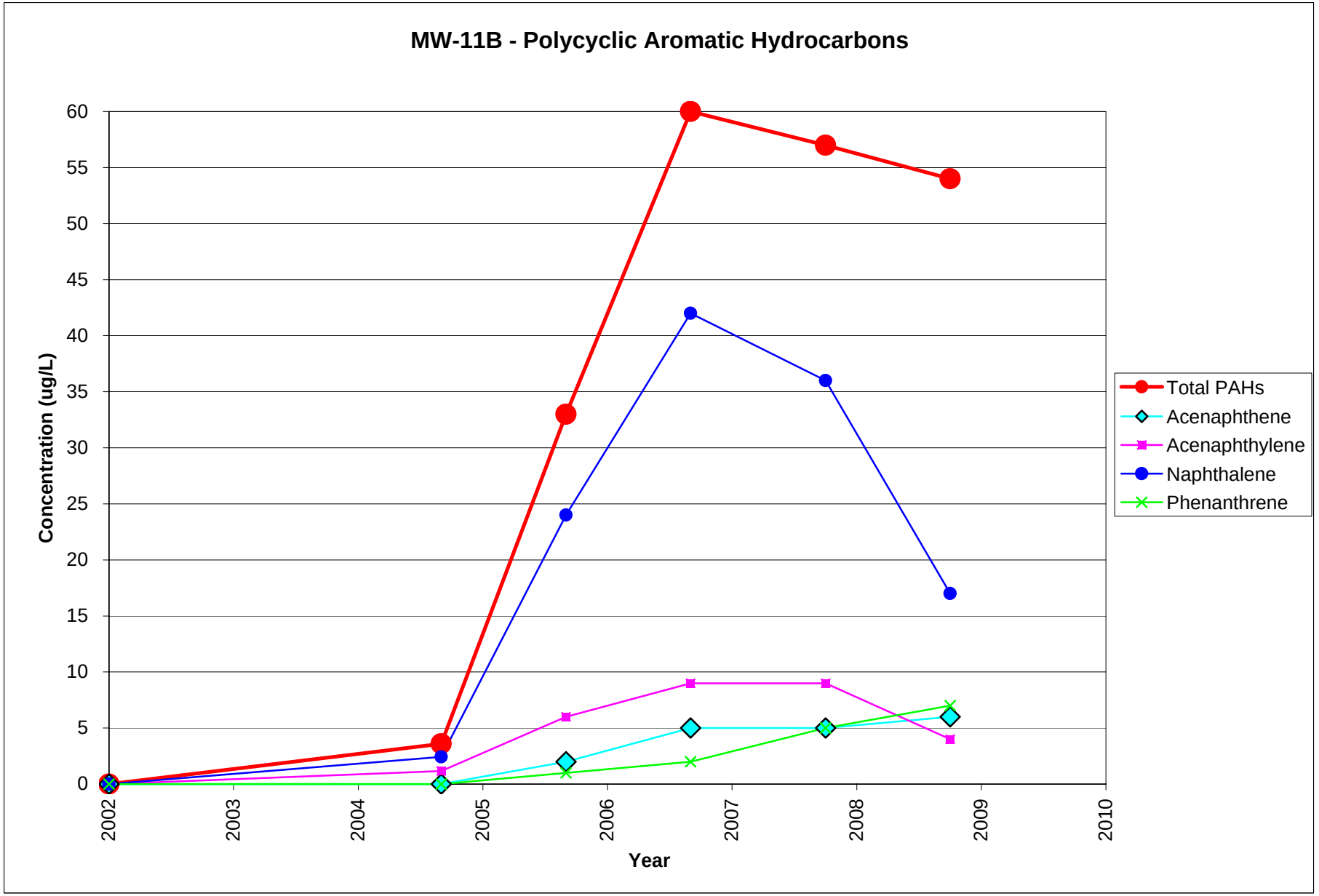

MW-10B - Total Cyanide
Concentration (ug/L)
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide

