KENNECOTT GREENS CREEK MINING COMPANY

November 14, 2005: High storm flow over the Greens Creek weir.

FRESH WATER MONITORING PROGRAM ANNUAL REPORT

WATER YEAR 2006

(October 1, 2005 through September 30, 2006)

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This annual report has been prepared by Kennecott Greens Creek Mining Company (KGCMC) in accordance with the mine's General Plan of Operations Appendix 1: Fresh Water Monitoring Program (FWMP). Monitoring data interpretative reports are presented for six surface water and eight groundwater monitoring sites. An additional interpretative report has been added to this year that presents surface water quality data for the site located on Tributary Creek, Site 9.

Each site's interpretative report summarizes the annual dataset with respect to several goals and objectives outlined in the FWMP. Each report contains a list of any exceptions, omissions or errors that occurred during data collection. The report lists a comparison of each site's annual dataset to all appropriate applicable Alaska Water Quality Standards (AWQS). Finally, a series of summary tables and X-Y graphs have been generated to meet the specific statistical goals for each site.

During the 2006 water year all required sampling was accomplished as specified in the monitoring schedule. For each site the specified analytic suite (P or Q) was performed on the collected samples. Applicable holding times were meet for all analytes except as follows: pH holding times were exceeded for the December-2005 samples by over 33 days due to a misplaced data sheet; June-2006, pH holding times were exceeded by approximately 24 hours due a lab error; September-2006, holding times for several sites (48, 6, 54, 49, 46, and 13) were exceeded by approximately 24 hours. Outlier flags were added to two samples from the December-2005 sample set (Sites 48 and 54) and two samples from the June-2006 dataset (Site 48 and Site 56) after comparison between field and laboratory pH values. All other data collected during the year was utilized in subsequent analyses.

Only one exceedance of AWQS occurred in the 920 Area at Site 13. The exceedance was for a sulfate value of 252 mg/l which is just slightly above the AWQS. Exceedances in the tailings area were noted for pH (both low and high), low alkalinity, and elevated levels of arsenic, and lead. The shallow wells (sites 58, 27, 29, and 32) continued to display their long history of exceedances due to the low-pH, low-alkalinity water that naturally characterize these sites. Additionally, a single exceedance for arsenic occurred at Site 29 due to the recently lowered AWQS for total arsenic from 50 µg/l to 10 µg/l. While not being flagged before at the prior higher AWQS level, the value reported, 20 mg/l, is well within historic norms for the site. Five exceedances for dissolved lead occurred at the three, downgradient shallow wells (sites 27, 29 and 32). These exceedances continue the recent history of low to moderate levels of lead that may in part be due to minor amounts of tailings escaping the containment controls around the impoundment due to fugitive dust or tracking. A study program has been proposed to investigate this issue. The single deep, downgradient well, Site 28, continued trends similar to prior years with high pH and elevated arsenic levels that are naturally associated with the marine unit that the well is completed in.

Graphical and non-parametric analyses for trend in the data were preformed for all sites monitored. Statistically significant trends were identified for three sites: Site 48, an upward trend in pH; Site 57, a downward trend in conductivity; and Site 28, a downward trend in conductivity. All the trends are relatively minor in relative magnitude for the respective sites. Site 48 and Site 57 are considered upgradient control sites and thus the trends are likely due to natural variation. Site 28 is a downgradient site. However, the identified trend is decreasing and thus is opposite to what would be expected if it were due to KGCMC activities.

A non-parametric comparison of medians was preformed for all the appropriately paired surface (48-6, 6-54, and 49-46) and groundwater (57-56) sites around the 920 area. Significant differences were noted for both paired datasets from Greens Creek (48-6 and 6-54) for conductivity, pH, sulfate and dissolved zinc. Except for pH, these differences have all been noted in previous annual reports and do not appear to be increasing in magnitude. The Bruin Creek sites (49 and 46) are somewhat similar in that conductivity and pH both show significant differences. The Bruin Creek difference in conductivity has been noted in prior years and appears to be of a consistent magnitude. A significant difference in pH has not been consistently noted in prior years for the Greens Creek sites and was noted in the current and prior year's report for the Bruin Creek sites. Currently, KGCMC does not feel that the lower pH at downgradient sites is due to our activities in at the 920 Millsite and Site 23/D due to the lack of additional collaborative evidence from other analytes. KGCMC will collect additional data with respect to field and laboratory pH throughout the 2007 water year and report those findings in next year's FWMP report.

Additional water chemistry monitoring was undertaken at Site 9 during the 2006 water year. AN interpretive section has been added to the report to discuss those results. A proposal to permanently add this site to the monitoring schedule during the months of May, July, and September for Suite Q analytes is suggested.

INTRODUCTION

This annual report for water year 2006 (October 1, 2005 through September 30, 2006) 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 sites 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 on 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 2006 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. During the 2006 Water Year the drinking water standard for Total Arsenic was lowered from 50 ug/l to 10 ug/l. 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, Kendall seasonal trend analysis that is routinely done for

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	**

+: Addional statitical trend analysis done for conductivity, pH, alkalinity, dissolved z

**: Insufficiant Data for a robust statistical evaluation conductivity, pH, alkalinity, and dissolved zinc. These are the key 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 2007 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 reference 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-Mann-Whitney 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 annualize 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. Computational 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 section of data limitations found in the monthly QA reviews. They list all data for that site that was qualified by the QA Reviewer for water year 2004 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 2006. 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.

All required sampling was accomplished during the 2006 water year as specified in the monitoring schedule .

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 2004-2006 water years, all scheduled sulfate samples were taken and analyzed as described in GPO Appendix 1.

MID-YEAR MODIFICATIONS

During the 2006 water year KGCMC recommenced collection of water chemistry sampling at Site 9, Tributary Creek. Under the current monitoring schedule the only sampling that is required is a Suite R, biomonitoring, during the month of July. The additional sampling was done after KGCMC received a suggestion from ADNR-Office of Habitat Management and Permitting personnel who noted that should the annual biomonitoring show significant changes that an understanding of any related water chemistry variation would enhance the interpretation of those results. During the 2006 water year, samples were collected in conjunction with the normal monthly FWMP sampling run during the months of May, July and September and analyzed for Suite Q elements. These samples were submitted at the same time as the normal FWMP samples and subject to the same laboratory techniques and QA review. An interpretative section has been added to this report that presents those findings. KGCMC recommends that routine sampling at Site 9 should be added to the annual monitoring schedule such that a sample is collected during the months of May, July, and September and analyzed for Suite Q. Additional suggestions for specific monitoring and statistical information goals are presented in the interpretative section of this report for Site 9.

FWMP SAMPLE LOG

Water Year October 2005 Through September 2006

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	10-18 P	11-16 P	12-08 Q	1-11 P	2-13 Q	3-27 P	4-11 P	5-16 P	6-14 P	7-18 - P 7-21 - R	8-16 P	9-19 P
9	Tributary Creek-Lower								5-17 Q		7-18 - Q 7-21 - R		9-15 Q
13	Mine Adit Discharge East	10-18 Q	11-16 Q						5-16 Q	6-14 Q	7-18 Q	8-16 Q	9-19 Q
27	Monitoring Well 2S								5-17 Q				9-20 Q
28	Monitoring Well 2D								5-17 Q				9-20 Q
29	Monitoring Well 3S								5-17 Q				9-20 Q
32	Monitoring Well 5S								5-17 Q				9-20 Q
46	Lower Bruin Creek	10-18 P	11-16 P	12-08 Q	1-11 P	2-13 Q	3-27 P	4-11 P	5-16 P	6-14 P	7-18 P	8-16 P	9-19 P
48	Upper Greens Creek	10-18 P	11-16 P	12-08 Q	1-11 P	2-13 Q	3-27 P	4-11 P	5-16 P	6-14 P	7-18 - P 7-20 - R	8-16 P	9-19 P
49	Control Site Upper Bruin Creek	10-18 P	11-16 P	12-08 Q	1-11 P	2-13 Q	3-27 P	4-11 P	5-16 P	6-14 P	7-18 P	8-16 P	9-19 P
54	Greens Creek below D-Pond	10-18 P	11-16 P	12-08 Q	1-11 P	2-13 Q	3-27 P	4-11 P	5-16 P	6-14 P	7-18 - P 7-20 - R	8-16 P	9-19 P
56	Monitoring Well -D-00-01	10-18 Q	11-16 Q					4-11 Q	5-16 Q	6-14 Q	7-18 Q	8-16 Q	9-20 Q
57	Monitoring Well -23-00-03	10-18 Q	11-16 Q					4-11 Q	5-16 Q	6-14 Q	7-18 Q	8-16 Q	9-20 Q
58	Monitoring Well -T-00-01C								5-17 Q				9-20 Q
59	Monitoring Well -T-00-01A								5-17 Q				9-20 Q

Sample Date / Suite	
Sample Date / Suite (yellow)	Monthly Field Blank taken at this site
Sample Date / Suite (cyan)	No Sample taken due to ice
Sample Date / Suite (orange)	No Sample taken due to lack of access (snow).
Sample Date / Suite (pink)	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

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PROPOSED PROGRAM MODIFICATIONS

As noted in the mid-year modifications, KGCMC is proposing to add routine water chemistry monitoring (Suite Q) to the monitoring schedule for Site 9 during the months of May, July, and September.

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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 2006" report. The table includes all the required FWMP analyte 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 years are included in the data analyses with the exception of the three outliers shown on the table below. During the current year two data points were flagged as outliers. Both flags are due to exceedance of parameter holding time. Additionally, when compared with the corresponding field pH the values, there was greater than 0.1 su difference.

Sample Date	Parameter	Value	Qualifier	Notes
12/5/2001	Cond Field, µS/cm	37.2	RR	Suspected field instrument malfunction
12/14/2005	pH Lab, su	8.00	RR	Holding time exceeded
6/14/2006	pH Lab, su	7.61	RR	Holding time exceeded

The data for Water Year 2006 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-05 though Sept-06.				

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. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). 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 lab pH is the only analyte that shows a statistically significant (p=0.99) trend and a slope estimate of 0.07 su/yr or a +1.0% increase over the last 6 years. This is nearly identical to the trend identified in the WY 2005 report for pH.

Site 48-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.48	o		
pH, Lab	6	**0.99**	**+**	**0.07**	**1.0**
Alkalinity, Total	6	0.90	+		
Zinc, Dissolved	6	0.09	-		

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

Given the low absolute magnitude of the change in pH and the fact that Site 48 is used as a background reference, this change is considered to be due to natural variation.

Table of Results for Water Year 2006

Site48 "Upper Greens Creek"

Sample Date/Parameter	10/18/2005	11/16/2005	12/14/2005	1/11/2006	2/13/2006	3/27/2006	4/11/2006	5/16/2006	6/14/2006	7/18/2006	8/16/2006	9/19/2006	**Median**
Water Temp (°C)	4.6	2.0	2.4	1.0	1.3	1.1	1.8	3.4	5.9	8.4	8.7	7.3	2.9
Conductivity-Field(µmho)	114	109	91	112	117	144	124	88	83	91	81	97	103
Conductivity-Lab (µmho)	108	115	107	124	112	146	114	89	77	99	92	122	110
pH Lab (standard units)	7.58 J	7.66	8.00 R	7.70 J	7.57	7.45	7.65 J	7.61	7.61 J	7.69	7.47	7.12 J	7.61
pH Field (standard units)	7.85	7.81	7.61	7.54	7.33	7.81	7.85	7.45	8.12	8.12	8.19	7.73	7.81
Total Alkalinity (mg/L)	43.6	42.3	38.9	44.6	41.4	54.3	43.4	40.3	30.4	39.0	39.5	46.2	41.9
Total Sulfate (mg/L)	12.2	14.0 J	12.3	17.5	12.9	20.0	14.1	7.7	6.3	10.1	8.6	13.9	12.6
Hardness (mg/L)	54.5	60.2	50.0	60.9	54.4	72.1	60.9	47.7	38.5	50.5	49.7	64.6	54.5
Dissolved As (ug/L)	0.206	0.216	0.249	0.141	0.230 U	0.018 J	0.233	0.161	0.194	0.209	0.221	0.233	0.213
Dissolved Ba (ug/L)			16.4		23.5								20.0
Dissolved Cd (ug/L)	0.0352	0.0397	0.0284	0.0367 U	0.0360	0.0360	0.0300	0.0299	0.0240 U	0.0238	0.0298	0.0383	0.0326
Dissolved Cr (ug/L)			0.163 J		0.391 U								0.277
Dissolved Cu (ug/L)	0.377	0.393	0.499 U	0.354 U	0.689	0.276 U	0.573	0.565	0.249 U	0.287	0.401	0.358	0.385
Dissolved Pb (ug/L)	<0.0040	0.0087 U	0.0135 U	0.0075 U	0.0200 U	0.0058 J	0.0049 U	0.0077 U	0.0125 U	0.0271 U	0.0135 U	0.0229	0.0106
Dissolved Ni (ug/L)			0.443 U		0.209 J								0.326
Dissolved Ag (ug/L)			<0.002		0.003 J								0.002
Dissolved Zn (ug/L)	3.09 U	2.94 U	2.37 U	2.65 U	2.79 U	2.73 U	1.97	1.83 U	1.70 U	1.24	2.56 UJ	2.53	2.55
Dissolved Se (ug/L)			1.040		0.153 J								0.597
Dissolved Hg (ug/L)	0.001130 U	0.000904 U	0.001030 U	0.000825 U	0.001490 U	0.000756 U	0.001320 U	0.001030 U	0.000976 U	0.000831	0.001120 U	0.000800 U	0.001003

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
48	01/11/2006	1:57:00 PM				
			pH Lab, su	7.7	J	Hold Time Violation
			Cd Diss, ug/l	0.0367	U	Field Blank Contamination
			Cu Diss, ug/l	0.354	U	Field Blank Contamination
			Pb Diss, ug/l	0.00751	U	Field Blank Contamination
			Zn Diss, ug/l	2.65	U	Field Blank Contamination
			Hg Diss, ug/l	0.000825	U	Field Blank Contamination
48	10/18/2005	12:51:00 PM				
			pH Lab, su	7.58	J	Hold Time Violation
			Zn Diss, ug/l	3.09	U	Field Blank Contamination
			Hg Diss, ug/l	0.00113	U	Field Blank Contamination
48	11/16/2005	12:08:00 PM				
			SO4 Tot, mg/l	14	J	Receipt Temperature
			Pb Diss, ug/l	0.00867	U	Field Blank Contamination
			Zn Diss, ug/l	2.94	U	Field Blank Contamination
			Hg Diss, ug/l	0.000904	U	Field Blank Contamination
48	12/14/2005	12:28:00 PM				
			pH Lab, su	8	R	Hold Time Violation
			Cr Diss, ug/l	0.163	J	Below Quantitative Range, D
			Cu Diss, ug/l	0.499	U	Field Blank Contamination
			Pb Diss, ug/l	0.0135	U	Field Blank Contamination
			Ni Diss, ug/l	0.443	U	Field Blank Contamination
			Zn Diss, ug/l	2.37	U	Field Blank Contamination
			Hg Diss, ug/l	0.00103	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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
48	02/13/2006	1:32:00 PM				
			As Diss, ug/l	0.23	U	Field Blank Contamination
			Cr Diss, ug/l	0.391	U	Field Blank Contamination
			Pb Diss, ug/l	0.02	U	Field Blank Contamination
			Ni Diss, ug/l	0.209	J	Duplicate RPD
			Ag Diss, ug/l	0.00266	J	Below Quantitative Range
			Zn Diss, ug/l	2.79	U	Field Blank Contamination
			Se Diss, ug/l	0.153	J	Below Quantitative Range
			Hg Diss, ug/l	0.00149	U	Field Blank Contamination
48	03/27/2006	12:37:00 PM				
			As Diss, ug/l	0.018	J	Below Quantitative Range
			Cu Diss, ug/l	0.276	U	Field Blank Contamination
			Pb Diss, ug/l	0.00577	J	Below Quantitative Range
			Zn Diss, ug/l	2.73	U	Field Blank Contamination
			Hg Diss, ug/l	0.000756	U	Field Blank Contamination
48	04/11/2006	12:47:00 PM				
			pH Lab, su	7.65	J	Outside Hold Time
			Pb Diss, ug/l	0.00492	U	Field Blank Contamination
			Hg Diss, ug/l	0.00132	U	Field Blank Contamination
48	05/16/2006	11:45:00 AM				
			Pb Diss, ug/l	0.00765	U	Field Blank Contamination
			Zn Diss, ug/l	1.83	U	Field Blank Contamination
			Hg Diss, ug/l	0.00103	U	Field Blank Contamination
48	06/14/2006	10:00:00 AM				
			pH Lab, su	7.61	J	Hold Time Violation
			Cd Diss, ug/l	0.024	U	Field Blank Contamination
			Cu Diss, ug/l	0.249	U	Field Blank Contamination
			Pb Diss, ug/l	0.0125	U	Field Blank Contamination
			Zn Diss, ug/l	1.7	U	Field Blank Contamination
			Hg Diss, ug/l	0.000976	U	Field Blank Contamination
48	07/18/2006	12:01:00 PM				
			Pb Diss, ug/l	0.0271	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

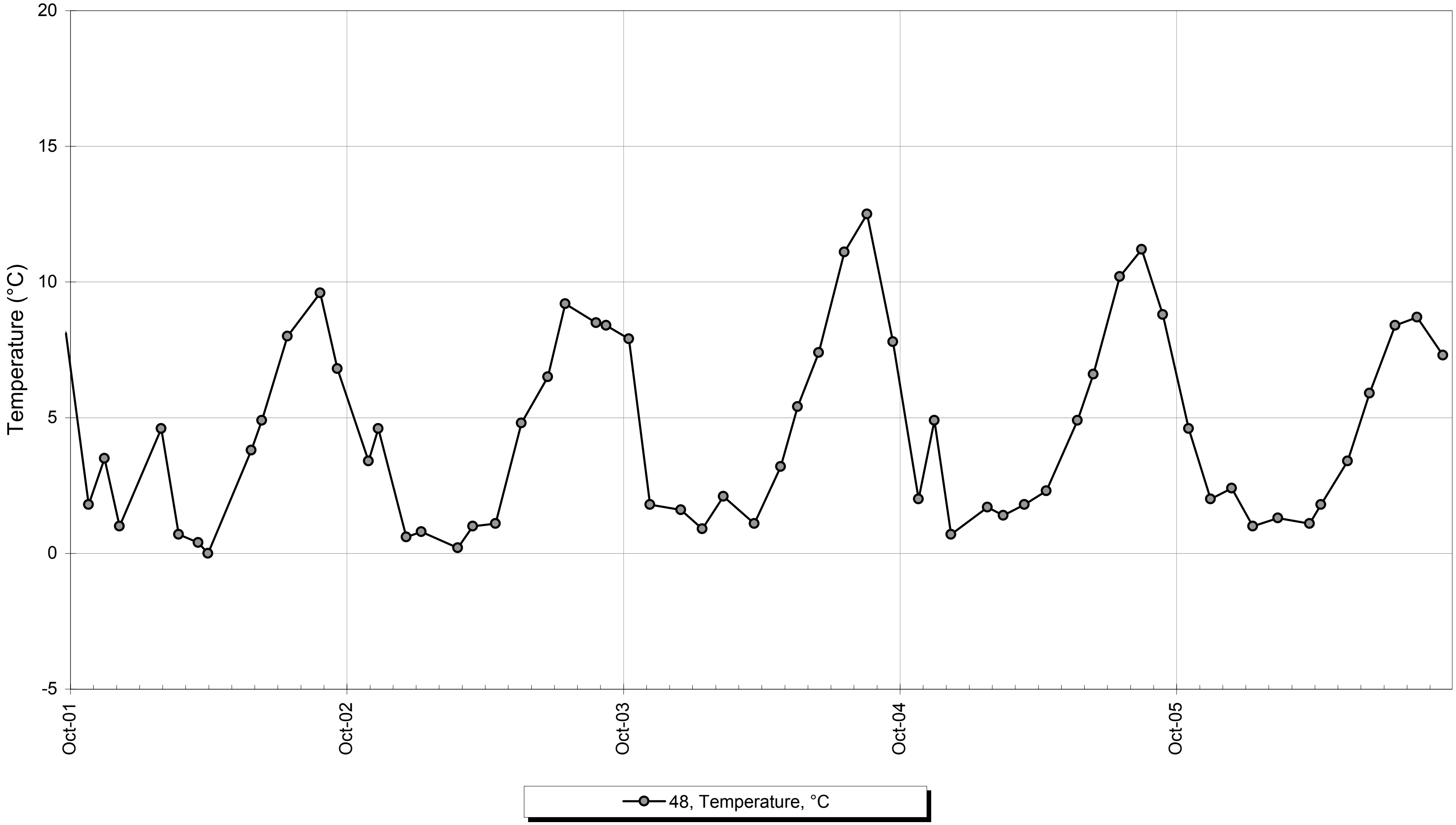
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

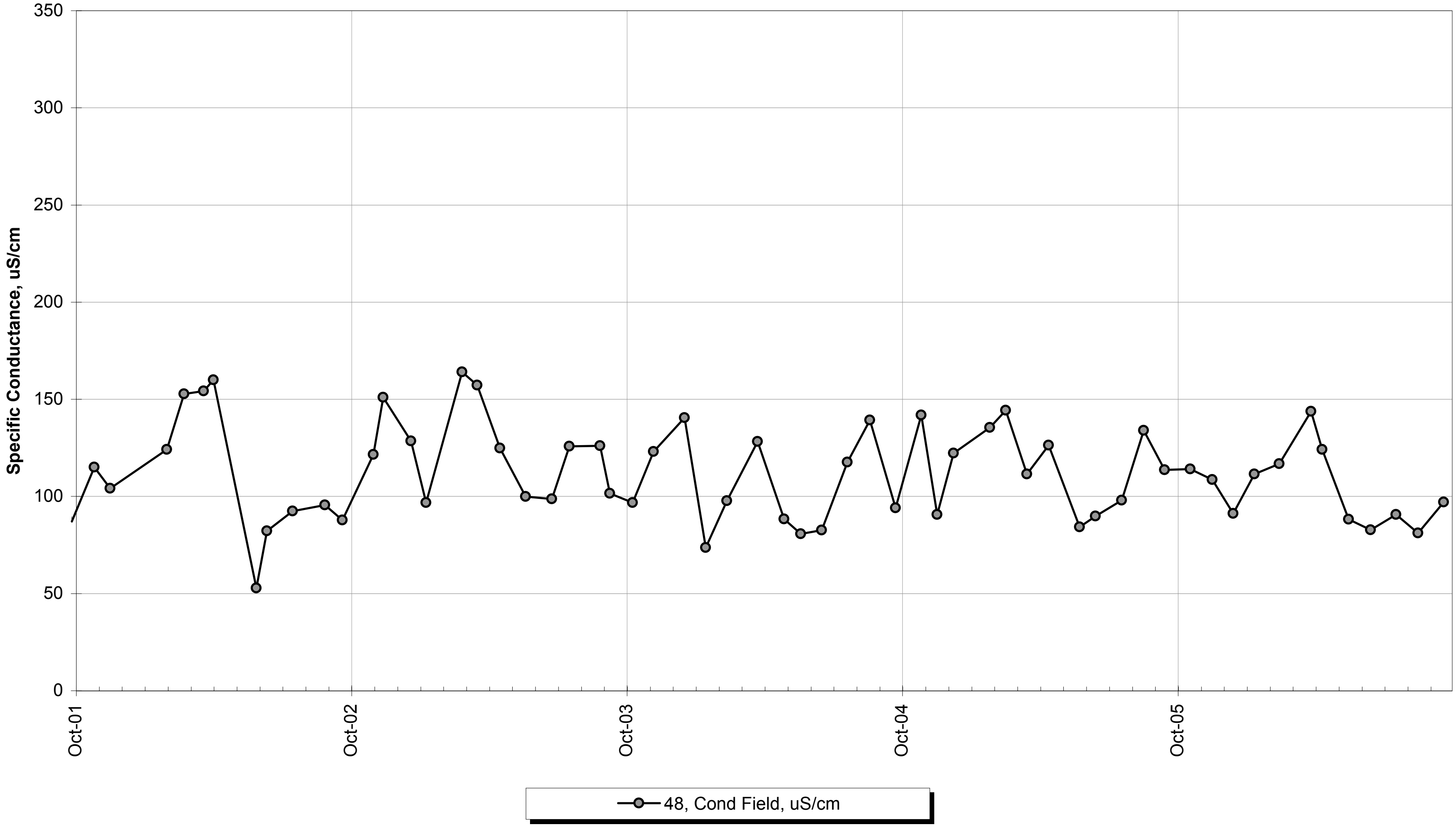
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
48	08/16/2006	1:56:00 PM				
			Pb Diss, ug/l	0.0135	U	Field Blank Contamination
			Zn Diss, ug/l	2.56	UJ	Field Blank Contamination, LC
			Hg Diss, ug/l	0.00112	U	Field Blank Contamination
48	09/19/2006	2:42:00 PM				
			pH Lab, su	7.12	J	Hold Time Violation
			Hg Diss, ug/l	0.0008	U	Field Blank Contamination

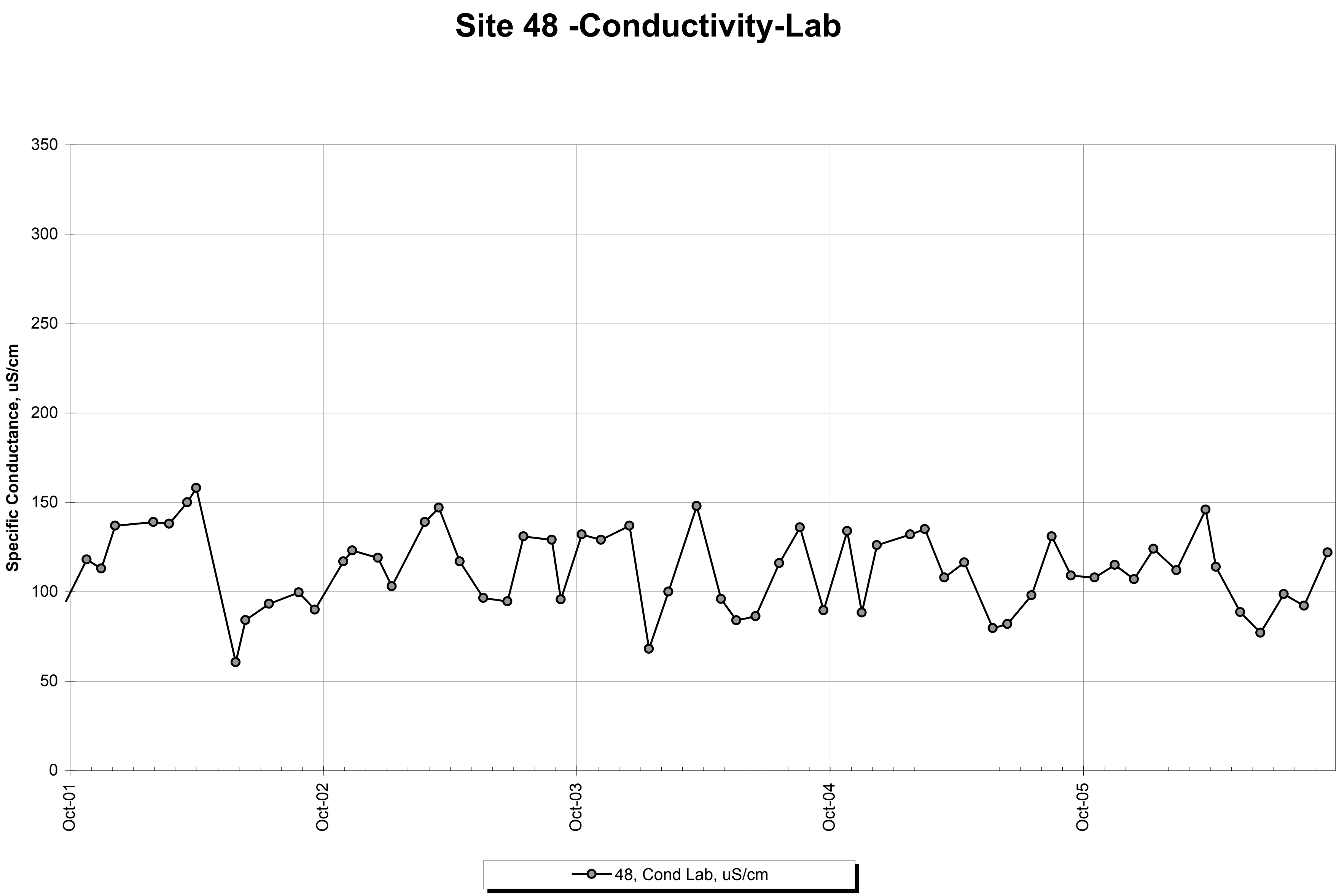
Qualifier	Description
J	Positively Identified - Approximate Concentration
N	Presumptive Evidence For Tentative Identification
NJ	Tentatively Identified - Approximate Concentration
R	Rejected - Cannot Be Verified
U	Not Detected Above Quantitation Limit
UJ	Not Detected Above Approximate Quantitation Limit

