KENNECOTT GREENS CREEK MINING COMPANY

FRESH WATER MONITORING PROGRAM
ANNUAL REPORT

WATER YEAR 2005

(October 1, 2004 through September 30, 2005)

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

INTRODUCTION

This annual report for water year 2005 (October 1, 2004 through September 30, 2005) provides the information required by the Fresh Water Monitoring Program (FWMP) for Kennecott Greens Creek Mining Company (KGCMC). It is separated into several sections, the first of which provides general information applicable to the entire program, followed by a comprehensive analysis of the data for each specific site.

To avoid confusion data values reported by the laboratory as being below the Method Detection Limit (MDL) are assigned a value of zero for plotting purposes. This is done so that the values below MDL are visually distinct and thus can be properly interpreted. On several of the graphs presented, changes have occurred in MDL over the period shown. This may lead to the visual impression that an upward trend exists when in fact the older analysis had MDL greater than ambient background levels. For the current water year's data the actual MDLs for non-detect values are listed in each site's table of results in the interpretative discussion of this report. For prior water year's historic MDLs please refer to GPO Appendix 1, Table 8-2.

The monitoring schedule varies from site to site and was modified under the most recent revision of GPO Appendix 1 that was implemented at the start of water year 2002. Different sites are monitored for different analytes during different months of the year. At times throughout the year sites scheduled for sampling may not be available due to weather or more rarely operational reasons. Copies of the water year 2005 sampling log are included on page 6 of this section and any variations from scheduled sampling events are noted on each site's table of results presented in the interpretive section.

The adjacent table outlines the requested Statistical Information Goals (SIGs) for each site sampled during the 2005 Water Year. A comparison to Alaska Water Quality Standards (AWQS) is required for all sites. In Appendix A the specific water quality criteria used for each comparison are summarized. Trend analysis is carried out by two different methods. The first method is a visual trend analysis for each analyte. For each site sampled a series of time-concentration graphs are constructed for the previous five years of data collected. The second method is a non-parametric statistical method, Mann-Kendall seasonal trend analysis that is routinely done for conductivity, pH, alkalinity, and dissolved zinc. These are the key

Site	Description	AWQS Comparison	Trend Visual	Trend Calc	Calculate Median	Median Comparison
48	Upper GC	X	X	+	X	
6	Middle GC	X	X	+	X	48 vs 6
54	Lower GC	X	X	+	X	6 vs 54
49	Upper Bruin Crk	X	X	+	X	
46	Lower Bruin Crk	X	X	+	X	49 vs 46
13	1350 Audit	X	X	+	X	
57	MW-23-00-03	X	X	**	X	
56	MW-D-00-01	X	X	**	X	57 vs 56
58	MW-T-00-01C	X	X	**	X	
27	MW-2S	X	X	+	X	**
29	MW-3S	X	X	+	X	**
32	MW-5S	X	X	+	X	**
59	MW-T-00-1A	X	X	**	X	
28	MW-2D	X	X	+	X	**

+: Additional statistical trend analysis done for conductivity, pH, alkalinity, diss-zinc.

**: Insufficient Data for a robust statistical evaluation parameters along with sulfate that can be strongly affected by AMD. Sulfate was added back into the required list of analytes in the 2002 water year and thus currently there is insufficient data to conduct a robust statistical trend analysis. KGCMC anticipates adding a non-parametric analysis for trend in the sulfate data set in the 2006 water year report for appropriate sites. Median calculation is shown in the annual table of results for each site. Finally, for all down gradient sites that are paired with an upgradient control site, which are monitored with a frequency greater than 4 times per year, a comparison of medians is presented for each specific site. These down gradient sites (upgradient site in parenthesis) include Site 6 (Site 48), Site 54 (Site 6), Site 46 (Site 49), and Site 58 (Site 57). For each of these sites, the statistical information goals requested a comparison of medians for total alkalinity, pH, conductivity, total sulfate and dissolved zinc. The statistical test utilized is a non-parametric, Wilcoxon signed-rank test. A brief summary of the two main statistical procedures, the Wilcoxon signed-rank sum test and the Mann-Kendall seasonal trend are given below.

Statistical Tests

The Mann-Kendall seasonal trend test is a non-parametric test for zero slope of a linear regression of time-ordered data verse time. Briefly the test consists of tabulating the Mann-Kendall statistic S_k (k=1 to 12, for each month) and its variance VAR(S) for data from each season (month). The S_k statistic is simply the sum of the number of positive differences minus the number of negative differences for time ordered data pairs. Any seasonal trend is removed by only considering data pairs taken within the same month. The individual monthly Mann-Kendall statistics (S_k) are tested for homogeneity of trend which is used to determine if it is reasonable to combine the monthly S_k statistics into an overall annual statistic (ΣS_k). If the test for monthly homogeneity is rejected the annualized statistic is not meaningful. However, the individual monthly Mann-Kendall statistics can still be tested for trend and a Sen's slope estimator can be calculated for each month (noted as Q_m in the interpretive section) with a significant trend.

The advantages of the Seasonal Kendall trend test is that it is a rank-based procedure especially suitable for non-normally distributed data, censored data, data containing outliers and non-linear trends. The null hypothesis (H_0) states that the data(x_1, .., x_n) are a sample of n independent and identically distributed random variables. The trend test statistic Z is used as a measure of trend magnitude, or of its significance. A positive Z value indicates an upward trend while a negative value indicates a downward trend. However, the Z statistic is not a direct quantification of trend magnitude. For trend of significant magnitude a separate statistic, Sen's slope estimator, is calculated by computing the seasonally adjusted (monthly) median value for the slope. For datasets which fail the homogeneity test, individual monthly S_k statistics are compared to a theoretical probability distribution of S derived by Mann and Kendall (Table A18 in Gilbert, 1987). Further guidance and background on these statistical methods can be found in Gilbert (1987) or Helsel and Hirsch (1992).

The Wilcoxon signed-rank test is used to determine if the median difference between paired data points is equal to zero. In general terms the signed-rank is used to determine if a set of paired data observations, x's and y's, come from the same population (i.e. have the same median) or as the alternative hypothesis differ only in the location of the central value (median). If the data are from the same population then the differences of the paired data should be equally distributed around 0, or about half the differences should be greater than 0 and half should be less than 0.

Computationally the test is straight forward. First the differences $D_i=x_i-y_i$,i=1…N are computed for each pair. The absolute values of the differences $|D_i|$, i=1…N are ranked from smallest to largest and data pairs that are tied, thus having differences of zero, are ignored. The ranks of the absolute differences are assigned the sign of the actual differences. For example, negative differences have negative-signed ranks and positive differences have positive-signed ranks thus the term "signed-rank" in the method name. The test statistic W^+ is the sum of all positively signed ranks. The statistic W^+ is then compared to tabled values that vary based on N. The one-tailed version of the signed-rank test has been applied to the key indicator analytes of conductivity, pH, total alkalinity, sulfate, and dissolved zinc as listed in the table below.

Analyte	Rationale	median |D|	Tail	Reject H_0 if:
Specific Conductance	Conductivity, as a proxy for total dissolved solids, **increases** due to sulfide oxidation.	<0	X's **<** Y's	$W^+(calc) < W(table)_{\alpha,n}$
Lab-pH	pH **decreases** though the addition of H^+ generated by pyrite oxidation.	>0	X's **>** Y's	$W^+(calc) > W(table)_{\alpha,n}$
Total Alkalinity	Total alkalinity **decreases** by consumption of buffing capacity due to H^+ produced by pyrite oxidation.	>0	X's **>** Y's	$W^+(calc) > W(table)_{\alpha,n}$
Total Sulfate	Total sulfate **increases** due to oxidation of sulfides	<0	X's **<** Y's	$W^+(calc) < W(table)_{\alpha,n}$
Dissolved Zinc	Dissolved zinc **increases** due to sulfide oxidation and is more readily soluble at neutral pH than other metals.	<0	X's **<** Y's	$W^+(calc) < W(table)_{\alpha,n}$

X: Upgradient Site

Y: Downgradient Site

Further guidance and background on the statistical methods utilized in this report can be found in one of the following references: Helsel and Hirsch (1992), Gilbert (1987), or Section 3.3.3.1 of the EPA document "Guidance for Data Quality Assessment" EPA/600/R-96/084.

Qualified Data by QA Reviewer reports are generated by KGCMC's custom-built Microsoft Access database (WDMS). The reports provide a summary for each site's section of data limitations found in the monthly QA reviews. They list all data for that site that were qualified by the QA Reviewer for water year 2005 along with the reason for qualification. These data are all included in the data analyses, unless also identified as an outlier in the WDMS Qualified Data Summary.

INTERVENTIONS

This section identifies below any procedural changes, natural phenomena, mine operational changes, or other interventions that could possibly have affected data during water year 2005. Results of any visual data analyses to detect evident effects of these interventions are so indicated.

Prior interventions (and negotiated mid-year program modifications such as changes to laboratories, methods, detection limits, and reporting limits), and anything else which may affect data comparability and quality which occurred during previous water years, are documented in the “General History” section of the FWMP and in previous annual reports.

No samples were taken at Site 13 during October 2004 because of limited site access due to snow cover on the 1350 Road.

The 2000 FWMP revision changed the suite of analytes to be monitored and added sulfate into the list of analytes. Through an oversight by KGCMC the addition of sulfate into the suite list was not identified until February 2003 when immediate remedial action was taken. The samples taken during November 2002 through February 2003 were still available at Battelle Marine Sciences Laboratory that has been the laboratory utilized for sample analyses since October 1996. The samples were sent to Analytica Alaska for sulfate analyses since Battelle does not have the necessary instrumentation for this analyte. The sulfate concentrations for the prior month’s samples were determined on March 12, 2003 and reported to KGCMC. Sulfate has a twenty-eight day holding time and thus all the data collected prior to that time are qualified for expired periods. For the remainder of the 2003 water year sulfate samples were routinely collected and analyzed as per the methods and procedures outlined in the FWMP program. For the 2004 and 2005 water year, all scheduled sulfate samples were taken and analyzed as described in GPO Appendix 1.

MID-YEAR MODIFICATIONS

There were no mid-year modifications during water year 2005.

FWMP SAMPLE LOG

Water Year October 2004 Through September 2005

Annual Water Quality Monitoring Schedule-Laboratory Samples

Site	Site Name	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
6	Middle Greens Creek	10-26 P	11-16 P	12-08 Q	1-25 P	2-15 Q	3-15 P	4-13 P	5-24 P	6-14 P	7-19 7-21 P,R	8-17 P	9-14 P
9	Tributary Creek-Lower										7-21 R		
13	Mine Adit Discharge East	10-26 Q	11-16 Q					4-13 Q	5-24 Q	6-14 Q	7-19 Q	8-17 Q	9-14 Q
27	Monitoring Well 2S								5-24 Q				9-15 Q
28	Monitoring Well 2D								5-24 Q				9-15 Q
29	Monitoring Well 3S								5-24 Q				9-15 Q
32	Monitoring Well 5S								5-24 Q				9-15 Q
46	Lower Bruin Creek	10-26 P	11-16 P	12-08 Q	1-25 P	2-15 Q	3-15 P	4-13 P	5-24 P	6-14 P	7-19 P	8-17 P	9-14 P
48	Upper Greens Creek	10-26 P	11-16 P	12-08 Q	1-25 P	2-15 Q	3-15 P	4-13 P	5-24 P	6-14 P	7-19 7-22 P,R	8-17 P	9-14 P
49	Control Site Upper Bruin Creek	10-26 P	11-16 P	12-08 Q	1-25 P	2-15 Q	3-15 P	4-13 P	5-24 P	6-14 P	7-19 P	8-17 P	9-14 P
54	Greens Creek below D-Pond	10-26 P	11-16 P	12-08 Q	1-25 P	2-15 Q	3-15 P	4-13 P	5-24 P	6-14 P	7-19 P	8-17 P	9-14 P
56	Monitoring Well -D-00-01	10-26 Q	11-16 Q					4-13 Q	5-24 Q	6-14 Q	7-19 Q	8-17 Q	9-14 Q
57	Monitoring Well -23-00-03	10-26 Q	11-16 Q					4-13 Q	5-24 Q	6-14 Q	7-19 Q	8-17 Q	9-14 Q
58	Monitoring Well -T-00-01C								5-24 Q				9-15 Q
59	Monitoring Well -T-00-01A								5-24 Q				9-15 Q

Legend	
Sample Date / Suite	
Sample Date / Suite	Monthly Field Blank taken at this site
Sample Date / Suite	No Sample taken due to ice
Sample Date / Suite	No Sample taken due to lack of access (snow).
Sample Date / Suite	No Sample taken due to lack of flow

SAMPLE SUITES

Suite P
(Surface water only)

Conductivity
pH
Temperature
Hardness
Sulfate
Total Alkalinity
Dissolved Arsenic
Dissolved Cadmium
Dissolved Copper
Dissolved Lead
Dissolved Mercury
Dissolved Zinc

Suite Q
(Groundwater and surface water twice a year)

Conductivity
pH
Temperature
Hardness
Sulfate
Total Alkalinity
Dissolved Arsenic
Dissolved Barium
Dissolved Cadmium
Dissolved Chromium
Dissolved Copper
Dissolved Lead
Dissolved Mercury
Dissolved Nickel
Dissolved Selenium
Dissolved Silver
Dissolved Zinc

PERSONNEL INVOLVED

USFS

Kathy Rodriguez,, Monument Manager
USFS
Pete Griffen, JRD Ranger
USFS
Jeff Defreest
USFS
Steve Hohensee
USFS
David Cox
USFS
Pete Schneider
USFS
Laurie Thorpe
USFS

Biomonitoring

James Durst
ADNR
Laura Jacobs
ADNR
James Cariello
ADNR
Angela Isaacs
USFS
William Morris
ADNR
Robert McLean
ADNR
Jack Winters
ADNR
Nora Foster
Private Contractor
Dr. Joe Margraf
University of Alaska
Dr. Mark Wipfli
University of Alaska
Ms. Kathy Pearse
University of Alaska

KGCMC

Rich Heig, General Manager
KGCMC
Bill Oelklaus, Environmental Manager
KGCMC
Kerry Lear, Geologist
KGCMC
Jim Akins, Environmental Technician
KGCMC
Ted Morales, Environmental Technician
KGCMC
Pete Condon, Geochemist
KGCMC
Jennifer Saran, Environmental Engineer
KGCMC
Sarah Croteau, Environmental Technician
KGCMC

Laboratory and Data Review

Suzan Hughes, Project Coordinator
Environmental Synectics, Inc.
Evin McKinney , Senior Scientist
Environmental Synectics, Inc.
Leticia Sangalang, Senior Scientist
Environmental Synectics, Inc.
Linda Bingler, Project Coordinator
Battelle Marine Sciences Laboratory
Sally Wanstall, Project Manager
Analytica Alaska

USF&WS

Deborah Rudis
USFWS

PROPOSED PROGRAM MODIFICATIONS

No modifications are proposed at this time.

BIBLIOGRAPHY

Environmental Design Engineering (EDE), *Site 23/D Hydrogeology and Geochemical Analysis*. February 2004.

Environmental Protection Agency (1998). *EPA Guidance for Data Quality Assessment.* EPA QA/G-9, EPA/600-R-96/084. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. 219 pp.

Gilbert, Richard O. (1987). *Statistical Methods for Environmental Pollution Monitoring.* Van Nostrand Reinhold, New York. 320 pp.

Helsel, D.R., and Hirsch, R.M. (1992). *Statistical methods in water resource.* Elsevier Publishers, Amsterdam. 510 pp.

Kennecott Greens Creek Mining Company (KGCMC), *General Plan of Operations – Appendix 1: Fresh Water Monitoring Program*, October 2000.

INTERPRETIVE REPORT
SITE 48 "UPPER GREENS CREEK"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses with the exception of one outlier shown on the table below. During the current year no data points were flagged as outliers.

Sample Date	Parameter	Value	Qualifier	Notes
12/5/2001	Cond Field, µS/cm	37.2	RR	Suspected field instrument malfunction

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious trends are apparent except for a general upward trend in lab pH from mid-2001 through the end of the current water year. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005).

Site 48-WY2005, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.87	+		
pH, Lab	6	**1.00**	+	0.09	1.2
Alkalinity, Total	6	**1.00**	+	1.47	3.4
Zinc, Dissolved	6	0.91	+		

(1): Number of years (2):Significance level

For data sets with a statistically significant trend ($\alpha/2=2.5\%$) a Seasonal-Sen's Slope estimate statistic has also been calculated. The datasets for lab pH and total alkalinity both show statistically significant trends for the period tested. Laboratory pH has an overall statistically significant ($p=1.00$) trend and a slope estimate of 0.09 su/yr or a +1.2% increase over the last 6 years. Total alkalinity shows an overall statistically significant ($p=1.00$) trend and has a slope estimate of 1.47 mg/L•yr or a +3.4% increase over the last 6 years. Given the low absolute magnitudes of the change in pH and total alkalinity and the fact that Site 48 is used as a background reference, these changes are considered to be due to natural variation.

Table of Results for Water Year 2005

Site48 "Upper Greens Creek"

Sample Date/Parameter	10/26/2004	11/16/2004	12/8/2004	1/25/2005	2/15/2005	3/15/2005	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	2.0	4.9	0.7	1.7	1.4	1.8	2.3	4.9	6.6	10.2	11.2	8.8	3.6
Conductivity-Field(μmho)	142	91	122	136	144	112	126	84	90	98	134	114	118
Conductivity-Lab (μmho)	134	88	126	132	135	108 J	116	80	82	98	131	109	113
pH Lab (standard units)	7.95	7.55	7.94	7.88	7.58	7.95	7.87	8.00	8.07	7.20	7.89	7.81	7.89
pH Field (standard units)	7.85	7.42	7.88	7.90	7.96	7.82	7.61	7.76	6.89	7.98	7.78	8.12	7.84
Total Alkalinity (mg/L)	55.2 J	39.7	51.3	57.2	61.2	50.1 J	53.8	39.8	37.8	42.2	50.4	45.3	50.3
Total Sulfate (mg/L)	14.1	7.8	13.5	15.9	19.1	11.7	15.0	7.4	8.8	9.9	16.8	11.9	12.7
Hardness (mg/L)	66.4	45.9	61.2	60.6	67.4	51.4	57.5	41.2	36.7	47.7	61.2	58.4	58.0
Dissolved As (ug/L)	0.199	0.186	0.198	0.190	0.182	0.201	0.181 J	0.202	0.193	0.252	0.268 J	0.240	0.199
Dissolved Ba (ug/L)			28.7		29.2								29.0
Dissolved Cd (ug/L)	0.0382 U	0.0327	0.0487	0.0406	0.0422	0.0402	0.0371	0.0282 U	0.0301	0.0294	0.0411	0.0300	0.0377
Dissolved Cr (ug/L)			1.280		0.082								0.681
Dissolved Cu (ug/L)	0.282	0.700	0.364	0.413 U	0.358 U	0.568	0.544 U	0.221 U	0.179 U	0.389	0.401	0.443	0.395
Dissolved Pb (ug/L)	0.0043 U	0.0112 U	0.0140 U	0.0148 U	0.0099 J	0.0089 U	0.0057 U	0.0041 U	<0.0040 U	0.0062 U	0.0095	0.0053 U	0.0076
Dissolved Ni (ug/L)			0.849		0.929								0.889
Dissolved Ag (ug/L)			0.006 U		<0.003								0.004
Dissolved Zn (ug/L)	2.52	3.01 U	3.84	3.02	2.93 UJ	3.92 U	2.43 J	2.78 U	2.16	1.99 U	1.59 J	2.02 U	2.65
Dissolved Se (ug/L)			0.921		1.090								1.006
Dissolved Hg (ug/L)	0.000655 U	0.001450	0.000700 U	0.000898 U	0.000845	0.001580	0.001270 U	0.000554 U	0.000486 U	0.000772 U	0.000640 U	0.000902	0.000809

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
48	01/25/2005	2:04:00 PM				
			Cu Diss, ug/l	0.413	U	Field Blank Contamination
			Pb Diss, ug/l	0.0148	U	Field Blank Contamination
			Hg Diss, ug/l	0.000898	U	Field Blank Contamination
48	10/26/2004	11:47:00 AM				
			Alk Tot, mg/l	55.2	J	Hold Time
			Cd Diss, ug/l	0.0382	U	Field Blank Contamination
			Pb Diss, ug/l	0.0043	U	Field Blank Contamination
			Hg Diss, ug/l	0.000655	U	Field Blank Contamination
48	11/16/2004	10:06:00 AM				
			Pb Diss, ug/l	0.0112	U	Field Blank Contamination
			Zn Diss, ug/l	3.01	U	Field Blank Contamination
48	12/08/2004	1:43:00 PM				
			Pb Diss, ug/l	0.014	U	Method Blank Contamination
			Ag Diss, ug/l	0.00643	U	Method Blank Contamination
			Hg Diss, ug/l	0.0007	U	Field Blank Contamination
48	02/15/2005	11:55:00 AM				
			Cu Diss, ug/l	0.358	U	Field Blank Contamination
			Pb Diss, ug/l	0.0099	J	Below Quantitative Range
			Zn Diss, ug/l	2.93	UJ	Field Blank Contamination, L
48	03/15/2005	12:09:00 PM				
			Cond Lab, umho	108	J	Holdtime
			Alk Tot, mg/l	50.1	J	Holdtime
			Pb Diss, ug/l	0.00893	U	Field Blank Contamination
			Zn Diss, ug/l	3.92	U	Field Blank Contamination
48	04/13/2005	12:41:00 PM				
			As Diss, ug/l	0.181	J	LCS Recovery
			Cu Diss, ug/l	0.544	U	Field Blank Contamination
			Pb Diss, ug/l	0.00567	U	Field Blank Contamination
			Zn Diss, ug/l	2.43	J	LCS Recovery
			Hg Diss, ug/l	0.00127	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

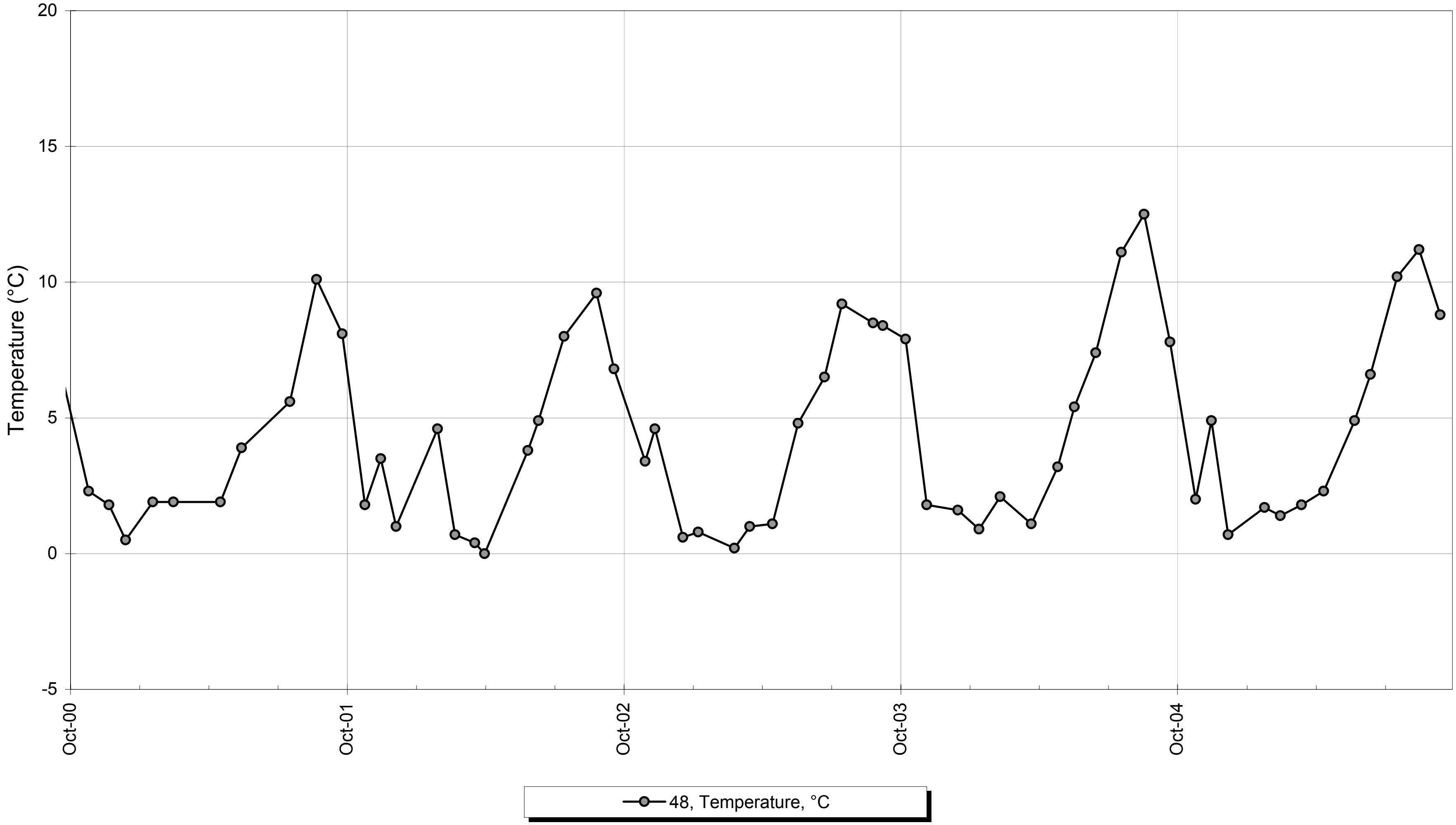
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

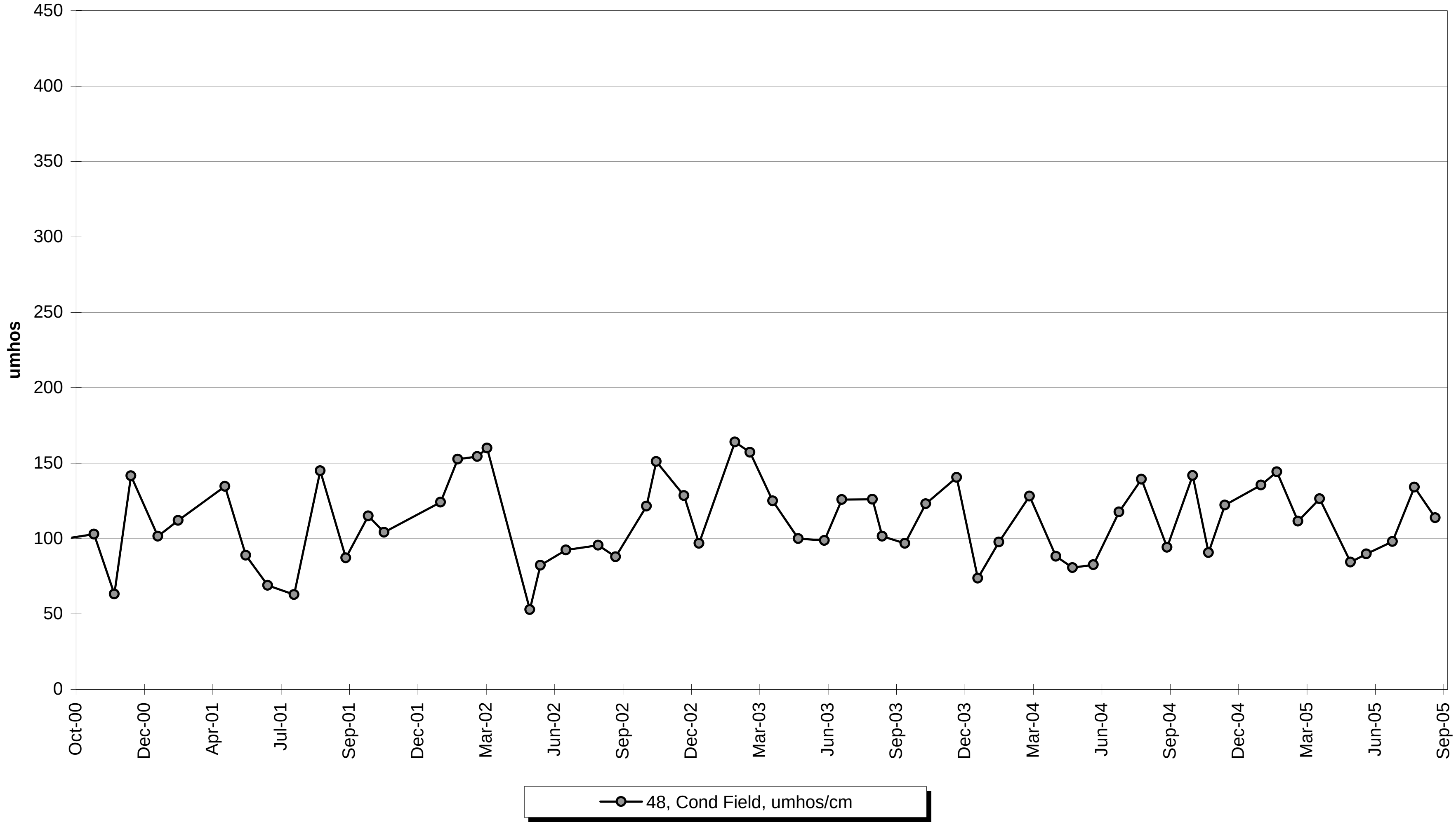
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
48	05/24/2005	11:50:00 AM				
			Cd Diss, ug/l	0.0282	U	Field Blank Contamination
			Cu Diss, ug/l	0.221	U	Field Blank Contamination
			Pb Diss, ug/l	0.00405	U	Field Blank Contamination
			Zn Diss, ug/l	2.78	U	Field Blank Contamination
			Hg Diss, ug/l	0.000554	U	Field Blank Contamination
48	06/14/2005	1:40:00 PM				
			Cu Diss, ug/l	0.179	U	Field Blank Contamination
			Pb Diss, ug/l	-0.004	U	Field Blank Contamination
			Hg Diss, ug/l	0.000486	U	Field Blank Contamination
48	07/19/2005	2:08:00 PM				
			Pb Diss, ug/l	0.0062	U	Field Blank Contamination
			Zn Diss, ug/l	1.99	U	Field Blank Contamination
			Hg Diss, ug/l	0.000772	U	Field Blank Contamination
48	08/17/2005	12:41:00 PM				
			As Diss, ug/l	0.268	J	LCS Recovery
			Zn Diss, ug/l	1.59	J	LCS Recovery
			Hg Diss, ug/l	0.00064	U	Field Blank Contamination
48	09/14/2005	12:28:00 PM				
			Pb Diss, ug/l	0.0053	U	Field Blank Contamination
			Zn Diss, ug/l	2.02	U	Field Blank Contamination

Qualifier	**Description**
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

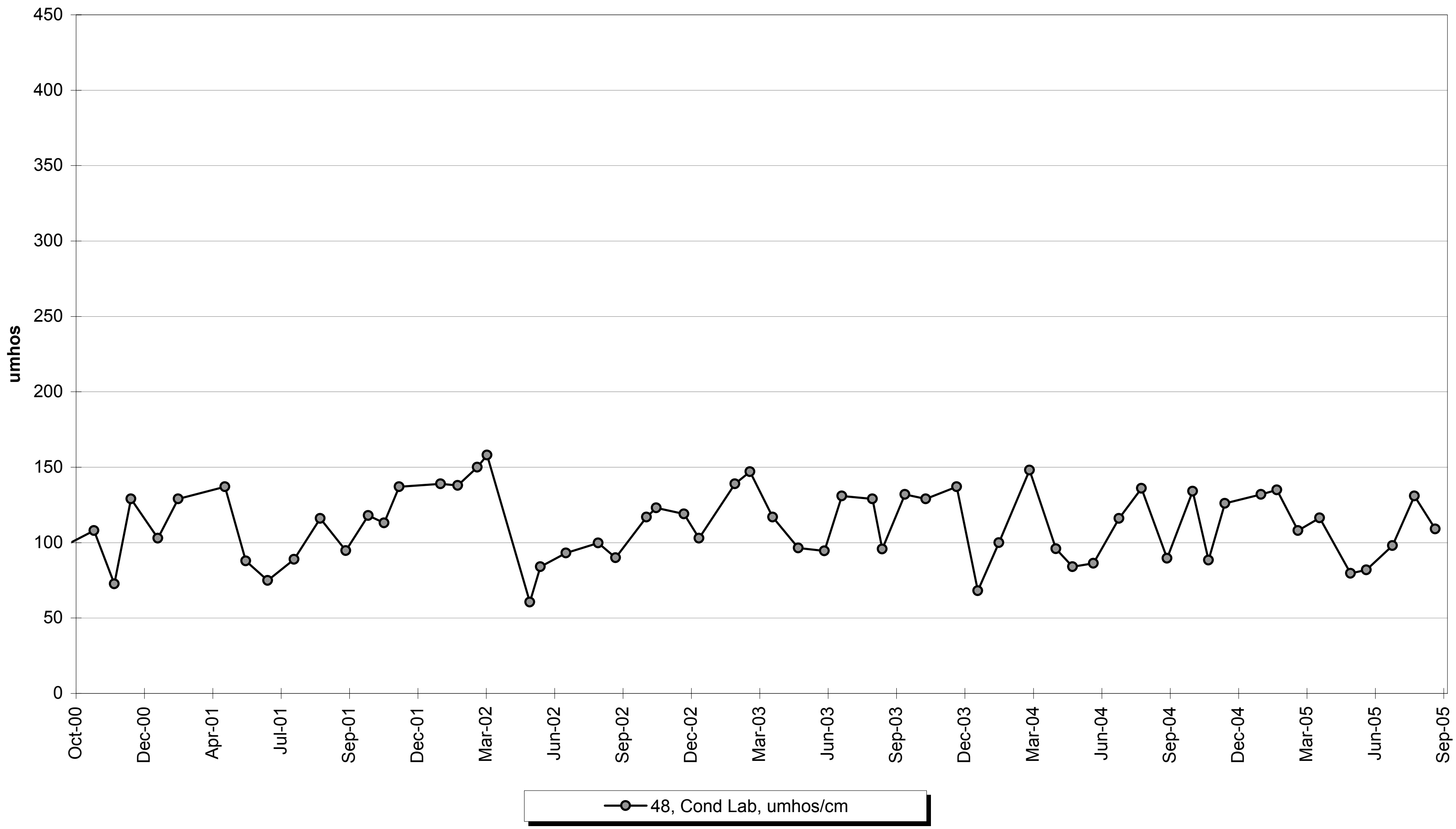
Site 48 -Water Temperature

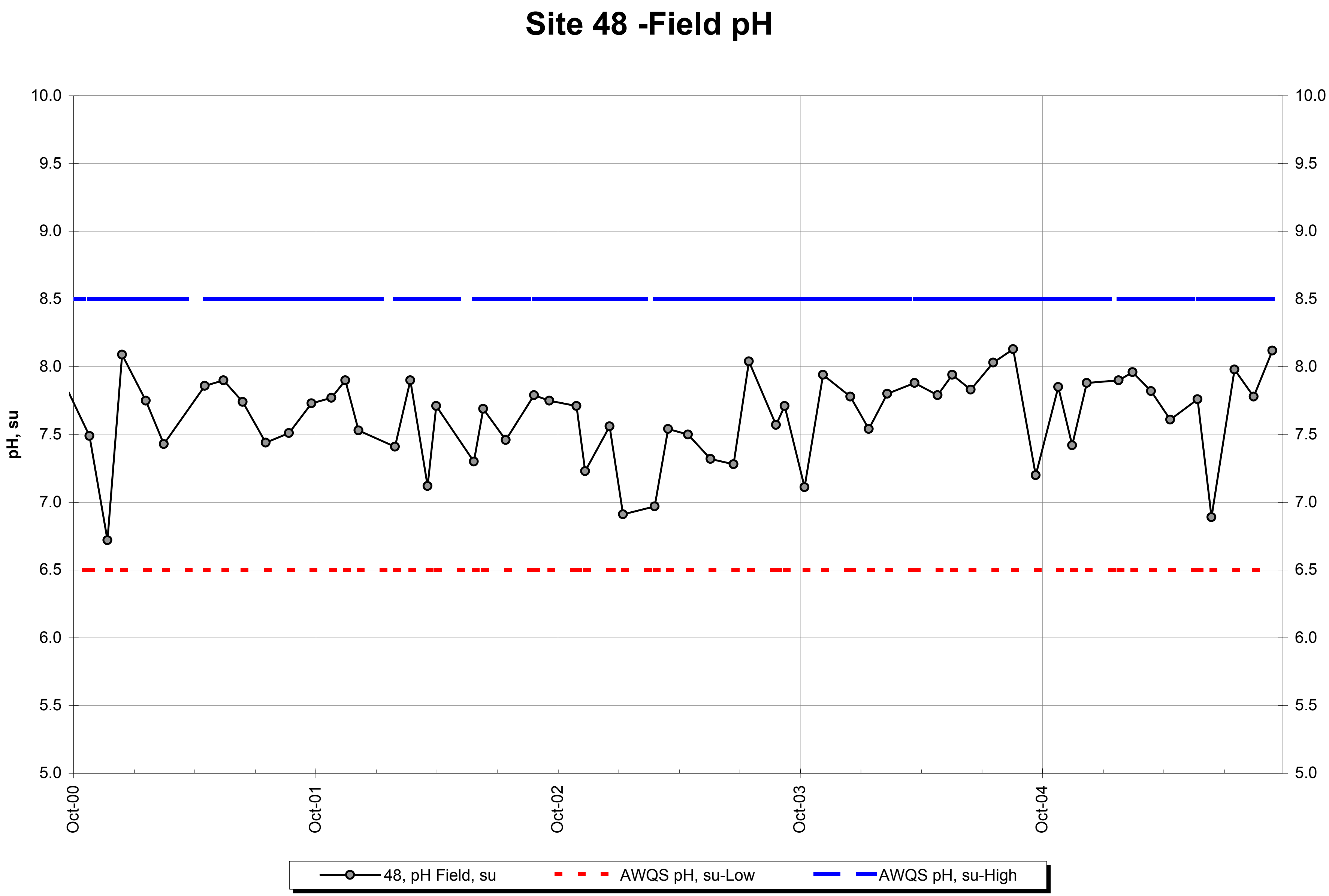


Site 48 -Conductivity-Field



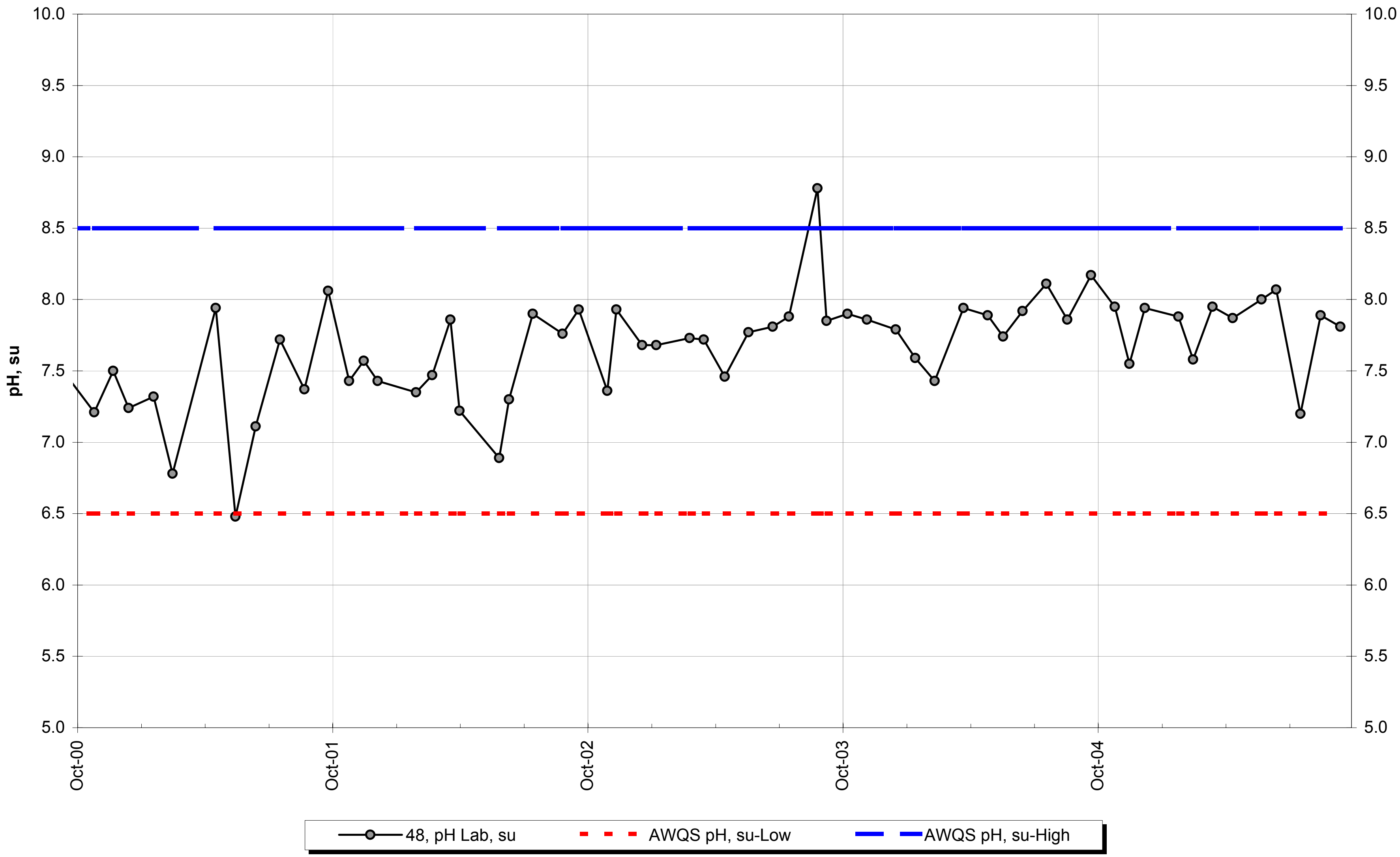
Site 48 -Conductivity-Lab

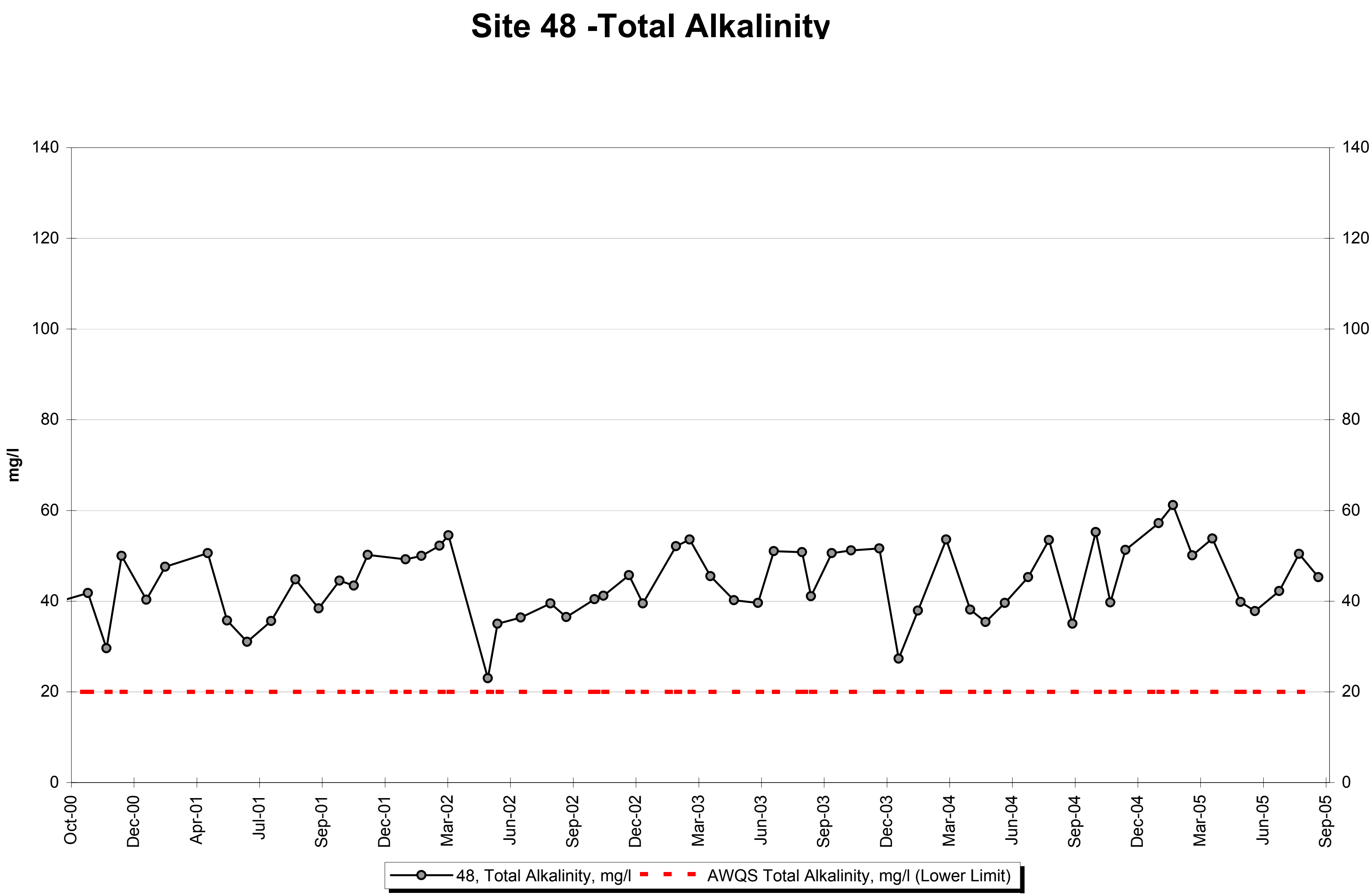




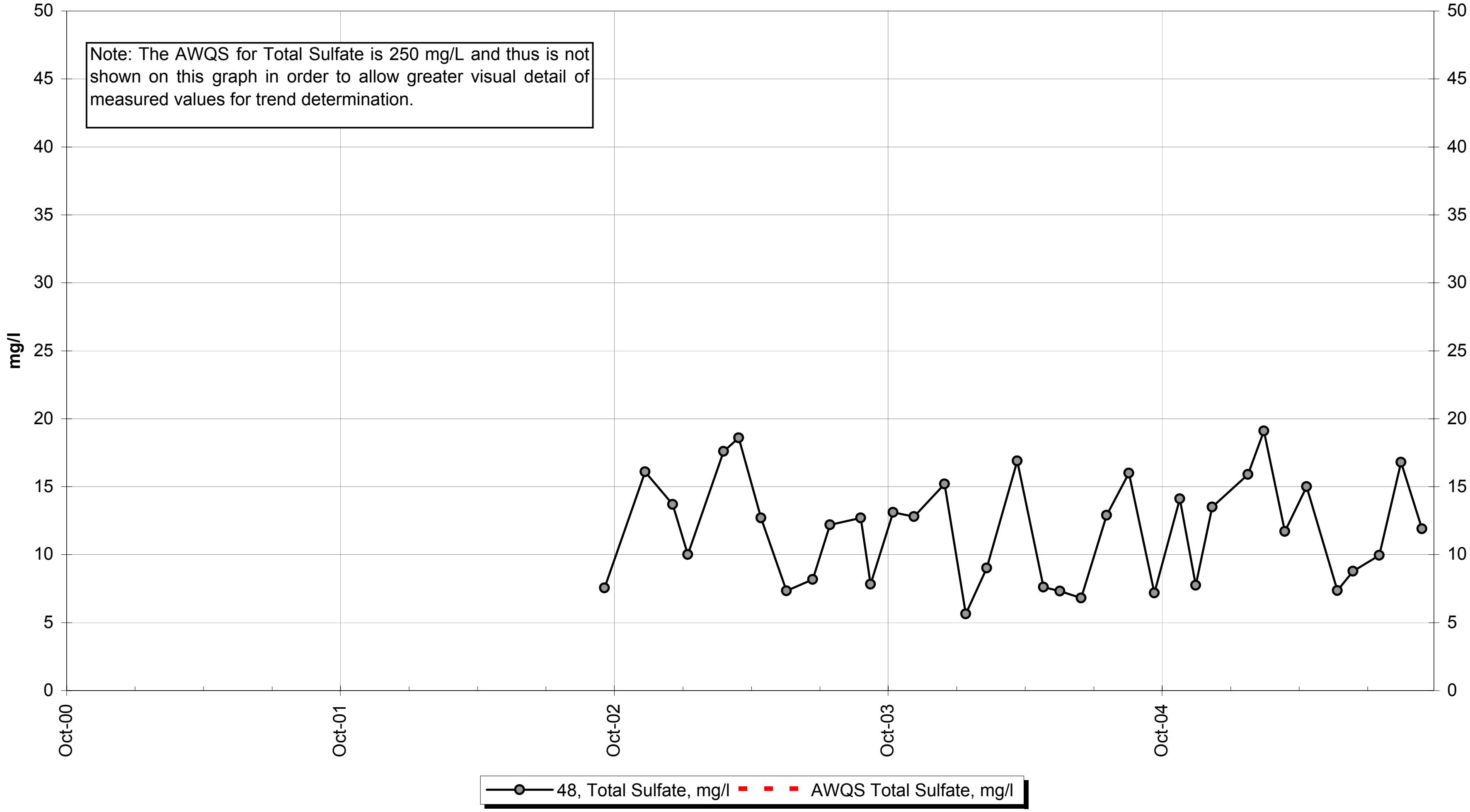
Site 48 -Field pH
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
pH, su
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
48, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

Site 48 -Lab pH

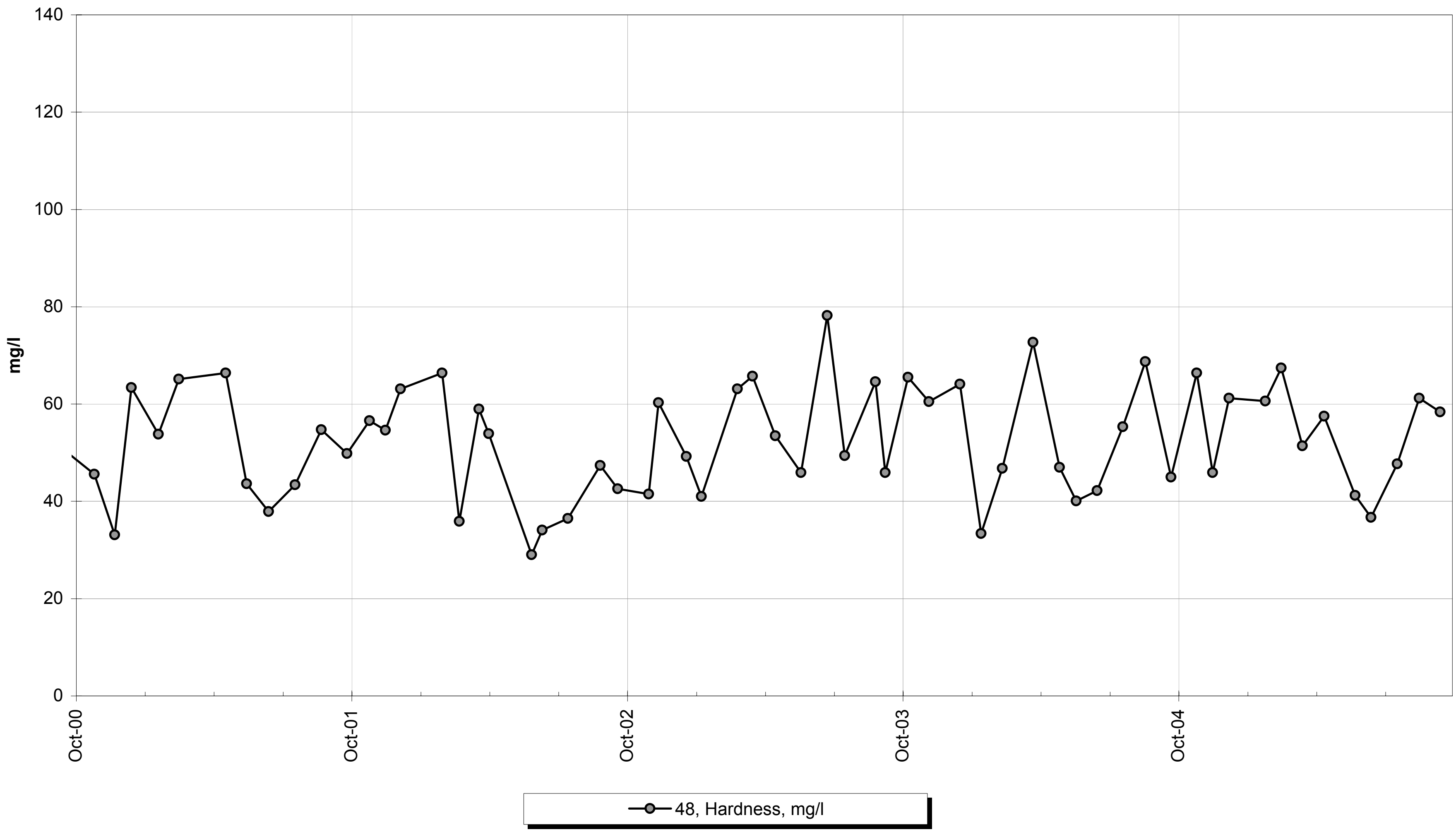



Site 48 -Total Alkalinity
mg/l
0
20
40
60
80
100
120
140
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
48, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

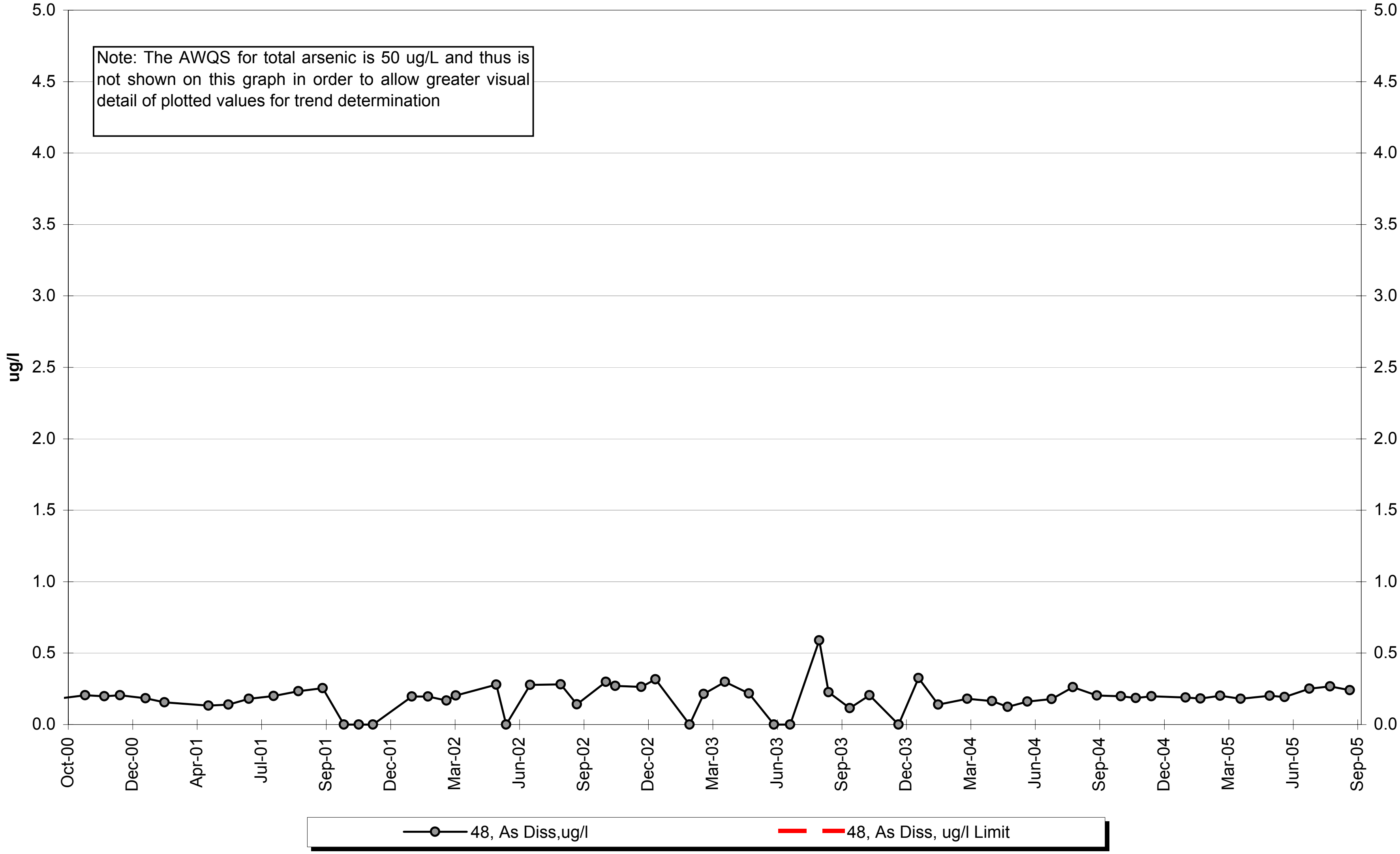
Site 48 -Total Sulfate



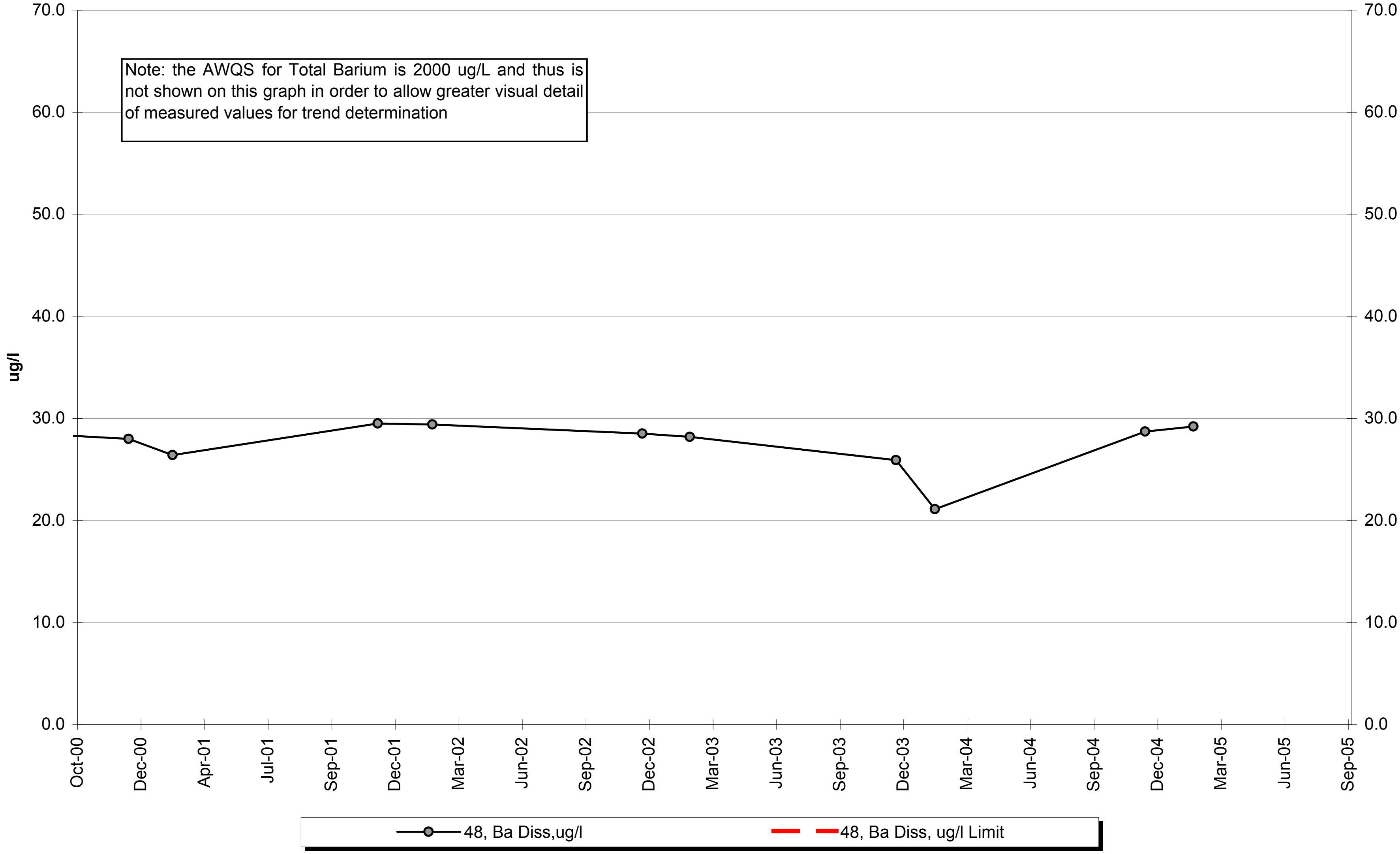
Site 48 -Hardness



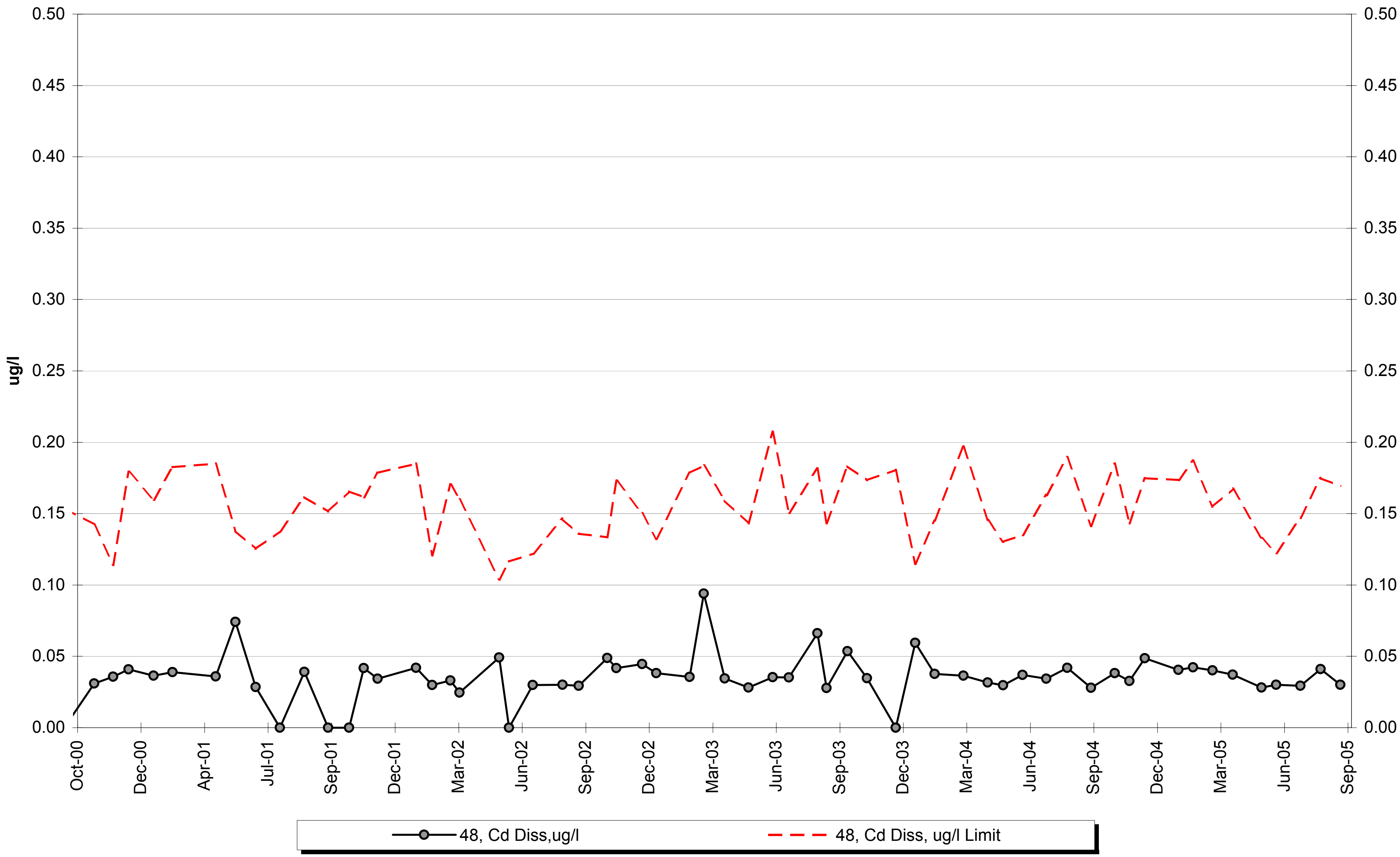
Site 48 -Dissolved Arsenic

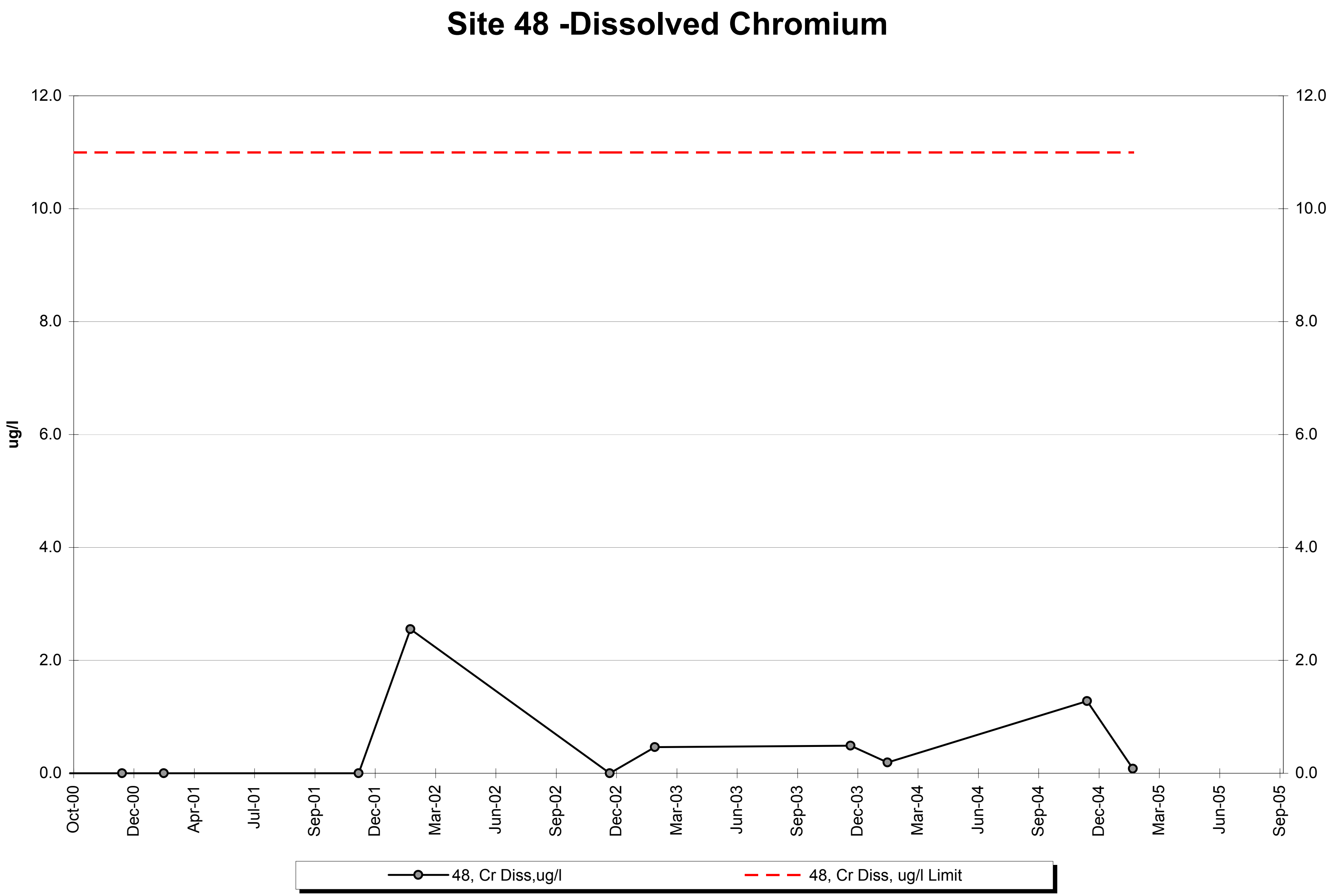


Site 48 -Dissolved Barium

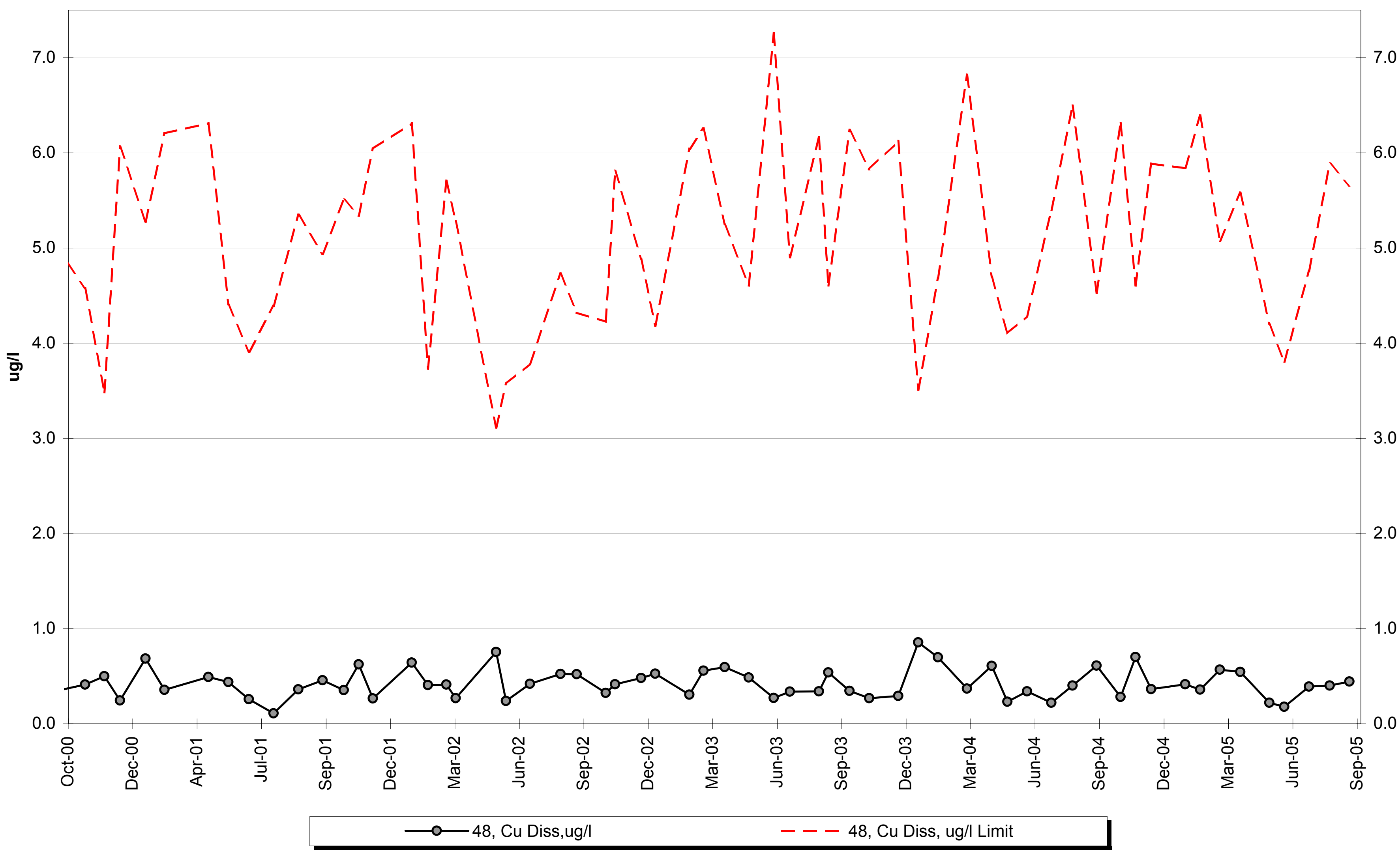


Site 48 -Dissolved Cadmium

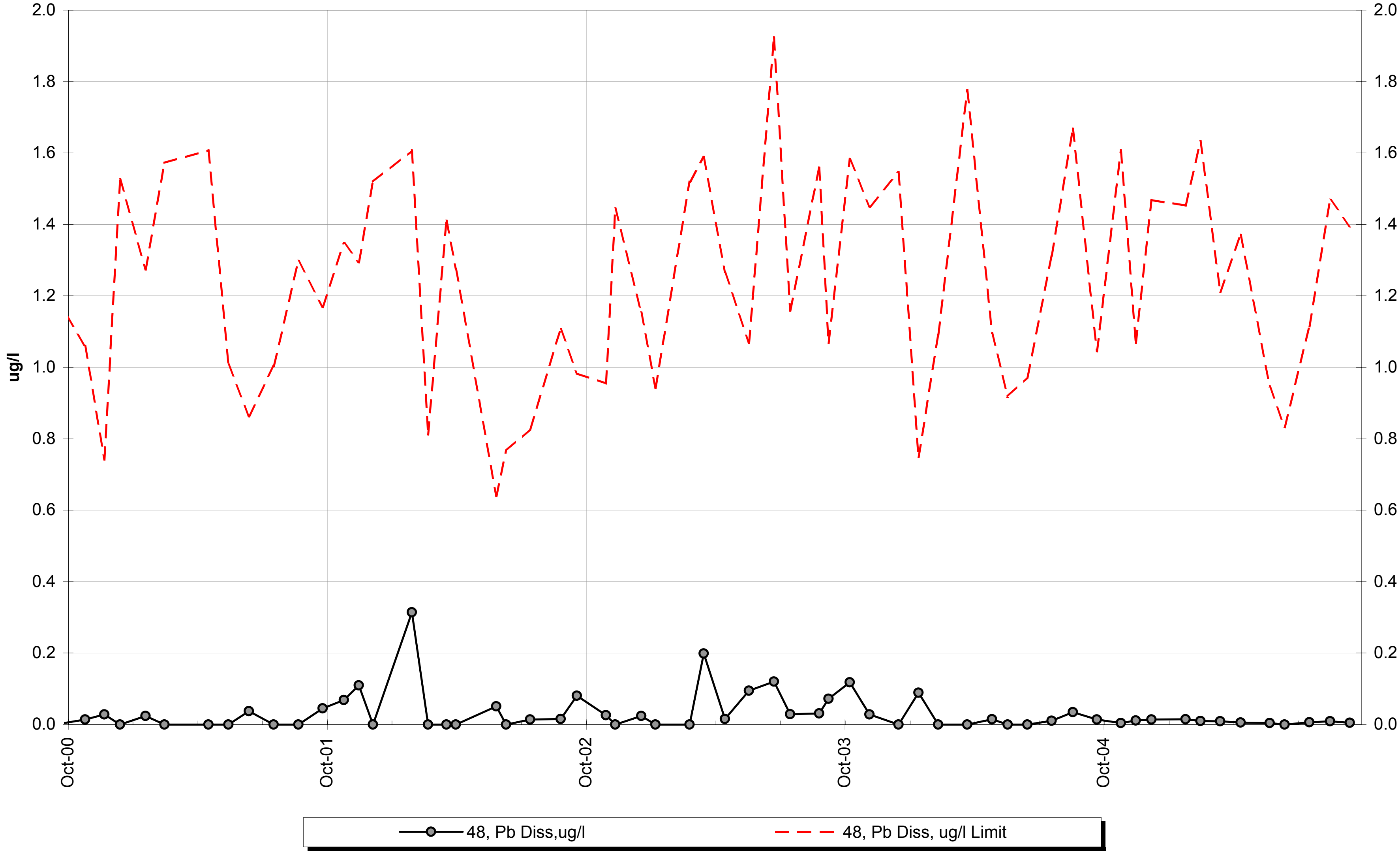


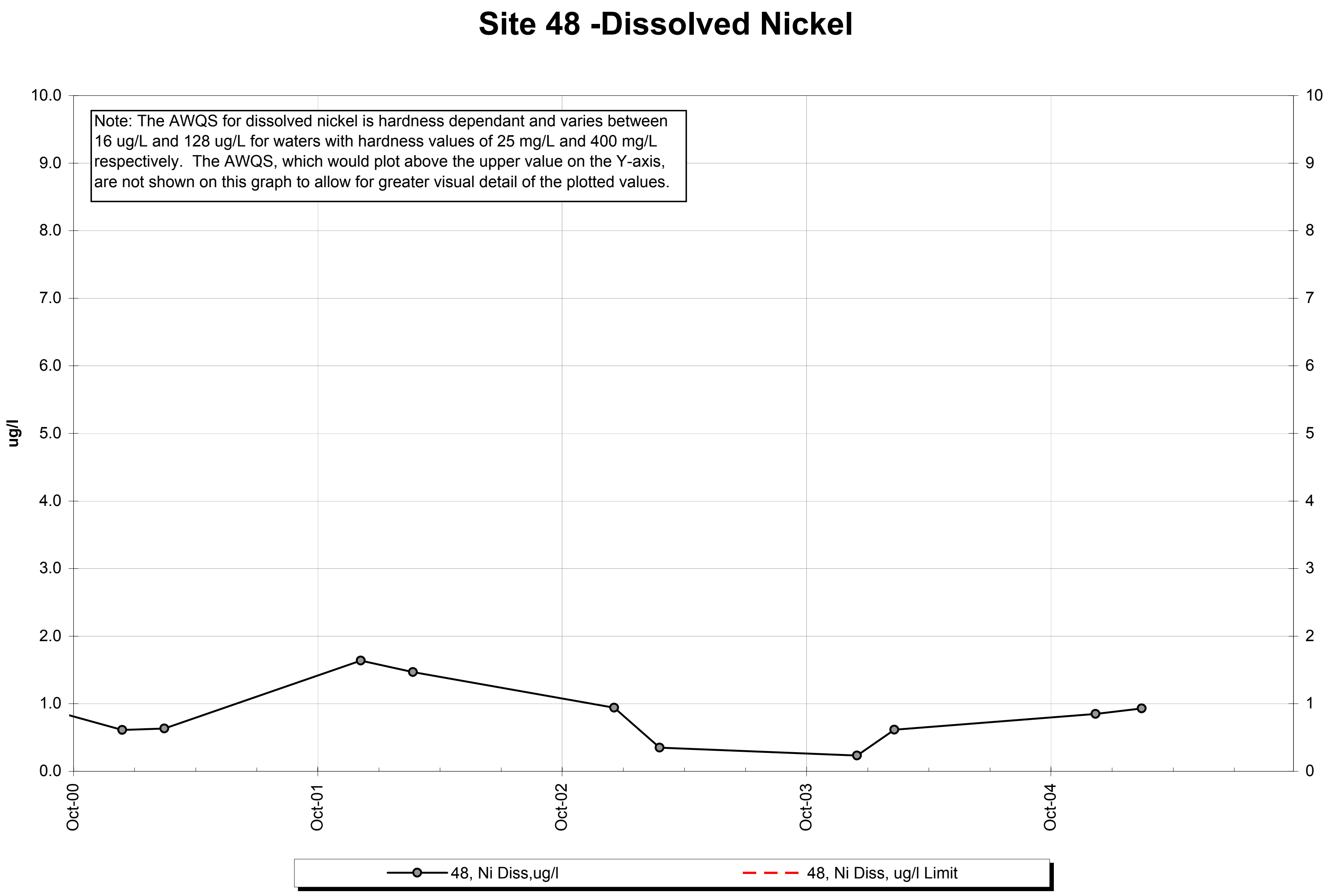

Site 48 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
48, Cr Diss,ug/l
48, Cr Diss, ug/l Limit

Site 48 -Dissolved Copper



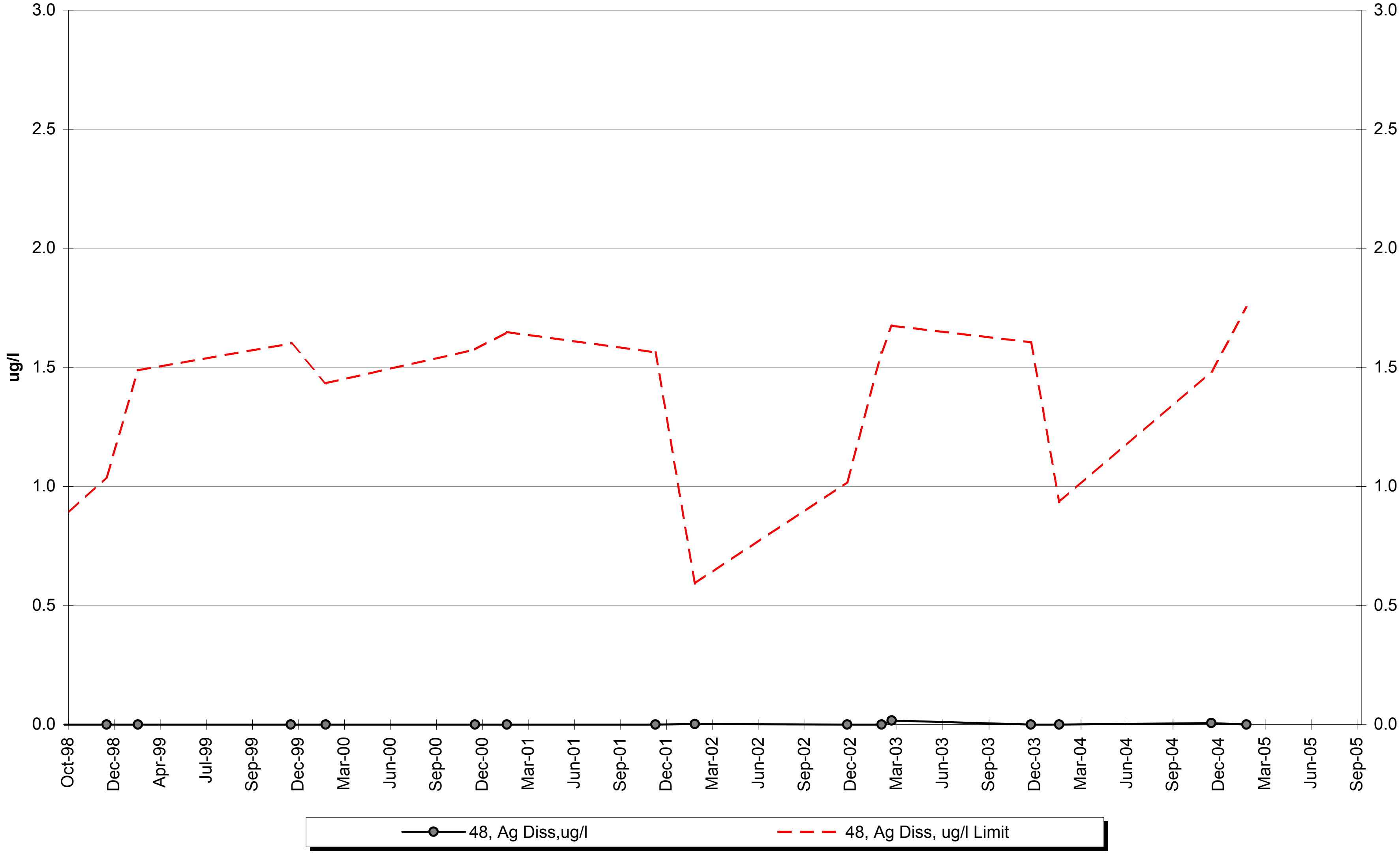
Site 48 -Dissolved Lead



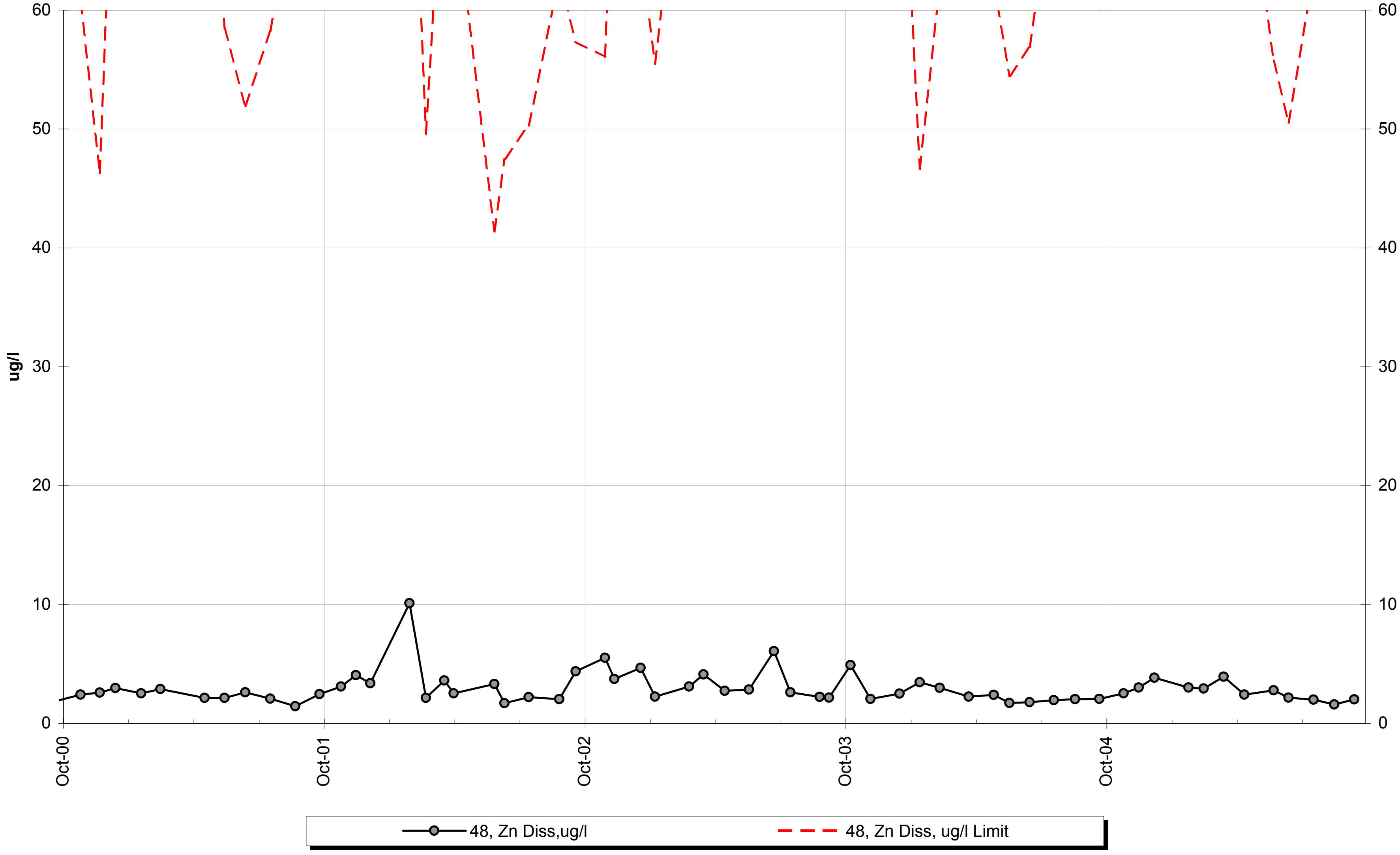


Site 48 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater visual detail of the plotted values.
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10
9
8
7
6
5
4
3
2
1
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
48, Ni Diss,ug/l
48, Ni Diss, ug/l Limit

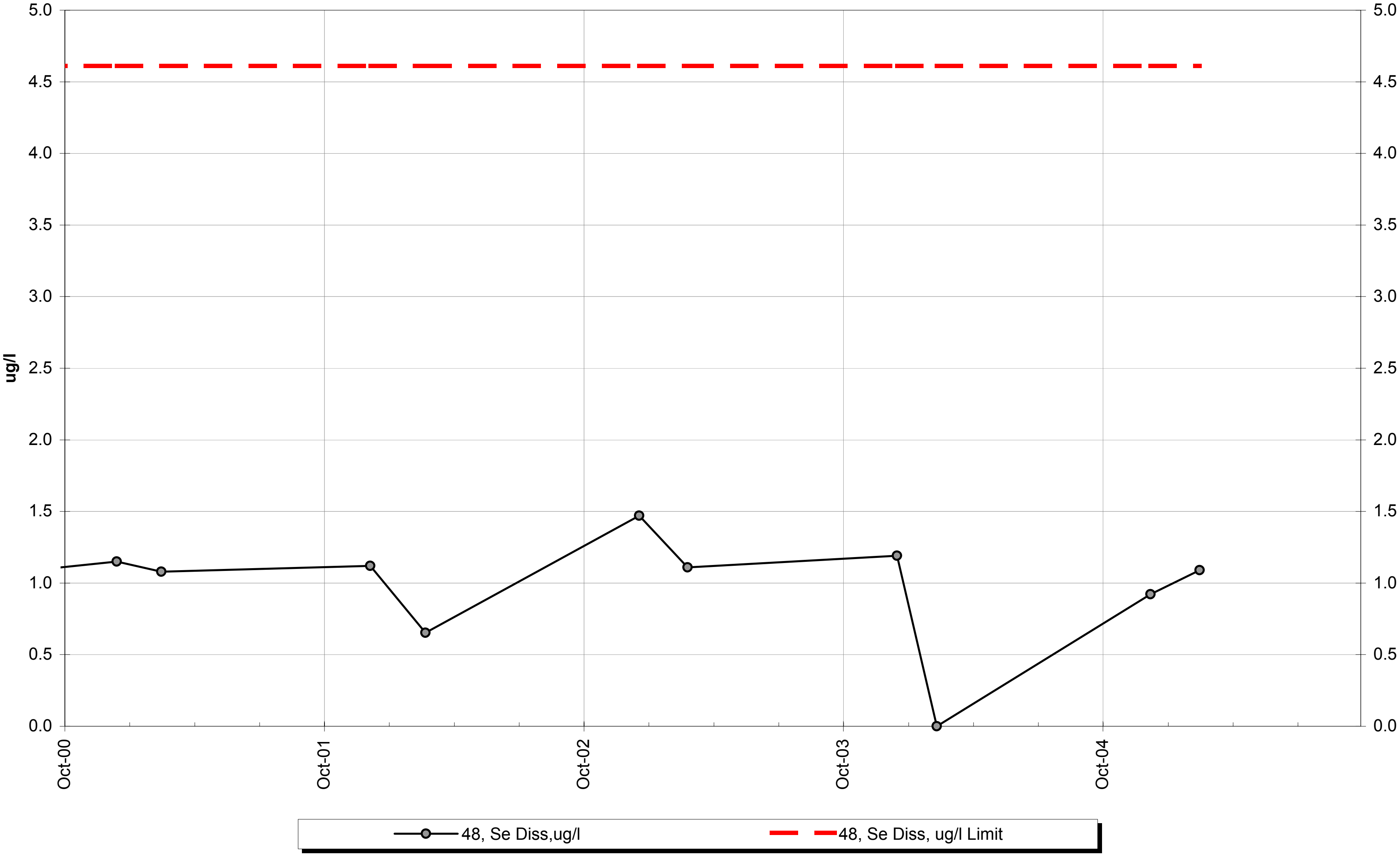
Site 48 -Dissolved Silver

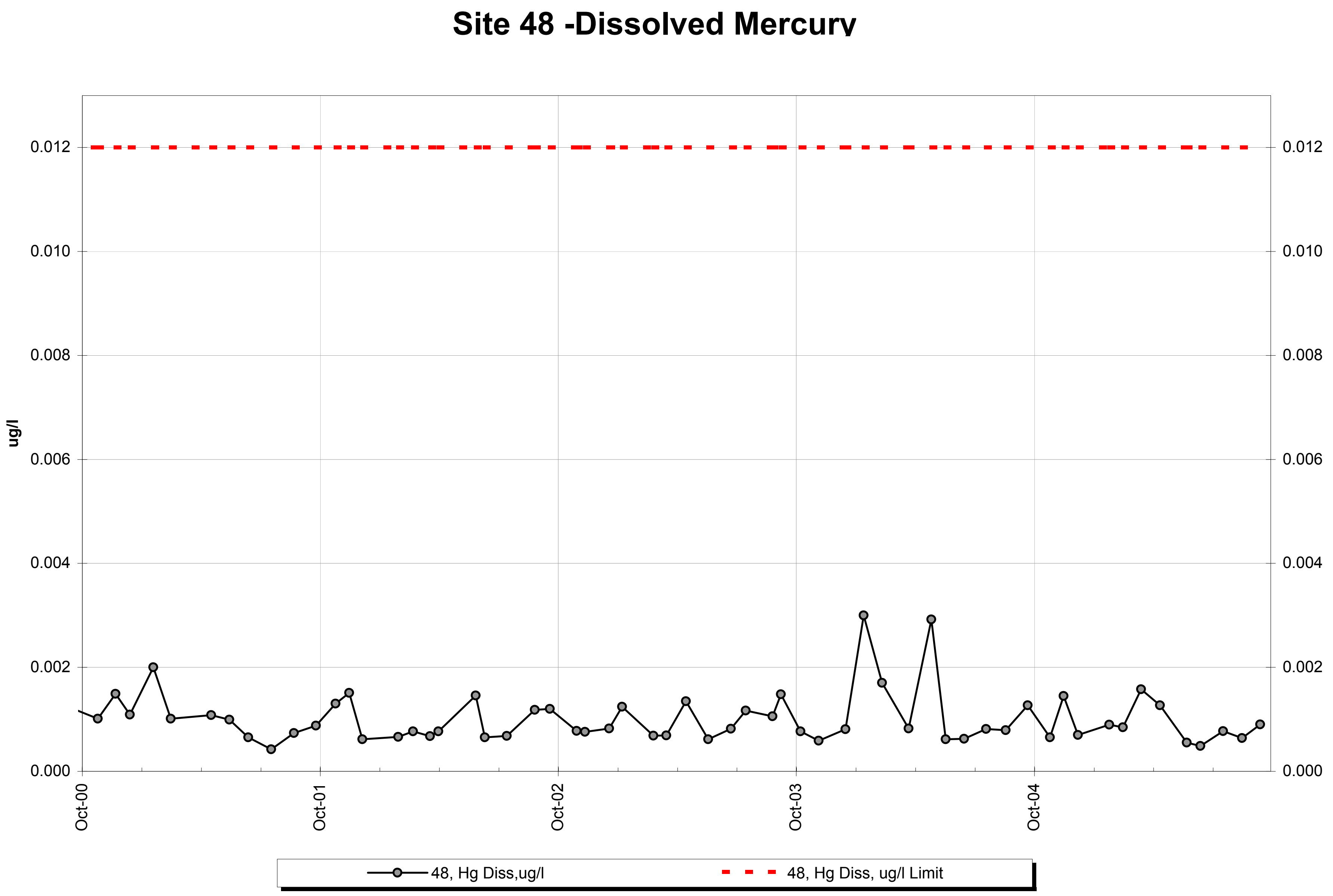


Site 48 -Dissolved Zinc



Site 48 -Dissolved Selenium





Site 48 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
48, Hg Diss,ug/l
48, Hg Diss, ug/l Limit

Site **#48** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

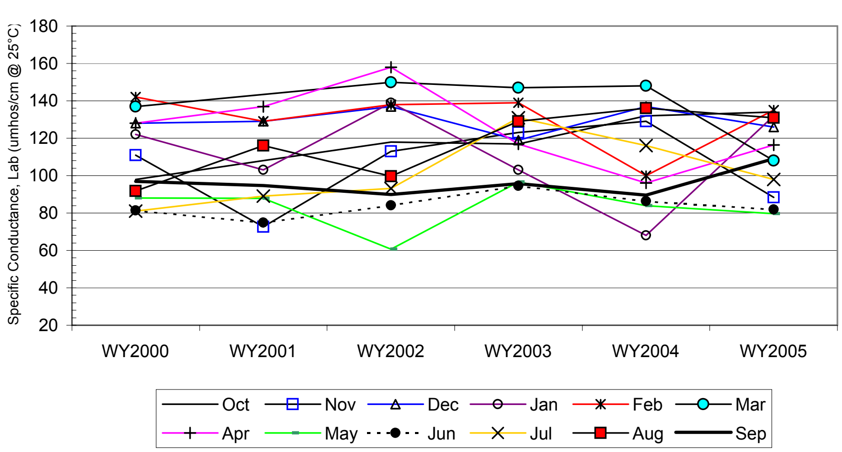
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	98.0	111.0	128.0	122.0	142.0	137.0	128.0	88.0	81.3	81.0	91.8	97.0
b	**WY2001**	108.0	72.7	129.0	103.0	129.0		137.0	87.8	74.9	89.0	116.0	94.7
c	**WY2002**	118.0	113.0	137.0	139.0	138.0	150.0	158.0	60.6	84.1	93.2	99.7	90.0
d	**WY2003**	117.0	123.0	119.0	103.0	139.0	147.0	117.0	96.5	94.6	131.0	129.0	95.7
e	**WY2004**	132.0	129.0	137.0	68.1	100.0	148.0	96.0	84.0	86.3	116.0	136.0	89.6
f	**WY2005**	134.0	88.4	126.0	132.0	135.0	108.0	116.4	79.6	81.9	98.0	131.0	109.0
	n	6	6	6	6	6	5	6	6	6	6	6	6
	t_1	0	0	1	1	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a	1	-1	1	-1	-1		1	-1	-1	1	1	-1
	c-a	1	1	1	1	-1	1	1	-1	1	1	1	-1
	d-a	1	1	-1	-1	-1	1	-1	1	1	1	1	-1
	e-a	1	1	1	-1	-1	1	-1	-1	1	1	1	-1
	f-a	1	-1	-1	1	-1	-1	-1	-1	1	1	1	1
	c-b	1	1	1	1	1		1	-1	1	1	-1	-1
	d-b	1	1	-1	0	1		-1	1	1	1	1	1
	e-b	1	1	1	-1	-1		-1	-1	1	1	1	-1
	f-b	1	1	-1	1	1		-1	-1	1	1	1	1
	d-c	-1	1	-1	-1	1	-1	-1	1	1	1	1	1
	e-c	1	1	0	-1	-1	-1	-1	1	1	1	1	-1
	f-c	1	-1	-1	-1	-1	-1	-1	1	-1	1	1	1
	e-d	1	1	1	-1	-1	1	-1	-1	-1	-1	1	-1
	f-d	1	-1	1	1	-1	-1	-1	-1	-1	-1	1	1
	f-e	1	-1	-1	1	1	-1	1	-1	-1	-1	-1	1
	S_k	13	5	0	-2	-5	-2	-7	-5	5	9	11	-1
	σ^2_S=	28.33	28.33	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33
	$Z_k = S_k/\sigma_S$	2.44	0.94	0.00	-0.38	-0.94	-0.49	-1.32	-0.94	0.94	1.69	2.07	-0.19
	Z^2_k	5.96	0.88	0.00	0.14	0.88	0.24	1.73	0.88	0.88	2.86	4.27	0.04

ΣZ_k= 3.83
ΣZ^2_k= 18.77
Z-bar=$\Sigma Z_k/K$= 0.32

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 71
ΣS_k 21

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		17.55	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
	p	**0.093**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	1.10	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
328.33	**p**	**0.865**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.00		4.12
0.050	-0.41	**1.40**	3.53
0.100	-0.20		2.89
0.200	0.45		2.27

Site **#48**

Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.5	7.5	7.5	7.6	7.4	7.7	7.5	7.8	7.2	7.7	7.4	7.5
b	**WY2001**	7.2	7.5	7.2	7.3	6.8		7.9	6.5	7.1	7.7	7.4	8.1
c	**WY2002**	7.4	7.6	7.4	7.4	7.5	7.9	7.2	6.9	7.3	7.9	7.8	7.9
d	**WY2003**	7.4	7.9	7.7	7.7	7.7	7.7	7.5	7.8	7.8	7.9	8.8	7.9
e	**WY2004**	7.9	7.9	7.8	7.6	7.4	7.9	7.9	7.7	7.9	8.1	7.9	8.2
f	**WY2005**	8.0	7.6	7.9	7.9	7.6	8.0	7.9	8.0	8.1	7.2	7.9	7.8
	n	6	6	6	6	6	5	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	1	0	0	1	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	0	-1	-1	-1		1	-1	-1	1	-1	1
c-a	-1	1	-1	-1	1	1	-1	-1	1	1	1	1
d-a	-1	1	1	1	1	1	-1	1	1	1	1	1
e-a	1	1	1	1	0	1	1	-1	1	1	1	1
f-a	1	1	1	1	1	1	1	1	1	-1	1	1
c-b	1	1	1	1	1		-1	1	1	1	1	-1
d-b	1	1	1	1	1		-1	1	1	1	1	-1
e-b	1	1	1	1	1		-1	1	1	1	1	1
f-b	1	1	1	1	1		-1	1	1	-1	1	-1
d-c	-1	1	1	1	1	-1	1	1	1	-1	1	-1
e-c	1	1	1	1	-1	1	1	1	1	1	1	1
f-c	1	-1	1	1	1	1	1	1	1	-1	1	-1
e-d	1	-1	1	-1	-1	1	1	-1	1	1	-1	1
f-d	1	-1	1	1	-1	1	1	1	1	-1	-1	-1
f-e	1	-1	1	1	1	1	-1	1	1	-1	1	-1
S_k	7	6	11	9	6	8	1	7	13	3	9	1

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	27.33	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.32	1.15	2.07	1.69	1.13	1.96	0.19	1.32	2.44	0.56	1.69	0.19
Z^2_k	1.73	1.32	4.27	2.86	1.27	3.84	0.04	1.73	5.96	0.32	2.86	0.04

ΣZ_k= 15.69

ΣZ^2_k= 26.23

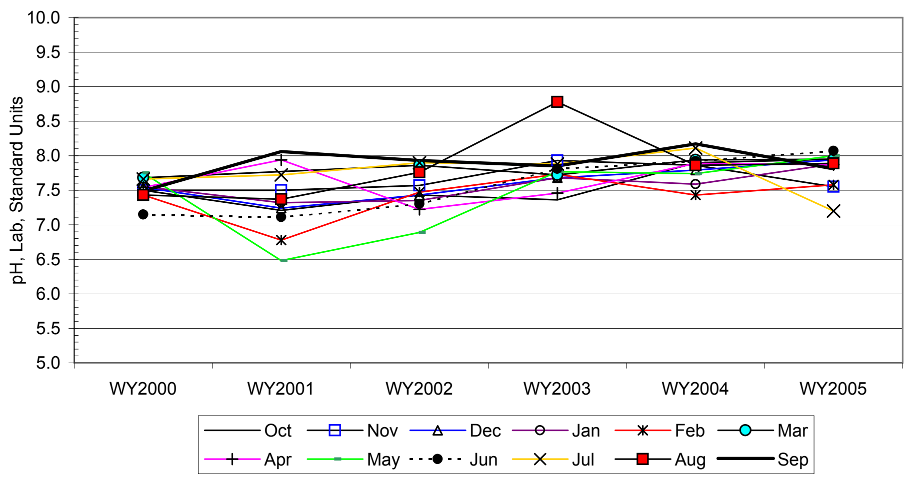
Z-bar=ΣZ_k/K= 1.31

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 71

ΣS_k 81

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	5.70	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.893**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 4.42	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
327.33	p **1.000**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.05		0.14
0.050	0.06	**0.09**	0.12
0.100	0.07		0.12
0.200	0.08		0.11

1.2%

Site **#48** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	33.1	37.8	44.6	46.3	51.2	49.2	46.5	33.7	33.4	31.6	39.0	39.9
b	**WY2001**	41.8	29.6	50.0	40.3	47.6		50.6	35.7	31.0	35.6	44.8	38.4
c	**WY2002**	44.5	43.4	50.2	49.2	50.0	52.2	54.5	23.0	35.0	36.4	39.5	36.5
d	**WY2003**	40.4	41.2	45.7	39.5	52.1	53.6	45.5	40.2	39.6	51.0	50.8	41.1
e	**WY2004**	50.6	51.2	51.6	27.3	37.9	53.6	38.1	35.4	39.6	45.3	53.5	35.0
f	**WY2005**	55.2	39.7	51.3	57.2	61.2	50.1	53.8	39.8	37.8	42.2	50.4	45.3
	n	6	6	6	6	6	5	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	1	0	0	1	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	1	-1	-1		1	1	-1	1	1	-1
c-a	1	1	1	1	-1	1	1	-1	1	1	1	-1
d-a	1	1	1	-1	1	1	-1	1	1	1	1	1
e-a	1	1	1	-1	-1	1	-1	1	1	1	1	-1
f-a	1	1	1	1	1	1	1	1	1	1	1	1
c-b	1	1	1	1	1		1	-1	1	1	-1	-1
d-b	-1	1	-1	-1	1		-1	1	1	1	1	1
e-b	1	1	1	-1	-1		-1	-1	1	1	1	-1
f-b	1	1	1	1	1		1	1	1	1	1	1
d-c	-1	-1	-1	-1	1	1	-1	1	1	1	1	1
e-c	1	1	1	-1	-1	1	-1	1	1	1	1	-1
f-c	1	-1	1	1	1	-1	-1	1	1	1	1	1
e-d	1	1	1	-1	-1	0	-1	-1	0	-1	1	-1
f-d	1	-1	1	1	1	-1	1	-1	-1	-1	-1	1
f-e	1	-1	-1	1	1	-1	1	1	-1	-1	-1	1
S_k	11	5	9	-1	3	3	-1	5	8	9	9	1

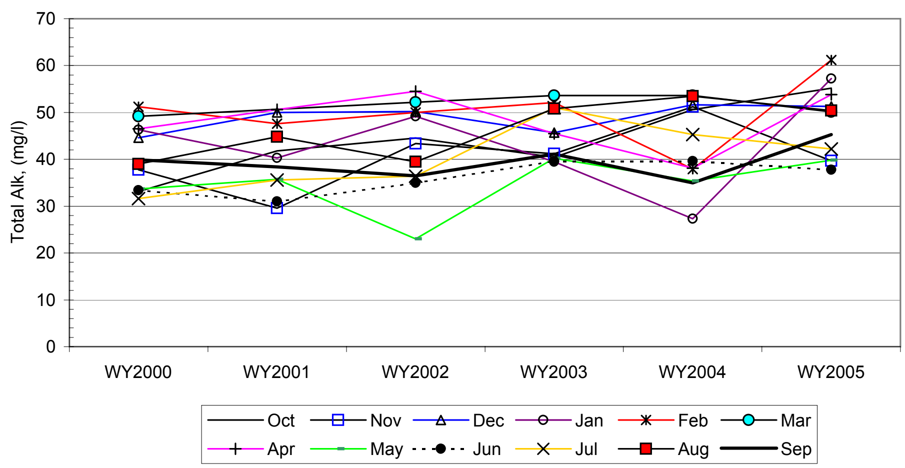
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.07	0.94	1.69	-0.19	0.56	0.73	-0.19	0.94	1.50	1.69	1.69	0.19
Z^2_k	4.27	0.88	2.86	0.04	0.32	0.54	0.04	0.88	2.26	2.86	2.86	0.04

ΣZ_k= 11.63
ΣZ^2_k= 17.83
Z-bar=ΣZ_k/K= 0.97

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 71
ΣS_k 61

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	6.56	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.833**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 328.33	Z_{calc} 3.31	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
	p **1.000**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.39		2.40
0.050	0.80	**1.47**	2.17
0.100	0.93		2.10
0.200	1.13		1.94

3.4%

Site **#48** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	2.3	3.7	2.3	2.4	2.3	2.5	2.7	2.0	2.0	1.8	1.8	1.8
b	**WY2001**	2.4	2.6	3.0	2.5	2.9		2.2	2.2	2.6	2.1	1.4	2.5
c	**WY2002**	3.1	4.1	3.4	10.1	2.1	3.6	2.5	3.3	1.7	2.2	2.0	4.4
d	**WY2003**	5.5	3.7	4.7	2.2	3.1	4.1	2.7	2.8	6.1	2.6	2.2	2.2
e	**WY2004**	4.9	2.1	2.5	3.5	3.0	2.3	2.4	1.7	1.8	2.0	2.0	2.1
f	**WY2005**	2.5	3.0	3.8	3.0	2.9	3.9	2.4	2.8	2.2	2.0	1.6	2.0
	n	6	6	6	6	6	5	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	1	1	1		-1	1	1	1	-1	1
c-a	1	1	1	1	-1	1	-1	1	-1	1	1	1
d-a	1	1	1	-1	1	1	1	1	1	1	1	1
e-a	1	-1	1	1	1	-1	-1	-1	-1	1	1	1
f-a	1	-1	1	1	1	1	-1	1	1	1	-1	1
c-b	1	1	1	1	-1		1	1	-1	1	1	1
d-b	1	1	1	-1	1		1	1	1	1	1	-1
e-b	1	-1	-1	1	1		1	-1	-1	-1	1	-1
f-b	1	1	1	1	1		1	1	-1	-1	1	-1
d-c	1	-1	1	-1	1	1	1	-1	1	1	1	-1
e-c	1	-1	-1	-1	1	-1	-1	-1	1	-1	1	-1
f-c	-1	-1	1	-1	1	1	-1	-1	1	-1	-1	-1
e-d	-1	-1	-1	1	-1	-1	-1	-1	-1	-1	-1	-1
f-d	-1	-1	-1	1	-1	-1	-1	-1	-1	-1	-1	-1
f-e	-1	1	1	-1	-1	1	1	1	1	1	-1	-1
S_k	7	-3	7	3	5	2	-1	1	1	3	3	-3

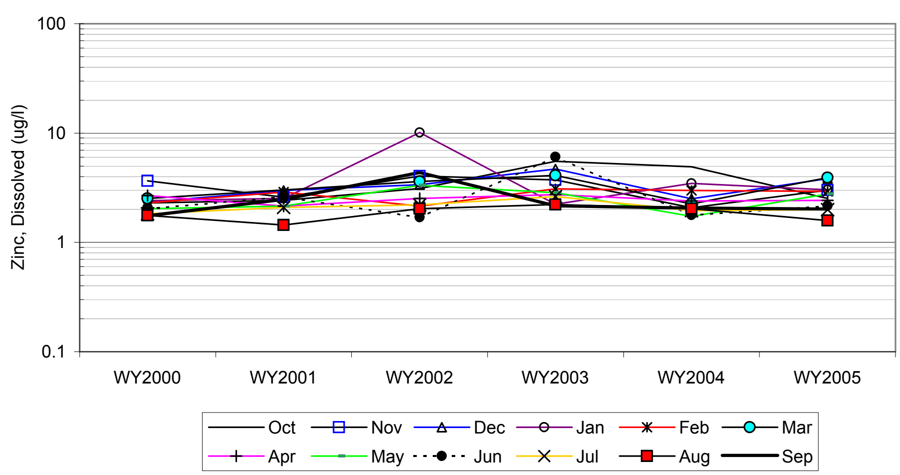
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.32	-0.56	1.32	0.56	0.94	0.49	-0.19	0.19	0.19	0.56	0.56	-0.56
Z^2_k	1.73	0.32	1.73	0.32	0.88	0.24	0.04	0.04	0.04	0.32	0.32	0.32

ΣZ_k=	4.81
ΣZ^2_k=	6.28
Z-bar=$\Sigma Z_k/K$=	0.40

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	71
ΣS_k	25

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	4.35	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.959**			$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 1.32	@α/2=2.5% Z=	1.96	**H_0** (No trend)	ACCEPT
328.33	p **0.907**			**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.06		0.15
0.050	-0.03	**0.04**	0.12
0.100	0.00		0.12
0.200	0.02		0.08

INTERPRETIVE REPORT
SITE 6 "MIDDLE GREENS CREEK"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses with the exception of one outlier shown on the table below. During the current year no new data point were flagged as outliers after review by KGCMC.

Sample Date	Parameter	Value	Qualifier	Notes
12/5/2001	Cond Field, µS/cm	38.9	RR	Suspected field instrument malfunction

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No visually obvious trends are apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The table below summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). The dataset for total alkalinity is the only analyte that shows a statistically significant (p=1.00) trend and a slope estimate of 1.58 mg/L•yr or a +3.7% increase over the last 6 years. This trend is nearly identical to the trend in total alkalinity identified at Site 48, the upgradient reference site, and is thus likely to be due to natural variation.

Site 6-WY2005, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.894	+		
pH, Lab	6	0.942	+		
Alkalinity, Total	6	**1.00**	+	1.58	3.7
Zinc, Dissolved	6	0.903	+		

(1): Number of years (2):Significance level

A comparison of median values for alkalinity, lab pH, lab conductivity, sulfate, and dissolved zinc between Site 6 and Site 48 has been conducted as specified in the Statistical Information Goals for Site 6. Additionally, X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 6 and Site 48, the upstream control site, to aid in the comparison between those sites. Calculation details of the non-parametric signed-rank tests are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results of the signed-rank test as performed on the Water Year 2005 data set. Additional tables summarizing results for Water Years 2000-2004 can also be found following this interpretive section. For pH and alkalinity there are no statistically significant differences between the measured median values at a significance level of α=0.05 for a one-tailed test. The lab conductivity, total sulfate and dissolved zinc concentrations are statistically different. The median values for lab conductivity for Site 48 and Site 6 are 112.7 uS/cm and 124.0 uS/cm respectively and the median of differences, Site 48 minus Site 6, is -6.0 uS/cm. Using the signed-rank test on prior water year's data yields similar results and differences going back for the past five water years. The median values for total sulfate for Site 48 and Site 6 are 12.7 mg/l and 14.3 mg/l respectively. The median of the differences, Site 48 minus Site 6, is -2.2 mg/l total-sulfate. Using the signed-rank test to the prior dataset for Water Years 2003 and 2004 yield similar significant differences of -1.8 mg/l ($p<0.01$) and -2.2 mg/l ($p<0.01$) respectively. Dissolved zinc results follow along in a similar manner where the median values for Site 48 and Site 6 are 2.65 ug/l and 4.92 ug/l respectively while the median difference is -2.54 ug/l. Similar results for dissolved zinc have been reported in prior years when using the less powerful sum-ranks tests. Applying the signed-rank test to the prior datasets for Water Years 2000 – 2004 show similar statistically significant differences with a median difference of -2.4 ug/l dissolved zinc. The application of a more statistically powerful median comparison test that takes advantage of the paired nature of the dataset has highlighted the differences that exist between Site 48 and Site 6. The magnitudes of these differences appear to have been relatively consistent over the past five water years and do not appear to be increasing. Also, the magnitude of the relative differences is small with respect to lab conductivity and well below the applicable AWQS in the case of sulfate and dissolved zinc. KGCMC believes that no additional monitoring is warranted at this time due to the consistent differences in the measured analytes between the two sites. Taking into consideration the small magnitude of the differences that are measurable between the two sites, the current FWMP program is sufficient to monitor any future increases at Site 6. Thus, if an as yet undetected upward trend in conductivity, total sulfate or dissolved zinc at Site 6 should occur, the current program is able to identify the change before any water quality values are impaired.

Site 6 vs. Site 48 - WY2005, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
Conductivity, Lab	**<0.01**	112.7	124.0	-6.0
pH, Lab	0.63	7.89	7.78	0.00
Alkalinity, Total	0.09	50.3	50.6	-0.5
Sulfate, Total	**0.01**	12.7	14.3	-2.2
Zinc, Dissolved	**<0.01**	2.65	4.92	-2.54

Table of Results for Water Year 2005

Site 6 "Middle Greens Creek"

Sample Date/Parameter	10/26/2004	11/16/2004	12/8/2004	1/25/2005	2/15/2005	3/15/2005	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	2.3	5.0	0.7	1.7	1.3	1.7	2.1	4.7	6.7	10.1	10.8	8.5	3.5
Conductivity-Field(μmho)	147.4	97.3	132.6	142.9	154.1	120.7	137.2	85.1	92.5	101.4	140.5	121.2	126.9
Conductivity-Lab (μmho)	140	96	131	140	145	117 J	145	84	86	101	137	113	124
pH Lab (standard units)	8.12	7.52	7.69	7.86	7.77	7.79	7.88	7.60	8.22	7.55	6.87	7.84	7.78
pH Field (standard units)	7.92	7.48	8.02	7.80	8.01	7.82	7.58	7.78	6.80	7.88	7.64	7.74	7.79
Total Alkalinity (mg/L)	54.8 J	40.4	53.2	59.1	62.1	51.1 J	76.7	39.4	36.5	42.5	50.0	45.5	50.6
Total Sulfate (mg/L)	16.5	10.1	16.1	19.5	23.6	14.9	12.5	7.9	9.5	11.0	18.9	13.6	14.3
Hardness (mg/L)	70.2	48.3	64.7	63.4	71.8	55.8	77.0	42.2	44.9	47.8	62.6	62.4	62.5
Dissolved As (ug/L)	0.194	0.196	0.251	0.170	0.186	0.198	0.214 J	0.216	0.183	0.231	0.255 J	0.258	0.206
Dissolved Ba (ug/L)			29.3		29.9								29.6
Dissolved Cd (ug/L)	0.0475 U	0.0555	0.0645	0.0513	0.0677	0.0646	0.0316	0.0316 U	0.0331	0.0272	0.0443	0.0421	0.0459
Dissolved Cr (ug/L)			1.500		0.145								0.823
Dissolved Cu (ug/L)	0.352	0.856	0.456	0.459 U	0.441	0.658	0.514 U	0.241 U	0.287 U	0.348	0.399	0.493	0.449
Dissolved Pb (ug/L)	0.0290	0.1160 U	0.0534 U	0.0253 U	0.0385	0.0850 U	0.0231 U	0.0076 U	0.0085 U	0.0124 U	0.0084 U	0.0583 U	0.0272
Dissolved Ni (ug/L)			0.959		1.080								1.020
Dissolved Ag (ug/L)			0.003 U		<0.003								0.002
Dissolved Zn (ug/L)	4.92	9.39	7.91	5.70	6.68 J	10.60 U	1.61 J	2.52 U	2.75	2.30 U	2.57 J	4.92	4.92
Dissolved Se (ug/L)			1.100		1.200								1.150
Dissolved Hg (ug/L)	0.000670 U	0.001700	0.000835 U	0.001010 U	0.000709	0.001470 U	0.001550 U	0.000582 U	0.000557 U	0.000833 U	0.000613 U	0.001050	0.000834

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
6	01/25/2005	12:28:00 PM				
			Cu Diss, ug/l	0.459	U	Field Blank Contamination
			Pb Diss, ug/l	0.0253	U	Field Blank Contamination
			Hg Diss, ug/l	0.00101	U	Field Blank Contamination
6	10/26/2004	12:43:00 PM				
			Alk Tot, mg/l	54.8	J	Hold Time
			Cd Diss, ug/l	0.0475	U	Field Blank Contamination
			Hg Diss, ug/l	0.00067	U	Field Blank Contamination
6	11/16/2004	10:47:00 AM				
			Pb Diss, ug/l	0.116	U	Field Blank Contamination
6	12/08/2004	1:07:00 PM				
			Pb Diss, ug/l	0.0534	U	Method Blank Contamination
			Ag Diss, ug/l	0.00322	U	Method Blank Contamination
			Hg Diss, ug/l	0.000835	U	Field Blank Contamination
6	02/15/2005	10:18:00 AM				
			Zn Diss, ug/l	6.68	J	LCS Recovery
6	03/15/2005	11:25:00 AM				
			Cond Lab, umho	117	J	Holdtime
			Alk Tot, mg/l	51.1	J	Holdtime
			Pb Diss, ug/l	0.085	U	Field Blank Contamination
			Zn Diss, ug/l	10.6	U	Field Blank Contamination
			Hg Diss, ug/l	0.00147	U	Field Blank Contamination
6	04/13/2005	11:39:00 AM				
			As Diss, ug/l	0.214	J	LCS Recovery
			Cu Diss, ug/l	0.514	U	Field Blank Contamination
			Pb Diss, ug/l	0.0231	U	Field Blank Contamination
			Zn Diss, ug/l	1.61	J	LCS Recovery
			Hg Diss, ug/l	0.00155	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

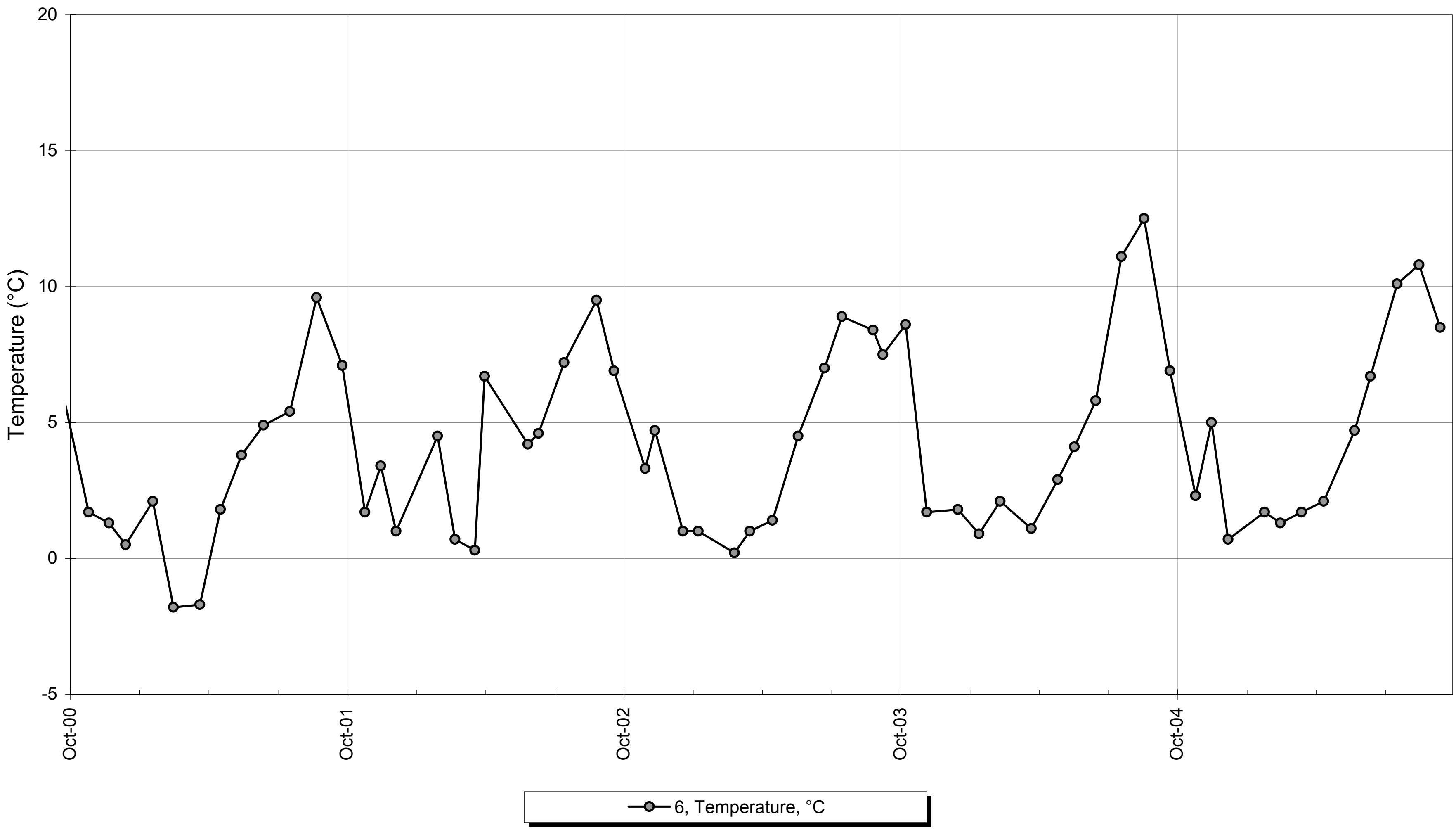
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

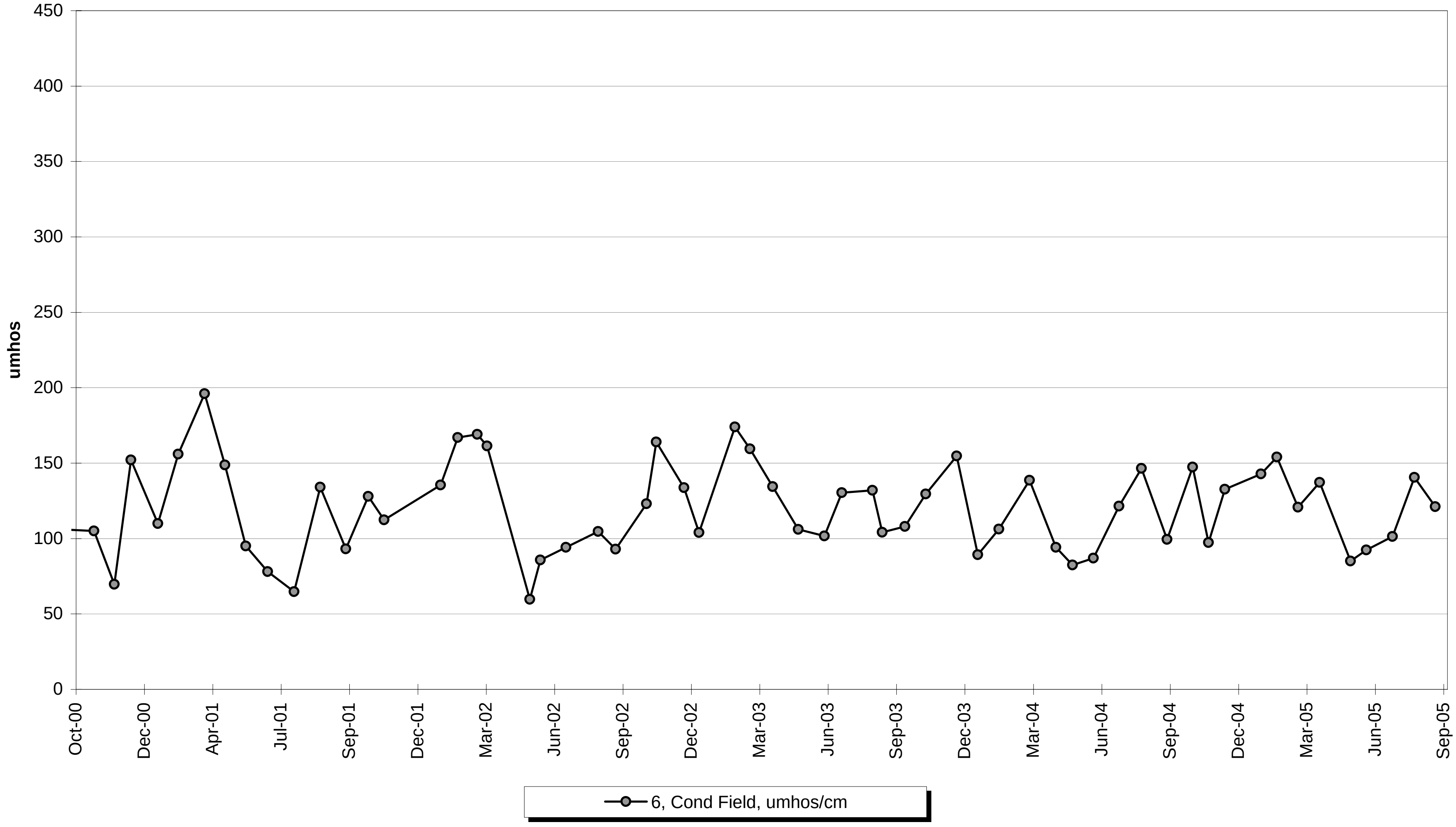
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
6	05/24/2005	8:28:00 AM				
			Cd Diss, ug/l	0.0316	U	Field Blank Contamination
			Cu Diss, ug/l	0.241	U	Field Blank Contamination
			Pb Diss, ug/l	0.00758	U	Field Blank Contamination
			Zn Diss, ug/l	2.52	U	Field Blank Contamination
			Hg Diss, ug/l	0.000582	U	Field Blank Contamination
6	06/14/2005	12:07:00 PM				
			Cu Diss, ug/l	0.287	U	Field Blank Contamination
			Pb Diss, ug/l	0.00853	U	Field Blank Contamination
			Hg Diss, ug/l	0.000557	U	Field Blank Contamination
6	07/19/2005	12:56:00 PM				
			Pb Diss, ug/l	0.0124	U	Field Blank Contamination
			Zn Diss, ug/l	2.3	U	Field Blank Contamination
			Hg Diss, ug/l	0.000833	U	Field Blank Contamination
6	08/17/2005	10:38:00 AM				
			As Diss, ug/l	0.255	J	LCS Recovery
			Pb Diss, ug/l	0.0084	U	Field Blank Contamination
			Zn Diss, ug/l	2.57	J	LCS Recovery
			Hg Diss, ug/l	0.000613	U	Field Blank Contamination
6	09/14/2005	10:45:00 AM				
			Pb Diss, ug/l	0.0583	U	Field Blank Contamination

Qualifier	**Description**
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

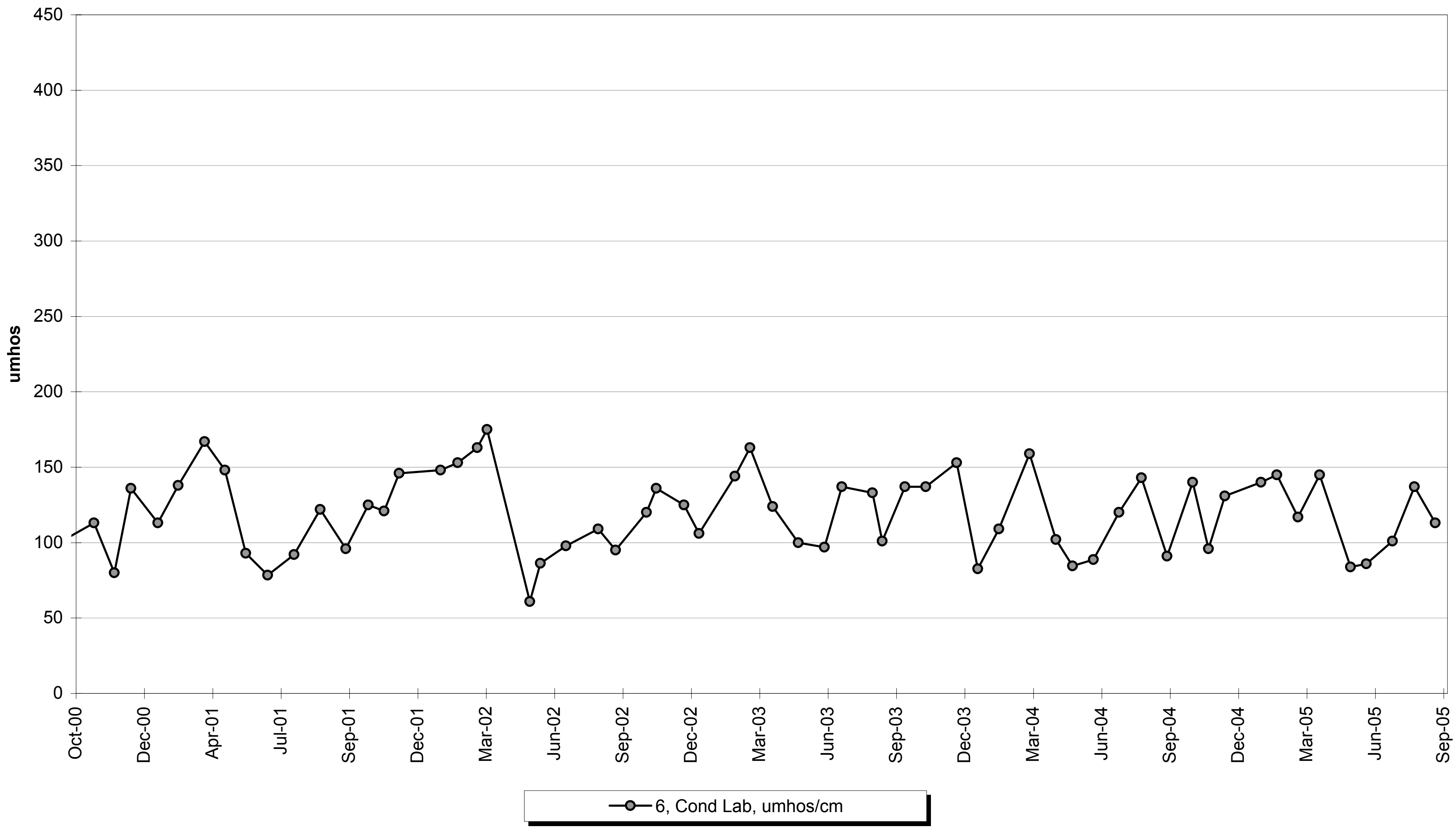
Site 6 -Water Temperature

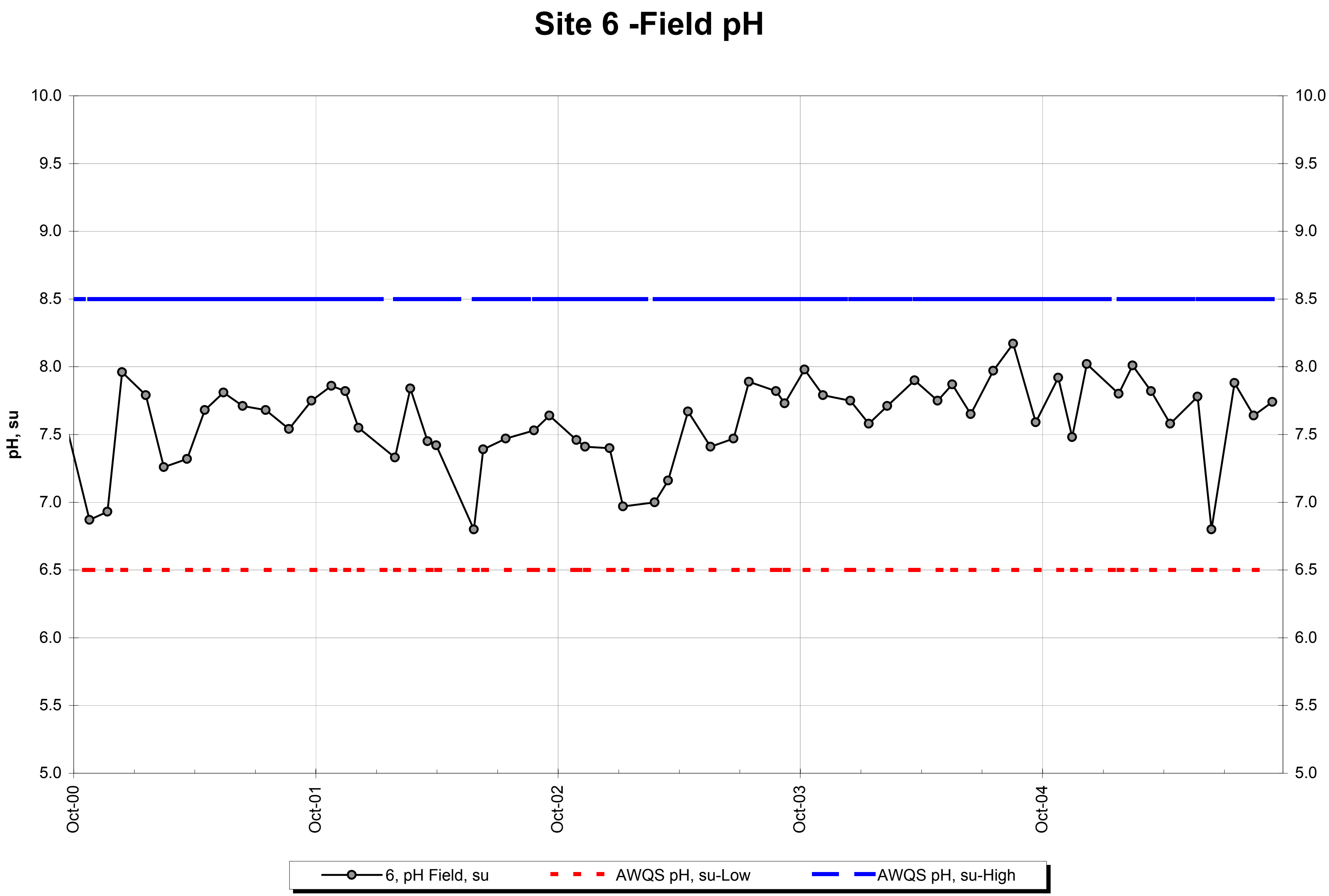


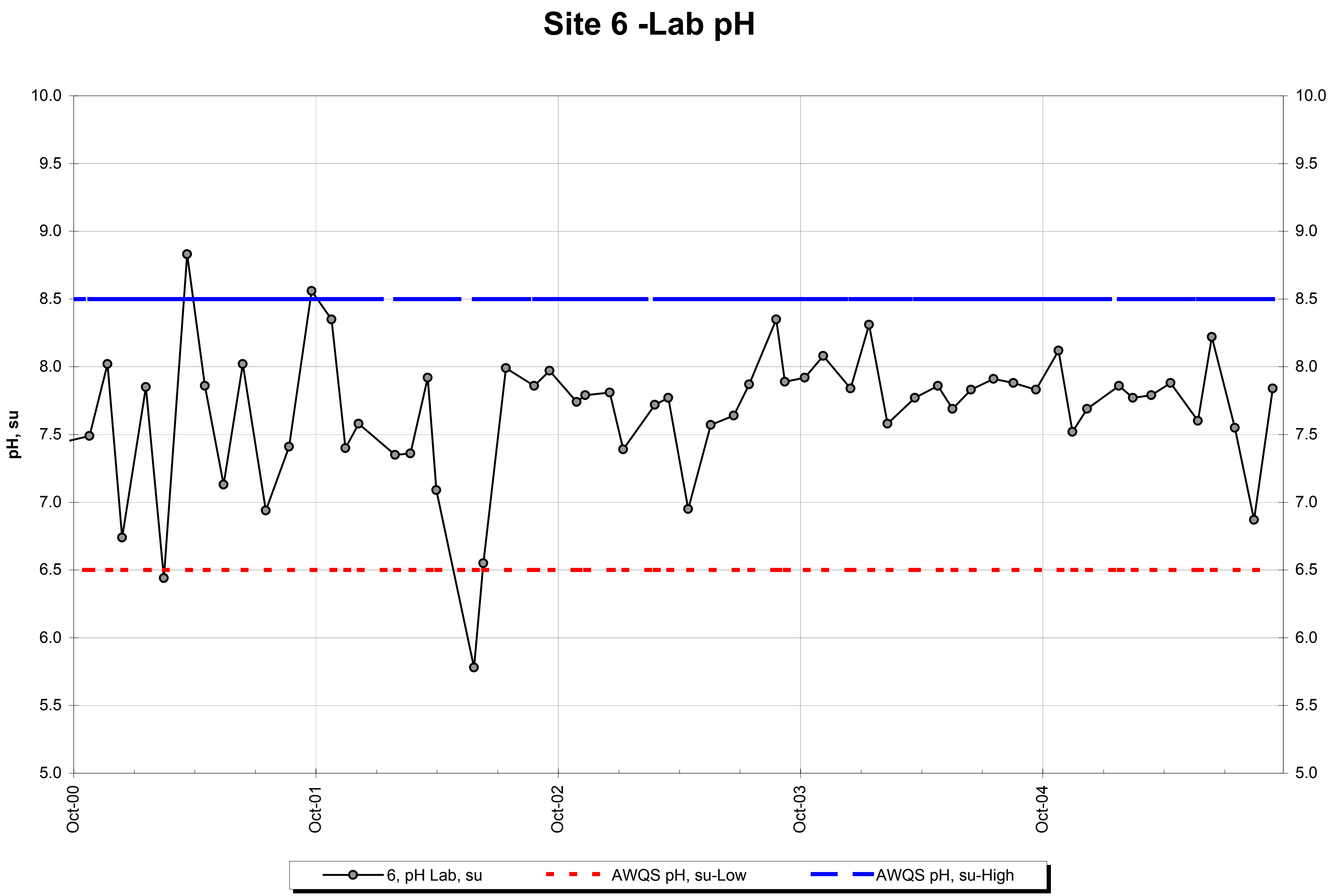
Site 6 -Conductivity-Field



Site 6 -Conductivity-Lab

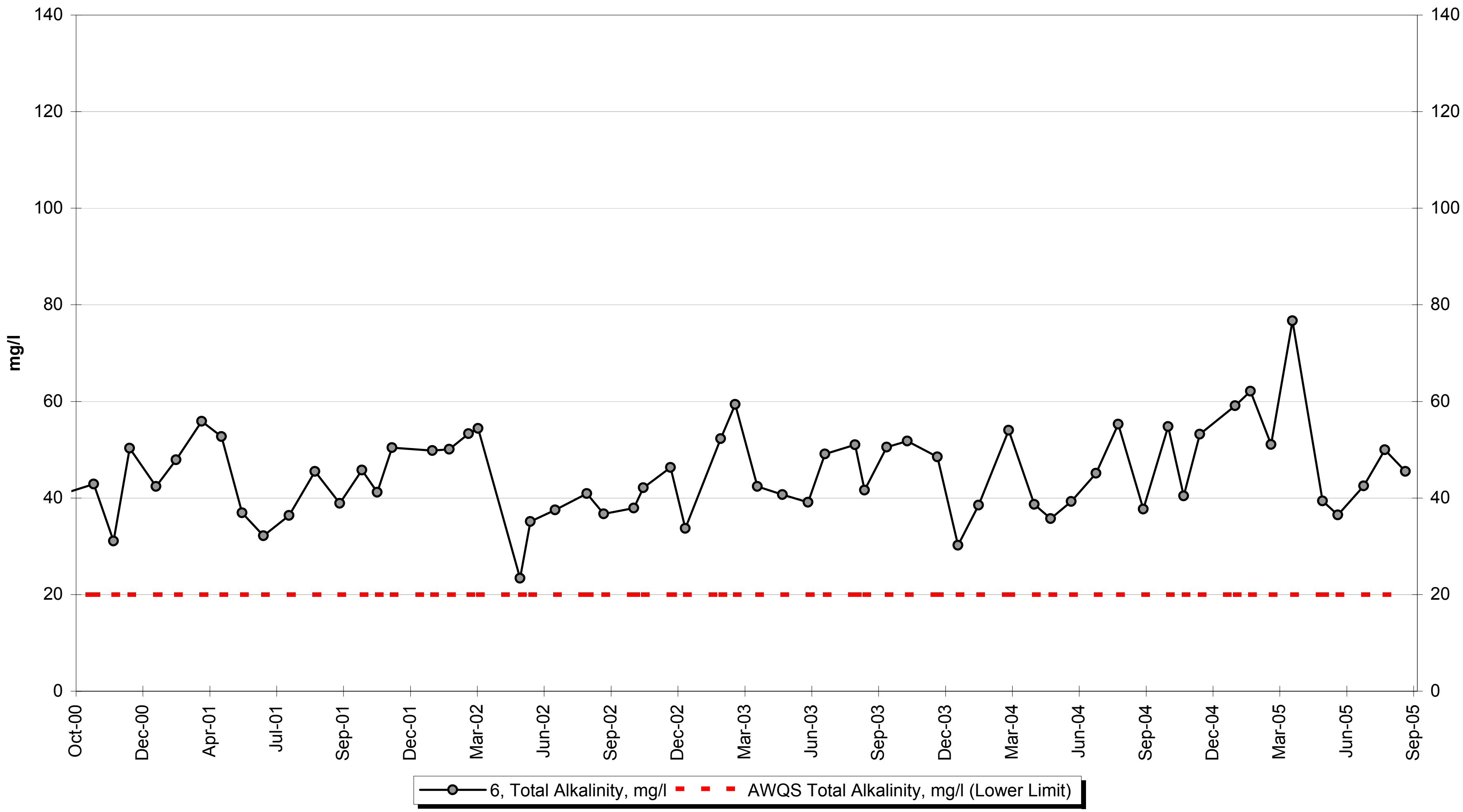



Site 6 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

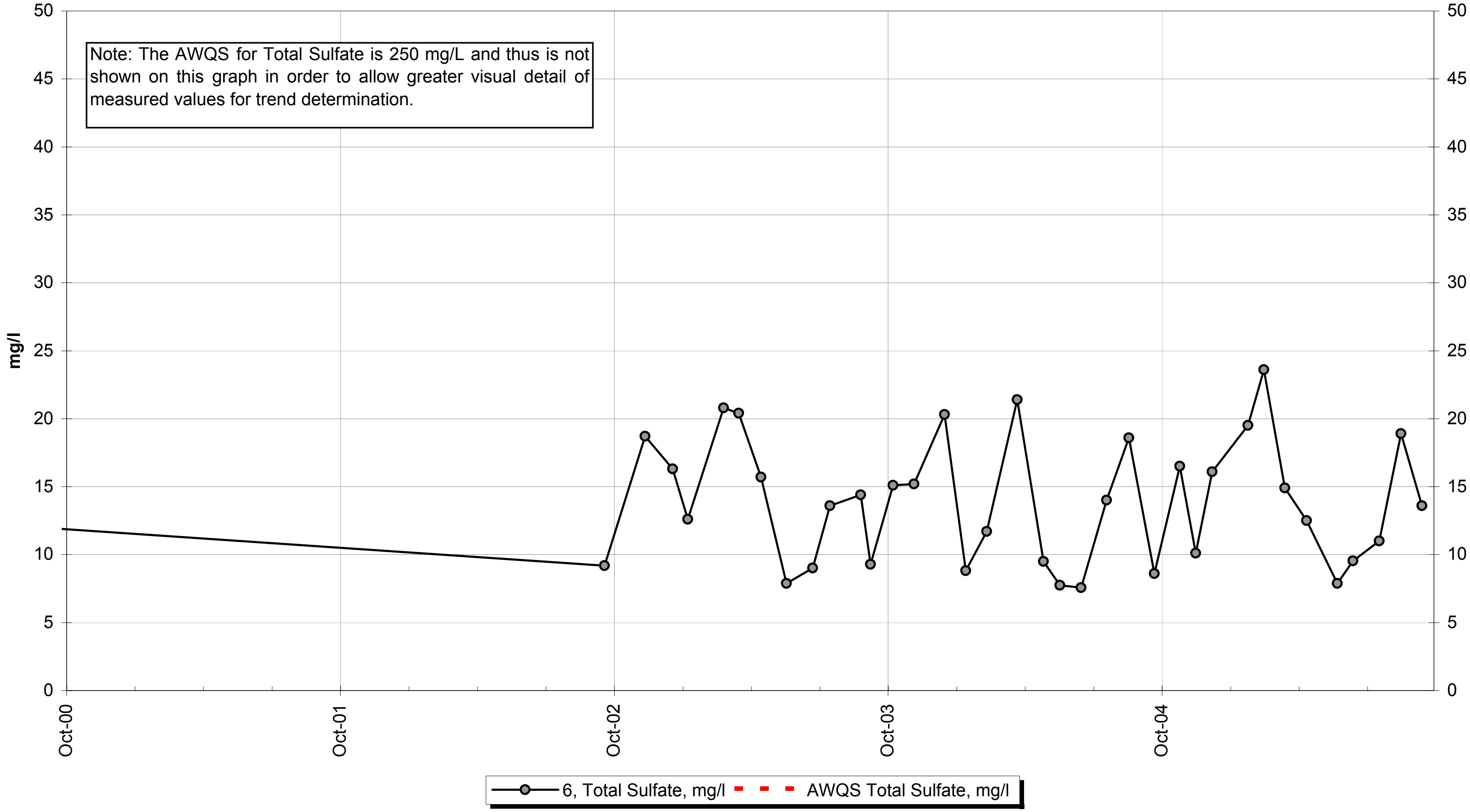


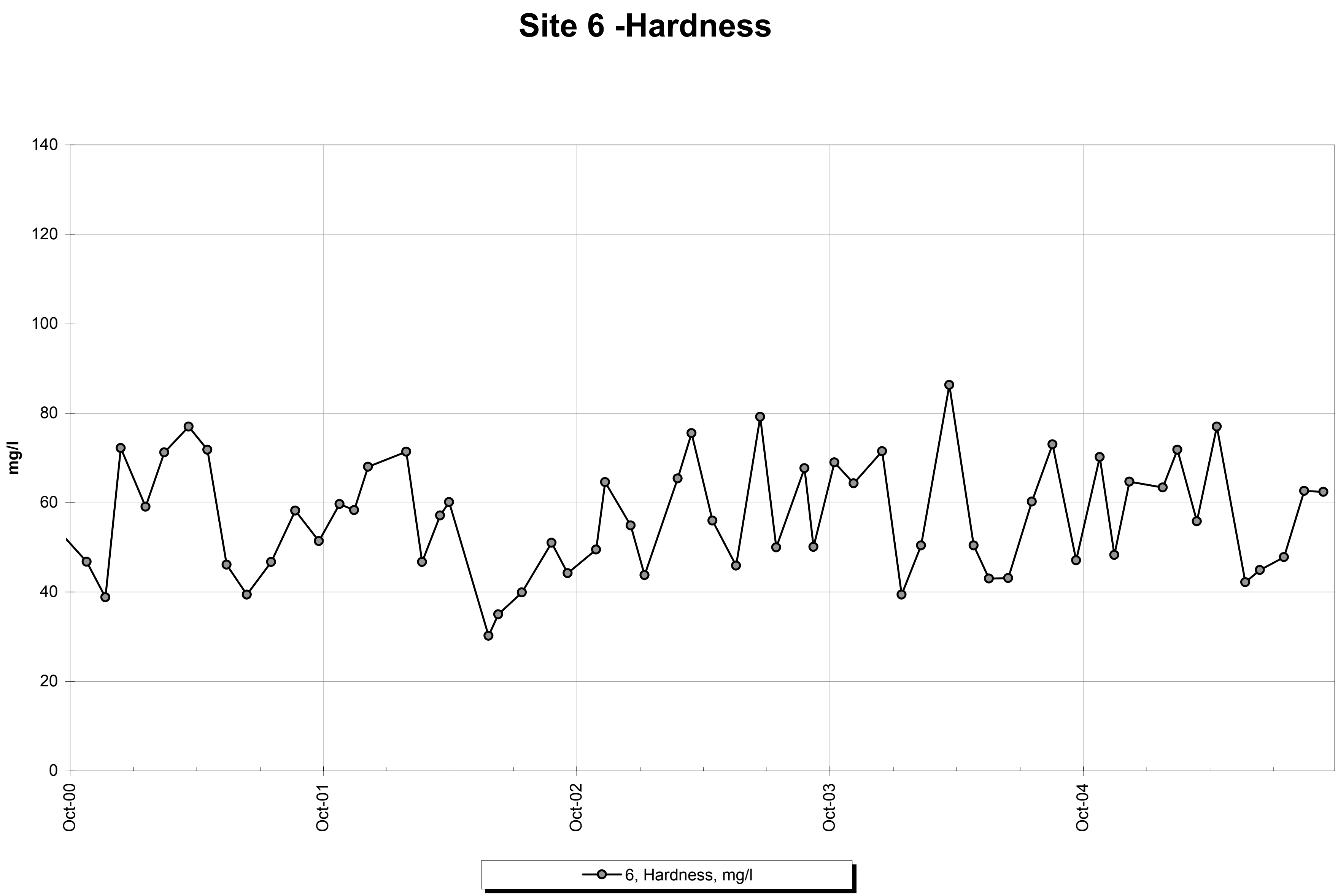
Site 6 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 6 -Total Alkalinity



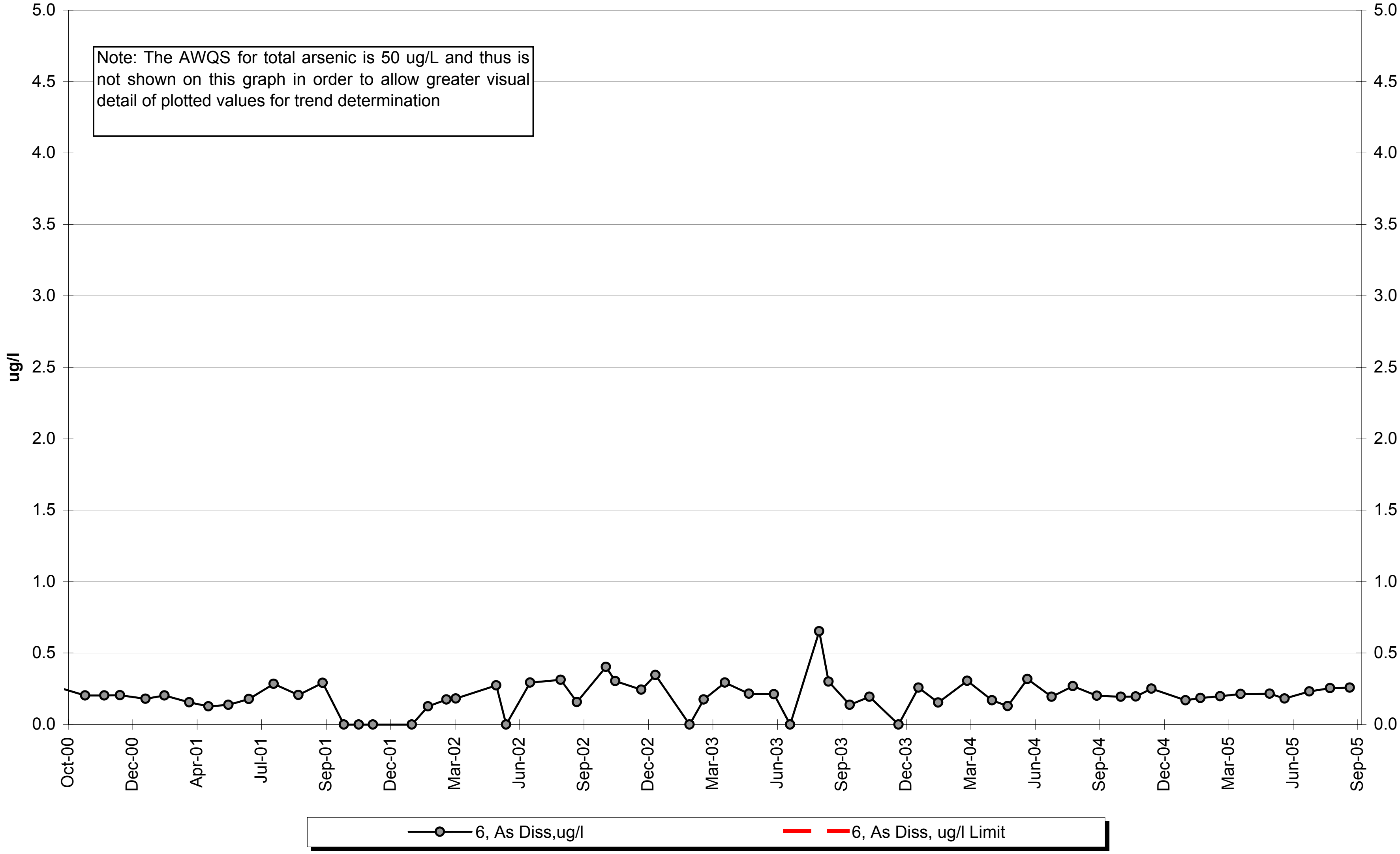
Site 6 -Total Sulfate

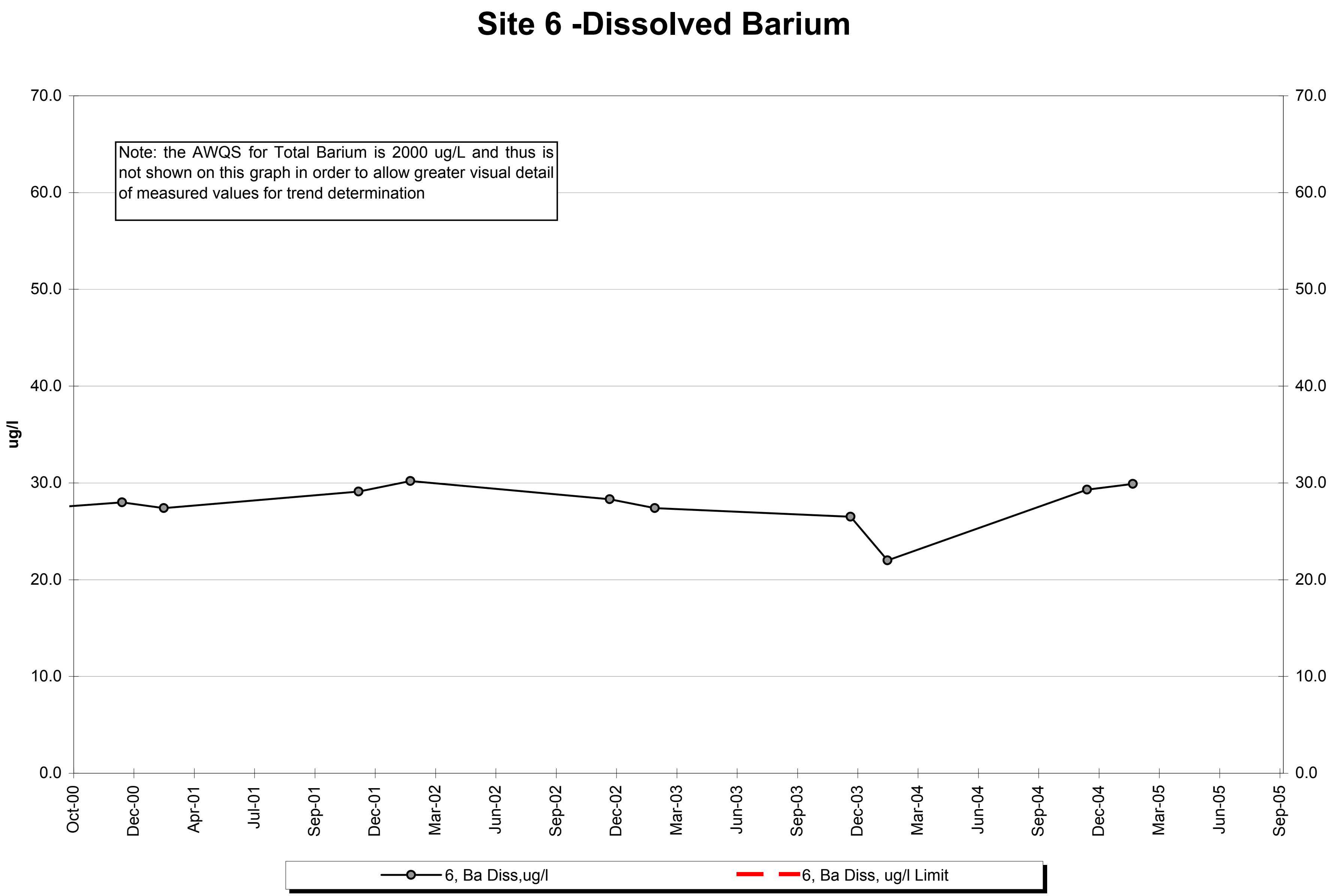




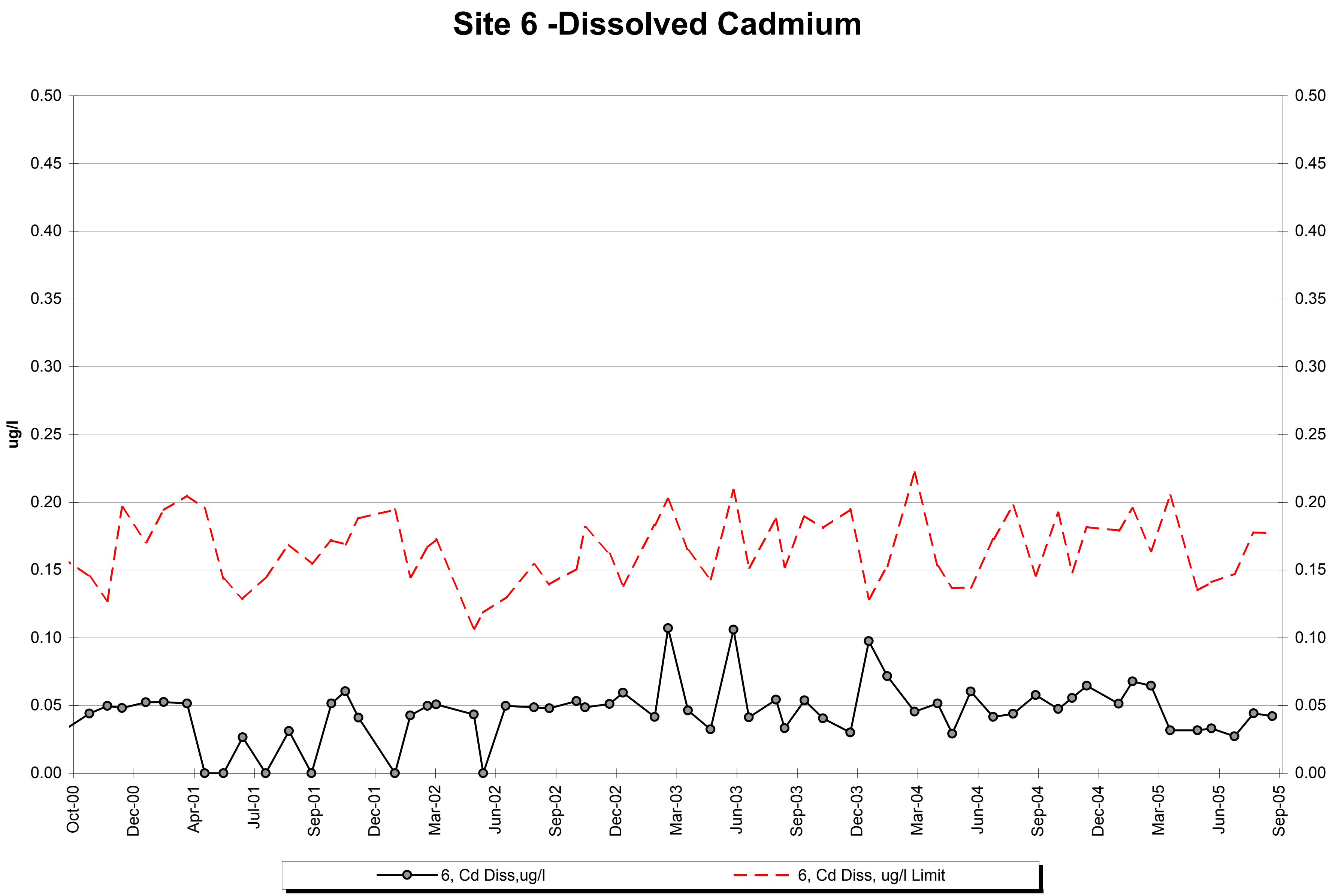
Site 6 -Hardness
mg/l
140
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, Hardness, mg/l

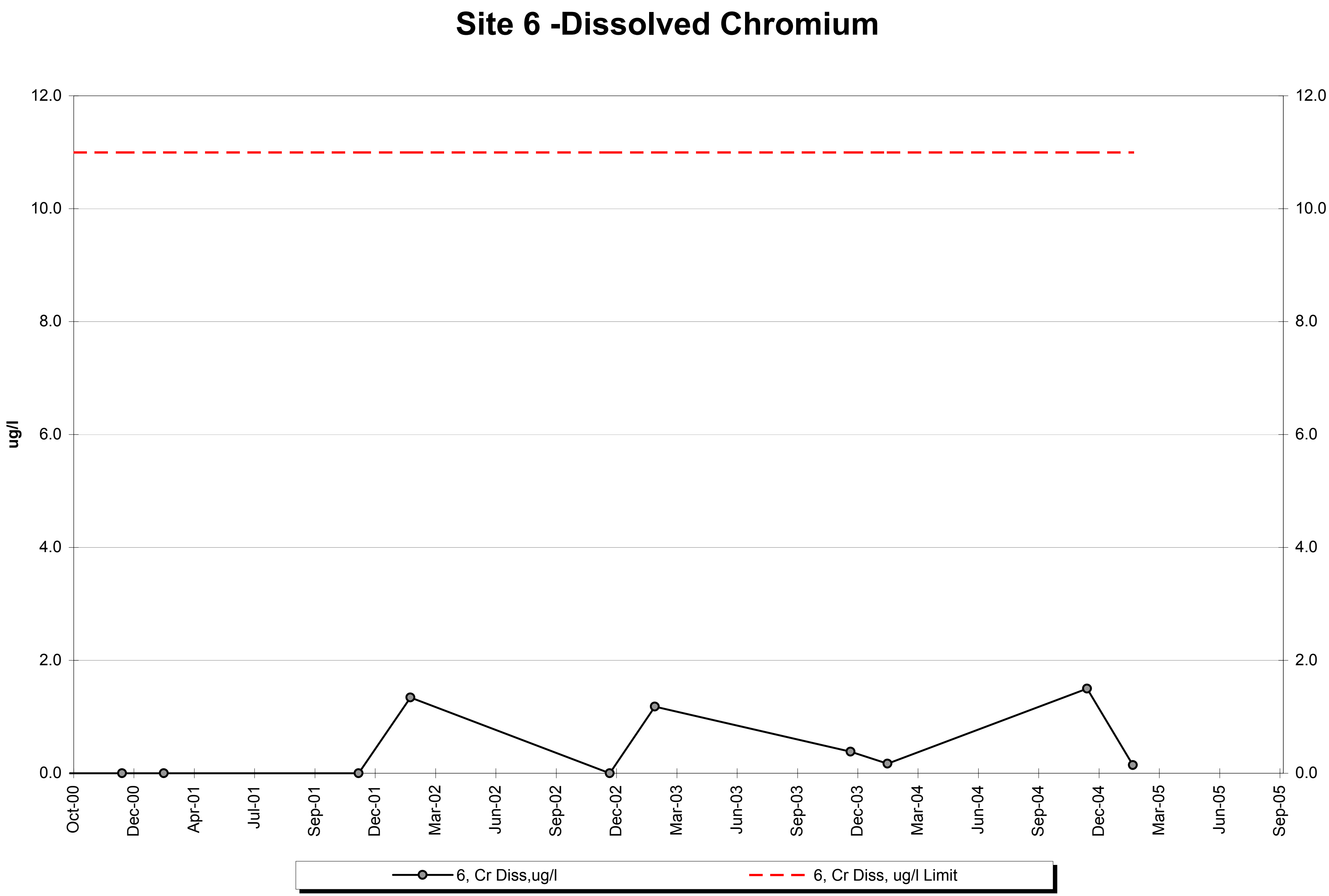
Site 6 -Dissolved Arsenic

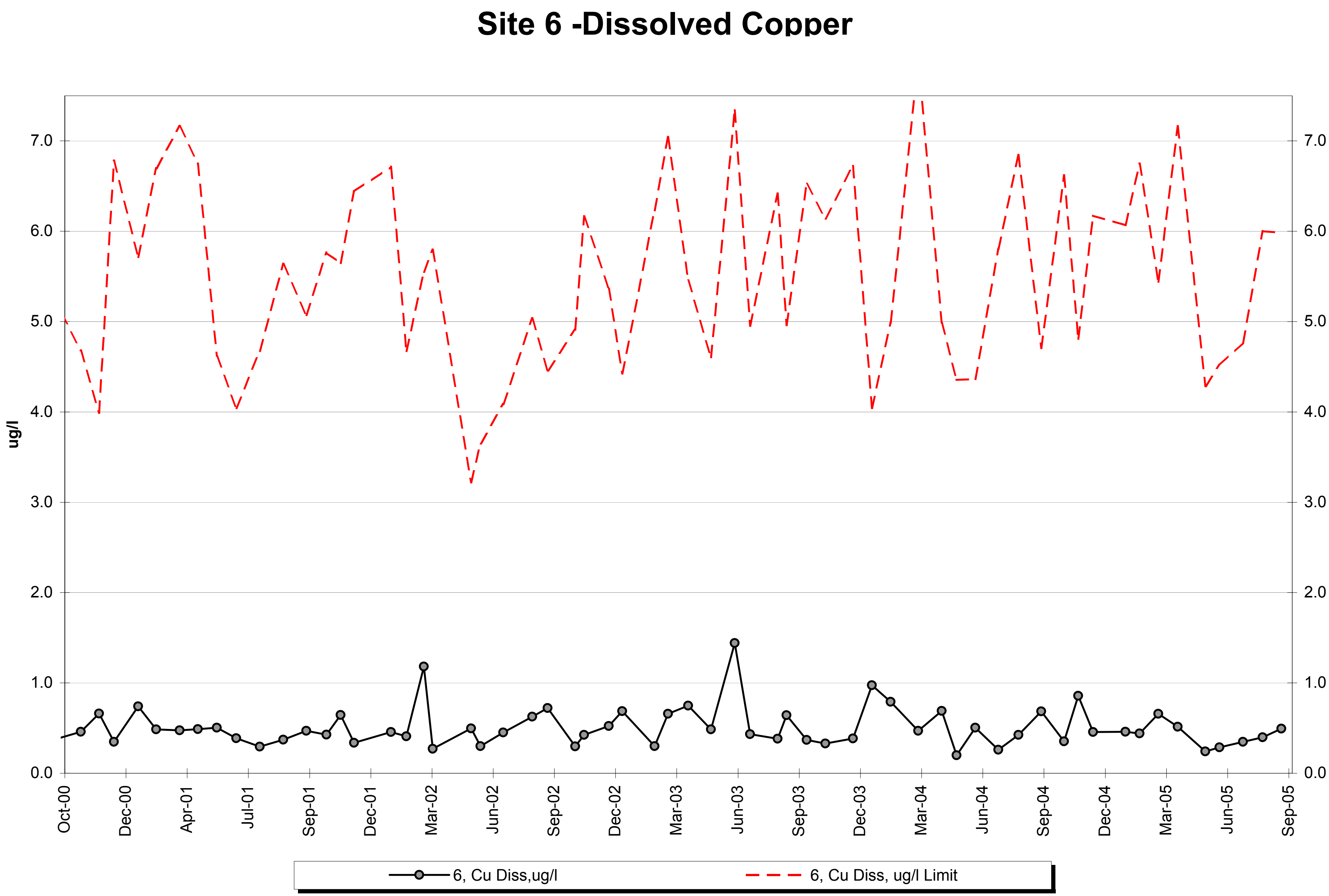




Site 6 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
6, Ba Diss,ug/l
6, Ba Diss, ug/l Limit

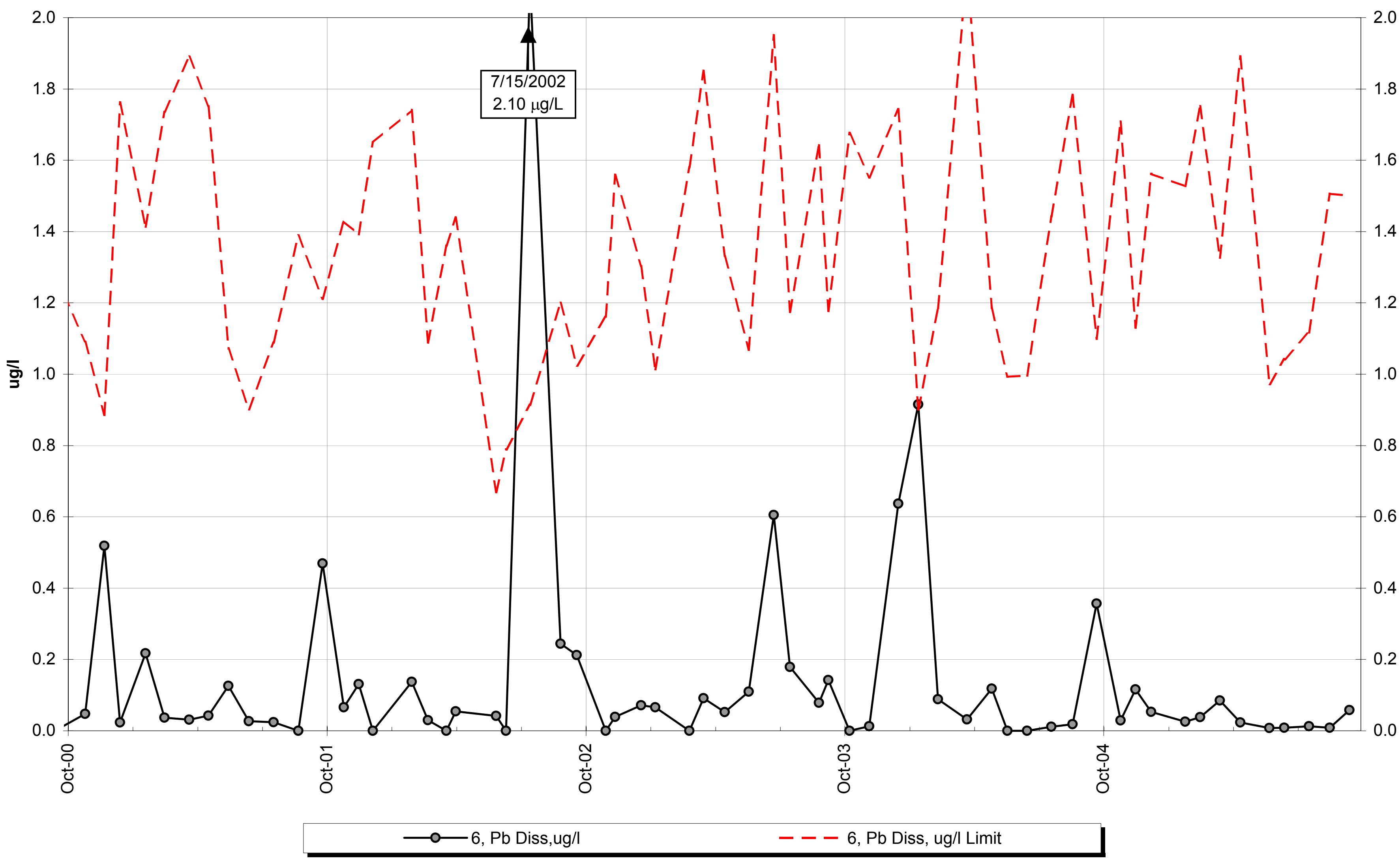

Site 6 -Dissolved Cadmium
ug/l
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
6, Cd Diss,ug/l
6, Cd Diss, ug/l Limit

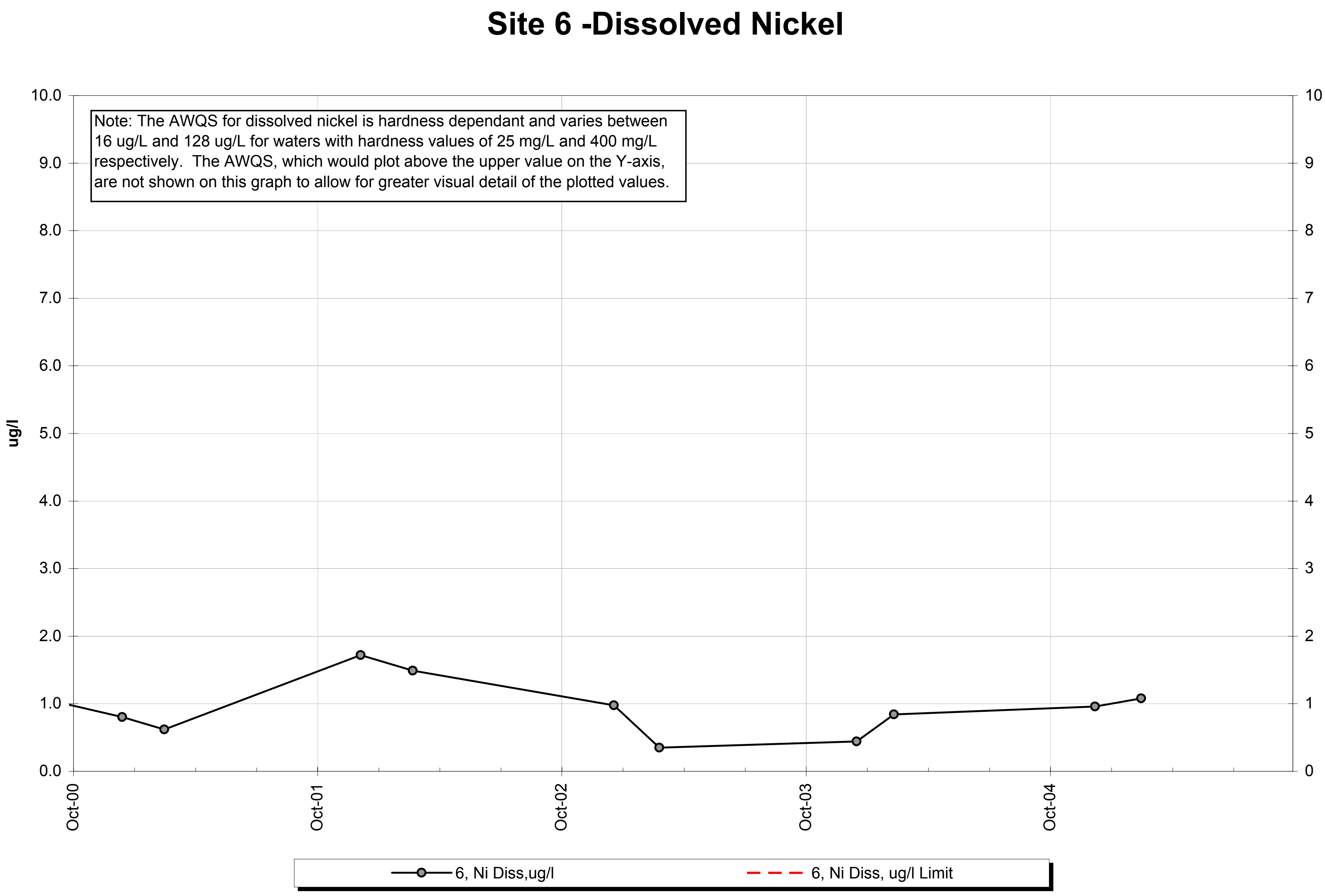

Site 6 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
6, Cr Diss,ug/l
6, Cr Diss, ug/l Limit