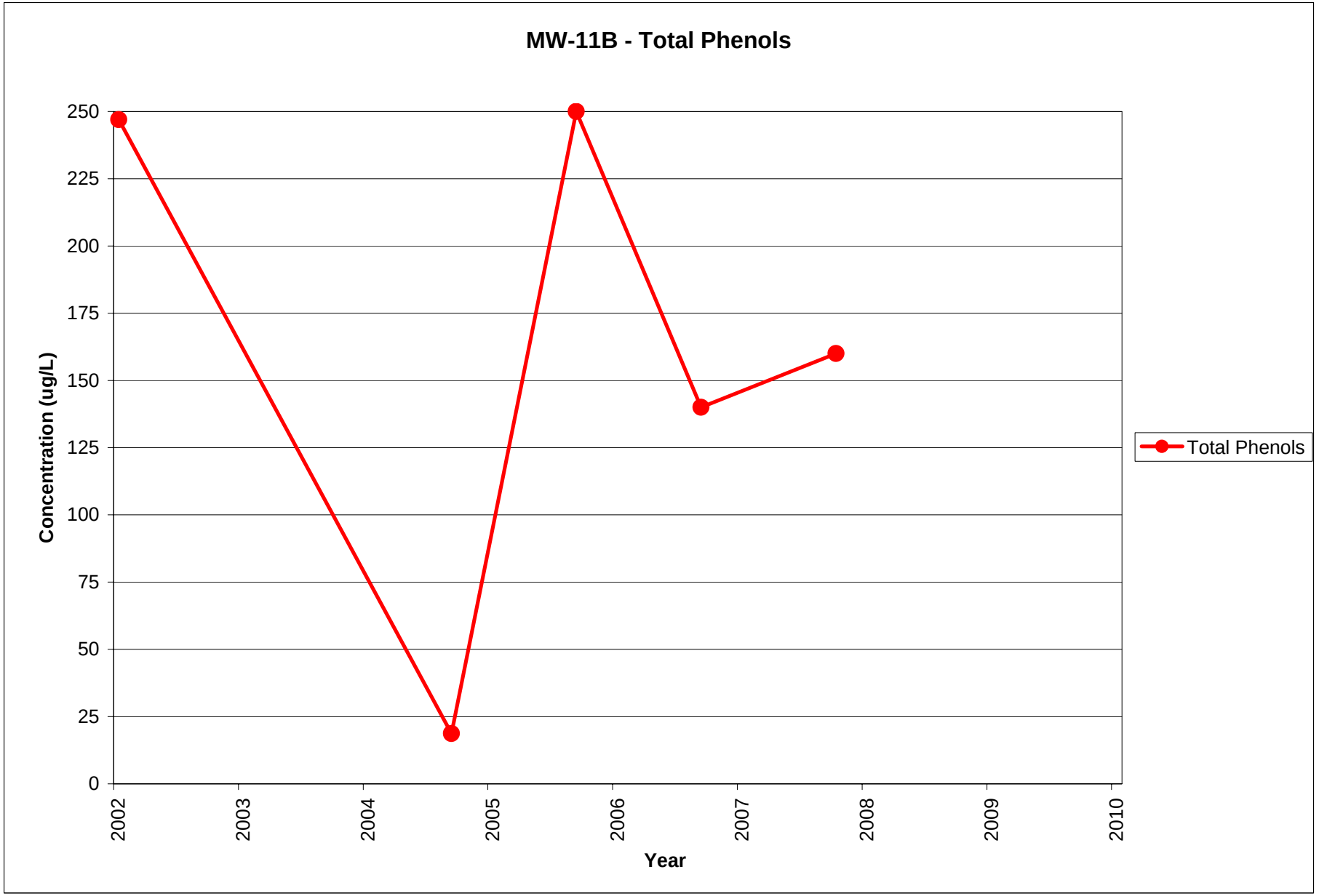

MW-10B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
10
9
8
7
6
5
4
3
2
1
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene


MW-10B - Total Phenols
Concentration (ug/L)
20
18
16
14
12
10
8
6
4
2
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols


MW-11B - Total Benzene, Toluene, Ethylbenzene, & Xylenes
Concentration (ug/L)
50
45
40
35
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total BTEX
Benzene
Ethylbenzene
Toluene
Xylene (total)


MW-11B - Total Cyanide
Concentration (ug/L)
14
12
10
8
6
4
2
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Cyanide


MW-11B - Polycyclic Aromatic Hydrocarbons
Concentration (ug/L)
60
55
50
45
40
35
30
25
20
15
10
5
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total PAHs
Acenaphthene
Acenaphthylene
Naphthalene
Phenanthrene


MW-11B - Total Phenols
Concentration (ug/L)
250
225
200
175
150
125
100
75
50
25
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year
Total Phenols

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-01B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	5	-10	0.119	No Trend
Naphthalene	WG	SVOA	4	1	1	0.625	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Chromium	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	4	1	-1	0.625	No Trend

LOCID: MW-02B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	7	7	0.191	No Trend
Ethylbenzene	WG	VOA	7	7	7	0.191	No Trend
Toluene	WG	VOA	7	7	8	0.191	No Trend
Xylene (total)	WG	VOA	7	7	4	0.386	No Trend
2-Methylnaphthalene	WG	SVOA	2	2		Insufficient Data *	
Acenaphthene	WG	SVOA	6	6	3	0.36	No Trend
Acenaphthylene	WG	SVOA	6	6	3	0.36	No Trend
Anthracene	WG	SVOA	6	5	1	0.5	No Trend
Benzo(a)anthracene	WG	SVOA	6	5	1	0.5	No Trend
Benzo(a)pyrene	WG	SVOA	6	5	1	0.5	No Trend
Benzo(b)fluoranthene	WG	SVOA	6	5	3	0.36	No Trend
Benzo(g,h,i)perylene	WG	SVOA	6	5	3	0.36	No Trend
Benzo(k)fluoranthene	WG	SVOA	6	5	1	0.5	No Trend
bis(2-Chloroethoxy)methane	WG	SVOA	3	2		Insufficient Data *	
Chrysene	WG	SVOA	3	3		Insufficient Data *	
Dibenz(a,h)anthracene	WG	SVOA	6	5	1	0.5	No Trend
Fluoranthene	WG	SVOA	6	5	1	0.5	No Trend
Fluorene	WG	SVOA	6	6	1	0.5	No Trend
Indeno(1,2,3-cd)pyrene	WG	SVOA	6	5	3	0.36	No Trend
Naphthalene	WG	SVOA	6	6	7	0.136	No Trend
Phenanthrene	WG	SVOA	6	6	3	0.36	No Trend
Pyrene	WG	SVOA	6	5	1	0.5	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-02B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Barium	WG	MET	1	1		Insufficient Data *	
Chromium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Lead	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Zinc	WG	MET	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	6	4	-4	0.36	No Trend

LOCID: MW-03B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	7	15	0.015	Upward Trend
Ethylbenzene	WG	VOA	7	5	14	0.035	Upward Trend
Toluene	WG	VOA	7	7	19	0.0014	Upward Trend
Xylene (total)	WG	VOA	7	5	19	0.0014	Upward Trend
Acenaphthene	WG	SVOA	7	5	15	0.015	Upward Trend
Acenaphthylene	WG	SVOA	7	5	16	0.015	Upward Trend
Fluorene	WG	SVOA	7	5	11	0.068	Upward Trend
Naphthalene	WG	SVOA	7	5	16	0.015	Upward Trend
Phenanthrene	WG	SVOA	7	4	6	0.281	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Cyanide	WG	MI	7	1	-6	0.281	No Trend
Phenolics, Total Recoverable	WG	MI	7	6	-2	0.5	No Trend