Site 48 -Water Temperature

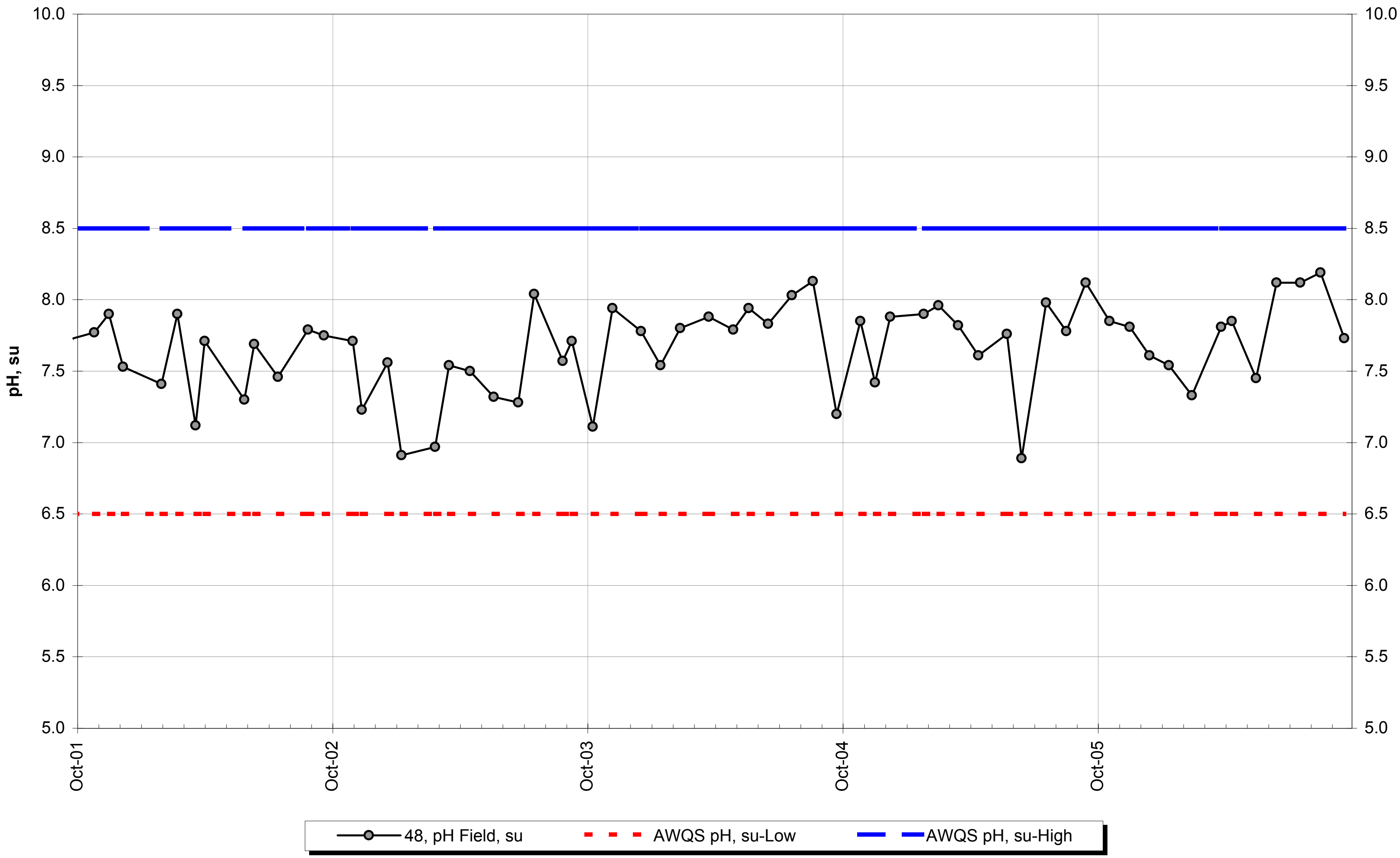


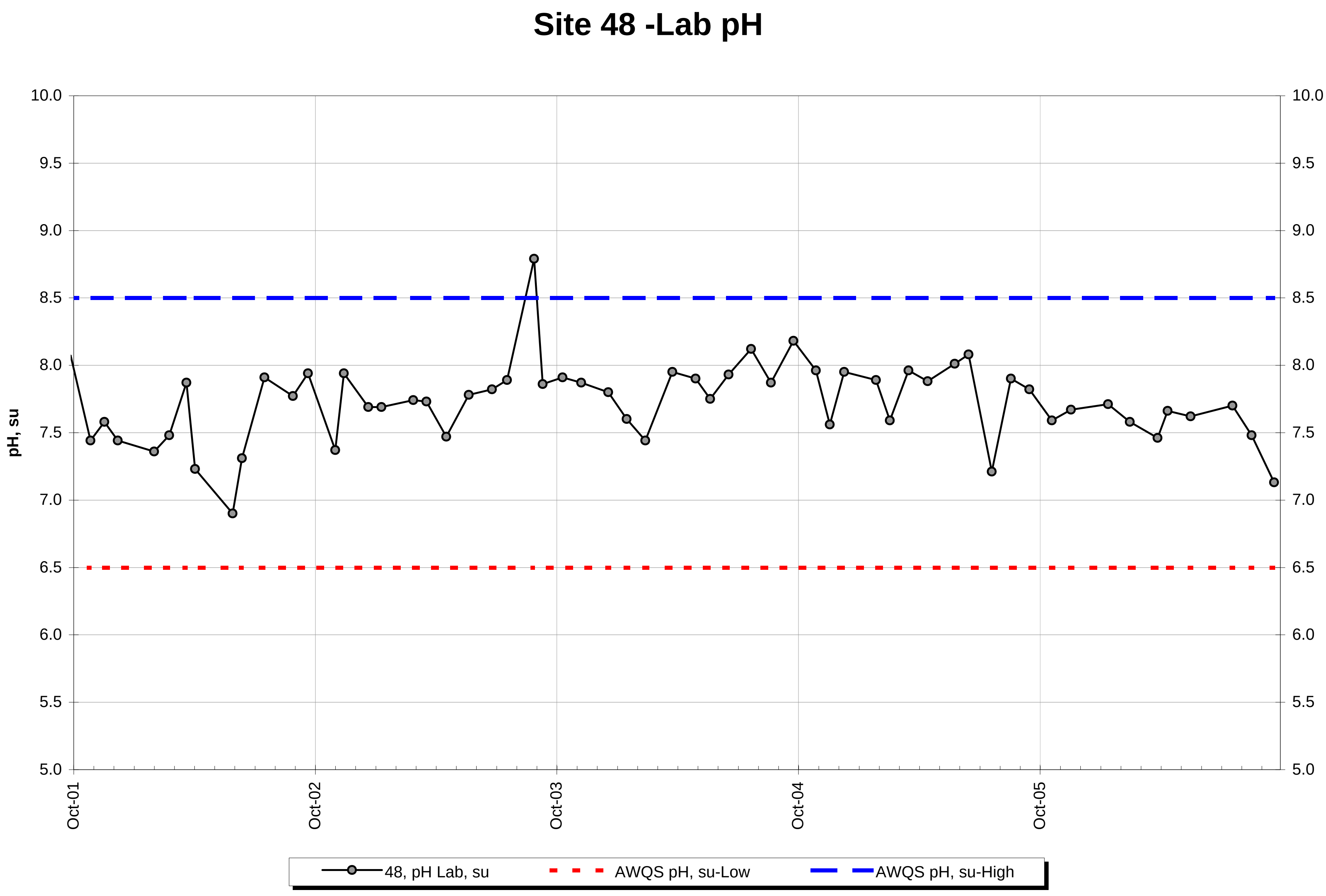
Site 48 -Conductivity-Field



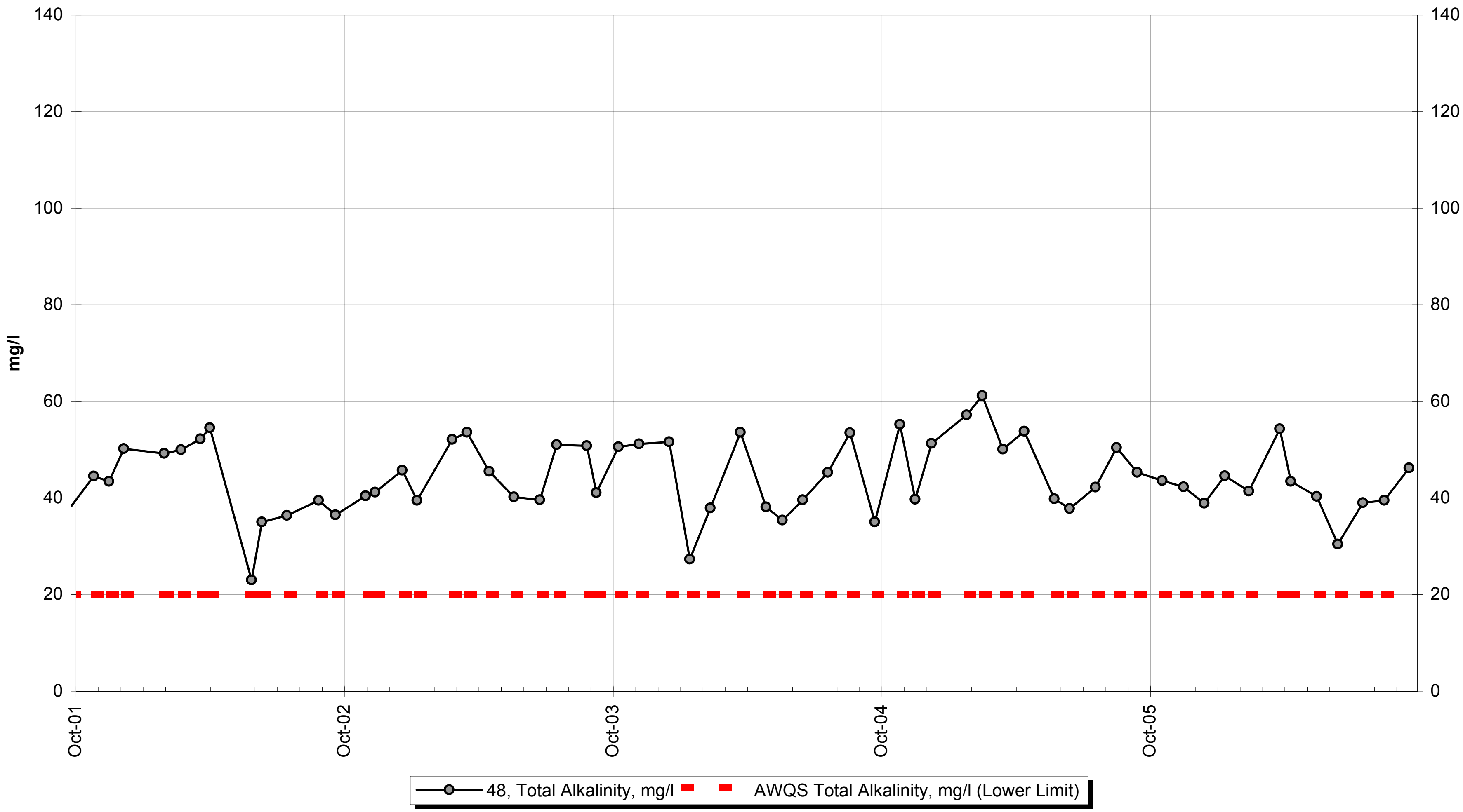

Site 48 -Conductivity-Lab
Specific Conductance, uS/cm
350
300
250
200
150
100
50
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Cond Lab, uS/cm

Site 48 -Field pH

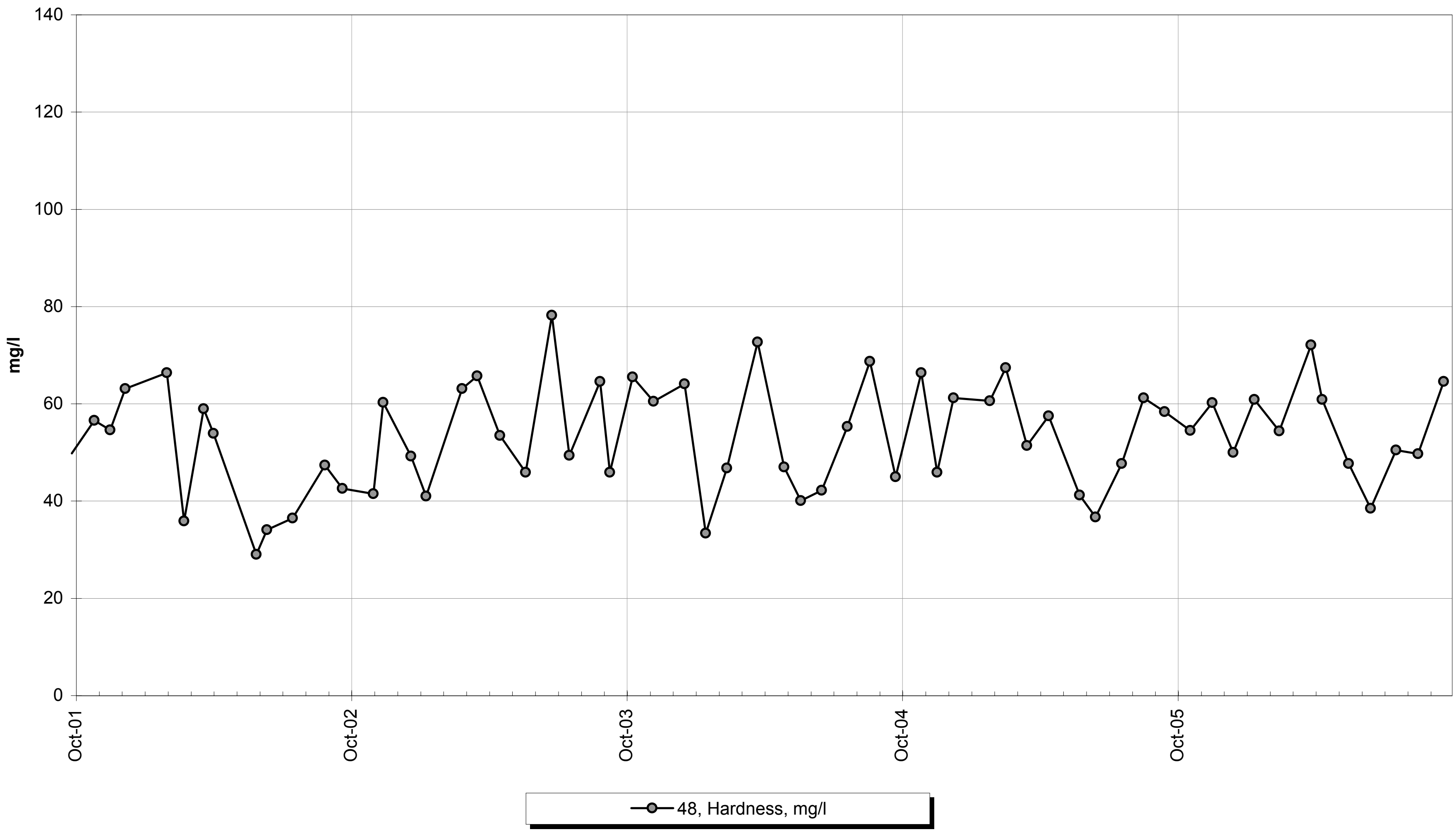



Site 48 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

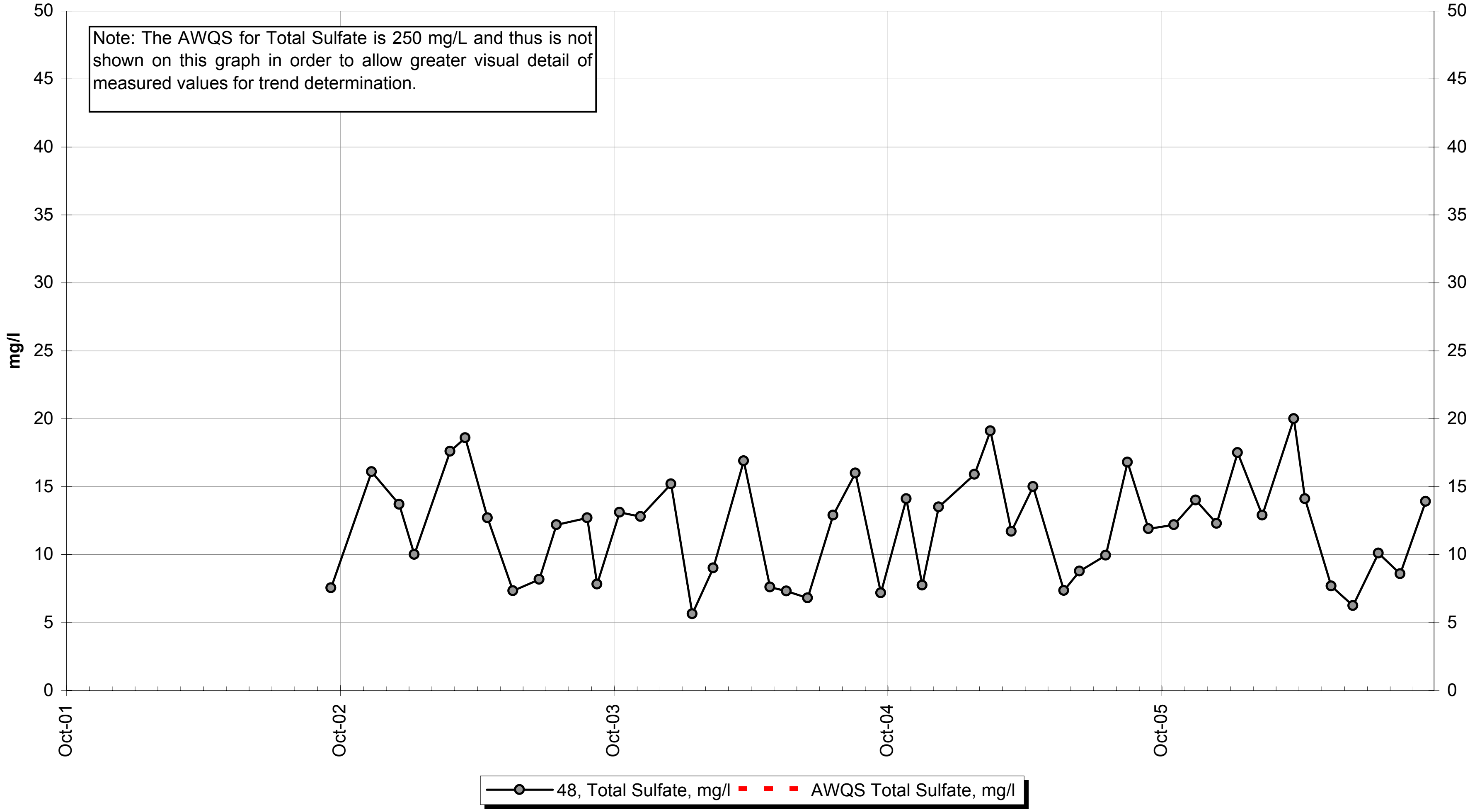
Site 48 -Total Alkalinity

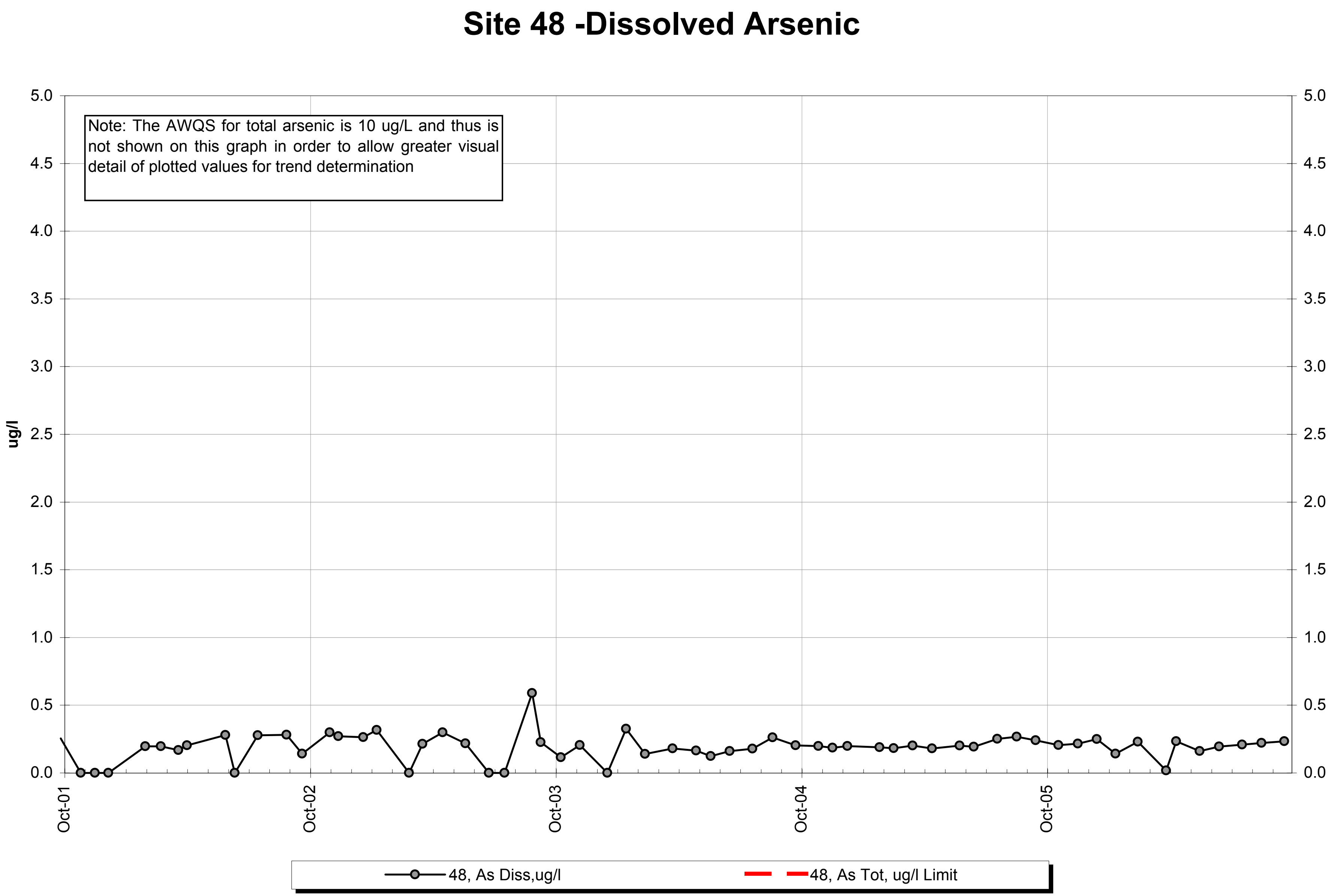


Site 48 -Hardness

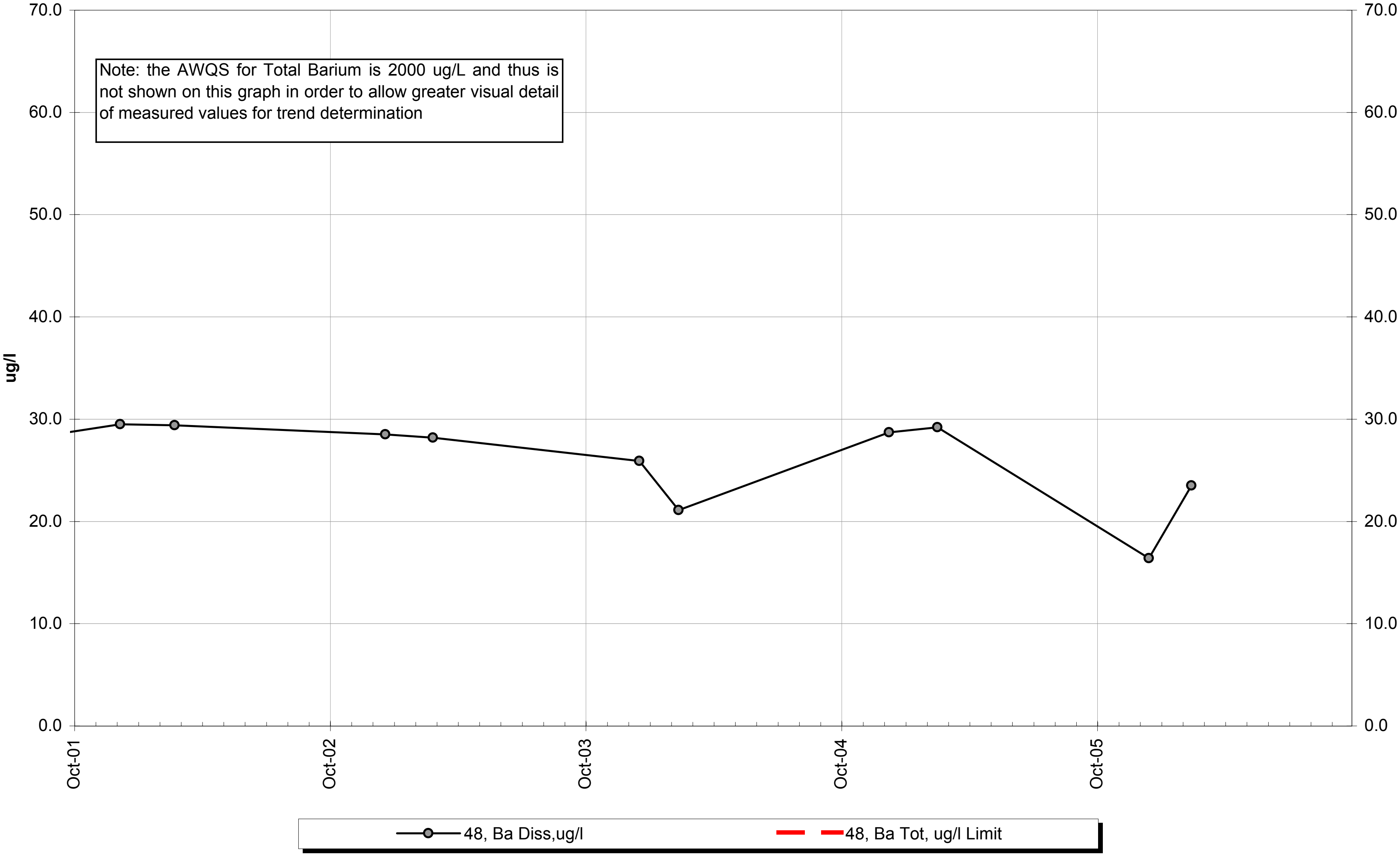


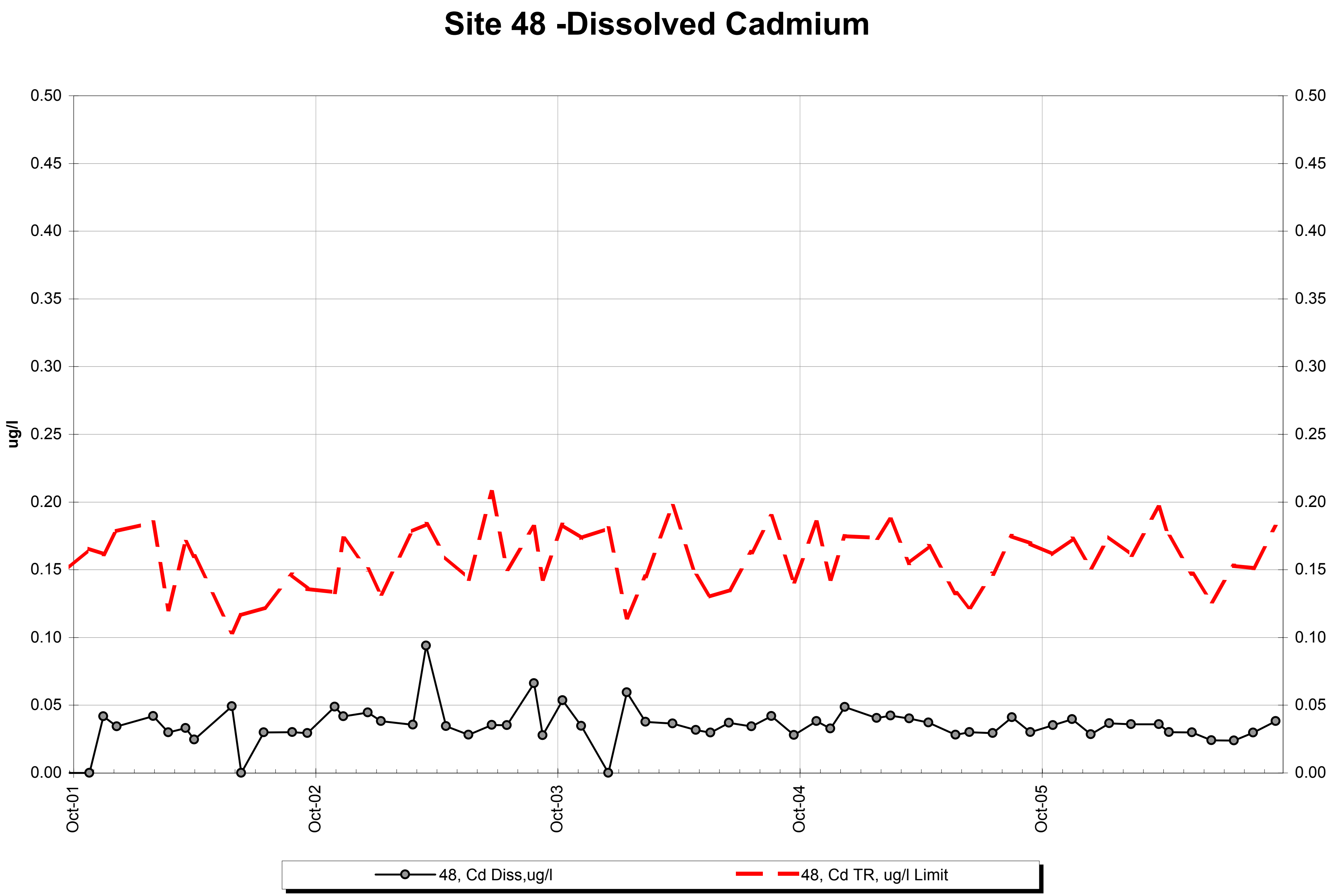
Site 48 -Total Sulfate



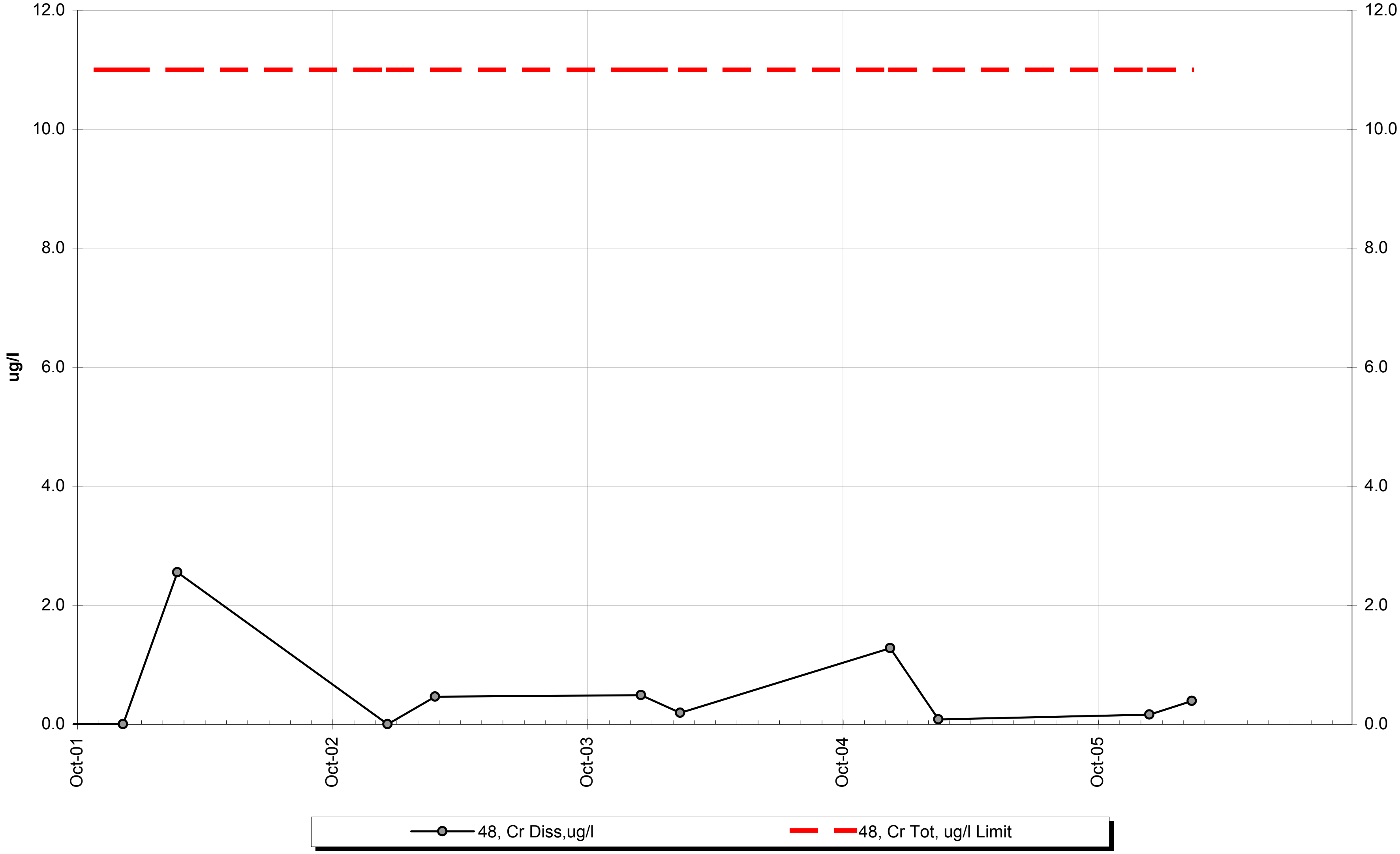

Site 48 -Dissolved Arsenic
Note: The AWQS for total arsenic is 10 ug/L and thus is not shown on this graph in order to allow greater visual detail of plotted values for trend determination
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, As Diss,ug/l
48, As Tot, ug/l Limit

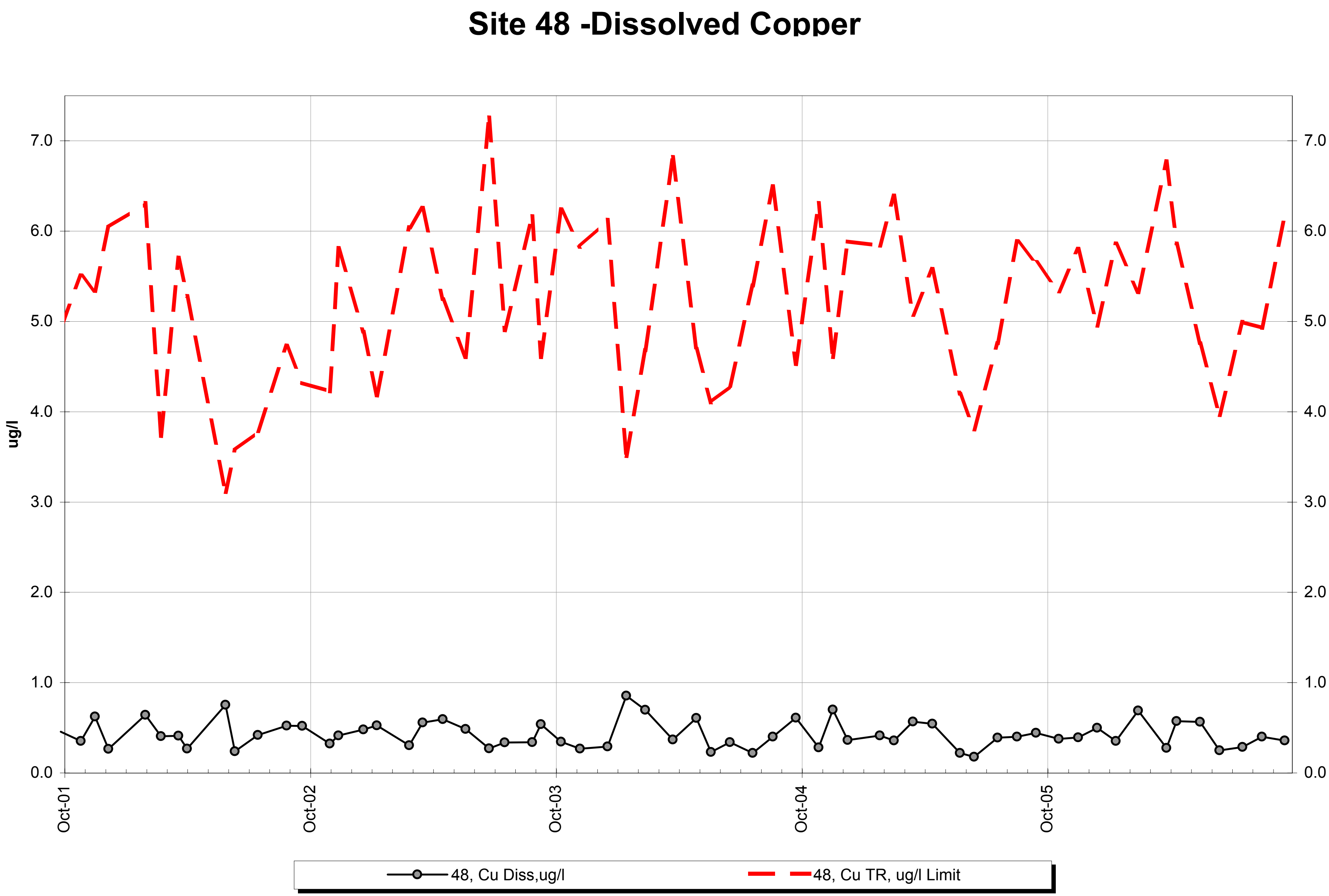
Site 48 -Dissolved Barium




Site 48 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Cd Diss,ug/l
48, Cd TR, ug/l Limit