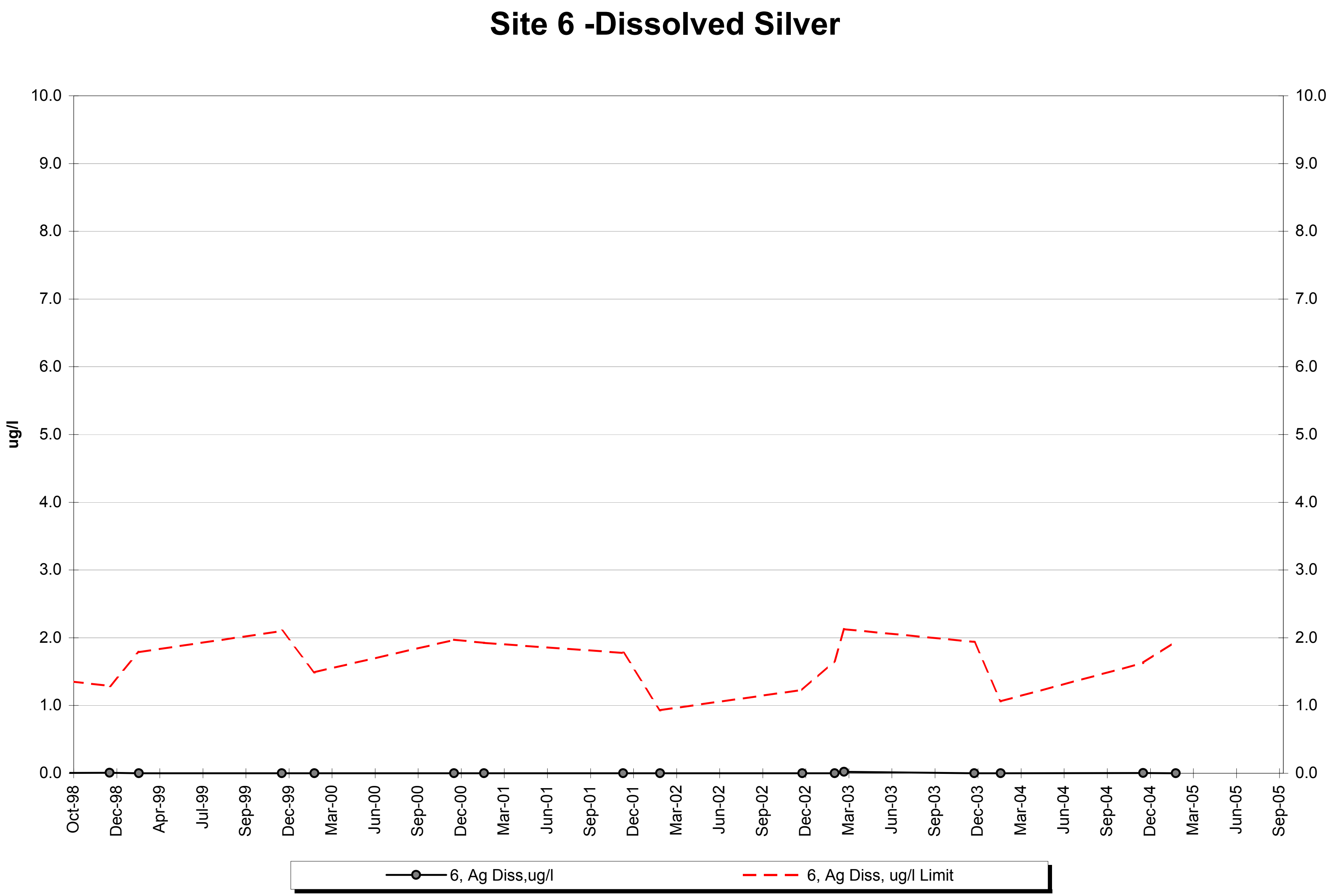


Site 6 -Dissolved Copper
ug/l
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
6, Cu Diss,ug/l
6, Cu Diss, ug/l Limit

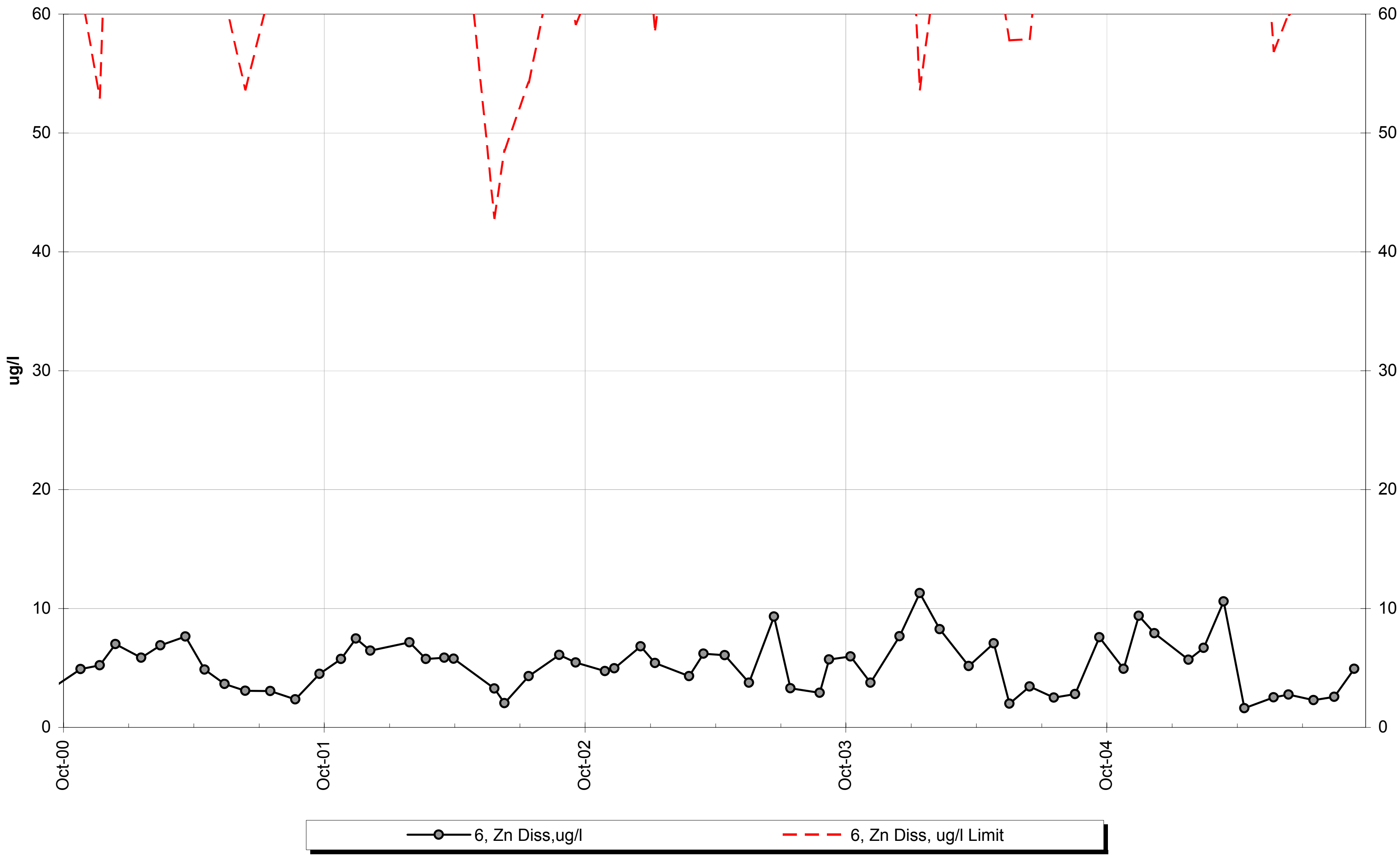
Site 6 -Dissolved Lead

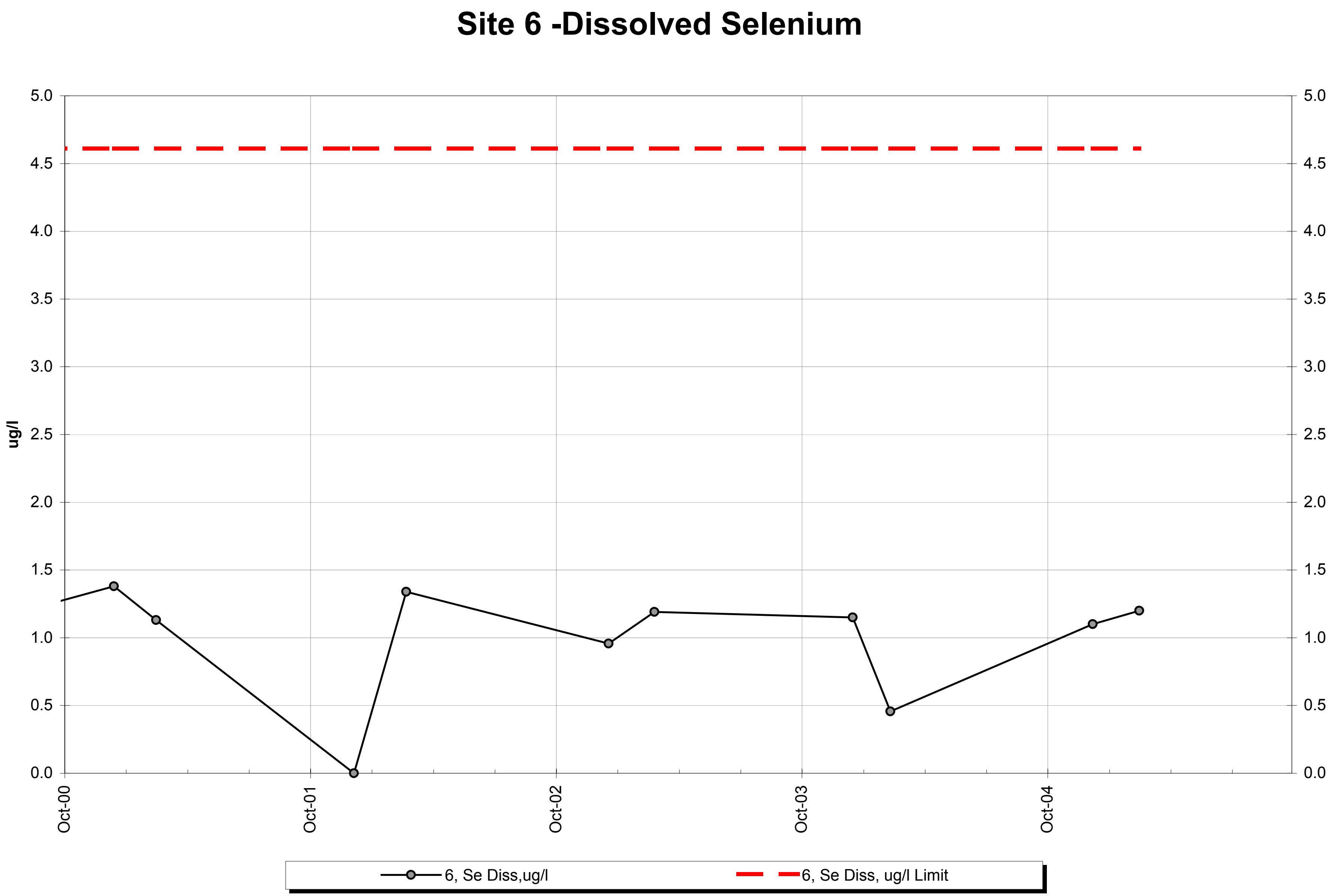



Site 6 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater visual detail of the plotted values.
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, Ni Diss,ug/l
6, Ni Diss, ug/l Limit

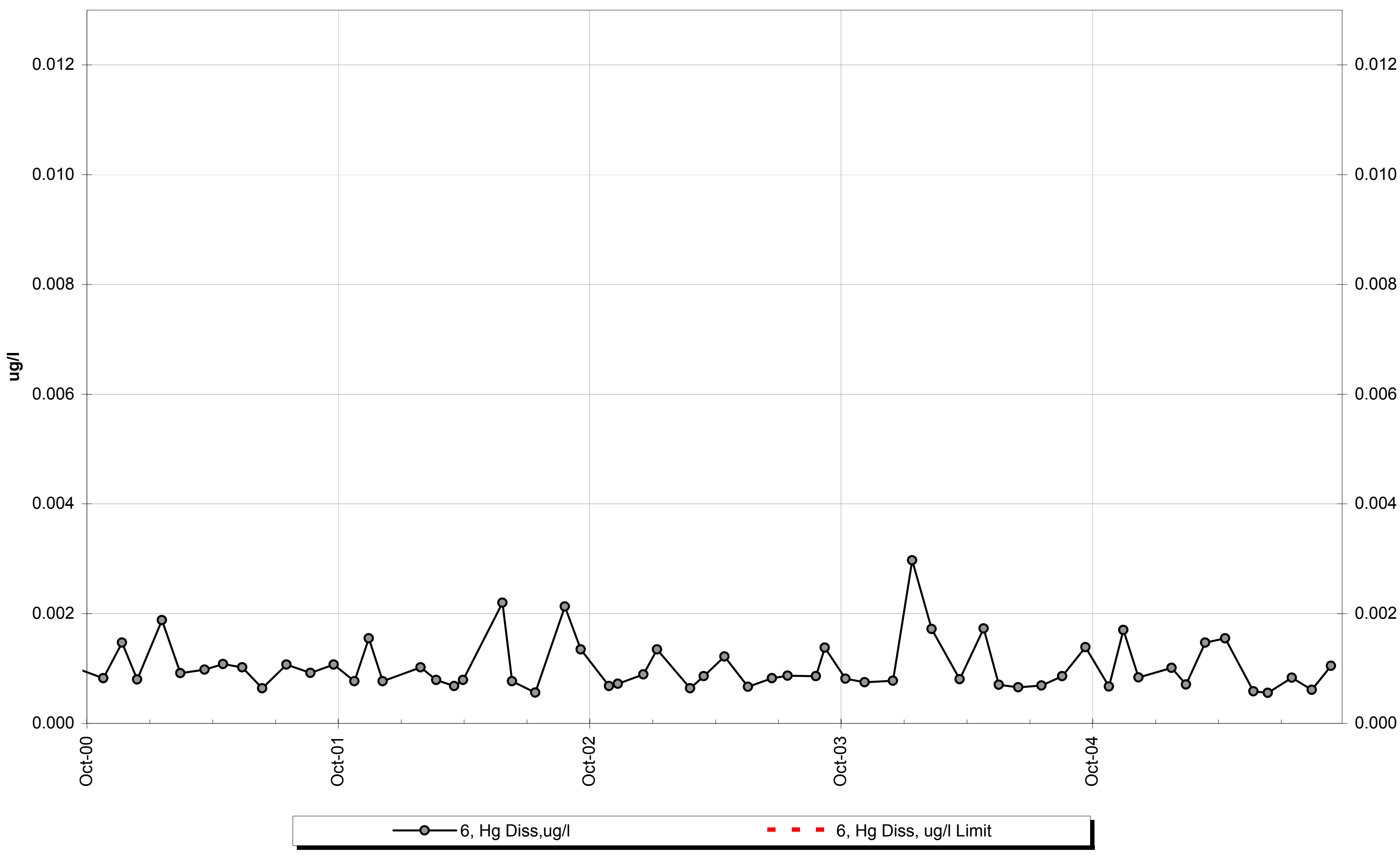

Site 6 -Dissolved Silver
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
6, Ag Diss,ug/l
6, Ag Diss, ug/l Limit

Site 6 -Dissolved Zinc

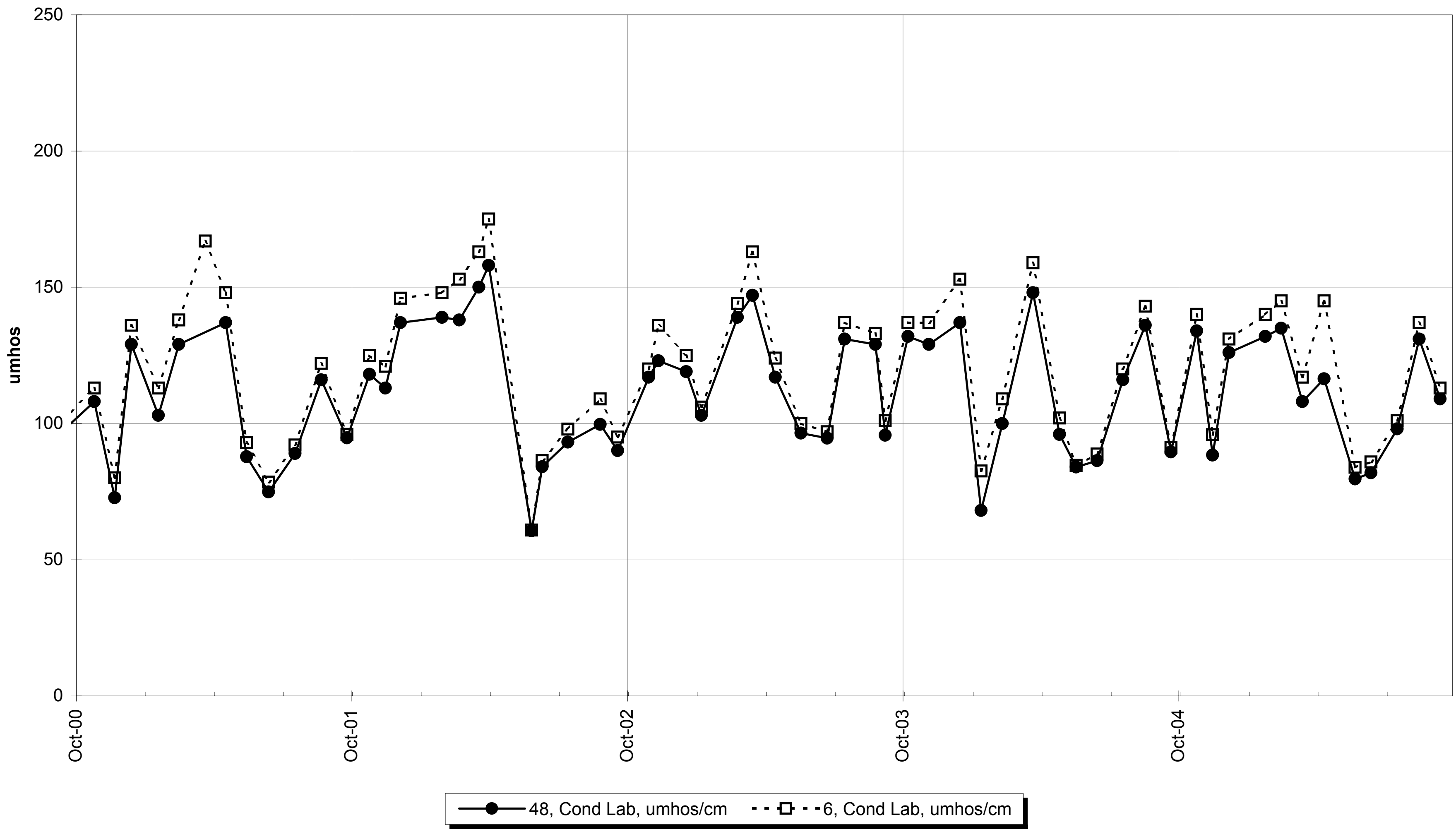


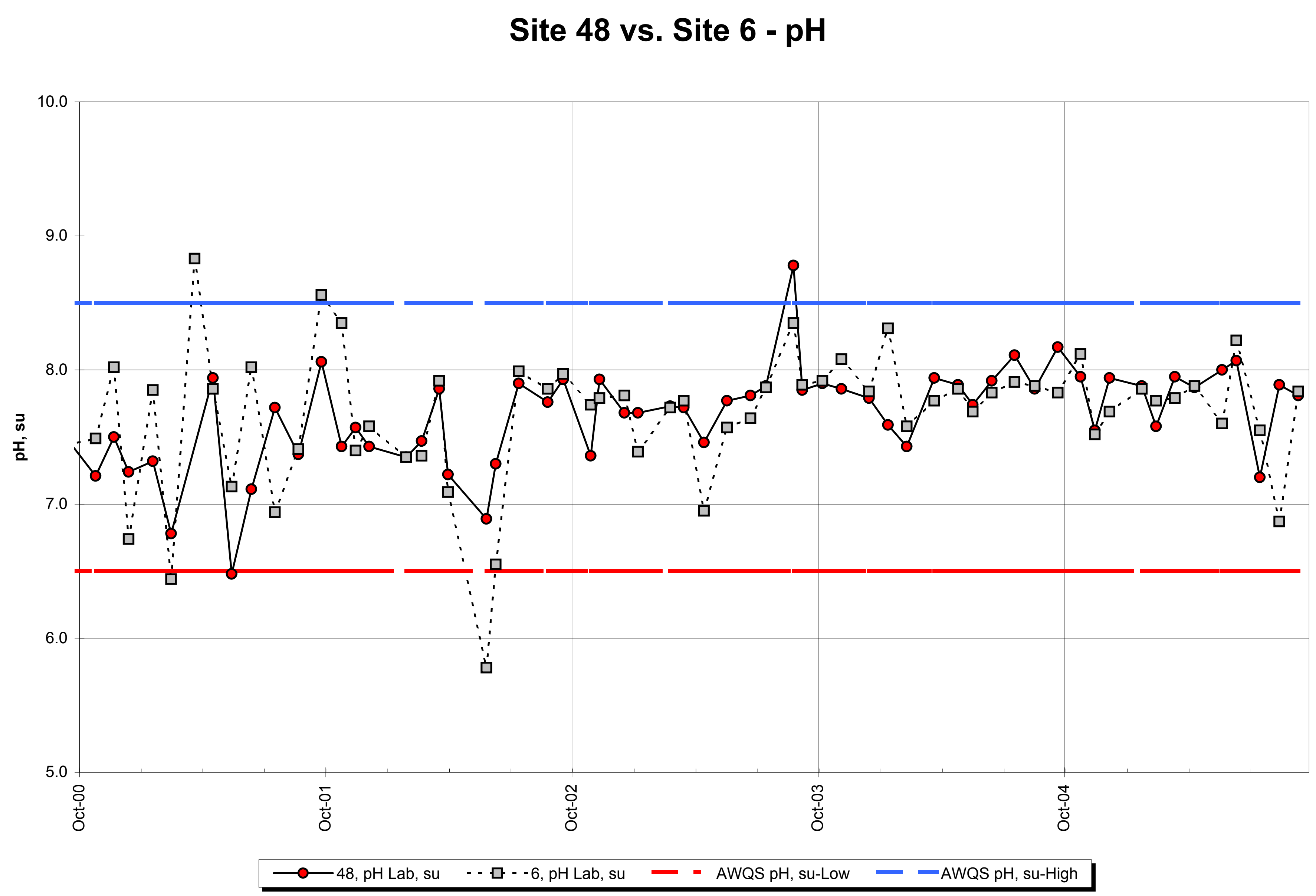

Site 6 -Dissolved Selenium
ug/l
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, Se Diss,ug/l
6, Se Diss, ug/l Limit

Site 6 -Dissolved Mercury



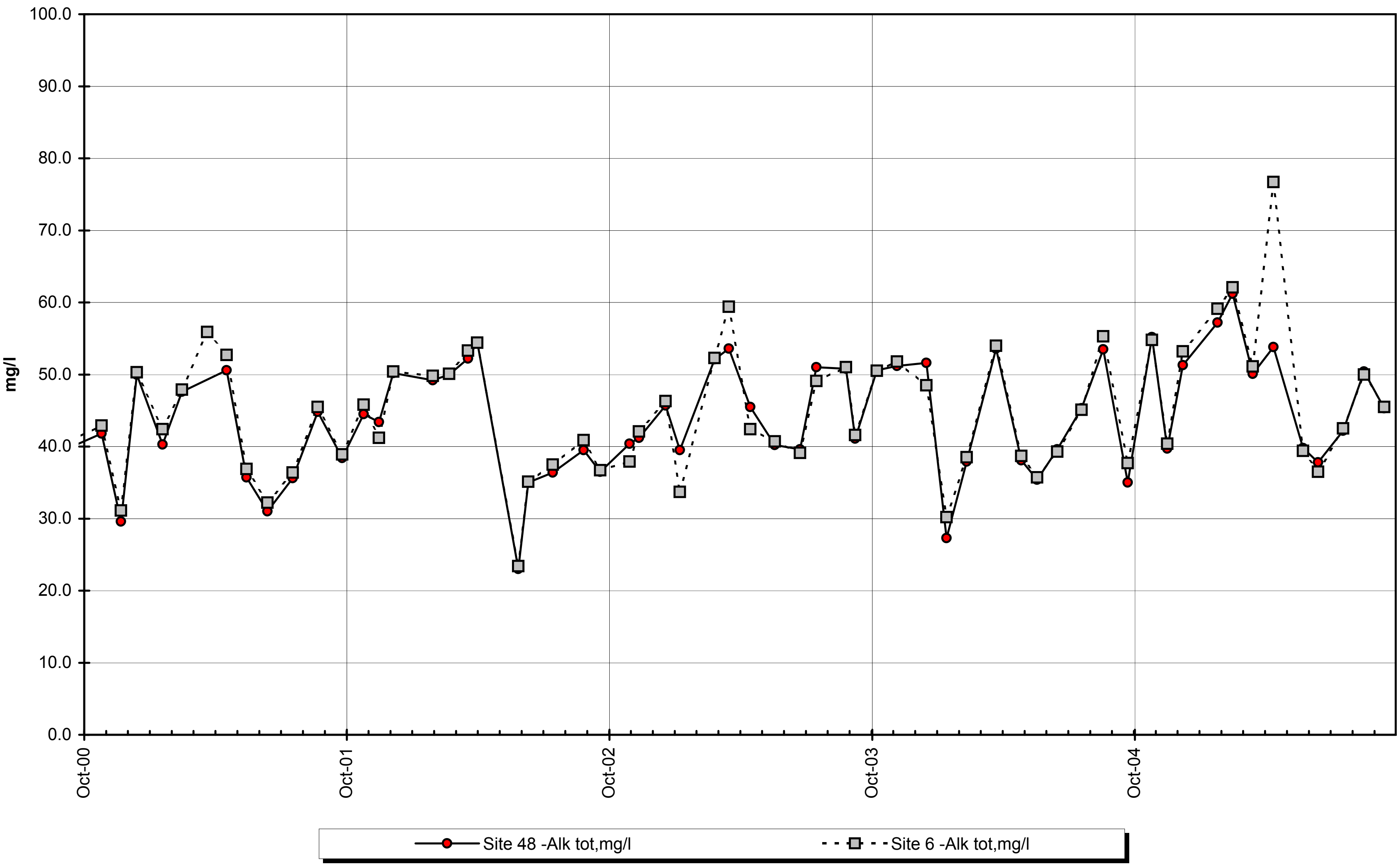
Site 48 vs Site 6 -Conductivity

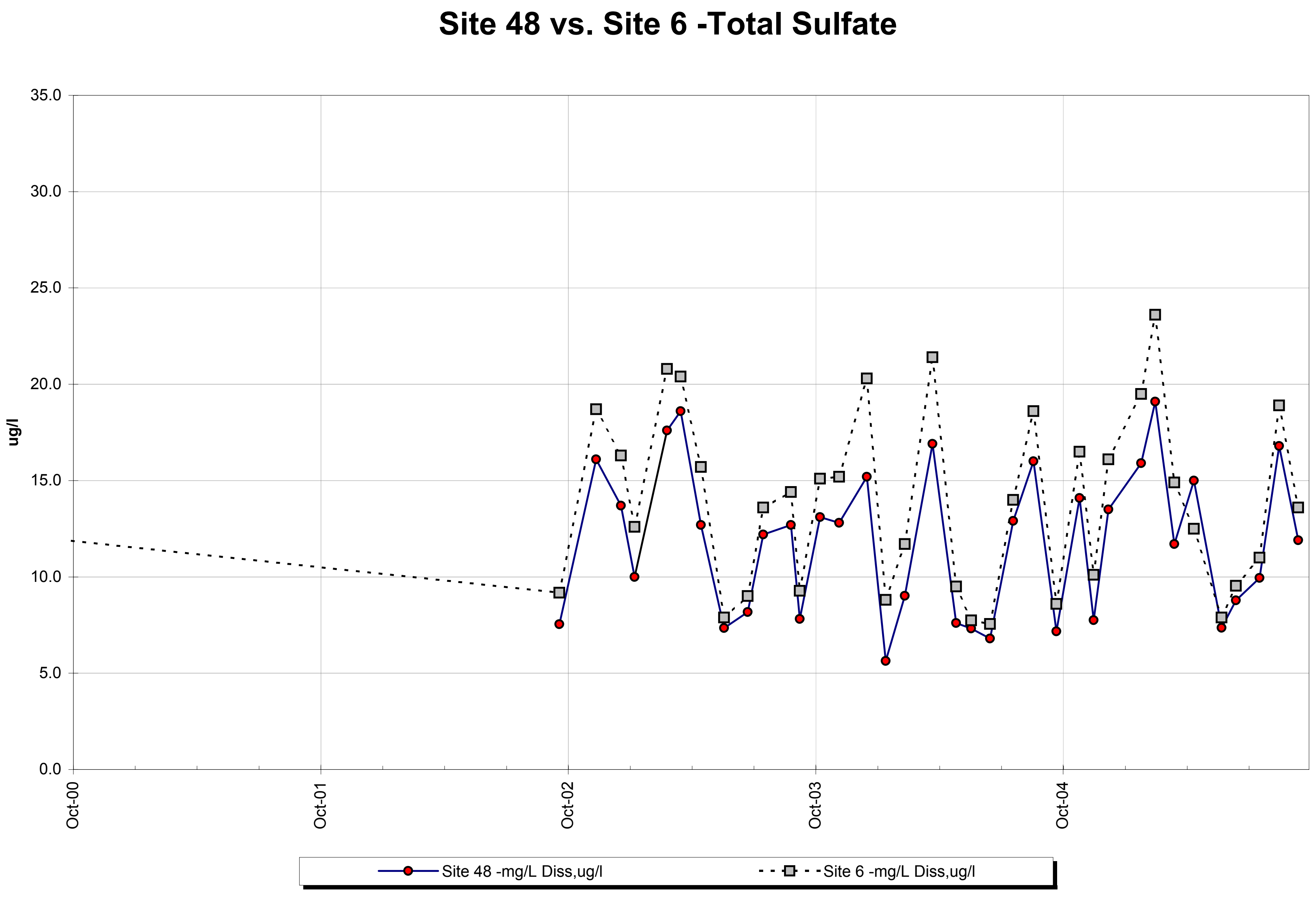




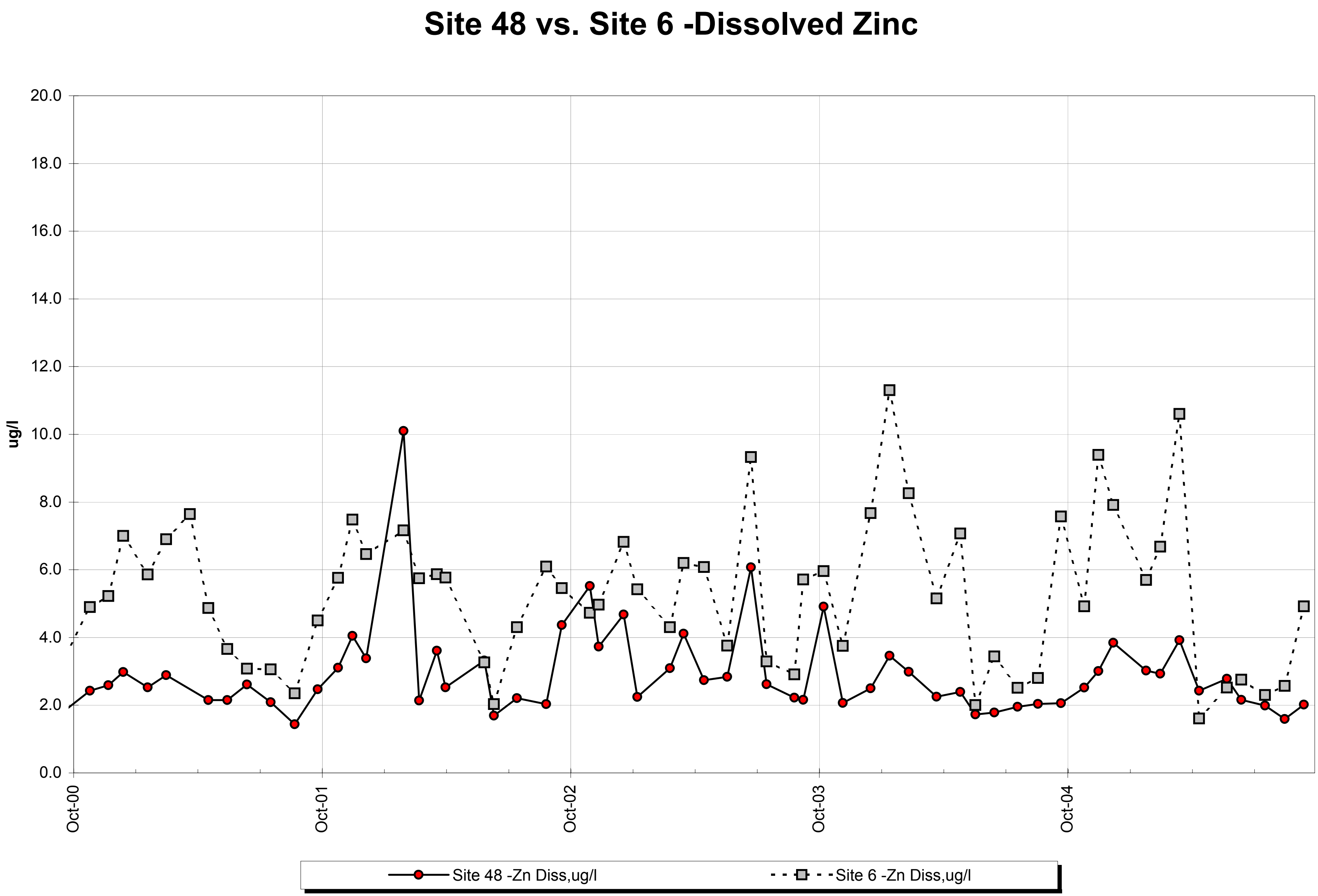
Site 48 vs. Site 6 - pH
10.0
9.0
8.0
7.0
6.0
5.0
pH, su
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
48, pH Lab, su
6, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 48 vs. Site 6 -Total Alkalinity





Site 48 vs. Site 6 -Total Sulfate
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
ug/l
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 48 -mg/L Diss,ug/l
Site 6 -mg/L Diss,ug/l



Site 48 vs. Site 6 -Dissolved Zinc
ug/l
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 48 -Zn Diss,ug/l
Site 6 -Zn Diss,ug/l

Site **#6** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	101.0	117.0	144.0	130.0	149.0	153.0	143.0	90.0	83.2	84.4	96.3	101.0
b	**WY2001**	113.0	80.0	136.0	113.0	138.0	167.0	148.0	93.0	78.5	92.1	122.0	96.0
c	**WY2002**	125.0	121.0	146.0	148.0	153.0	163.0	175.0	60.9	86.3	97.9	109.0	95.0
d	**WY2003**	120.0	136.0	125.0	106.0	144.0	163.0	124.0	100.0	96.9	137.0	133.0	101.0
e	**WY2004**	137.0	137.0	153.0	82.6	109.0	159.0	102.0	84.6	88.8	120.0	143.0	91.1
f	**WY2005**	140.0	95.9	131.0	140.0	145.0	117.0	145.0	83.9	85.9	101.0	137.0	113.0
	n	6	6	6	6	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	1	0	0	0	0	0	1
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	-1	-1	-1	1	1	1	-1	1	1	-1
c-a	1	1	1	1	1	1	1	-1	1	1	1	-1
d-a	1	1	-1	-1	-1	1	-1	1	1	1	1	0
e-a	1	1	1	-1	-1	1	-1	-1	1	1	1	-1
f-a	1	-1	-1	1	-1	-1	1	-1	1	1	1	1
c-b	1	1	1	1	1	-1	1	-1	1	1	-1	-1
d-b	1	1	-1	-1	1	-1	-1	1	1	1	1	1
e-b	1	1	1	-1	-1	-1	-1	-1	1	1	1	-1
f-b	1	1	-1	1	1	-1	-1	-1	1	1	1	1
d-c	-1	1	-1	-1	-1	0	-1	1	1	1	1	1
e-c	1	1	1	-1	-1	-1	-1	1	1	1	1	-1
f-c	1	-1	-1	-1	-1	-1	-1	1	-1	1	1	1
e-d	1	1	1	-1	-1	-1	-1	-1	-1	-1	1	-1
f-d	1	-1	1	1	1	-1	1	-1	-1	-1	1	1
f-e	1	-1	-1	1	1	-1	1	-1	-1	-1	-1	1
S_k	13	5	-1	-3	-3	-6	-3	-3	5	9	11	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.44	0.94	-0.19	-0.56	-0.56	-1.13	-0.56	-0.56	0.94	1.69	2.07	0.00
Z^2_k	5.96	0.88	0.04	0.32	0.32	1.27	0.32	0.32	0.88	2.86	4.27	0.00

ΣZ_k= 4.51

ΣZ^2_k= 17.44

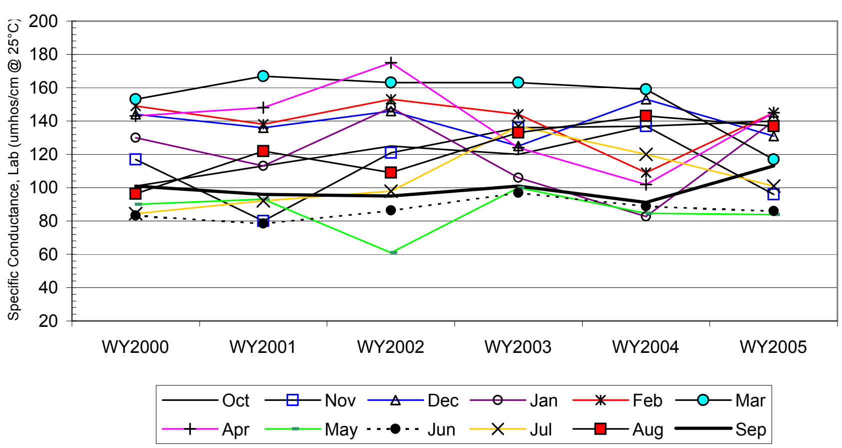
Z-bar=ΣZ_k/K= 0.38

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 72

ΣS_k 24

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	15.74	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.151**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc}	1.25	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
340.00 p	**0.894**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.65		3.85
0.050	-0.76	**1.80**	3.33
0.100	0.00		3.00
0.200	0.65		2.36

Site **#6** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.6	7.7	7.9	7.8	7.3	7.9	8.2	7.6	6.9	7.8	7.2	7.4
b	**WY2001**	7.5	8.0	6.7	7.9	6.4	8.8	7.9	7.1	8.0	6.9	7.4	8.6
c	**WY2002**	8.4	7.4	7.6	7.4	7.4	7.9	7.1	5.8	6.6	8.0	7.9	8.0
d	**WY2003**	7.7	7.8	7.8	7.4	7.7	7.8	7.0	7.6	7.6	7.9	8.4	7.9
e	**WY2004**	7.9	8.1	7.8	8.3	7.6	7.8	7.9	7.7	7.8	7.9	7.9	7.8
f	**WY2005**	8.1	7.5	7.7	7.9	7.8	7.8	7.9	7.6	8.2	7.6	6.9	7.8
	n	6	6	6	6	6	6	6	6	6	6	6	6
	t_1	0	0	0	0	0	1	1	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a	-1	1	-1	1	-1	1	-1	-1	1	-1	1	1
	c-a	1	-1	-1	-1	1	1	-1	-1	-1	1	1	1
	d-a	1	1	-1	-1	1	-1	-1	-1	1	1	1	1
	e-a	1	1	-1	1	1	-1	-1	1	1	1	1	1
	f-a	1	-1	-1	1	1	-1	-1	1	1	-1	-1	1
	c-b	1	-1	1	-1	1	-1	-1	-1	-1	1	1	-1
	d-b	1	-1	1	-1	1	-1	-1	1	-1	1	1	-1
	e-b	1	1	1	1	1	-1	0	1	-1	1	1	-1
	f-b	1	-1	1	1	1	-1	1	1	1	1	-1	-1
	d-c	-1	1	1	1	1	-1	-1	1	1	-1	1	-1
	e-c	-1	1	1	1	1	-1	1	1	1	-1	1	-1
	f-c	-1	1	1	1	1	-1	1	1	1	-1	-1	-1
	e-d	1	1	1	1	-1	0	1	1	1	1	-1	-1
	f-d	1	-1	-1	1	1	1	1	1	1	-1	-1	-1
	f-e	1	-1	-1	-1	1	1	1	-1	1	-1	-1	1
	S_k	7	1	1	5	11	-6	-2	5	7	1	3	-3
	σ^2_S=	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
	$Z_k = S_k/\sigma_S$	1.32	0.19	0.19	0.94	2.07	-1.13	-0.38	0.94	1.32	0.19	0.56	-0.56
	Z^2_k	1.73	0.04	0.04	0.88	4.27	1.27	0.14	0.88	1.73	0.04	0.32	0.32

ΣZ_k= 5.64

ΣZ^2_k= 11.65

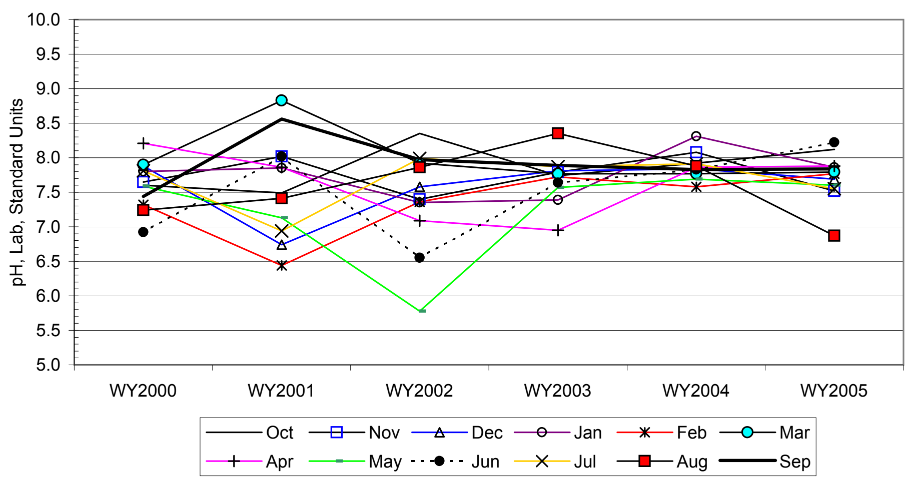
Z-bar=ΣZ_k/K= 0.47

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 72

ΣS_k 30

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	9.00	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.622**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 1.57	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
340.00	**p** **0.942**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.03		0.11
0.050	0.00	**0.02**	0.08
0.100	0.00		0.05
0.200	0.01		0.04

Site **#6** Seasonal Kendall analysis for Total Alk, (mg/l)

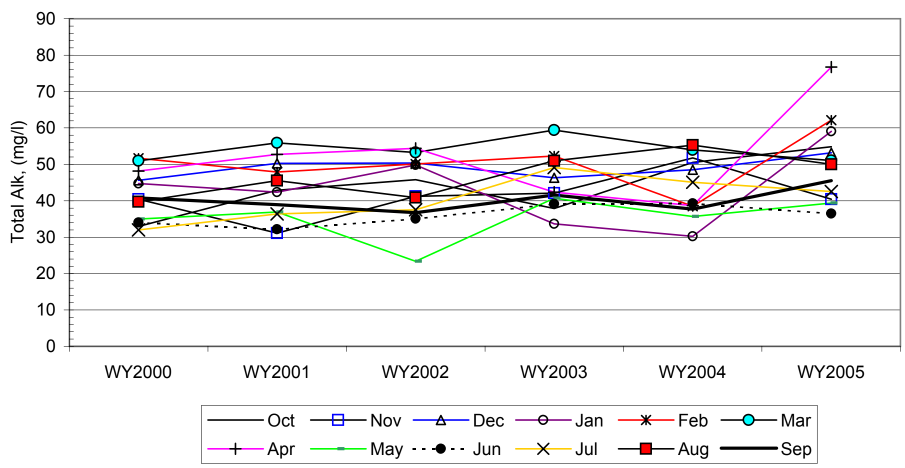
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	33.0	40.4	45.6	44.7	51.7	51.0	48.2	35.0	34.0	32.0	39.7	40.8
b	**WY2001**	42.9	31.1	50.3	42.4	47.9	55.9	52.7	36.9	32.2	36.4	45.5	38.9
c	**WY2002**	45.8	41.2	50.4	49.8	50.1	53.3	54.4	23.4	35.1	37.5	40.9	36.7
d	**WY2003**	37.9	42.1	46.3	33.7	52.3	59.4	42.4	40.7	39.1	49.1	51.0	41.6
e	**WY2004**	50.5	51.8	48.5	30.2	38.5	54.0	38.7	35.7	39.3	45.1	55.3	37.7
f	**WY2005**	54.8	40.4	53.2	59.1	62.1	51.1	76.7	39.4	36.5	42.5	50.0	45.5
	n	6	6	6	6	6	6	6	6	6	6	6	6
	t_1	0	1	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a	1	-1	1	-1	-1	1	1	1	-1	1	1	-1
	c-a	1	1	1	1	-1	1	1	-1	1	1	1	-1
	d-a	1	1	1	-1	1	1	-1	1	1	1	1	1
	e-a	1	1	1	-1	-1	1	-1	1	1	1	1	-1
	f-a	1	0	1	1	1	1	1	1	1	1	1	1
	c-b	1	1	1	1	1	-1	1	-1	1	1	-1	-1
	d-b	-1	1	-1	-1	1	1	-1	1	1	1	1	1
	e-b	1	1	-1	-1	-1	-1	-1	-1	1	1	1	-1
	f-b	1	1	1	1	1	-1	1	1	1	1	1	1
	d-c	-1	1	-1	-1	1	1	-1	1	1	1	1	1
	e-c	1	1	-1	-1	-1	1	-1	1	1	1	1	1
	f-c	1	-1	1	1	1	-1	1	1	1	1	1	1
	e-d	1	1	1	-1	-1	-1	-1	-1	1	-1	1	-1
	f-d	1	-1	1	1	1	-1	1	-1	-1	-1	-1	1
	f-e	1	-1	1	1	1	-1	1	1	-1	-1	-1	1
	S_k	11	6	7	-1	3	1	1	5	9	9	9	3
	$\sigma^2_S=$	28.33	27.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
	$Z_k = S_k/\sigma_S$	2.07	1.15	1.32	-0.19	0.56	0.19	0.19	0.94	1.69	1.69	1.69	0.56
	Z^2_k	4.27	1.32	1.73	0.04	0.32	0.04	0.04	0.88	2.86	2.86	2.86	0.32

$\Sigma Z_k=$ 11.86
$\Sigma Z^2_k=$ 17.52
$Z\text{-bar}=\Sigma Z_k/K=$ 0.99

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 72
ΣS_k 63

$\chi^2_h=\Sigma Z^2_k-K(Z\text{-bar})^2=$ 5.80		@α=5% $\chi^2_{(K-1)}=$ 19.68	Test for station homogeneity	
p	**0.886**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 3.37	@$\alpha/2$=2.5% $Z=$ 1.96	H_0 (No trend)	REJECT
339.00	p **1.000**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.44		2.38
0.050	0.62	**1.58**	2.20
0.100	0.78		2.08
0.200	0.97		1.90
		3.7%	

Site **#6** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	4.5	8.8	4.1	5.4	4.5	5.7	8.8	3.3	2.4	2.5	2.7	3.2
b	**WY2001**	4.9	5.2	7.0	5.9	6.9	7.6	4.9	3.7	3.1	3.1	2.4	4.5
c	**WY2002**	5.8	7.5	6.5	7.2	5.8	5.9	5.8	3.3	2.0	4.3	6.1	5.5
d	**WY2003**	4.7	5.0	6.8	5.4	4.3	6.2	6.1	3.8	9.3	3.3	2.9	5.7
e	**WY2004**	6.0	3.8	7.7	11.3	8.3	5.2	7.1	2.0	3.4	2.5	2.8	7.6
f	**WY2005**	4.9	9.4	7.9	5.7	6.7	10.6	1.6	2.5	2.8	2.3	2.6	4.9
	n	6	6	6	6	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	1	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	1	1	1	1	-1	1	1	1	-1	1
c-a	1	-1	1	1	1	1	-1	-1	-1	1	1	1
d-a	1	-1	1	1	-1	1	-1	1	1	1	1	1
e-a	1	-1	1	1	1	-1	-1	-1	1	0	1	1
f-a	1	1	1	1	1	1	-1	-1	1	-1	-1	1
c-b	1	1	-1	1	-1	-1	1	-1	-1	1	1	1
d-b	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1
e-b	1	-1	1	1	1	-1	1	-1	1	-1	1	1
f-b	1	1	1	-1	-1	1	-1	-1	-1	-1	1	1
d-c	-1	-1	1	-1	-1	1	1	1	1	-1	-1	1
e-c	1	-1	1	1	1	-1	1	-1	1	-1	-1	1
f-c	-1	1	1	-1	1	1	-1	-1	1	-1	-1	-1
e-d	1	-1	1	1	1	-1	1	-1	-1	-1	-1	1
f-d	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1
f-e	-1	1	1	-1	-1	1	-1	1	-1	-1	-1	-1
S_k	7	-3	11	5	3	3	-3	-5	3	-4	-1	9

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.32	-0.56	2.07	0.94	0.56	0.56	-0.56	-0.94	0.56	-0.75	-0.19	1.69
Z^2_k	1.73	0.32	4.27	0.88	0.32	0.32	0.32	0.88	0.32	0.56	0.04	2.86

ΣZ_k= 4.70

ΣZ^2_k= 12.81

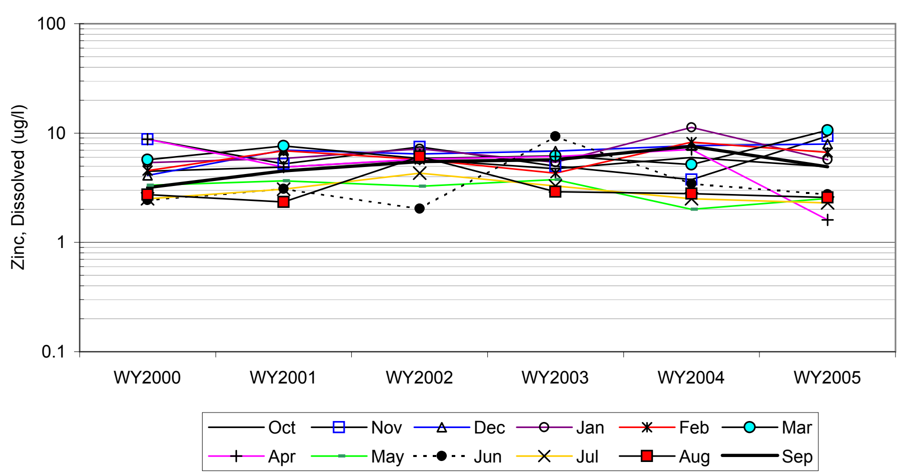
Z-bar=$\Sigma Z_k/K$= 0.39

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 72

ΣS_k 25

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	10.97	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.445**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 340.00	Z_{calc} 1.30	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.903**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.10		0.34
0.050	-0.04	**0.10**	0.25
0.100	0.00		0.24
0.200	0.05		0.15

Wilcoxon-signed-ranks test

Exact Form

Variable: **Specific Conductance, Lab (umhos/cm**

	X	**Y**	Differences		
Site	#48	#6			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	134.0	140.0	-6.0	6.0	-6.5
Nov	88.4	95.9	-7.5	7.5	-8
Dec	126.0	131.0	-5.0	5.0	-5
Jan	132.0	140.0	-8.0	8.0	-9
Feb	135.0	145.0	-10.0	10.0	-11
Mar	108.0	117.0	-9.0	9.0	-10
Apr	116.4	145.0	-28.6	28.6	-12
May	79.6	83.9	-4.3	4.3	-4
Jun	81.9	85.9	-4.0	4.0	-2.5
Jul	98.0	101.0	-3.0	3.0	-1
Aug	131.0	137.0	-6.0	6.0	-6.5
Sep	109.0	113.0	-4.0	4.0	-2.5
Median	112.7	124.0	-6.0	6.0	

n	**m**
12	12

N= 12

$\Sigma R=$ -78

α
5.0%
W'α,n
17

$W^{+}=$
0
p-test
0.02%

H_0	median [D]=0	**REJECT**
H_1	median [D]<0	**ACCEPT**

Wilcoxon-signed-ranks test

Exact Form

Variable: **pH, Lab, Standard Units**

	X	**Y**			
Site	#48	#6	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	7.95	8.12	-0.17	0.17	-7
Nov	7.55	7.52	0.03	0.03	3
Dec	7.94	7.69	0.25	0.25	9
Jan	7.88	7.86	0.02	0.02	2
Feb	7.58	7.77	-0.19	0.19	-8
Mar	7.95	7.79	0.16	0.16	6
Apr	7.87	7.88	-0.01	0.01	-1
May	8.00	7.60	0.40	0.40	11
Jun	8.07	8.22	-0.15	0.15	-5
Jul	7.20	7.55	-0.35	0.35	-10
Aug	7.89	6.87	1.02	1.02	12
Sep	7.81	7.84	-0.03	0.03	-4
Median	7.89	7.78	0.00	0.17	

n	**m**
12	12

N= 12

ΣR= 8

α
95.0%
W'α,n
59

W^{+}=
43
p-test
63.33%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Total Alk, (mg/l)**

	X	**Y**			
Site	#48	#6	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	55.2	54.8	0.4	0.4	5
Nov	39.7	40.4	-0.7	0.7	-6
Dec	51.3	53.2	-1.9	1.9	-11
Jan	57.2	59.1	-1.9	1.9	-10
Feb	61.2	62.1	-0.9	0.9	-7
Mar	50.1	51.1	-1.0	1.0	-8
Apr	53.8	76.7	-22.9	22.9	-12
May	39.8	39.4	0.4	0.4	3.5
Jun	37.8	36.5	1.3	1.3	9
Jul	42.2	42.5	-0.3	0.3	-2
Aug	50.4	50.0	0.4	0.4	3.5
Sep	45.3	45.5	-0.2	0.2	-1
Median	50.3	50.6	-0.5	0.8	

n	**m**
12	12

N= 12

ΣR= -36

α
95.0%
W'α,n
59

W^{+}=
21
p-test
8.81%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Sulfate, Total (mg/l)**

	X	**Y**			
Site	#48	#6	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	14.1	16.5	-2.4	2.4	-7
Nov	7.8	10.1	-2.4	2.4	-6
Dec	13.5	16.1	-2.6	2.6	-9
Jan	15.9	19.5	-3.6	3.6	-11
Feb	19.1	23.6	-4.5	4.5	-12
Mar	11.7	14.9	-3.2	3.2	-10
Apr	15.0	12.5	2.5	2.5	8
May	7.4	7.9	-0.5	0.5	-1
Jun	8.8	9.5	-0.8	0.8	-2
Jul	9.9	11.0	-1.1	1.1	-3
Aug	16.8	18.9	-2.1	2.1	-5
Sep	11.9	13.6	-1.7	1.7	-4
Median	12.7	14.3	-2.2	2.4	

n	**m**
12	12

N= 12

$\Sigma R=$ -62

α
5.0%
W'α,n
17

$W^+=$
8
p-test
0.61%

H_0	median [D]=0	**REJECT**
H_1	median [D]<0	**ACCEPT**

Wilcoxon-signed-ranks test

Exact Form

Variable: **Zinc, Dissolved (ug/l)**

	X	**Y**	Differences		
Site	#48	#6			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	2.52	4.92	-2.40	2.40	-6
Nov	3.01	9.39	-6.38	6.38	-11
Dec	3.84	7.91	-4.07	4.07	-10
Jan	3.02	5.70	-2.68	2.68	-7
Feb	2.93	6.68	-3.75	3.75	-9
Mar	3.92	10.60	-6.68	6.68	-12
Apr	2.43	1.61	0.82	0.82	4
May	2.78	2.52	0.26	0.26	1
Jun	2.16	2.75	-0.59	0.59	-3
Jul	1.99	2.30	-0.31	0.31	-2
Aug	1.59	2.57	-0.98	0.98	-5
Sep	2.02	4.92	-2.90	2.90	-8
Median	2.65	4.92	-2.54	2.54	

n	**m**
12	12

N= 12

$\Sigma R=$ -68

α
5.0%
W'α,n
17

$W^{+}=$
5
p-test
0.24%

H_0	median [D]=0	**REJECT**
H_1	median [D]<0	**ACCEPT**

Lab Conductivity (umhos/cm): Prior five water years' signed-rank comparisons between Site 6 and Site 48.

Water Year	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
2000	<.01	104.5	109.0	-5.3
2001	<.01	103.0	113.0	-6.0
2002	<.01	115.5	123.0	-8.5
2003	<.01	118.0	124.5	-5.2
2004	<.01	108.0	114.5	-6.5

Laboratory-pH (s.u.): Prior five water years' signed-rank comparisons between Site 6 and Site 48.

Water Year	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
2000	0.17	7.52	7.63	0.13
2001	0.17	7.32	7.67	0.28
2002	0.71	7.45	7.49	0.02
2003	0.91	7.75	7.76	-0.08
2004	0.58	7.88	7.85	0.00

Total Alkalinity (mg/l): Prior five water years' signed-rank comparisons between Site 6 and Site 48.

Water Year	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
2000	0.01	39.5	40.6	-0.8
2001	<0.01	40.3	42.7	-1.1
2002	0.02	44.0	43.5	-0.3
2003	0.60	43.4	42.3	-0.2
2004	0.05	42.5	42.2	-0.5

Total Sulfate (mg/l): Prior two water years' signed-rank comparisons between Site 6 and Site 48.

Water Year	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
2003	<0.01	12.7	14.4	-1.8
2004	<0.01	10.9	12.9	-2.2

Dissolved Zinc (ug/l): Prior five water years' signed-rank comparisons between Site 6 and Site 48.

Water Year	Signed Ranks p-value	Site #48 median	Site #06 median	Median of Differences
2000	<0.01	2.30	4.30	-1.98
2001	<0.01	2.47	4.89	-2.47
2002	<0.01	3.22	5.77	-2.46
2003	<0.01	2.97	5.20	-1.67
2004	<0.01	2.16	5.56	-2.29

INTERPRETIVE REPORT
SITE 54 "LOWER GREENS CREEK"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses with the exception of one outlier shown on the table below. During the current year no new data point were flagged as outliers after review by KGCMC.

Sample Date	Parameter	Value	Qualifier	Notes
12/5/2001	Cond Field µS/cm	45.7	RR	Suspected field instrument malfunction

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No visually obvious trends are apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The table below summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). No statistically significant ($\alpha/2$=2.5%) trends are present in the data for conductivity and dissolved zinc. The datasets for lab pH and total alkalinity both show statistically significant (p=0.99 and p=1.00 respectively) trends. The slope

		Mann-Kendall test statistic			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	0.33	+	0.63		
pH, Lab	6	2.38	+	**0.99**	0.07	0.9
Alkalinity, Total	6	2.98	+	**1.00**	1.23	2.8
Zinc, Dissolved	6	1.32	+	0.907		

(1): Number of years (2):Significance level

estimate for the pH trend is 0.07 su/yr or +0.9% increase and for total alkalinity is 1.23 mg/L•yr or a +2.8% increase over the last 6 years. The trend in total alkalinity is nearly identical to the trends identified at Site 6, the upgradient reference site for this site, and at Site 48 the upgradient/non-mine influence background site. Thus the upward trend in alkalinity is present at all three sites in Greens Creek and is considered to be due to natural variation. The upward trend in lab pH is relatively minor and very similar to the trend identified at Site 48 the upgradient, background site. The slight increase in pH may also be related to the upward trend in total alkalinity. Overall, the identified trends at Site 54 are of small magnitude and similar to trends identified in upgradient sites and thus are consider due to natural variation.

A comparison of median values for alkalinity, lab pH, lab conductivity, sulfate, and dissolved zinc between Site 54 and Site 6 has been conducted as specified in the Statistical Information Goals for Site 54. Additionally, X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 54 and Site 6, the upstream control site, to aid in the comparison between those sites. Calculation details of the non-parametric signed-rank tests are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results of the signed-rank test as performed on the Water Year 2005 data set. Additional tables summarizing results for Water Years 2000-2004 can also be found following this interpretive section. For pH, total alkalinity, and dissolved zinc there are no statistically significant differences between the measured median values at a significance level of α=0.05 for a one-tailed test. The lab conductivity and total sulfate are statistically different. The median values for conductivity for Site 6 and Site 54 are 124.0 uS/cm and 123.0 uS/cm respectively and the median of differences, Site 6 minus Site 54, is -1.0 uS/cm. Using the signed-rank test on prior water year's data yields similar significant results and median differences going back for the past five water years. The median values for total sulfate for Site 6 and Site 54 are 14.3 mg/l and 16.3 mg/l respectively. The median of the differences, Site 6 minus Site 54, is -0.2 mg/l total-sulfate. Once again, similar results are obtained using the signed-rank test on the WY2003 and WY2004 total-sulfate datasets. In general, these trends are similar to differences measured between Site 48 and Site 6, although of a smaller magnitude. KGCMC feels that given the small magnitude of the differences and the consistency of the variations over the past several years, that the current FWMP program is adequate to measure and quantify any future changes that may occur due to the influence of Waste Rock Site 23/D that occur between Site 6 and Site 54.

Site 54 vs Site 6 - WY2005, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site #6 median	Site #54 median	Median of Differences
Conductivity, Lab	**0.05**	124	123	-1.0
pH, Lab	0.91	7.78	7.63	0.05
Alkalinity, Total	0.09	50.6	51.4	-1.0
Sulfate, Total	**0.02**	14.3	16.3	-0.2
Zinc, Dissolved	0.23	4.92	6.06	-0.08

Table of Results for Water Year 2005

Site 54 "Lower Greens Creek"

Sample Date/Parameter	10/26/2004	11/16/2004	12/8/2004	1/25/2005	2/15/2005	3/15/2005	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	2.3	5.0	0.8	1.7	1.2	1.1	2.1	4.8	6.8	10.1	10.8	8.5	3.6
Conductivity-Field(µmho)	149	100	144	145	156	126	140	85	94	102	143	125	133
Conductivity-Lab (µmho)	142	99	136	141	146	121 J	125	84	85	102	136	115	123
pH Lab (standard units)	8.10	7.53	7.81	7.95	7.81	7.88	7.72	7.29	6.89	6.99	6.79	6.67	7.63
pH Field (standard units)	7.85	7.45	7.57	7.98	8.24	7.84	7.78	7.79	6.53	7.66	7.59	7.48	7.72
Total Alkalinity (mg/L)	58.9 J	42.4	54.2	59.2	64.1	51.8 J	56.7	40.3	39.5	41.4	51.0	44.8	51.4
Total Sulfate (mg/L)	16.6	10.3	16.4	18.9	23.8	16.2	19.4	7.9	9.6	11.2	19.0	13.6	16.3
Hardness (mg/L)	66.2	53.4	66.5	65.3	74.7	58.2	65.7	42.2	45.1	49.8	70.2	63.6	64.5
Dissolved As (ug/L)	0.182	0.183	0.247	0.169	0.159	0.189	0.166 J	0.198	0.259	0.235	0.241 J	0.246	0.194
Dissolved Ba (ug/L)			32.5		26.5								29.5
Dissolved Cd (ug/L)	0.051 U	0.058	0.069	0.050	0.051	0.066	0.059	0.030 U	0.031	0.033	0.045	0.043	0.051
Dissolved Cr (ug/L)			1.580		0.121								0.851
Dissolved Cu (ug/L)	0.336	0.860	0.499	0.444 U	0.369 U	0.671	0.613	0.243 U	0.485 U	0.444	0.425	0.504	0.465
Dissolved Pb (ug/L)	0.0344	0.0958 U	0.0403 U	0.0211 U	0.0201	0.0717 U	0.0466 U	0.0061 U	0.0182 U	0.0217 U	0.0160 U	0.0589 U	0.0281
Dissolved Ni (ug/L)			1.090		0.971								1.031
Dissolved Ag (ug/L)			0.003 U		<0.003								0.002
Dissolved Zn (ug/L)	4.86	9.23	8.27	6.49	5.62 J	9.59 U	8.15 J	2.51 U	2.69	2.80 U	2.73 J	8.92	6.06
Dissolved Se (ug/L)			1.330		1.250								1.290
Dissolved Hg (ug/L)	0.000765 U	0.001570	0.000899 U	0.000767 U	0.000767	0.001410 U	0.001230 U	0.000599 U	0.000560 U	0.000761 U	0.000755 U	0.001040	0.000767

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
54	01/25/2005	12:02:00 PM				
			Cu Diss, ug/l	0.444	U	Field Blank Contamination
			Pb Diss, ug/l	0.0211	U	Field Blank Contamination
			Hg Diss, ug/l	0.000767	U	Field Blank Contamination
54	10/26/2004	12:20:00 PM				
			Alk Tot, mg/l	58.9	J	Hold Time
			Cd Diss, ug/l	0.0508	U	Field Blank Contamination
			Hg Diss, ug/l	0.000765	U	Field Blank Contamination
54	11/16/2004	10:35:00 AM				
			Pb Diss, ug/l	0.0958	U	Field Blank Contamination
54	12/08/2004	12:48:00 PM				
			Pb Diss, ug/l	0.0403	U	Method Blank Contamination
			Ag Diss, ug/l	0.00321	U	Method Blank Contamination
			Hg Diss, ug/l	0.000899	U	Field Blank Contamination
54	02/15/2005	9:52:00 AM				
			Cu Diss, ug/l	0.369	U	Field Blank Contamination
			Zn Diss, ug/l	5.62	J	LCS Recovery
54	03/15/2005	11:04:00 AM				
			Cond Lab, umho	121	J	Holdtime
			Alk Tot, mg/l	51.8	J	Holdtime
			Pb Diss, ug/l	0.0717	U	Field Blank Contamination
			Zn Diss, ug/l	9.59	U	Field Blank Contamination
			Hg Diss, ug/l	0.00141	U	Field Blank Contamination
54	04/13/2005	11:18:00 AM				
			As Diss, ug/l	0.166	J	LCS Recovery
			Pb Diss, ug/l	0.0466	U	Field Blank Contamination
			Zn Diss, ug/l	8.15	J	LCS Recovery
			Hg Diss, ug/l	0.00123	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

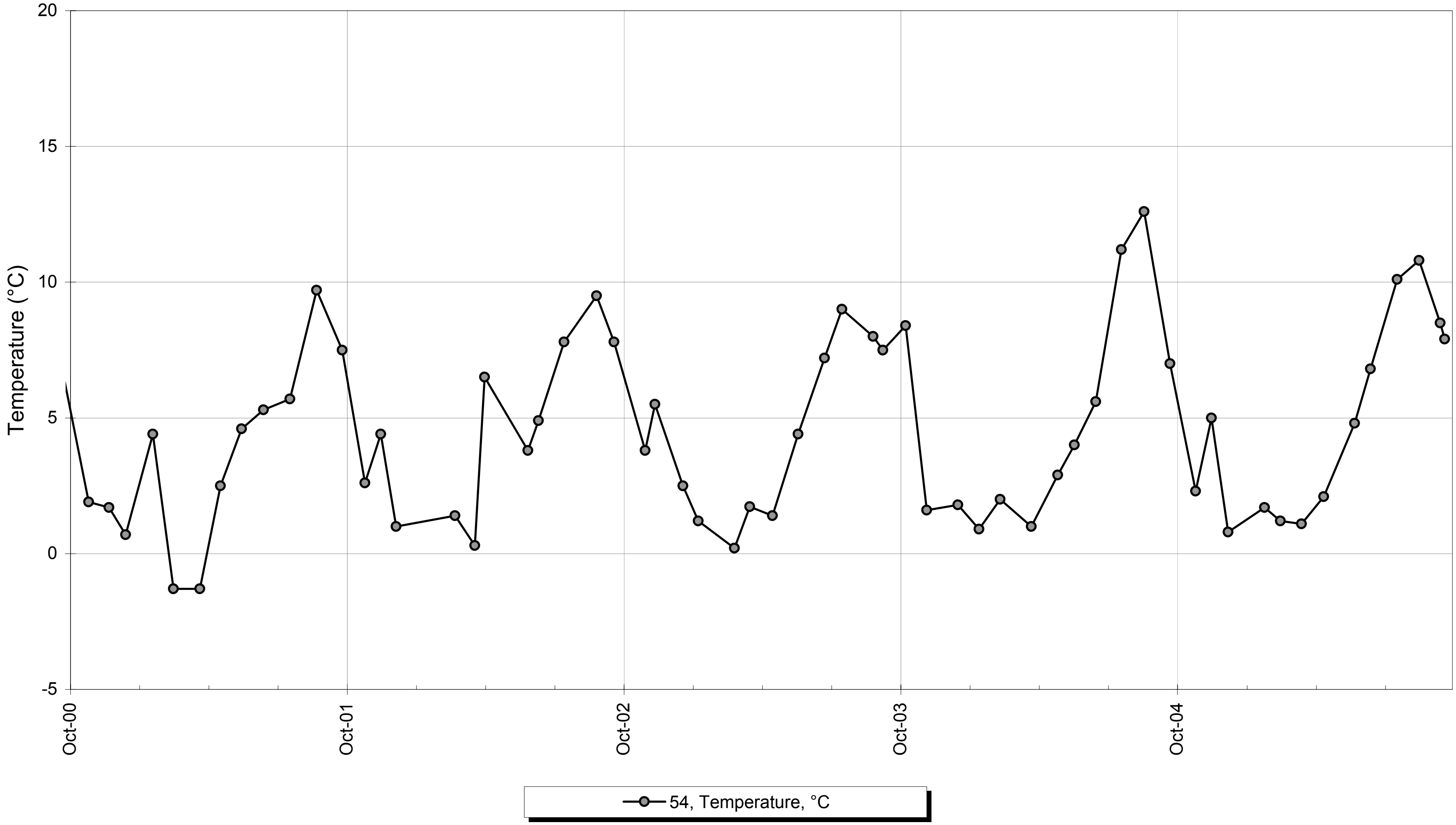
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

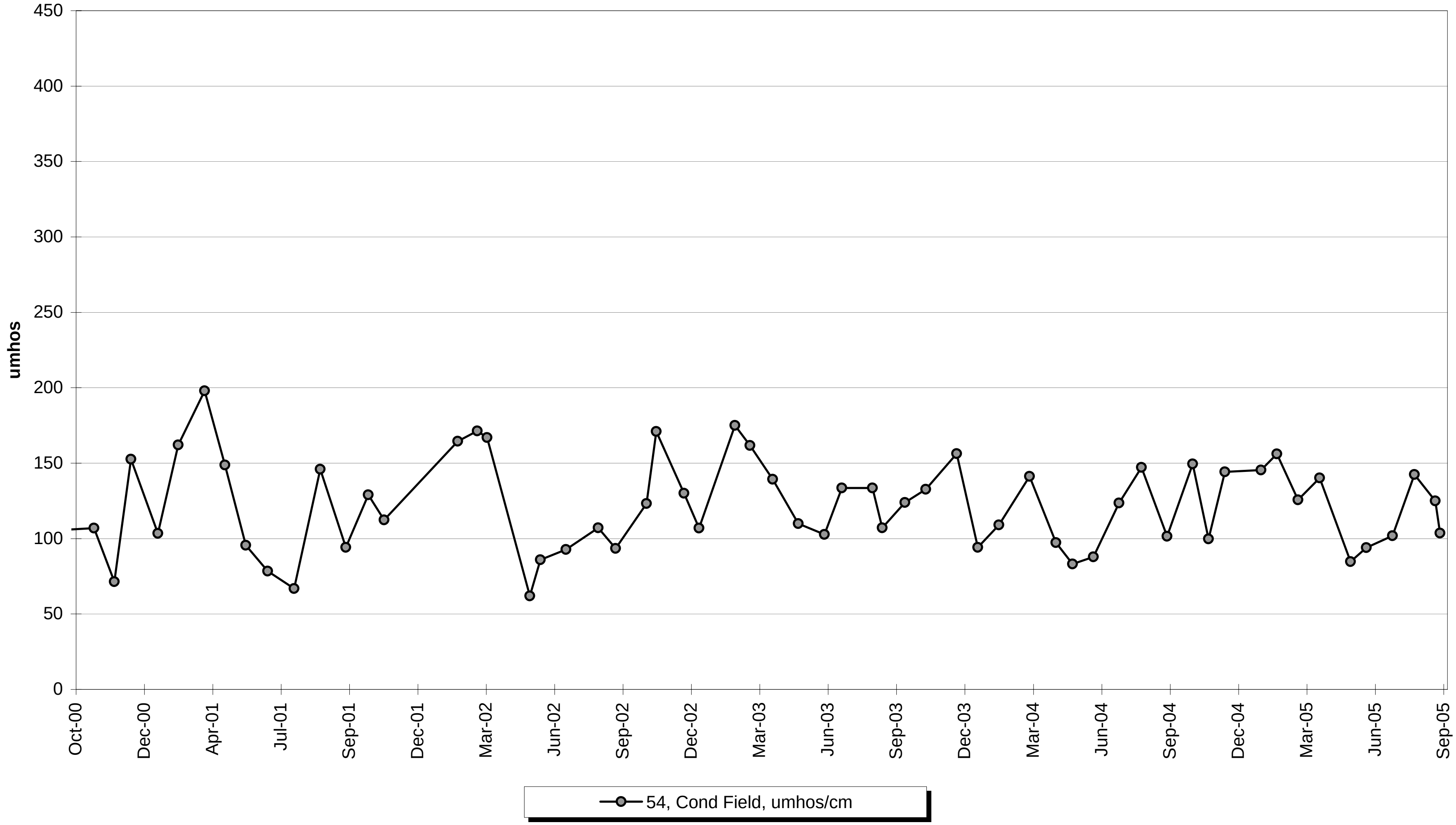
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
54	05/24/2005	8:15:00 AM				
			Cd Diss, ug/l	0.0295	U	Field Blank Contamination
			Cu Diss, ug/l	0.243	U	Field Blank Contamination
			Pb Diss, ug/l	0.00608	U	Field Blank Contamination
			Zn Diss, ug/l	2.51	U	Field Blank Contamination
			Hg Diss, ug/l	0.000599	U	Field Blank Contamination
54	06/14/2005	11:54:00 AM				
			Cu Diss, ug/l	0.485	U	Field Blank Contamination
			Pb Diss, ug/l	0.0182	U	Field Blank Contamination
			Hg Diss, ug/l	0.00056	U	Field Blank Contamination
54	07/19/2005	12:45:00 PM				
			Pb Diss, ug/l	0.0217	U	Field Blank Contamination
			Zn Diss, ug/l	2.8	U	Field Blank Contamination
			Hg Diss, ug/l	0.000761	U	Field Blank Contamination
54	08/17/2005	10:20:00 AM				
			As Diss, ug/l	0.241	J	LCS Recovery
			Pb Diss, ug/l	0.016	U	Field Blank Contamination
			Zn Diss, ug/l	2.73	J	LCS Recovery
			Hg Diss, ug/l	0.000755	U	Field Blank Contamination
54	09/14/2005	10:35:00 AM				
			Pb Diss, ug/l	0.0589	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

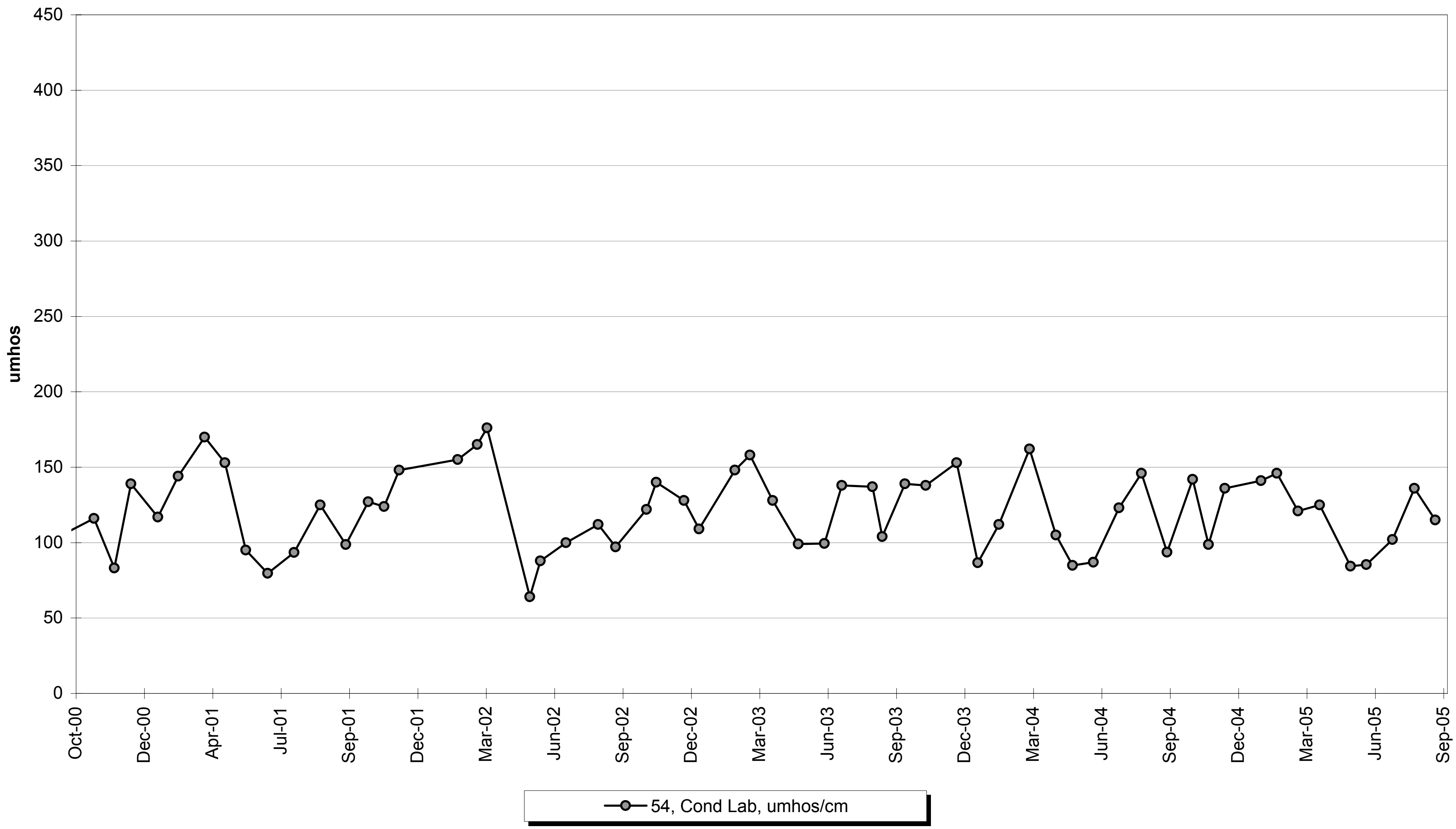
Site 54 -Water Temperature

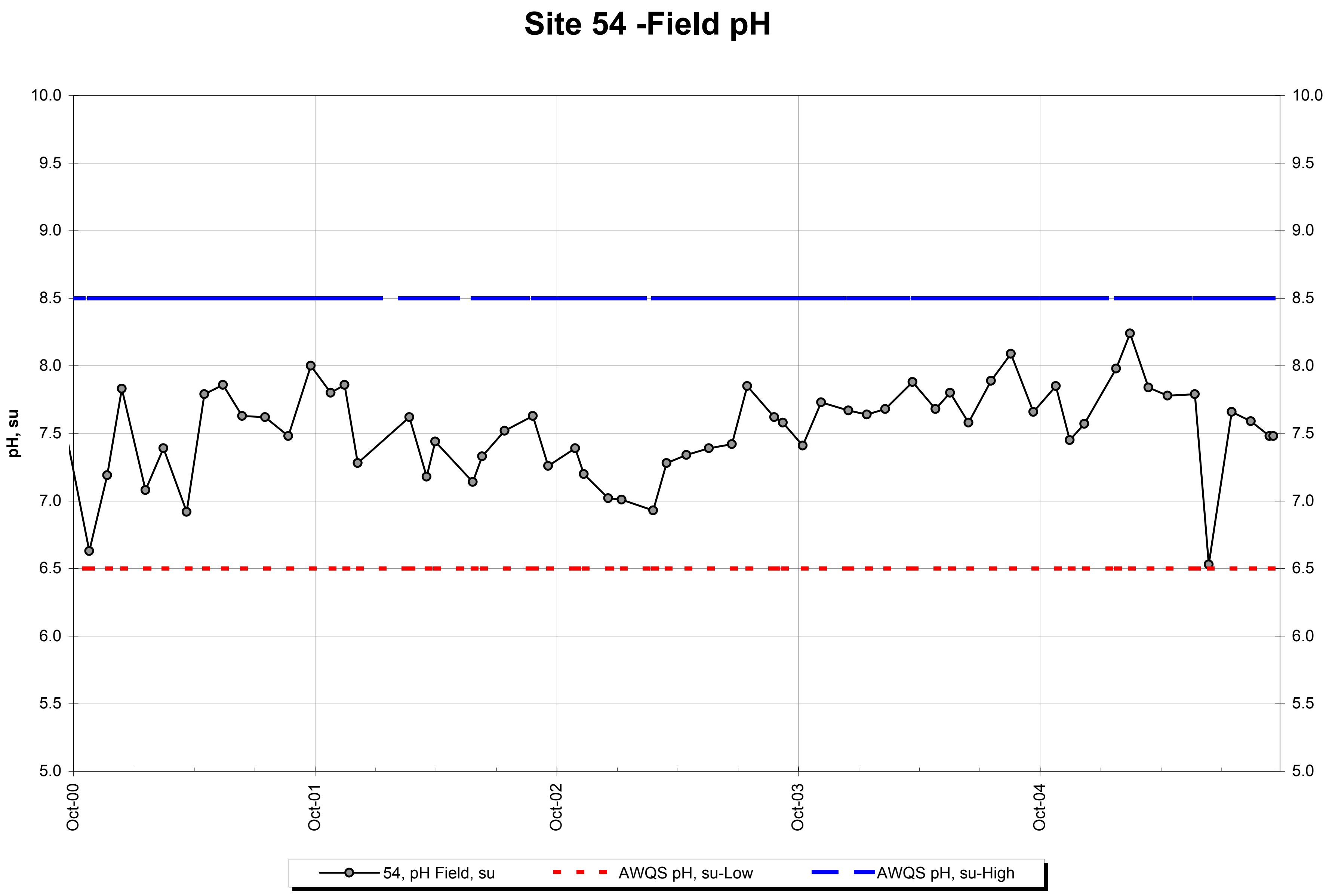


Site 54 -Conductivity-Field



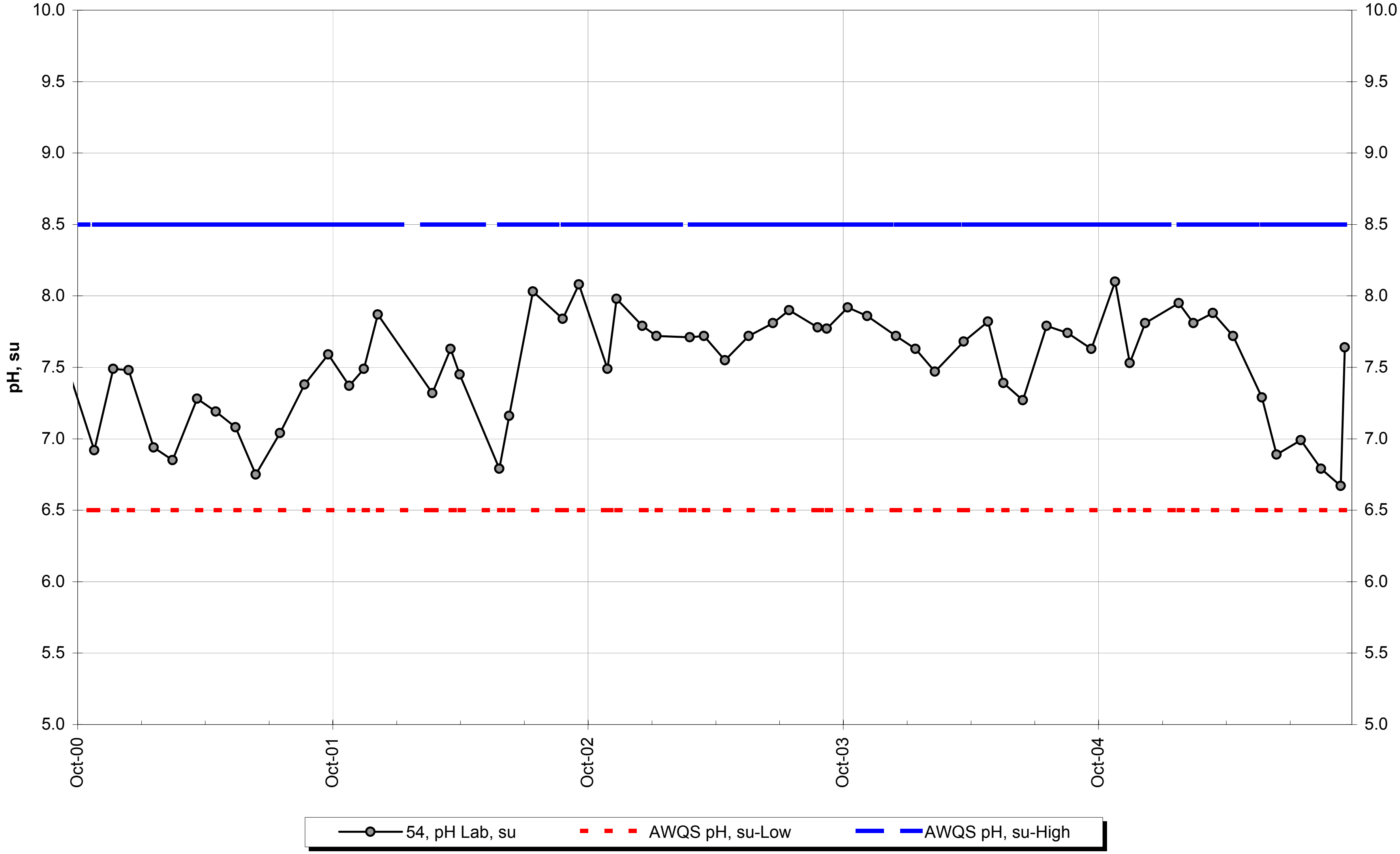
Site 54 -Conductivity-Lab



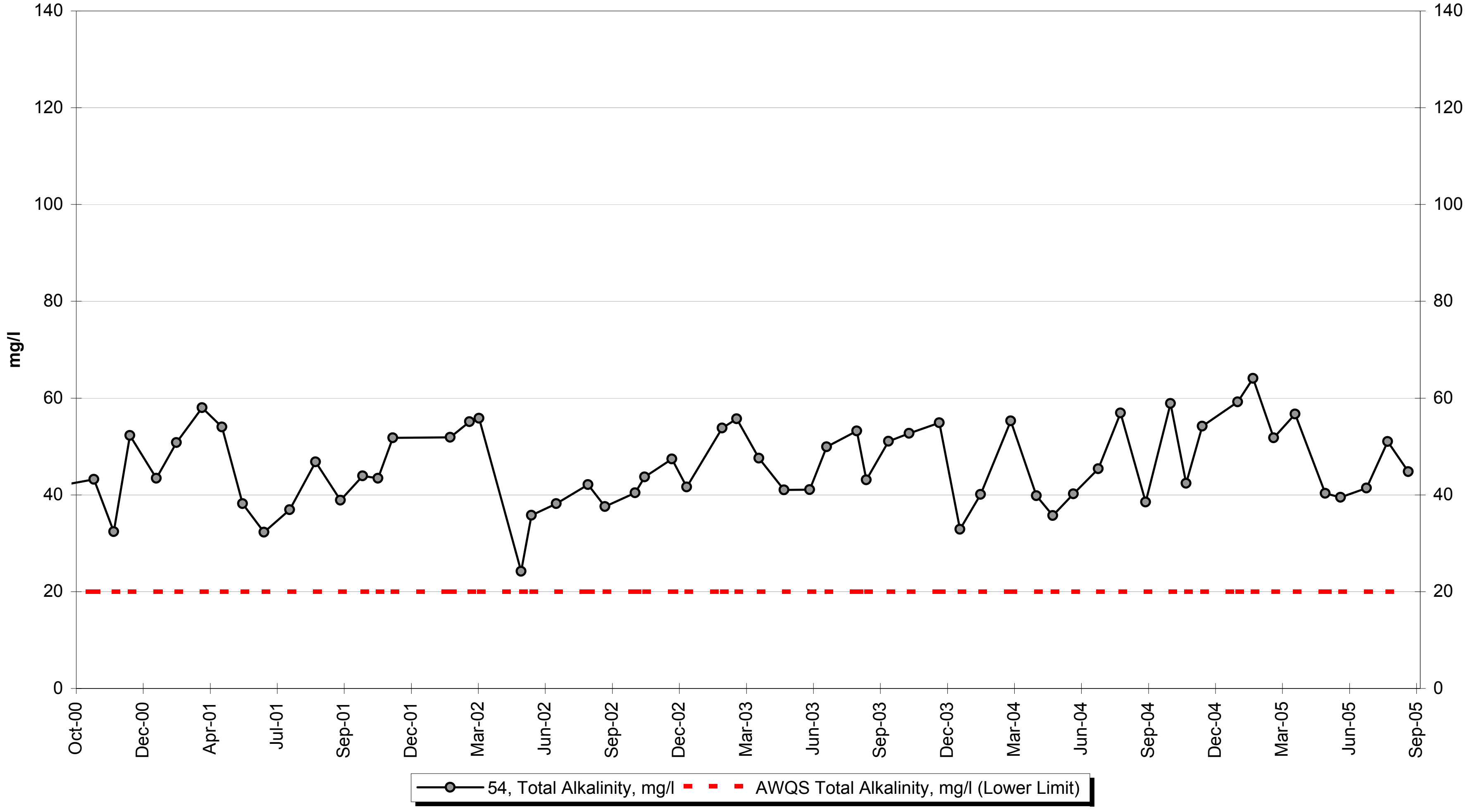


Site 54 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
54, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

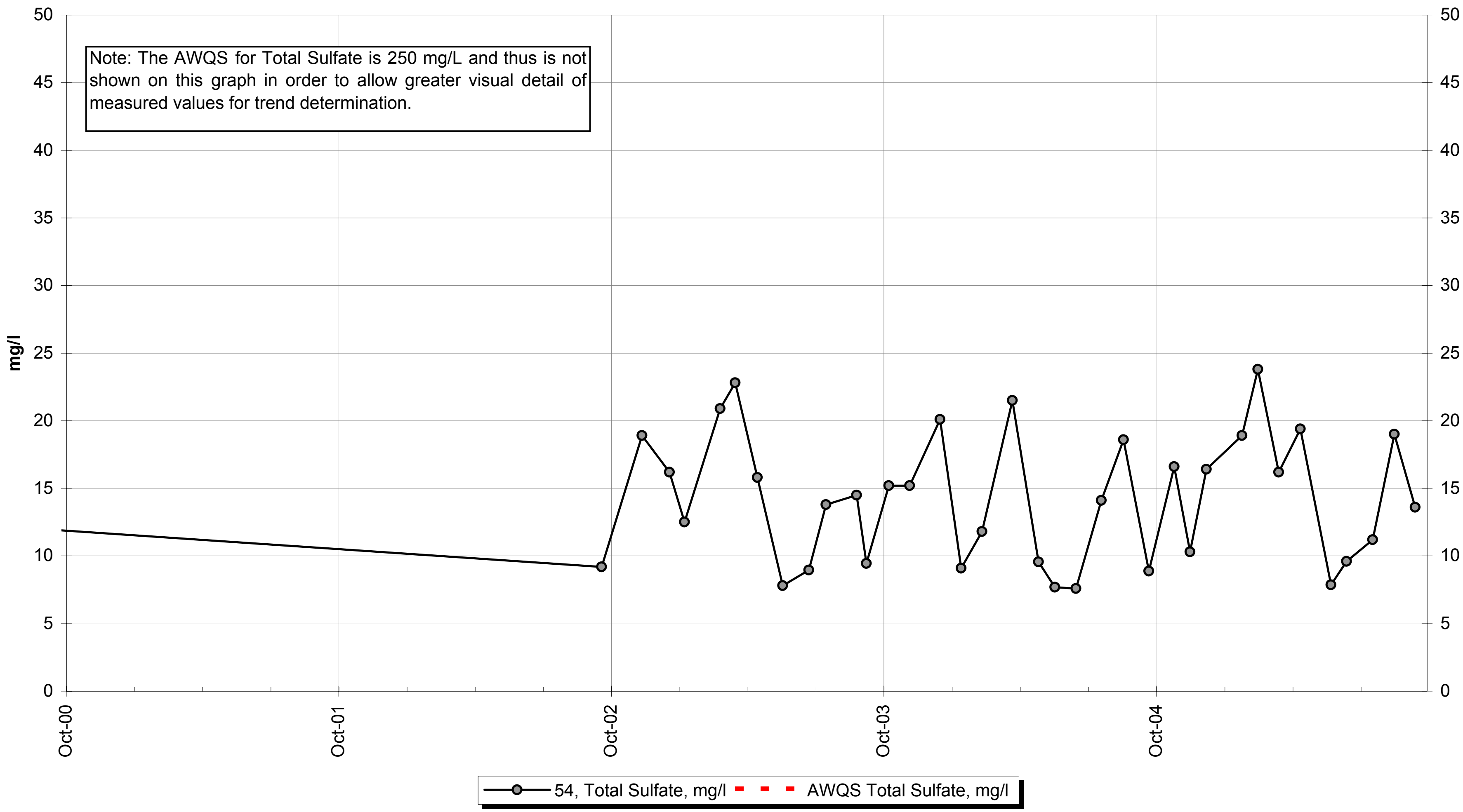
Site 54 -Lab pH

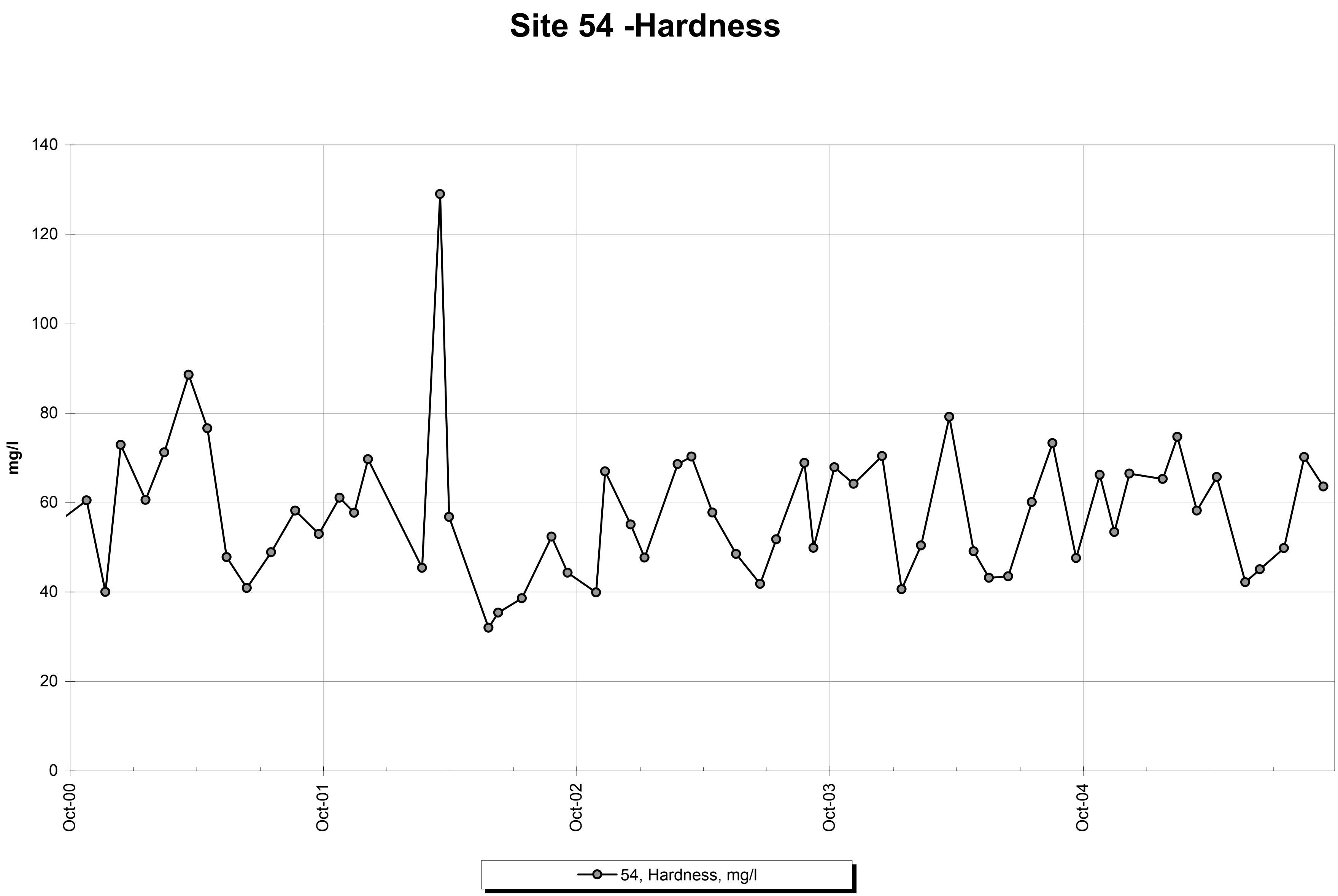


Site 54 -Total Alkalinity

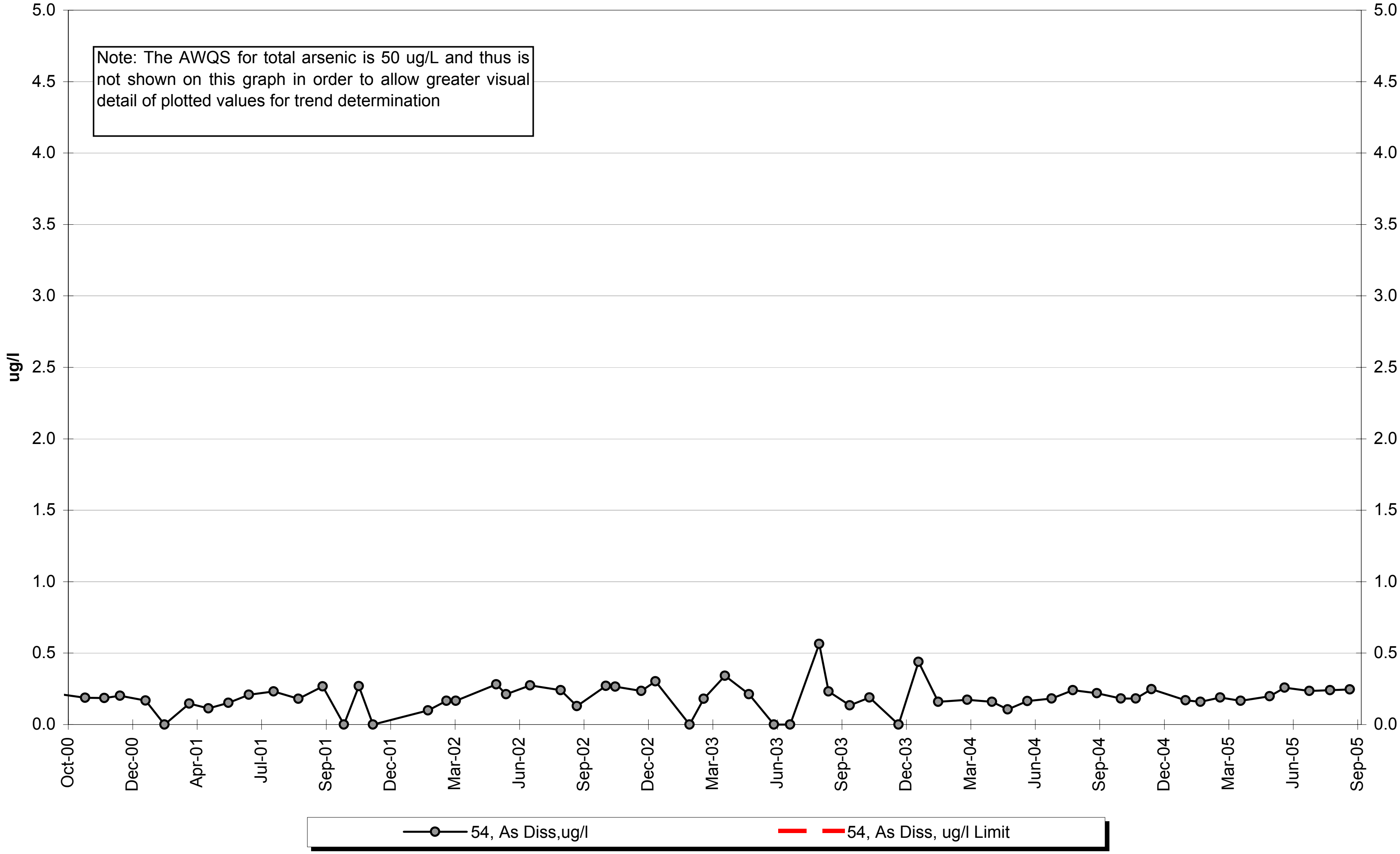


Site 54 -Total Sulfate

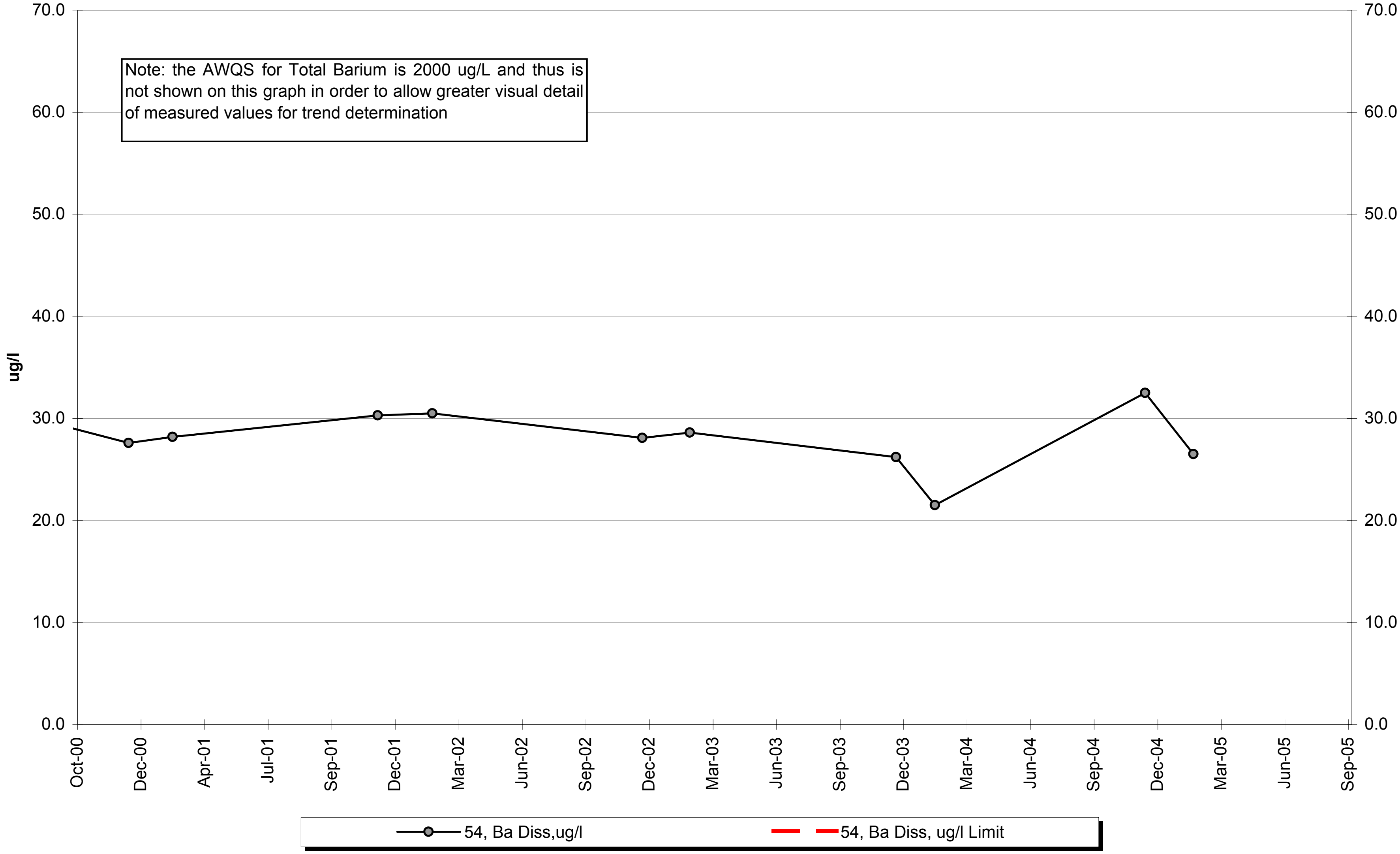



Site 54 -Hardness
mg/l
140
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
54, Hardness, mg/l

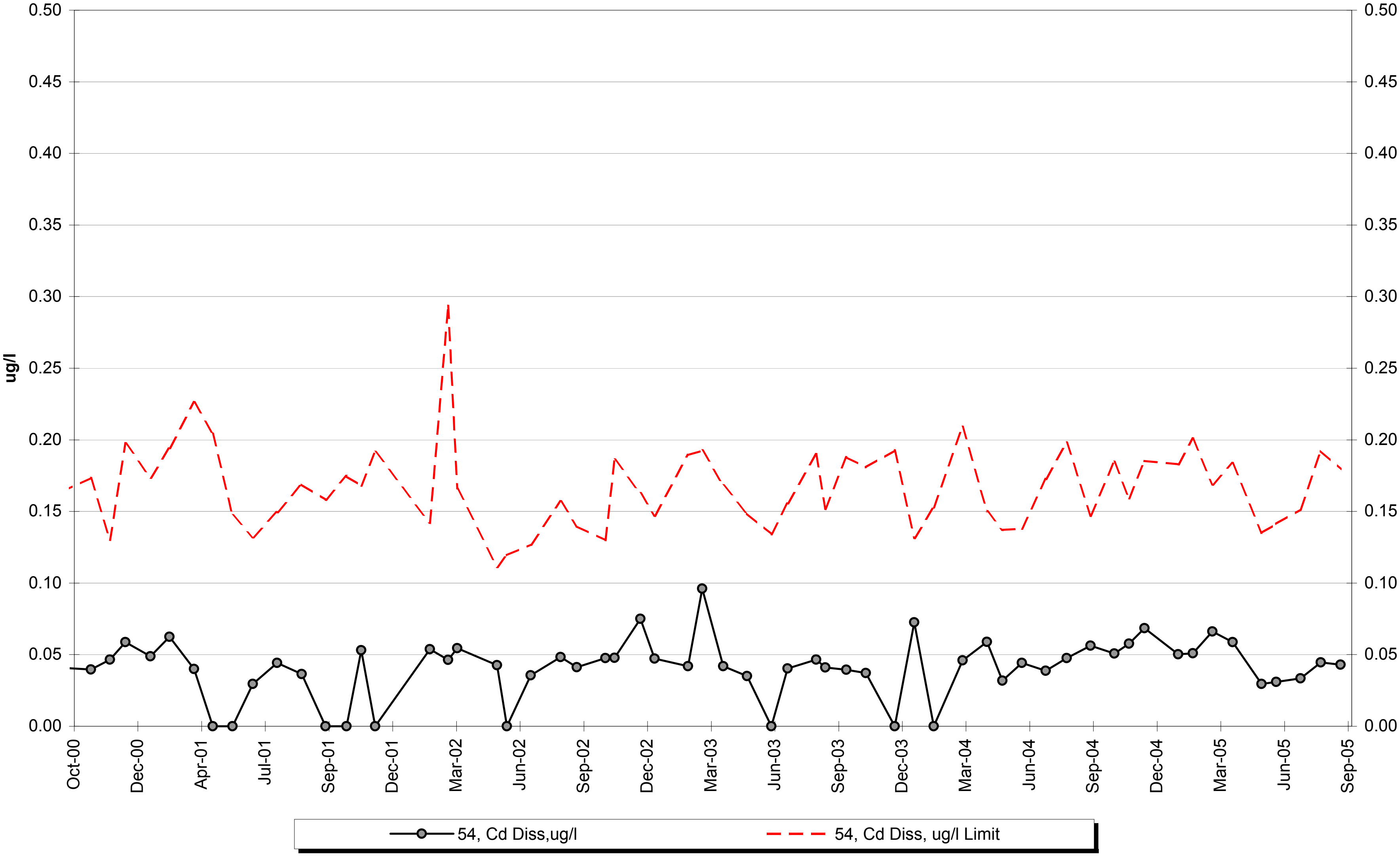
Site 54 -Dissolved Arsenic

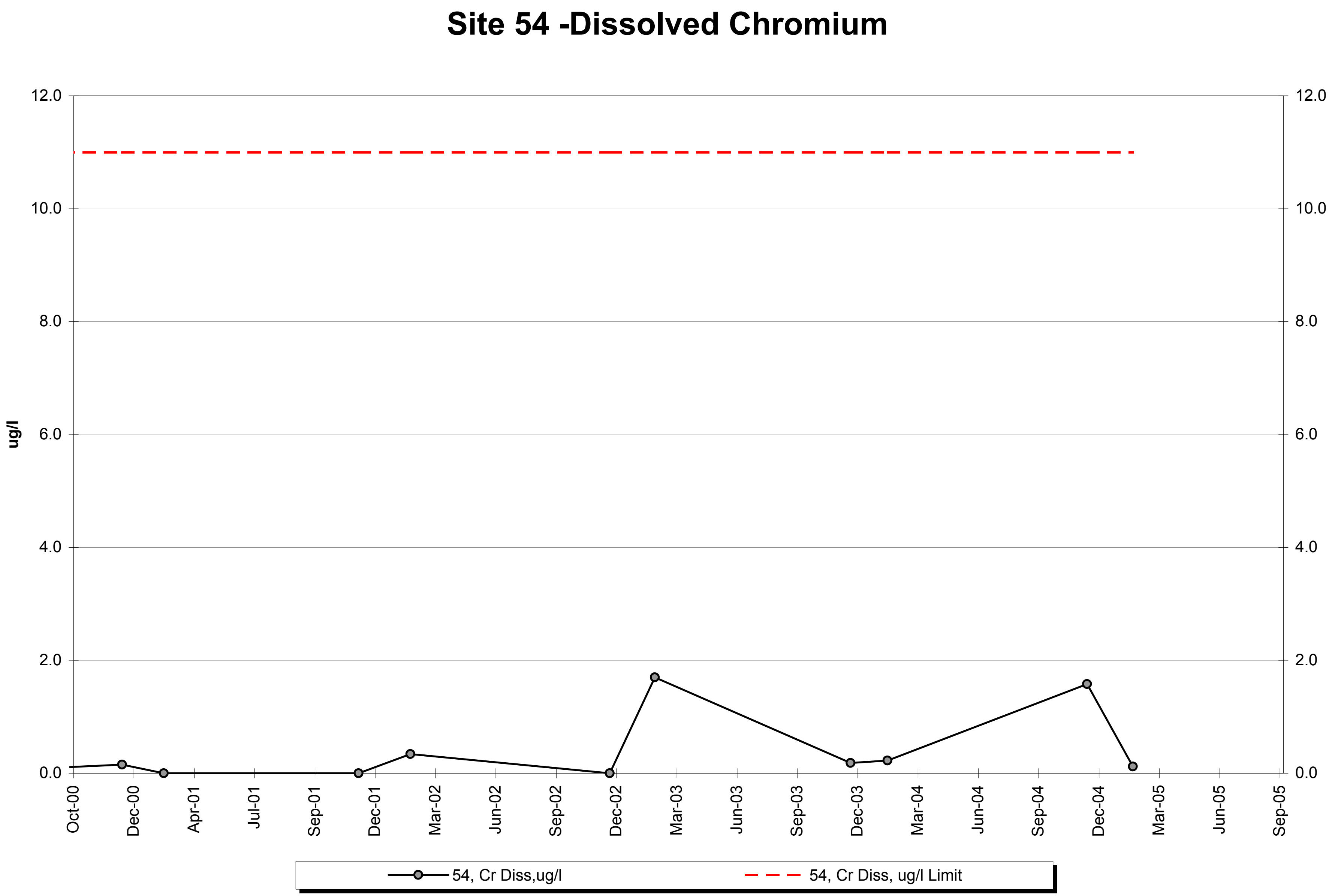


Site 54 -Dissolved Barium

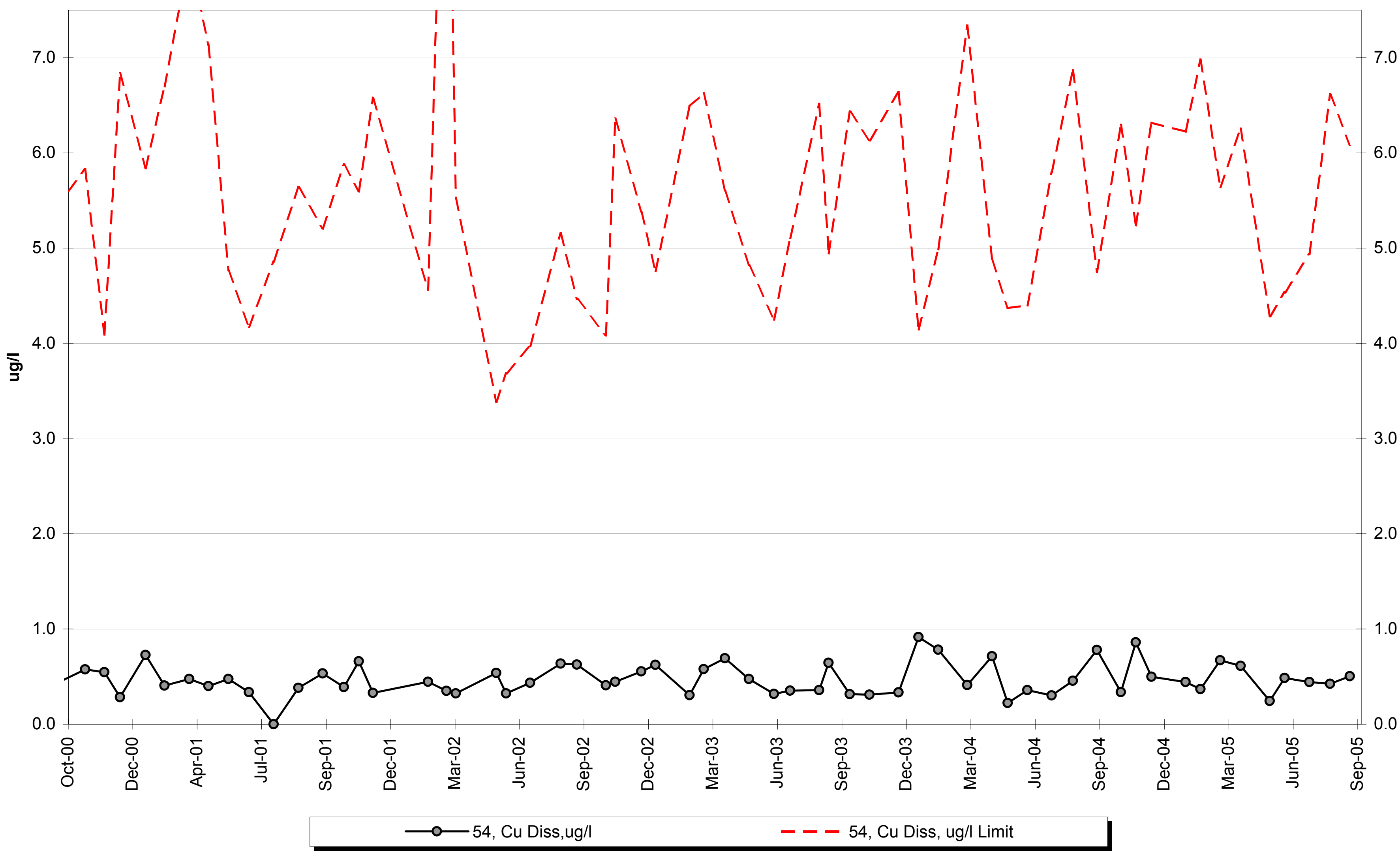


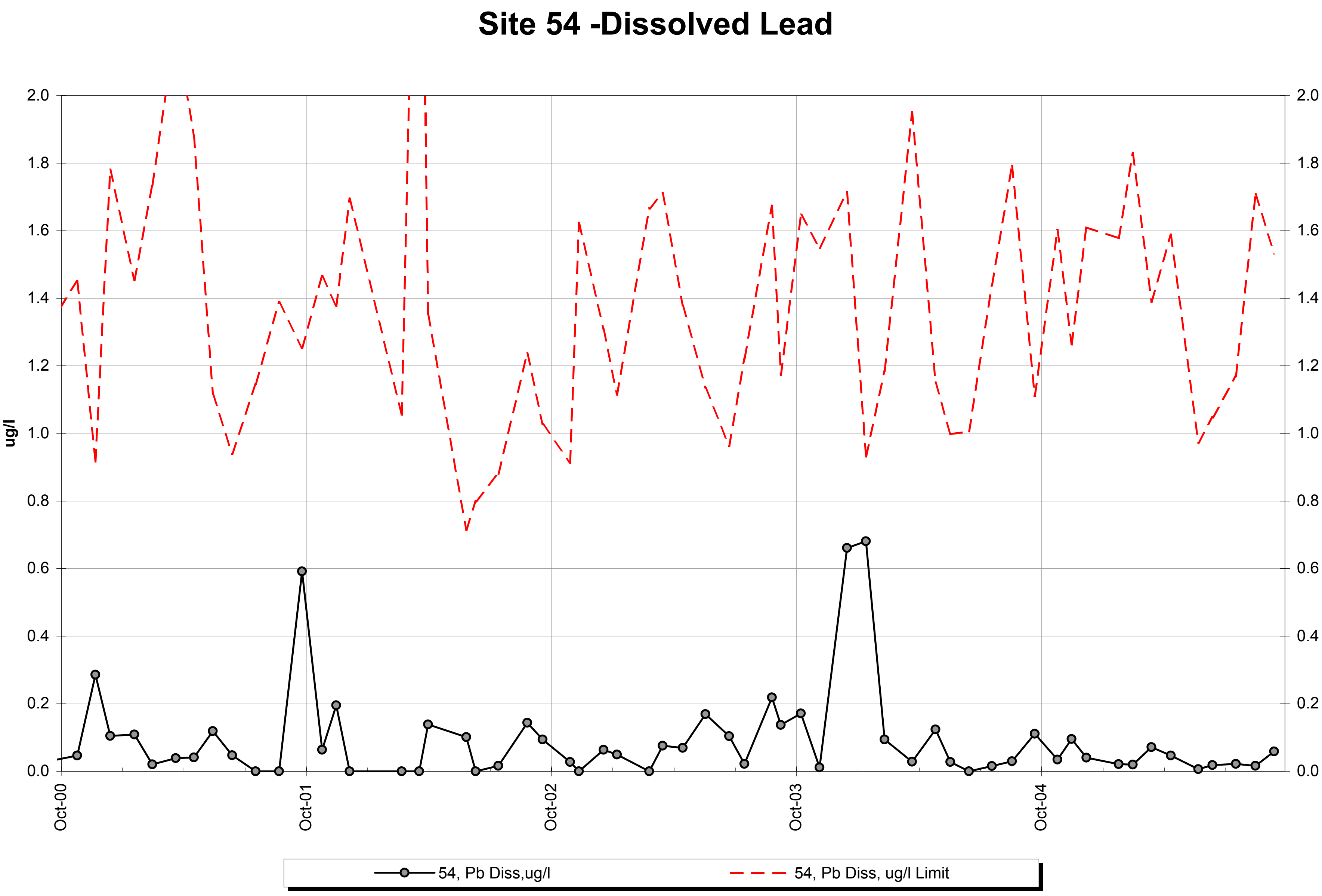
Site 54 -Dissolved Cadmium



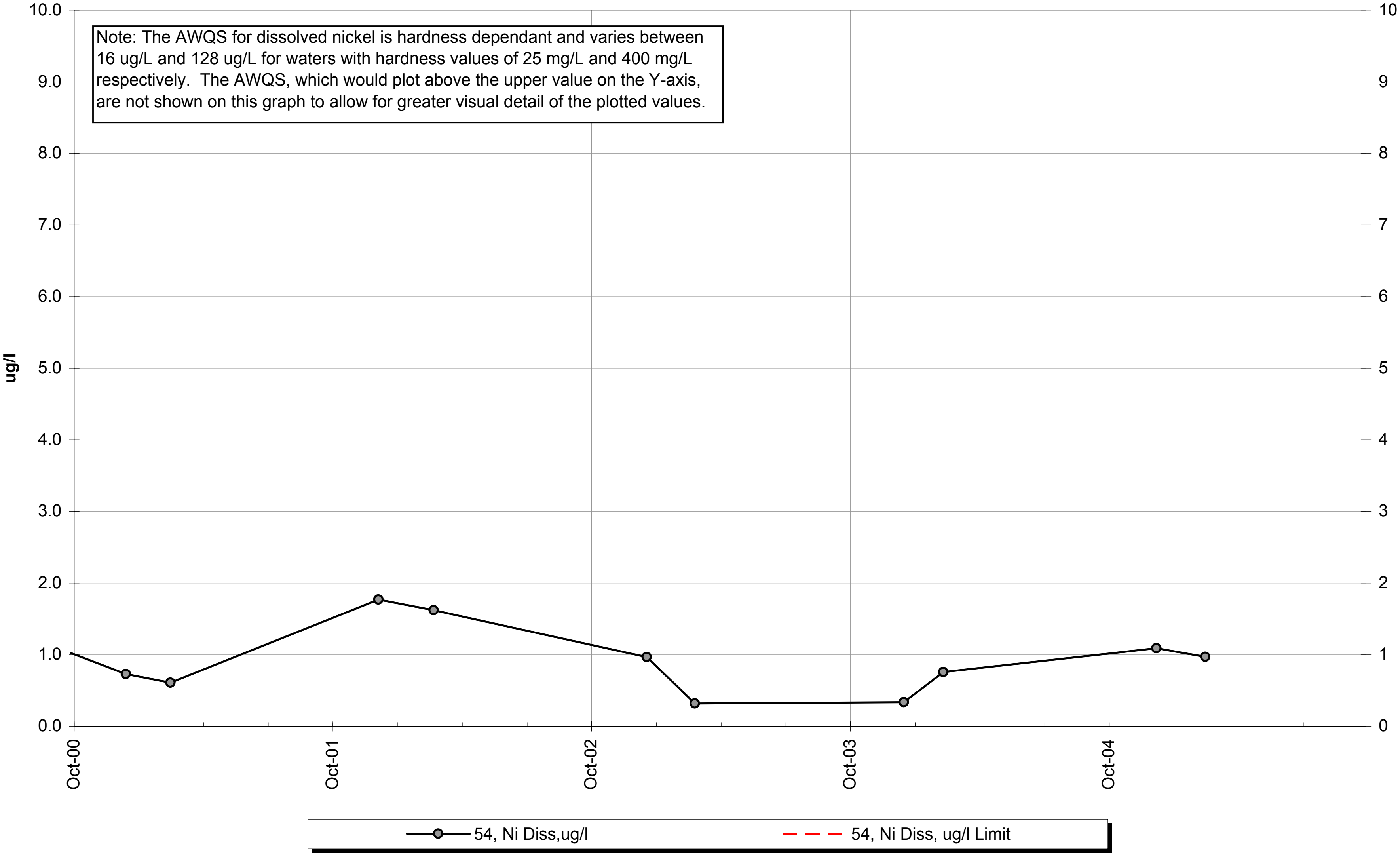

Site 54 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
54, Cr Diss,ug/l
54, Cr Diss, ug/l Limit

Site 54 -Dissolved Copper

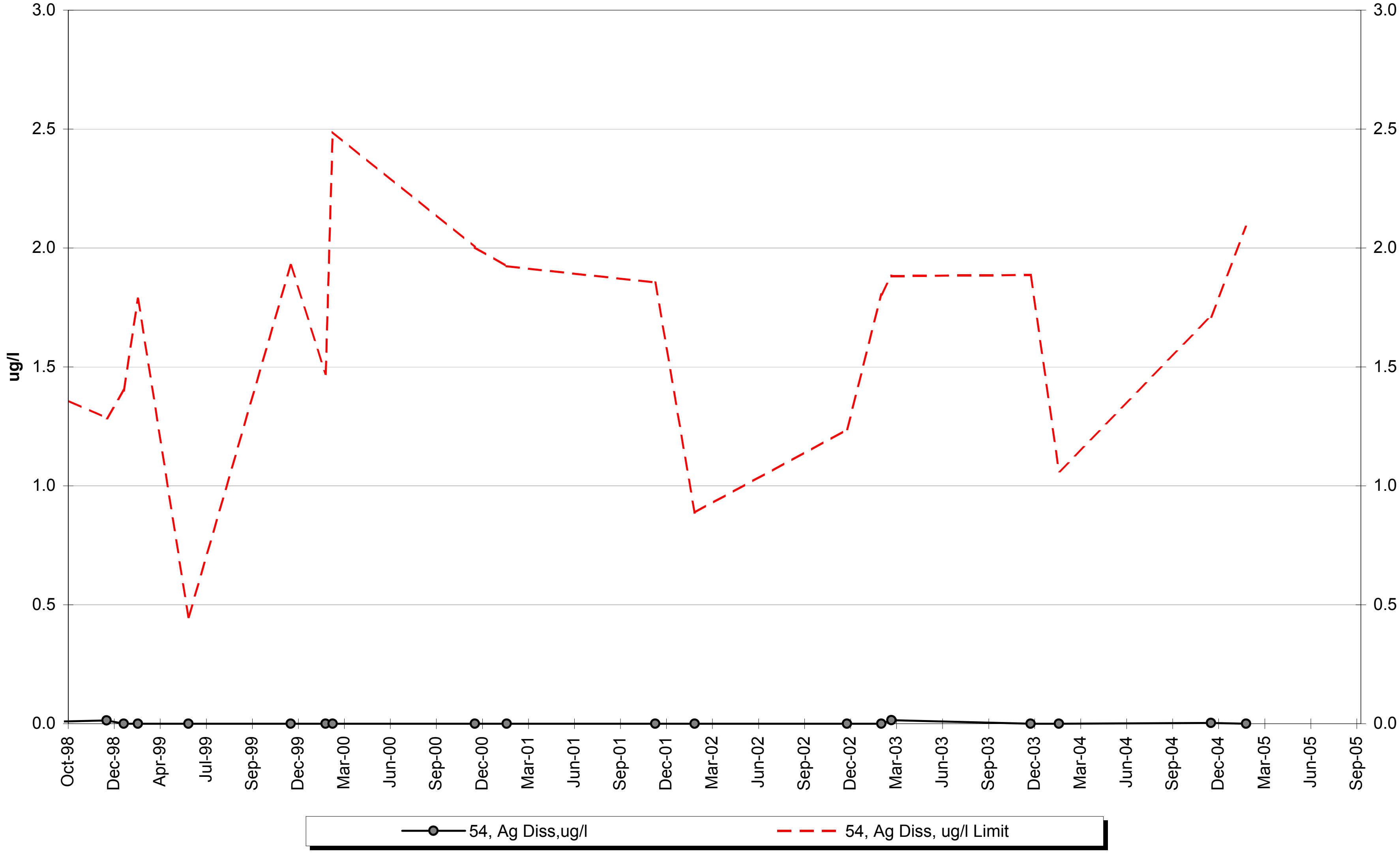



Site 54 -Dissolved Lead
ug/l
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
54, Pb Diss,ug/l
54, Pb Diss, ug/l Limit

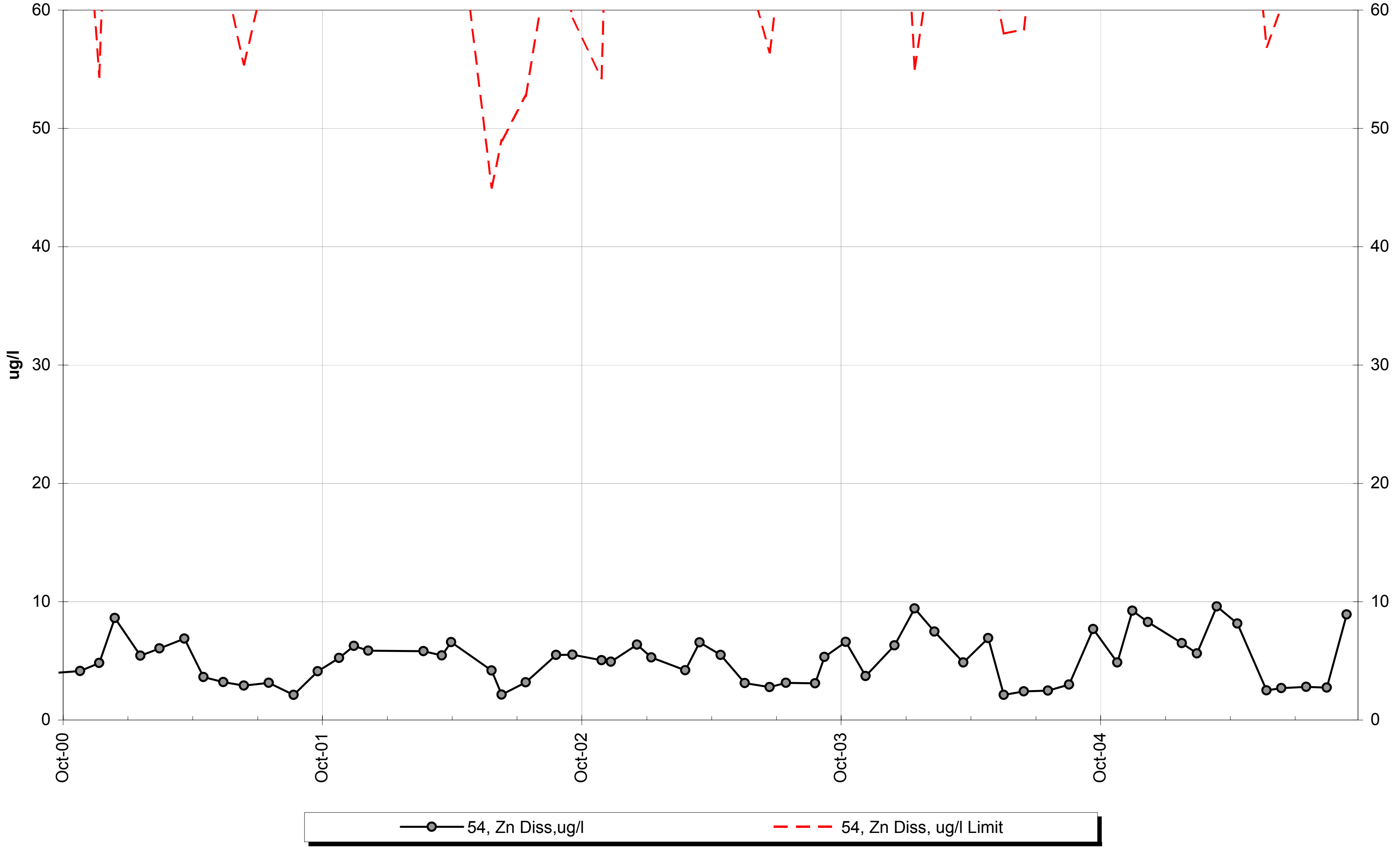
Site 54 -Dissolved Nickel



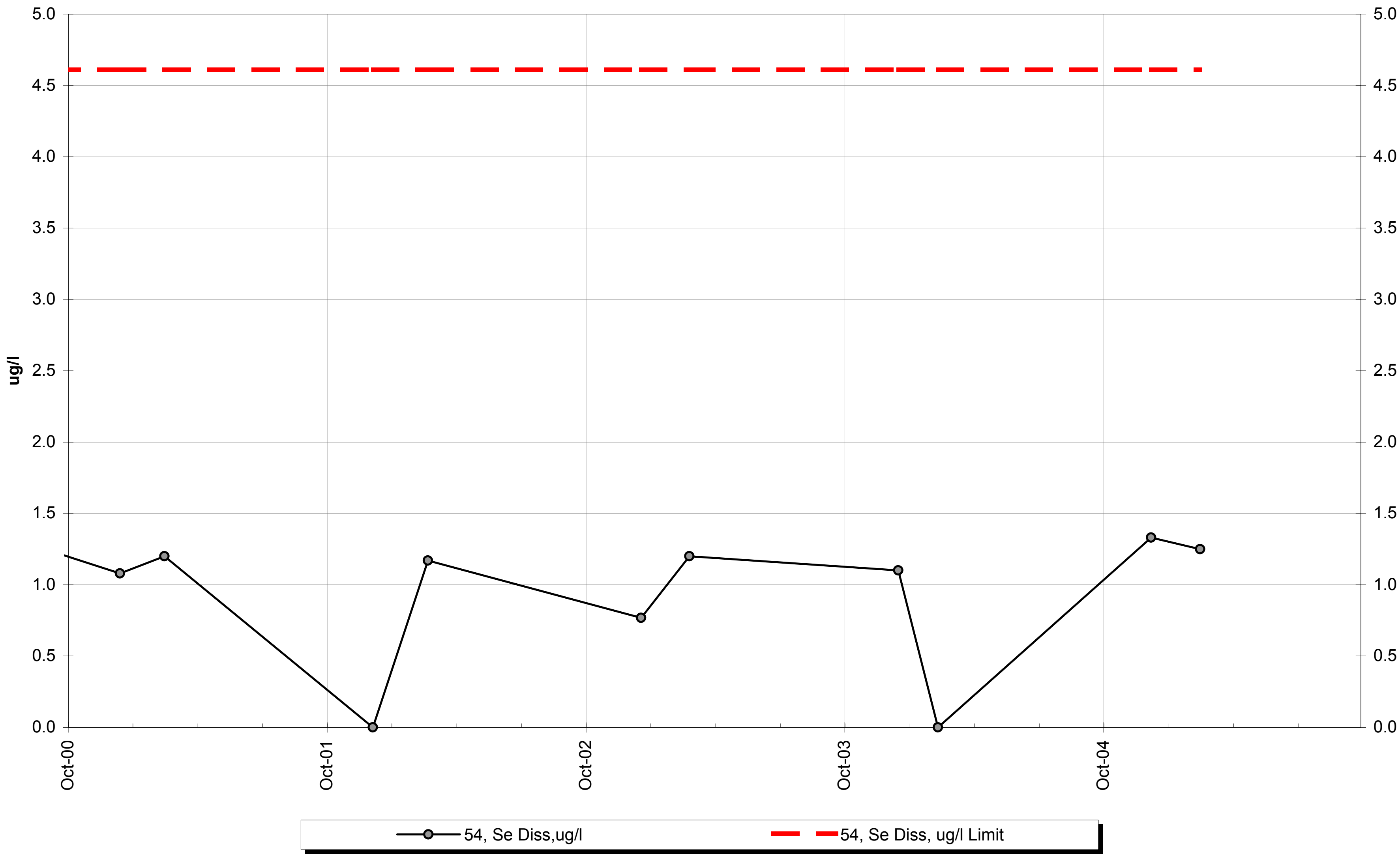
Site 54 -Dissolved Silver

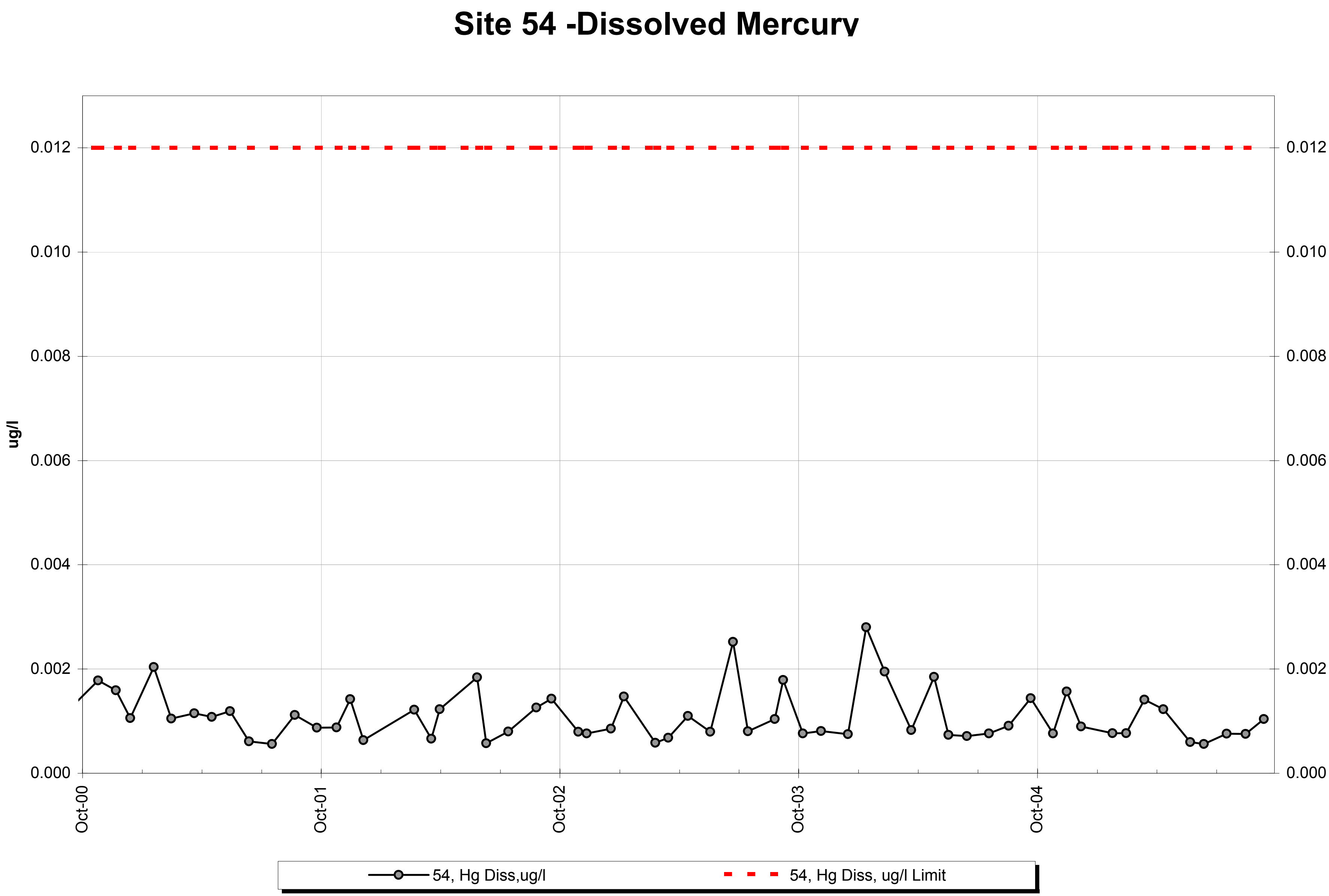


Site 54 -Dissolved Zinc



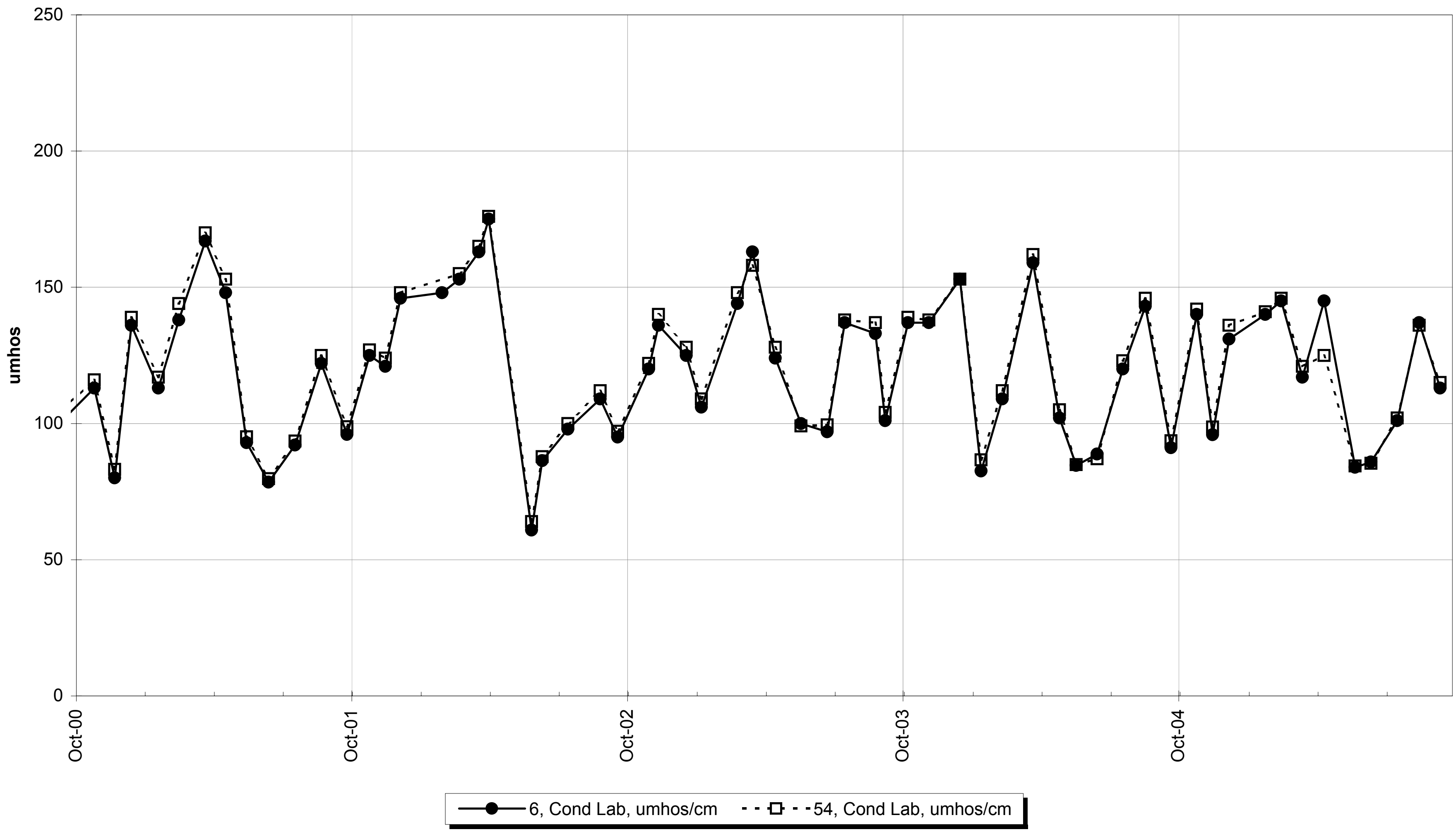
Site 54 -Dissolved Selenium

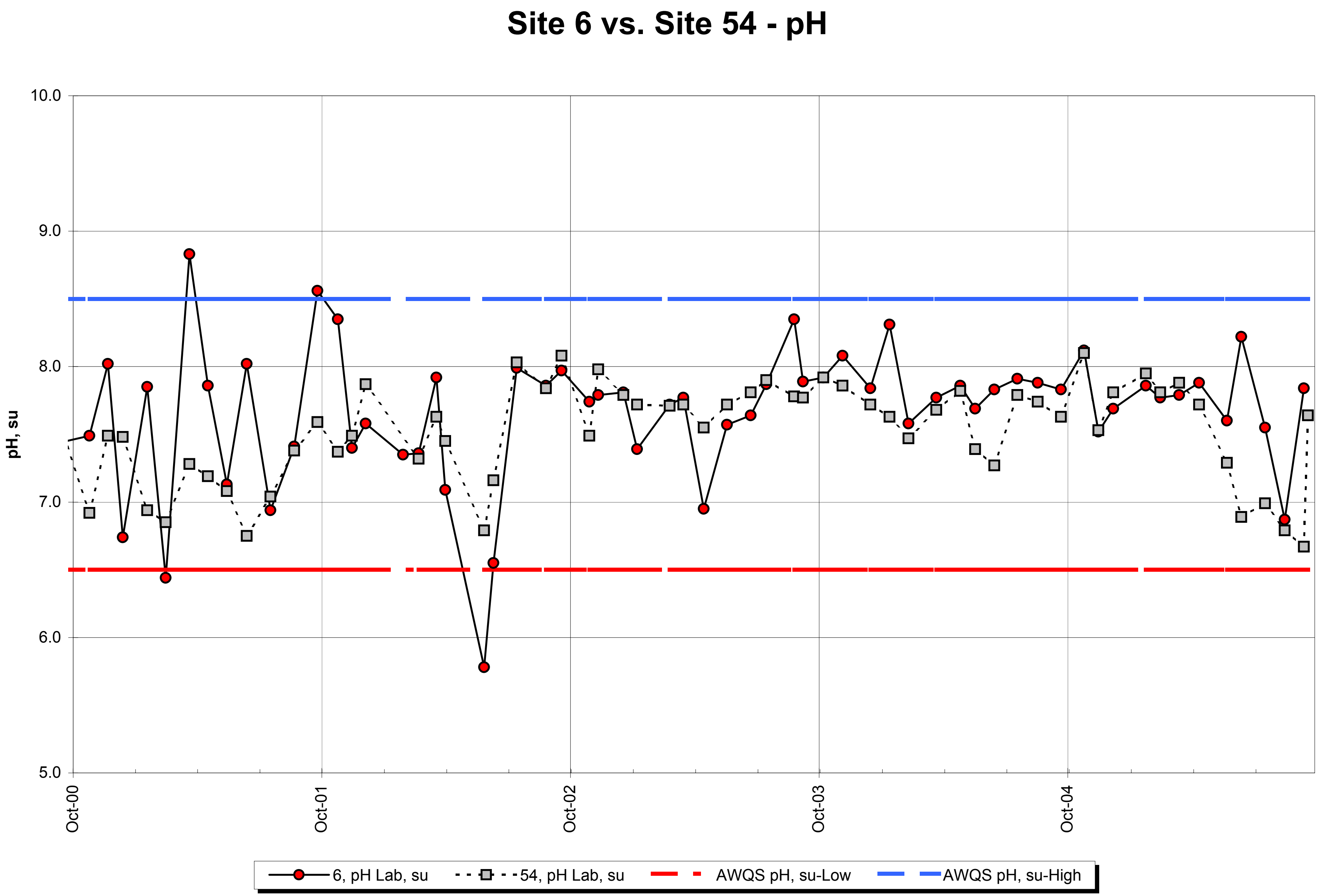




Site 54 -Dissolved Mercury
ug/l
0.000
0.002
0.004
0.006
0.008
0.010
0.012
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
54, Hg Diss,ug/l
54, Hg Diss, ug/l Limit

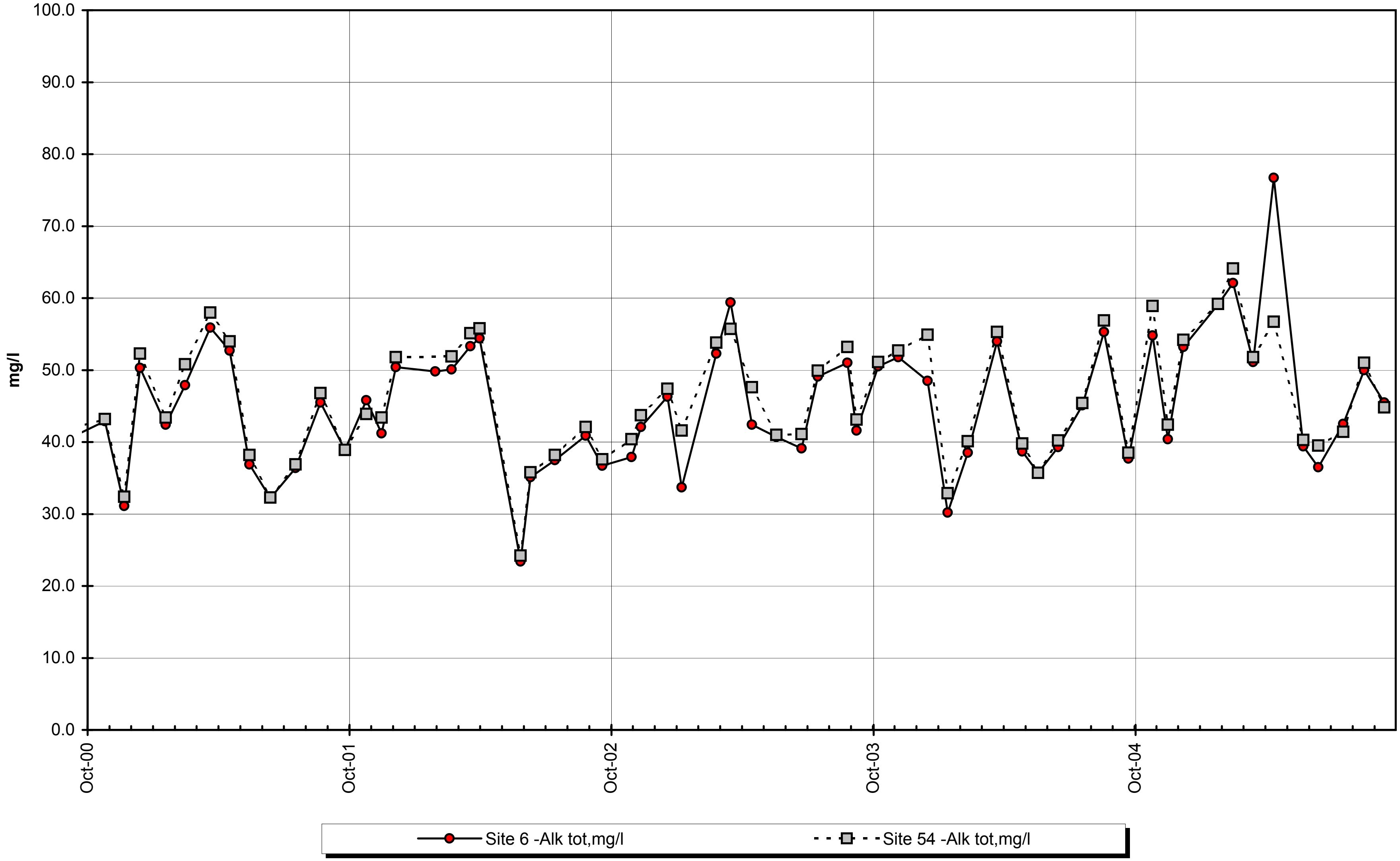
Site 6 vs Site 54 -Conductivity

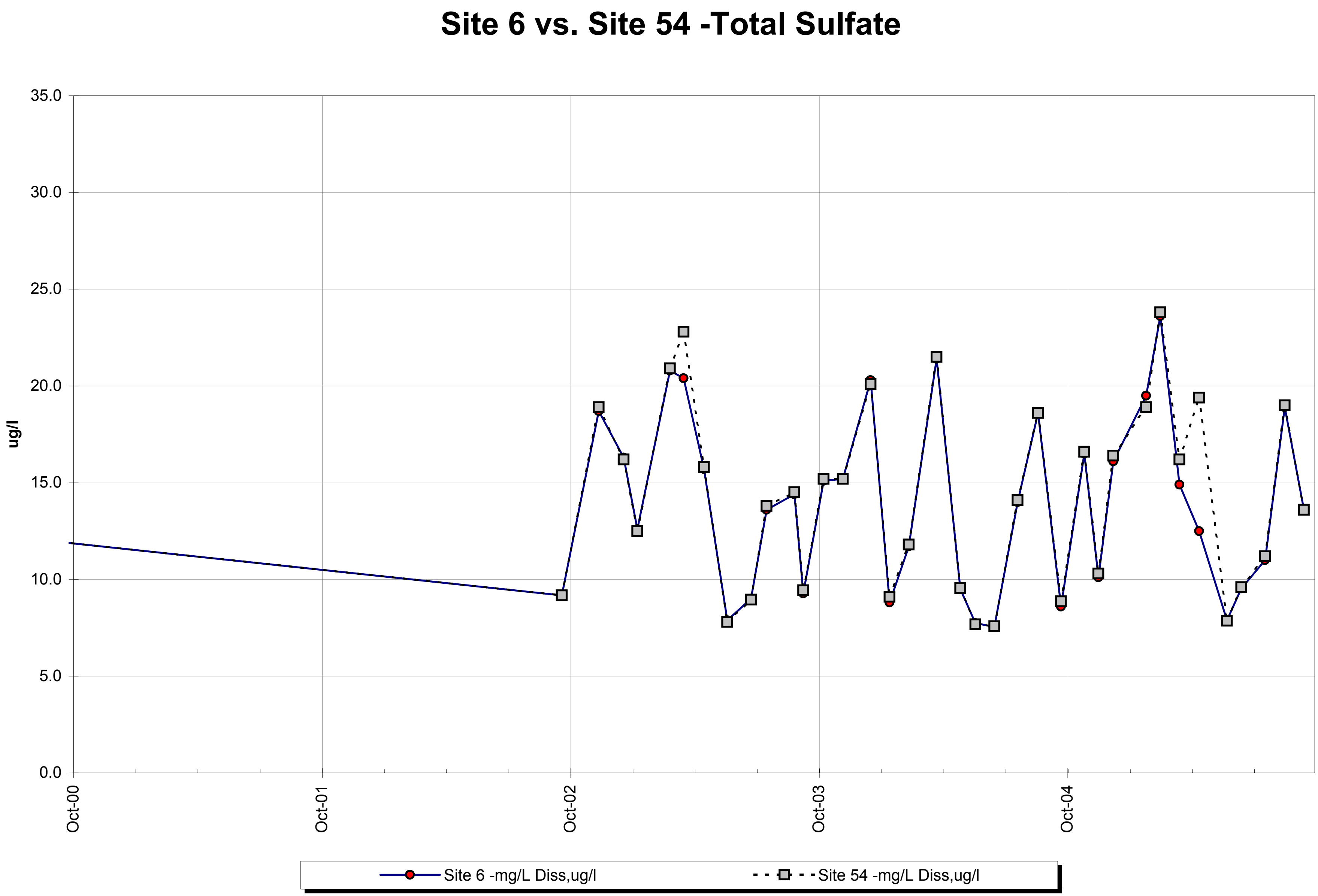




Site 6 vs. Site 54 - pH
pH, su
10.0
9.0
8.0
7.0
6.0
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6, pH Lab, su
54, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

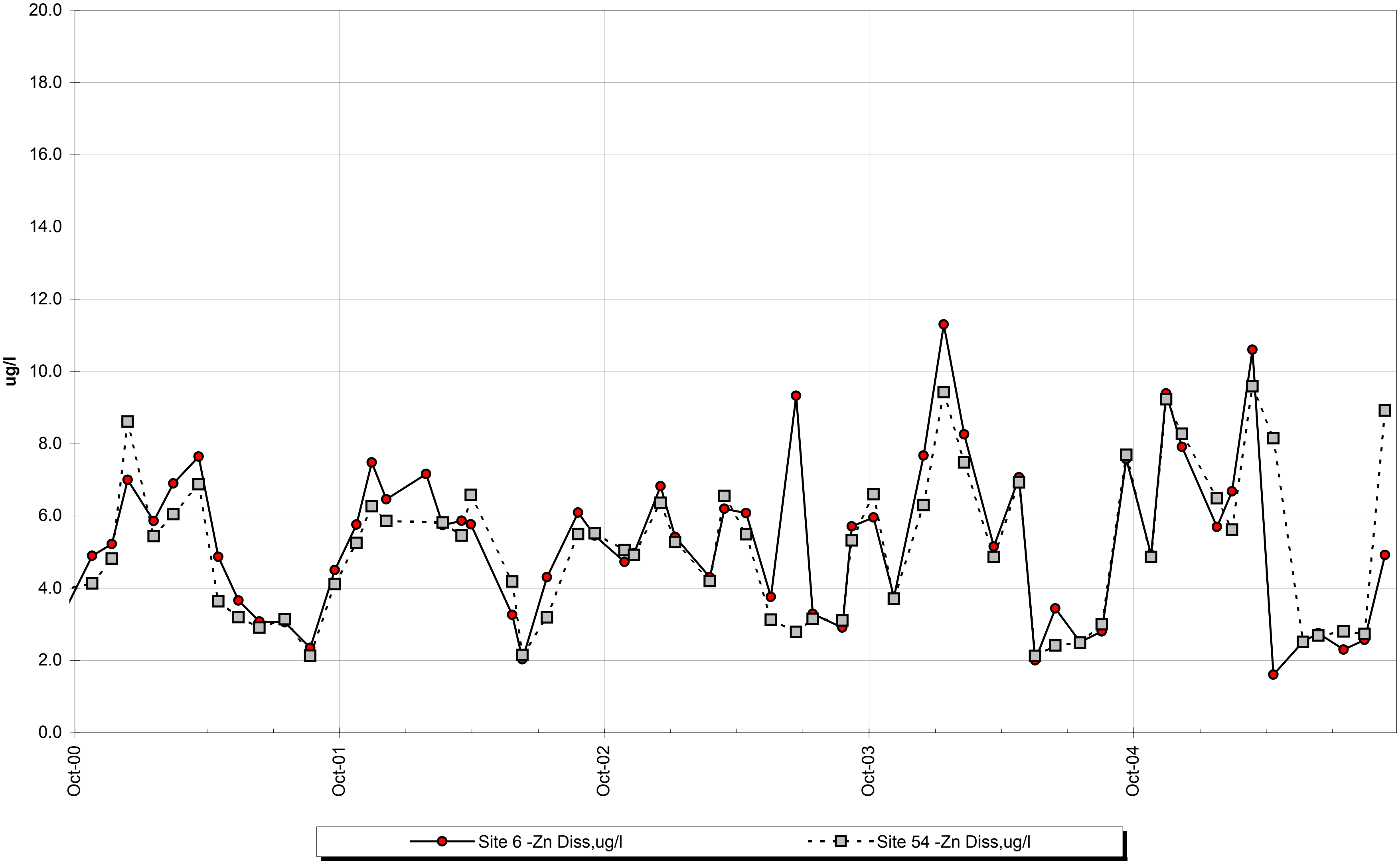
Site 6 vs. Site 54 -Total Alkalinity





Site 6 vs. Site 54 -Total Sulfate
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
ug/l
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 6 -mg/L Diss,ug/l
Site 54 -mg/L Diss,ug/l

Site 6 vs. Site 54 -Dissolved Zinc



Site **#54** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	105.0	124.0	147.0	133.0	158.0	162.0	146.0	94.0	83.8	86.3	100.0	105.0
b	**WY2001**	116.0	83.1	139.0	117.0	144.0	170.0	153.0	95.1	79.7	93.5	125.0	98.8
c	**WY2002**	127.0	124.0	148.0		155.0	165.0	176.0	64.0	87.8	100.0	112.0	97.1
d	**WY2003**	122.0	140.0	128.0	109.0	148.0	158.0	128.0	99.1	99.5	138.0	137.0	104.0
e	**WY2004**	139.0	138.0	153.0	86.6	112.0	162.0	105.0	84.9	87.0	123.0	146.0	93.6
f	**WY2005**	142.0	98.7	136.0	141.0	146.0	121.0	125.0	84.4	85.4	102.0	136.0	115.0
	n	6	6	6	5	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	1	0	0	0	1	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	-1	-1	-1	1	1	1	-1	1	1	-1
c-a	1	0	1		-1	1	1	-1	1	1	1	-1
d-a	1	1	-1	-1	-1	-1	-1	1	1	1	1	-1
e-a	1	1	1	-1	-1	0	-1	-1	1	1	1	-1
f-a	1	-1	-1	1	-1	-1	-1	-1	1	1	1	1
c-b	1	1	1		1	-1	1	-1	1	1	-1	-1
d-b	1	1	-1	-1	1	-1	-1	1	1	1	1	1
e-b	1	1	1	-1	-1	-1	-1	-1	1	1	1	-1
f-b	1	1	-1	1	1	-1	-1	-1	1	1	1	1
d-c	-1	1	-1		-1	-1	-1	1	1	1	1	1
e-c	1	1	1		-1	-1	-1	1	-1	1	1	-1
f-c	1	-1	-1		-1	-1	-1	1	-1	1	1	1
e-d	1	-1	1	-1	-1	1	-1	-1	-1	-1	1	-1
f-d	1	-1	1	1	-1	-1	-1	-1	-1	-1	-1	1
f-e	1	-1	-1	1	1	-1	1	-1	-1	-1	-1	1
S_k	13	2	-1	-2	-7	-8	-7	-3	3	9	9	-1

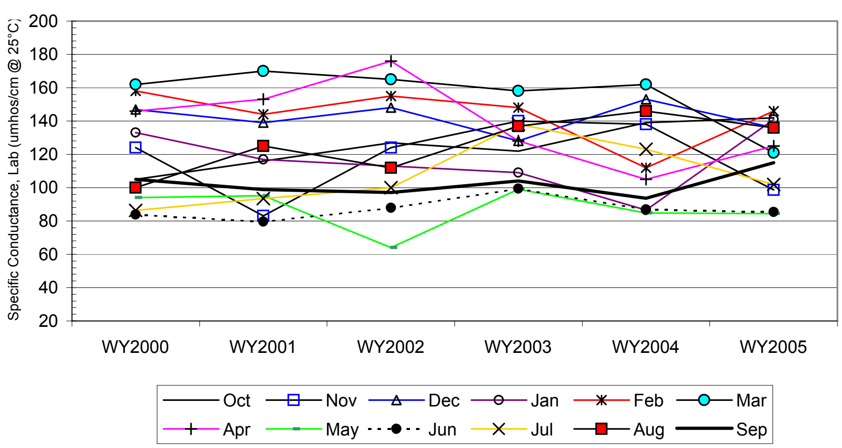
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
$\sigma^2_S=$	28.33	27.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.44	0.38	-0.19	-0.49	-1.32	-1.50	-1.32	-0.56	0.56	1.69	1.69	-0.19
Z^2_k	5.96	0.15	0.04	0.24	1.73	2.26	1.73	0.32	0.32	2.86	2.86	0.04

$\Sigma Z_k=$ 1.21
$\Sigma Z^2_k=$ 18.49
Z-bar=$\Sigma Z_k/K=$ 0.10

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 71
ΣS_k 7

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2=$	18.37	@α=5% $\chi^2_{(K-1)}=$ 19.68	Test for station homogeneity
p	**0.073**		$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k) 327.33	Z_{calc} 0.33	@α/2=2.5% Z= 1.96	**H_0** (No trend) ACCEPT
	p **0.630**		**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.11		3.34
0.050	-1.54	**0.50**	2.46
0.100	-1.35		2.00
0.200	-0.53		1.61

Site **#54** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.7	7.1	7.1	7.9	7.5	7.5	7.6	7.5	7.2	7.6	7.5	7.6
b	**WY2001**	6.9	7.5	7.5	6.9	6.9	7.3	7.2	7.1	6.8	7.0	7.4	7.6
c	**WY2002**	7.4	7.5	7.9		7.3	7.6	7.5	6.8	7.2	8.0	7.8	8.1
d	**WY2003**	7.5	8.0	7.8	7.7	7.7	7.7	7.6	7.7	7.8	7.9	7.8	7.8
e	**WY2004**	7.9	7.9	7.7	7.6	7.5	7.7	7.8	7.4	7.3	7.8	7.7	7.6
f	**WY2005**	8.1	7.5	7.8	8.0	7.8	7.9	7.7	7.3	6.9	7.0	6.8	7.2
	n	6	6	6	5	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	1	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	1	1	-1	-1	-1	-1	-1	-1	-1	-1	1
c-a	-1	1	1		-1	1	-1	-1	-1	1	1	1
d-a	-1	1	1	-1	1	1	-1	1	1	1	1	1
e-a	1	1	1	-1	-1	1	1	-1	1	1	1	1
f-a	1	1	1	1	1	1	1	-1	-1	-1	-1	-1
c-b	1	0	1		1	1	1	-1	1	1	1	1
d-b	1	1	1	1	1	1	1	1	1	1	1	1
e-b	1	1	1	1	1	1	1	1	1	1	1	1
f-b	1	1	1	1	1	1	1	1	1	-1	-1	-1
d-c	1	1	-1		1	1	1	1	1	-1	-1	-1
e-c	1	1	-1		1	1	1	1	1	-1	-1	-1
f-c	1	1	-1		1	1	1	1	-1	-1	-1	-1
e-d	1	-1	-1	-1	-1	-1	1	-1	-1	-1	-1	-1
f-d	1	-1	1	1	1	1	1	-1	-1	-1	-1	-1
f-e	1	-1	1	1	1	1	-1	-1	-1	-1	-1	-1
S_k	9	8	7	2	7	11	7	-1	1	-3	-3	-1

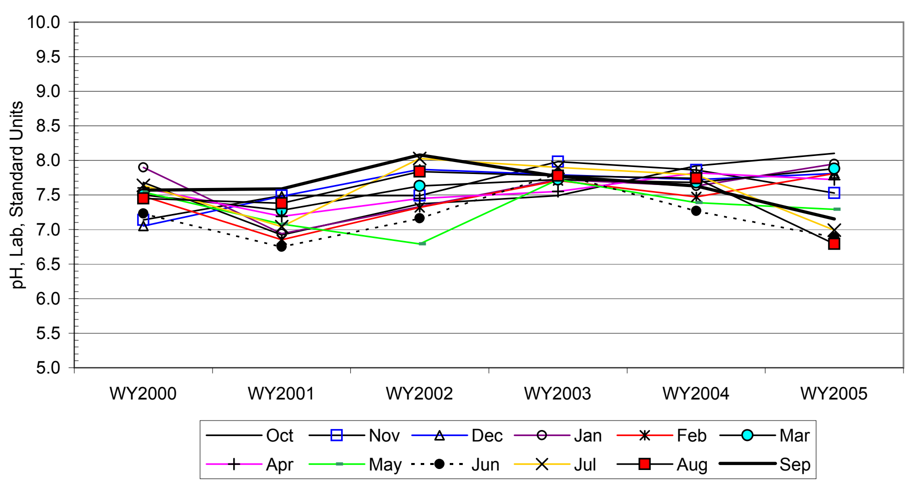
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	27.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.69	1.53	1.32	0.49	1.32	2.07	1.32	-0.19	0.19	-0.56	-0.56	-0.19
Z^2_k	2.86	2.34	1.73	0.24	1.73	4.27	1.73	0.04	0.04	0.32	0.32	0.04

ΣZ_k= 8.41
ΣZ^2_k= 15.64
Z-bar=ΣZ_k/K= 0.70

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 71
ΣS_k 44

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=	9.75	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
p	**0.553**		$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc} 2.38	@α/2=2.5% Z= 1.96	**H_0** (No trend) REJECT
327.33	**p** **0.991**		**H_A** (± trend) ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.00		0.11
0.050	0.01	**0.07**	0.09
0.100	0.02		0.08
0.200	0.05		0.08

0.9%

Site **#54** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	33.1	36.1	44.8	48.1	53.1	52.9	48.6	36.8	34.4	32.4	40.6	42.0
b	**WY2001**	43.2	32.4	52.3	43.4	50.8	58.0	54.0	38.2	32.3	36.9	46.8	38.9
c	**WY2002**	43.9	43.4	51.8		51.9	55.1	55.8	24.2	35.8	38.2	42.1	37.6
d	**WY2003**	40.4	43.7	47.4	41.6	53.8	55.7	47.6	41.0	41.1	49.9	53.2	43.1
e	**WY2004**	51.1	52.7	54.9	32.9	40.1	55.3	39.8	35.7	40.2	45.4	56.9	38.5
f	**WY2005**	58.9	42.4	54.2	59.2	64.1	51.8	56.7	40.3	39.5	41.4	51.0	44.8
	n	6	6	6	5	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0
b-a	1	-1	1	-1	-1	1	1	1	-1	1	1	-1
c-a	1	1	1		-1	1	1	-1	1	1	1	-1
d-a	1	1	1	-1	1	1	-1	1	1	1	1	1
e-a	1	1	1	-1	-1	1	-1	-1	1	1	1	-1
f-a	1	1	1	1	1	-1	1	1	1	1	1	1
c-b	1	1	-1		1	-1	1	-1	1	1	-1	-1
d-b	-1	1	-1	-1	1	-1	-1	1	1	1	1	1
e-b	1	1	1	-1	-1	-1	-1	-1	1	1	1	-1
f-b	1	1	1	1	1	-1	1	1	1	1	1	1
d-c	-1	1	-1		1	1	-1	1	1	1	1	1
e-c	1	1	1		-1	1	-1	1	1	1	1	1
f-c	1	-1	1		1	-1	1	1	1	1	1	1
e-d	1	1	1	-1	-1	-1	-1	-1	-1	-1	1	-1
f-d	1	-1	1	1	1	-1	1	-1	-1	-1	-1	1
f-e	1	-1	-1	1	1	-1	1	1	-1	-1	-1	1
S_k	11	7	7	-2	3	-3	1	3	7	9	9	3

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.07	1.32	1.32	-0.49	0.56	-0.56	0.19	0.56	1.32	1.69	1.69	0.56
Z^2_k	4.27	1.73	1.73	0.24	0.32	0.32	0.04	0.32	1.73	2.86	2.86	0.32

ΣZ_k= 10.22

ΣZ^2_k= 16.72

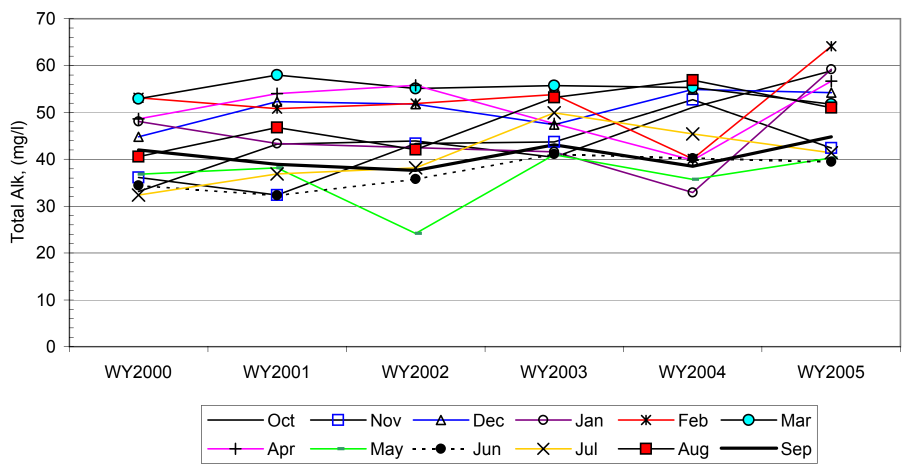
Z-bar=ΣZ_k/K= 0.85

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 71

ΣS_k 55

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2= 8.02	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p **0.711**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc} 2.98	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
328.33 p **0.999**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.46		2.23
0.050	0.69	**1.23**	1.89
0.100	0.74		1.80
0.200	0.87		1.48
		2.8%	

Site **#54** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	4.5	8.2	4.6	19.9	4.9	5.1	7.7	3.1	2.4	2.6	2.6	4.0
b	**WY2001**	4.1	4.8	8.6	5.4	6.1	6.9	3.6	3.2	2.9	3.1	2.1	4.1
c	**WY2002**	5.3	6.3	5.9		5.8	5.5	6.6	4.2	2.2	3.2	5.5	5.5
d	**WY2003**	5.1	4.9	6.4	5.3	4.2	6.6	5.5	3.1	2.8	3.2	3.1	5.3
e	**WY2004**	6.6	3.7	6.3	9.4	7.5	4.9	6.9	2.1	2.4	2.5	3.0	7.7
f	**WY2005**	4.9	9.2	8.3	6.5	5.6	9.6	8.2	2.5	2.7	2.8	2.7	8.9
	n	6	6	6	5	6	6	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	-1	1	-1	1	1	-1	1	1	1	-1	1
c-a	1	-1	1		1	1	-1	1	-1	1	1	1
d-a	1	-1	1	-1	-1	1	-1	1	1	1	1	1
e-a	1	-1	1	-1	1	-1	-1	-1	1	-1	1	1
f-a	1	1	1	-1	1	1	1	-1	1	1	1	1
c-b	1	1	-1		-1	-1	1	1	-1	1	1	1
d-b	1	1	-1	-1	-1	-1	1	-1	-1	1	1	1
e-b	1	-1	-1	1	1	-1	1	-1	-1	-1	1	1
f-b	1	1	-1	1	-1	1	1	-1	-1	-1	1	1
d-c	-1	-1	1		-1	1	-1	-1	1	-1	-1	-1
e-c	1	-1	1		1	-1	1	-1	1	-1	-1	1
f-c	-1	1	1		-1	1	1	-1	1	-1	-1	1
e-d	1	-1	-1	1	1	-1	1	-1	-1	-1	-1	1
f-d	-1	1	1	1	1	1	1	-1	-1	-1	-1	1
f-e	-1	1	1	-1	-1	1	1	1	1	1	-1	1
S_k	5	-1	5	-2	1	3	5	-5	1	-1	1	13

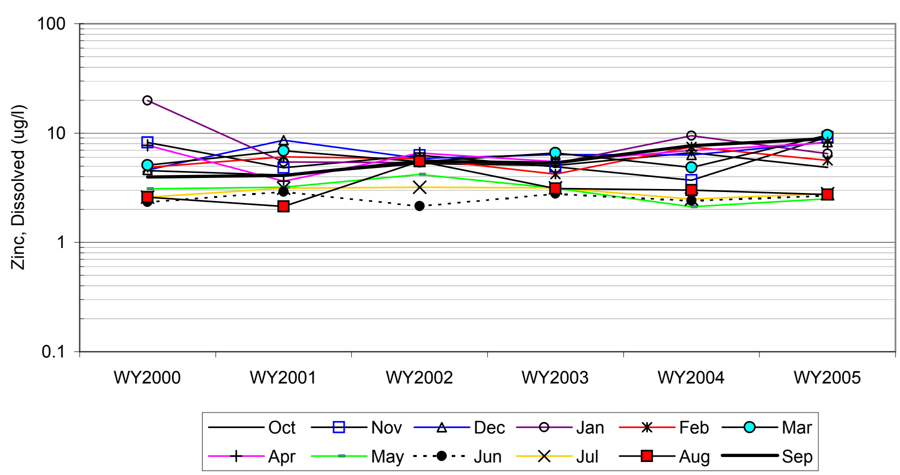
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	16.67	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	-0.19	0.94	-0.49	0.19	0.56	0.94	-0.94	0.19	-0.19	0.19	2.44
Z^2_k	0.88	0.04	0.88	0.24	0.04	0.32	0.88	0.88	0.04	0.04	0.04	5.96

ΣZ_k=	4.58
ΣZ^2_k=	10.23
Z-bar=ΣZ_k/K=	0.38

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	71
ΣS_k	25

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2= 8.48	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p **0.670**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 328.33	Z_{calc} 1.32	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.907**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	**Lower Limit**	**Slope**	**Upper Limit**
0.010	-0.07		0.41
0.050	-0.04	**0.13**	0.27
0.100	0.00		0.19
0.200	0.04		0.18

Wilcoxon-signed-ranks test

Exact Form

Variable: **Specific Conductance, Lab (umhos/cm**

	X	**Y**			
Site	#6	#54	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	140.0	142.0	-2.0	2.0	-7.5
Nov	95.9	98.7	-2.8	2.8	-9
Dec	131.0	136.0	-5.0	5.0	-11
Jan	140.0	141.0	-1.0	1.0	-4.5
Feb	145.0	146.0	-1.0	1.0	-4.5
Mar	117.0	121.0	-4.0	4.0	-10
Apr	145.0	125.0	20.0	20.0	12
May	83.9	84.4	-0.5	0.5	-1.5
Jun	85.9	85.4	0.5	0.5	1.5
Jul	101.0	102.0	-1.0	1.0	-4.5
Aug	137.0	136.0	1.0	1.0	4.5
Sep	113.0	115.0	-2.0	2.0	-7.5
Median	124.0	123.0	-1.0	1.5	

n	**m**
12	12

N= 12

ΣR= -42

α
5.0%
W'α,n
17

W^+=
18
p-test
5.49%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **pH, Lab, Standard Units**

	X	**Y**	Differences		
Site	#6	#54			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	8.12	8.10	0.02	0.02	2
Nov	7.52	7.53	-0.01	0.01	-1
Dec	7.69	7.81	-0.12	0.12	-7
Jan	7.86	7.95	-0.09	0.09	-5.5
Feb	7.77	7.81	-0.04	0.04	-3
Mar	7.79	7.88	-0.09	0.09	-5.5
Apr	7.88	7.72	0.16	0.16	8
May	7.60	7.29	0.31	0.31	9
Jun	8.22	6.89	1.33	1.33	12
Jul	7.55	6.99	0.56	0.56	10
Aug	6.87	6.79	0.08	0.08	4
Sep	7.84	7.16	0.69	0.69	11
Median	7.78	7.63	0.05	0.11	

n	**m**
12	12

N= 12

ΣR= 34

α
95.0%
W'α,n
59

W^{+}=
56
p-test
91.19%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Total Alk, (mg/l)**

	X	**Y**	Differences		
Site	#6	#54			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	54.8	58.9	-4.1	4.1	-11
Nov	40.4	42.4	-2.0	2.0	-8.5
Dec	53.2	54.2	-1.0	1.0	-5.5
Jan	59.1	59.2	-0.1	0.1	-1
Feb	62.1	64.1	-2.0	2.0	-8.5
Mar	51.1	51.8	-0.7	0.7	-2.5
Apr	76.7	56.7	20.0	20.0	12
May	39.4	40.3	-0.9	0.9	-4
Jun	36.5	39.5	-3.0	3.0	-10
Jul	42.5	41.4	1.1	1.1	7
Aug	50.0	51.0	-1.0	1.0	-5.5
Sep	45.5	44.8	0.7	0.7	2.5
Median	50.6	51.4	-1.0	1.1	

n	**m**
12	12

N= 12

ΣR= -35

α
95.0%
W'α,n
59

W^+=
21.5
p-test
8.81%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Sulfate, Total (mg/l)**

	X	**Y**	Differences		
Site	#6	#54			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	16.5	16.6	-0.1	0.1	-3.5
Nov	10.1	10.3	-0.2	0.2	-7
Dec	16.1	16.4	-0.3	0.3	-8
Jan	19.5	18.9	0.6	0.6	9
Feb	23.6	23.8	-0.2	0.2	-5.5
Mar	14.9	16.2	-1.3	1.3	-10
Apr	12.5	19.4	-6.9	6.9	-11
May	7.9	7.9	0.0	0.0	1
Jun	9.5	9.6	-0.1	0.1	-2
Jul	11.0	11.2	-0.2	0.2	-5.5
Aug	18.9	19.0	-0.1	0.1	-3.5
Sep	13.6	13.6	0.0		
Median	14.3	16.3	-0.2	0.2	

n	**m**
12	11

N= 11

ΣR= -46

α
5.0%
W'α,n
13

W^{+}=
10
p-test
2.10%

H_0	median [D]=0	**REJECT**
H_1	median [D]<0	**ACCEPT**

Wilcoxon-signed-ranks test

Exact Form

Variable: **Zinc, Dissolved (ug/l)**

	X	**Y**	Differences		
Site	#6	#54			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	4.92	4.86	0.06	0.06	2
Nov	9.39	9.23	0.16	0.16	4.5
Dec	7.91	8.27	-0.36	0.36	-6
Jan	5.70	6.49	-0.79	0.79	-8
Feb	6.68	5.62	1.06	1.06	10
Mar	10.60	9.59	1.01	1.01	9
Apr	1.61	8.15	-6.54	6.54	-12
May	2.52	2.51	0.01	0.01	1
Jun	2.75	2.69	0.06	0.06	3
Jul	2.30	2.80	-0.50	0.50	-7
Aug	2.57	2.73	-0.16	0.16	-4.5
Sep	4.92	8.92	-4.00	4.00	-11
Median	4.92	6.06	-0.08	0.43	

n	**m**
12	12

N= 12

ΣR= -19

α
5.0%
W'α,n
17

W^+=
29.5
p-test
23.48%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Lab Conductivity (umhos/cm): Prior five water years' signed-rank comparisons between Site 54 and Site 6.

Water Year	Signed Ranks p-value	Site #06 median	Site #54 median	Median of Differences
2000	**<0.01**	109.0	114.5	-3.9
2001	**<0.01**	113.0	116.5	-3.0
2002	**<0.01**	123.0	124.0	-2.0
2003	**0.02**	124.5	128.0	-3.0
2004	**<0.01**	114.5	117.5	-2.8

Laboratory-pH (s.u.): Prior five water years' signed-rank comparisons between Site 54 and Site 6.

Water Year	Signed Ranks p-value	Site #06 median	Site #54 median	Median of Differences
2000	0.79	7.63	7.52	0.02
2001	**0.97**	7.67	7.14	-0.55
2002	0.14	7.49	7.49	0.09
2003	0.31	7.76	7.75	0.01
2004	**1.00**	7.85	7.70	-0.13

Total Alkalinity (mg/l): Prior five water years' signed-rank comparisons between Site 54 and Site 6.