LOCID: MW-06B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	7	16	0.015	Upward Trend
Ethylbenzene	WG	VOA	7	6	12	0.068	Upward Trend

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-06B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Toluene	WG	VOA	7	6	19	0.0014	Upward Trend
Xylene (total)	WG	VOA	7	6	19	0.0014	Upward Trend
2-Methylnaphthalene	WG	SVOA	2	1		Insufficient Data *	
Acenaphthene	WG	SVOA	5	3	9	0.042	Upward Trend
Acenaphthylene	WG	SVOA	5	4	8	0.042	Upward Trend
Anthracene	WG	SVOA	5	3	7	0.117	No Trend
Benzo(a)anthracene	WG	SVOA	5	3	5	0.242	No Trend
Benzo(a)pyrene	WG	SVOA	5	3	5	0.242	No Trend
Benzo(b)fluoranthene	WG	SVOA	5	3	5	0.242	No Trend
Benzo(g,h,i)perylene	WG	SVOA	5	3	5	0.242	No Trend
Benzo(k)fluoranthene	WG	SVOA	5	3	5	0.242	No Trend
Chrysene	WG	SVOA	3	3		Insufficient Data *	
Dibenz(a,h)anthracene	WG	SVOA	5	3	7	0.117	No Trend
Fluoranthene	WG	SVOA	5	3	5	0.242	No Trend
Fluorene	WG	SVOA	5	3	9	0.042	Upward Trend
Indeno(1,2,3-cd)pyrene	WG	SVOA	5	3	5	0.242	No Trend
Naphthalene	WG	SVOA	5	4	8	0.042	Upward Trend
Phenanthrene	WG	SVOA	5	4	8	0.042	Upward Trend
Phenol	WG	SVOA	1	1		Insufficient Data *	
Pyrene	WG	SVOA	5	3	5	0.242	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	5	5	-4	0.242	No Trend

LOCID: MW-07BD

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	7	7	0.191	No Trend
Ethylbenzene	WG	VOA	7	7	1	0.5	No Trend
Toluene	WG	VOA	7	7	5	0.281	No Trend
Xylene (total)	WG	VOA	7	7	-3	0.386	No Trend
2-Methylnaphthalene	WG	SVOA	2	2		Insufficient Data *	

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-07BD

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Acenaphthene	WG	SVOA	6	6	7	0.136	No Trend
Acenaphthylene	WG	SVOA	6	6	3	0.36	No Trend
Anthracene	WG	SVOA	6	6	3	0.36	No Trend
Benzo(a)anthracene	WG	SVOA	6	6	5	0.235	No Trend
Benzo(a)pyrene	WG	SVOA	6	6	7	0.136	No Trend
Benzo(b)fluoranthene	WG	SVOA	6	6	5	0.235	No Trend
Benzo(g,h,i)perylene	WG	SVOA	6	5	9	0.068	Upward Trend
Benzo(k)fluoranthene	WG	SVOA	6	6	3	0.36	No Trend
bis(2-Chloroethoxy)methane	WG	SVOA	2	2		Insufficient Data *	
bis(2-Ethylhexyl)phthalate	WG	SVOA	1	1		Insufficient Data *	
Chrysene	WG	SVOA	4	4	0	0.625	No Trend
Dibenz(a,h)anthracene	WG	SVOA	6	5	7	0.136	No Trend
Fluoranthene	WG	SVOA	6	6	5	0.235	No Trend
Fluorene	WG	SVOA	6	6	5	0.235	No Trend
Indeno(1,2,3-cd)pyrene	WG	SVOA	6	5	9	0.068	Upward Trend
Naphthalene	WG	SVOA	6	6	1	0.5	No Trend
Phenanthrene	WG	SVOA	6	6	5	0.235	No Trend
Pyrene	WG	SVOA	6	6	5	0.235	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Zinc	WG	MET	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	6	6	3	0.36	No Trend