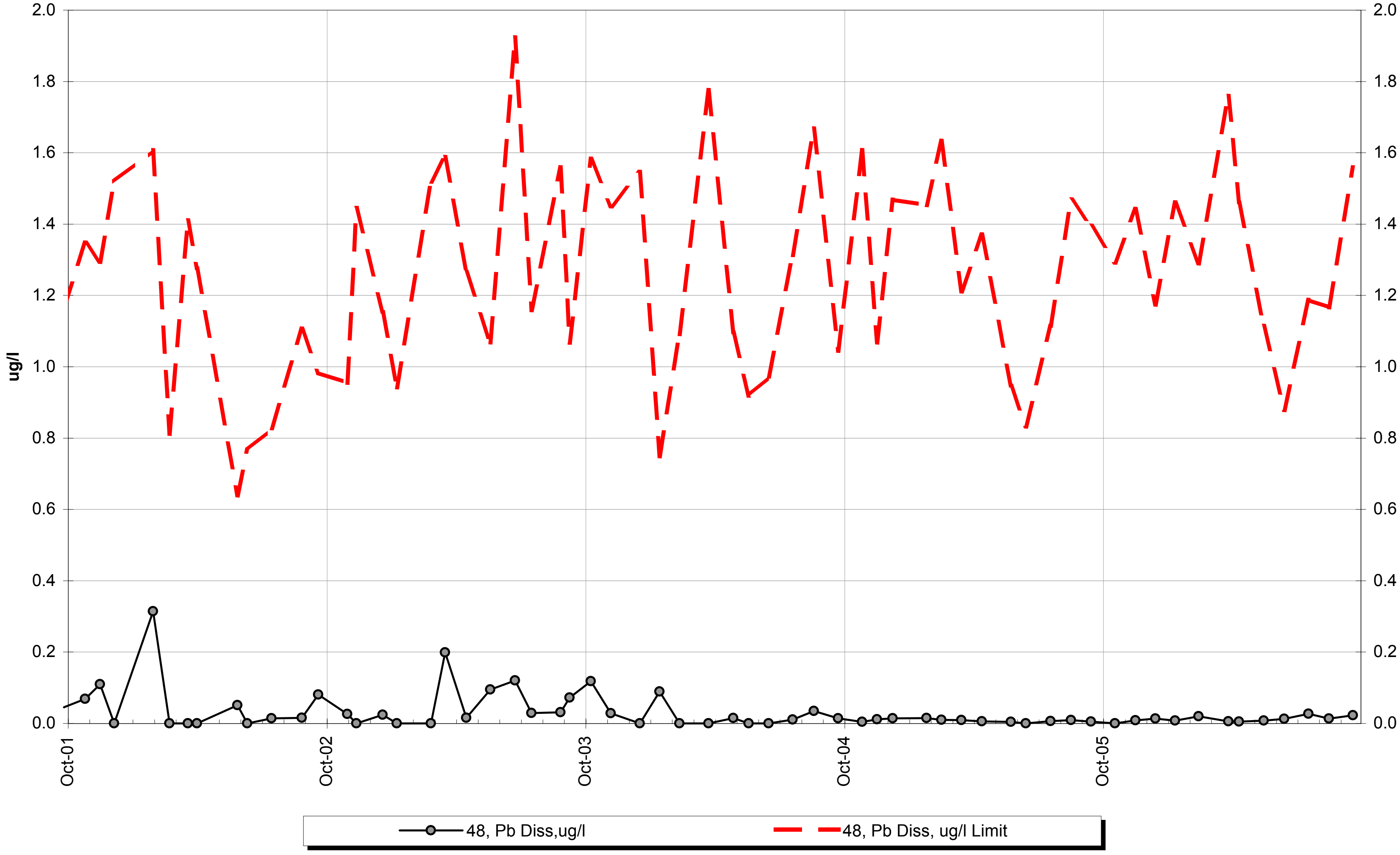
Site 48 -Dissolved Chromium



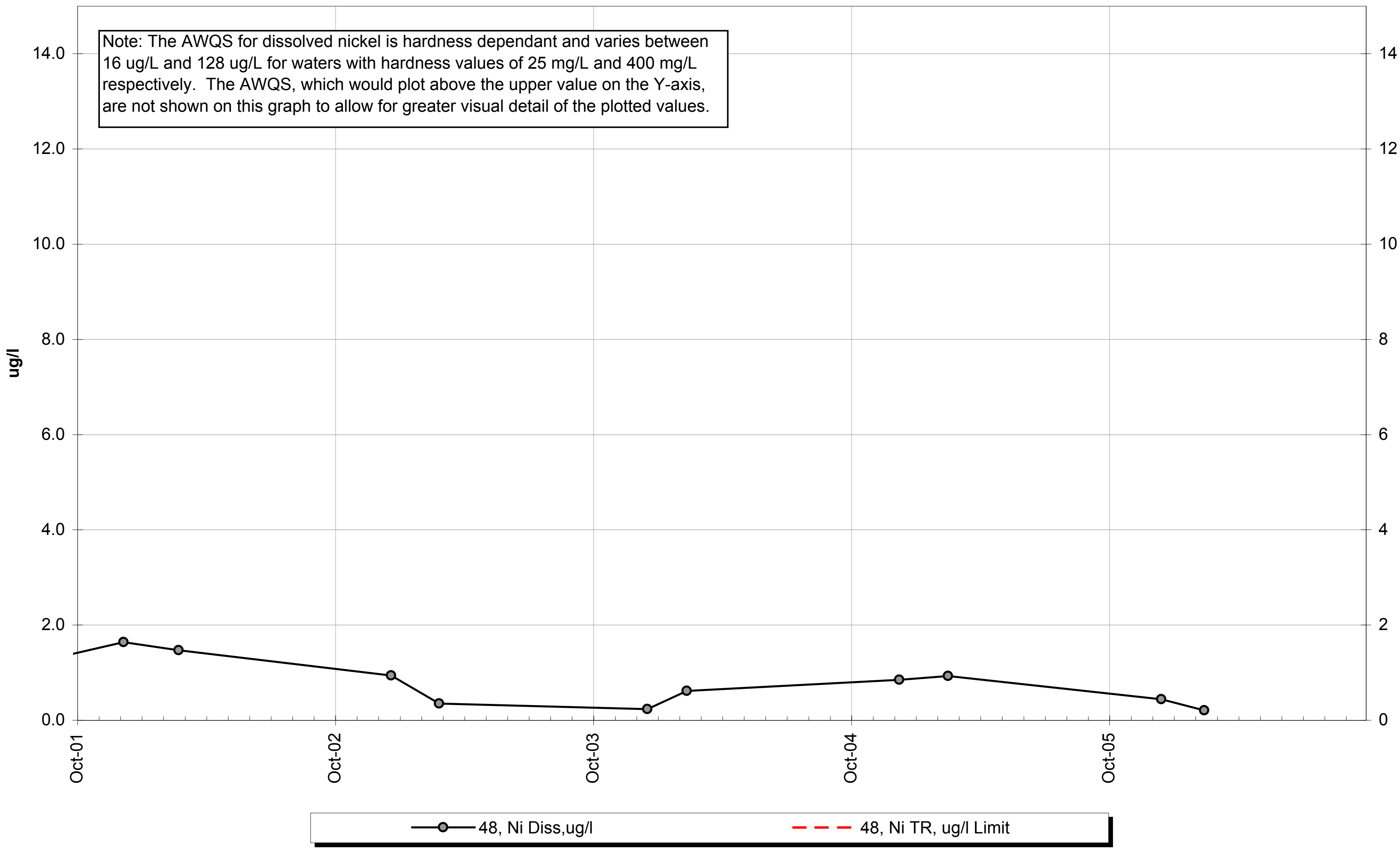


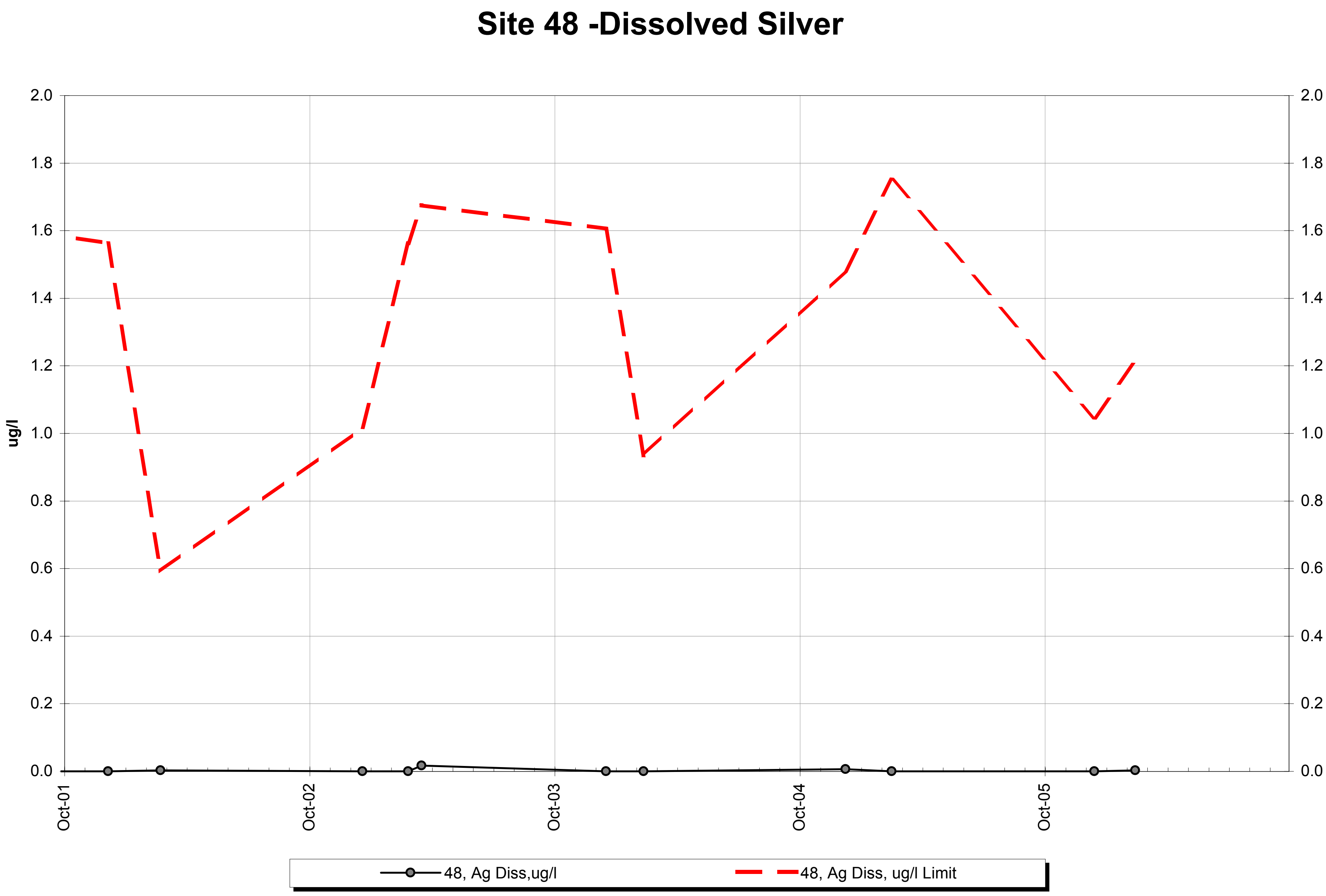
Site 48 -Dissolved Copper
ug/l
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Cu Diss,ug/l
48, Cu TR, ug/l Limit

Site 48 -Dissolved Lead

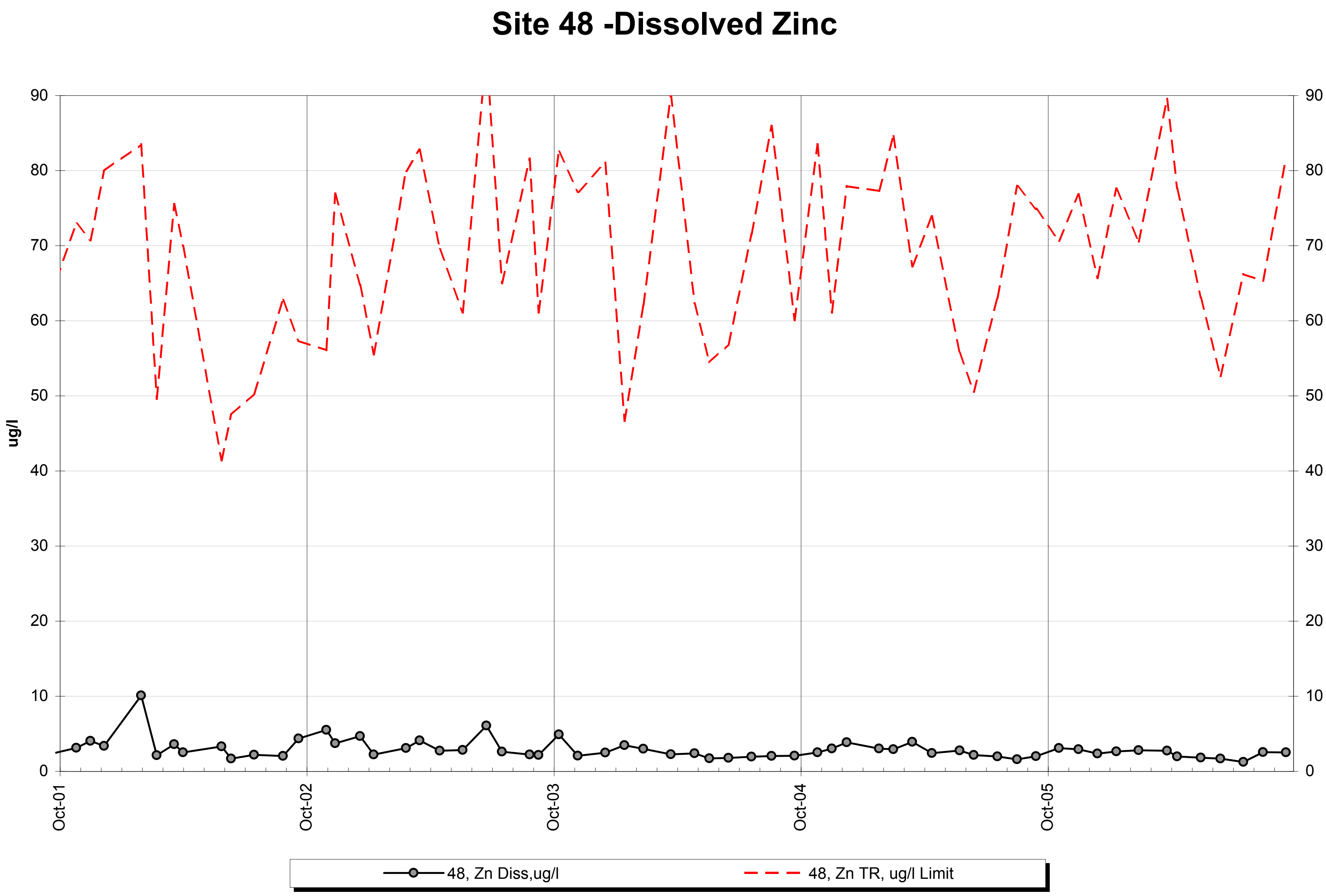


Site 48 -Dissolved Nickel

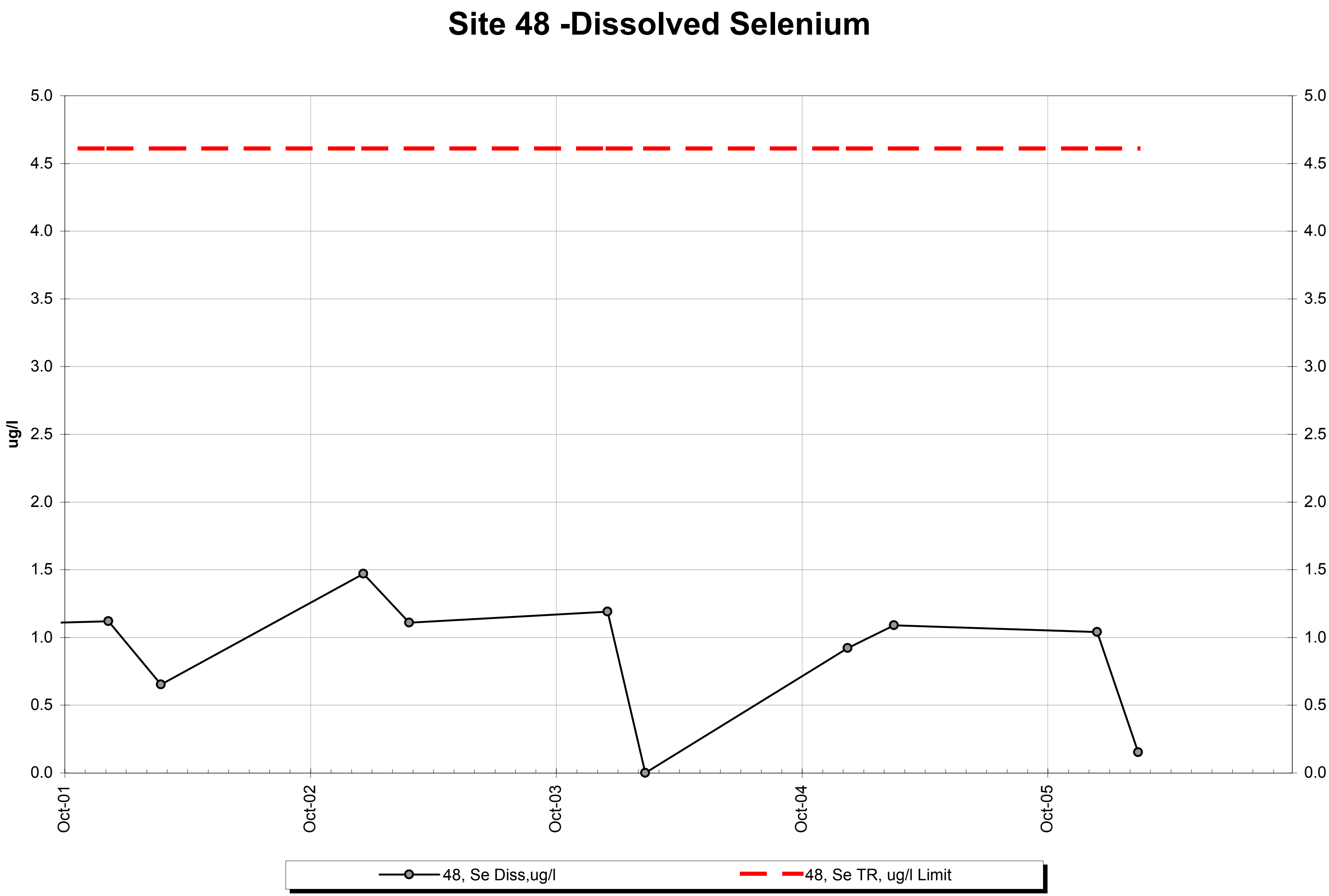


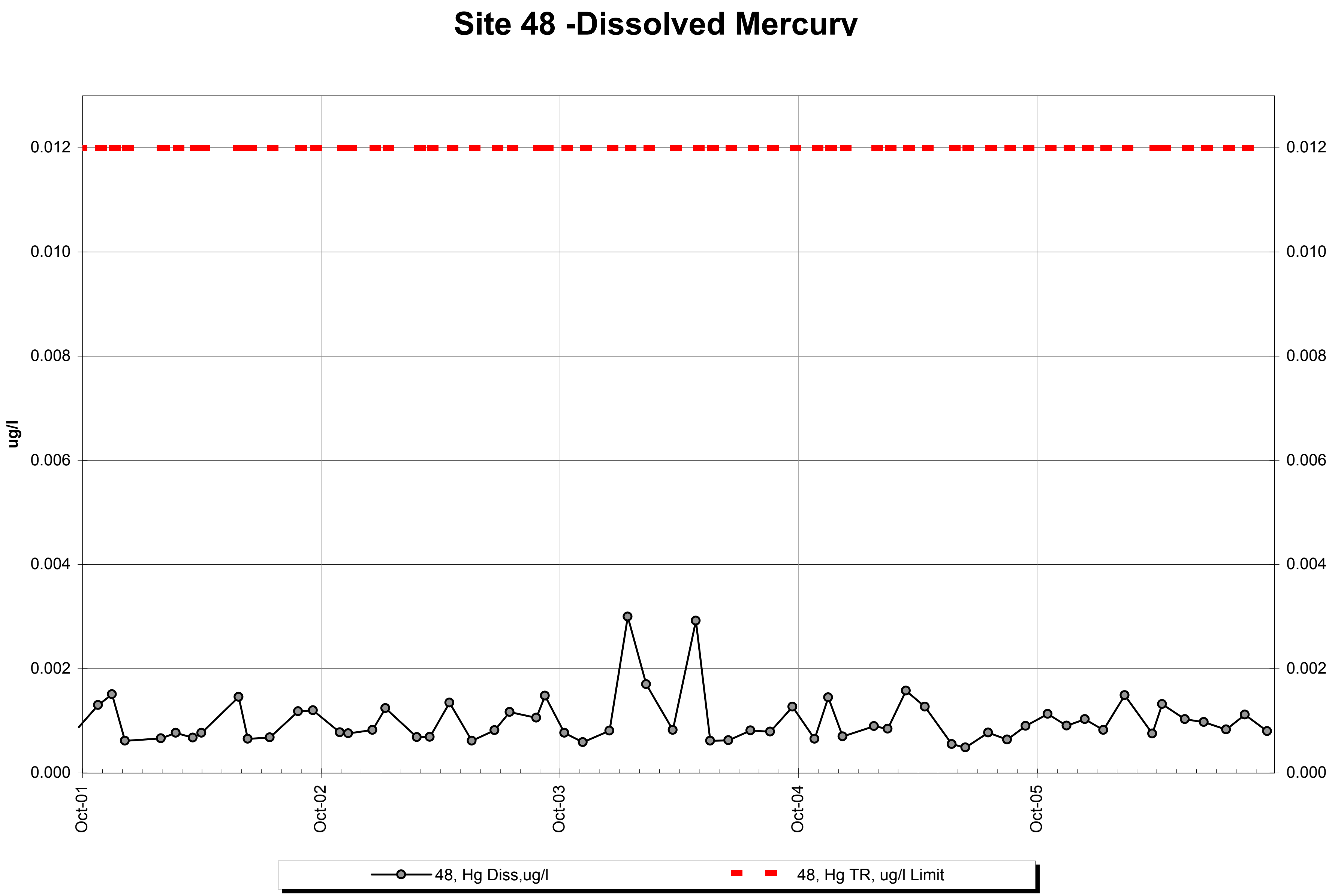


Site 48 -Dissolved Silver
ug/l
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Ag Diss,ug/l
48, Ag Diss, ug/l Limit



Site 48 -Dissolved Zinc
ug/l
0
10
20
30
40
50
60
70
80
90
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Zn Diss,ug/l
48, Zn TR, ug/l Limit


Site 48 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Se Diss,ug/l
48, Se TR, ug/l Limit



Site 48 -Dissolved Mercury
ug/l
0.000
0.002
0.004
0.006
0.008
0.010
0.012
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
48, Hg Diss,ug/l
48, Hg TR, 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	**WY2001**	108	72.7	129	103	129		137	87.8	74.9	89	116	94.7
b	**WY2002**	118	113	137	139	138	150	158	60.6	84.1	93.2	99.7	90
c	**WY2003**	117	123	119	103	139	147	117	96.5	94.6	131	129	95.7
d	**WY2004**	132	129	137	68.1	100	148	96	84	86.3	116	136	89.6
e	**WY2005**	134	88.4	126	132	135	108	116.4	79.6	81.9	98	131	109
f	**WY2006**	108	115	107	124	112	146	114	88.6	77	98.7	92.2	122
	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	1	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

	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	0	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
f-a	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	0	-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	4	5	-6	0	-3	-6	-9	1	-1	5	1	7

	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
$Z_k = S_k/\sigma_S$	0.75	0.94	-1.13	0.00	-0.56	-1.47	-1.69	0.19	-0.19	0.94	0.19	1.32
Z^2_k	0.56	0.88	1.27	0.00	0.32	2.16	2.86	0.04	0.04	0.88	0.04	1.73

ΣZ_k= -0.72

ΣZ^2_k= 10.77

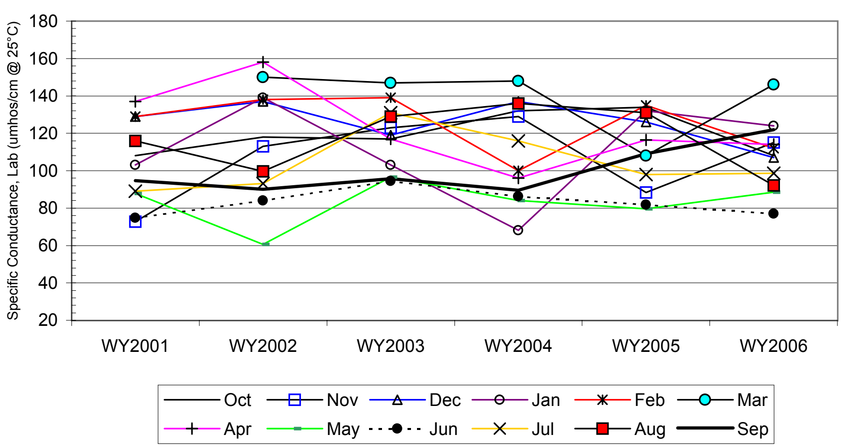
Z-bar=$\Sigma Z_k/K$= -0.06

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	3	0	0	0	0

Σn 71

ΣS_k -2

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		10.73	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
	p	**0.466**		$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.06	@α/2=2.5% Z= 1.96	**H_0** (No trend) ACCEPT
328.33	p	**0.478**		**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.65		3.15
0.050	-1.93	**0.00**	1.66
0.100	-1.31		1.13
0.200	-1.00		0.74

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	**WY2001**	7.2	7.5	7.2	7.3	6.8		7.9	6.5	7.1	7.7	7.4	8.1
b	**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
c	**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
d	**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
e	**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
f	**WY2006**	7.6	7.7		7.7	7.6	7.5	7.7	7.6		7.7	7.5	7.1
	n	6	6	5	6	6	5	6	6	5	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
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
f-a	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
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
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
f-e	-1	1		-1	-1	-1	-1	-1		1	-1	-1
S_k	9	3	10	11	5	0	-1	7	10	-3	3	-9

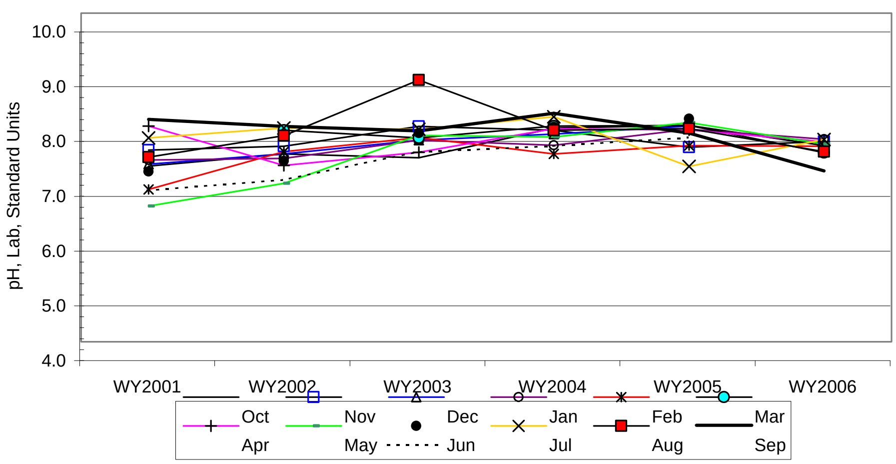
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
s^2_S=	28.33	28.33	16.67	28.33	28.33	16.67	28.33	28.33	16.67	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.69	0.56	2.45	2.07	0.94	0.00	-0.19	1.32	2.45	-0.56	0.56	-1.69
Z^2_k	2.86	0.32	6.00	4.27	0.88	0.00	0.04	1.73	6.00	0.32	0.32	2.86

ΣZ_k= 9.60
ΣZ^2_k= 25.59
Z-bar=$\Sigma Z_k/K$= 0.80

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

Σn 69
ΣS_k 45

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$= 17.92	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p **0.084**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 305.00	Z_{calc} 2.52	@α/2=2.5% Z= 1.96	**H_0** (No trend)	REJECT
	p **0.994**		**H_A** (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

a	Lower Limit	Sen's Slope	Upper Limit
0.010	0.01		0.13
0.050	0.03	**0.07**	0.12
0.100	0.04		0.11
0.200	0.04		0.10

1.0%

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

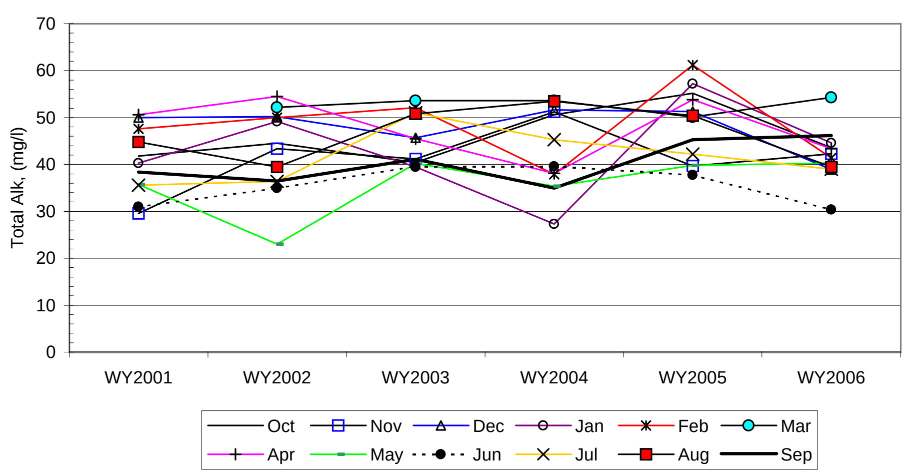
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**	41.8	29.6	50.0	40.3	47.6		50.6	35.7	31.0	35.6	44.8	38.4
b	**WY2002**	44.5	43.4	50.2	49.2	50.0	52.2	54.5	23.0	35.0	36.4	39.5	36.5
c	**WY2003**	40.4	41.2	45.7	39.5	52.1	53.6	45.5	40.2	39.6	51.0	50.8	41.1
d	**WY2004**	50.6	51.2	51.6	27.3	37.9	53.6	38.1	35.4	39.6	45.3	53.5	35.0
e	**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
f	**WY2006**	43.6	42.3	38.9	44.6	41.4	54.3	43.4	40.3	30.4	39.0	39.5	46.2
	n	6	6	6	6	6	5	6	6	6	6	6	6
	t_1	0	0	0	0	0	1	0	0	1	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
	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
	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
	f-a	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	0	1
	d-c	1	1	1	-1	-1	0	-1	-1	0	-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	5	3	-1	1	1	3	-5	7	0	3	0	7
	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
	$Z_k = S_k/\sigma_S$	0.94	0.56	-0.19	0.19	0.19	0.73	-0.94	1.32	0.00	0.56	0.00	1.32
	Z^2_k	0.88	0.32	0.04	0.04	0.04	0.54	0.88	1.73	0.00	0.32	0.00	1.73

ΣZ_k=	4.68
ΣZ^2_k=	6.50
Z-bar=ΣZ_k/K=	0.39

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	3	0	0	0	0

Σn	71
ΣS_k	24

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		4.68	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
	p	**0.946**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	1.27	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
328.33	p	**0.898**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.36		1.71
0.050	-0.15	**0.53**	1.40
0.100	0.00		1.03
0.200	0.23		0.87

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	**WY2001**	2.4	2.6	3.0	2.5	2.9		2.2	2.2	2.6	2.1	1.4	2.5
b	**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
c	**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
d	**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
e	**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
f	**WY2006**	3.1	2.9	2.4	2.7	2.8	2.7	2.0	1.8	1.7	1.2	2.6	2.5
	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
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
f-a	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	1	-3	-3	-1	-1	-2	-3	-5	-3	-7	7	-5

	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
$Z_k = S_k/\sigma_S$	0.19	-0.56	-0.56	-0.19	-0.19	-0.49	-0.56	-0.94	-0.56	-1.32	1.32	-0.94
Z^2_k	0.04	0.32	0.32	0.04	0.04	0.24	0.32	0.88	0.32	1.73	1.73	0.88

ΣZ_k= -4.81

ΣZ^2_k= 6.84

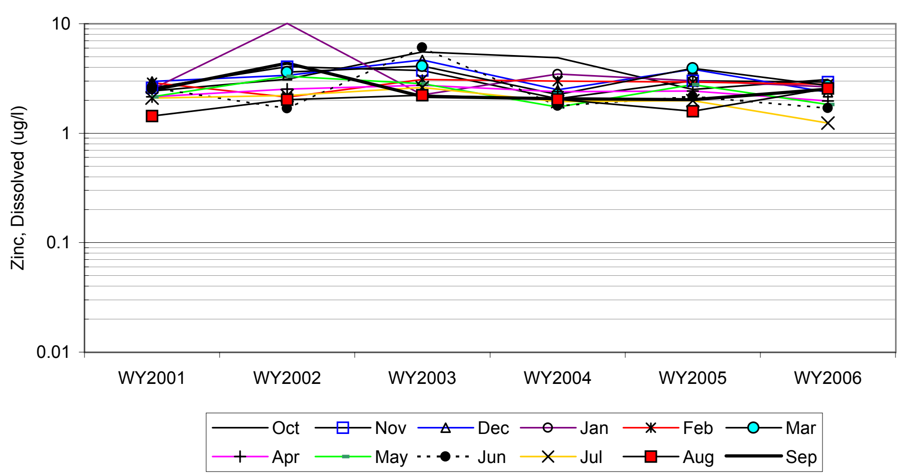
Z-bar=ΣZ_k/K= -0.40

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

Σn 71

ΣS_k -25

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	4.91	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.935**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 328.33	Z_{calc} -1.32	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.093**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.16		0.04
0.050	-0.14	**-0.07**	0.01
0.100	-0.12		-0.02
0.200	-0.10		-0.04

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 2006" report. The table includes all the required FWMP analyte 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 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 points 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 2006 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-05 though Sept-06.				