Water Year	Signed Ranks p-value	Site #06 median	Site #54 median	Median of Differences
2000	<0.01	40.6	41.3	-0.6
2001	<0.01	42.7	43.3	-1.3
2002	<0.01	43.5	43.4	-1.2
2003	0.01	42.3	45.6	-1.6
2004	<0.01	42.2	42.8	-1.0

Total Sulfate (mg/l): Prior two water years' signed-rank comparisons between Site 54 and Site 6.

Water Year	Signed Ranks p-value	Site #06 median	Site #54 median	Median of Differences
2003	**0.0269**	14.40	14.50	-0.10
2004	*0.0527*	12.85	12.95	-0.08

** There are two tied data pairs for WY2004, this reduces the power of the signed-rank test and may lead to false-rejection of H_a

Dissolved Zinc (ug/l): Prior five water years' signed-rank comparisons between Site 54 and Site 6.

Water Year	Signed Ranks p-value	Site #06 median	Site #54 median	Median of Differences
2000	0.515	4.30	4.57	0.01
2001	0.983	4.89	4.12	0.41
2002	0.817	5.77	5.50	0.41
2003	0.954	5.20	4.99	0.14
2004	0.924	5.56	5.58	0.09

INTERPRETIVE REPORT
SITE 49 "UPPER BRUIN CREEK"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious visual trends are apparent except for pH. The lab pH does appear to have a step increase of approximately 0.3 su from a pH of 7.5 to 7.8 that occurs after June-2002. The visual trend analysis was followed-up with an additional non-parametric statistical analysis for trend. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented on the pages following this interpretive section. The table above summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). For data sets with a statistically significant trend ($\alpha/2=2.5\%$) a Seasonal-Sen's Slope estimate statistic has also been calculated. The dataset for conductivity failed the test for seasonal (monthly) homogeneity. Conductivity showed significant upward trends in October ($S_k=13$, $Q_m=8.0$ uS/cm•yr) and June ($S_k=11$, $Q_m=8.2$ uS/cm•yr). Significant positive trends are present for lab pH, alkalinity, and dissolved

Site 49-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	Fails Test for Monthly Homogeneity				
pH, Lab	6	3.55	+	**1.00**	0.09	1.2
Alkalinity, Total	6	2.19	+	**0.99**	2.32	3.7
Zinc, Dissolved	6	2.37	+	**0.99**	0.09	4.3

(1): Number of years (2):Significance level

zinc. The trend for pH is significant ($p=1.00$) and has a slope estimate of 0.09 su/yr or a 1.2% increase over the six year period. The trend for alkalinity is significant ($p=0.99$) and has a slope estimate of 2.32 $mg{\bullet}L^{-1}{\bullet}yr^{-1}$ or a 3.7% increase over the period. Finally, dissolved zinc follows a similar pattern with a significant trend ($p=0.99$) that has a slope estimate of 0.09 $ug{\bullet}L^{-1}{\bullet}yr^{-1}$ or a 4.3% increase over the period. Given the low absolute magnitude of the changes and the fact that site is used as a background/non-mine influenced reference site, the changes are considered due to natural variation. Additionally, several of the same trends with similar magnitudes were also noted at Site 48, the upgradient control site on Greens Creek.

Table of Results for Water Year 2005

Site 49 "Upper Bruin Creek"

Sample Date/Parameter	10/26/2004	11/16/2004	12/8/2004	1/25/2005	2/15/2005	3/15/2005	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	2.6	5.3	0.8	1.4	1.3	2.0	2.7	6.6	8.7	10.5	11.6	8.9	4.0
Conductivity-Field(μmho)	175	129	147	160	171	142	152	96	139	142	172	136	145
Conductivity-Lab (μmho)	164	127	147	157	160	139 J	142	92	130	142	169	130	142
pH Lab (standard units)	8.11	7.77	8.00	8.00	7.91	8.10	7.88	7.87	7.53	7.49	7.55	7.87	7.88
pH Field (standard units)	7.63	7.56	8.23	7.92	8.16	8.26	8.02	7.98	7.70	7.98	7.91	8.23	7.98
Total Alkalinity (mg/L)	77.5 J	60.6	70.4	78.3	83.7	70.4 J	74.4	48.8	63.8	64.6	74.2	58.7	70.4
Total Sulfate (mg/L)	12.0	9.0	9.8	12.2	15.2	10.3	12.4	5.6	10.8	10.6	15.2	9.1	10.7
Hardness (mg/L)	82.1	72.0	74.9	74.7	84.1	68.9	77.7	49.7	73.7	71.8	87.0	73.3	74.2
Dissolved As (ug/L)	0.164	0.186	0.173	0.145	0.126	0.198	0.153 J	0.127	0.179	0.185	0.231	0.232	0.176
Dissolved Ba (ug/L)			8.6		12.3								10.5
Dissolved Cd (ug/L)	0.027 U	0.032	0.031 U	0.027	0.031	0.031	0.026	0.029 U	0.033	0.034	0.034	0.033	0.031
Dissolved Cr (ug/L)			2.600		0.266								1.433
Dissolved Cu (ug/L)	0.429	0.652	0.380	0.435 U	0.428	0.521	0.456 U	0.377	0.814 U	0.548	0.506	0.556	0.481
Dissolved Pb (ug/L)	0.0617	0.0130 U	0.0226 U	0.0065 U	<0.0050	0.0195 U	0.0055 U	0.0105 U	0.0055 U	0.0176 U	0.0046	0.0124 U	0.0115
Dissolved Ni (ug/L)			1.040		1.300								1.170
Dissolved Ag (ug/L)			0.003 U		<0.003								0.002
Dissolved Zn (ug/L)	2.32	2.94 U	3.17	1.82	1.97 UJ	2.95 U	1.77 J	2.20 U	2.31	1.98 U	1.30	2.68 U	2.26
Dissolved Se (ug/L)			0.273 J		0.964								0.619
Dissolved Hg (ug/L)	0.001180 U	0.002040	0.001230	0.001370	0.000880	0.001790	0.001680	0.001260 U	0.001660 U	0.001490 U	0.001080 U	0.001820	0.001430

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
49	01/25/2005	1:06:00 PM				
			Cu Diss, ug/l	0.435	U	Field Blank Contamination
			Pb Diss, ug/l	0.00653	U	Field Blank Contamination
49	10/26/2004	2:36:00 PM				
			Alk Tot, mg/l	77.5	J	Hold Time
			Cd Diss, ug/l	0.0268	U	Field Blank Contamination
			Hg Diss, ug/l	0.00118	U	Field Blank Contamination
49	11/16/2004	12:03:00 PM				
			Pb Diss, ug/l	0.013	U	Field Blank Contamination
			Zn Diss, ug/l	2.94	U	Field Blank Contamination
49	12/08/2004	2:21:00 PM				
			Cd Diss, ug/l	0.0314	U	Method Blank Contamination
			Pb Diss, ug/l	0.0226	U	Method Blank Contamination
			Ag Diss, ug/l	0.00278	U	Method Blank Contamination
			Se Diss, ug/l	0.273	J	Below Quantitative Range
49	02/15/2005	1:05:00 PM				
			Zn Diss, ug/l	1.97	UJ	Field Blank Contamination, L
49	03/15/2005	12:41:00 PM				
			Cond Lab, umho	139	J	Holdtime
			Alk Tot, mg/l	70.4	J	Holdtime
			Pb Diss, ug/l	0.0195	U	Field Blank Contamination
			Zn Diss, ug/l	2.95	U	Field Blank Contamination
49	04/13/2005	2:16:00 PM				
			As Diss, ug/l	0.153	J	LCS Recovery
			Cu Diss, ug/l	0.456	U	Field Blank Contamination
			Pb Diss, ug/l	0.00551	U	Field Blank Contamination
			Zn Diss, ug/l	1.77	J	LCS Recovery
49	05/24/2005	10:42:00 AM				
			Cd Diss, ug/l	0.029	U	Field Blank Contamination
			Pb Diss, ug/l	0.0105	U	Field Blank Contamination
			Zn Diss, ug/l	2.2	U	Field Blank Contamination
			Hg Diss, ug/l	0.00126	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

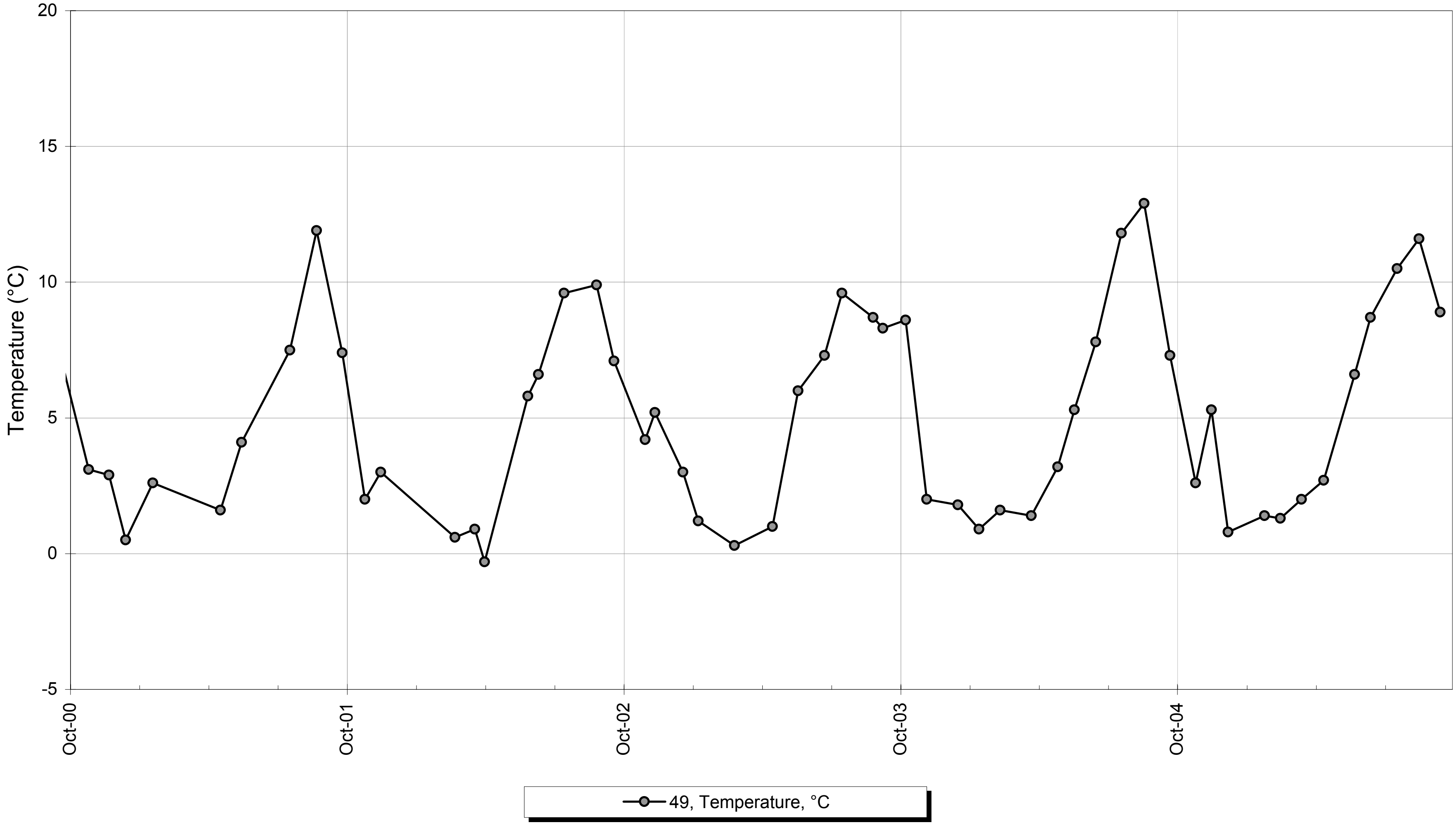
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

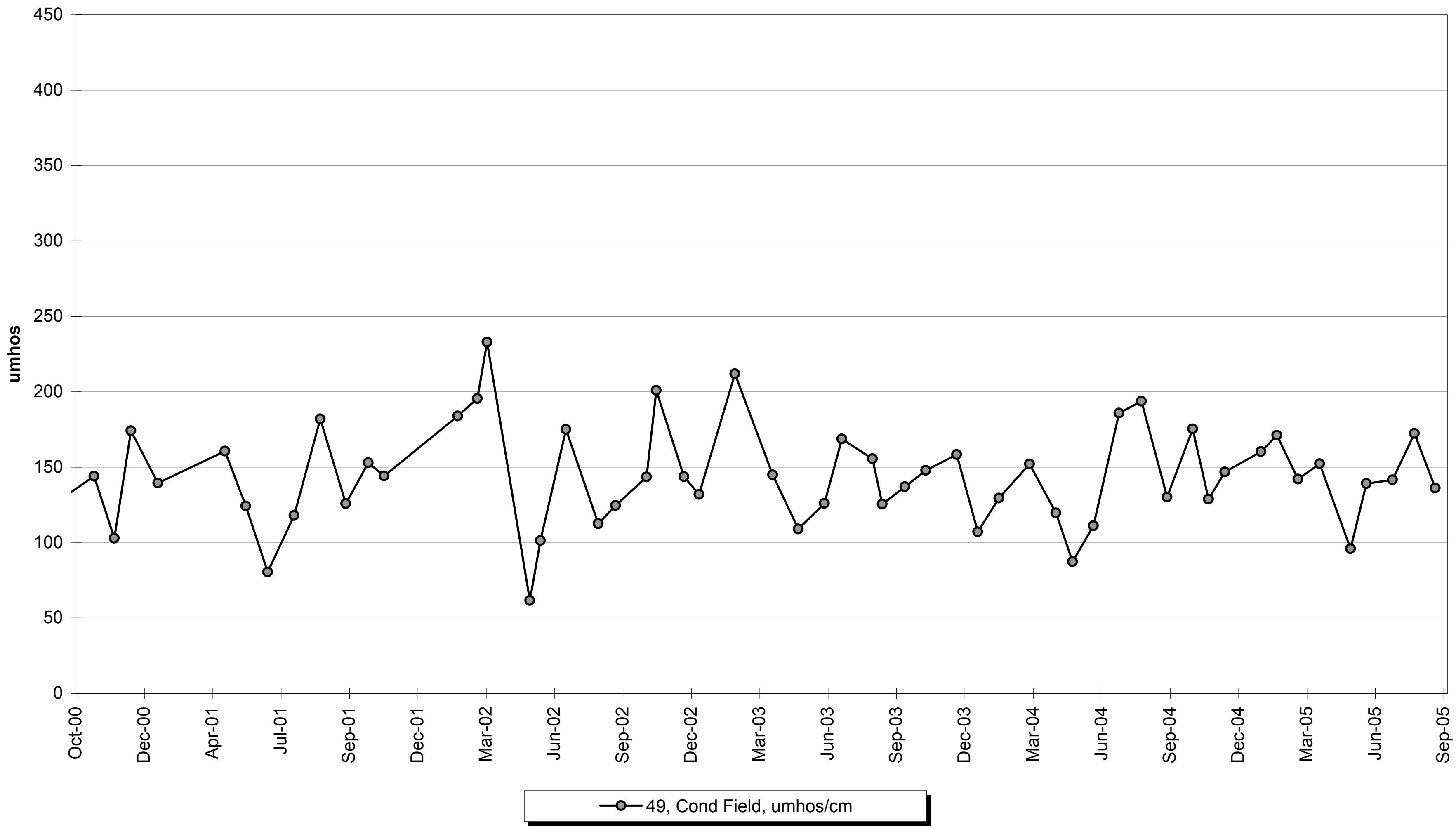
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
49	06/14/2005	2:18:00 PM				
			Cu Diss, ug/l	0.814	U	Field Blank Contamination
			Pb Diss, ug/l	0.00547	U	Field Blank Contamination
			Hg Diss, ug/l	0.00166	U	Field Blank Contamination
49	07/19/2005	2:33:00 PM				
			Pb Diss, ug/l	0.0176	U	Field Blank Contamination
			Zn Diss, ug/l	1.98	U	Field Blank Contamination
			Hg Diss, ug/l	0.00149	U	Field Blank Contamination
49	08/17/2005	1:16:00 PM				
			As Diss, ug/l	0.231	J	LCS Recovery
			Pb Diss, ug/l	0.00455	U	Field Blank Contamination
			Zn Diss, ug/l	1.3	J	LCS Recovery
			Hg Diss, ug/l	0.00108	U	Field Blank Contamination
49	09/14/2005	12:54:00 PM				
			Pb Diss, ug/l	0.0124	U	Field Blank Contamination
			Zn Diss, ug/l	2.68	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

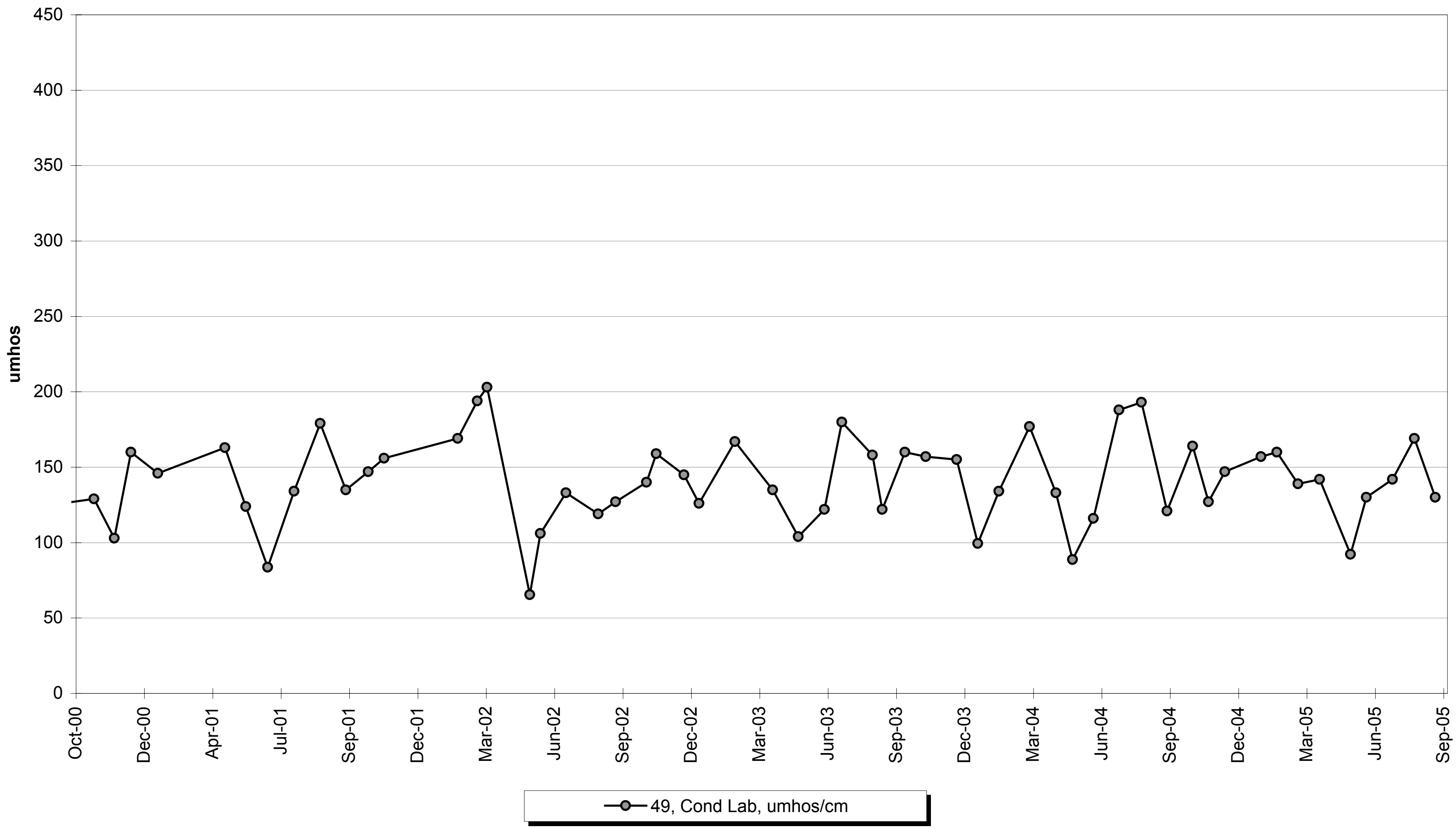
Site 49 -Water Temperature

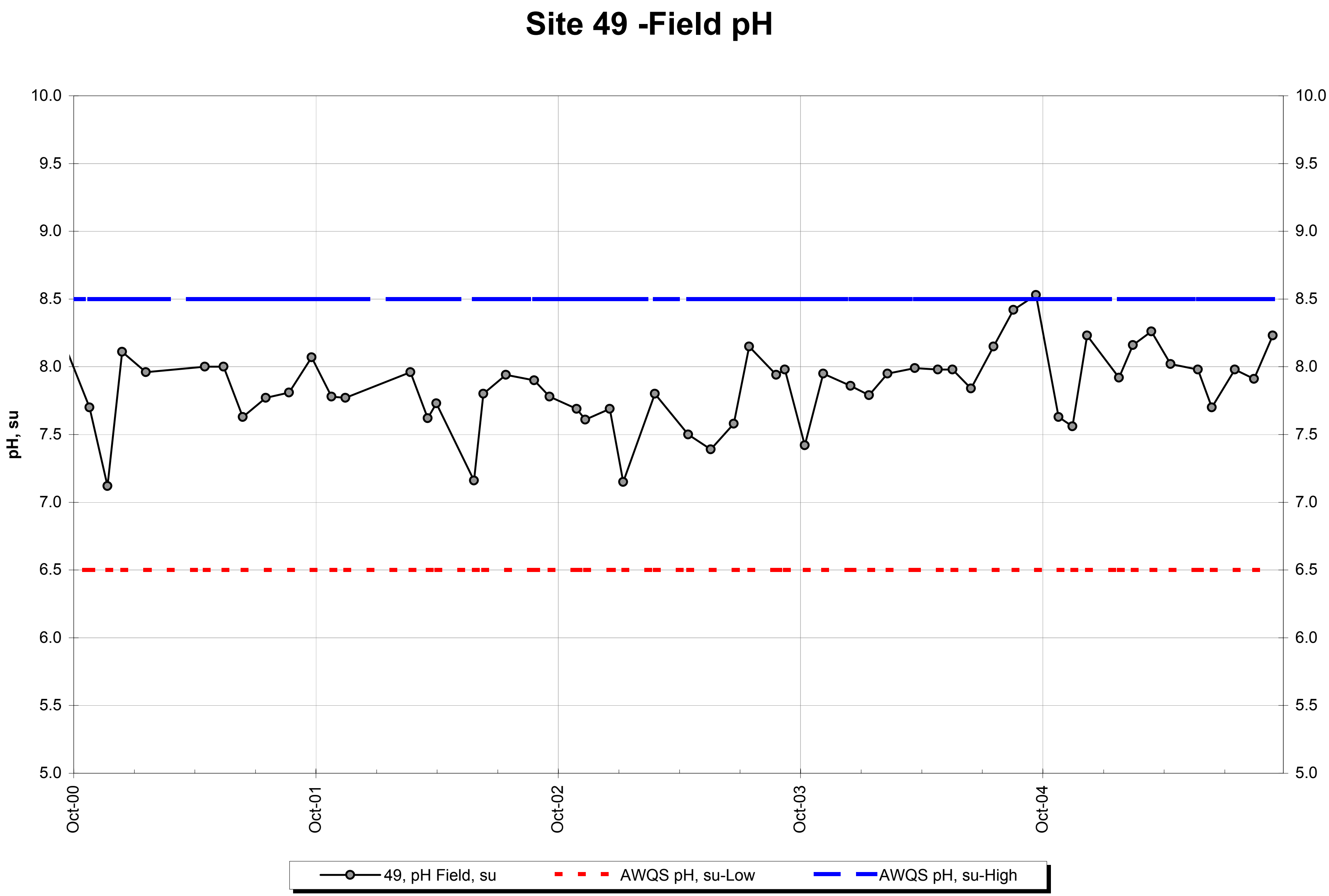


Site 49 -Conductivity-Field

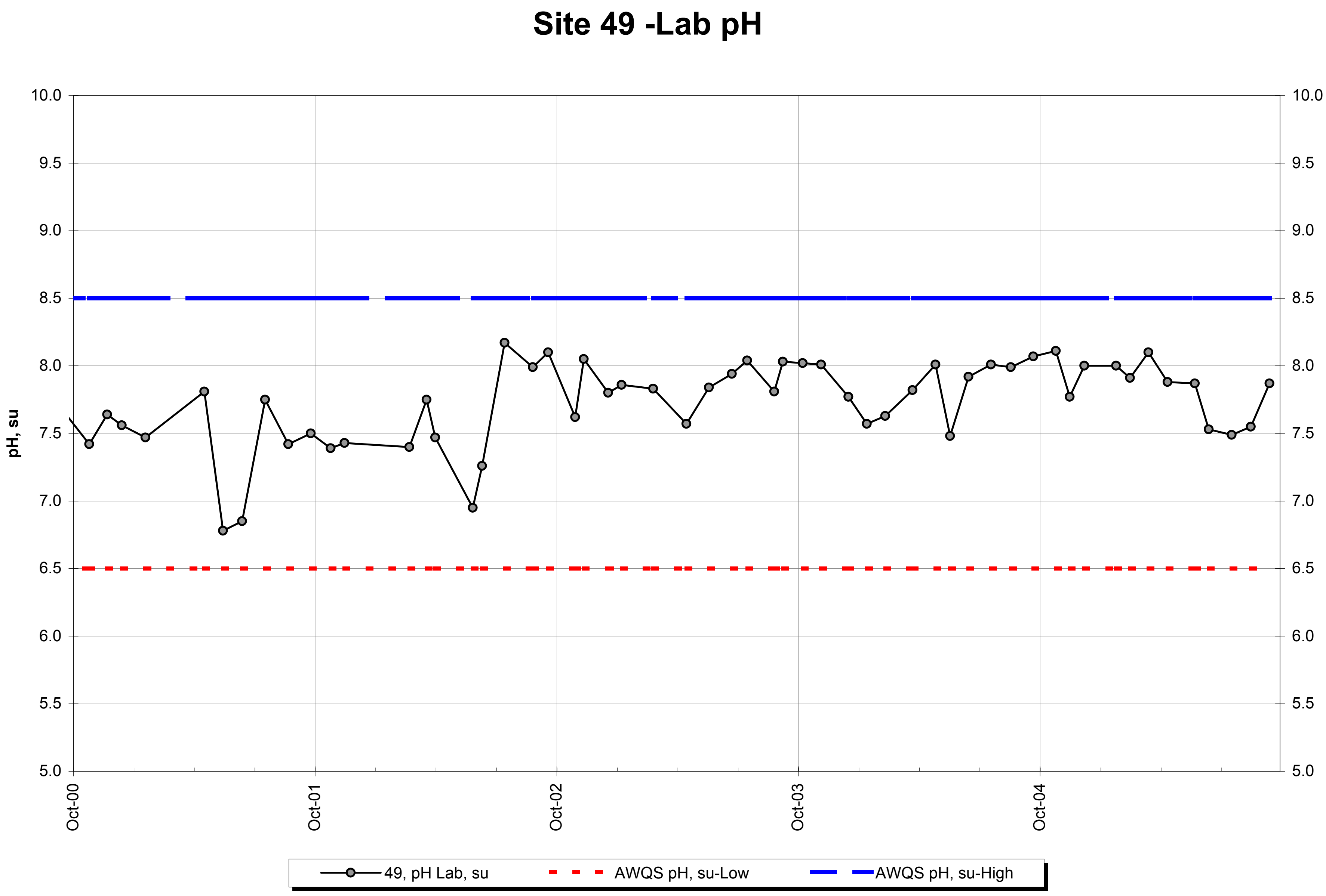


Site 49 -Conductivity-Lab



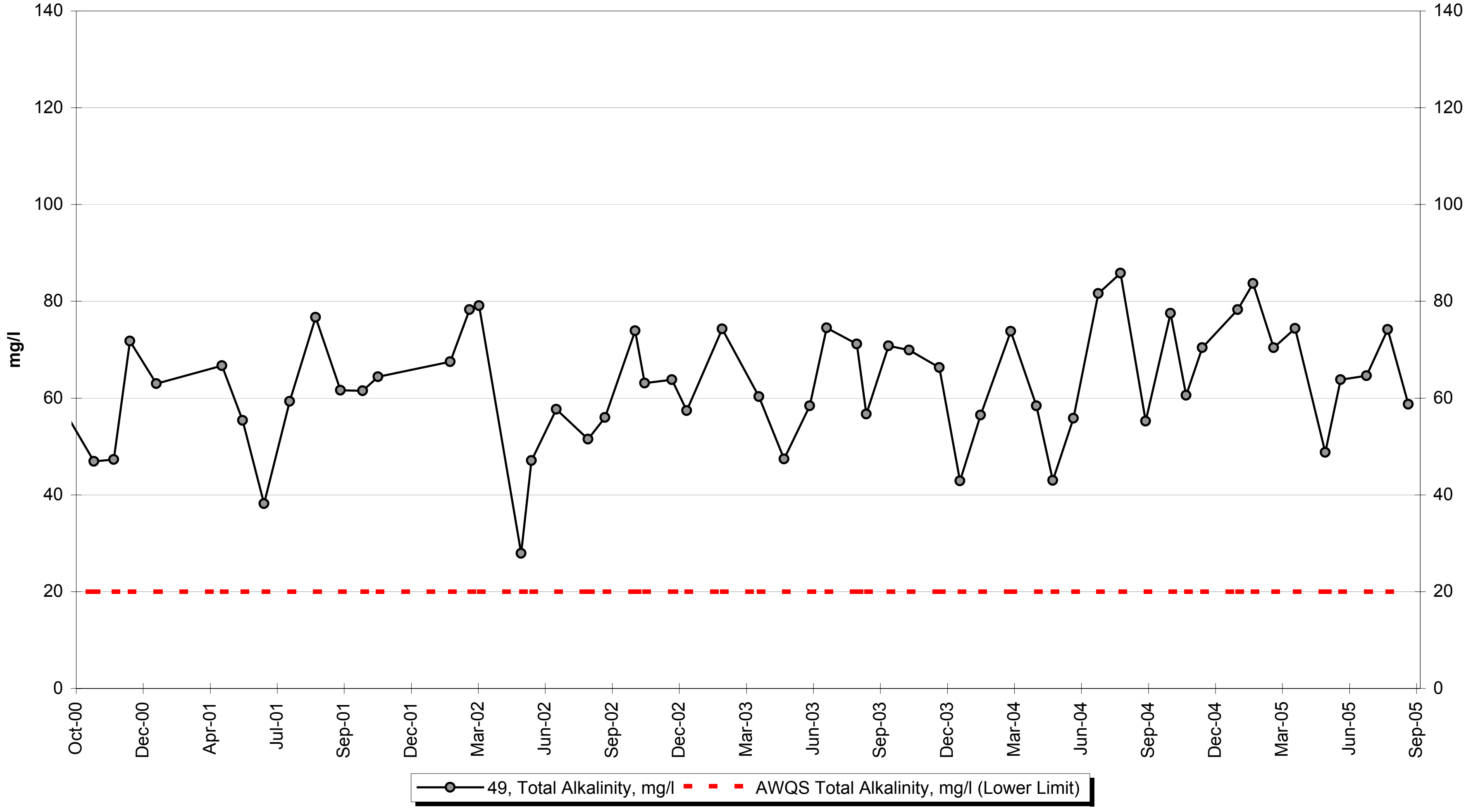


Site 49 -Field pH
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
pH, su
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
49, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

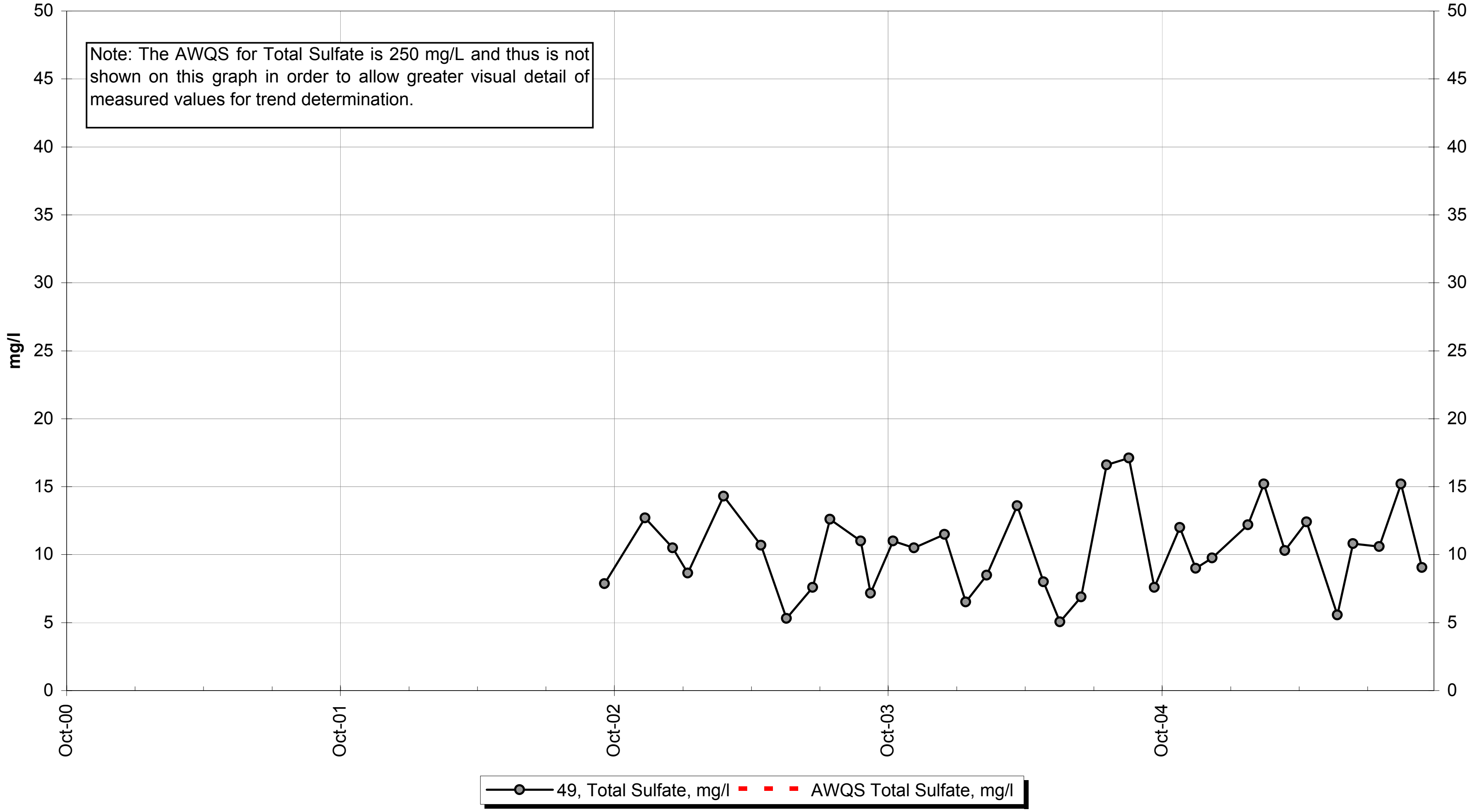


Site 49 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
49, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

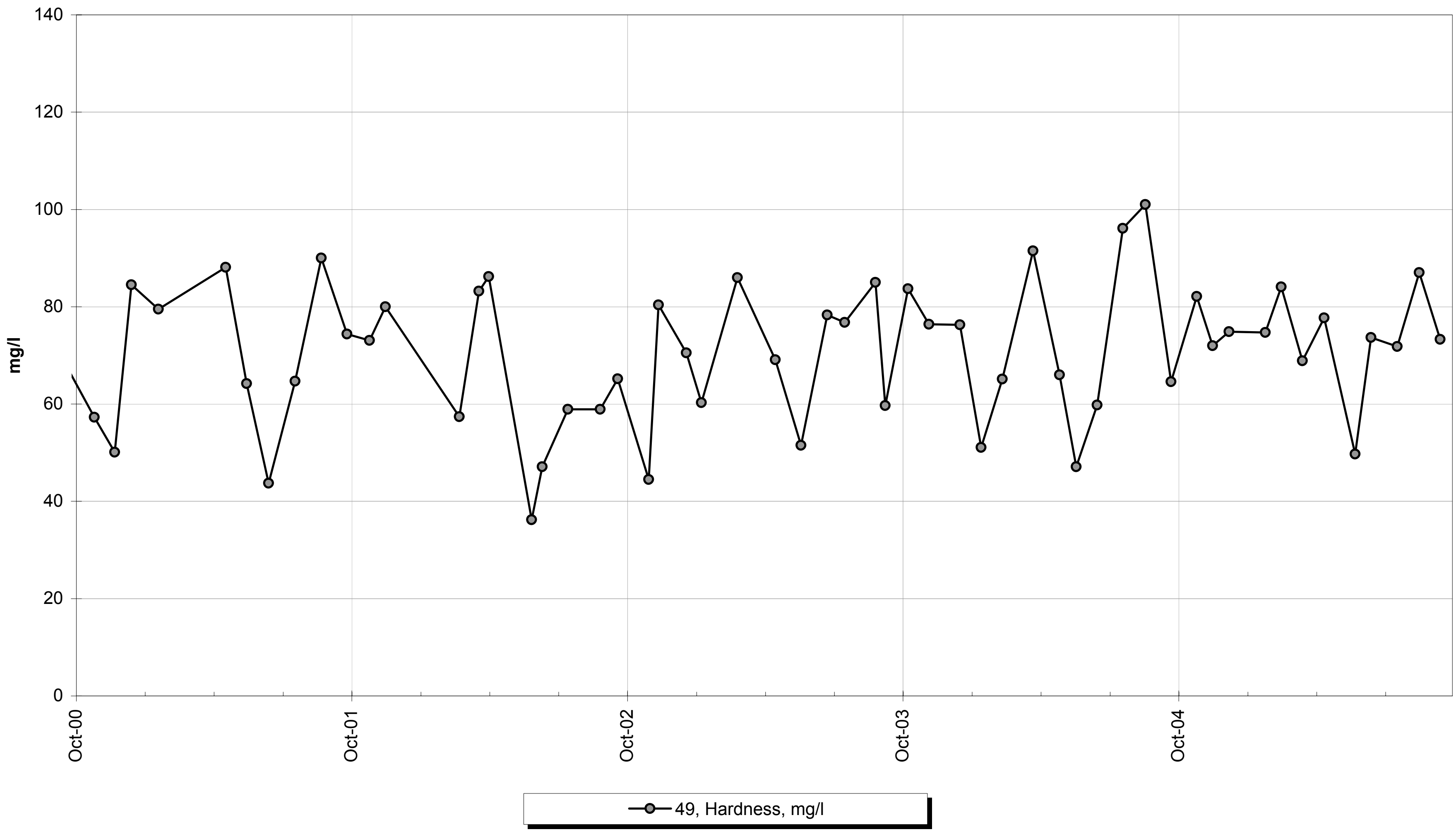
Site 49 -Total Alkalinity

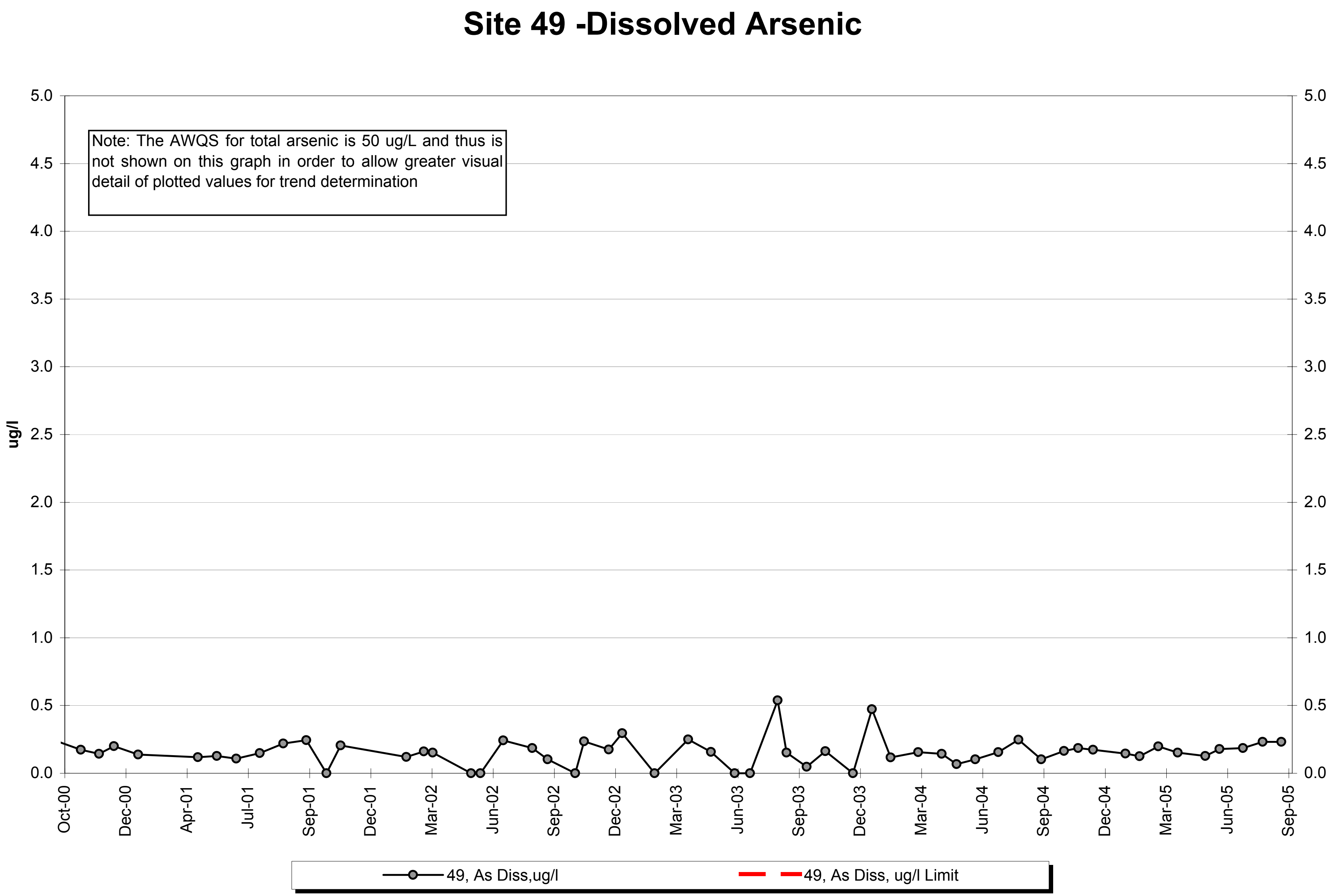


Site 49 -Total Sulfate

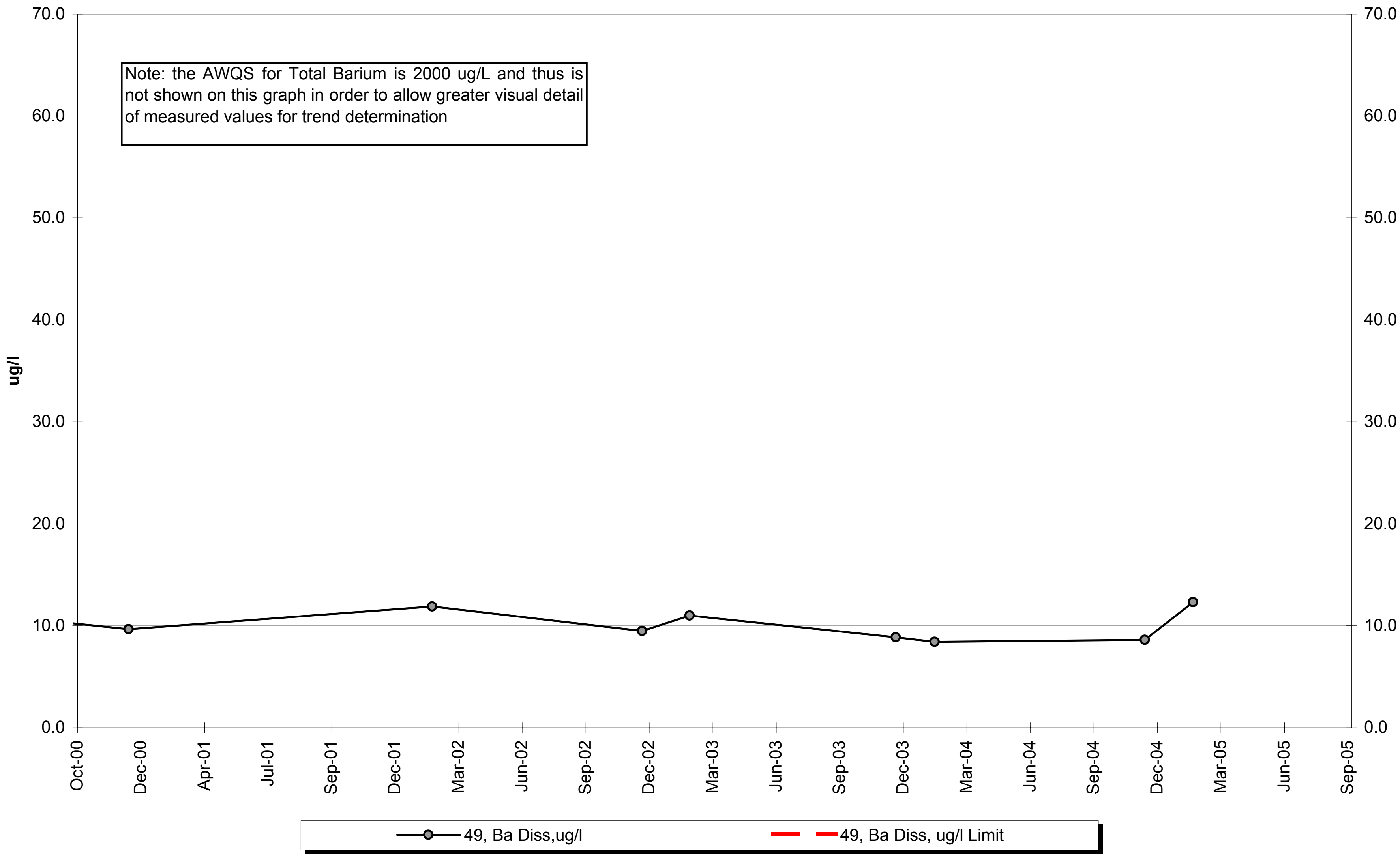


Site 49 -Hardness

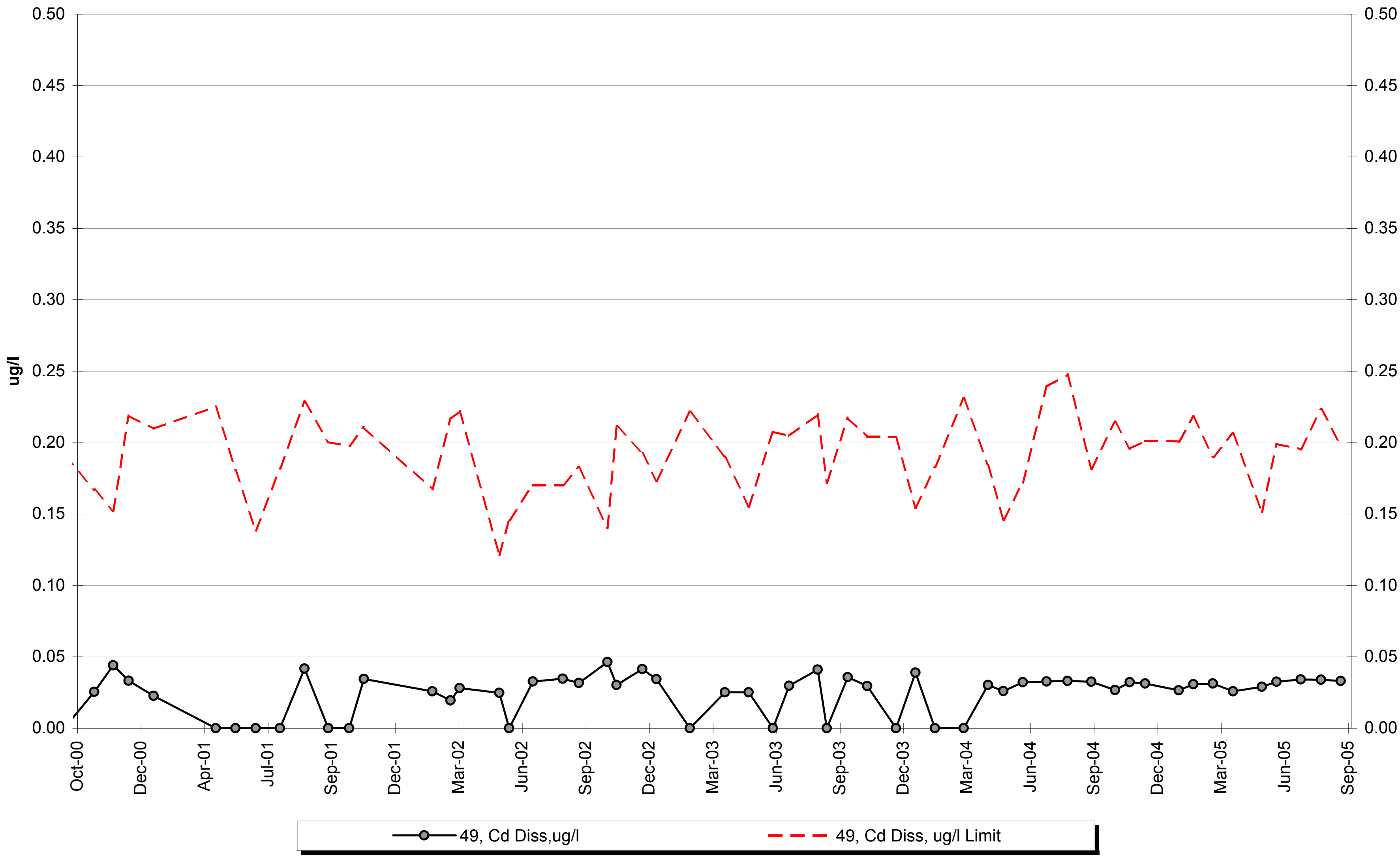



Site 49 -Dissolved Arsenic
Note: The AWQS for total arsenic is 50 ug/L and thus is not shown on this graph in order to allow greater visual detail of plotted values for trend determination
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
49, As Diss,ug/l
49, As Diss, ug/l Limit

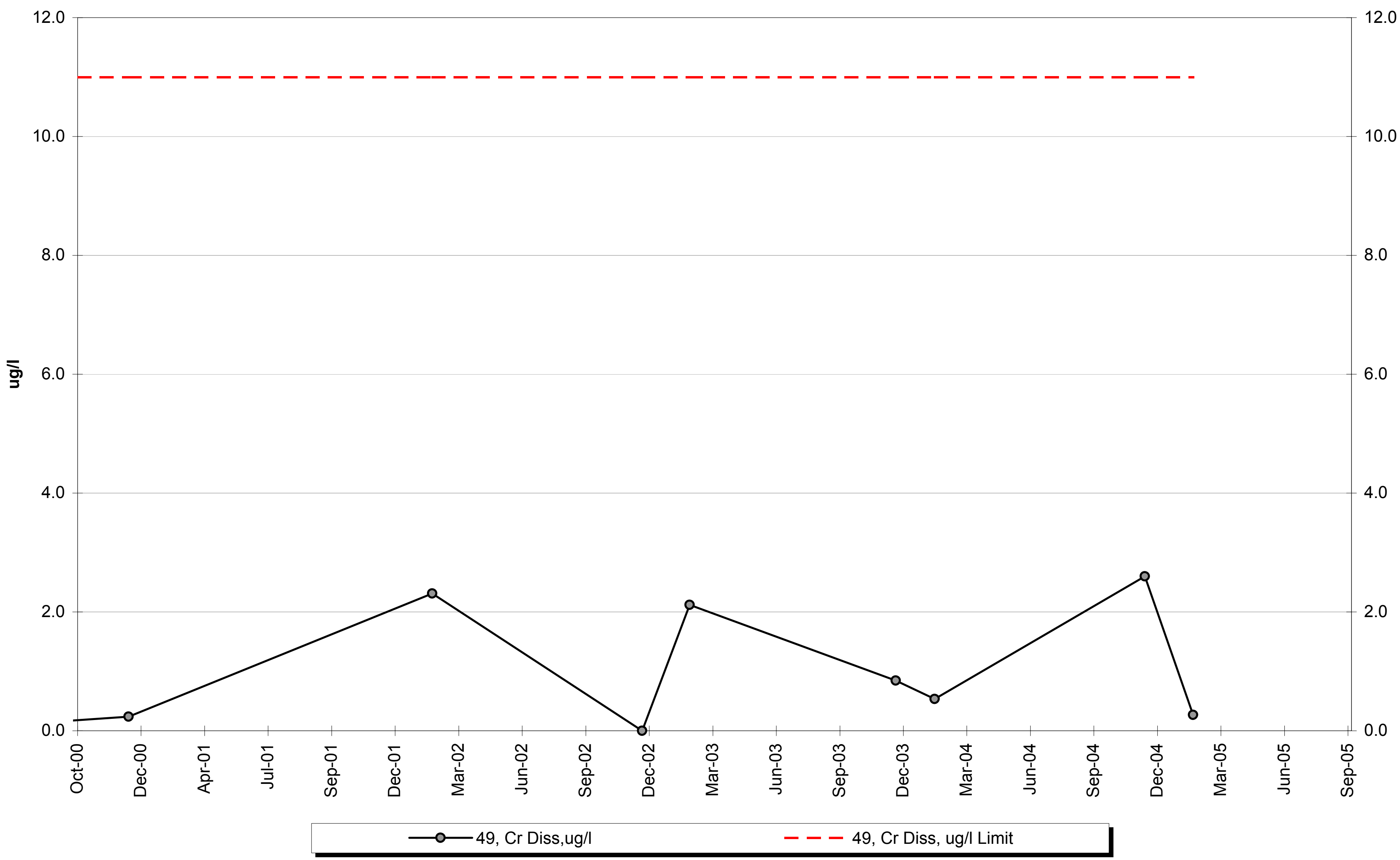
Site 49 -Dissolved Barium

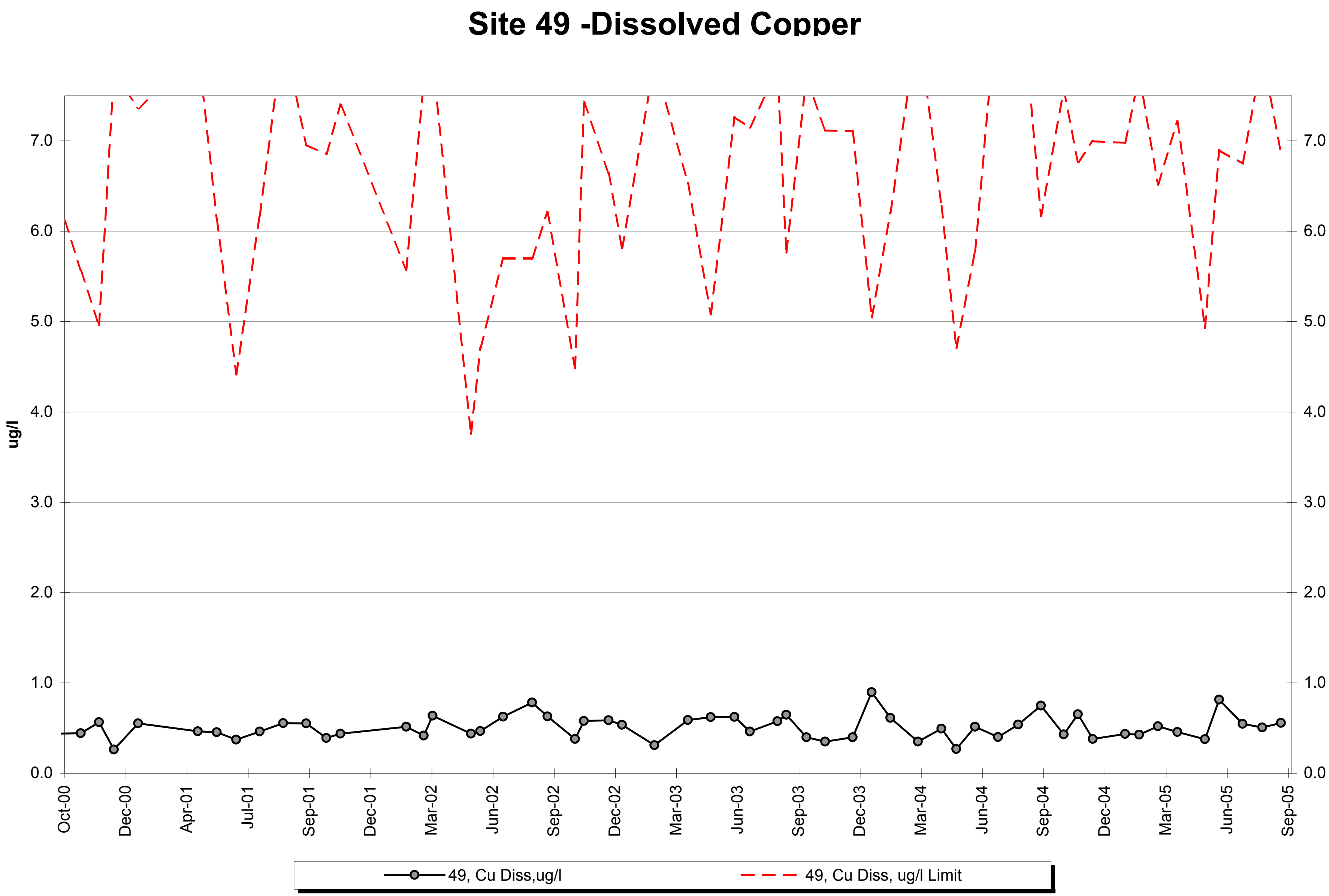


Site 49 -Dissolved Cadmium



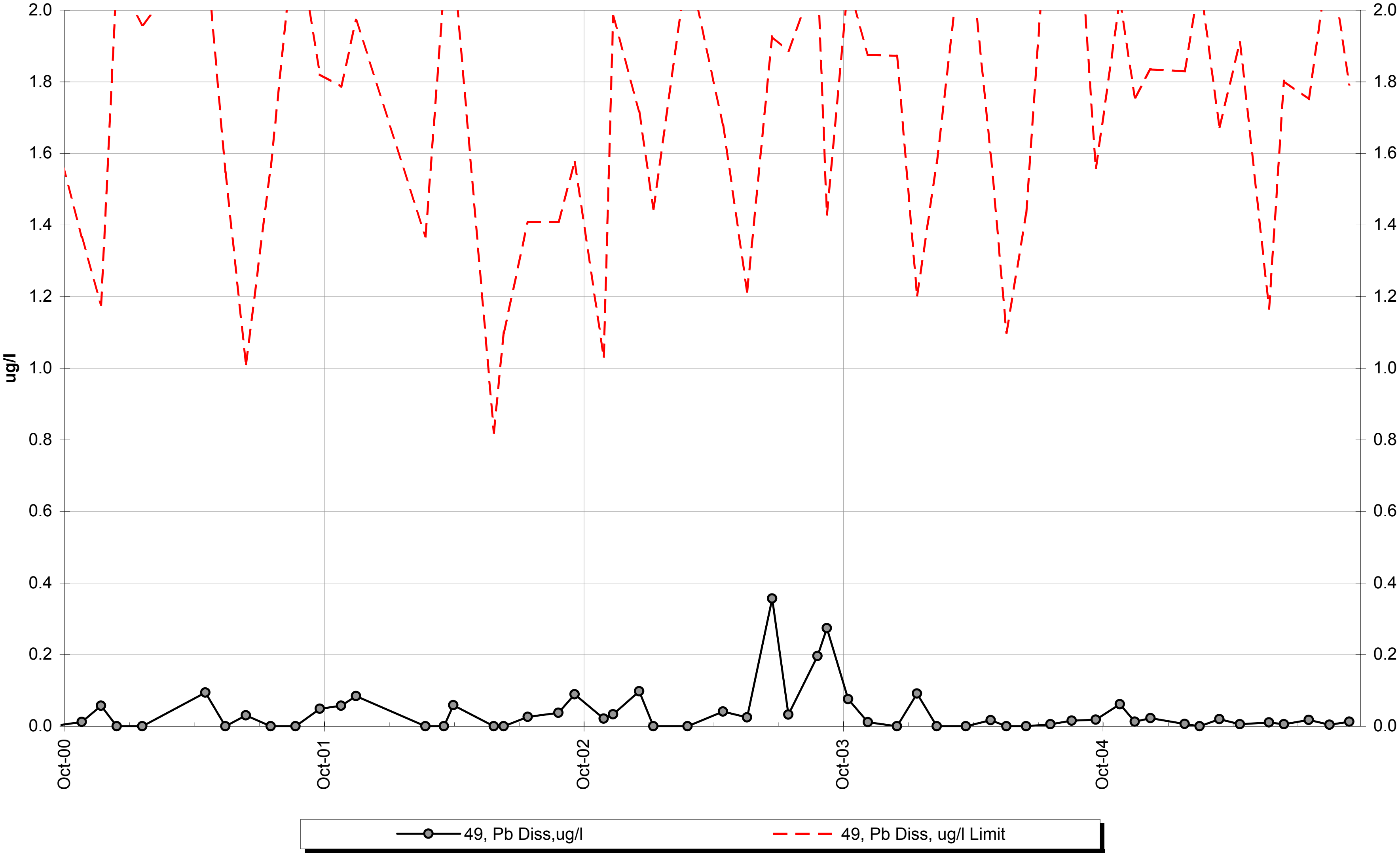
Site 49 -Dissolved Chromium



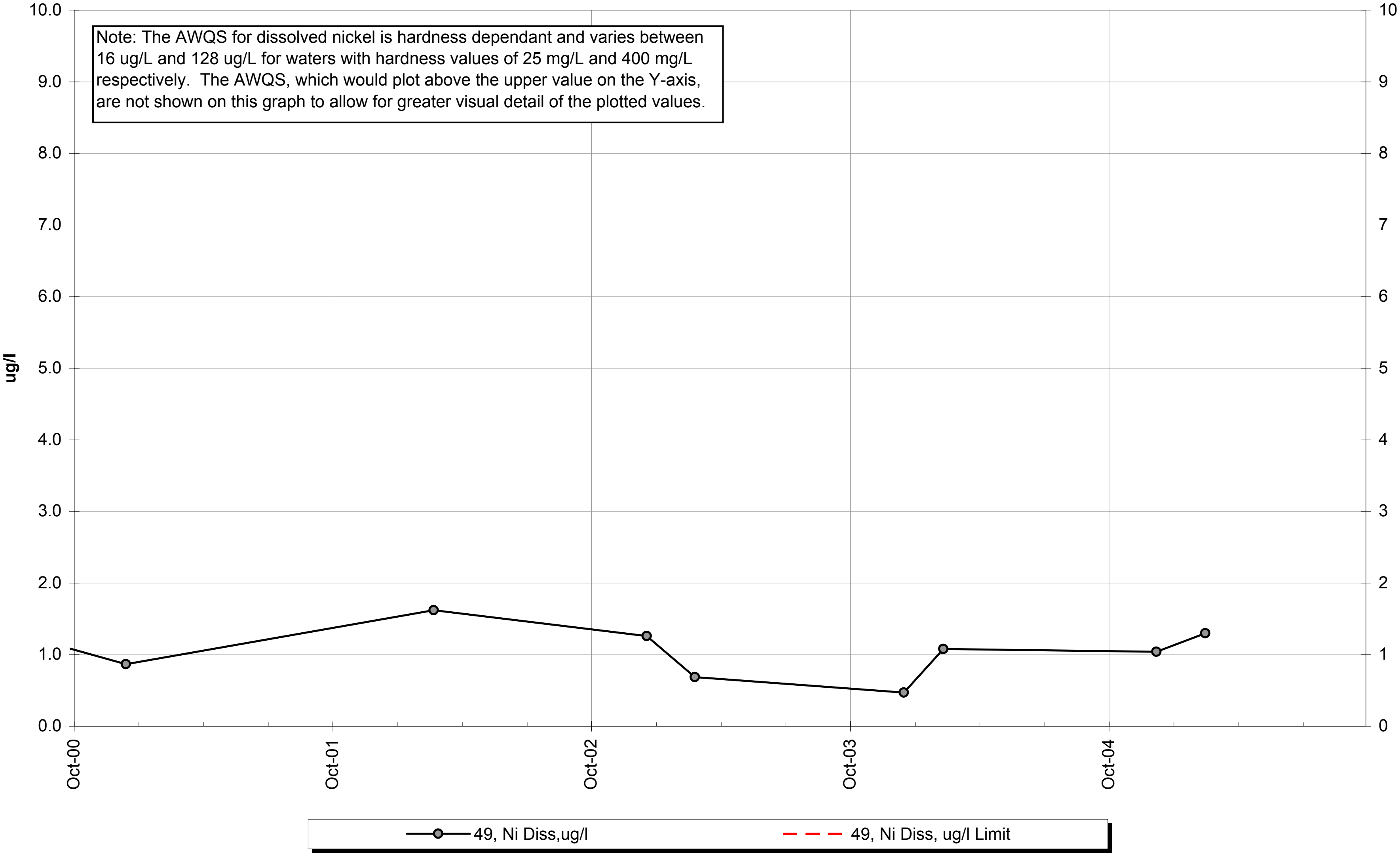


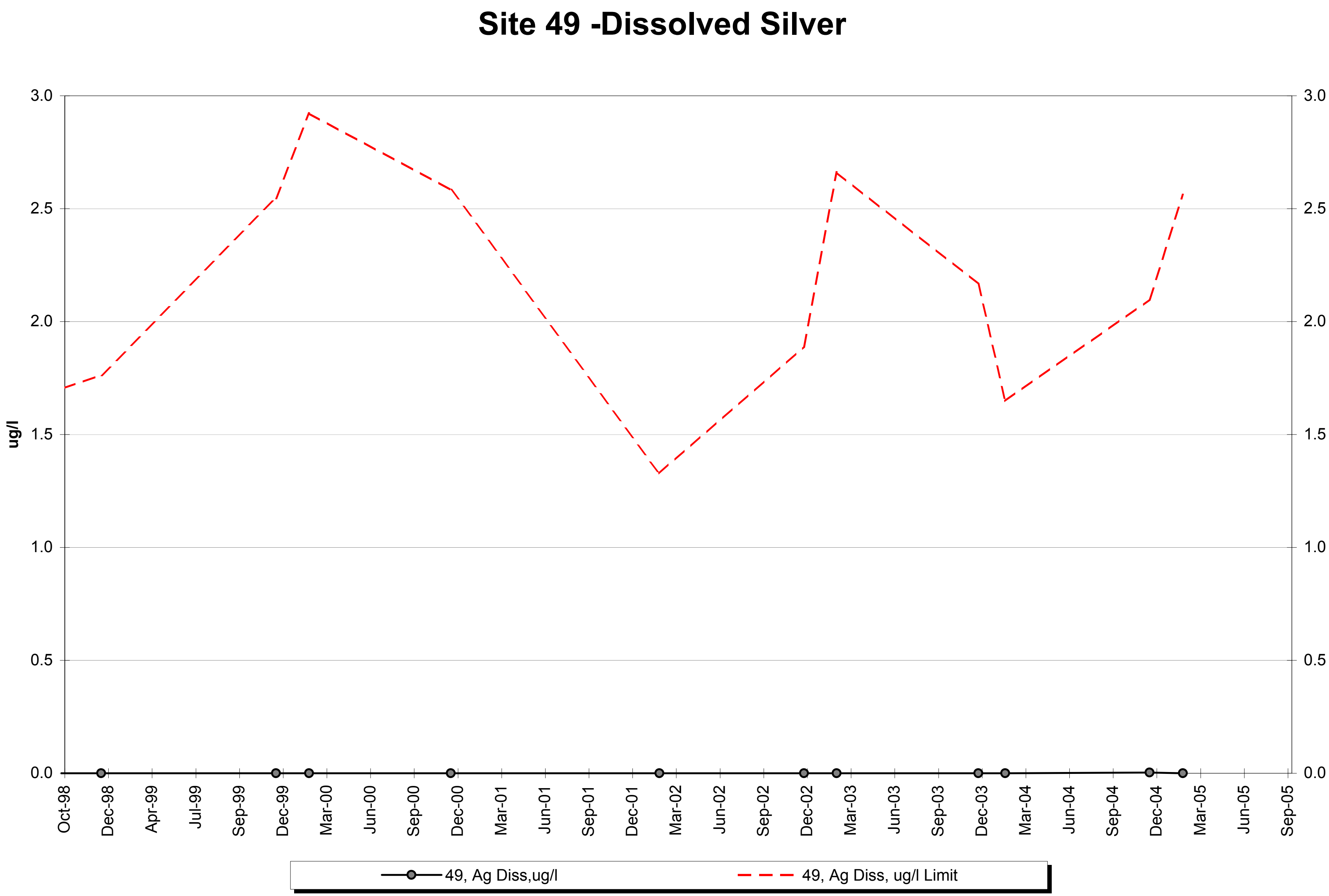
Site 49 -Dissolved Copper
ug/l
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
49, Cu Diss,ug/l
49, Cu Diss, ug/l Limit

Site 49 -Dissolved Lead



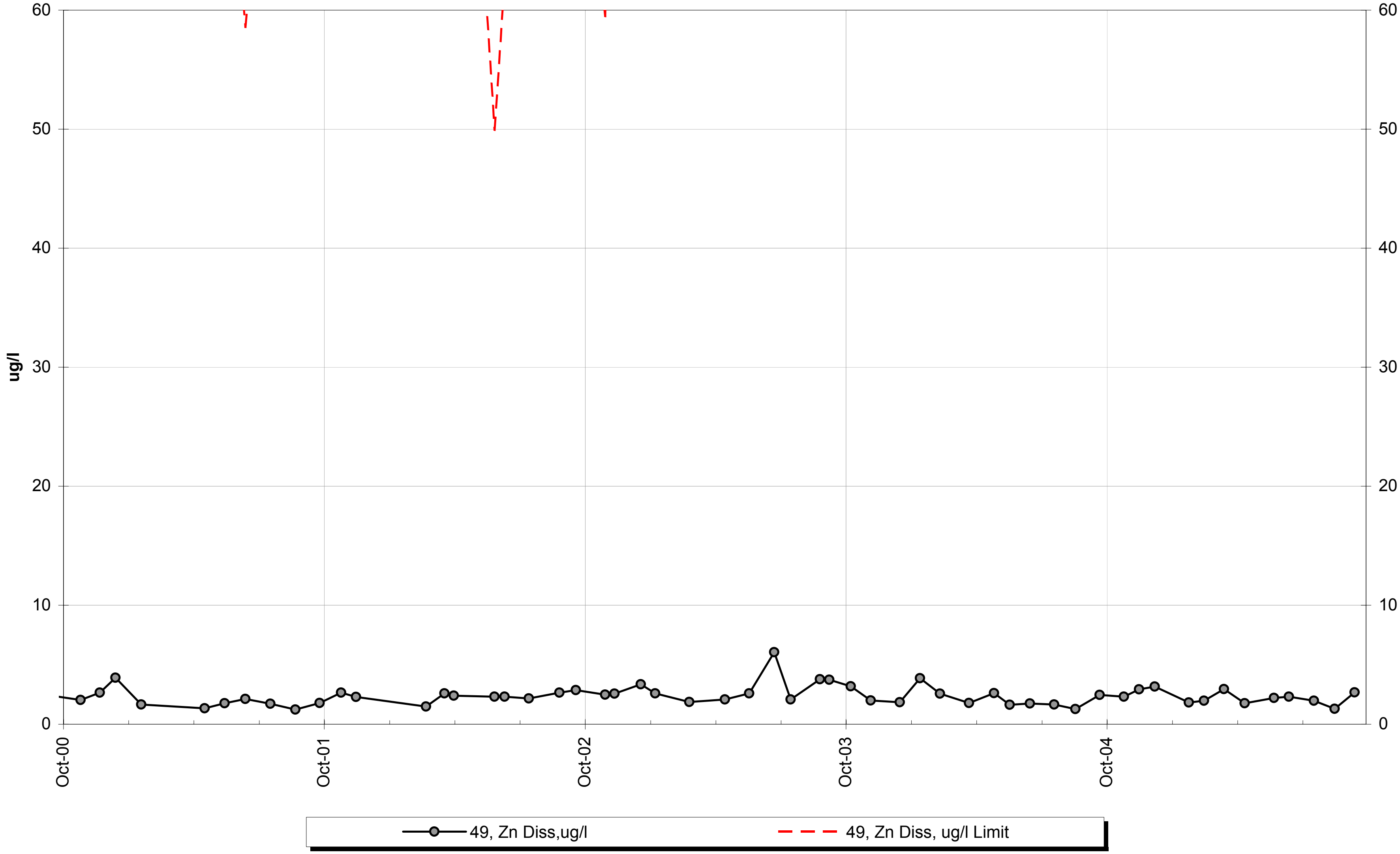
Site 49 -Dissolved Nickel

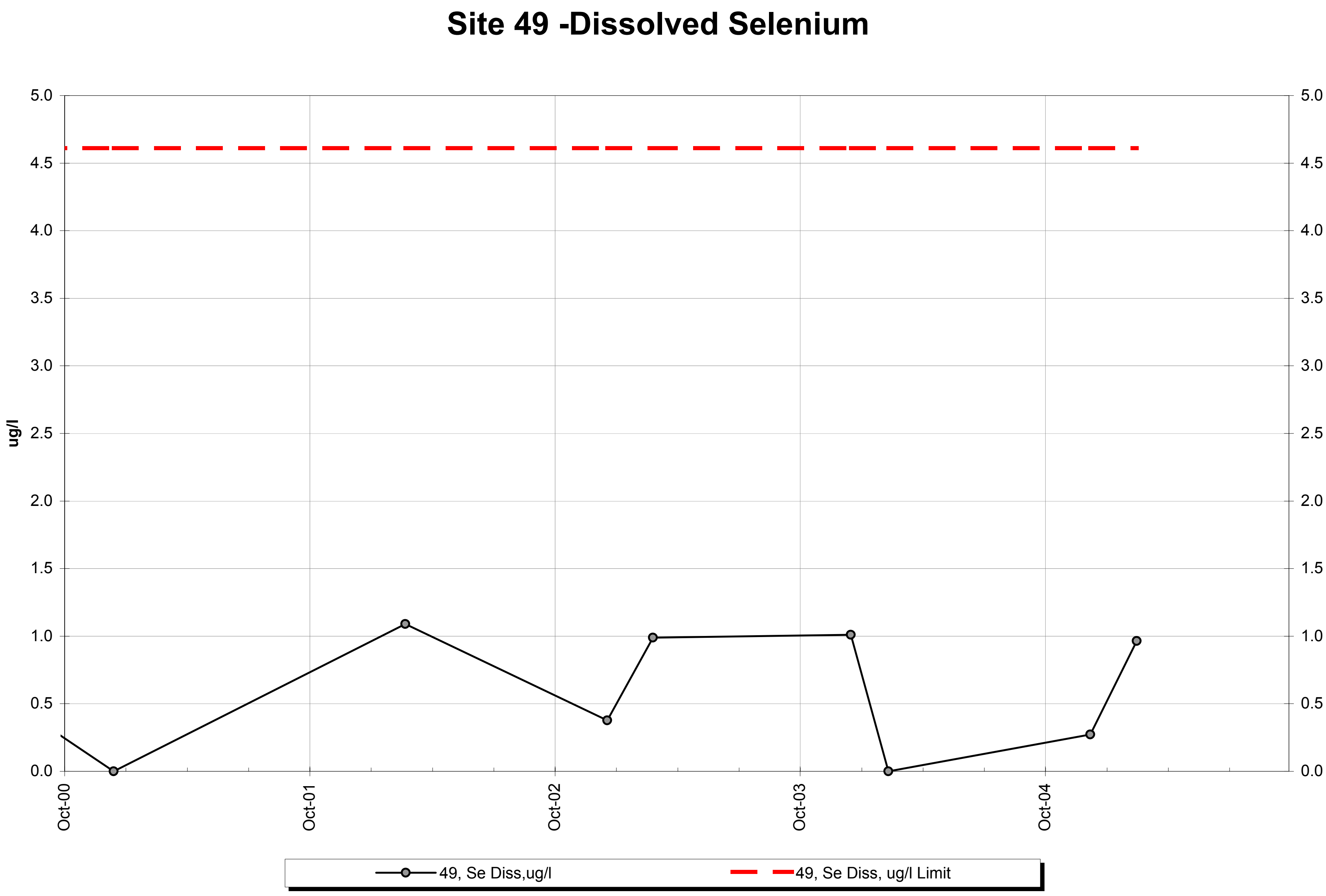




Site 49 -Dissolved Silver
ug/l
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
49, Ag Diss,ug/l
49, Ag Diss, ug/l Limit

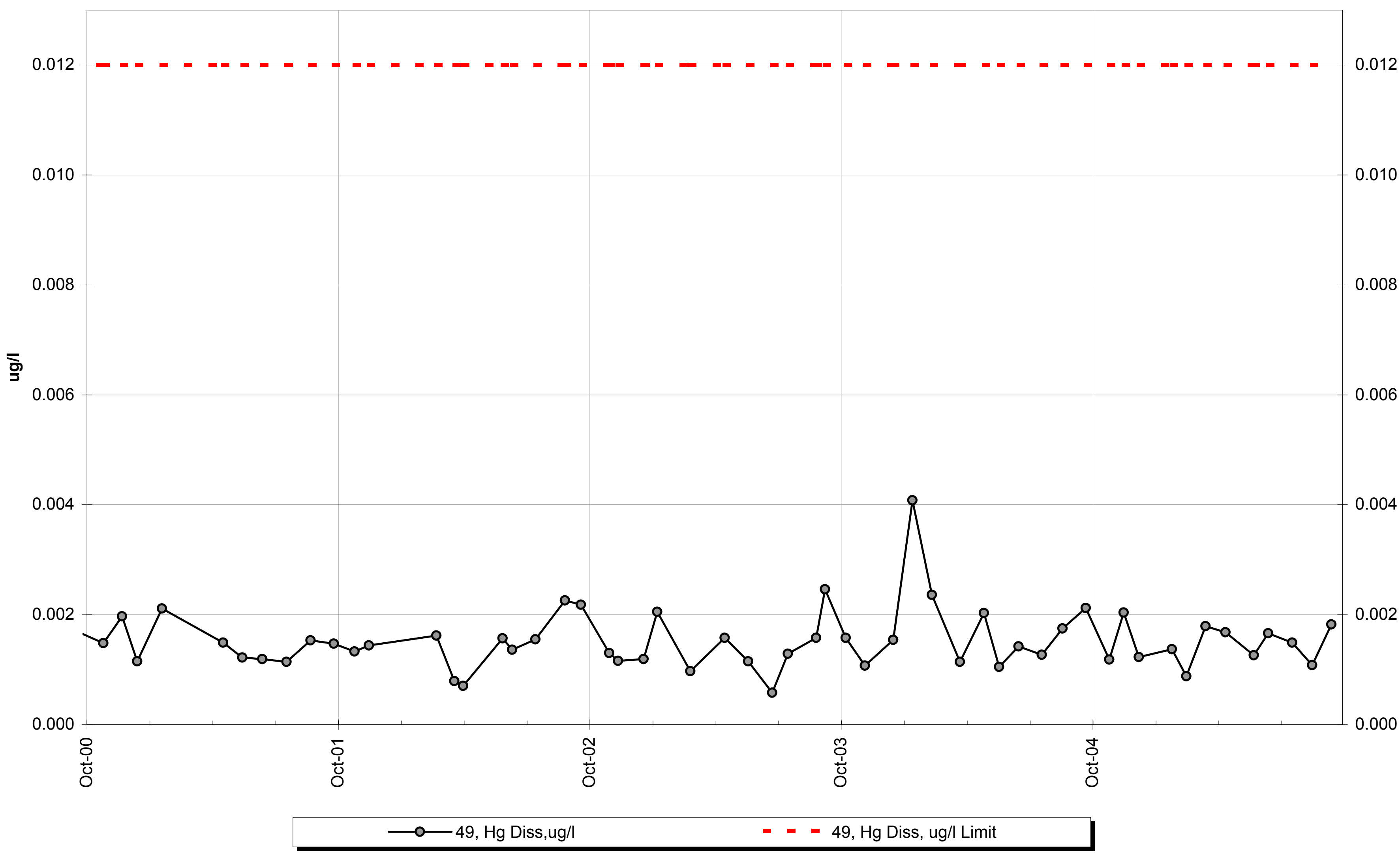
Site 49 -Dissolved Zinc





Site 49 -Dissolved Selenium
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
49, Se Diss,ug/l
49, Se Diss, ug/l Limit

Site 49 -Dissolved Mercury



Site **#49** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	124.0	130.0	163.0	146.0	181.0	183.0	147.0	116.0	89.6	117.0	137.0	126.0
b	**WY2001**	129.0	103.0	160.0	146.0			163.0	124.0	83.7	134.0	179.0	135.0
c	**WY2002**	147.0	156.0			169.0	194.0	203.0	65.5	106.0	133.0	119.0	127.0
d	**WY2003**	140.0	159.0	145.0	126.0	167.0		135.0	104.0	122.0	180.0	158.0	122.0
e	**WY2004**	160.0	157.0	155.0	99.4	134.0	177.0	133.0	88.8	116.0	188.0	193.0	121.0
f	**WY2005**	164.0	127.0	147.0	157.0	160.0	139.0	142.0	92.2	130.0	142.0	169.0	130.0
	n	6	6	5	5	5	4	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	1	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	-1	0			1	1	-1	1	1	1
c-a	1	1			-1	1	1	-1	1	1	-1	1
d-a	1	1	-1	-1	-1		-1	-1	1	1	1	-1
e-a	1	1	-1	-1	-1	-1	-1	-1	1	1	1	-1
f-a	1	-1	-1	1	-1	-1	-1	-1	1	1	1	1
c-b	1	1					1	-1	1	-1	-1	-1
d-b	1	1	-1	-1			-1	-1	1	1	-1	-1
e-b	1	1	-1	-1			-1	-1	1	1	1	-1
f-b	1	1	-1	1			-1	-1	1	1	-1	-1
d-c	-1	1			-1		-1	1	1	1	1	-1
e-c	1	1			-1	-1	-1	1	1	1	1	-1
f-c	1	-1			-1	-1	-1	1	1	1	1	1
e-d	1	-1	1	-1	-1		-1	-1	-1	1	1	-1
f-d	1	-1	1	1	-1		1	-1	1	-1	1	1
f-e	1	-1	-1	1	1	-1	1	1	1	-1	-1	1
S_k	13	3	-6	-1	-8	-4	-5	-5	11	9	5	-3
Qm	8.0								8.2			
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.44	0.56	-1.47	-0.24	-1.96	-1.36	-0.94	-0.94	2.07	1.69	0.94	-0.56
Z^2_k	5.96	0.32	2.16	0.06	3.84	1.85	0.88	0.88	4.27	2.86	0.88	0.32

ΣZ_k= 0.23

ΣZ^2_k= 24.28

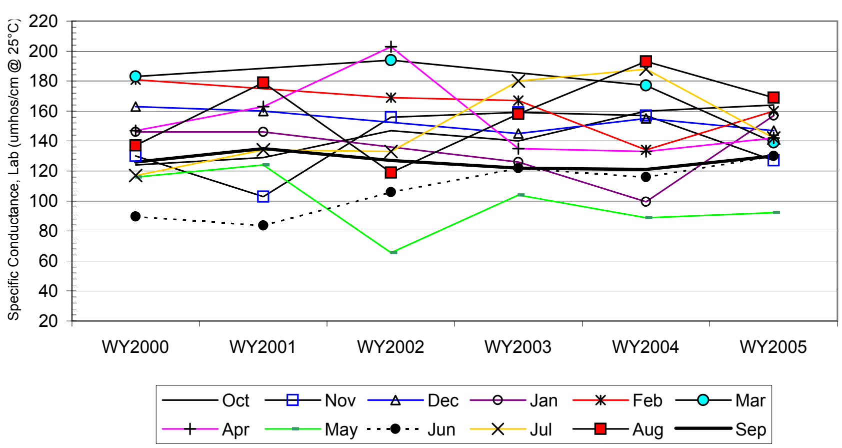
Z-bar=$\Sigma Z_k/K$= 0.02

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 67

ΣS_k 9

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	24.28	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
p	**0.012**		$\chi^2_h<\chi^2_{(K-1)}$ **REJECT**
$\Sigma VAR(S_k)$ 285.33	Z_{calc} 0.47	@α/2=2.5% Z= 1.96	H_0 (No trend) NA
	p **0.682**		H_A (± trend) NA



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.00		5.61
0.050	-1.96	**1.00**	5.00
0.100	-1.32		4.00
0.200	-1.00		3.41

Site **#49** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.7	7.3	7.2	7.6	7.5	7.7	7.7	7.7	7.3	7.7	7.5	7.7
b	**WY2001**	7.4	7.6	7.6	7.5			7.8	6.8	6.9	7.8	7.4	7.5
c	**WY2002**	7.4	7.4			7.4	7.8	7.5	7.0	7.3	8.2	8.0	8.1
d	**WY2003**	7.6	8.1	7.8	7.9	7.8		7.6	7.8	7.9	8.0	7.8	8.0
e	**WY2004**	8.0	8.0	7.8	7.6	7.6	7.8	8.0	7.5	7.9	8.0	8.0	8.1
f	**WY2005**	8.1	7.8	8.0	8.0	7.9	8.1	7.9	7.9	7.5	7.5	7.6	7.9
	n	6	6	5	5	5	4	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	1	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	1	1	-1			1	-1	-1	1	-1	-1
c-a	-1	1			-1	1	-1	-1	-1	1	1	1
d-a	-1	1	1	1	1		-1	1	1	1	1	1
e-a	1	1	1	-1	1	1	1	-1	1	1	1	1
f-a	1	1	1	1	1	1	1	1	1	-1	1	1
c-b	-1	-1					-1	1	1	1	1	1
d-b	1	1	1	1			-1	1	1	1	1	1
e-b	1	1	1	1			1	1	1	1	1	1
f-b	1	1	1	1			1	1	1	-1	1	1
d-c	1	1			1		1	1	1	-1	-1	-1
e-c	1	1			1	1	1	1	1	-1	0	-1
f-c	1	1			1	1	1	1	1	-1	-1	-1
e-d	1	-1	-1	-1	-1		1	-1	-1	-1	1	1
f-d	1	-1	1	1	1		1	1	-1	-1	-1	-1
f-e	1	-1	1	1	1	1	-1	1	-1	-1	-1	-1
S_k	7	7	8	4	6	6	5	7	5	-1	4	3

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.32	1.32	1.96	0.98	1.47	2.04	0.94	1.32	0.94	-0.19	0.75	0.56
Z^2_k	1.73	1.73	3.84	0.96	2.16	4.15	0.88	1.73	0.88	0.04	0.56	0.32

ΣZ_k= 13.40

ΣZ^2_k= 18.98

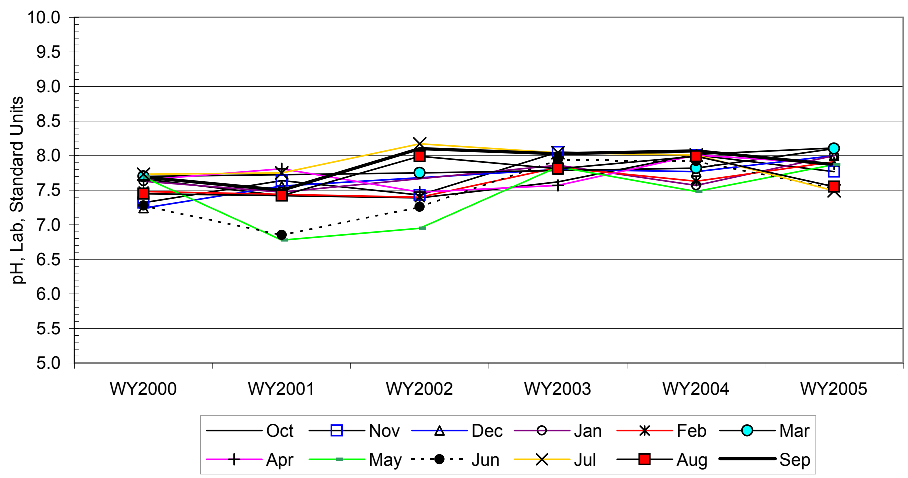
Z-bar=$\Sigma Z_k/K$= 1.12

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 67

ΣS_k 61

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	4.02	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.969**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 285.33	Z_{calc} 3.55	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
	p **1.000**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.04		0.13
0.050	0.05	0.09	0.11
0.100	0.06		0.11
0.200	0.07		0.10

1.2%

Site **#49** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	45.2	47.9	63.2	62.3	73.6	73.9	62.7	49.7	41.1	51.3	63.7	58.1
b	**WY2001**	46.9	47.3	71.8	63.0			66.7	55.4	38.2	59.3	76.7	61.6
c	**WY2002**	61.5	64.4			67.5	78.3	79.1	27.9	47.1	57.7	51.5	56.0
d	**WY2003**	73.9	63.1	63.8	57.4	74.3		60.3	47.4	58.4	74.5	71.2	56.7
e	**WY2004**	70.8	69.9	66.3	42.9	56.5	73.8	58.4	43.0	55.8	81.6	85.8	55.2
f	**WY2005**	77.5	60.6	70.4	78.3	83.7	70.4	74.4	48.8	63.8	64.6	74.2	58.7
	n	6	6	5	5	5	4	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1	1	1			1	1	-1	1	1	1
c-a	1	1			-1	1	1	-1	1	1	-1	-1
d-a	1	1	1	-1	1		-1	-1	1	1	1	-1
e-a	1	1	1	-1	-1	-1	-1	-1	1	1	1	-1
f-a	1	1	1	1	1	-1	1	-1	1	1	1	1
c-b	1	1					1	-1	1	-1	-1	-1
d-b	1	1	-1	-1			-1	-1	1	1	-1	-1
e-b	1	1	-1	-1			-1	-1	1	1	1	-1
f-b	1	1	-1	1			1	-1	1	1	-1	-1
d-c	1	-1			1		-1	1	1	1	1	1
e-c	1	1			-1	-1	-1	1	1	1	1	-1
f-c	1	-1			1	-1	-1	1	1	1	1	1
e-d	-1	1	1	-1	-1		-1	-1	-1	1	1	-1
f-d	1	-1	1	1	1		1	1	1	-1	1	1
f-e	1	-1	1	1	1	-1	1	1	1	-1	-1	1
S_k	13	5	4	0	2	-4	-1	-3	11	9	5	-3

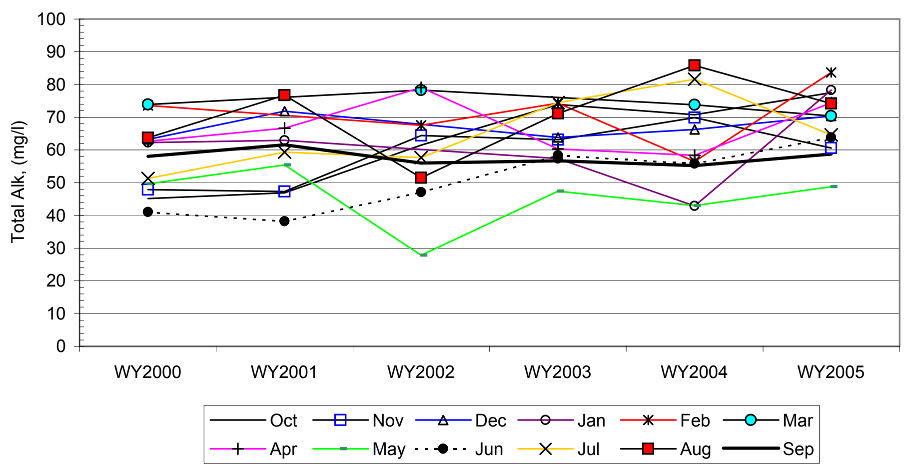
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	2.44	0.94	0.98	0.00	0.49	-1.36	-0.19	-0.56	2.07	1.69	0.94	-0.56
Z^2_k	5.96	0.88	0.96	0.00	0.24	1.85	0.04	0.32	4.27	2.86	0.88	0.32

ΣZ_k= 6.87
ΣZ^2_k= 18.58
Z-bar=ΣZ_k/K= 0.57

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 67
ΣS_k 38

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	14.64	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.200**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 285.33	Z_{calc} 2.19	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
	p **0.986**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.13		4.26
0.050	0.70	**2.32**	3.48
0.100	0.92		3.20
0.200	1.49		2.78
		3.7%	

Site **#49** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	2.2	3.1	1.4	1.6	1.2	1.3	1.6	1.4	1.9	1.6	2.1	2.4
b	**WY2001**	2.0	2.7	3.9	1.7			1.3	1.8	2.1	1.7	1.2	1.8
c	**WY2002**	2.7	2.3			1.5	2.6	2.4	2.3	2.3	2.2	2.7	2.9
d	**WY2003**	2.5	2.6	3.4	2.6	1.9		2.1	2.6	6.1	2.1	3.8	3.7
e	**WY2004**	3.2	2.0	1.8	3.9	2.6	1.8	2.6	1.6	1.8	1.7	1.3	2.5
f	**WY2005**	2.3	2.9	3.2	1.8	2.0	3.0	1.8	2.2	2.3	2.0	1.3	2.7
	n	6	6	5	5	5	4	6	6	6	6	6	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	1	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	-1	1	1			-1	1	1	1	-1	-1
c-a	1	-1			1	1	1	1	1	1	1	1
d-a	1	-1	1	1	1		1	1	1	1	1	1
e-a	1	-1	1	1	1	1	1	1	-1	1	-1	1
f-a	1	-1	1	1	1	1	1	1	1	1	-1	1
c-b	1	-1					1	1	1	1	1	1
d-b	1	-1	-1	1			1	1	1	1	1	1
e-b	1	-1	-1	1			1	-1	-1	-1	1	1
f-b	1	1	-1	1			1	1	1	1	1	1
d-c	-1	1			1		-1	1	1	-1	1	1
e-c	1	-1			1	-1	1	-1	-1	-1	-1	-1
f-c	-1	1			1	1	-1	-1	0	-1	-1	-1
e-d	1	-1	-1	1	1		1	-1	-1	-1	-1	-1
f-d	-1	1	-1	-1	1		-1	-1	-1	-1	-1	-1
f-e	-1	1	1	-1	-1	1	-1	1	1	1	1	1
S_k	5	-5	0	6	8	4	5	5	4	3	1	5

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	-0.94	0.00	1.47	1.96	1.36	0.94	0.94	0.75	0.56	0.19	0.94
Z^2_k	0.88	0.88	0.00	2.16	3.84	1.85	0.88	0.88	0.56	0.32	0.04	0.88

ΣZ_k= 9.11

ΣZ^2_k= 13.18

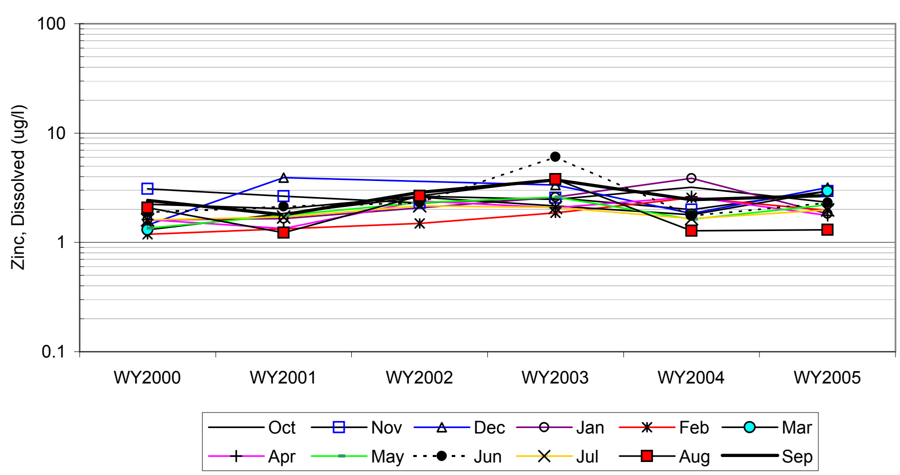
Z-bar=$\Sigma Z_k/K$= 0.76

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 67

ΣS_k 41

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	6.26	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.855**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 2.37	@α/2=2.5% Z= 1.96	**H_0** (No trend)	REJECT
285.33	**p** **0.991**		**H_A** (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	0.00		0.21
0.050	0.02	**0.09**	0.18
0.100	0.04		0.16
0.200	0.05		0.13
		4.3%	

INTERPRETIVE REPORT
SITE 46 "LOWER BRUIN CREEK"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No visually obvious trends are apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented on the pages following this interpretive section. The table below summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). For data sets with a statistically significant trend ($\alpha/2$=2.5%) a Seasonal-Sen's Slope estimate statistic has also been calculated. The dataset for conductivity failed the test for seasonal (monthly) homogeneity. Conductivity showed significant upward trends in October (S_k=13, Q_m=8.5 uS/cm•yr) and June (S_k=11, Q_m=7.3 uS/cm•yr). These monthly trends are nearly identical to those identified at Site 49, the upgradient control site. A significant trend (p=0.99) was identified for pH and has a slope estimate of 0.06 su/yr or a 0.8% increase over the six year period. This trend is also very similar to the pH trend

Site 46-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistic			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	Fails Test for Monthly Homogeneity				
pH, Lab	6	2.16	+	**0.99**	0.06	0.8
Alkalinity, Total	6	1.81	+	0.97		
Zinc, Dissolved	6	1.74	+	0.96		

(1): Number of years (2):Significance level

identified at Site 49. Given the low magnitude and correspondingly identified trends at Site 49, the upgradient control site, the trends identified for Site 46 are considered to be due to natural variation.

A comparison of median values for alkalinity, lab pH, lab conductivity, sulfate, and dissolved zinc between Site 49 and Site 46 has been conducted as specified in the Statistical Information Goals for Site 46. Additionally, X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 46 and Site 49, the upstream control site, to aid in the comparison between those sites. Calculation details of the non-parametric signed-rank tests are presented in detail on the pages following this interpretive section. The table below summarizes the results of the signed-rank test as performed on the Water Year 2005 data set. Additional tables summarizing results for Water Years 2000-2004 can also be found following this interpretive section. For conductivity, alkalinity, and dissolved zinc there are no statistically significant differences between the measured median values at a significance level of α=0.05 for a one-tailed test. The lab pH is identified as being significantly (p=1.00) different. The median values for pH for Site 49 and Site 46 are 7.88-s.u. and 7.73-s.u respectively and the median of differences, Site 49 minus Site 46, is 0.09-s.u. Applying a similar analysis to prior water years' data sets does not yield any significant differences for the past five water years. Given the small magnitude and the inconsistency with prior water years' datasets, the current statistically significant difference is considered an anomaly. Additionally, the absence of any other indicators such as a statistically significant increase in conductivity or decrease in alkalinity indicate that the lower pH values at the downgradient site are not due to waters that are substantially influenced by contact with the byproducts of pyrite oxidation. If in future water years the significant statistical difference in pH continues, KGCMC will reassess this interpretation and evaluate if additional data collection is warranted.

Site 46 vs. Site 49 - WY2005, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
Conductivity, Lab	0.25	142.0	142.5	-1.0
pH, Lab	**1.00**	7.88	7.73	0.09
Alkalinity, Total	0.15	70.4	69.0	-0.8
Sulfate, Total	0.79	10.7	10.7	0.1
Zinc, Dissolved	0.94	2.26	1.93	0.46

Table of Results for Water Year 2005

Site 46 "Lower Bruin Creek"													
Sample Date/Parameter	10/26/2004	11/16/2004	12/8/2004	1/25/2005	2/15/2005	3/15/2005	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	2.4	5.3	0.7	1.2	1.2	2.3	2.5	6.9	9.1	10.9	12.0	9.0	3.9
Conductivity-Field(μmho)	173	131	148	162	167	143	155	98	139	144	171	138	146
Conductivity-Lab (μmho)	165	128	148	159	157	140 J	127	94	130	145	169	130	143
pH Lab (standard units)	7.99	7.70	7.99	7.93	7.75	7.68	7.90	7.71	7.05	7.44	6.79	7.84	7.73
pH Field (standard units)	8.03	7.76	8.34	7.81	7.91	8.02	7.86	7.97	7.05	8.15	7.46	8.22	7.94
Total Alkalinity (mg/L)	79.4 J	63.5	70.2	78.6	81.1	71.6 J	57.7	51.4	64.2	67.7	73.6	60.9	69.0
Total Sulfate (mg/L)	11.9	9.0	9.7	12.0	14.3	10.1	19.5	5.7	10.5	10.8	13.9	9.2	10.7
Hardness (mg/L)	83.9	69.3	77.0	76.1	82.6	69.2	51.0	50.6	72.2	75.7	88.7	74.8	75.3
Dissolved As (ug/L)	0.201	0.270	0.293	0.184	0.137	0.314	0.169 J	0.157	0.173	0.215	0.179 J	0.289	0.193
Dissolved Ba (ug/L)			10.5		11.9								11.2
Dissolved Cd (ug/L)	0.023 U	0.027	0.026 U	0.024	0.026	0.026	0.061	0.023 U	0.024	0.020	0.032	0.028	0.026
Dissolved Cr (ug/L)			1.080		0.250								0.665
Dissolved Cu (ug/L)	0.408	0.996	0.411	0.452 U	0.449	0.512	0.624	0.380	0.532 U	0.534	0.578	0.557	0.522
Dissolved Pb (ug/L)	0.0103 U	0.0137 U	0.0205 U	0.0080 U	<0.0050	0.0421 U	0.0287 U	0.0112 U	0.0094 U	0.0077 J	0.0247 U	0.0195 U	0.0125
Dissolved Ni (ug/L)			1.140		0.966								1.053
Dissolved Ag (ug/L)			<0.002		<0.003								0.001
Dissolved Zn (ug/L)	2.87	2.42 U	2.01	1.38	1.41 UJ	2.47 U	9.06 J	1.85 U	1.82	1.56 U	1.20 J	2.09 U	1.93
Dissolved Se (ug/L)			0.487		0.720								0.604
Dissolved Hg (ug/L)	0.001210 U	0.002250	0.001220	0.001520	0.000910	0.001970	0.001300 U	0.001410 U	0.001500 U	0.001580 U	0.000907 U	0.001890	0.001455

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
46	01/25/2005	12:17:00 PM				
			Cu Diss, ug/l	0.452	U	Field Blank Contamination
			Pb Diss, ug/l	0.00802	U	Field Blank Contamination
46	10/26/2004	12:52:00 PM				
			Alk Tot, mg/l	79.4	J	Hold Time
			Cd Diss, ug/l	0.0228	U	Field Blank Contamination
			Pb Diss, ug/l	0.0103	U	Field Blank Contamination
			Hg Diss, ug/l	0.00121	U	Field Blank Contamination
46	11/16/2004	10:52:00 AM				
			Pb Diss, ug/l	0.0137	U	Field Blank Contamination
			Zn Diss, ug/l	2.42	U	Field Blank Contamination
46	12/08/2004	1:15:00 PM				
			Cd Diss, ug/l	0.0259	U	Method Blank Contamination
			Pb Diss, ug/l	0.0205	U	Method Blank Contamination
46	02/15/2005	10:34:00 AM				
			Zn Diss, ug/l	1.41	UJ	Field Blank Contamination, LC
46	03/15/2005	11:40:00 AM				
			Cond Lab, umho	140	J	Holdtime
			Alk Tot, mg/l	71.6	J	Holdtime
			Pb Diss, ug/l	0.0421	U	Field Blank Contamination
			Zn Diss, ug/l	2.47	U	Field Blank Contamination
46	04/13/2005	11:52:00 AM				
			As Diss, ug/l	0.169	J	LCS Recovery
			Pb Diss, ug/l	0.0287	U	Field Blank Contamination
			Zn Diss, ug/l	9.06	J	LCS Recovery
			Hg Diss, ug/l	0.0013	U	Field Blank Contamination
46	05/24/2005	8:40:00 AM				
			Cd Diss, ug/l	0.023	U	Field Blank Contamination
			Pb Diss, ug/l	0.0112	U	Field Blank Contamination
			Zn Diss, ug/l	1.85	U	Field Blank Contamination
			Hg Diss, ug/l	0.00141	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

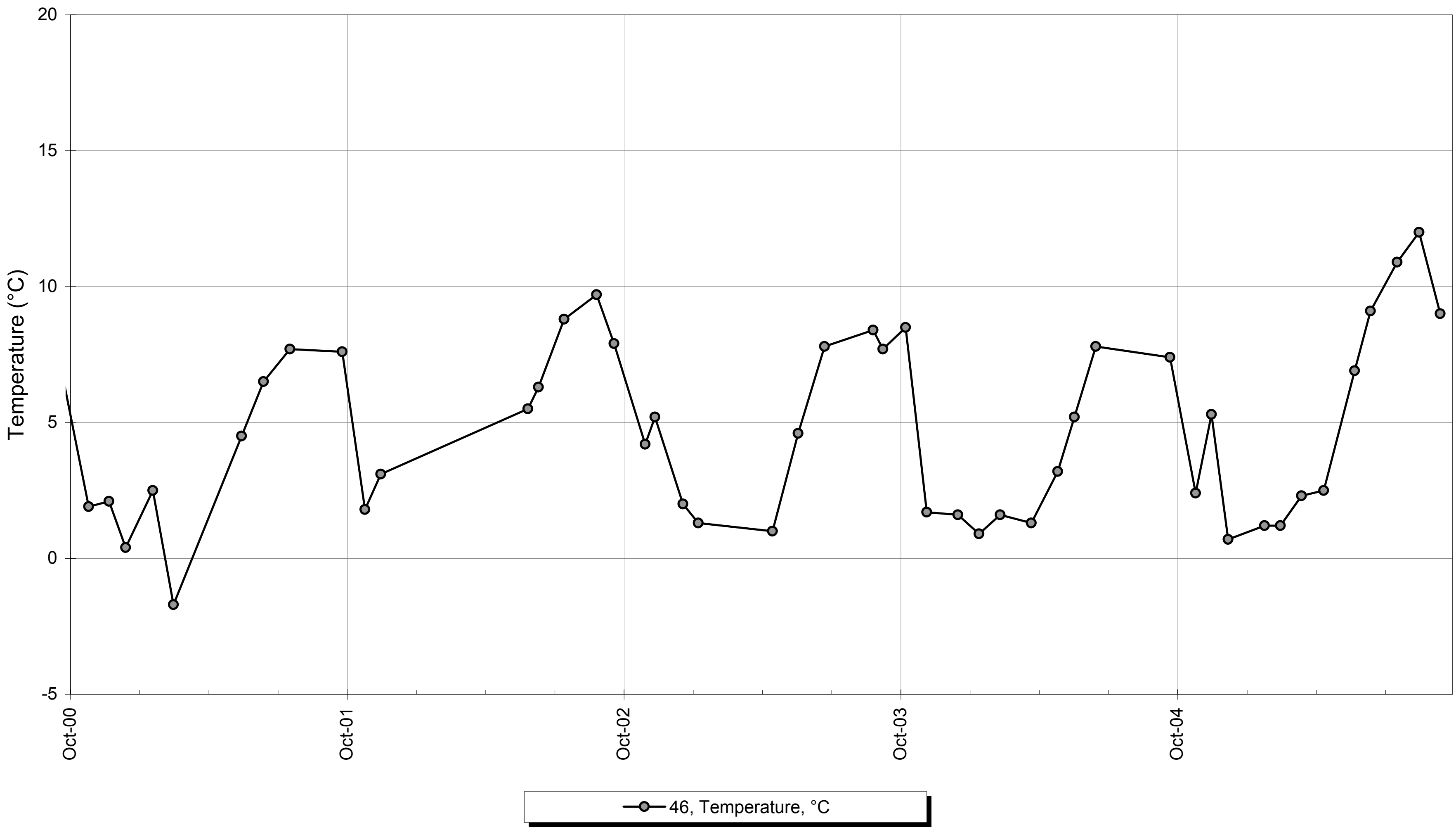
Qualified Data by QA Reviewer

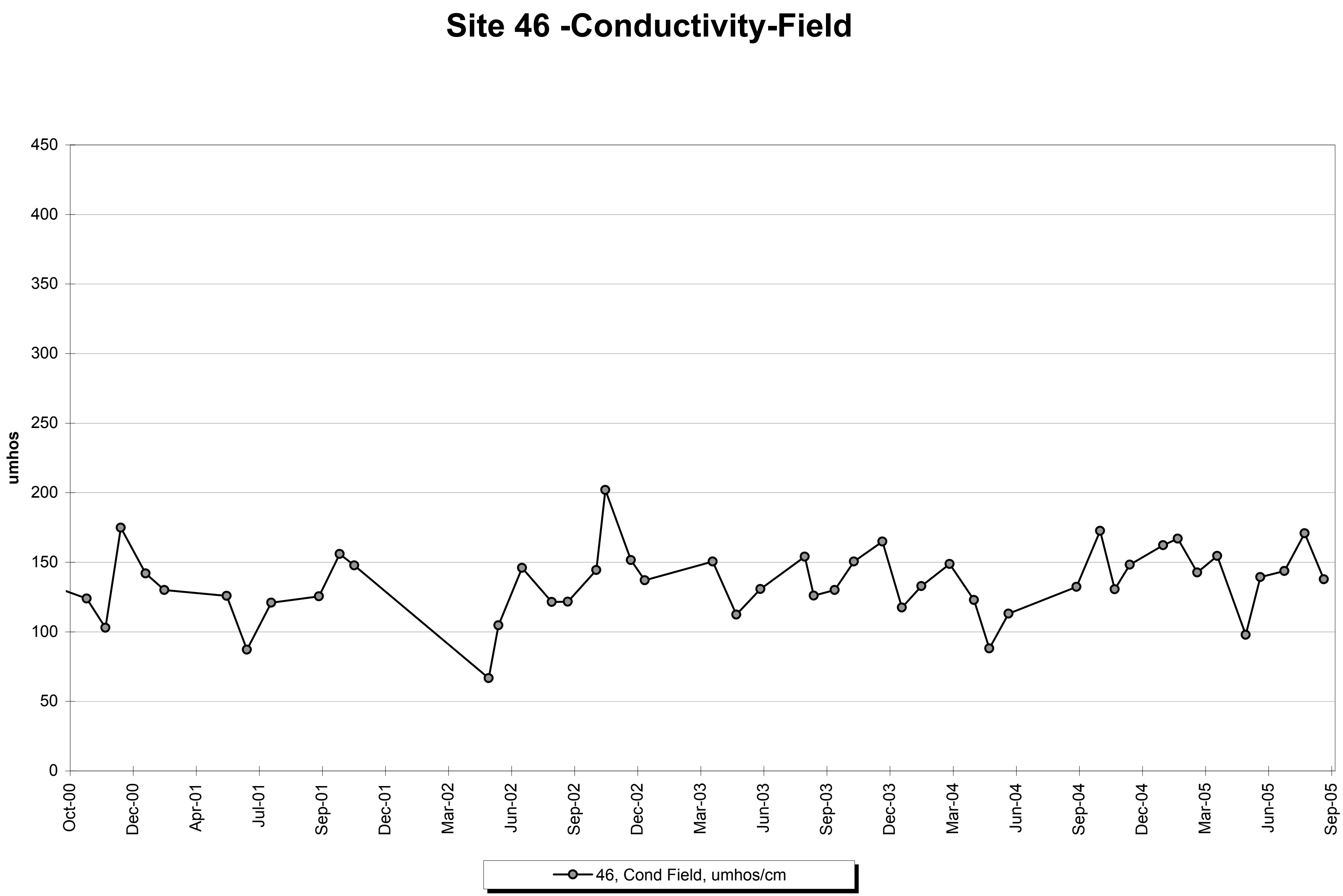
Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
46	06/14/2005	12:14:00 PM				
			Cu Diss, ug/l	0.532	U	Field Blank Contamination
			Pb Diss, ug/l	0.00941	U	Field Blank Contamination
			Hg Diss, ug/l	0.0015	U	Field Blank Contamination
46	07/19/2005	1:01:00 PM				
			Pb Diss, ug/l	0.00773	J	Field Blank Contamination
			Zn Diss, ug/l	1.56	U	Field Blank Contamination
			Hg Diss, ug/l	0.00158	U	Field Blank Contamination
46	08/17/2005	10:45:00 AM				
			As Diss, ug/l	0.179	J	LCS Recovery
			Pb Diss, ug/l	0.0247	U	Field Blank Contamination
			Zn Diss, ug/l	1.2	J	LCS Recovery
			Hg Diss, ug/l	0.000907	U	Field Blank Contamination
46	09/14/2005	10:55:00 AM				
			Pb Diss, ug/l	0.0195	U	Field Blank Contamination
			Zn Diss, ug/l	2.09	U	Field Blank Contamination

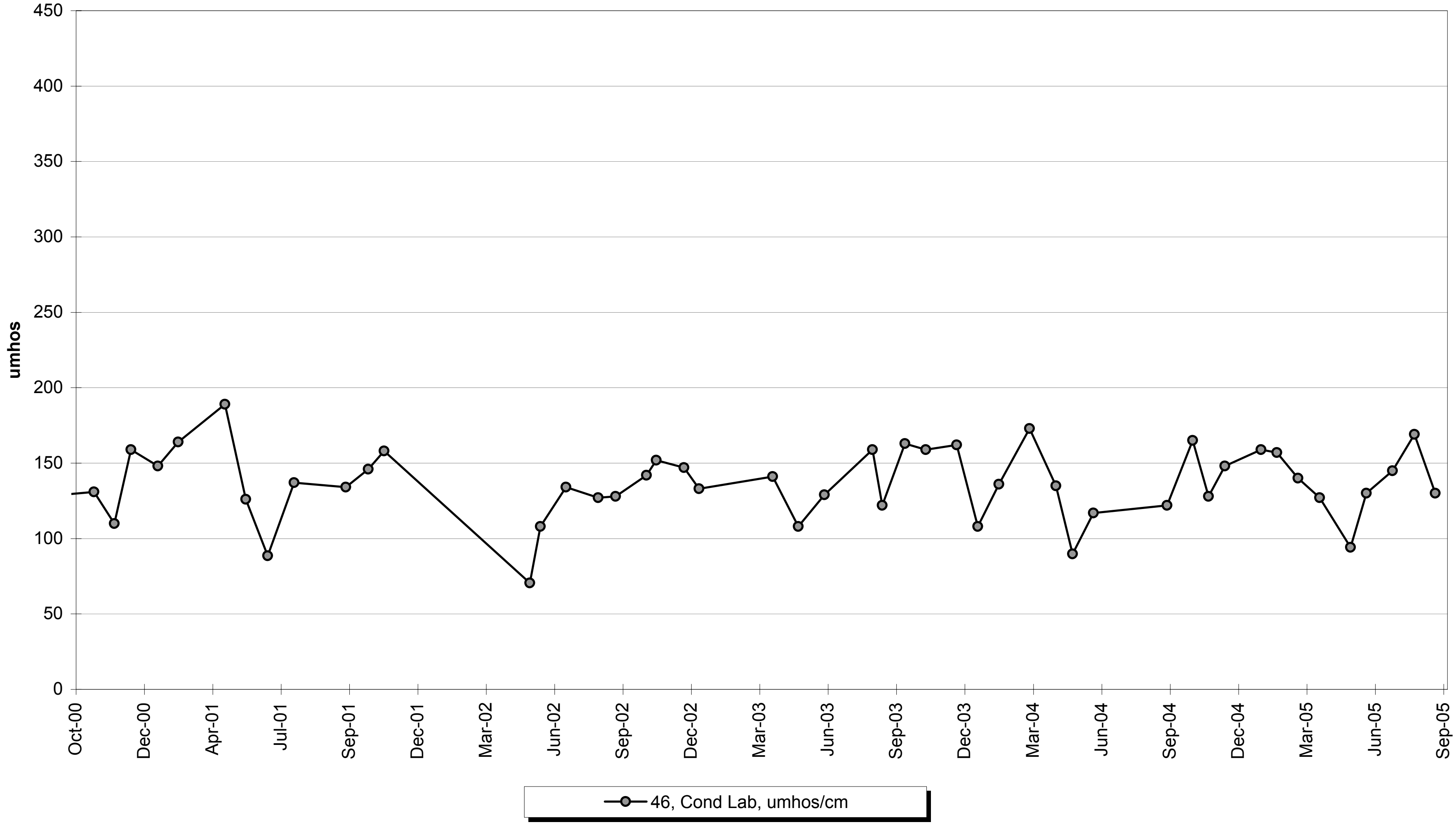
Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

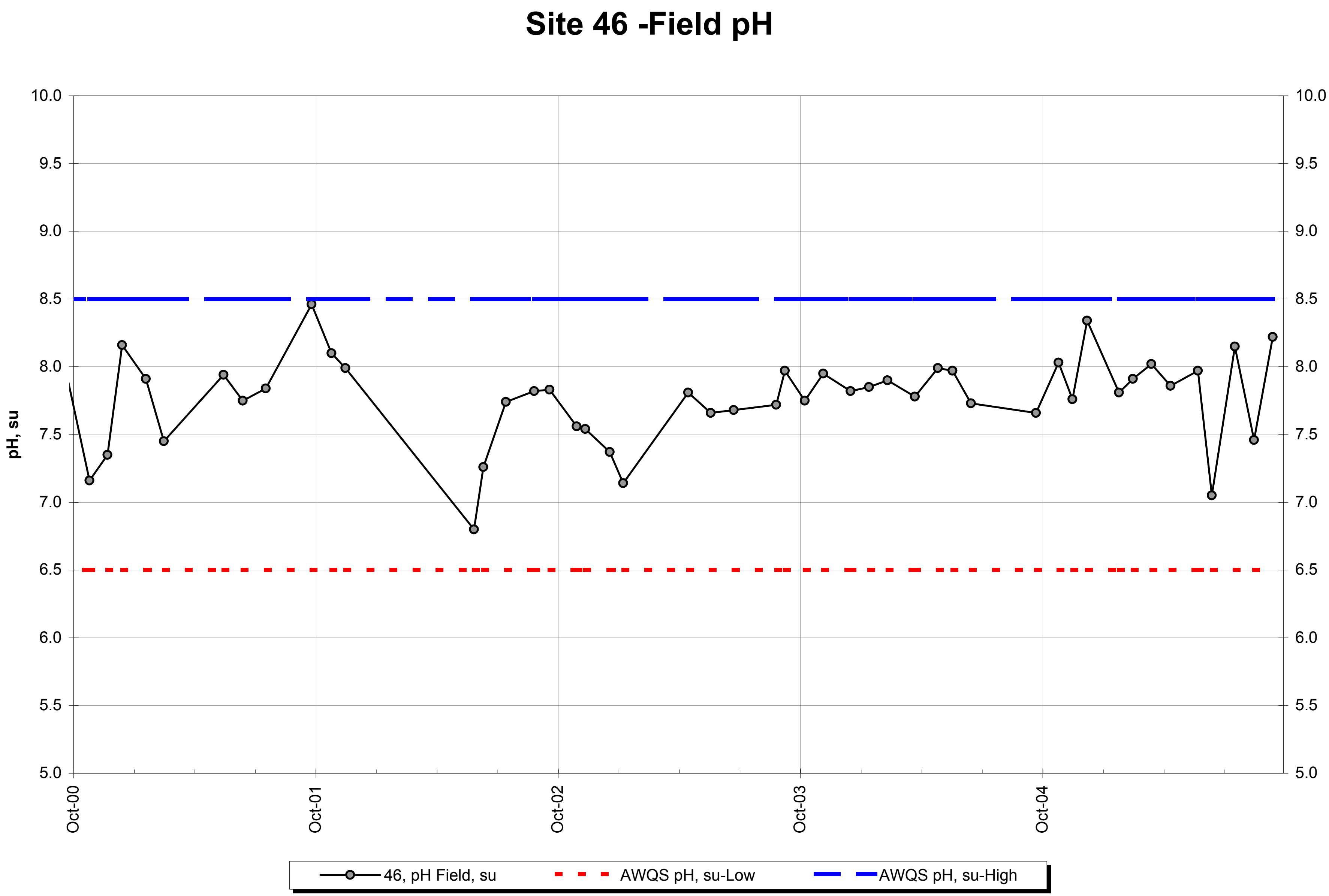
Site 46 -Water Temperature



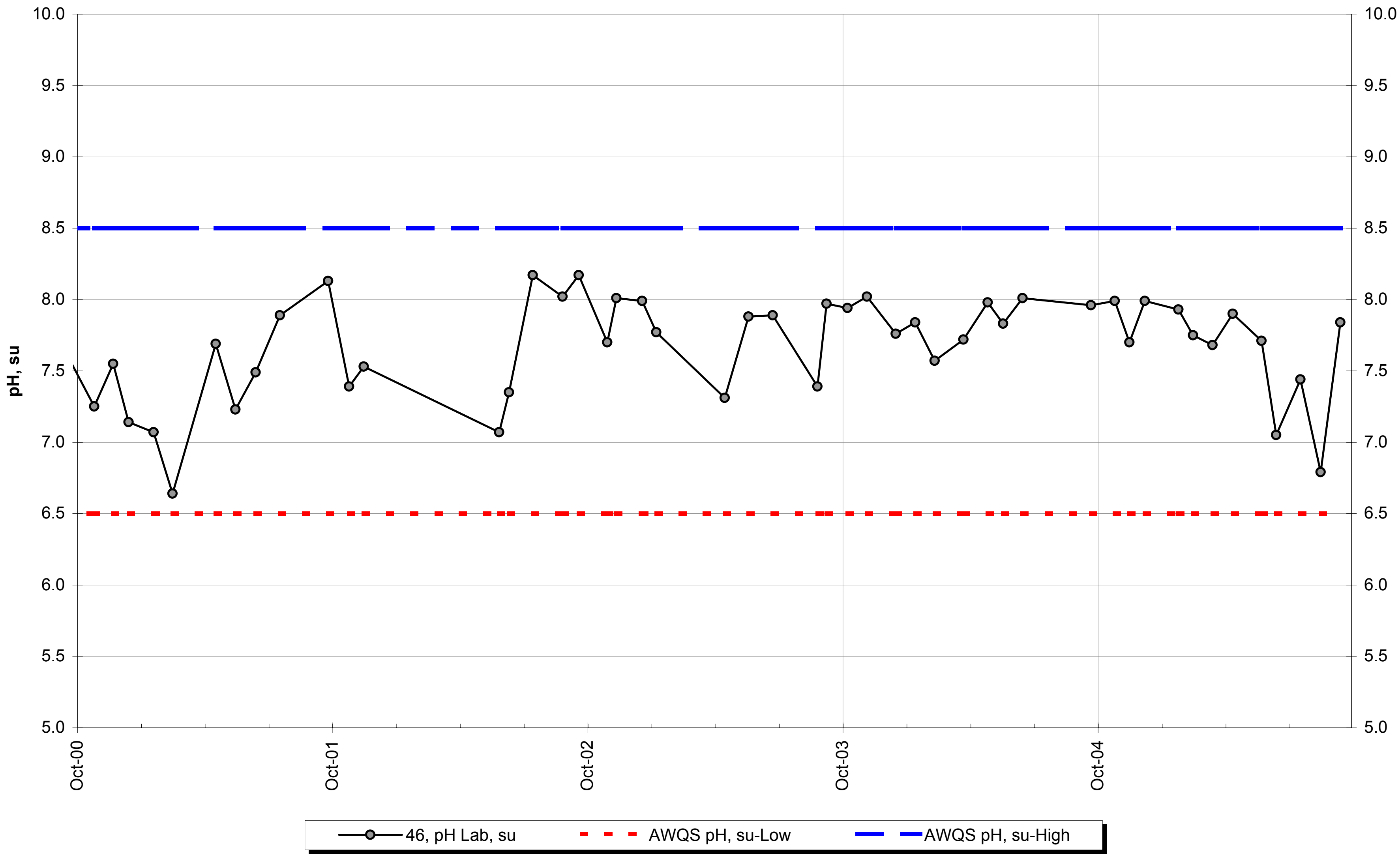

Site 46 -Conductivity-Field
umhos
450
400
350
300
250
200
150
100
50
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
46, Cond Field, umhos/cm

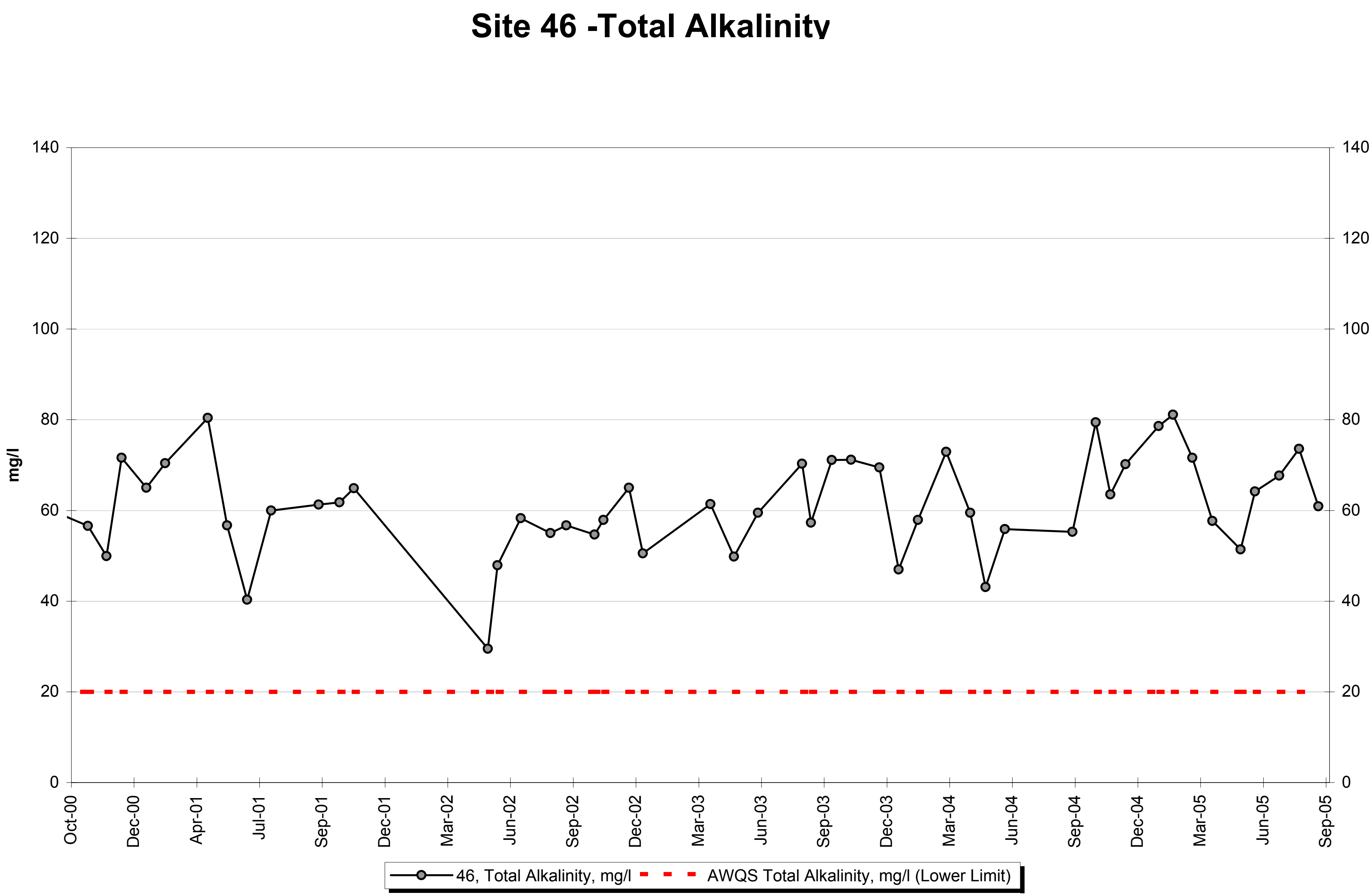
Site 46 -Conductivity-Lab




Site 46 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
46, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

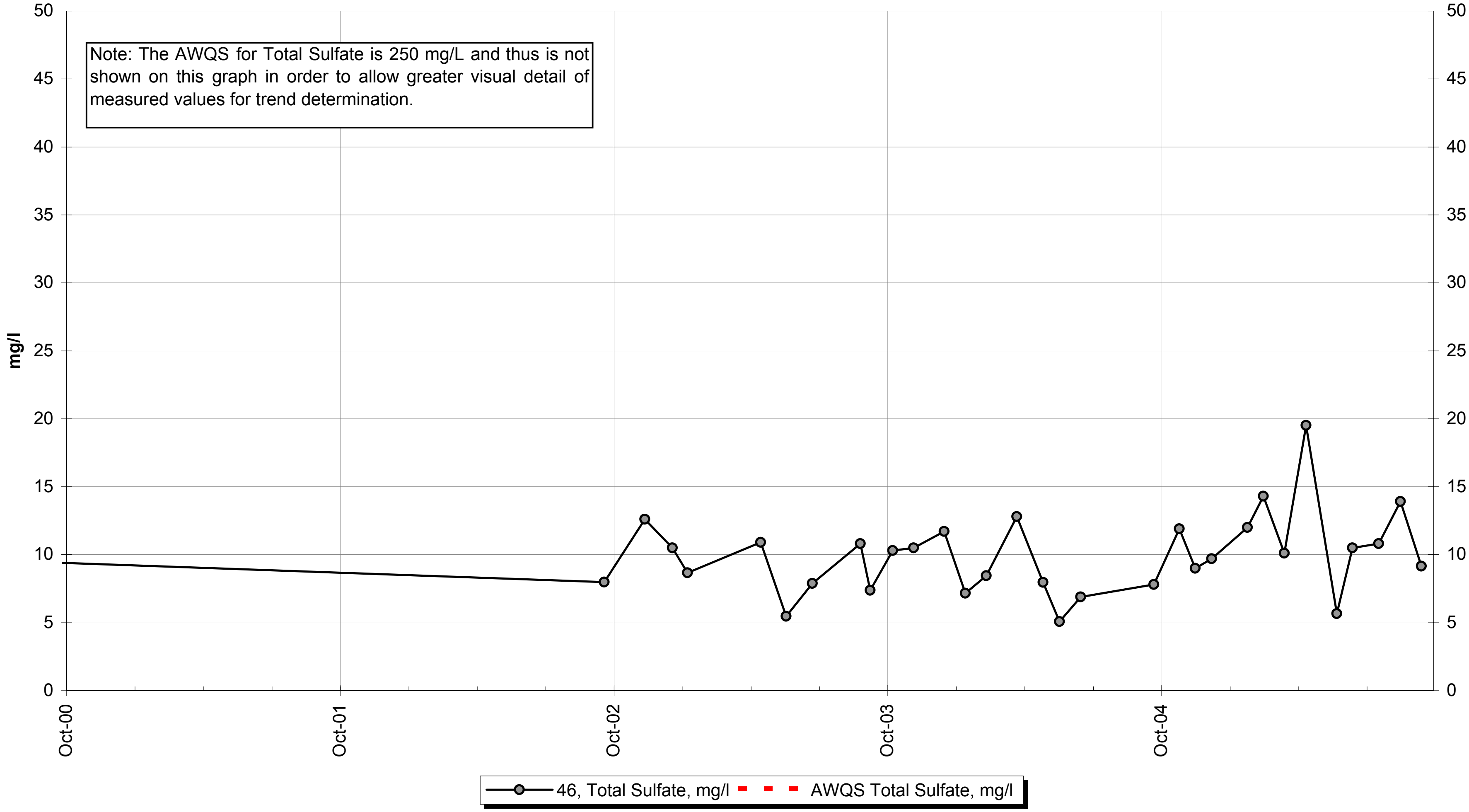
Site 46 -Lab pH



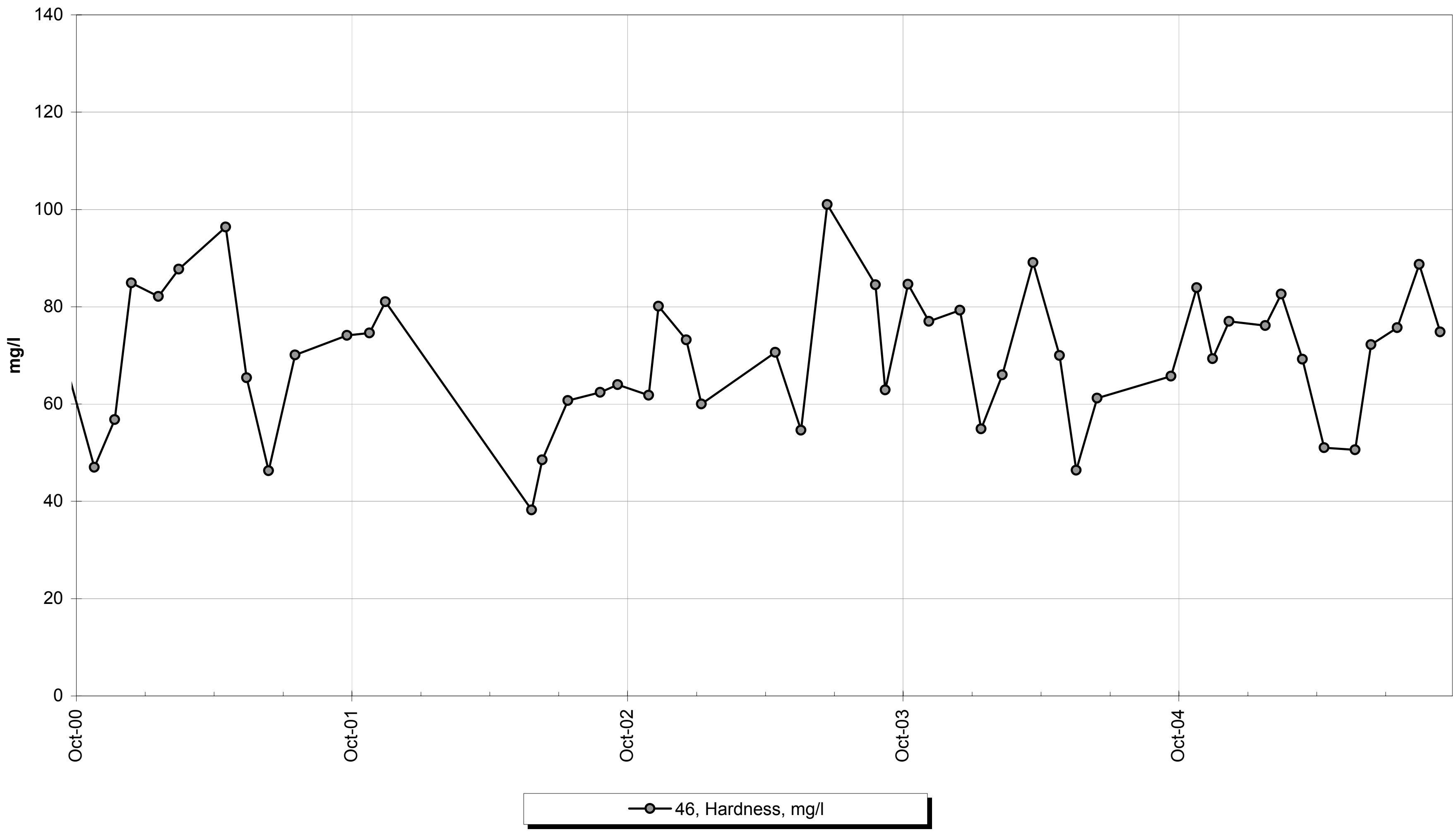


Site 46 -Total Alkalinity
mg/l
140
120
100
80
60
40
20
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
46, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

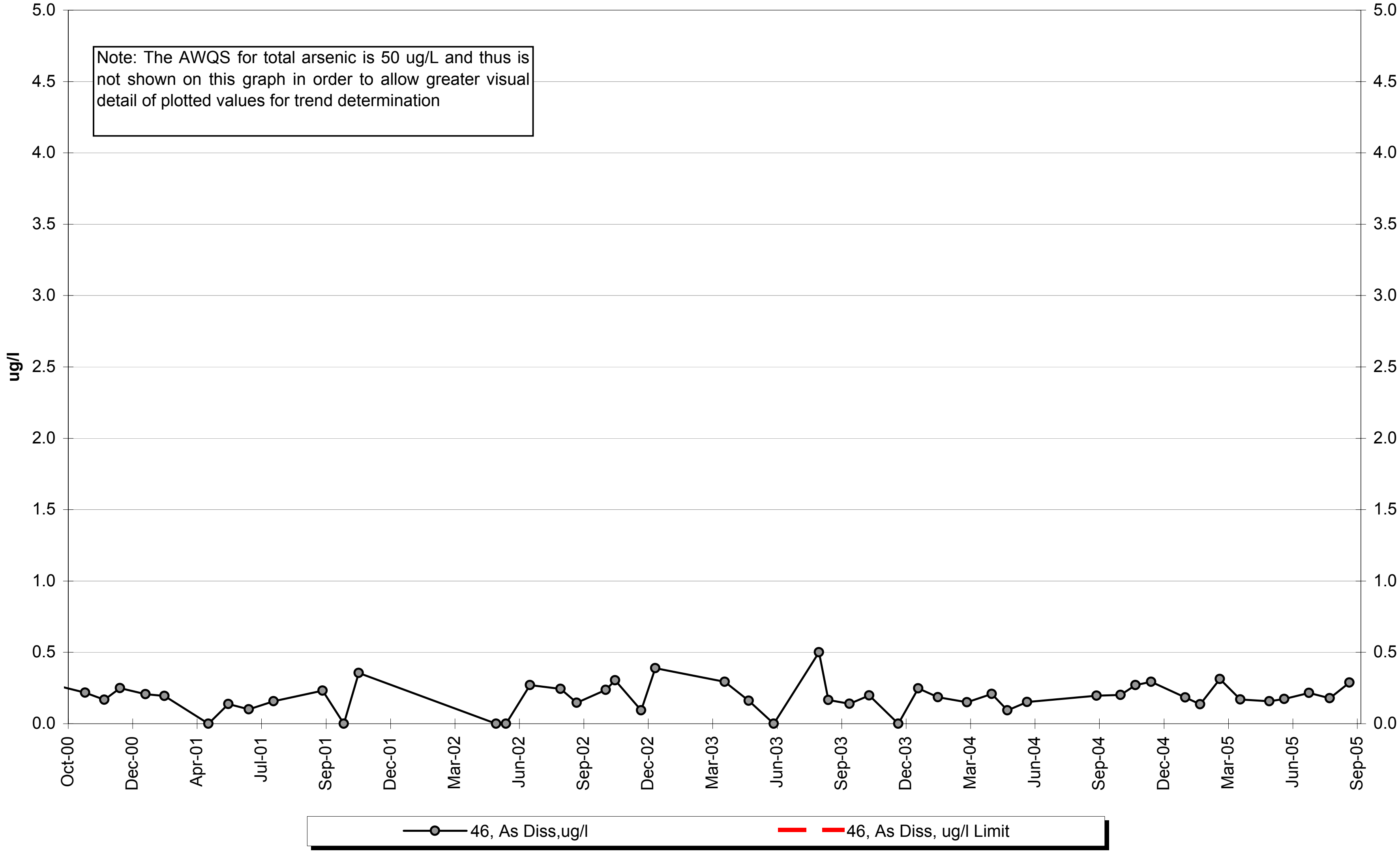
Site 46 -Total Sulfate



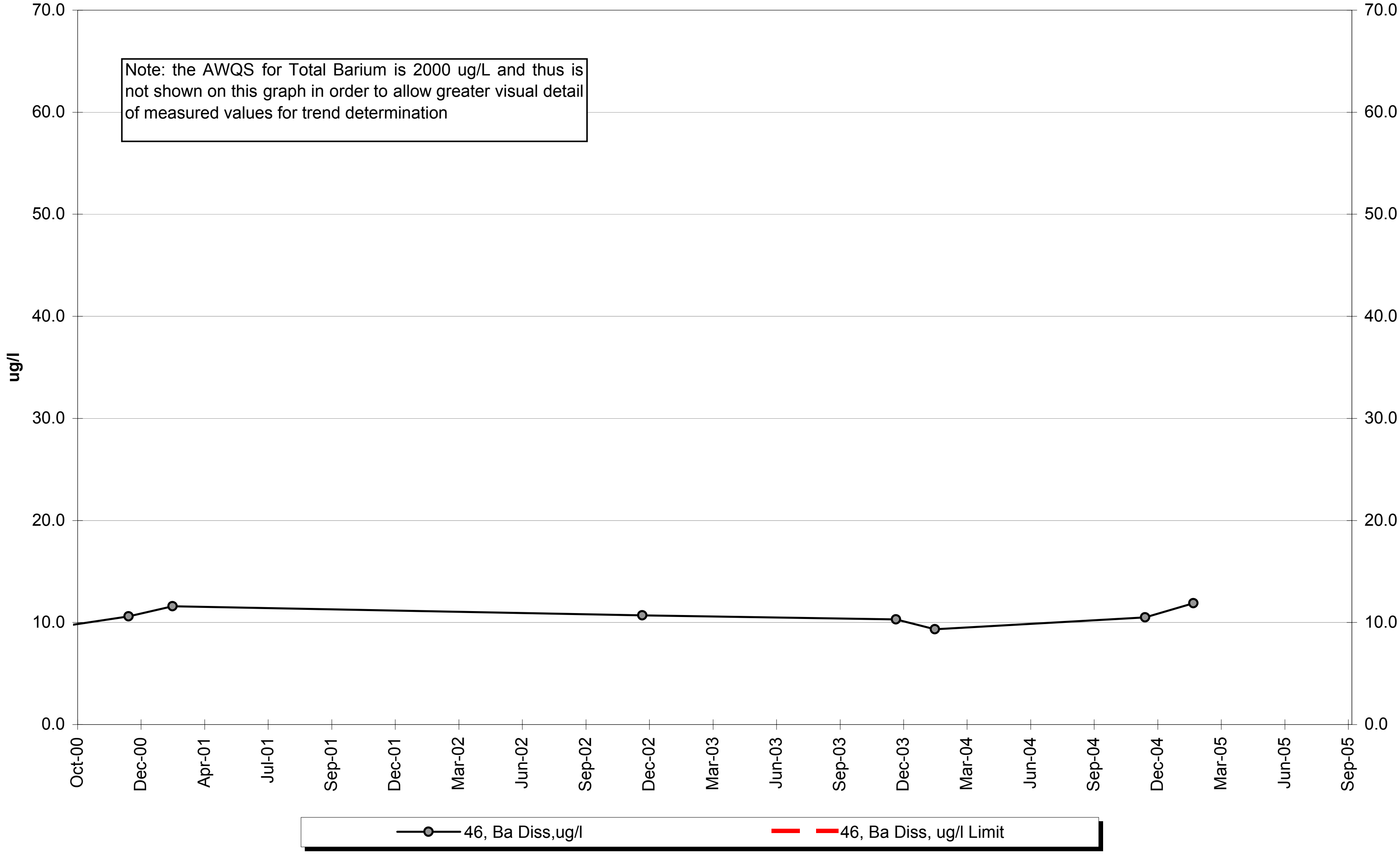
Site 46 -Hardness



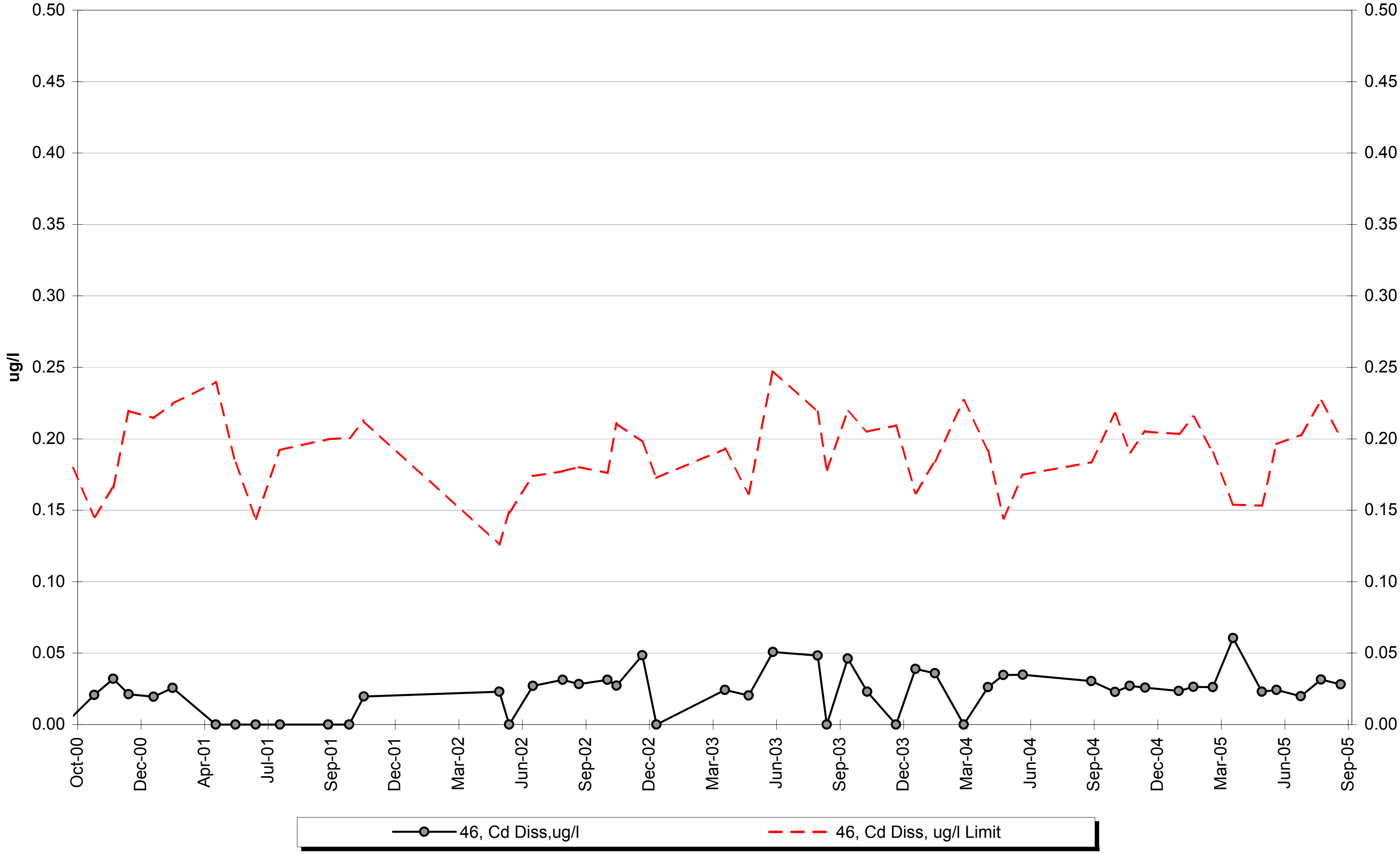
Site 46 -Dissolved Arsenic



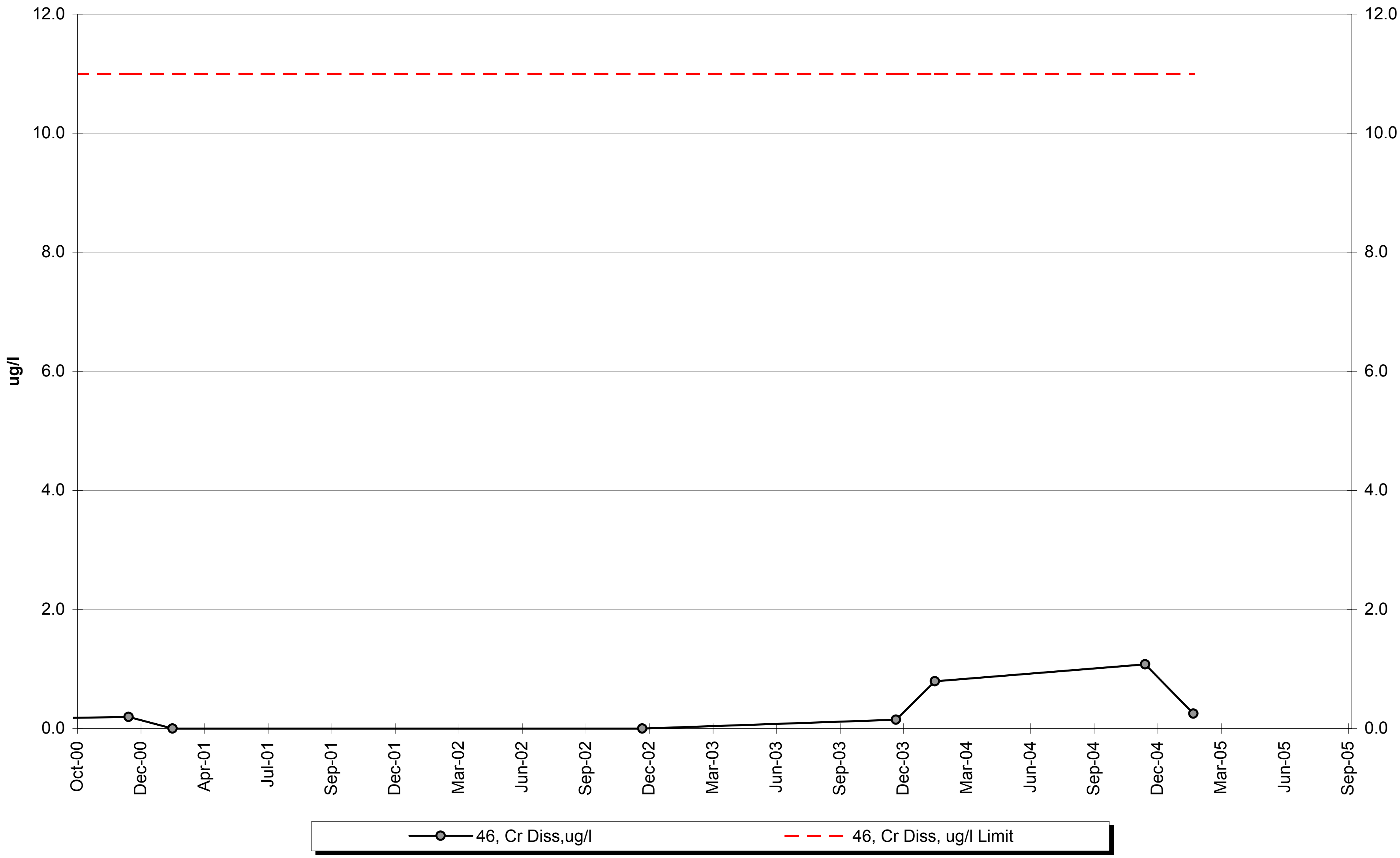
Site 46 -Dissolved Barium



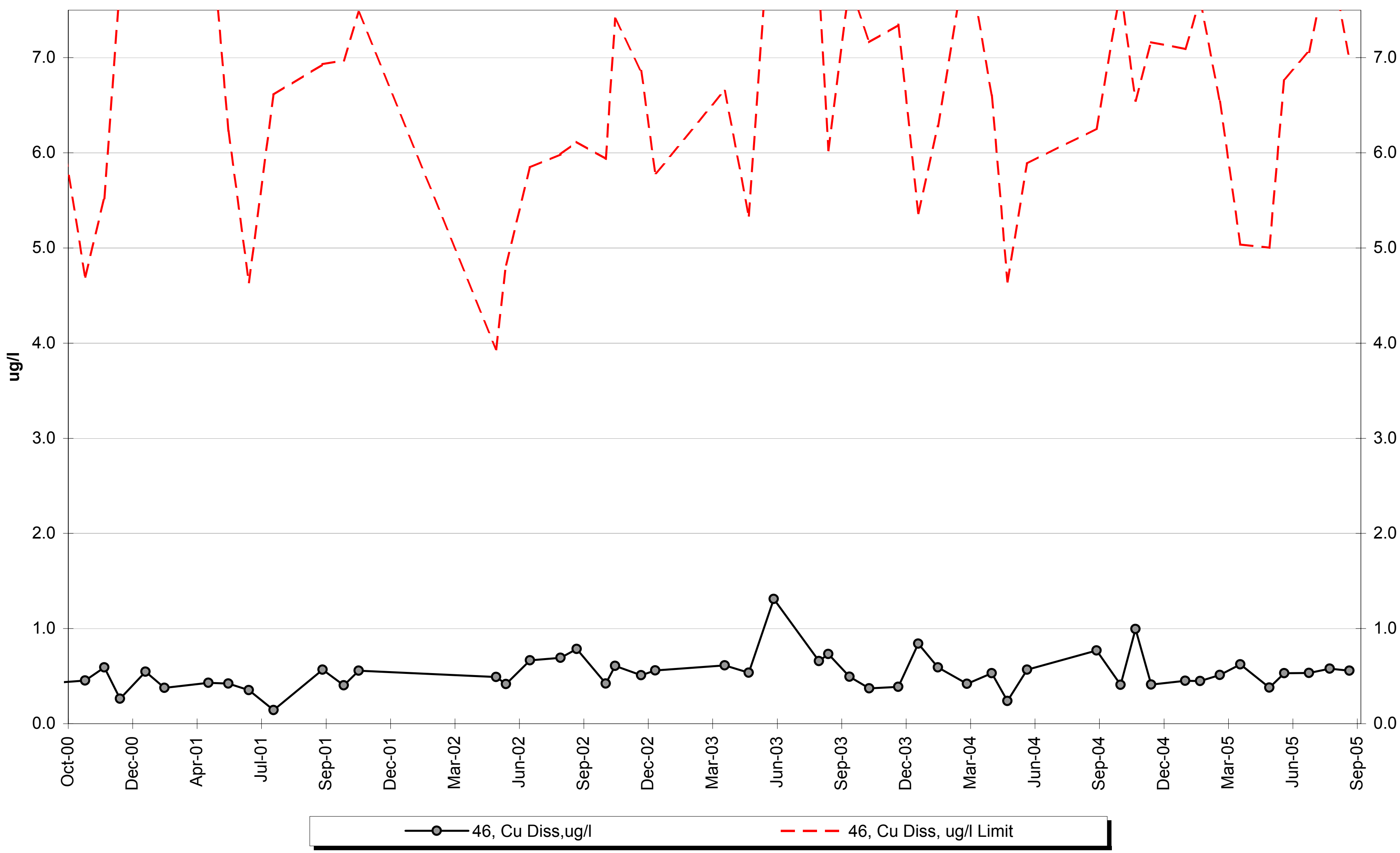
Site 46 -Dissolved Cadmium

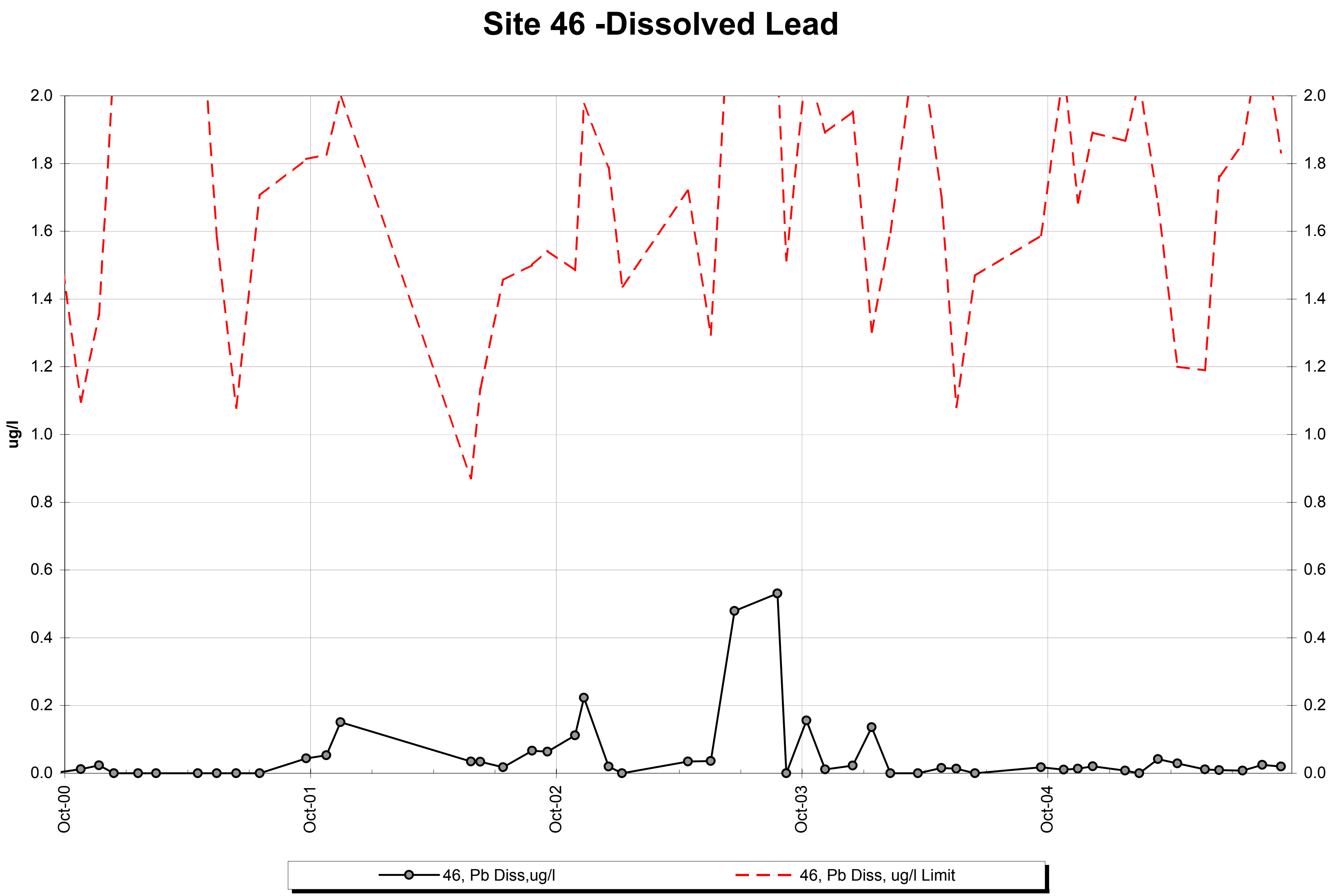


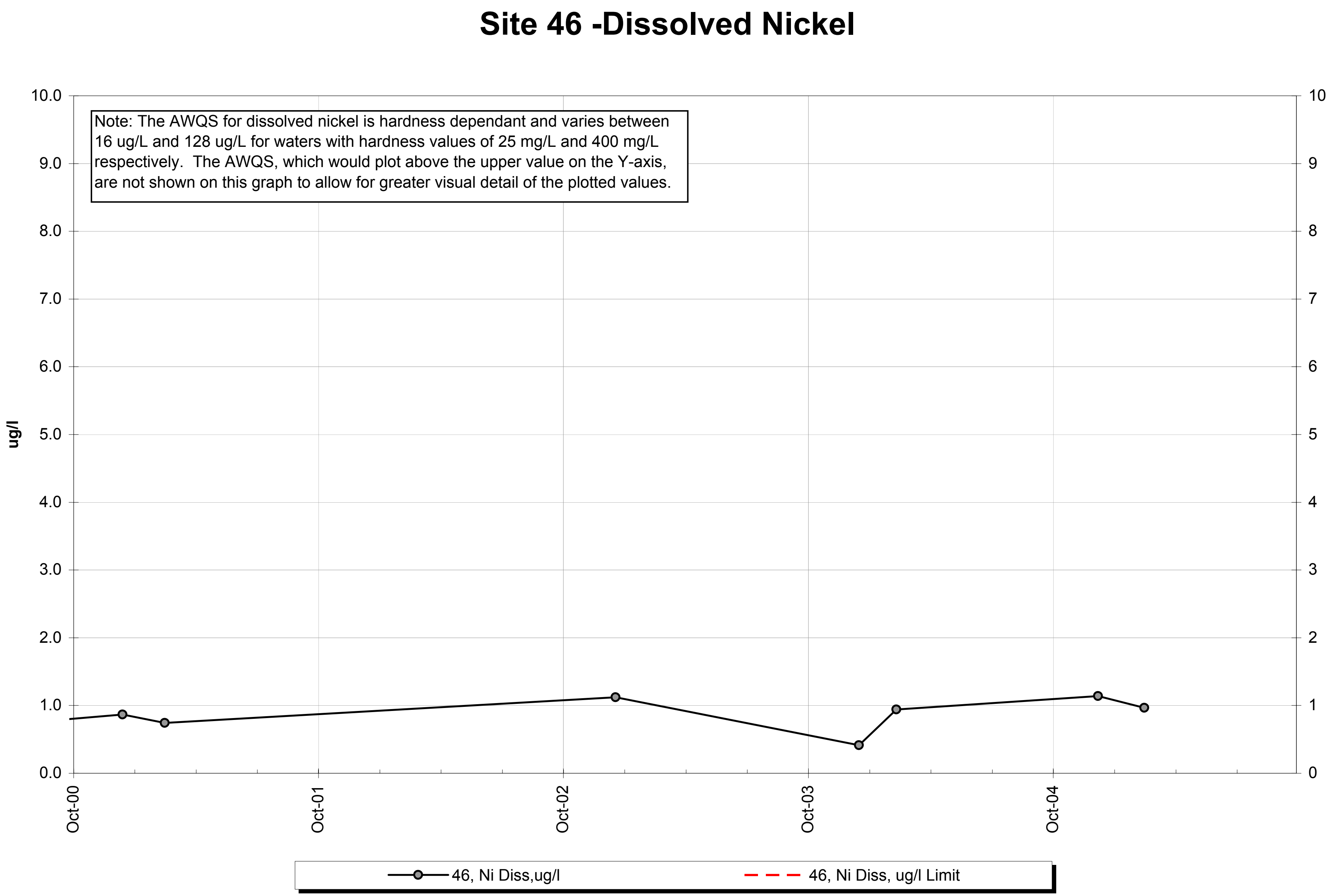
Site 46 -Dissolved Chromium



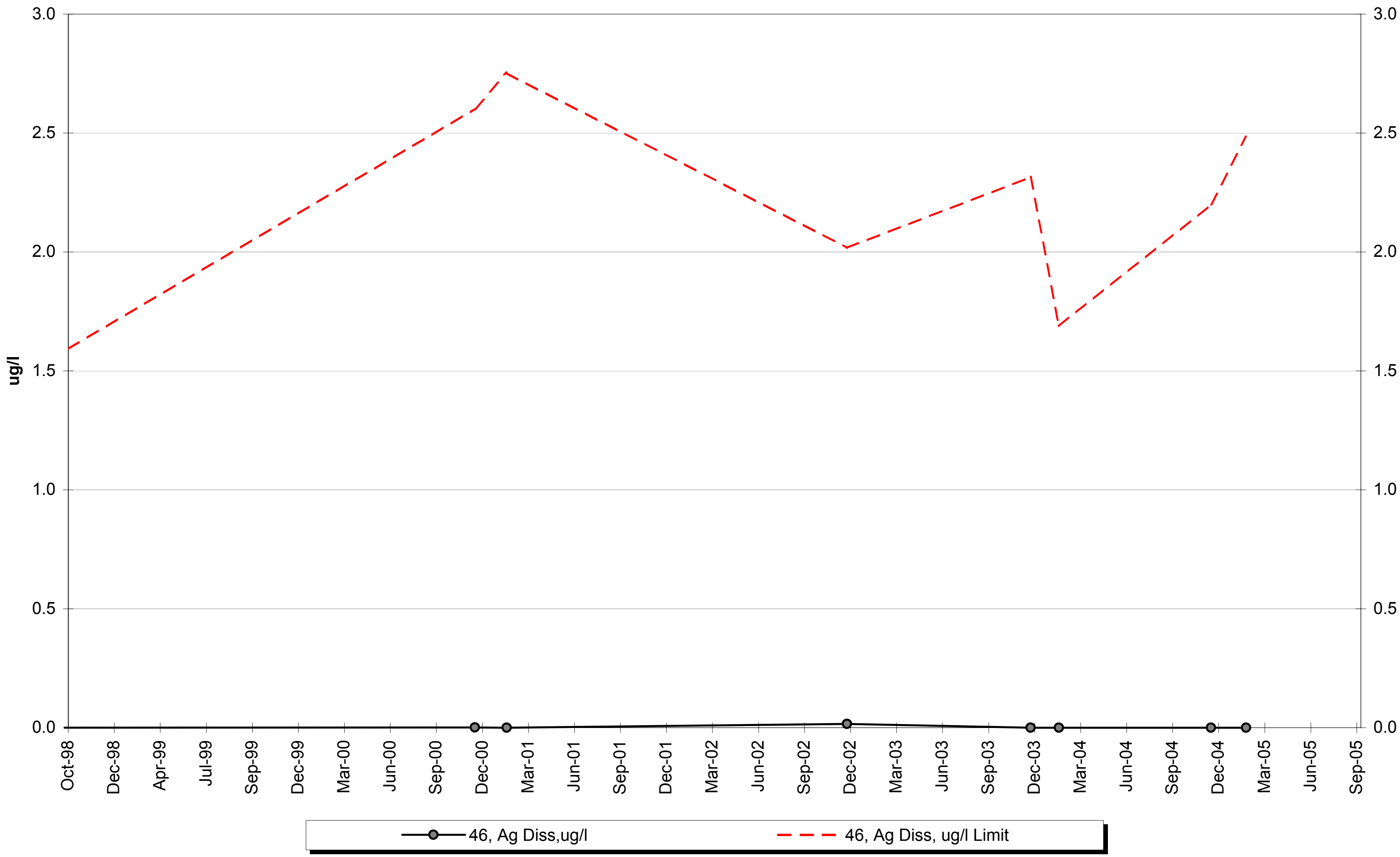
Site 46 -Dissolved Copper

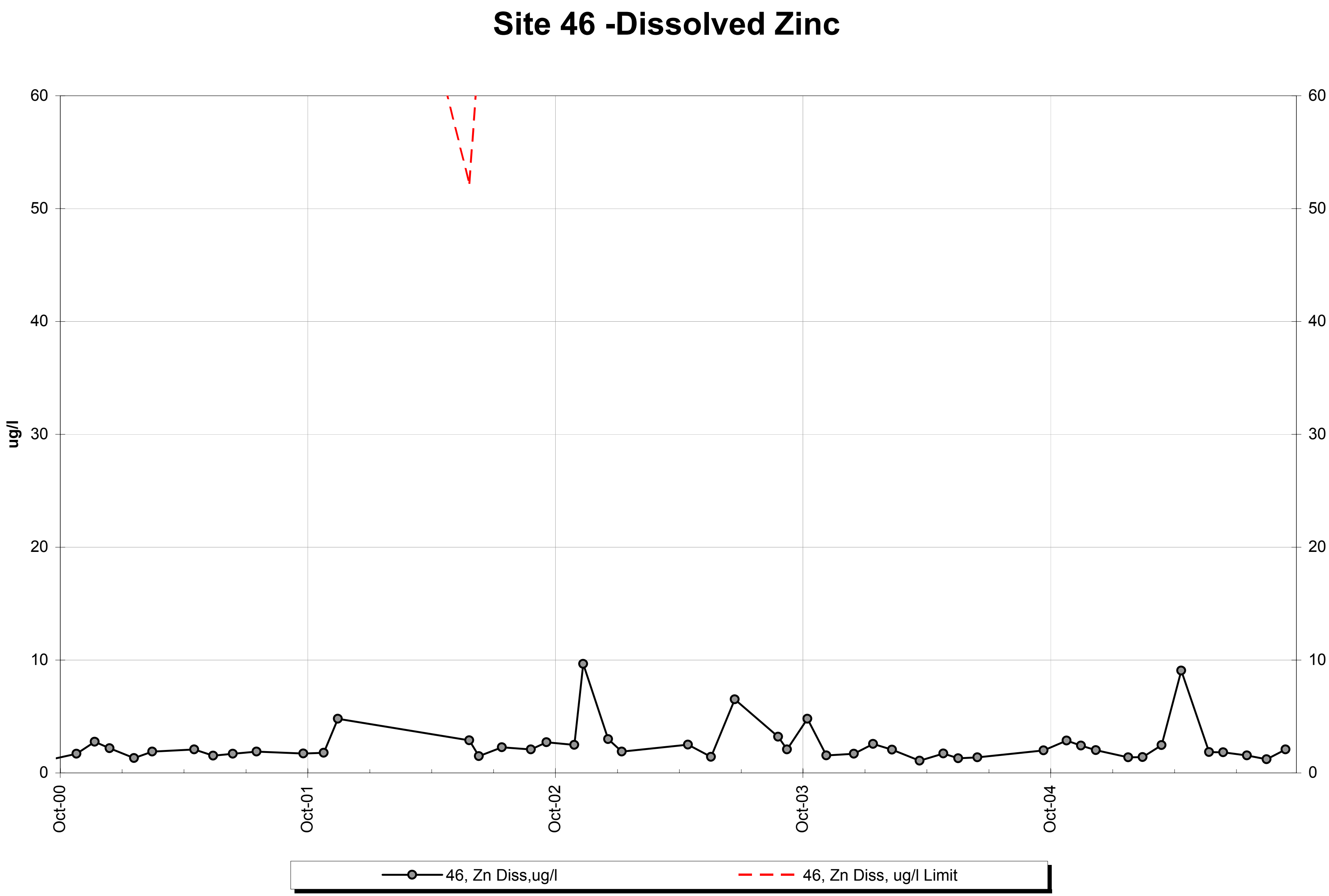



Site 46 -Dissolved Lead
ug/l
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
46, Pb Diss,ug/l
46, Pb Diss, ug/l Limit


Site 46 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater visual detail of the plotted values.
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10
9
8
7
6
5
4
3
2
1
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
46, Ni Diss,ug/l
46, Ni Diss, ug/l Limit

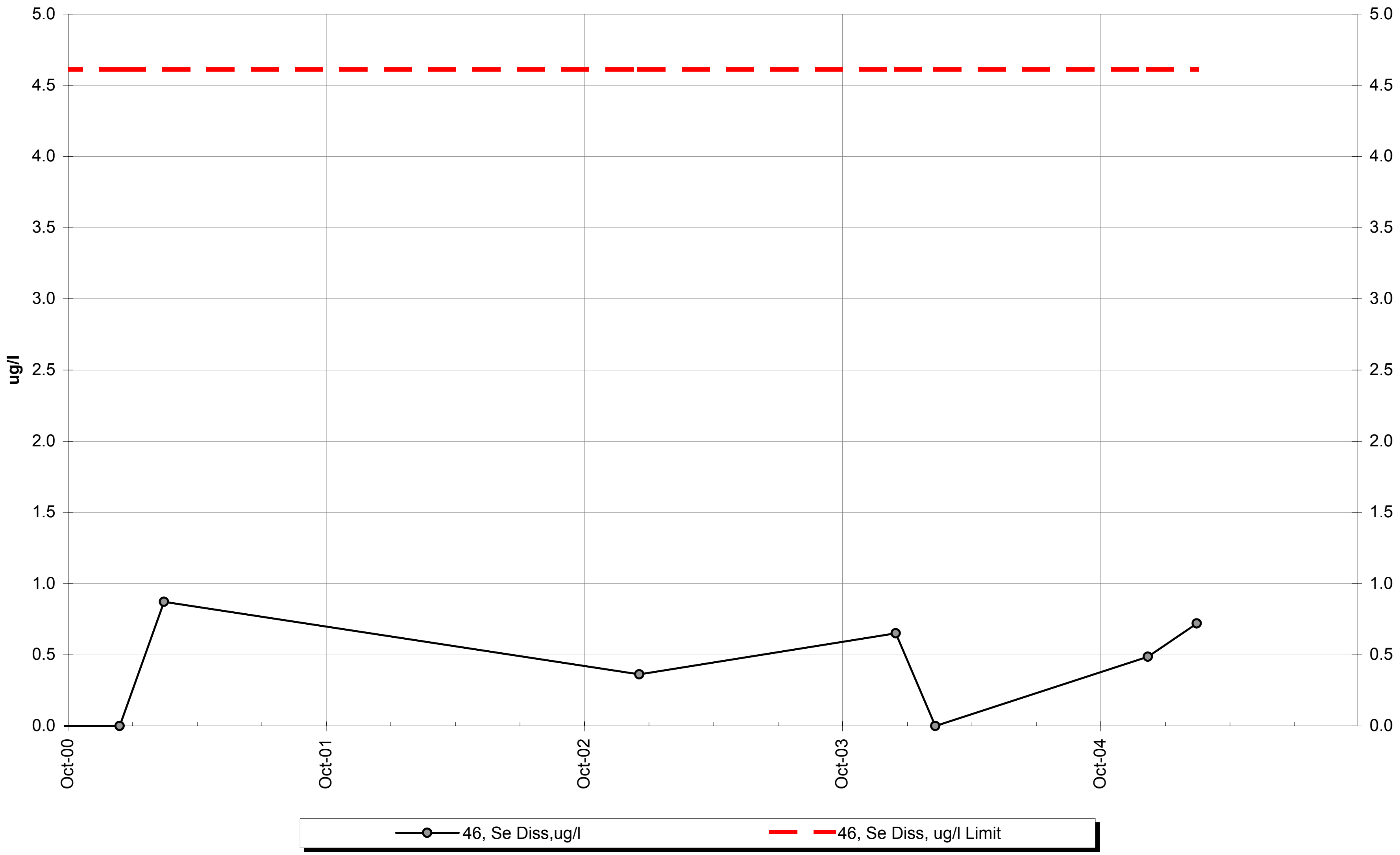
Site 46 -Dissolved Silver



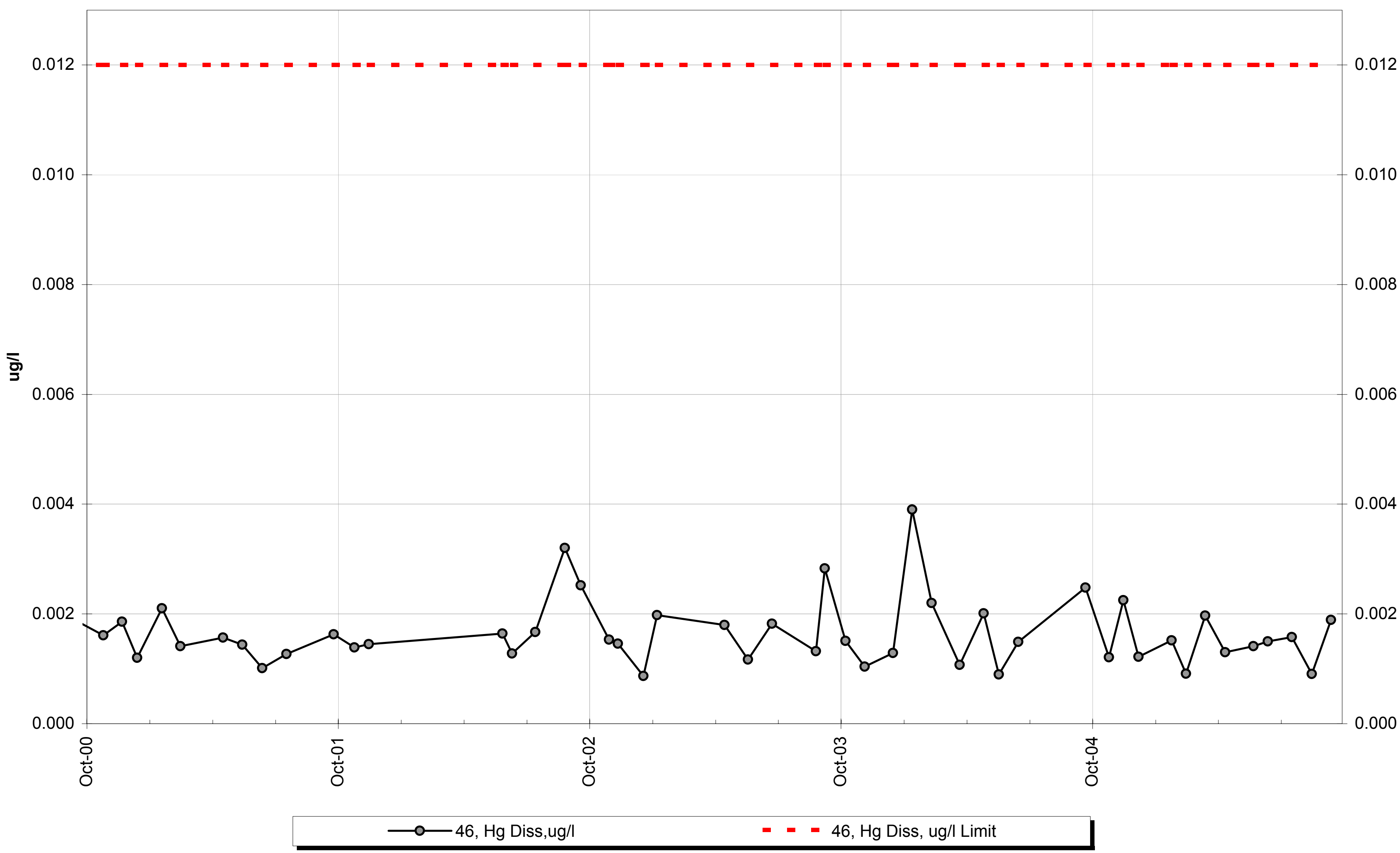


Site 46 -Dissolved Zinc
ug/l
0
10
20
30
40
50
60
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
46, Zn Diss,ug/l
46, Zn Diss, ug/l Limit