LOCID: MW-07BS

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	7	-12	0.068	Downward Trend
Ethylbenzene	WG	VOA	7	7	-16	0.015	Downward Trend
Toluene	WG	VOA	7	7	-16	0.015	Downward Trend
Xylene (total)	WG	VOA	7	7	-18	0.0054	Downward Trend
2-Methylnaphthalene	WG	SVOA	2	2		Insufficient Data *	

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-07BS

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Acenaphthene	WG	SVOA	7	7	-15	0.015	Downward Trend
Acenaphthylene	WG	SVOA	7	7	-11	0.068	Downward Trend
Anthracene	WG	SVOA	7	7	-8	0.191	No Trend
Benzo(a)anthracene	WG	SVOA	7	4	3	0.386	No Trend
Benzo(a)pyrene	WG	SVOA	7	3	-1	0.5	No Trend
Benzo(b)fluoranthene	WG	SVOA	7	2	1	0.5	No Trend
Benzo(g,h,i)perylene	WG	SVOA	7	2	1	0.5	No Trend
Benzo(k)fluoranthene	WG	SVOA	7	2	1	0.5	No Trend
bis(2-Chloroethoxy)methane	WG	SVOA	3	2		Insufficient Data *	
Chrysene	WG	SVOA	4	2	3	0.375	No Trend
Dibenzofuran	WG	SVOA	1	1		Insufficient Data *	
Fluoranthene	WG	SVOA	7	7	-4	0.386	No Trend
Fluorene	WG	SVOA	7	7	-9	0.119	No Trend
Indeno(1,2,3-cd)pyrene	WG	SVOA	7	2	3	0.386	No Trend
Naphthalene	WG	SVOA	7	7	-17	0.0054	Downward Trend
Phenanthrene	WG	SVOA	7	7	-9	0.119	No Trend
Pyrene	WG	SVOA	7	7	-2	0.5	No Trend
Arsenic	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Cyanide	WG	MI	7	3	-9	0.119	No Trend
Phenolics, Total Recoverable	WG	MI	7	2	-9	0.119	No Trend

LOCID: MW-07DD

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Phenol	WG	SVOA	1	1		Insufficient Data *	
Aluminum	WG	MET	1	1		Insufficient Data *	
Chromium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Cyanide	WG	MI	1	1		Insufficient Data *	

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-08B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	

LOCID: MW-08BD

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Phenolics, Total Recoverable	WG	MI	1	1		Insufficient Data *	

LOCID: MW-09B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	1	-6	0.281	No Trend
Toluene	WG	VOA	7	1	6	0.281	No Trend
Xylene (total)	WG	VOA	7	1	-6	0.281	No Trend
Acenaphthene	WG	SVOA	5	1	0	0.592	No Trend
Acenaphthylene	WG	SVOA	5	2	0	0.592	No Trend
Naphthalene	WG	SVOA	5	2	-3	0.408	No Trend
Phenanthrene	WG	SVOA	5	2	2	0.408	No Trend
Phenol	WG	SVOA	1	1		Insufficient Data *	
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Chromium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Zinc	WG	MET	1	1		Insufficient Data *	
Cyanide	WG	MI	2	1		Insufficient Data *	
Free Cyanide	WG	MI	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	2	2		Insufficient Data *	

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
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** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

MANN-KENDALL TREND RESULTS
GROUNDWATER MONITORING 2002-2009
NYSEG FORMER MGP SITE, BRIDGE STREET, PLATTSBURGH, NEW YORK

LOCID: MW-10B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	4	-17	0.0054	Downward Trend
Acenaphthylene	WG	SVOA	7	1	0	Undefined **	
Dibenzofuran	WG	SVOA	1	1		Insufficient Data *	
Naphthalene	WG	SVOA	7	1	-4	0.386	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Manganese	WG	MET	1	1		Insufficient Data *	
Phenolics, Total Recoverable	WG	MI	6	3	-6	0.235	No Trend