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 preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). No significant trends are identified.

Site 6-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.46	-		
pH, Lab	6	0.35	-		
Alkalinity, Total	6	0.87	+		
Zinc, Dissolved	6	0.31	-		

(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 (lab and field), 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 table below summarizes the results of the signed-rank test as performed on the Water Year 2006 data set. Alkalinity does not show a statistically significant difference between the measured median values at a significance level of α=0.05 for a one-tailed test. The lab conductivity, lab pH, total sulfate and dissolved zinc concentrations are statistically different. The median values for lab conductivity for Site 48 and Site 6 are 110 uS/cm and 118 uS/cm respectively and the median of differences, Site 48 minus Site 6, is -7.0 uS/cm. Using the signed-rank test on prior water year's data yields similar results and differences going back for the past six water years. The median values for lab pH for Site 48 and Site 6 are 7.61 su and 7.31 su respectively and the median of the differences, Site 48 minus Site 6, is 0.27 su. A comparison of the X-Y co-plots for laboratory and field pH show that while the is the same general trend for Site 6 field pHs to be lower than Site 48 but to a lesser and more variable degree. Currently, KGCMC interprets the lower pH at Site 6 as due to natural variation. In addition a similar difference has been noted at Site 46 for the past two water years. KGCMC plans to collect additional data over the 2007 water year to better understand the inconsistencies between filed and lab pH for these sites. The median values for total sulfate for Site 48 and Site 6 are 12.6 mg/l and 15.6 mg/l respectively. The median of the differences, Site 48 minus Site 6, is -2.5 mg/l total sulfate. Prior Water Year's datasets from 2003-2005 have yielded similar differences ranging for -1.8 mg/l to -2.2 mg/l. Dissolved zinc results follow along in a similar manner where the median values for Site 48 and Site 6 are 2.55 ug/l and 5.21 ug/l respectively while the median difference is -2.52 ug/l. Similar signed-rank test results for prior datasets for Water Years 2000 – 2005 show similar statistically significant differences with an median difference ranging from -1.7 ug/l to -2.6 ug/l dissolved zinc. The magnitudes of these differences appear to have been relatively consistent over the past five 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 - WY2006, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site 48 median	Site 6 median	Median of Differences
Conductivity, Lab	**0.02**	**110**	**118**	**-7.0**
pH, Lab	**0.99**	**7.60**	**7.31**	**0.18**
Alkalinity, Total	0.06	41.9	42.8	-0.8
Sulfate, Total	**0.02**	**12.6**	**15.6**	**-2.5**
Zinc, Dissolved	**0.05**	**2.55**	**5.21**	**-2.52**

Table of Results for Water Year 2006

Site 6 "Middle Greens Creek"

Sample Date/Parameter	10/18/05	11/16/05	12/14/05	1/11/06	2/13/06	3/27/06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/19/06	**Median**
Water Temp (°C)	4.5	2.0	2.4	1.1	1.4	1.0	1.9	3.0	5.2	8.1	8.6	7.3	2.7
Conductivity-Field(µmho)	118.1	114.9	96.7	119.5	128.0	156.6	143.1	93.4	80.5	93.9	94.2	121.3	116.5
Conductivity-Lab (µmho)	114	122	112	139	122	161	130	93	79	103	102	129	118
pH Lab (standard units)	6.84 J	7.26	7.66 R	7.50 J	7.42	7.36	7.66 J	7.74	7.17 J	6.90	6.96	7.00 J	7.31
pH Field (standard units)	7.84	8.06	7.74	7.25	7.56	7.77	7.75	7.22	7.06	7.79	8.01	7.89	7.76
Total Alkalinity (mg/L)	43.2	43.9	38.6	47.2	42.3	53.4	44.6	37.7	30.9	40.7	41.6	46.8	42.8
Total Sulfate (mg/L)	14.2	16.8 J	14.7	21.6	16.5	26.3	20.3	9.2	7.1	11.1	10.7	16.4	15.6
Hardness (mg/L)	58.6	63.6	54.2	65.7	59.8	79.9	65.2	49.7	39.9	52.1	55.0	68.1	59.2
Dissolved As (ug/L)	0.226	0.217	0.274	0.132	0.255 U	0.030 J	0.184	0.155	0.205	0.204	0.220	0.228	0.211
Dissolved Ba (ug/L)			20.0		23.8								21.9
Dissolved Cd (ug/L)	0.0518	0.0547	0.0482	0.0468 U	0.0595	0.0535	0.0744	0.0274	0.0215 U	0.0295	0.0413	0.0497	0.0490
Dissolved Cr (ug/L)			0.078 J		0.811								0.445
Dissolved Cu (ug/L)	0.453	0.424	0.653 U	0.386 U	0.731	0.311 U	0.763	0.523	0.226 U	0.312	0.455	0.392	0.439
Dissolved Pb (ug/L)	0.0835 U	0.0634 U	0.0382 U	0.0262 U	0.1500	0.0293	0.0608	0.0131 U	0.0124 U	0.0088 U	0.5650	0.0673	0.0495
Dissolved Ni (ug/L)			0.614 U		0.294								0.454
Dissolved Ag (ug/L)			<0.002		0.002 J								0.002
Dissolved Zn (ug/L)	6.20 U	6.38	5.93	5.37	7.96 U	5.04 U	13.80	2.93 U	1.70 U	2.07	3.78 J	4.67	5.21
Dissolved Se (ug/L)			0.878		0.148 J								0.513
Dissolved Hg (ug/L)	0.000859 U	0.000903 U	0.001120 U	0.000861 U	0.001500 U	0.000687 U	0.001150 U	0.001230 U	0.000990 U	0.000946	0.001060 U	0.000723 U	0.000968

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
6	01/11/2006	1:25:00 PM				
			pH Lab, su	7.5	J	Hold Time Violation
			Cd Diss, ug/l	0.0468	U	Field Blank Contamination
			Cu Diss, ug/l	0.386	U	Field Blank Contamination
			Pb Diss, ug/l	0.0262	U	Field Blank Contamination
			Hg Diss, ug/l	0.000861	U	Field Blank Contamination
6	10/18/2005	11:25:00 AM				
			pH Lab, su	6.84	J	Hold Time Violation
			Pb Diss, ug/l	0.0835	U	Field Blank Contamination
			Zn Diss, ug/l	6.2	U	Field Blank Contamination
			Hg Diss, ug/l	0.000859	U	Field Blank Contamination
6	11/16/2005	10:20:00 AM				
			SO4 Tot, mg/l	16.8	J	Receipt Temperature
			Pb Diss, ug/l	0.0634	U	Field Blank Contamination
			Hg Diss, ug/l	0.000903	U	Field Blank Contamination
6	12/14/2005	11:44:00 AM				
			pH Lab, su	7.66	R	Hold Time Violation
			Cr Diss, ug/l	0.0784	J	Below Quantitative Range, D
			Cu Diss, ug/l	0.653	U	Field Blank Contamination
			Pb Diss, ug/l	0.0382	U	Field Blank Contamination
			Ni Diss, ug/l	0.614	U	Field Blank Contamination
			Hg Diss, ug/l	0.00112	U	Field Blank Contamination
6	02/13/2006	12:51:00 PM				
			As Diss, ug/l	0.255	U	Field Blank Contamination
			Ag Diss, ug/l	0.00212	J	Below Quantitative Range
			Zn Diss, ug/l	7.96	U	Field Blank Contamination
			Se Diss, ug/l	0.148	J	Below Quantitative Range
			Hg Diss, ug/l	0.0015	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

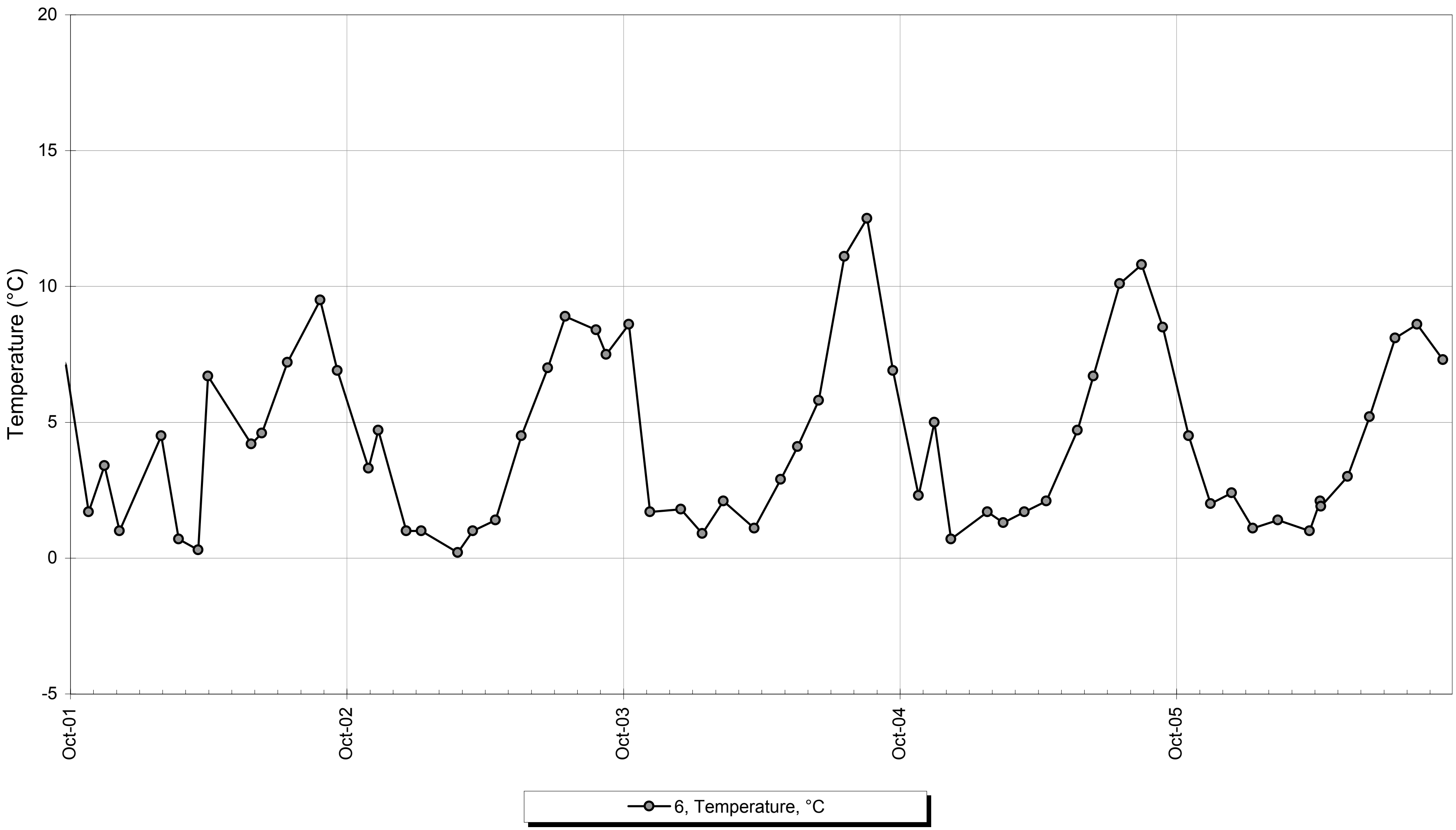
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

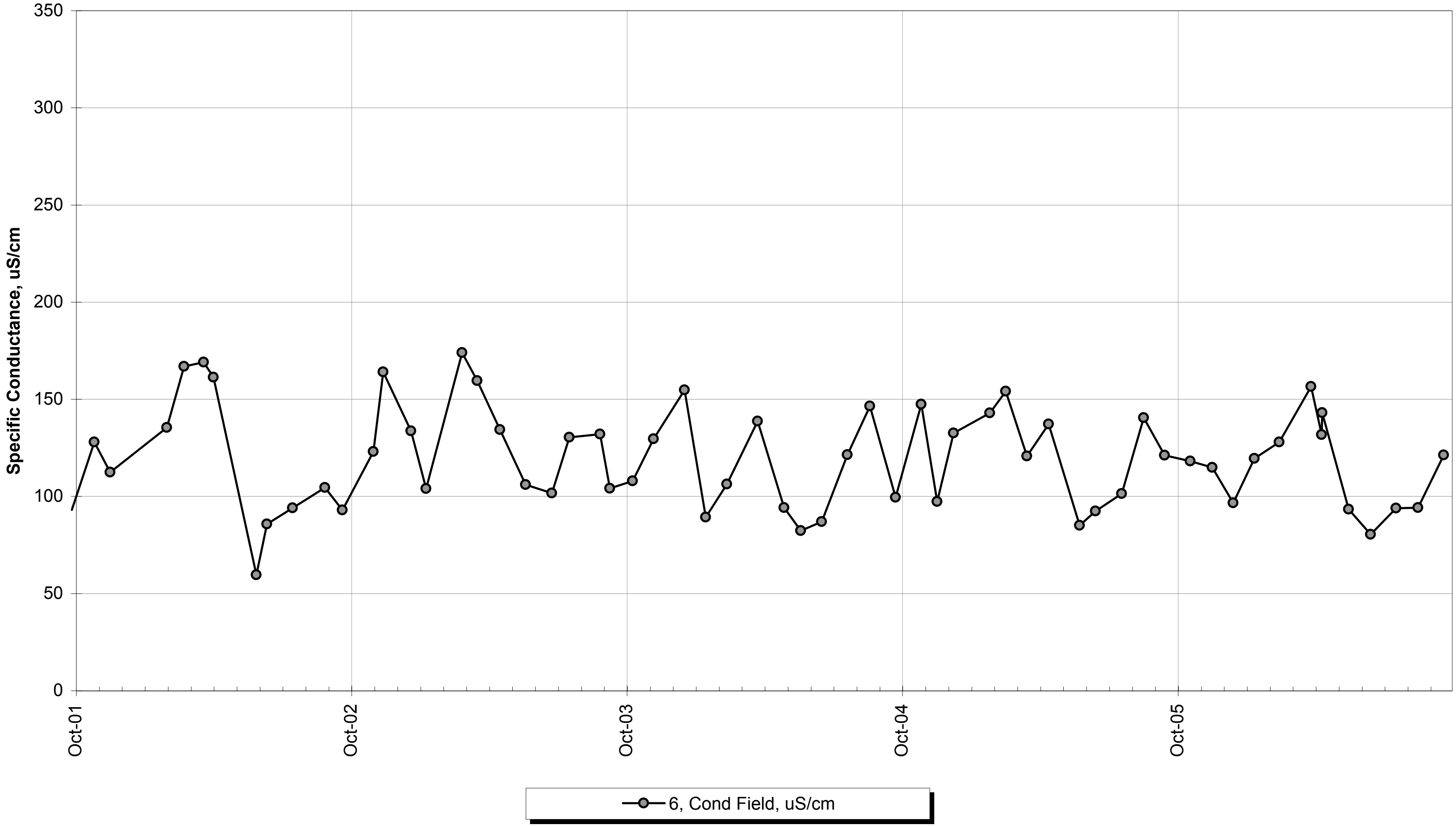
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
6	03/27/2006	11:50:00 AM				
			As Diss, ug/l	0.0304	J	Below Quantitative Range
			Cu Diss, ug/l	0.311	U	Field Blank Contamination
			Zn Diss, ug/l	5.04	U	Field Blank Contamination
			Hg Diss, ug/l	0.000687	U	Field Blank Contamination
6	04/11/2006	12:09:00 PM				
			pH Lab, su	7.66	J	Outside Hold Time
			Hg Diss, ug/l	0.00115	U	Field Blank Contamination
6	05/16/2006	10:45:00 AM				
			Pb Diss, ug/l	0.0131	U	Field Blank Contamination
			Zn Diss, ug/l	2.93	U	Field Blank Contamination
			Hg Diss, ug/l	0.00123	U	Field Blank Contamination
6	06/14/2006	7:50:00 AM				
			pH Lab, su	7.17	J	Hold Time Violation
			Cd Diss, ug/l	0.0215	U	Field Blank Contamination
			Cu Diss, ug/l	0.226	U	Field Blank Contamination
			Pb Diss, ug/l	0.0124	U	Field Blank Contamination
			Zn Diss, ug/l	1.7	U	Field Blank Contamination
			Hg Diss, ug/l	0.00099	U	Field Blank Contamination
6	07/18/2006	9:50:00 AM				
			Pb Diss, ug/l	0.00878	U	Field Blank Contamination
6	08/16/2006	12:31:00 PM				
			Zn Diss, ug/l	3.78	J	LCS Recovery
			Hg Diss, ug/l	0.00106	U	Field Blank Contamination
6	09/19/2006	1:10:00 PM				
			pH Lab, su	7	J	Hold Time Violation
			Hg Diss, ug/l	0.000723	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