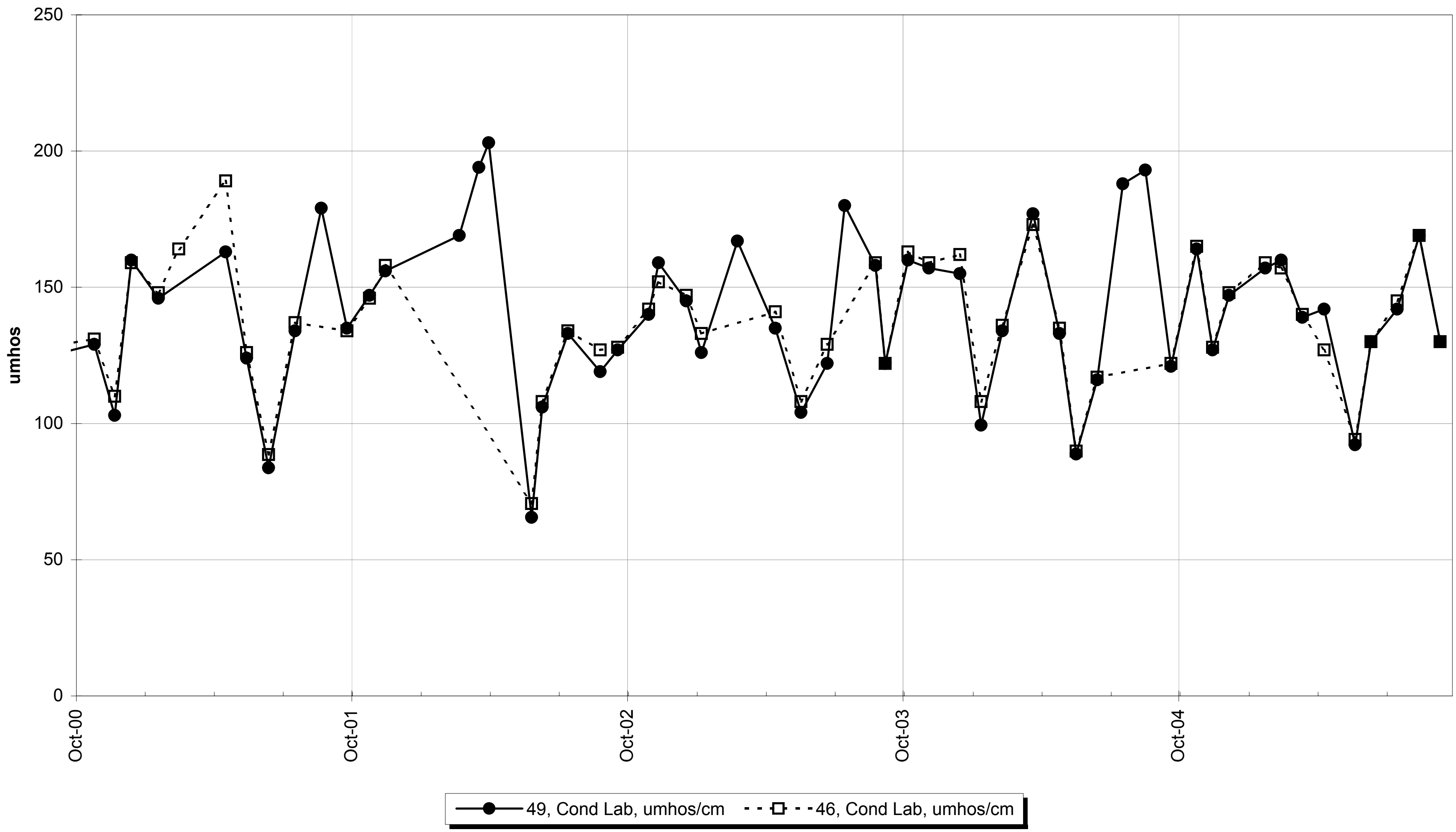
Site 46 -Dissolved Selenium

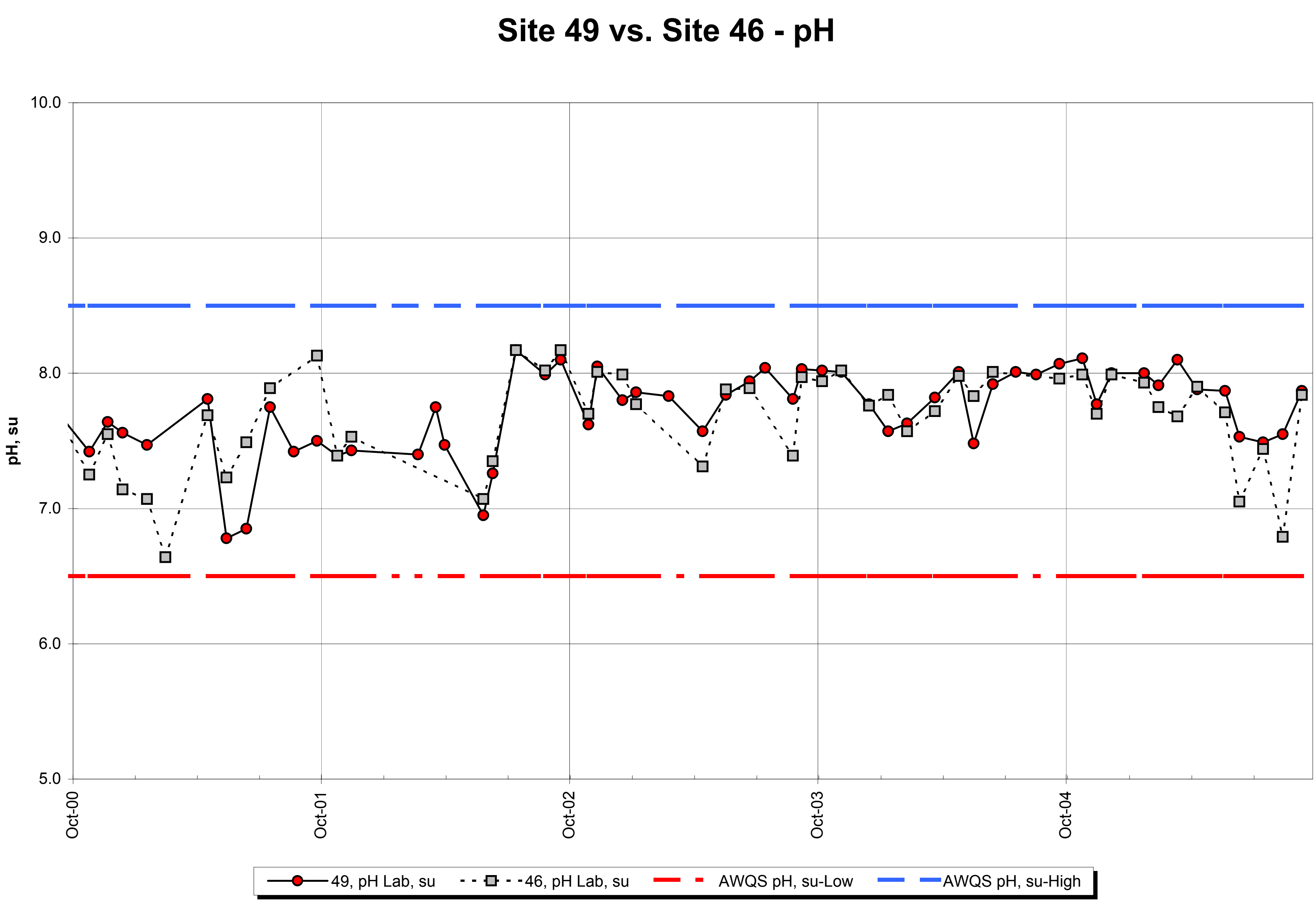


Site 46 -Dissolved Mercury



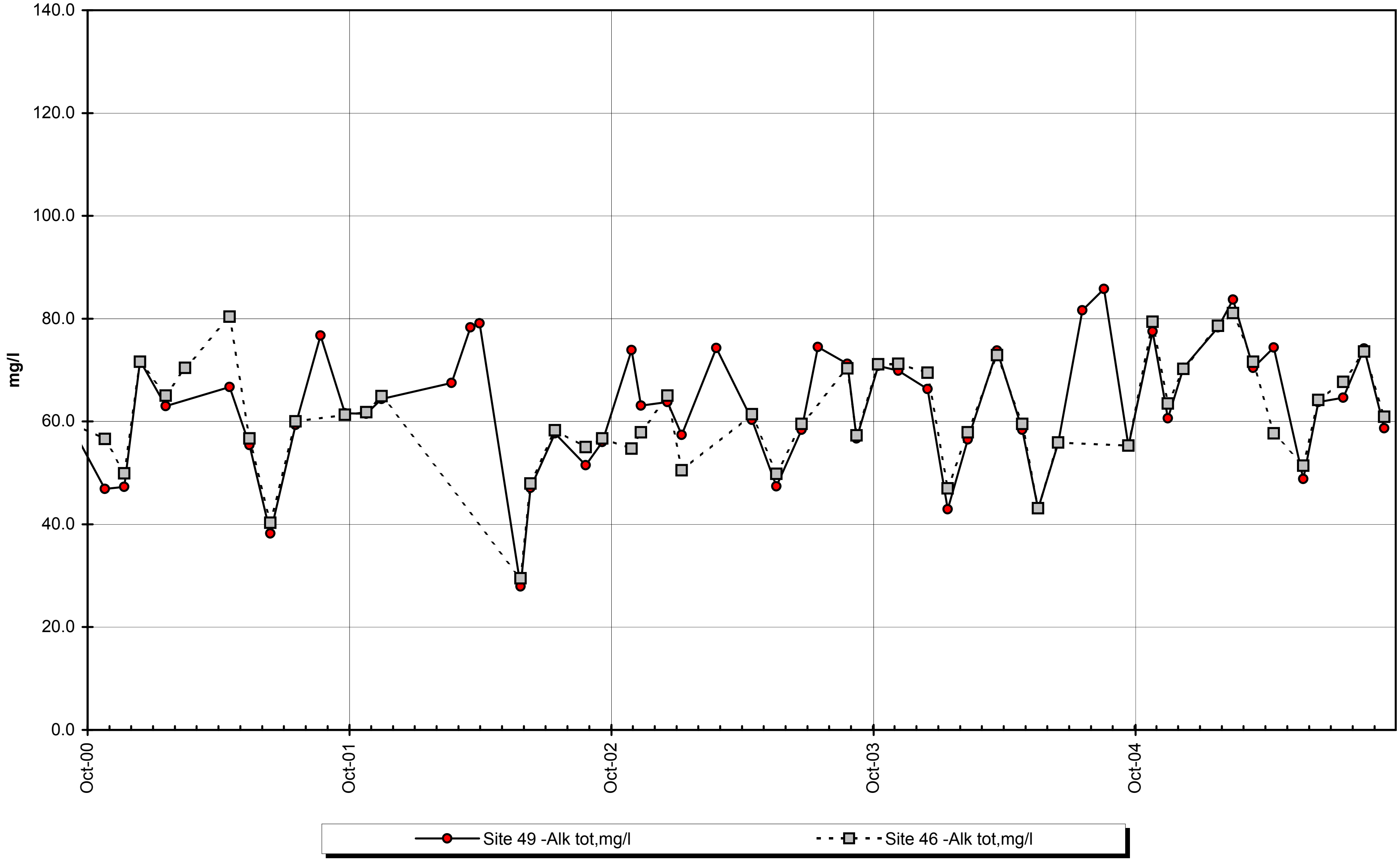
Site 49 vs Site 46 -Conductivity



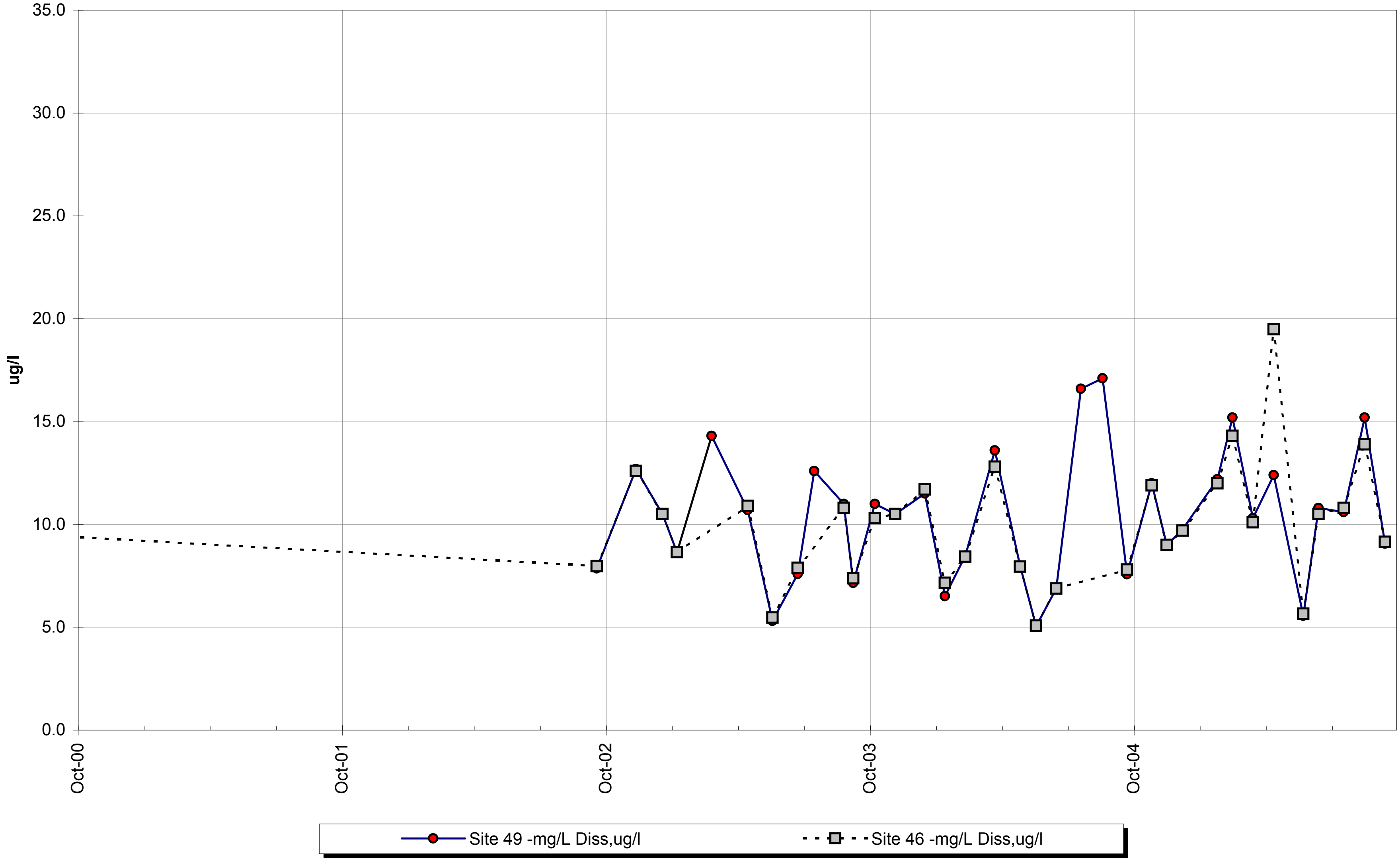


Site 49 vs. Site 46 - pH
10.0
9.0
8.0
7.0
6.0
5.0
pH, su
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
49, pH Lab, su
46, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

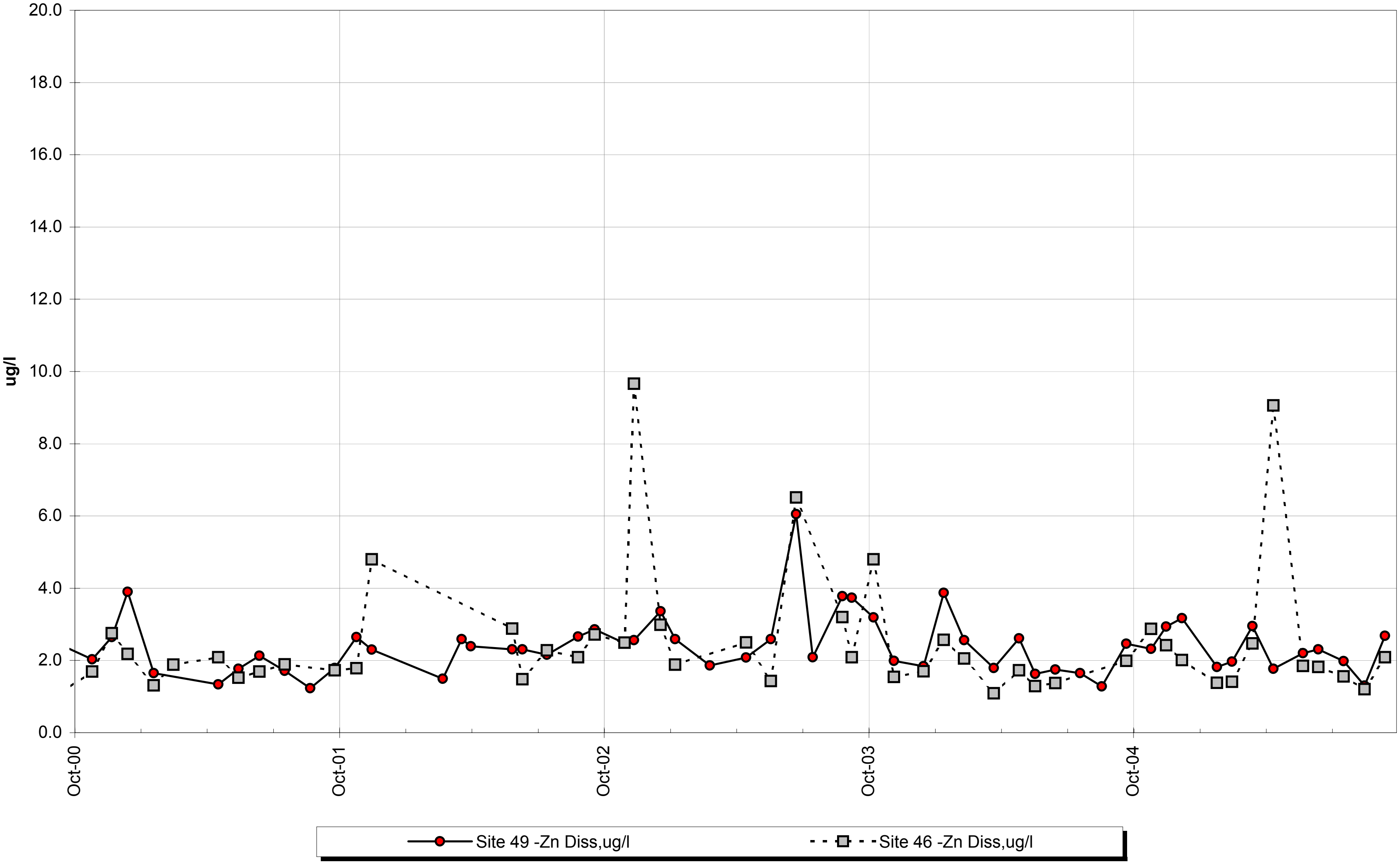
Site 49 vs. Site 46 -Total Alkalinity



Site 49 vs. Site 46 -Total Sulfate



Site 49 vs. Site 46 -Dissolved Zinc



Site **#46** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	124.0	130.0		141.0			158.0	117.0	94.2	122.0	140.0	129.0
b	**WY2001**	131.0	110.0	159.0	148.0	164.0		189.0	126.0	88.6	137.0		134.0
c	**WY2002**	146.0	158.0						70.6	108.0	134.0	127.0	128.0
d	**WY2003**	142.0	152.0	147.0	133.0			141.0	108.0	129.0		159.0	122.0
e	**WY2004**	163.0	159.0	162.0	108.0	136.0	173.0	135.0	89.8	117.0			122.0
f	**WY2005**	165.0	128.0	148.0	159.0	157.0	140.0	127.0	94.1	130.0	145.0	169.0	130.0
	n	6	6	4	5	3	2	5	6	6	4	4	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	1
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

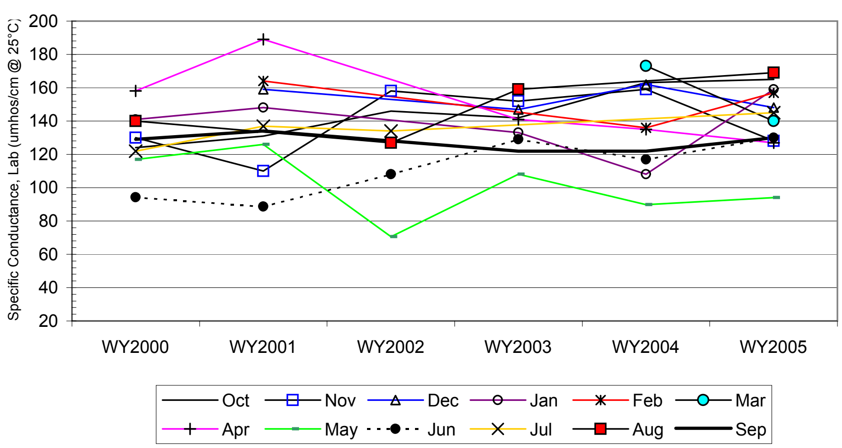
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1		1			1	1	-1	1		1
c-a	1	1						-1	1	1	-1	-1
d-a	1	1		-1			-1	-1	1		1	-1
e-a	1	1		-1			-1	-1	1			-1
f-a	1	-1		1			-1	-1	1	1	1	1
c-b	1	1						-1	1	-1		-1
d-b	1	1	-1	-1			-1	-1	1			-1
e-b	1	1	1	-1	-1		-1	-1	1			-1
f-b	1	1	-1	1	-1		-1	-1	1	1		-1
d-c	-1	-1						1	1		1	-1
e-c	1	1						1	1			-1
f-c	1	-1						1	1	1	1	1
e-d	1	1	1	-1			-1	-1	-1			0
f-d	1	-1	1	1			-1	-1	1		1	1
f-e	1	-1	-1	1	1	-1	-1	1	1			1
S_k	13	3	0	0	-1	-1	-8	-5	11	4	4	-4
Qm	8.5								7.3			
σ^2_S=	28.33	28.33	8.67	16.67	3.67	1.00	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	2.44	0.56	0.00	0.00	-0.52	-1.00	-1.96	-0.94	2.07	1.36	1.36	-0.75
Z^2_k	5.96	0.32	0.00	0.00	0.27	1.00	3.84	0.88	4.27	1.85	1.85	0.56

ΣZ_k= 2.62
ΣZ^2_k= 20.81
Z-bar=$\Sigma Z_k/K$= 0.22

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 57
ΣS_k 16

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	20.23	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.042**			$\chi^2_h<\chi^2_{(K-1)}$	**REJECT**
ΣVAR(S_k)	Z_{calc} 1.05	@α/2=2.5% Z=	1.96	H_0 (No trend)	NA
205.67	p **0.852**			H_A (± trend)	NA



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.00		6.33
0.050	-1.75	**2.00**	5.56
0.100	-0.47		4.88
0.200	0.34		4.41

Site **#46** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.7	7.5		7.6			7.6	7.5	7.5	7.9	7.6	7.7
b	**WY2001**	7.3	7.6	7.1	7.1	6.6		7.7	7.2	7.5	7.9		8.1
c	**WY2002**	7.4	7.5						7.1	7.4	8.2	8.0	8.2
d	**WY2003**	7.7	8.0	8.0	7.8			7.3	7.9	7.9		7.4	8.0
e	**WY2004**	7.9	8.0	7.8	7.8	7.6	7.7	8.0	7.8	8.0			8.0
f	**WY2005**	8.0	7.7	8.0	7.9	7.8	7.7	7.9	7.7	7.1	7.4	6.8	7.8
	n	6	6	4	5	3	2	5	6	6	4	4	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	1	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	1		-1			1	-1	1	1		1
c-a	-1	1						-1	-1	1	1	1
d-a	-1	1		1			-1	1	1		-1	1
e-a	1	1		1			1	1	1			1
f-a	1	1		1			1	1	-1	-1	-1	1
c-b	1	-1						-1	-1	1		1
d-b	1	1	1	1			-1	1	1			-1
e-b	1	1	1	1	1		1	1	1			-1
f-b	1	1	1	1	1		1	1	-1	-1		-1
d-c	1	1						1	1		-1	-1
e-c	1	1						1	1			-1
f-c	1	1						1	-1	-1	-1	-1
e-d	1	1	-1	1			1	-1	1			-1
f-d	1	-1	0	1			1	-1	-1		-1	-1
f-e	1	-1	1	1	1	-1	-1	-1	-1			-1
S_k	9	9	3	8	3	-1	4	3	1	0	-4	-3

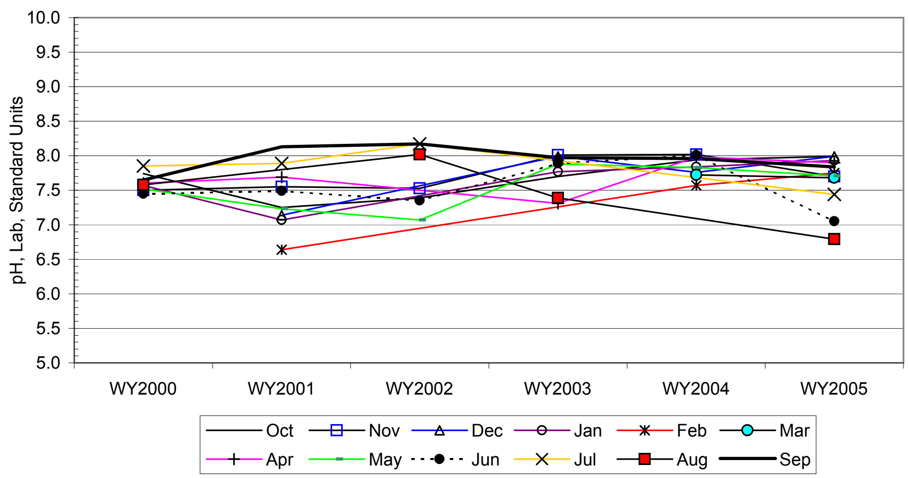
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	8.67	16.67	3.67	1.00	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	1.69	1.69	1.02	1.96	1.57	-1.00	0.98	0.56	0.19	0.00	-1.36	-0.56
Z^2_k	2.86	2.86	1.04	3.84	2.45	1.00	0.96	0.32	0.04	0.00	1.85	0.32

ΣZ_k= 6.74
ΣZ^2_k= 17.53
Z-bar=ΣZ_k/K= 0.56

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 57
ΣS_k 32

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$= 13.75		@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
p **0.247**			$\chi^2_h < \chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc} 2.16	@α/2=2.5% Z= 1.96	H_0 (No trend) REJECT
205.67	p **0.985**		H_A (± trend) ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.01		0.13
0.050	0.04	**0.06**	0.10
0.100	0.04		0.09
0.200	0.04		0.08

0.8%

Site **#46** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	46.3	50.1		63.5			64.1	47.2	42.8	51.6	64.2	59.4
b	**WY2001**	56.6	49.9	71.6	65.0	70.4		80.4	56.7	40.3	60.0		61.3
c	**WY2002**	61.8	64.9						29.5	47.9	58.3	55.0	56.7
d	**WY2003**	54.7	57.9	65.0	50.5			61.4	49.8	59.5		70.3	57.3
e	**WY2004**	71.1	71.2	69.5	47.0	57.9	72.9	59.5	43.1	55.9			55.3
f	**WY2005**	79.4	63.5	70.2	78.6	81.1	71.6	57.7	51.4	64.2	67.7	73.6	60.9
	n	6	6	4	5	3	2	5	6	6	4	4	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	-1		1			1	1	-1	1		1
c-a	1	1						-1	1	1	-1	-1
d-a	1	1		-1			-1	1	1		1	-1
e-a	1	1		-1			-1	-1	1			-1
f-a	1	1		1			-1	1	1	1	1	1
c-b	1	1						-1	1	-1		-1
d-b	-1	1	-1	-1			-1	-1	1			-1
e-b	1	1	-1	-1	-1		-1	-1	1			-1
f-b	1	1	-1	1	1		-1	-1	1	1		-1
d-c	-1	-1						1	1		1	1
e-c	1	1						1	1			-1
f-c	1	-1						1	1	1	1	1
e-d	1	1	1	-1			-1	-1	-1			-1
f-d	1	1	1	1			-1	1	1		1	1
f-e	1	-1	1	1	1	-1	-1	1	1			1
S_k	11	7	0	0	1	-1	-8	1	11	4	4	-3

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	8.67	16.67	3.67	1.00	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	2.07	1.32	0.00	0.00	0.52	-1.00	-1.96	0.19	2.07	1.36	1.36	-0.56
Z^2_k	4.27	1.73	0.00	0.00	0.27	1.00	3.84	0.04	4.27	1.85	1.85	0.32

ΣZ_k= 5.35

ΣZ^2_k= 19.43

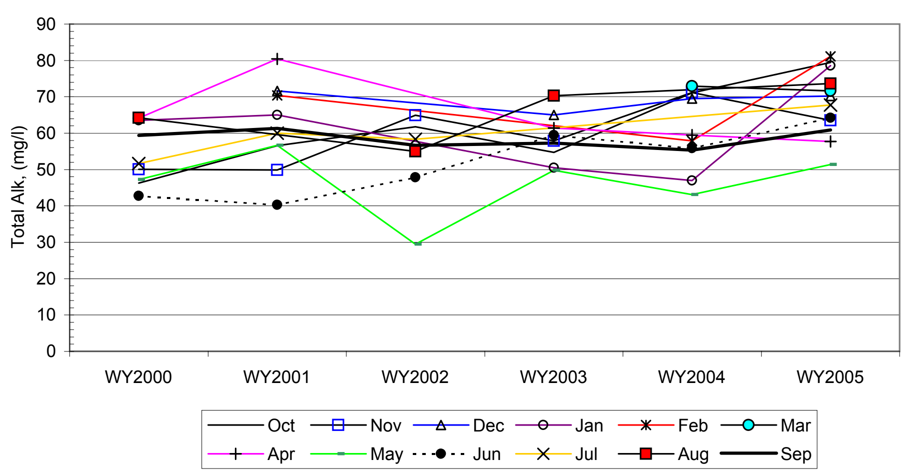
Z-bar=ΣZ_k/K= 0.45

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 57

ΣS_k 27

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	17.04	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.107**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 205.67	Z_{calc} 1.81	@α/2=2.5% Z=	1.96	**H_0** (No trend)	ACCEPT
p	**0.965**			**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.51		3.51
0.050	0.51	**2.03**	3.17
0.100	0.81		2.95
0.200	1.45		2.68

Site **#46** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	2.4	2.4		1.3			2.4	1.3	1.5	1.4	1.5	1.1
b	**WY2001**	1.7	2.8	2.2	1.3	1.9		2.1	1.5	1.7	1.9		1.7
c	**WY2002**	1.8	4.8						2.9	1.5	2.3	2.1	2.7
d	**WY2003**	2.5	9.7	3.0	1.9			2.5	1.4	6.5		3.2	2.1
e	**WY2004**	4.8	1.5	1.7	2.6	2.1	1.1	1.7	1.3	1.4			2.0
f	**WY2005**	2.9	2.4	2.0	1.4	1.4	2.5	9.1	1.9	1.8	1.6	1.2	2.1
	n	6	6	4	5	3	2	5	6	6	4	4	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	1
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	1		1			-1	1	1	1		1
c-a	-1	1						1	-1	1	1	1
d-a	1	1		1			1	1	1		1	1
e-a	1	-1		1			-1	-1	-1			1
f-a	1	1		1			1	1	1	1	-1	1
c-b	1	1						1	-1	1		1
d-b	1	1	1	1			1	-1	1			1
e-b	1	-1	-1	1	1		-1	-1	-1			1
f-b	1	-1	-1	1	-1		1	1	1	-1		1
d-c	1	1						-1	1		1	-1
e-c	1	-1						-1	-1			-1
f-c	1	-1						-1	1	-1	-1	-1
e-d	1	-1	-1	1			-1	-1	-1			-1
f-d	1	-1	-1	-1			1	1	-1		-1	0
f-e	-1	1	1	-1	-1	1	1	1	1			1
S_k	9	1	-2	6	-1	1	2	1	1	2	0	6

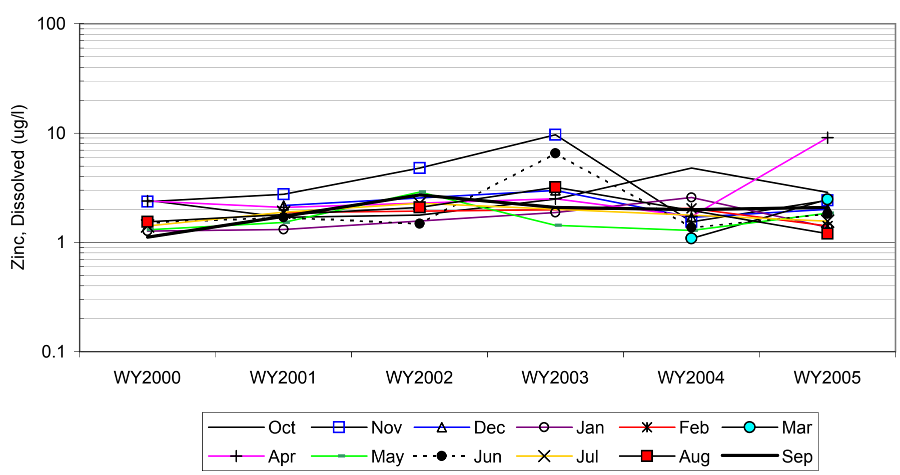
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	8.67	16.67	3.67	1.00	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	1.69	0.19	-0.68	1.47	-0.52	1.00	0.49	0.19	0.19	0.68	0.00	1.13
Z^2_k	2.86	0.04	0.46	2.16	0.27	1.00	0.24	0.04	0.04	0.46	0.00	1.27

ΣZ_k= 5.82
ΣZ^2_k= 8.83
Z-bar=ΣZ_k/K= 0.48

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 57
ΣS_k 26

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	6.01	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
p	**0.873**		$\chi^2_h < \chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k) 205.67	Z_{calc} 1.74	@α/2=2.5% Z= 1.96	**H_0** (No trend) ACCEPT
	p **0.959**		**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.04		0.28
0.050	0.01	**0.09**	0.20
0.100	0.02		0.19
0.200	0.03		0.11

Wilcoxon-signed-ranks test

Exact Form

Variable: **Specific Conductance, Lab (umhos/cm**

	X	**Y**	Differences		
Site	#49	#46			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	164.0	165.0	-1.0	1.0	-2.5
Nov	127.0	128.0	-1.0	1.0	-2.5
Dec	147.0	148.0	-1.0	1.0	-2.5
Jan	157.0	159.0	-2.0	2.0	-6
Feb	160.0	157.0	3.0	3.0	7.5
Mar	139.0	140.0	-1.0	1.0	-2.5
Apr	142.0	127.0	15.0	15.0	9
May	92.2	94.1	-1.9	1.9	-5
Jun	130.0	130.0	0.0		
Jul	142.0	145.0	-3.0	3.0	-7.5
Aug	169.0	169.0	0.0		
Sep	130.0	130.0	0.0		
Median	142.0	142.5	-1.0	1.9	

n	**m**
12	9

N= 9

$\Sigma R=$ -12

α
5.0%
W'α,n
8

$W^{+}=$
16.5
p-test
24.80%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **pH, Lab, Standard Units**

	X	Y	Differences		
Site	#49	#46			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	8.11	7.99	0.12	0.12	7
Nov	7.77	7.70	0.07	0.07	5
Dec	8.00	7.99	0.01	0.01	1
Jan	8.00	7.93	0.07	0.07	6
Feb	7.91	7.75	0.16	0.16	8.5
Mar	8.10	7.68	0.42	0.42	10
Apr	7.88	7.90	-0.02	0.02	-2
May	7.87	7.71	0.16	0.16	8.5
Jun	7.53	7.05	0.48	0.48	11
Jul	7.49	7.44	0.05	0.05	4
Aug	7.55	6.79	0.76	0.76	12
Sep	7.87	7.84	0.03	0.03	3
Median	7.88	7.73	0.09	0.09	

n	m
12	12

N= 12

$\Sigma R=$ 74

α
95.0%
W'α,n
59

$W^{+}=$
76
p-test
99.95%

H_0	median [D]=0	**REJECT**
H_1	median [D]>0	**ACCEPT**

Wilcoxon-signed-ranks test

Exact Form

Variable: **Total Alk, (mg/l)**

	X	**Y**			
Site	#49	#46	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	77.5	79.4	-1.9	1.9	-6
Nov	60.6	63.5	-2.9	2.9	-10
Dec	70.4	70.2	0.2	0.2	1
Jan	78.3	78.6	-0.3	0.3	-2
Feb	83.7	81.1	2.6	2.6	8.5
Mar	70.4	71.6	-1.2	1.2	-5
Apr	74.4	57.7	16.7	16.7	12
May	48.8	51.4	-2.6	2.6	-8.5
Jun	63.8	64.2	-0.4	0.4	-3
Jul	64.6	67.7	-3.1	3.1	-11
Aug	74.2	73.6	0.6	0.6	4
Sep	58.7	60.9	-2.2	2.2	-7
Median	70.4	69.0	-0.8	2.1	

n	**m**
12	12

N= 12

$\Sigma R=$ -27

α
95.0%
W'α,n
59

$W^{+}=$
25.5
p-test
15.06%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Sulfate, Total (mg/l)**

	X	**Y**			
Site	#49	#46	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	12.0	11.9	0.1	0.1	4
Nov	9.0	9.0	0.0	0.0	-1
Dec	9.8	9.7	0.1	0.1	2
Jan	12.2	12.0	0.2	0.2	6
Feb	15.2	14.3	0.9	0.9	10
Mar	10.3	10.1	0.2	0.2	7
Apr	12.4	19.5	-7.1	7.1	-12
May	5.6	5.7	-0.1	0.1	-5
Jun	10.8	10.5	0.3	0.3	9
Jul	10.6	10.8	-0.2	0.2	-8
Aug	15.2	13.9	1.3	1.3	11
Sep	9.1	9.2	-0.1	0.1	-3
Median	10.7	10.7	0.1	0.2	

n	**m**
12	12

N= 12

ΣR= 20

α
5.0%
W'α,n
17

W^+=
49
p-test
78.81%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Zinc, Dissolved (ug/l)**

	X	Y	Differences		
Site	#49	#46			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	2.32	2.87	-0.55	0.55	-8
Nov	2.94	2.42	0.52	0.52	7
Dec	3.17	2.01	1.16	1.16	11
Jan	1.82	1.38	0.44	0.44	4
Feb	1.97	1.41	0.56	0.56	9
Mar	2.95	2.47	0.48	0.48	5
Apr	1.77	9.06	-7.29	7.29	-12
May	2.20	1.85	0.35	0.35	2
Jun	2.31	1.82	0.49	0.49	6
Jul	1.98	1.56	0.42	0.42	3
Aug	1.30	1.20	0.10	0.10	1
Sep	2.68	2.09	0.59	0.59	10
Median	2.26	1.93	0.46	0.51	

n	m
12	12

N= 12

ΣR= 38

α
5.0%
W'α,n
17

W^{+}=
58
p-test
93.53%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Lab Conductivity (umhos/cm): Prior five water years' signed-rank comparisons between Site 49 and Site 46.

Water Year	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
2000	0.08	133.5	129.0	-3.0
2001	**0.01**	134.5	**135.5**	-2.0
2002	**0.02**	140.0	128.0	-2.0
2003	0.05	140.0	**141.0**	-2.0
2004	**0.02**	144.5	135.5	-2.0

Lab-pH (s.u.): Prior five water years' signed-rank comparisons between Site 49 and Site 46.

Water Year	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
2000	0.15	7.64	7.58	0.08
2001	0.33	7.49	7.37	-0.09
2002	0.03	7.45	7.53	0.07
2003	0.85	7.84	7.88	-0.05
2004	0.54	7.96	7.89	-0.02

Total Alkalinity (mg/l): Prior five water years' signed-rank comparisons between Site 46 and Site 49.

Water Year	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
2000	0.06	60.2	51.6	-1.2
2001	0.01	60.5	60.7	-2.0
2002	0.01	59.6	56.7	-0.7
2003	0.67	63.1	57.9	-0.6
2004	0.01	62.4	58.7	-0.7

Total Sulfate (mg/l): Prior two water years' signed-rank comparisons between Site 46 and Site 49.

Water Year	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
2003	0.11	10.6	9.6	-0.1
2004	0.63	9.5	8.2	0.0

Dissolved Zinc (ug/l): Prior five water years' signed-rank comparisons between Site 46 and Site 49.

Water Year	Signed Ranks p-value	Site #49 median	Site #46 median	Median of Differences
2000	0.94	1.62	1.52	0.34
2001	0.88	1.78	1.81	0.25
2002	0.66	2.35	2.28	0.14
2003	0.75	2.59	2.50	0.37
2004	0.97	1.92	1.72	0.46

INTERPRETIVE REPORT
SITE 57 "MONITORING WELL 23-00-03"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

Sampling at this site was added to the FWMP in October-2001 to monitor upgradient groundwater quality at Site 23/D. During a prior annual report (FWMP Annual Report-Water Year 2003) the Jul-03 total alkalinity determination of 35.3 mg/l was flagged as an outlier. While no identifiable errors were noted in the lab QA/QC, the large deviation from the typical distribution of the existing alkalinity dataset was used as justification to classify this datum as an outlier. During the current water year the Nov-2004 total alkalinity determination returned a similar value of 33.9 mg/l. Subsequent sample events indicate that the alkalinity values have returned to the more typical range of 160±40 mg/l. Given this repeatable excursion from what is considered the normal range for alkalinity at this site, KGCMC has removed the outlier flag from the Jul-2003 alkalinity determination. Thus as shown in the table below, all the data collected at this site for the past four years are included in the data analyses.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-01 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Three results for two analytes exceeding these criteria have been identified: (1) for dissolved cadmium and (2) for dissolved lead. The dissolved cadmium exceedance occurred in Oct-2004. This sample occurs as the last datum in a series of seven contiguous sample events that occurred between April-2004 and October-2004. All of these sampling events returned values above the applicable AWQS for dissolved cadmium. Since the Oct-2004 sample event dissolved cadmium values have fallen below the AWQS for dissolved cadmium. The dissolved lead exceedances occurred in October and November of 2004. The leads mimics the previously discussed trend displayed by cadmium with a series of sample events that span the period from Oct-2003 through Nov-2004 that continuously exceeded the applicable AWQS for dissolved lead. This site is the upgradient groundwater site used for comparison purposes to monitor any influence from Site 23/D. Thus, while the cadmium

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
10/26/04	Cadmium Dissolved ug/L	0.408	167	0.351	Aquatic Life, chronic
10/26/04	Lead, Dissolved ug/L	8.01	167	4.38	Aquatic Life, chronic
11/16/04	Lead, Dissolved ug/L	6.34	212	5.64	Aquatic Life, chronic

and lead values are above applicable AWQS and appear erratic when compared to the 2003WY results, the variances are interpreted to be within the natural range for this site.

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No long-term monotonically increasing or decreasing trends are present. As noted previously, dissolved cadmium and lead and additionally dissolved zinc all have shown some large variations over that past two water years and are currently trending downward over the past water year. Given the erratic nature of the trends and the number of different analytes involved, the changes in water chemistry may reflect a change in the character of the ground water at this site. As noted in the “Site 23/D Hydrogeology and Geochemistry Analysis” report (EDE, 2004) Site 57 may sample one of multiple perched water lenses. Thus, if Site 57 samples a relatively small aquifer it may be more susceptible to short term variations in recharge rate. The changes noted at Site 57 are thus interpreted to most likely be the result of the limited aquifer sampled at this site. No statistical analysis for trend was performed on the Site 57 data. For a robust analysis of trend at least five years of data are required. KGCMC anticipates adding this component into the Water Year 2006 annual report for this site.

Table of Results for Water Year 2005

Site 57 "MW-23-00-03"

Sample Date/Parameter	10/26/2004	11/16/2004	Dec-04	Jan-05	Feb-05	Mar-05	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/15/2005	**Median**
Water Temp (°C)	4.5	7.5					5.8	6.9	7.3	7.3	9.1	6.7	7.1
Conductivity-Field(μmho)	391	423					396	390	420	438	423	423	422
Conductivity-Lab (μmho)	388	378					346	359	366	399	391	380	379
pH Lab (standard units)	7.51	7.37					7.66	7.56	7.34	7.34	7.08	6.94	7.36
pH Field (standard units)	7.06	7.52					7.60	7.78	6.80	7.88	7.41	7.80	7.56
Total Alkalinity (mg/L)	166.0 J	33.9					153.0	156.0	161.0	159.0	158.0	134.0	156.0
Total Sulfate (mg/L)	50.8	56.5					51.3	52.0	62.7	66.2	68.2	68.6	59.6
Hardness (mg/L)	167.0	212.0					191.0	203.0	185.0	206.0	199.0	222.0	201.0
Dissolved As (ug/L)	0.735	0.710	NOT SCHEDULED FOR SAMPLING				0.764 J	0.907	0.856	0.901	0.837 J	0.741	0.801
Dissolved Ba (ug/L)	38.8	35.0					26.8	26.0	30.7	31.5	33.4	31.8	31.7
Dissolved Cd (ug/L)	0.408	0.353					0.230	0.234	0.223	0.239	0.237	0.199	0.236
Dissolved Cr (ug/L)	0.394	0.545					0.450	0.287	0.609 U	0.839	0.412	0.951	0.498
Dissolved Cu (ug/L)	0.289	0.658					0.402 U	0.440	1.550 U	1.360	1.350	0.499	0.579
Dissolved Pb (ug/L)	8.01	6.34					1.41	1.83	2.51	2.98 J	2.38	1.20	2.45
Dissolved Ni (ug/L)	2.11	2.73					1.65	1.42	2.64 U	2.25	2.04	2.20	2.16
Dissolved Ag (ug/L)	0.002 J	<0.003					<0.003	0.003 J	0.002 J	0.002 J	<0.003	<0.002	0.002
Dissolved Zn (ug/L)	91.30	69.70					14.70 J	21.80	19.40	31.30	23.90 J	12.40	22.85
Dissolved Se (ug/L)	0.672 J	1.040					0.794 J	1.010 UJ	0.849	1.270	1.090 J	1.060	1.025
Dissolved Hg (ug/L)	0.000909 U	0.000767 U					0.000851 U	0.000727 U	0.000712 U	0.000669 U	0.000571 U	0.000489 J	0.000720

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
57	10/26/2004	2:11:00 PM				
			Alk Tot, mg/l	166	J	Hold Time
			Ag Diss, ug/l	0.00218	J	Below Quantitative Range
			Se Diss, ug/l	0.672	J	LCS Recoveries
			Hg Diss, ug/l	0.000909	U	Field Blank Contamination
57	11/16/2004	12:34:00 PM				
			Hg Diss, ug/l	0.000767	U	Field Blank Contamination
57	04/13/2005	1:53:00 PM				
			As Diss, ug/l	0.764	J	LCS Recovery
			Cu Diss, ug/l	0.402	U	Field Blank Contamination
			Zn Diss, ug/l	14.7	J	LCS Recovery
			Se Diss, ug/l	0.794	J	LCS Recovery
			Hg Diss, ug/l	0.000851	U	Field Blank Contamination
57	05/24/2005	11:05:00 AM				
			Ag Diss, ug/l	0.00334	J	Below Quantitative Range
			Se Diss, ug/l	1.01	UJ	LCS Recovery
			Hg Diss, ug/l	0.000727	U	Field Blank Contamination
57	06/14/2005	2:41:00 PM				
			Cr Diss, ug/l	0.609	U	Field Blank Contamination
			Cu Diss, ug/l	1.55	U	Field Blank Contamination
			Ni Diss, ug/l	2.64	U	Field Blank Contamination
			Ag Diss, ug/l	0.00239	J	Below Quantitative Range
			Hg Diss, ug/l	0.000712	U	Field Blank Contamination
57	07/19/2005	2:49:00 PM				
			Pb Diss, ug/l	2.98	J	Matrix Spike Recovery
			Ag Diss, ug/l	0.00214	J	Below Quantitative Range
			Hg Diss, ug/l	0.000669	U	Field Blank Contamination
57	08/17/2005	1:36:00 PM				
			As Diss, ug/l	0.837	J	LCS Recovery
			Zn Diss, ug/l	23.9	J	LCS Recovery
			Se Diss, ug/l	1.09	J	LCS Recovery
			Hg Diss, ug/l	0.000571	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

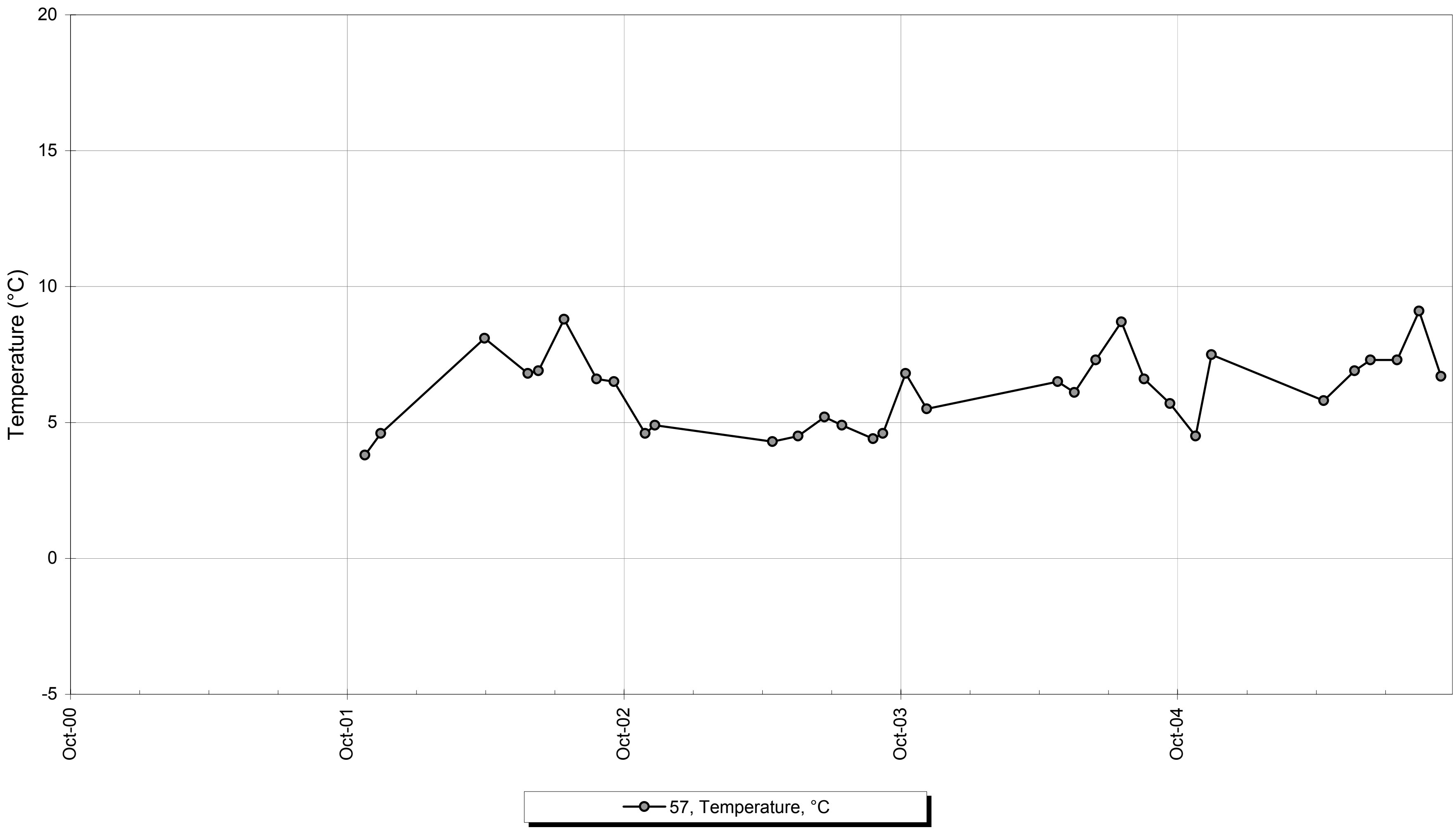
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

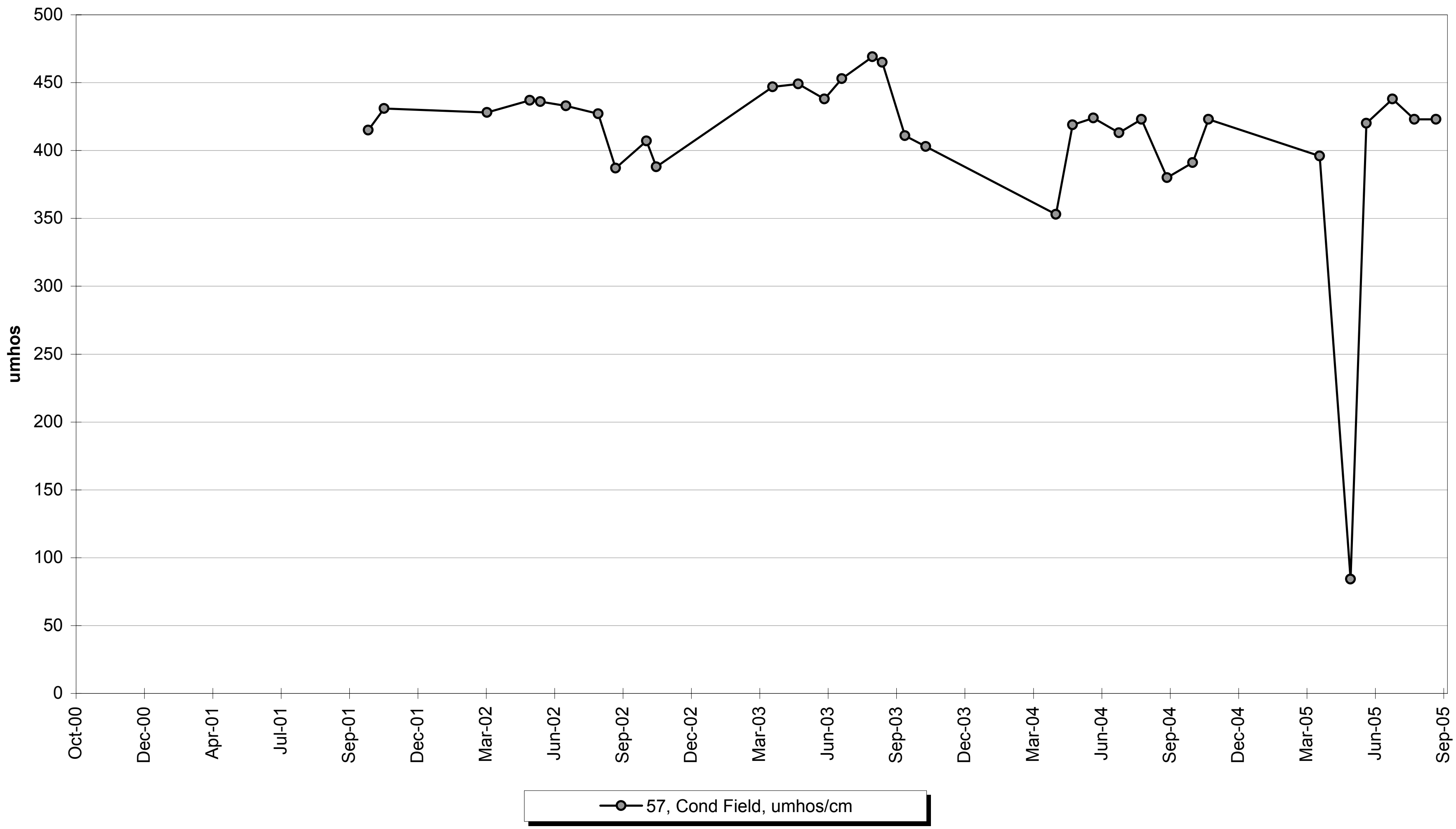
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
57	09/15/2005	10:42:00 AM				
			Hg Diss, ug/l	0.000489	J	Below Quantitative Range

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

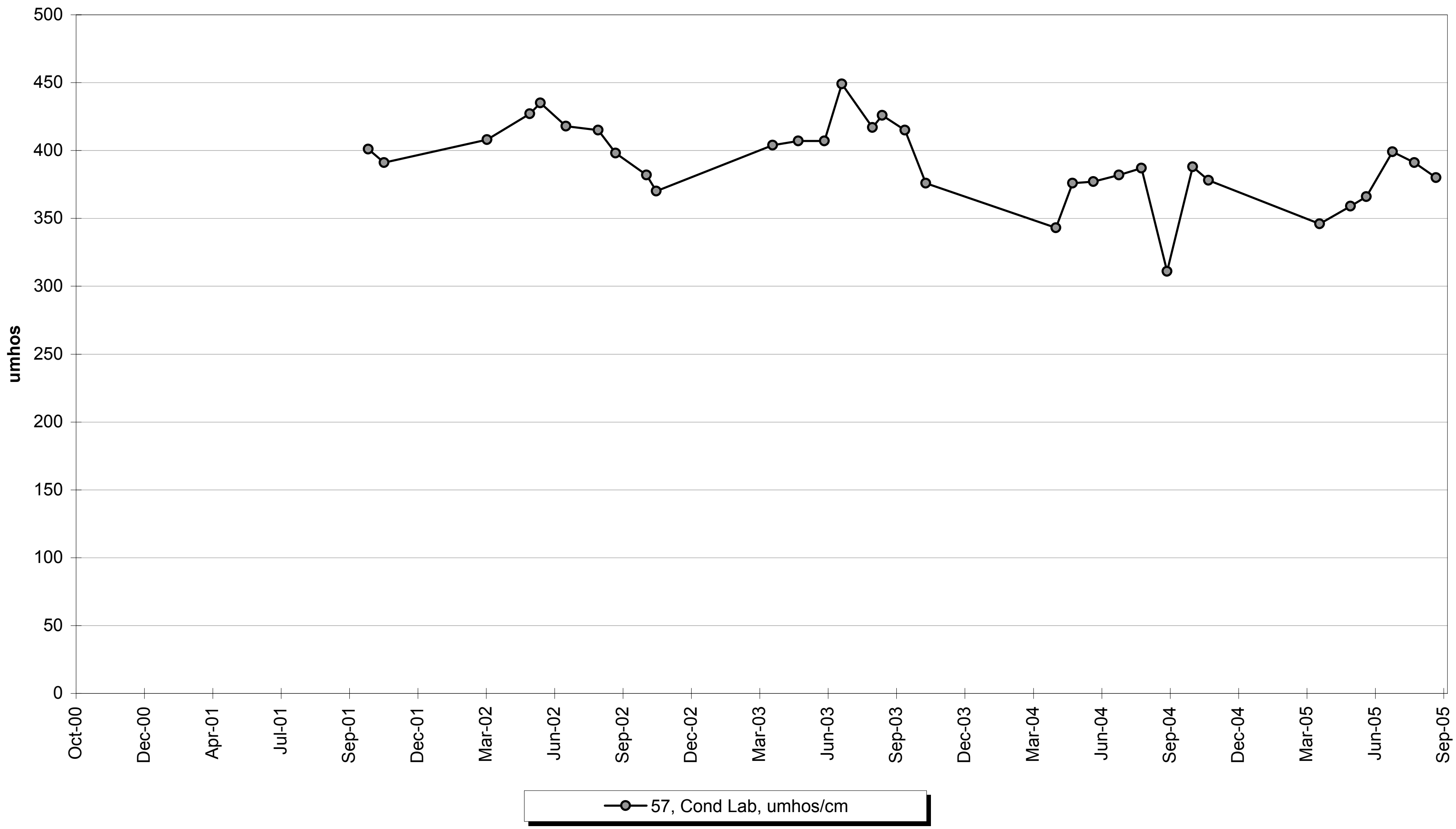
Site 57 -Water Temperature

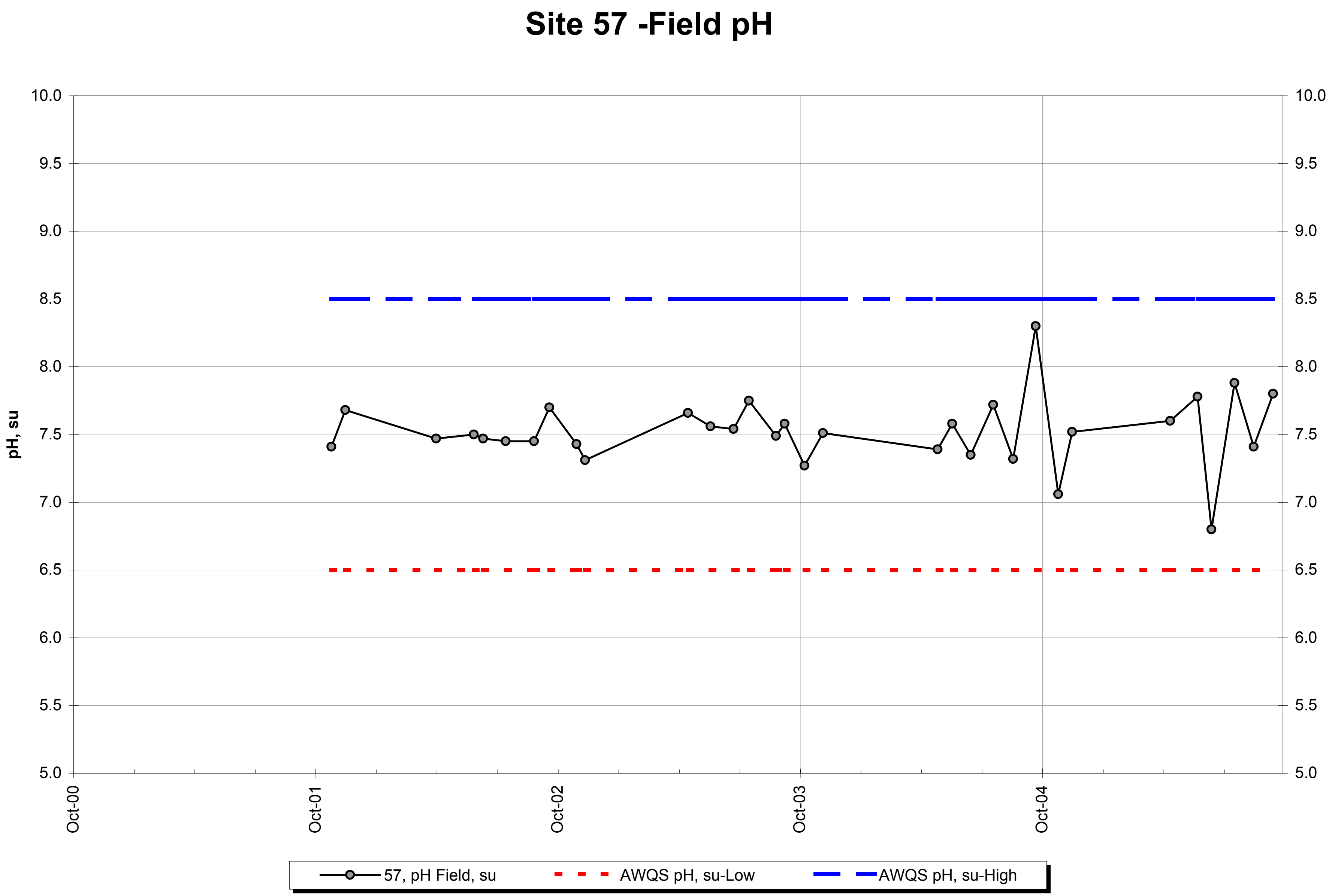


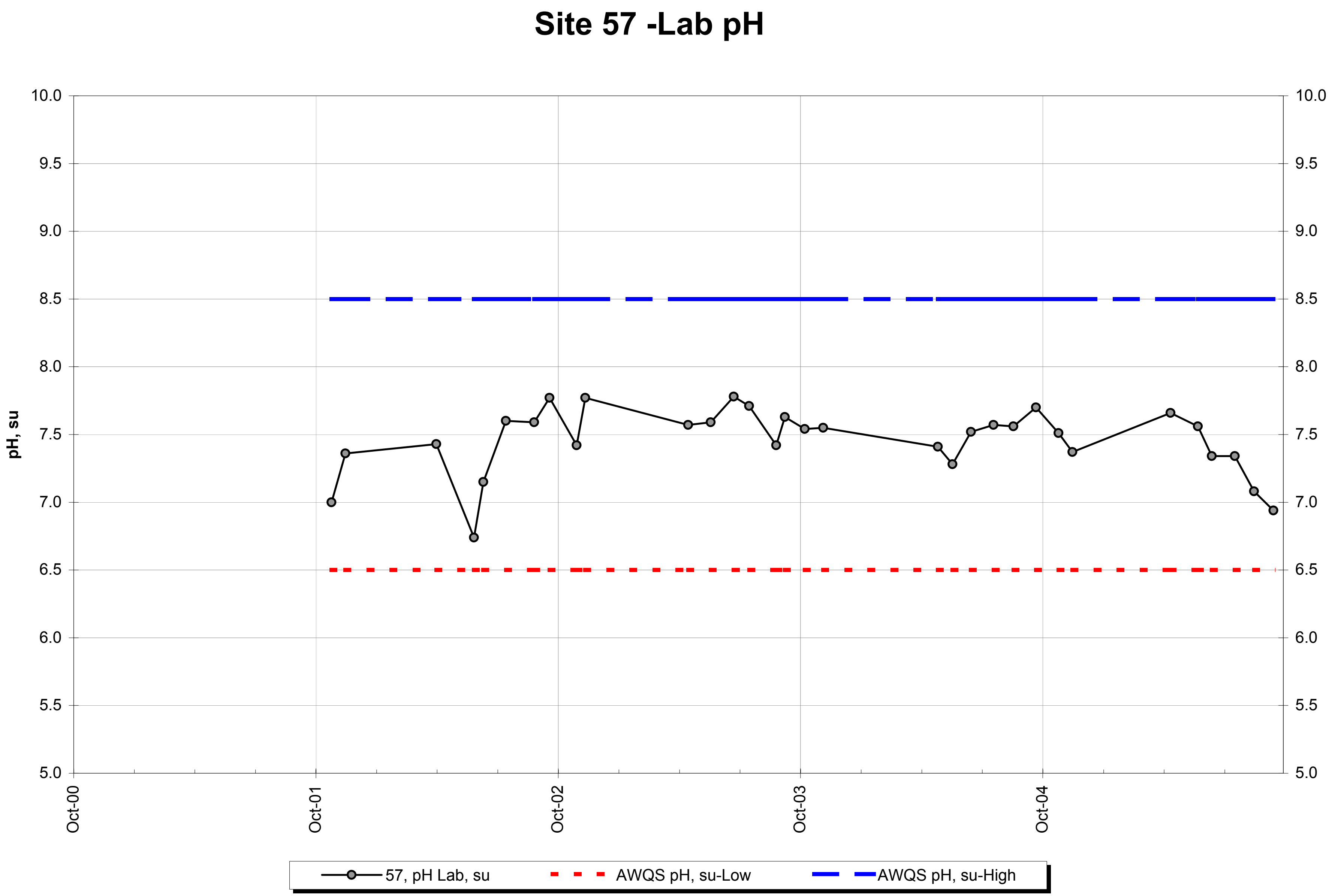
Site 57 -Conductivity-Field



Site 57 -Conductivity-Lab

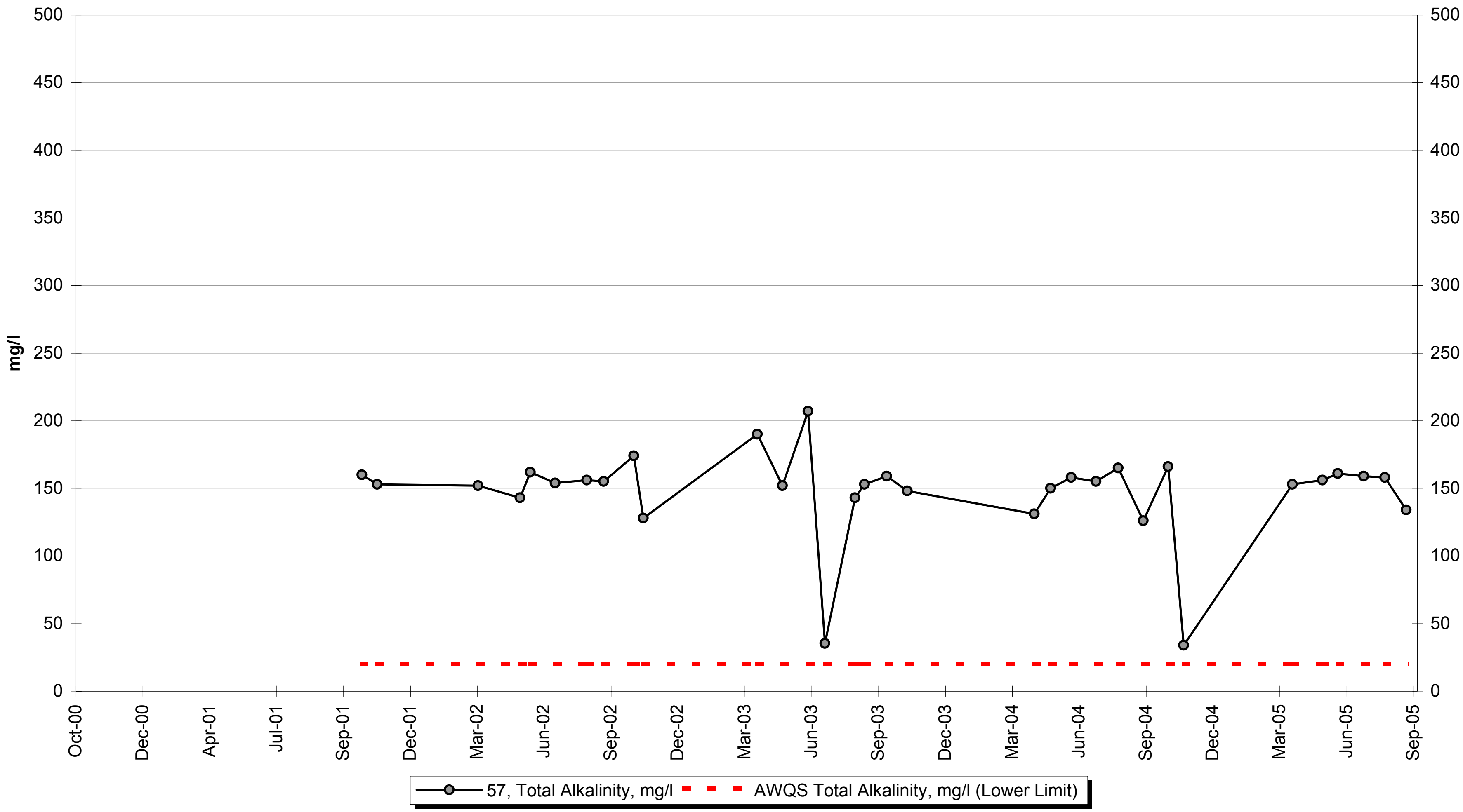



Site 57 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
57, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

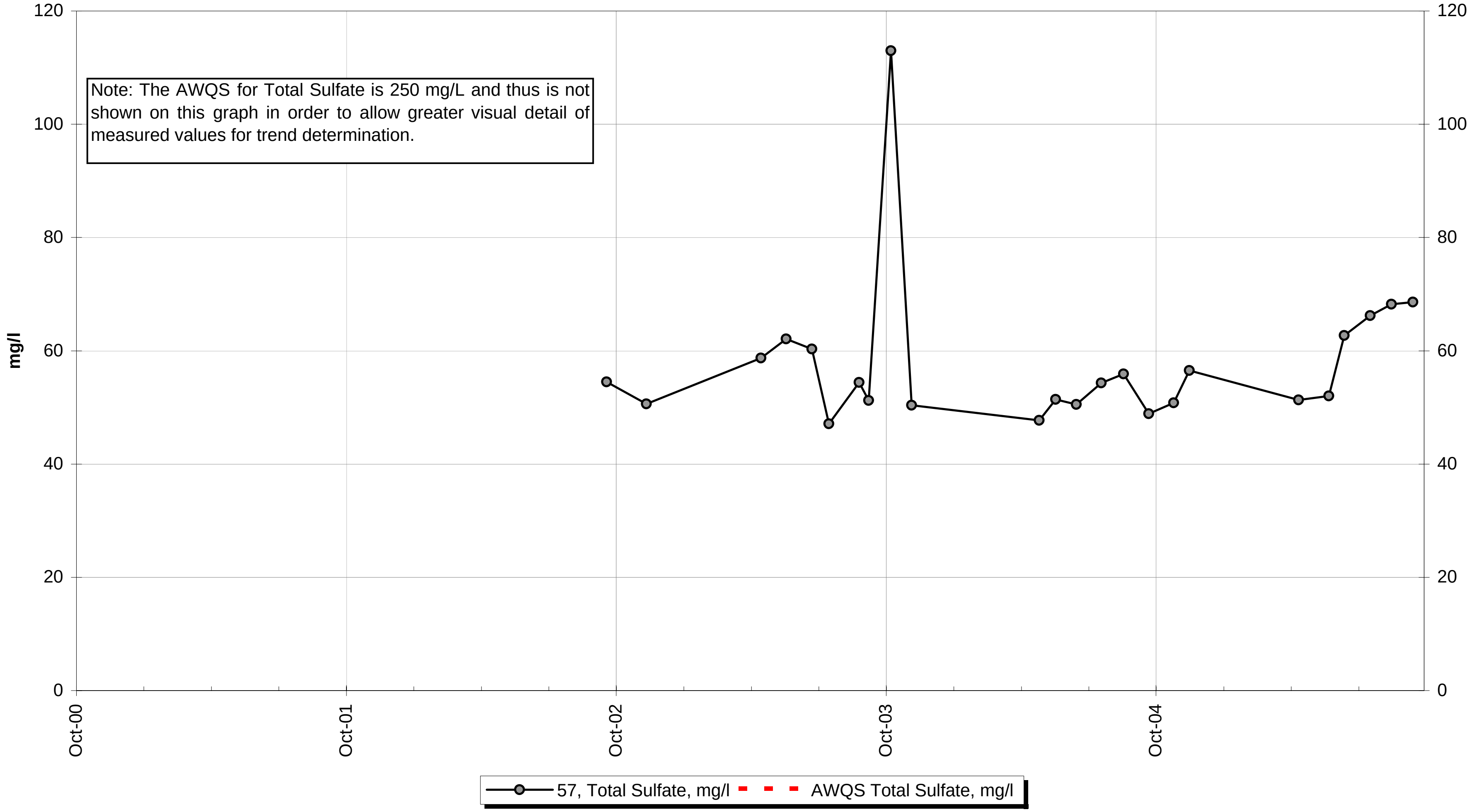


Site 57 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
57, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

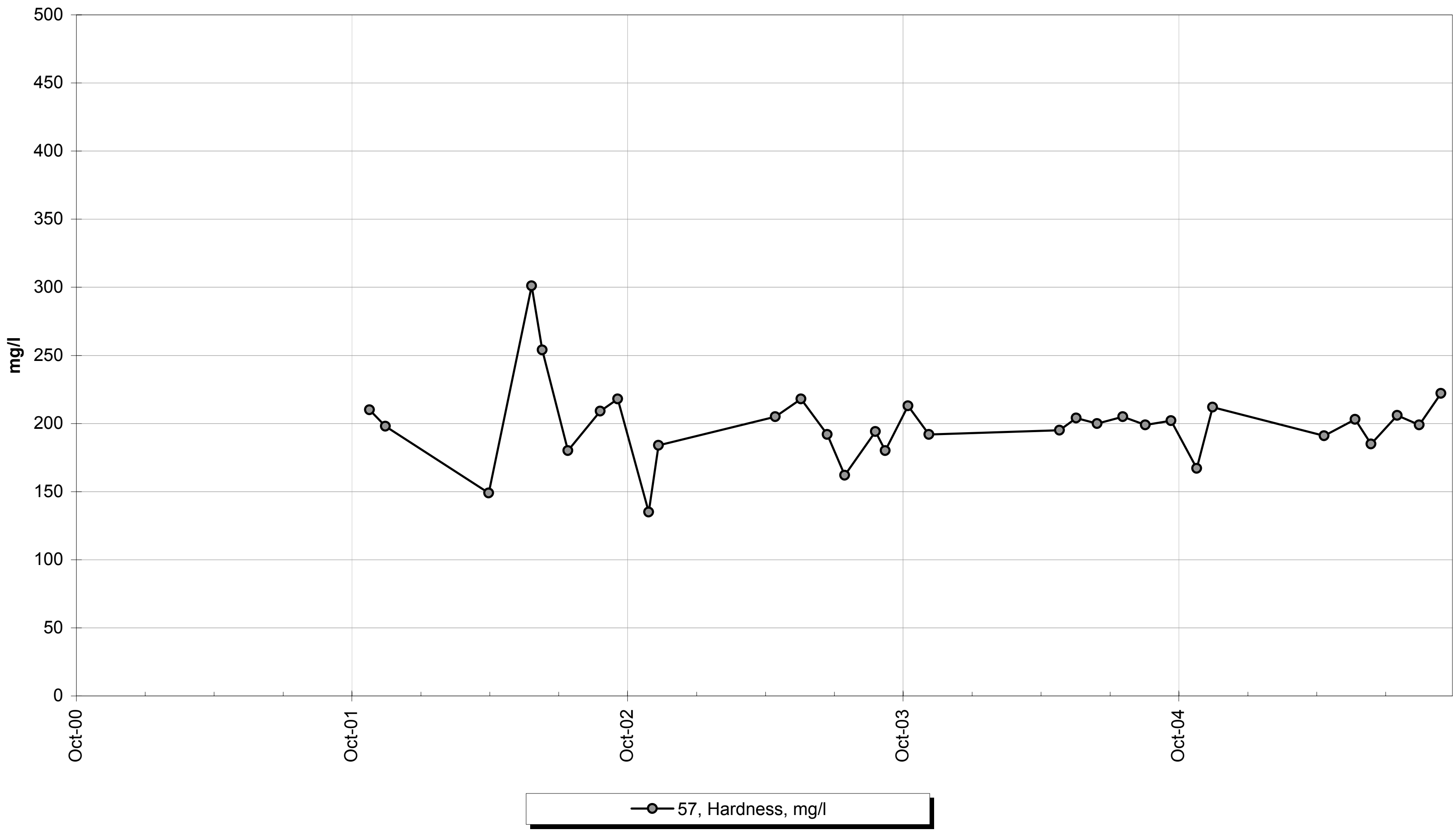
Site 57 -Total Alkalinity



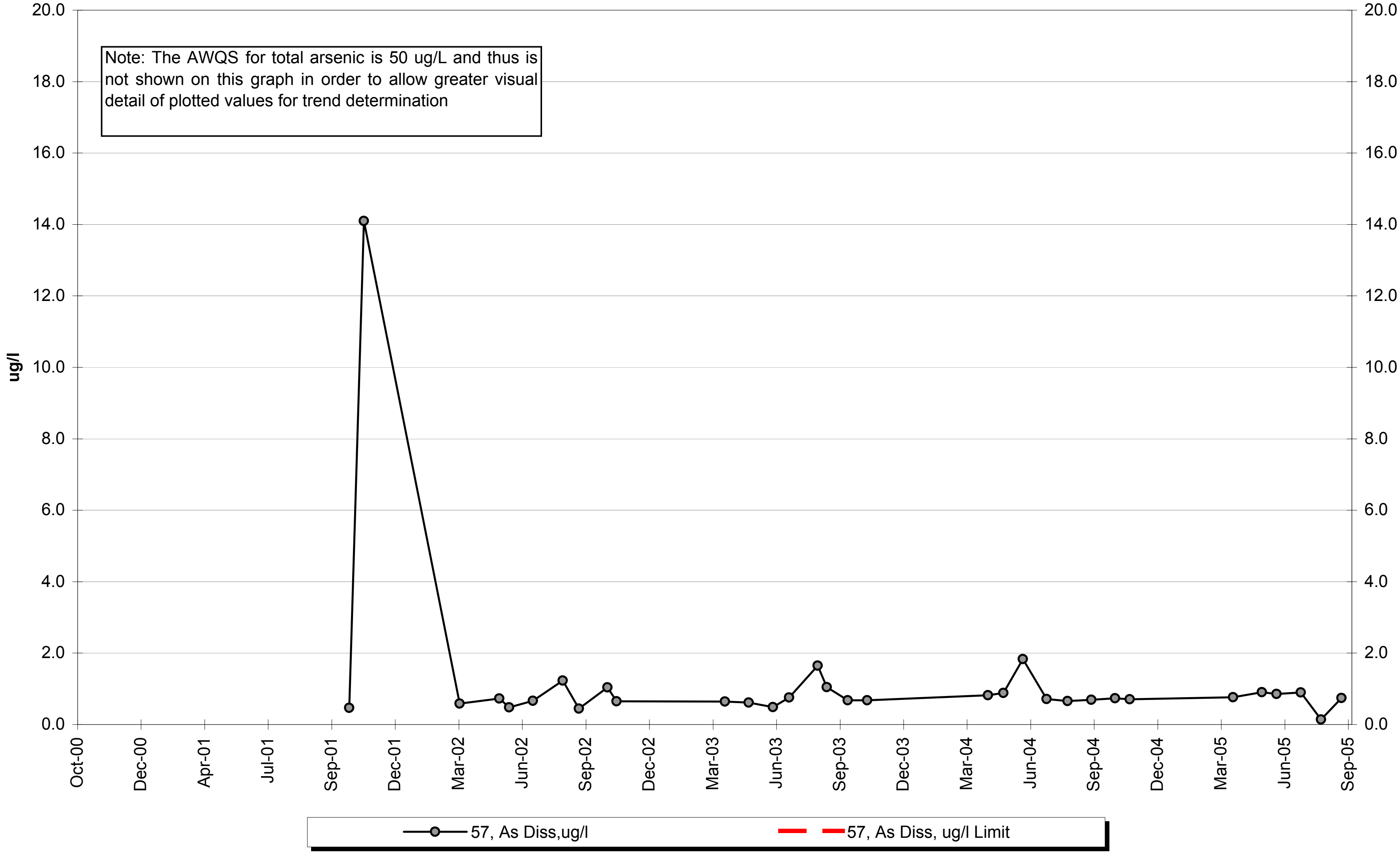
Site 57 -Total Sulfate



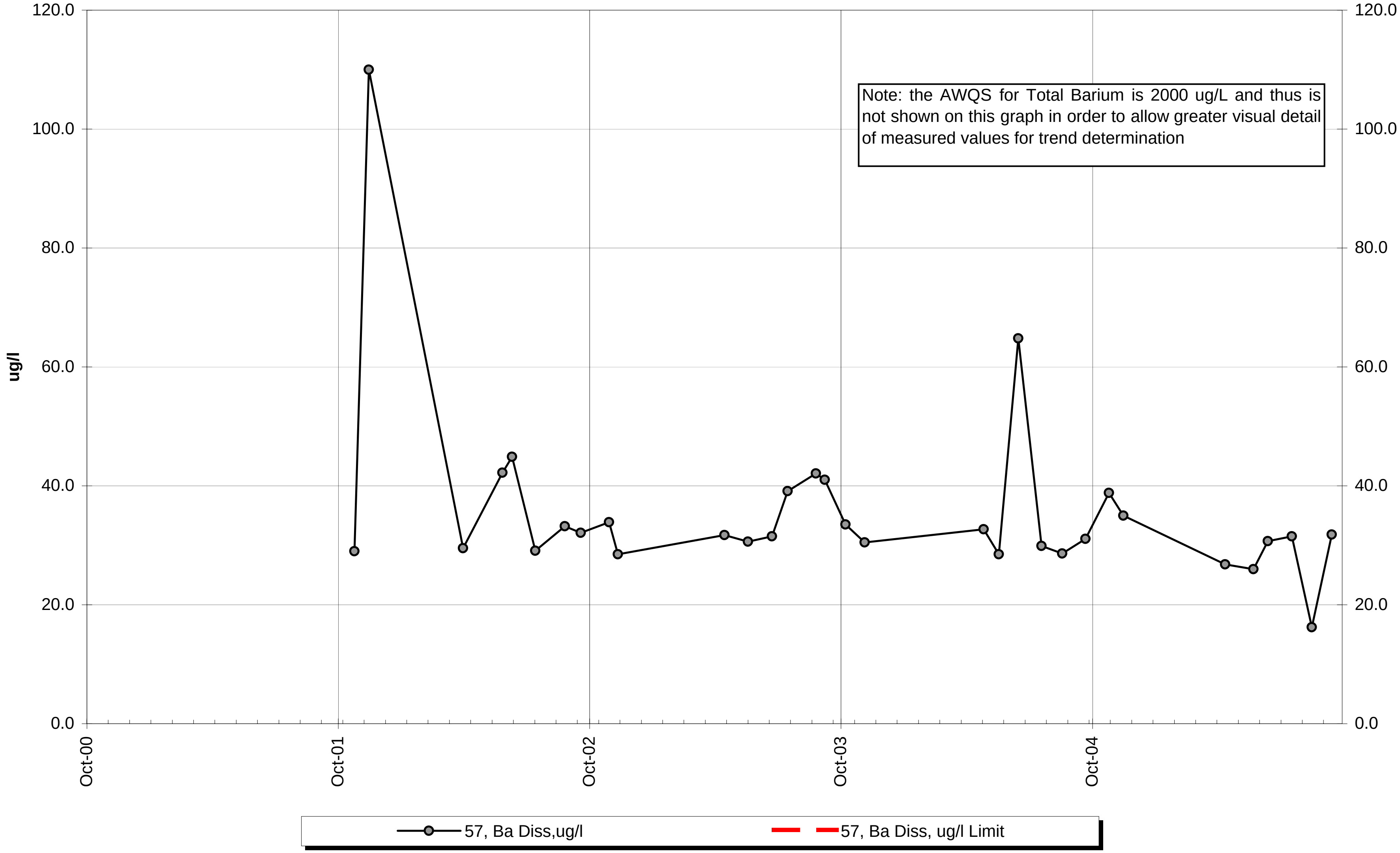
Site 57 -Hardness

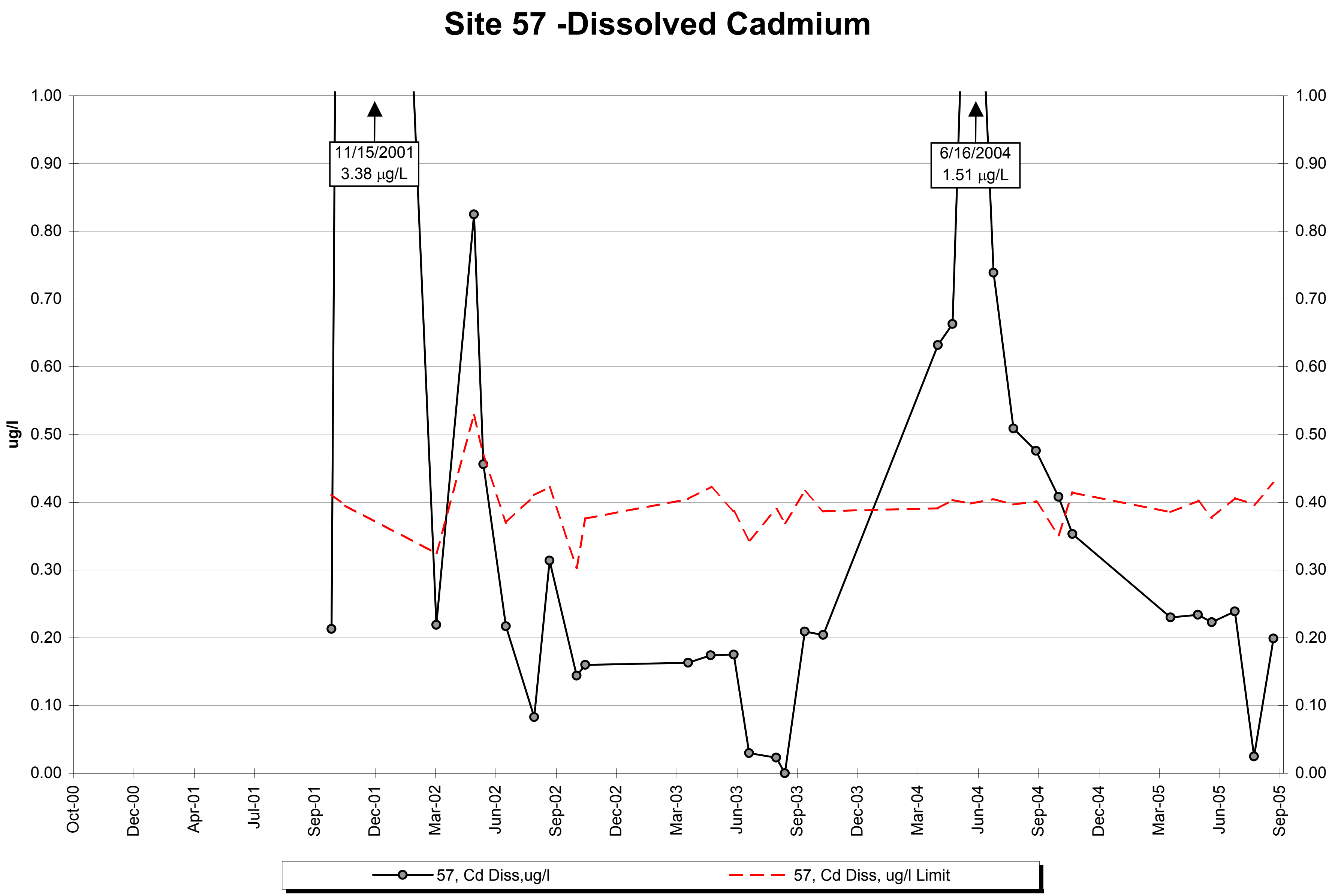


Site 57 -Dissolved Arsenic

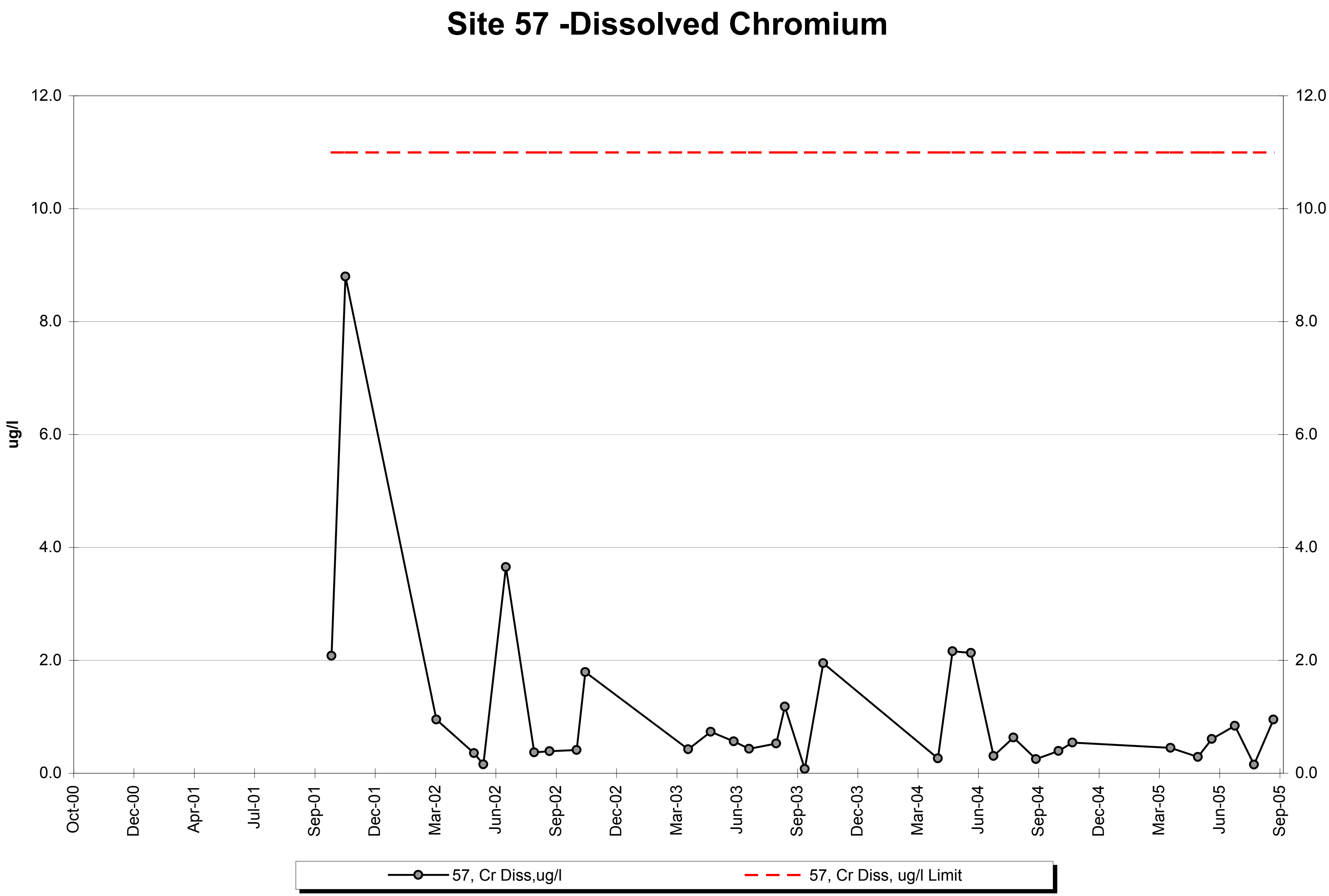


Site 57 -Dissolved Barium



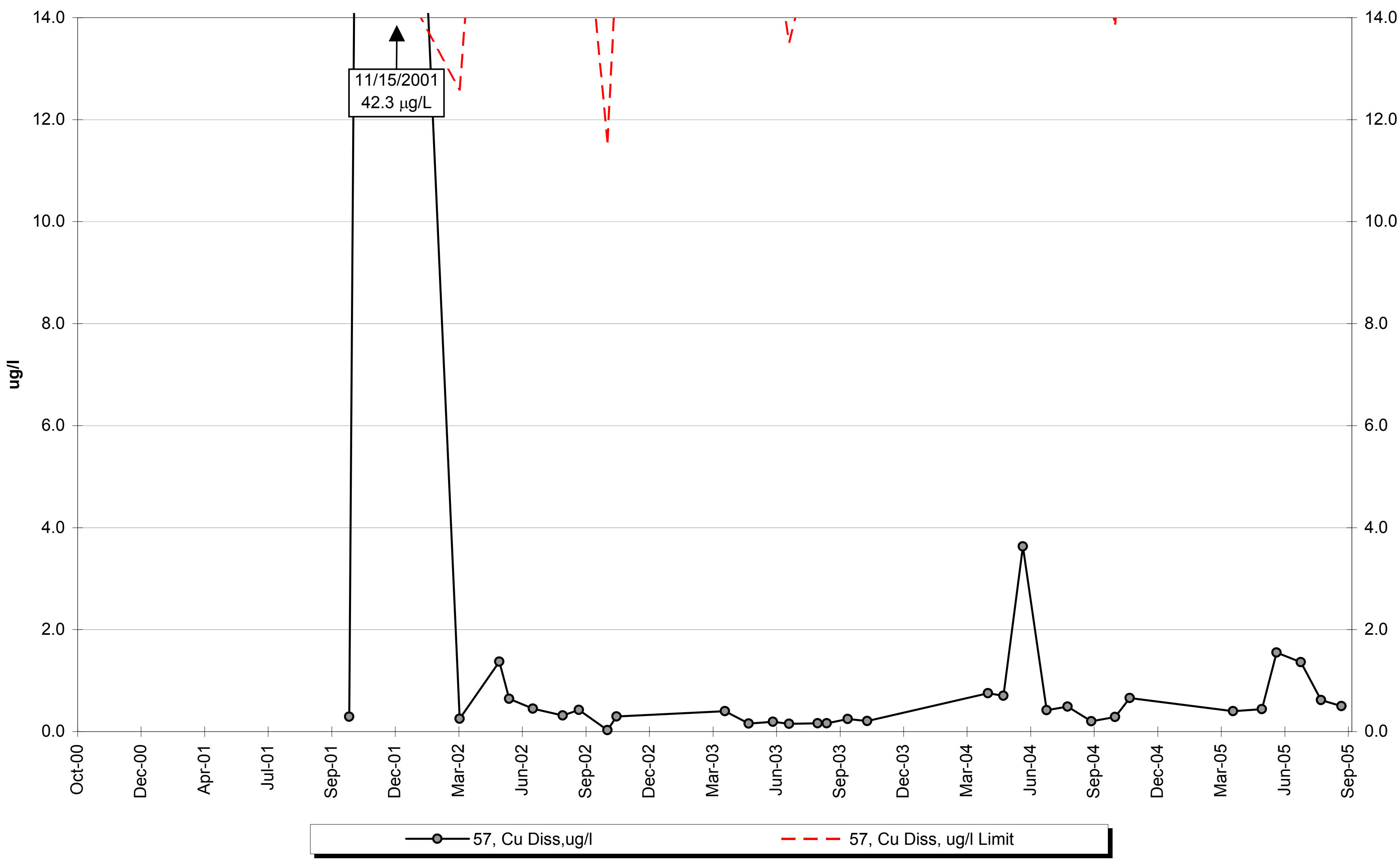


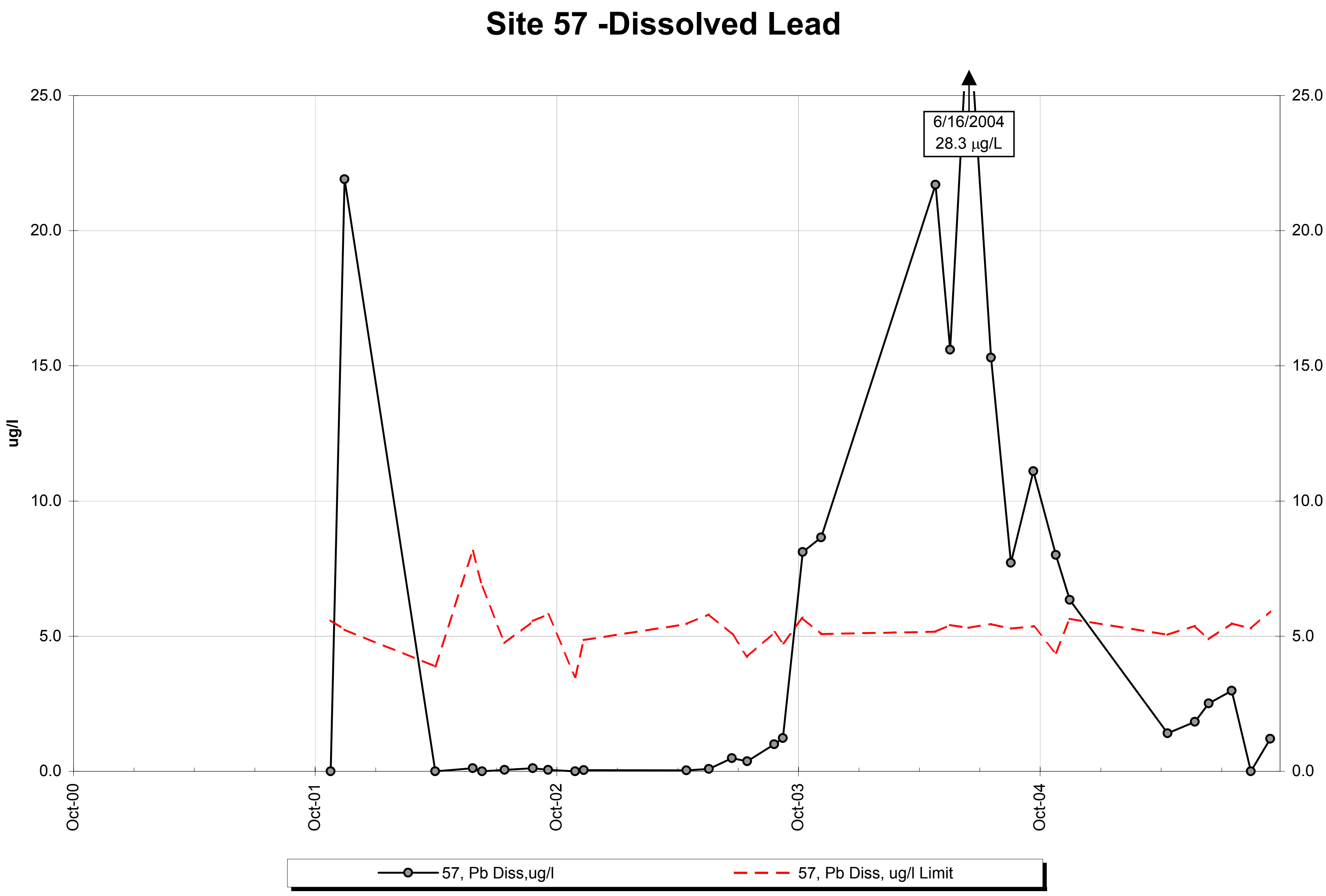
Site 57 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
11/15/2001
3.38 µg/L
6/16/2004
1.51 µg/L
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
57, Cd Diss,ug/l
57, Cd Diss, ug/l Limit



Site 57 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
57, Cr Diss,ug/l
57, Cr Diss, ug/l Limit

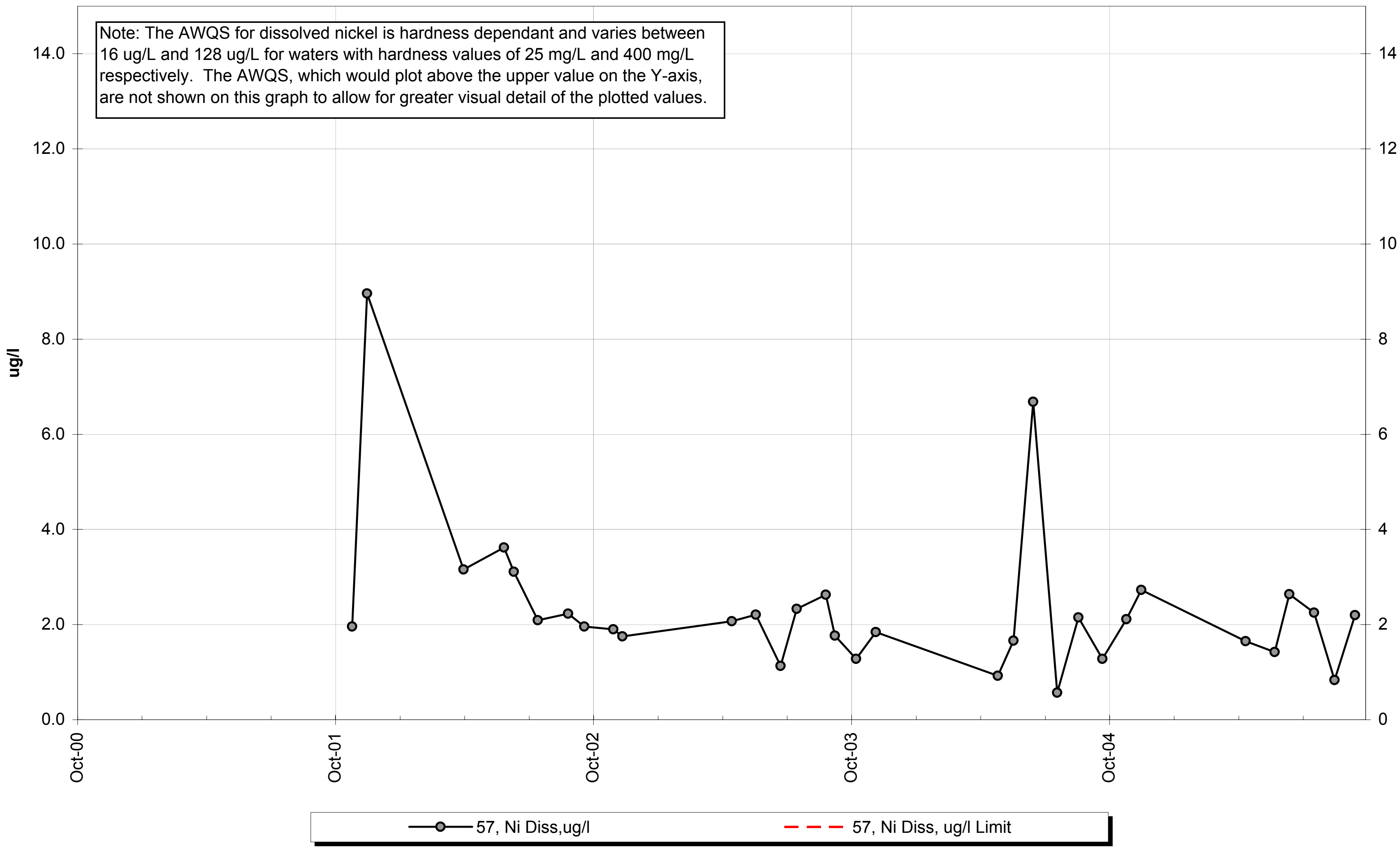
Site 57 -Dissolved Copper

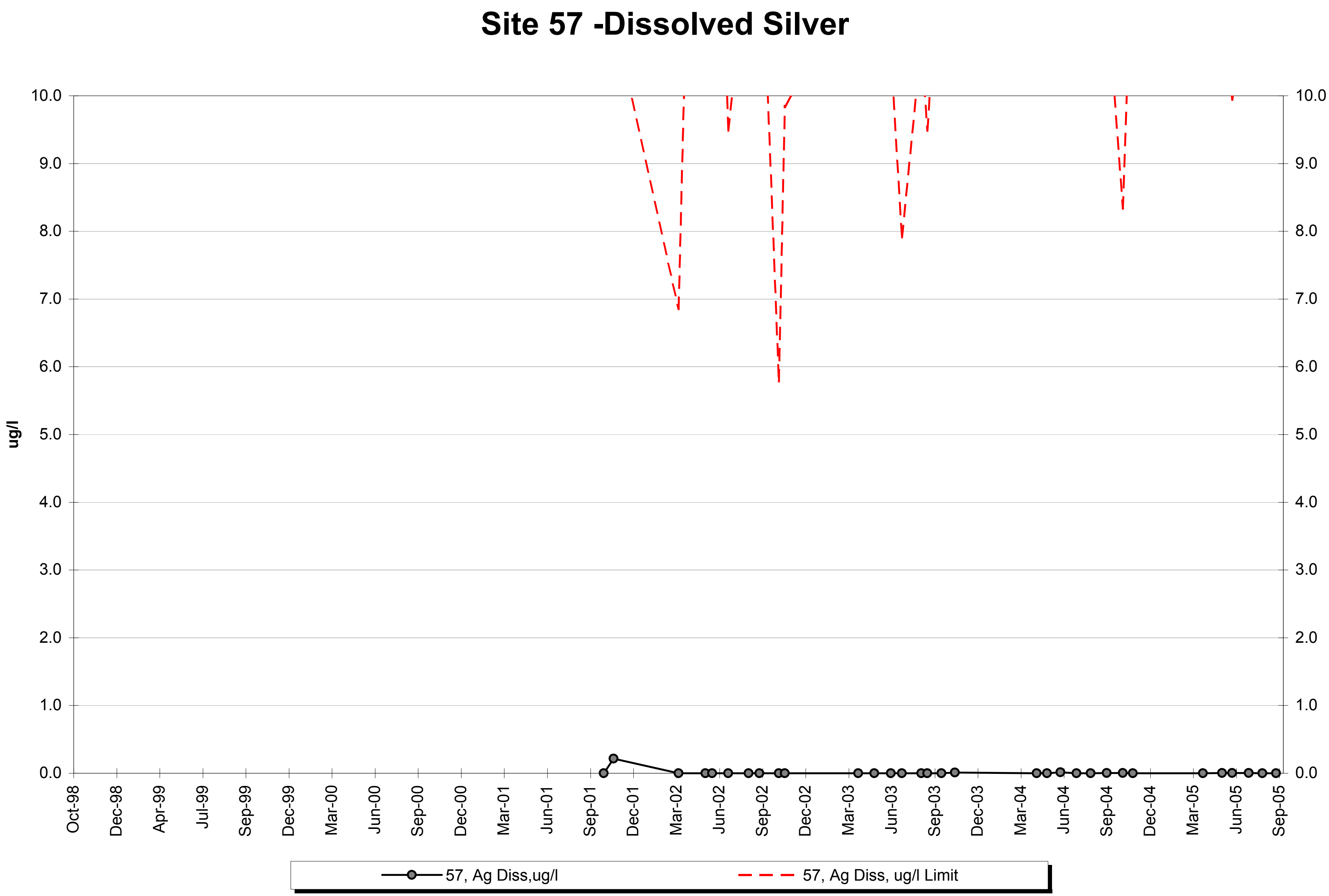




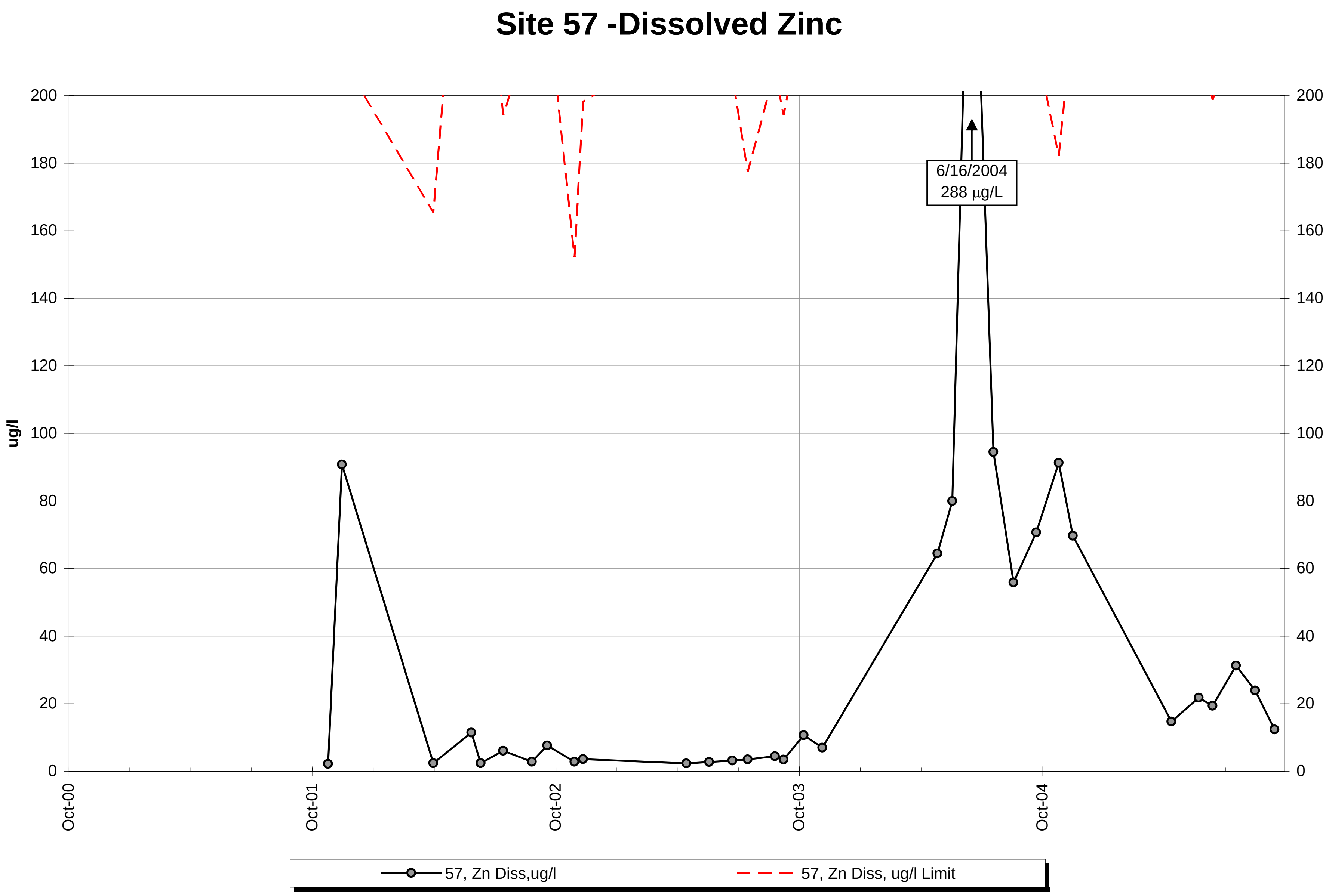
Site 57 -Dissolved Lead
ug/l
25.0
20.0
15.0
10.0
5.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6/16/2004
28.3 µg/L
57, Pb Diss,ug/l
57, Pb Diss, ug/l Limit

Site 57 -Dissolved Nickel



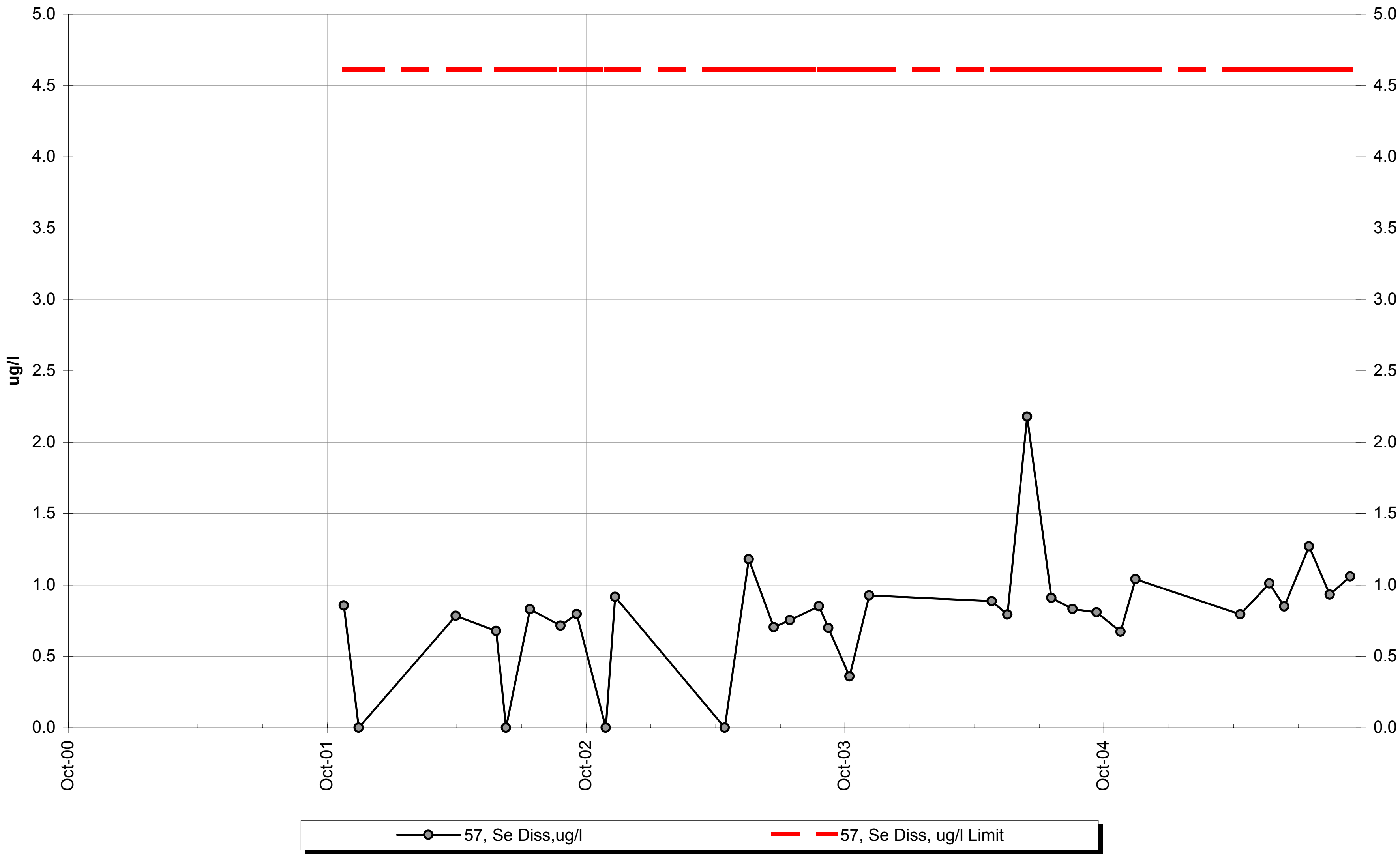


Site 57 -Dissolved Silver
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
57, Ag Diss,ug/l
57, Ag Diss, ug/l Limit

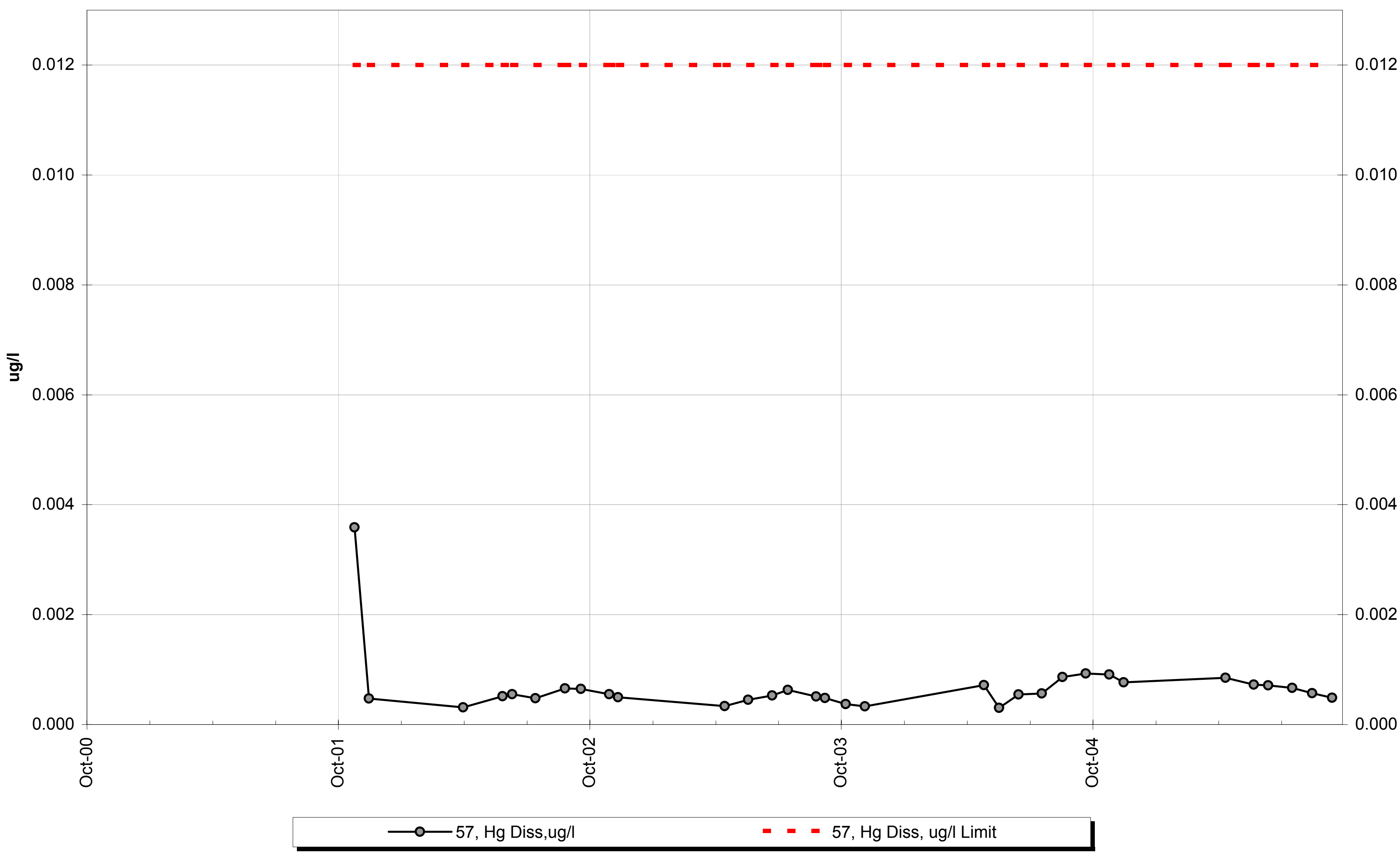


Site 57 -Dissolved Zinc
ug/l
200
180
160
140
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
6/16/2004
288 µg/L
57, Zn Diss,ug/l
57, Zn Diss, ug/l Limit

Site 57 -Dissolved Selenium



Site 57 -Dissolved Mercury



INTERPRETIVE REPORT
SITE 56 “MONITORING WELL D-00-01”

The data collected during the current water year are listed in the following “Table of Results for Water Year 2005” report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report “Qualified Data by QA Reviewer”. The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

Sampling at this site was added to the FWMP in October-2001. All data collected at this site since its inception into the FWMP are included in the data analyses with the exception of the three outliers shown on the table below. During the current year no new data points were flagged as outliers after review by KGCMC.

Sample Date	Parameter	Value	Qualifier	Notes
8/27/2003	Cond Lab, umho	6.0	RR	Statistical outlier, not collaborated by field measurements.
8/27/2003	pH Lab, su	2.1	RR	Suspected sample contamination
8/27/2003	Alkalinity, Total mg/L	<0.0	RR	Suspected sample contamination

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. No results exceeding these criteria have been identified as listed in the table below.

Sample Date	Parameter	Value	Standard	Standard Type
No exceedances have been identified by KGCMC for the period of Oct-04 though Sept-05.				

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No visually obvious trends were apparent. While not forming a trend, there was a distinct spike in dissolved mercury, 0.0096-ug/l, in the Aug-03 sample. This appears to have been a unique event since values have returned to normal levels in subsequent samples. No statistical analysis for trend was performed on the Site 56 data. For a robust analysis of trend at least five years of data are required. KGCMC anticipates adding this component into the Water Year 2006 annual report for this site.

A comparison of median values for alkalinity, lab pH, lab conductivity, sulfate, and dissolved zinc between Site 57 and Site 56 has been conducted as specified in the Statistical Information Goals for Site 56. Additional X-Y plots have been generated for alkalinity, pH, conductivity, sulfate, and dissolved zinc that co-plot data from Site 56 and Site 57, the up-gradient control site, to aid in the comparison between those two sites. Calculation details of the non-parametric signed-rank tests are presented in detail on the pages following this interpretive section. The table below summarizes the results of the signed-rank test as performed on the Water Year 2005 data set. Additional tables summarizing results for Water Years 2002-2004 can also be found following this interpretive section. The only significant difference identified by the typical one-tailed test was for alkalinity. The median values for alkalinity for Site 57 and Site 56 are 157.0 mg/l and 64.8 mg/l respectively. The median difference, Site 57 minus Site 56, is 88.8 mg/l. It should be noted that if a two-tailed signed-rank test was applied to the dataset for these sites a significant (p=1.00) difference would exist with respect to the other parameters included in the signed-ranks analysis. Specifically, conductivity, sulfate, and dissolved zinc fail to meet the null hypothesis of no significant difference between medians when the alternative hypothesis is proposed as a two-tailed test (H_a: median [D]$\neq$0). The obvious differences of the major water-quality parameters at these sites are likely the result of several inherent hydrological/geological differences between the two sites.

Site 56 vs. Site 57 - WY2005, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
Conductivity, Lab	1.00	379.0	138.5	244.5
pH, Lab	0.16	7.36	7.41	-0.06
Alkalinity, Total	**1.00**	157.0	64.8	88.8
Sulfate, Total	1.00	59.6	10.3	50.1
Zinc, Dissolved	1.00	22.85	0.52	22.31

The two major differences between the sites are the unit of completion and the hydrological setting. The up-gradient control site, Site 57, is in an area away from the influence of any major surface flow. The screened interval is in the colluvial unit that underlies most of Site-23 production rock area and samples 63 to 68 feet below the surface. The aquifer sampled by the screened interval appears to be one of multiple perched aquifers located below Site 23 as noted in the “Site 23/D Hydrogeology and Geochemistry Analysis” report (EDE, 2004). The down-gradient well, Site 56, is to the southeast of the Site-23/D production rock areas and is located approximately 40 ft. west of the lower reaches of Bruin Creek. The screened interval was originally interpreted as the same colluvial unit as Site 57, but recent drilling information suggests the completion is in the alluvial sands which underlie most of Site-D. The sampled interval is at a depth of 14 to 19 feet. The difference in the unit of completion may have an effect on the resulting water quality. The colluvium is characterized as a fine to coarse sand with angular to sub-rounded, partially weathered chloritic rock with localized residual pyrite. The alluvial sand is characterized as a fine to coarse sand with subangular to rounded gravel and is composed of well-weathered clasts with a more stable mineral assemblage. Thus the colluvial material, being less deeply weathered, would typically generate a higher leachable load of dissolved salts that would be reflected in the chemistry of the associated ground water. Additionally, the proximity of Site 56 to Bruin Creek and Greens Creek and its shallow completion depth suggest there would be a much greater influence of a surface water component relative to Site 57. The water temperature data for Site 56 reflects this by showing a very strong seasonal variation that is very similar to the data collected at the nearby surface sites 46 (Lower Bruin Creek) and 6 (Middle Greens Creek). In contrast the Site 57 water temperature data shows a much lower variation that is indicative of groundwater with a minor seasonal surface component. The surface water recharge to the local aquifer would tend to act as a diluent with respect to the more concentrated dissolved fraction of groundwater. Finally, if Site 57 does sample a localized, perched aquifer it would probably be more strongly influenced by seasonal and/or annual variations in recharge rate since the area of capture would be more limited than for Site 56. In summary, the combined effects of the difference in completion units and the different hydrological regimes likely explain the disparity in analyte concentrations found at the two sites.

Table of Results for Water Year 2005

Site 56 "MW-D-00-01"

Sample Date/Parameter	10/26/2004	11/16/2004	Dec-04	Jan-05	Feb-05	Mar-05	4/13/2005	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	3.7	5.2					2.7	6.2	9.0	10.9	12.4	9.8	7.6
Conductivity-Field(μmho)	201	130					159	106	138	154	163	137	146
Conductivity-Lab (μmho)	158	132					145	96	123	145	166	131	139
pH Lab (standard units)	7.83	7.41					7.73	7.47	7.11	7.37	7.25	7.40	7.41
pH Field (standard units)	7.52	6.92					7.33	7.11	6.79	7.32	6.95	7.44	7.22
Total Alkalinity (mg/L)	74.2 J	62.8					80.0	52.9	62.3	66.8	72.3	59.5	64.8
Total Sulfate (mg/L)	10.9	9.1					12.8	5.3	9.8	10.8	14.2	9.0	10.3
Hardness (mg/L)	63.6	73.2					78.3	50.0	68.9	71.7	82.5	72.9	72.3
Dissolved As (ug/L)	0.116	0.119	NOT SCHEDULED FOR SAMPLING				0.123 J	0.120	0.150	0.127	0.140 J	0.176	0.125
Dissolved Ba (ug/L)	10.8	9.6					9.9	7.5	11.2	11.2	16.2	12.7	11.0
Dissolved Cd (ug/L)	0.014 U	0.014 U					0.012 J	0.013 U	0.016	0.018	0.025	0.014	0.014
Dissolved Cr (ug/L)	0.234 U	0.249					0.248	<0.056	0.235 U	0.269	0.153	0.427	0.242
Dissolved Cu (ug/L)	0.430	0.749					0.519 U	0.523	0.541 U	0.842	0.619	0.693	0.580
Dissolved Pb (ug/L)	0.0053 U	0.0076 U					0.0058 U	0.0907 U	0.0191 U	0.0091 U	0.0033	0.0081 U	0.0078
Dissolved Ni (ug/L)	0.938	1.080					0.824	0.531	0.636 U	0.947	0.831	0.788	0.828
Dissolved Ag (ug/L)	0.000 J	<0.002					<0.003	0.004 J	0.000 J	<0.002	<0.003	<0.002	0.001
Dissolved Zn (ug/L)	0.44	0.60 U					0.29 UJ	0.88 U	0.81 U	0.83 U	0.20 J	0.44 U	0.52
Dissolved Se (ug/L)	0.587 J	0.390					0.786 J	0.294 J	0.494	0.667	0.932 J	0.483	0.541
Dissolved Hg (ug/L)	0.001030 U	0.001880					0.001610	0.001830 U	0.000844 U	0.001310 U	0.000612 U	0.001570	0.001440

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
56	10/26/2004	1:00:00 PM				
			Alk Tot, mg/l	74.2	J	Hold Time
			Cd Diss, ug/l	0.0136	U	Field Blank Contamination
			Cr Diss, ug/l	0.234	U	Field Blank Contamination
			Pb Diss, ug/l	0.00526	U	Field Blank Contamination
			Ag Diss, ug/l	0.000305	J	Below Quantitative Range
			Se Diss, ug/l	0.587	J	LCS Recoveries
			Hg Diss, ug/l	0.00103	U	Field Blank Contamination
56	11/16/2004	11:03:00 AM				
			Cd Diss, ug/l	0.0141	U	Field Blank Contamination
			Pb Diss, ug/l	0.00756	U	Field Blank Contamination
			Zn Diss, ug/l	0.603	U	Field Blank Contamination
56	04/13/2005	12:00:00 PM				
			As Diss, ug/l	0.123	J	LCS Recovery
			Cd Diss, ug/l	0.0116	J	Below Quantitative Range
			Cu Diss, ug/l	0.519	U	Field Blank Contamination
			Pb Diss, ug/l	0.00578	U	Field Blank Contamination
			Zn Diss, ug/l	0.288	UJ	Field Blank Contamination, L
			Se Diss, ug/l	0.786	J	LCS Recovery
56	05/24/2005	8:55:00 AM				
			Cd Diss, ug/l	0.0126	U	Field Blank Contamination
			Pb Diss, ug/l	0.0907	U	Field Blank Contamination
			Ag Diss, ug/l	0.00409	J	Below Quantitative Range
			Zn Diss, ug/l	0.882	U	Field Blank Contamination
			Se Diss, ug/l	0.294	J	Below Quantitative Range, L
			Hg Diss, ug/l	0.00183	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

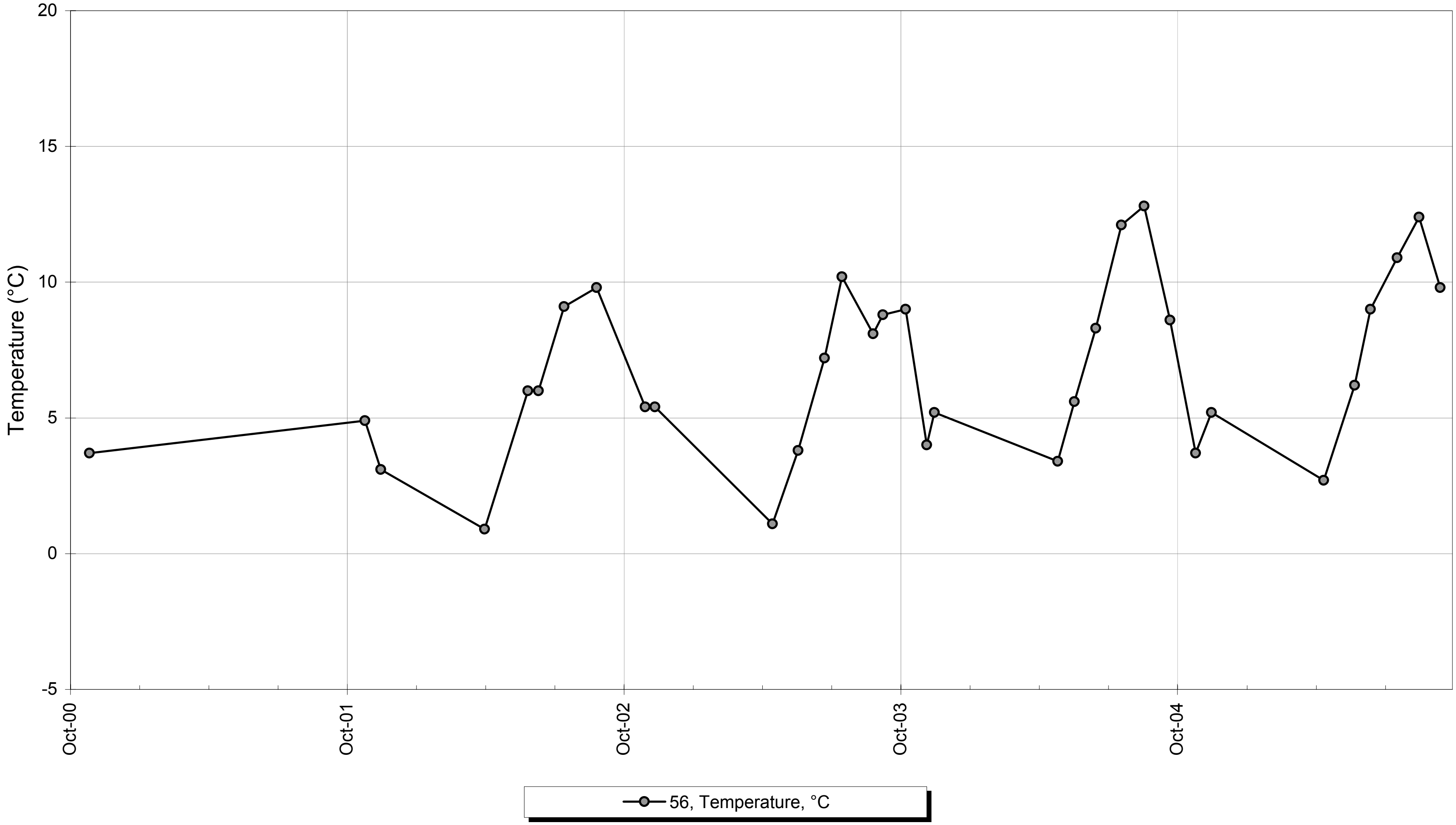
Qualified Data by QA Reviewer

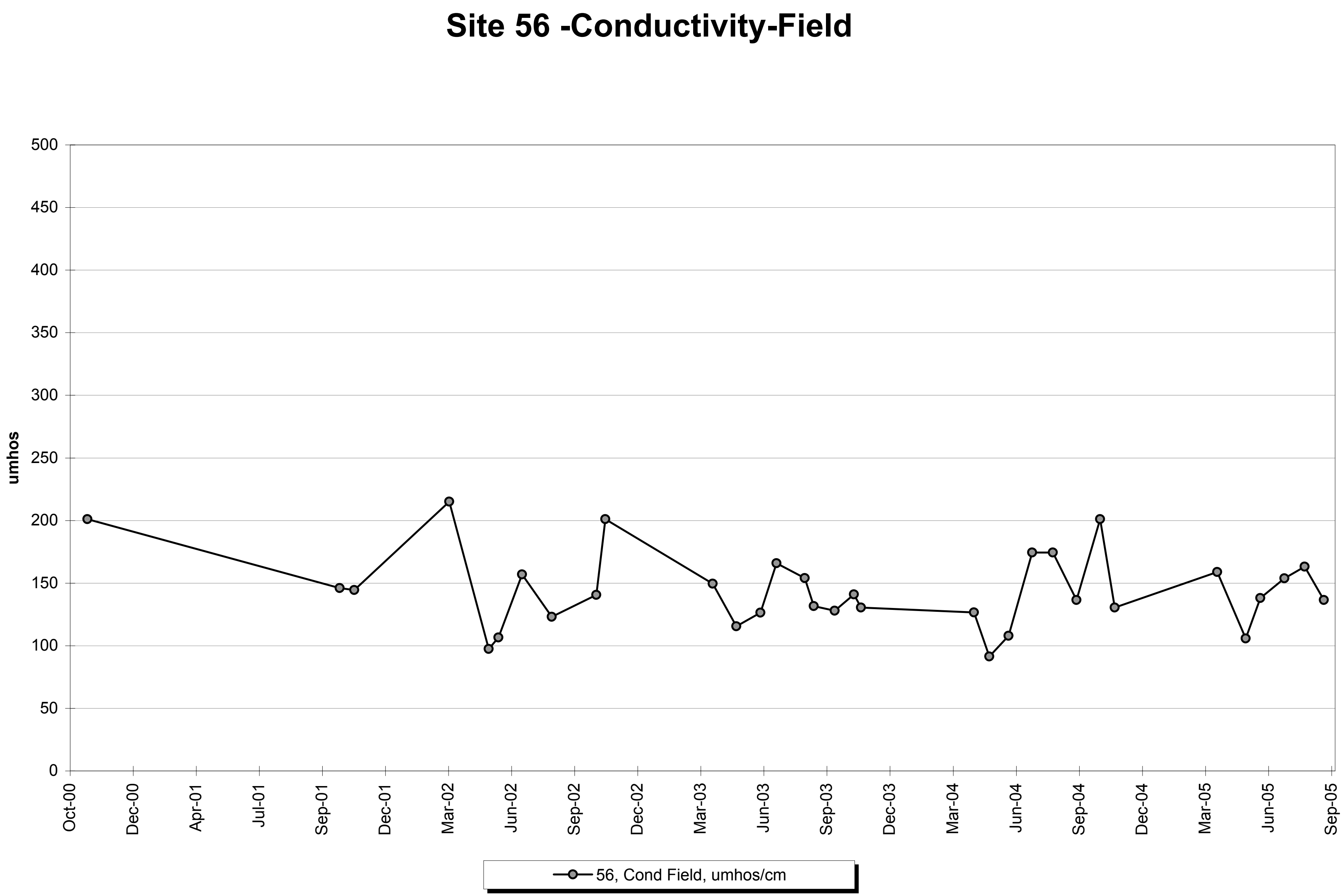
Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
56	06/14/2005	12:25:00 PM				
			Cr Diss, ug/l	0.235	U	Field Blank Contamination
			Cu Diss, ug/l	0.541	U	Field Blank Contamination
			Pb Diss, ug/l	0.0191	U	Field Blank Contamination
			Ni Diss, ug/l	0.636	U	Field Blank Contamination
			Ag Diss, ug/l	0.000461	J	Below Quantitative Range
			Zn Diss, ug/l	0.806	U	Field Blank Contamination
			Hg Diss, ug/l	0.000844	U	Field Blank Contamination
56	07/19/2005	1:08:00 PM				
			Pb Diss, ug/l	0.00912	U	Field Blank Contamination
			Zn Diss, ug/l	0.833	U	Field Blank Contamination
			Hg Diss, ug/l	0.00131	U	Field Blank Contamination
56	08/17/2005	11:00:00 AM				
			As Diss, ug/l	0.14	J	LCS Recovery
			Cr Diss, ug/l	0.153	J	Below Quantitative Range
			Pb Diss, ug/l	0.00332	U	Field Blank Contamination
			Zn Diss, ug/l	0.202	J	LCS Recovery
			Se Diss, ug/l	0.932	J	LCS Recovery
			Hg Diss, ug/l	0.000612	U	Field Blank Contamination
56	09/14/2005	11:08:00 AM				
			Pb Diss, ug/l	0.00811	U	Field Blank Contamination
			Zn Diss, ug/l	0.439	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

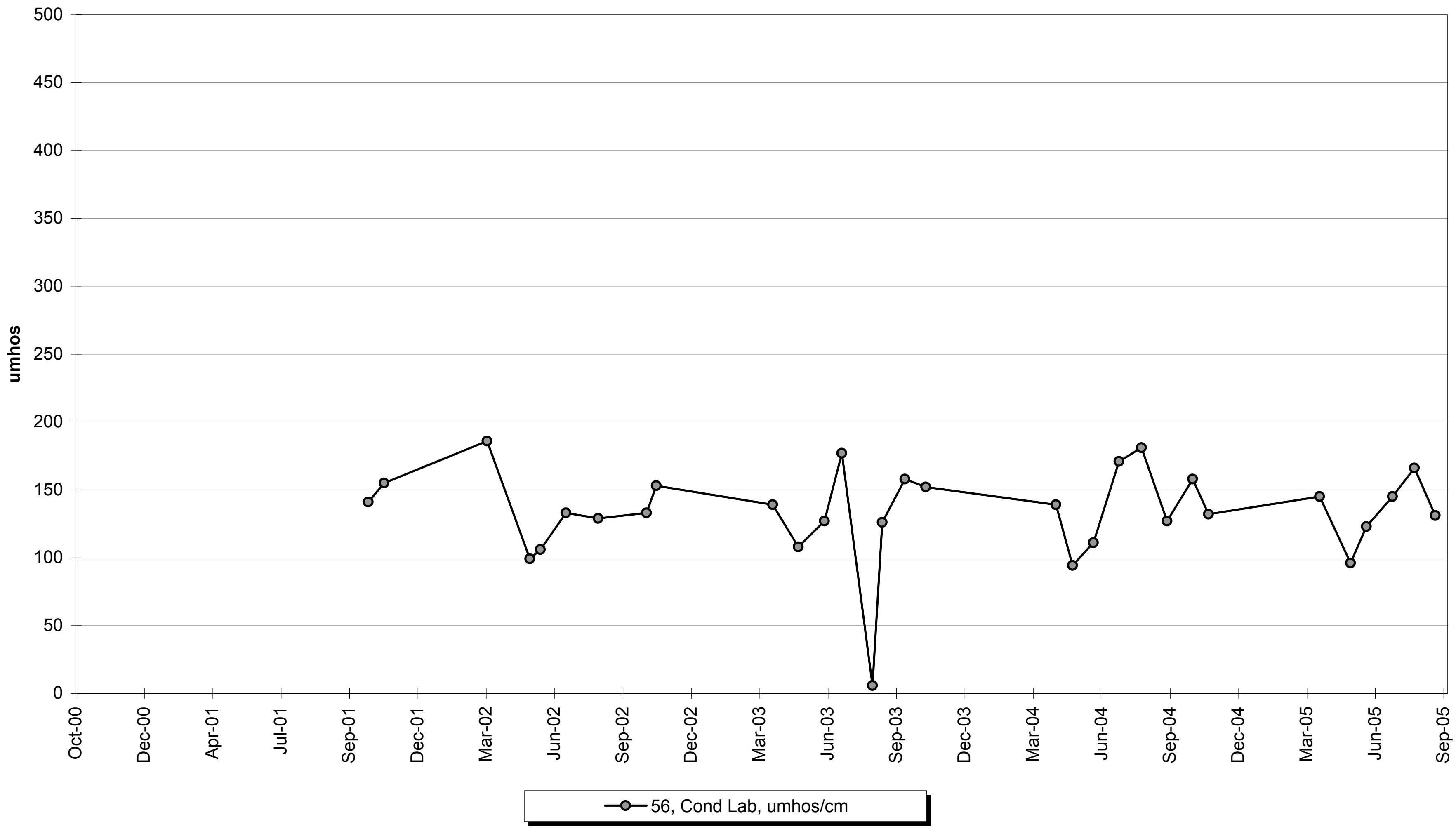
Site 56 -Water Temperature

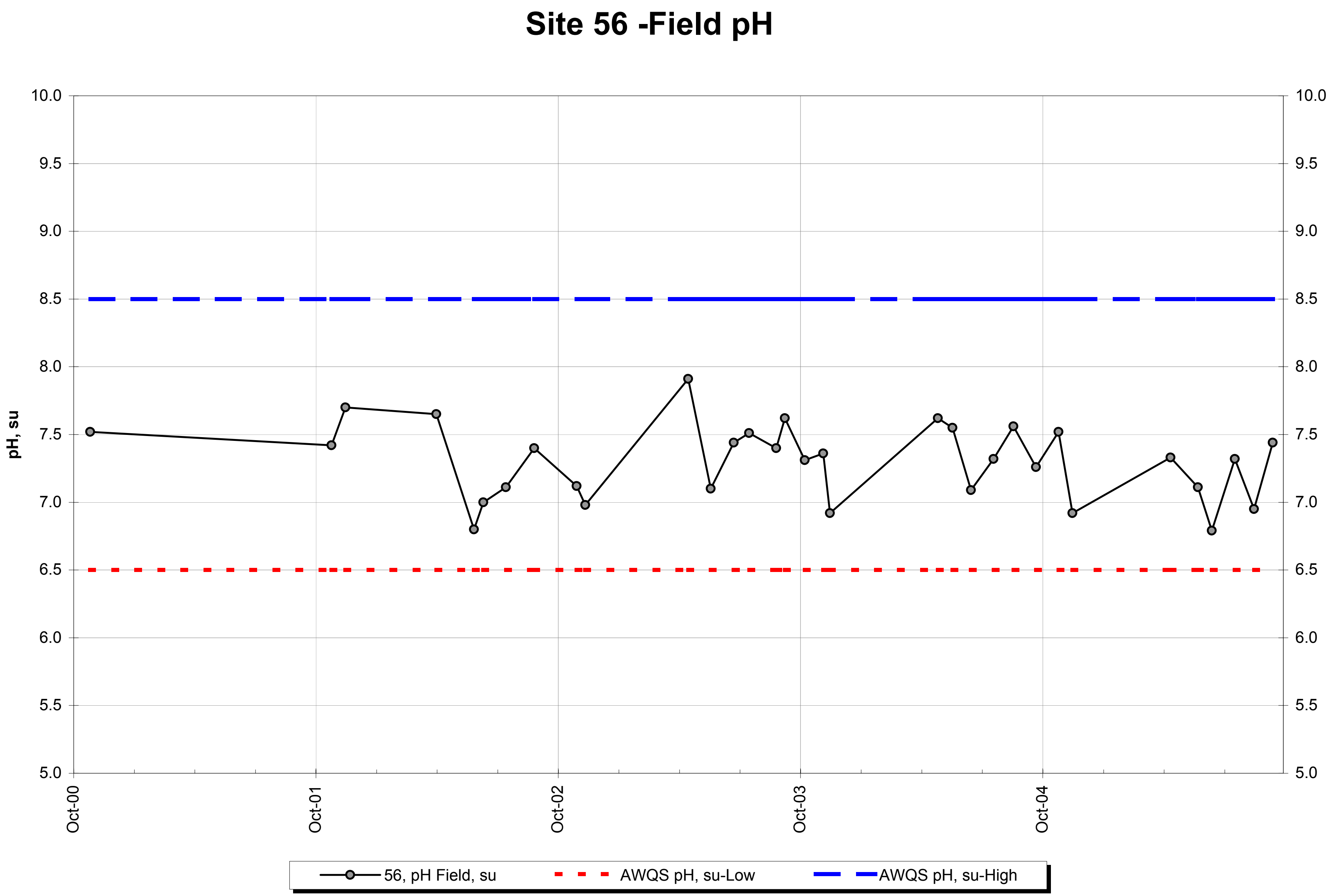




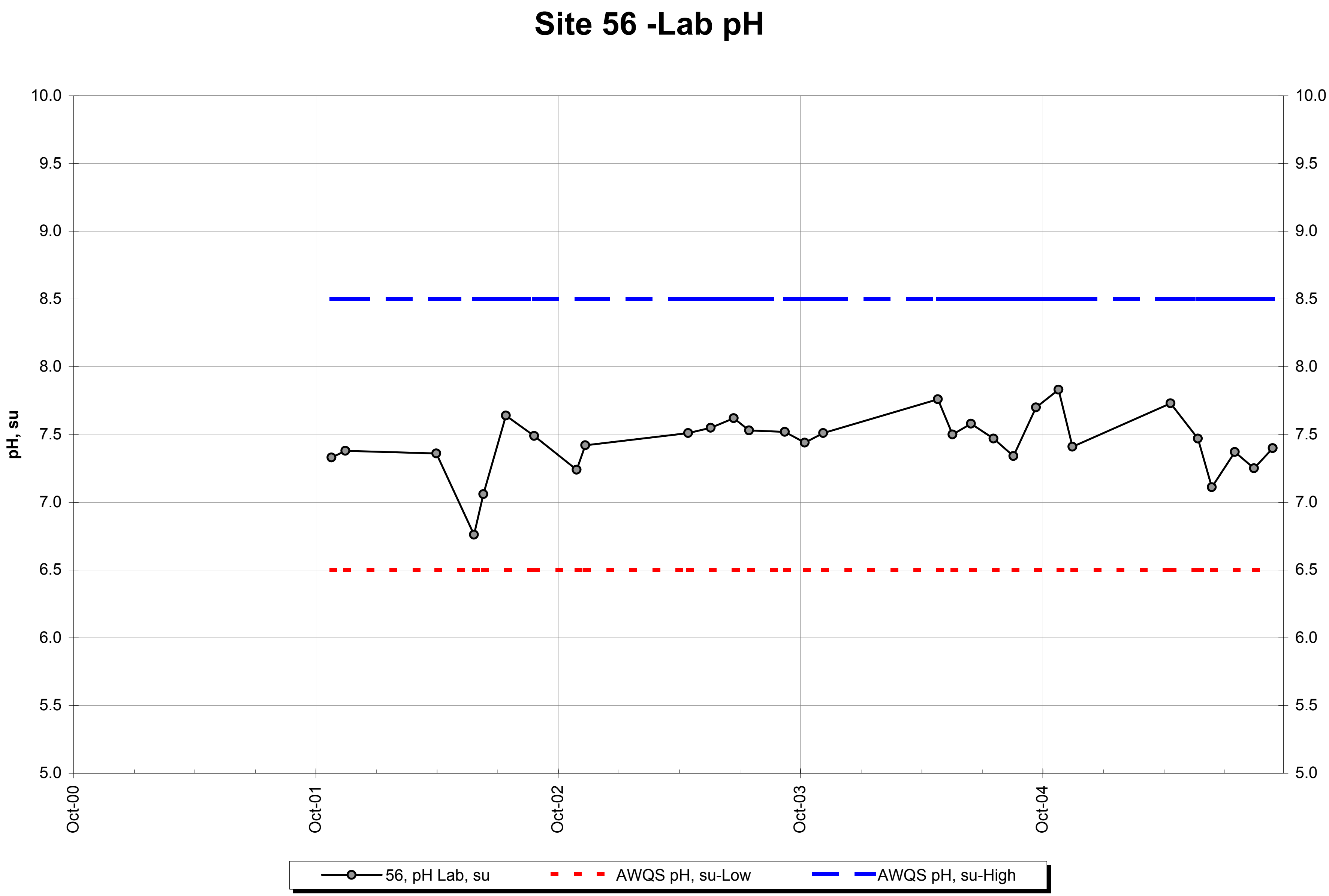
Site 56 -Conductivity-Field
umhos
500
450
400
350
300
250
200
150
100
50
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
56, Cond Field, umhos/cm

Site 56 -Conductivity-Lab



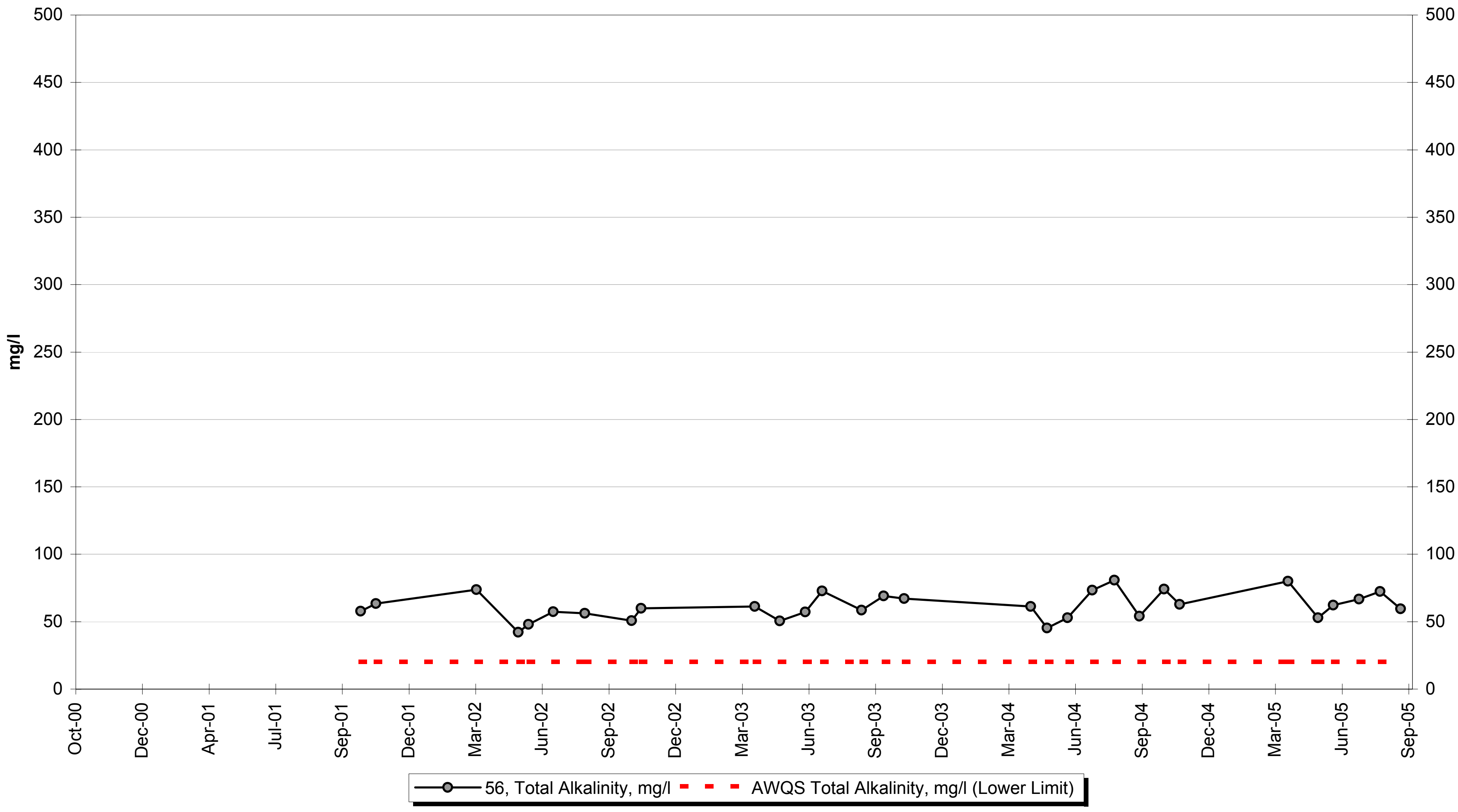


Site 56 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
56, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

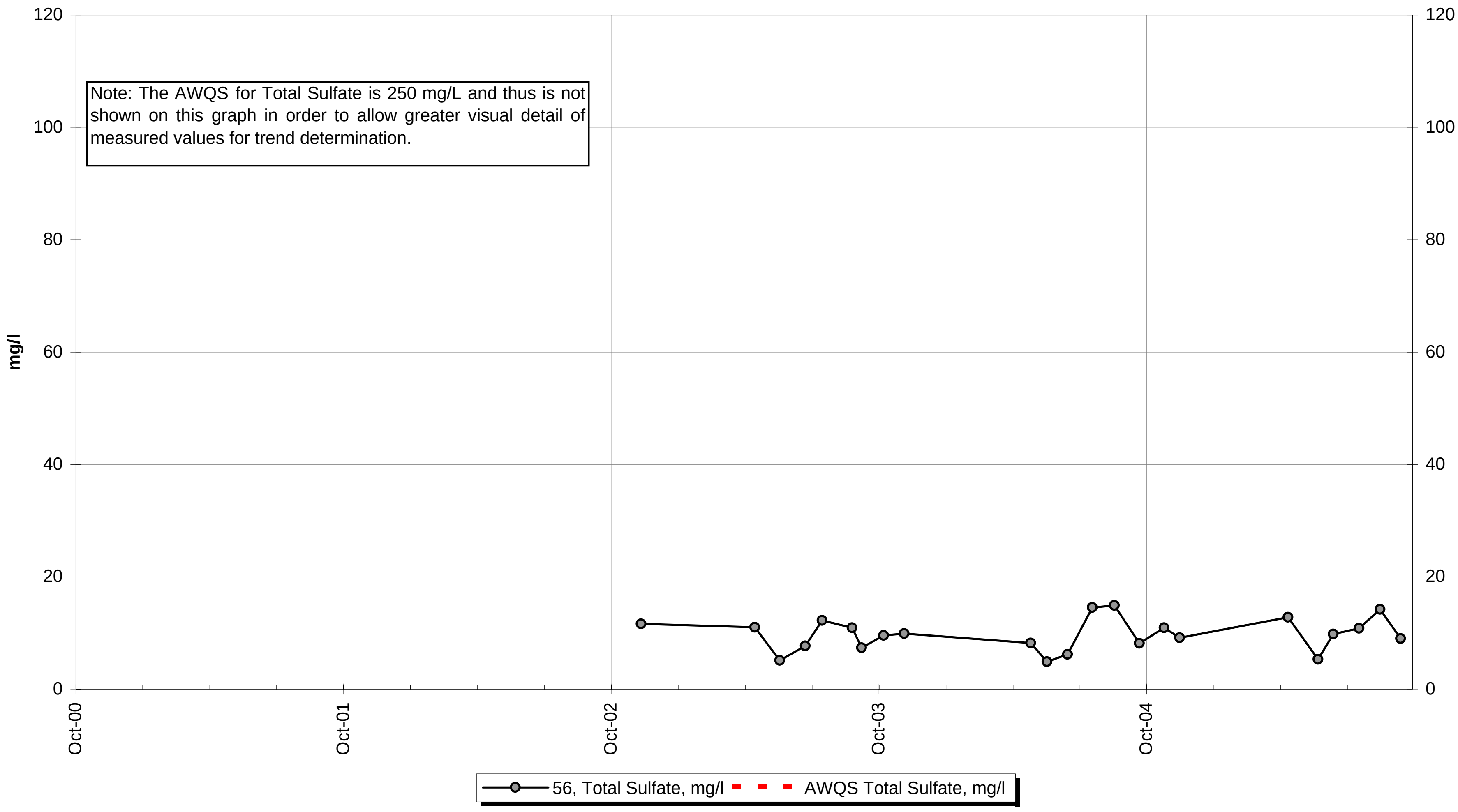


Site 56 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
56, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

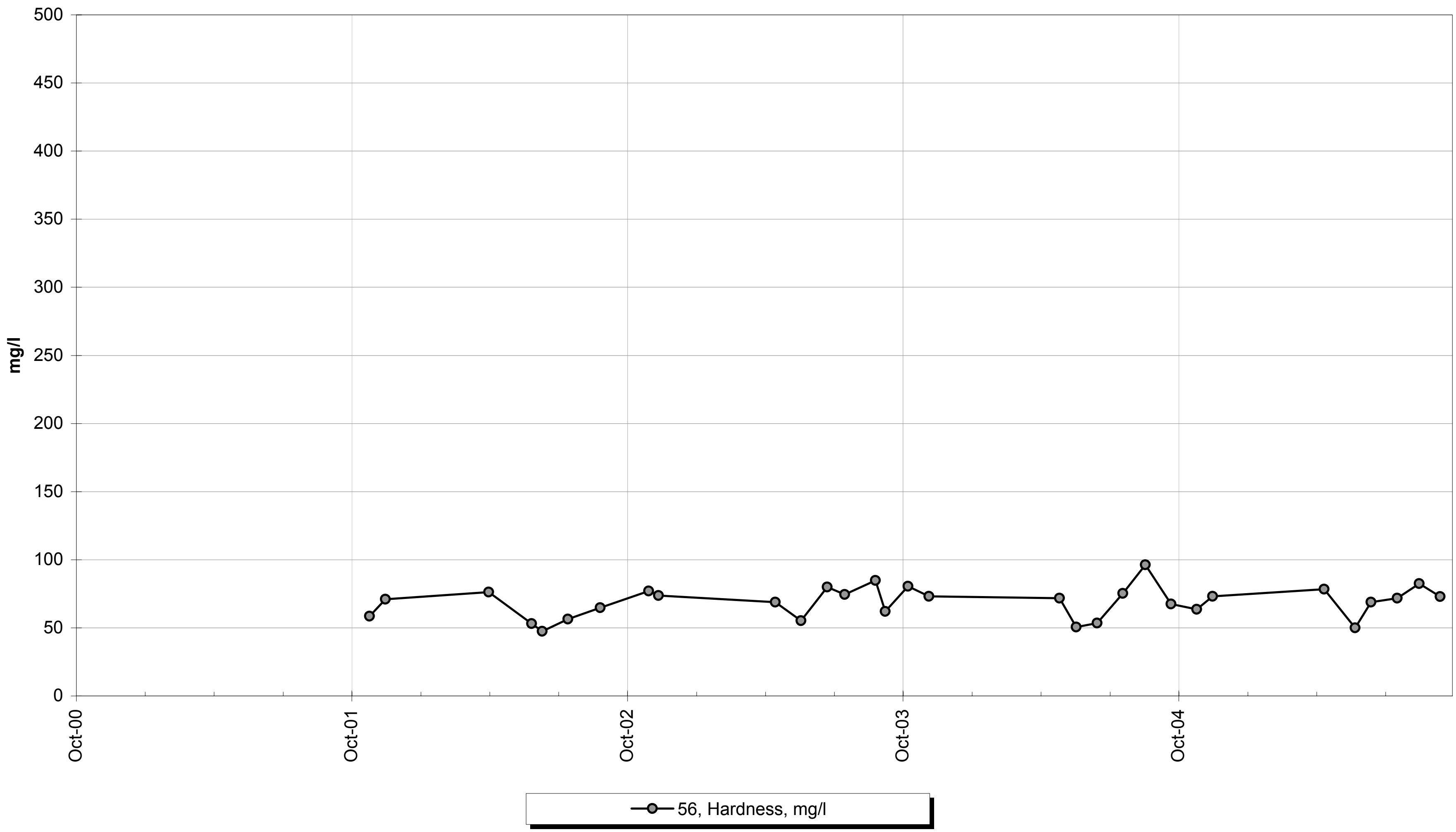
Site 56 -Total Alkalinity



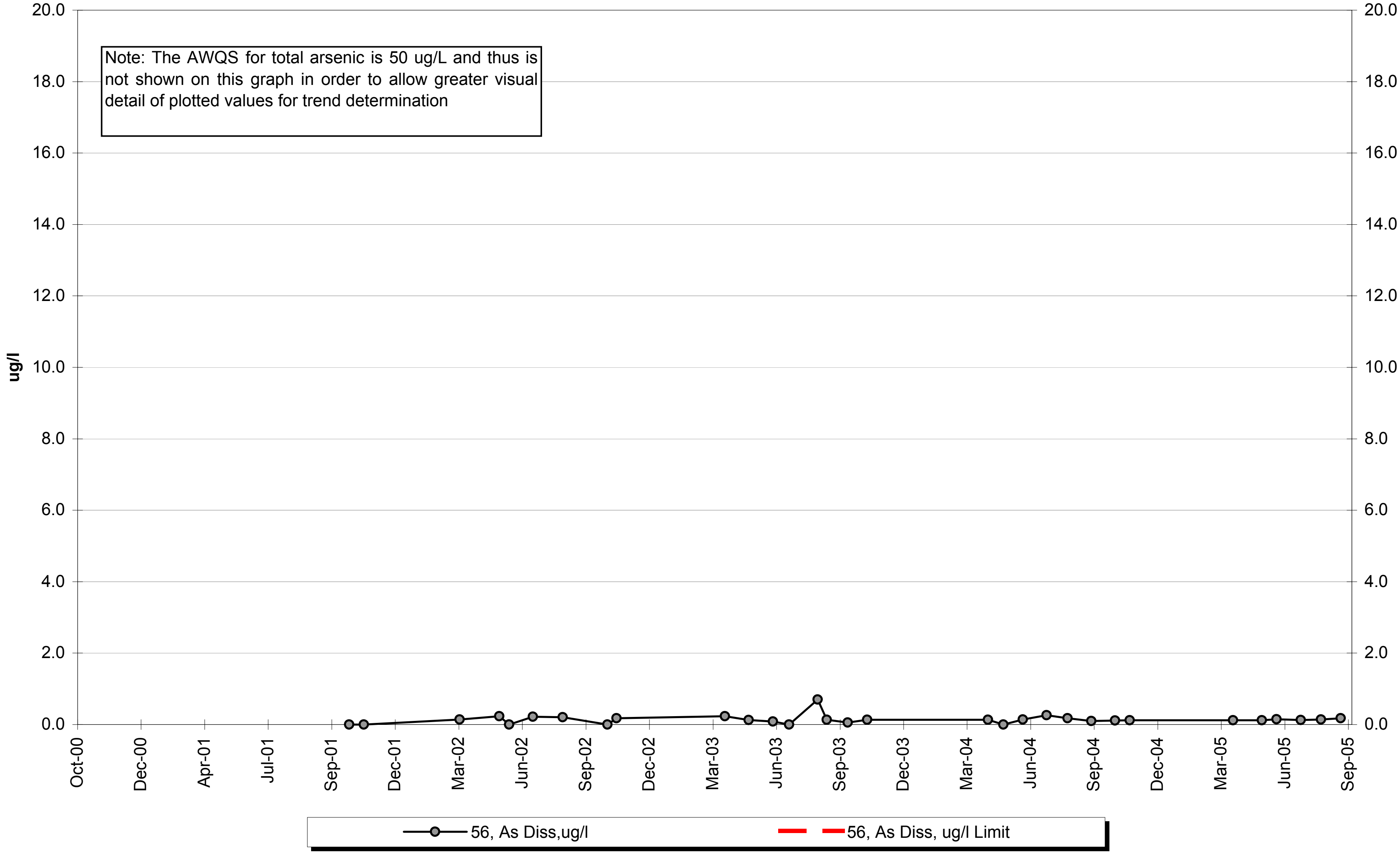
Site 56 -Total Sulfate

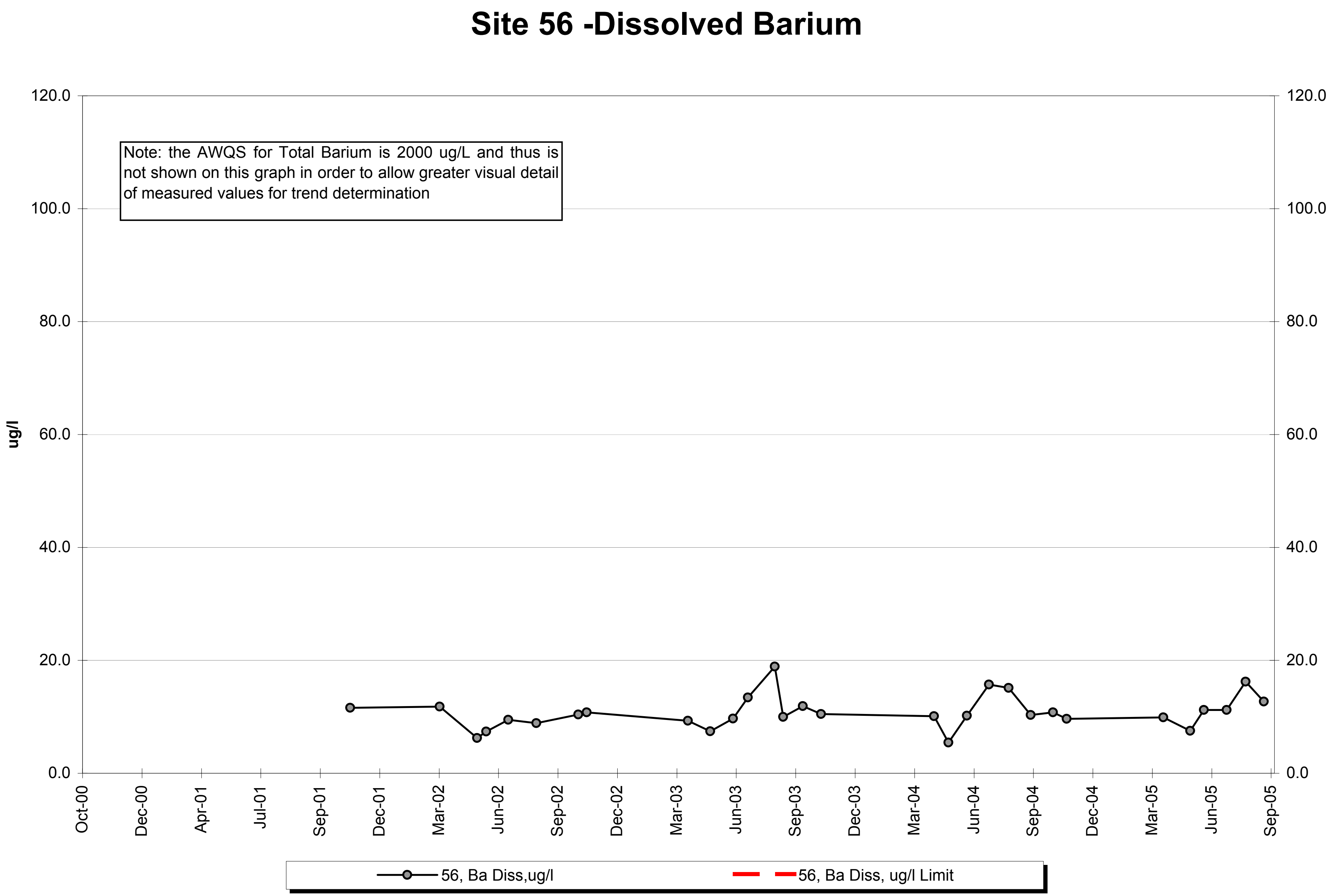


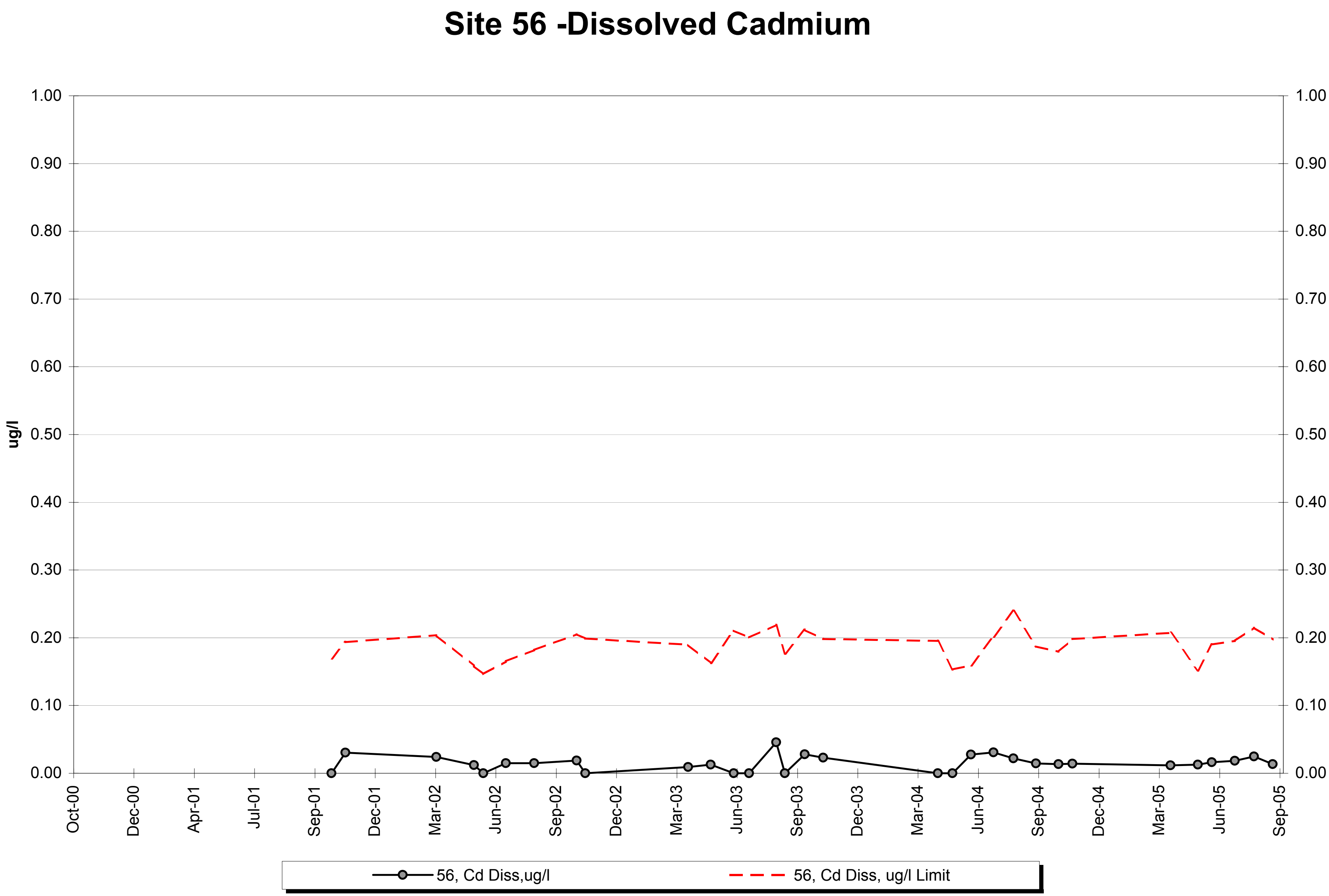
Site 56 -Hardness

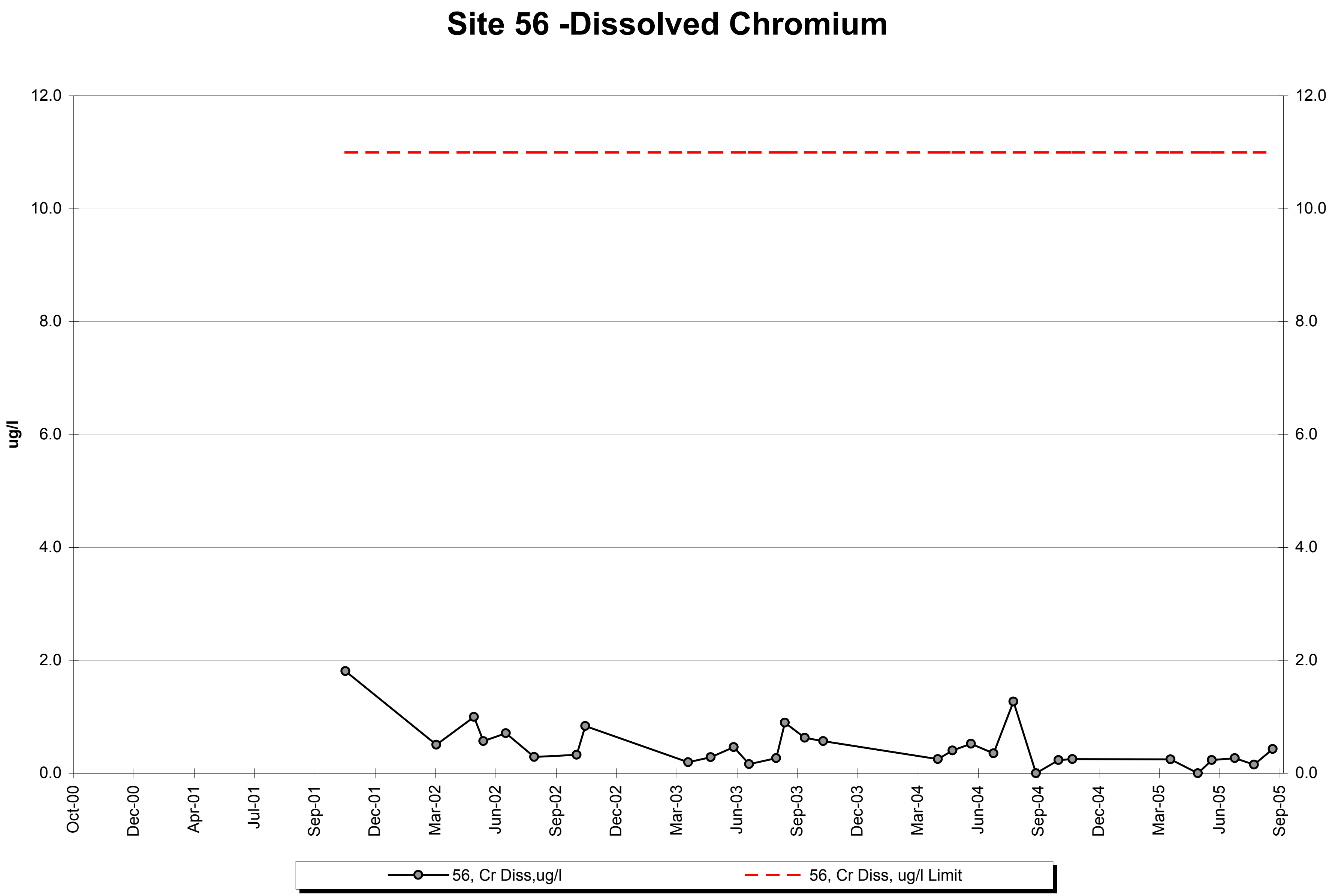


Site 56 -Dissolved Arsenic

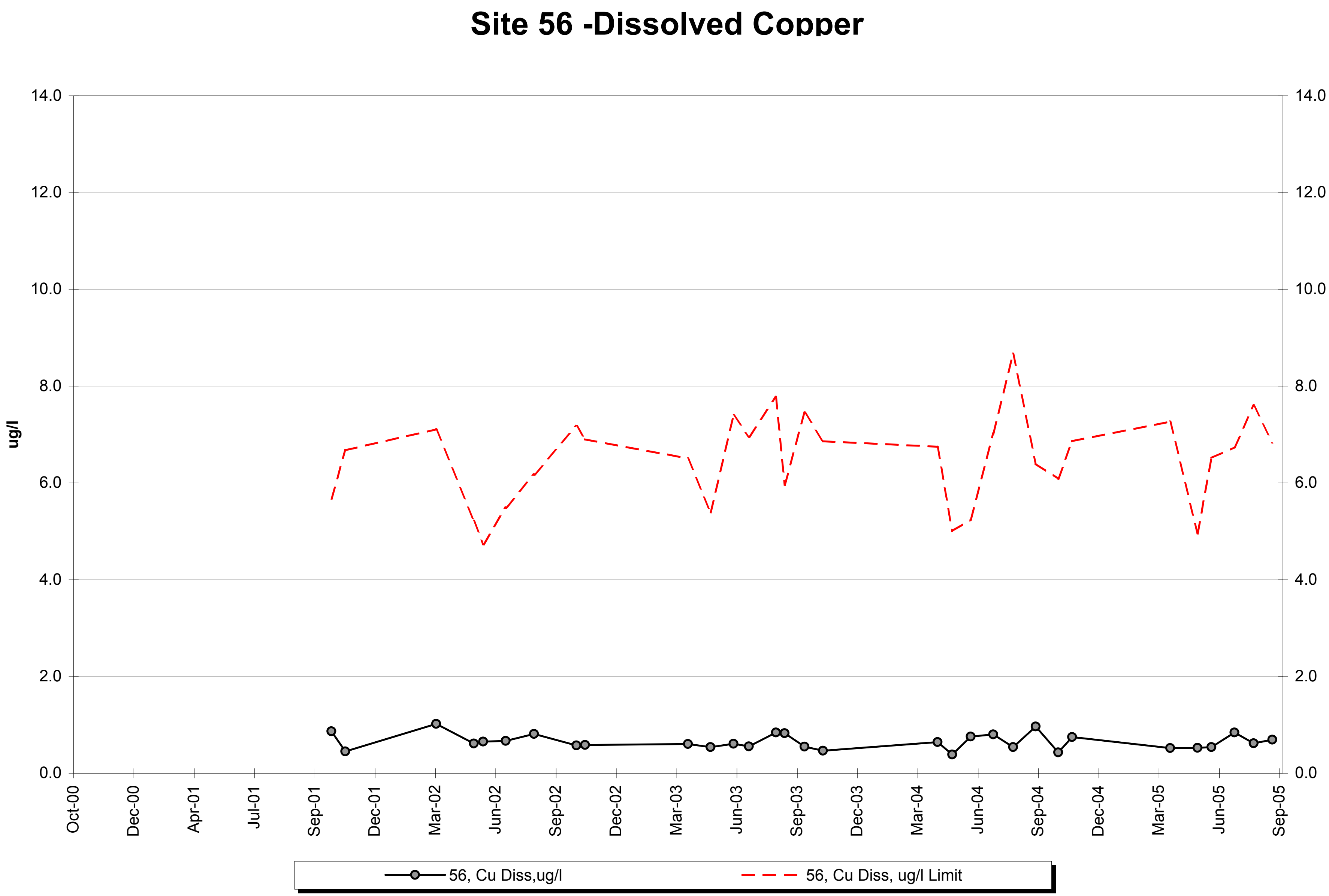



Site 56 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
56, Ba Diss,ug/l
56, Ba Diss, ug/l Limit


Site 56 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
56, Cd Diss,ug/l
56, Cd Diss, ug/l Limit