LOCID: MW-11B

Parameter	Matrix	Class	Num of Data Points	Num of Data Point Detections	Mann-Kendall Statistic S	Probabilities (1)	Trend (2)
Benzene	WG	VOA	7	6	5	0.281	No Trend
Ethylbenzene	WG	VOA	7	6	11	0.068	Upward Trend
Toluene	WG	VOA	7	6	4	0.386	No Trend
Xylene (total)	WG	VOA	7	6	11	0.068	Upward Trend
Acenaphthene	WG	SVOA	6	4	13	0.0083	Upward Trend
Acenaphthylene	WG	SVOA	6	5	8	0.136	No Trend
Dibenz(a,h)anthracene	WG	SVOA	6	1	5	0.235	No Trend
Fluoranthene	WG	SVOA	6	1	5	0.235	No Trend
Fluorene	WG	SVOA	6	3	9	0.068	Upward Trend
Indeno(1,2,3-cd)pyrene	WG	SVOA	6	1	5	0.235	No Trend
Naphthalene	WG	SVOA	6	5	7	0.136	No Trend
Phenanthrene	WG	SVOA	6	4	14	0.0083	Upward Trend
Phenol	WG	SVOA	1	1		Insufficient Data *	
Pyrene	WG	SVOA	6	1	5	0.235	No Trend
Aluminum	WG	MET	1	1		Insufficient Data *	
Barium	WG	MET	1	1		Insufficient Data *	
Copper	WG	MET	1	1		Insufficient Data *	
Iron	WG	MET	1	1		Insufficient Data *	
Cyanide	WG	MI	6	3	2	0.5	No Trend
Phenolics, Total Recoverable	WG	MI	5	5	0	0.592	No Trend

For multiple observations per time period, the Mann-Kendall test to the median was used.
Data reported as less than the detection limit were used by assigning a common value to the data that was smaller than the smallest measurement in the data set.
(1) - Probabilities for Mann-Kendall Nonparameteric Test for Trend (Gilbert R.O. 1987, Table A18).
(2) - Assuming a probability of error of 10% in the analyis method and or data, then the probability of no trend as calculated by the Mann-Kendall statistic is less than 10%, then it is assumed that there is a trend.
* - Number of obsevations too small to calculate probablities.
** - Probability Undefined for S=0 and N=6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30, 31, 34, or 35.

Only Detected Results Reported.

TABLE 1
ANALYTICAL DATA SUMMARY

Well Number	Direction	VOA	PAHs	Metals	CN	Phenols	NAPL (12/2009 event)	Trend Analysis (2002-2009)	Remarks
MW-1B	onsite/upgradient	x	x		x	x		no trend	CN - ND; Phenols - no trend
MW-2B	onsite/upgradient	x	x		x	x	trace NAPL	no trend	CN - ND; Phenols - no trend
MW-3B	downgradient	x	x		x	x		upward trend	CN & Phenols - no trend
MW-6B	onsite	x	x		x	x	NAPL	upward trend	CN - ND; Phenols - no trend
MW-7BS	onsite/higher elevation in aquifer	x	x		x	x	slight odor and sheen	downward trend/ no trend	This is the only well screened in the upper zone of the aquifer; continue to review downward trend and elim-inate when no NAPL indications. CN - ND; Phenols - no trend
MW-7BD	onsite	x	x		x	x	trace NAPL	no trend/ upward trend	CN - ND; Phenols - no trend
MW-9B	downgradient	x	x		x	x		no trend	CN & Phenols - no trend due to insufficient data
MW-10B	upgradient	x	x		x	x		no trend/ downward trend	Eliminate since there are multiple upgradient wells; no VOC, SVOC, CN or phenol SCG exceedances since 2006.
MW-11B	downgradient	x	x		x	x	slight odor and sheen	no trend/ upward trend	CN - ND; Phenols - no trend