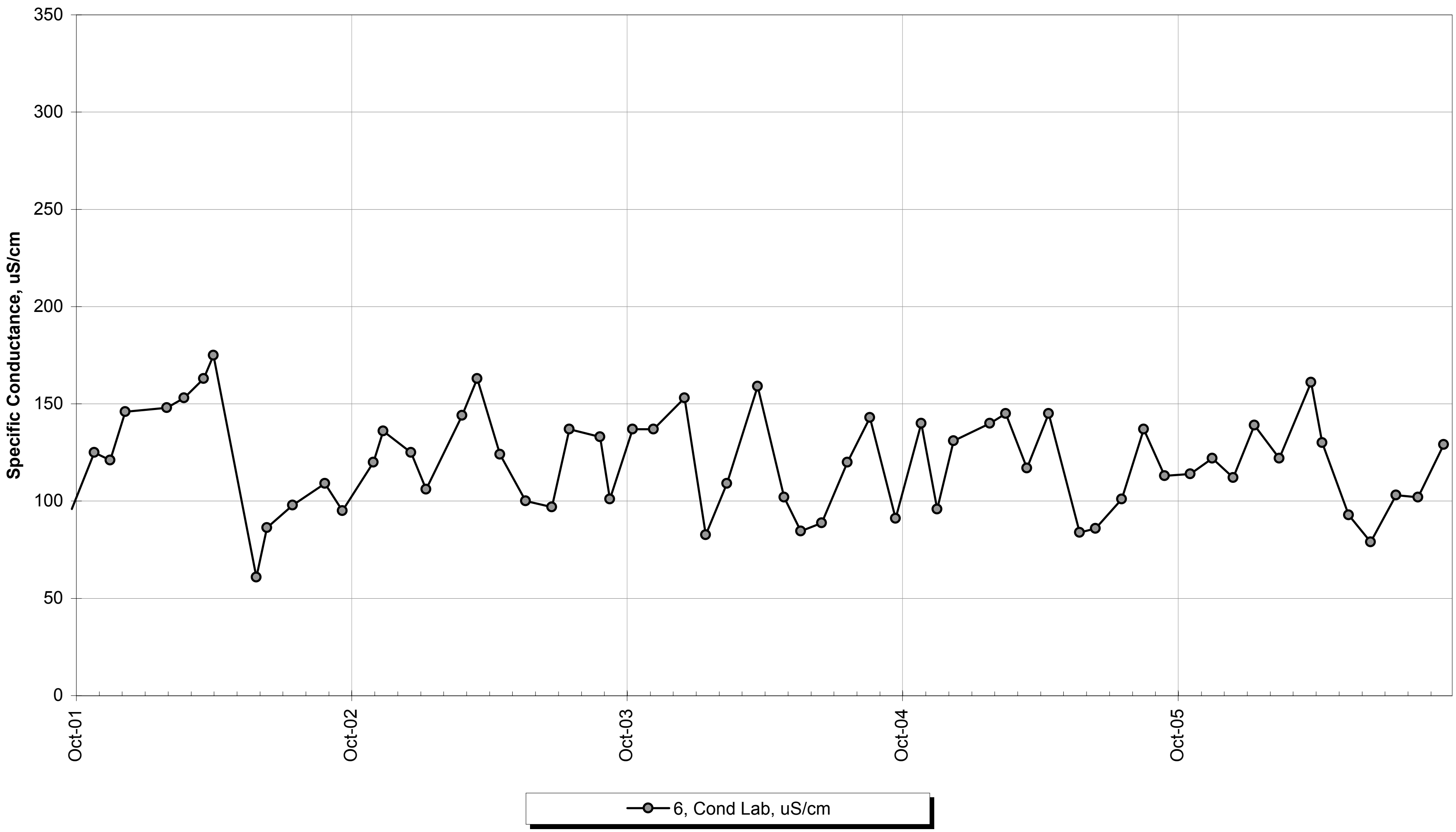
Site 6 -Water Temperature



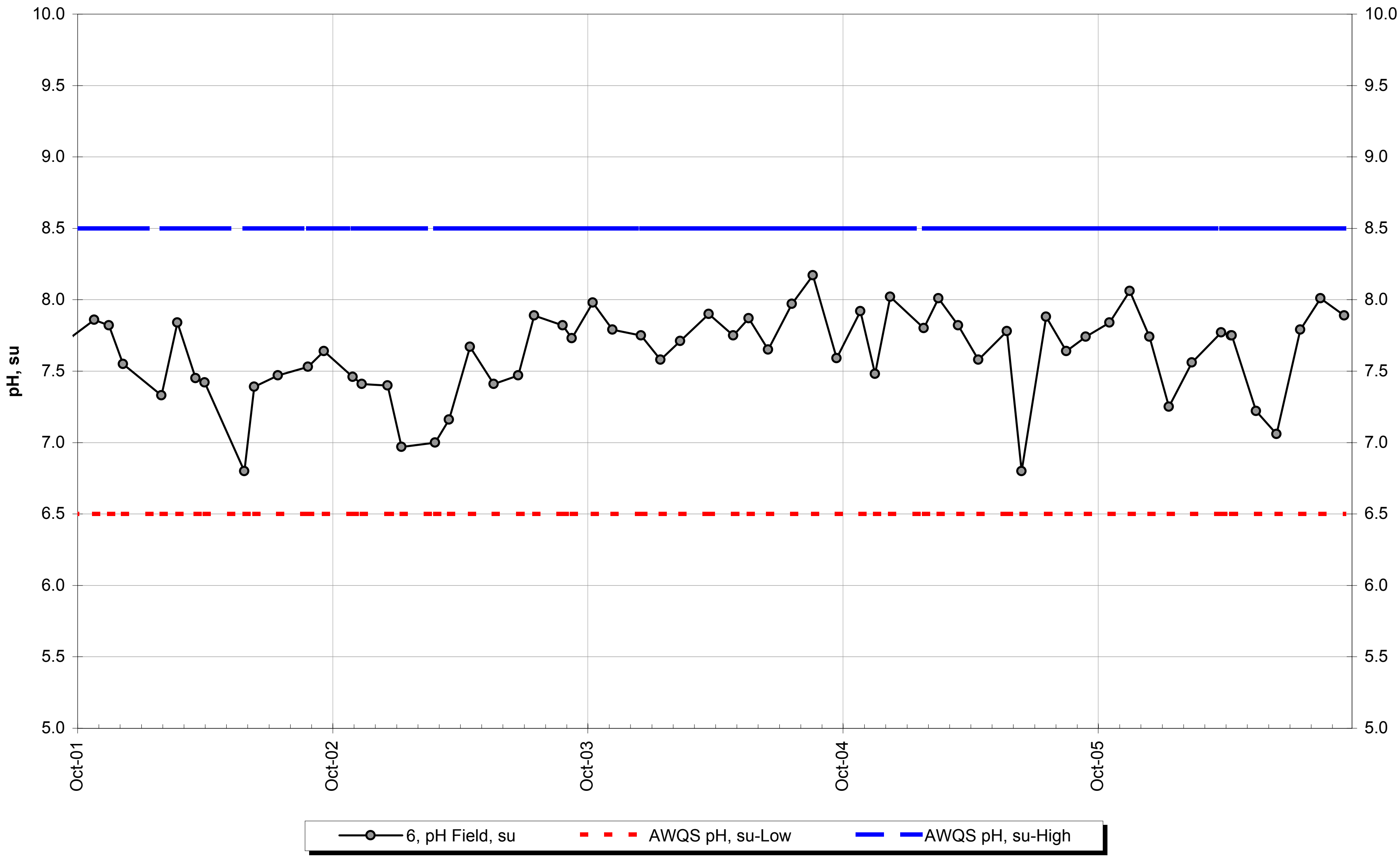
Site 6 -Conductivity-Field



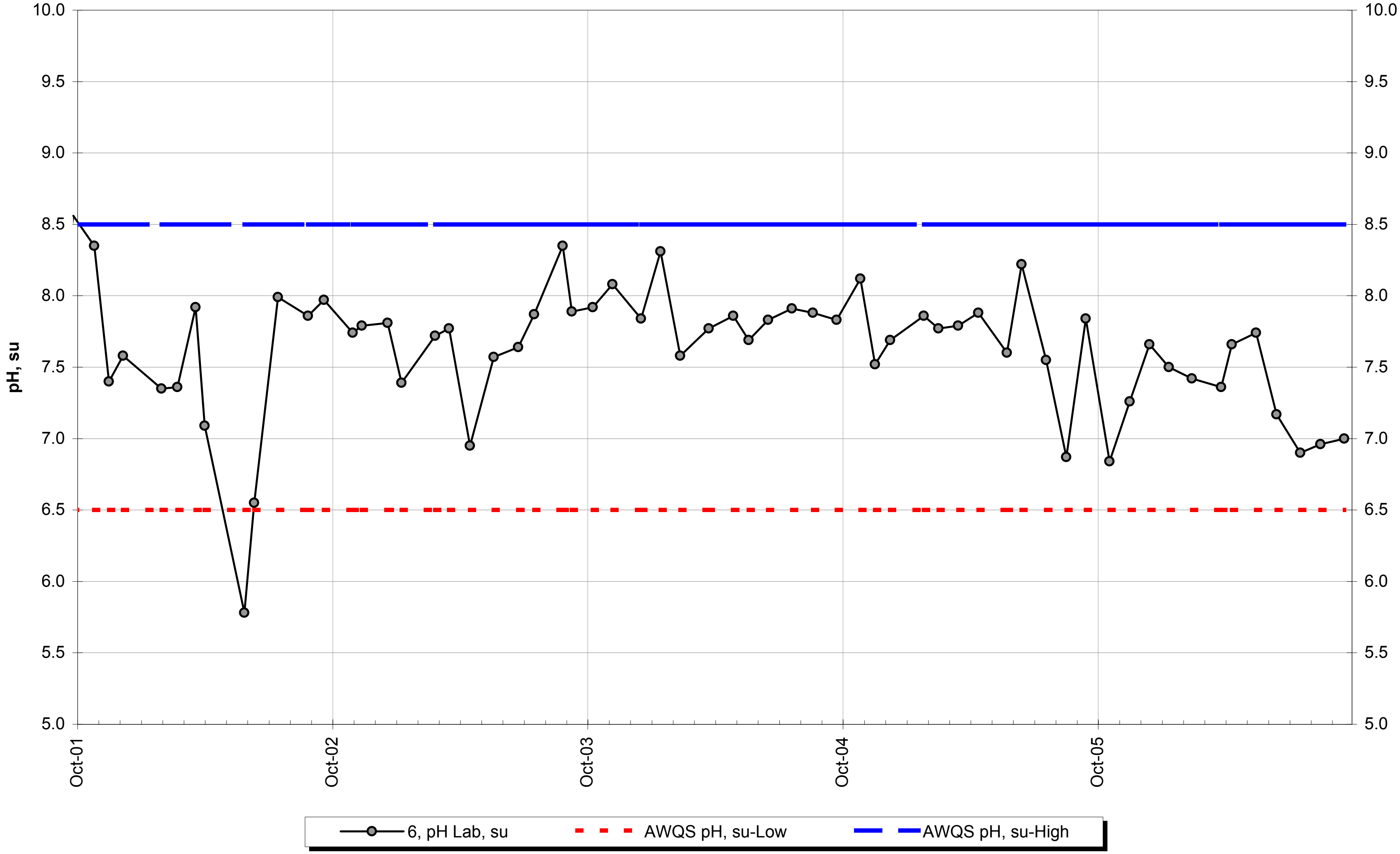
Site 6 -Conductivity-Lab



Site 6 -Field pH

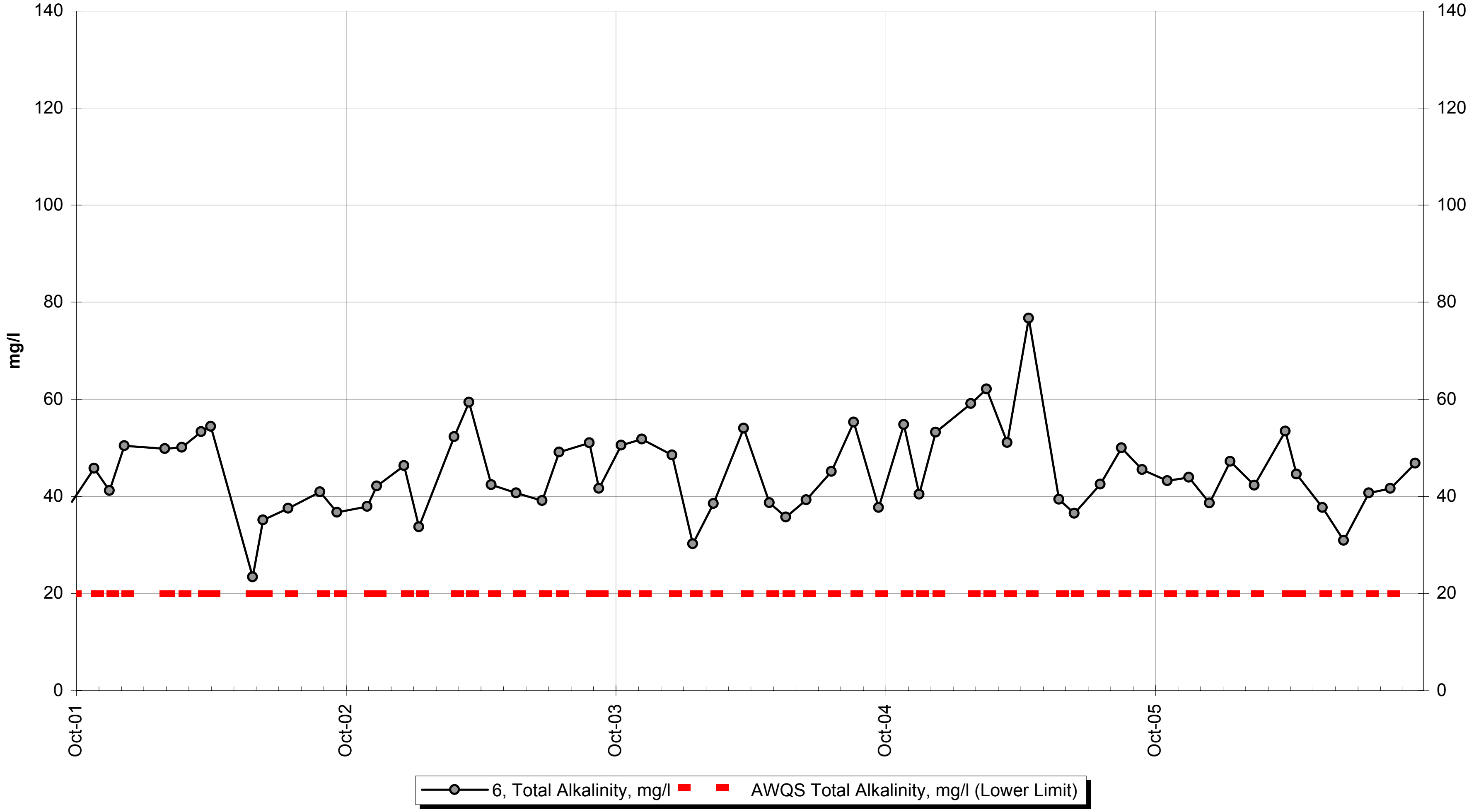


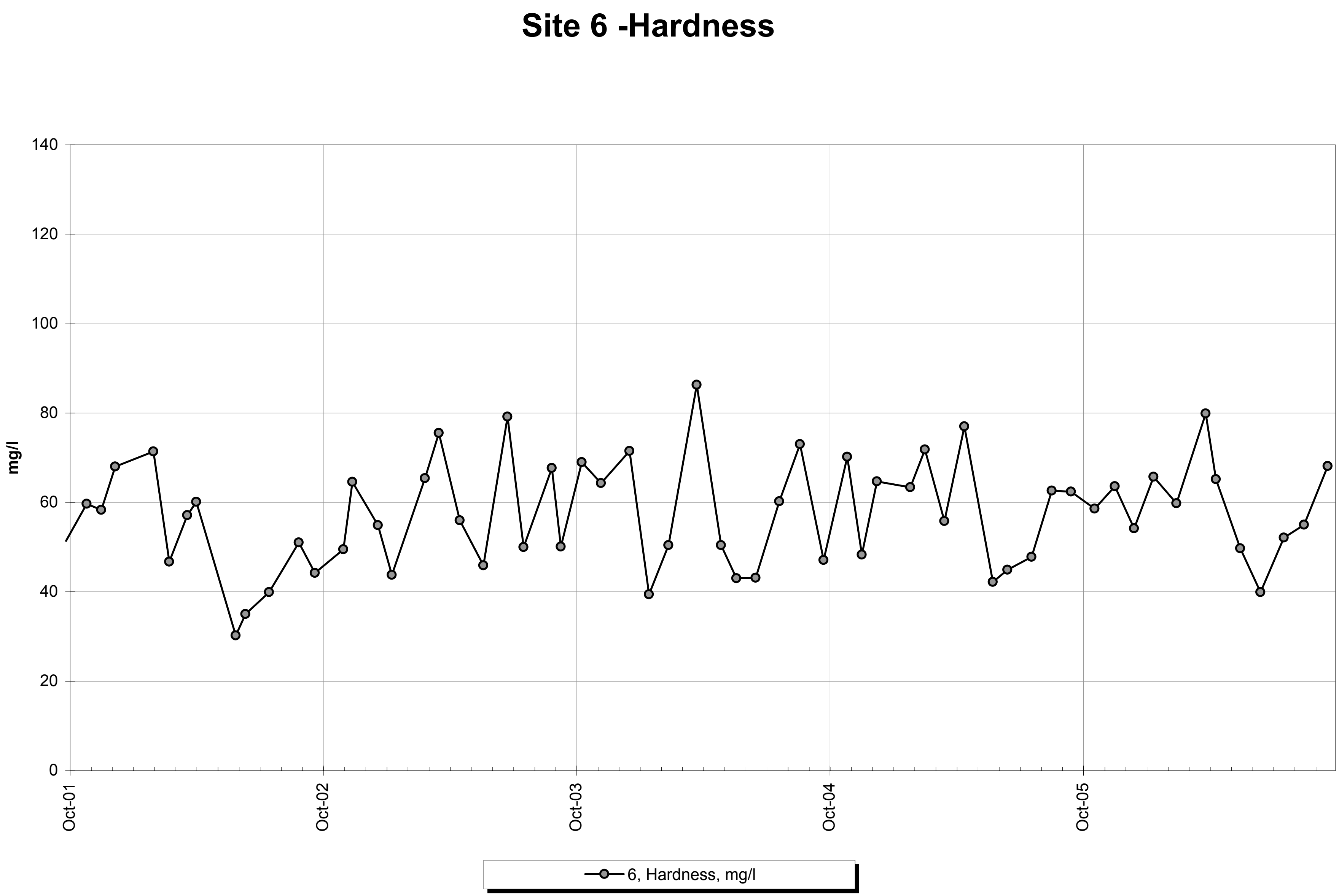
Site 6 -Lab pH



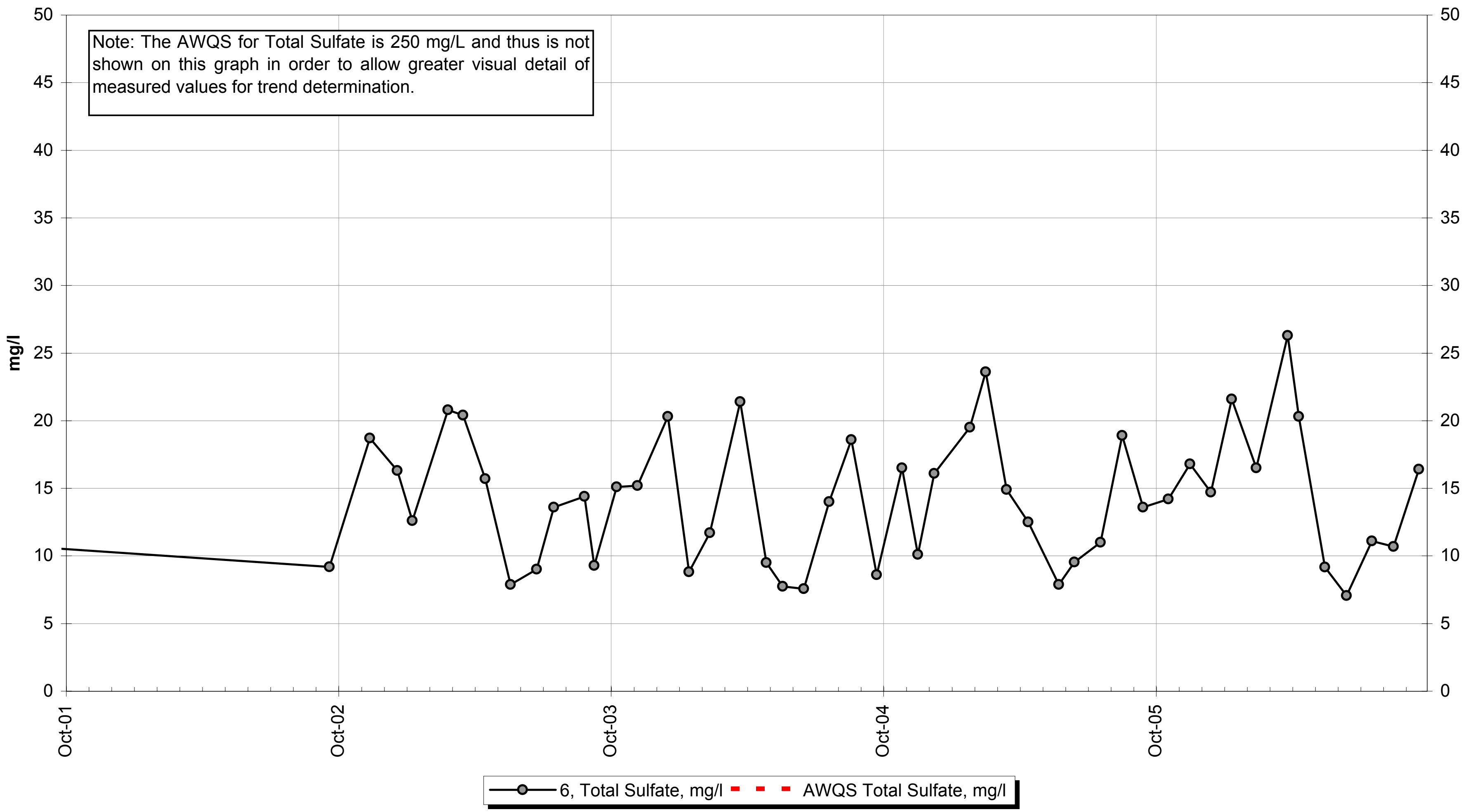
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
6, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 6 -Total Alkalinity

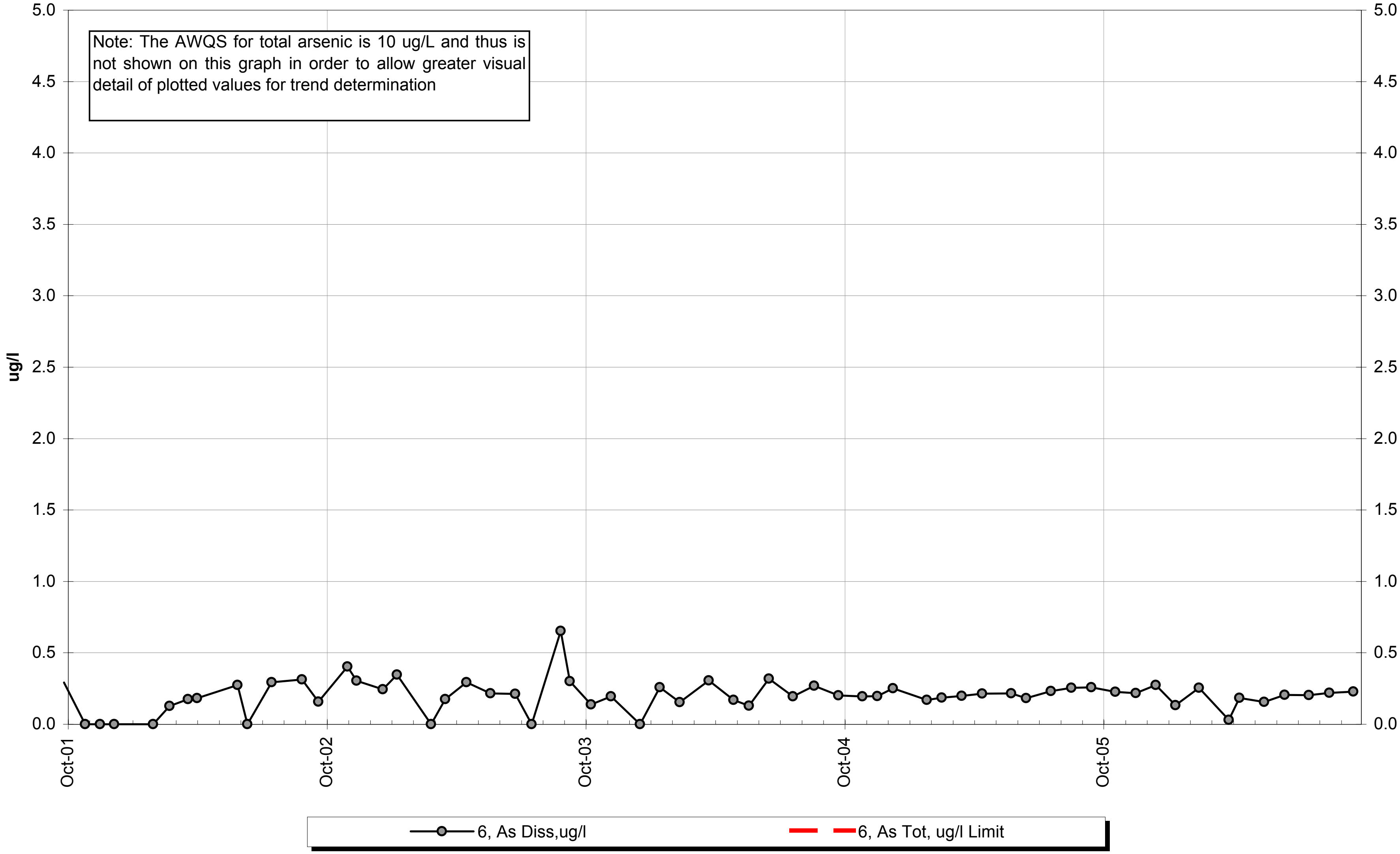



Site 6 -Hardness
mg/l
140
120
100
80
60
40
20
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
6, Hardness, mg/l