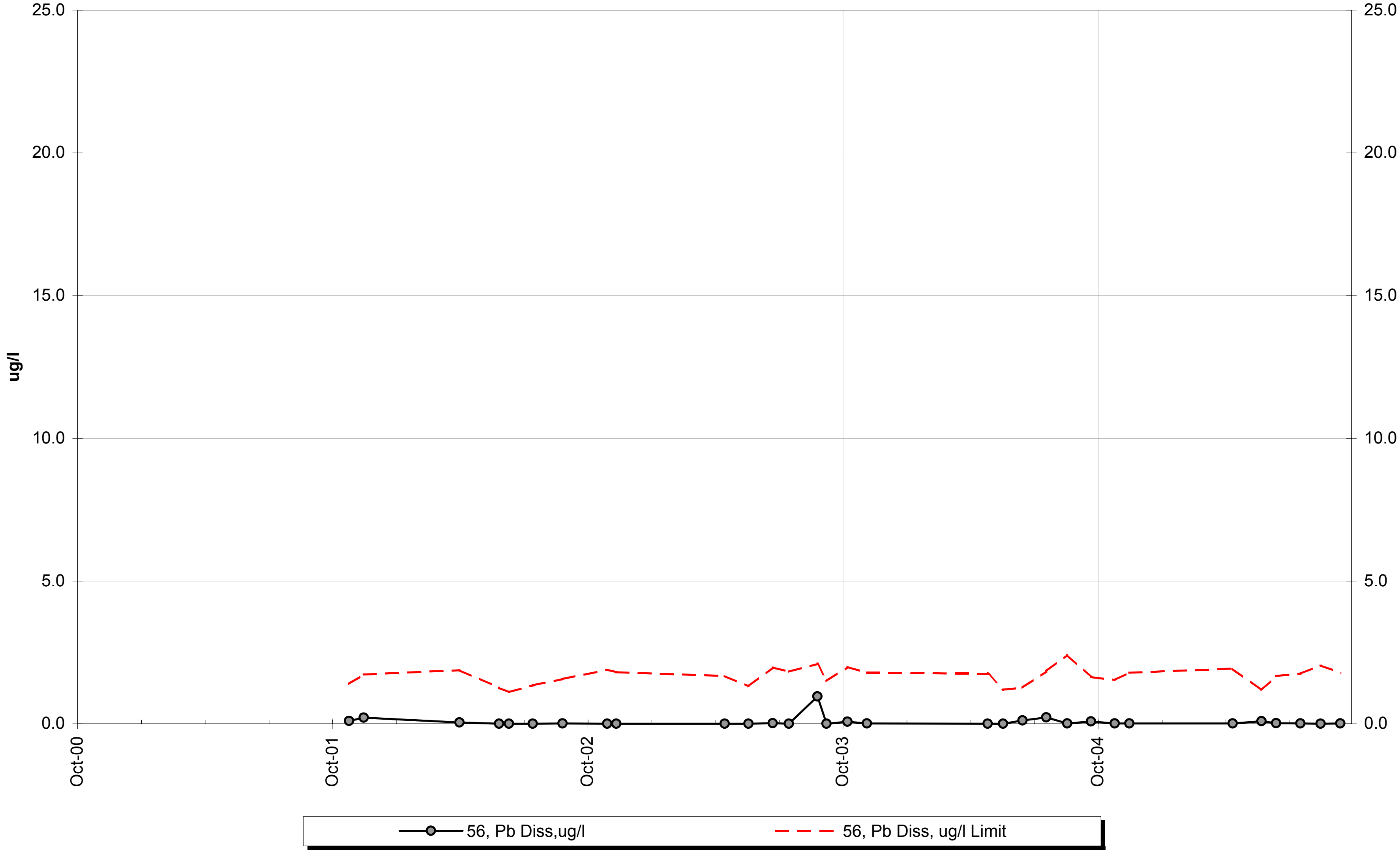


Site 56 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
56, Cr Diss,ug/l
56, Cr Diss, ug/l Limit

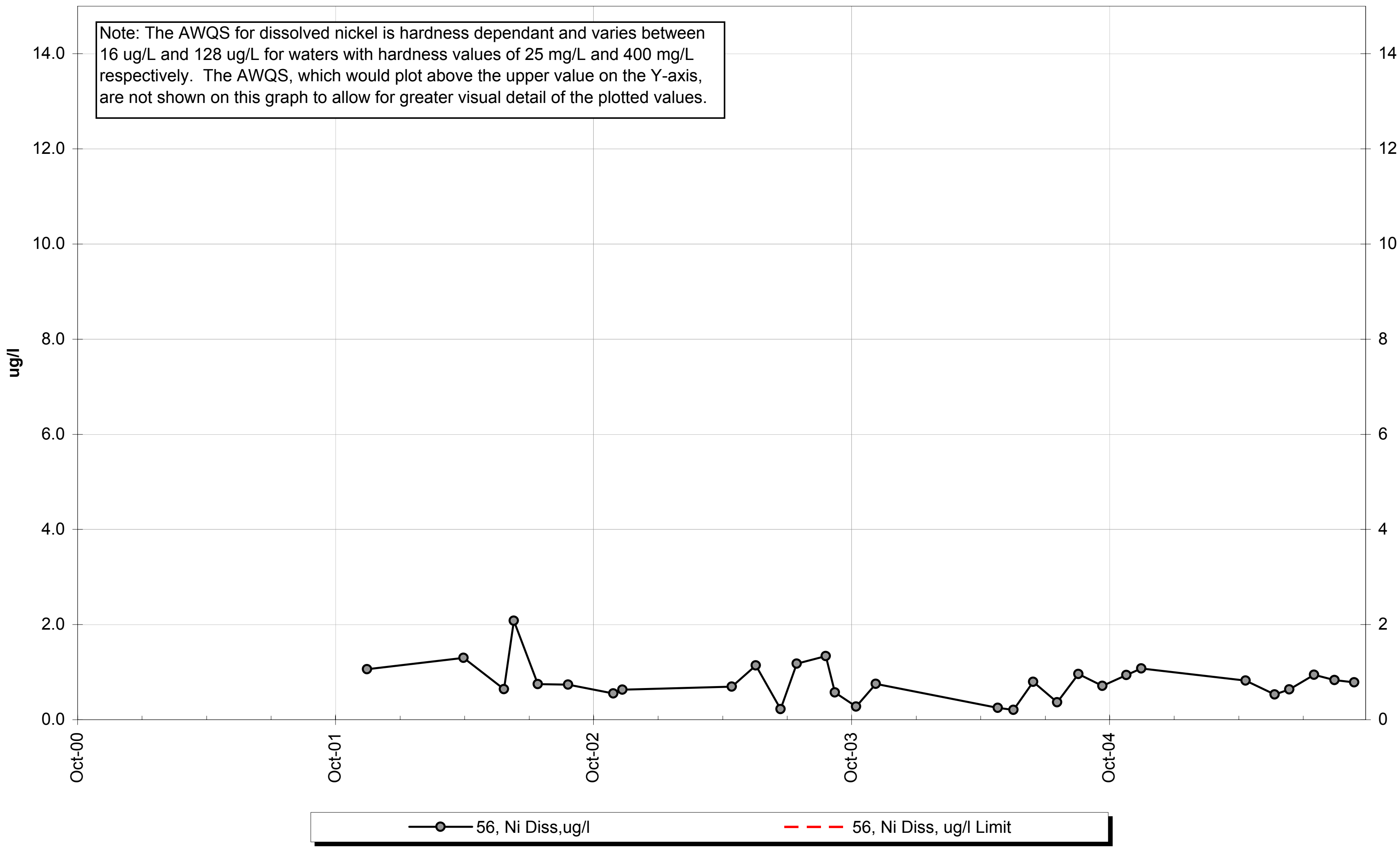


Site 56 -Dissolved Copper
ug/l
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
56, Cu Diss,ug/l
56, Cu Diss, ug/l Limit

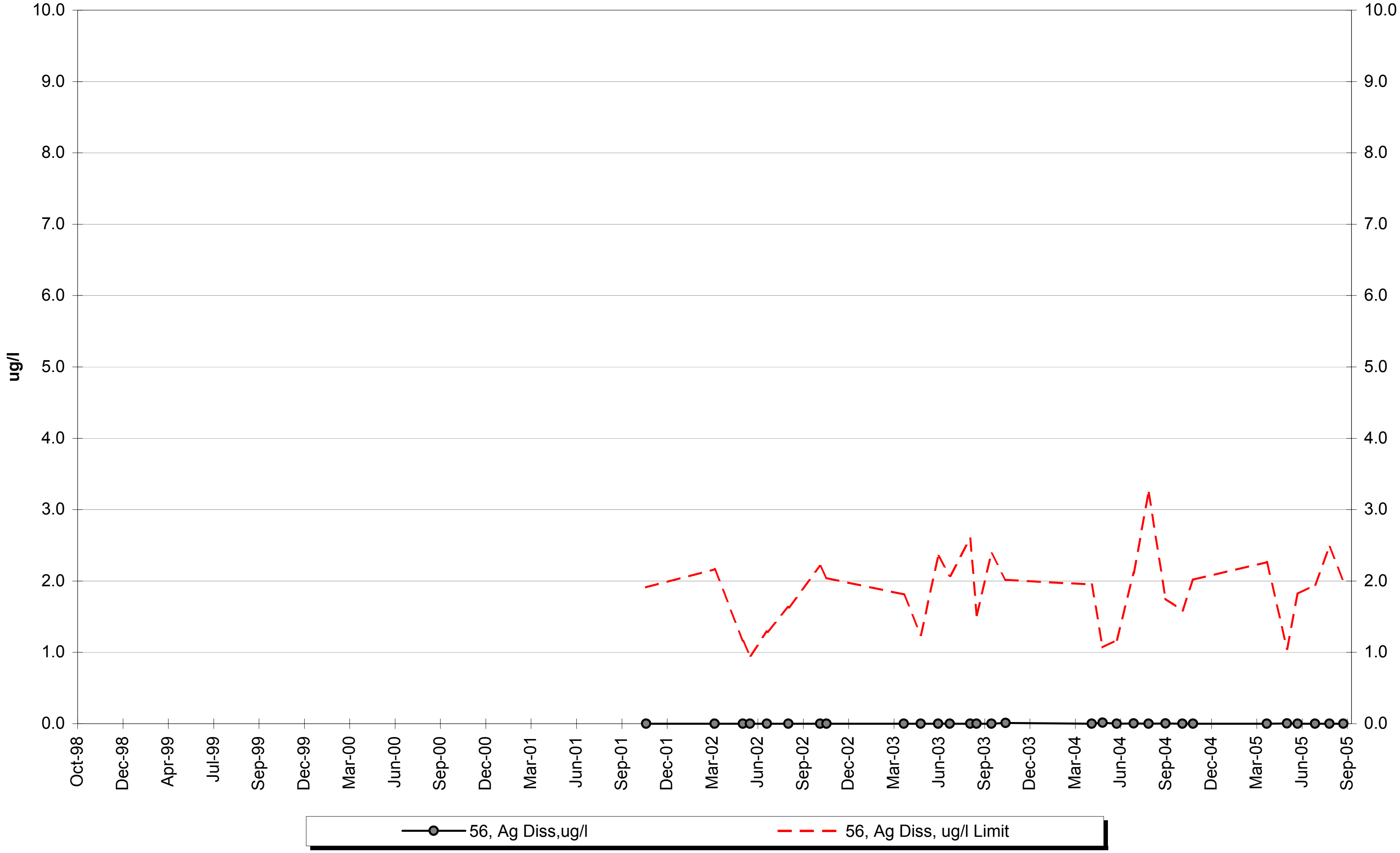
Site 56 -Dissolved Lead



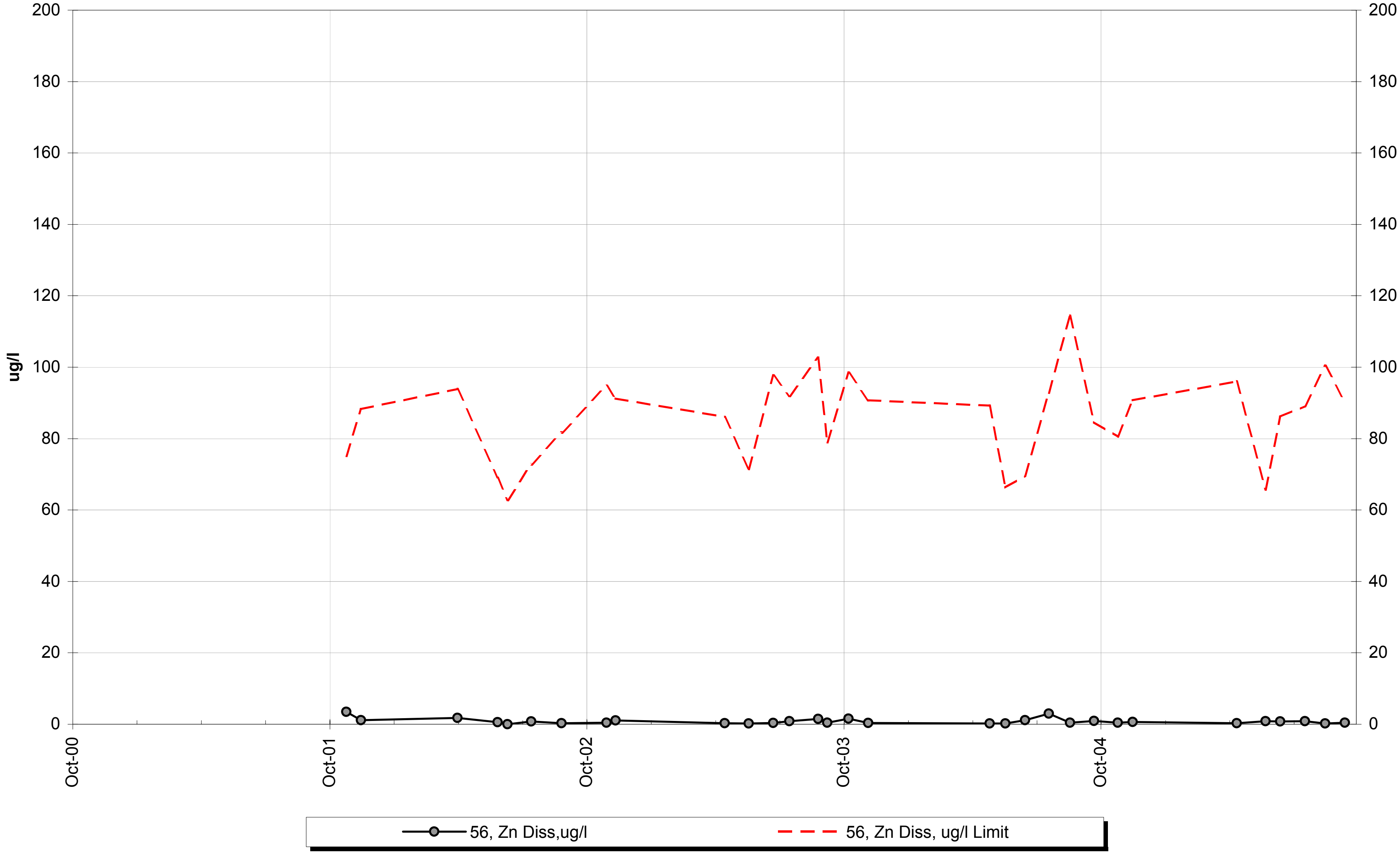
Site 56 -Dissolved Nickel



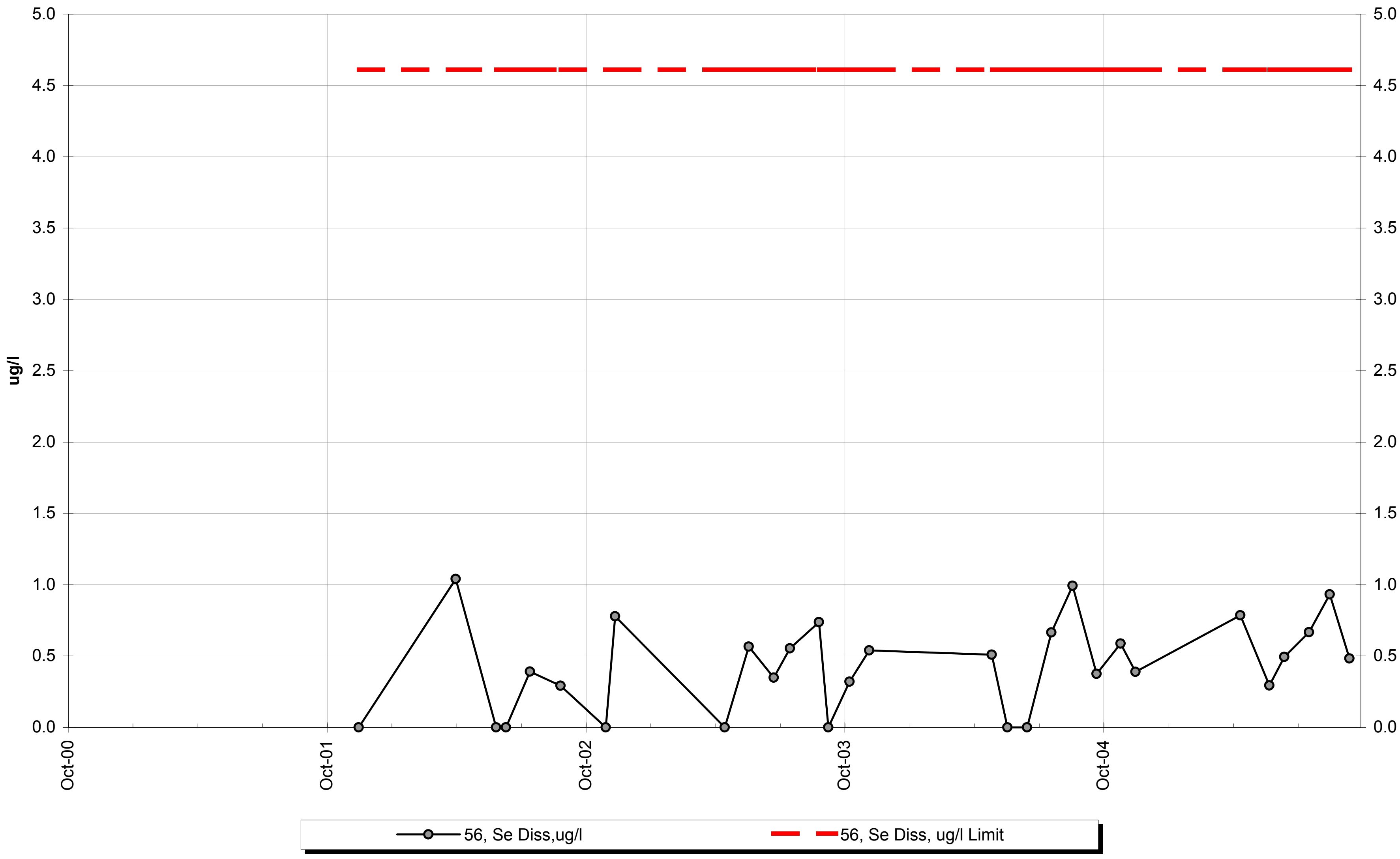
Site 56 -Dissolved Silver

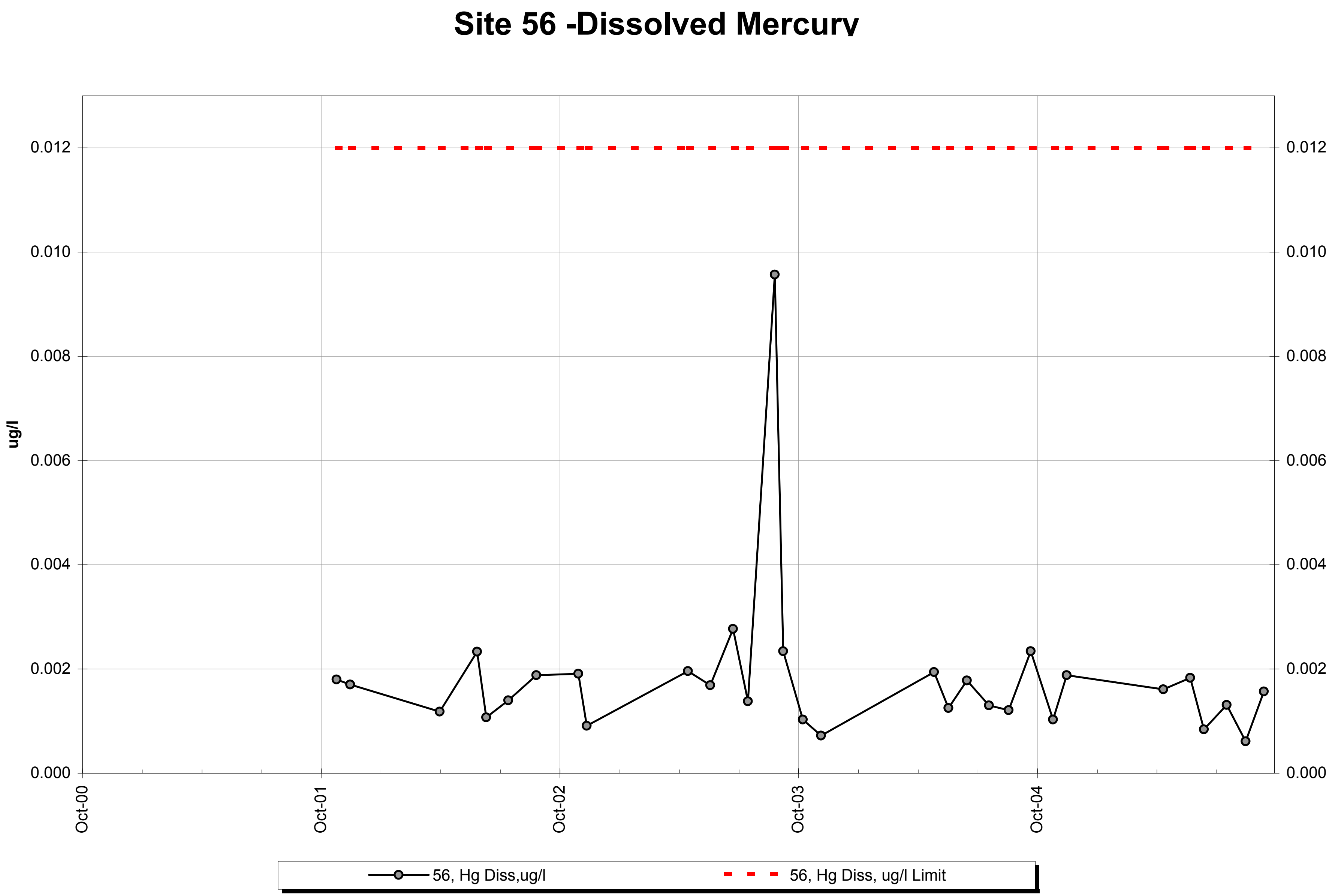


Site 56 -Dissolved Zinc



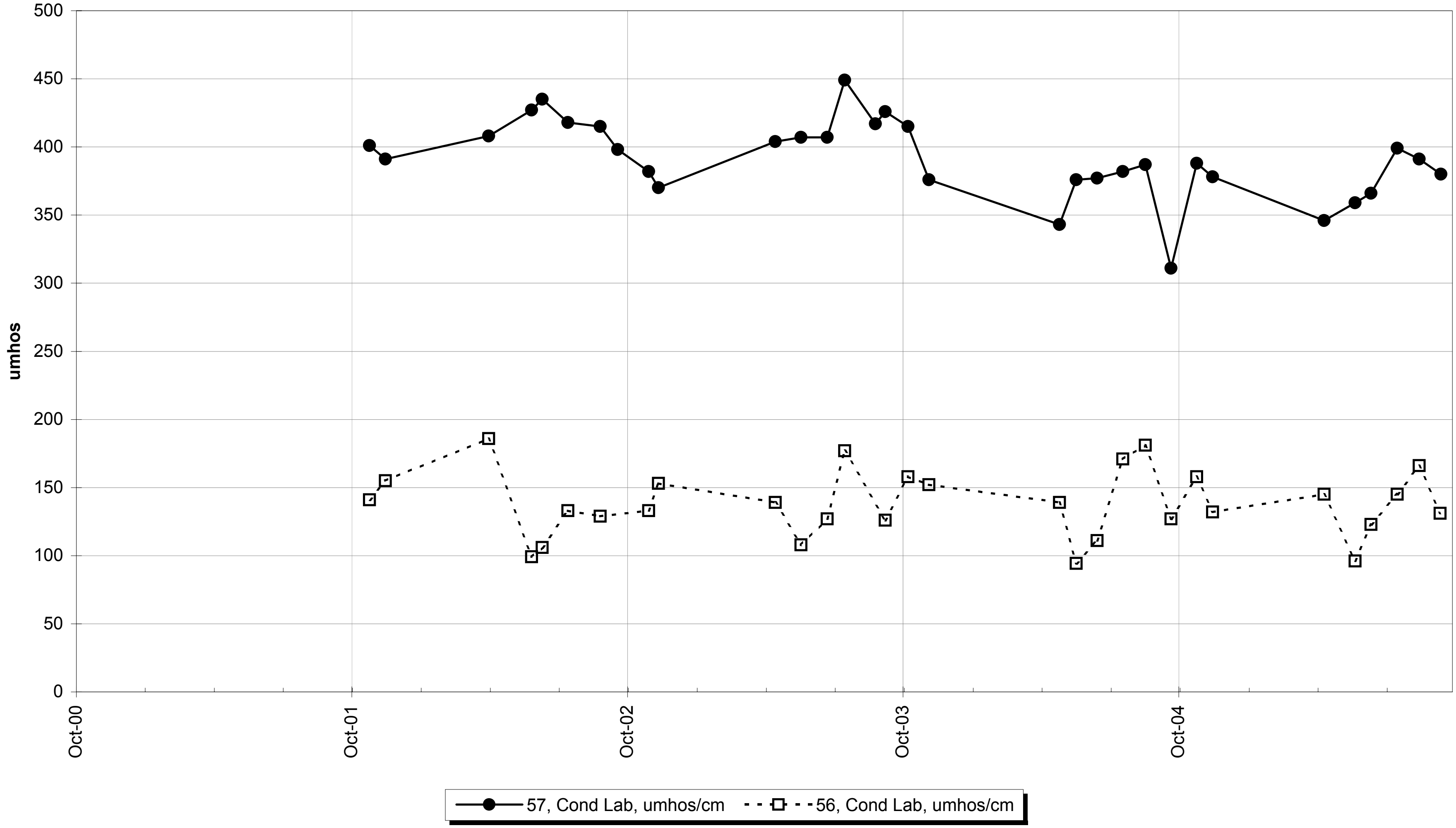
Site 56 -Dissolved Selenium

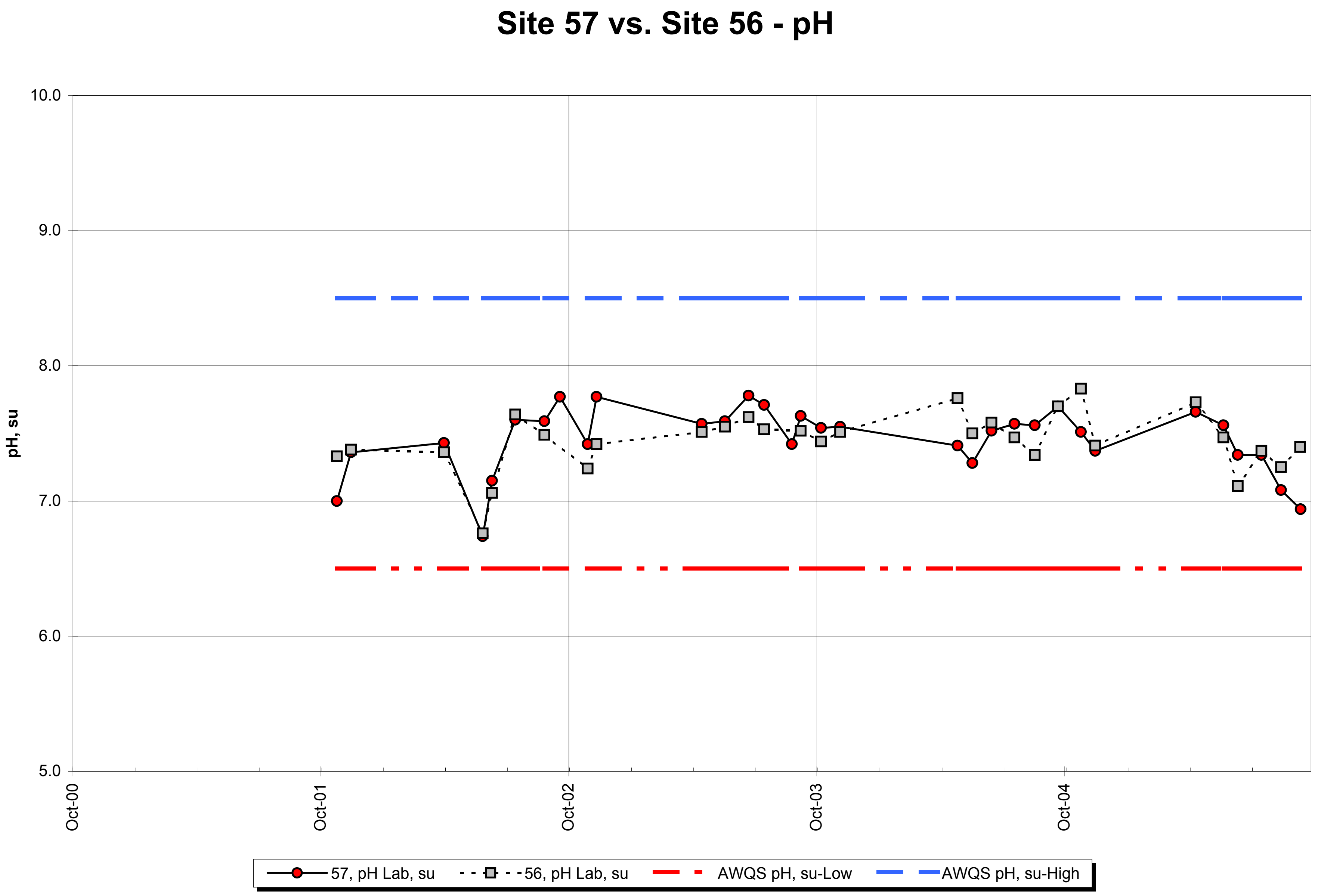




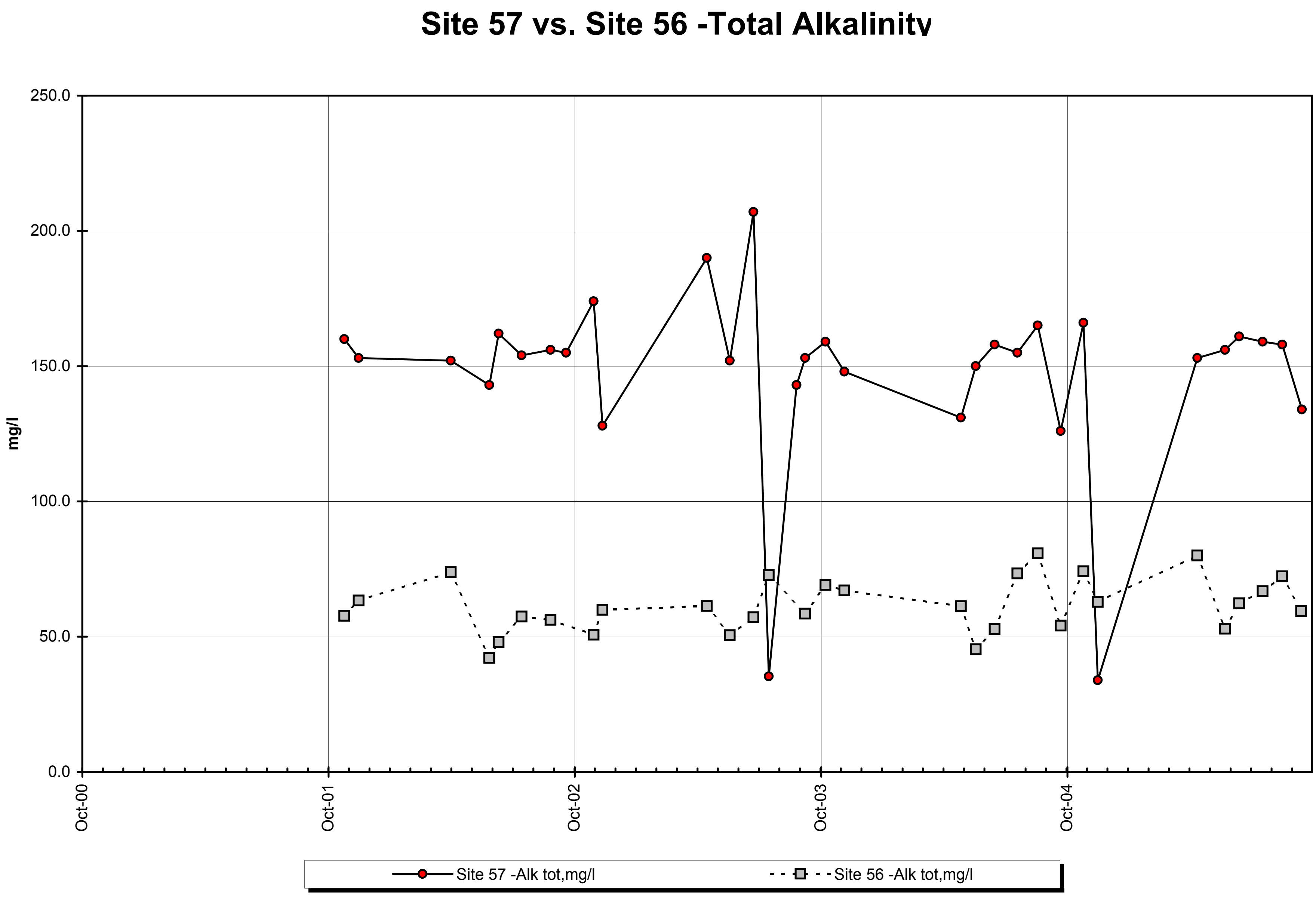
Site 56 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
56, Hg Diss,ug/l
56, Hg Diss, ug/l Limit

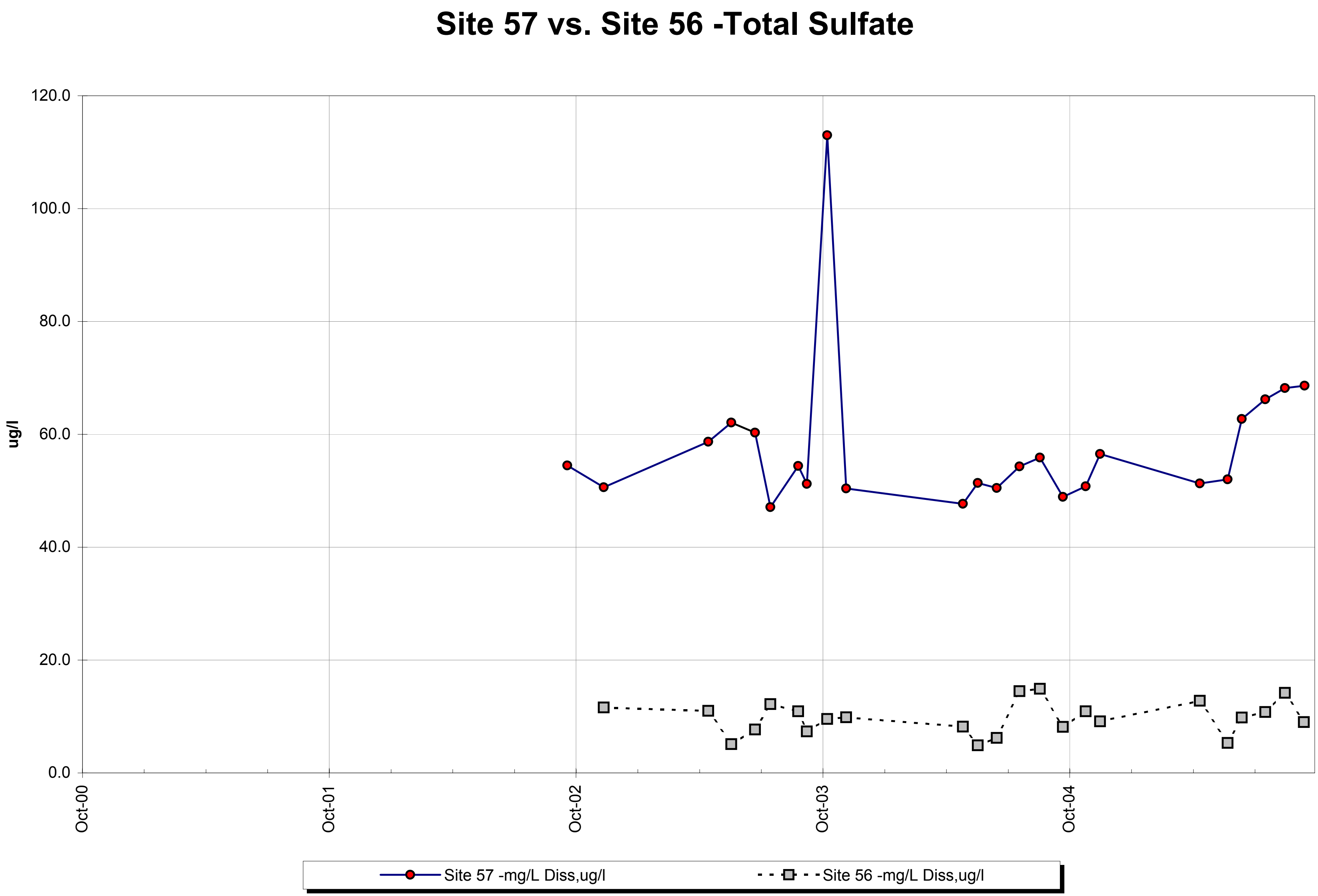
Site 57 vs Site 56 -Conductivity





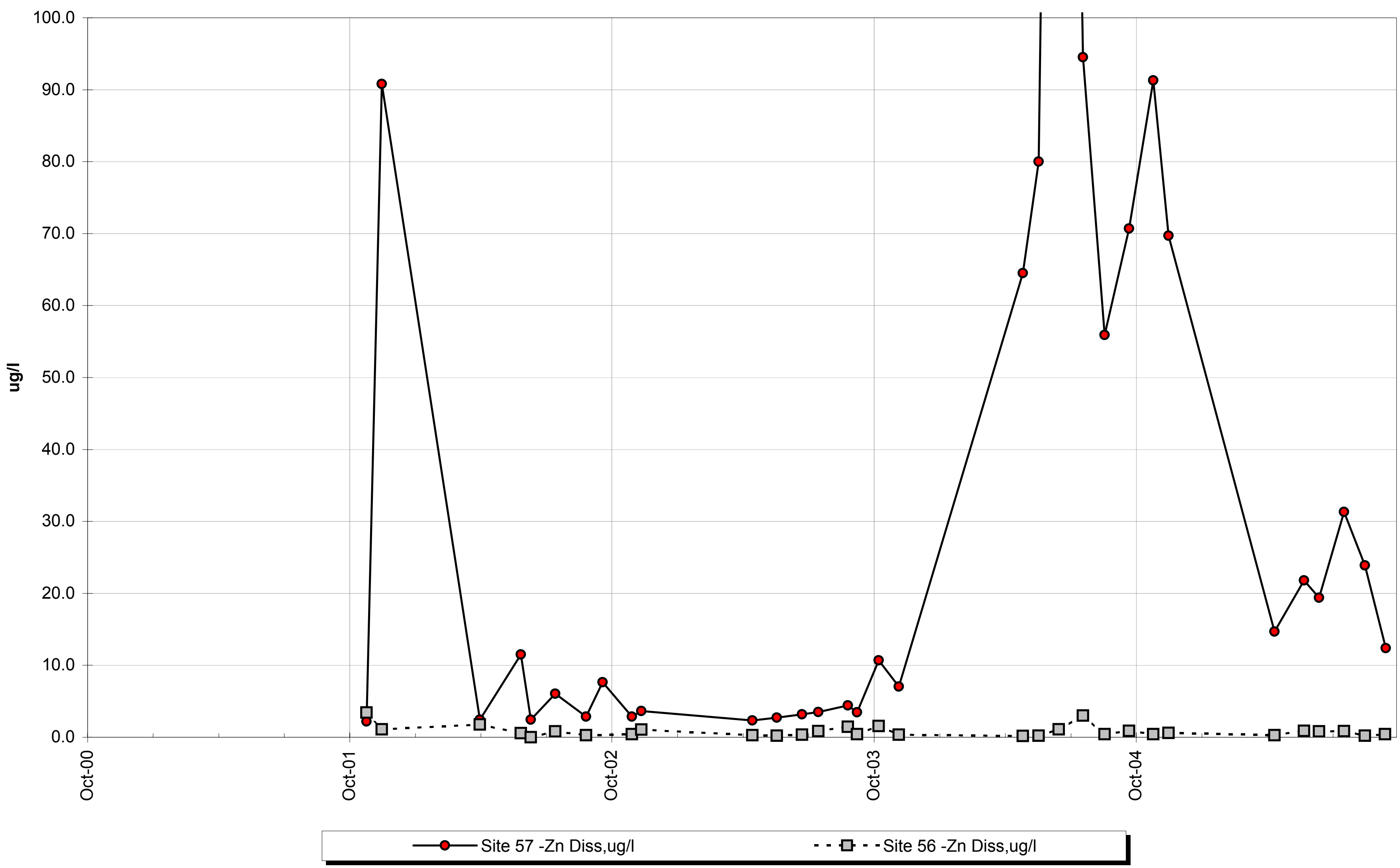
Site 57 vs. Site 56 - pH
pH, su
10.0
9.0
8.0
7.0
6.0
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
57, pH Lab, su
56, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High


Site 57 vs. Site 56 -Total Alkalinity
mg/l
250.0
200.0
150.0
100.0
50.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 57 -Alk tot,mg/l
Site 56 -Alk tot,mg/l



Site 57 vs. Site 56 -Total Sulfate
ug/l
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 57 -mg/L Diss,ug/l
Site 56 -mg/L Diss,ug/l

Site 57 vs. Site 56 -Dissolved Zinc



Wilcoxon-signed-ranks test

Exact Form

Variable: **Specific Conductance, Lab (umhos/cm**

	X	Y	Differences		
Site	#57	#56			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	388.0	158.0	230.0	230.0	3
Nov	378.0	132.0	246.0	246.0	5
Dec					
Jan					
Feb					
Mar					
Apr	346.0	145.0	201.0	201.0	1
May	359.0	96.0	263.0	263.0	8
Jun	366.0	123.0	243.0	243.0	4
Jul	399.0	145.0	254.0	254.0	7
Aug	391.0	166.0	225.0	225.0	2
Sep	380.0	131.0	249.0	249.0	6
Median	379.0	138.5	244.5	244.5	

n	**m**
8	8

N= 8

$\Sigma R=$ 36

α
5.0%
W'α,n
5

$W^{+}=$
36
p-test
100.00%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **pH, Lab, Standard Units**

	X	**Y**			
Site	#57	#56	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	7.51	7.83	-0.32	0.32	-7
Nov	7.37	7.41	-0.04	0.04	-2
Dec					
Jan					
Feb					
Mar					
Apr	7.66	7.73	-0.07	0.07	-3
May	7.56	7.47	0.09	0.09	4
Jun	7.34	7.11	0.23	0.23	6
Jul	7.34	7.37	-0.03	0.03	-1
Aug	7.08	7.25	-0.17	0.17	-5
Sep	6.94	7.40	-0.46	0.46	-8
Median	7.36	7.41	-0.06	0.13	

n	**m**
8	8

N= 8

$\Sigma R=$ -16

α
95.0%
W'α,n
29

$W^{+}=$
10
p-test
15.62%

H_0	median [D]=0	ACCEPT
H_1	median [D]>0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Total Alk, (mg/l)**

	X	**Y**			
Site	#57	#56	Differences		
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	166.0	74.2	91.8	91.8	5
Nov	33.9	62.8	-28.9	28.9	-1
Dec					
Jan					
Feb					
Mar					
Apr	153.0	80.0	73.0	73.0	2
May	156.0	52.9	103.1	103.1	8
Jun	161.0	62.3	98.7	98.7	7
Jul	159.0	66.8	92.2	92.2	6
Aug	158.0	72.3	85.7	85.7	4
Sep	134.0	59.5	74.5	74.5	3
Median	157.0	64.8	88.8	88.8	

n	**m**
8	8

N= 8

$\Sigma R=$ 34

α
95.0%
W'α,n
29

$W^{+}=$
35
p-test
99.61%

H_0	median [D]=0	**REJECT**
H_1	median [D]>0	**ACCEPT**

Wilcoxon-signed-ranks test

Exact Form

Variable: **Sulfate, Total (mg/l)**

	X	**Y**	Differences		
Site	#57	#56			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	50.8	10.9	39.9	39.9	2
Nov	56.5	9.1	47.4	47.4	4
Dec					
Jan					
Feb					
Mar					
Apr	51.3	12.8	38.5	38.5	1
May	52.0	5.3	46.7	46.7	3
Jun	62.7	9.8	52.9	52.9	5
Jul	66.2	10.8	55.4	55.4	7
Aug	68.2	14.2	54.0	54.0	6
Sep	68.6	9.0	59.6	59.6	8
Median	59.6	10.3	50.1	50.1	

n	**m**
8	8

N= 8

ΣR= 36

α
5.0%
W'α,n
5

W^+=
36
p-test
100.00%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Wilcoxon-signed-ranks test

Exact Form

Variable: **Zinc, Dissolved (ug/l)**

	X	**Y**	Differences		
Site	#57	#56			
Year	WY2005	WY2005	**D**	**|D|**	**Rank**
Oct	91.30	0.44	90.86	90.86	8
Nov	69.70	0.60	69.10	69.10	7
Dec					
Jan					
Feb					
Mar					
Apr	14.70	0.29	14.41	14.41	2
May	21.80	0.88	20.92	20.92	4
Jun	19.40	0.81	18.59	18.59	3
Jul	31.30	0.83	30.47	30.47	6
Aug	23.90	0.20	23.70	23.70	5
Sep	12.40	0.44	11.96	11.96	1
Median	22.85	0.52	22.31	22.31	

n	**m**
8	8

N= 8

$\Sigma R=$ 36

α
5.0%
W'α,n
5

$W^{+}=$
36
p-test
100.00%

H_0	median [D]=0	ACCEPT
H_1	median [D]<0	

Lab Conductivity (umhos/cm): Prior three water years' signed-rank comparisons between Site 57 and Site 56.

Water Year	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
2002	1.00	411.5	133.0	285.0
2003	1.00	407.0	130.0	276.0
2004	1.00	376.5	145.5	217.5

Lab-pH (s.u.): Prior three water years' signed-rank comparisons between Site 57 and Site 56.

Water Year	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
2002	0.59	7.40	7.36	-0.02
2003	1.00	7.61	7.52	0.17
2004	0.47	7.55	7.51	0.02

Total Alkalinity (mg/l): Prior three water years' signed-rank comparisons between Site 56 and Site 57.

Water Year	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
2002	**1.00**	154.5	57.4	99.8
2003	**1.00**	152.5	57.9	112.4
2004	**1.00**	152.5	64.2	82.9

Total Sulfate (mg/l): Prior two water years' signed-rank comparisons between Site 56 and Site 57.

Water Year	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
2003	1.00	54.4	10.9	43.9
2004	1.00	51.0	8.9	40.9

Dissolved Zinc (ug/l): Prior three water years' signed-rank comparisons between Site 56 and Site 57.

Water Year	Signed Ranks p-value	Site #57 median	Site #56 median	Median of Differences
2002	0.98	4.46	0.80	2.64
2003	1.00	3.34	0.43	2.63
2004	1.00	67.60	0.66	67.06

INTERPRETIVE REPORT
SITE 13 “MINE ADIT DISCHARGE EAST”

The data collected during the current water year are listed in the following “Table of Results for Water Year 2005” report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report “Qualified Data by QA Reviewer”. The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Three results exceeding these criteria have been identified, as listed in the table below. The data are for total sulfate and range from 337 - 367 mg/l. The elevated sulfate is likely the result of oxidation of sulfides contained in the waste rock storage area located immediately upstream from Site 13. KGCMC plans for the removal of this material are listed in the General Plan of Operation, Appendix 14 –Attachment A, November 2001. KGCMC began removal of some of this material in the late-summer of 2005. While complete removal of all the waste rock at this site is a multi-year project, KGCMC anticipates that when the removal of the waste rock is complete that the ambient sulfate concentrations measured at Site 13 will be below AWQS.

Sample Date	Parameter	Value	Standard	Standard Type
07/19/05	Sulfate, Total mg/L	358	250	Water Supply, Drinking
08/17/05	Sulfate, Total mg/L	337	250	Water Supply, Drinking
09/14/05	Sulfate, Total mg/L	367	250	Water Supply, Drinking

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. No visually obvious trends were apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The table on the next page summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). For datasets with a statistically significant trend a Seasonal-Sen’s Slope estimate statistic has also been calculated. No statistically significant ($\alpha/2=2.5\%$) trends are present in the datasets for conductivity, pH, and dissolved zinc. Total alkalinity indicates a significant ($p=1.00$) trend with a slope estimate of 10.5 mg/l or a +6.8% increase over the six year period. The increasing trend in alkalinity most likely reflects carbonate mineral dissolution due to pyrite oxidation.

Since there is adequate alkalinity present, as evidenced by the non-trending pH, there is still ample buffering capacity contained in the waste rock at this site. The overall constituent loading for this site is within the range expected from exposed waste rock.

Site 13-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	1.17	+	0.88		
pH, Lab	6	0.39	+	0.65		
Alkalinity, Total	6	2.74	+	**1.00**	10.5	6.8%
Zinc, Dissolved	6	-0.39	-	0.35		

(1): Number of years (2):Significance level

In summary it is anticipated that upon completion of the planned reclamation of this site, constituent loads will return to background levels. Steep slopes preclude constructing an oxygen-limiting soil cover on this site and thus in-situ reclamation is not an option. Consequently, as previously noted, KGCMC intends to incrementally haul the material from this site to the 920 portal for underground disposal or to one of the active surface disposal facilities.

Table of Results for Water Year 2005

Site 13 "Mine Adit Discharge East"

Sample Date/Parameter	10/26/2004	11/16/2004	Dec-04	Jan-05	Feb-05	Mar-05	4/13/05	5/24/2005	6/14/2005	7/19/2005	8/17/2005	9/14/2005	**Median**
Water Temp (°C)	Site Inaccessible due to Ice & Snow	5.2	NOT SCHEDULED FOR SAMPLING					7.8	8.9	11.0	12.1	10.1	9.5
Conductivity-Field(μmho)		674						681	676	854	980	549	679
Conductivity-Lab (μmho)		591						639	604	826	921	781	710
pH Lab (standard units)		7.36						7.71	7.75	7.72	7.55	7.70	7.71
pH Field (standard units)		7.37						8.01	6.90	8.14	7.93	7.94	7.94
Total Alkalinity (mg/L)		120.0						186.0	201.0	188.0	207.0	162.0	187.0
Total Sulfate (mg/L)		241.0						217.0	208.0	358.0	337.0	367.0	289.0
Hardness (mg/L)		361.0						392.0	376.0	508.0	591.0	525.0	450.0
Dissolved As (ug/L)		0.104						0.176	0.278	0.167	0.178	0.230	0.177
Dissolved Ba (ug/L)		22.4						17.5	19.3	32.6	34.0	36.3	27.5
Dissolved Cd (ug/L)		0.071						0.019 U	0.028	0.038	0.027	0.039	0.033
Dissolved Cr (ug/L)		0.277						0.101 J	1.220	0.591	0.265	0.739	0.434
Dissolved Cu (ug/L)		1.530						0.704	1.180 U	1.590	1.450	0.493	1.315
Dissolved Pb (ug/L)		0.0384 U						0.0081 U	0.1380	0.0104 U	0.0413	0.0472 U	0.0399
Dissolved Ni (ug/L)		2.410						1.560	2.790 U	2.320	2.560	2.720	2.485
Dissolved Ag (ug/L)		0.004 J						<0.003	0.005 J	<0.002	<0.003	<0.002	0.002
Dissolved Zn (ug/L)		40.50						11.30	13.50	20.30	6.04	15.00	14.25
Dissolved Se (ug/L)		0.256						0.421 UJ	0.185 J	0.399	0.471	<0.116	0.328
Dissolved Hg (ug/L)		0.000960 U						0.000987 U	0.001530 U	0.000699 U	0.000919 U	0.000917	0.000940

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

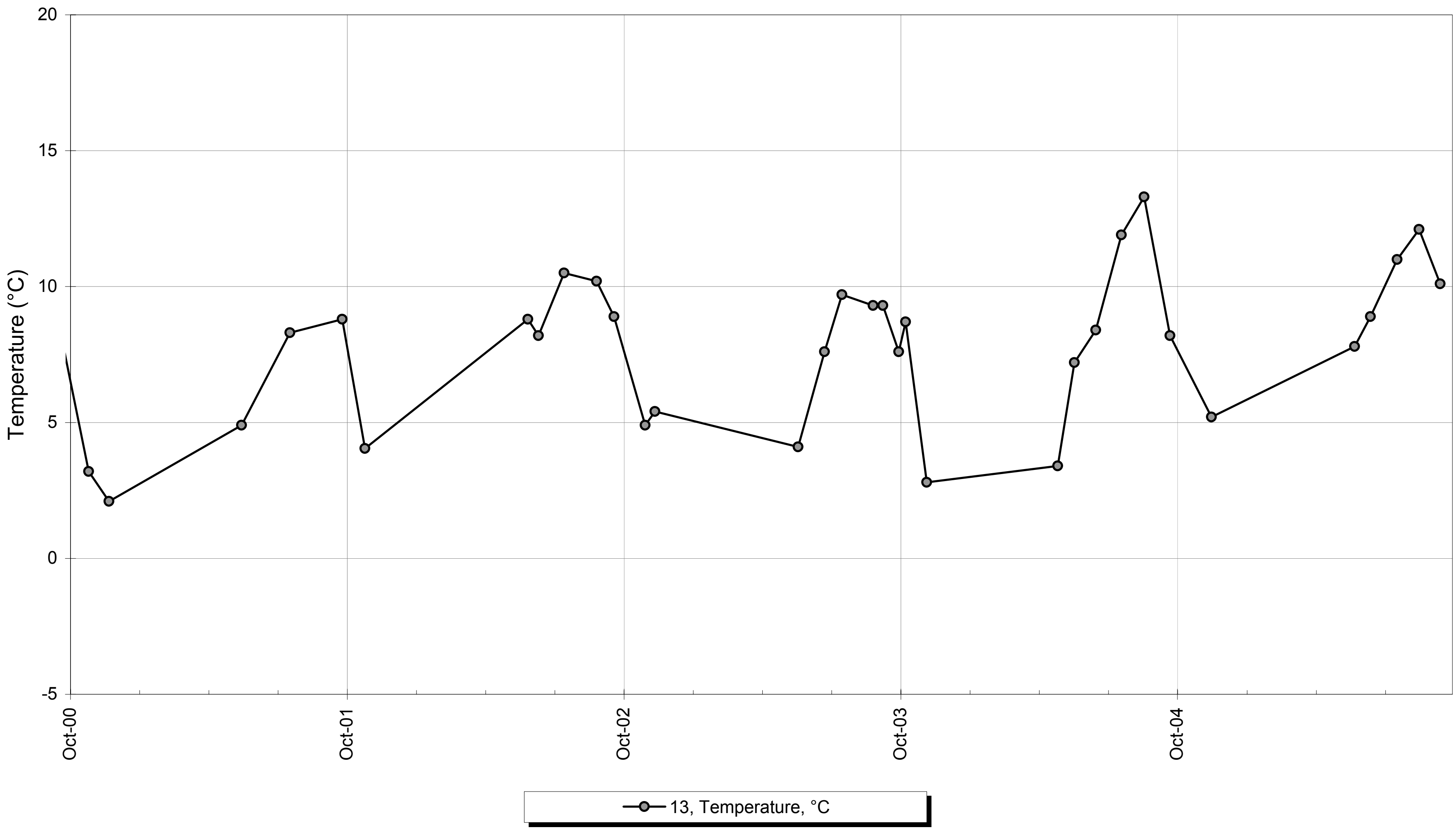
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

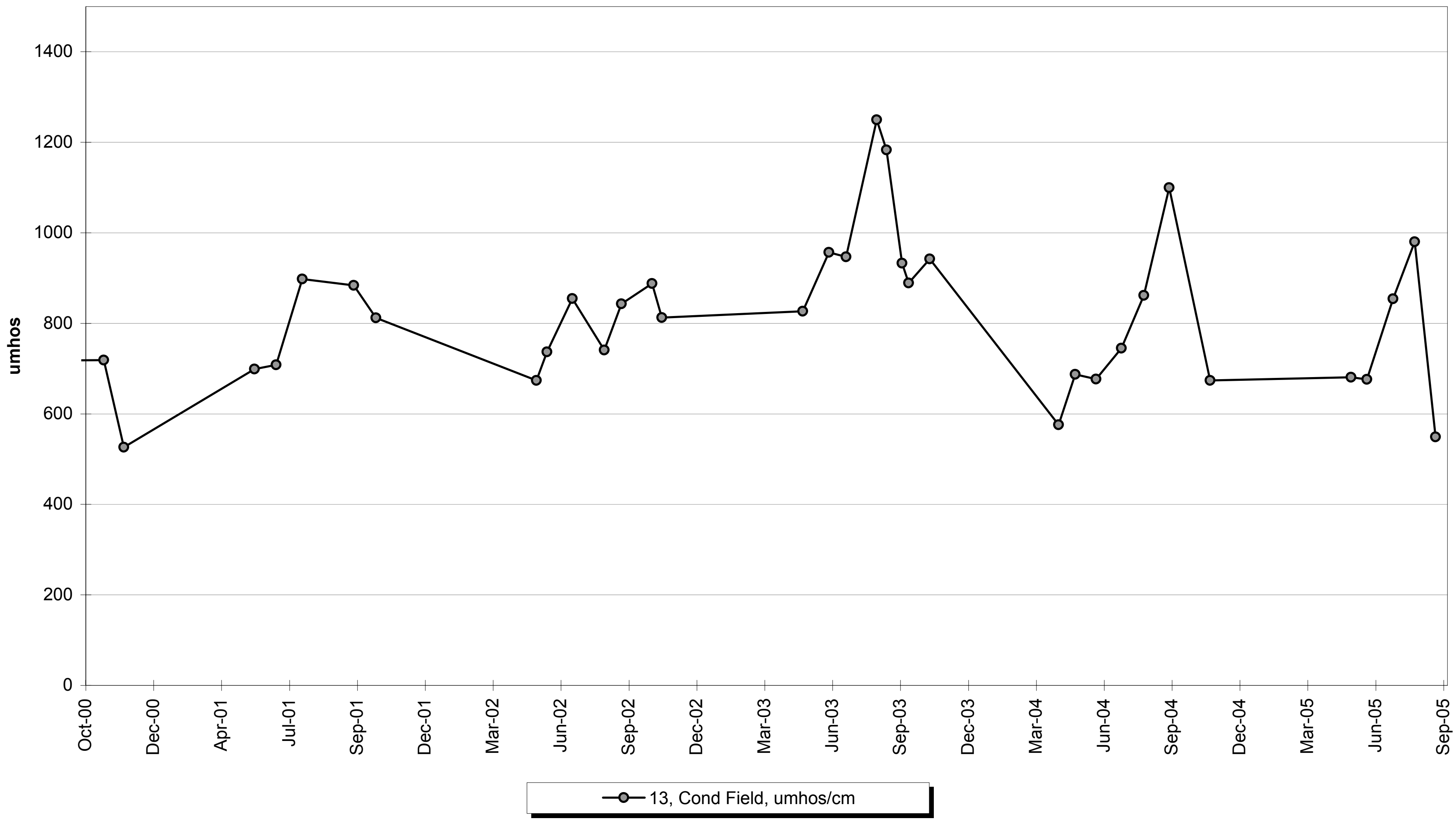
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
13	11/16/2004	9:40:00 AM				
			Pb Diss, ug/l	0.0384	U	Field Blank Contamination
			Ag Diss, ug/l	0.00412	J	Below Quantitative Range, M
			Hg Diss, ug/l	0.00096	U	Field Blank Contamination
13	05/24/2005	9:55:00 AM				
			Cd Diss, ug/l	0.0194	U	Field Blank Contamination
			Cr Diss, ug/l	0.101	J	Below Quantitative Range
			Pb Diss, ug/l	0.00807	U	Field Blank Contamination
			Se Diss, ug/l	0.421	UJ	LCS Recovery
			Hg Diss, ug/l	0.000987	U	Field Blank Contamination
13	06/14/2005	12:55:00 PM				
			Cu Diss, ug/l	1.18	U	Field Blank Contamination
			Ni Diss, ug/l	2.79	U	Field Blank Contamination
			Ag Diss, ug/l	0.00528	J	Below Quantitative Range
			Se Diss, ug/l	0.185	J	Below Quantitative Range
			Hg Diss, ug/l	0.00153	U	Field Blank Contamination
13	07/19/2005	1:40:00 PM				
			Pb Diss, ug/l	0.0104	U	Field Blank Contamination
			Hg Diss, ug/l	0.000699	U	Field Blank Contamination
13	08/17/2005	12:11:00 PM				
			Hg Diss, ug/l	0.000919	U	Field Blank Contamination
13	09/14/2005	11:45:00 AM				
			Pb Diss, ug/l	0.0472	U	Field Blank Contamination

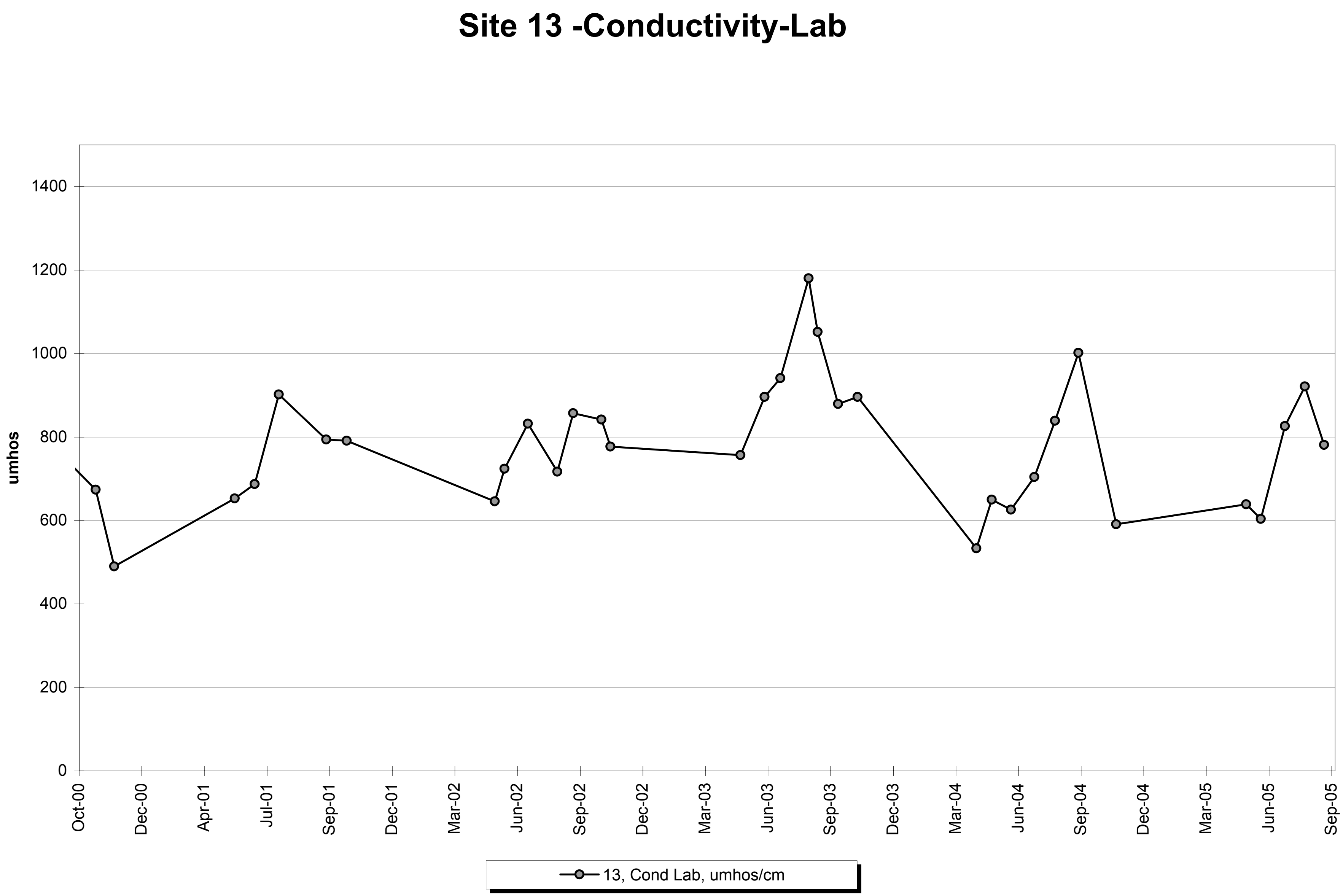
Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

Site 13 -Water Temperature



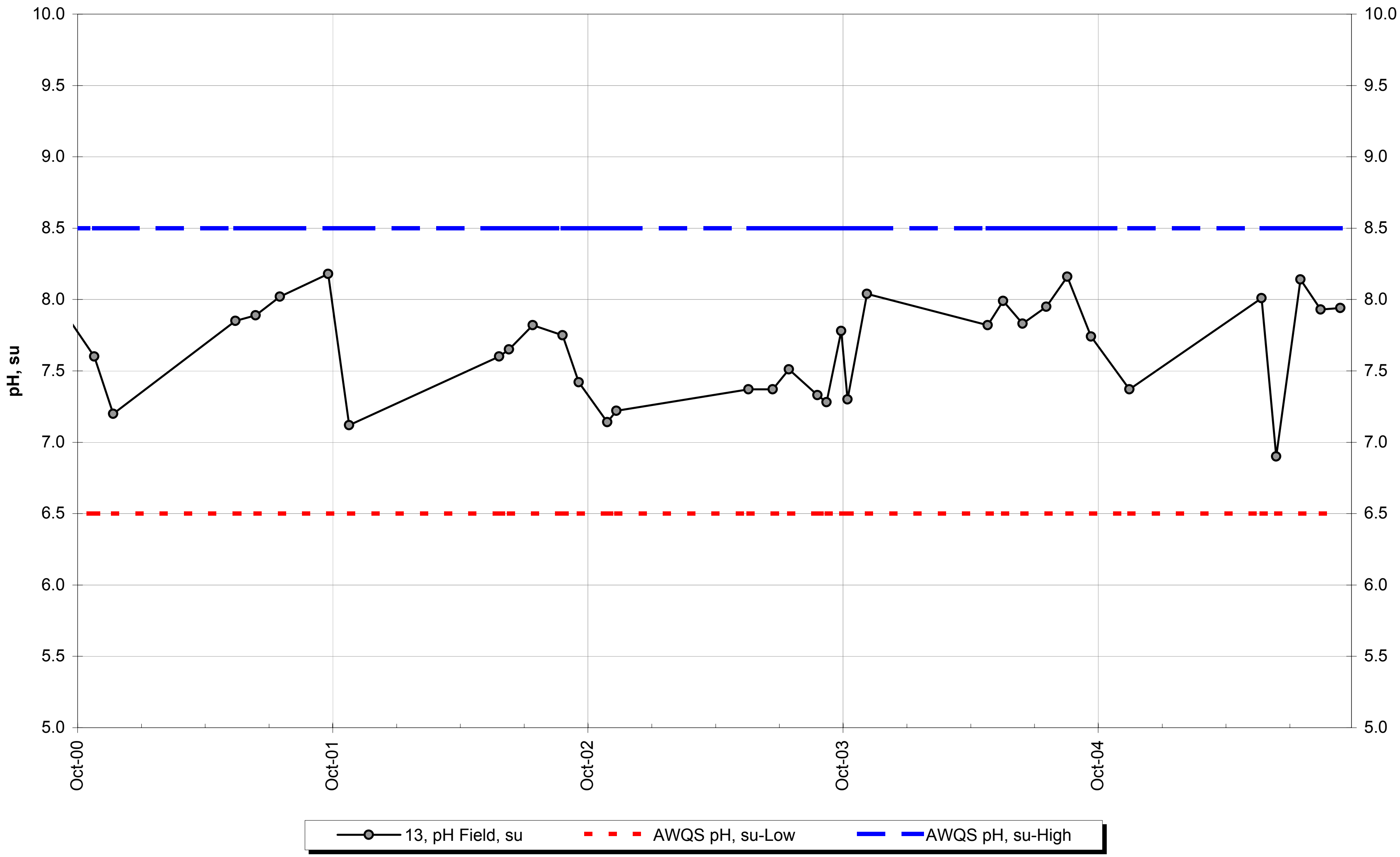
Site 13 -Conductivity-Field

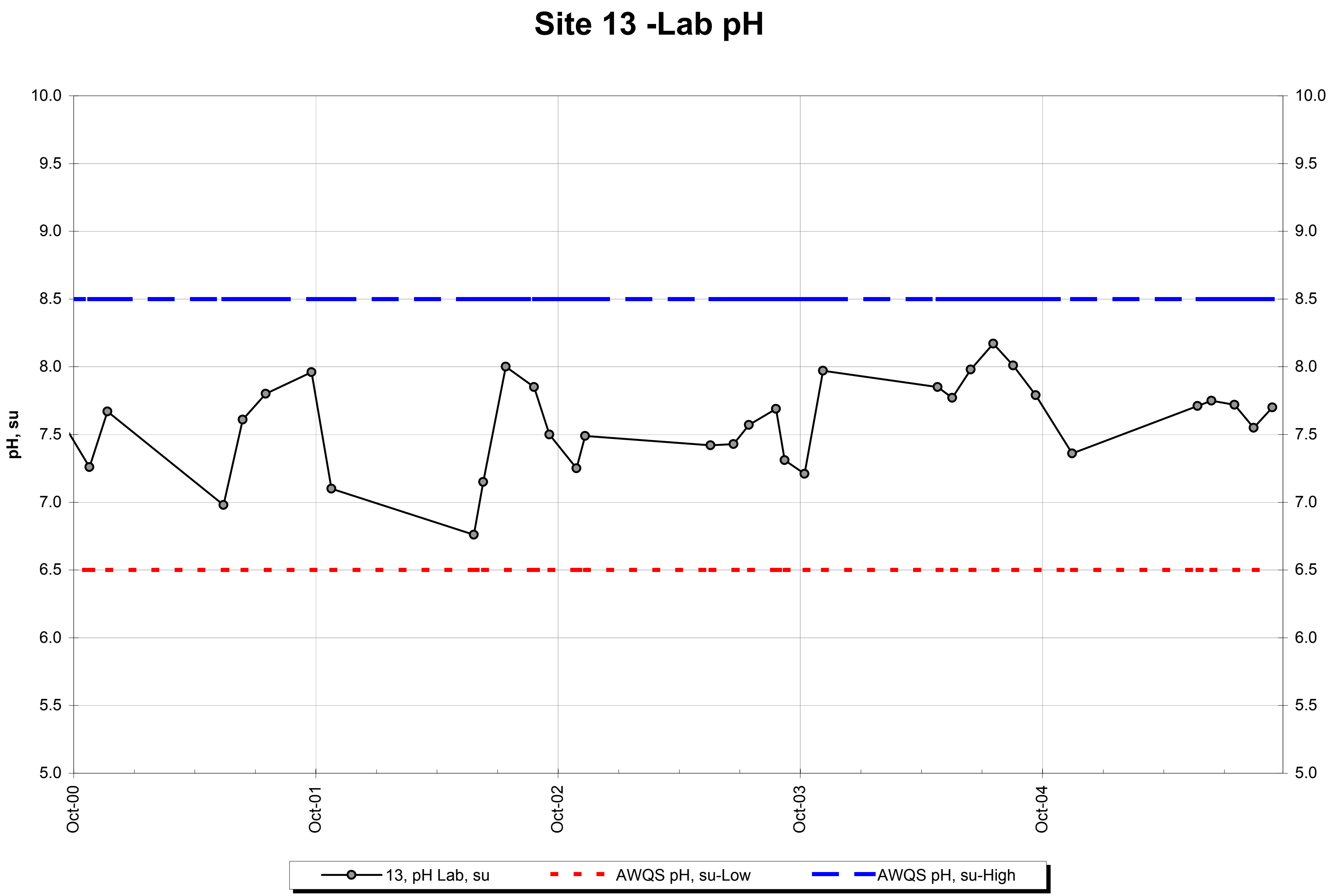




Site 13 -Conductivity-Lab
umhos
0
200
400
600
800
1000
1200
1400
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
13, Cond Lab, umhos/cm

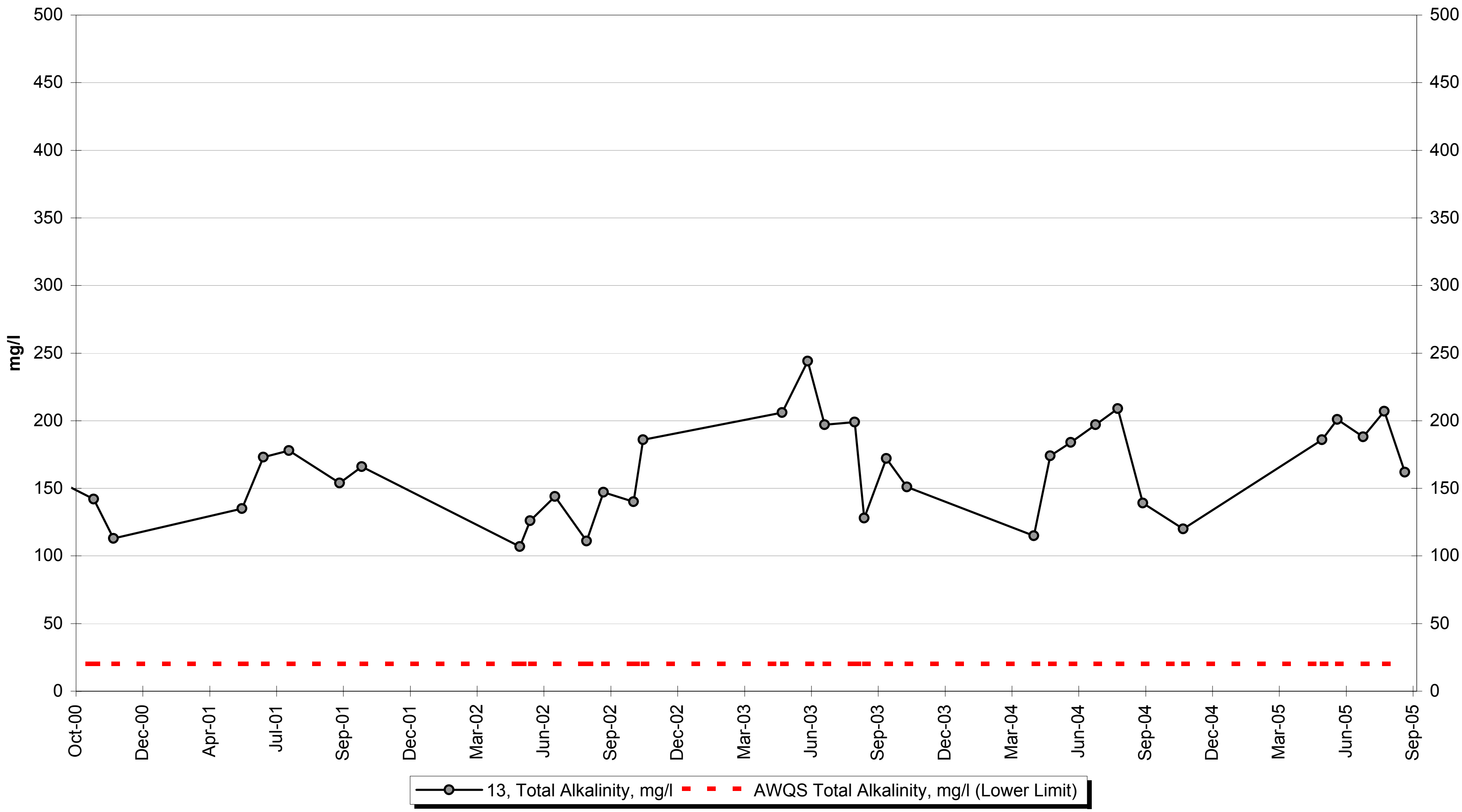
Site 13 -Field pH



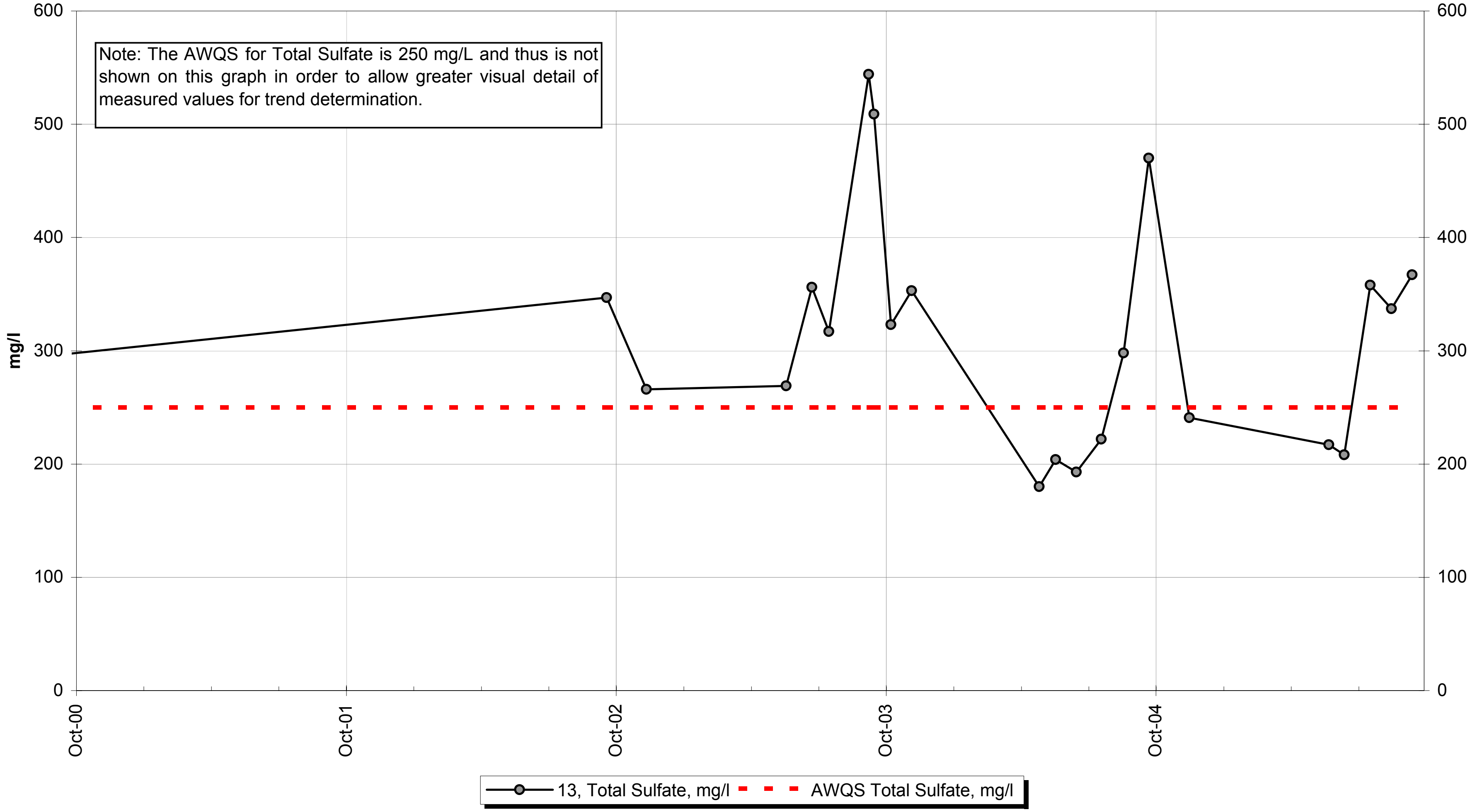


Site 13 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
13, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

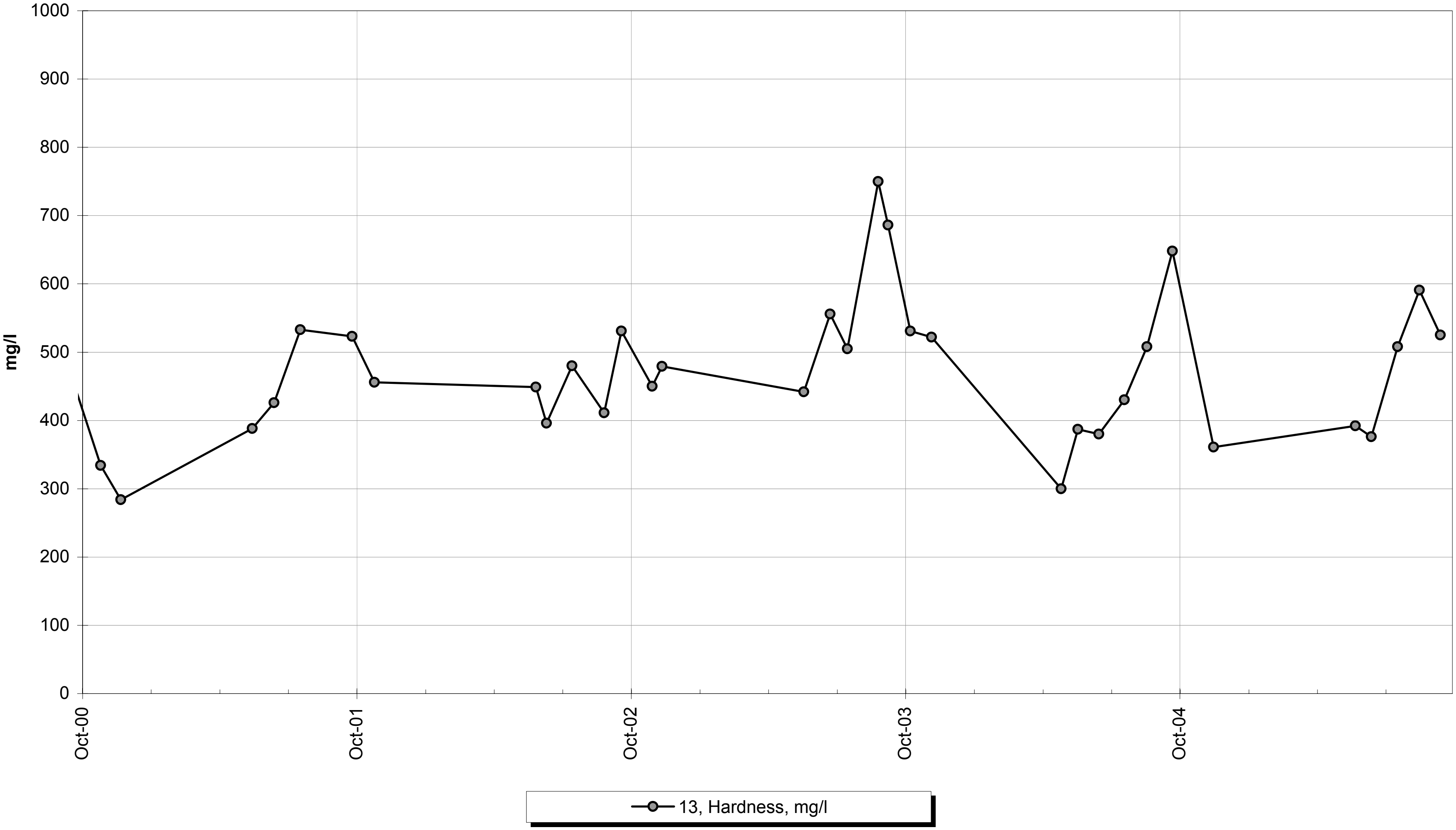
Site 13 -Total Alkalinity



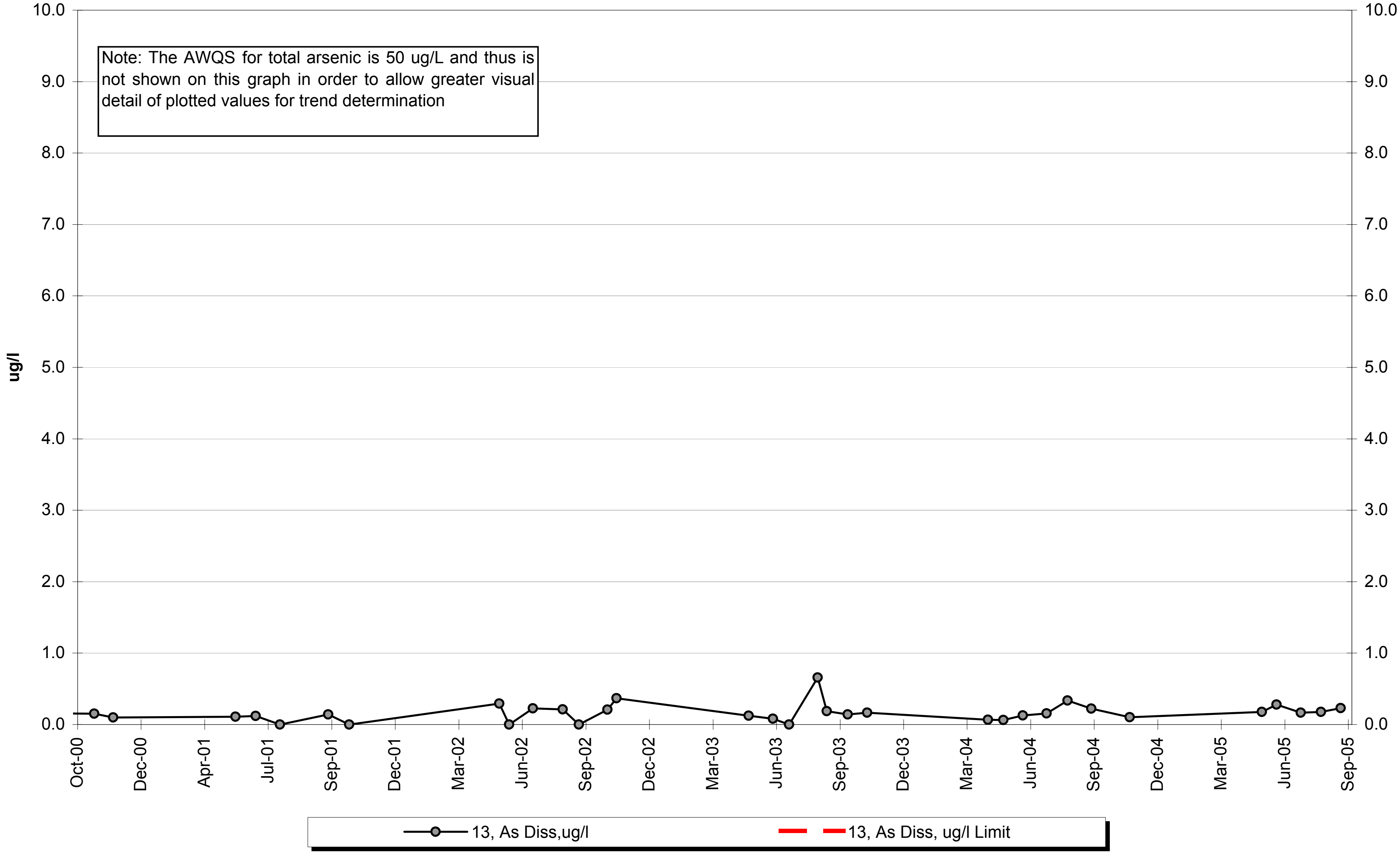
Site 13 -Total Sulfate



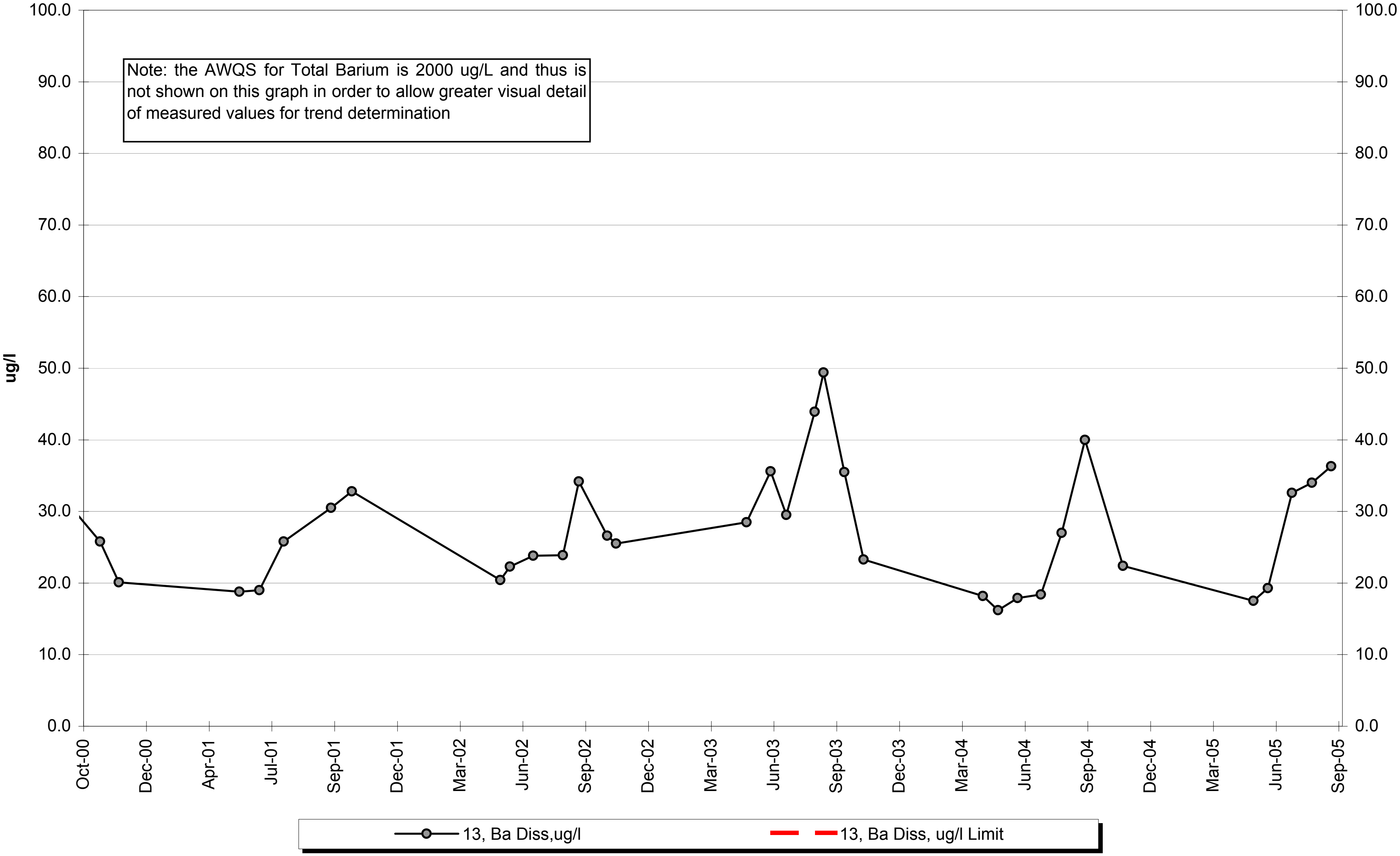
Site 13 -Hardness

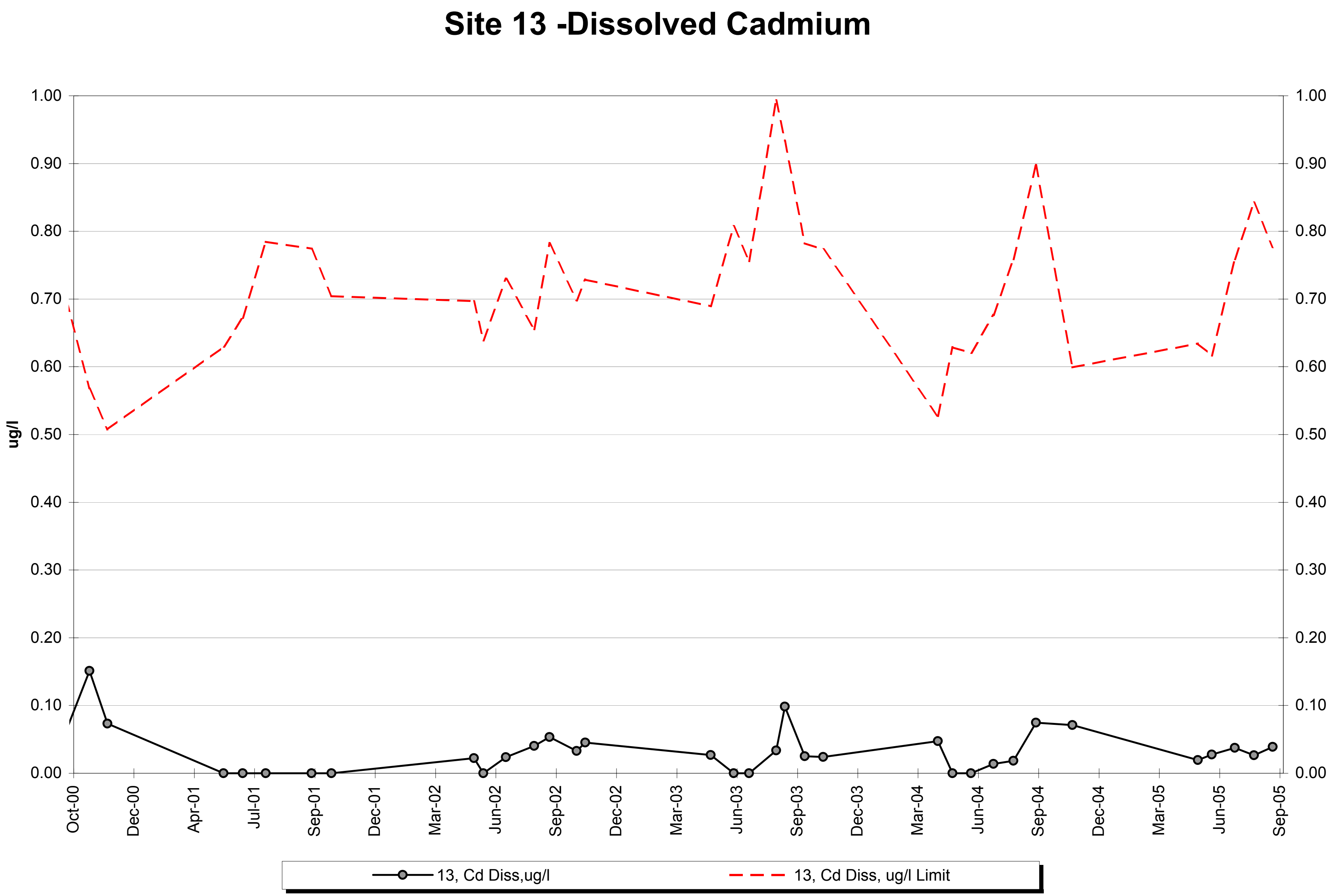


Site 13 -Dissolved Arsenic

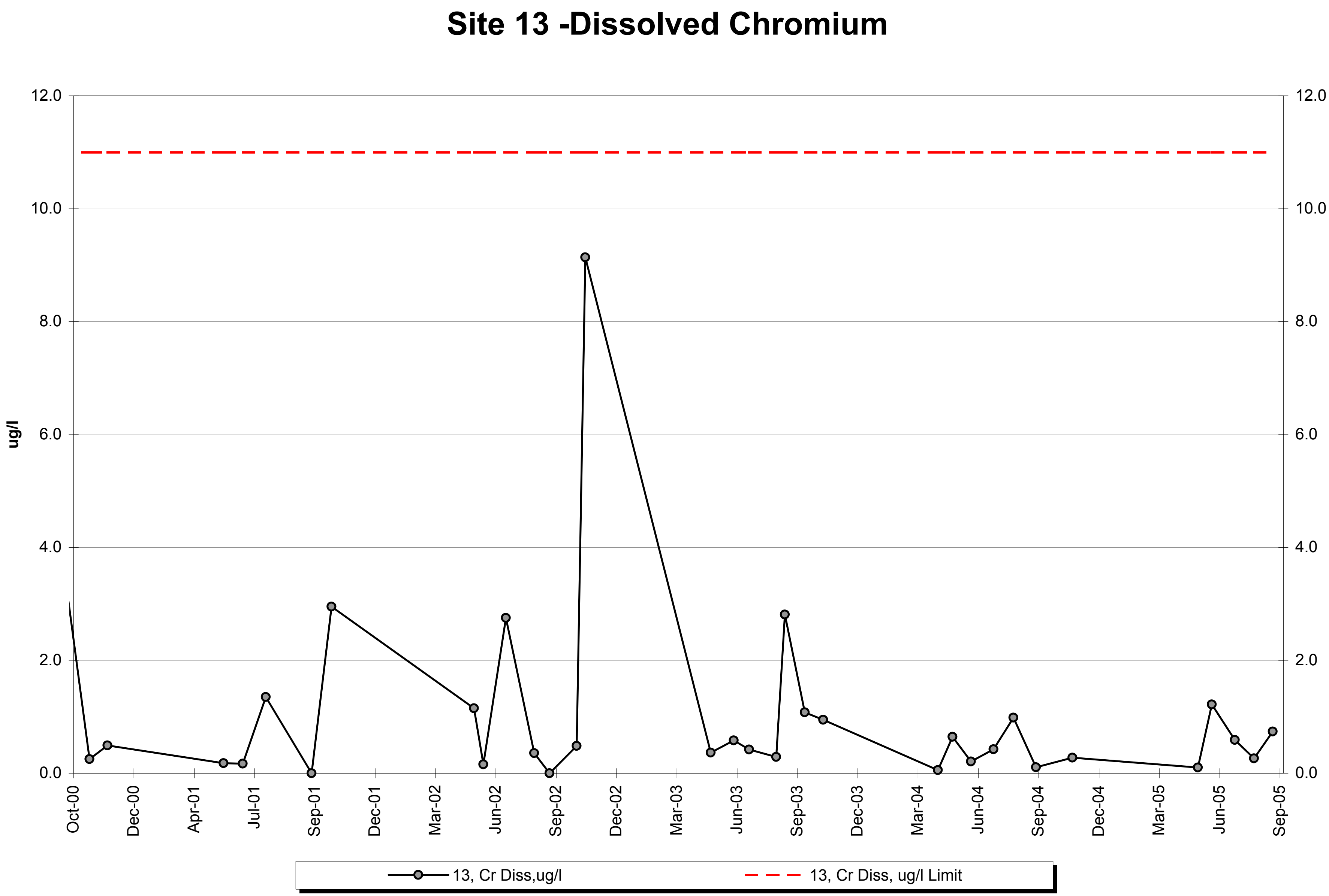


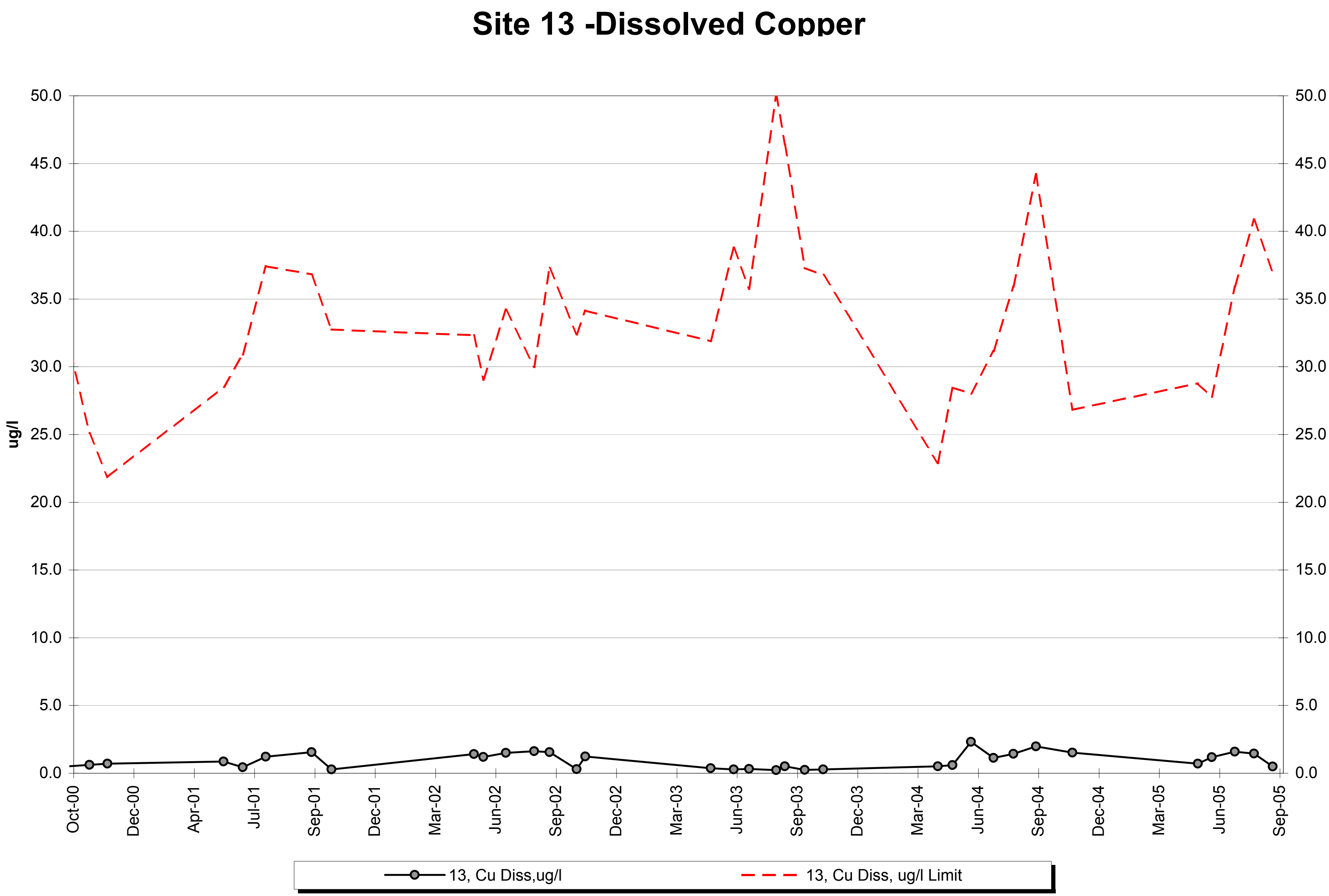
Site 13 -Dissolved Barium



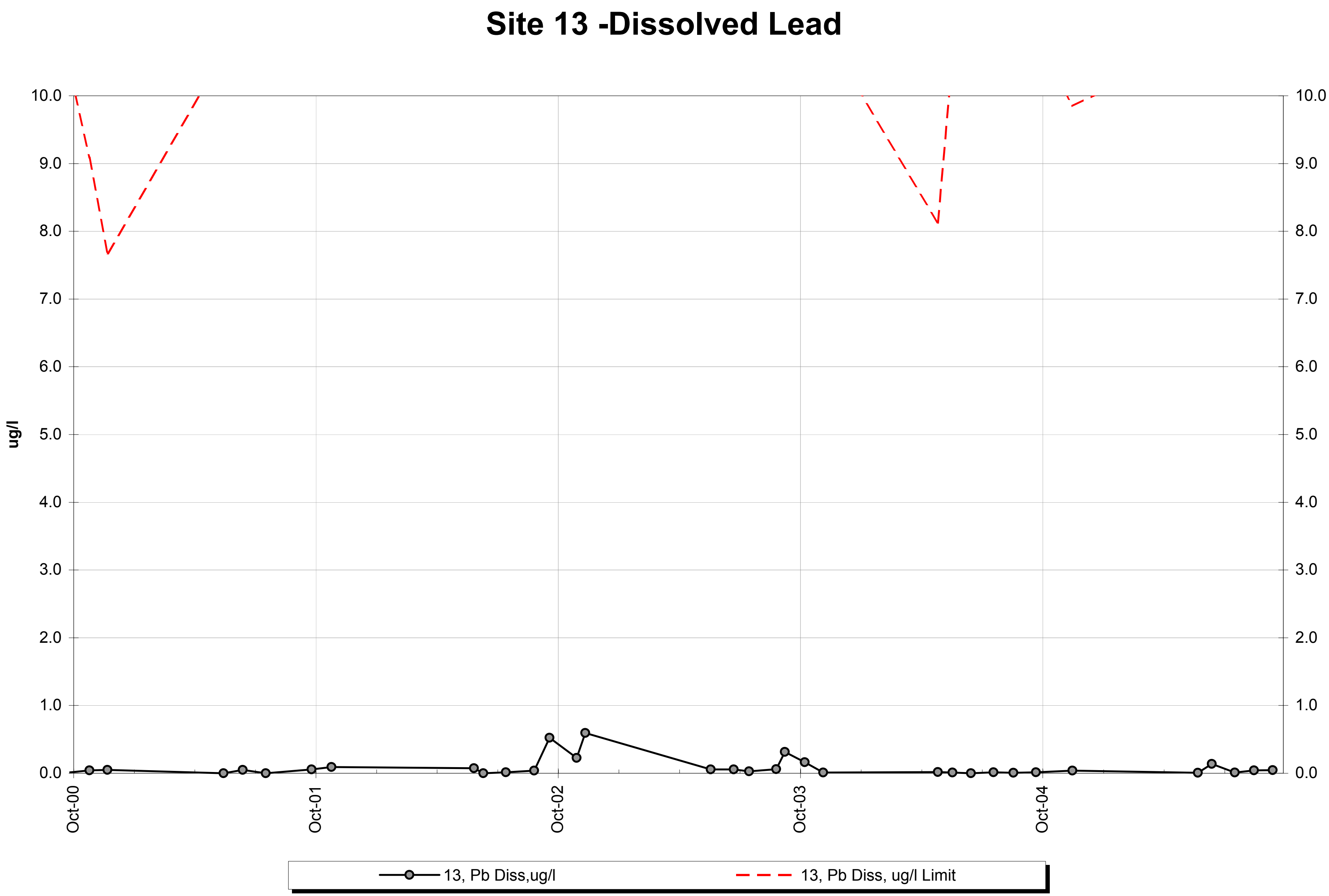


Site 13 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
13, Cd Diss,ug/l
13, Cd Diss, ug/l Limit


Site 13 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
13, Cr Diss,ug/l
13, Cr Diss, ug/l Limit

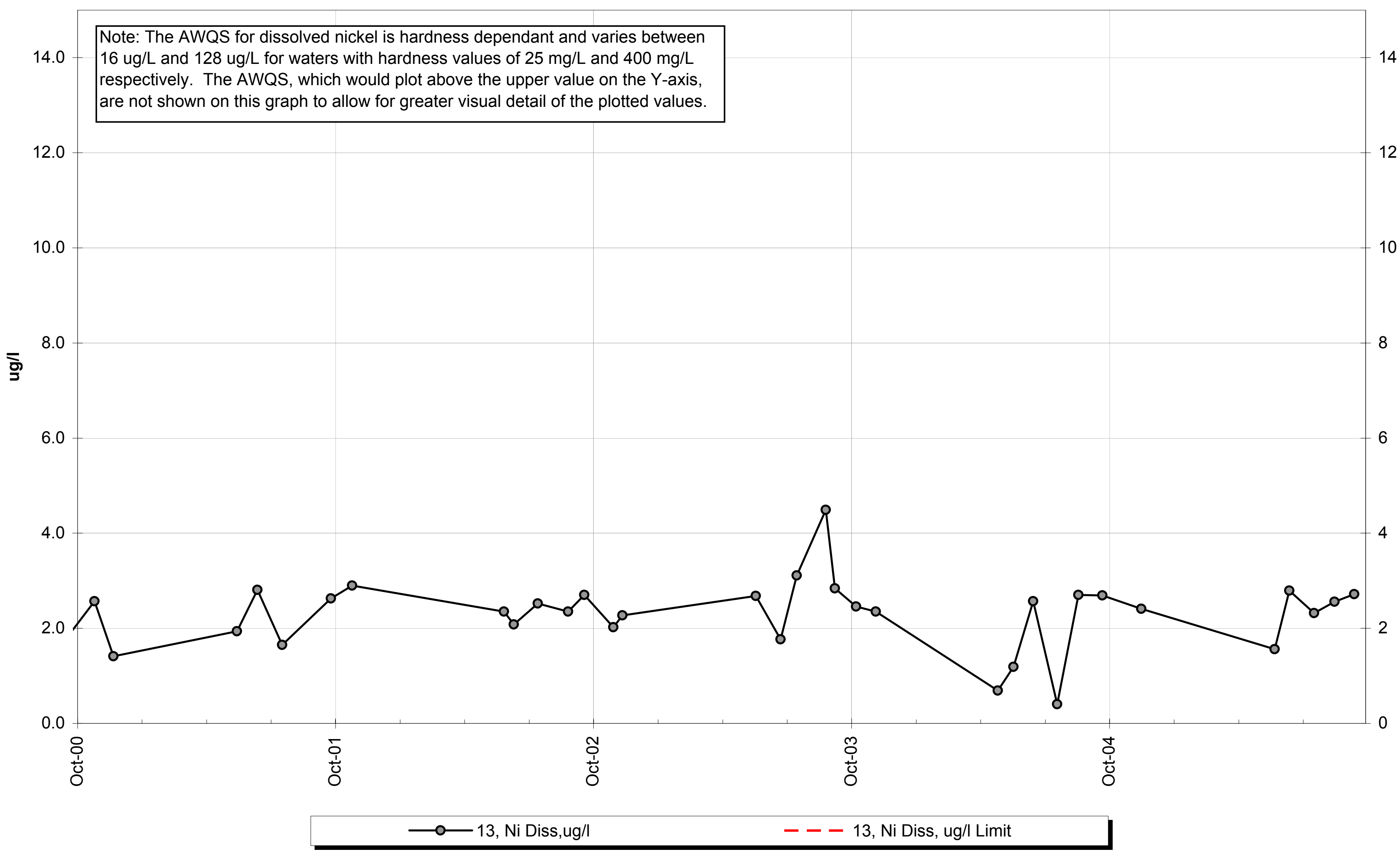


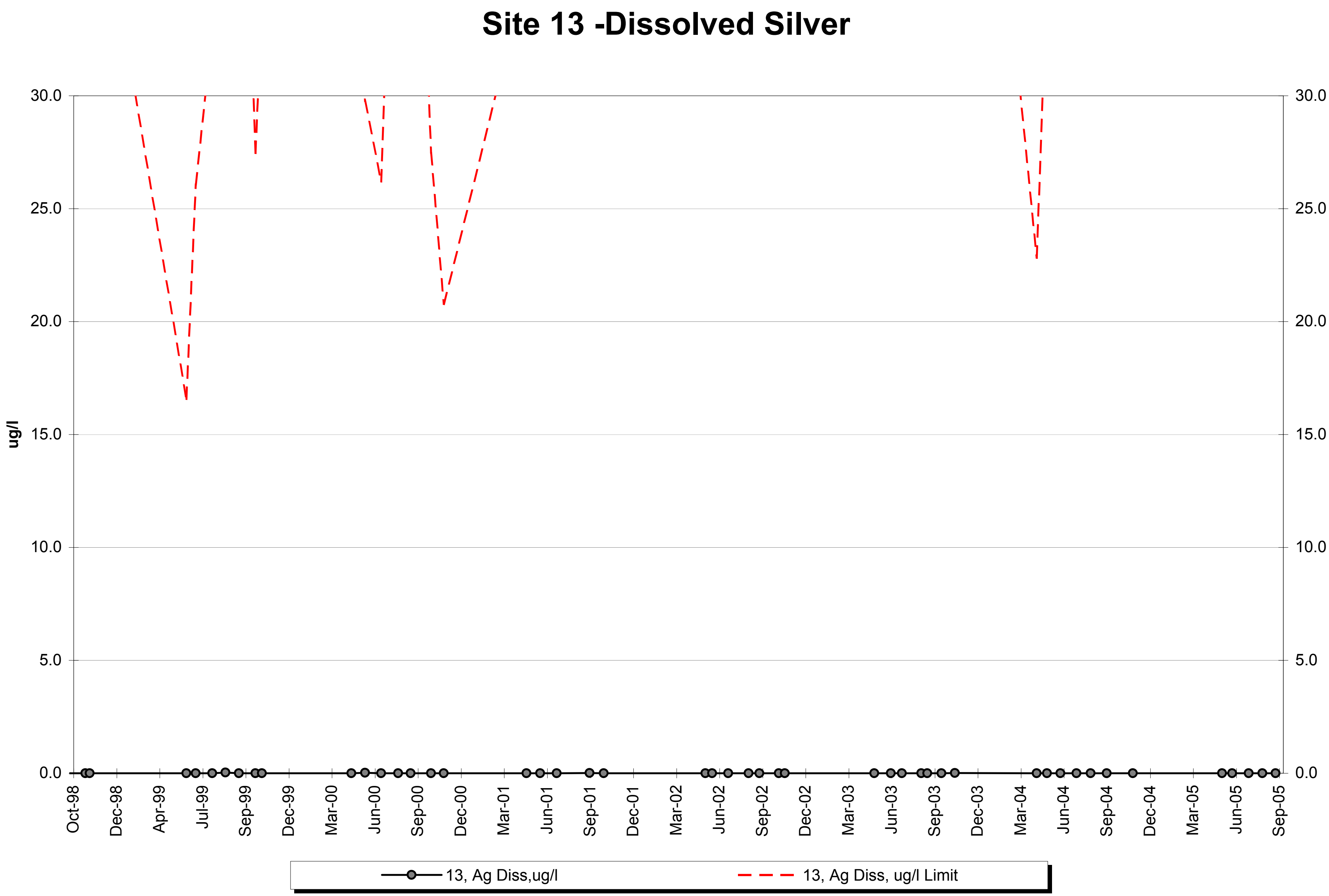
Site 13 -Dissolved Copper
ug/l
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
13, Cu Diss,ug/l
13, Cu Diss, ug/l Limit

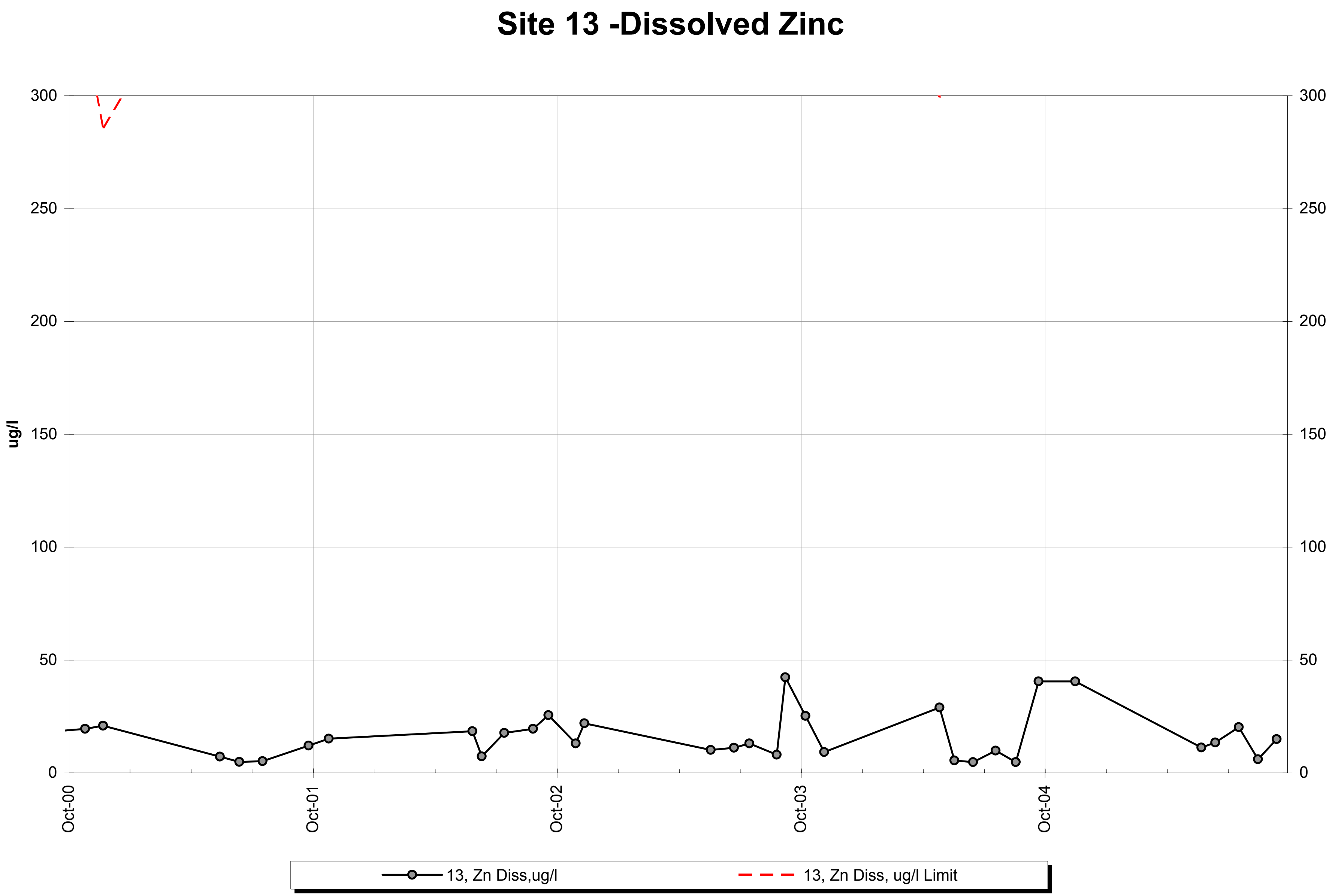


Site 13 -Dissolved Lead
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
13, Pb Diss,ug/l
13, Pb Diss, ug/l Limit

Site 13 -Dissolved Nickel

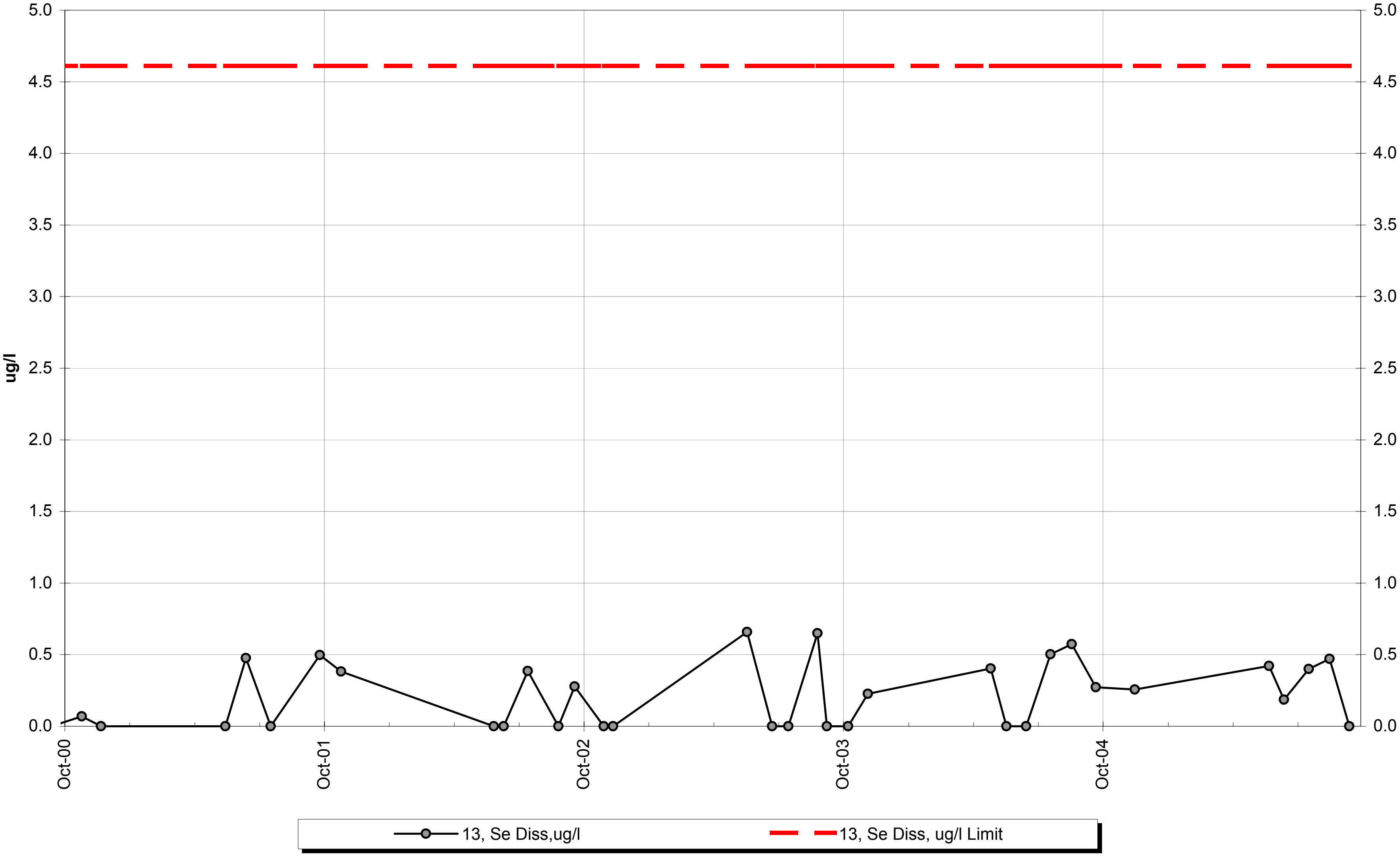



Site 13 -Dissolved Silver
ug/l
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
13, Ag Diss,ug/l
13, Ag Diss, ug/l Limit

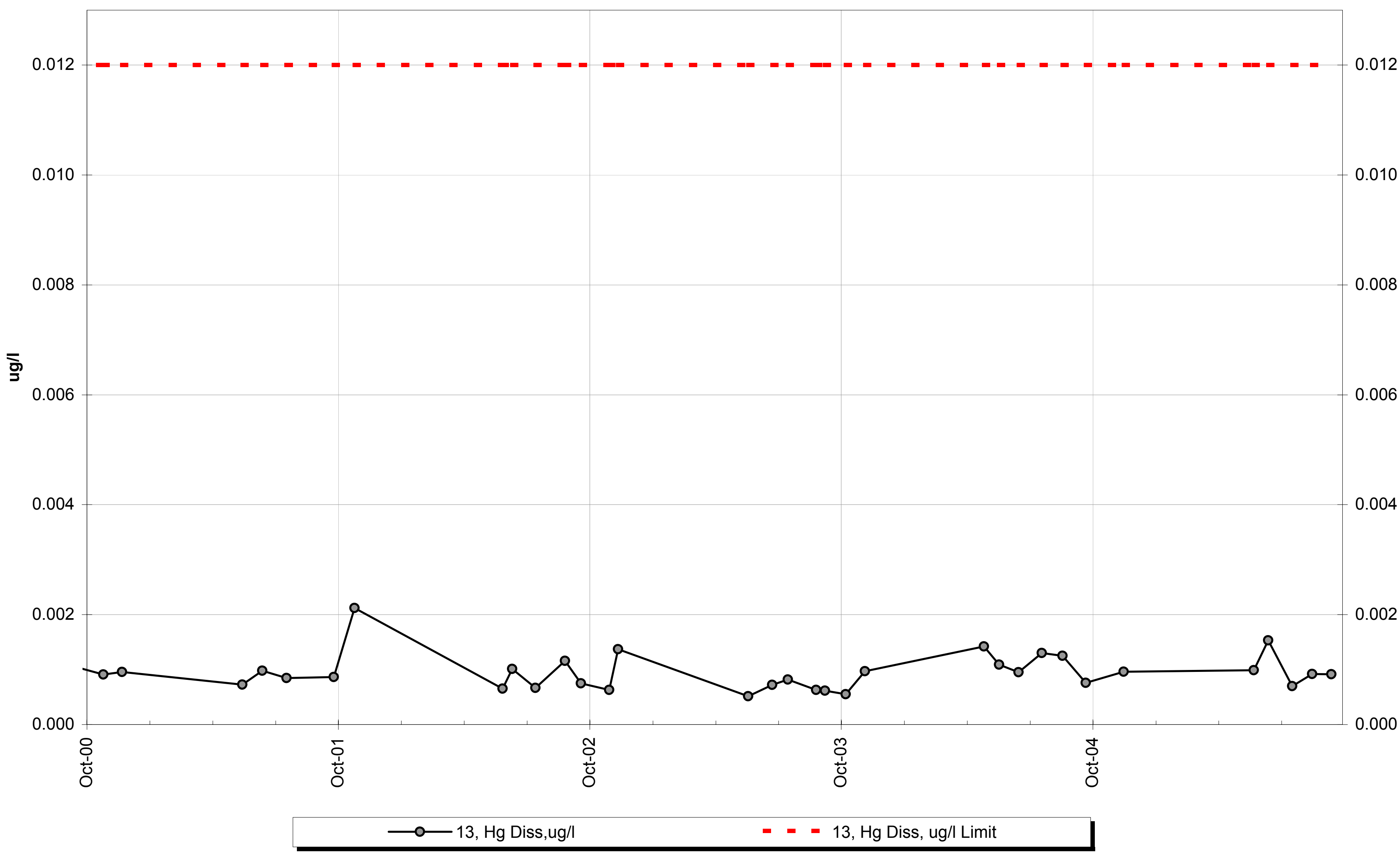


Site 13 -Dissolved Zinc
ug/l
300
250
200
150
100
50
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
13, Zn Diss,ug/l
13, Zn Diss, ug/l Limit

Site 13 -Dissolved Selenium



Site 13 -Dissolved Mercury



Site **#13** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

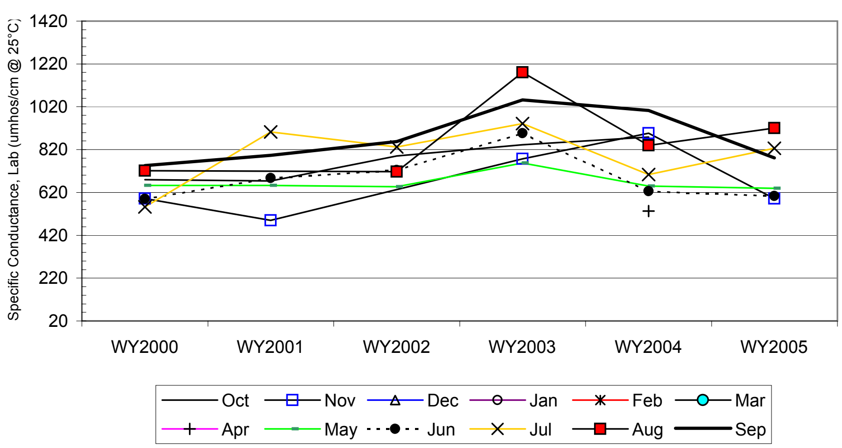
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	680.0	592.0						652.0	590.0	552.0	721.0	746.0
b	**WY2001**	674.0	490.0						653.0	687.0	902.0		794.0
c	**WY2002**	791.0							646.0	724.0	832.0	717.0	857.0
d	**WY2003**	842.0	777.0						757.0	896.0	941.0	1180.0	1052.0
e	**WY2004**	879.0	896.0					533.0	650.0	626.0	704.0	839.0	1002.0
f	**WY2005**		591.0						639.0	604.0	826.0	921.0	781.0
	n	5	5	0	0	0	0	1	6	6	6	5	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a	-1	-1						1	1	1		1
	c-a	1							-1	1	1	-1	1
	d-a	1	1						1	1	1	1	1
	e-a	1	1						-1	1	1	1	1
	f-a		-1						-1	1	1	1	1
	c-b	1							-1	1	-1		1
	d-b	1	1						1	1	1		1
	e-b	1	1						-1	-1	-1		1
	f-b		1						-1	-1	-1		-1
	d-c	1							1	1	1	1	1
	e-c	1							1	-1	-1	1	1
	f-c								-1	-1	-1	1	-1
	e-d	1	1						-1	-1	-1	-1	-1
	f-d		-1						-1	-1	-1	-1	-1
	f-e		-1						-1	-1	1	1	-1
	S_k	8	2	0	0	0	0	0	-5	1	1	4	5
	σ^2_S=	16.67	16.67						28.33	28.33	28.33	16.67	28.33
	$Z_k = S_k/\sigma_S$	1.96	0.49						-0.94	0.19	0.19	0.98	0.94
	Z^2_k	3.84	0.24						0.88	0.04	0.04	0.96	0.88

ΣZ_k= 3.81
ΣZ^2_k= 6.88
Z-bar=ΣZ_k/K= 0.54

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 40
ΣS_k 16

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=		4.81	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
	p	**0.569**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	1.17	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
163.33	p	**0.880**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.95		60.26
0.050	-1.51	32.25	53.02
0.100	-0.26		49.99
0.200	2.50		41.51

Site **#13** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	7.5	7.3						7.7	7.5	7.8	7.4	7.6
b	**WY2001**	7.3	7.7						7.0	7.6	7.8		8.0
c	**WY2002**	7.1							6.8	7.2	8.0	7.9	7.5
d	**WY2003**	7.3	7.5						7.4	7.4	7.6	7.7	7.3
e	**WY2004**	7.2	8.0					7.9	7.8	8.0	8.2	8.0	7.8
f	**WY2005**		7.4						7.7	7.8	7.7	7.6	7.7
	n	5	5	0	0	0	0	1	6	6	6	5	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	1	0	1	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	1						-1	1	0		1
c-a	-1							-1	-1	1	1	-1
d-a	-1	1						-1	-1	-1	1	-1
e-a	-1	1						1	1	1	1	1
f-a		1						0	1	-1	1	1
c-b	-1							-1	-1	1		-1
d-b	-1	-1						1	-1	-1		-1
e-b	-1	1						1	1	1		-1
f-b		-1						1	1	-1		-1
d-c	1							1	1	-1	-1	-1
e-c	1							1	1	1	1	1
f-c								1	1	-1	-1	1
e-d	-1	1						1	1	1	1	1
f-d		-1						1	1	1	-1	1
f-e		-1						-1	-1	-1	-1	-1
S_k	-6	2	0	0	0	0	0	4	5	0	2	-1

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67						28.33	28.33	28.33	16.67	28.33
$Z_k = S_k/\sigma_S$	-1.47	0.49						0.75	0.94	0.00	0.49	-0.19
Z^2_k	2.16	0.24						0.56	0.88	0.00	0.24	0.04

ΣZ_k= 1.01

ΣZ^2_k= 4.12

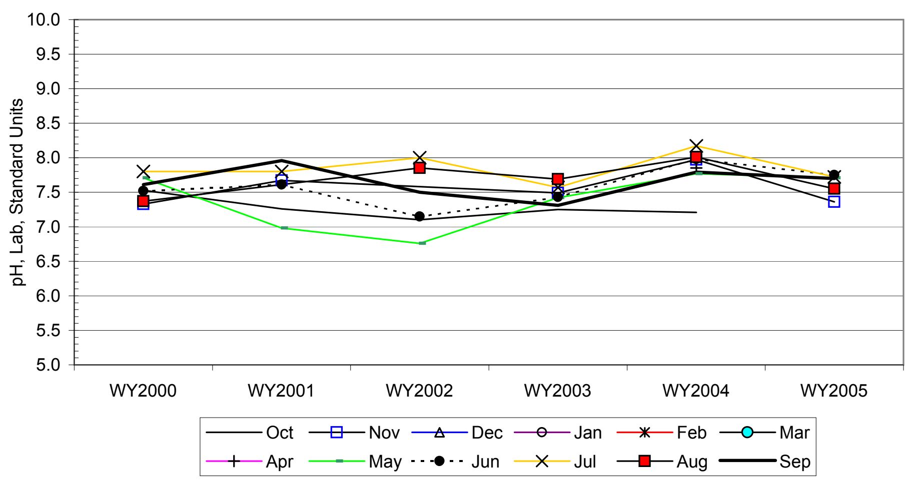
Z-bar=ΣZ_k/K= 0.14

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 40

ΣS_k 6

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	3.98	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
p	**0.680**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 0.39	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
163.33	**p** **0.652**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.07		0.10
0.050	-0.06	**0.02**	0.08
0.100	-0.03		0.07
0.200	-0.02		0.05

Site **#13** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	100.0	98.5						124.0	137.0	119.0	178.0	154.0
b	**WY2001**	142.0	113.0						135.0	173.0	178.0		154.0
c	**WY2002**	166.0							107.0	126.0	144.0	111.0	147.0
d	**WY2003**	140.0	186.0						206.0	244.0	197.0	199.0	128.0
e	**WY2004**	172.0	151.0					115.0	174.0	184.0	197.0	209.0	139.0
f	**WY2005**		120.0						186.0	201.0	188.0	207.0	162.0
	n	5	5	0	0	0	0	1	6	6	6	5	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	1	0	1
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	1	1						1	1	1		0
c-a	1							-1	-1	1	-1	-1
d-a	1	1						1	1	1	1	-1
e-a	1	1						1	1	1	1	-1
f-a		1						1	1	1	1	1
c-b	1							-1	-1	-1		-1
d-b	-1	1						1	1	1		-1
e-b	1	1						1	1	1		-1
f-b		1						1	1	1		1
d-c	-1							1	1	1	1	-1
e-c	1							1	1	1	1	-1
f-c								1	1	1	1	1
e-d	1	-1						-1	-1	0	1	1
f-d		-1						-1	-1	-1	1	1
f-e		-1						1	1	-1	-1	1
S_k	6	4	0	0	0	0	0	7	7	8	6	-2

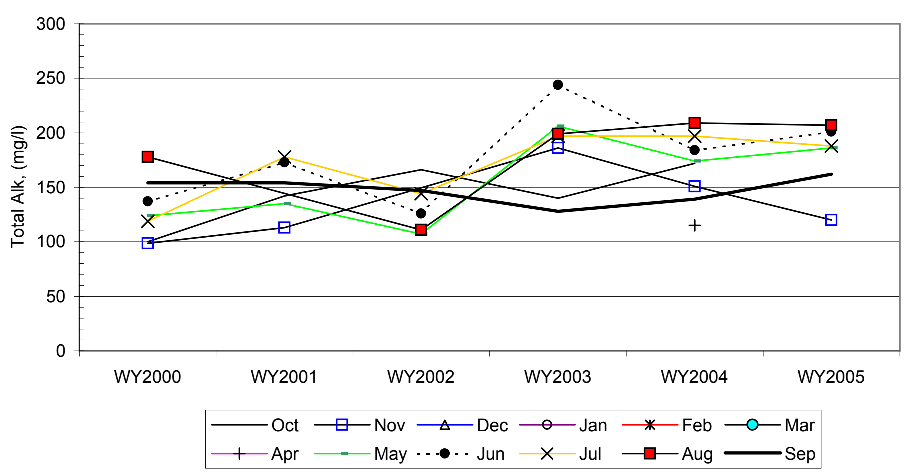
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67						28.33	28.33	28.33	16.67	28.33
$Z_k = S_k/\sigma_S$	1.47	0.98						1.32	1.32	1.50	1.47	-0.38
Z^2_k	2.16	0.96						1.73	1.73	2.26	2.16	0.14

ΣZ_k= 7.68
ΣZ^2_k= 11.14
Z-bar=ΣZ_k/K= 1.10

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	2	0	0	0	0

Σn 40
ΣS_k 36

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	2.72	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
p	**0.843**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc}	2.74	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
163.33 **p**	**0.997**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	1.78		14.41
0.050	3.83	**10.50**	12.90
0.100	4.87		12.68
0.200	6.75		12.44

6.8%

Site **#13** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**	32.2	45.8						23.5	8.9	14.5	7.9	18.5
b	**WY2001**	19.5	20.9						7.3	4.9	5.2		12.1
c	**WY2002**	15.2							18.5	7.3	17.7	19.5	25.6
d	**WY2003**	13.1	22.0						10.2	11.1	13.1	8.1	42.4
e	**WY2004**	25.3	9.3					29.0	5.5	4.8	9.9	4.7	40.5
f	**WY2005**		40.5						11.3	13.5	20.3	6.0	15.0
	n	5	5	0	0	0	0	1	6	6	6	5	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a	-1	-1						-1	-1	-1		-1
c-a	-1							-1	-1	1	1	1
d-a	-1	-1						-1	1	-1	1	1
e-a	-1	-1						-1	-1	-1	-1	1
f-a		-1						-1	1	1	-1	-1
c-b	-1							1	1	1		1
d-b	-1	1						1	1	1		1
e-b	1	-1						-1	-1	1		1
f-b		1						1	1	1		1
d-c	-1							-1	1	-1	-1	1
e-c	1							-1	-1	-1	-1	1
f-c								-1	1	1	-1	-1
e-d	1	-1						-1	-1	-1	-1	-1
f-d		1						1	1	1	-1	-1
f-e		1						1	1	1	1	-1
S_k	-4	-2	0	0	0	0	0	-5	3	3	-4	3

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67						28.33	28.33	28.33	16.67	28.33
$Z_k = S_k/\sigma_S$	-0.98	-0.49						-0.94	0.56	0.56	-0.98	0.56
Z^2_k	0.96	0.24						0.88	0.32	0.32	0.96	0.32

ΣZ_k= -1.70

ΣZ^2_k= 4.00

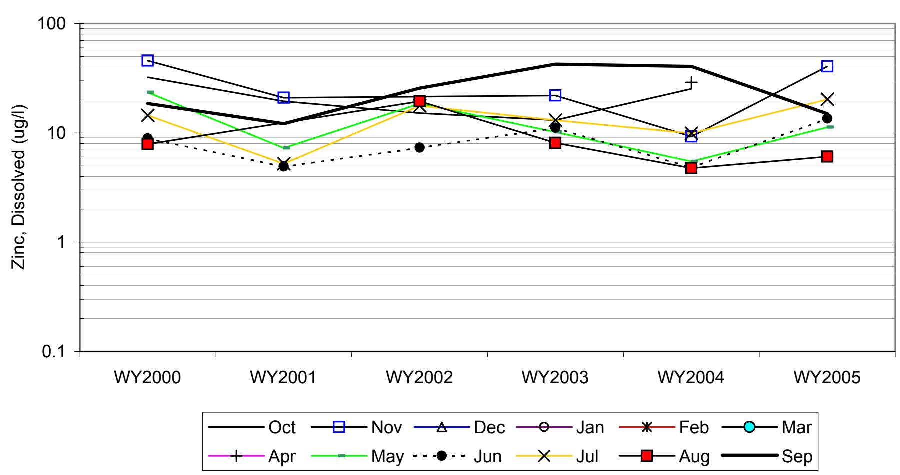
Z-bar=$\Sigma Z_k/K$= -0.24

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 40

ΣS_k -6

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	3.58	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
p	**0.733**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$ 163.33	Z_{calc} -0.39	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.348**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.11		1.45
0.050	-2.00	**-0.53**	0.97
0.100	-1.34		0.77
0.200	-1.04		0.55

INTERPRETIVE REPORT
SITE 58 “MONITORING WELL T-00-01C”

The data collected during the current water year are listed in the following “Table of Results for Water Year 2005” report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report “Qualified Data by QA Reviewer”. The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

Sampling at this site was added to the FWMP in May-2002 to serve as an upgradient control site. All data collected at this site since it’s inception into the FWMP are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of May-02 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Three results exceeding these criteria have been identified, as listed in the table below. These data are for pH, both for lab and field. Values for lab and field pH from other wells completed into organic rich peat sediments similar to Site 58 have historically resulted in pH values ranging from 5 to 6 s.u. (e.g. Sites 27, 29, and 32).

Sample Date	Parameter	Value	Standard	Standard Type
05/24/05	pH Lab, su	6.26	6.5 - 8.5	Aquatic Life
09/15/05	pH Lab, su	6.12	6.5 - 8.5	Aquatic Life
09/15/05	pH Field, su	6.22	6.5 - 8.5	Aquatic Life

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. Total alkalinity and conductivity appear to both have moderate increasing trends over the four-year period that sampling has occurred. Total alkalinity has increased from ~25 mg/l to a high of 47.0 mg/l sampled in May-2005. Lab specific conductance has increased from ~70uS/cm to a high of 89.1 uS/cm sampled in May-2005. Given the short timeframe that sampling has been active at this site it is difficult to interpret if the noted trends are within the standard range of values that can be anticipated at this site. However, since this site is an upgradient, reference site the variations are consider due to natural variation. No statistical analysis for trend was performed on Site 58 data. For a robust analysis of trend at least five years of data is required. KGCMC anticipates adding this component into the Water Year 2006 annual report for this site.

Table of Results for Water Year 2005

Site 58 "MW-T-00-01C"													
Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							6.9	NOT SCHEDULED FOR SAMPLING			11.5	9.2
Conductivity-Field(µmho)								112				78	95
Conductivity-Lab (µmho)								94				75	85
pH Lab (standard units)								6.26				6.12	6.19
pH Field (standard units)								6.58				6.22	6.40
Total Alkalinity (mg/L)								47.0				32.8	39.9
Total Sulfate (mg/L)								3.9				1.3	2.6
Hardness (mg/L)								45.6				36.6	41.1
Dissolved As (ug/L)								0.068 J				0.212	0.140
Dissolved Ba (ug/L)								7.4				8.2	7.8
Dissolved Cd (ug/L)								<0.004				<0.003	0.002
Dissolved Cr (ug/L)								0.455				0.785	0.620
Dissolved Cu (ug/L)								0.068 U				0.136 U	0.102
Dissolved Pb (ug/L)								0.0452 U				0.0825 U	0.0639
Dissolved Ni (ug/L)								0.320				0.300 U	0.310
Dissolved Ag (ug/L)								<0.003				0.002 J	0.002
Dissolved Zn (ug/L)								0.86 U				0.12 U	0.49
Dissolved Se (ug/L)								0.171 J				<0.116	0.115
Dissolved Hg (ug/L)								0.000340 U				0.000914	0.000627

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

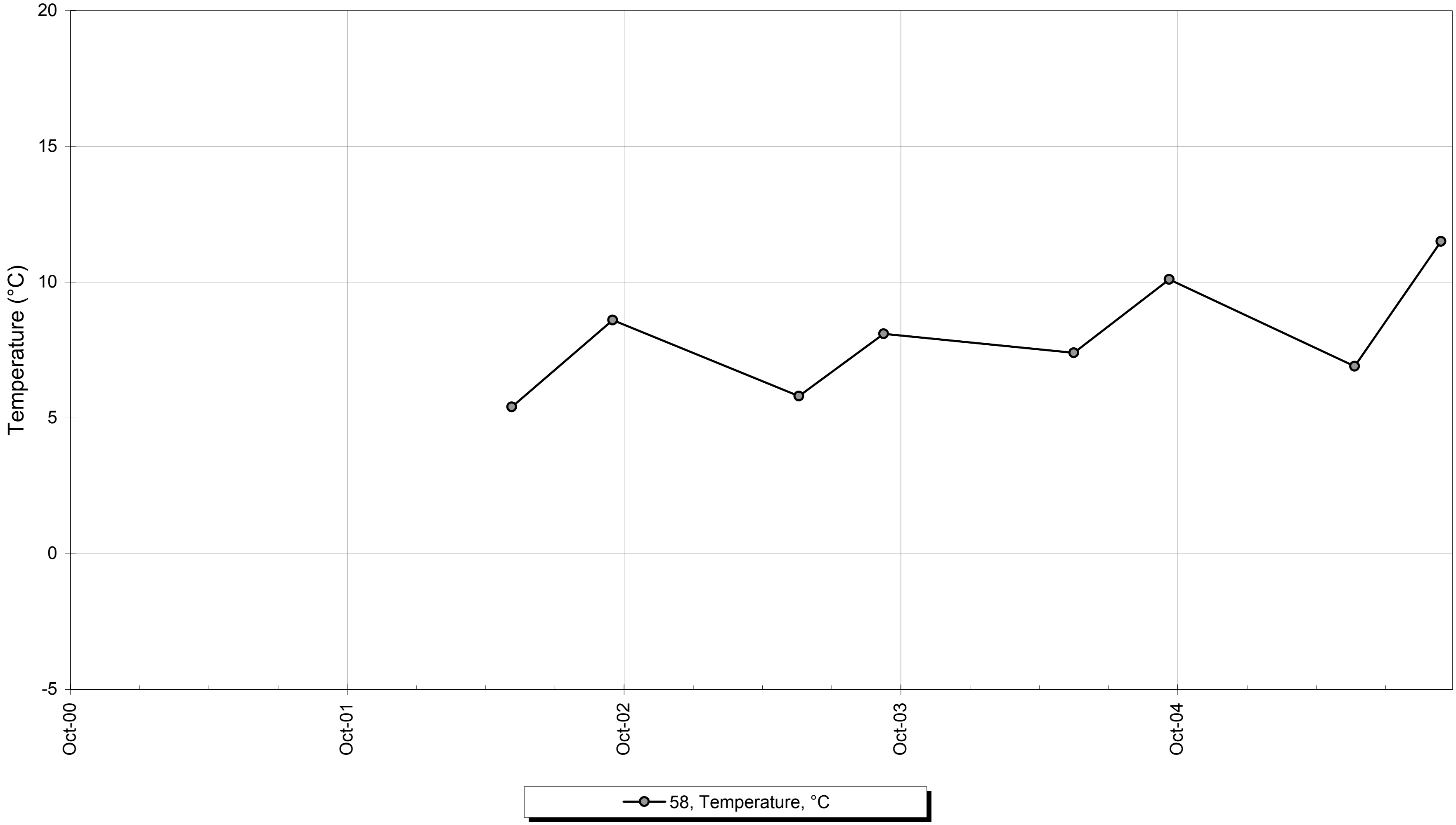
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

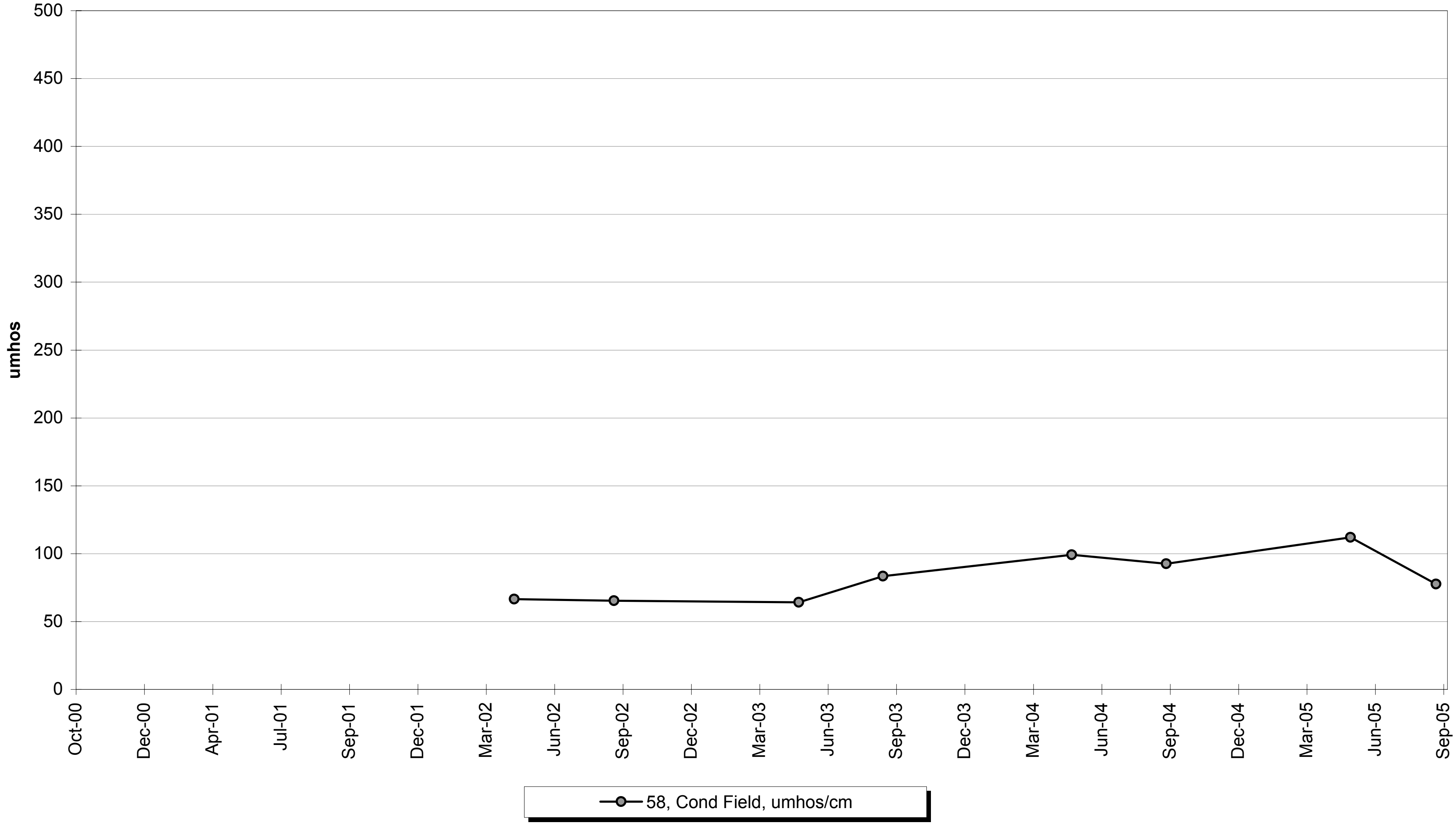
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
58	05/24/2005	1:55:00 PM				
			As Diss, ug/l	0.0683	J	Below Quantitative Range
			Cu Diss, ug/l	0.0684	U	Field Blank Contamination
			Pb Diss, ug/l	0.0452	U	Field Blank Contamination
			Zn Diss, ug/l	0.859	U	Field Blank Contamination
			Se Diss, ug/l	0.171	J	Below Quantitative Range, L
			Hg Diss, ug/l	0.00034	U	Field Blank Contamination
58	09/15/2005	2:55:00 PM				
			Cu Diss, ug/l	0.136	U	Field Blank Contamination
			Pb Diss, ug/l	0.0825	U	Field Blank Contamination
			Ni Diss, ug/l	0.3	U	Field Blank Contamination
			Ag Diss, ug/l	0.00223	J	Below Quantitative Range
			Zn Diss, ug/l	0.118	U	Field Blank Contamination

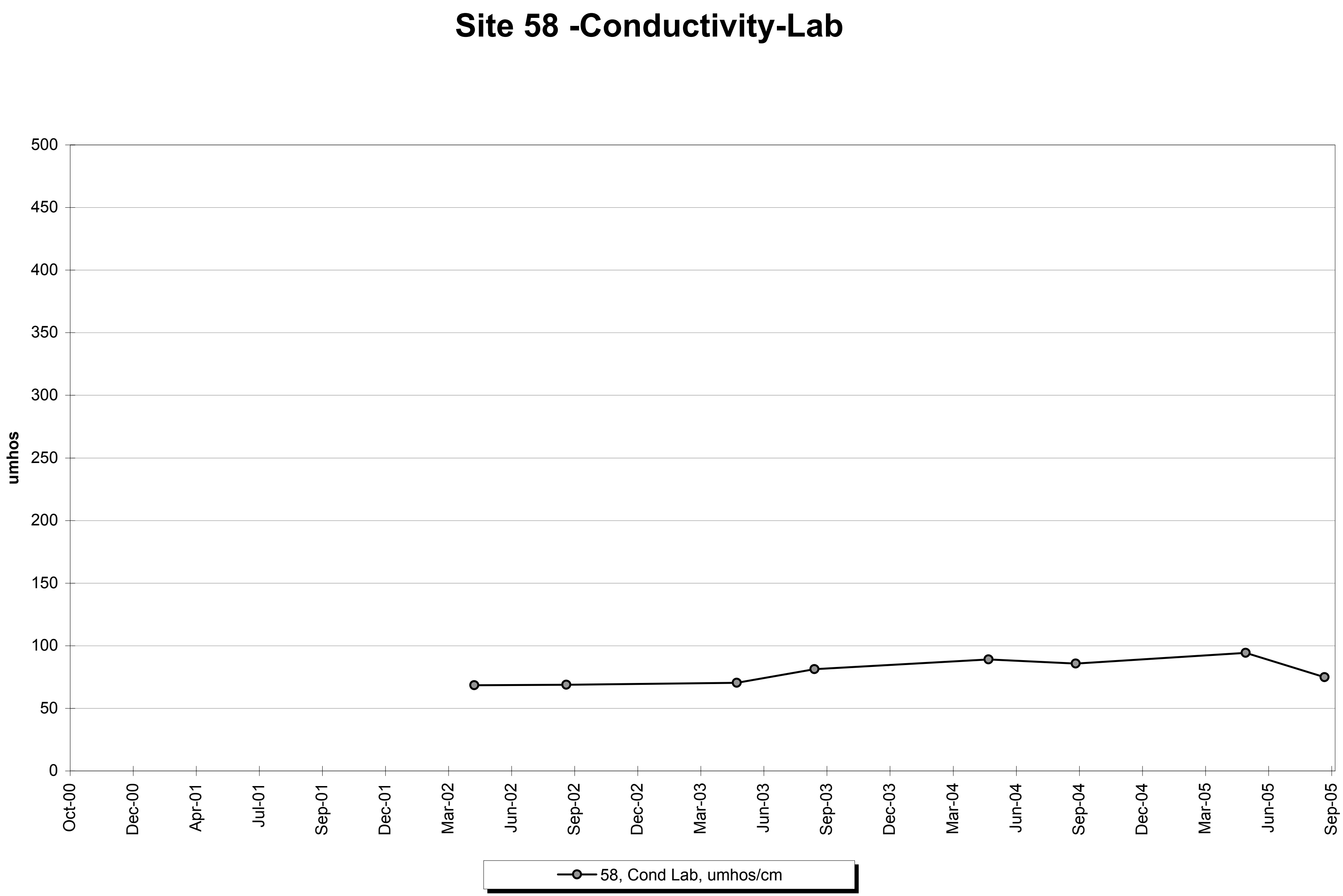
Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

Site 58 -Water Temperature



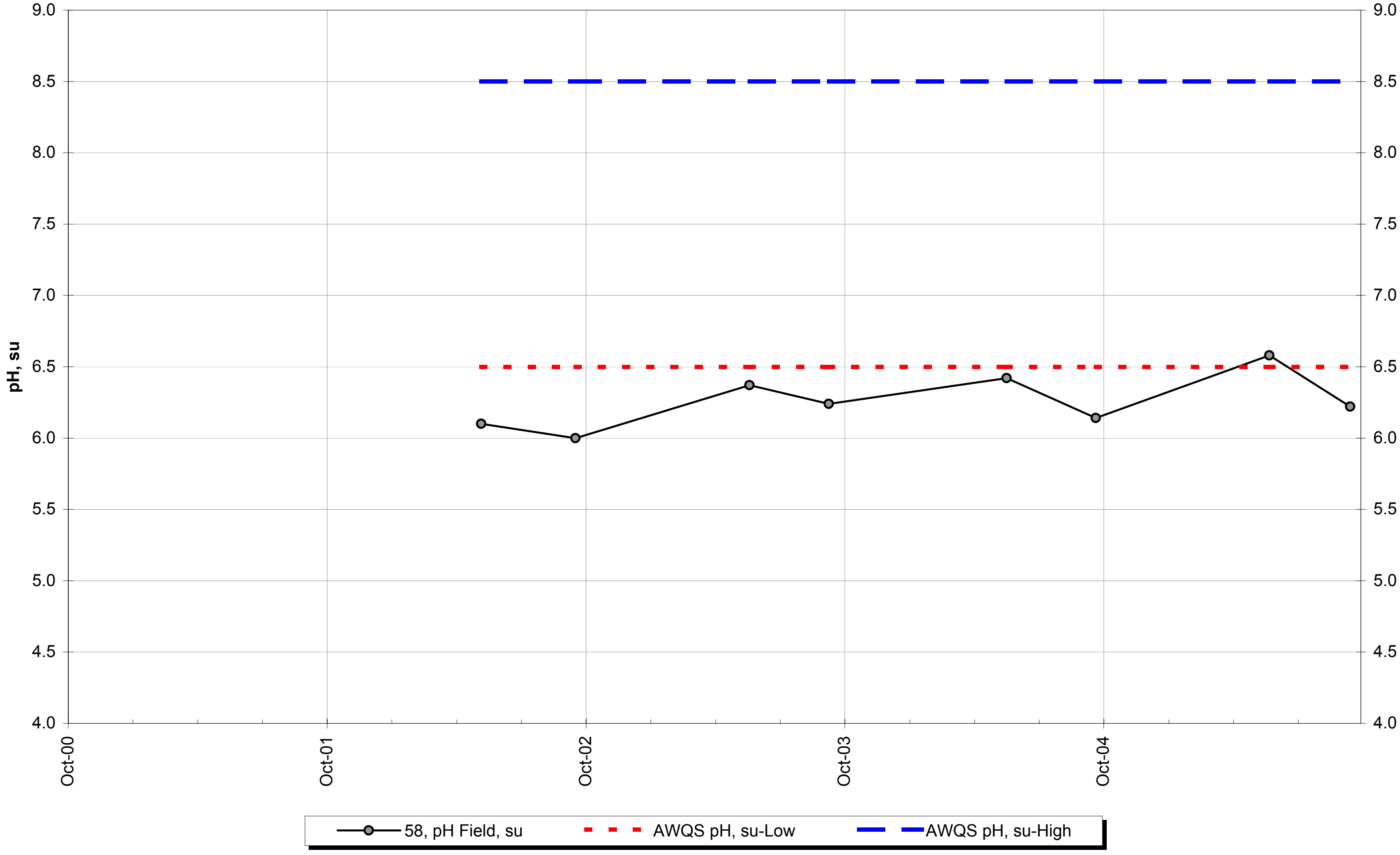
Site 58 -Conductivity-Field



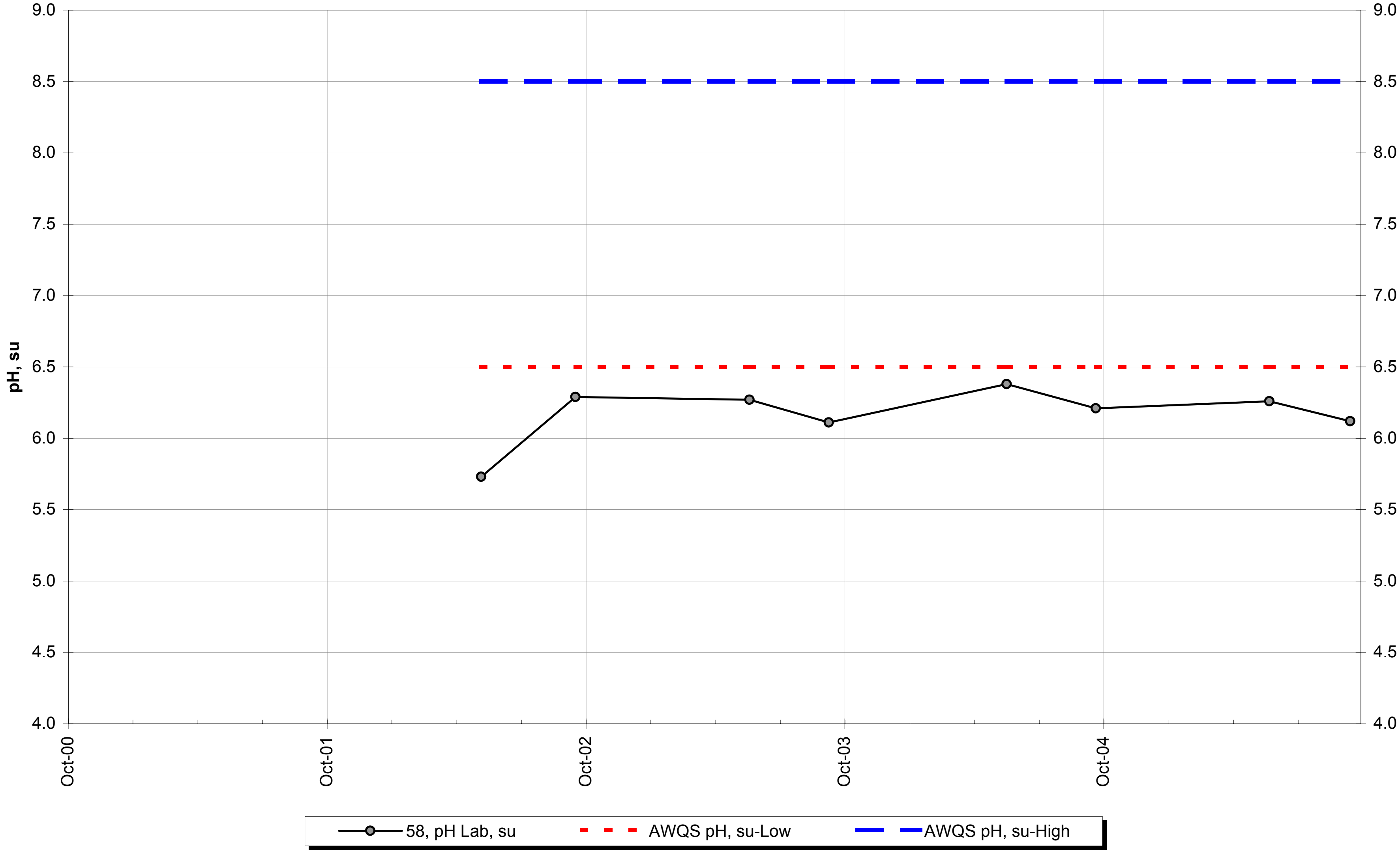


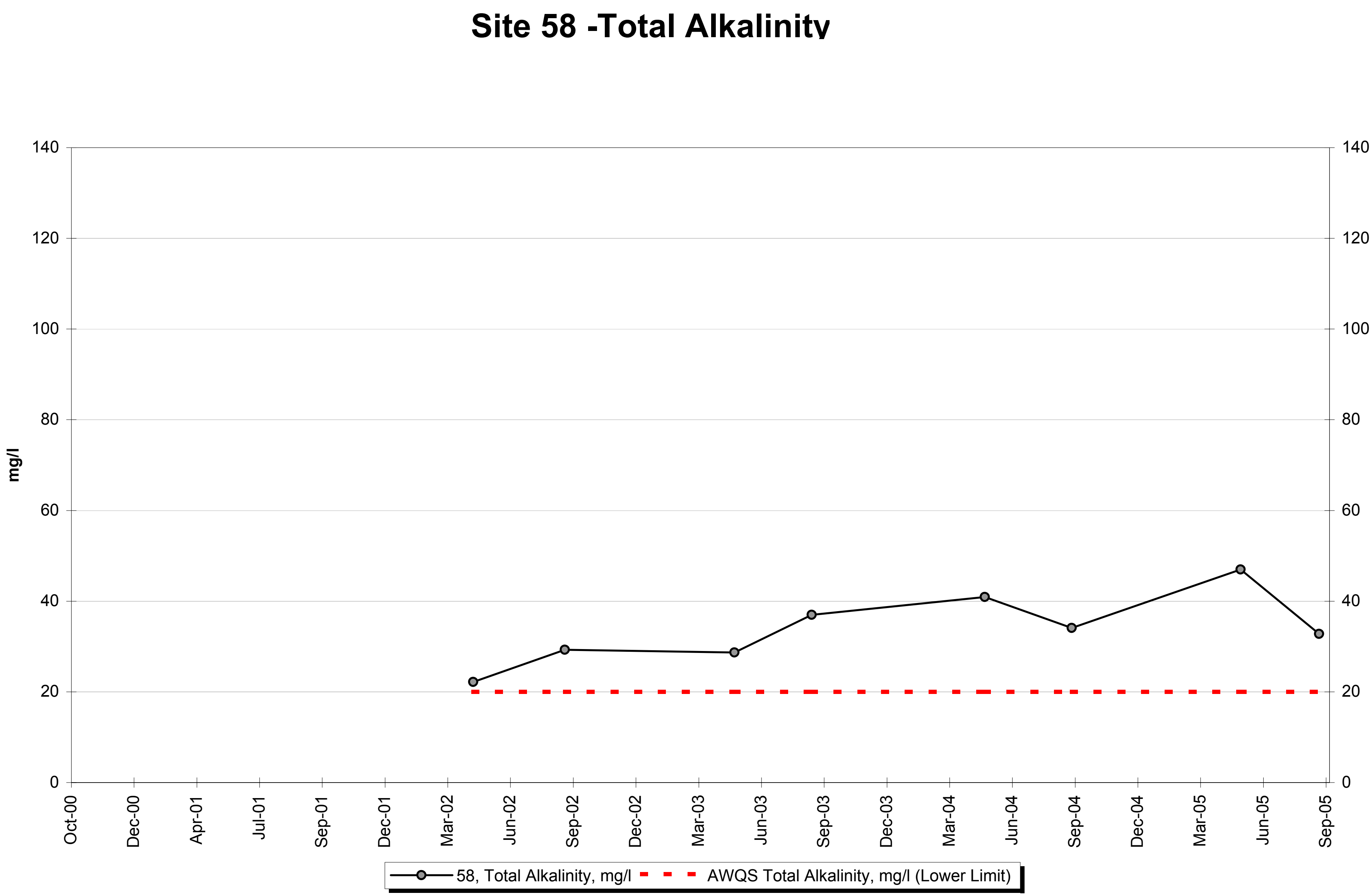
Site 58 -Conductivity-Lab
umhos
500
450
400
350
300
250
200
150
100
50
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
58, Cond Lab, umhos/cm

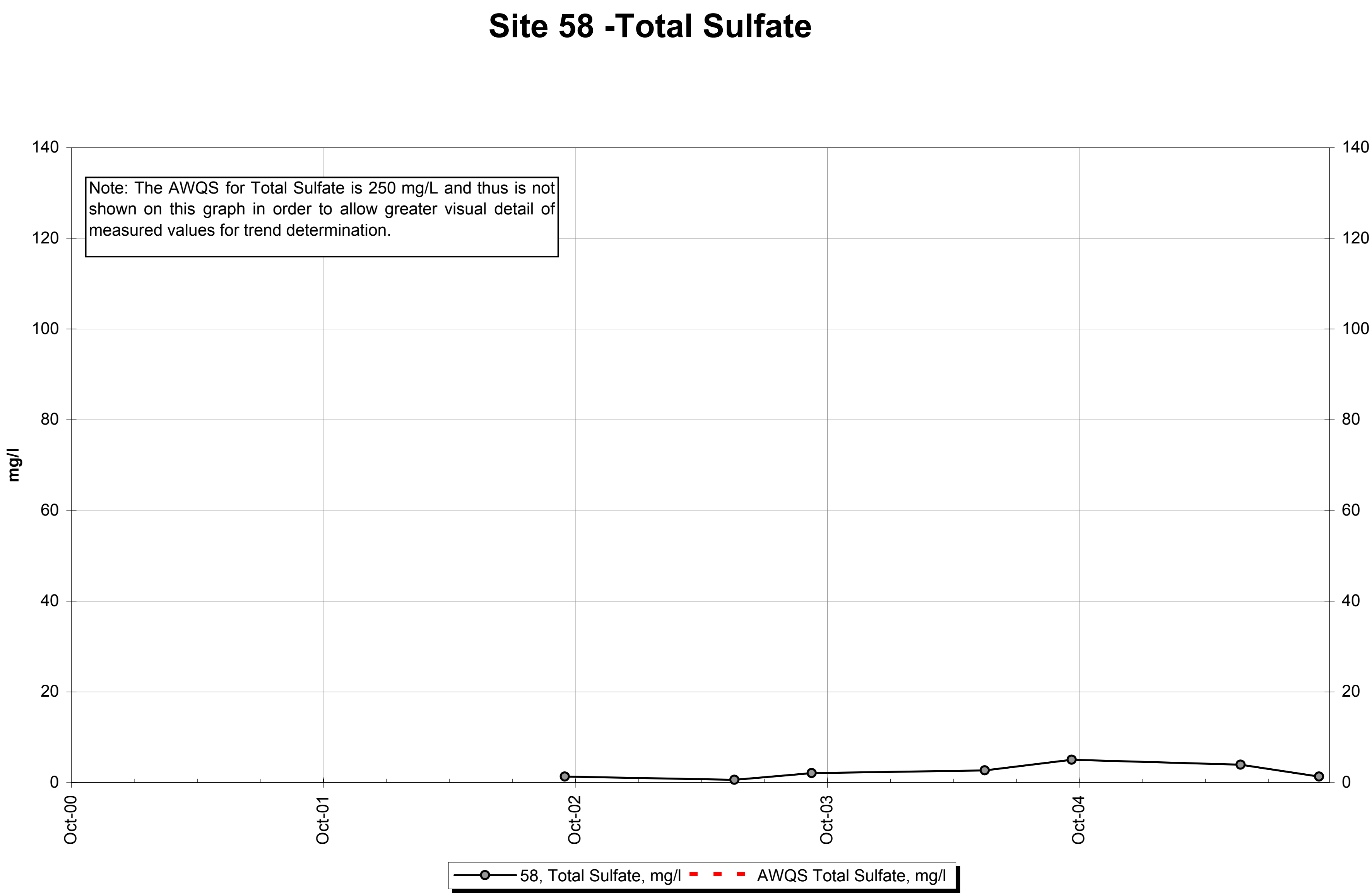
Site 58 -Field pH



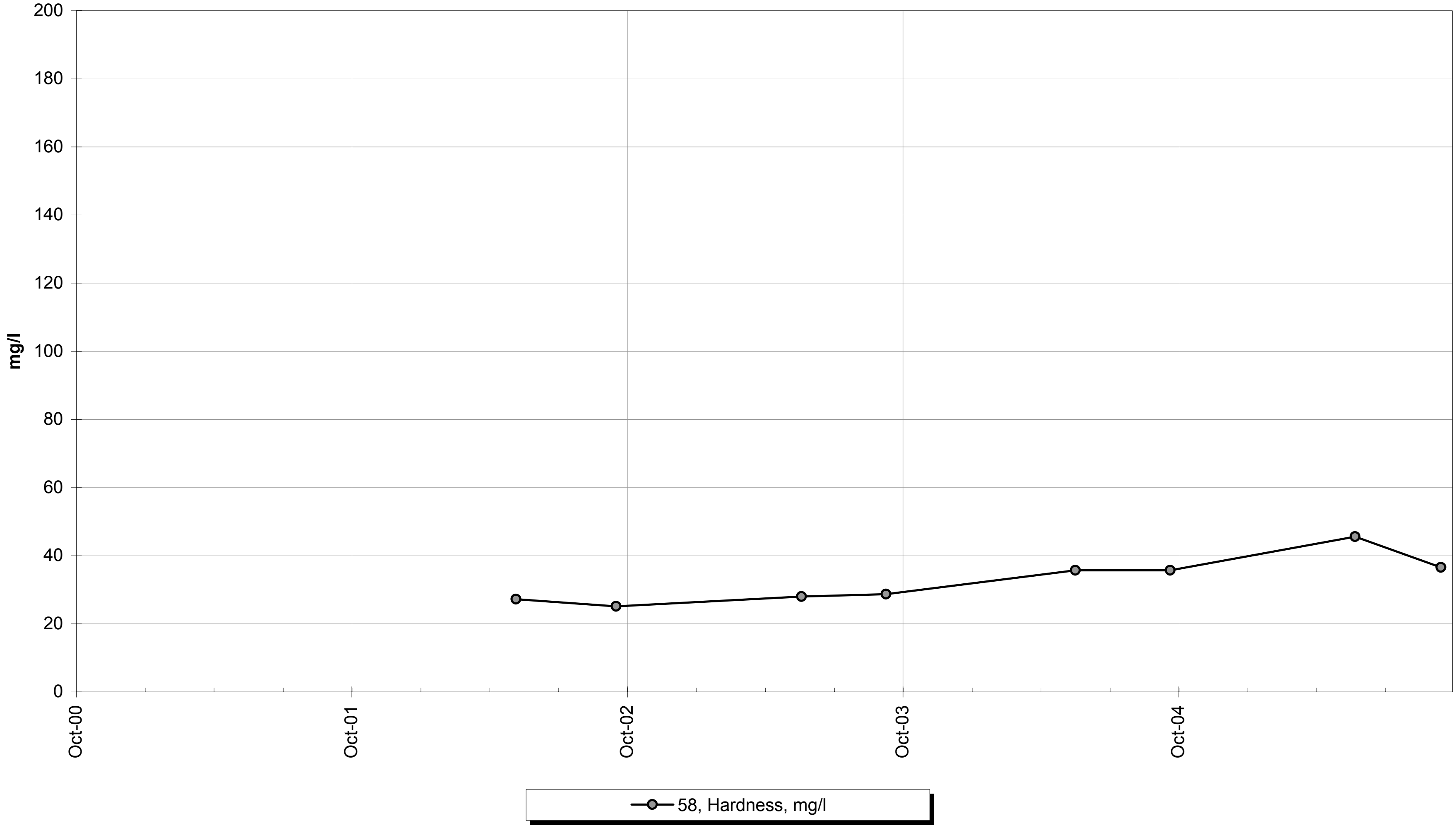
Site 58 -Lab pH



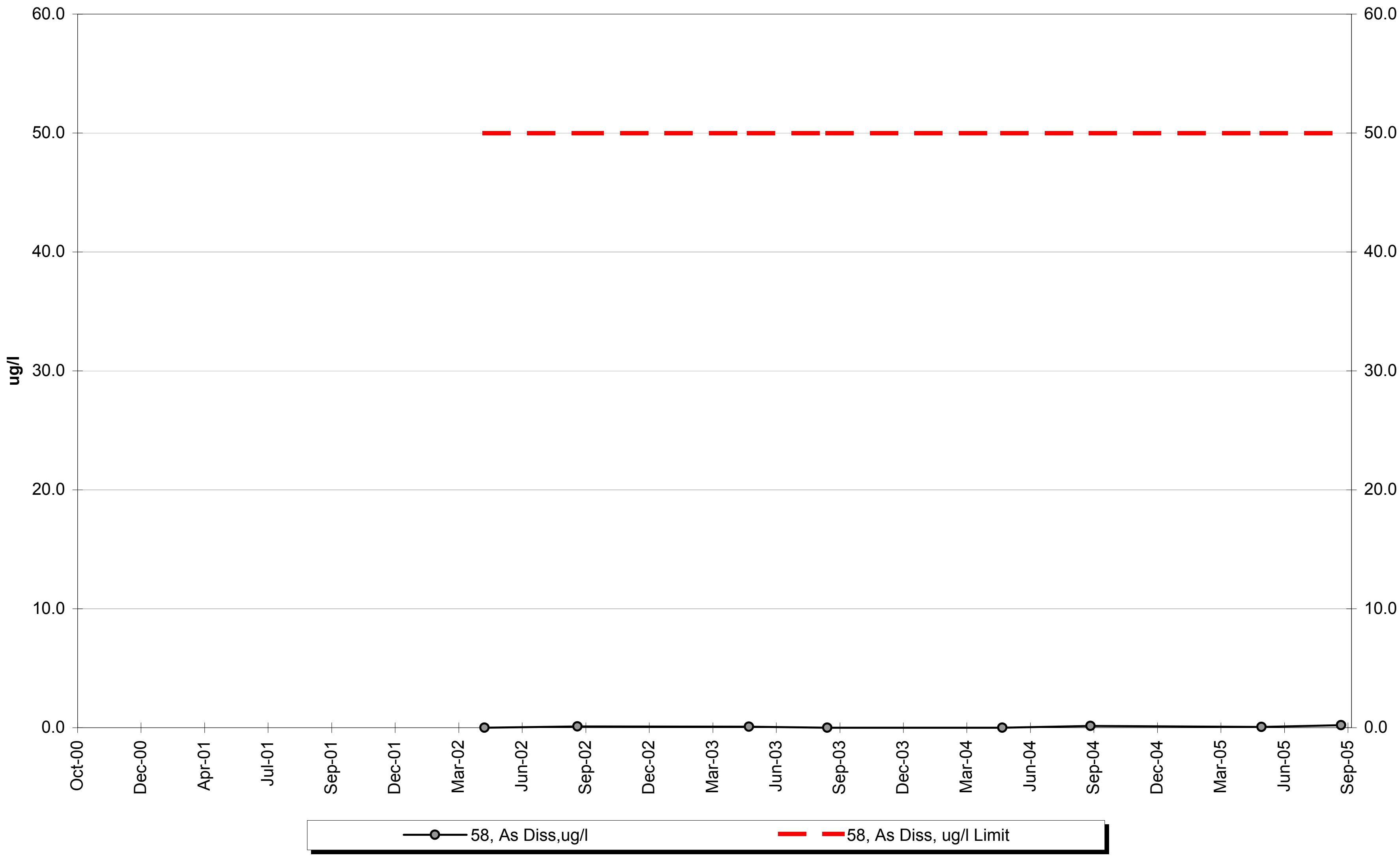

Site 58 -Total Alkalinity
mg/l
140
120
100
80
60
40
20
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
58, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)


Site 58 -Total Sulfate
Note: The AWQS for Total Sulfate is 250 mg/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination.
mg/l
140
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
58, Total Sulfate, mg/l
AWQS Total Sulfate, mg/l

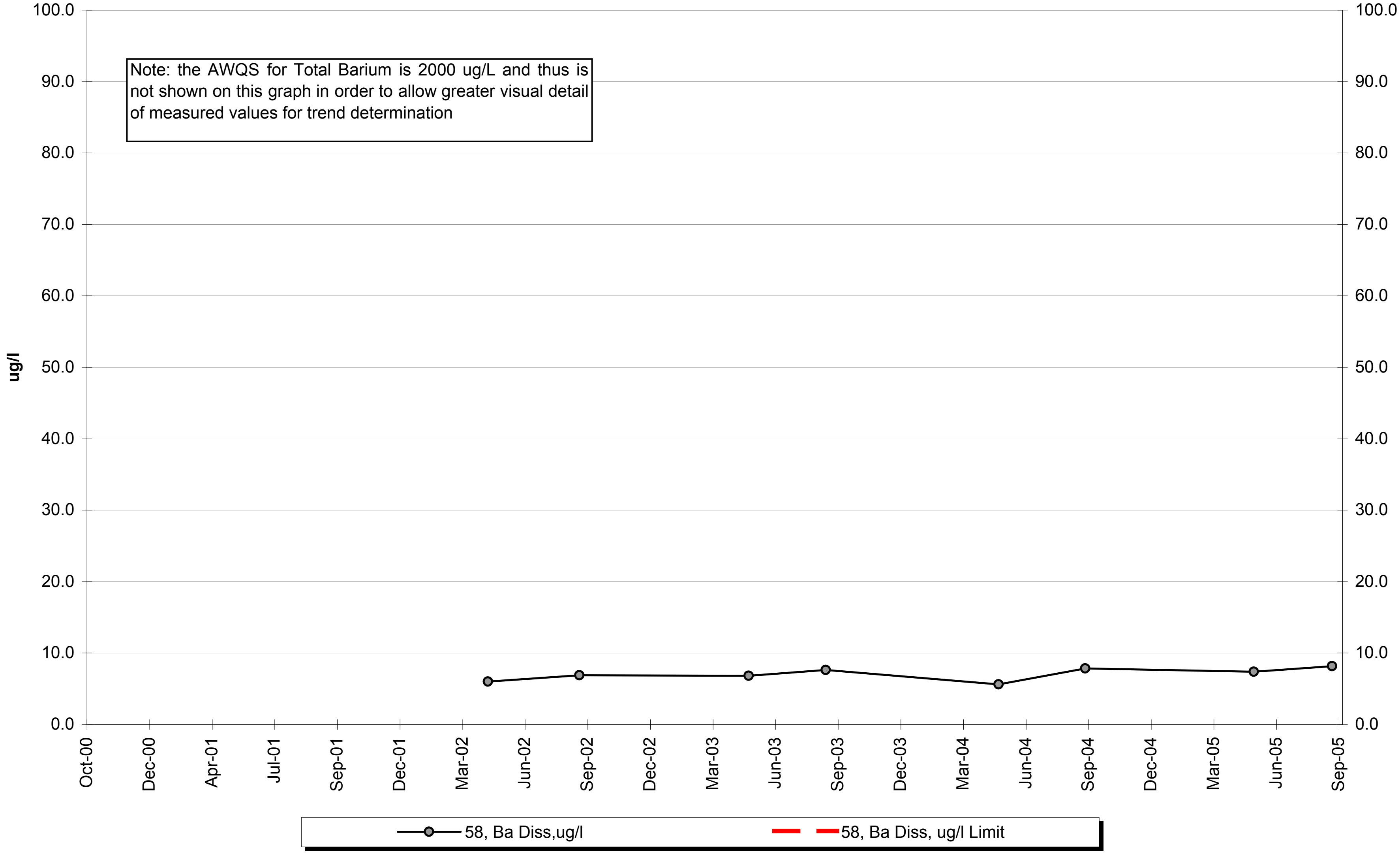
Site 58 -Hardness



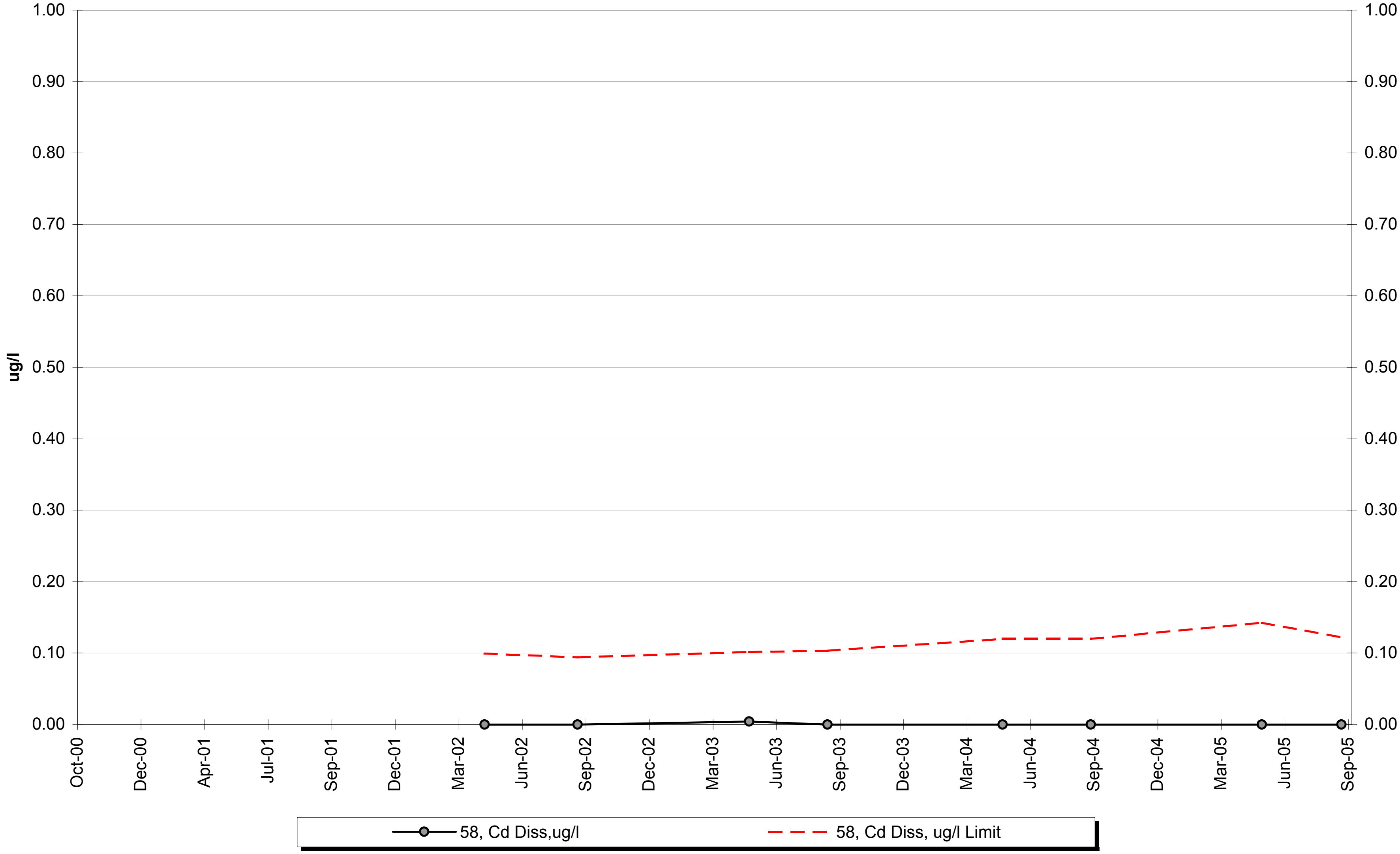
Site 58 -Dissolved Arsenic

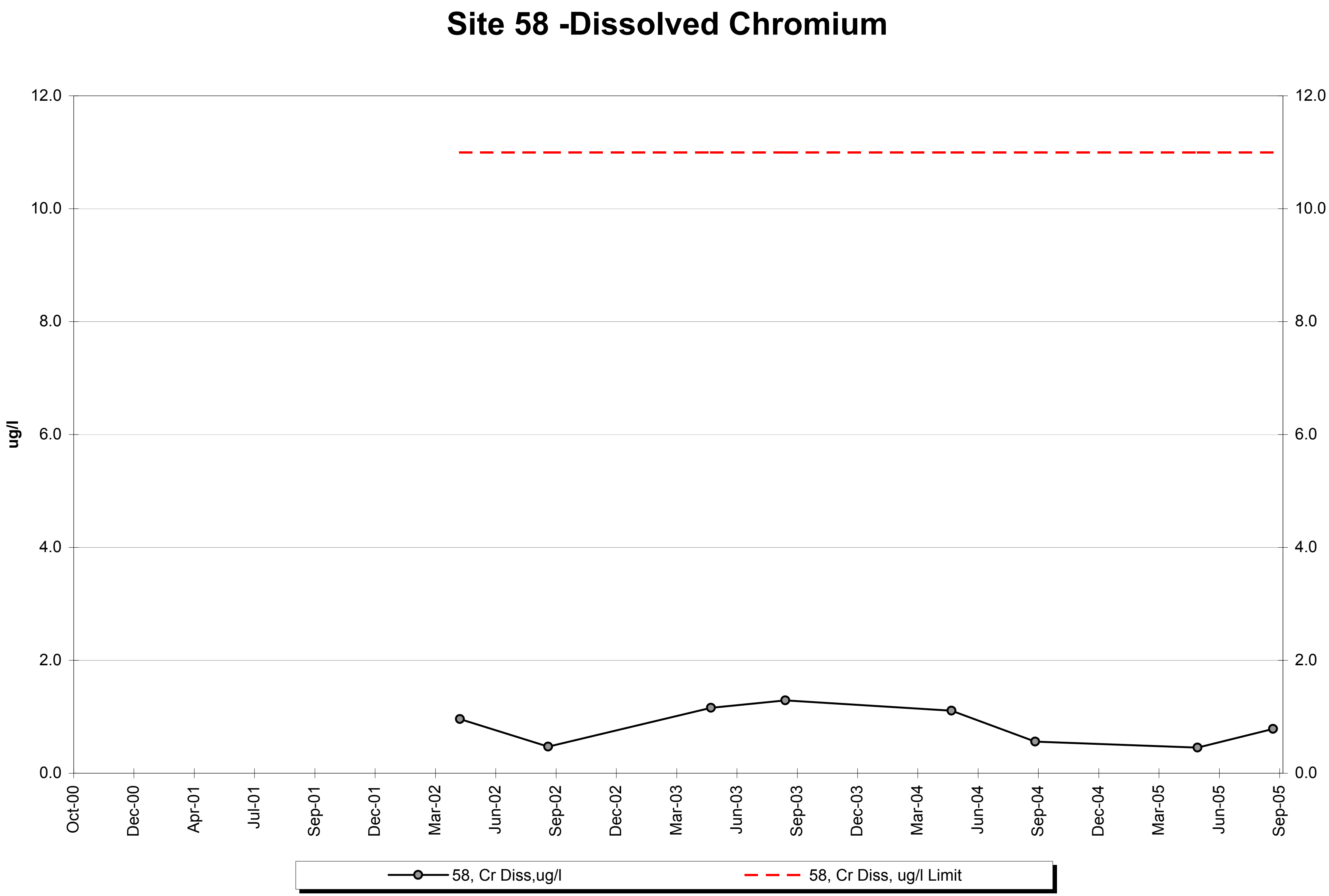


Site 58 -Dissolved Barium



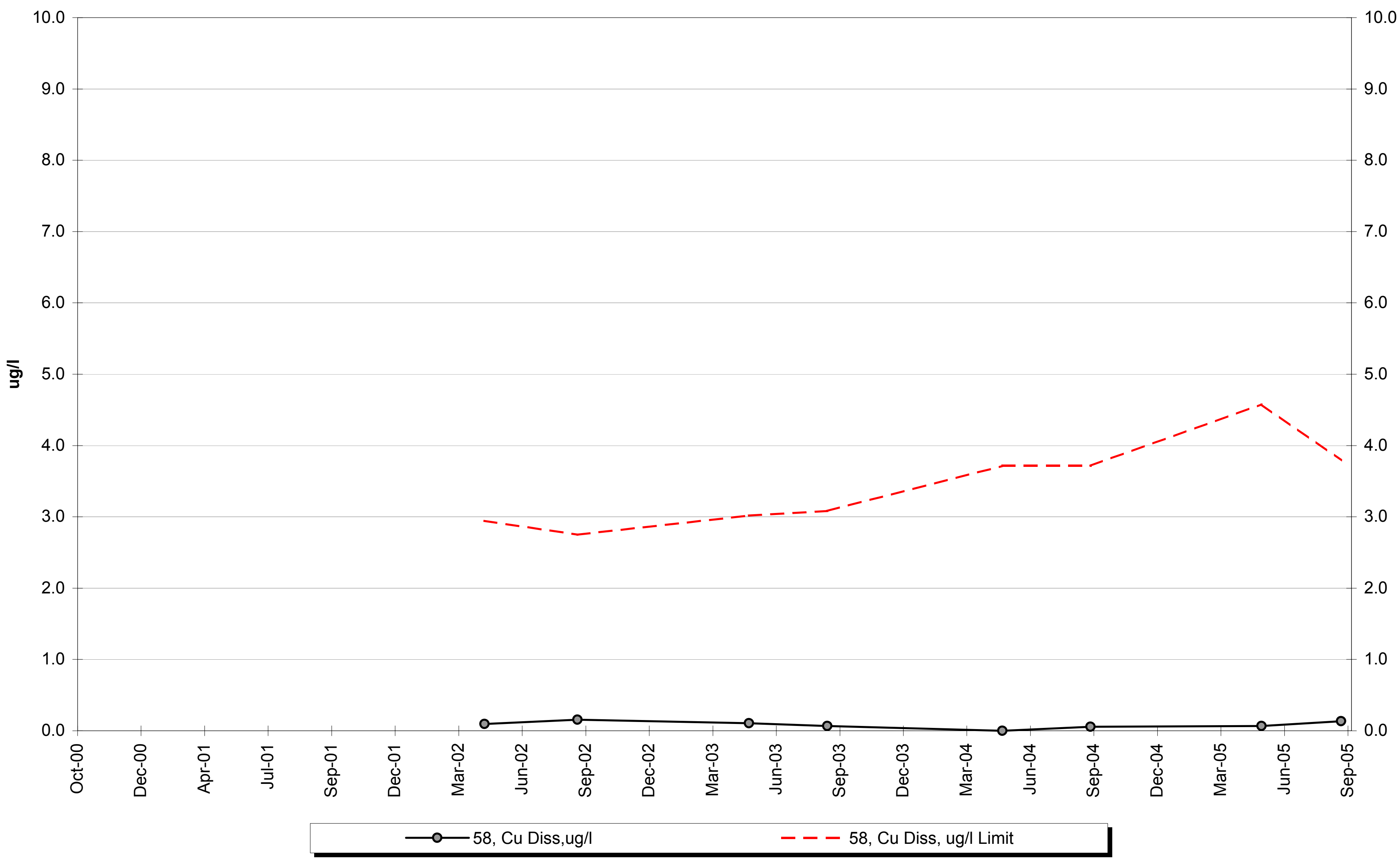
Site 58 -Dissolved Cadmium



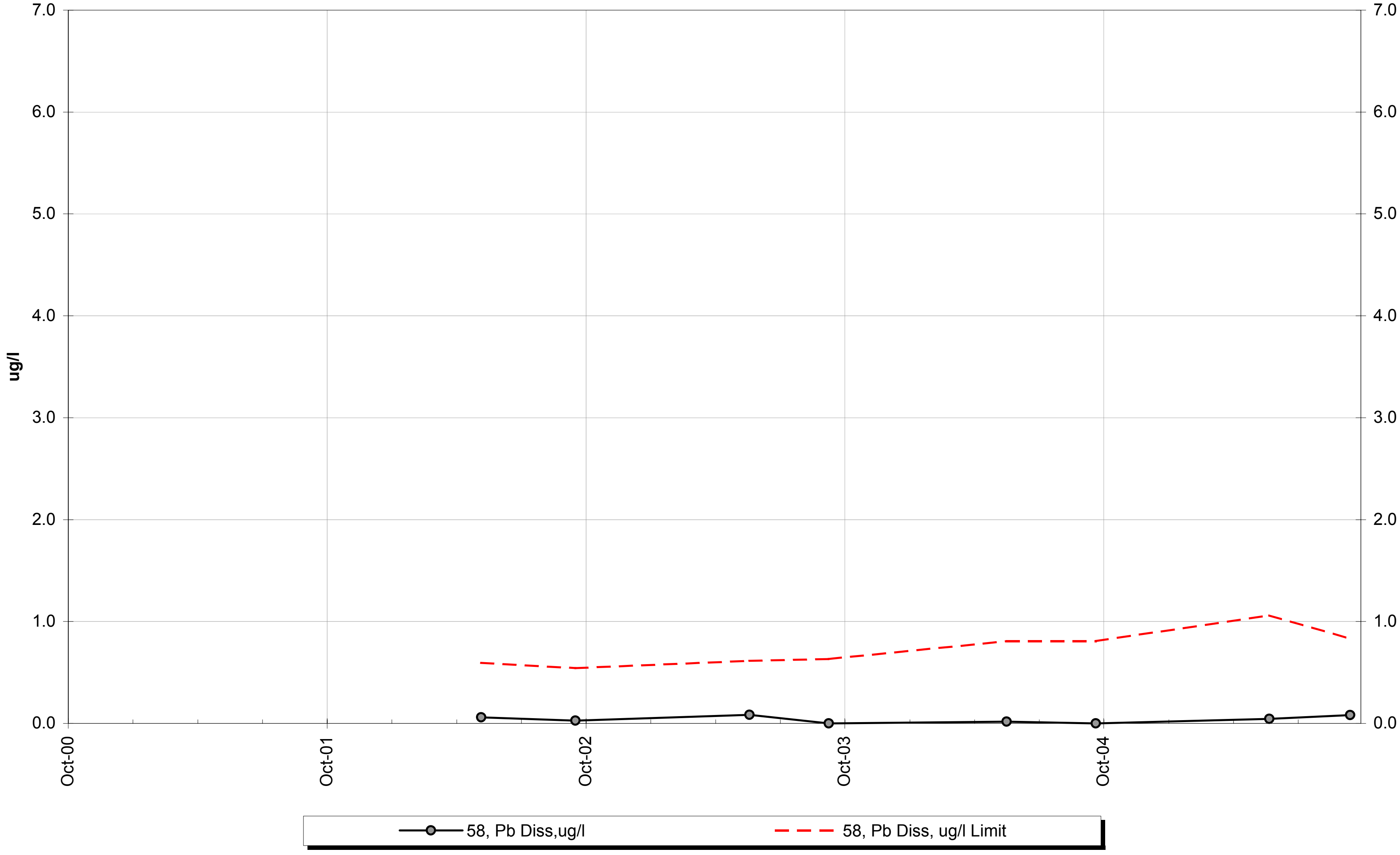


Site 58 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
58, Cr Diss,ug/l
58, Cr Diss, ug/l Limit

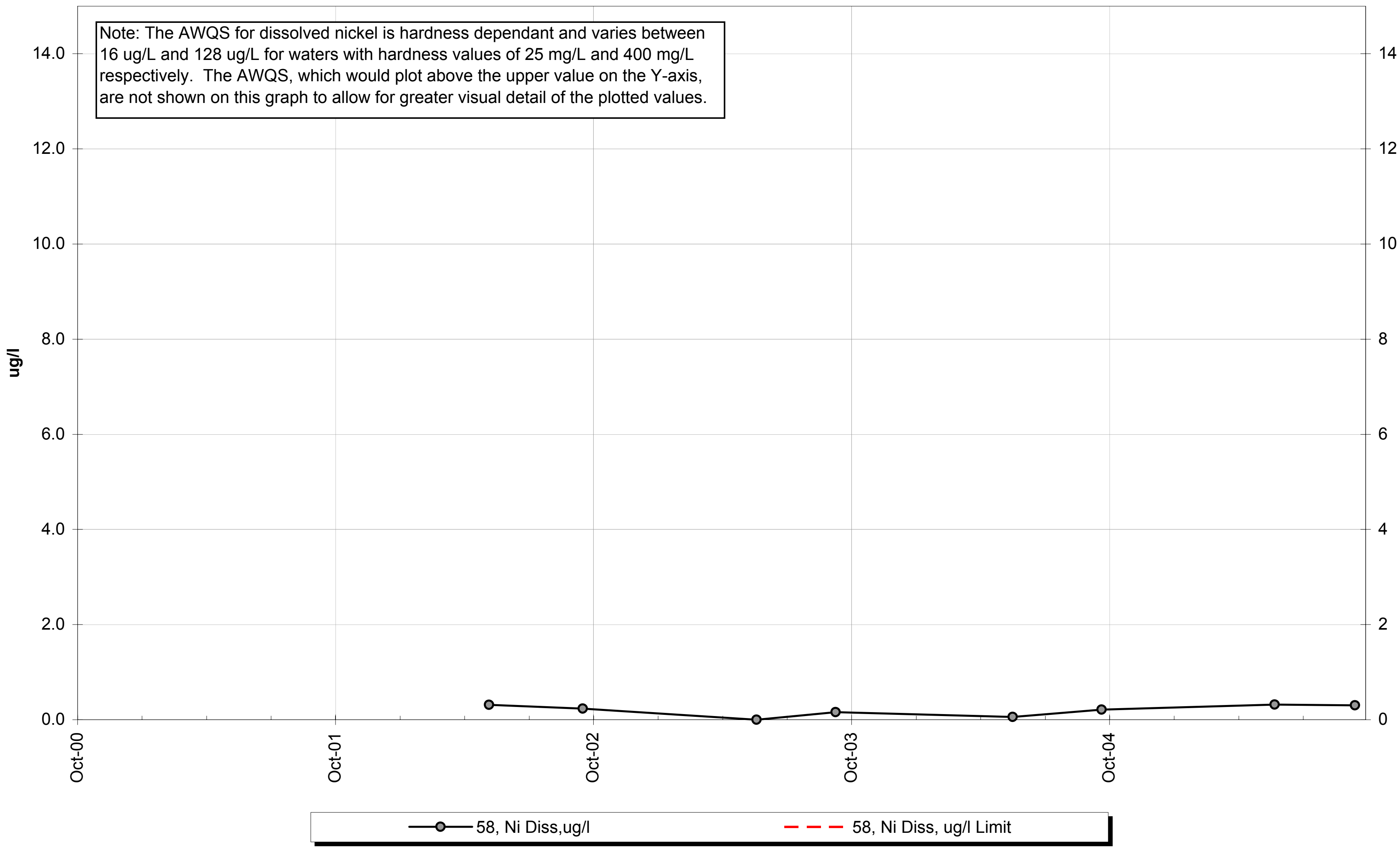
Site 58 -Dissolved Copper

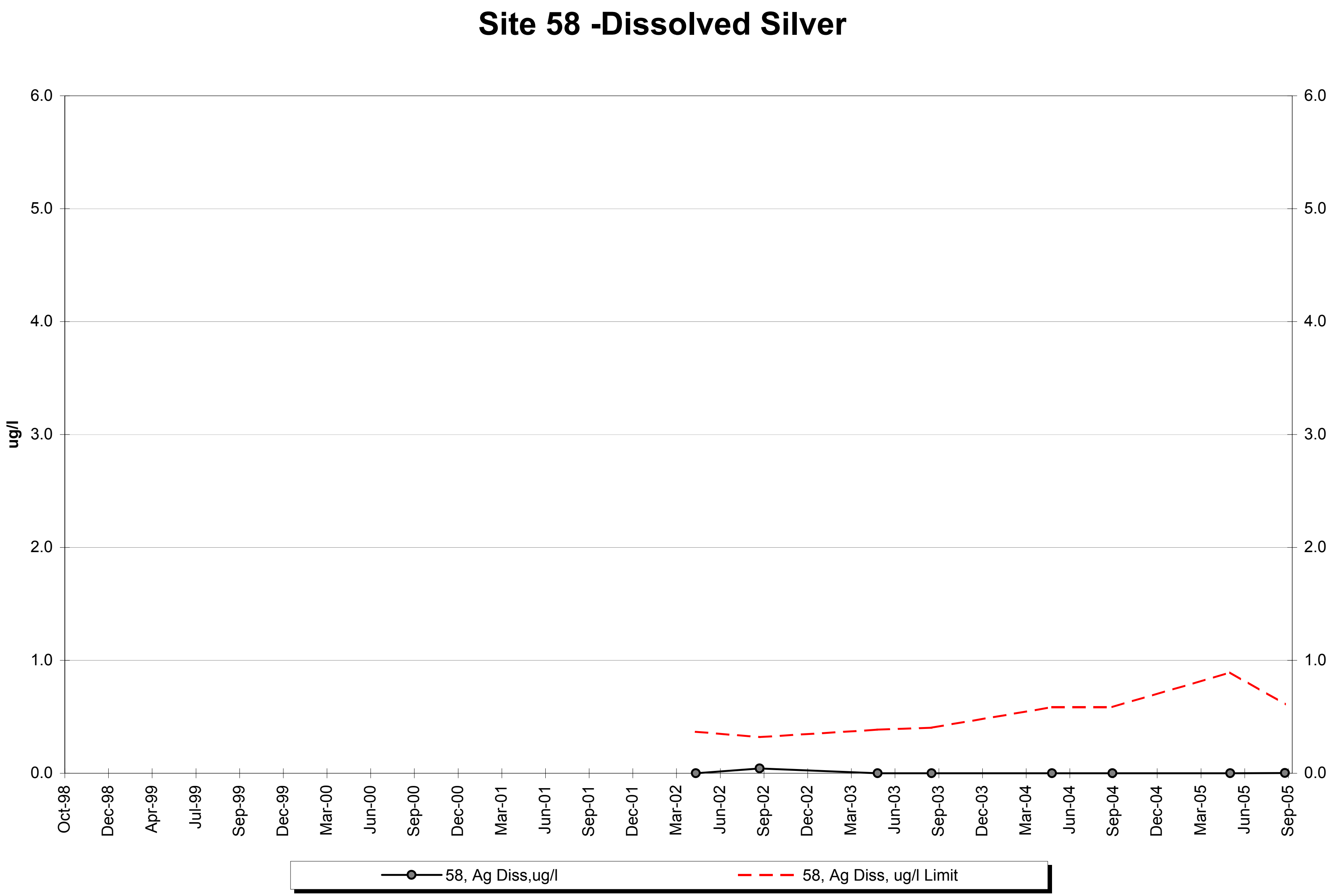


Site 58 -Dissolved Lead

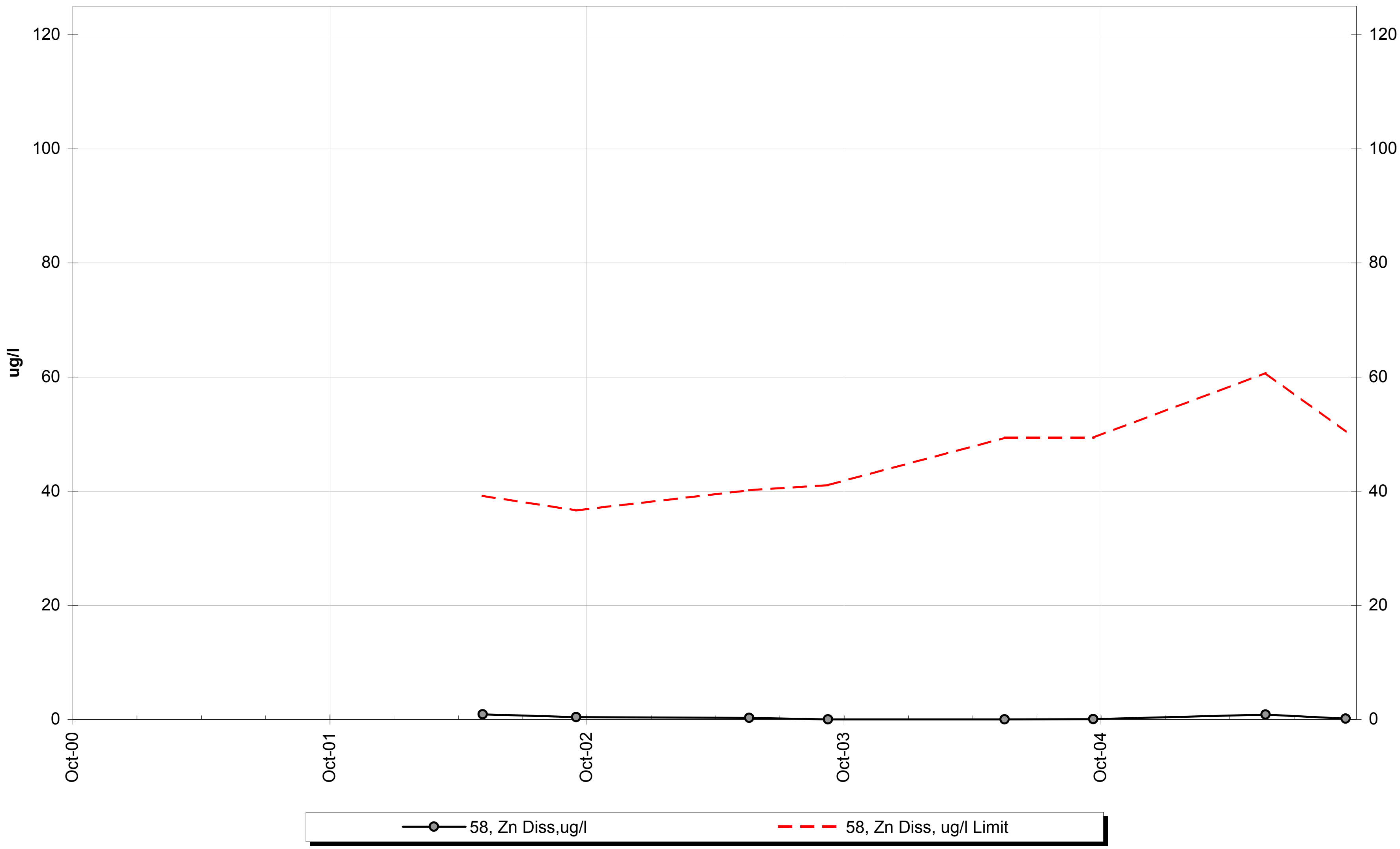


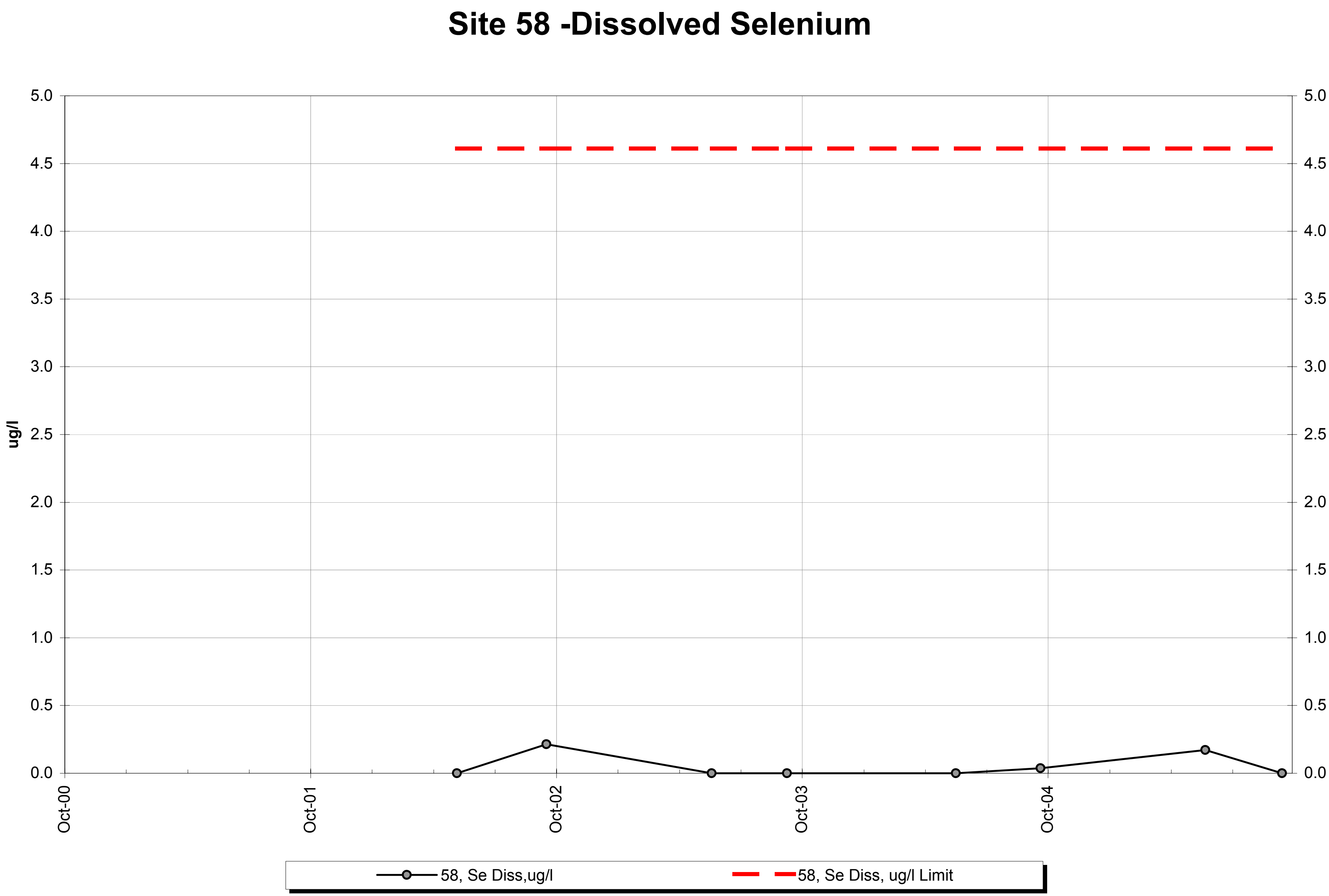
Site 58 -Dissolved Nickel




Site 58 -Dissolved Silver
ug/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
58, Ag Diss,ug/l
58, Ag Diss, ug/l Limit

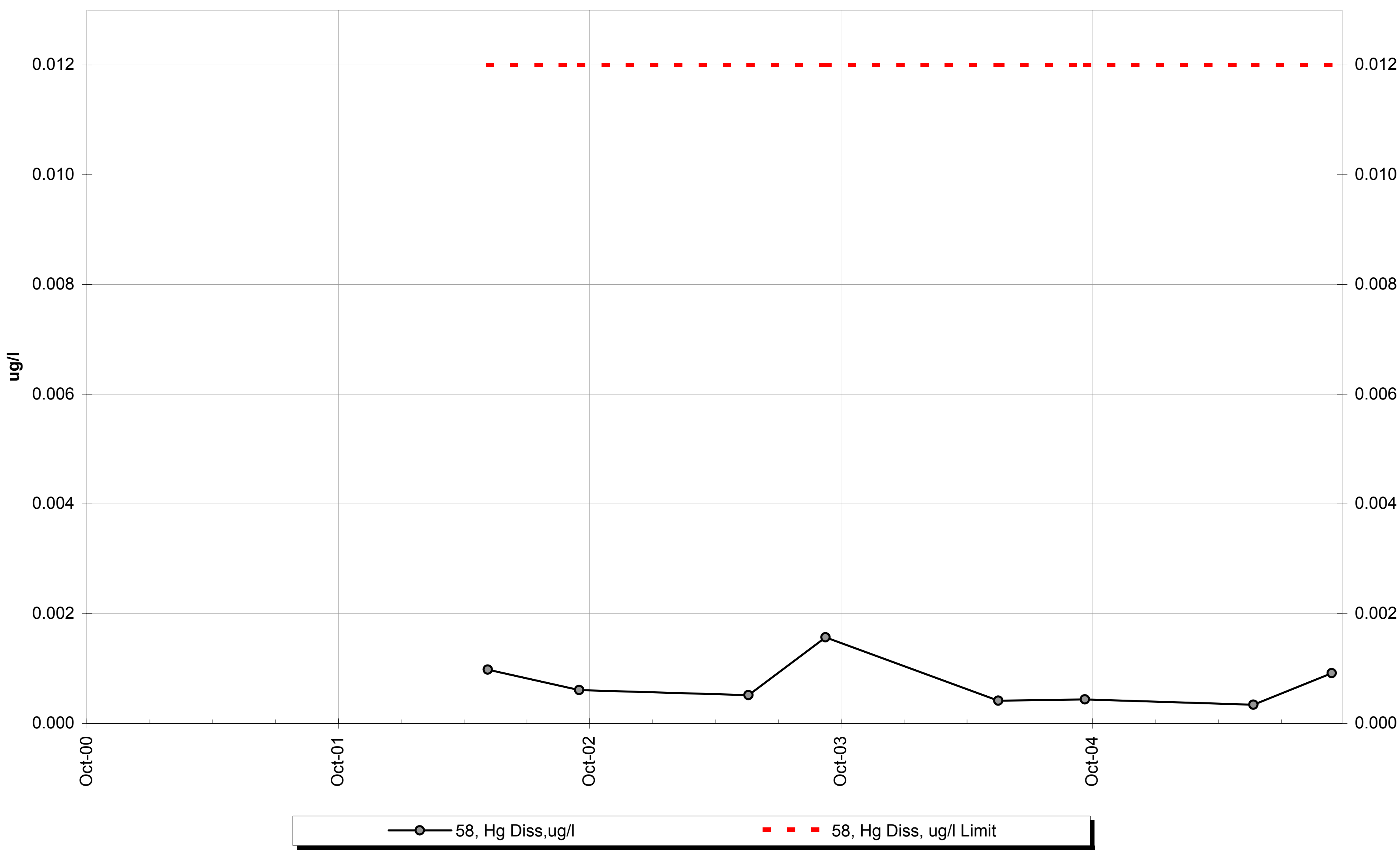
Site 58 -Dissolved Zinc





Site 58 -Dissolved Selenium
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
58, Se Diss,ug/l
58, Se Diss, ug/l Limit

Site 58 -Dissolved Mercury



INTERPRETIVE REPORT
SITE 27 "MONITORING WELL 2S"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Four results exceeding these criteria have been identified, as listed in the table below. These data are for pH, both for lab and field. Values for lab and field pH from other wells completed into organic rich peat sediments similar to Site 27 have historically resulted in pH values ranging from 5 to 6 su (e.g. Sites 58, 29, and 32).

Sample Date	Parameter	Value	Standard	Standard Type
05/24/05	pH Lab, su	5.74	6.5 - 8.5	Aquatic Life
05/24/05	pH Field, su	6.11	6.5 - 8.5	Aquatic Life
09/15/05	pH Lab, su	5.82	6.5 - 8.5	Aquatic Life
09/15/05	pH Field, su	6.00	6.5 - 8.5	Aquatic Life

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious trends were apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). The dataset for dissolved zinc

Site 27-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	-0.66	-	0.25		
pH, Lab	6	0.00	+	0.50		
Alkalinity, Total	6	-0.13	-	0.45		
Zinc, Dissolved	6	-1.99	-	**0.02**	-0.52	-16.9

(1): Number of years (2):Significance level

is the only analyte that shows a statistically significant ($p=0.02$) trend and a slope estimate of -0.52 ug/L•yr or a -16.9% decrease over the last 6 years. This trend may be the continuation of a much longer term trend over the past 10 years. While somewhat masked by higher detection limits, sampling prior to 1998 tended to return dissolved zinc values greater than 10 ug/l. Between 1998 and 2000 values generally decreased from >10 ug/l to approximately 4 ug/l. The trend identified by this analysis, 2000-2005WY, continues that decrease but at a slower rate. The underlying cause for the decrease is unknown. However, this decreasing trend is opposite what would be anticipated if contact water from the adjacent tailings impoundment were escaping containment and mixing with background sources. Thus the trend does not indicate that additional sampling is warranted.

Additional X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 27 and Site 58, the upgradient control site, to aid in the comparison between those two sites. Total alkalinity, lab conductivity, and sulfate are all approximately within the same range for both sites. Lab pH is slightly lower at Site 27 than Site 58. Dissolved zinc was slightly higher at Site 27 than at Site 58. However, the ranges have begun to overlap with the continued decreasing trend noted above. In general the waters for these two different sites are characterized by significantly different hydrological and geological conditions. Site 58 is located in close proximity to the large bedrock ridge, which defines the eastern geologic and hydrologic boundary of the tails area. The upslope portion of the ridge acts as the major recharge zone to the area aquifer. Along this ridge it is likely that groundwater flow is dominated by shallow or near surface flows due to the steep gradient and thin mineral soil. Thus, the groundwater at Site 58 is typically a mixture of surficial recharge from the immediate area with a component of relatively juvenile groundwater originating from the ridge to the east. In contrast, Site 27 is located in an area of gently sloping muskeg that forms part of the upper Tributary Creek drainage area. The area's groundwater is characterized by diffuse flow through the peat/sand strata that make up the upper portion of the unconsolidated sediment fill in the Tributary Creek valley. Additionally, Site 27 is located in an area identified as a groundwater discharge site into Tributary Creek. Thus, Site 27 samples groundwater that is relatively mature in comparison to Site 58 and may have a higher component of groundwater that has been in contact with a larger variety of strata for a longer period of time. Therefore the groundwater would be expected to have a higher dissolved load. The lower pH would be due to the greater interaction with organic matter in the muskeg and would promote greater solubility for naturally occurring dissolved metals sampled at this site.

Table of Results for Water Year 2005

Site 27 "MW-2S"													
Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							7.0	NOT SCHEDULED FOR SAMPLING			11.0	9.0
Conductivity-Field(μmho)								111				88	99
Conductivity-Lab (μmho)								81				73	77
pH Lab (standard units)								5.74				5.82	5.78
pH Field (standard units)								6.11				6.00	6.06
Total Alkalinity (mg/L)								40.6				29.4	35.0
Total Sulfate (mg/L)								0.8				1.4	1.1
Hardness (mg/L)								189.0				21.3	105.2
Dissolved As (ug/L)								7.210				4.320	5.765
Dissolved Ba (ug/L)								83.2				25.1	54.2
Dissolved Cd (ug/L)								<0.004				<0.003	0.002
Dissolved Cr (ug/L)								1.620				1.640	1.630
Dissolved Cu (ug/L)								0.263				0.442	0.353
Dissolved Pb (ug/L)								0.0107 U				0.3500 U	0.1804
Dissolved Ni (ug/L)								2.750				2.420	2.585
Dissolved Ag (ug/L)								<0.003				0.003 J	0.002
Dissolved Zn (ug/L)								0.54 U				3.32 U	1.93
Dissolved Se (ug/L)								<0.116 UJ				<0.116	0.058
Dissolved Hg (ug/L)								0.000693 U				0.001410	0.001052

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

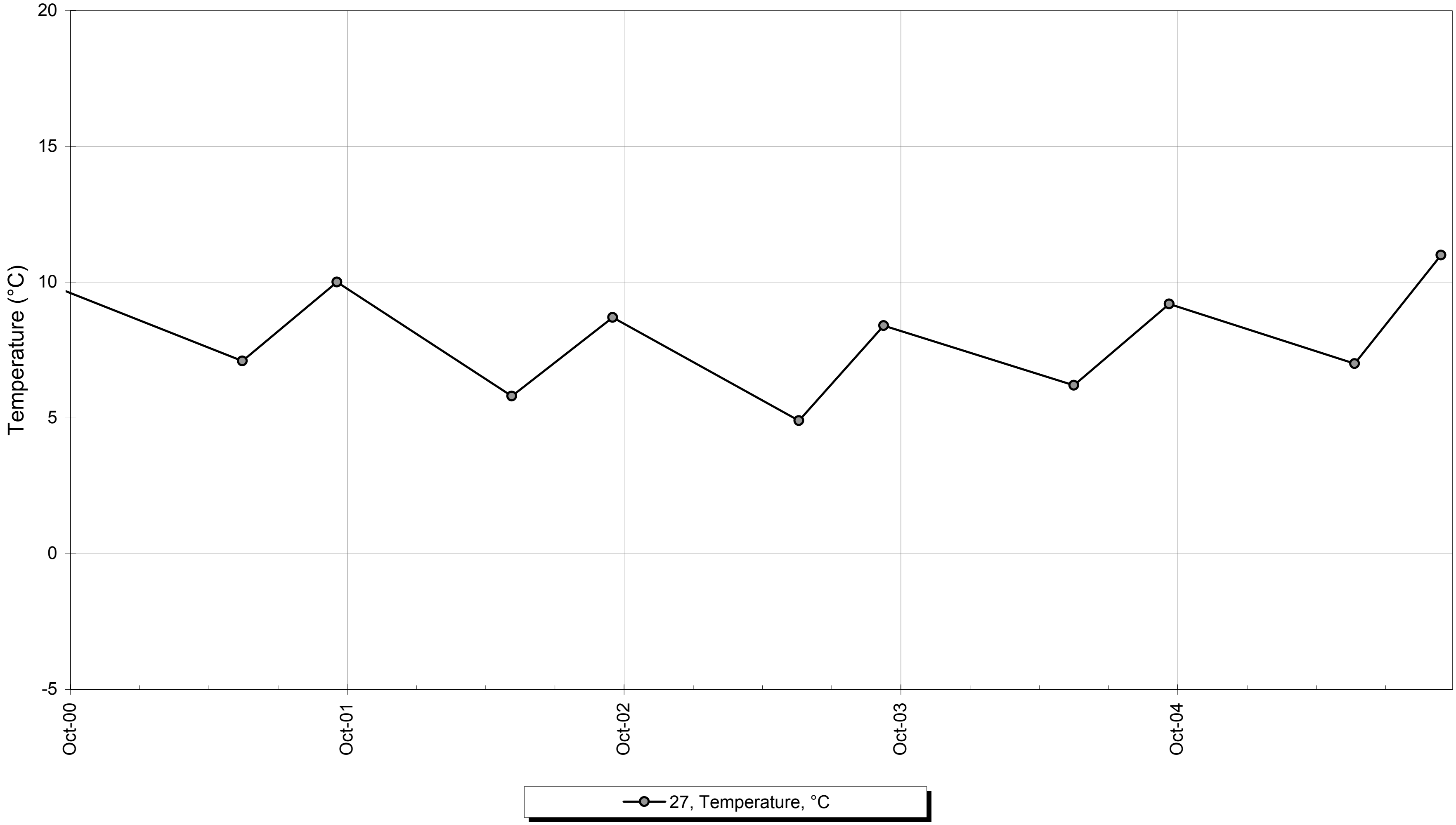
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

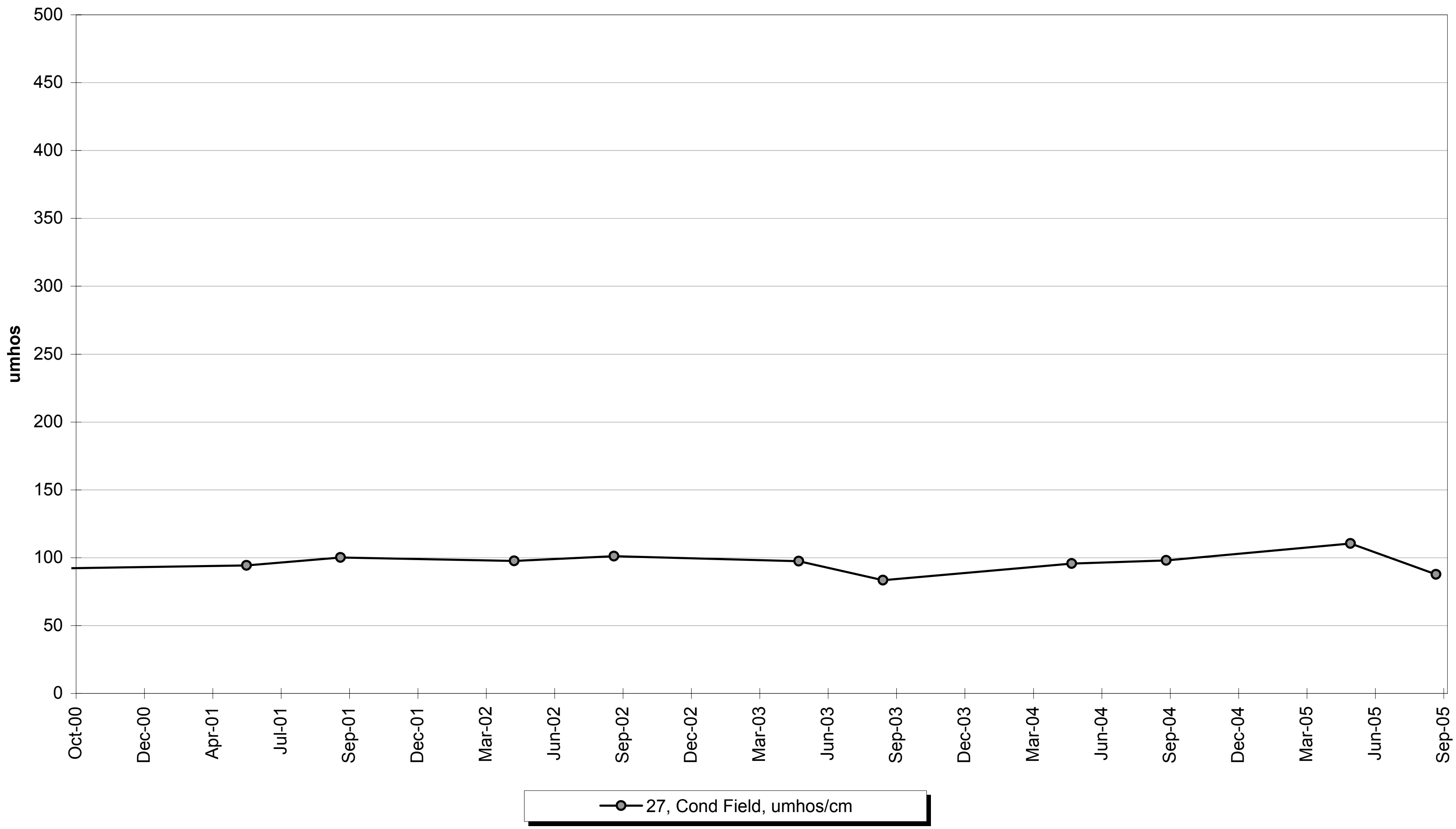
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
27	05/24/2005	3:35:00 PM				
			Pb Diss, ug/l	0.0107	U	Field Blank Contamination
			Zn Diss, ug/l	0.536	U	Field Blank Contamination
			Se Diss, ug/l	-0.116	UJ	LCS Recovery
			Hg Diss, ug/l	0.000693	U	Field Blank Contamination
27	09/15/2005	12:17:00 PM				
			Pb Diss, ug/l	0.35	U	Field Blank Contamination
			Ag Diss, ug/l	0.0033	J	Below Quantitative Range
			Zn Diss, ug/l	3.32	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

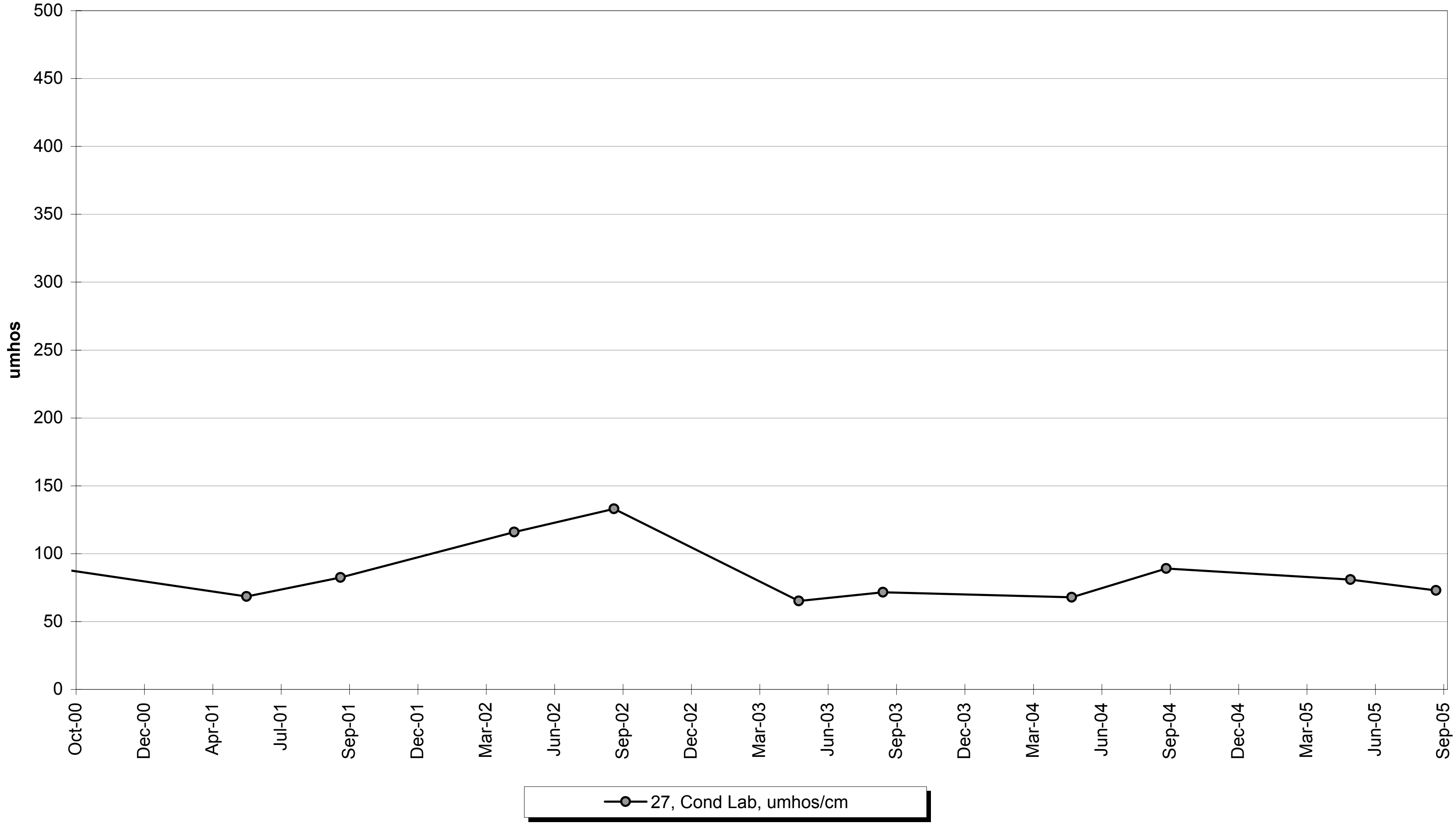
Site 27 -Water Temperature



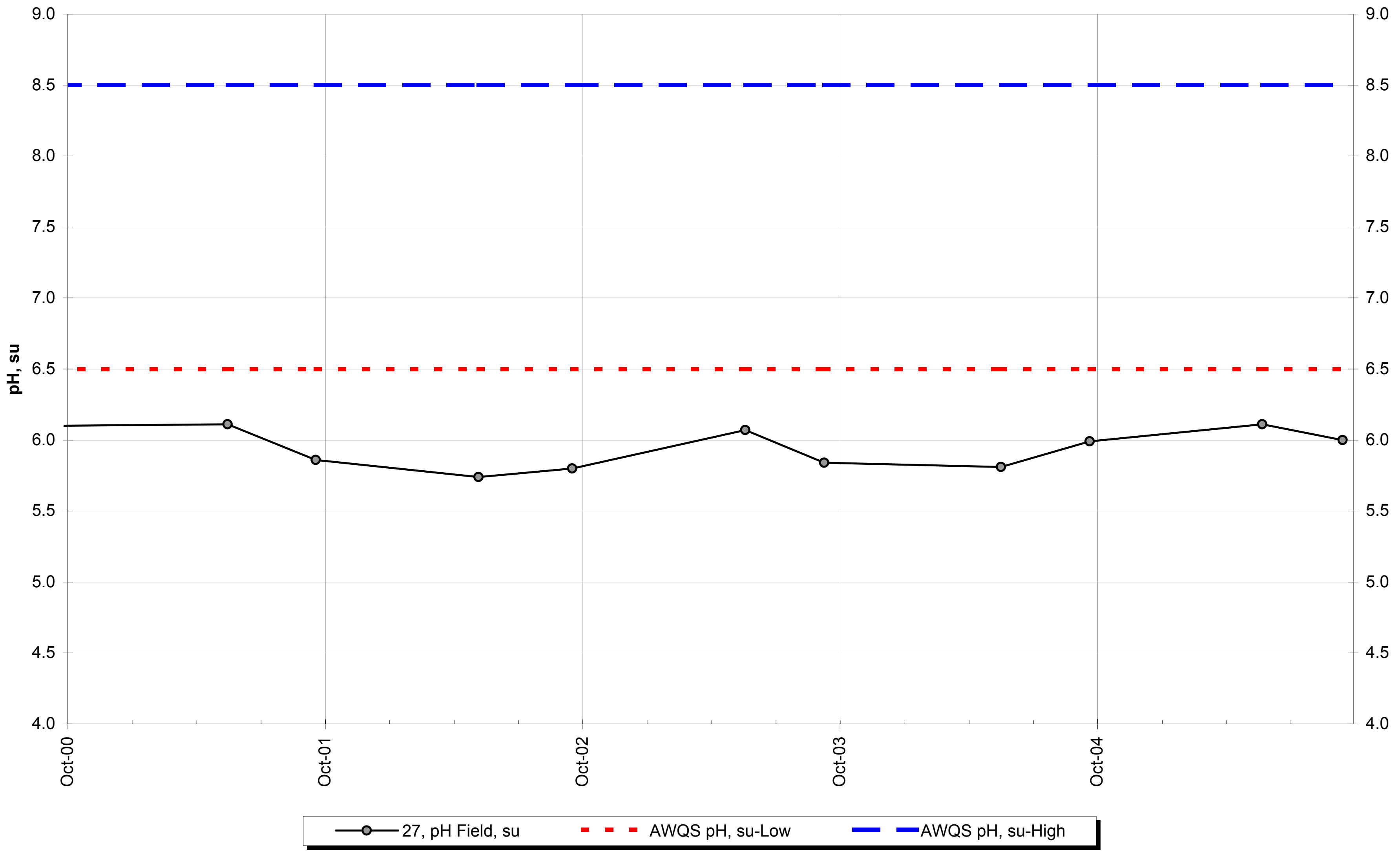
Site 27 -Conductivity-Field

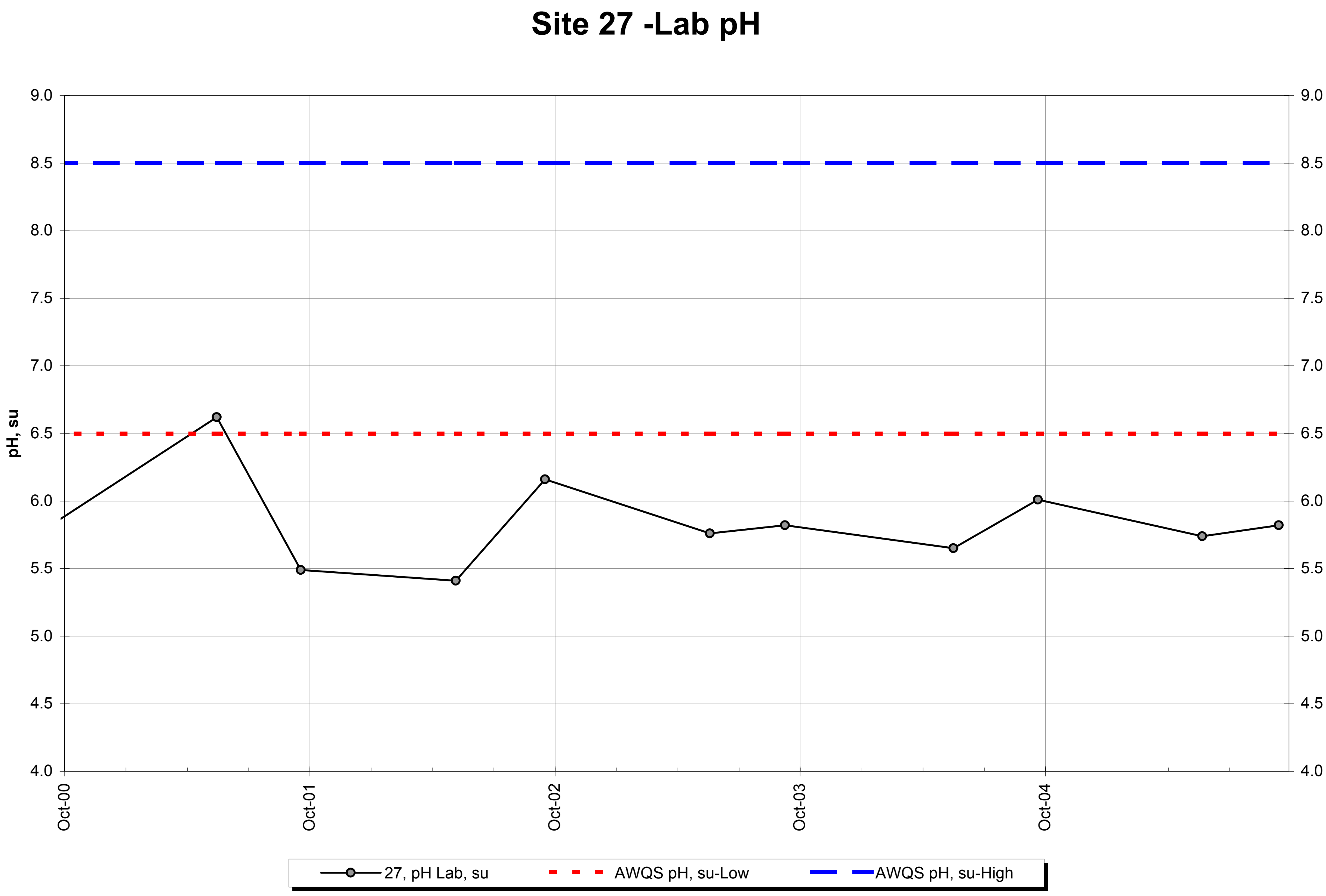


Site 27 -Conductivity-Lab



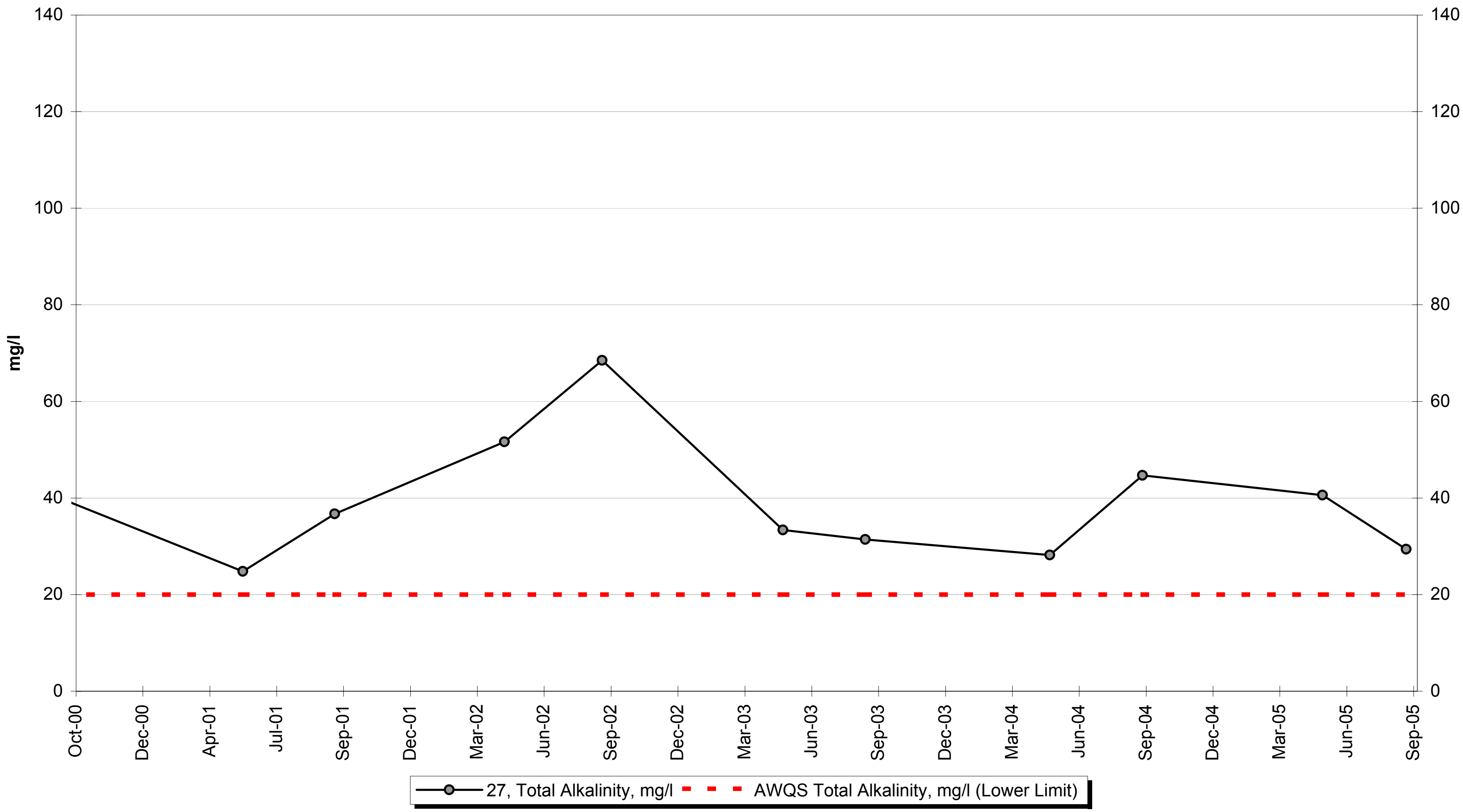
Site 27 -Field pH



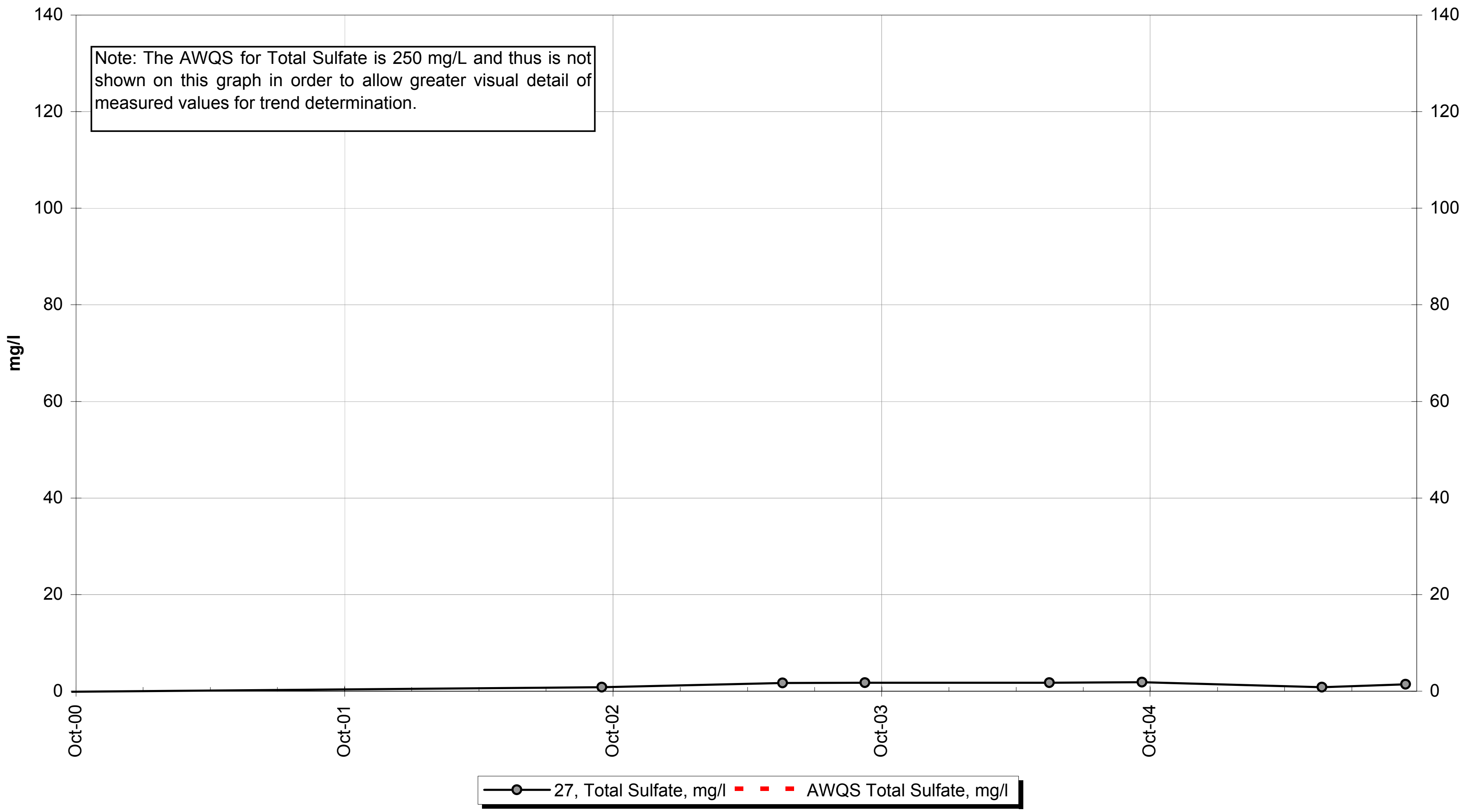


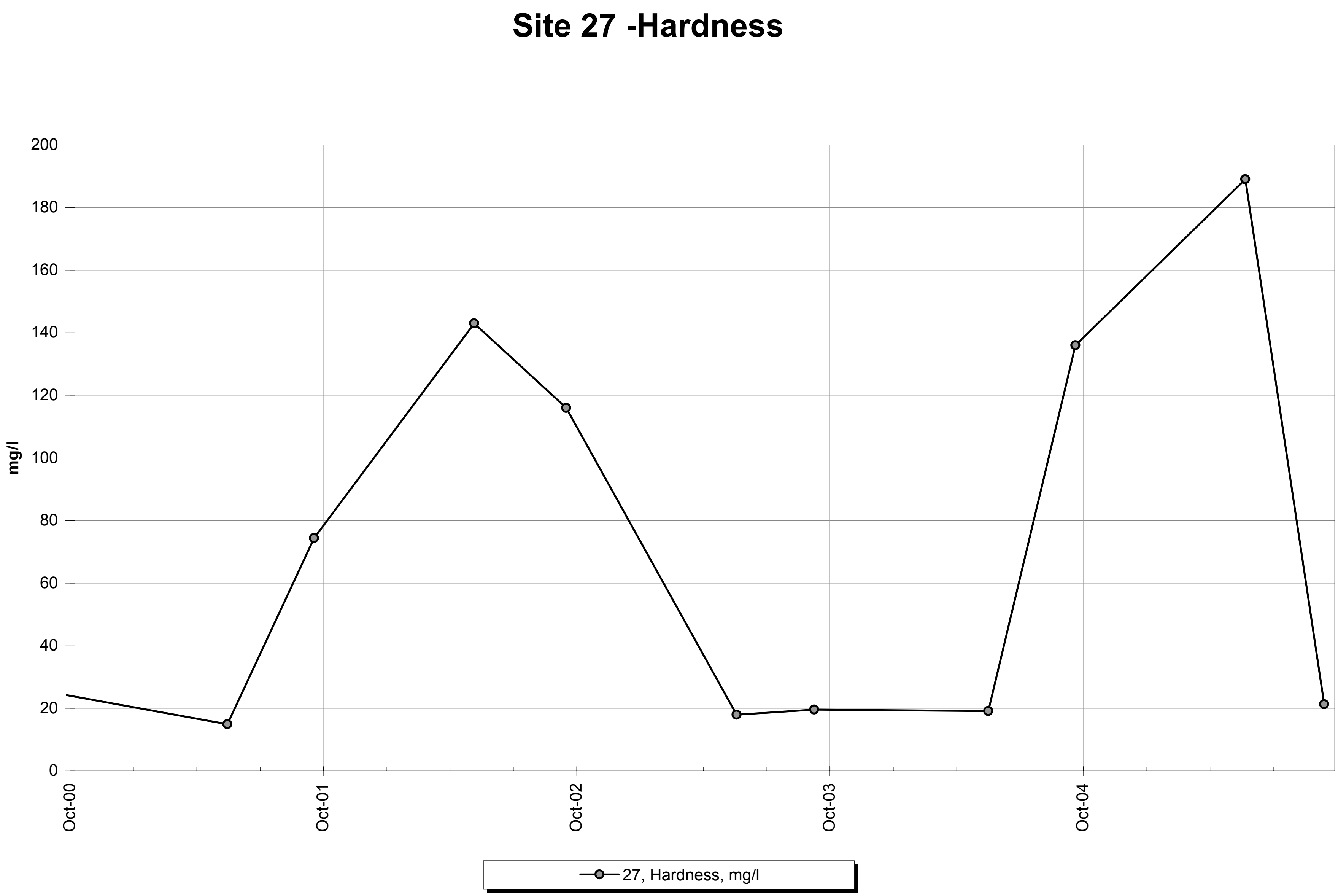
Site 27 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
27, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

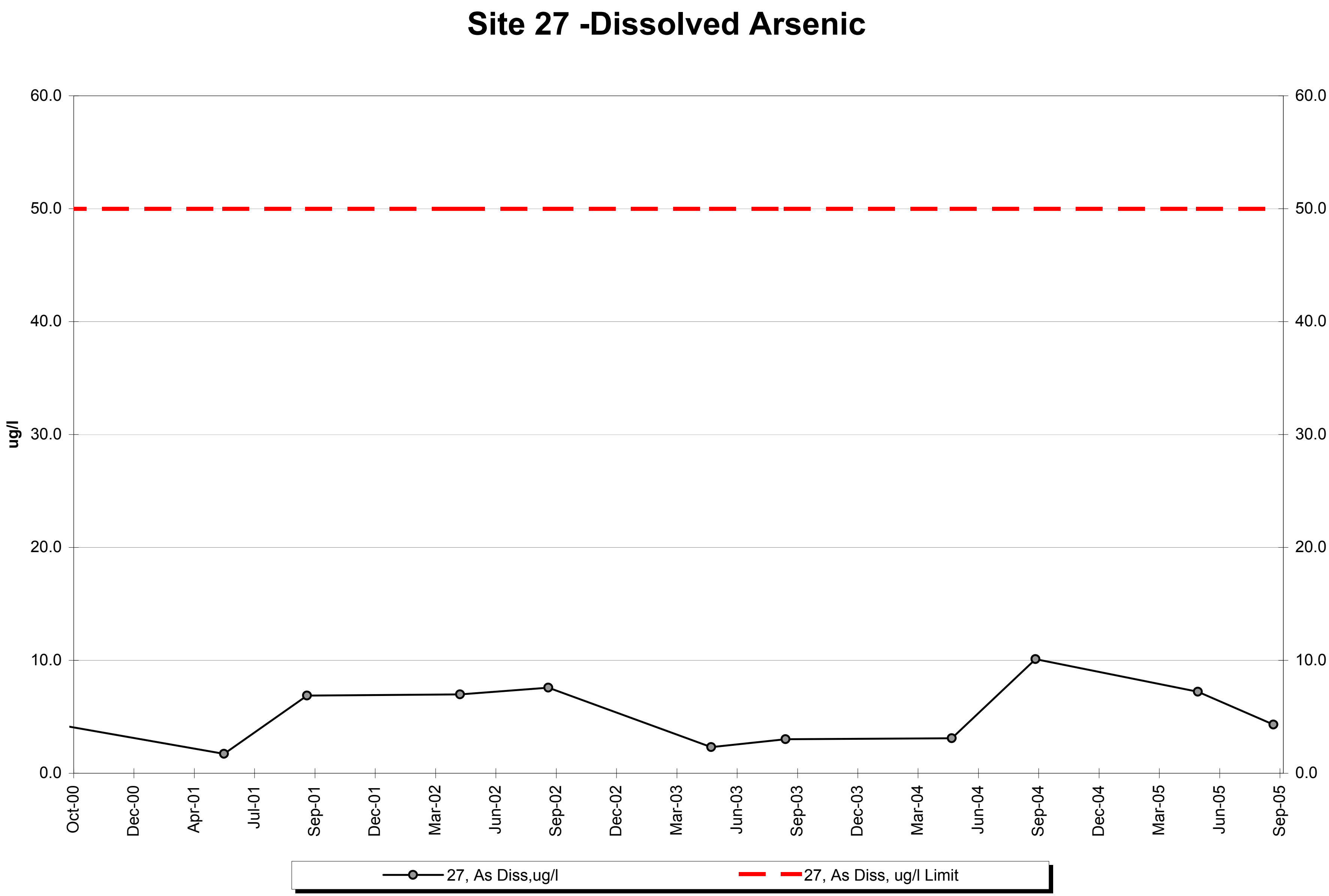
Site 27 -Total Alkalinity



Site 27 -Total Sulfate

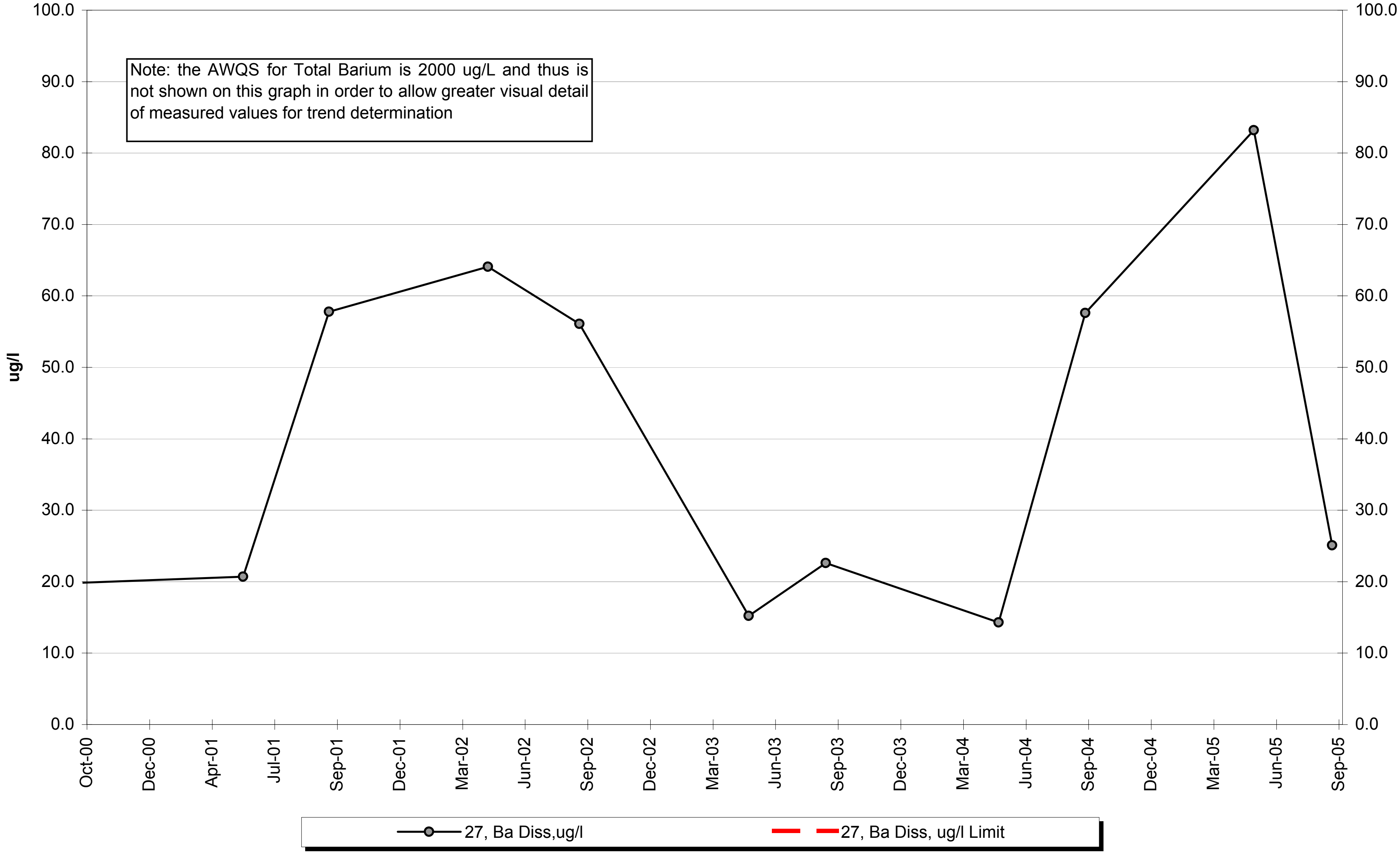


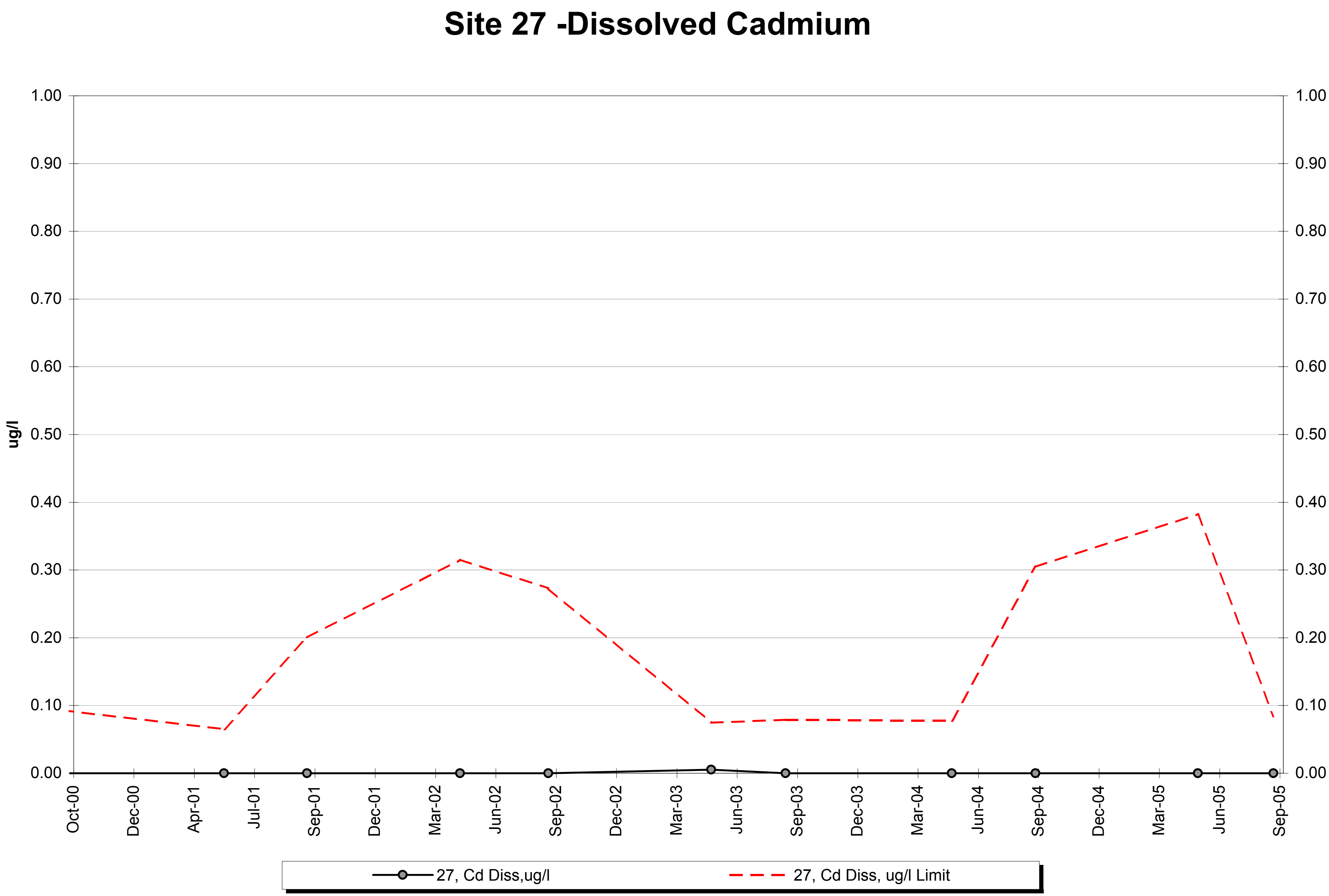

Site 27 -Hardness
200
180
160
140
120
100
80
60
40
20
0
mg/l
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
27, Hardness, mg/l



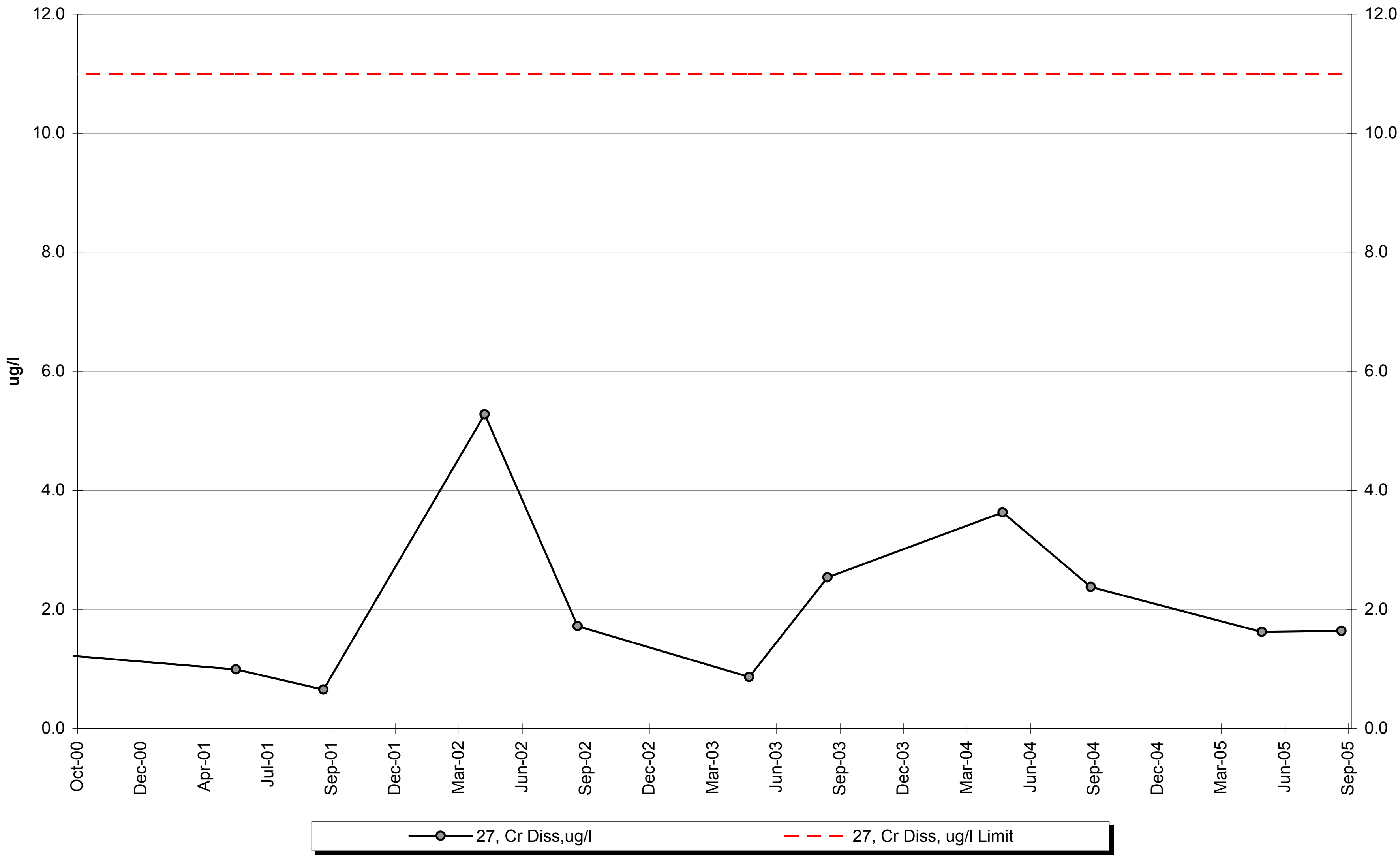
Site 27 -Dissolved Arsenic
ug/l
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
27, As Diss,ug/l
27, As Diss, ug/l Limit

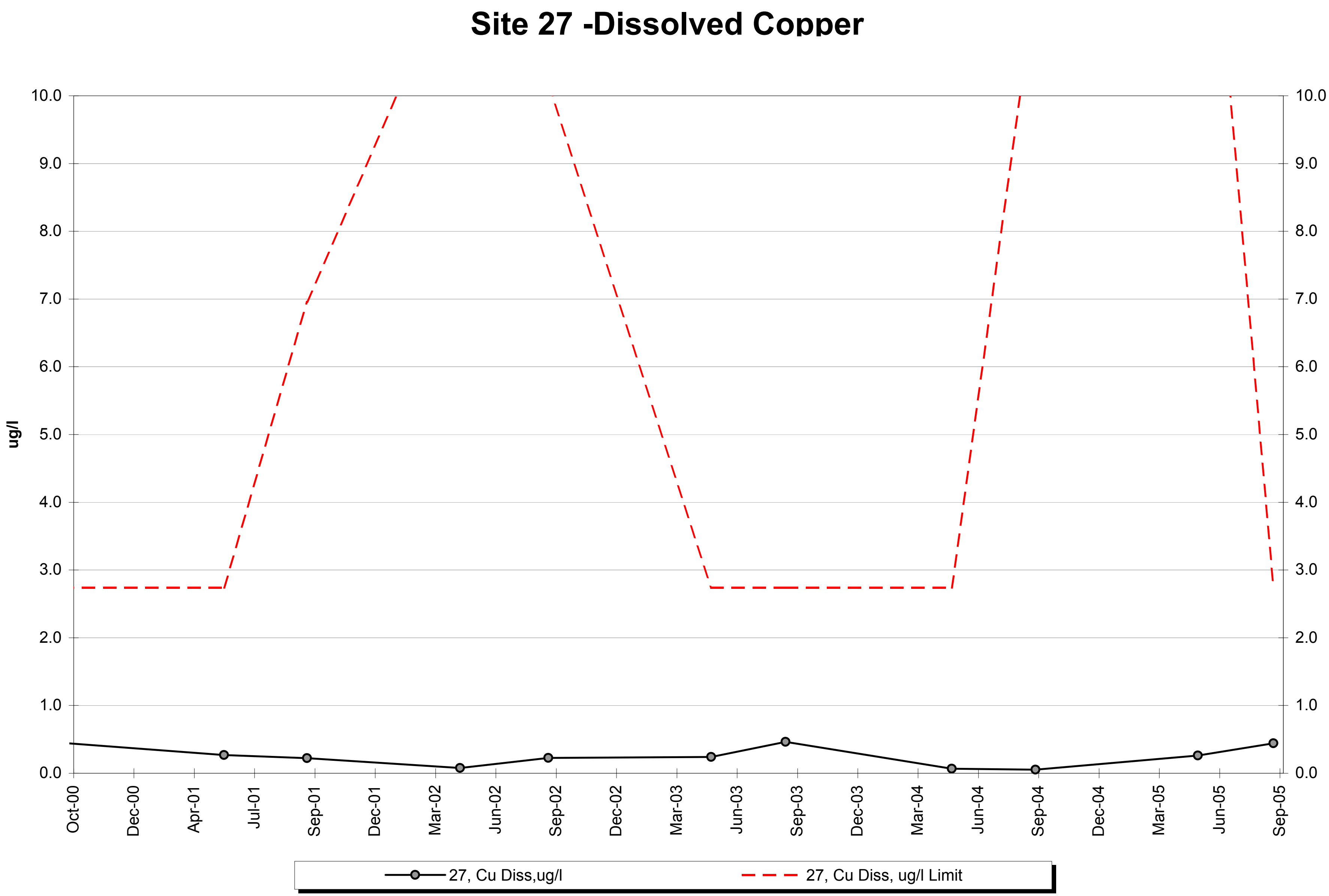
Site 27 -Dissolved Barium




Site 27 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
27, Cd Diss,ug/l
27, Cd Diss, ug/l Limit

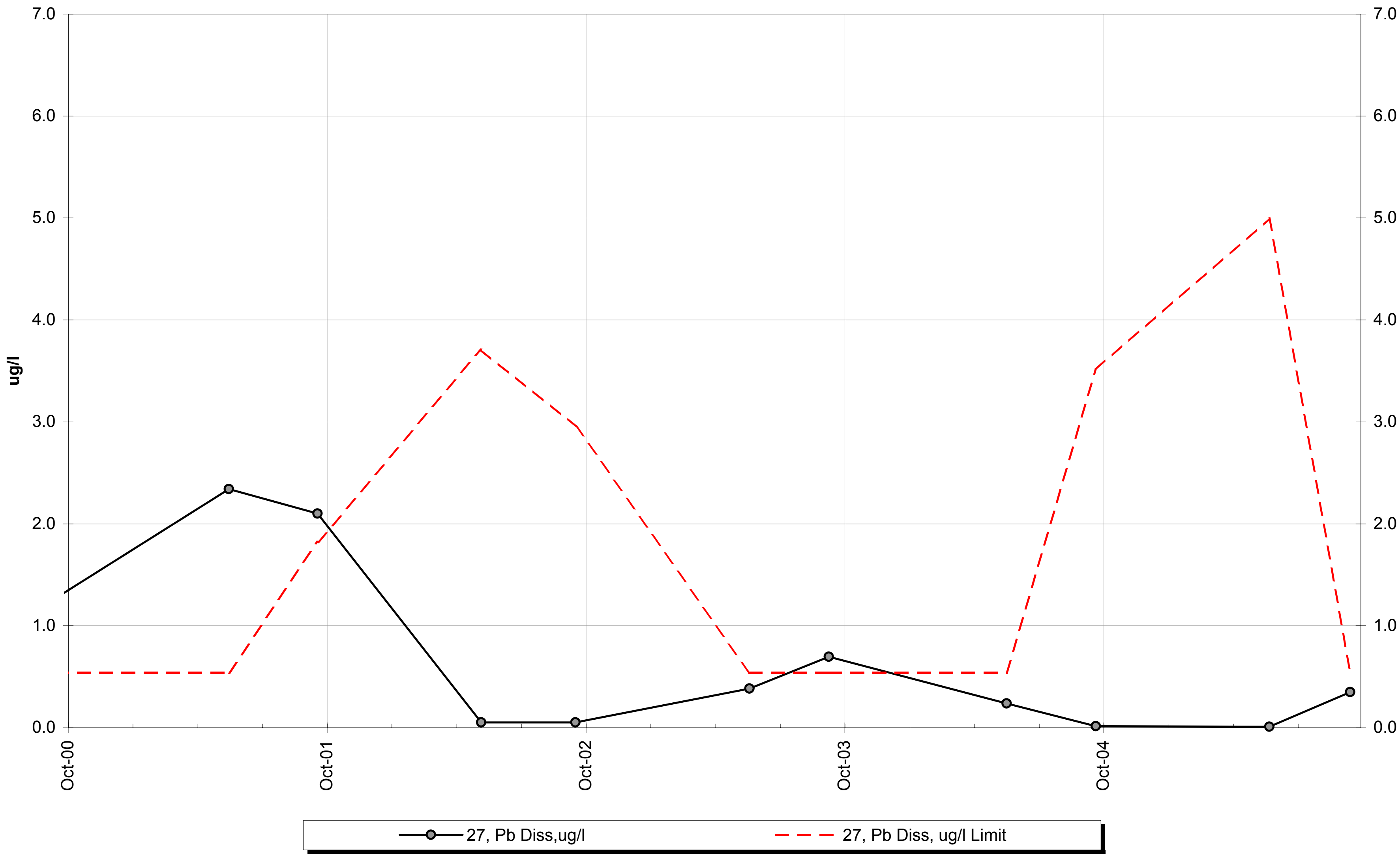
Site 27 -Dissolved Chromium



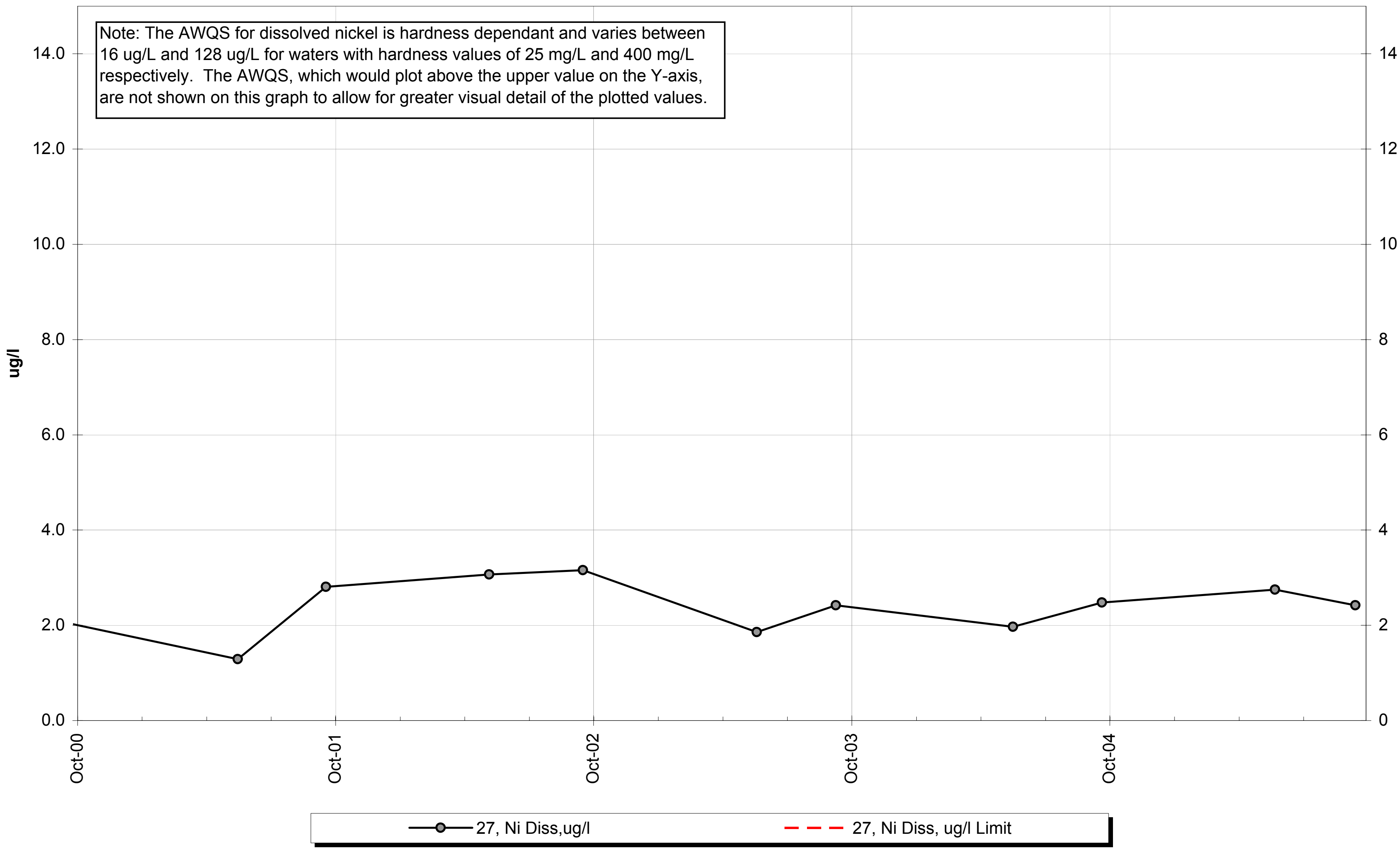


Site 27 -Dissolved Copper
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
27, Cu Diss,ug/l
27, Cu Diss, ug/l Limit

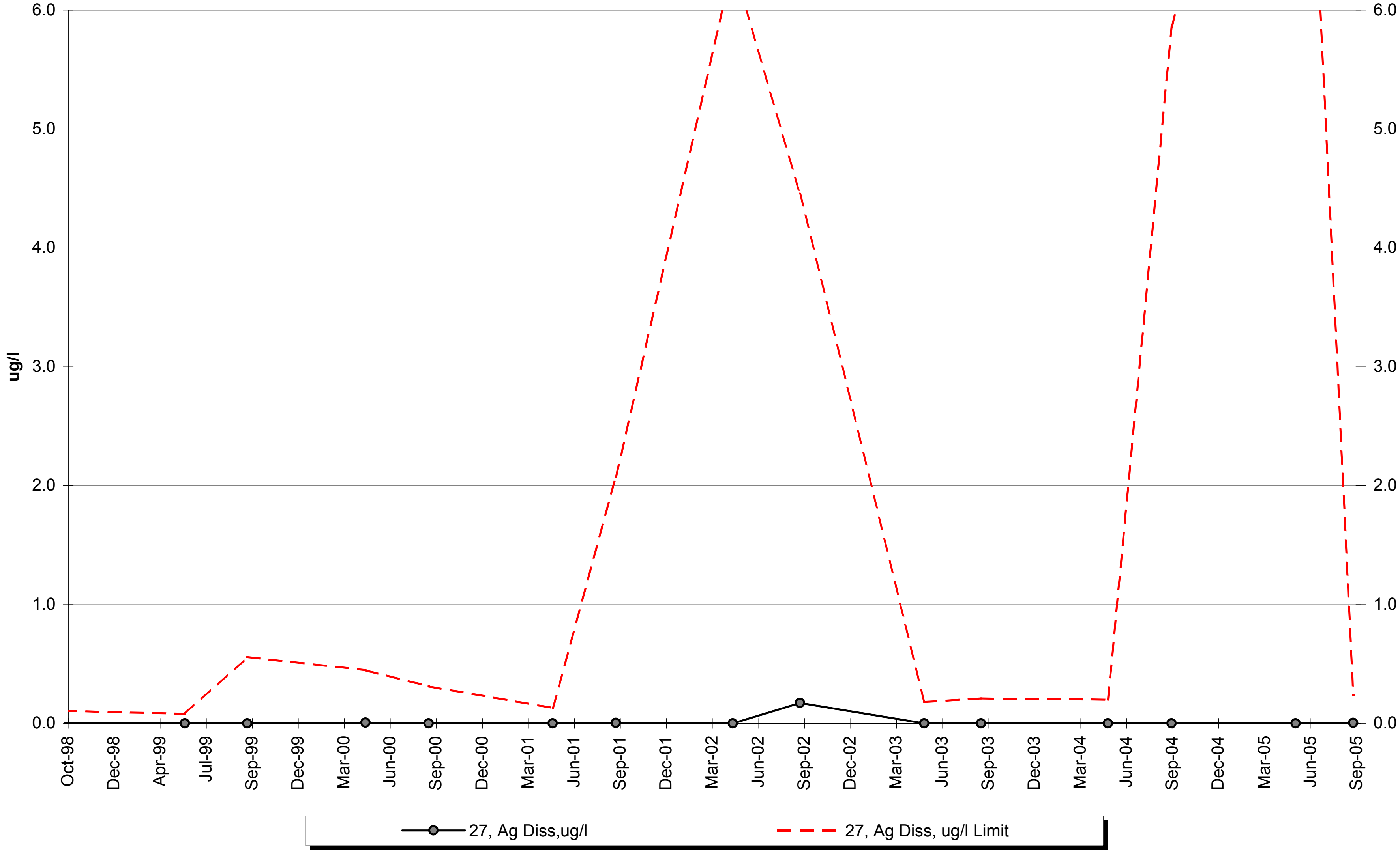
Site 27 -Dissolved Lead



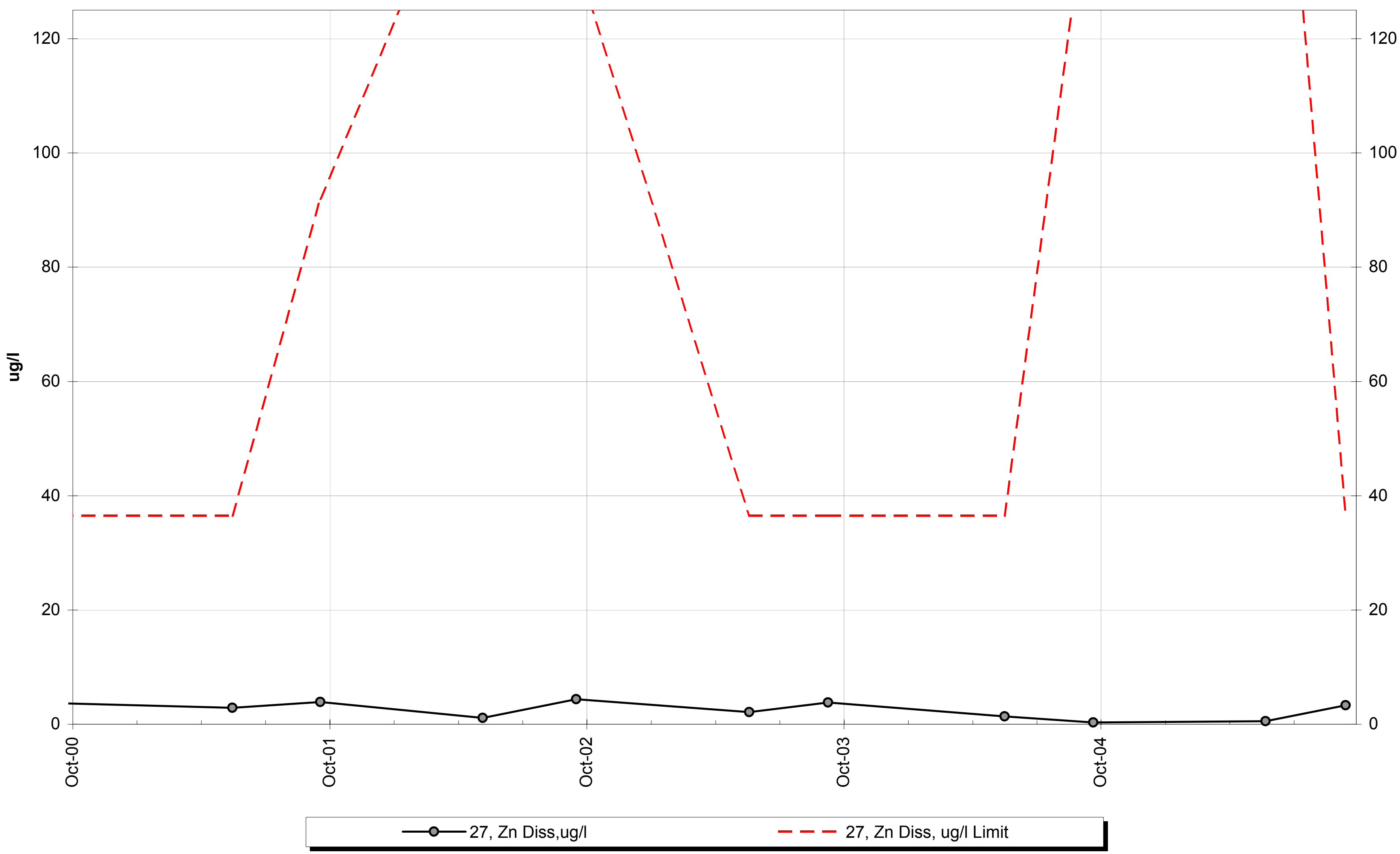
Site 27 -Dissolved Nickel



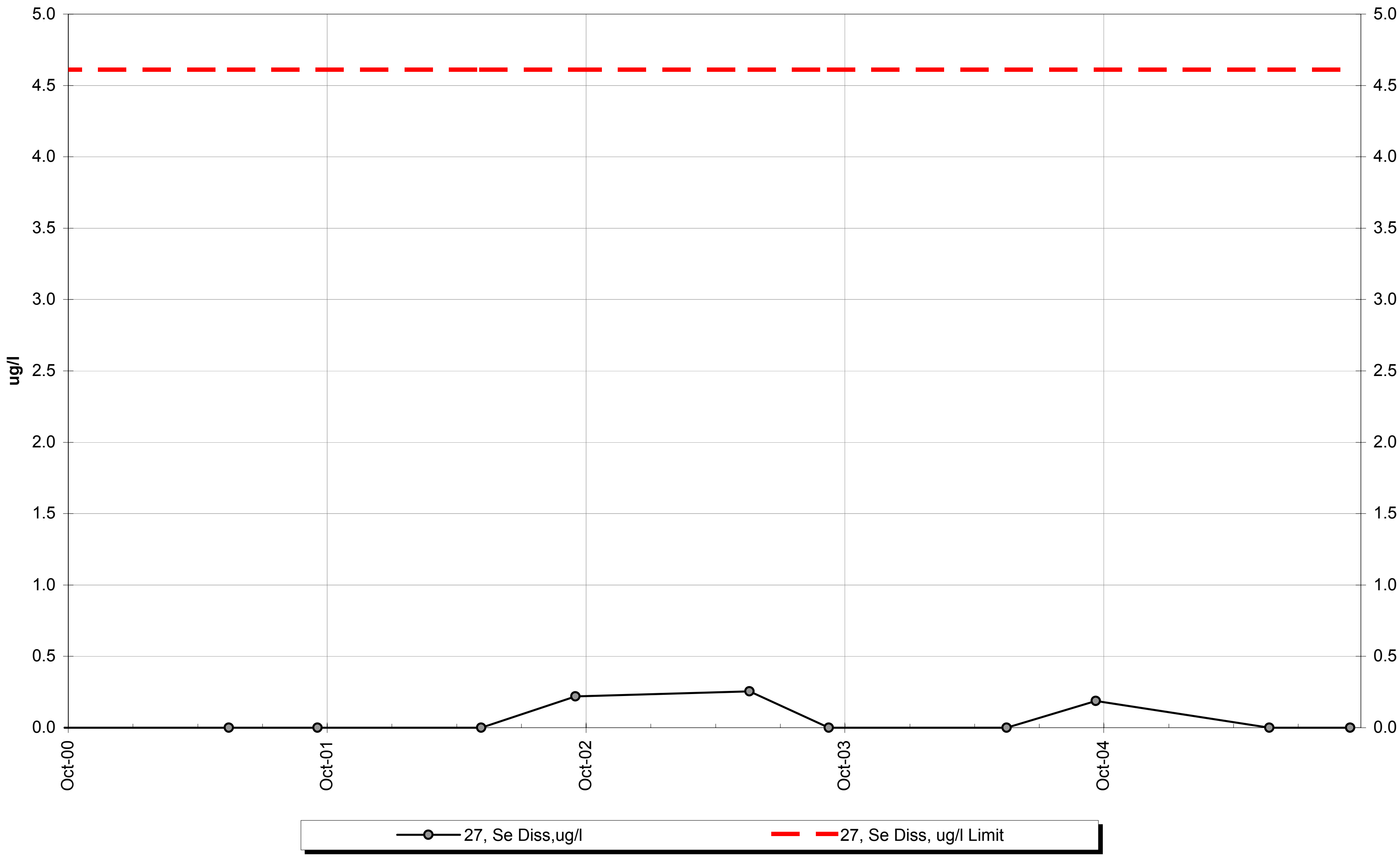
Site 27 -Dissolved Silver



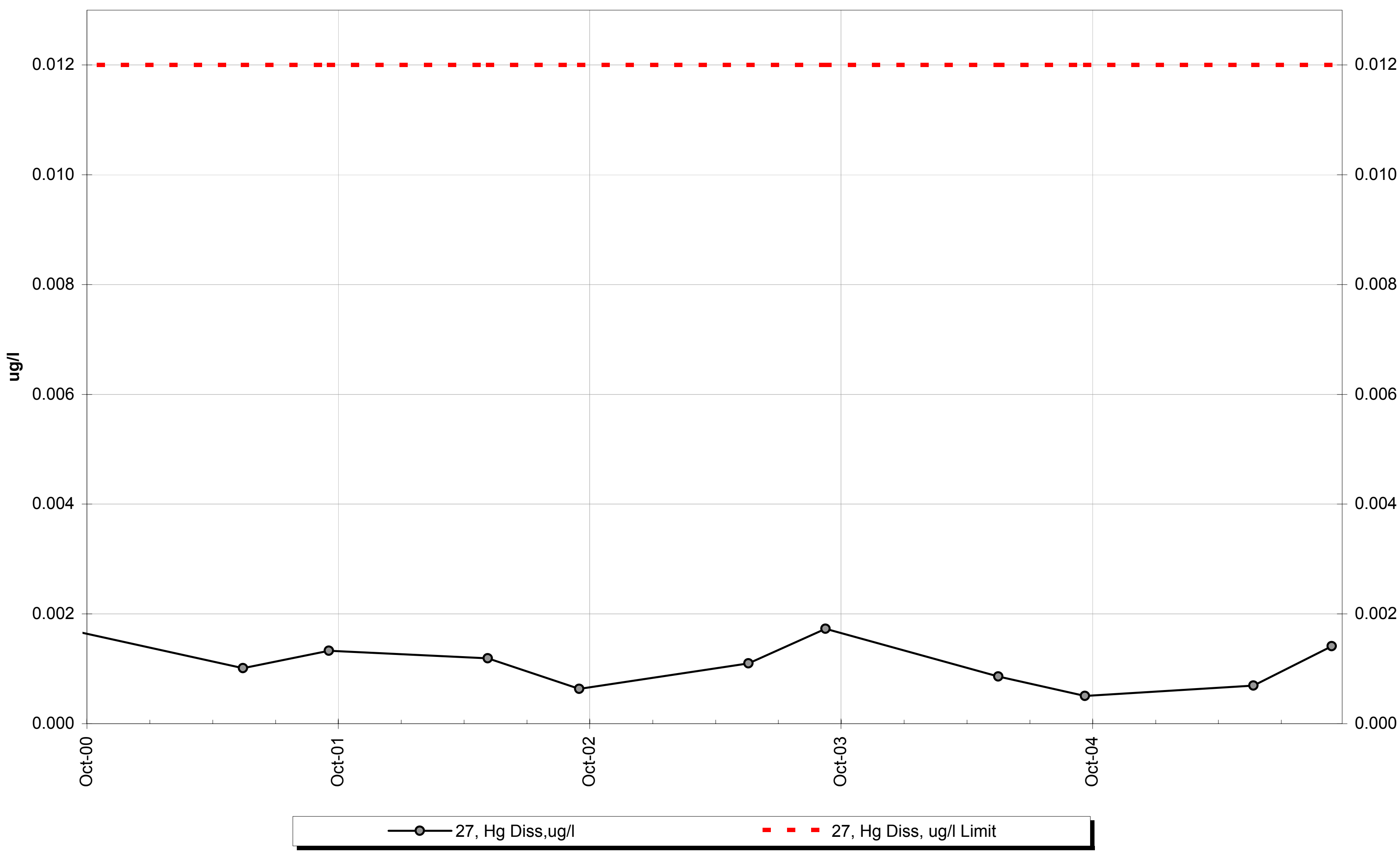
Site 27 -Dissolved Zinc

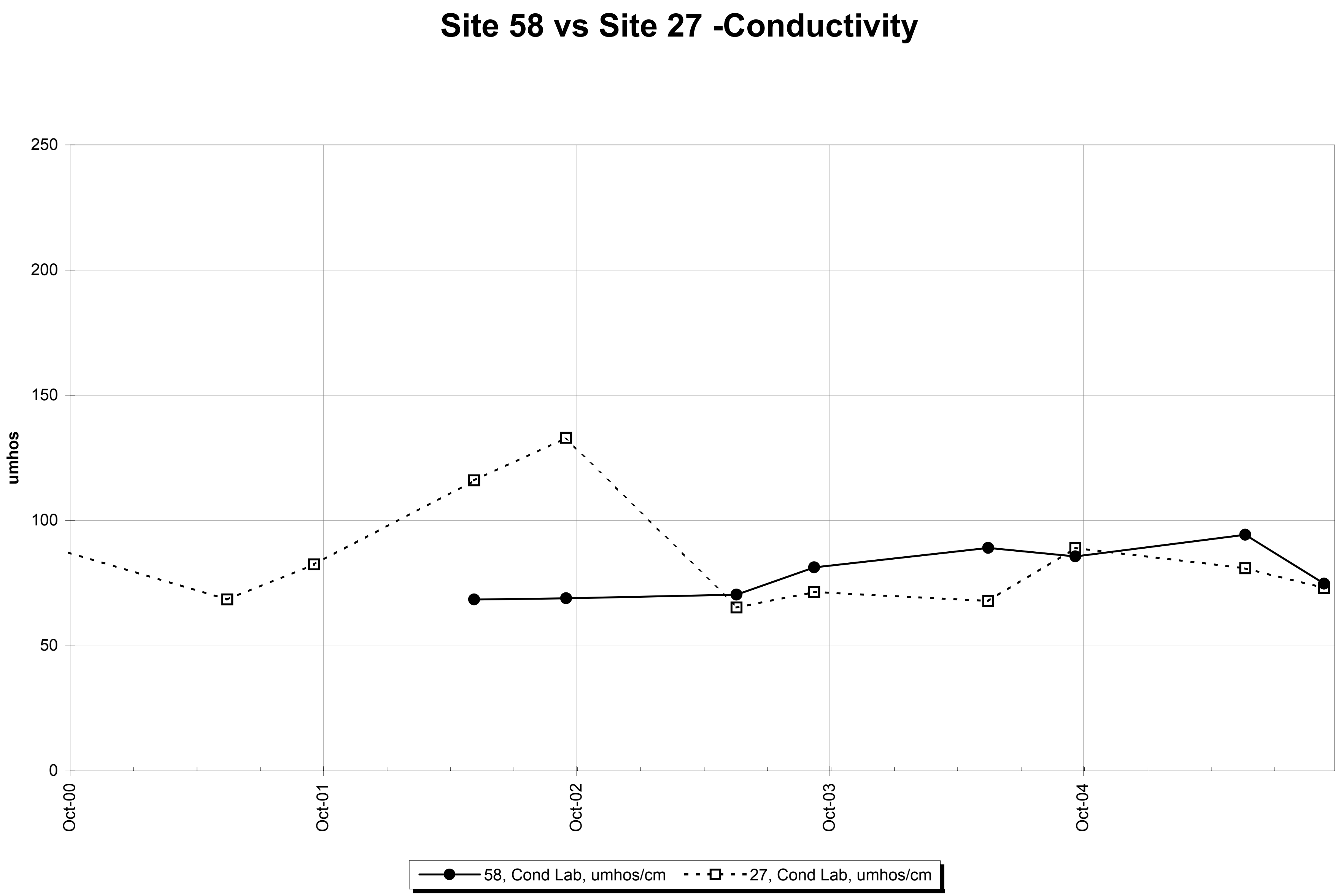


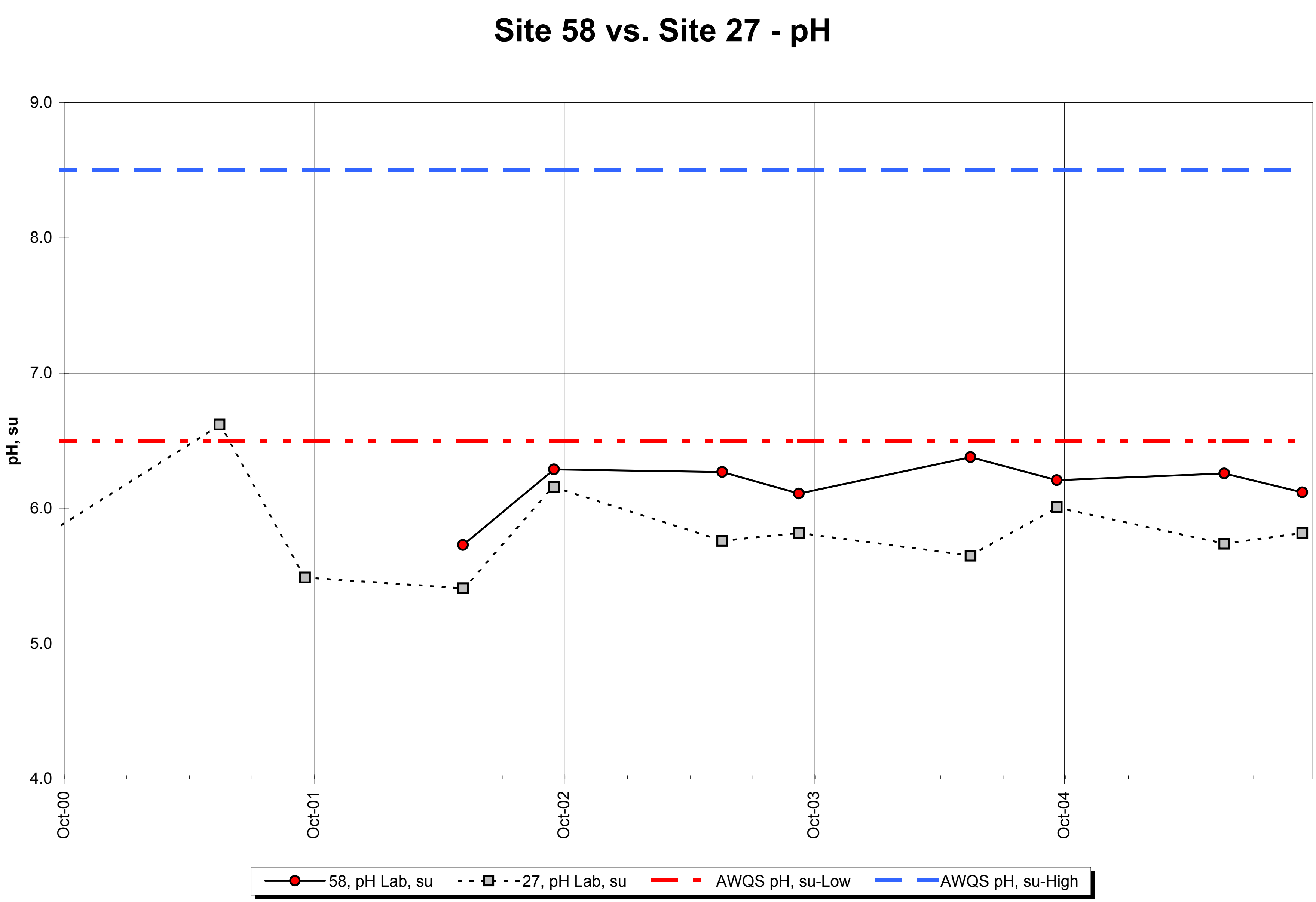
Site 27 -Dissolved Selenium



Site 27 -Dissolved Mercury

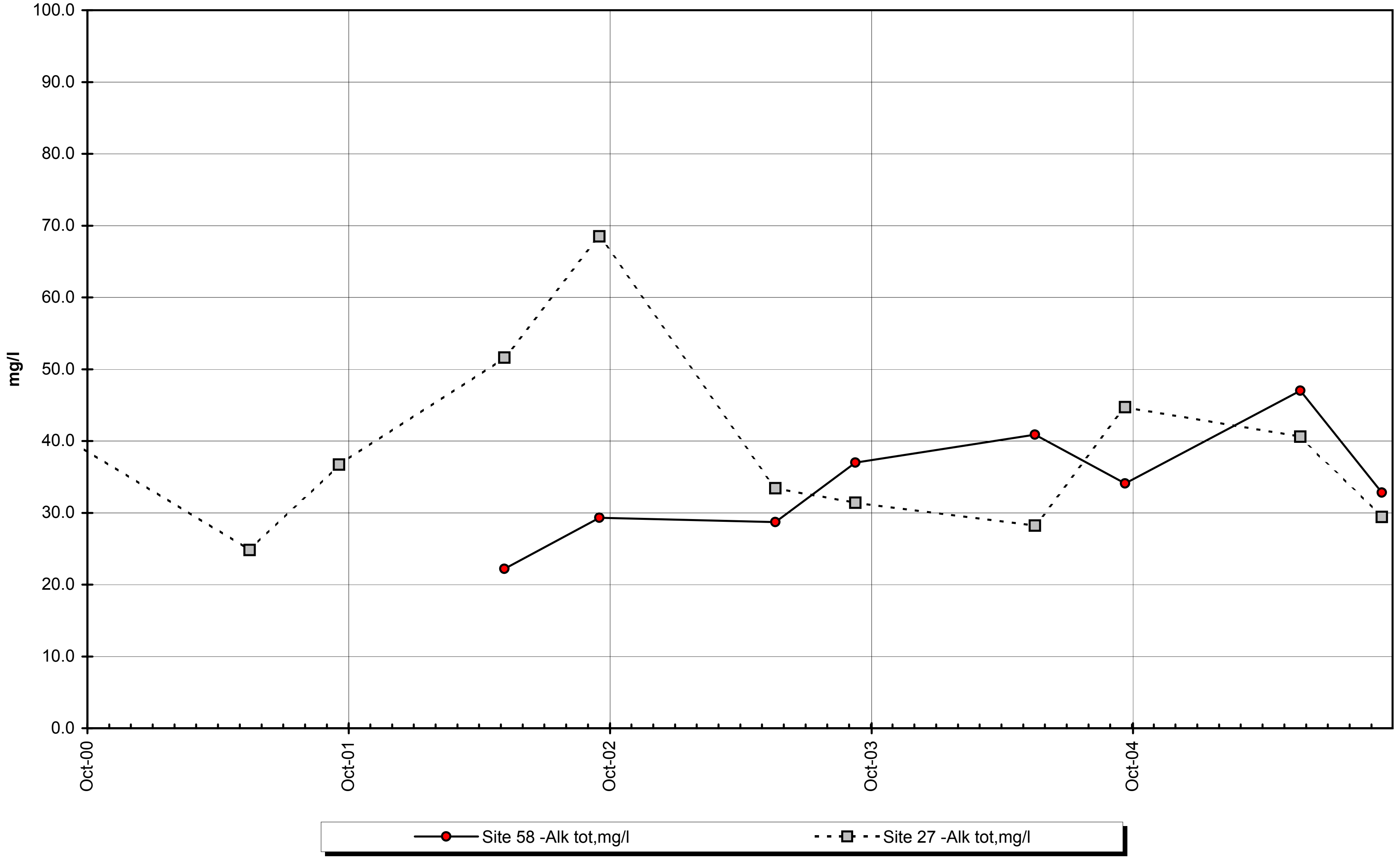


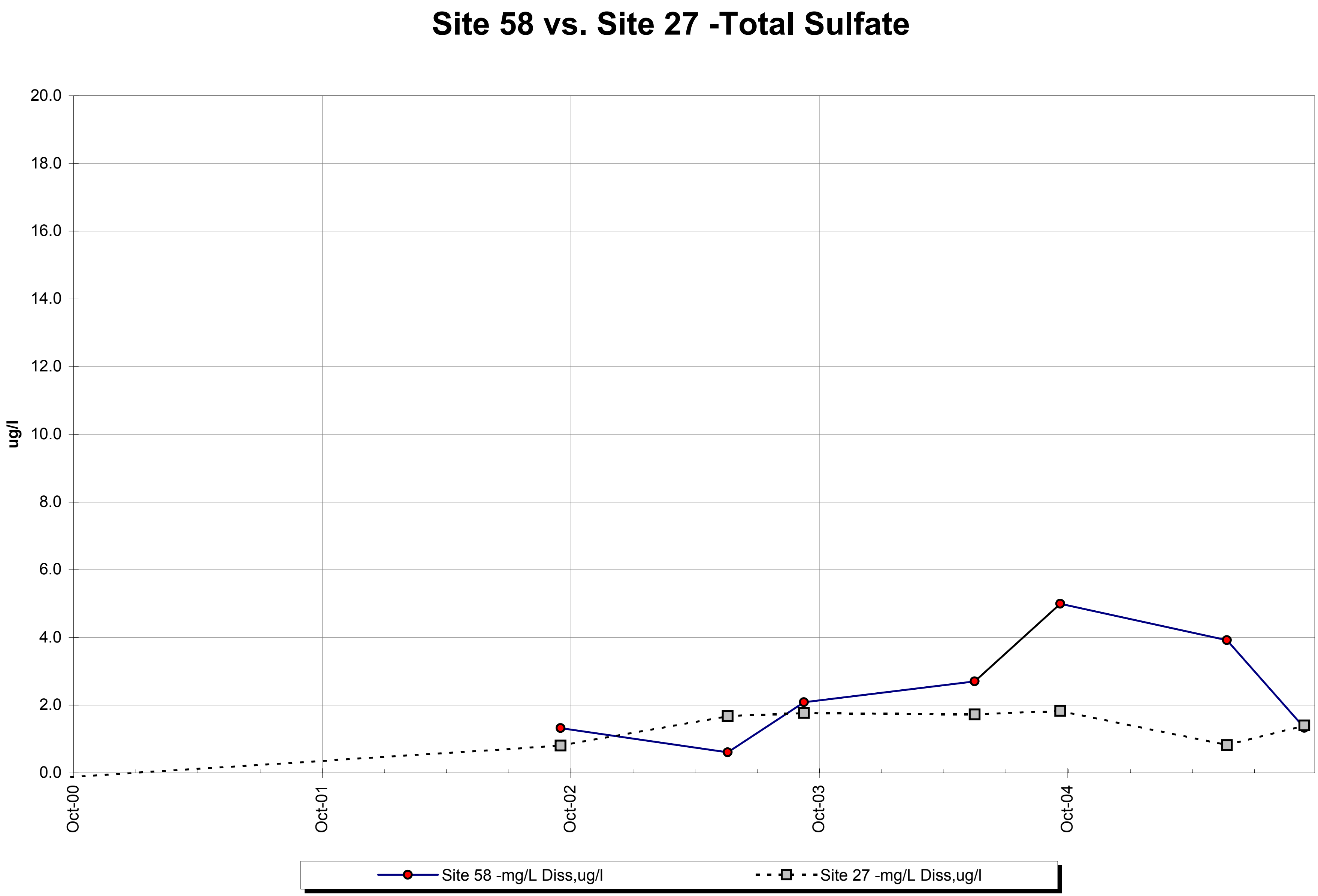

Site 58 vs Site 27 -Conductivity
250
200
150
100
50
0
umhos
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
58, Cond Lab, umhos/cm
27, Cond Lab, umhos/cm

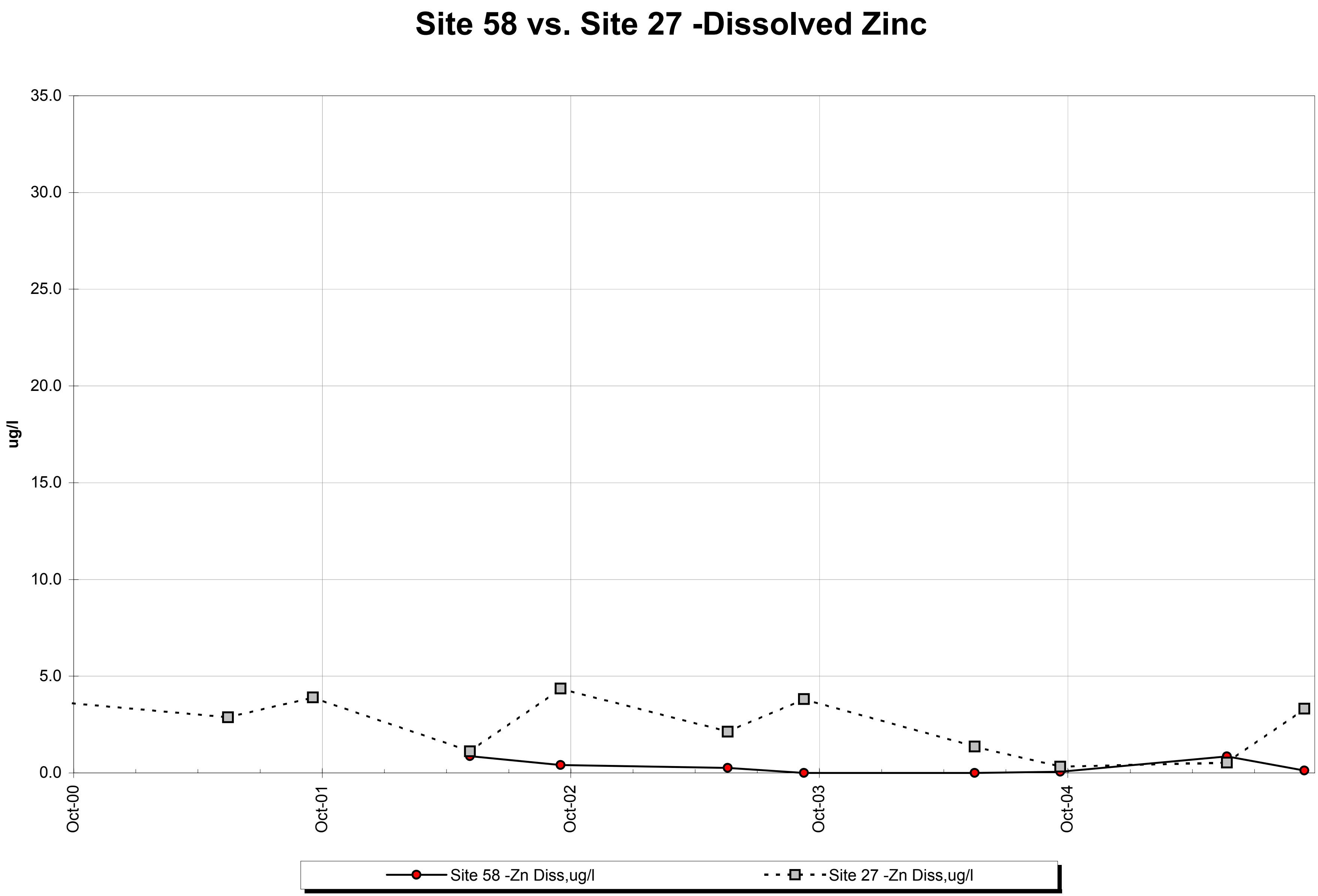


Site 58 vs. Site 27 - pH
pH, su
9.0
8.0
7.0
6.0
5.0
4.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
58, pH Lab, su
27, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 58 vs. Site 27 -Total Alkalinity




Site 58 vs. Site 27 -Total Sulfate
ug/l
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 58 -mg/L Diss,ug/l
Site 27 -mg/L Diss,ug/l



Site 58 vs. Site 27 -Dissolved Zinc
ug/l
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 58 -Zn Diss,ug/l
Site 27 -Zn Diss,ug/l

Site **#27** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

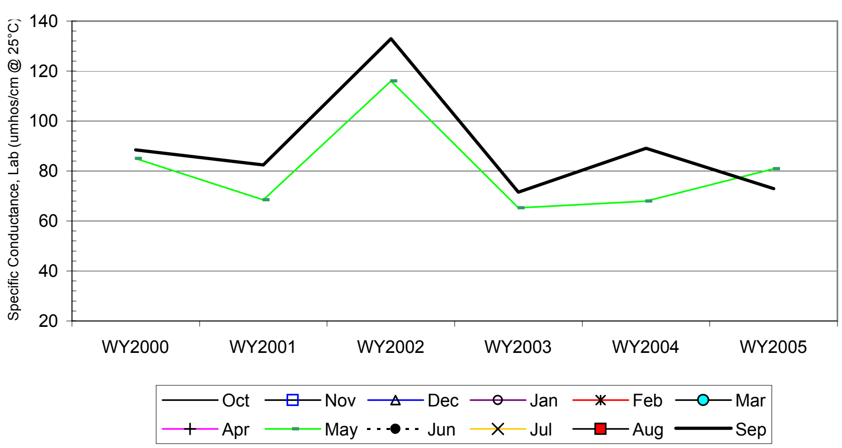
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								85.0				88.5
b	**WY2001**								68.5				82.5
c	**WY2002**								116.0				133.0
d	**WY2003**								65.2				71.5
e	**WY2004**								67.9				89.1
f	**WY2005**								80.9				73.0
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								-1				-1
	c-a								1				1
	d-a								-1				-1
	e-a								-1				1
	f-a								-1				-1
	c-b								1				1
	d-b								-1				-1
	e-b								-1				1
	f-b								1				-1
	d-c								-1				-1
	e-c								-1				-1
	f-c								-1				-1
	e-d								1				1
	f-d								1				1
	f-e								1				-1
	S_k	0	0	0	0	0	0	0	-3	0	0	0	-3
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-0.56				-0.56
	Z^2_k								0.32				0.32

ΣZ_k=	-1.13
ΣZ^2_k=	0.64
Z-bar=ΣZ_k/K=	-0.56

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	12
ΣS_k	-6

$\chi^2_h=\Sigma Z^2_k-K(Z\text{-bar})^2$=	0.00	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
	p **1.000**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.66	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
56.67	**p** **0.253**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-16.40		6.69
0.050	-7.57	**-2.01**	2.30
0.100	-5.94		0.64
0.200	-5.53		-0.14

Site **#27** Seasonal Kendall analysis for pH, Lab, Standard Units

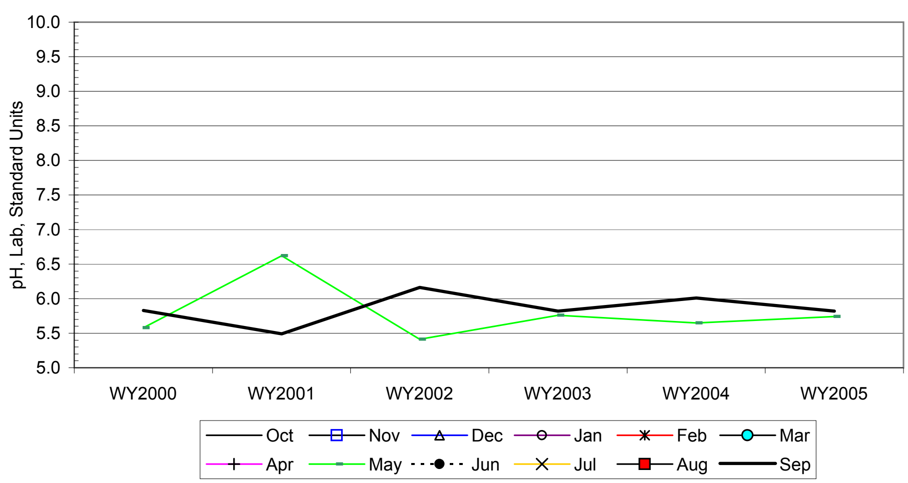
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								5.6				5.8
b	**WY2001**								6.6				5.5
c	**WY2002**								5.4				6.2
d	**WY2003**								5.8				5.8
e	**WY2004**								5.7				6.0
f	**WY2005**								5.7				5.8
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	1
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								1				-1
	c-a								-1				1
	d-a								1				-1
	e-a								1				1
	f-a								1				-1
	c-b								-1				1
	d-b								-1				1
	e-b								-1				1
	f-b								-1				1
	d-c								1				-1
	e-c								1				-1
	f-c								1				-1
	e-d								-1				1
	f-d								-1				0
	f-e								1				-1
	S_k	0	0	0	0	0	0	0	1	0	0	0	0
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								0.19				0.00
	Z^2_k								0.04				0.00

ΣZ_k= 0.19
ΣZ^2_k= 0.04
Z-bar=ΣZ_k/K= 0.09

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 12
ΣS_k 1

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	0.02	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.894**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 0.00	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	p **0.500**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.21		0.15
0.050	-0.11	**0.01**	0.09
0.100	-0.08		0.08
0.200	-0.02		0.05

Site **#27** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								30.5				39.7
b	**WY2001**								24.8				36.7
c	**WY2002**								51.6				68.5
d	**WY2003**								33.4				31.4
e	**WY2004**								28.2				44.7
f	**WY2005**								40.6				29.4
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				-1
c-a								1				1
d-a								1				-1
e-a								-1				1
f-a								1				-1
c-b								1				1
d-b								1				-1
e-b								1				1
f-b								1				-1
d-c								-1				-1
e-c								-1				-1
f-c								-1				-1
e-d								-1				1
f-d								1				-1
f-e								1				-1
S_k	0	0	0	0	0	0	0	3	0	0	0	-5

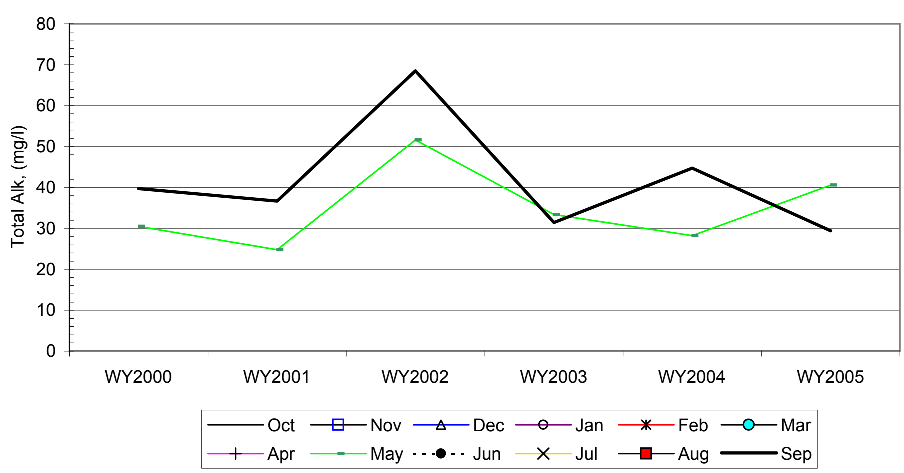
	May	Sep
σ^2_S=	28.33	28.33
$Z_k = S_k/\sigma_S$	0.56	-0.94
Z^2_k	0.32	0.88

ΣZ_k= -0.38
ΣZ^2_k= 1.20
Z-bar=$\Sigma Z_k/K$= -0.19

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12
ΣS_k -2

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	1.13	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
p	**0.288**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.13	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
56.67	**p** **0.447**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-10.24		4.21
0.050	-3.96	**-0.79**	2.84
0.100	-2.96		1.88
0.200	-2.67		1.15

Site **#27** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								5.5				3.7
b	**WY2001**								2.9				3.9
c	**WY2002**								1.1				4.4
d	**WY2003**								2.1				3.8
e	**WY2004**								1.4				0.3
f	**WY2005**								0.5				3.3
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								-1				1
	c-a								-1				1
	d-a								-1				1
	e-a								-1				-1
	f-a								-1				-1
	c-b								-1				1
	d-b								-1				-1
	e-b								-1				-1
	f-b								-1				-1
	d-c								1				-1
	e-c								1				-1
	f-c								-1				-1
	e-d								-1				-1
	f-d								-1				-1
	f-e								-1				1
	S_k	0	0	0	0	0	0	0	-11	0	0	0	-5
	σ^2_S=								28.33				28.33
	Z_k = S_k/σ_S								-2.07				-0.94
	Z^2_k								4.27				0.88

ΣZ_k= -3.01

ΣZ^2_k= 5.15

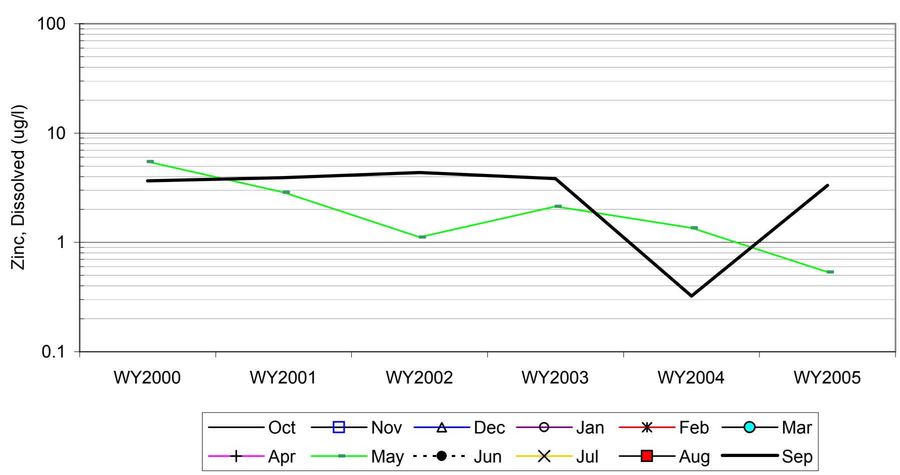
Z-bar=ΣZ_k/K= -1.50

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12

ΣS_k -16

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2=$		0.64	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity
	p	**0.425**			$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc}	-1.99	@α/2=2.5% Z=	1.96	**H_0** (No trend) REJECT
56.67	**p**	**0.023**			**H_A** (± trend) ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.17		0.03
0.050	-1.00	**-0.52**	-0.13
0.100	-0.83		-0.20
0.200	-0.80		-0.33

-16.9%

INTERPRETIVE REPORT
SITE 29 “MONITORING WELL 3S”

The data collected during the current water year are listed in the following “Table of Results for Water Year 2005” report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report “Qualified Data by QA Reviewer”. The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Four results exceeding these criteria have been identified, as listed in the table below. These data are for pH, both for lab and field. Values for lab and field pH from other wells completed into organic rich peat sediments similar to Site 29 have historically resulted in pH values ranging from 5 to 6 su (e.g. Sites 58, 27, and 32).

Sample Date	Parameter	Value	Standard	Standard Type
05/24/05	pH Lab, su	5.28	6.5 - 8.5	Aquatic Life
05/24/05	pH Field, su	5.62	6.5 - 8.5	Aquatic Life
09/15/05	pH Lab, su	5.21	6.5 - 8.5	Aquatic Life
09/15/05	pH Field, su	5.52	6.5 - 8.5	Aquatic Life

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious trends were apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). No significant trends are identified.

Site 29-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	-1.46	-	0.07		
pH, Lab	6	-0.80	-	0.21		
Alkalinity, Total	6	-1.20	-	0.12		
Zinc, Dissolved	6	-1.73	-	0.04		

(1): Number of years (2):Significance level

Additional X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 29 and Site 58, the up-gradient control site, to aid in the comparison between those two sites. Lab conductivity and total alkalinity are within similar ranges at both sites. Lab pH is slightly lower at Site 29 than Site 58 while total sulfate is slightly higher at Site 58 (note Site 29 typical returns sulfate values that are below the 0.1 mg/l SO_4 MDL). Site 29 routinely has dissolved zinc values that are ~3ug/l higher than values found at Site 58. These results are similar in magnitude and range to what was noted previously for Site 27 with respect to the comparison with Site 58. The hydrogeologic conditions that exist at Site 29 are similar to Site 27 with the exception that Site 29 is not typically in an active surface discharge zone. However, the area around Site 29 is located in an area of gently sloping muskeg that is part of the upper headwater region of Further Creek, which drains westward into Hawk Inlet. The site's groundwater is characterized by diffuse flow through the peat/sand strata. Thus the lower pH would be a due to the greater interaction with organic matter in the muskeg. The lower pH would also promote greater solubility for naturally occurring dissolved metals sampled at this site.

Table of Results for Water Year 2005

Site 29 "MW-3S"													
Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)								7.9				9.0	8.5
Conductivity-Field(µmho)								119				99	109
Conductivity-Lab (µmho)								77				66	72
pH Lab (standard units)								5.28				5.21	5.25
pH Field (standard units)								5.62				5.52	5.57
Total Alkalinity (mg/L)								39.5				28.6	34.1
Total Sulfate (mg/L)								<0.1				<0.1	0.1
Hardness (mg/L)								32.0				34.5	33.3
Dissolved As (ug/L)								11.60				14.20	12.90
Dissolved Ba (ug/L)				NOT SCHEDULED FOR SAMPLING				19.7		NOT SCHEDULED FOR SAMPLING		17.8	18.8
Dissolved Cd (ug/L)								<0.004				<0.003	0.002
Dissolved Cr (ug/L)								1.890				3.120	2.505
Dissolved Cu (ug/L)								0.141 U				0.277	0.209
Dissolved Pb (ug/L)								0.2810 U				0.4280 U	0.3545
Dissolved Ni (ug/L)								2.060				1.670	1.865
Dissolved Ag (ug/L)								0.004 J				0.006	0.005
Dissolved Zn (ug/L)								2.94 U				2.93 U	2.94
Dissolved Se (ug/L)								0.201 J				<0.116	0.130
Dissolved Hg (ug/L)								0.000735 U				0.000861	0.000798

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

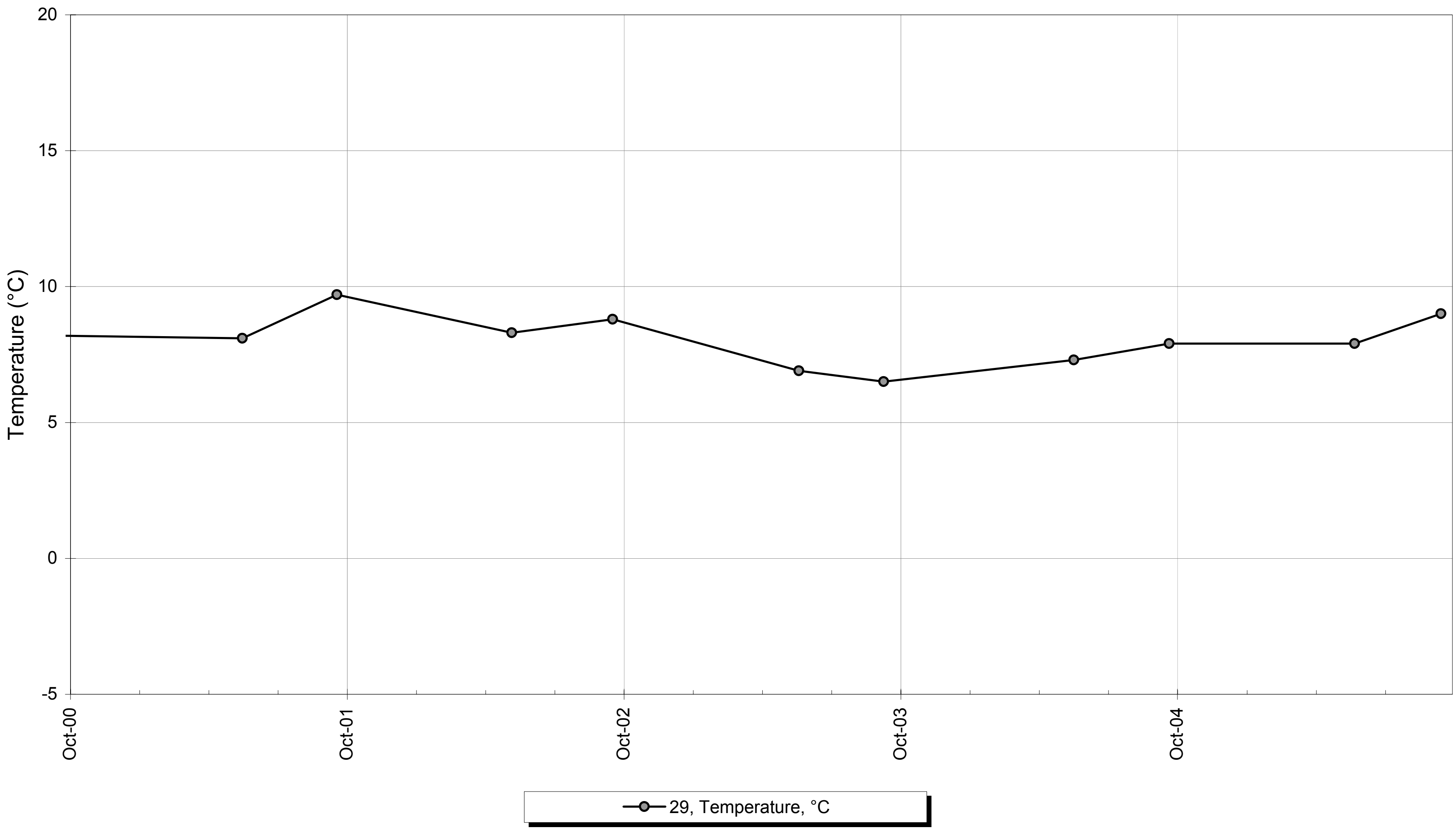
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

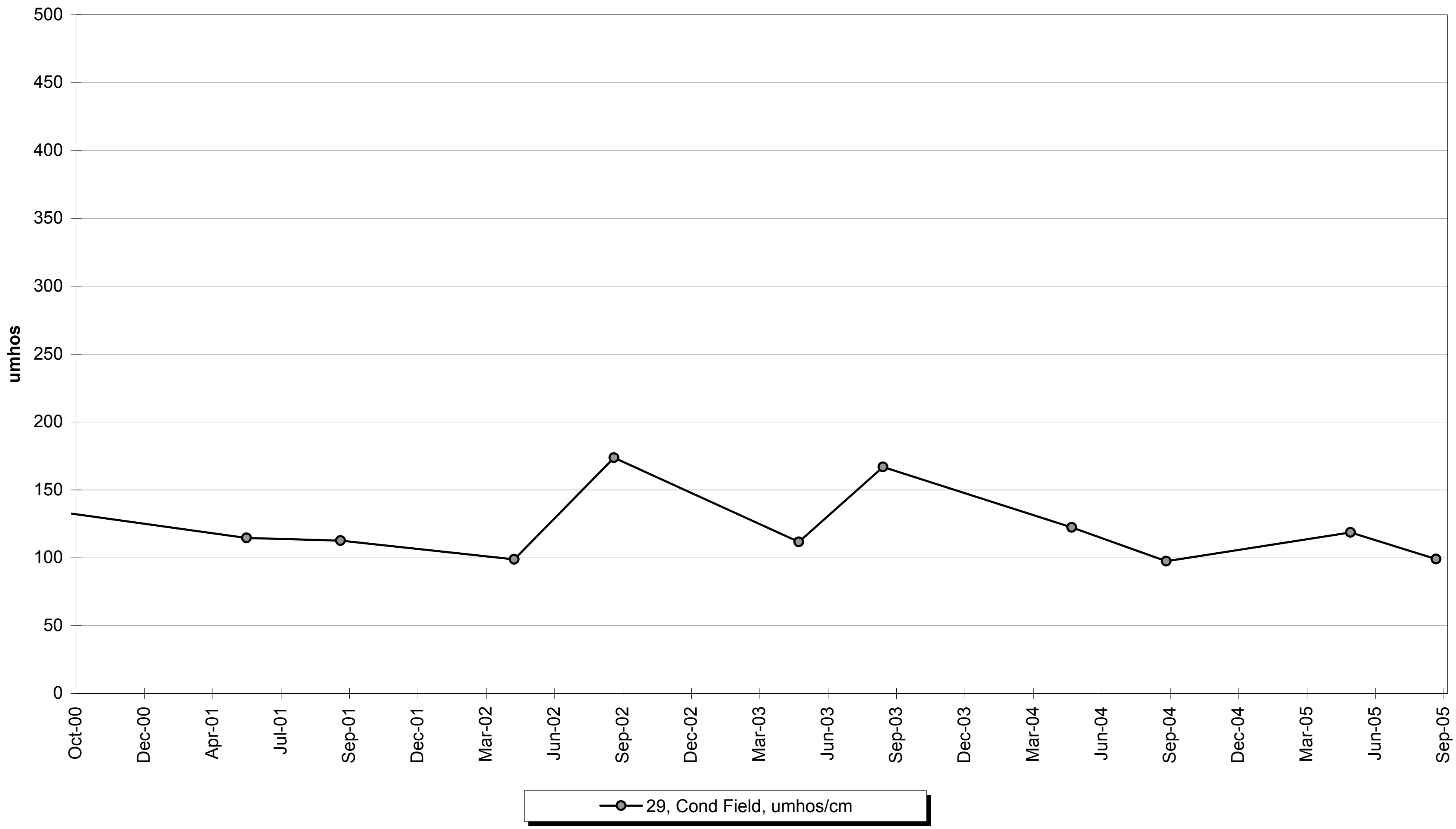
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
29	05/24/2005	2:16:00 PM				
			Cu Diss, ug/l	0.141	U	Field Blank Contamination
			Pb Diss, ug/l	0.281	U	Field Blank Contamination
			Ag Diss, ug/l	0.00365	J	Below Quantitative Range
			Zn Diss, ug/l	2.94	U	Field Blank Contamination
			Se Diss, ug/l	0.201	J	Below Quantitative Range, L
			Hg Diss, ug/l	0.000735	U	Field Blank Contamination
29	09/15/2005	2:05:00 PM				
			Pb Diss, ug/l	0.428	U	Field Blank Contamination
			Zn Diss, ug/l	2.93	U	Field Blank Contamination

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

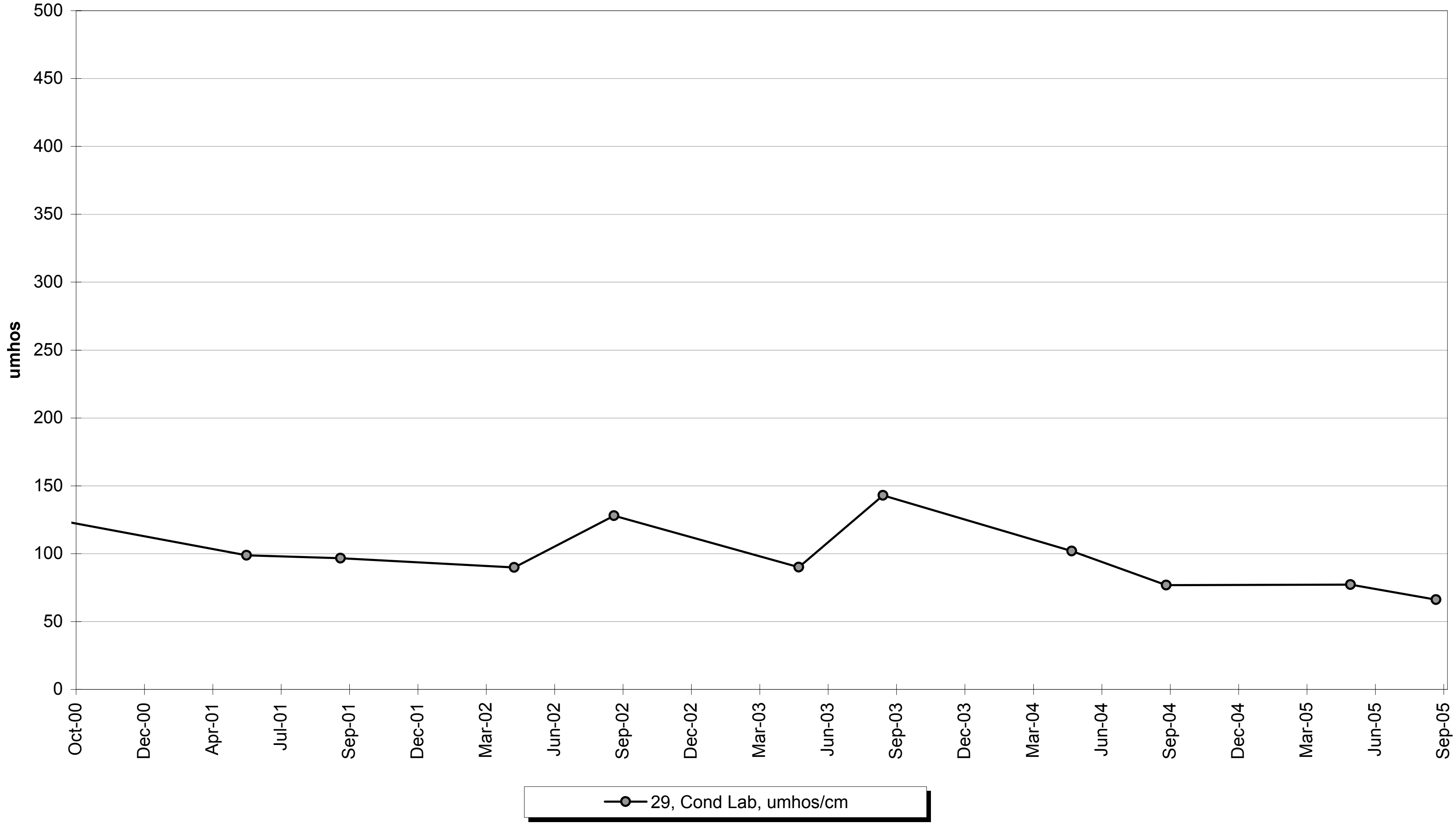
Site 29 -Water Temperature

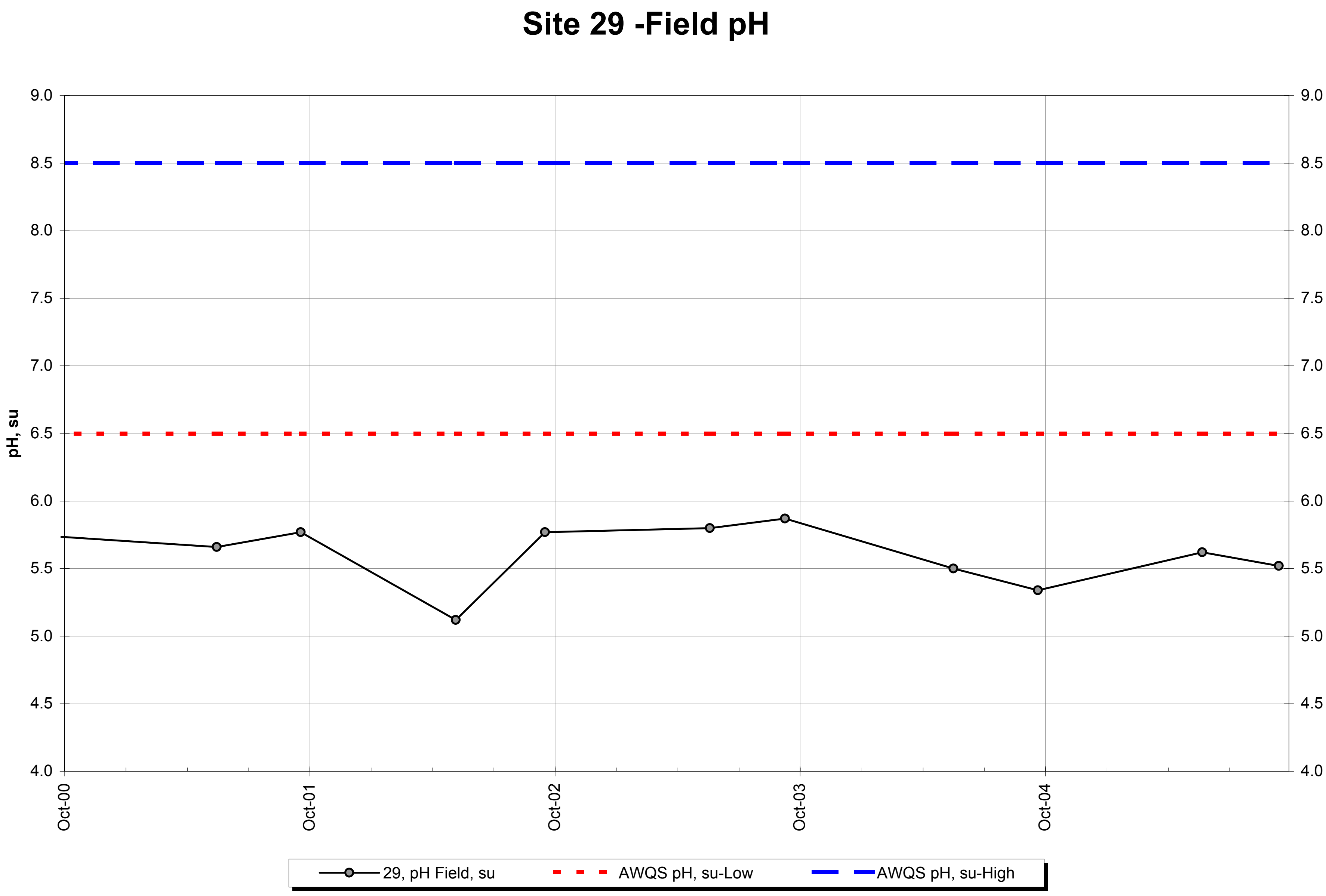


Site 29 -Conductivity-Field

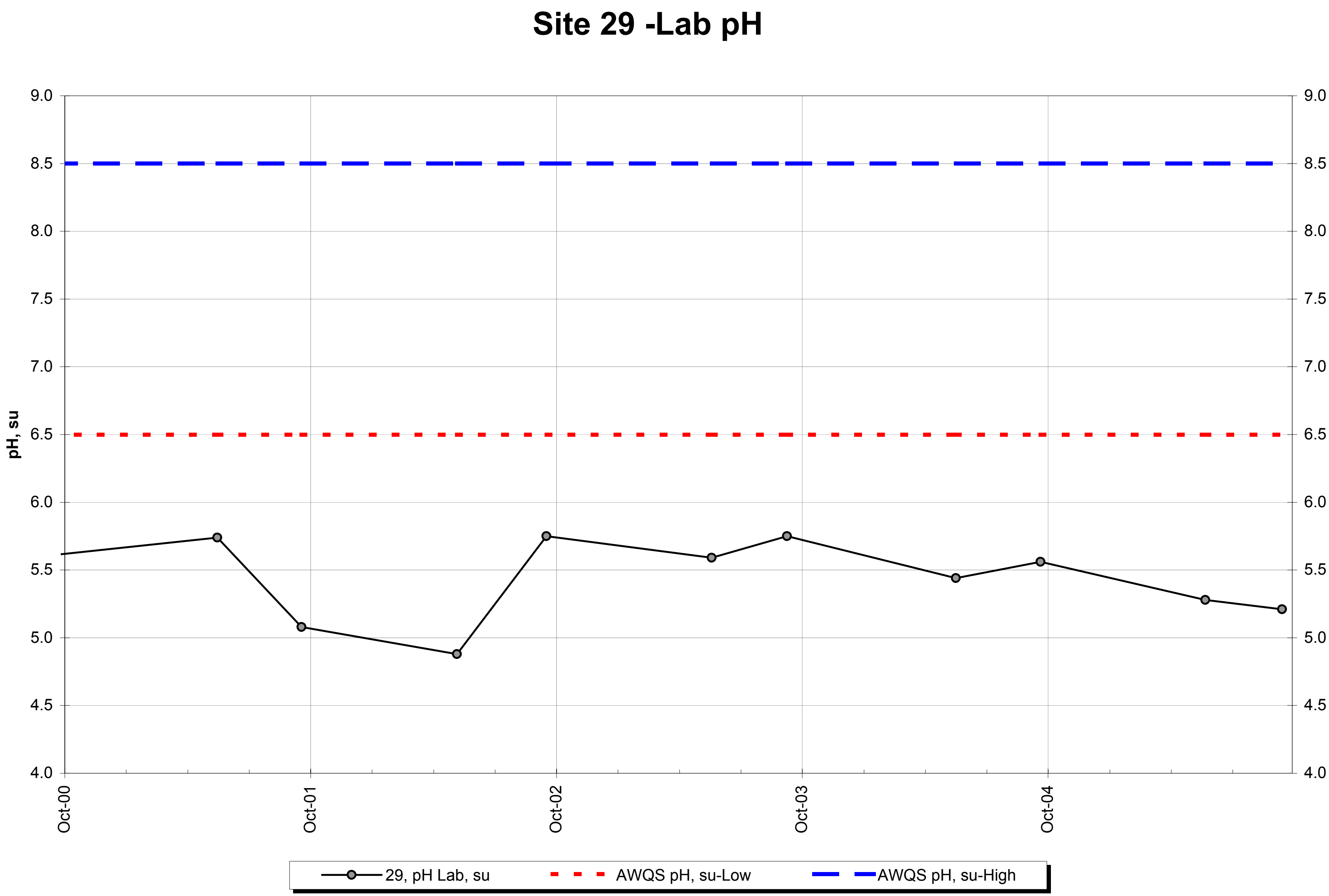


Site 29 -Conductivity-Lab

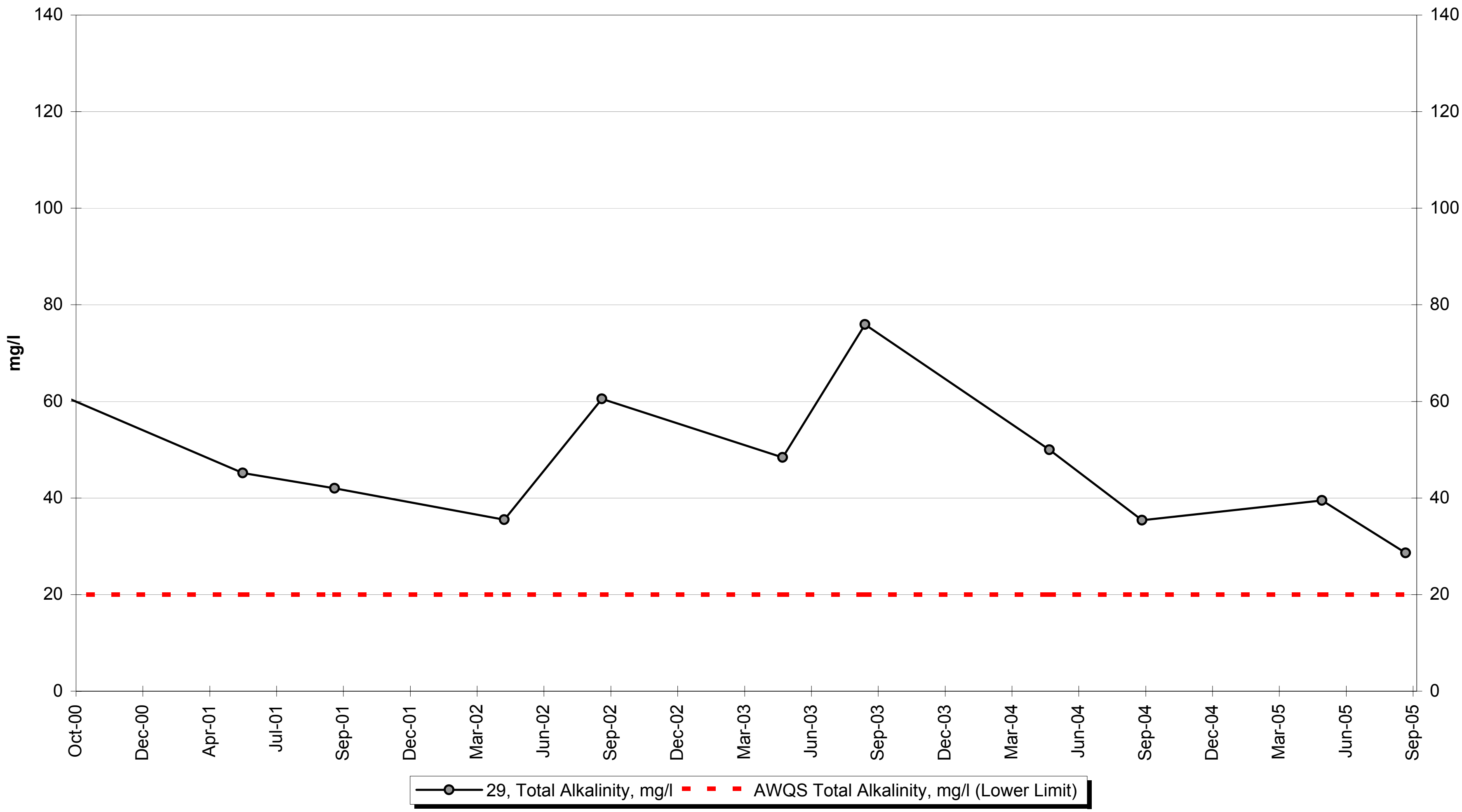




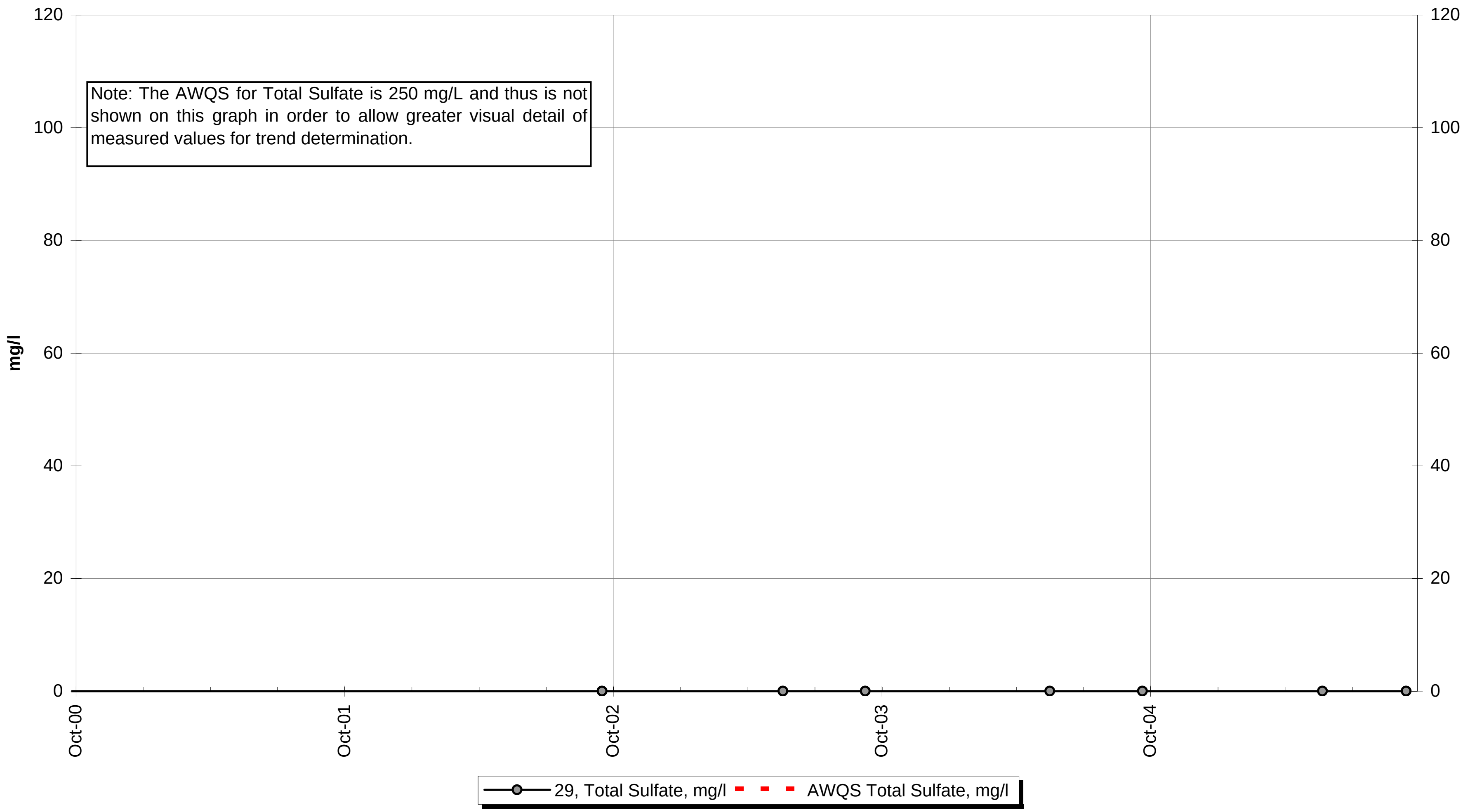
Site 29 -Field pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
29, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High


Site 29 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
29, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