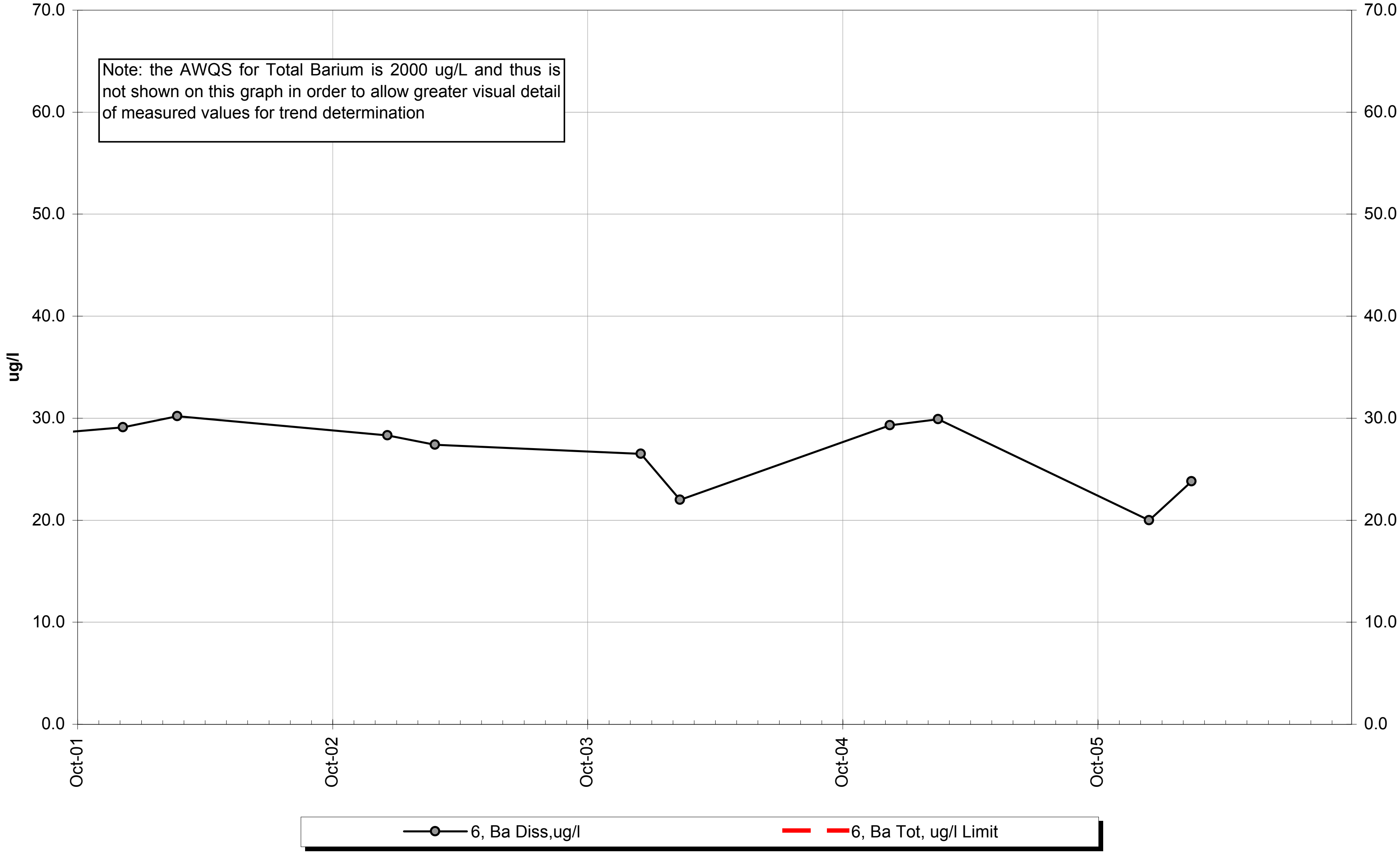
Site 6 -Total Sulfate



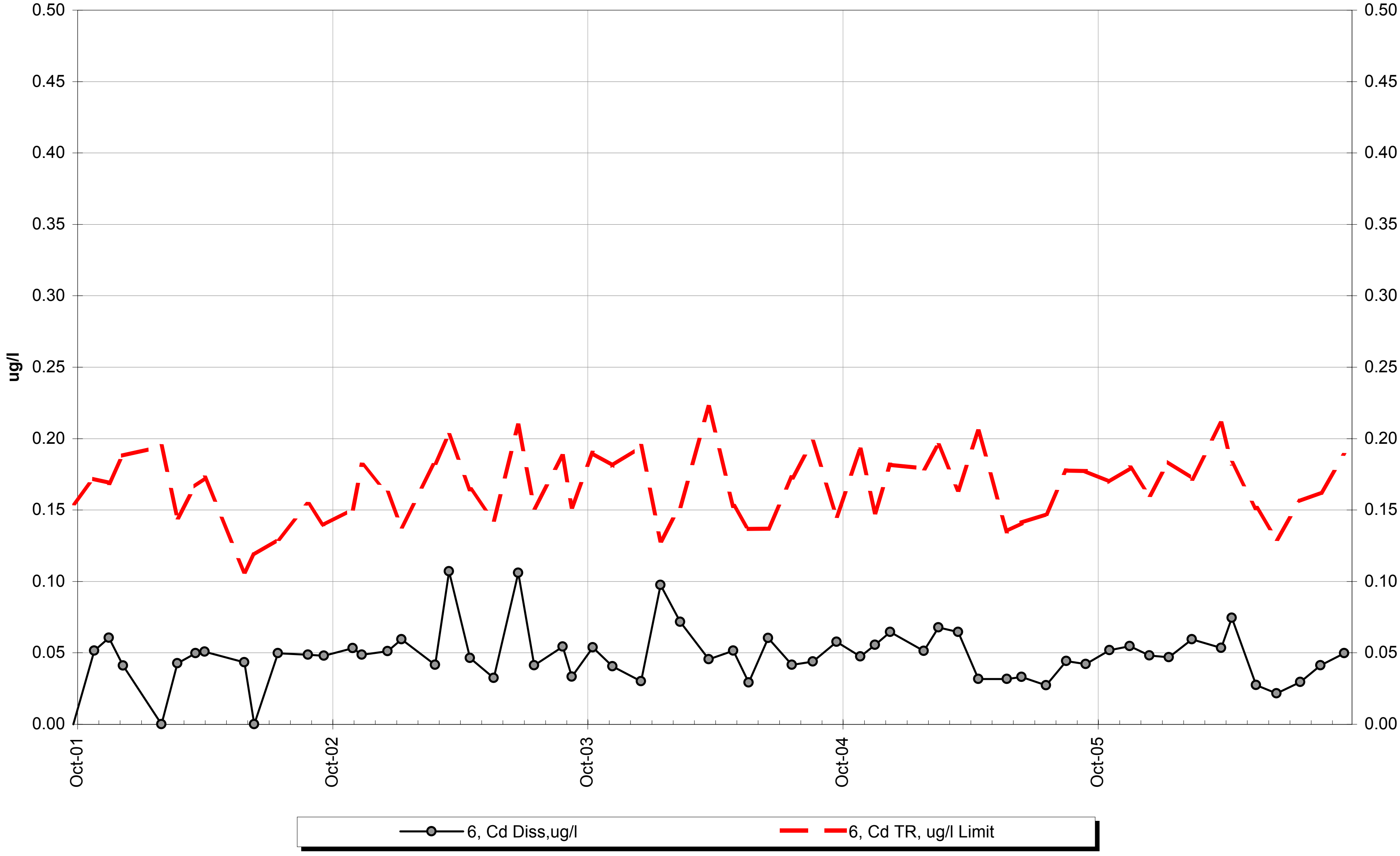
Site 6 -Dissolved Arsenic



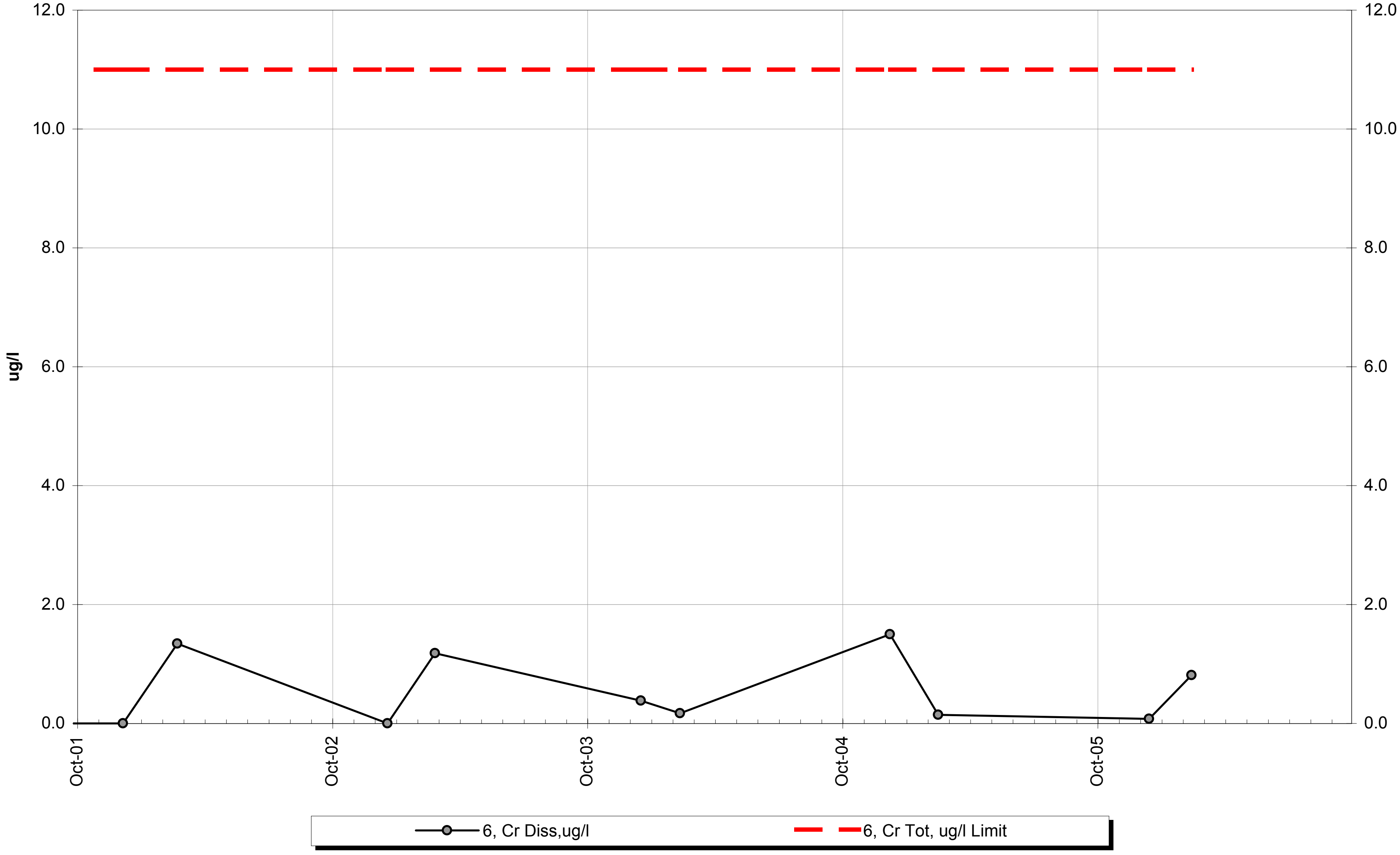
Site 6 -Dissolved Barium



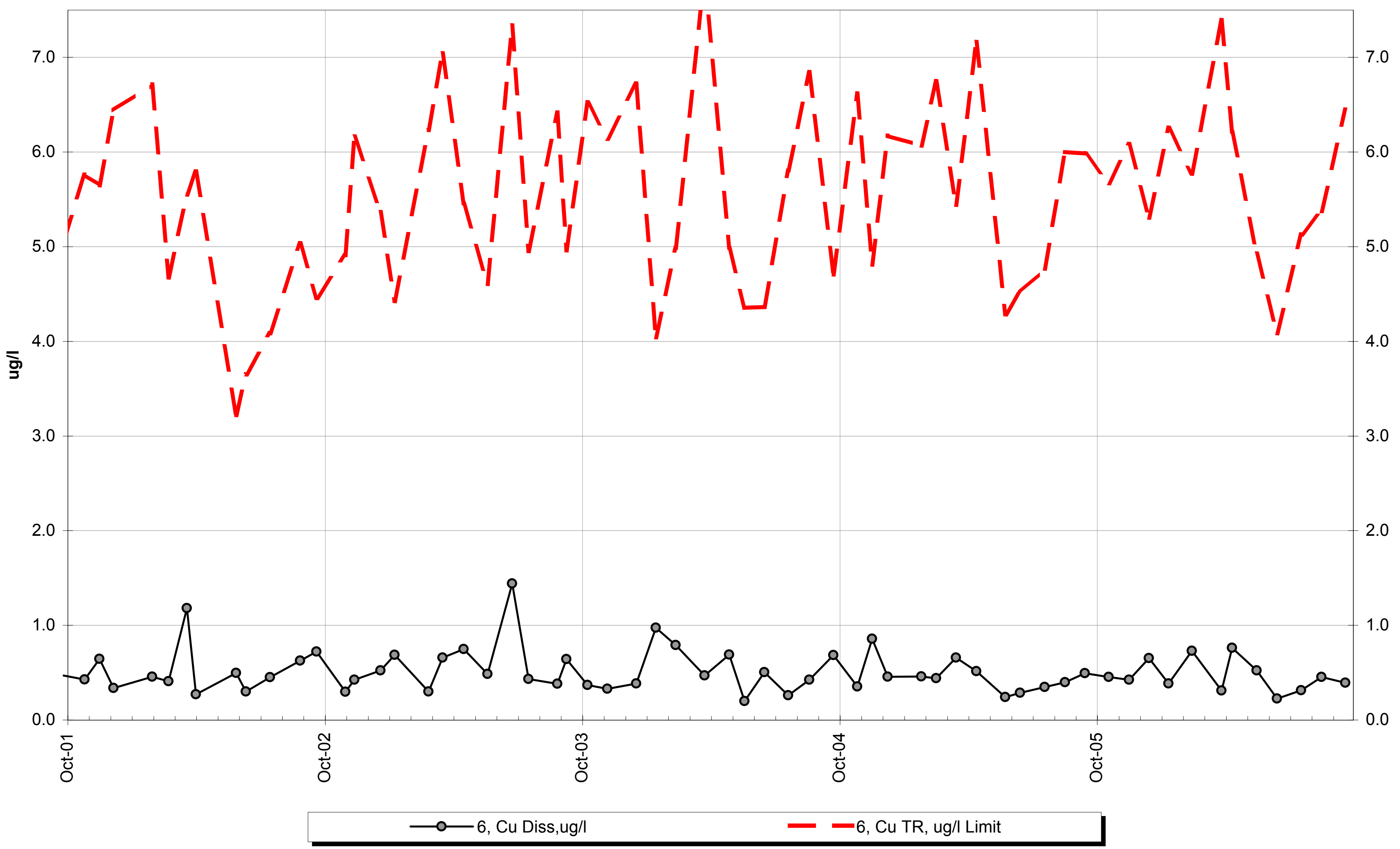
Site 6 -Dissolved Cadmium



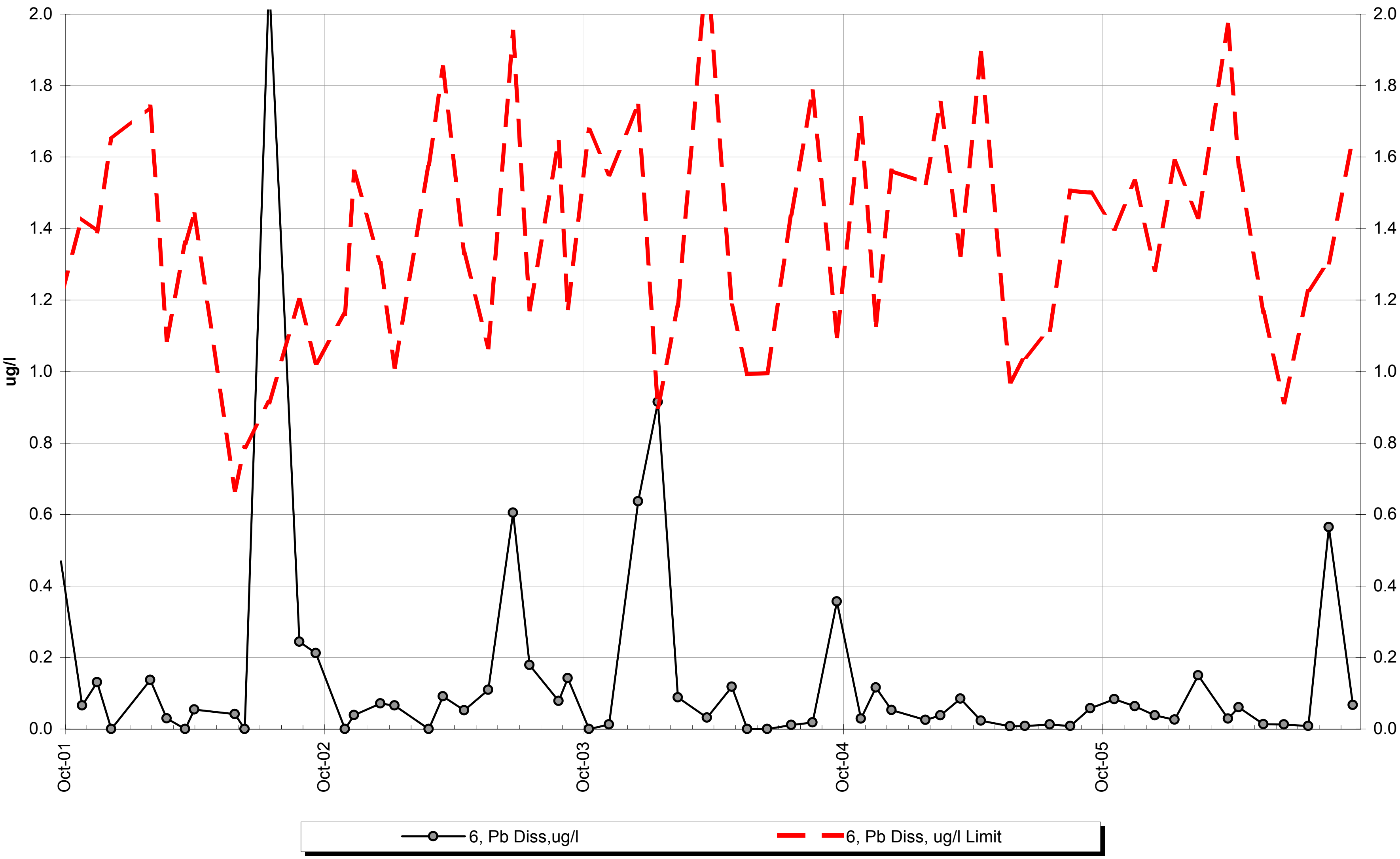
Site 6 -Dissolved Chromium

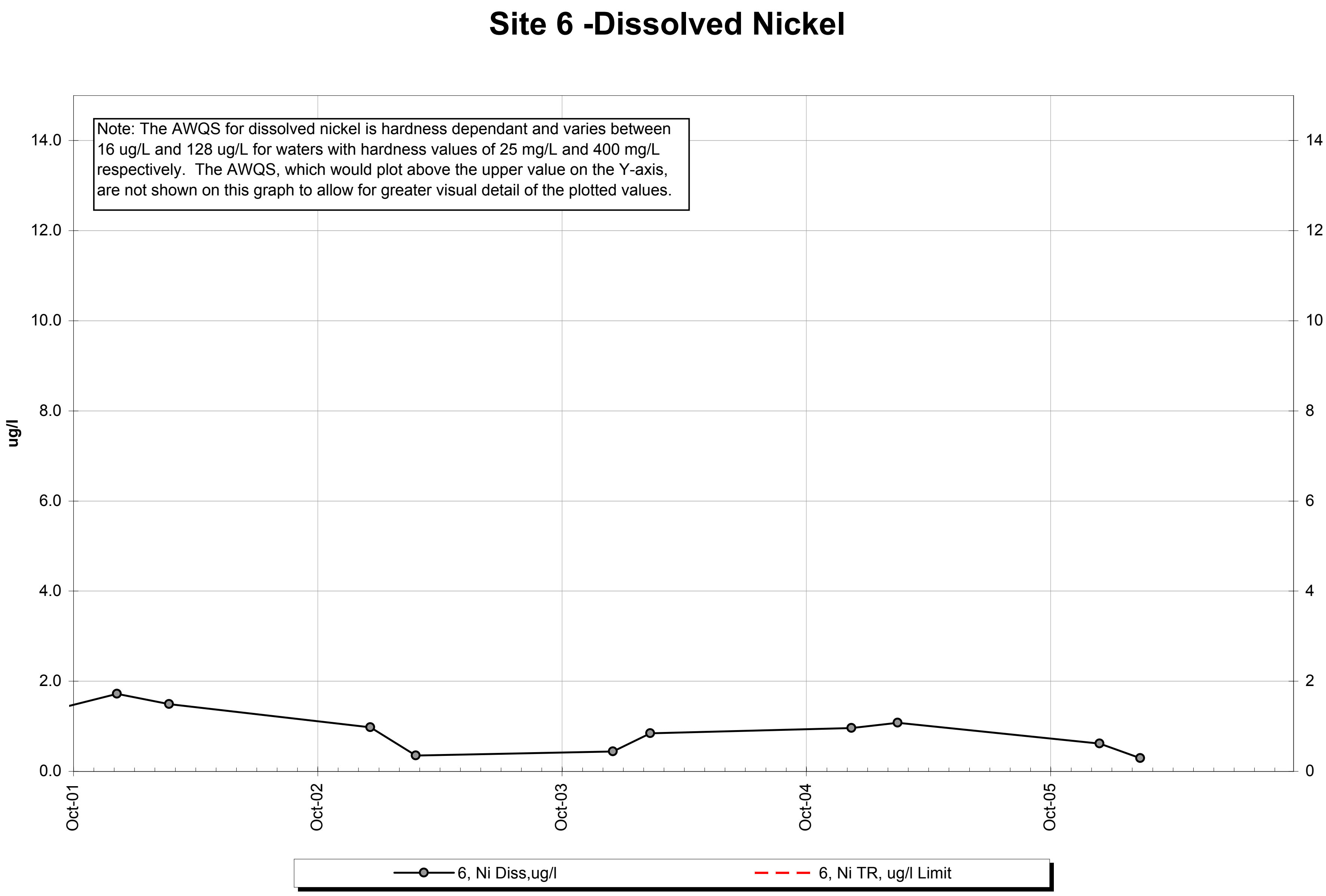


Site 6 -Dissolved Copper

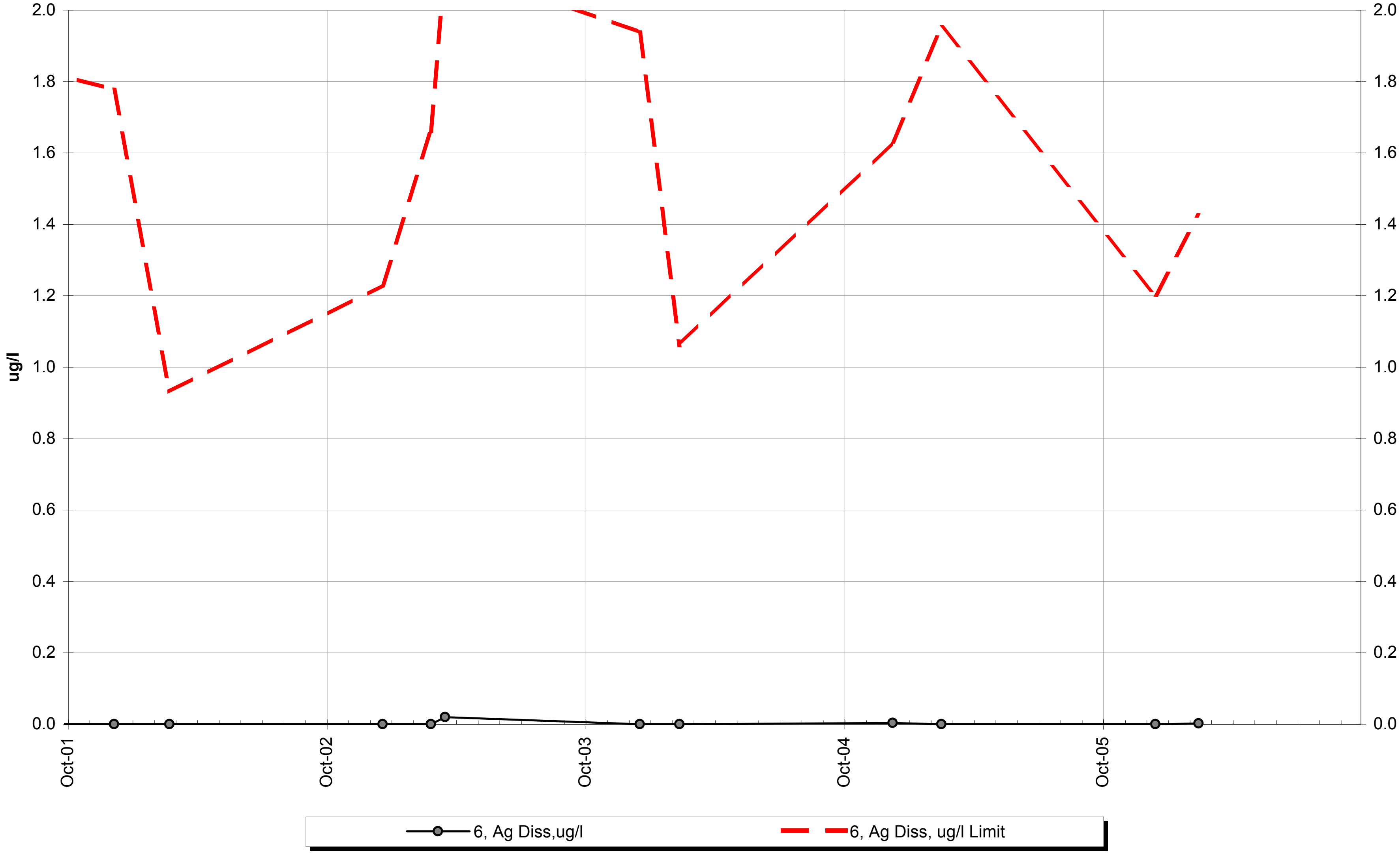


Site 6 -Dissolved Lead

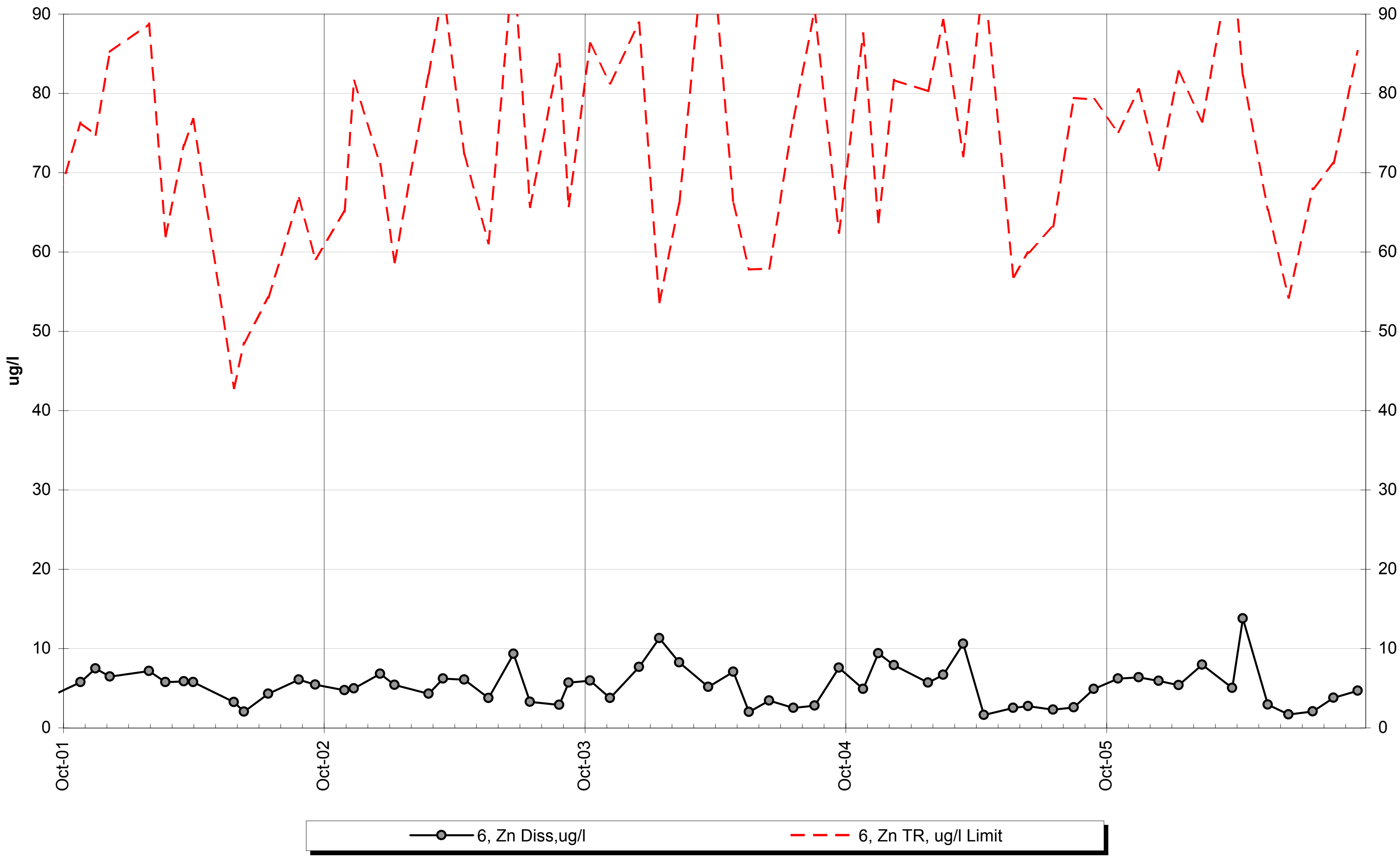



Site 6 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater visual detail of the plotted values.
ug/l
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-01
Oct-02
Oct-03
Oct-04
Oct-05
6, Ni Diss,ug/l
6, Ni TR, ug/l Limit

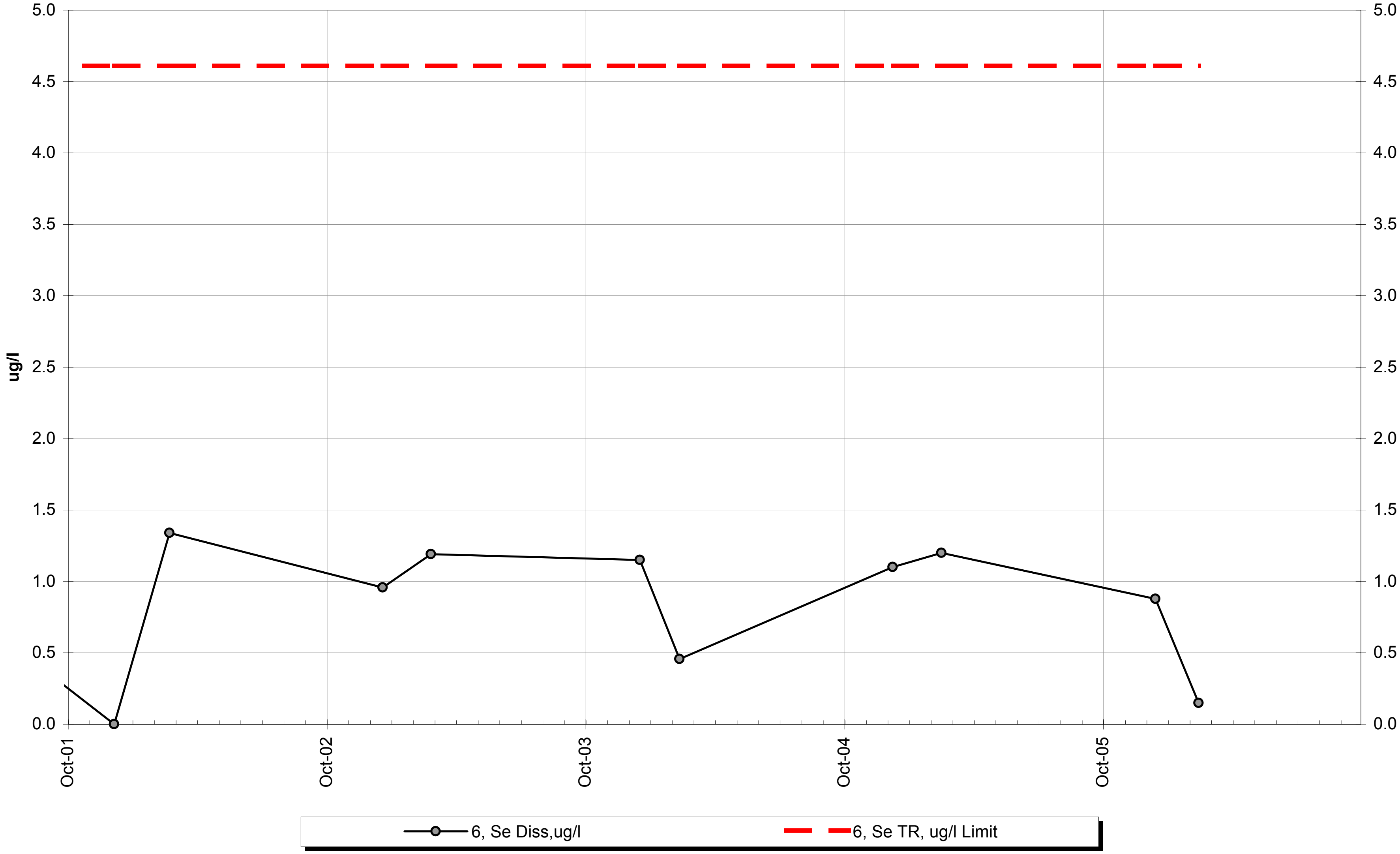
Site 6 -Dissolved Silver



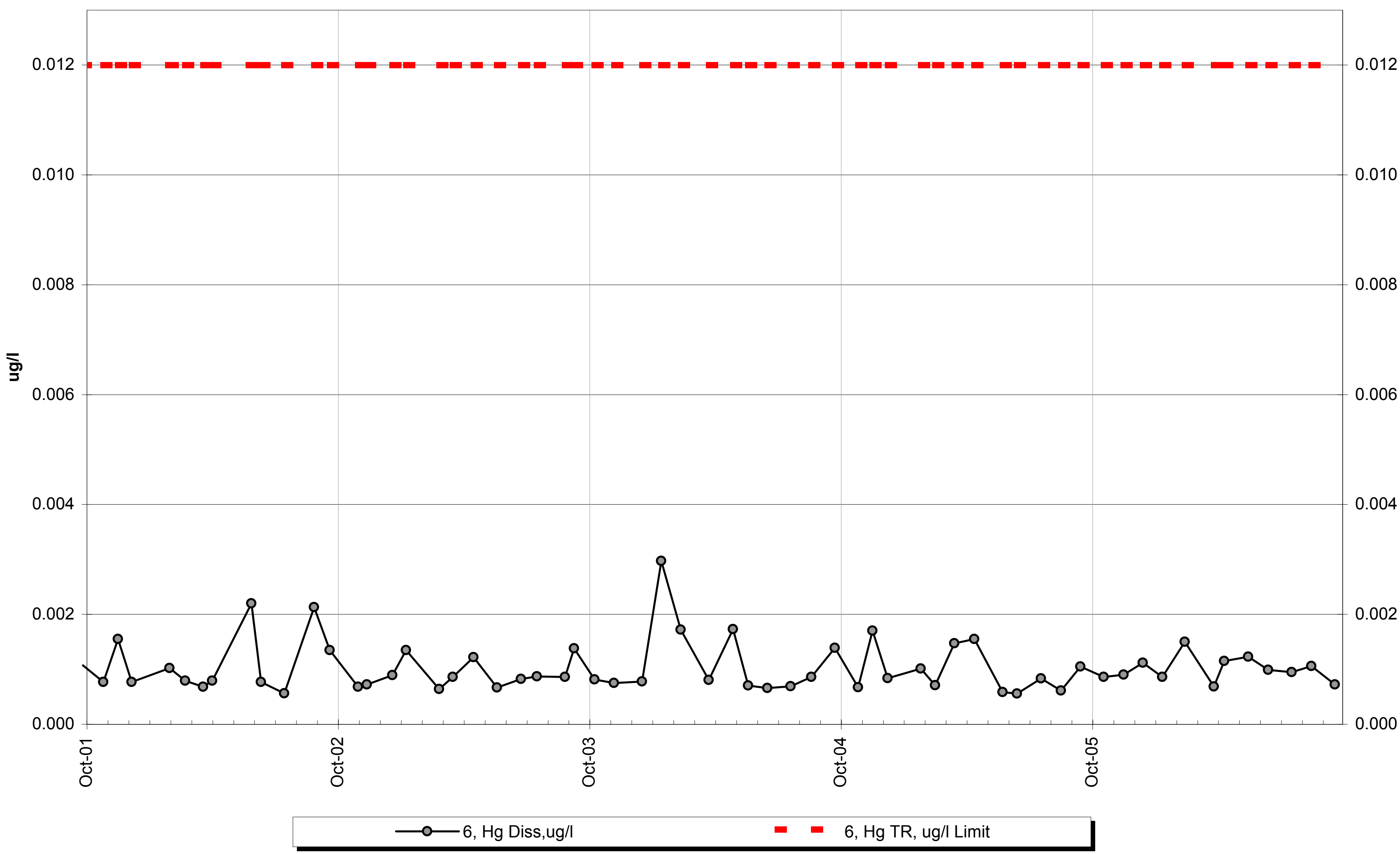
Site 6 -Dissolved Zinc



Site 6 -Dissolved Selenium



Site 6 -Dissolved Mercury



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

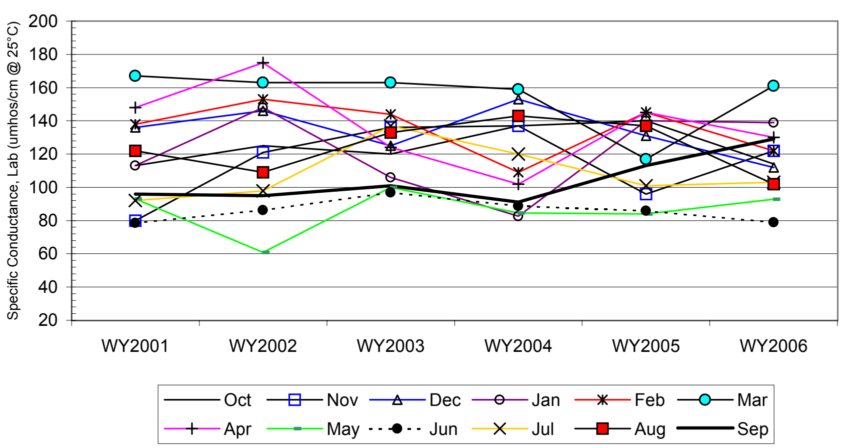
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**	113.0	80.0	136.0	113.0	138.0	167.0	148.0	93.0	78.5	92.1	122.0	96.0
b	**WY2002**	125.0	121.0	146.0	148.0	153.0	163.0	175.0	60.9	86.3	97.9	109.0	95.0
c	**WY2003**	120.0	136.0	125.0	106.0	144.0	163.0	124.0	100.0	96.9	137.0	133.0	101.0
d	**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
e	**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
f	**WY2006**	114.0	122.0	112.0	139.0	122.0	161.0	130.0	92.8	79.0	103.0	102.0	129.0
	n	6	6	6	6	6	6	6	6	6	6	6	6
	t_1	0	0	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
	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	0	-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		5	5	-5	-1	-3	-10	-5	-1	-1	5	1	7
	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
	$Z_k = S_k/\sigma_S$	0.94	0.94	-0.94	-0.19	-0.56	-1.88	-0.94	-0.19	-0.19	0.94	0.19	1.32
	Z^2_k	0.88	0.88	0.88	0.04	0.32	3.53	0.88	0.04	0.04	0.88	0.04	1.73

ΣZ_k=	-0.56
ΣZ^2_k=	10.13
Z-bar=$\Sigma Z_k/K$=	-0.05

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

Σn	72
ΣS_k	-3

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	10.10	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
	p **0.521**			$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} -0.11	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
340.00	**p** **0.457**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.70		3.00
0.050	-2.04	**-0.09**	2.00
0.100	-1.93		1.66
0.200	-1.24		1.00

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	**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
b	**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
c	**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
d	**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
e	**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
f	**WY2006**	6.8	7.3	7.7	7.5	7.4	7.4	7.7	7.7	7.2	6.9	7.0	7.0
	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	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

	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	0	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	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	-1	-5	5	3	7	-10	2	11	1	-5	-3	-13

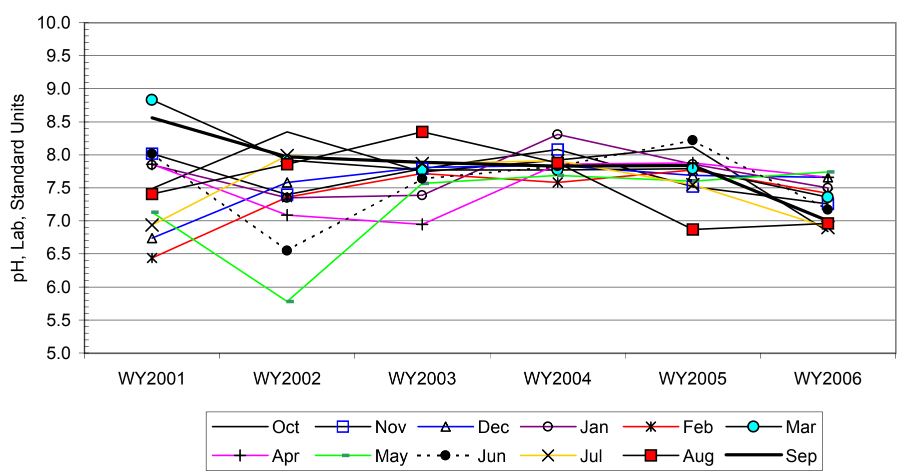
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	-0.19	-0.94	0.94	0.56	1.32	-1.88	0.38	2.07	0.19	-0.94	-0.56	-2.44
Z^2_k	0.04	0.88	0.88	0.32	1.73	3.53	0.14	4.27	0.04	0.88	0.32	5.96

ΣZ_k= -1.50
ΣZ^2_k= 18.99
Z-bar=ΣZ_k/K= -0.13

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

Σn 72
ΣS_k -8

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	18.80	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.065**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.38	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
340.00	p **0.352**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.12		0.04
0.050	-0.09	**-0.03**	0.02
0.100	-0.08		0.01
0.200	-0.06		0.01

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	**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
b	**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
c	**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
d	**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
e	**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
f	**WY2006**	43.2	43.9	38.6	47.2	42.3	53.4	44.6	37.7	30.9	40.7	41.6	46.8
	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	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	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	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	5	7	-3	1	1	-5	-1	3	1	3	1	9

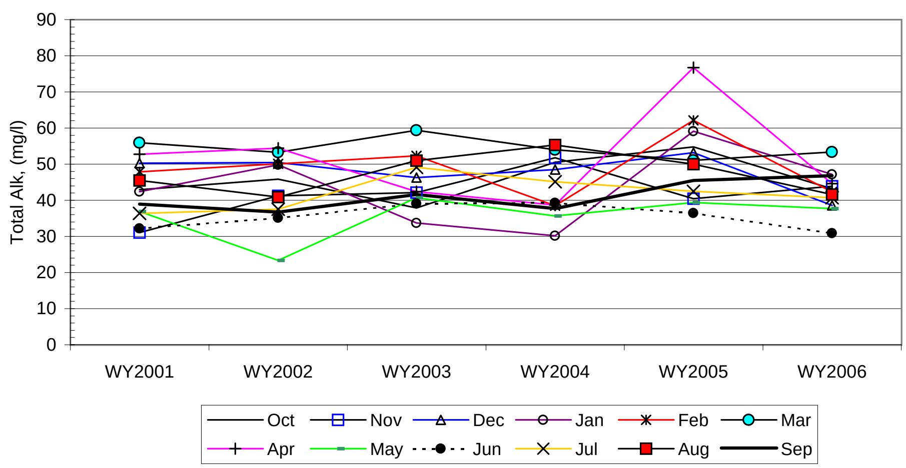
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	1.32	-0.56	0.19	0.19	-0.94	-0.19	0.56	0.19	0.56	0.19	1.69
Z^2_k	0.88	1.73	0.32	0.04	0.04	0.88	0.04	0.32	0.04	0.32	0.04	2.86

ΣZ_k= 4.13
ΣZ^2_k= 7.48
Z-bar=ΣZ_k/K= 0.34

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

Σn 72
ΣS_k 22

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	6.06	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.869**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 1.14	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
340.00	p **0.873**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.65		1.76
0.050	-0.42	**0.65**	1.53
0.100	-0.27		1.12
0.200	0.11		0.95

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	**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
b	**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
c	**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
d	**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
e	**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
f	**WY2006**	6.2	6.4	5.9	5.4	8.0	5.0	13.8	2.9	1.7	2.1	3.8	4.7
	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	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	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	-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	1	1	-5	3	-5	7	-5	-5	-11	1	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	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	0.56	-0.94	1.32	-0.94	-0.94	-2.07	0.19	0.19
Z^2_k	1.73	0.04	0.04	0.88	0.32	0.88	1.73	0.88	0.88	4.27	0.04	0.04

ΣZ_k= -1.88

ΣZ^2_k= 11.72

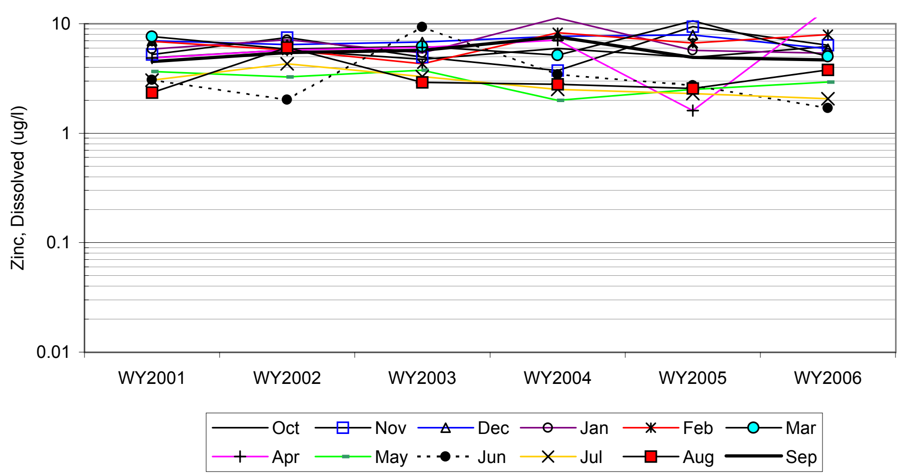
Z-bar=ΣZ_k/K= -0.16

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

Σn 72

ΣS_k -10

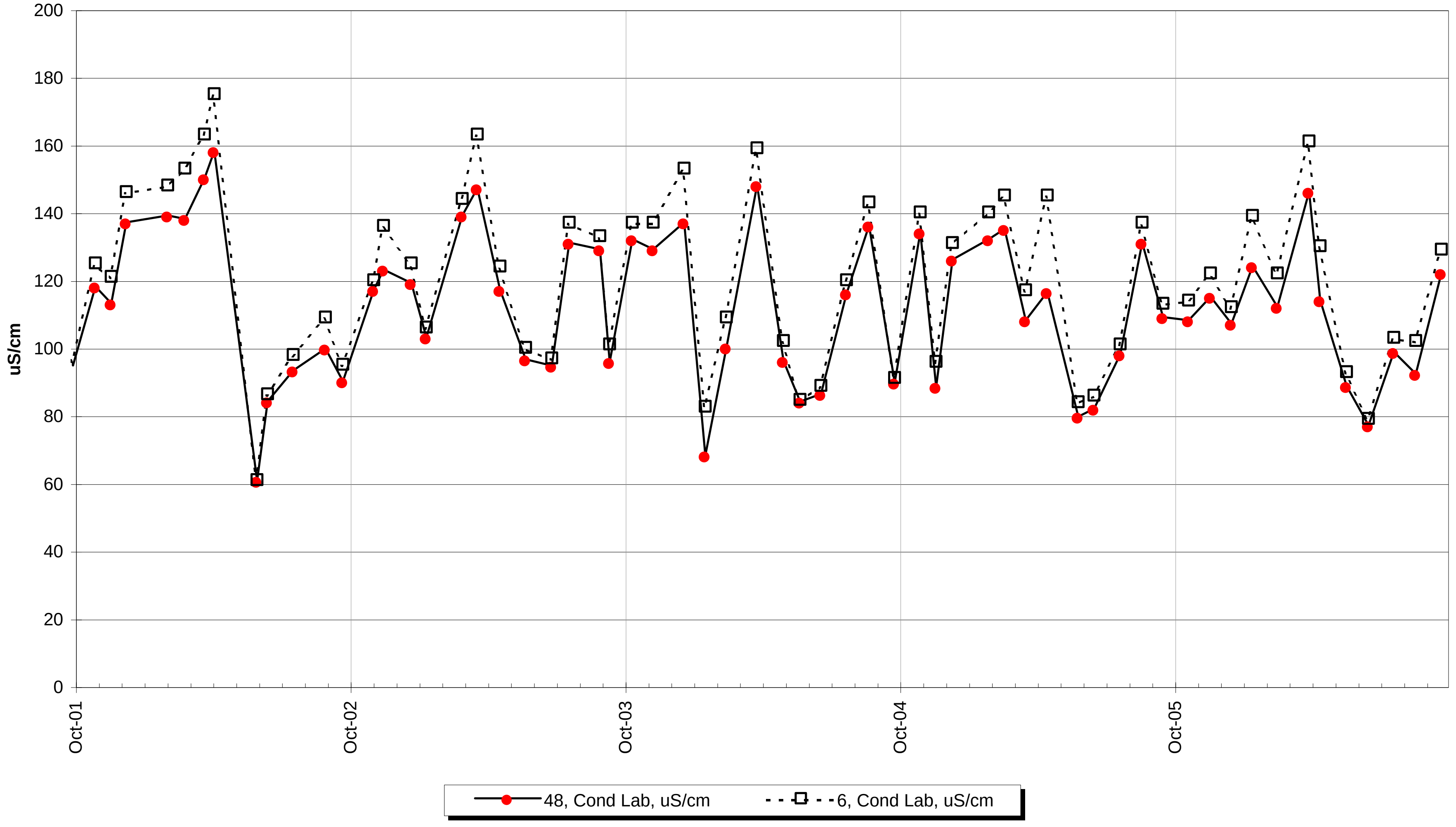
$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	11.42	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.408**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 340.00	Z_{calc} -0.49	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.313**		H_A (± trend)	REJECT



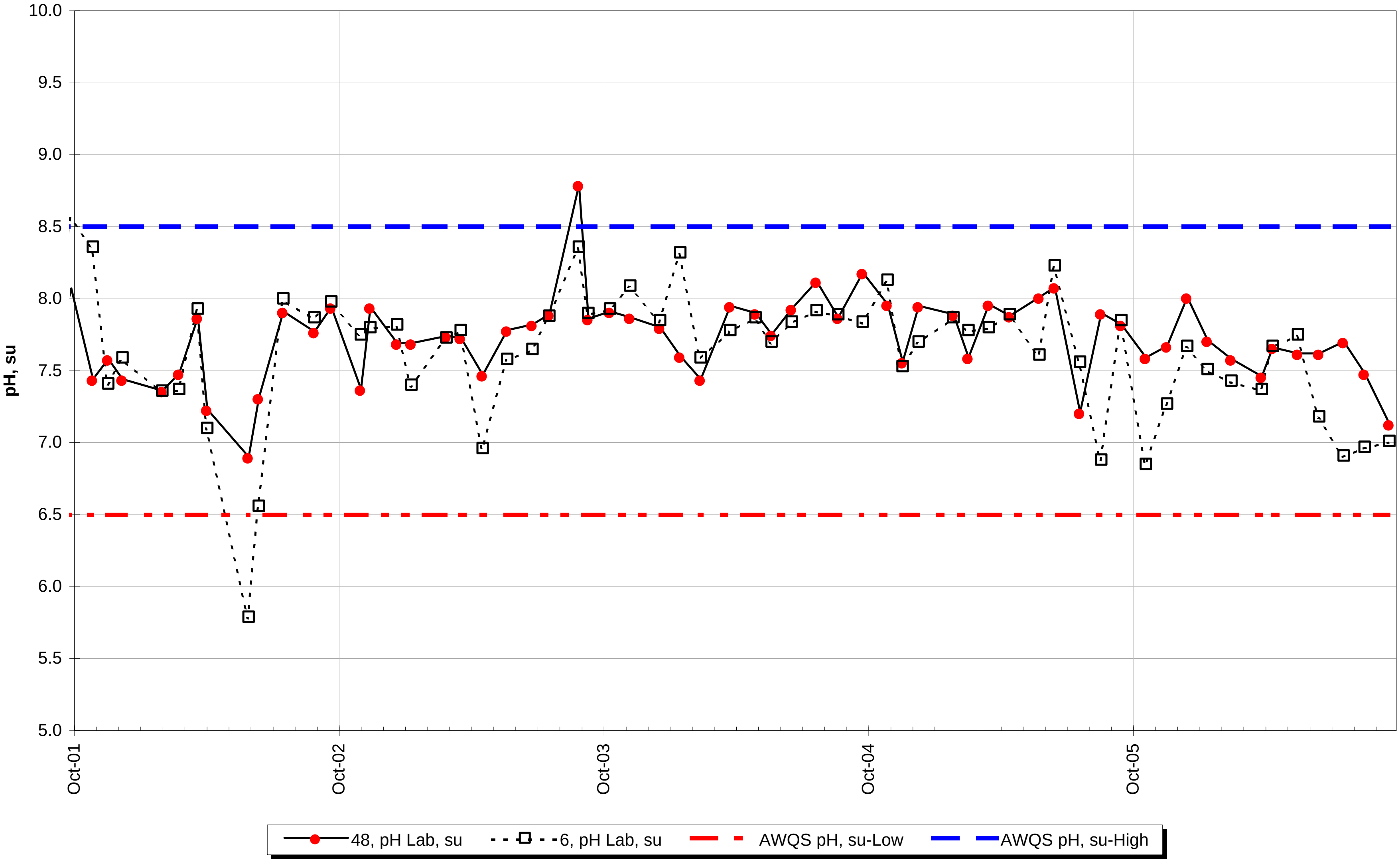
Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.23		0.23
0.050	-0.20	**-0.08**	0.12
0.100	-0.18		0.10
0.200	-0.14		0.05

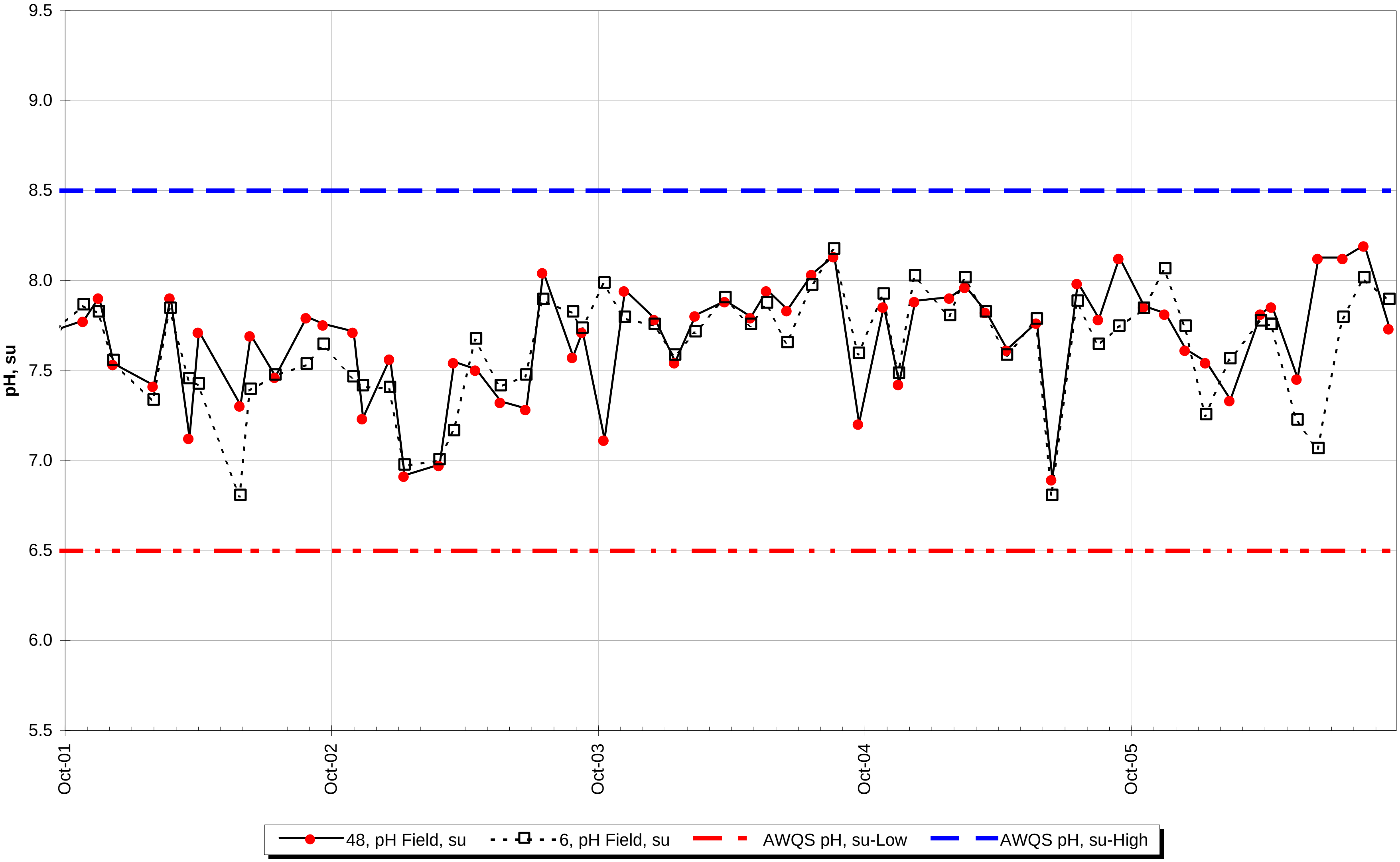
Site 48 vs Site 6 -Conductivity



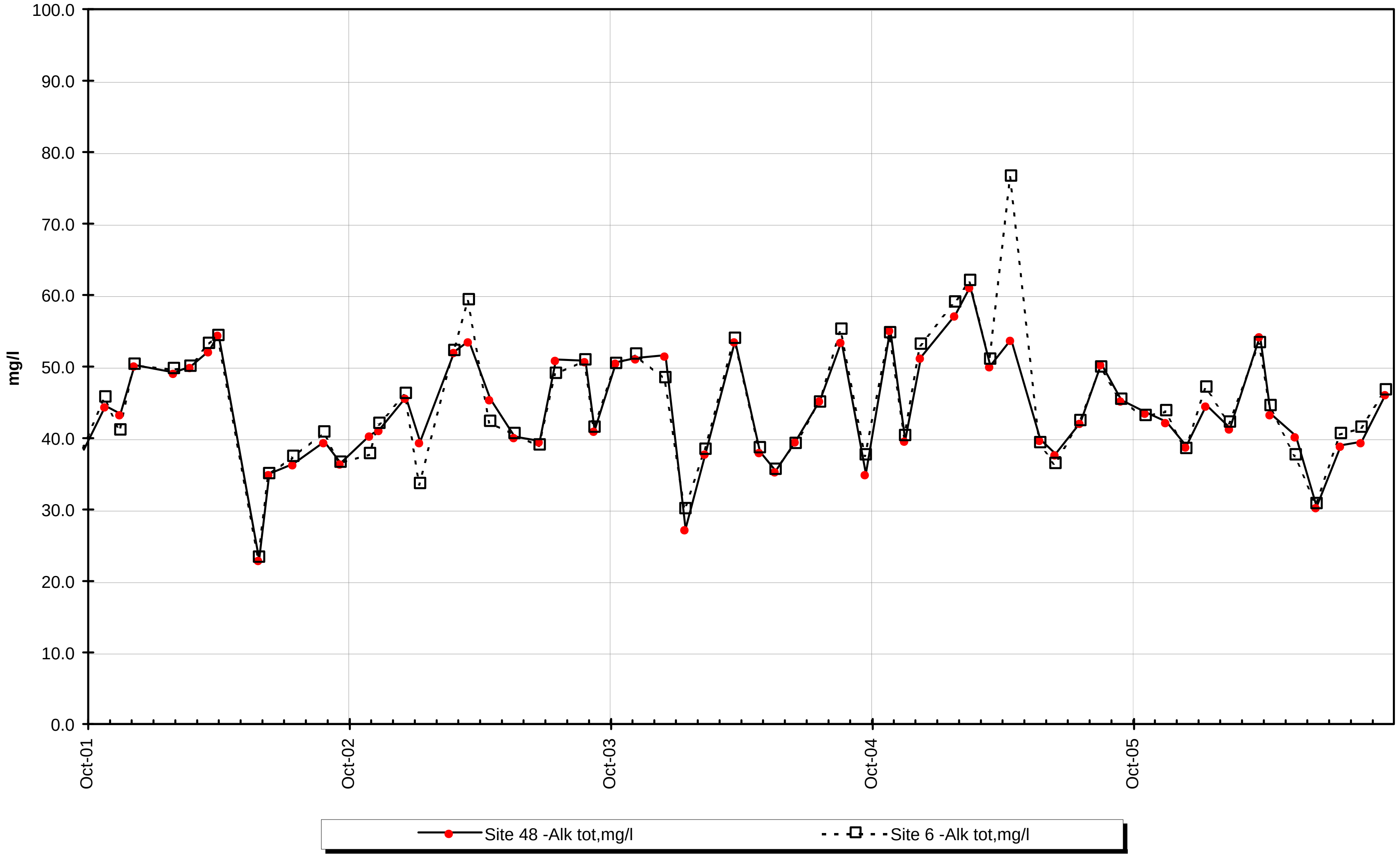
Site 48 vs. Site 6 -Lab pH

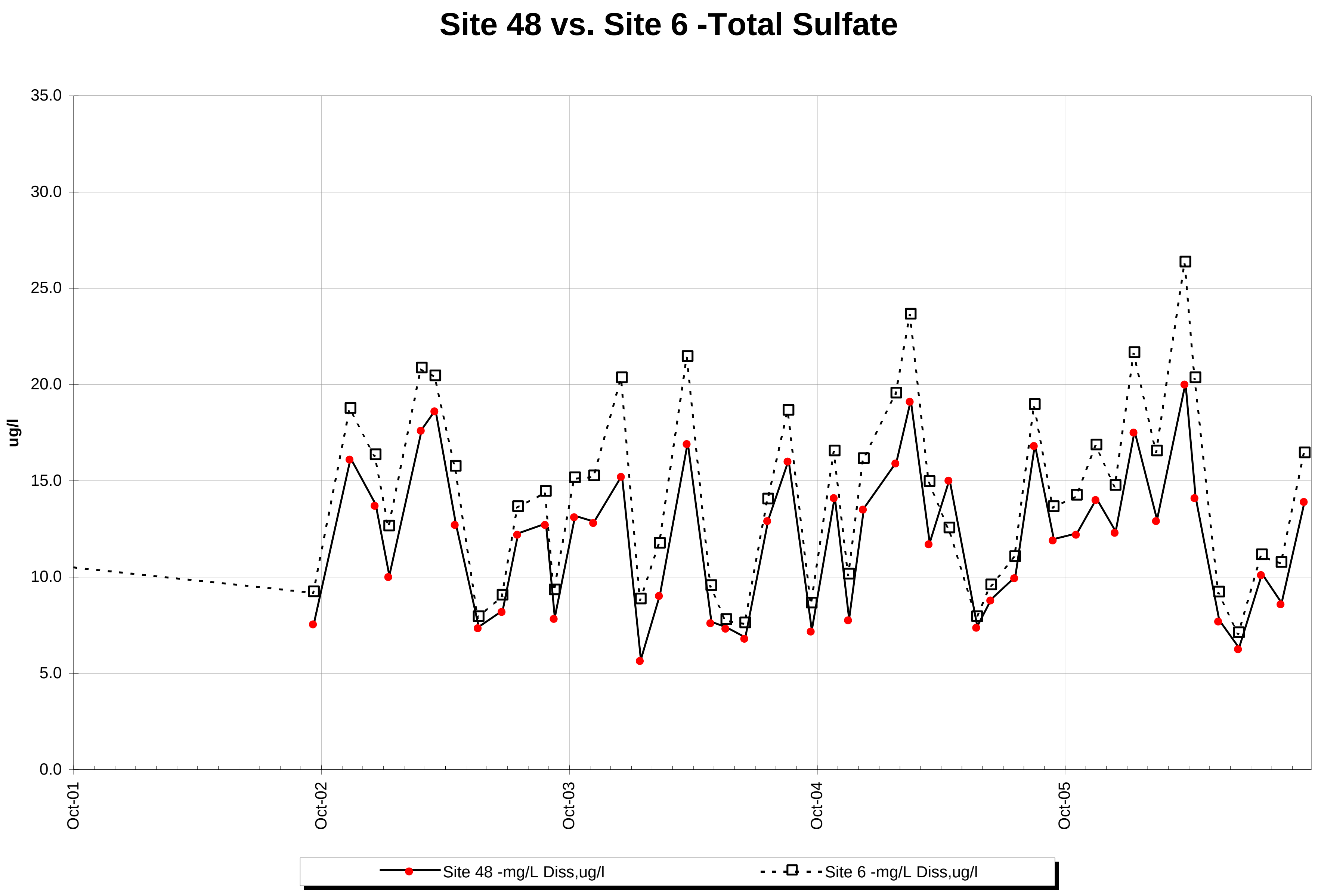


Site 48 vs. Site 6 -Field pH



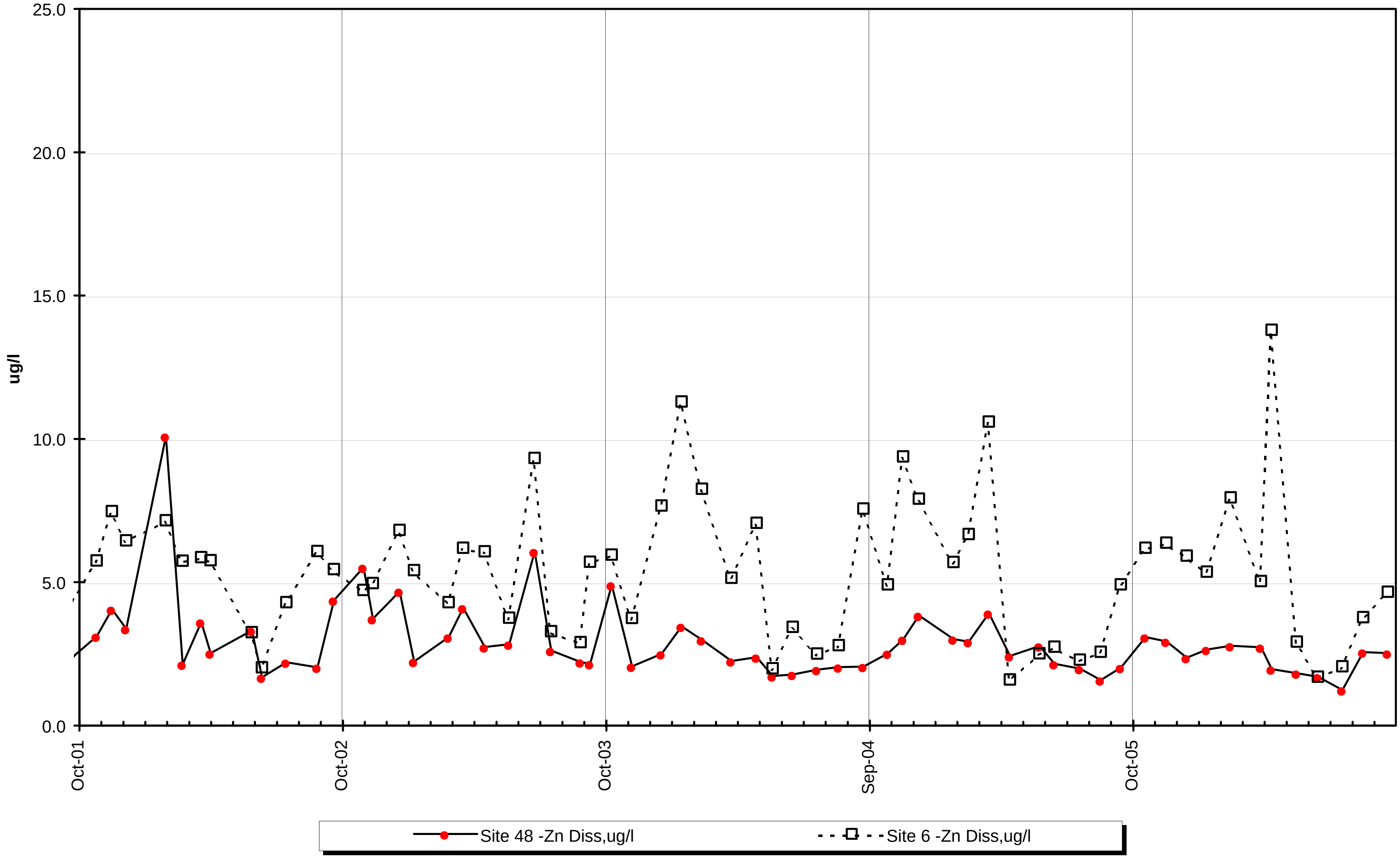
Site 48 vs. Site 6 -Total Alkalinity





Site 48 vs. Site 6 -Total Sulfate
ug/l
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 48 -mg/L Diss,ug/l
Site 6 -mg/L Diss,ug/l

Site 48 vs. Site 6 -Dissolved Zinc



Wilcoxon-signed-ranks test

Exact Form

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

	X	**Y**	Differences		
Site	#48	#6			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	108.0	114.0	-6.0	6.0	-5
Nov	115.0	122.0	-7.0	7.0	-6.5
Dec	107.0	112.0	-5.0	5.0	-4
Jan	124.0	139.0	-15.0	15.0	-10.5
Feb	112.0	122.0	-10.0	10.0	-9
Mar	146.0	161.0	-15.0	15.0	-10.5
Apr	114.0	130.0	-16.0	16.0	-12
May	88.6	92.8	-4.2	4.2	-2
Jun	77.0	79.0	-2.0	2.0	-1
Jul	98.7	103.0	-4.3	4.3	-3
Aug	92.2	102.0	-9.8	9.8	-8
Sep	122.0	129.0	-7.0	7.0	-6.5
Median	110.0	118.0	-7.0	7.0	

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	Differences		
Site	#48	#6			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	7.58	6.84	0.74	0.74	9
Nov	7.66	7.26	0.40	0.40	7
Dec		7.66			
Jan	7.70	7.50	0.20	0.20	6
Feb	7.57	7.42	0.15	0.15	5
Mar	7.45	7.36	0.09	0.09	2
Apr	7.65	7.66	-0.01	0.01	-1
May	7.61	7.74	-0.13	0.13	-4
Jun		7.17			
Jul	7.69	6.90	0.79	0.79	10
Aug	7.47	6.96	0.51	0.51	8
Sep	7.12	7.00	0.12	0.12	3
Median	7.60	7.31	0.18	0.18	

n	m
10	10

N= 10
ΣR= 45

α
95.0%
W'α,n
43

W^{+}=
50
p-test
0.993

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	Differences		
Site	#48	#6			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	43.6	43.2	0.4	0.4	2
Nov	42.3	43.9	-1.6	1.6	-8
Dec	38.9	38.6	0.3	0.3	1
Jan	44.6	47.2	-2.6	2.6	-12
Feb	41.4	42.3	-0.9	0.9	-6
Mar	54.3	53.4	0.9	0.9	5
Apr	43.4	44.6	-1.2	1.2	-7
May	40.3	37.7	2.6	2.6	11
Jun	30.4	30.9	-0.5	0.5	-3
Jul	39.0	40.7	-1.7	1.7	-9
Aug	39.5	41.6	-2.1	2.1	-10
Sep	46.2	46.8	-0.6	0.6	-4
Median	41.9	42.8	-0.8	1.1	

n	**m**
12	12

N= 12

ΣR= -40

α
95.0%
W'α,n
59

W^+=
19
p-test
6.47%

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	#48	#6			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	12.2	14.2	-2.0	2.0	-4
Nov	14.0	16.8	-2.8	2.8	-8
Dec	12.3	14.7	-2.4	2.4	-6
Jan	17.5	21.6	-4.1	4.1	-10
Feb	12.9	16.5	-3.6	3.6	-9
Mar	20.0	26.3	-6.3	6.3	-12
Apr	14.1	20.3	-6.2	6.2	-11
May	7.7	9.2	-1.5	1.5	-3
Jun	6.3	7.1	-0.8	0.8	-1
Jul	10.1	11.1	-1.0	1.0	-2
Aug	8.6	10.7	-2.1	2.1	-5
Sep	13.9	16.4	-2.5	2.5	-7
Median	12.6	15.6	-2.5	2.5	

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

	X	**Y**	Differences		
Site	#48	#6			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	3.09	6.20	-3.11	3.11	-7
Nov	2.94	6.38	-3.44	3.44	-8
Dec	2.37	5.93	-3.56	3.56	-9
Jan	2.65	5.37	-2.72	2.72	-6
Feb	2.79	7.96	-5.17	5.17	-10
Mar	2.73	5.04	-2.31	2.31	-5
Apr	1.97	13.80	-11.83	11.83	-11
May	1.83	2.93	-1.10	1.10	-2
Jun	1.70	1.70	0.00		
Jul	1.24	2.07	-0.83	0.83	-1
Aug	2.56	3.78	-1.22	1.22	-3
Sep	2.53	4.67	-2.14	2.14	-4
Median	2.55	5.21	-2.52	2.72	

n	**m**
12	11

N= 11

$\Sigma R=$ -66

α
5.0%
W'α,n
13

$W^{+}=$
0
p-test
0.05%

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

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 2006" report. The table includes all the required FWMP analyte 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 years are included in the data analyses with the exception of one outlier shown on the table below. During the current year one new data point was flagged as an outliers after review by KGCMC. The outlier flag is due to exceedance of parameter holding time. Additionally, when compared with the corresponding field pH the value, there was greater than 0.1 su difference.

Sample Date	Parameter	Value	Qualifier	Notes
12/5/2001	Cond Field, uS/cm	45.7	RR	Suspected field instrument malfunction
12/14/2006	pH Lab, su	8.23	RR	Holding time exceeded, field-lab not comparable

The data for Water Year 2006 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-05 though Sept-06.				

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 whose 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 2006 data set. Total alkalinity and dissolved zinc are the only constituents tested that do not have a statistically significant difference between the measured median values

Site 54 vs Site 6 - WY2006, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site 6 median	Site 54 median	Median of Differences
Conductivity, Lab	**0.03**	**118**	**121**	**-2.5**
pH, Lab	**1.00**	**7.31**	**7.07**	**0.14**
Alkalinity, Total	<0.01	42.8	44.3	-1.2
Sulfate, Total	**0.01**	**15.6**	**15.7**	**-0.3**
Zinc, Dissolved	0.97	5.21	4.47	0.27

at a significance level of $\alpha=0.05$ for a one-tailed test. The median values for conductivity for Site 6 and Site 54 are 118 µS/cm and 121 µS/cm respectively and the median of the differences, Site 6 minus Site 54, is -2.5 µS/cm. Datasets from WY2002 – WY2005 yield similar significant results with similar magnitudes. The median values for pH for Site 6 and Site 54 are 7.31 su and 7.10 su respectively and the median of differences, Site 6 minus Site 54, is 0.11 su Site 54 has intermittently shown significantly lower pH reading for the prior five water years (WY2001 and WY 2004). This may in part be due to inflow of Bruin Creek which typically has slightly lower pHs than Greens Creek. The median values for alkalinity are 42.8 mg/l and 44The median values for total sulfate for Site 6 and Site 54 are 15.6 mg/l and 15.7 mg/l respectively. The median of the differences, Site 6 minus Site 54, is -0.3 mg/l total sulfate. Once again, similar results are obtained using the signed-rank test on the WY2003 - WY2005 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.

Table of Results for Water Year 2006

Site 54 "Lower Greens Creek"

Sample Date/Parameter	10/18/2005	11/16/2005	12/14/2005	1/11/2006	2/13/2006	3/27/2006	4/11/2006	5/16/2006	6/14/2006	7/18/2006	8/16/2006	9/19/2006	**Median**
Water Temp (°C)	4.5	2.0	2.5	1.1	1.4	1.2	1.9	3.0	5.2	8.2	8.6	7.4	2.8
Conductivity-Field(µmho)	119	107	100	123	132	159	143	73	83	96	97	143	113
Conductivity-Lab (µmho)	115	126	115	134	127	164	131	97	79	102	106	131	121
pH Lab (standard units)	6.77 J	7.05	8.23 R	7.33 J	7.40	7.36	7.36 J	7.07	7.13 J	6.70	6.82	7.04 J	7.10
pH Field (standard units)	8.04	7.79	7.41	7.38	7.55	8.14	7.70	7.73	7.03	7.76	7.73	7.88	7.73
Total Alkalinity (mg/L)	44.4	44.3	39.7	46.4	43.7	53.3	46.2	41.3	31.0	40.7	44.2	48.5	44.3
Total Sulfate (mg/L)	14.3	17.4 J	15.0	21.3	17.0	26.5	20.9	9.8	6.9	11.4	10.8	16.4	15.7
Hardness (mg/L)	59.2	67.4	55.0	65.5	61.5	80.5	70.2	52.2	40.0	53.5	55.8	69.1	60.4
Dissolved As (ug/L)	0.231	0.186	0.207	0.127	0.290	0.035 J	0.234	0.158	0.198	0.208	0.216	0.231	0.208
Dissolved Ba (ug/L)			15.9		24.5								20.2
Dissolved Cd (ug/L)	0.050	0.057	0.037	0.049 U	0.055	0.042	0.069	0.032	0.024 U	0.028	0.048	0.048	0.048
Dissolved Cr (ug/L)			0.129 J		0.725 U								0.427
Dissolved Cu (ug/L)	0.458	0.447	0.620 U	0.434 U	0.837	0.313 U	0.719	0.590	0.250 U	0.308	0.507	0.398	0.453
Dissolved Pb (ug/L)	0.0716 U	0.0810	0.0307 U	0.0264 U	0.1320	0.0290	0.0301	0.0136 U	0.0064 U	0.0092 U	0.5840	0.0278	0.0296
Dissolved Ni (ug/L)			0.555 U		0.352								0.454
Dissolved Ag (ug/L)			<0.002		<0.002								0.001
Dissolved Zn (ug/L)	5.58 U	6.23	4.67 U	5.40	6.79 U	4.22 U	11.00	3.18 U	1.81 U	2.05	4.14 J	4.27	4.47
Dissolved Se (ug/L)			1.190		0.210 J								0.700
Dissolved Hg (ug/L)	0.001050 U	0.000901 U	0.001150 U	0.000826 U	0.001540 U	0.000732 U	0.001190 U	0.001160 U	0.000777 U	0.000851	0.001160 U	0.000770 U	0.000976

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
54	01/11/2006	1:10:00 PM				
			pH Lab, su	7.33	J	Hold Time Violation
			Cd Diss, ug/l	0.0485	U	Field Blank Contamination
			Cu Diss, ug/l	0.434	U	Field Blank Contamination
			Pb Diss, ug/l	0.0264	U	Field Blank Contamination
			Hg Diss, ug/l	0.000826	U	Field Blank Contamination
54	10/18/2005	11:04:00 AM				
			pH Lab, su	6.77	J	Hold Time Violation
			Pb Diss, ug/l	0.0716	U	Field Blank Contamination
			Zn Diss, ug/l	5.58	U	Field Blank Contamination
			Hg Diss, ug/l	0.00105	U	Field Blank Contamination
54	11/16/2005	10:10:00 AM				
			SO4 Tot, mg/l	17.4	J	Receipt Temperature
			Hg Diss, ug/l	0.000901	U	Field Blank Contamination
54	12/14/2005	11:31:00 AM				
			pH Lab, su	8.23	R	Hold Time Violation
			Cr Diss, ug/l	0.129	J	Below Quantitative Range, D
			Cu Diss, ug/l	0.62	U	Field Blank Contamination
			Pb Diss, ug/l	0.0307	U	Field Blank Contamination
			Ni Diss, ug/l	0.555	U	Field Blank Contamination
			Zn Diss, ug/l	4.67	U	Field Blank Contamination
			Hg Diss, ug/l	0.00115	U	Field Blank Contamination
54	02/13/2006	12:36:00 PM				
			Cr Diss, ug/l	0.725	U	Field Blank Contamination
			Zn Diss, ug/l	6.79	U	Field Blank Contamination
			Se Diss, ug/l	0.21	J	Below Quantitative Range
			Hg Diss, ug/l	0.00154	U	Field Blank Contamination
54	03/27/2006	11:30:00 AM				
			As Diss, ug/l	0.0345	J	Below Quantitative Range
			Cu Diss, ug/l	0.313	U	Field Blank Contamination
			Zn Diss, ug/l	4.22	U	Field Blank Contamination
			Hg Diss, ug/l	0.000732	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

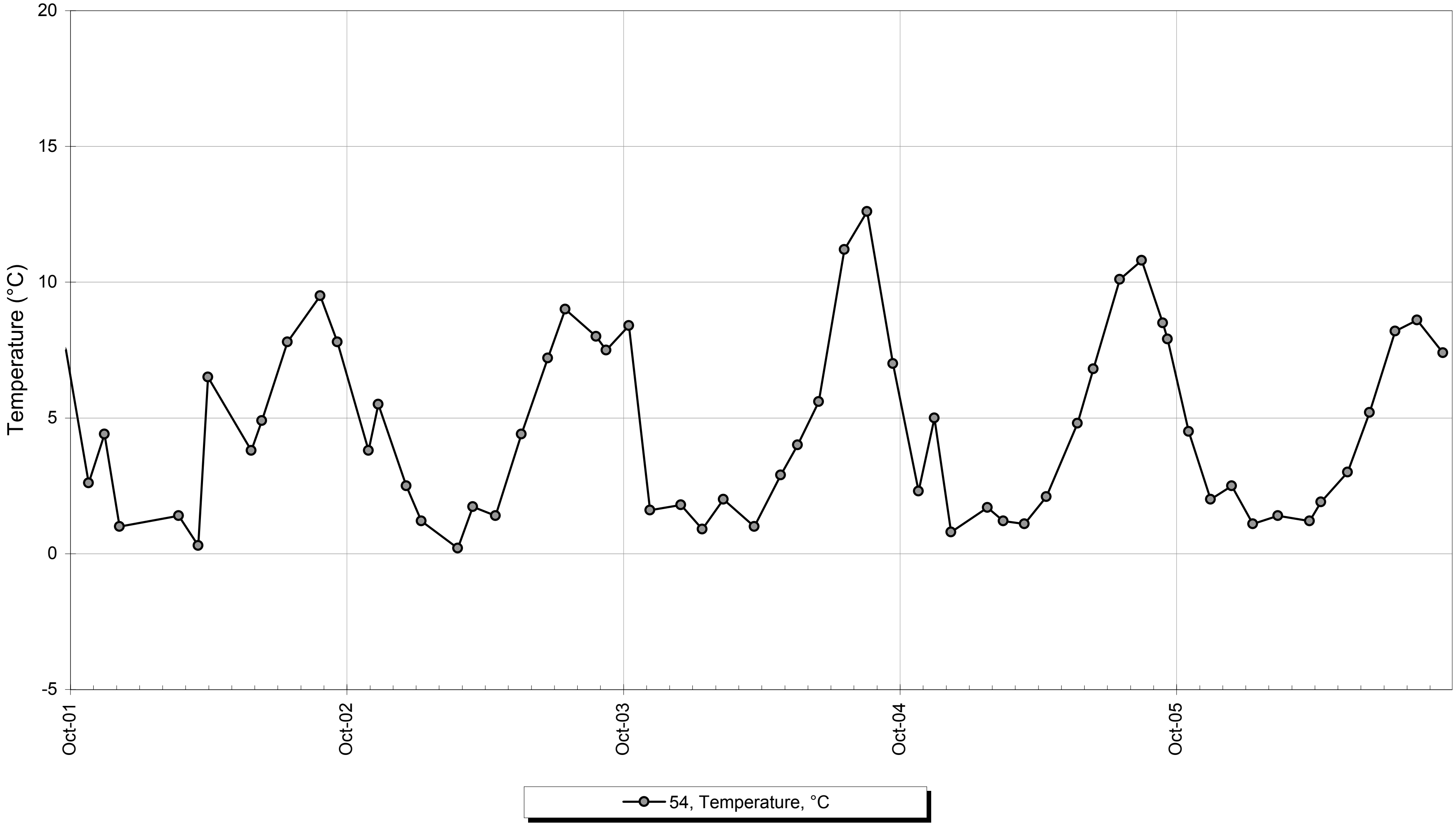
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