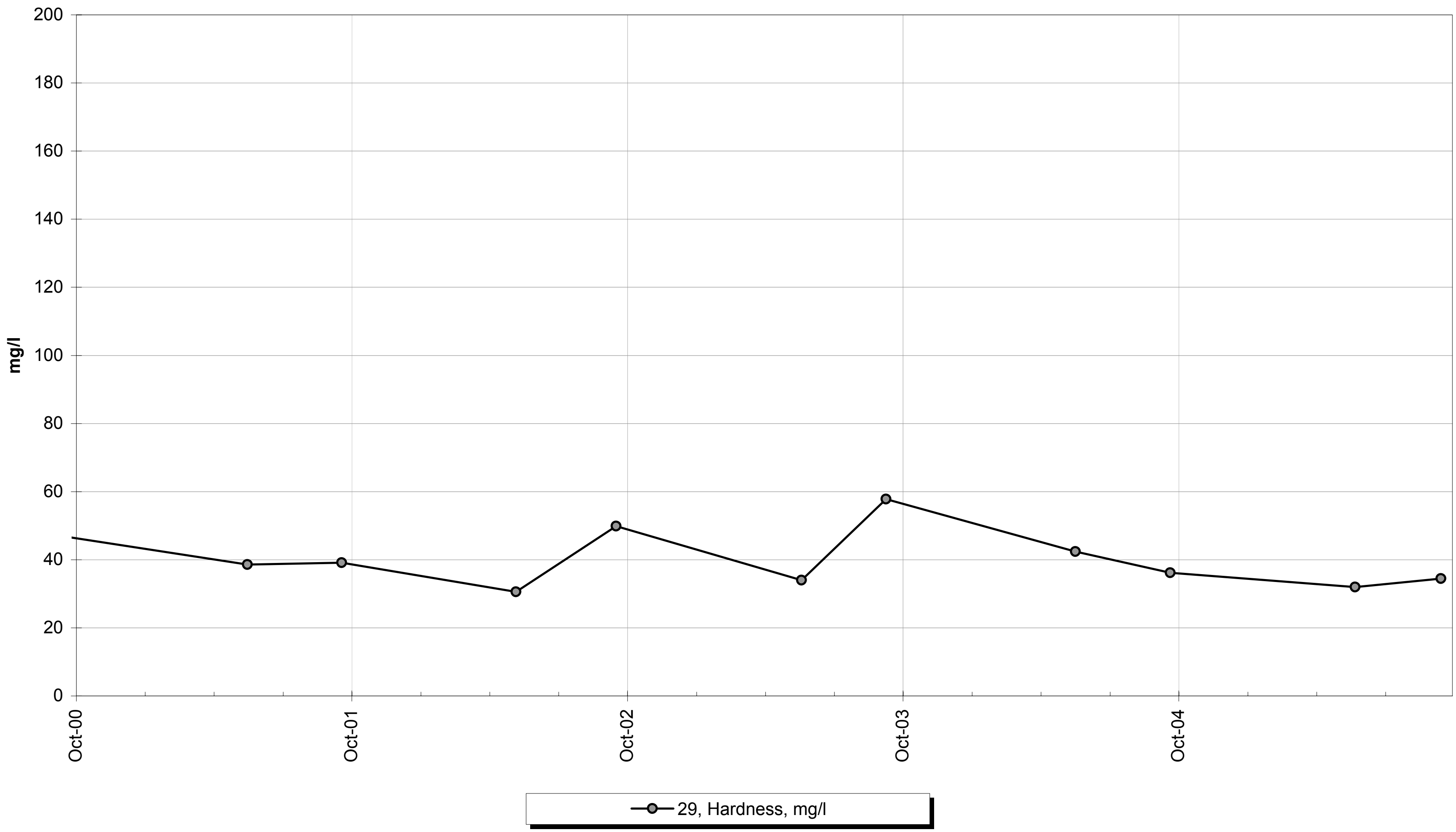
Site 29 -Total Alkalinity

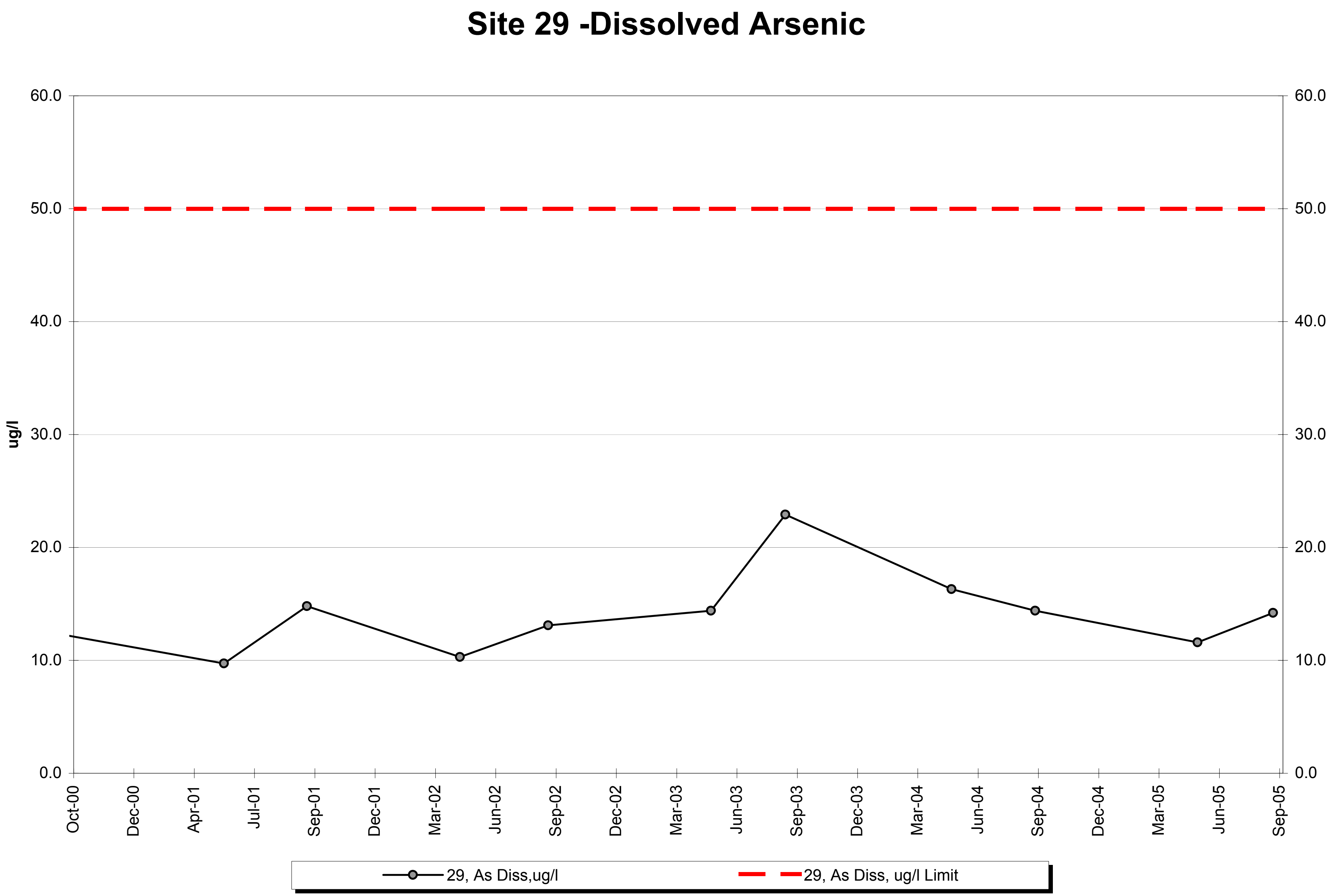


Site 29 -Total Sulfate



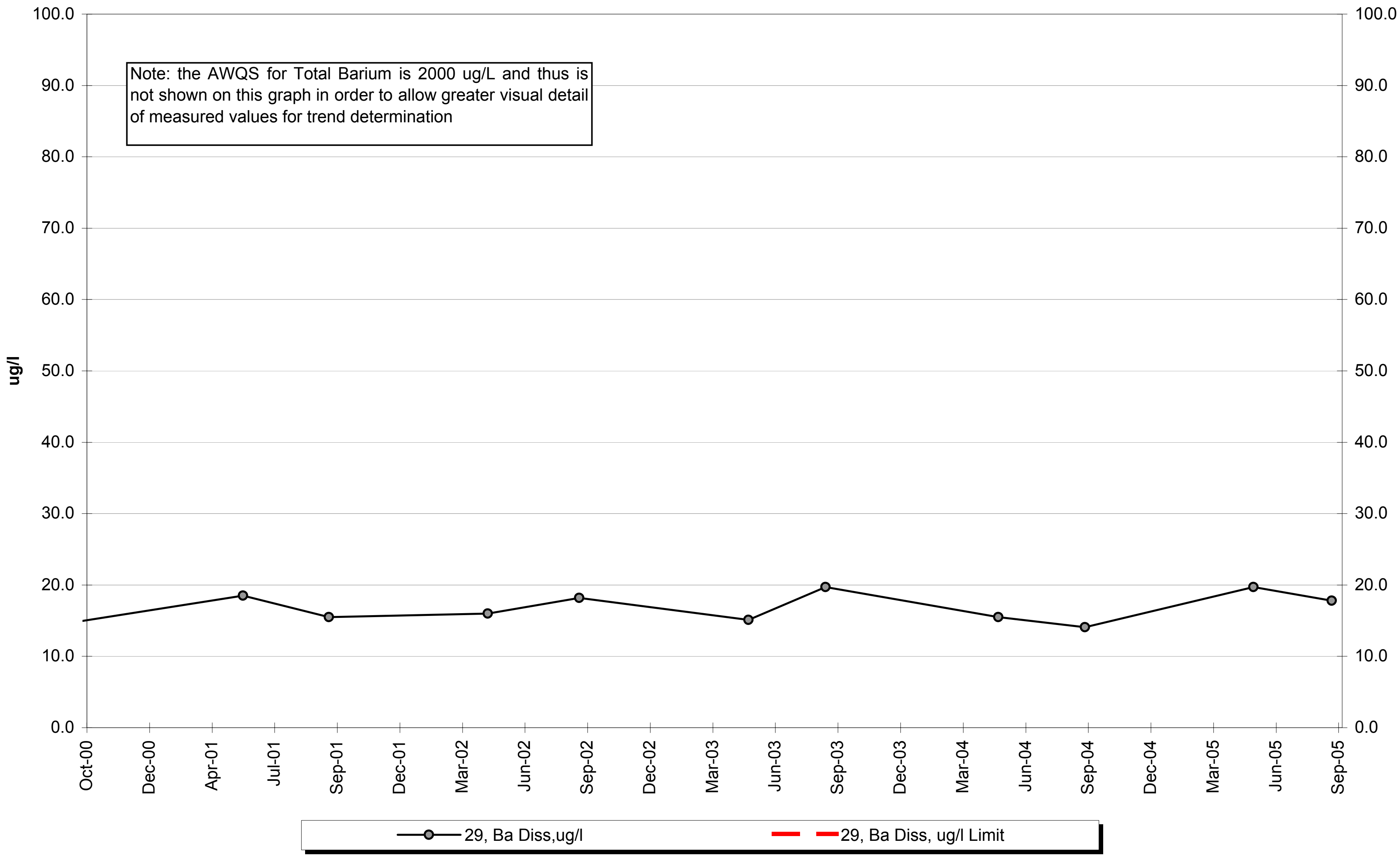
Site 29 -Hardness

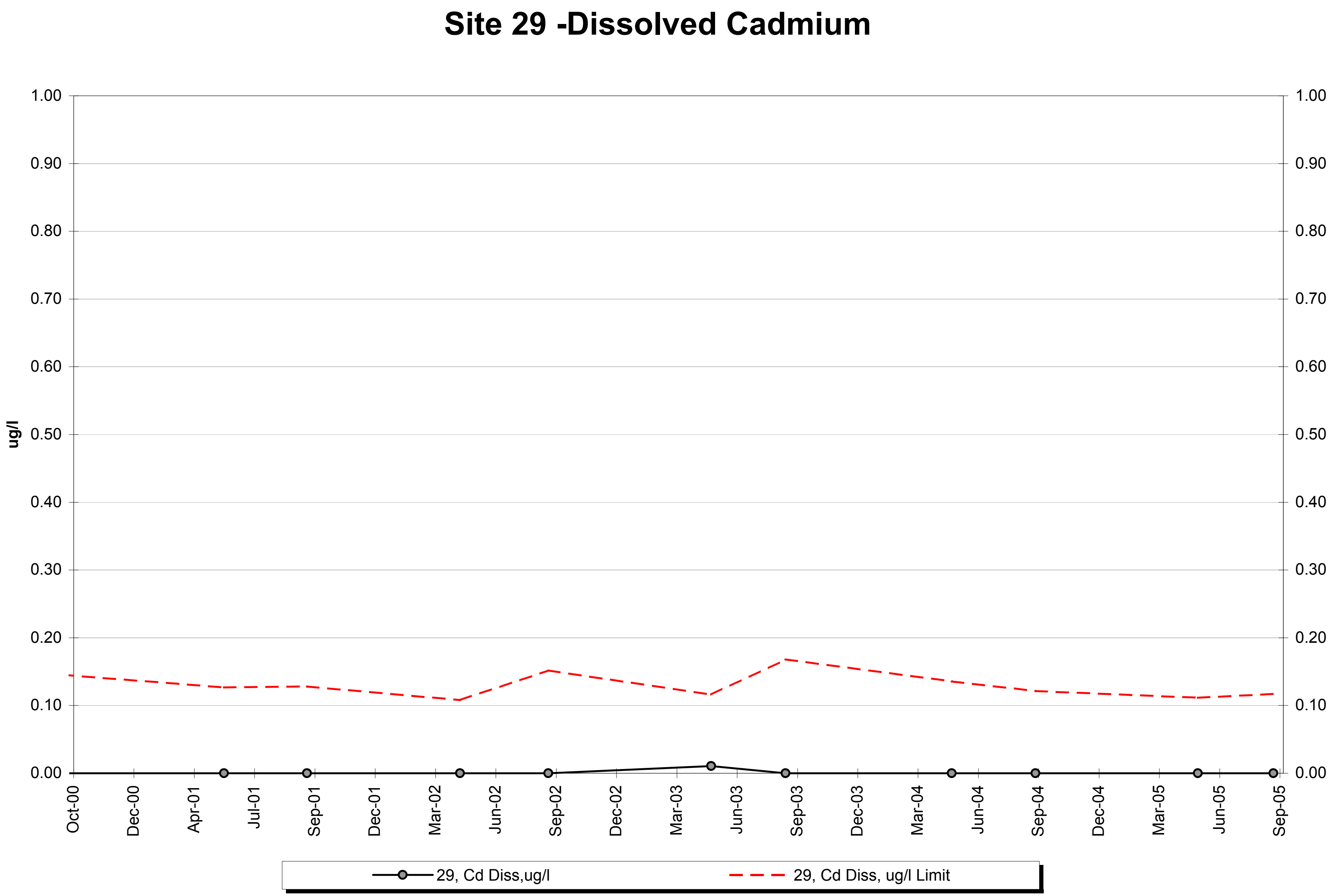


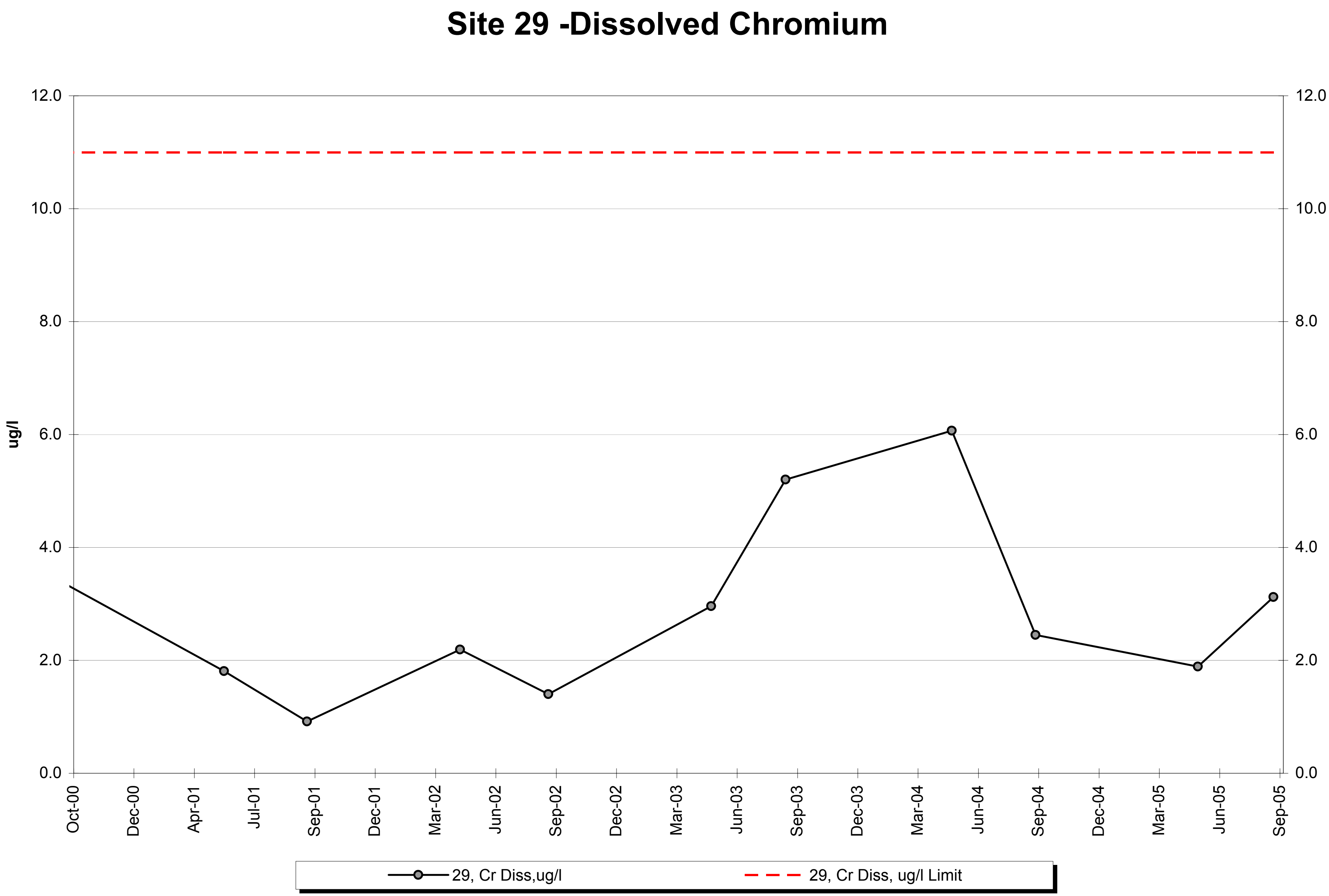


Site 29 -Dissolved Arsenic
ug/l
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
29, As Diss,ug/l
29, As Diss, ug/l Limit

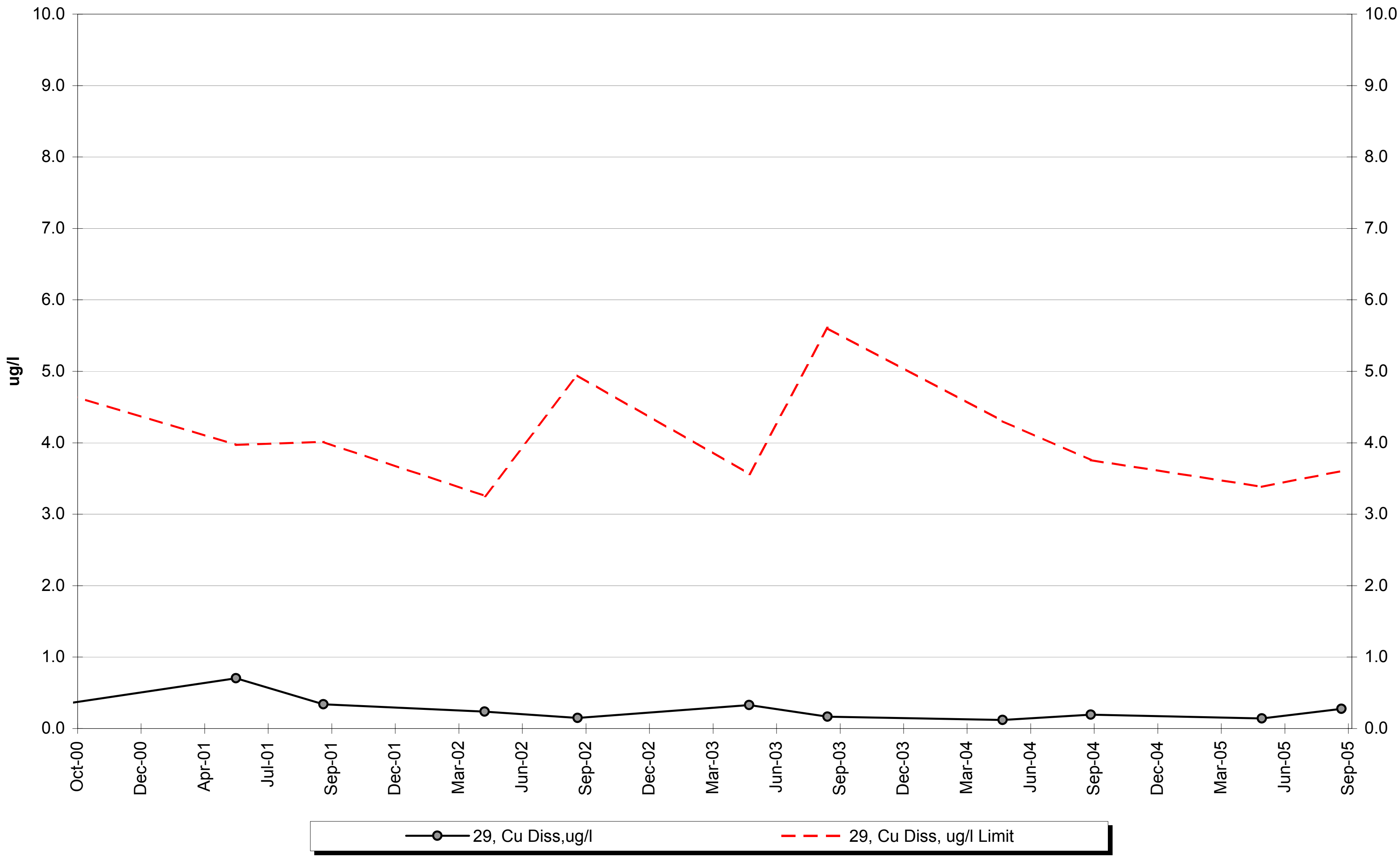
Site 29 -Dissolved Barium

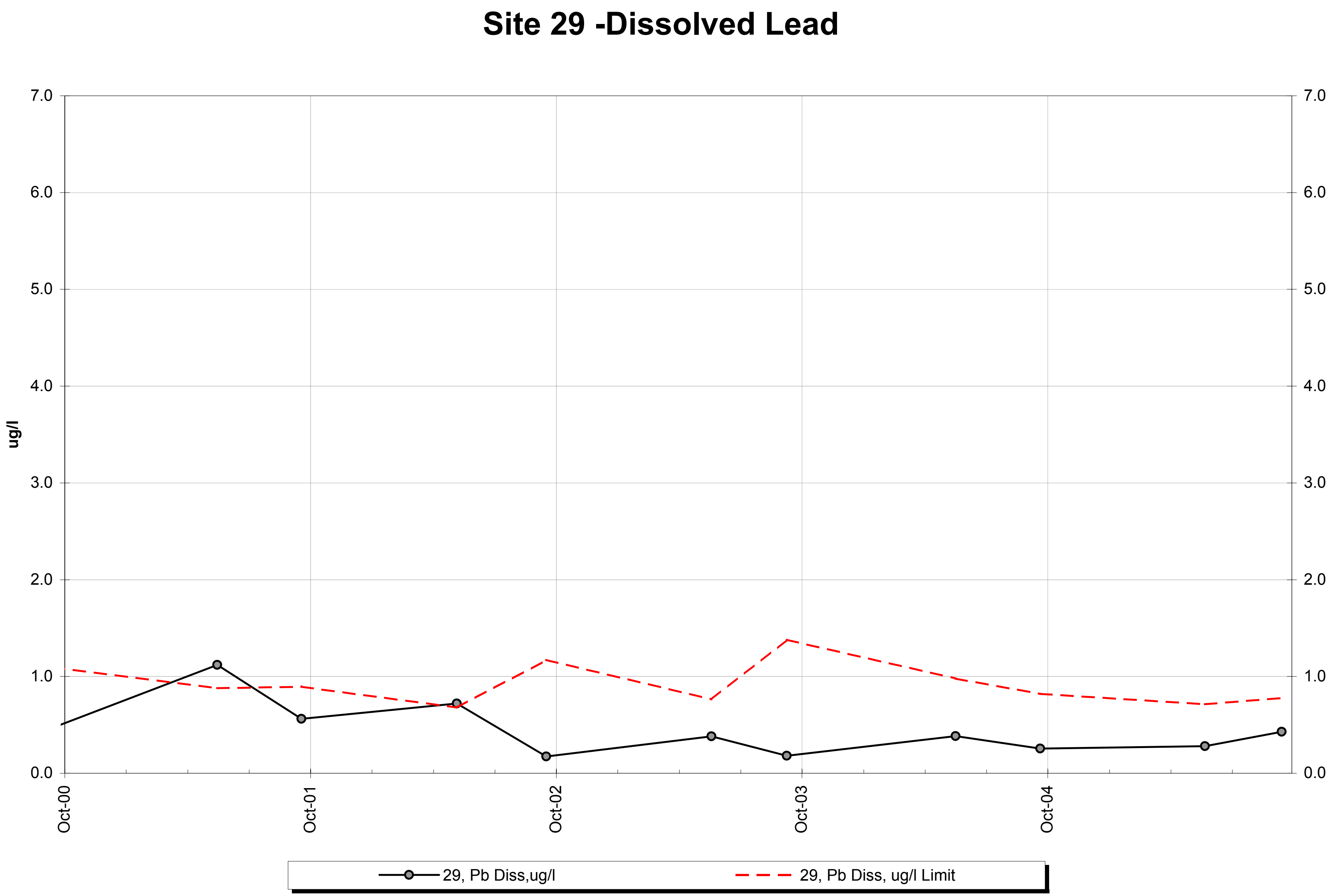



Site 29 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
29, Cd Diss,ug/l
29, Cd Diss, ug/l Limit


Site 29 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
29, Cr Diss,ug/l
29, Cr Diss, ug/l Limit

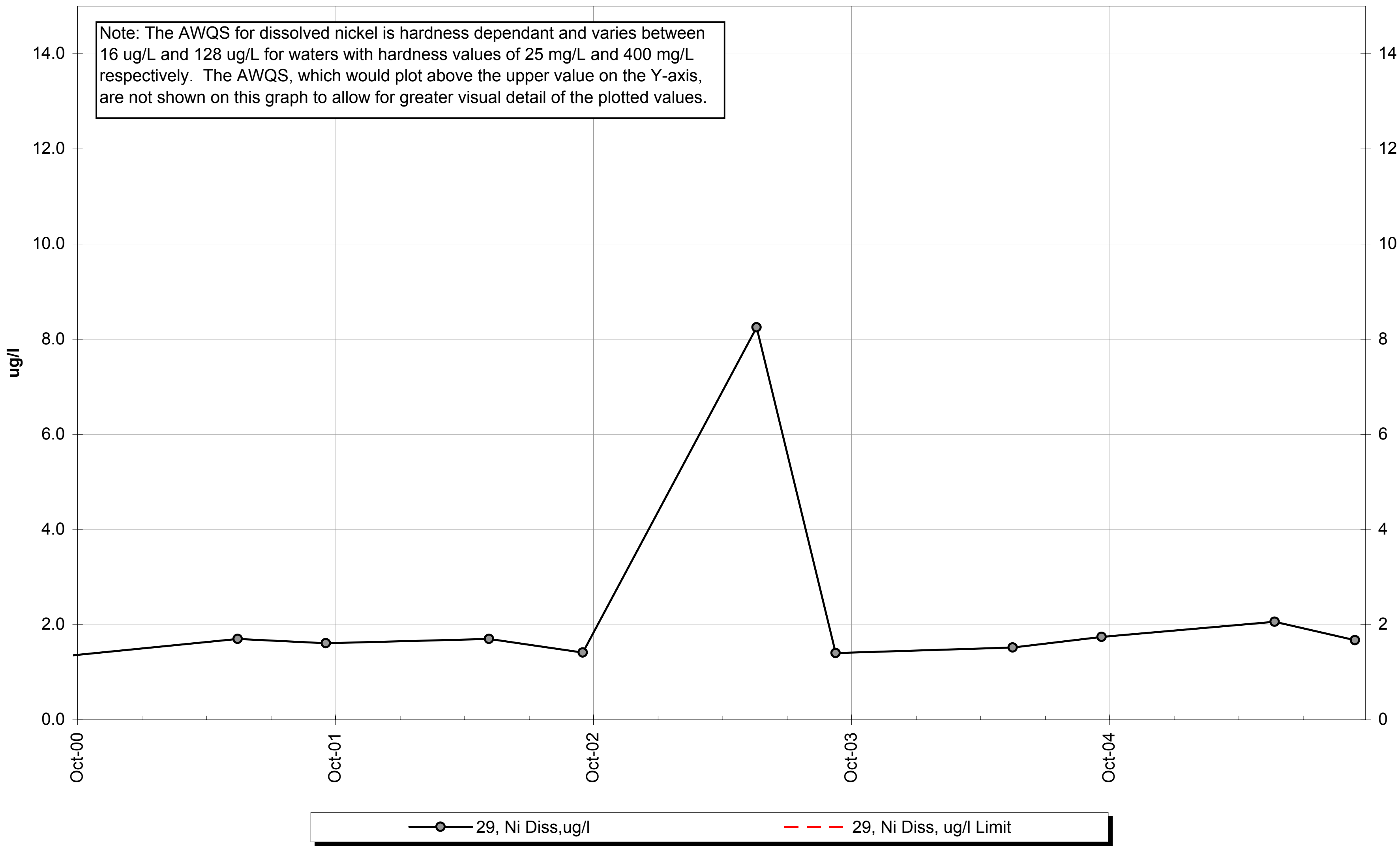
Site 29 -Dissolved Copper

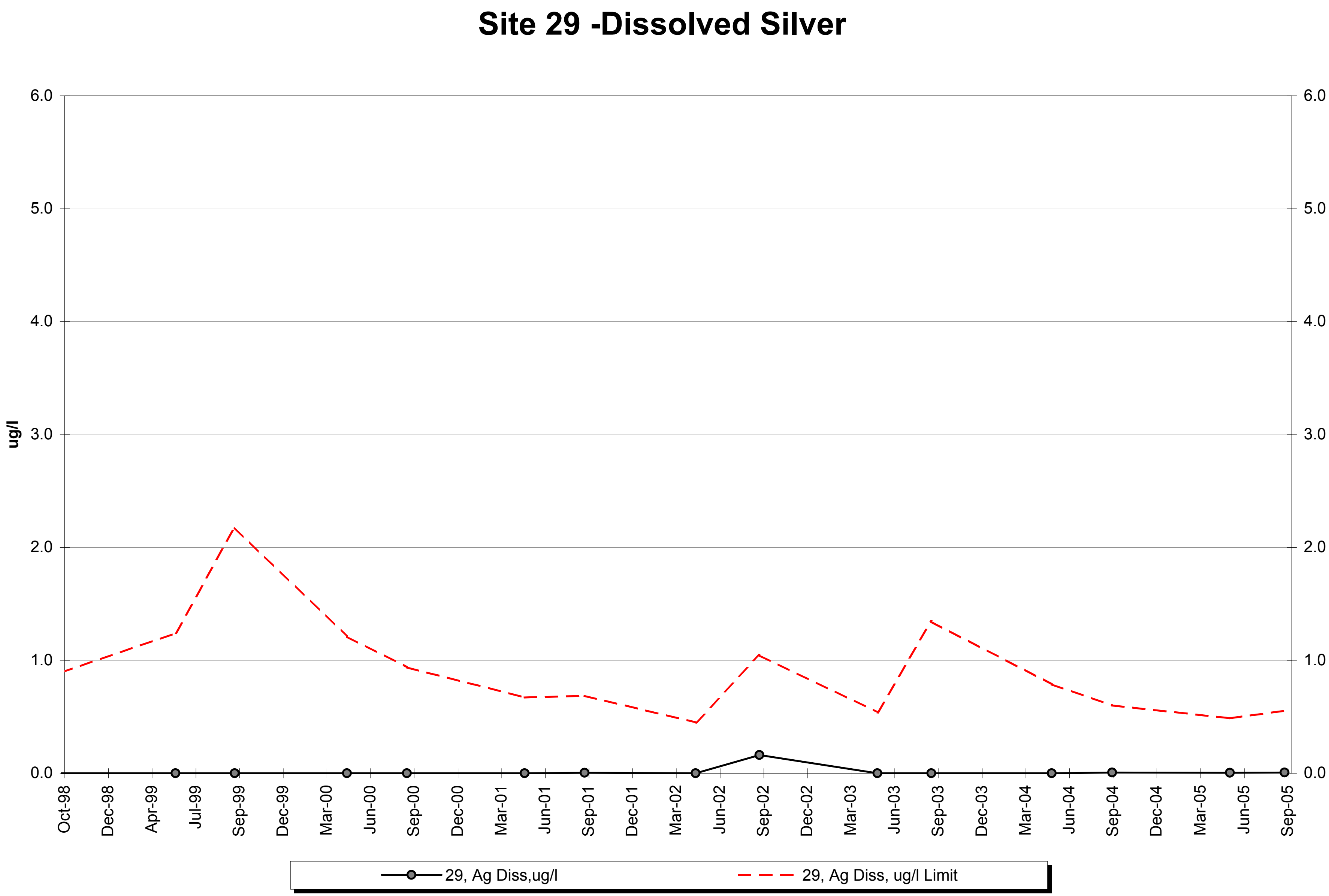




Site 29 -Dissolved Lead
ug/l
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
29, Pb Diss,ug/l
29, Pb Diss, ug/l Limit

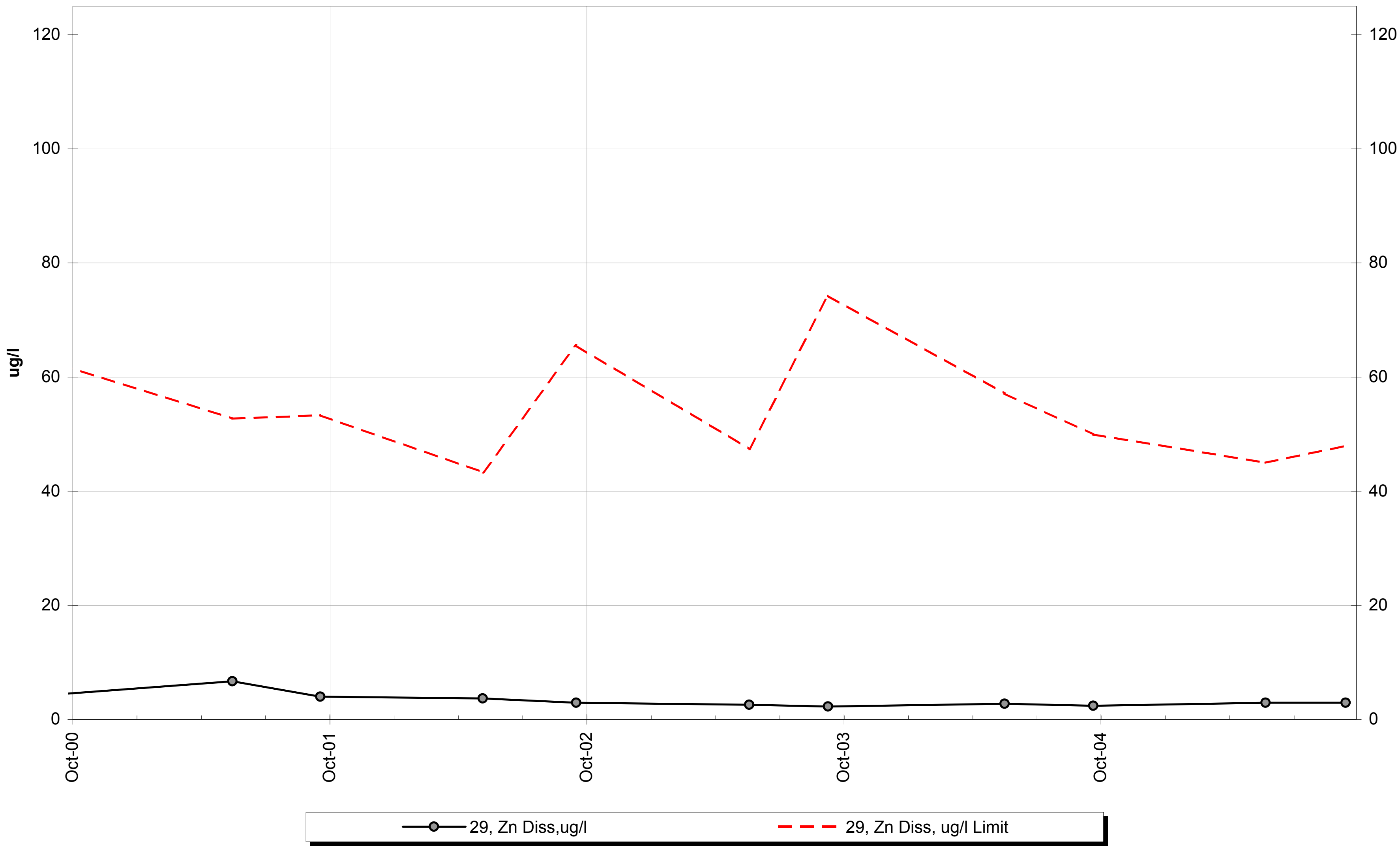
Site 29 -Dissolved Nickel



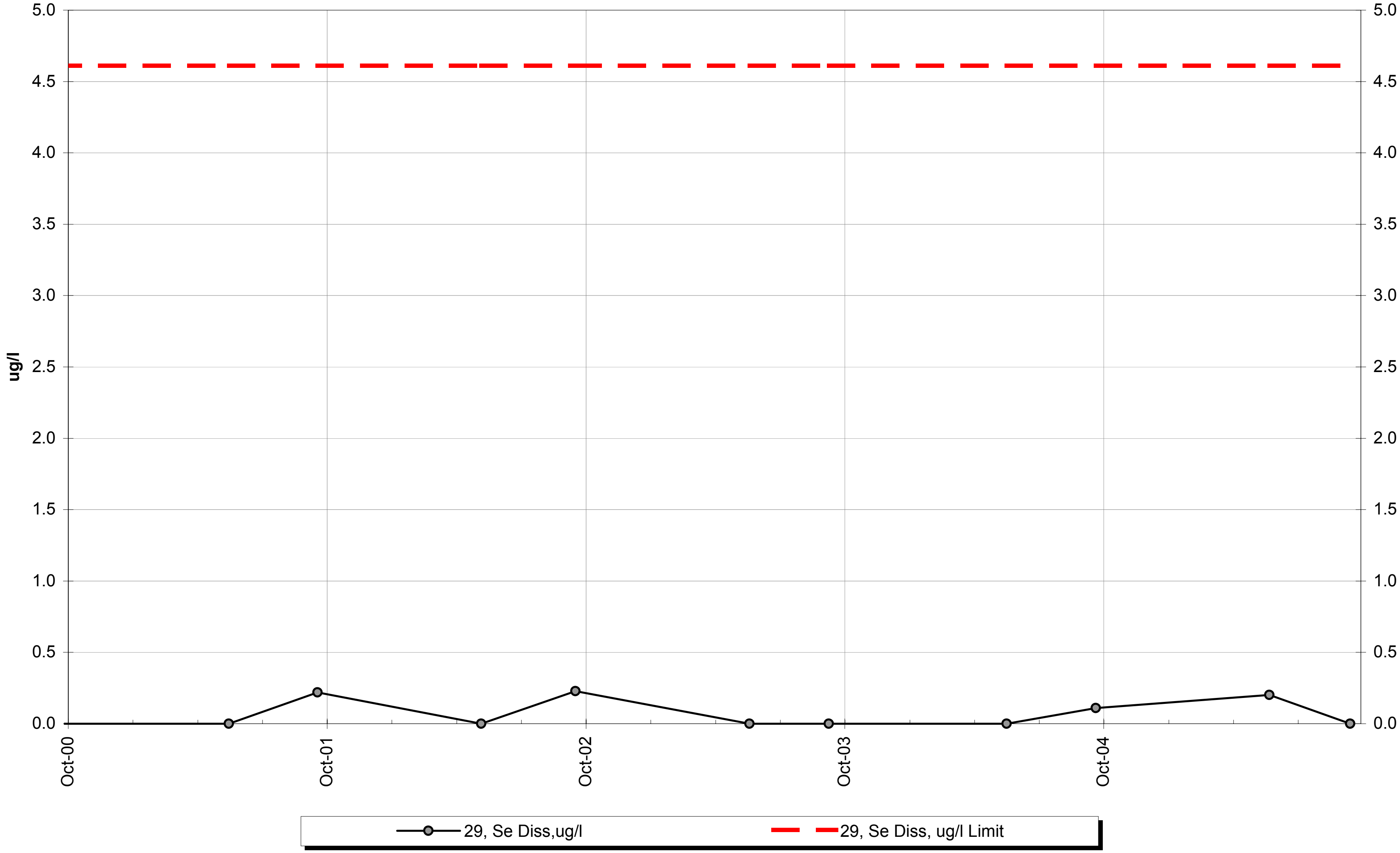


Site 29 -Dissolved Silver
ug/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
29, Ag Diss,ug/l
29, Ag Diss, ug/l Limit

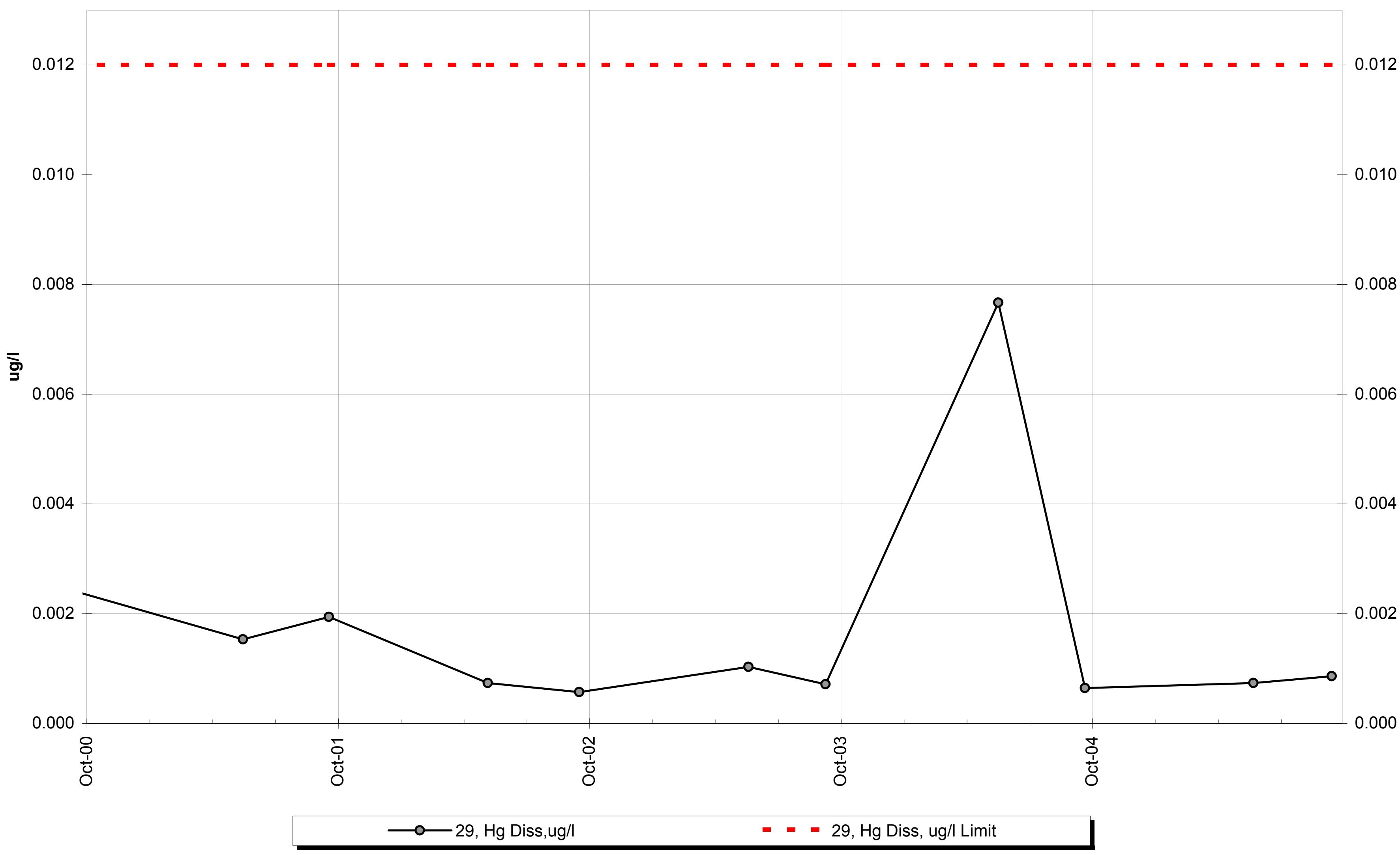
Site 29 -Dissolved Zinc



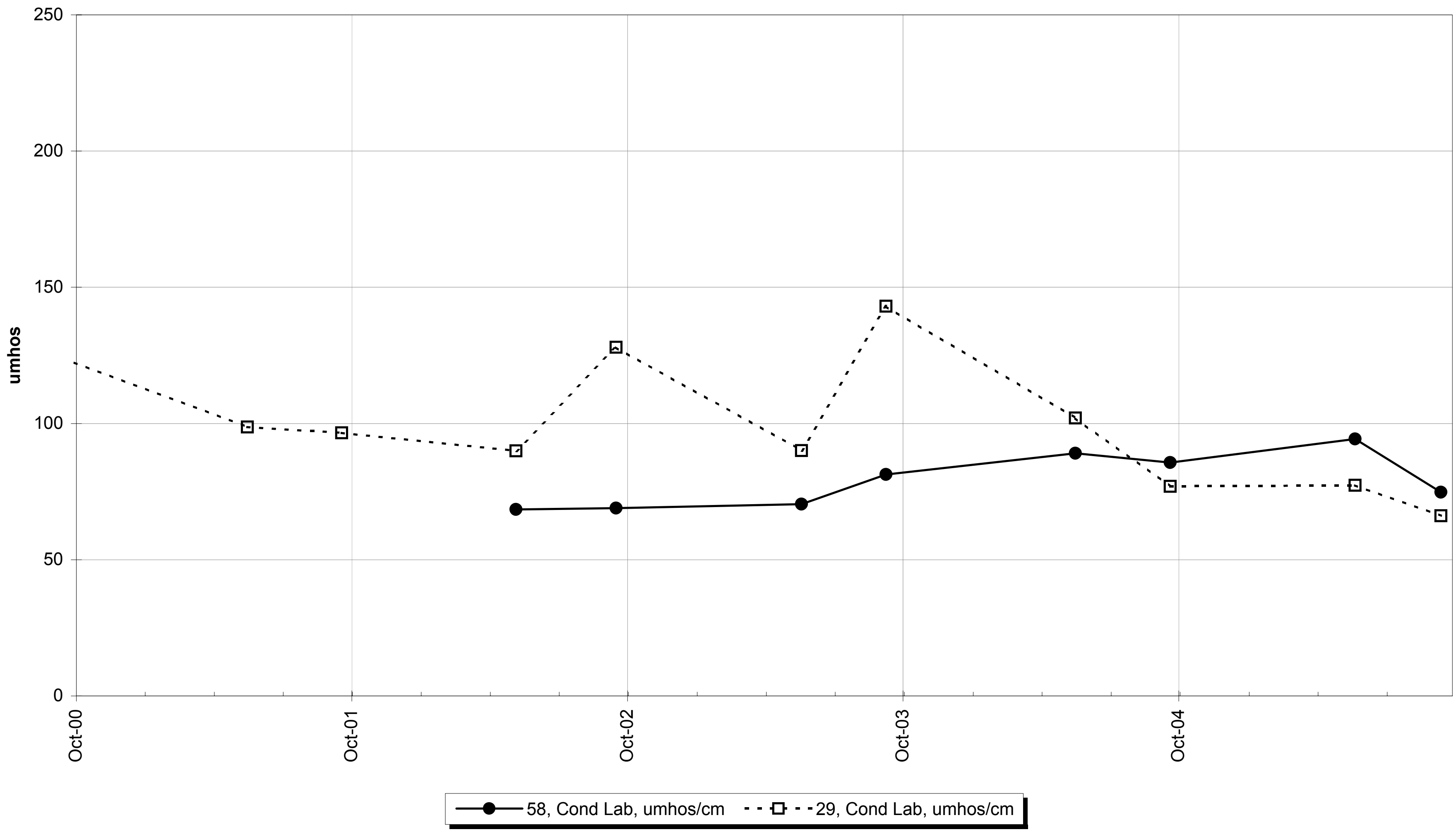
Site 29 -Dissolved Selenium

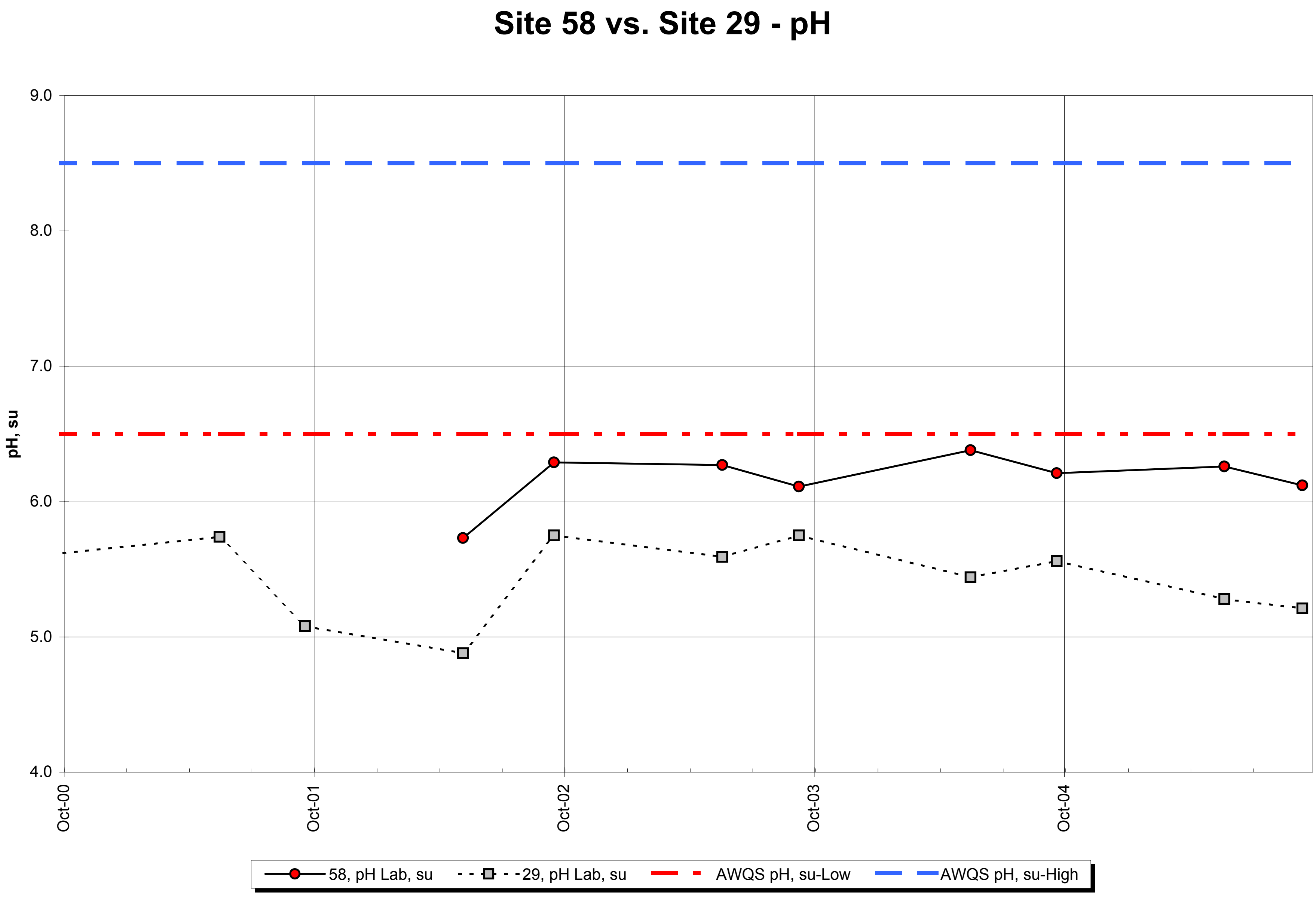


Site 29 -Dissolved Mercury



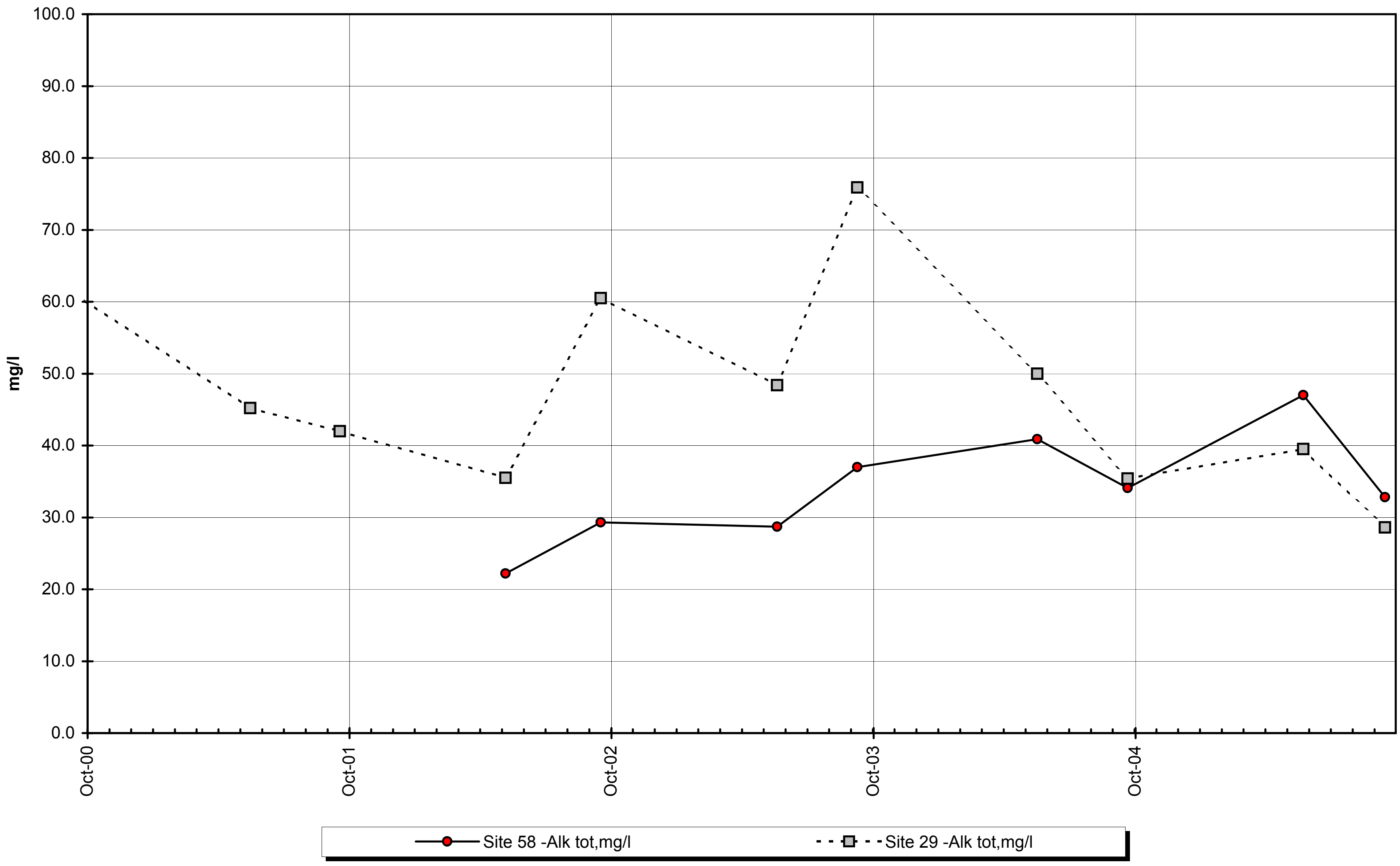
Site 58 vs Site 29 -Conductivity

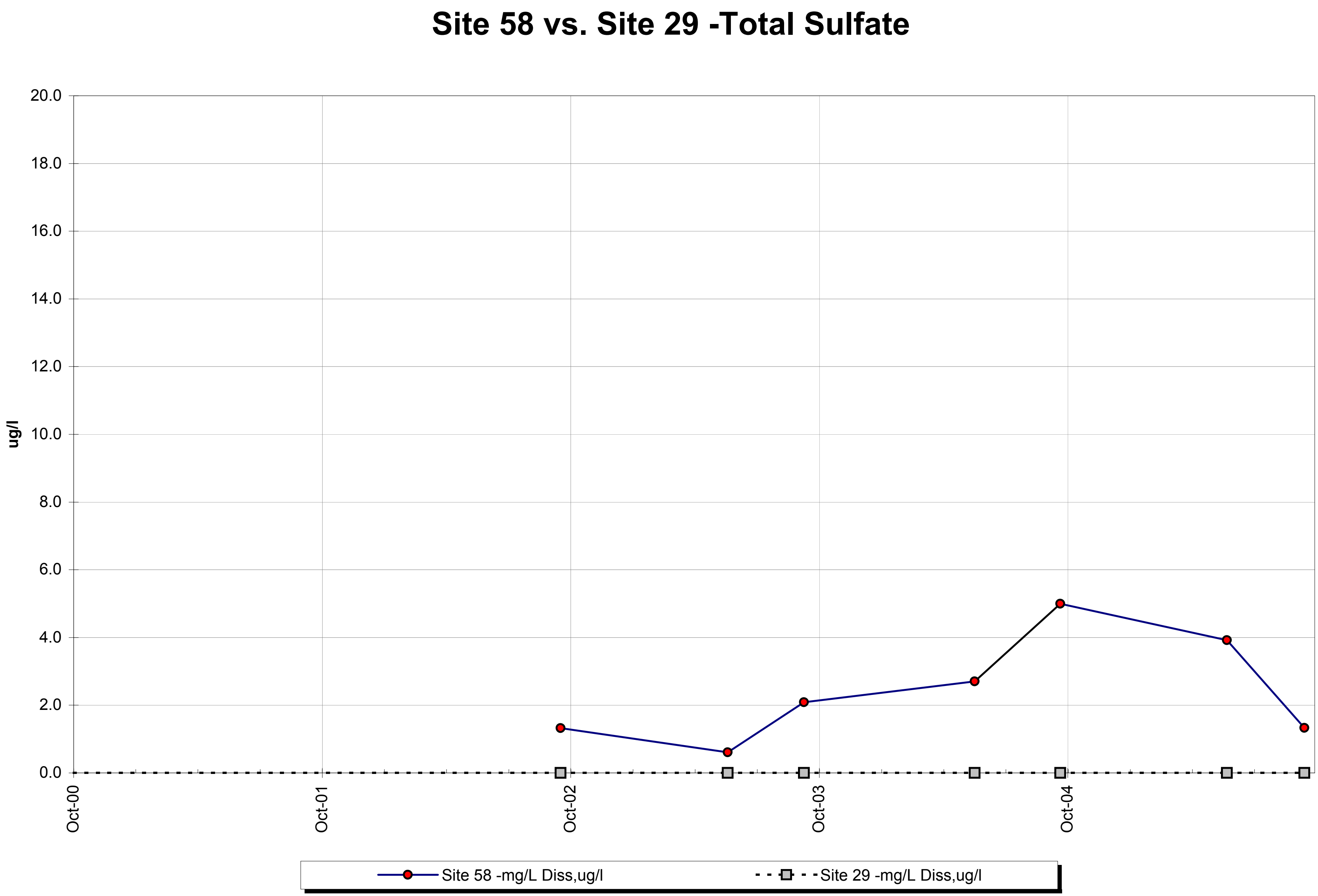


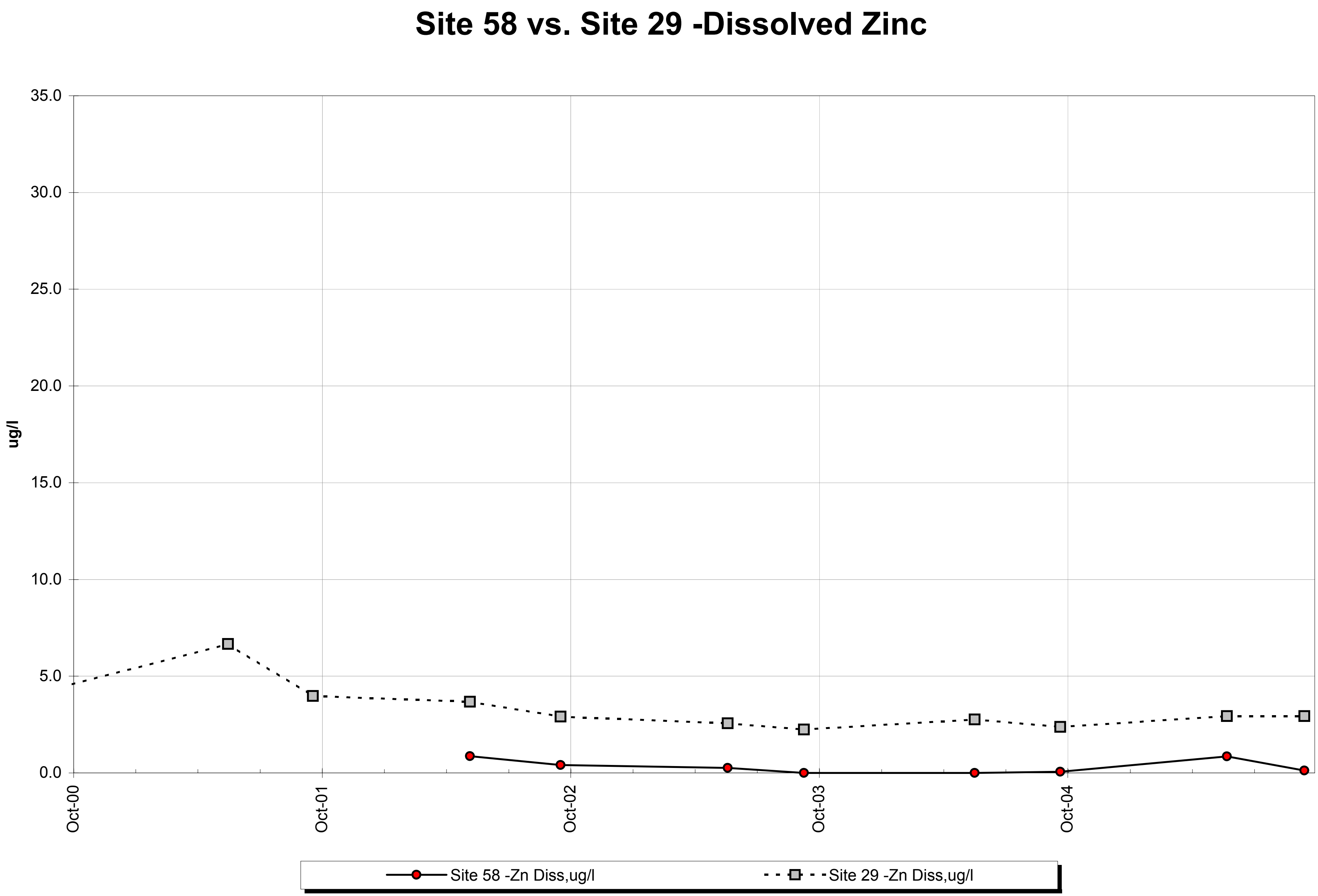


Site 58 vs. Site 29 - pH
9.0
8.0
7.0
6.0
5.0
4.0
pH, su
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
58, pH Lab, su
29, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 58 vs. Site 29 -Total Alkalinity




Site 58 vs. Site 29 -Total Sulfate
ug/l
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 58 -mg/L Diss,ug/l
Site 29 -mg/L Diss,ug/l


Site 58 vs. Site 29 -Dissolved Zinc
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
ug/l
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 58 -Zn Diss,ug/l
Site 29 -Zn Diss,ug/l

Site **#29** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								132.0				124.0
b	**WY2001**								98.7				96.6
c	**WY2002**								89.9				128.0
d	**WY2003**								90.0				143.0
e	**WY2004**								102.0				76.9
f	**WY2005**								77.3				66.1
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				-1
c-a								-1				1
d-a								-1				1
e-a								-1				-1
f-a								-1				-1
c-b								-1				1
d-b								-1				1
e-b								1				-1
f-b								-1				-1
d-c								1				1
e-c								1				-1
f-c								-1				-1
e-d								1				-1
f-d								-1				-1
f-e								-1				-1
S_k	0	0	0	0	0	0	0	-7	0	0	0	-5

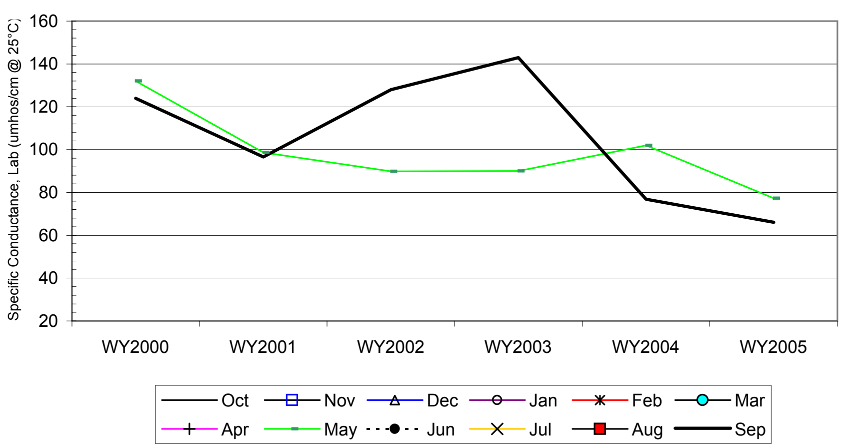
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-1.32				-0.94
Z^2_k								1.73				0.88

ΣZ_k= -2.25
ΣZ^2_k= 2.61
Z-bar=ΣZ_k/K= -1.13

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12
ΣS_k -12

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=	0.07	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity
p	**0.790**		$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc} -1.46	@α/2=2.5% Z= 1.96	H_0 (No trend) ACCEPT
56.67	**p** **0.072**		H_A (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-23.81		1.78
0.050	-15.27	**-7.56**	-3.38
0.100	-11.74		-4.53
0.200	-11.05		-6.18

Site **#29** Seasonal Kendall analysis for pH, Lab, Standard Units

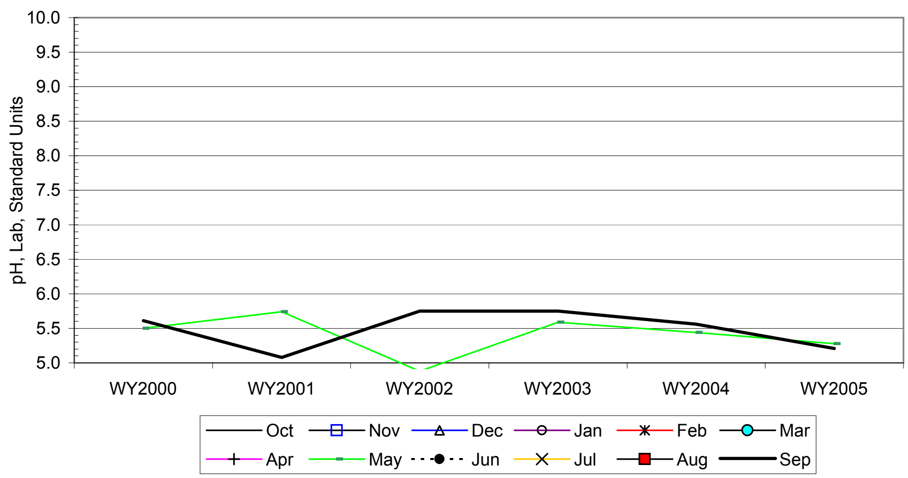
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								5.5				5.6
b	**WY2001**								5.7				5.1
c	**WY2002**								4.9				5.8
d	**WY2003**								5.6				5.8
e	**WY2004**								5.4				5.6
f	**WY2005**								5.3				5.2
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	1
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								1				-1
	c-a								-1				1
	d-a								1				1
	e-a								-1				-1
	f-a								-1				-1
	c-b								-1				1
	d-b								-1				1
	e-b								-1				1
	f-b								-1				1
	d-c								1				0
	e-c								1				-1
	f-c								1				-1
	e-d								-1				-1
	f-d								-1				-1
	f-e								-1				-1
	S_k	0	0	0	0	0	0	0	-5	0	0	0	-2
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-0.94				-0.38
	Z^2_k								0.88				0.14

ΣZ_k=	-1.32
ΣZ^2_k=	1.02
Z-bar=ΣZ_k/K=	-0.66

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn	12
ΣS_k	-7

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.16	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.690**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.80	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	p	**0.213**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.19		0.12
0.050	-0.16	**-0.06**	0.04
0.100	-0.14		0.02
0.200	-0.10		-0.01

Site **#29** Seasonal Kendall analysis for Total Alk, (mg/l)

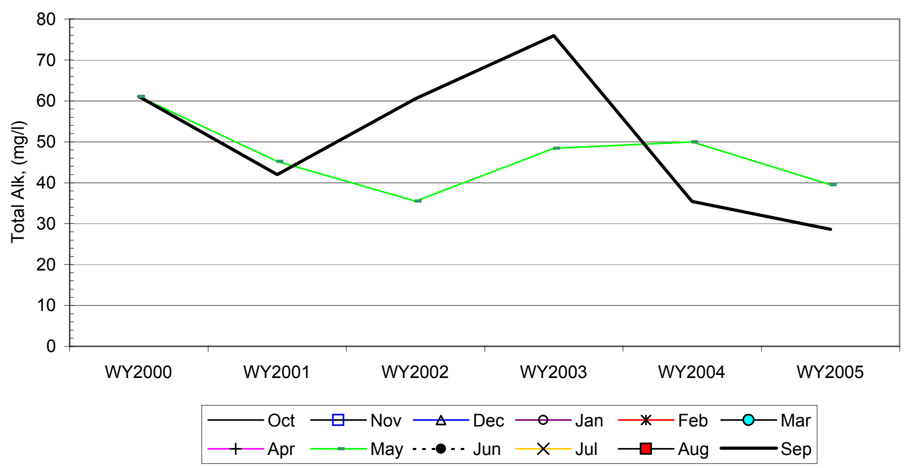
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								61.1				61.1
b	**WY2001**								45.2				42.0
c	**WY2002**								35.5				60.5
d	**WY2003**								48.4				75.9
e	**WY2004**								50.0				35.4
f	**WY2005**								39.5				28.6
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								-1				-1
	c-a								-1				-1
	d-a								-1				1
	e-a								-1				-1
	f-a								-1				-1
	c-b								-1				1
	d-b								1				1
	e-b								1				-1
	f-b								-1				-1
	d-c								1				1
	e-c								1				-1
	f-c								1				-1
	e-d								1				-1
	f-d								-1				-1
	f-e								-1				-1
	S_k	0	0	0	0	0	0	0	-3	0	0	0	-7
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-0.56				-1.32
	Z^2_k								0.32				1.73

ΣZ_k= -1.88
ΣZ^2_k= 2.05
Z-bar=ΣZ_k/K= -0.94

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12
ΣS_k -10

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.28	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.595**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-1.20	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	p	**0.116**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-12.08		1.60
0.050	-9.85	**-3.79**	1.38
0.100	-6.75		-0.50
0.200	-6.44		-2.07

Site **#29** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								5.0				4.4
b	**WY2001**								6.7				4.0
c	**WY2002**								3.7				2.9
d	**WY2003**								2.6				2.2
e	**WY2004**								2.8				2.4
f	**WY2005**								2.9				2.9
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								1				-1
c-a								-1				-1
d-a								-1				-1
e-a								-1				-1
f-a								-1				-1
c-b								-1				-1
d-b								-1				-1
e-b								-1				-1
f-b								-1				-1
d-c								-1				-1
e-c								-1				-1
f-c								-1				1
e-d								1				1
f-d								1				1
f-e								1				1
S_k	0	0	0	0	0	0	0	-7	0	0	0	-7

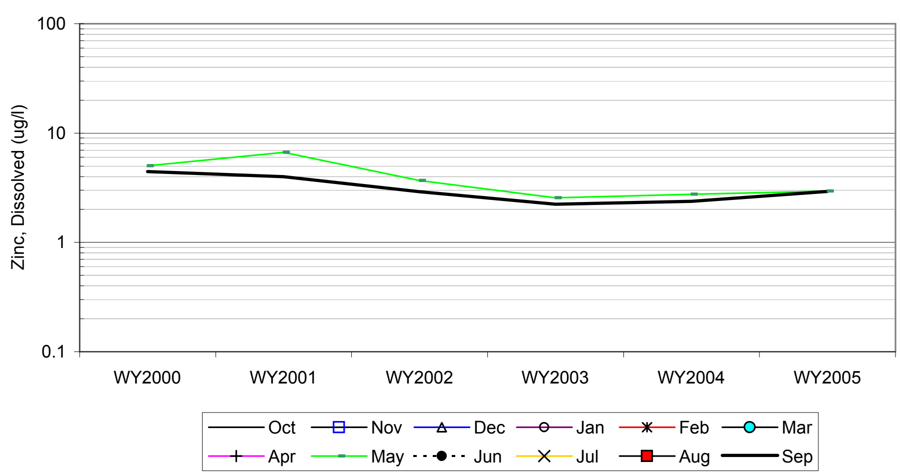
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-1.32				-1.32
Z^2_k								1.73				1.73

ΣZ_k=	-2.63
ΣZ^2_k=	3.46
Z-bar=ΣZ_k/K=	-1.32

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	12
ΣS_k	-14

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=		0.00	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**1.000**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-1.73	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	p	**0.042**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.92		0.11
0.050	-0.77	**-0.49**	-0.26
0.100	-0.72		-0.27
0.200	-0.67		-0.39

INTERPRETIVE REPORT
SITE 32 "MONITORING WELL 5S"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Seven results exceeding these criteria have been identified, as listed in the table below. Four of these datum are for lab pH values below the lower limit of 6.5 su listed in AWQS. Lab and field pH for Site 32 has historically resulted in values ranging from a pH of 4.5 to 5.5 su which are characteristic for wells completed in organic rich peat sediments. One (1) exceedance for total alkalinity in Sept-2005 for which Site 32 has a eleven-year average value of 19.3 mg/l, which is below AWQS of 20 mg/l. The final two exceedances are for dissolved lead concentrations. The May-2005 sample had a dissolved lead concentration of 1.06 µg/l that exceeds the minimum hardness dependent AWQS standard of 0.541 µg/l. The September-2005 sample had a dissolved lead concentration of 1.52 µg/l that exceeds the hardness dependent AWQS standard of 0.541 µg/l. Due to the low hardness for this site 18 of the past 19 samples have returned lead values higher than AWQS but within the same general range of 1.0-3.5µg/l of dissolved lead. The eighteen samples represent all the samples taken since the inception of a lower MDL for lead determinations in June-1998.

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
05/24/05	pH Lab, su	5.07		6.5 - 8.5	Aquatic Life
05/24/05	pH Field, su	5.28		6.5 - 8.5	Aquatic Life
09/15/05	pH Lab, su	5.12		6.5 - 8.5	Aquatic Life
09/15/05	pH Field, su	5.27		6.5 - 8.5	Aquatic Life
09/15/05	Total Alkalinity, mg/L	17.6		>20	Aquatic Life, chronic
05/24/05	Lead, Dissolved ug/L	1.06	10.4	0.541	Aquatic Life, chronic
09/15/05	Lead, Dissolved ug/L	1.52	10.4	0.541	Aquatic Life, chronic

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious trends are apparent except perhaps for dissolved barium. The last datum collected for dissolved barium in Sept-2005 was a new site maximum value of 32.2 µg/l. This new maximum on the right-hand side of the graph gives the visual impression of an increasing trend. However, all the data collected from Sept-2001 through May-2005 forms a fairly tight range of values between 18 – 25 µg/l dissolved barium. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). No significant trends are identified.

Site 32-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	-1.20	-	0.12		
pH, Lab	6	0.00	o	0.50		
Alkalinity, Total	6	0.80	+	0.79		
Zinc, Dissolved	6	-0.40	-	0.35		

(1): Number of years (2):Significance level

Additional X-Y plots have been generated for alkalinity, pH, conductance, sulfate, and dissolved zinc that co-plot data from Site 32 and Site 58, the upgradient control site, to aid in comparison between those two sites. Lab conductivity, total sulfate, and total alkalinity are slightly higher at Site 58 while lab pH is more basic at Site 58, median pH of 6.24, than at Site 32 with a median pH of 5.2. Dissolved zinc levels are higher at Site 32 than at Site 58. The long-term median value for dissolved zinc since June 1998 is 8.9 µg/l, which is greater than Site 58 and the other shallow wells completed into peat (e.g. Site 27 and Site 29) yet continues below the AWQS level. The lower pH at Site 32 with respect to the other shallow wells may account for the elevated zinc concentration found there due to the higher zinc solubility at a lower pH.

Table of Results for Water Year 2005

Site 32 "MW-5S"													
Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							8.0	NOT SCHEDULED FOR SAMPLING			10.0	9.0
Conductivity-Field(µmho)								75				69	72
Conductivity-Lab (µmho)								58				55	56
pH Lab (standard units)								5.07				5.12	5.10
pH Field (standard units)								5.28				5.27	5.28
Total Alkalinity (mg/L)								21.4				17.6	19.5
Total Sulfate (mg/L)								<0.1				<0.1	0.1
Hardness (mg/L)								10.4				10.4	10.4
Dissolved As (ug/L)								5.030				6.910	5.970
Dissolved Ba (ug/L)								22.9				32.2	27.6
Dissolved Cd (ug/L)								0.008 U				0.007 J	0.008
Dissolved Cr (ug/L)								2.610				3.550	3.080
Dissolved Cu (ug/L)								0.794				0.890	0.842
Dissolved Pb (ug/L)								1.0600				1.5200	1.2900
Dissolved Ni (ug/L)								3.950				4.090	4.020
Dissolved Ag (ug/L)								<0.003				0.004 J	0.003
Dissolved Zn (ug/L)								6.48				8.95	7.72
Dissolved Se (ug/L)								0.329 J				0.239 J	0.284
Dissolved Hg (ug/L)								0.001880 U				0.001120	0.001500

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

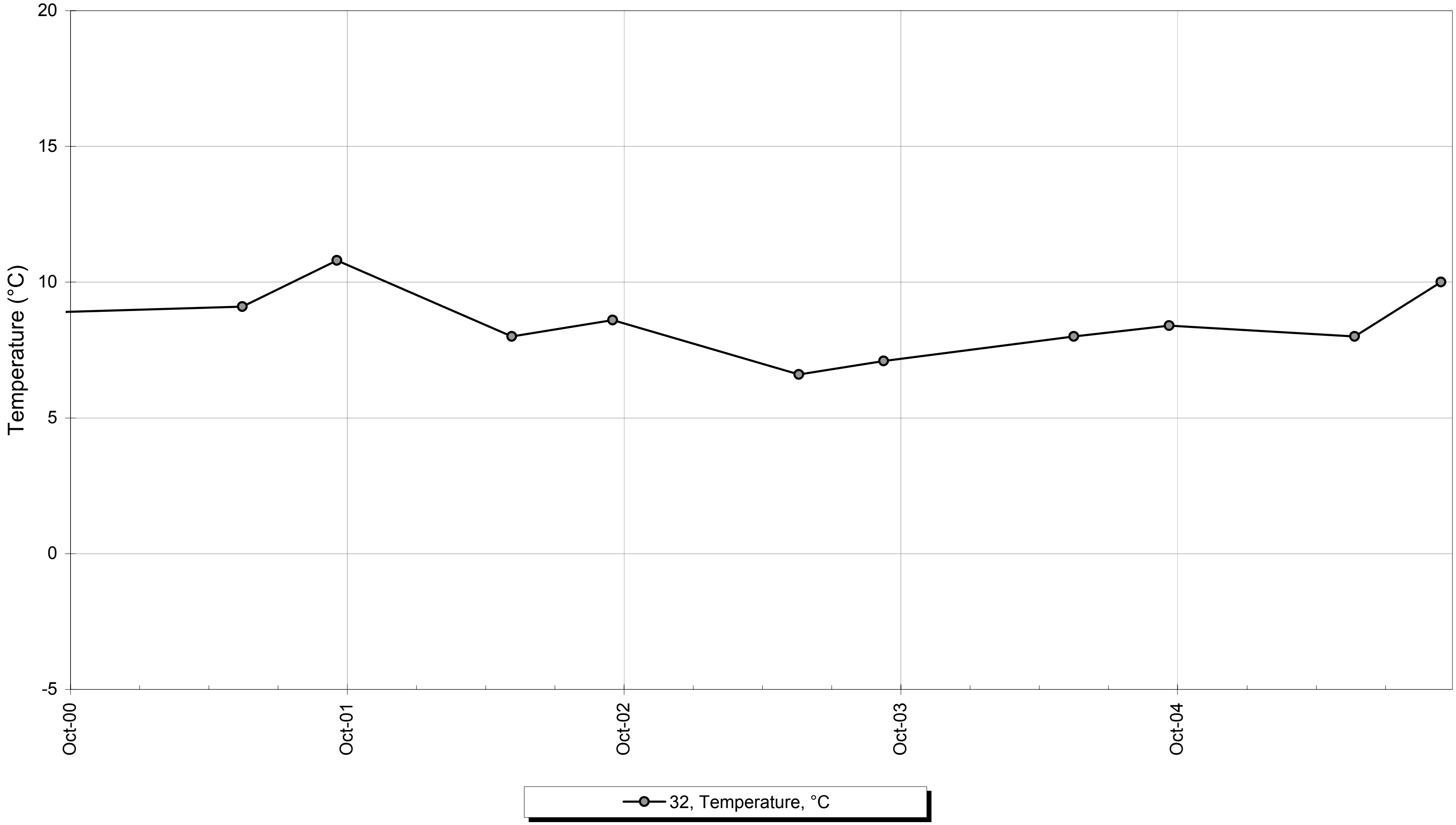
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

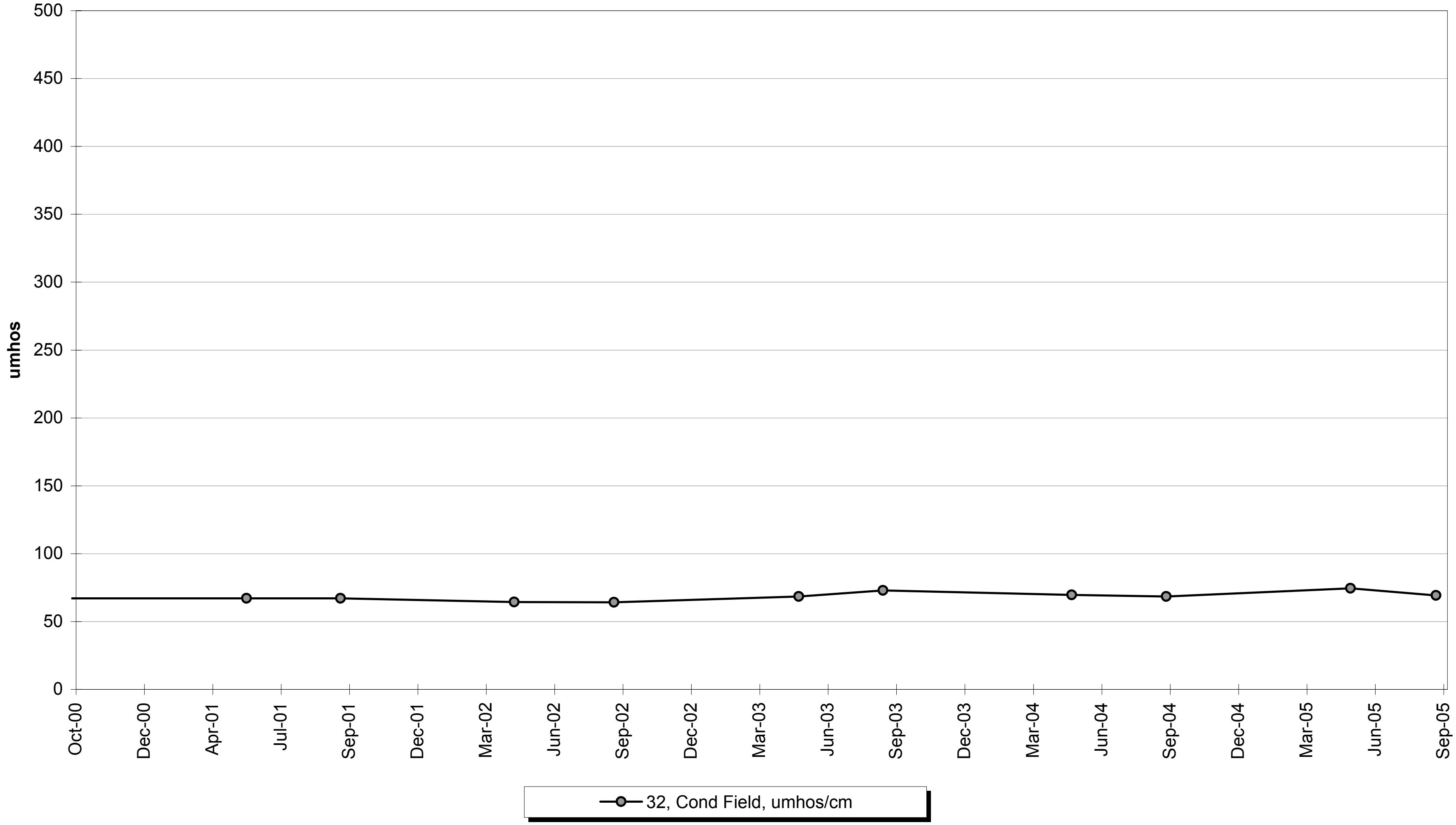
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
32	05/24/2005	2:55:00 PM				
			Cd Diss, ug/l	0.00807	U	Field Blank Contamination
			Se Diss, ug/l	0.329	J	Below Quantitative Range, L
			Hg Diss, ug/l	0.00188	U	Field Blank Contamination
32	09/15/2005	1:50:00 PM				
			Cd Diss, ug/l	0.00697	J	Below Quantitative Range
			Ag Diss, ug/l	0.00366	J	Below Quantitative Range
			Se Diss, ug/l	0.239	J	Below Quantitative Range

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

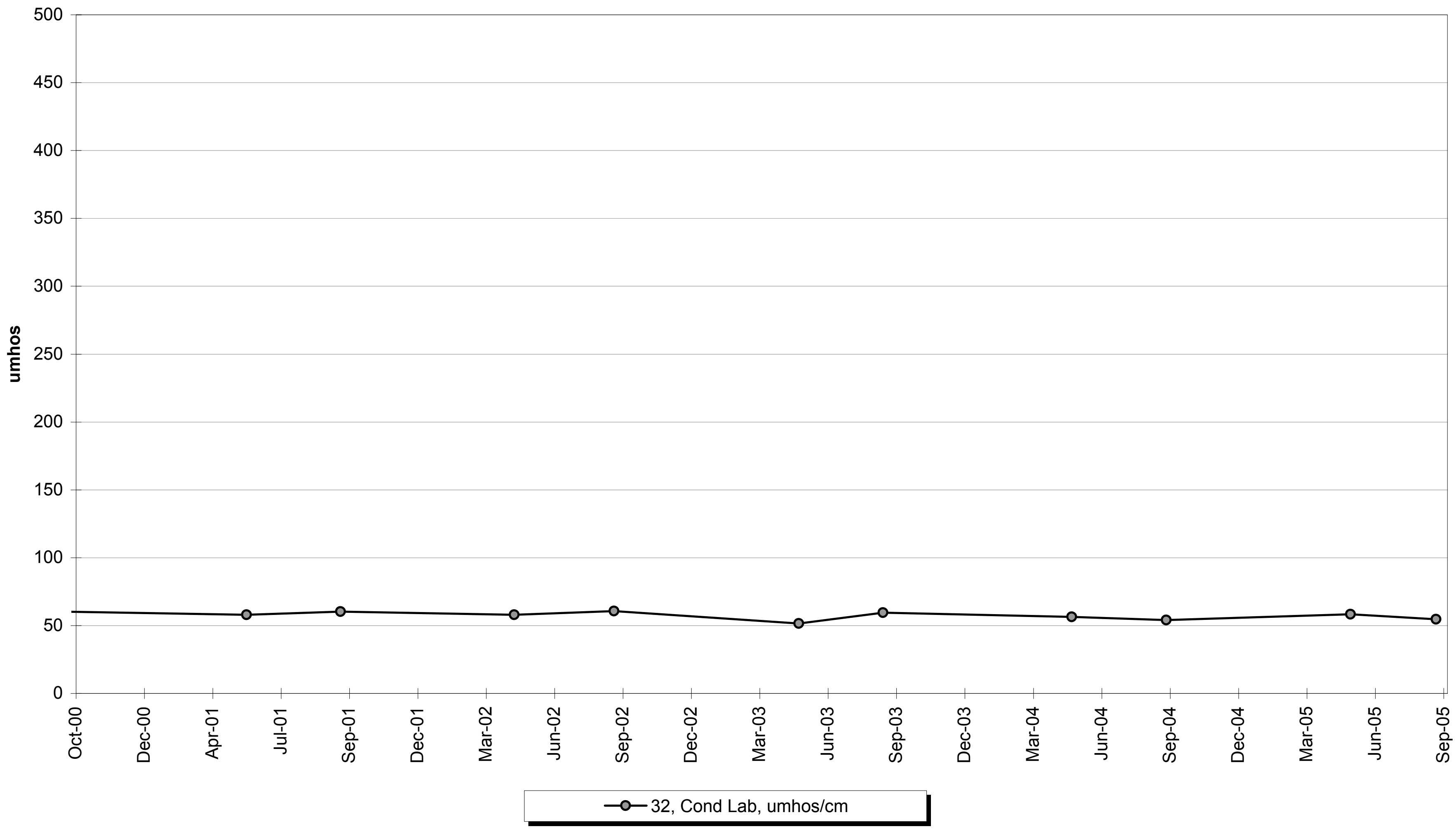
Site 32 -Water Temperature



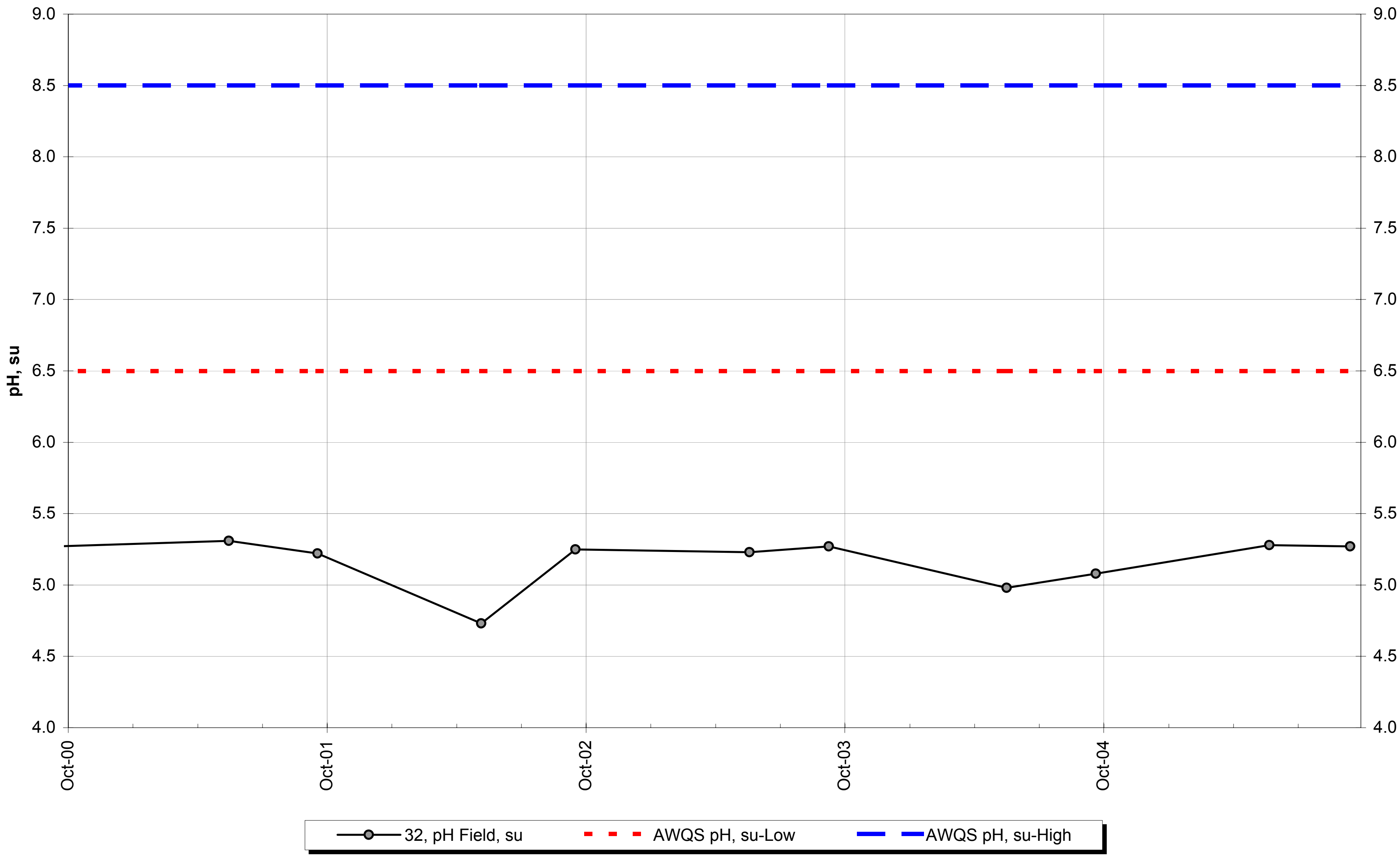
Site 32 -Conductivity-Field



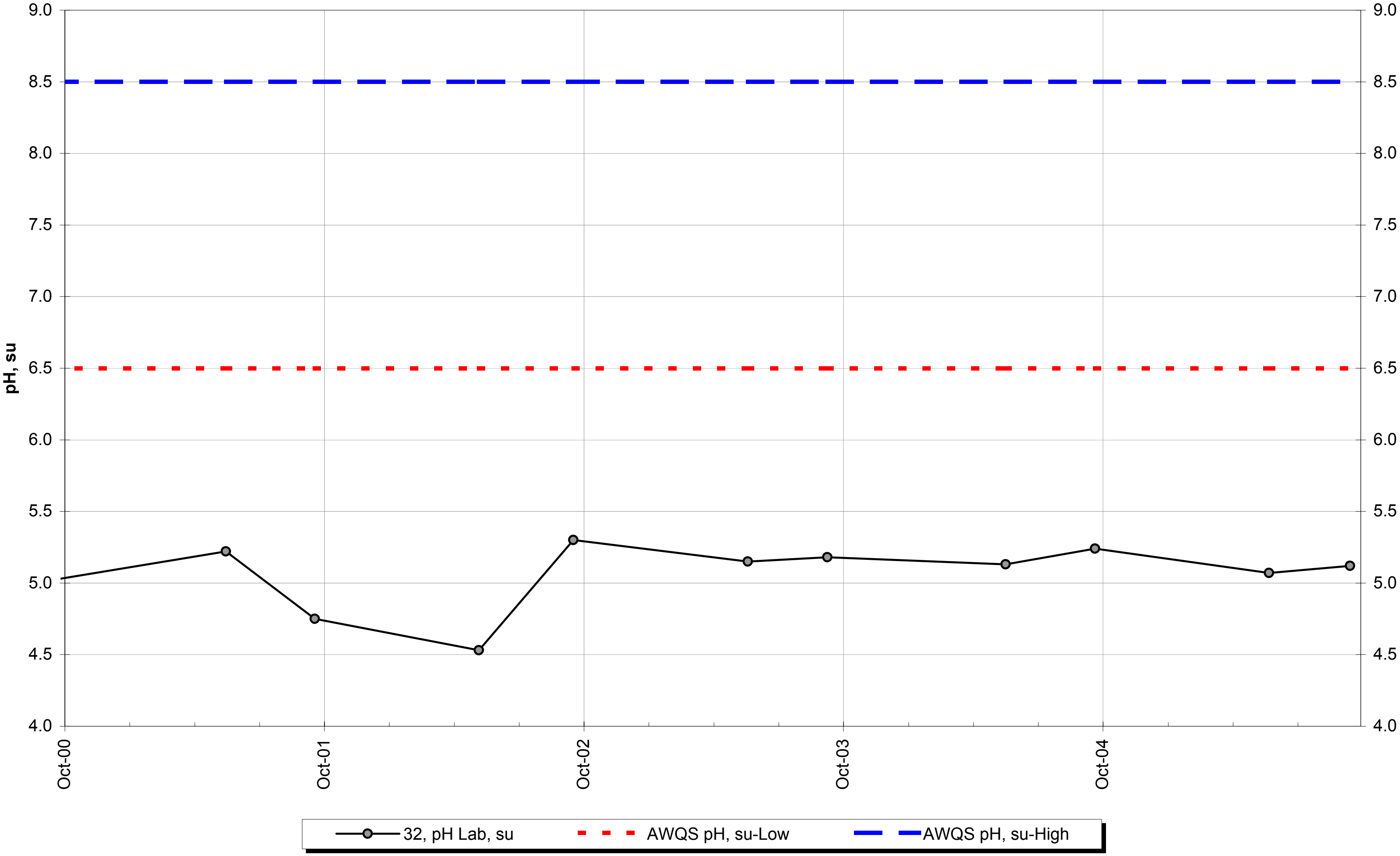
Site 32 -Conductivity-Lab



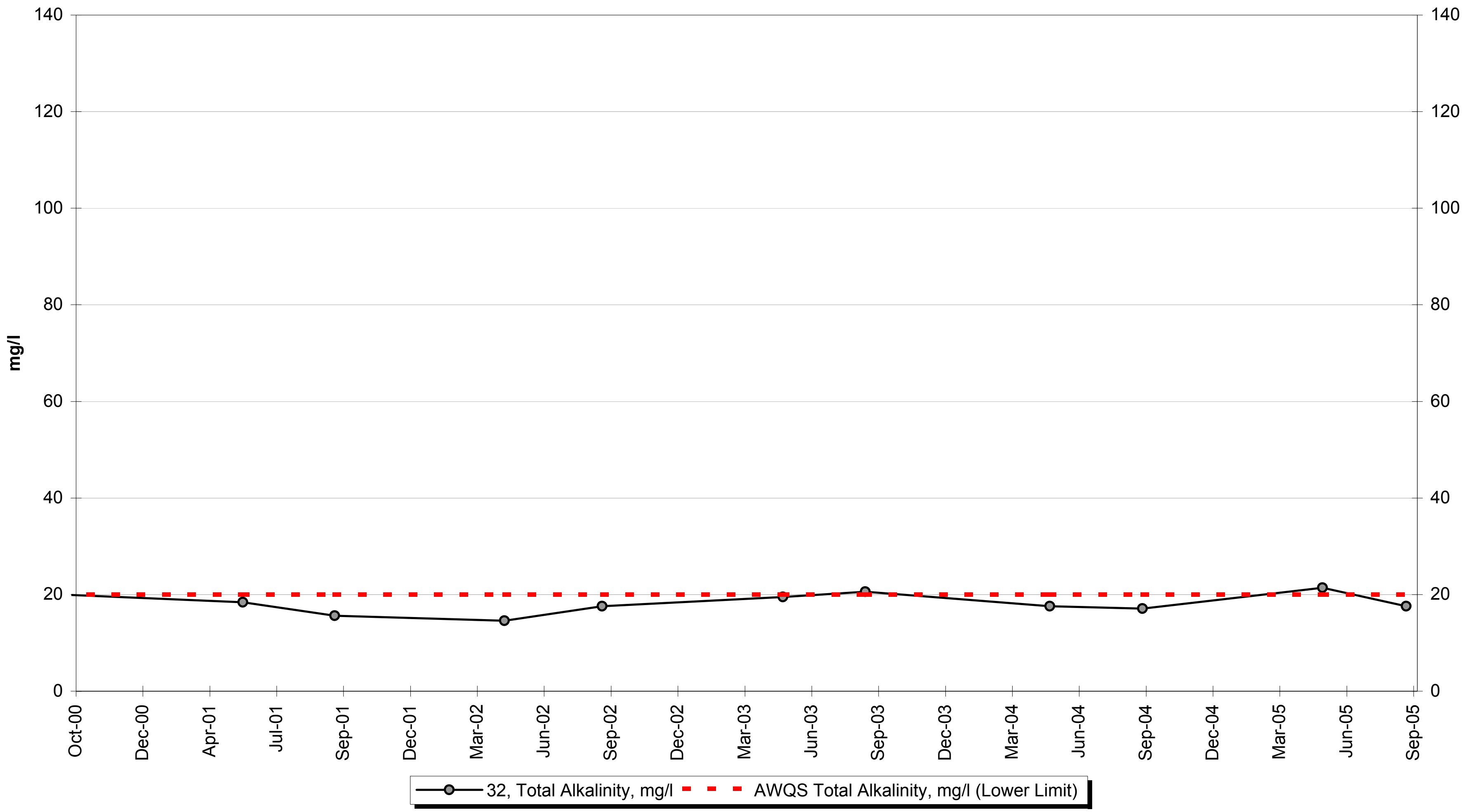
Site 32 -Field pH



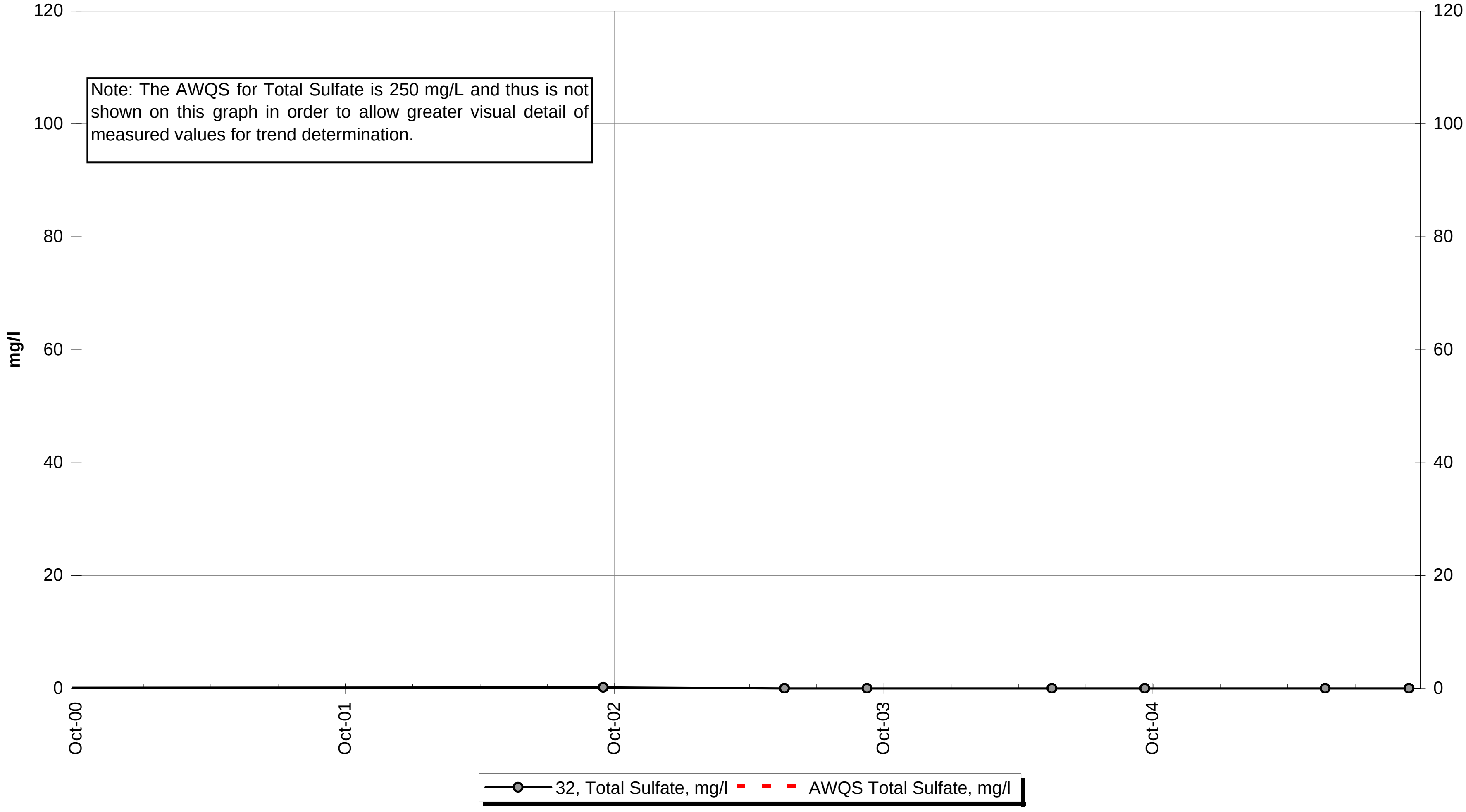
Site 32 -Lab pH

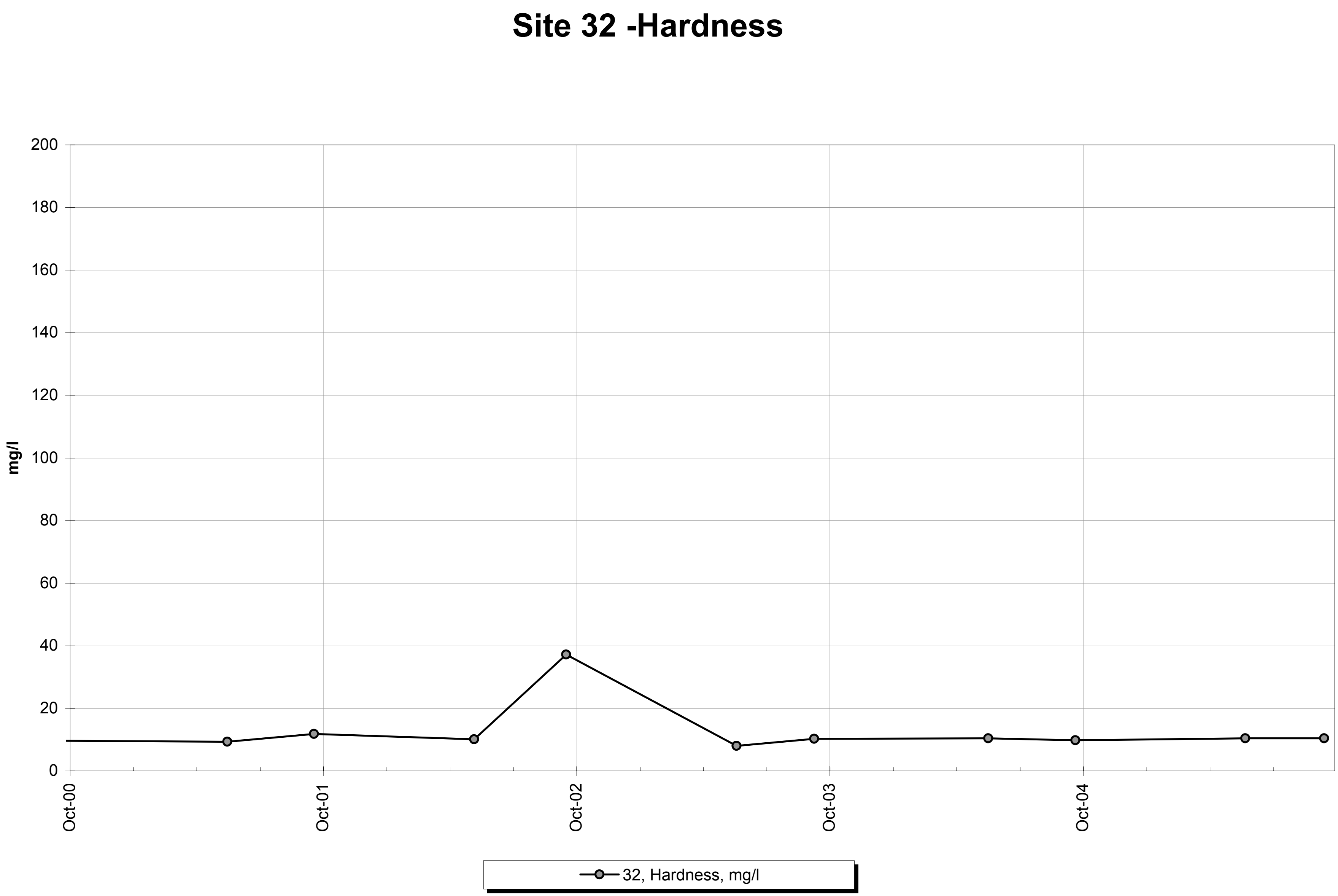


Site 32 -Total Alkalinity



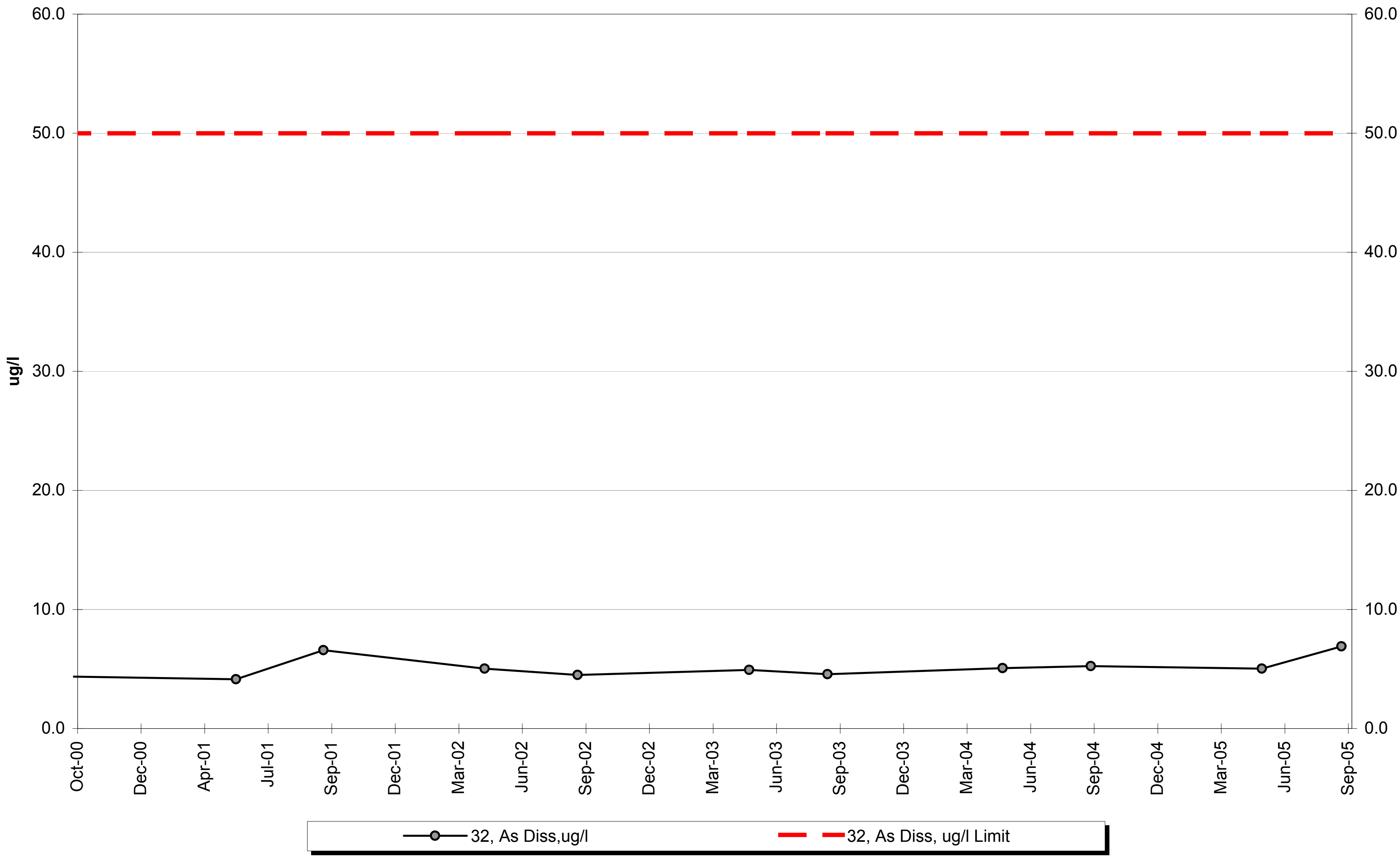
Site 32 -Total Sulfate



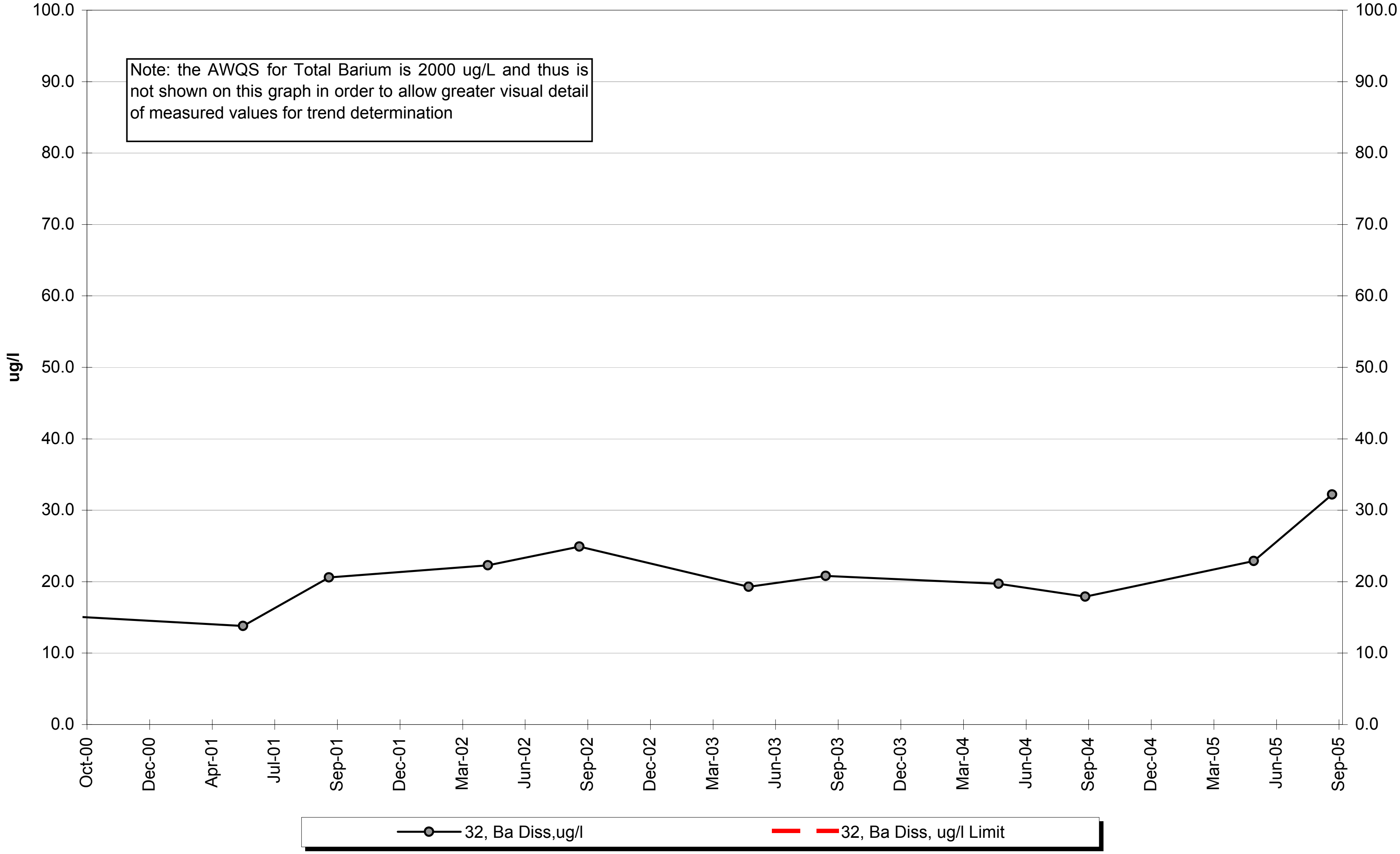


Site 32 -Hardness
mg/l
200
180
160
140
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
32, Hardness, mg/l

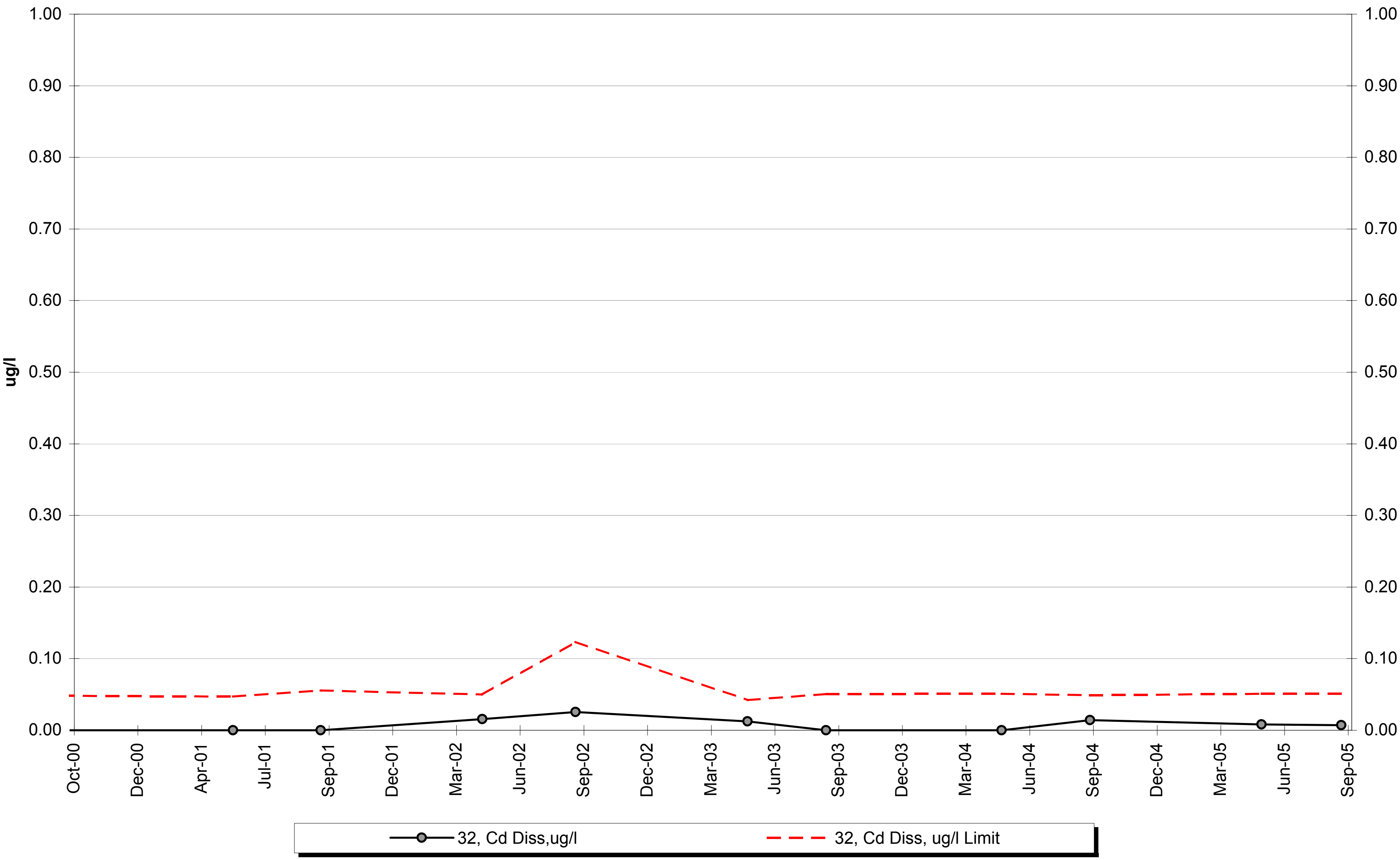
Site 32 -Dissolved Arsenic

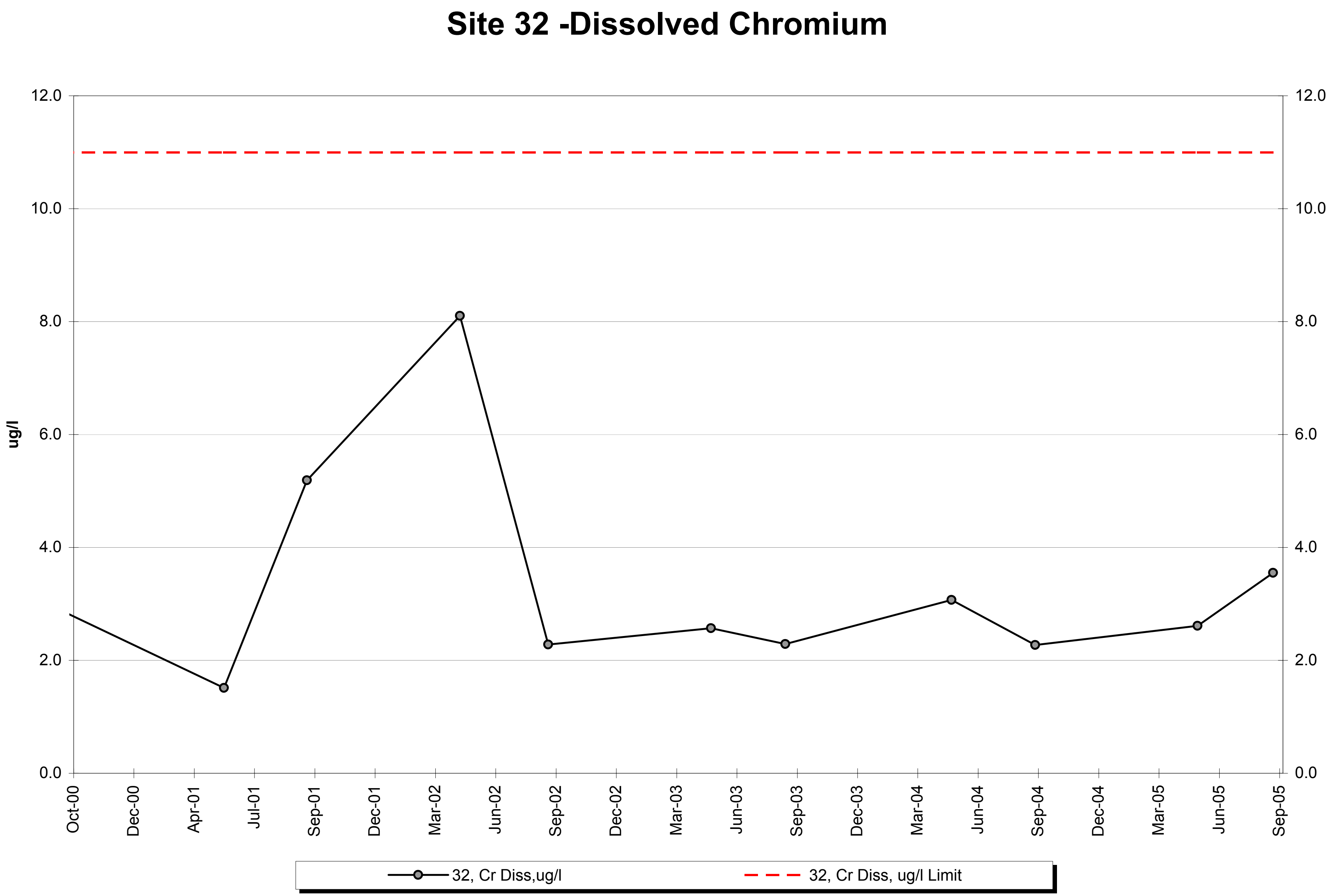


Site 32 -Dissolved Barium

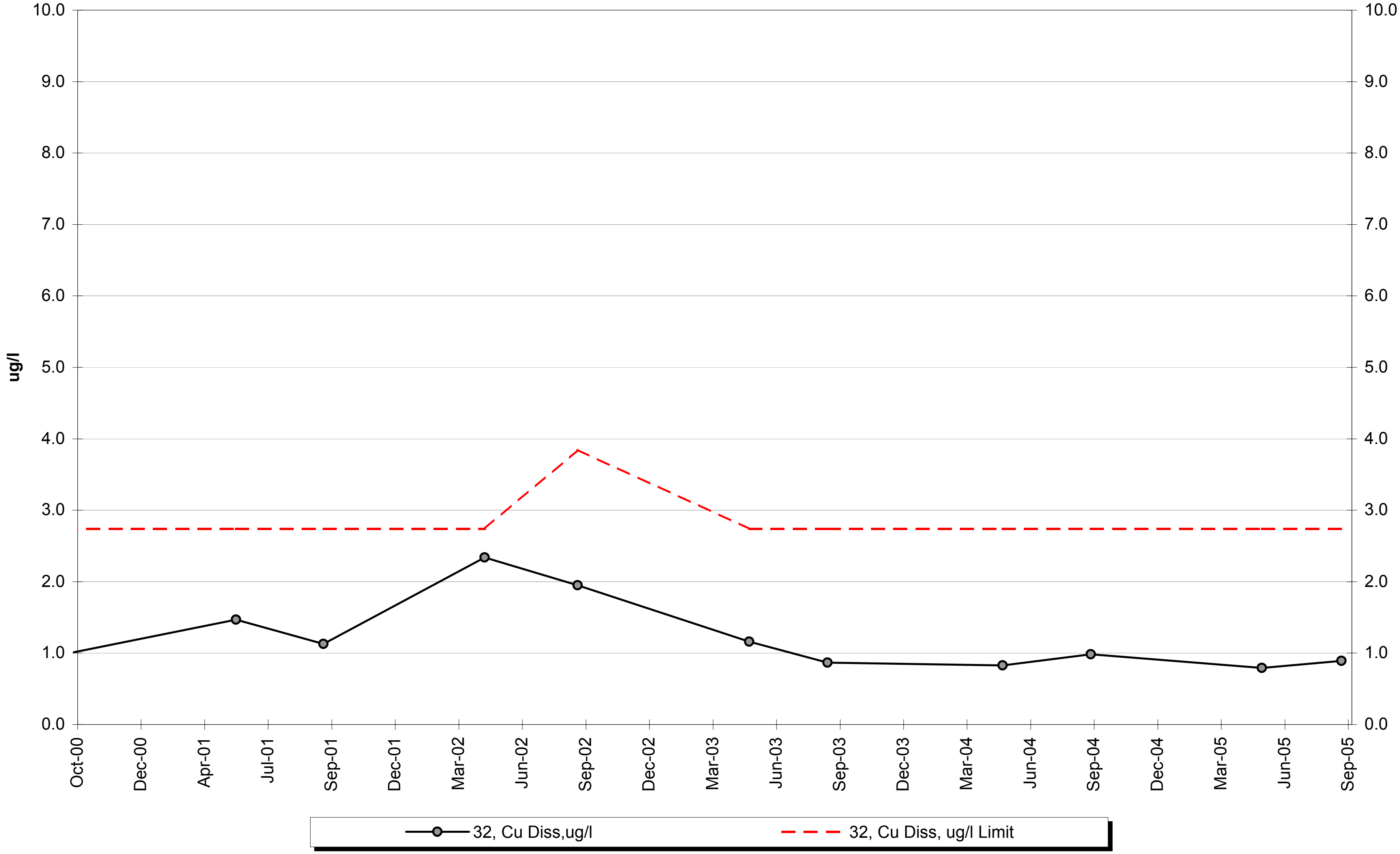


Site 32 -Dissolved Cadmium

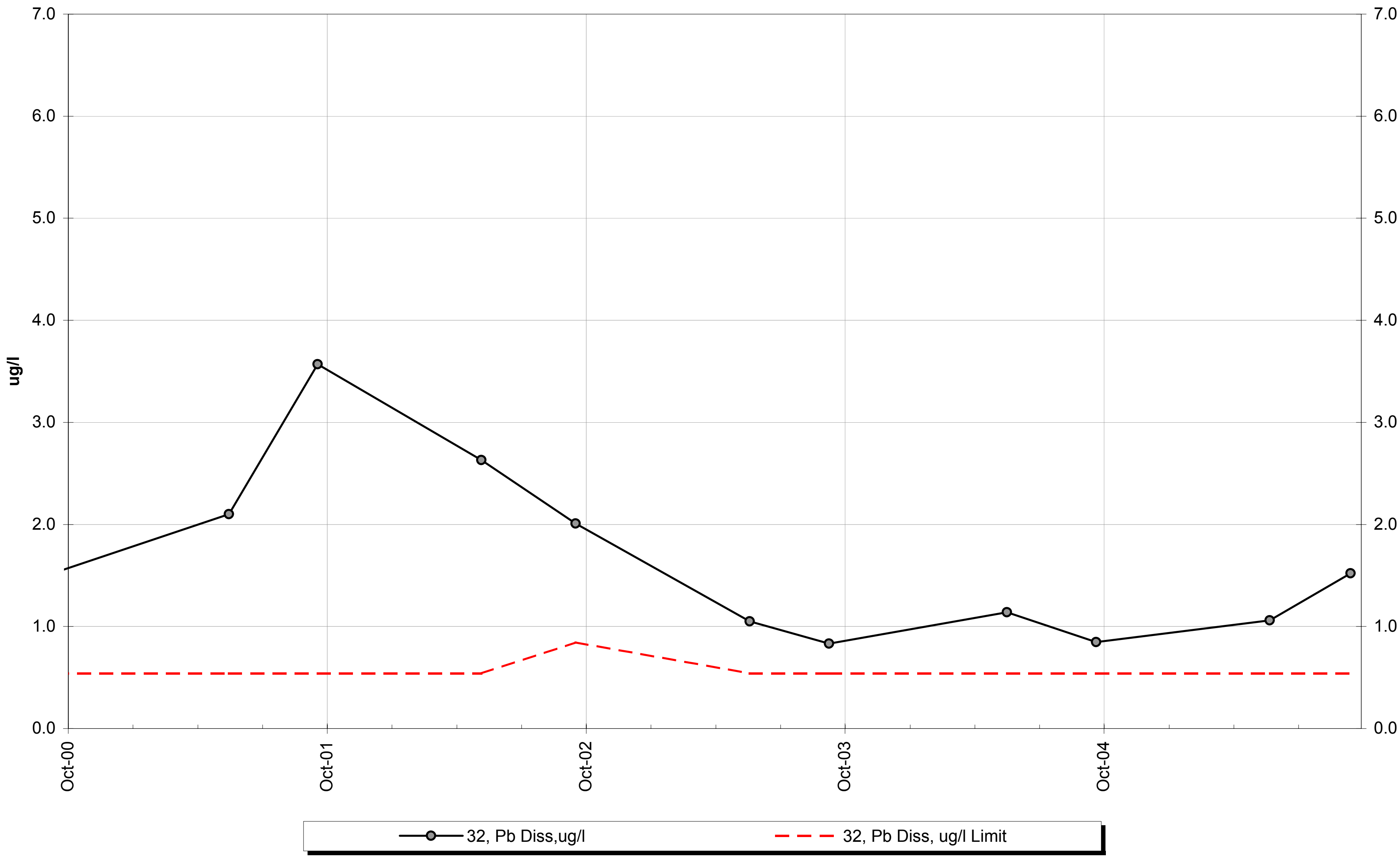



Site 32 -Dissolved Chromium
12.0
10.0
8.0
6.0
4.0
2.0
0.0
ug/l
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
32, Cr Diss,ug/l
32, Cr Diss, ug/l Limit

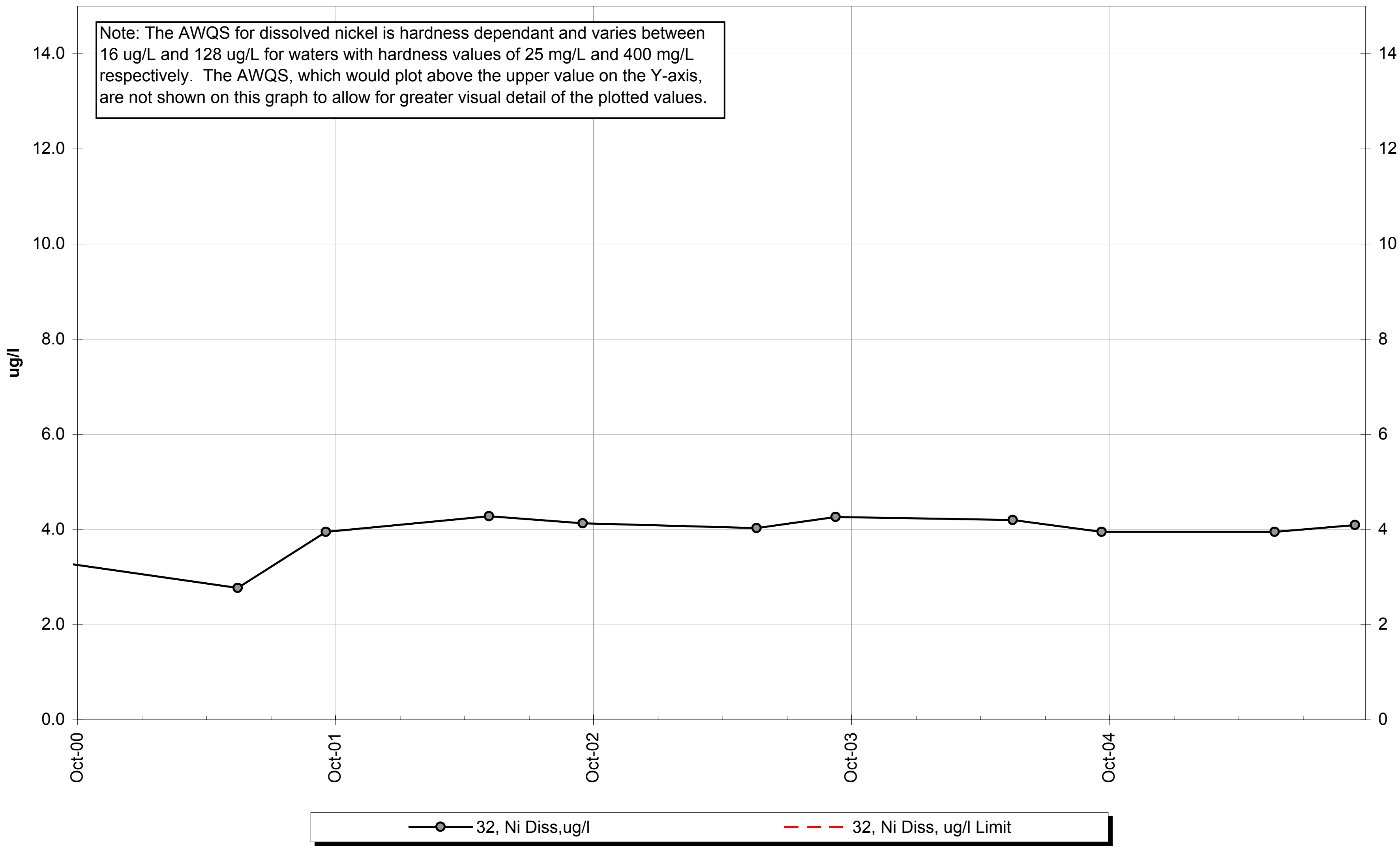
Site 32 -Dissolved Copper

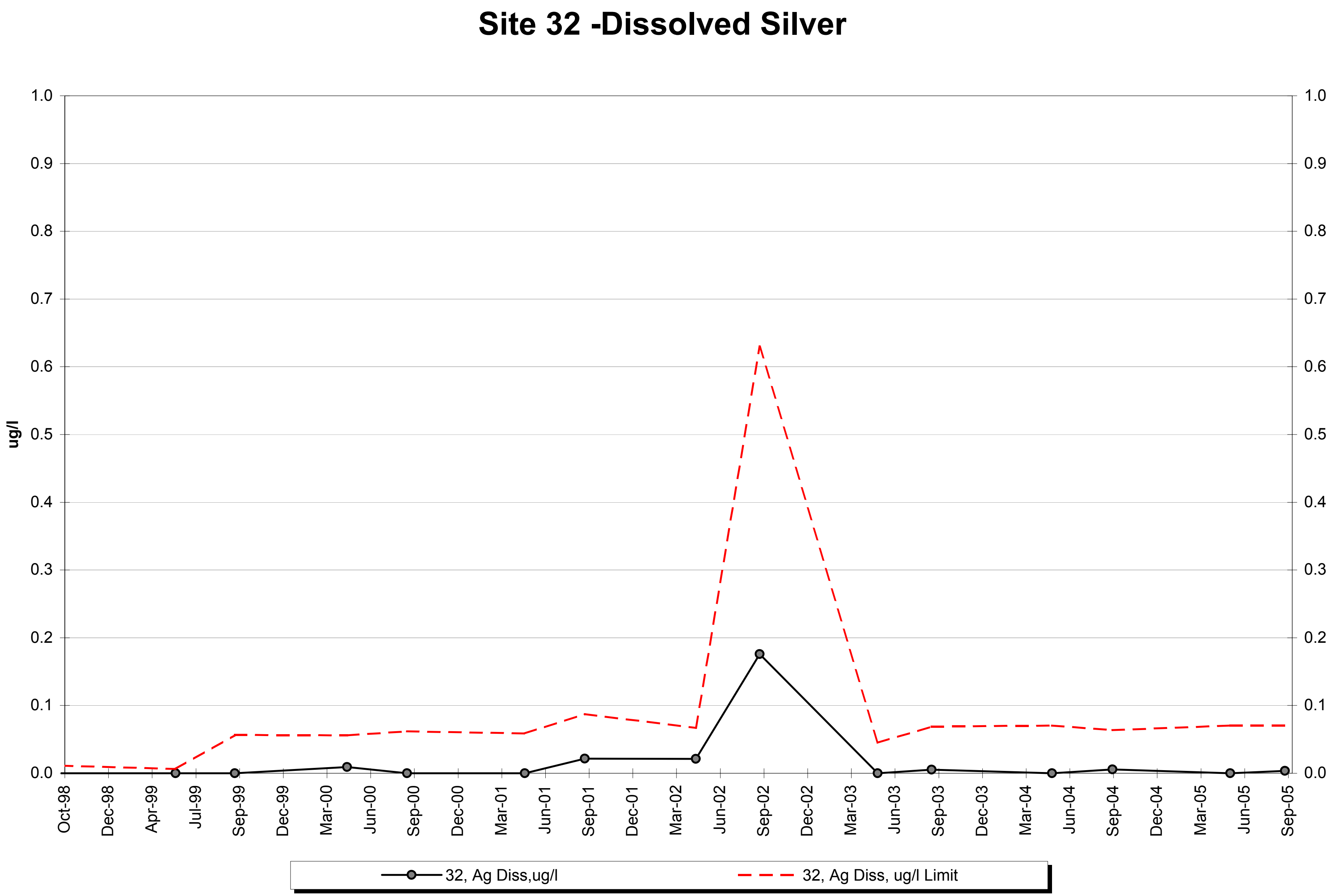


Site 32 -Dissolved Lead

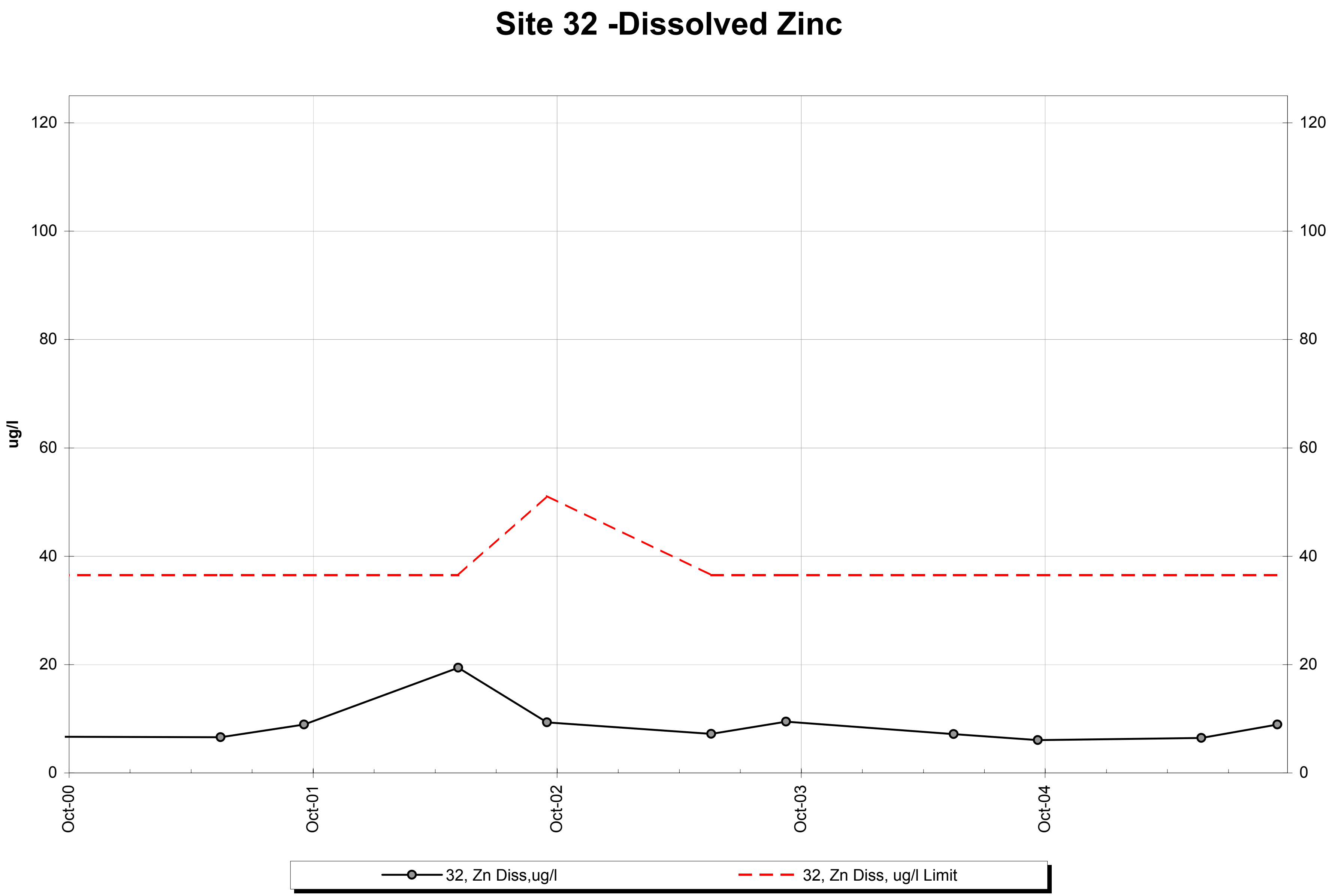


Site 32 -Dissolved Nickel



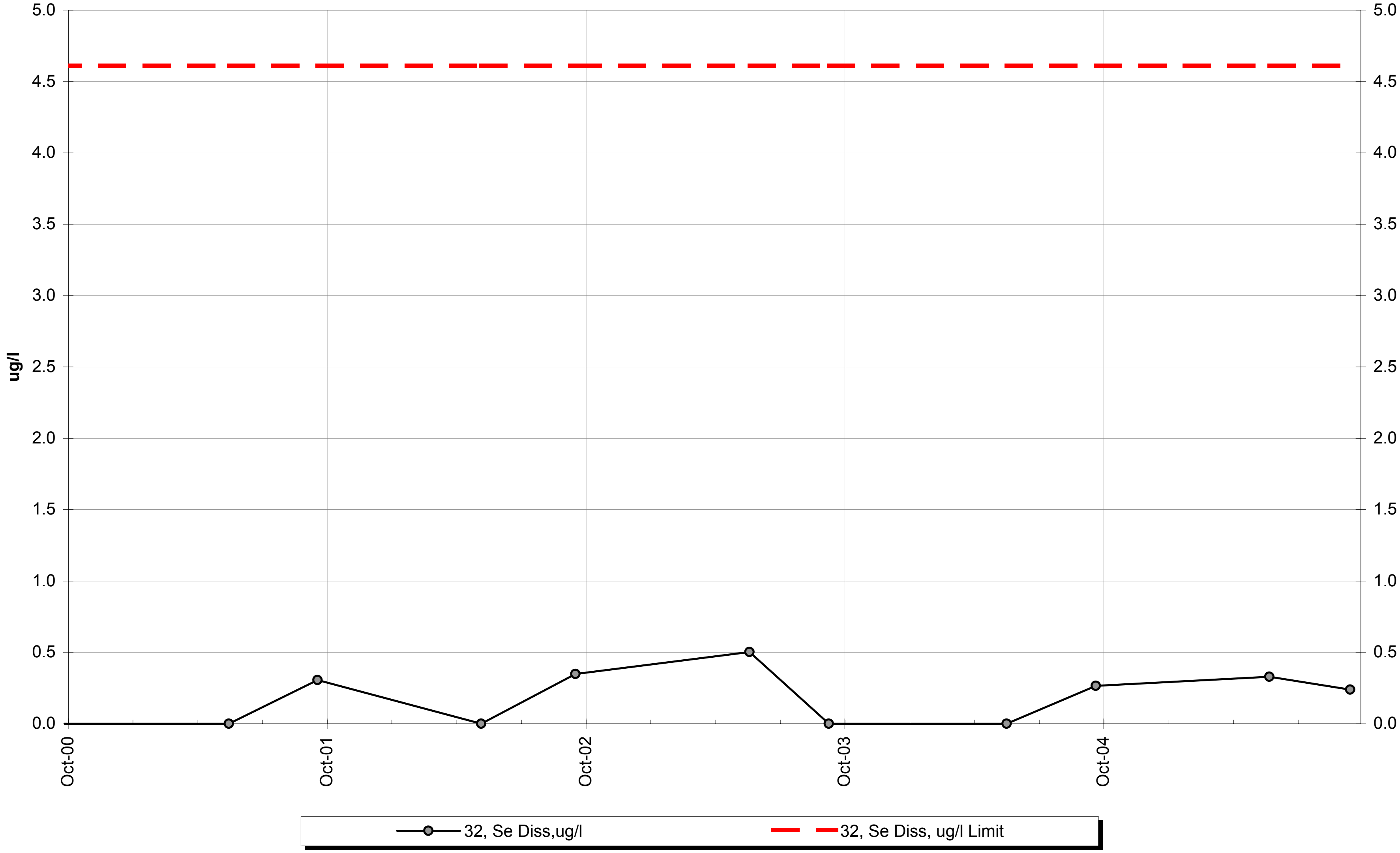


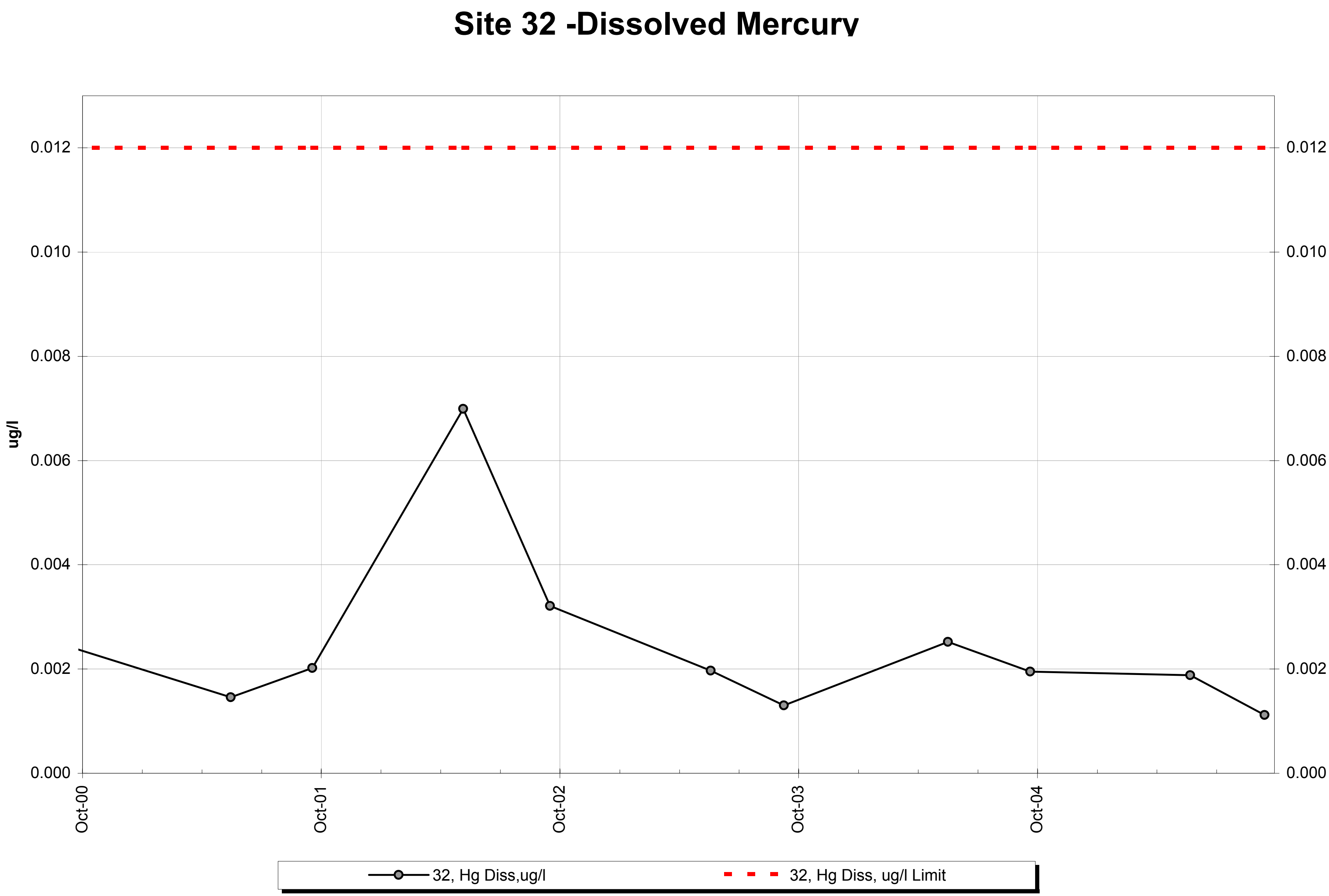
Site 32 -Dissolved Silver
ug/l
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
32, Ag Diss,ug/l
32, Ag Diss, ug/l Limit



Site 32 -Dissolved Zinc
ug/l
120
100
80
60
40
20
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
32, Zn Diss,ug/l
32, Zn Diss, ug/l Limit

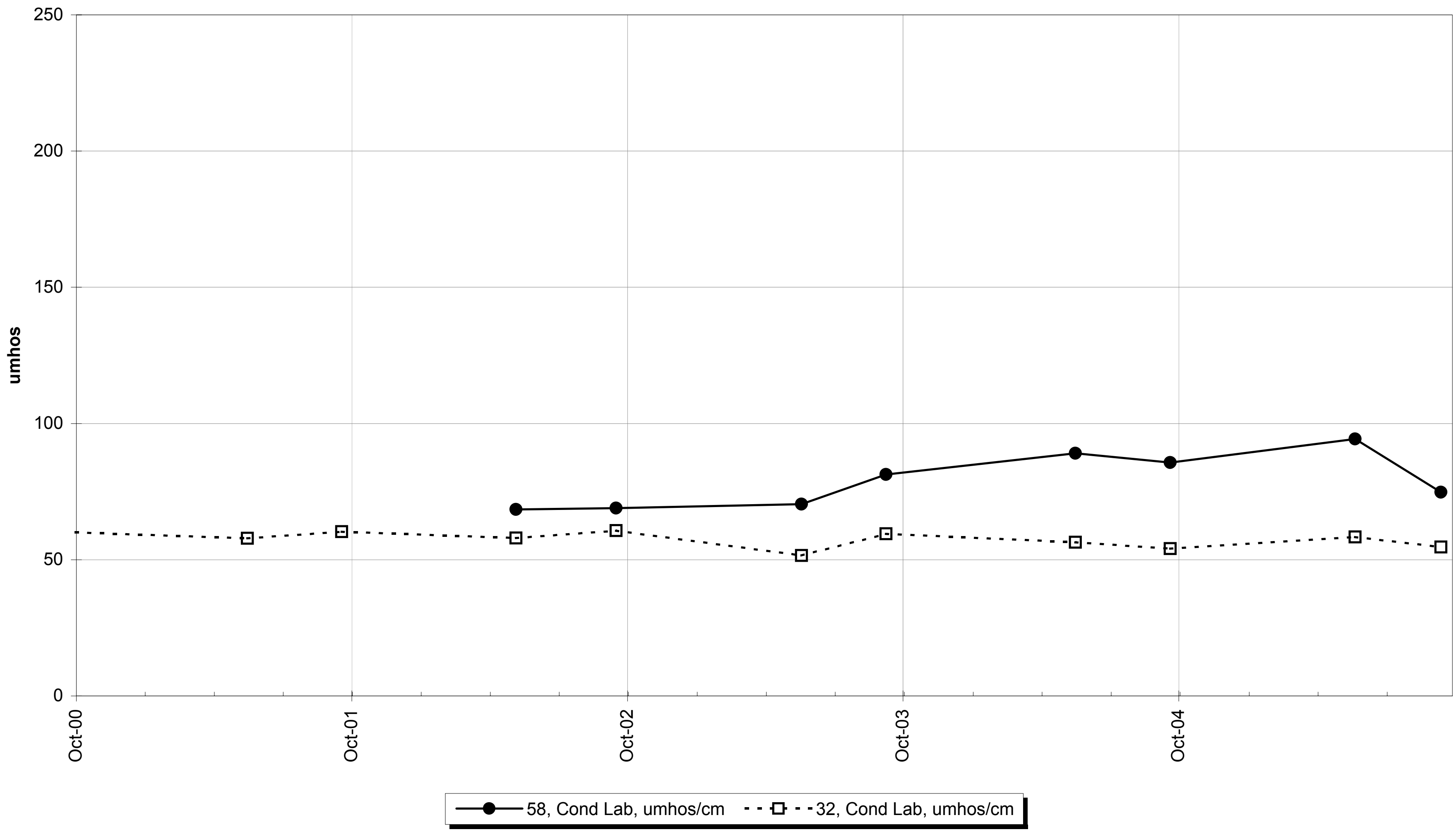
Site 32 -Dissolved Selenium



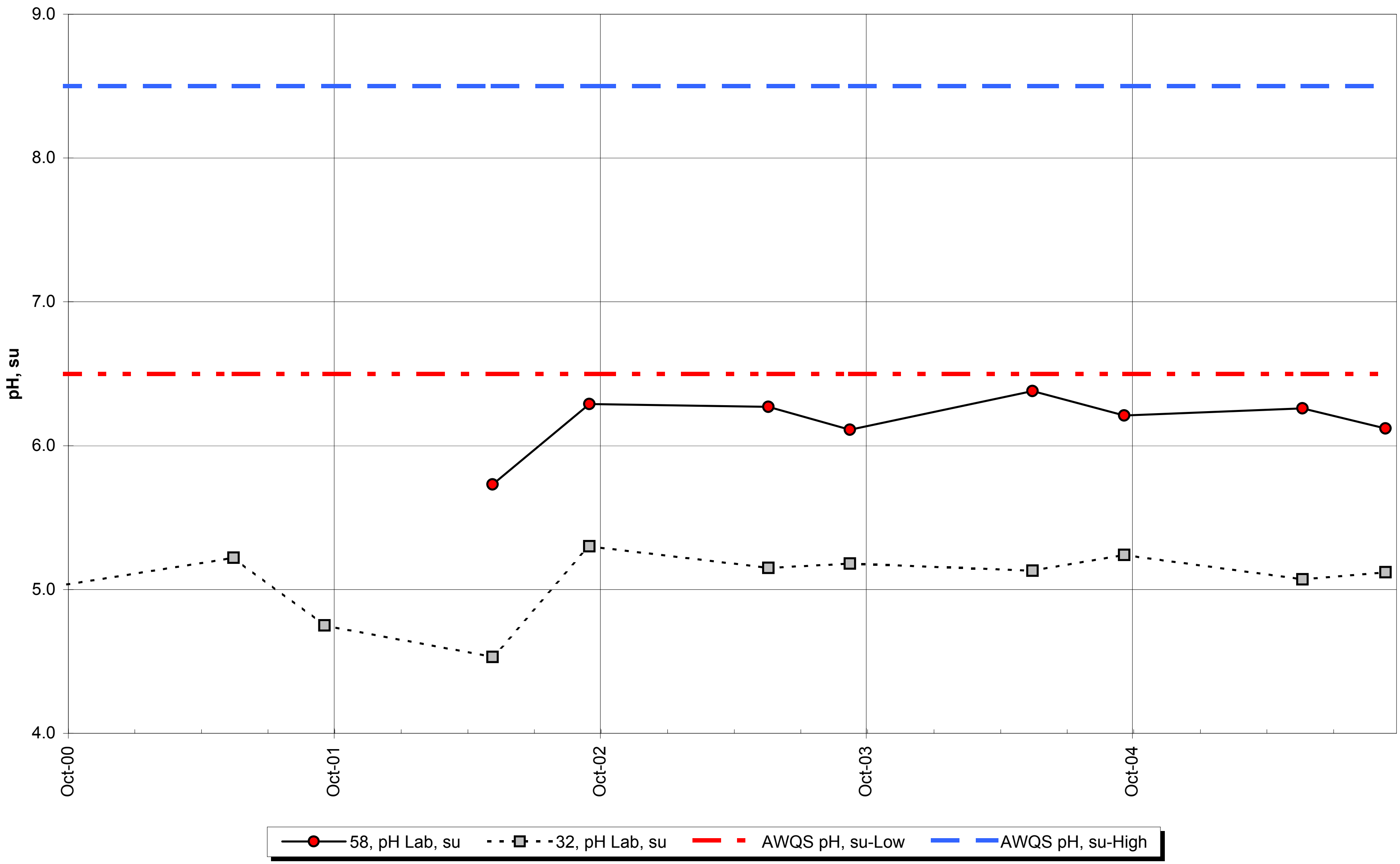


Site 32 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
32, Hg Diss,ug/l
32, Hg Diss, ug/l Limit

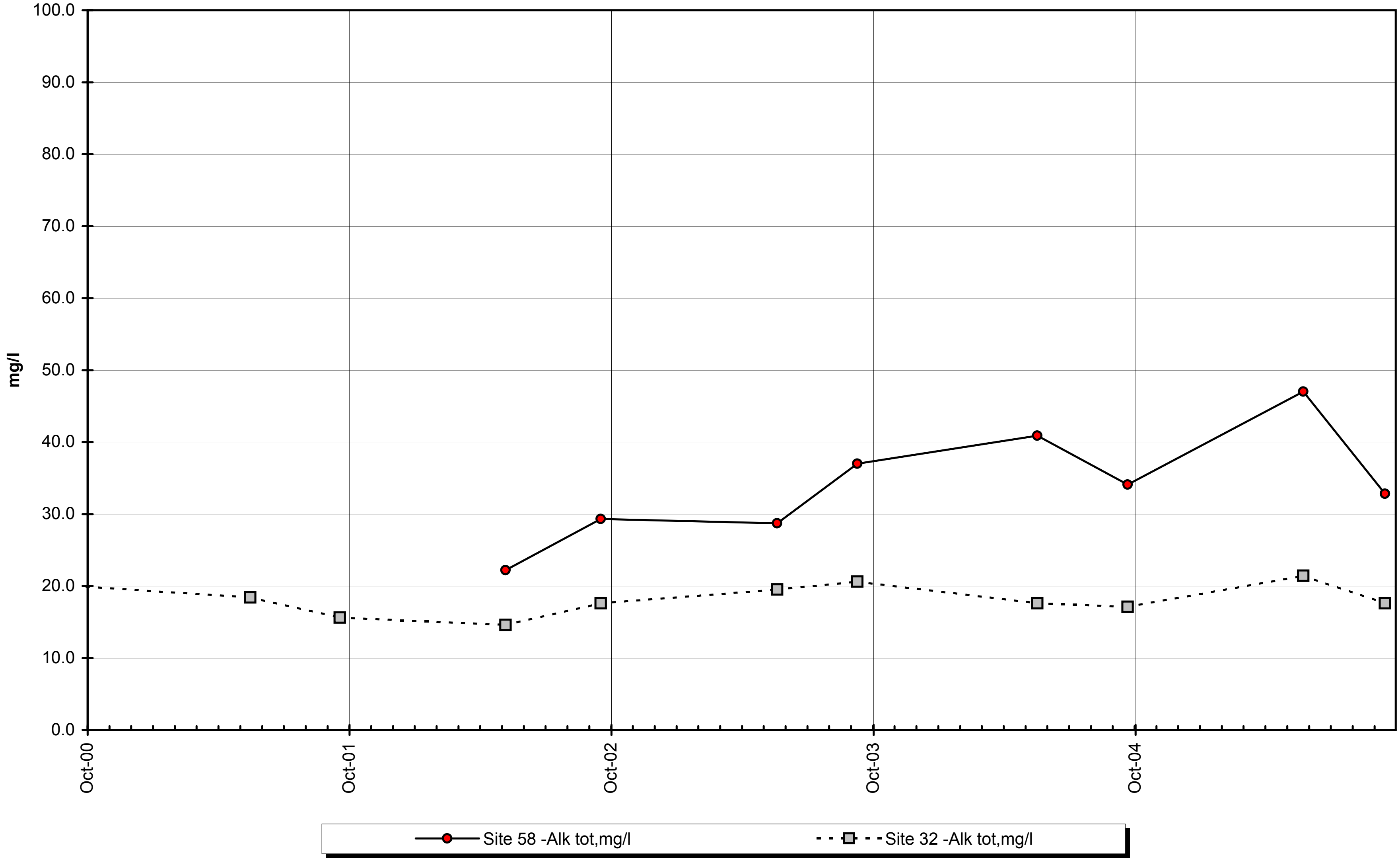
Site 58 vs Site 32 -Conductivity

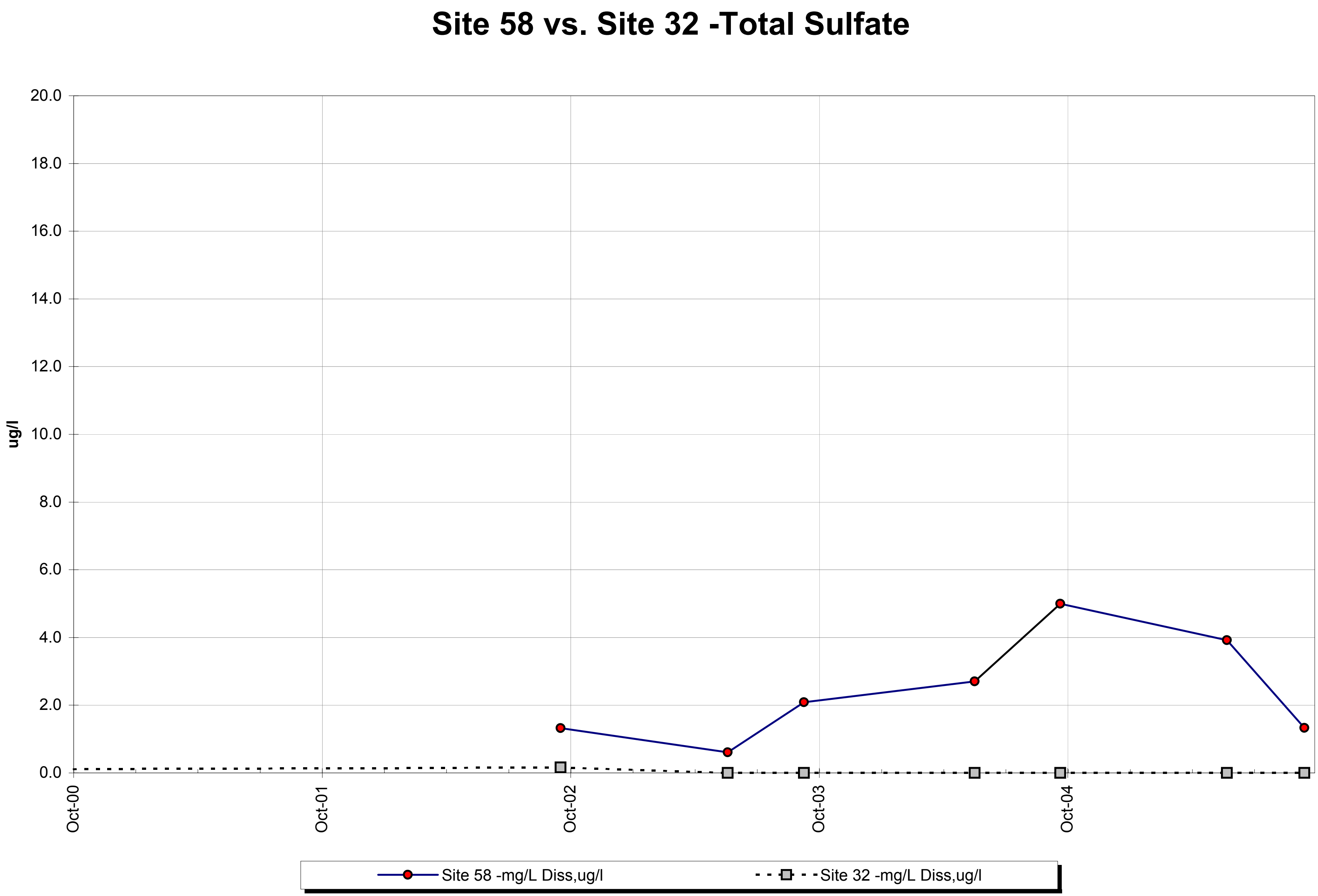


Site 58 vs. Site 32 - pH



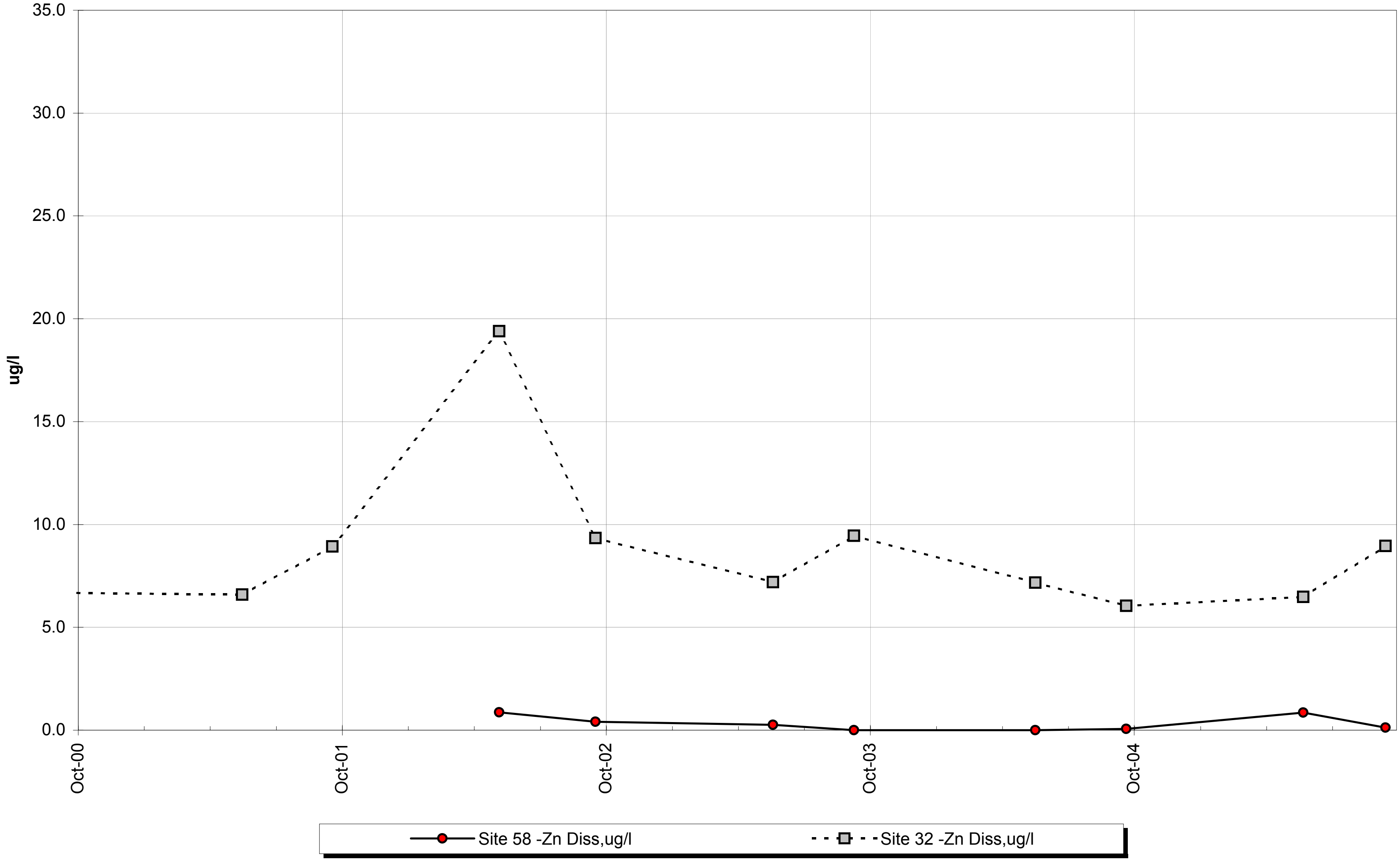
Site 58 vs. Site 32 -Total Alkalinity





Site 58 vs. Site 32 -Total Sulfate
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
ug/l
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 58 -mg/L Diss,ug/l
Site 32 -mg/L Diss,ug/l

Site 58 vs. Site 32 -Dissolved Zinc



Site **#32** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								59.0				60.2
b	**WY2001**								57.9				60.3
c	**WY2002**								58.0				60.7
d	**WY2003**								51.5				59.5
e	**WY2004**								56.4				54.1
f	**WY2005**								58.3				54.6
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				1
c-a								-1				1
d-a								-1				-1
e-a								-1				-1
f-a								-1				-1
c-b								1				1
d-b								-1				-1
e-b								-1				-1
f-b								1				-1
d-c								-1				-1
e-c								-1				-1
f-c								1				-1
e-d								1				-1
f-d								1				-1
f-e								1				1
S_k	0	0	0	0	0	0	0	-3	0	0	0	-7

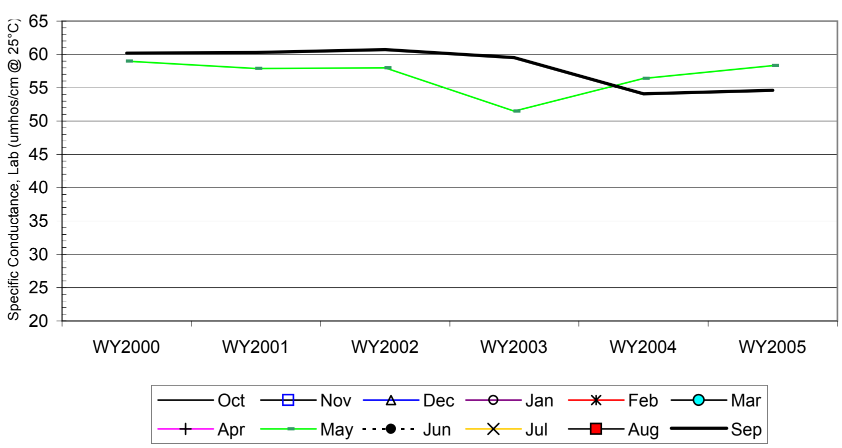
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
Z_k = S_k/σ_S								-0.56				-1.32
Z^2_k								0.32				1.73

ΣZ_k=	-1.88
ΣZ^2_k=	2.05
Z-bar=ΣZ_k/K=	-0.94

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	12
ΣS_k	-10

χ^2_h=ΣZ^2_k-K(Z-bar)^2=	0.28	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
p	**0.595**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -1.20	@α/2=2.5% Z=	1.96	**H_0** (No trend)	ACCEPT
56.67	p **0.116**			**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.36		0.10
0.050	-1.62	**-0.58**	0.10
0.100	-1.39		-0.16
0.200	-1.13		-0.37

Site **#32** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								5.1				5.0
b	**WY2001**								5.2				4.8
c	**WY2002**								4.5				5.3
d	**WY2003**								5.2				5.2
e	**WY2004**								5.1				5.2
f	**WY2005**								5.1				5.1
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								1				-1
c-a								-1				1
d-a								1				1
e-a								1				1
f-a								-1				1
c-b								-1				1
d-b								-1				1
e-b								-1				1
f-b								-1				1
d-c								1				-1
e-c								1				-1
f-c								1				-1
e-d								-1				1
f-d								-1				-1
f-e								-1				-1
S_k	0	0	0	0	0	0	0	-3	0	0	0	3

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-0.56				0.56
Z^2_k								0.32				0.32

ΣZ_k= 0.00

ΣZ^2_k= 0.64

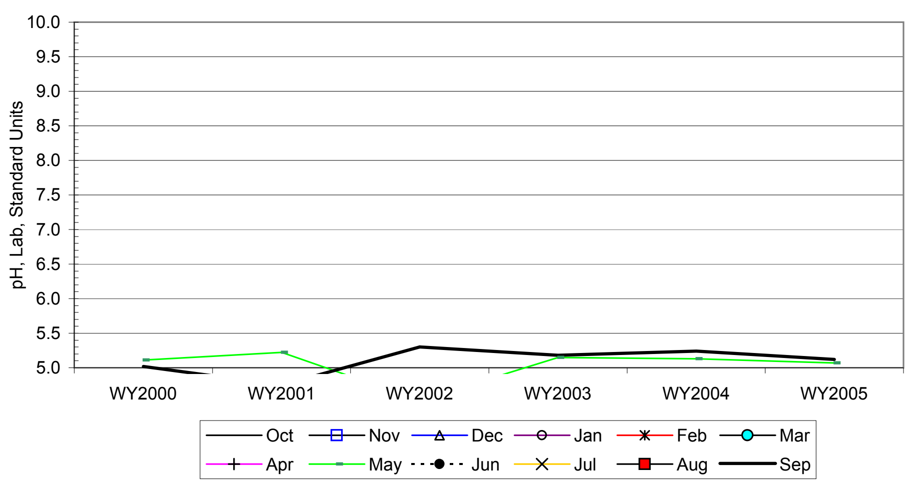
Z-bar=ΣZ_k/K= 0.00

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12

ΣS_k 0

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	0.64	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.425**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 0.00	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	**p** **0.500**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.06		0.13
0.050	-0.04	**0.00**	0.07
0.100	-0.03		0.05
0.200	-0.03		0.03

Site **#32** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								16.8				20.0
b	**WY2001**								18.4				15.6
c	**WY2002**								14.6				17.6
d	**WY2003**								19.5				20.6
e	**WY2004**								17.6				17.1
f	**WY2005**								21.4				17.6
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	1
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								1				-1
c-a								-1				-1
d-a								1				1
e-a								1				-1
f-a								1				-1
c-b								-1				1
d-b								1				1
e-b								-1				1
f-b								1				1
d-c								1				1
e-c								1				-1
f-c								1				0
e-d								-1				-1
f-d								1				-1
f-e								1				1
S_k	0	0	0	0	0	0	0	7	0	0	0	0

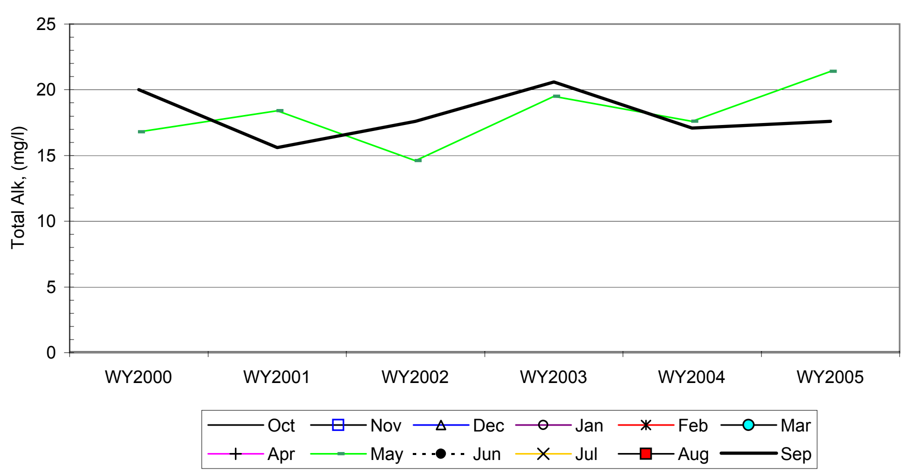
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								1.32				0.00
Z^2_k								1.73				0.00

ΣZ_k=	1.32
ΣZ^2_k=	1.73
Z-bar=ΣZ_k/K=	0.66

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn	12
ΣS_k	7

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.86	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.352**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	0.80	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	**p**	**0.787**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.18		1.58
0.050	-0.53	**0.50**	0.93
0.100	-0.26		0.87
0.200	-0.04		0.58

Site **#32** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

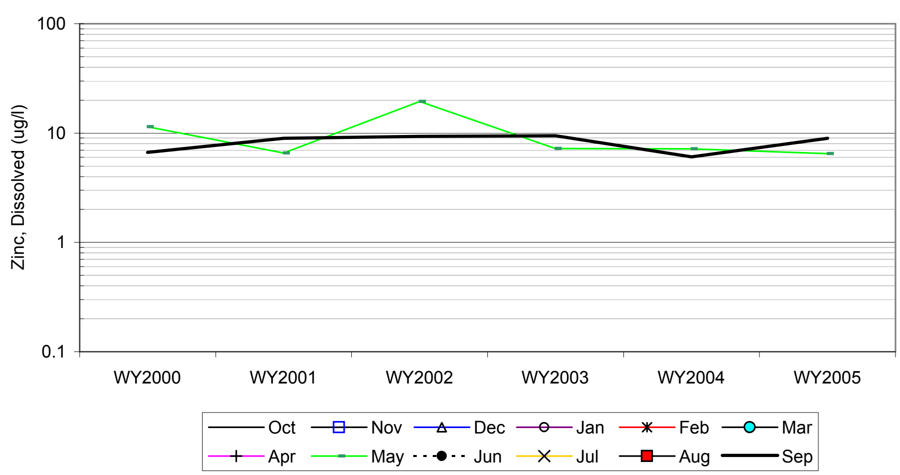
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								11.4				6.7
b	**WY2001**								6.6				8.9
c	**WY2002**								19.4				9.3
d	**WY2003**								7.2				9.5
e	**WY2004**								7.2				6.1
f	**WY2005**								6.5				9.0
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								-1				1
	c-a								1				1
	d-a								-1				1
	e-a								-1				-1
	f-a								-1				1
	c-b								1				1
	d-b								1				1
	e-b								1				-1
	f-b								-1				1
	d-c								-1				1
	e-c								-1				-1
	f-c								-1				-1
	e-d								-1				-1
	f-d								-1				-1
	f-e								-1				1
	S_k	0	0	0	0	0	0	0	-7	0	0	0	3
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-1.32				0.56
	Z^2_k								1.73				0.32

ΣZ_k= -0.75
ΣZ^2_k= 2.05
Z-bar=ΣZ_k/K= -0.38

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12
ΣS_k -4

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		1.76	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity
	p	**0.184**			$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.40	@α/2=2.5% Z=	1.96	**H_0** (No trend) ACCEPT
56.67	p	**0.345**			**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.59		0.44
0.050	-1.00	**-0.08**	0.27
0.100	-0.91		0.18
0.200	-0.42		0.02

INTERPRETIVE REPORT
SITE 59 "MONITORING WELL T-00-01A"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

Sampling at this site was added to the FWMP in May-2002 to serve as an upgradient control site. All data collected at this site since it's inception into the FWMP are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of May-02 though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. One result exceeding these criteria has been identified, as listed in the table below. This datum is for a lab pH value of 6.26 s.u. which is just below the AWQS limit of 6.50 s.u. The corresponding field pH is 7.36 s.u. which is within the acceptable range.

Sample Date	Parameter	Value	Standard	Standard Type
09/15/05	pH Lab, su	6.26	6.5 - 8.5	Aquatic Life

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. No obvious trends have been identified. No statistical analysis for trend was performed on Site 59 data. For a robust analysis of trend at least five years of data is required. KGCMC anticipates adding this component into the Water Year 2006 annual report for this site.

Table of Results for Water Year 2005

Site 59 "MW-T-00-01A"													
Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							6.8	NOT SCHEDULED FOR SAMPLING			12.6	9.7
Conductivity-Field(μmho)								105				101	103
Conductivity-Lab (μmho)								103				95	99
pH Lab (standard units)								6.65				6.26	6.46
pH Field (standard units)								6.57				7.36	6.97
Total Alkalinity (mg/L)								51.6				40.9	46.3
Total Sulfate (mg/L)								4.6				4.4	4.5
Hardness (mg/L)								45.4				46.9	46.2
Dissolved As (ug/L)								0.192				0.148	0.170
Dissolved Ba (ug/L)								4.8				7.4	6.1
Dissolved Cd (ug/L)								0.008 U				0.008 J	0.008
Dissolved Cr (ug/L)								3.840				3.770	3.805
Dissolved Cu (ug/L)								0.532				0.130 U	0.331
Dissolved Pb (ug/L)								0.0061 U				0.0140 U	0.0100
Dissolved Ni (ug/L)								0.635				0.786	0.711
Dissolved Ag (ug/L)								<0.003				<0.002	0.001
Dissolved Zn (ug/L)								0.68 U				1.03 U	0.85
Dissolved Se (ug/L)								0.461 UJ				0.316 J	0.389
Dissolved Hg (ug/L)								0.000279 U				0.000331 J	0.000305

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

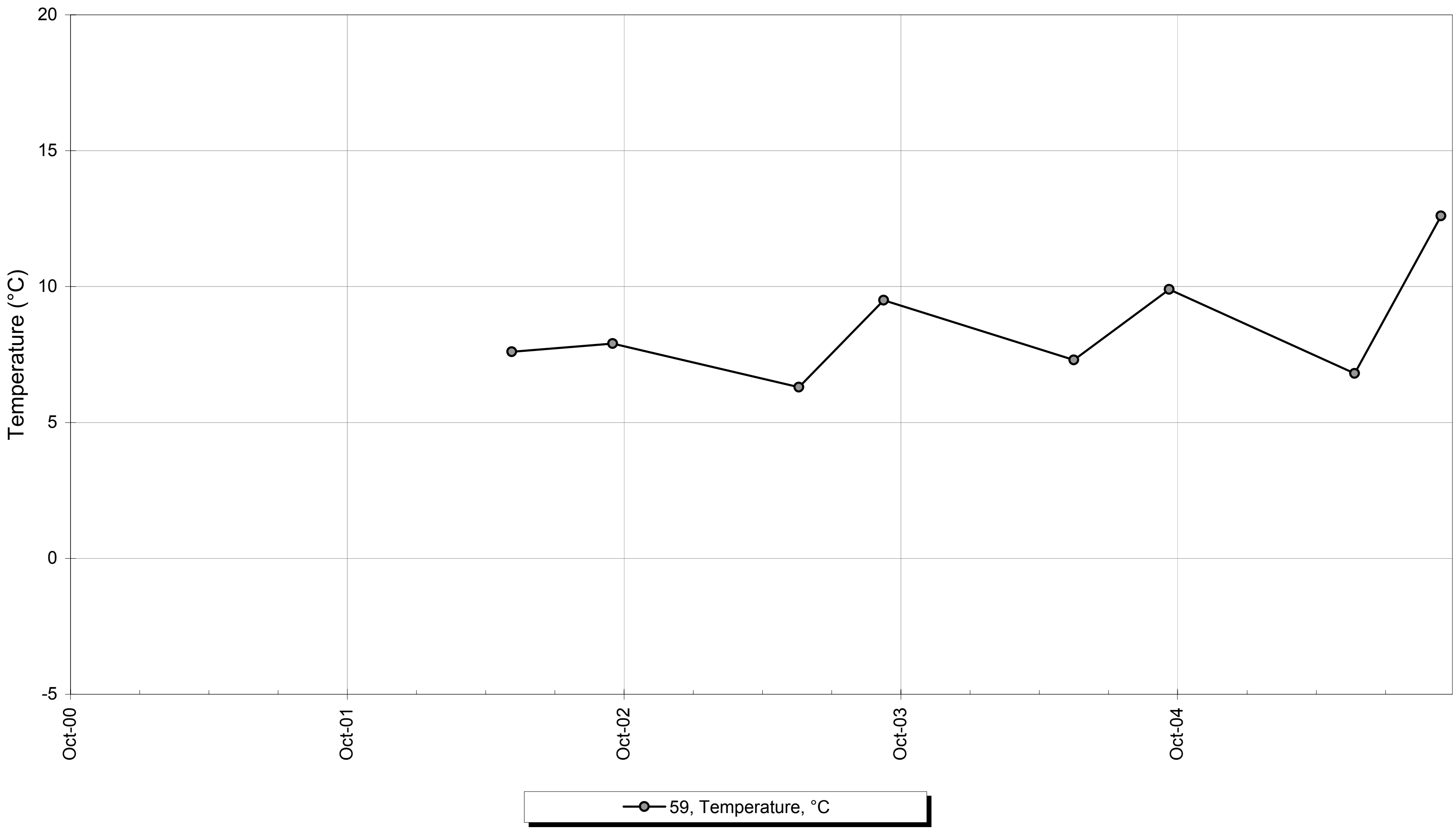
Qualified Data by QA Reviewer

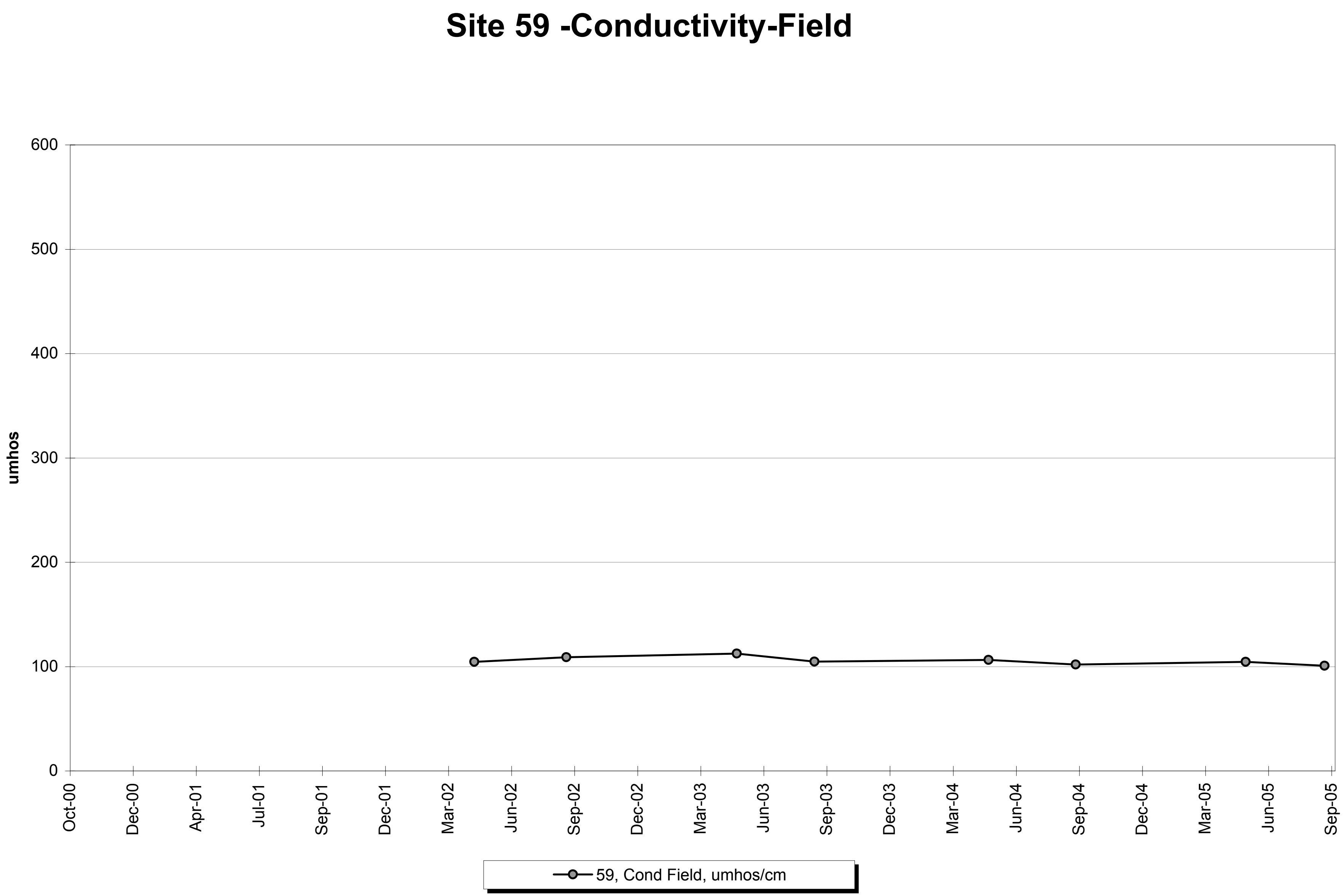
Date Range: 10/01/2004 to 09/30/2005

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
59	05/24/2005	1:40:00 PM				
			Cd Diss, ug/l	0.00805	U	Field Blank Contamination
			Pb Diss, ug/l	0.00605	U	Field Blank Contamination
			Zn Diss, ug/l	0.678	U	Field Blank Contamination
			Se Diss, ug/l	0.461	UJ	LCS Recovery
			Hg Diss, ug/l	0.000279	U	Field Blank Contamination
59	09/15/2005	2:41:00 PM				
			Cd Diss, ug/l	0.00817	J	Below Quantitative Range
			Cu Diss, ug/l	0.13	U	Field Blank Contamination
			Pb Diss, ug/l	0.014	U	Field Blank Contamination
			Zn Diss, ug/l	1.03	U	Field Blank Contamination
			Se Diss, ug/l	0.316	J	Below Quantitative Range
			Hg Diss, ug/l	0.000331	J	Below Quantitative Range

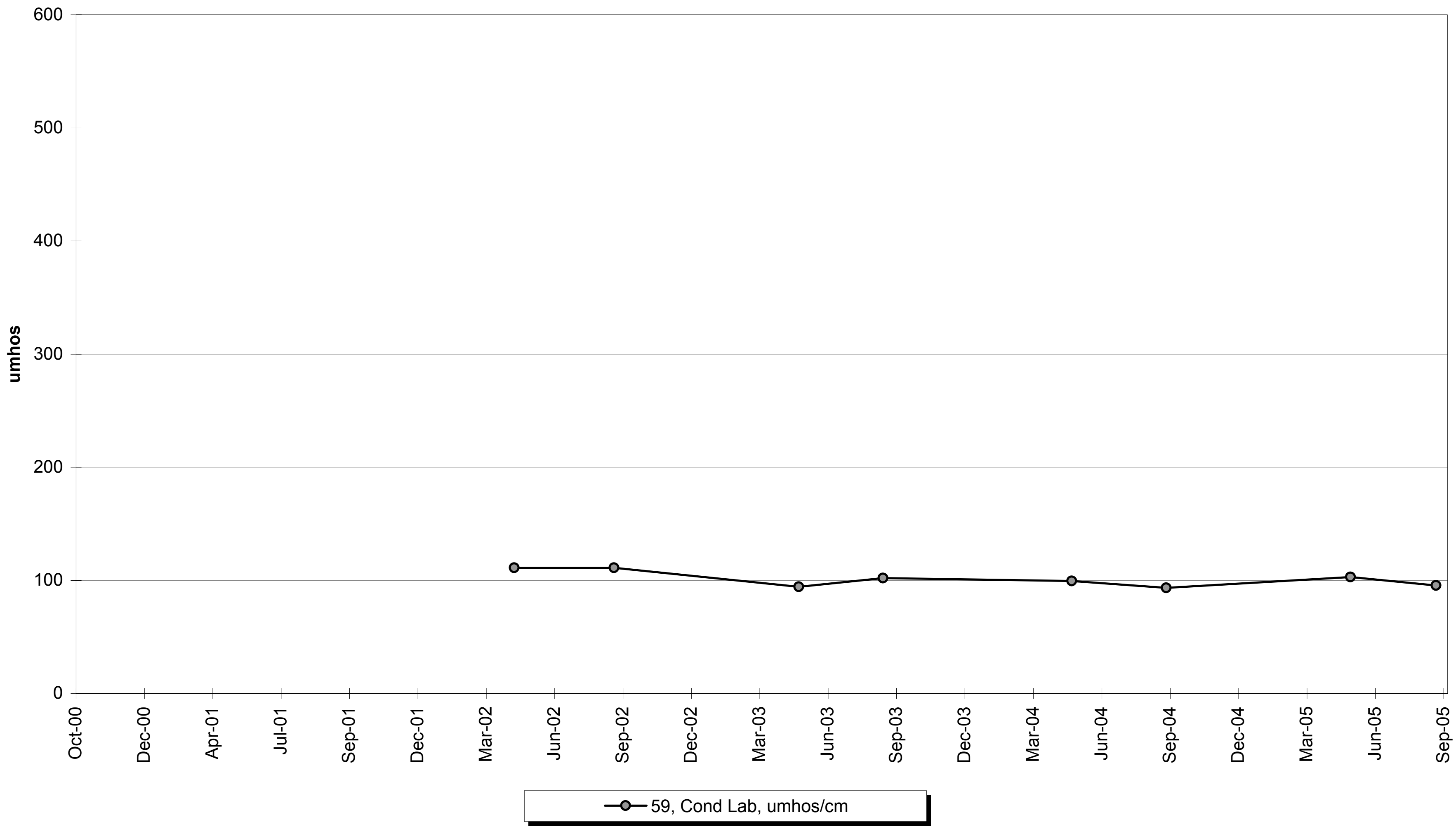
Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

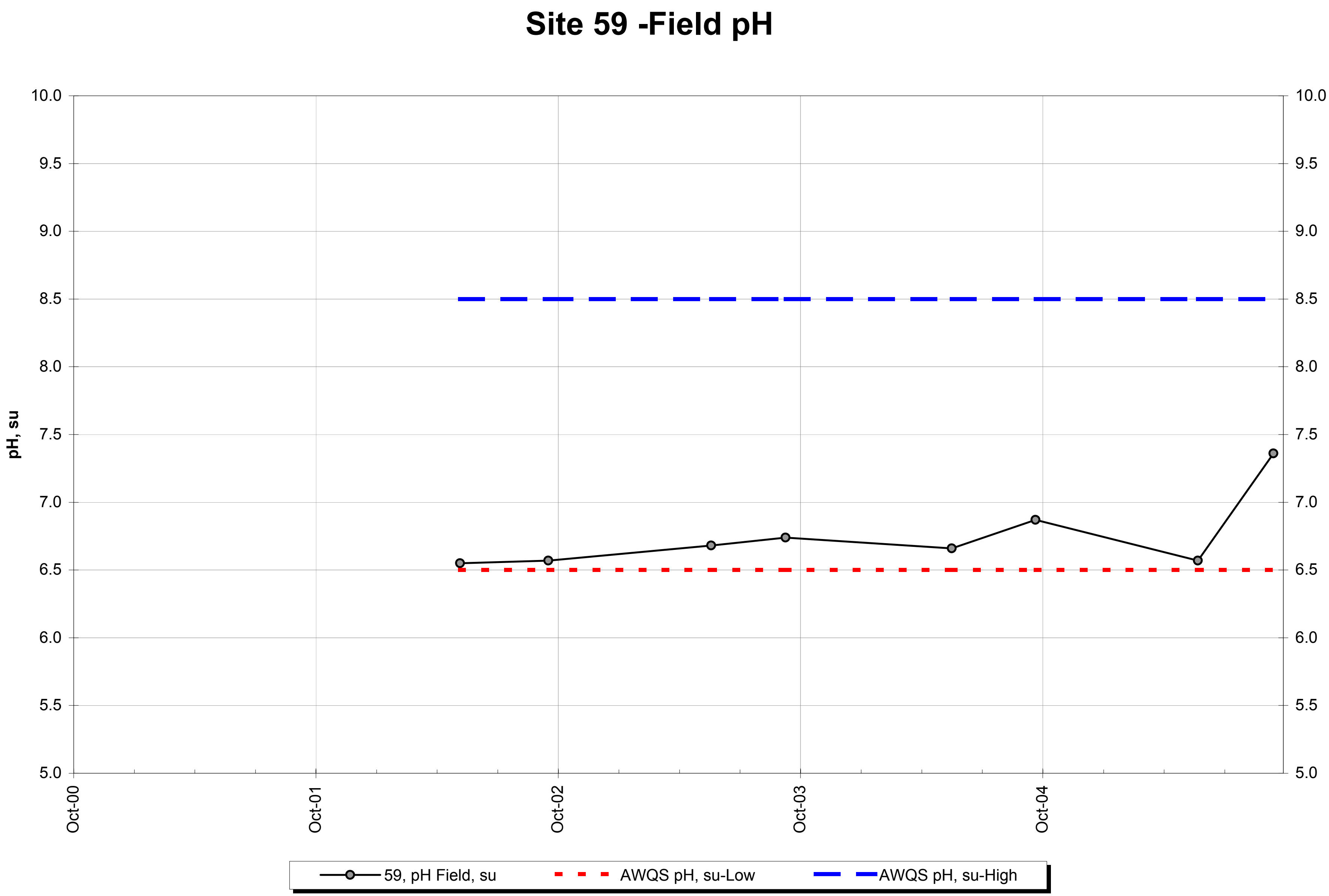
Site 59 -Water Temperature



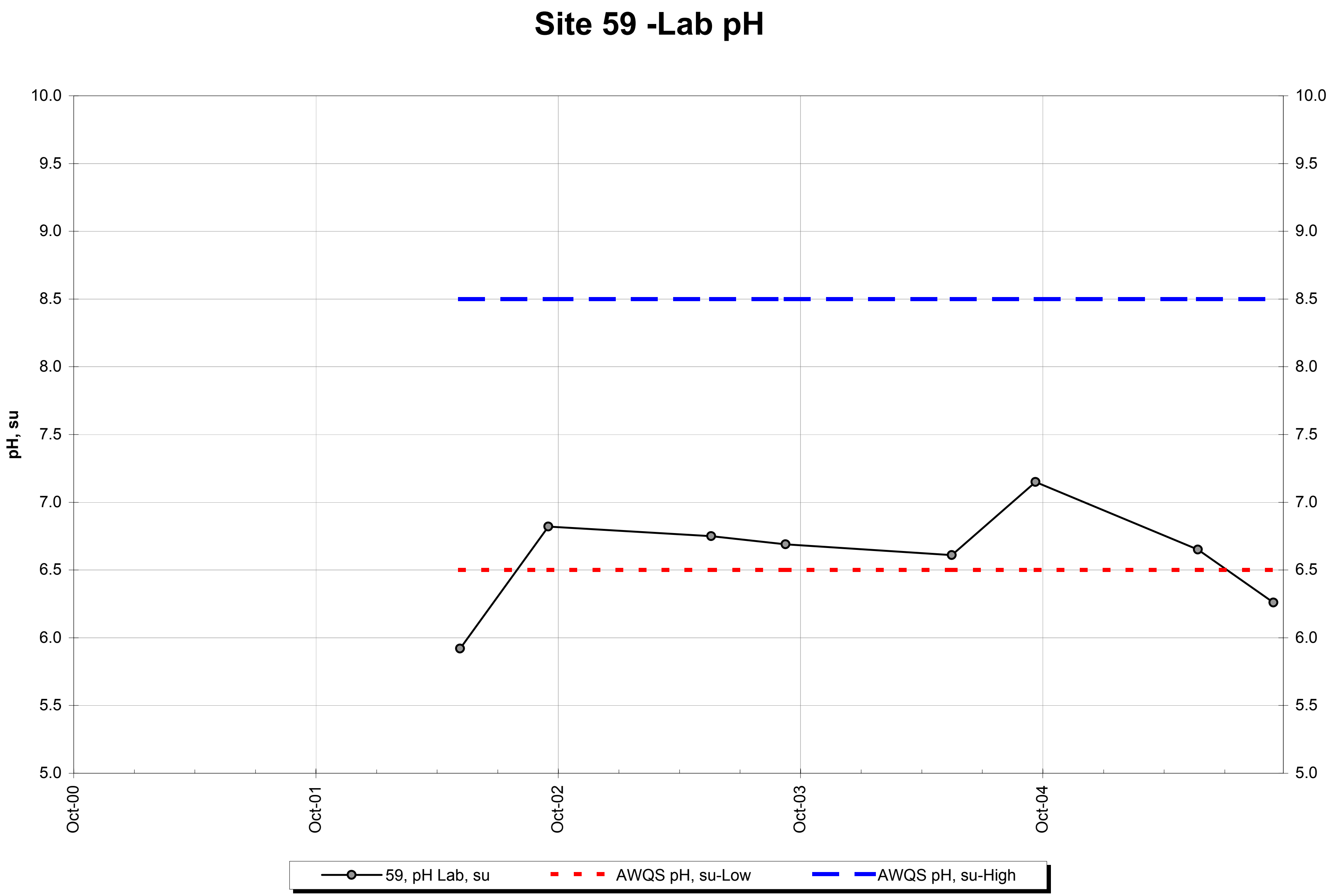

Site 59 -Conductivity-Field
umhos
600
500
400
300
200
100
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
59, Cond Field, umhos/cm

Site 59 -Conductivity-Lab

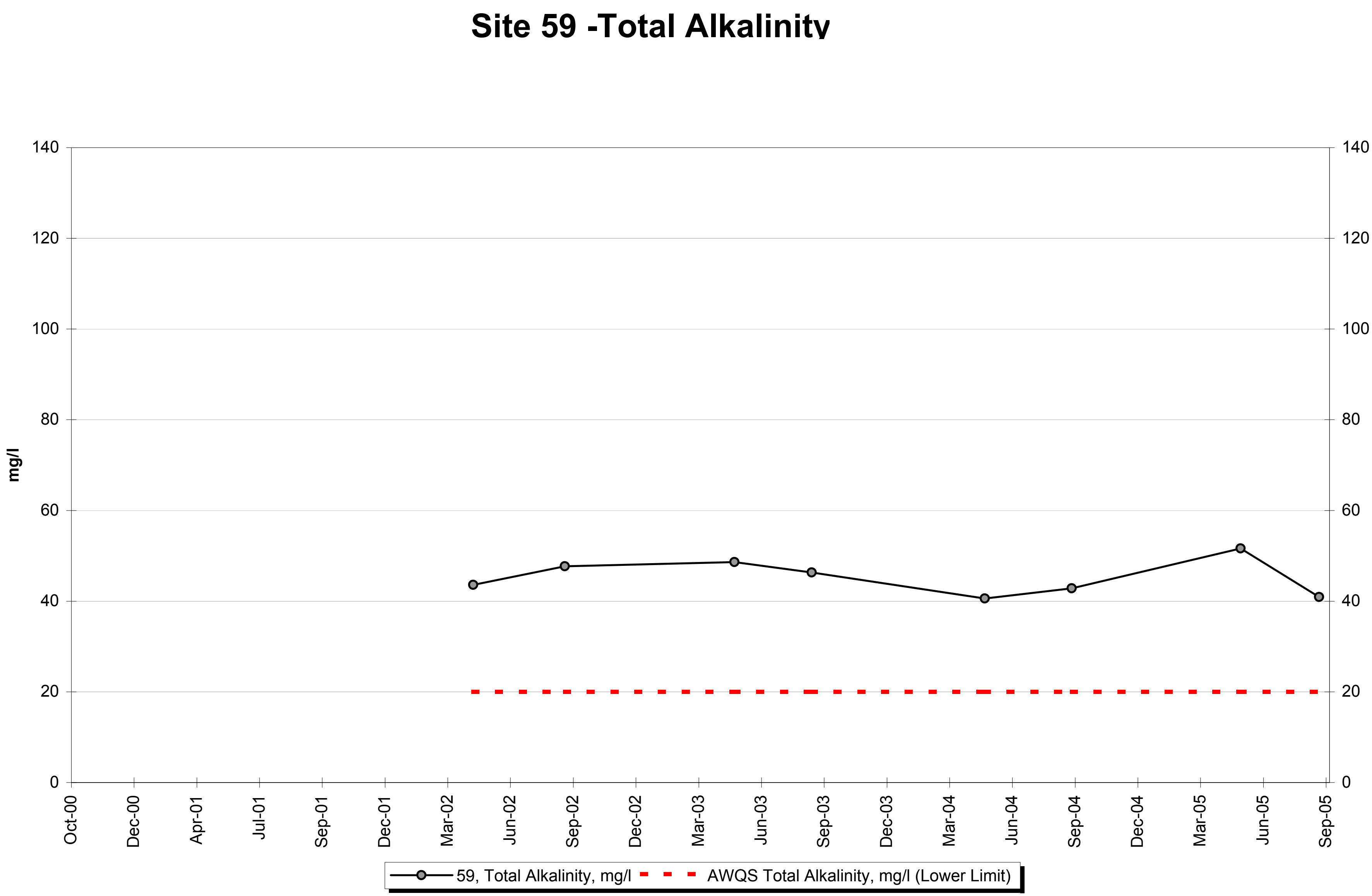




Site 59 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
59, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

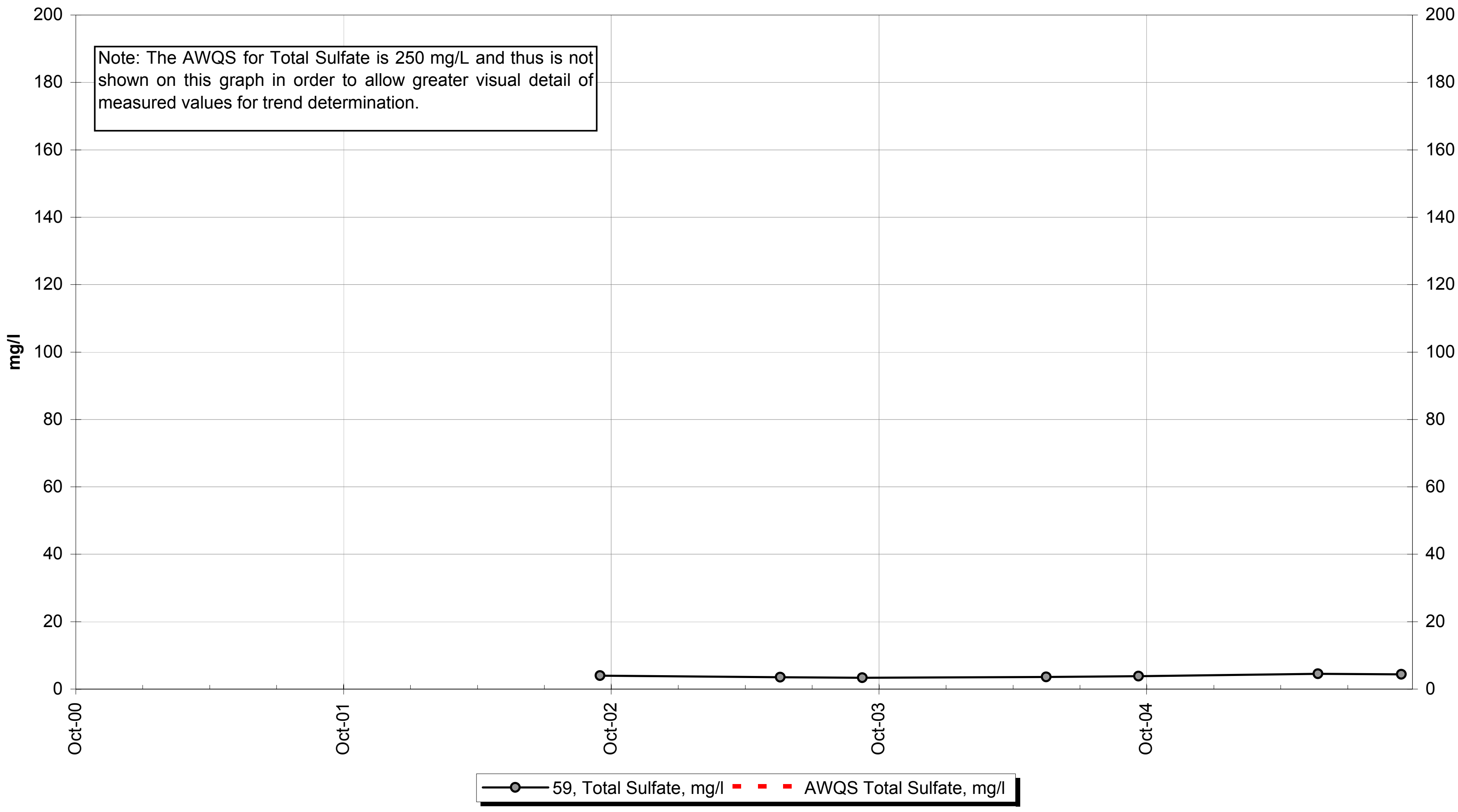


Site 59 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
59, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

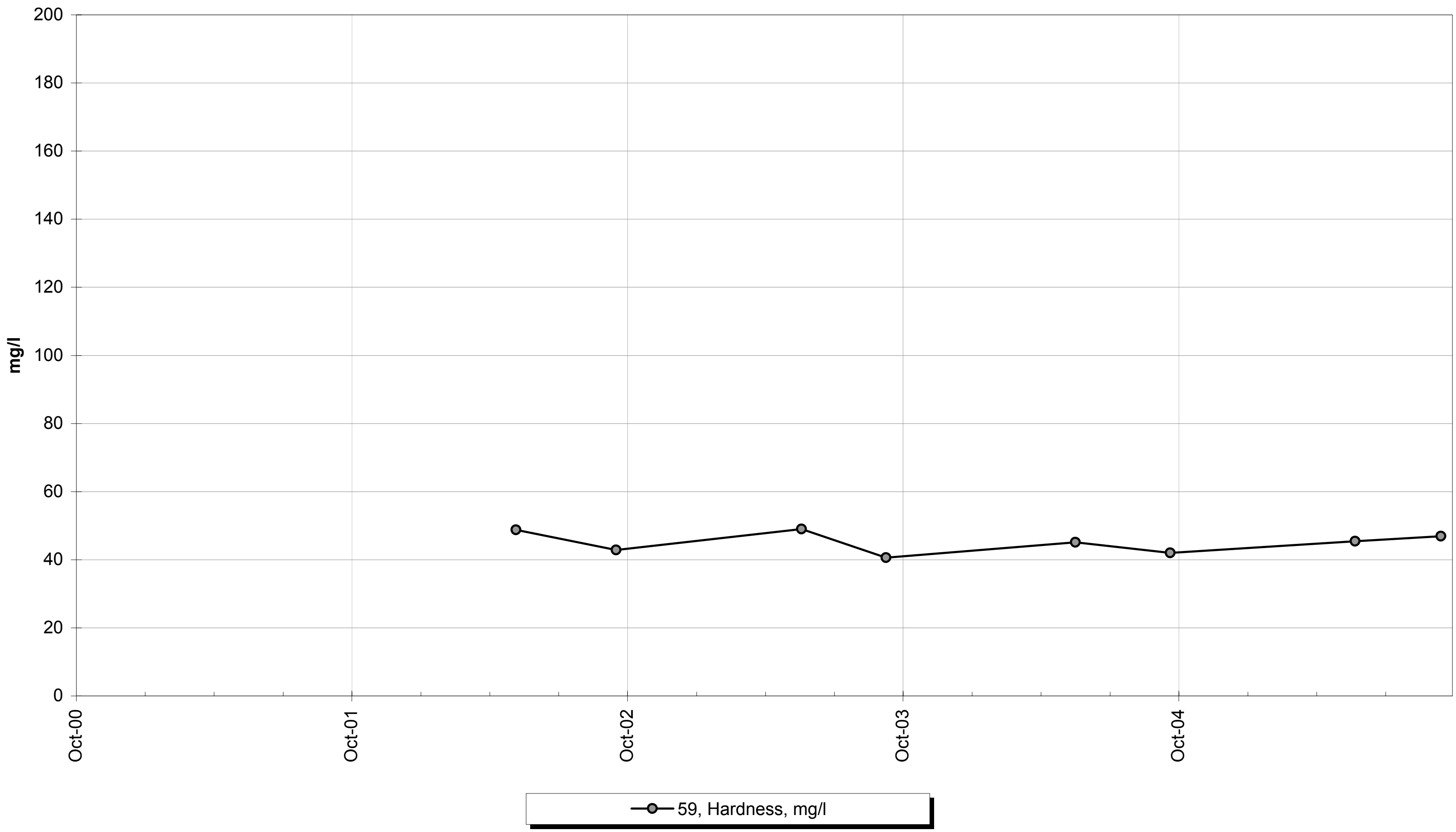


Site 59 -Total Alkalinity
mg/l
140
120
100
80
60
40
20
0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
59, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

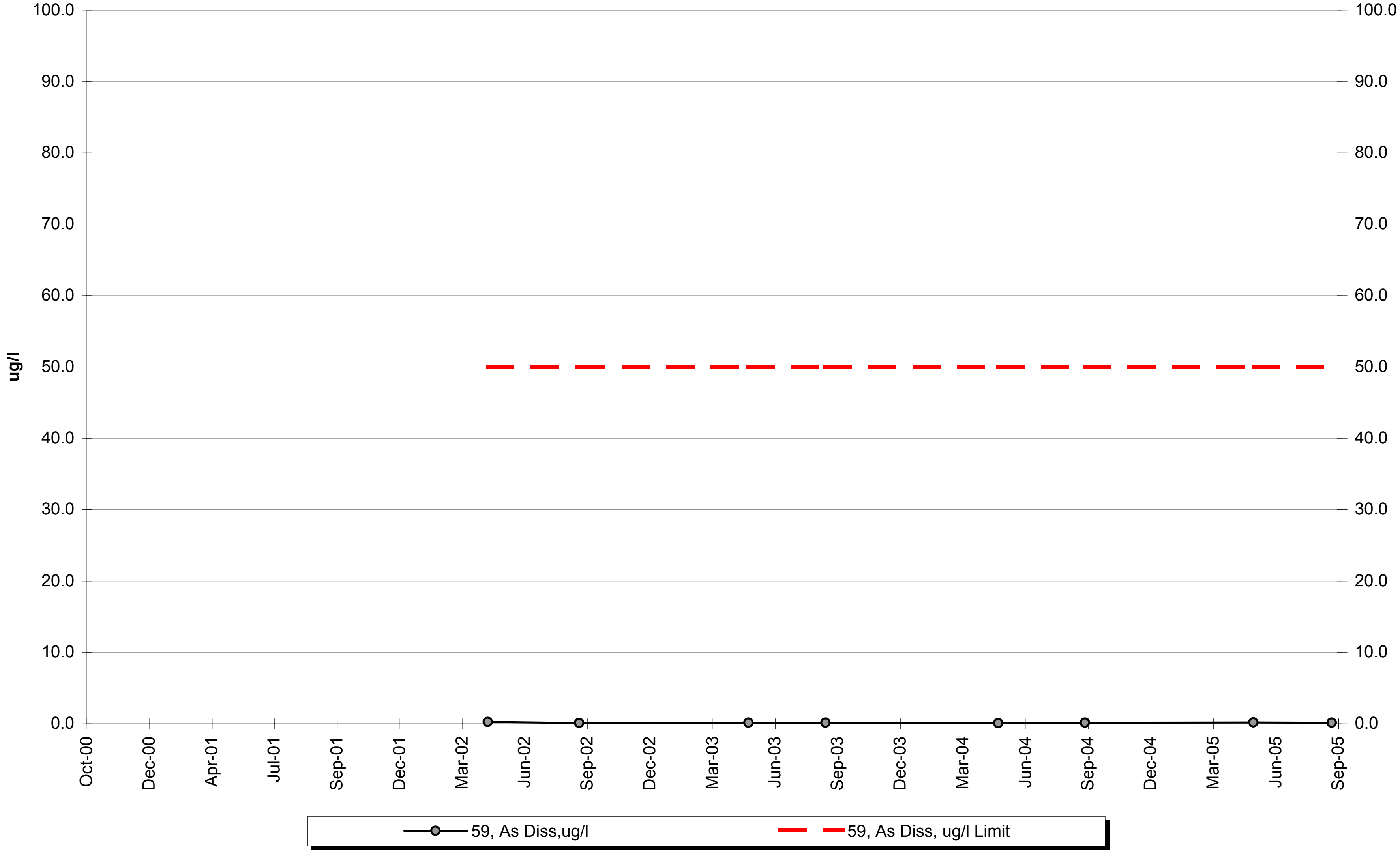
Site 59 -Total Sulfate



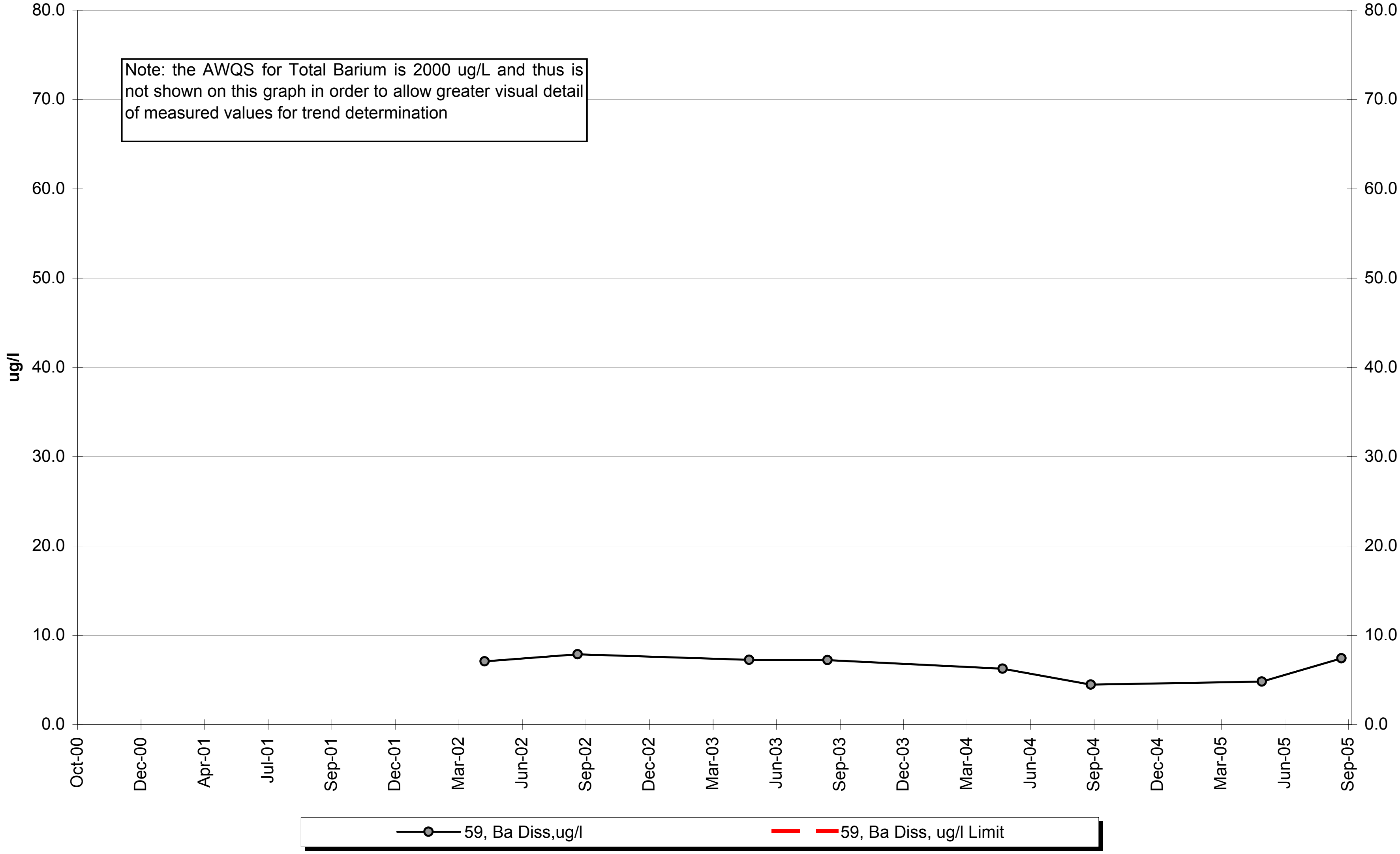
Site 59 -Hardness

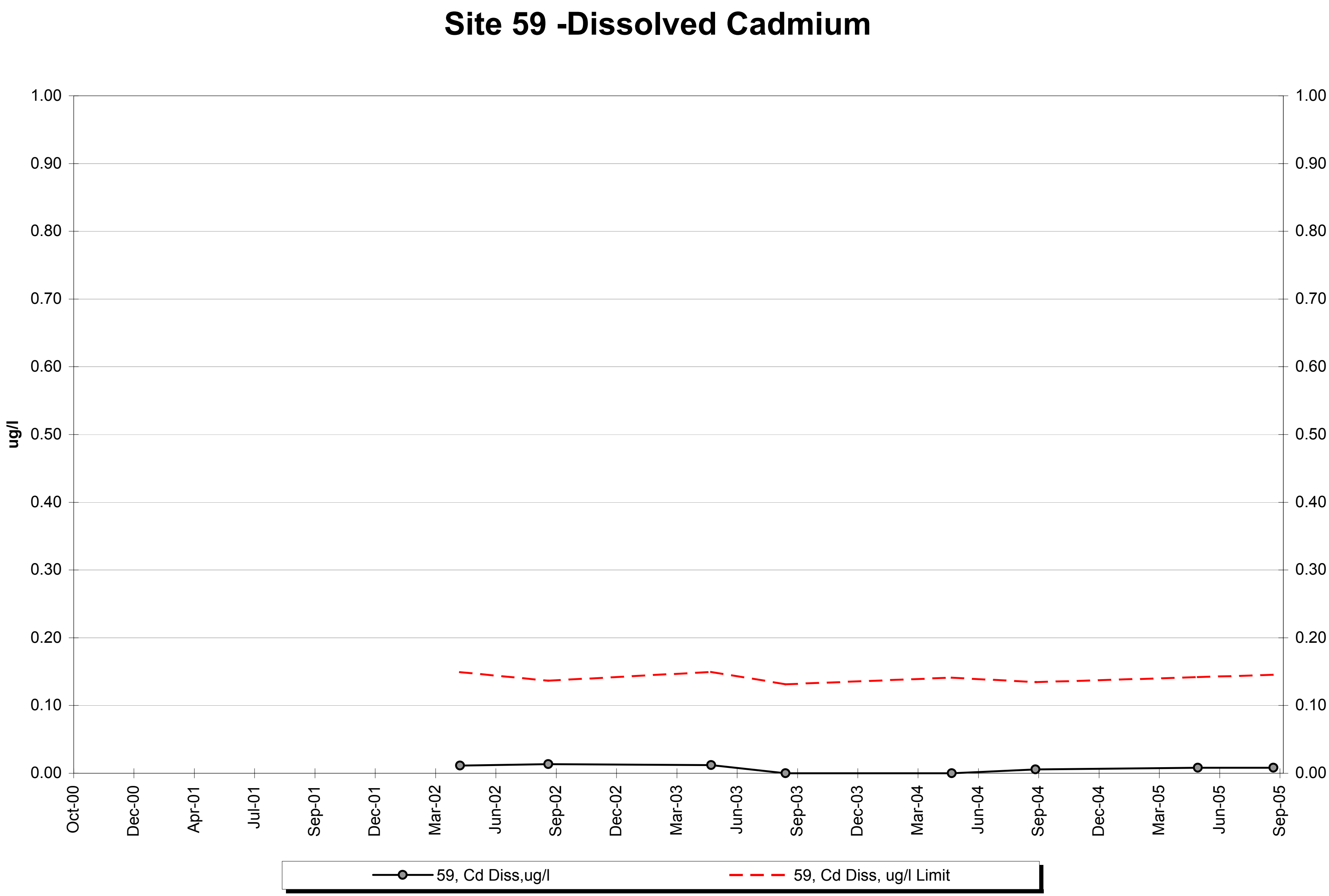


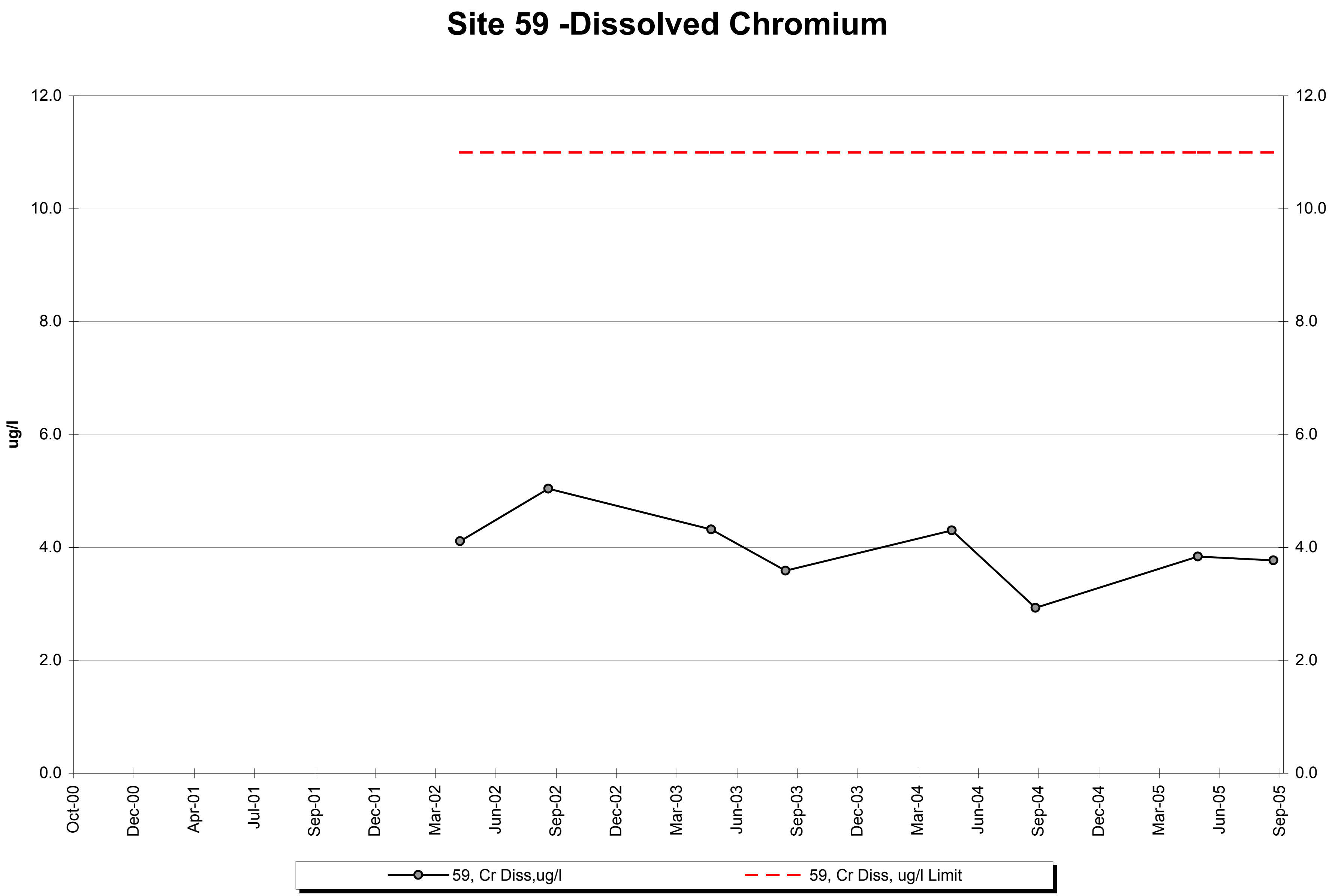
Site 59 -Dissolved Arsenic



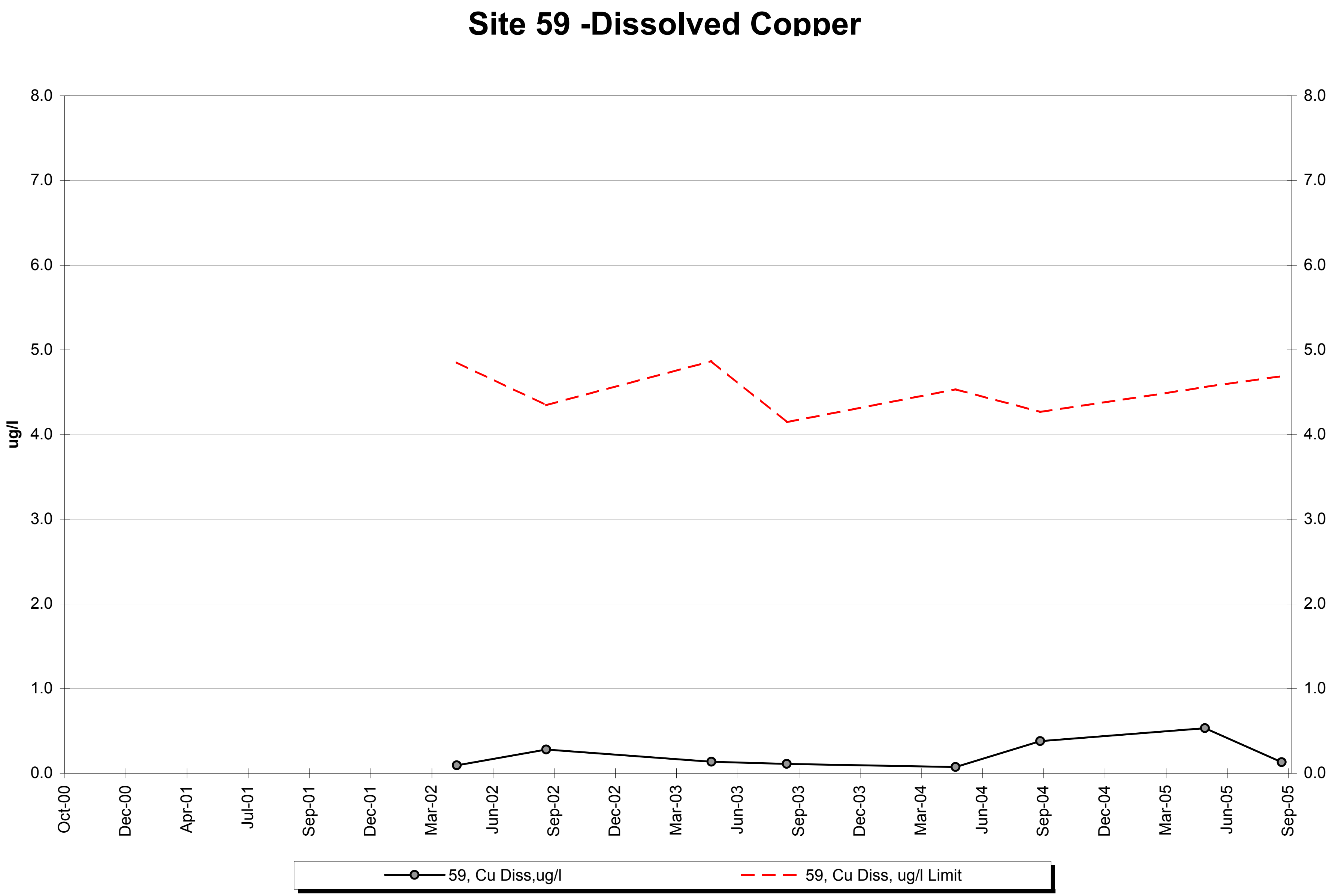
Site 59 -Dissolved Barium



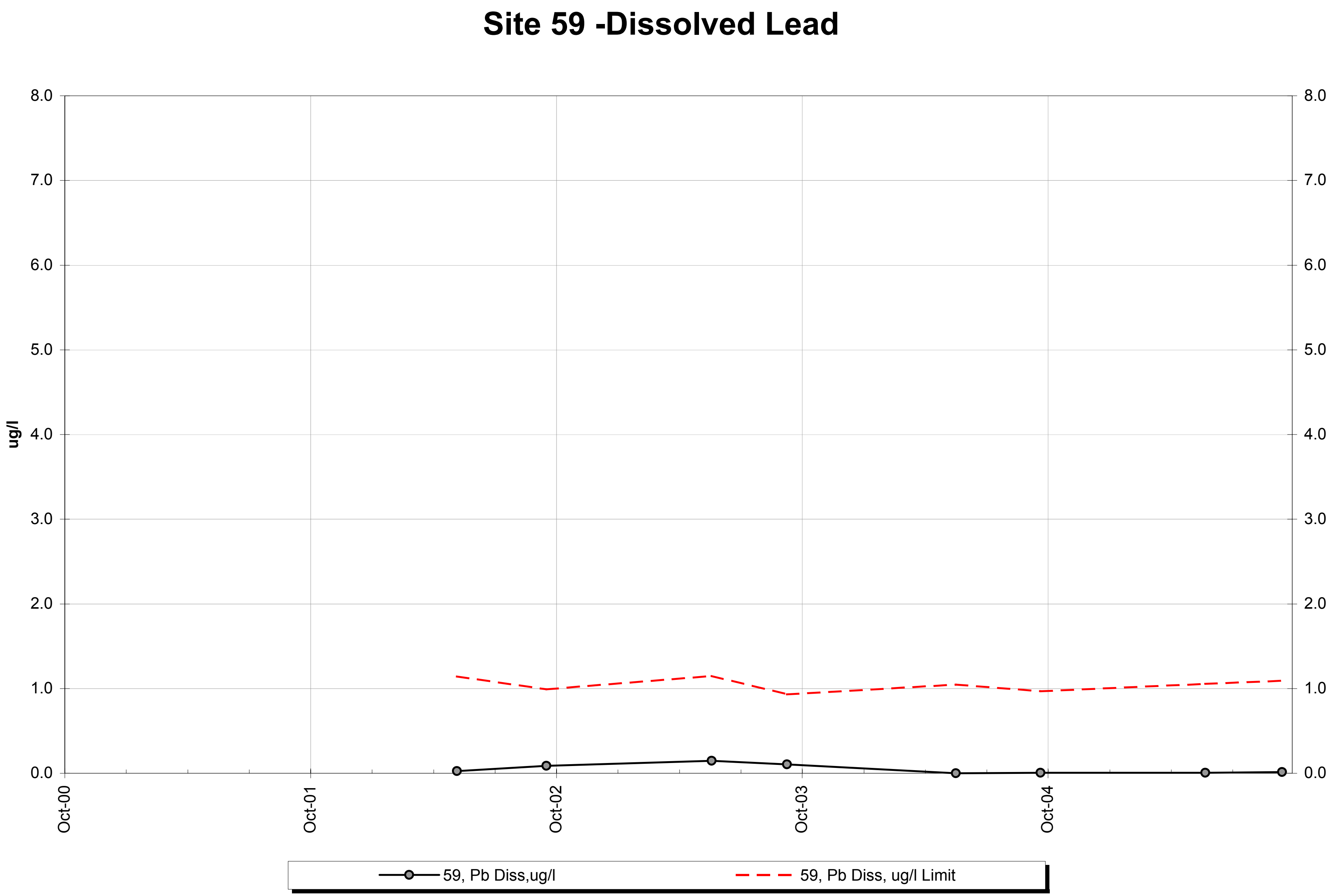

Site 59 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
59, Cd Diss,ug/l
59, Cd Diss, ug/l Limit



Site 59 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
59, Cr Diss,ug/l
59, Cr Diss, ug/l Limit

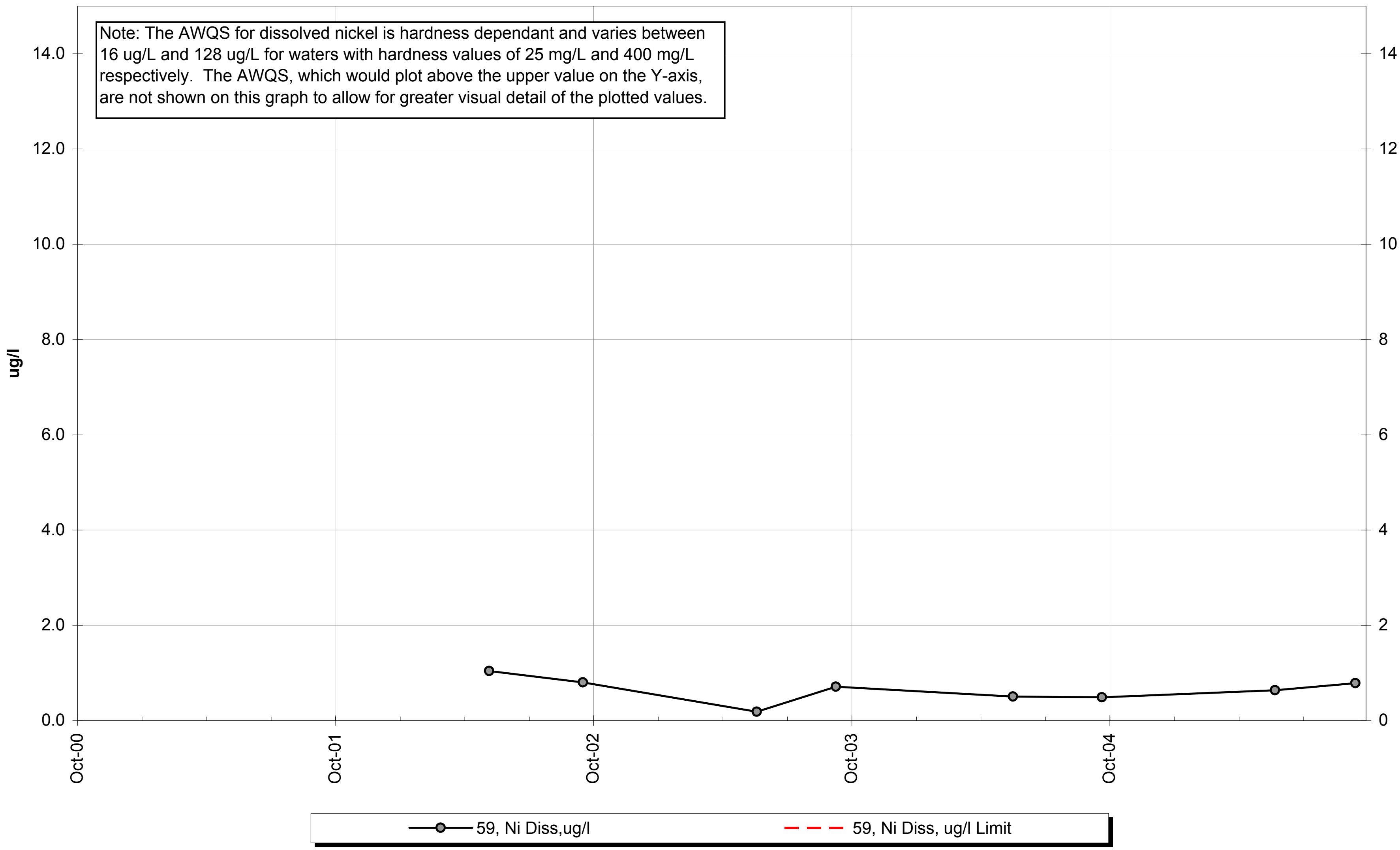


Site 59 -Dissolved Copper
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
59, Cu Diss,ug/l
59, Cu Diss, ug/l Limit

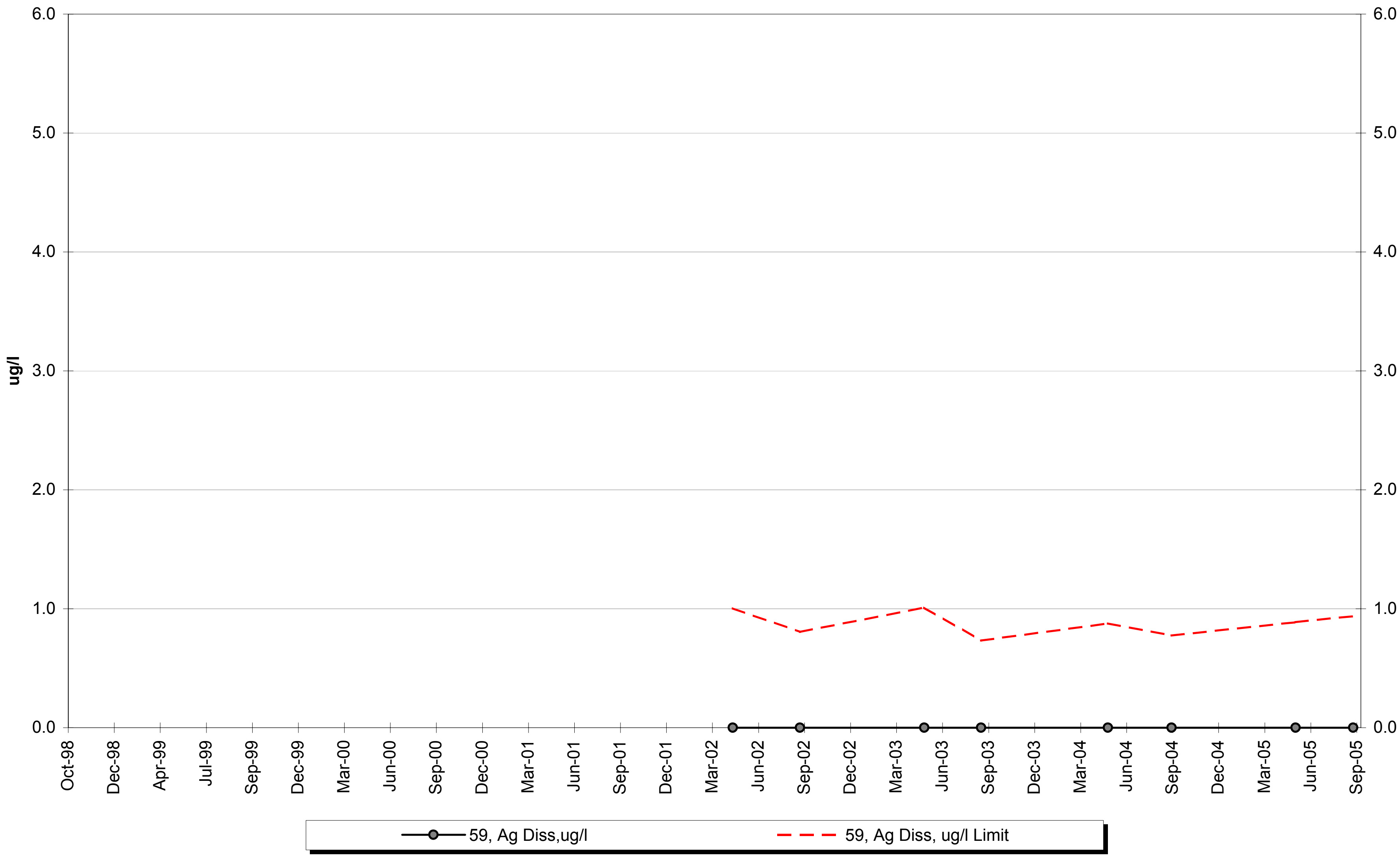


Site 59 -Dissolved Lead
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
59, Pb Diss,ug/l
59, Pb Diss, ug/l Limit

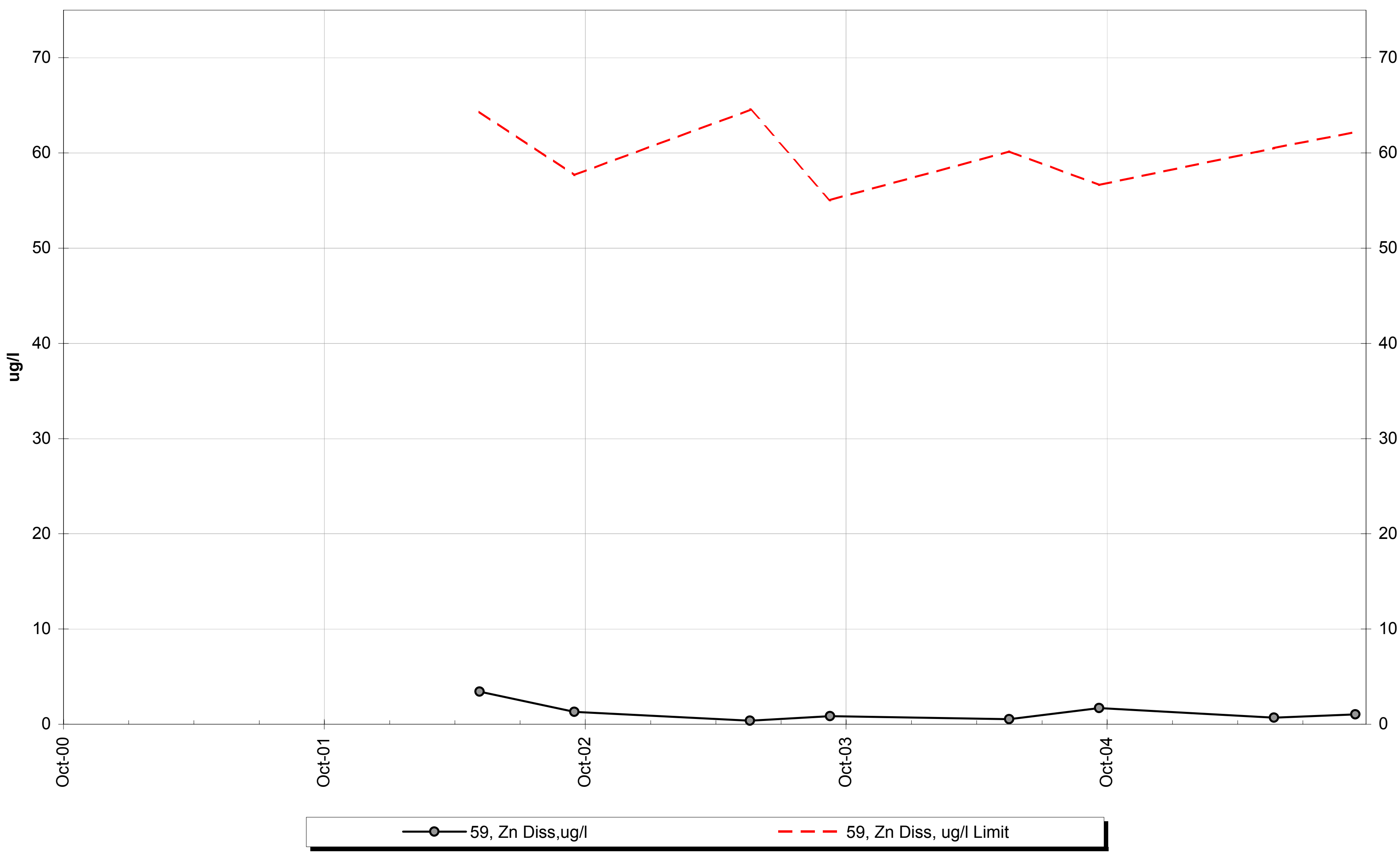
Site 59 -Dissolved Nickel

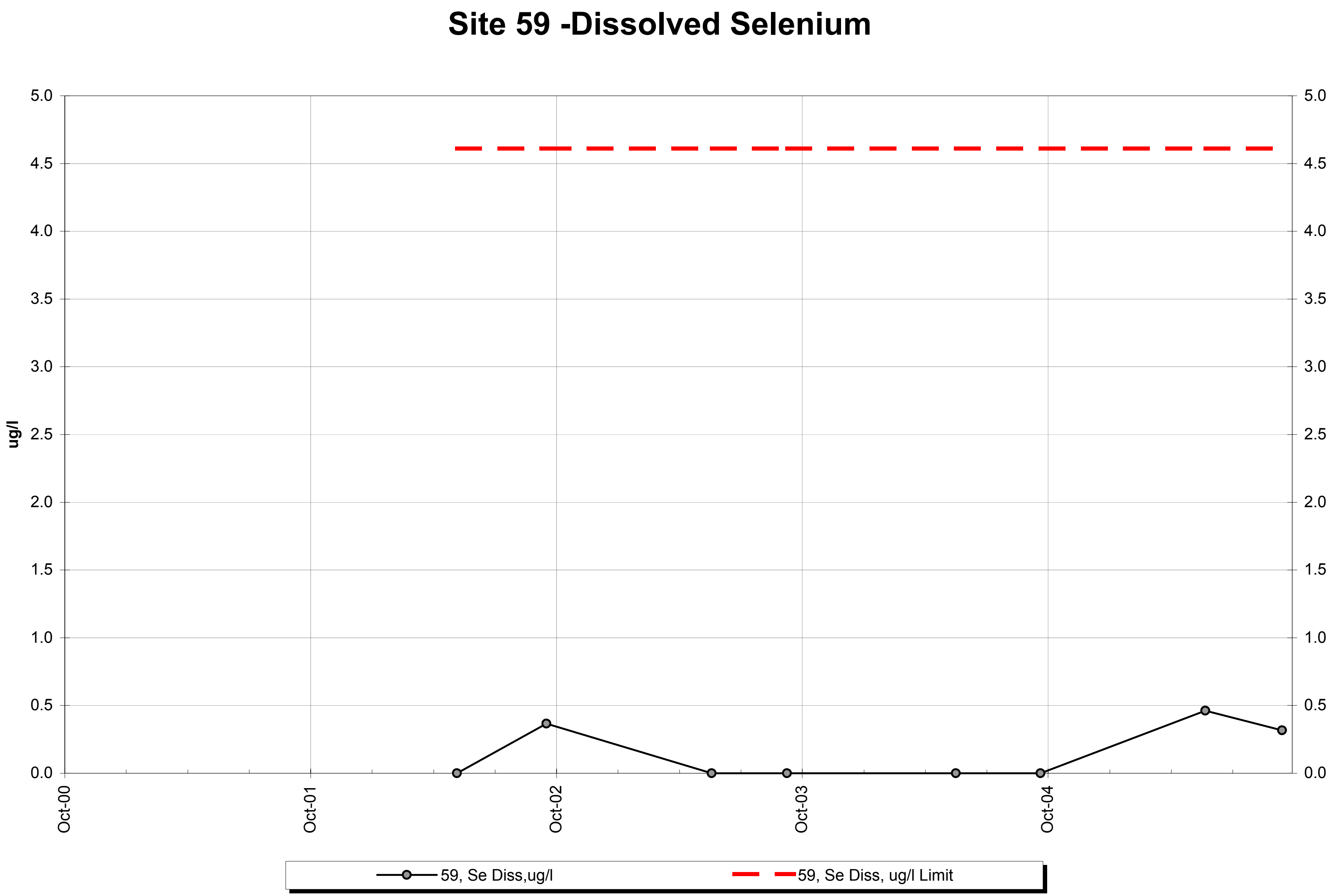


Site 59 -Dissolved Silver

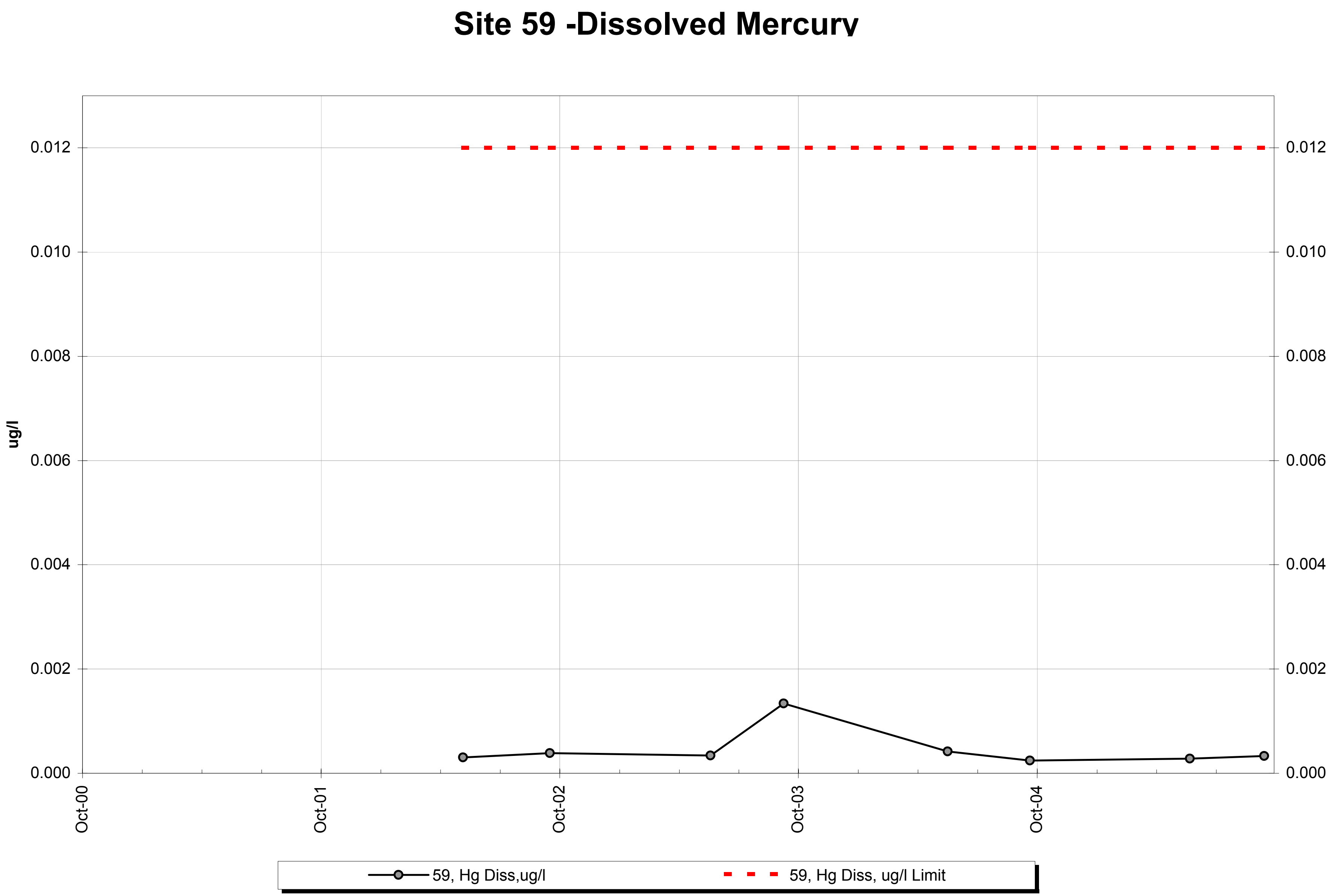


Site 59 -Dissolved Zinc





Site 59 -Dissolved Selenium
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
59, Se Diss,ug/l
59, Se Diss, ug/l Limit



Site 59 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
59, Hg Diss,ug/l
59, Hg Diss, ug/l Limit

INTERPRETIVE REPORT
SITE 28 "MONITORING WELL 2D"

The data collected during the current water year are listed in the following "Table of Results for Water Year 2005" report. The table includes all the data, field and lab, collected for the current water year and a series of flags keyed to the summary report "Qualified Data by QA Reviewer". The QA report lists any associated data limitations found during the monthly QA reviews of laboratory data for this site. Median values for all analytes have been calculated and are shown in the right-most column of the table of results. Any value reported as less than MDL has been replaced with a value of ½ MDL for the purpose of median calculation.

All data collected at this site for the past five water years are included in the data analyses. As shown in the table below there were no data outliers.

Sample Date	Parameter	Value	Qualifier	Notes
No outliers have been identified by KGCMC for the period of Oct-00though Sept-05.				

The data for Water Year 2005 have been compared to the strictest fresh water quality criterion for each applicable analyte. Three results exceeding these criteria have been identified, as listed in the table below. One datum is for a field pH value above the upper limit of 8.5 su listed in AWQS. Field and lab pH for Site 28 has historically resulted in values ranging from a pH of 7.0 to 8.8 su which are characteristic for wells completed in marine sediments. Two datum are for dissolved arsenic values of 74.3 µg/l and 76.1 µg/l for May-2005 and September-2005 respectively which exceed the AWQS of 50 µg/l. This site has routinely returned arsenic values above the AWQS and has a median value of 74.0 µg/l based on sampling since October-1988.

Sample Date	Parameter	Value	Standard	Standard Type
09/15/05	pH Field, su	8.81	6.5 - 8.5	Aquatic Life
05/24/05	Arenic Dissolved ug/L	74.3	50*	Drinking Water
09/15/05	Arenic Dissolved ug/L	76.1	50*	Drinking Water

* Standard is for Total Arsenic

X-Y plots have been generated to graphically present the data for each of the analytes requested in the Statistical Information Goals for this site. These plots have been visually analyzed for the appearance of any trend in concentration. No obvious trends were apparent. A non-parametric statistical analysis for trend was performed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Mann-Kendall analyses are presented in detail on the pages following this interpretive section. The table on the next page summarizes the results on the data collected between Oct-99 and Sep-05 (WY2000-WY2005). The dataset for lab conductivity is the only analyte that shows a statistically significant ($p<0.01$) trend and a slope estimate of -6.83 µS/cm•yr or a -3.1% decrease over the last 6 years. This trend may be the continuation of a much longer term, cyclical trend that has occurred over the past 10 years. During 1995-1996 typical conductivity values for this site were typically in the range of 200 – 220 μS/cm. Measured conductivities slowly increased to maximum of 269 μS/cm in Sept-2000 although not in a pure linear fashion. Since Sept-2000 the conductivities have slowly decreased back to a low of 199.3 μS/cm in Sept-2005. Thus, this trend appears to be within the range of variability experienced by this site in prior years.

Site 28-WY2005, summary statistics for trend analysis.

		Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	Z	Trend	p(2)	Q	Q(%)
Conductivity, Lab	6	-2.79	-	**<0.01**	-6.83	-3.1
pH, Lab	6	0.13	+	0.55		
Alkalinity, Total	6	-0.80	-	0.21		
Zinc, Dissolved	6	0.66	+	0.75		

(1): Number of years (2):Significance level

Additional X-Y plots have been generated for alkalinity, pH, sulfate, conductance, and dissolved zinc that co-plot data from Site 28 and Site 59, the up-gradient control site, to aid in comparison between those two sites. Lab conductivity, lab pH, total alkalinity, and sulfate are all higher at Site 28 than at Site 59 while the dissolved zinc concentrations are similar. Site 59 and Site 28 are deep completion wells that are each respectively colocated with Site 58 and Site 27. A similar line of reasoning discussed in the section for Site 28 can be applied to explaining the differences in water chemistry between Site 59 and Site 28. Thus, the generally higher concentrations at Site 28 reflect the more mature nature of the groundwater sampled at this site, while the similar values for dissolved zinc are a strong indication of the lack of any influence from tailings contact water.

Table of Results for Water Year 2005

Site 28 "MW-2D"

Sample Date/Parameter	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	5/24/2005	Jun-05	Jul-05	Aug-05	9/15/2005	**Median**
Water Temp (°C)								6.6				7.0	6.8
Conductivity-Field(µmho)								223				199	211
Conductivity-Lab (µmho)								205				190	198
pH Lab (standard units)								8.06				7.74	7.90
pH Field (standard units)								8.05				8.81	8.43
Total Alkalinity (mg/L)								100.0				88.9	94.5
Total Sulfate (mg/L)								10.1				10.4	10.3
Hardness (mg/L)								74.3				76.1	75.2
Dissolved As (ug/L)								66.10				68.30	67.20
Dissolved Ba (ug/L)	NOT SCHEDULED FOR SAMPLING							6.9	NOT SCHEDULED FOR SAMPLING			6.8	6.9
Dissolved Cd (ug/L)								<0.004				<0.003	0.002
Dissolved Cr (ug/L)								<0.056				0.373	0.201
Dissolved Cu (ug/L)								0.239 U				0.136 U	0.188
Dissolved Pb (ug/L)								0.0581 U				0.0047 U	0.0314
Dissolved Ni (ug/L)								0.405				0.483	0.444
Dissolved Ag (ug/L)								0.005 J				<0.002	0.003
Dissolved Zn (ug/L)								0.84 U				0.09 U	0.47
Dissolved Se (ug/L)								<0.116 UJ				<0.116	0.058
Dissolved Hg (ug/L)								0.000289 U				0.000354 J	0.000322

For individual sample/analyte qualifier descriptions see "Qualified Data by QA Reviewer" table.

Values reported as less than MDL are replaced by 1/2 MDL for median calculation purposes.

Shaded data has been qualified as an outlier by KGCMC and removed from any further analysis and is not included into the calculation of the median

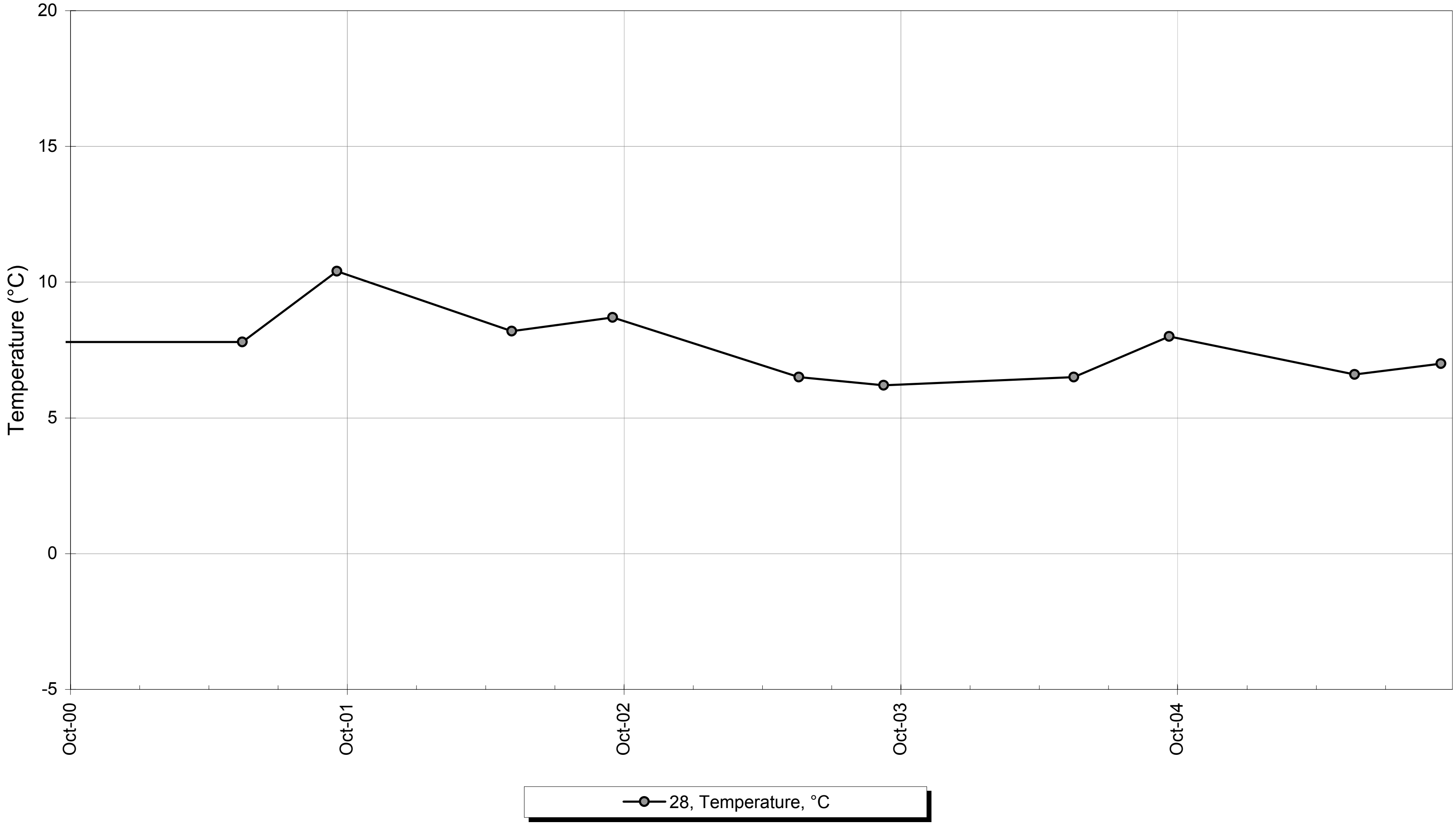
Qualified Data by QA Reviewer

Date Range: 10/01/2004 to 09/30/2005

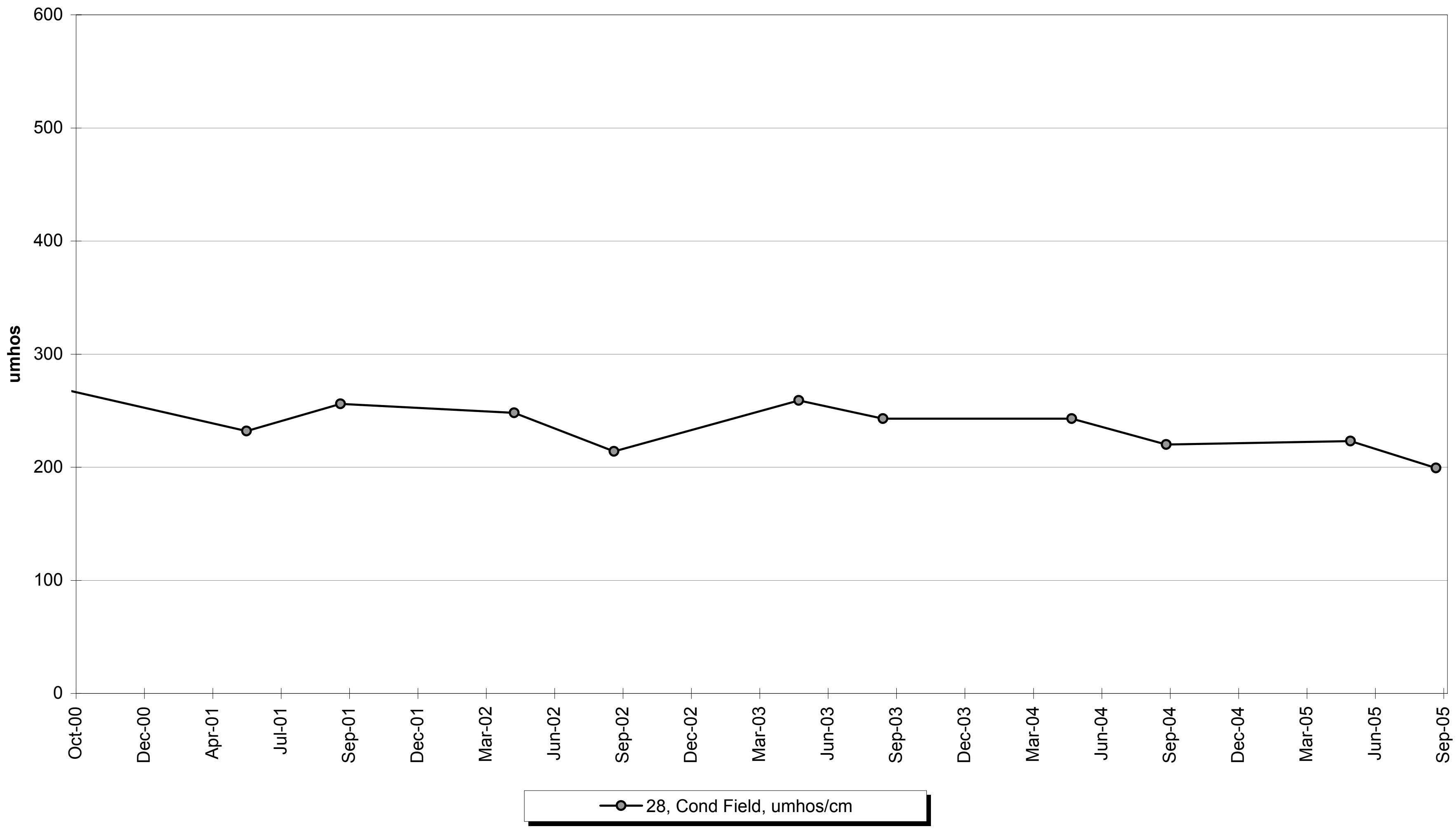
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
28	05/24/2005	3:25:00 PM				
			Cu Diss, ug/l	0.239	U	Field Blank Contamination
			Pb Diss, ug/l	0.0581	U	Field Blank Contamination
			Ag Diss, ug/l	0.00456	J	Below Quantitative Range
			Zn Diss, ug/l	0.843	U	Field Blank Contamination
			Se Diss, ug/l	-0.116	UJ	LCS Recovery
			Hg Diss, ug/l	0.000289	U	Field Blank Contamination
28	09/15/2005	12:05:00 PM				
			Cu Diss, ug/l	0.136	U	Field Blank Contamination
			Pb Diss, ug/l	0.00466	U	Field Blank Contamination
			Zn Diss, ug/l	0.0944	U	Field Blank Contamination
			Hg Diss, ug/l	0.000354	J	Below Quantitative Range

Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

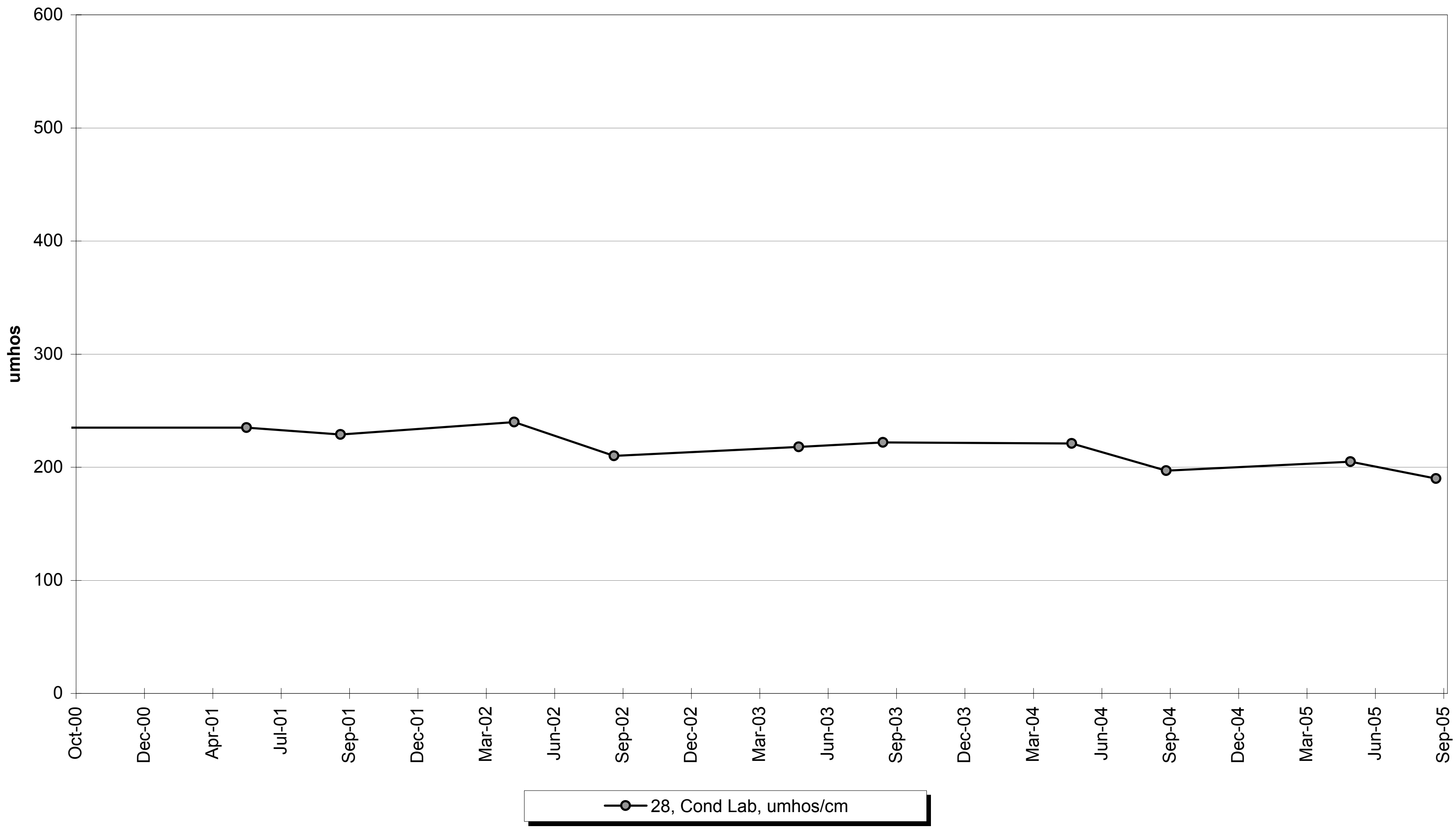
Site 28 -Water Temperature



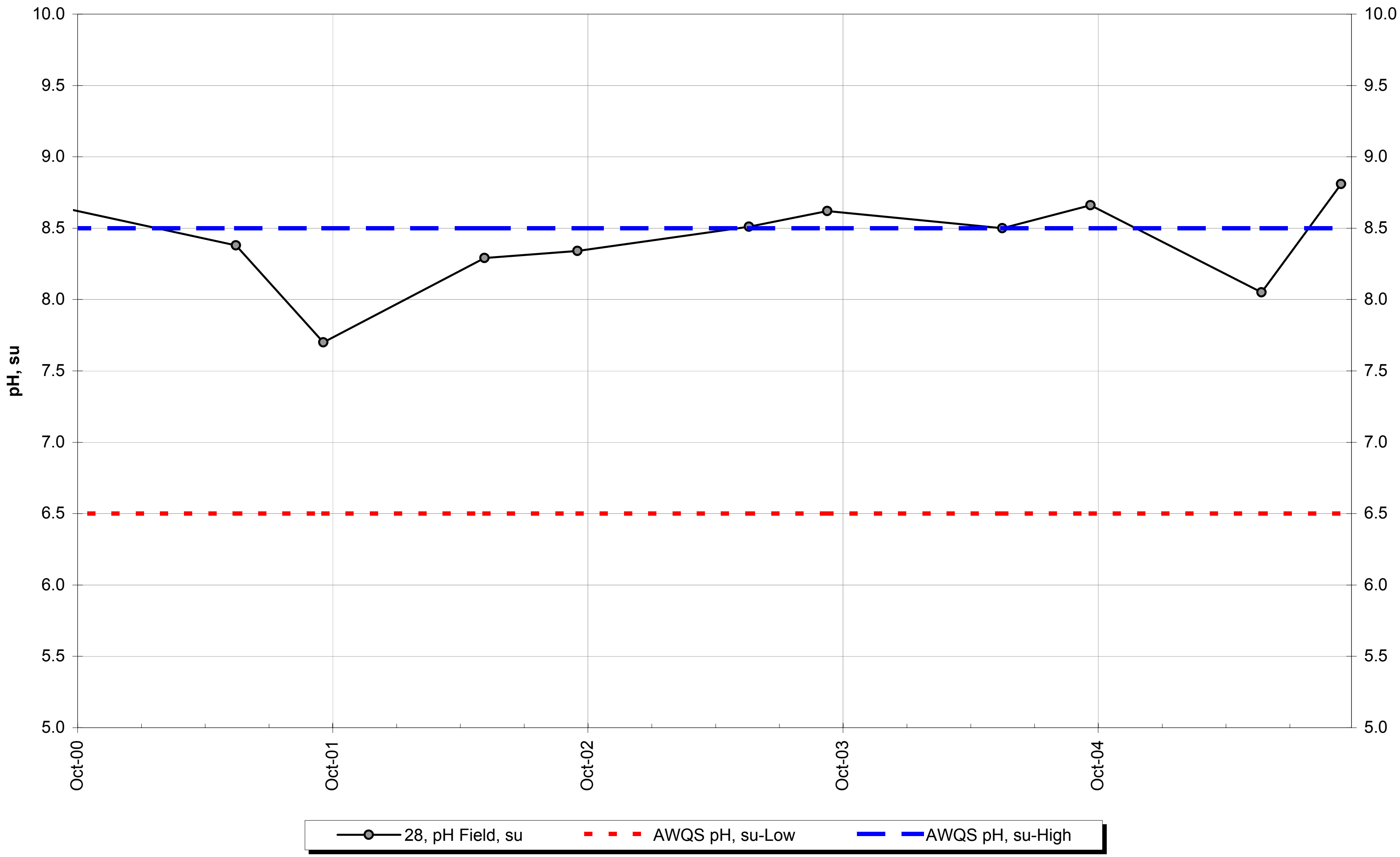
Site 28 -Conductivity-Field



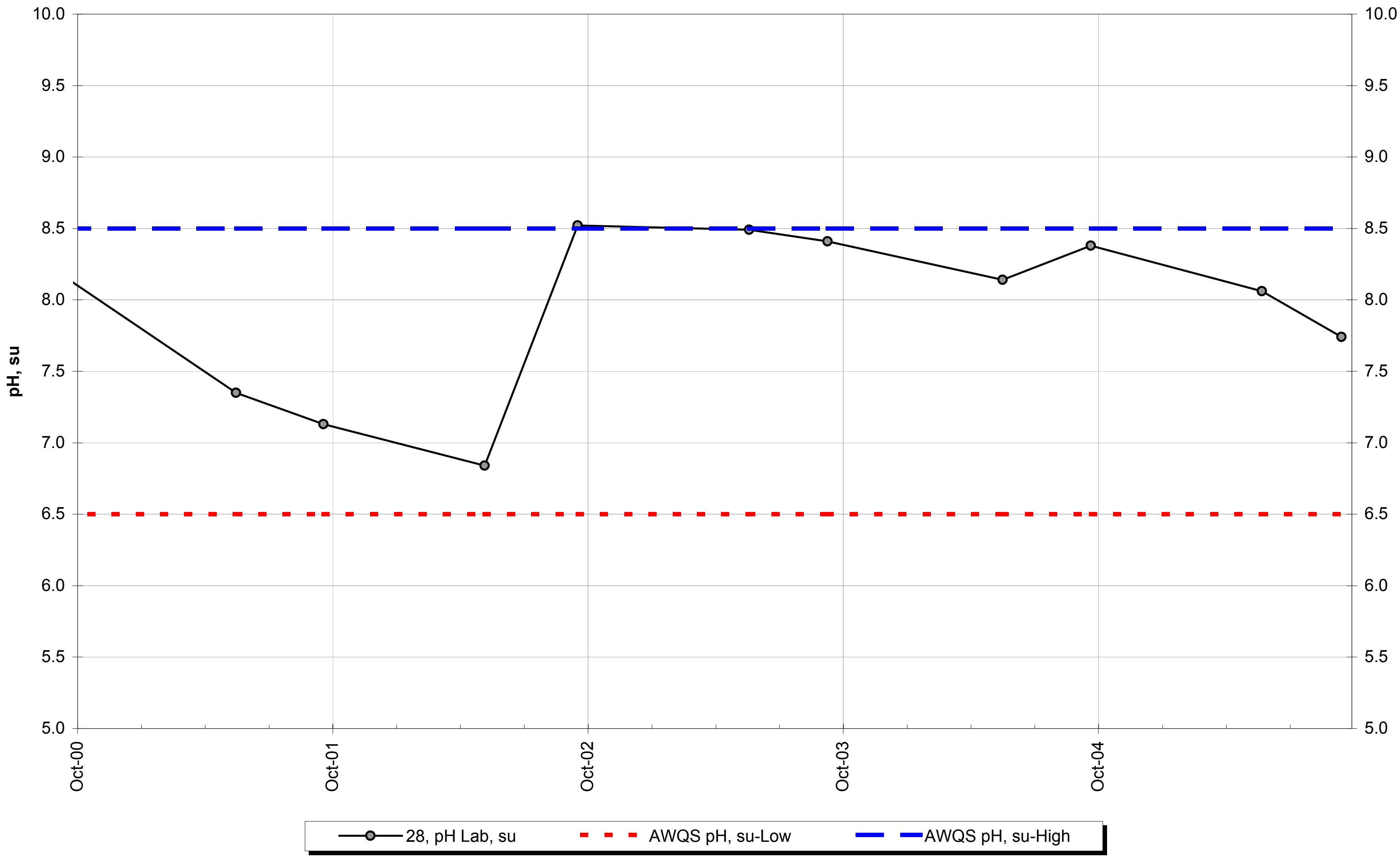
Site 28 -Conductivity-Lab



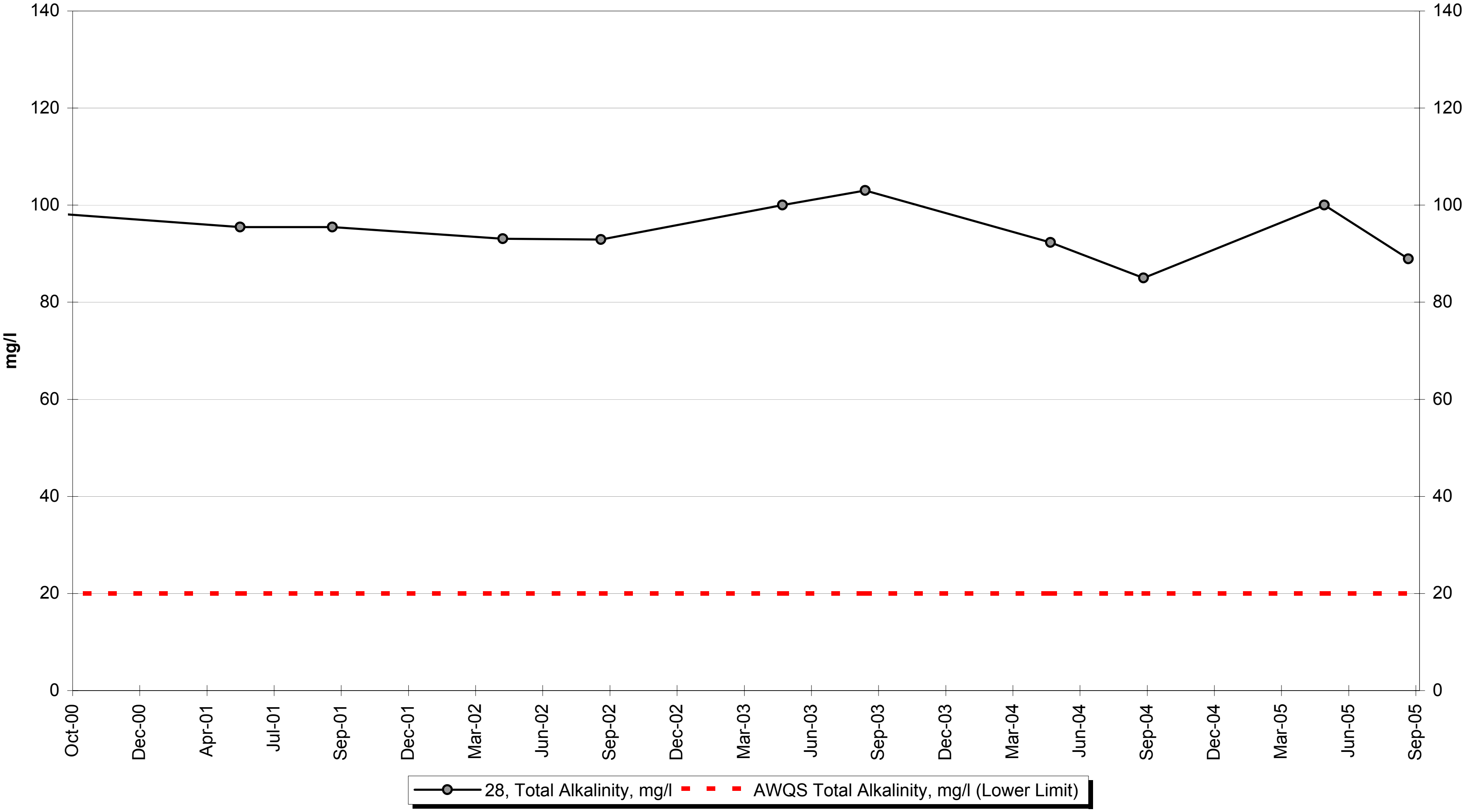
Site 28 -Field pH



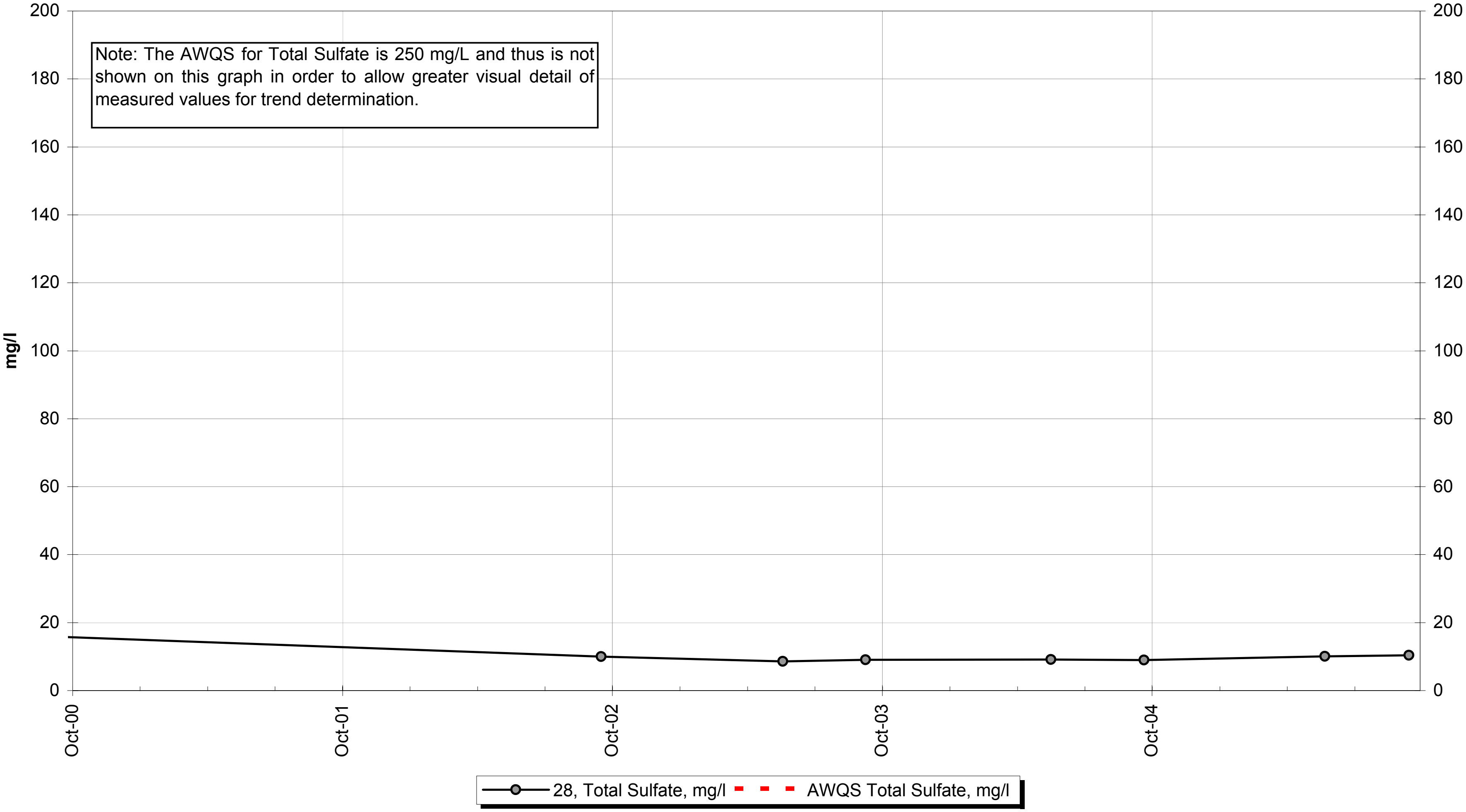
Site 28 -Lab pH



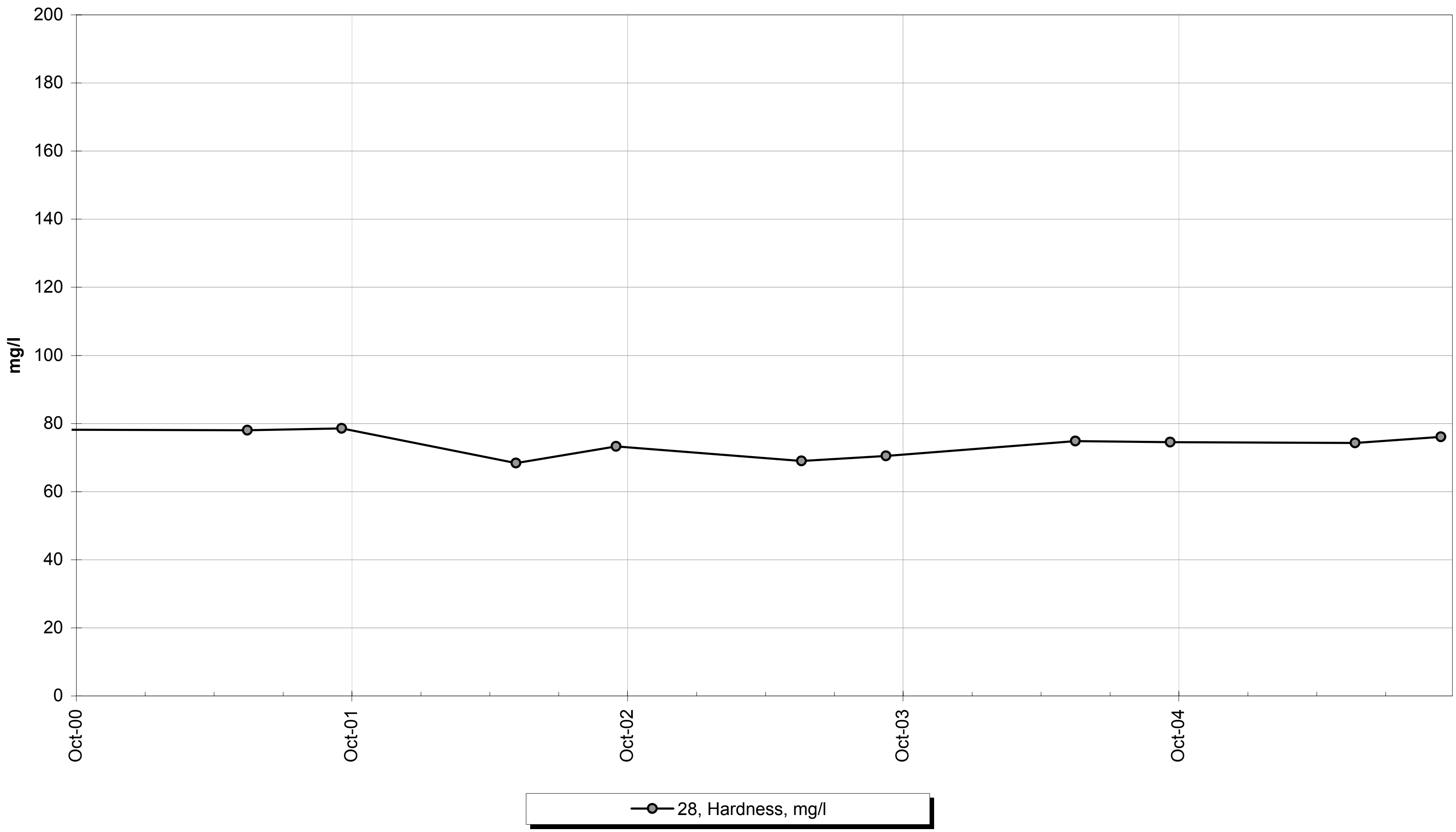
Site 28 -Total Alkalinity



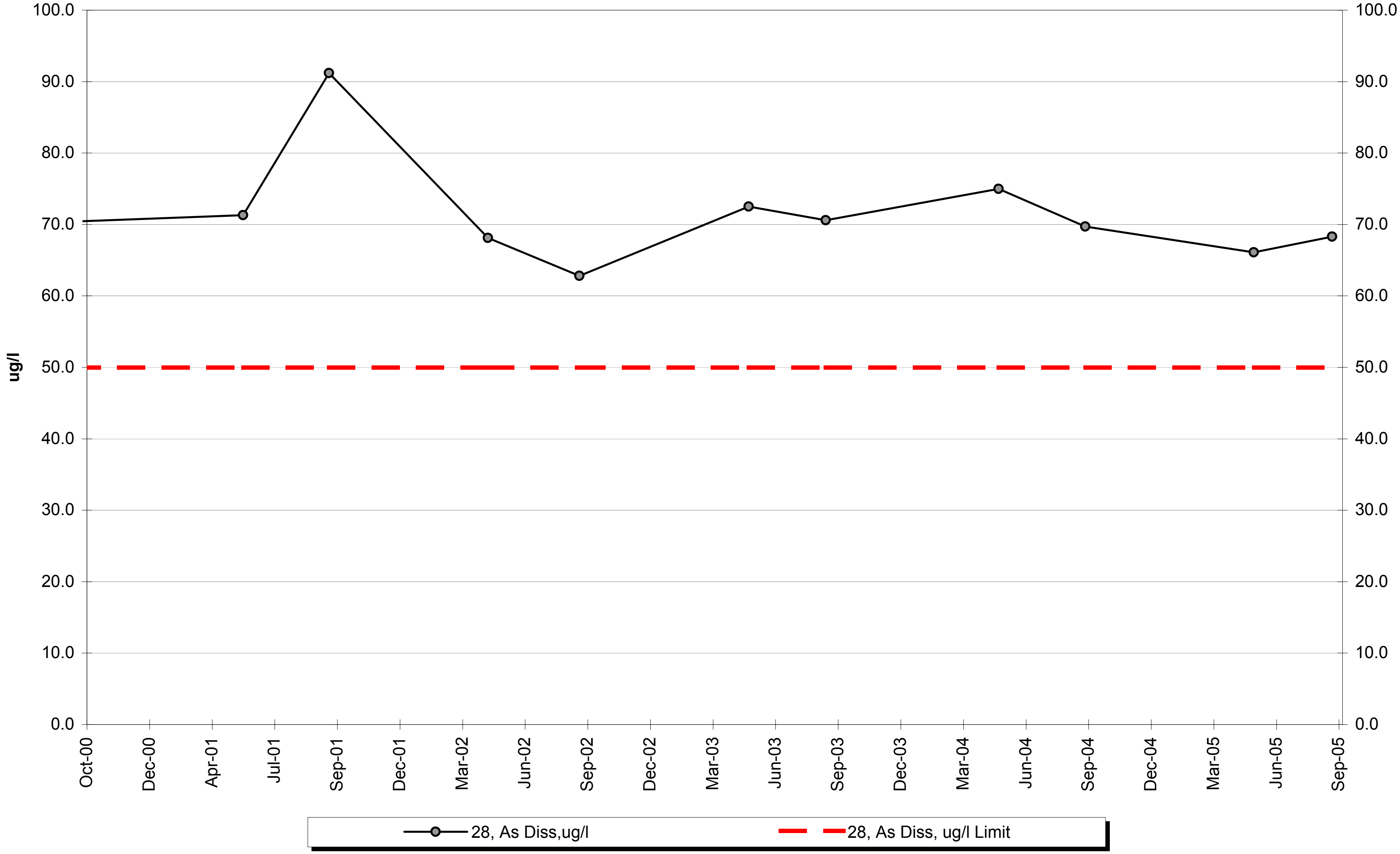
Site 28 -Total Sulfate



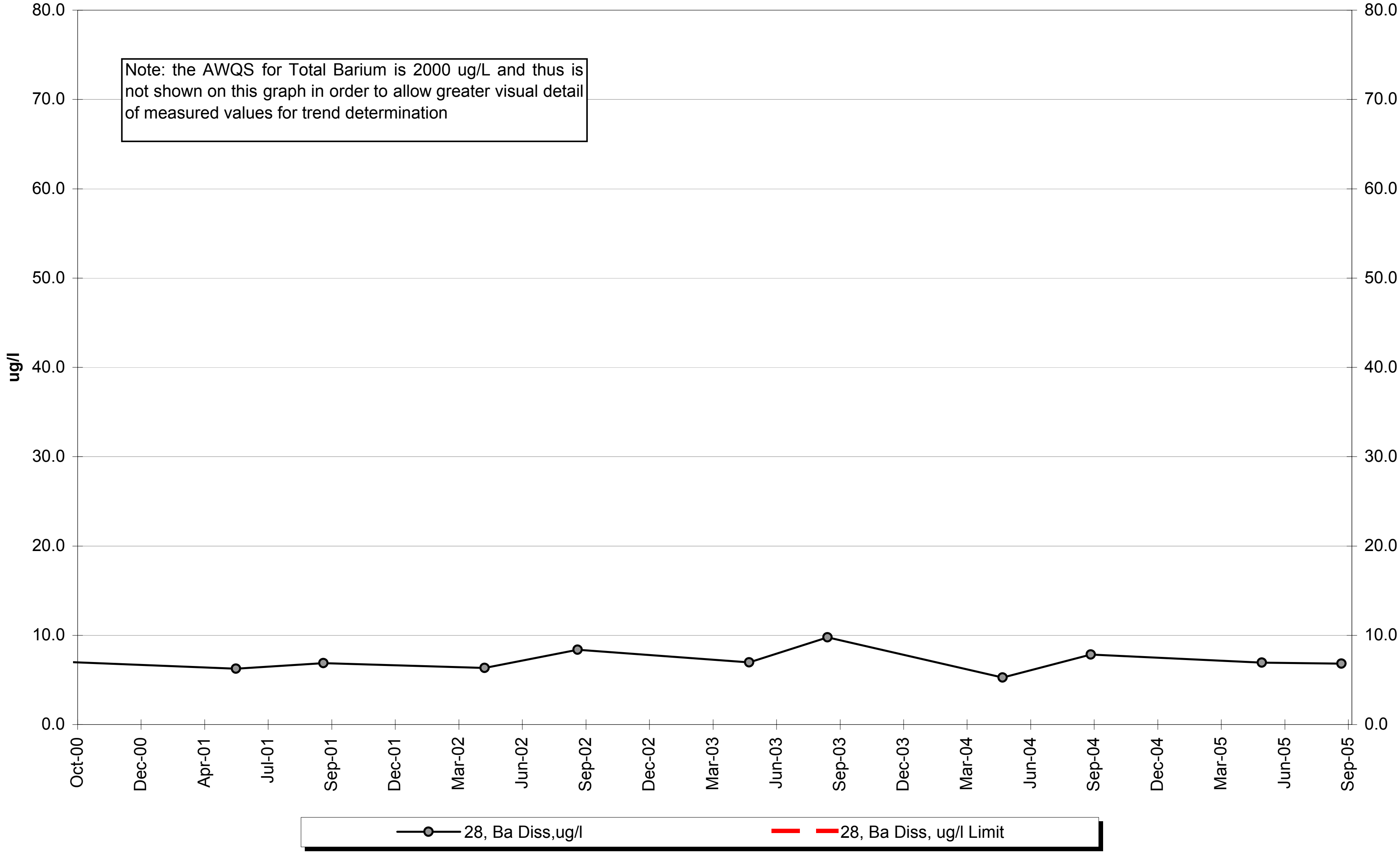
Site 28 -Hardness

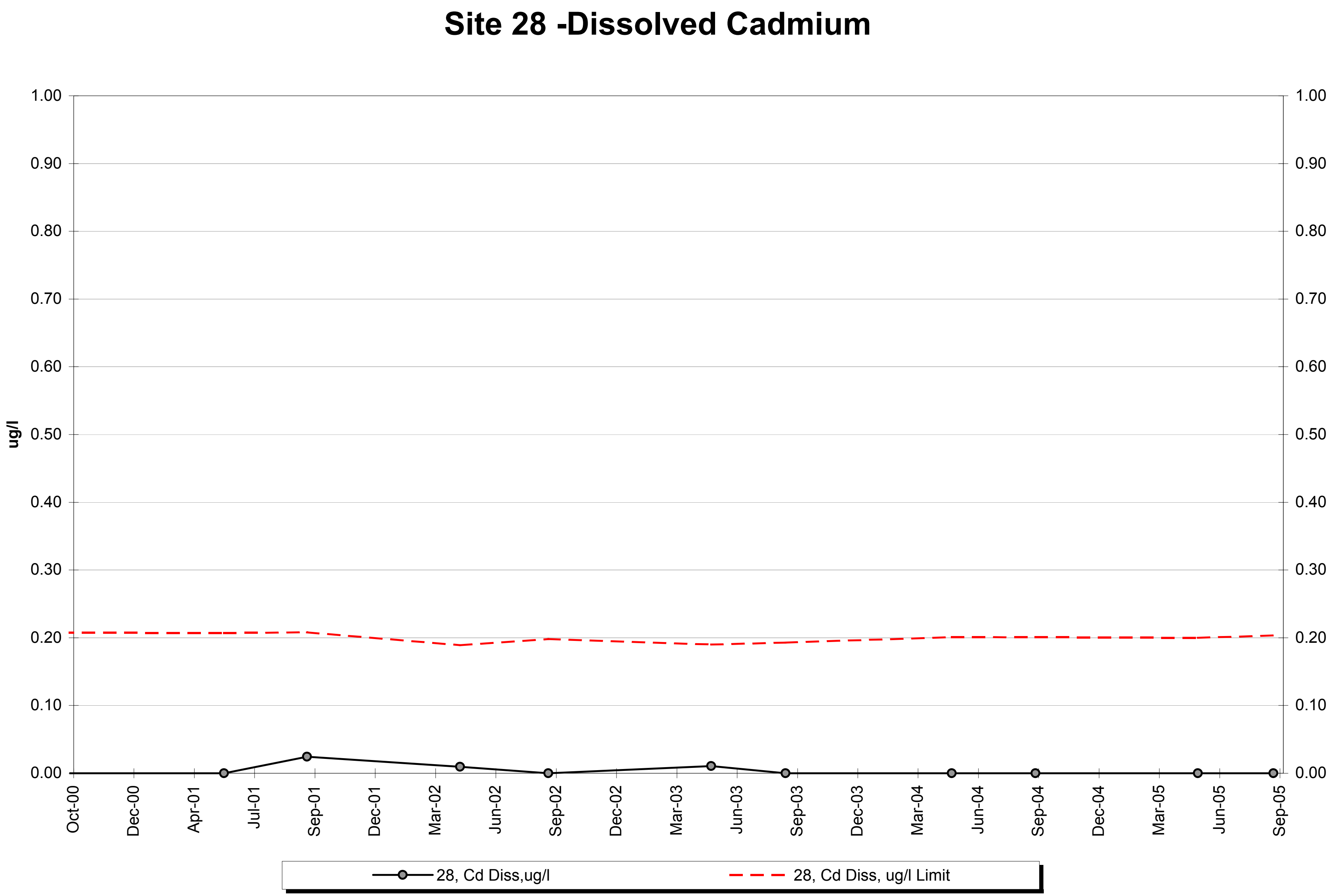


Site 28 -Dissolved Arsenic



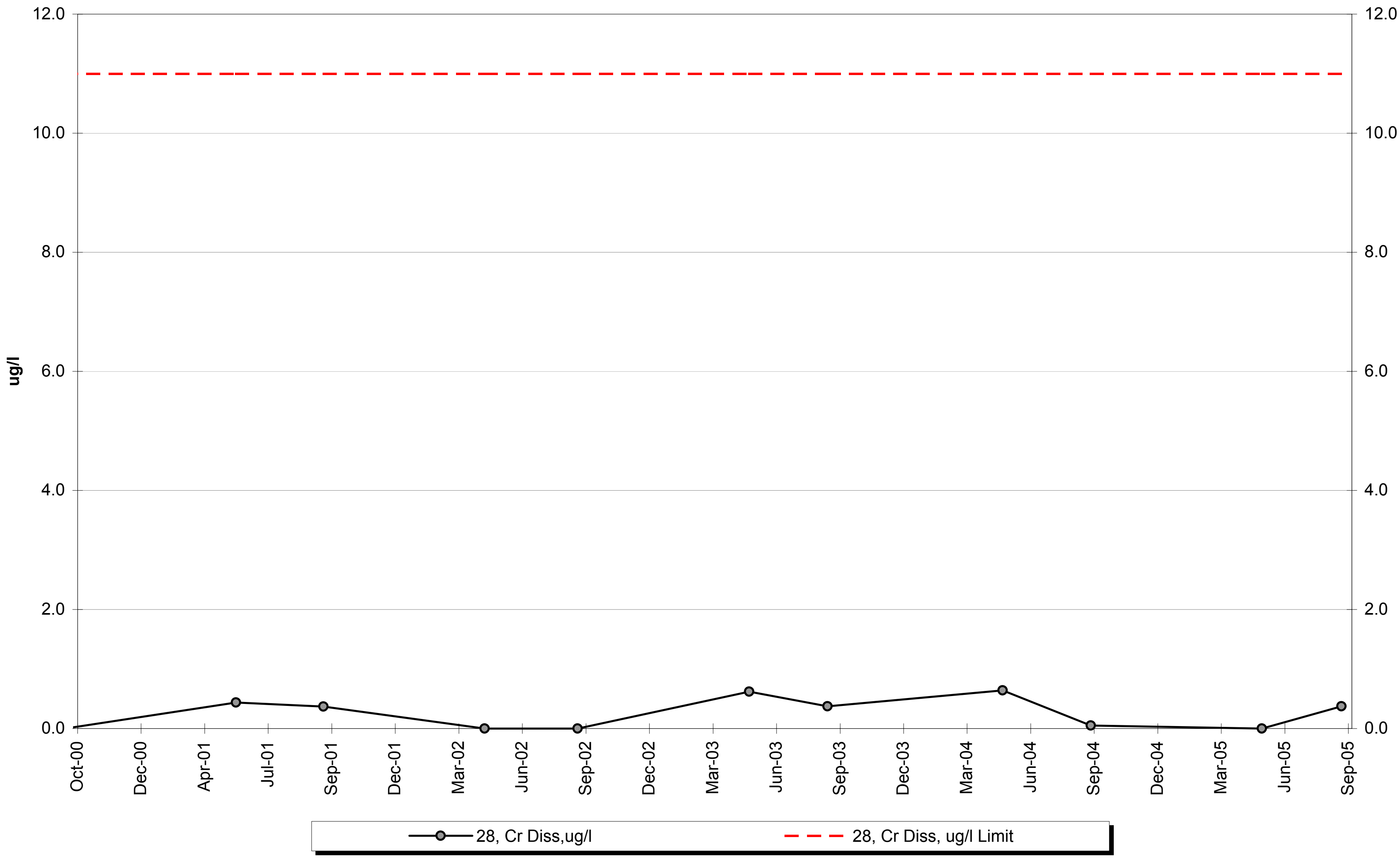
Site 28 -Dissolved Barium

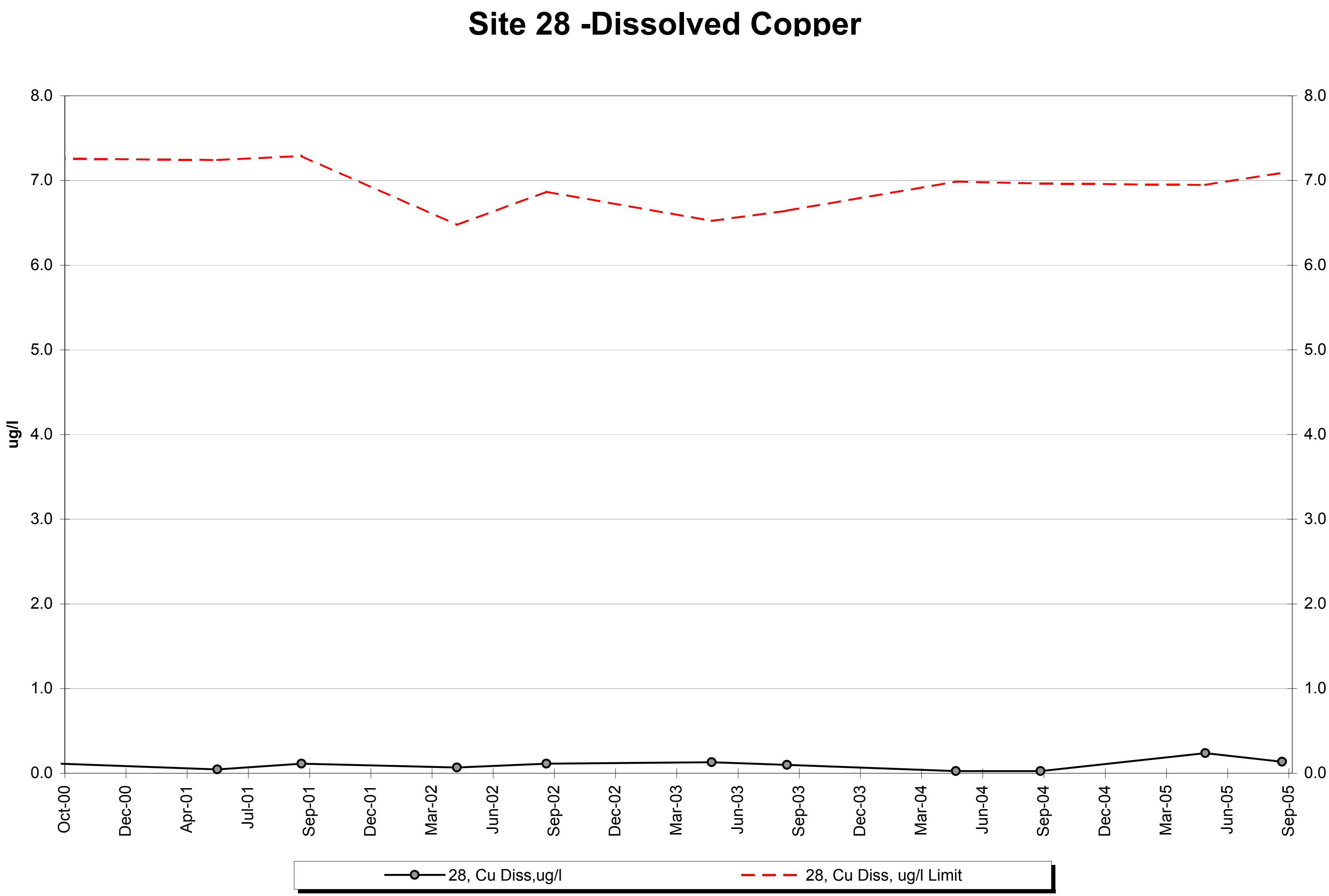


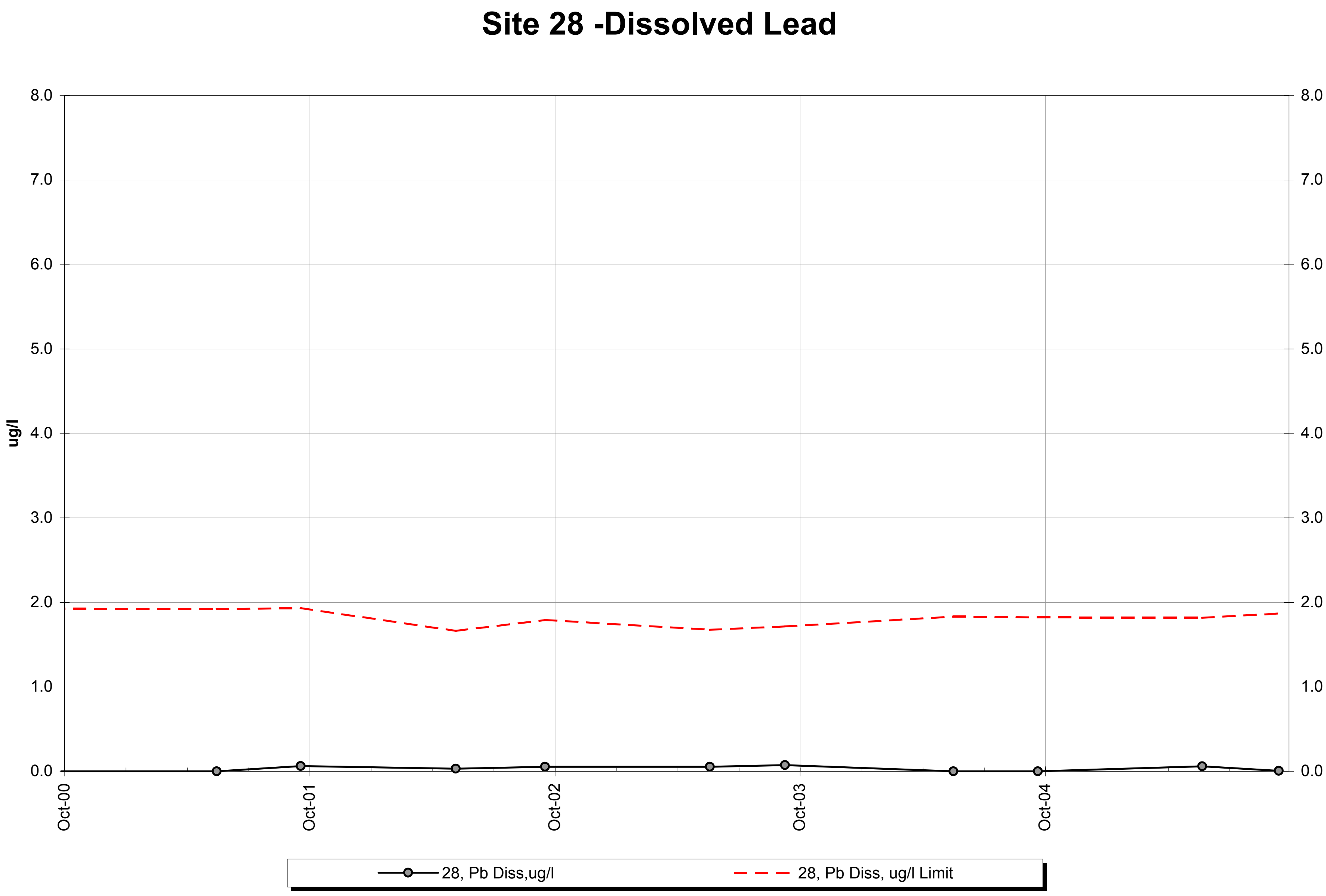


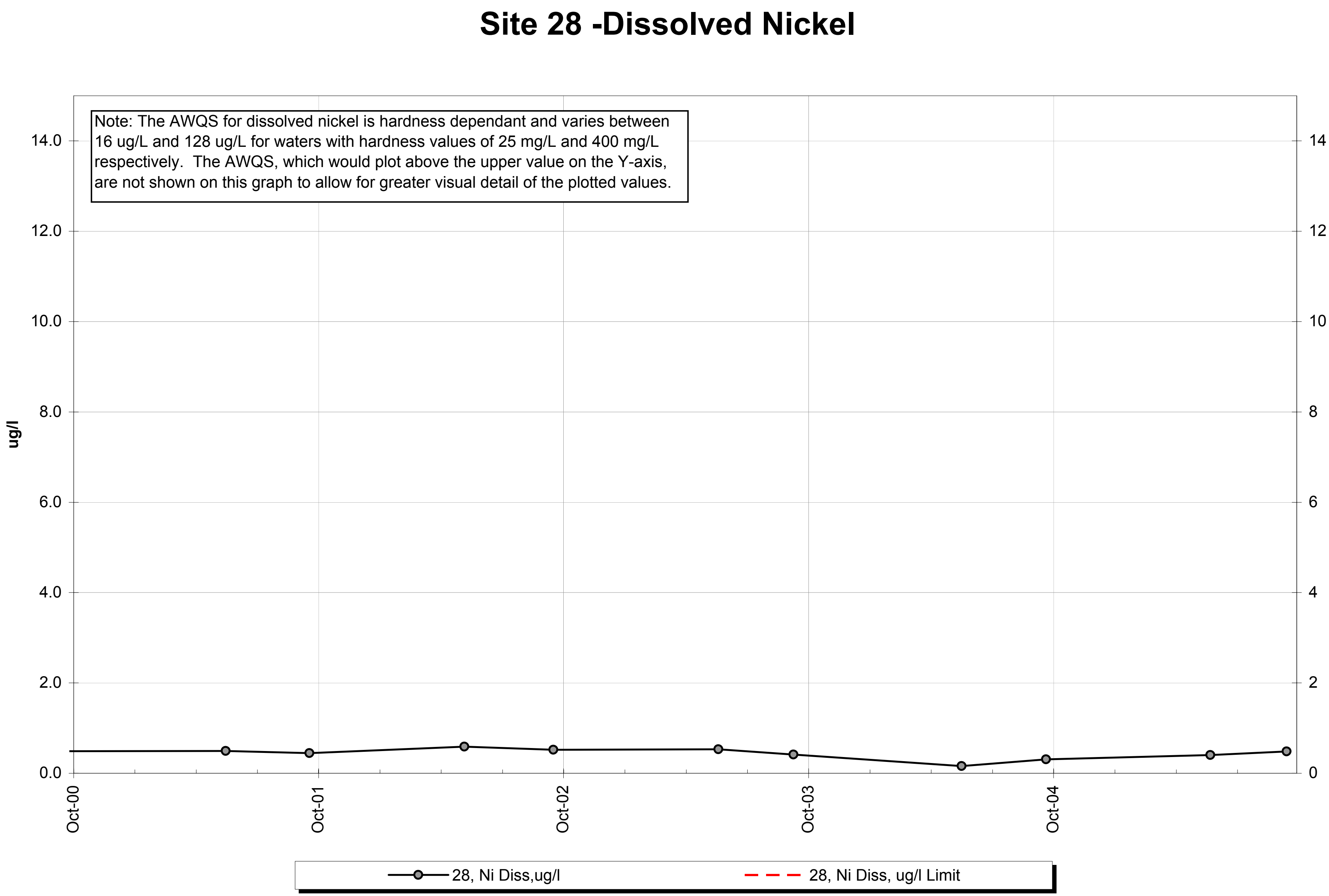
Site 28 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
28, Cd Diss,ug/l
28, Cd Diss, ug/l Limit

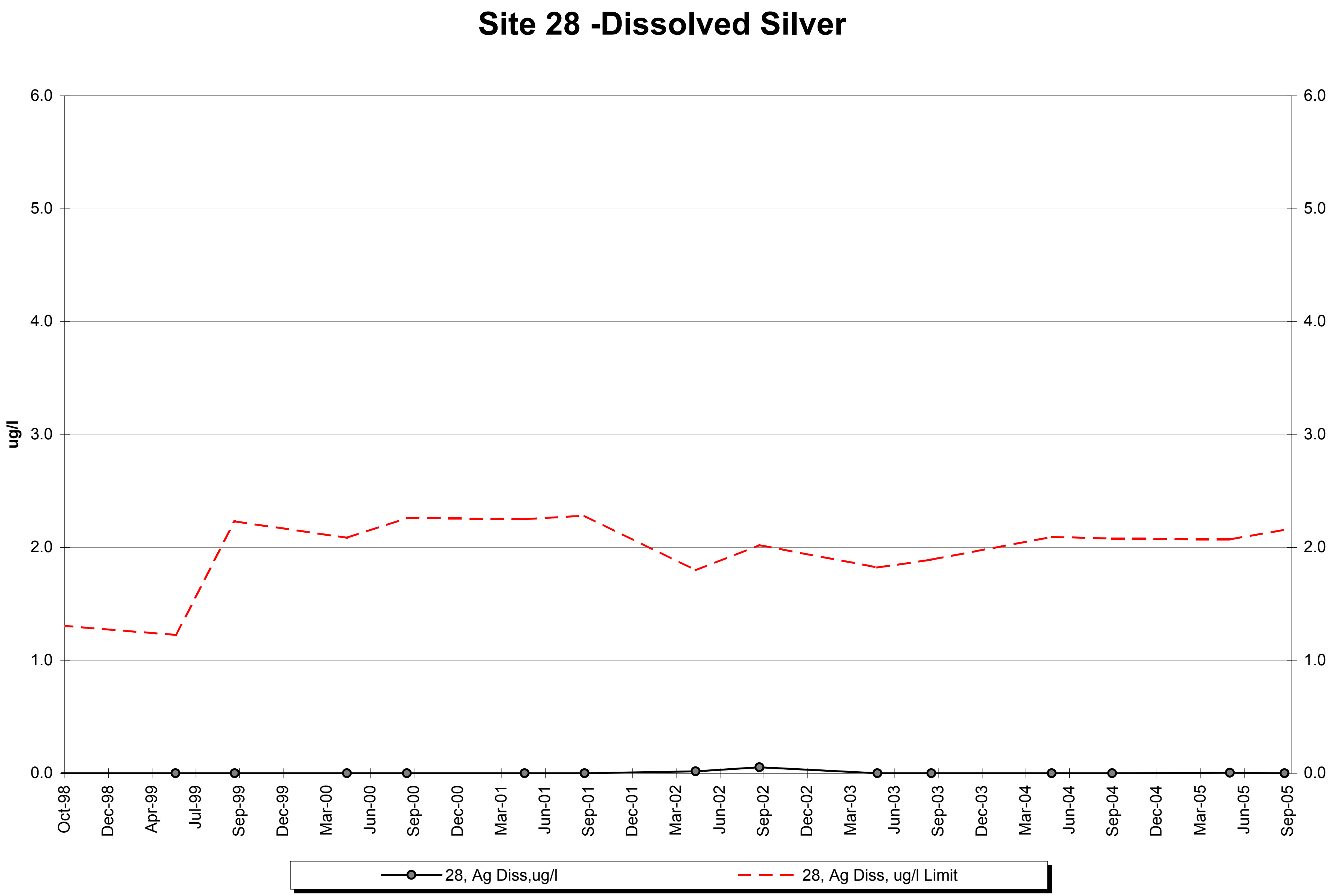
Site 28 -Dissolved Chromium



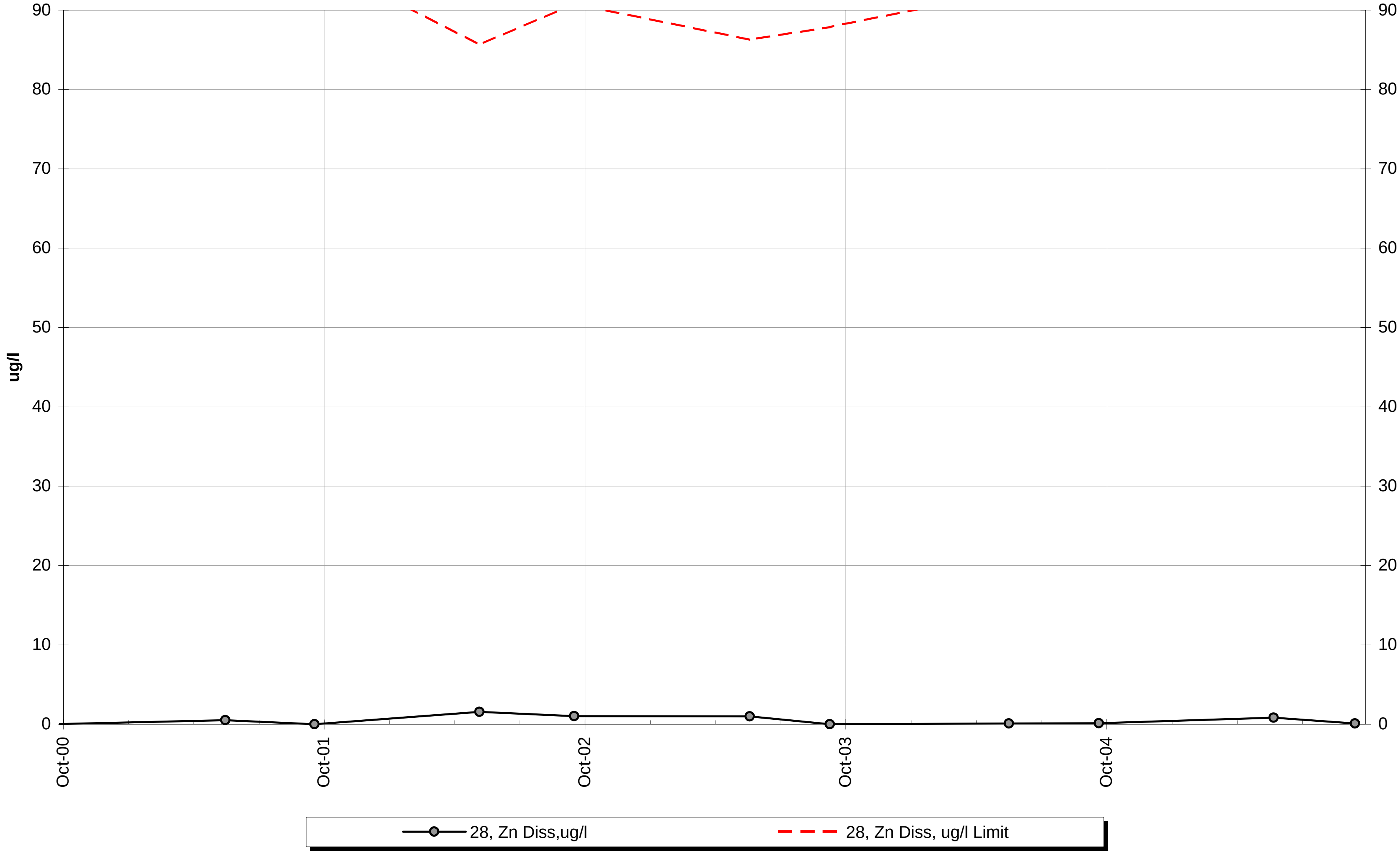

Site 28 -Dissolved Copper
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Dec-00
Apr-01
Jul-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
28, Cu Diss,ug/l
28, Cu Diss, ug/l Limit

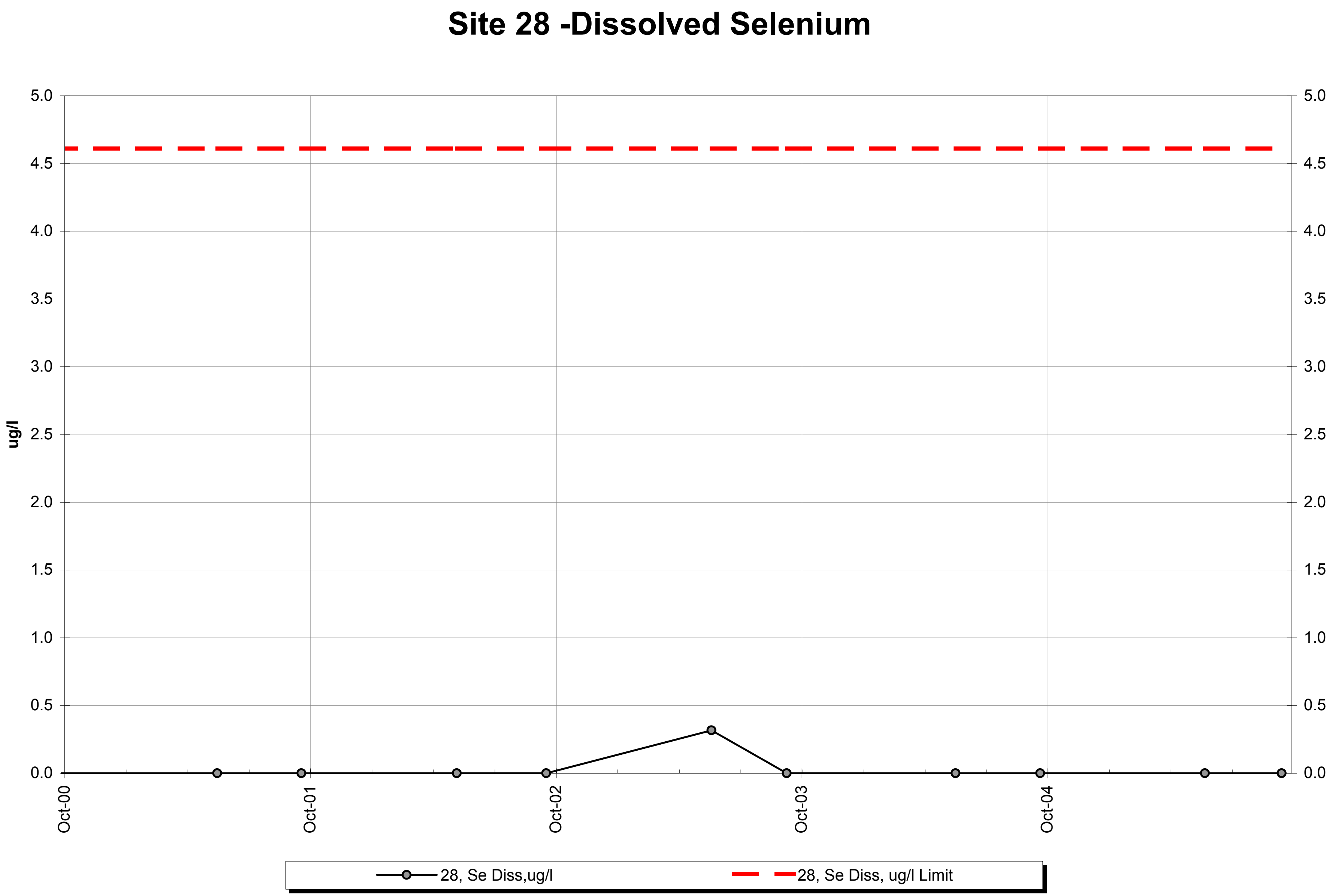

Site 28 -Dissolved Lead
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
28, Pb Diss,ug/l
28, Pb Diss, ug/l Limit


Site 28 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater visual detail of the plotted values.
ug/l
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
14
12
10
8
6
4
2
0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
28, Ni Diss,ug/l
28, Ni Diss, ug/l Limit

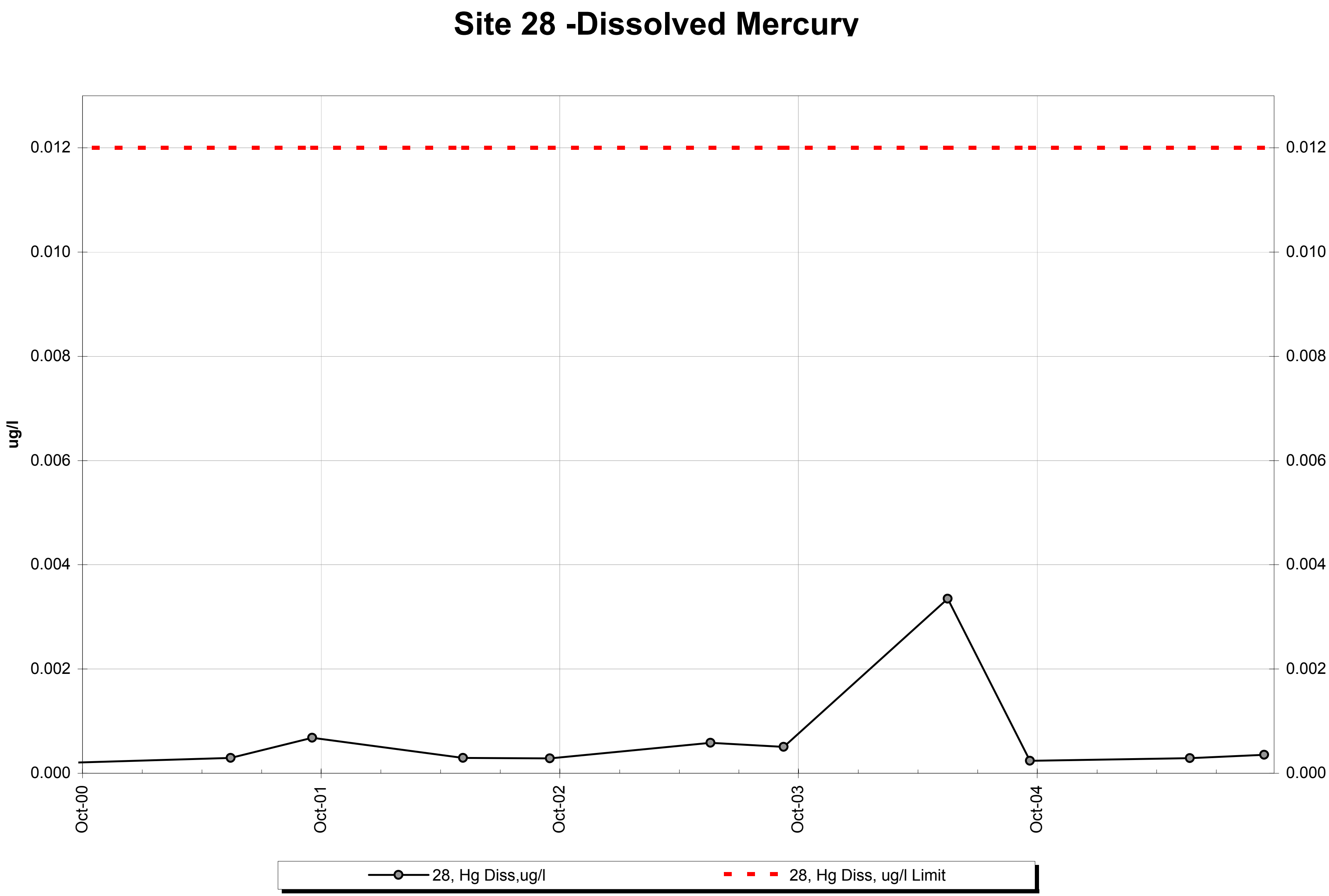

Site 28 -Dissolved Silver
ug/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-98
Dec-98
Apr-99
Jul-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
28, Ag Diss,ug/l
28, Ag Diss, ug/l Limit

Site 28 -Dissolved Zinc



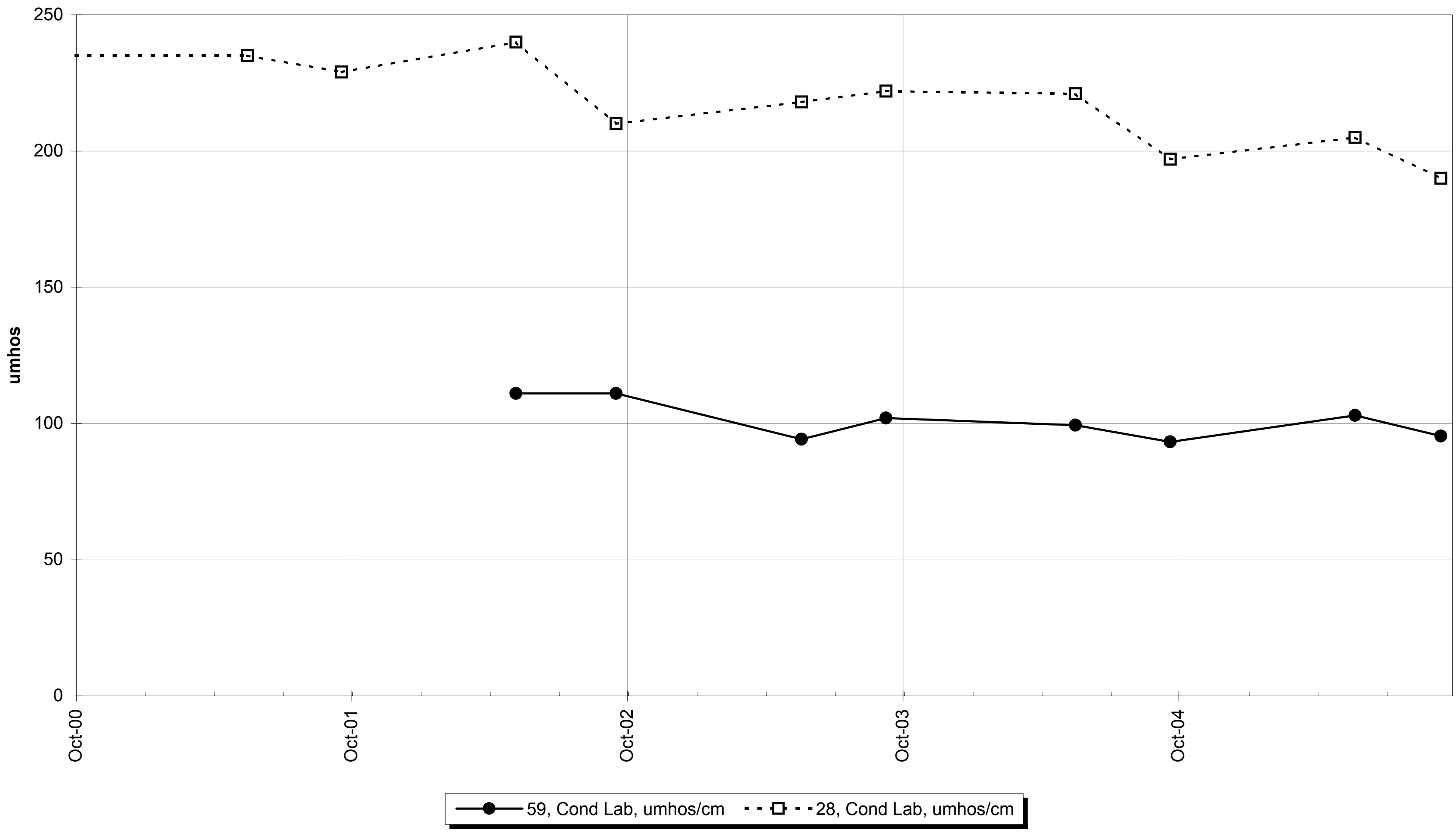


Site 28 -Dissolved Selenium
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
28, Se Diss,ug/l
28, Se Diss, ug/l Limit

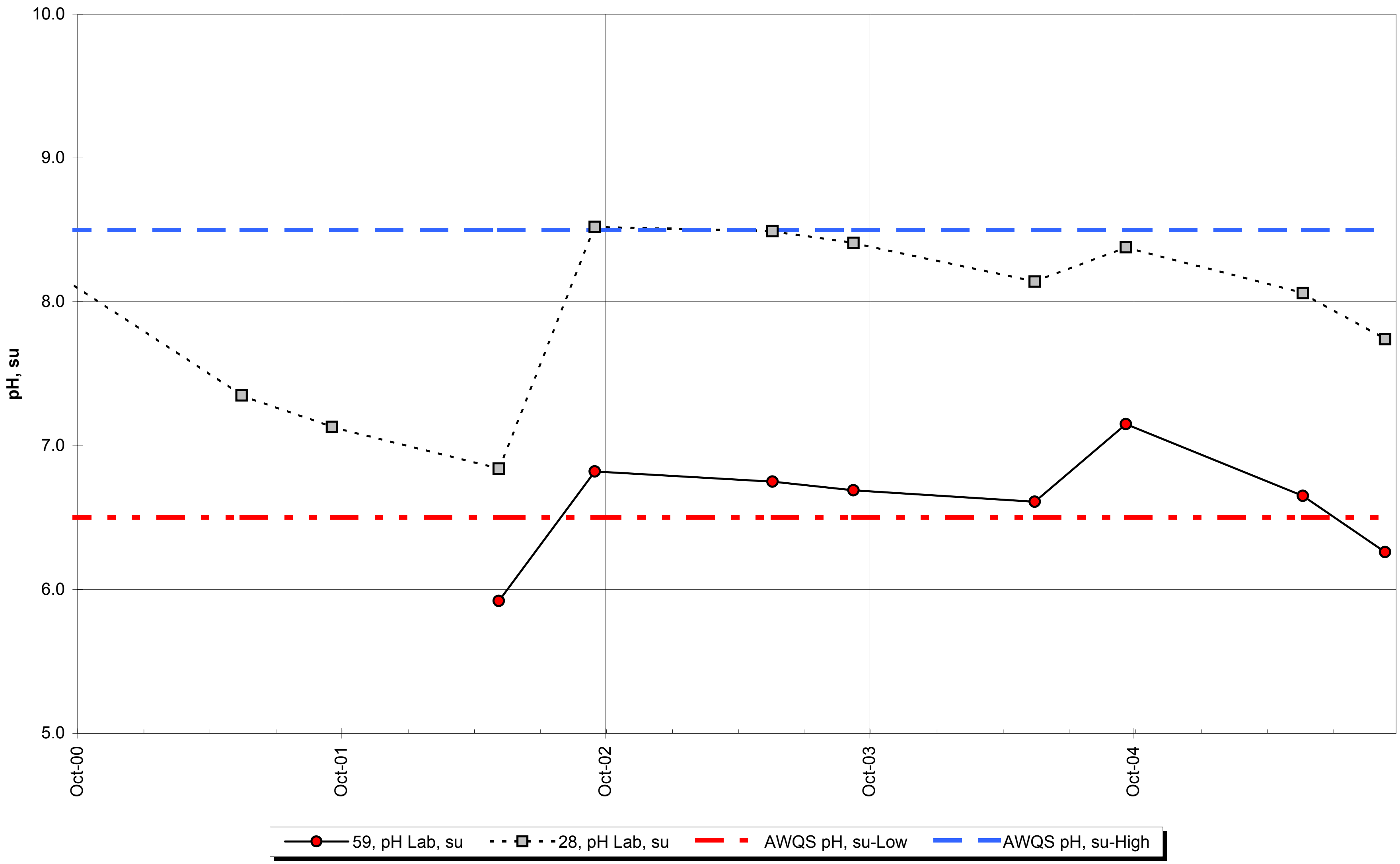


Site 28 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
28, Hg Diss,ug/l
28, Hg Diss, ug/l Limit

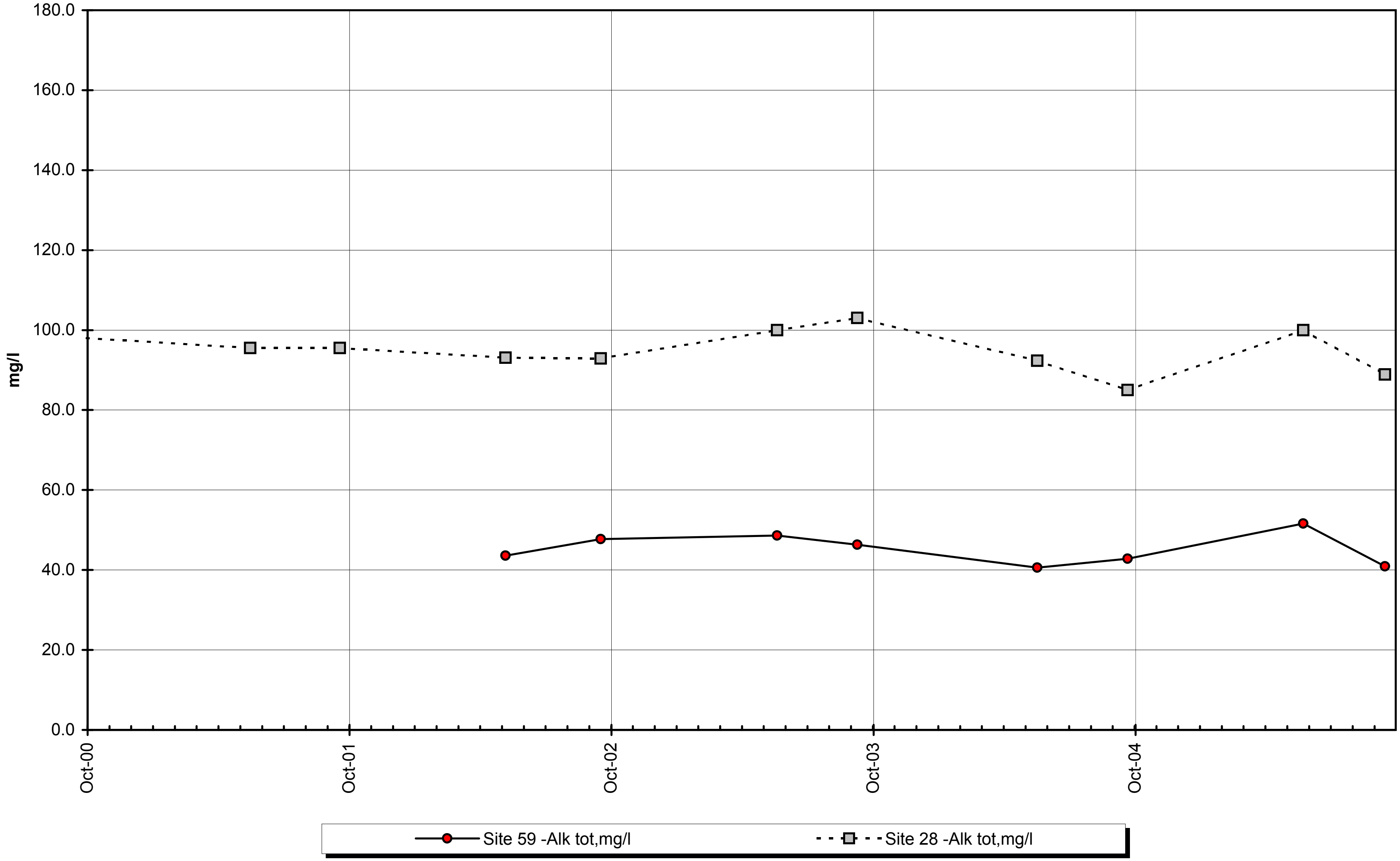
Site 59 vs Site 28 -Conductivity

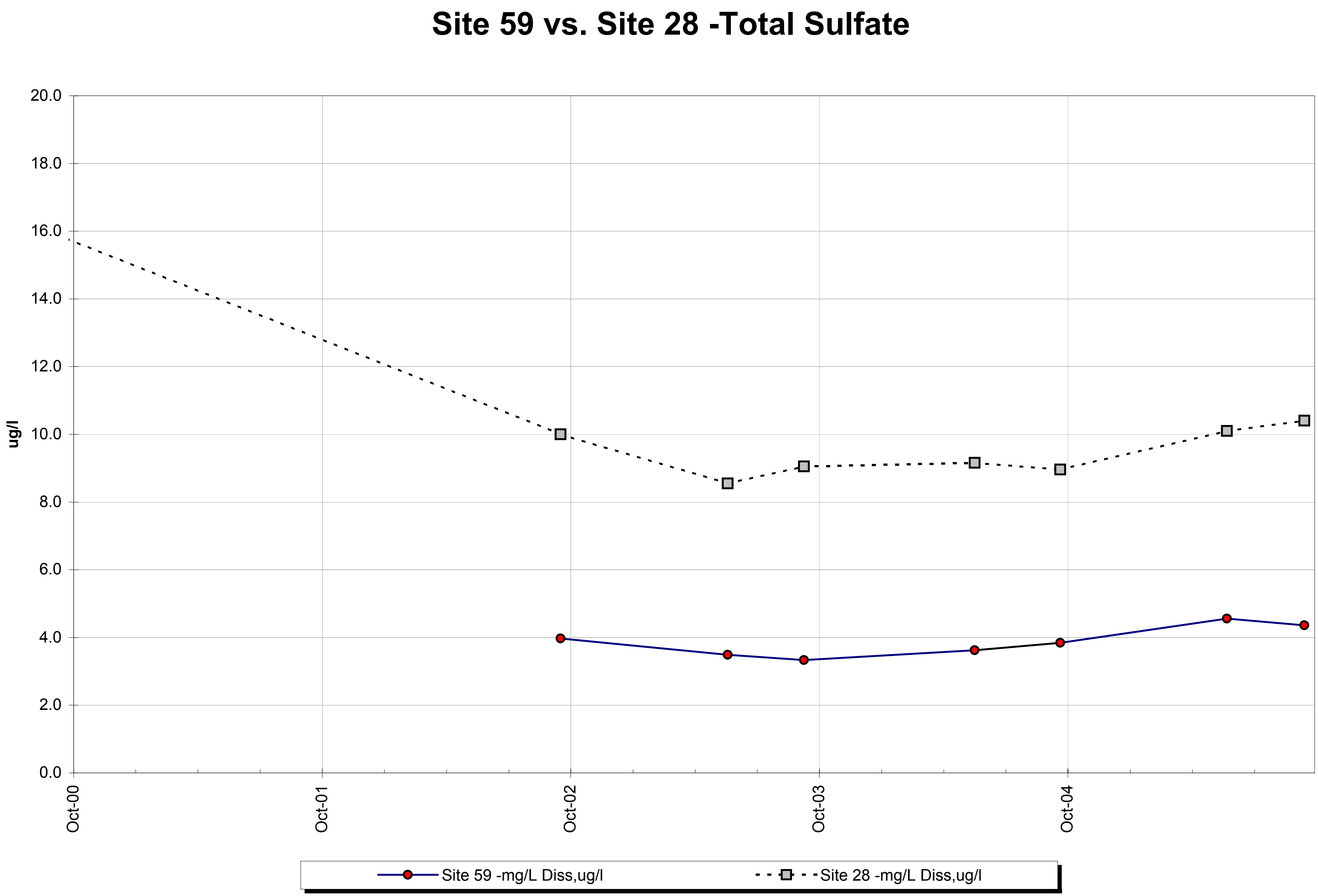


Site 59 vs. Site 28 - pH

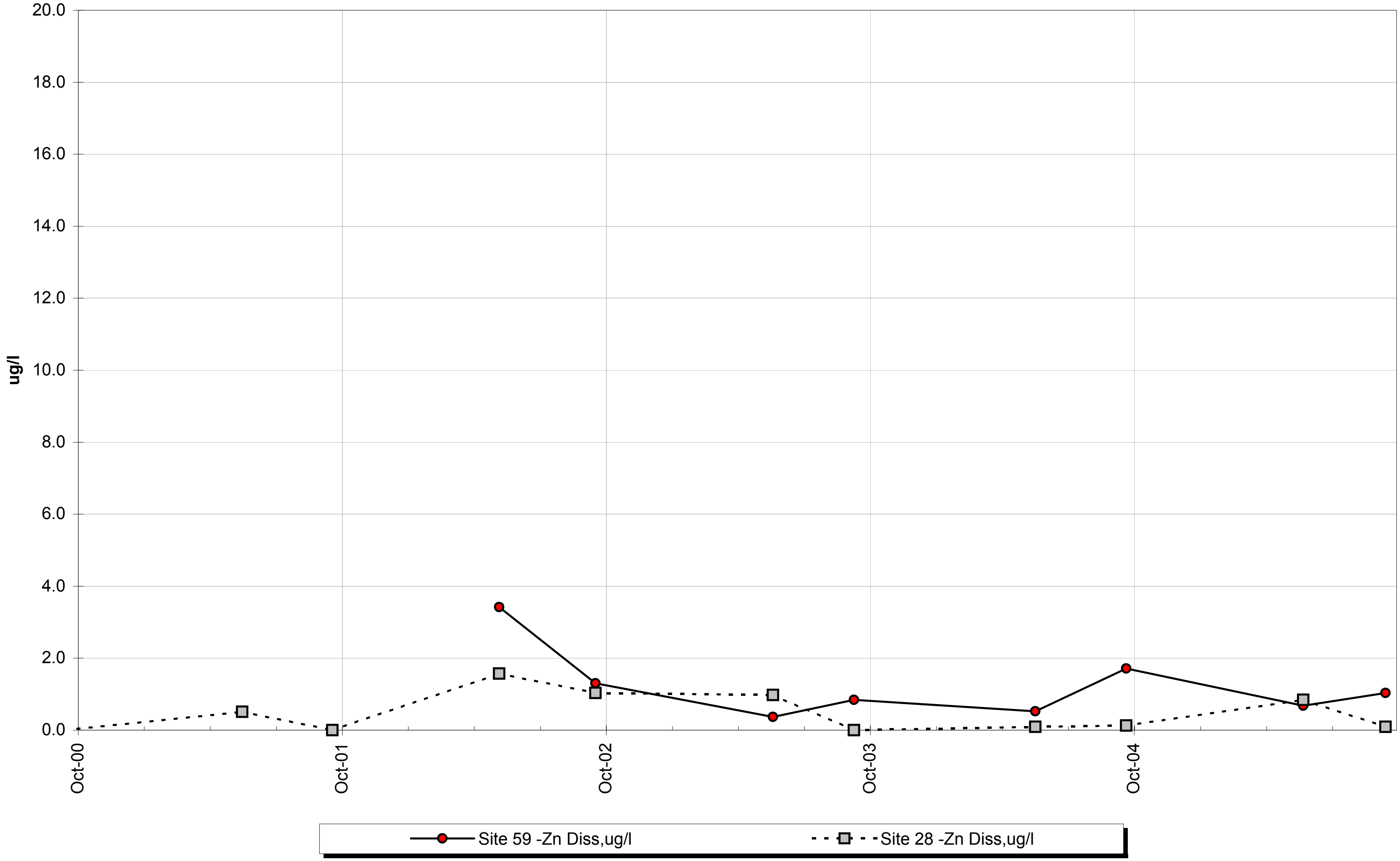


Site 59 vs. Site 28 -Total Alkalinity




Site 59 vs. Site 28 -Total Sulfate
ug/l
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Site 59 -mg/L Diss,ug/l
Site 28 -mg/L Diss,ug/l

Site 59 vs. Site 28 -Dissolved Zinc



Site **#28** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								238.0				235.0
b	**WY2001**								235.0				229.0
c	**WY2002**								240.0				210.0
d	**WY2003**								218.0				222.0
e	**WY2004**								221.0				197.0
f	**WY2005**								205.0				190.0
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				-1
c-a								1				-1
d-a								-1				-1
e-a								-1				-1
f-a								-1				-1
c-b								1				-1
d-b								-1				-1
e-b								-1				-1
f-b								-1				-1
d-c								-1				1
e-c								-1				-1
f-c								-1				-1
e-d								1				-1
f-d								-1				-1
f-e								-1				-1
S_k	0	0	0	0	0	0	0	-9	0	0	0	-13

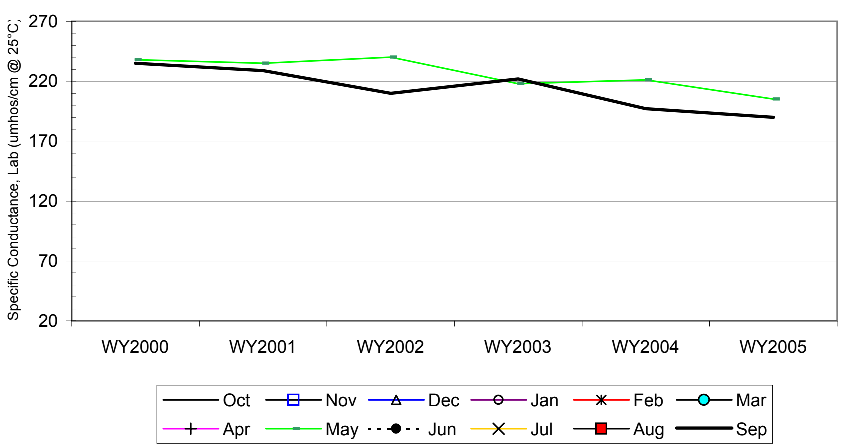
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-1.69				-2.44
Z^2_k								2.86				5.96

ΣZ_k=	-4.13
ΣZ^2_k=	8.82
Z-bar=ΣZ_k/K=	-2.07

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	12
ΣS_k	-22

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	0.28	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.595**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -2.79	@α/2=2.5% Z= 1.96	**H_0** (No trend)	REJECT
56.67	**p** **0.003**		**H_A** (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-12.30		-4.27
0.050	-9.93	**-6.83**	-5.75
0.100	-9.50		-6.50
0.200	-9.08		-6.58
		-3.1%	

Site **#28** Seasonal Kendall analysis for pH, Lab, Standard Units

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								7.9				8.2
b	**WY2001**								7.4				7.1
c	**WY2002**								6.8				8.5
d	**WY2003**								8.5				8.4
e	**WY2004**								8.1				8.4
f	**WY2005**								8.1				7.7
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	0	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				-1
c-a								-1				1
d-a								1				1
e-a								1				1
f-a								1				-1
c-b								-1				1
d-b								1				1
e-b								1				1
f-b								1				1
d-c								1				-1
e-c								1				-1
f-c								1				-1
e-d								-1				-1
f-d								-1				-1
f-e								-1				-1
S_k	0	0	0	0	0	0	0	3	0	0	0	-1

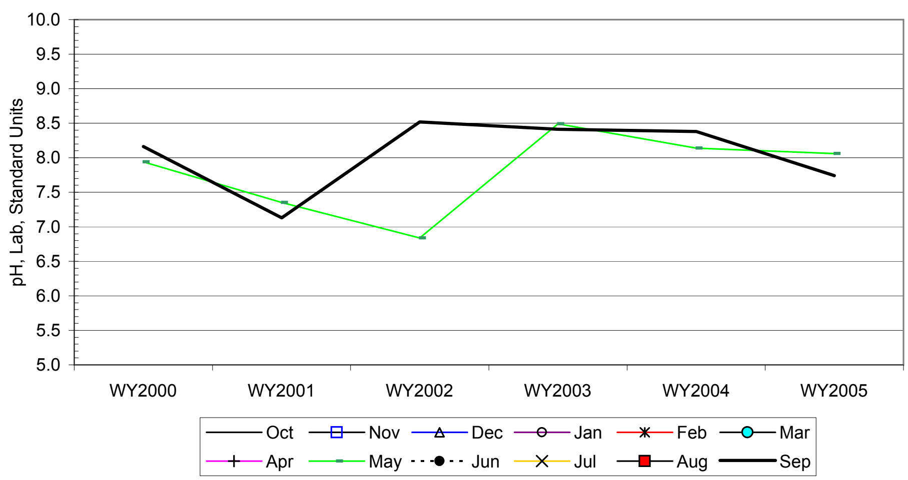
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								0.56				-0.19
Z^2_k								0.32				0.04

ΣZ_k= 0.38
ΣZ^2_k= 0.35
Z-bar=ΣZ_k/K= 0.19

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn 12
ΣS_k 2

$\chi^2_h=\Sigma Z^2_k-K(Z\text{-bar})^2$=		0.28	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.595**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	0.13	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	p	**0.553**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.35		0.37
0.050	-0.22	**0.04**	0.18
0.100	-0.11		0.17
0.200	-0.08		0.09

Site **#28** Seasonal Kendall analysis for Total Alk, (mg/l)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								96.8				98.2
b	**WY2001**								95.5				95.5
c	**WY2002**								93.1				92.9
d	**WY2003**								100.0				103.0
e	**WY2004**								92.3				85.0
f	**WY2005**								100.0				88.9
	n	0	0	0	0	0	0	0	6	0	0	0	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	0	0	0	0	0	0	0	1	0	0	0	0
t_2	0	0	0	0	0	0	0	0	0	0	0	0
t_3	0	0	0	0	0	0	0	0	0	0	0	0
t_4	0	0	0	0	0	0	0	0	0	0	0	0
t_5	0	0	0	0	0	0	0	0	0	0	0	0

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
b-a								-1				-1
c-a								-1				-1
d-a								1				1
e-a								-1				-1
f-a								1				-1
c-b								-1				-1
d-b								1				1
e-b								-1				-1
f-b								1				-1
d-c								1				1
e-c								-1				-1
f-c								1				-1
e-d								-1				-1
f-d								0				-1
f-e								1				1
S_k	0	0	0	0	0	0	0	0	0	0	0	-7

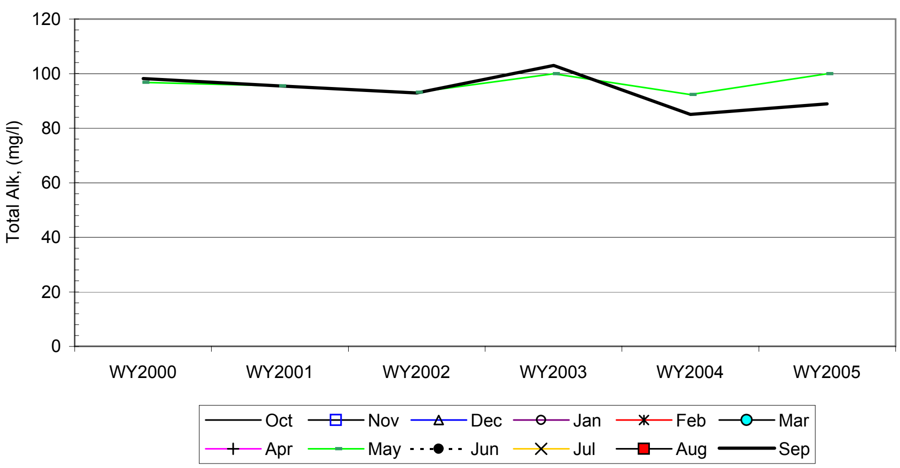
	May	Sep
σ^2_S=	28.33	28.33
$Z_k = S_k/\sigma_S$	0.00	-1.32
Z^2_k	0.00	1.73

ΣZ_k= -1.32
ΣZ^2_k= 1.73
Z-bar=ΣZ_k/K= -0.66

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	1	0	0	0	0

Σn 12
ΣS_k -7

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	0.86	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.352**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 56.67	Z_{calc} -0.80	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
	p **0.213**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.15		2.09
0.050	-2.61	**-1.21**	1.08
0.100	-2.30		0.53
0.200	-1.85		-0.33

Site **#28** Seasonal Kendall analysis for Zinc, Dissolved (ug/l)

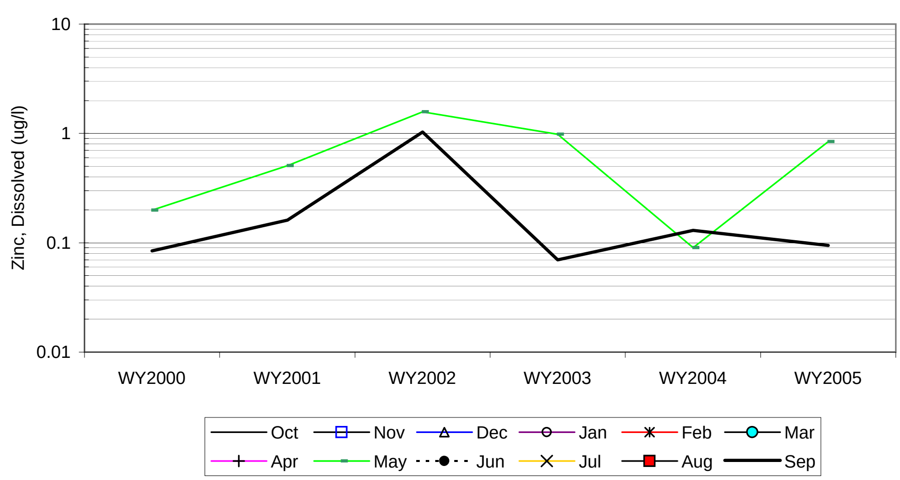
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2000**								0.2				-0.2
b	**WY2001**								0.5				-0.3
c	**WY2002**								1.6				1.0
d	**WY2003**								1.0				-0.1
e	**WY2004**								0.1				0.1
f	**WY2005**								0.8				0.1
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	0
	t_2	0	0	0	0	0	0	0	0	0	0	0	0
	t_3	0	0	0	0	0	0	0	0	0	0	0	0
	t_4	0	0	0	0	0	0	0	0	0	0	0	0
	t_5	0	0	0	0	0	0	0	0	0	0	0	0
	b-a								1				-1
	c-a								1				1
	d-a								1				1
	e-a								-1				1
	f-a								1				1
	c-b								1				1
	d-b								1				1
	e-b								-1				1
	f-b								1				1
	d-c								-1				-1
	e-c								-1				-1
	f-c								-1				-1
	e-d								-1				1
	f-d								-1				1
	f-e								1				-1
	S_k	0	0	0	0	0	0	0	1	0	0	0	5
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								0.19				0.94
	Z^2_k								0.04				0.88

ΣZ_k=	1.13
ΣZ^2_k=	0.92
Z-bar=$\Sigma Z_k/K$=	0.56

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	0	0	0	0	0

Σn	12
ΣS_k	6

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.28	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.595**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc}	0.66	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	p	**0.747**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.29		0.27
0.050	-0.14	**0.08**	0.17
0.100	-0.06		0.13
0.200	-0.03		0.11

APPENDIX A

Parameter	Drinking Water	Stockwater	Irrigation Water	Aquatic Life-Fresh Water								Human Health Criteria for NonCarcinogens	
				Acute				Chronic					
				criteria	as	multilply by conversion factor	to convert to	criteria	as	multiply by conversion factor	to convert to	Water + Aquatic Organisms	Aquatic Organisms Only
alkalinity								**20,000 minimum**					
As	**50**	**50**	100	340	TR	1	D	150	TR	1	D		
Ba	**2,000**												
Cd	5	10	10	e^1.0166(ln hardness)-3.924	TR	1.136672-[(ln hardness)(0.041838)]	D	e^0.7409(ln hardness)-4.719	TR	1.101672-[(ln hardness)(0.041838)]	**D**		
Cr	100												
Cr(total)			100										
Cr(III)				e^0.819(ln hardness)+3.7256	TR	0.316	D	e^0.819(ln hardness)+0.6848	TR	0.860	D		
Cr(VI)		50		16	D			**11**	**D**				
Cu			200	e^0.9422(ln hardness)-1.700	TR	0.960	D	e^0.8545(ln hardness)-1.702	TR	**0.960**	**D**	1,300	
Pb		50	5,000	e^1.273(ln hardness)-1.460	TR	1.46203-[(ln hardness)(0.145712)]	D	e^1.273(ln hardness)-4.705	TR	1.46203-[(ln hardness)(0.145712)]	**D**		
Hg	2			1.4	D			0.77	D			**0.05**	0.051
Ni	100		200	e^0.846(ln hardness)+2.255	TR	0.998	D	e^0.846(ln hardness)+0.0584	TR	0.997	D	610	4,600
Se	50	10	20	1/[([selenite]/185.9)+([selenate]/12.83]	TR	0.922	D	**5**	**TR**	**0.922**	**D**	170	11,000
Ag				**e^1.72(ln hardness)-6.52**	**TR**	**0.850**	**D**						
Zn			2,000	e^0.8473(ln hardness)+0.884	TR	0.978	D	e^0.8473(ln hardness)+0.884	TR	**0.986**	**D**	9,100	69,000

all units in micrograms per liter (ug/L)

DENOTES STRICTEST CRITERIA

TR total recoverable
D dissolved
H some of the criteria for this parameter are hardness dependant
FWA Fresh Water Acute
FWC Fresh Water Chronic

Source: http://www.dec.state.ak.us/water/wqsar/wqs/toxicsbook.xls
Table formatting was modified by KGCMC to include only parameters include in Suite P and Q and to highlight the strictest standard.

APPENDIX B

Biomonitoring Report