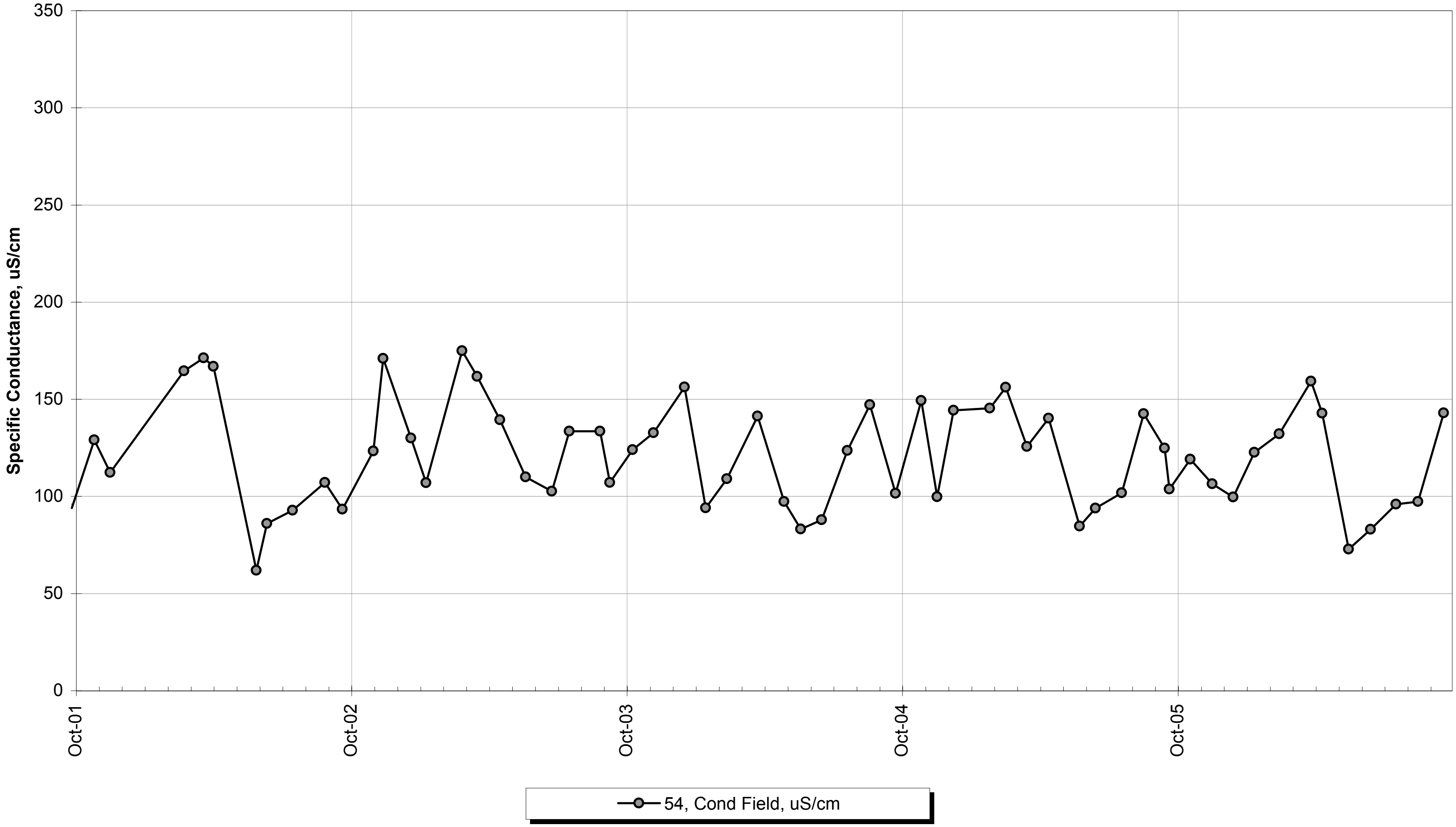
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
54	04/11/2006	11:48:00 AM				
			pH Lab, su	7.36	J	Outside Hold Time
			Hg Diss, ug/l	0.00119	U	Field Blank Contamination
54	05/16/2006	10:18:00 AM				
			Pb Diss, ug/l	0.0136	U	Field Blank Contamination
			Zn Diss, ug/l	3.18	U	Field Blank Contamination
			Hg Diss, ug/l	0.00116	U	Field Blank Contamination
54	06/14/2006	7:30:00 AM				
			pH Lab, su	7.13	J	Hold Time Violation
			Cd Diss, ug/l	0.024	U	Field Blank Contamination
			Cu Diss, ug/l	0.25	U	Field Blank Contamination
			Pb Diss, ug/l	0.00636	U	Field Blank Contamination
			Zn Diss, ug/l	1.81	U	Field Blank Contamination
			Hg Diss, ug/l	0.000777	U	Field Blank Contamination
54	07/18/2006	9:35:00 AM				
			Pb Diss, ug/l	0.00924	U	Field Blank Contamination
54	08/16/2006	12:20:00 PM				
			Zn Diss, ug/l	4.14	J	LCS Recovery
			Hg Diss, ug/l	0.00116	U	Field Blank Contamination
54	09/19/2006	12:49:00 PM				
			pH Lab, su	7.04	J	Hold Time Violation
			Hg Diss, ug/l	0.00077	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

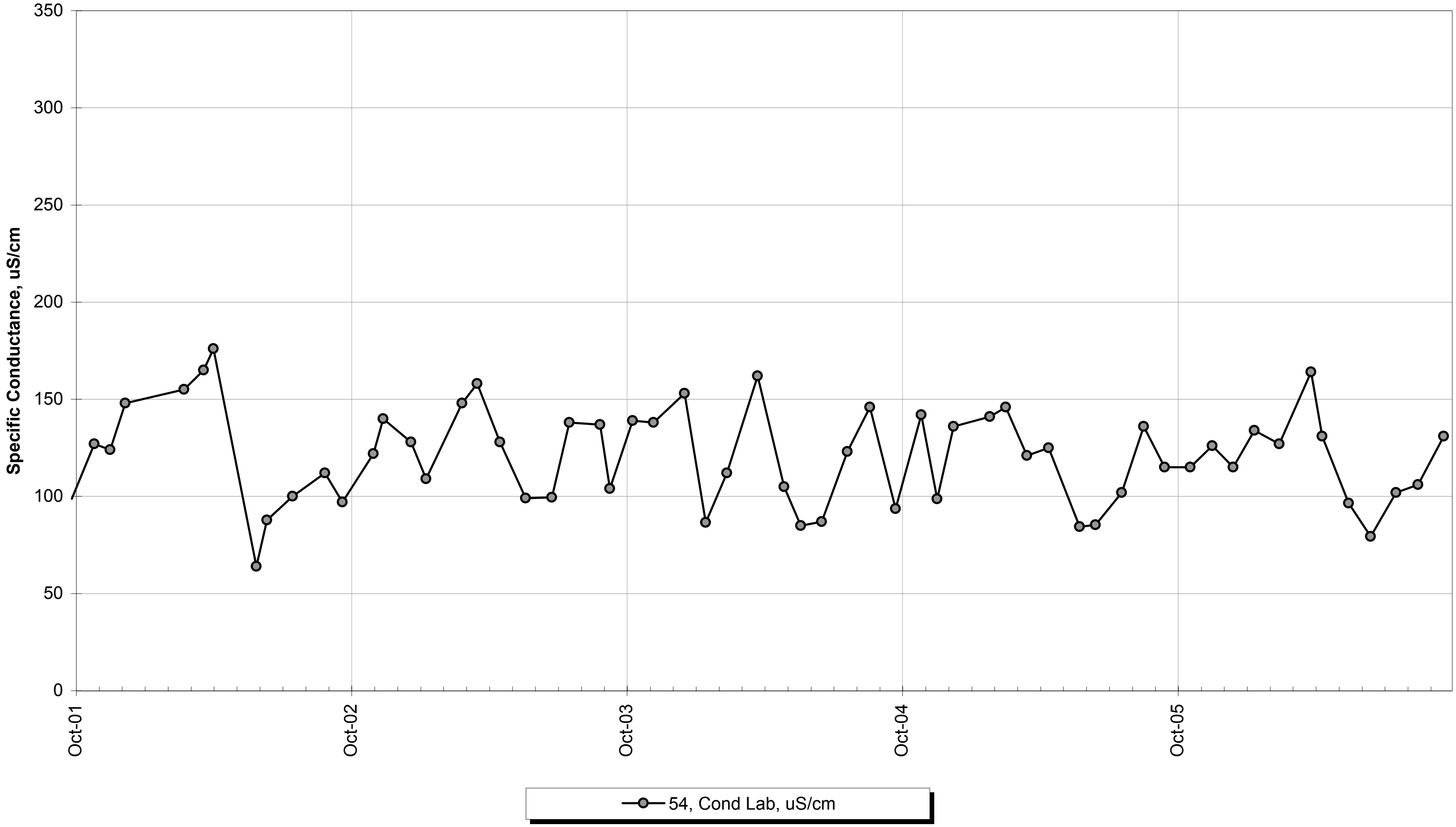
Site 54 -Water Temperature

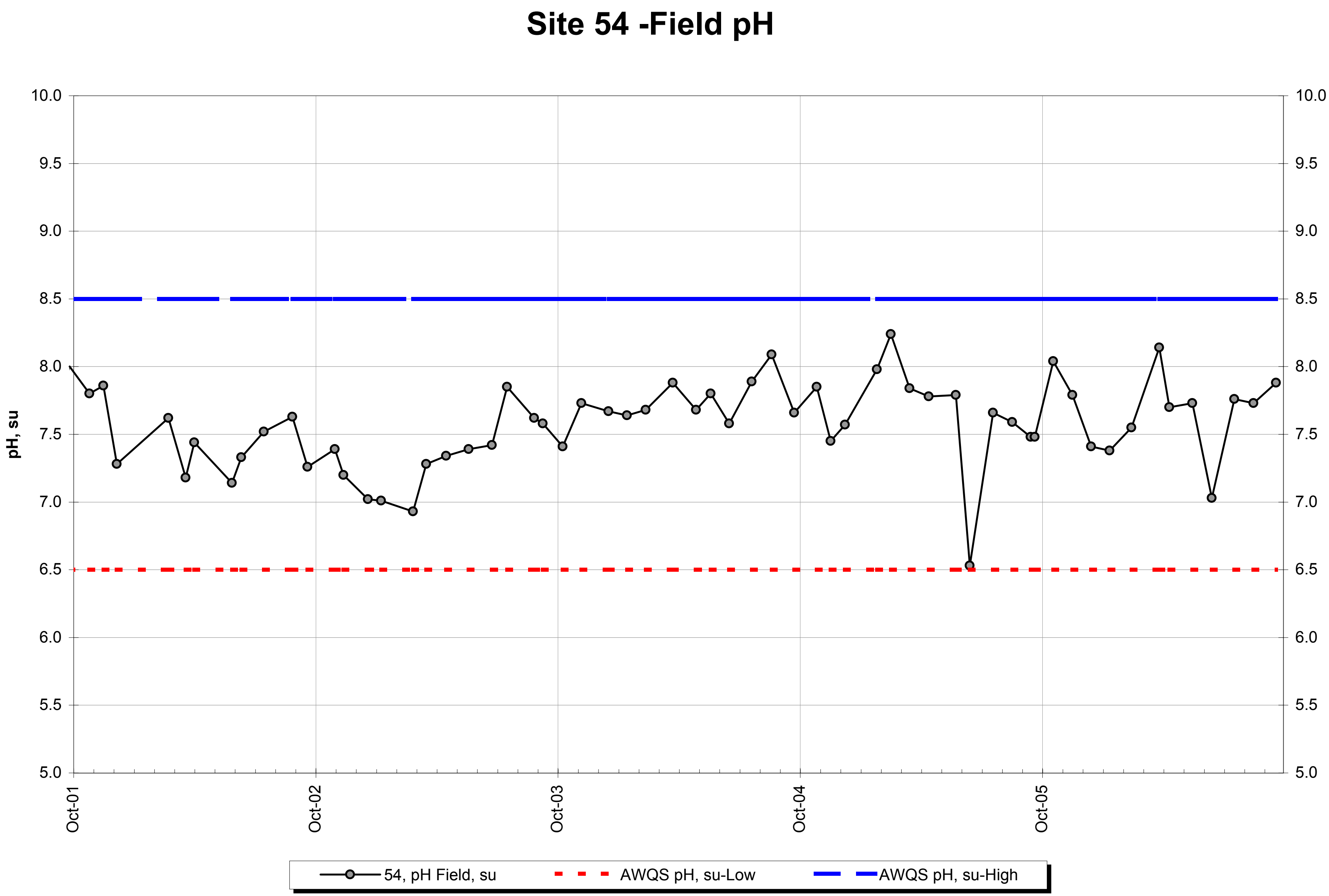


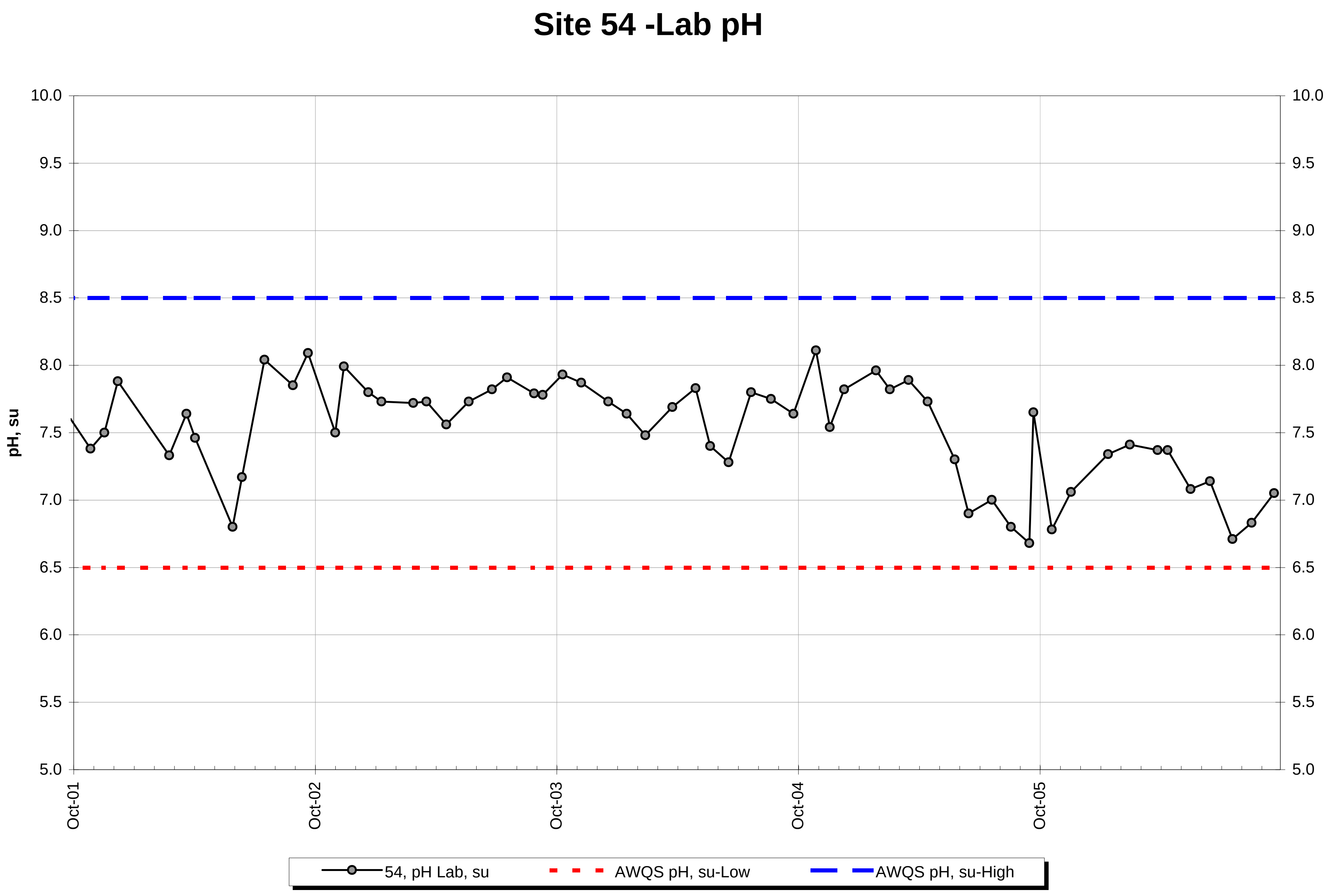
Site 54 -Conductivity-Field



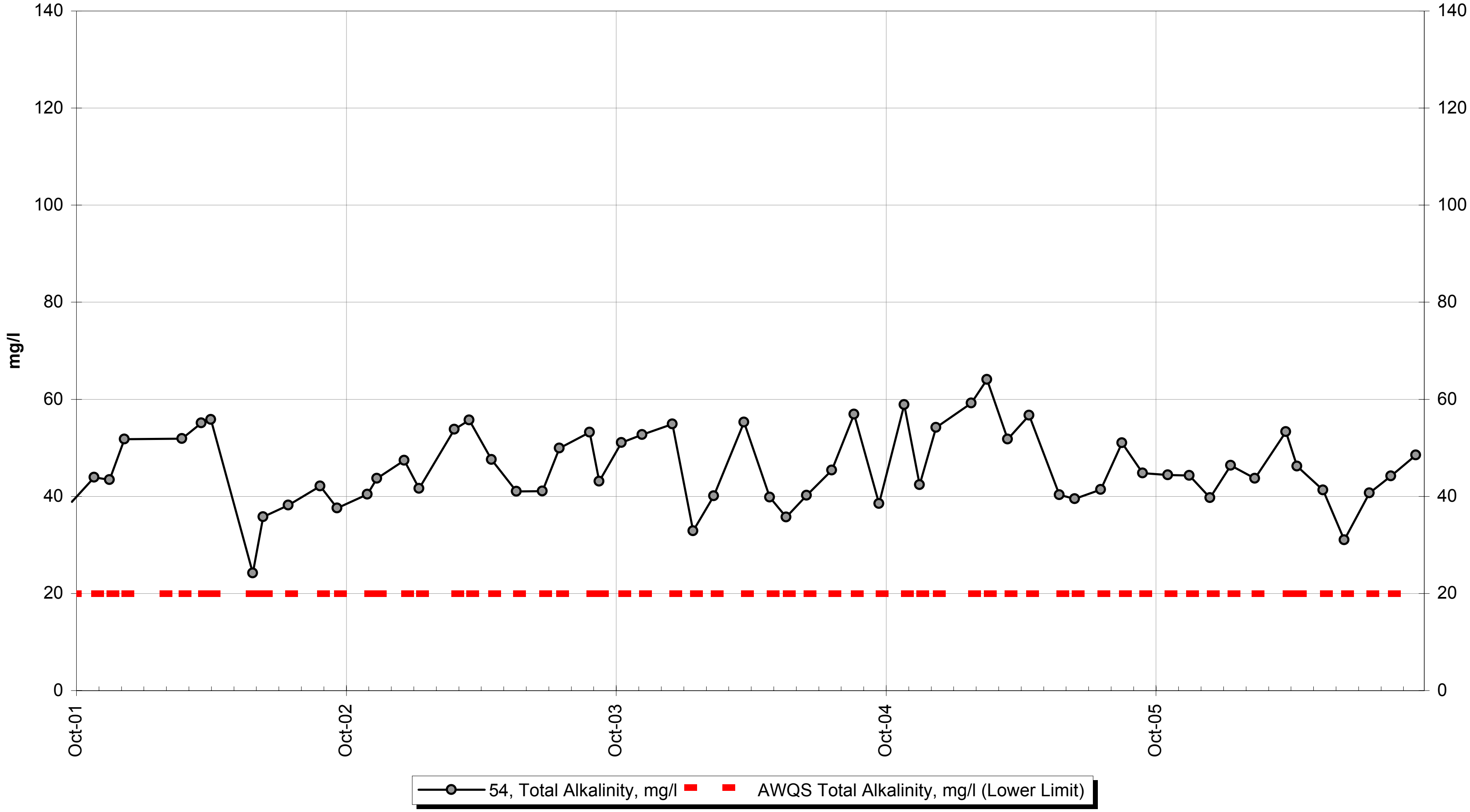
Site 54 -Conductivity-Lab



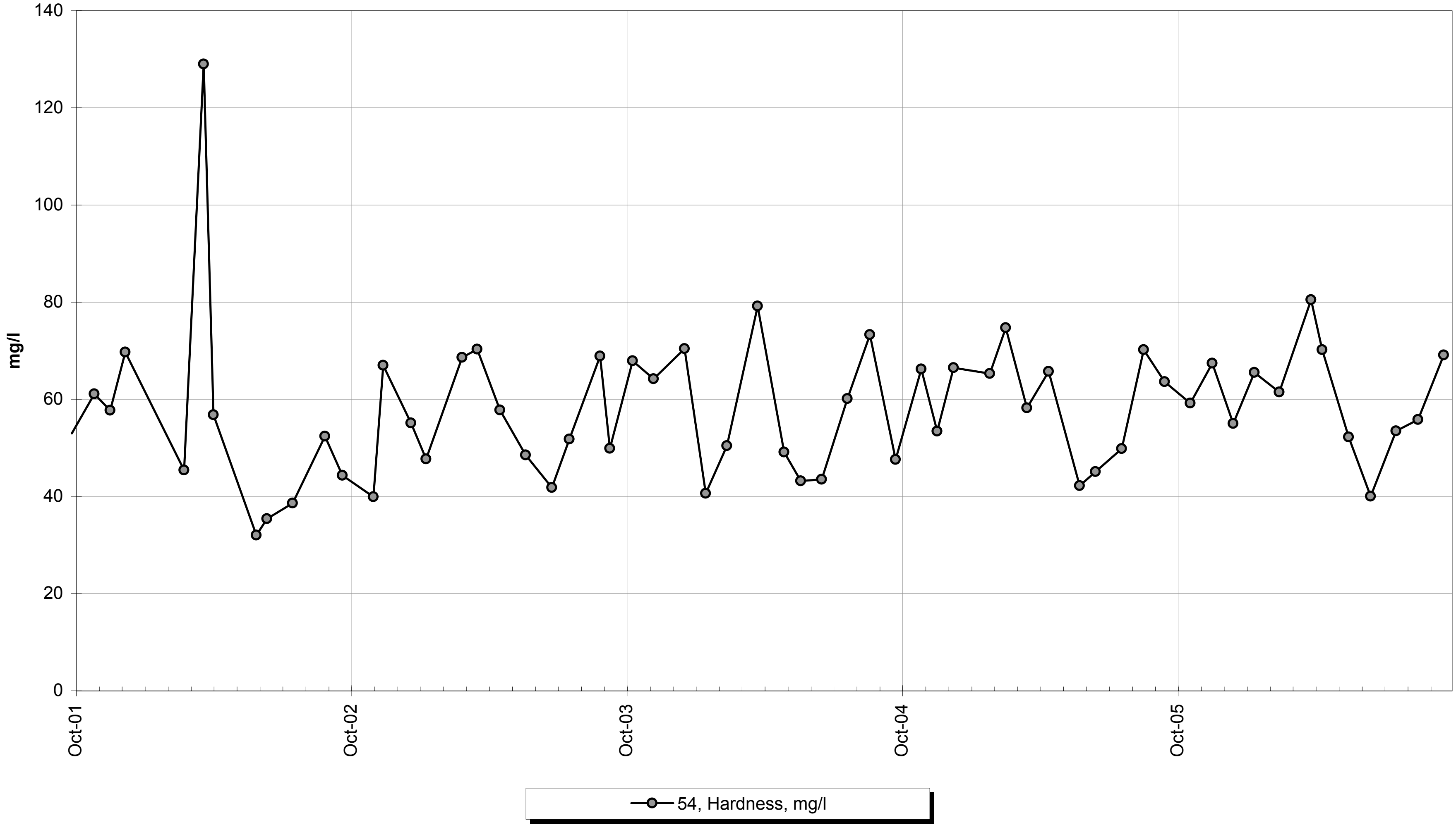

Site 54 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
54, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High


Site 54 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
54, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

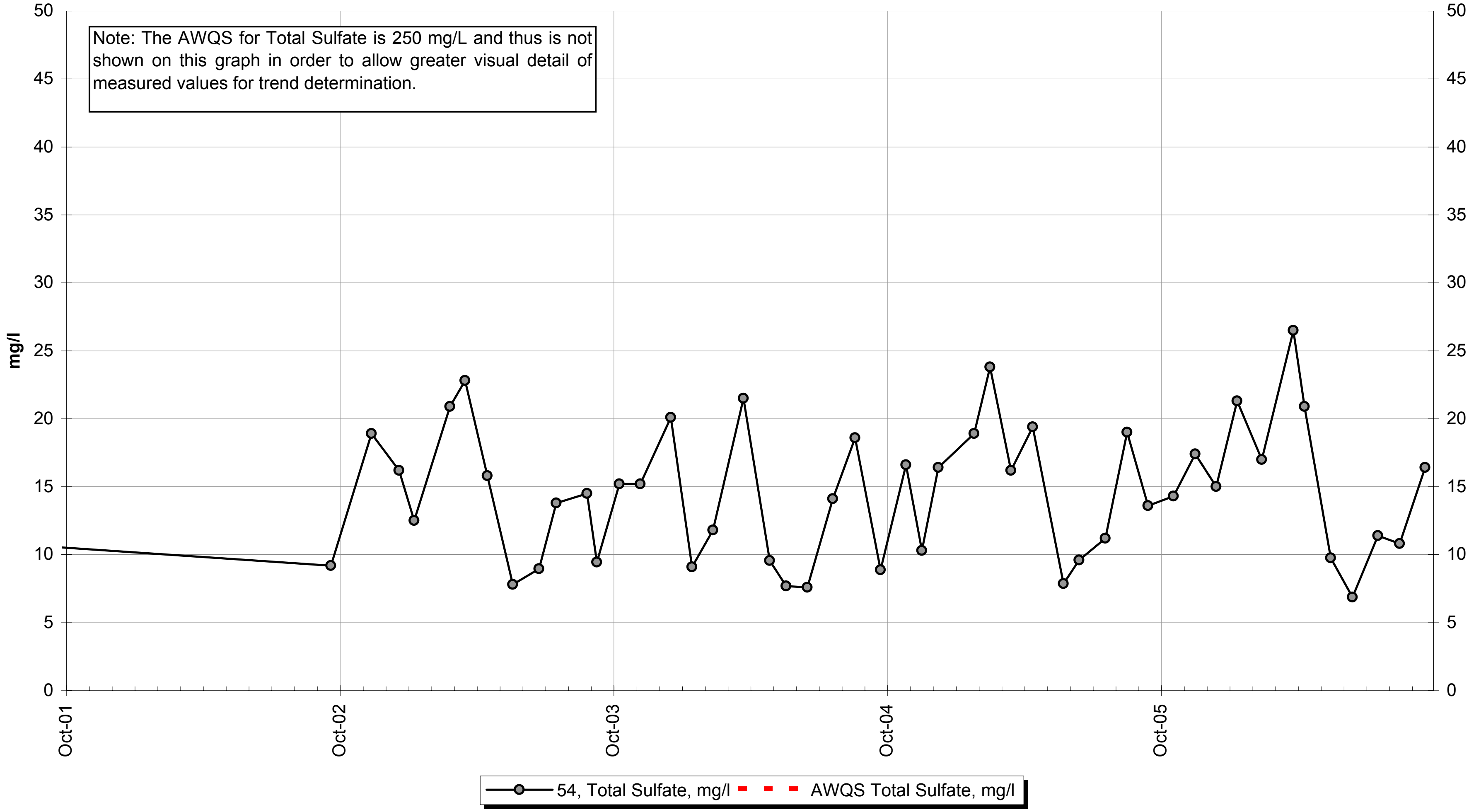
Site 54 -Total Alkalinity

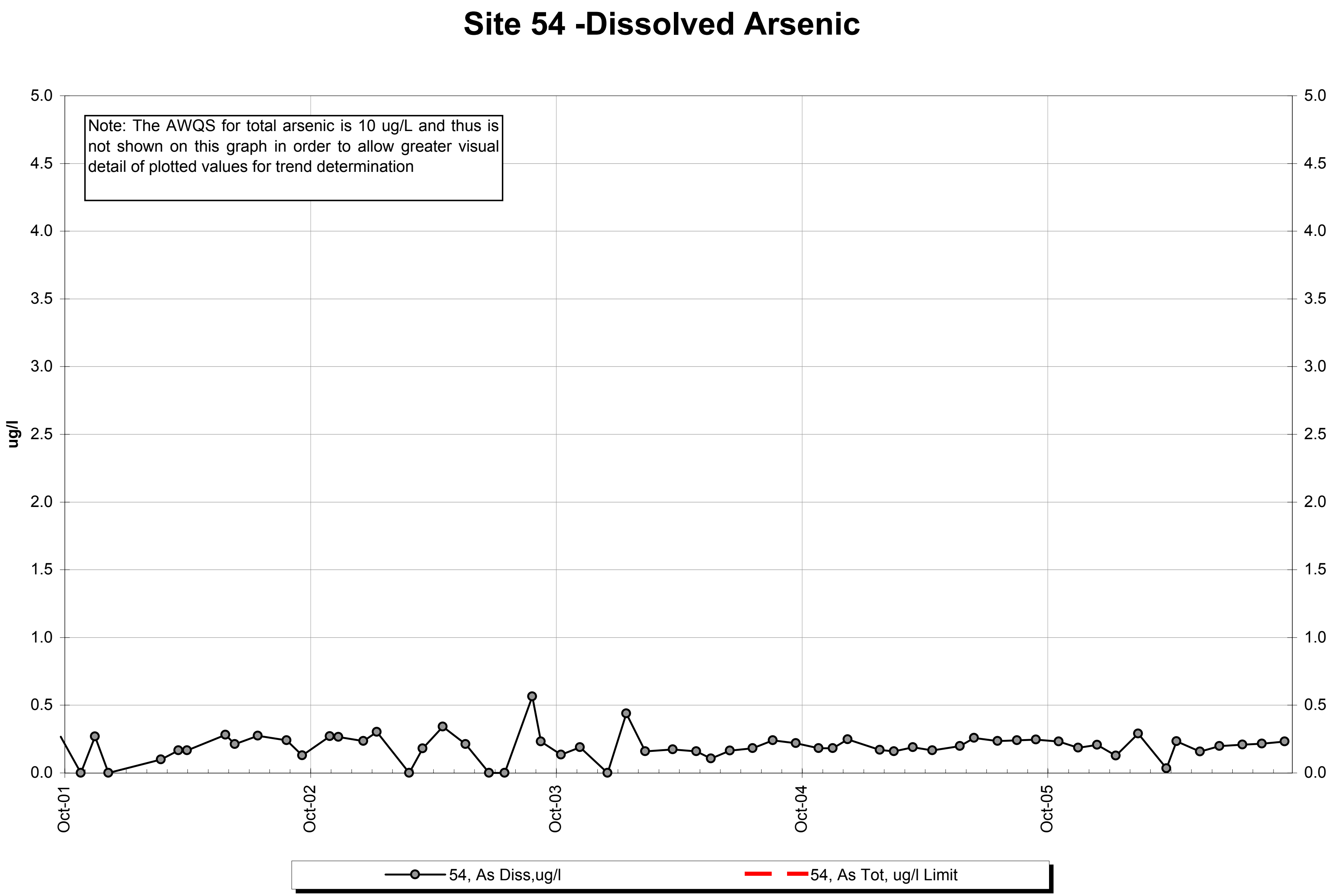


Site 54 -Hardness



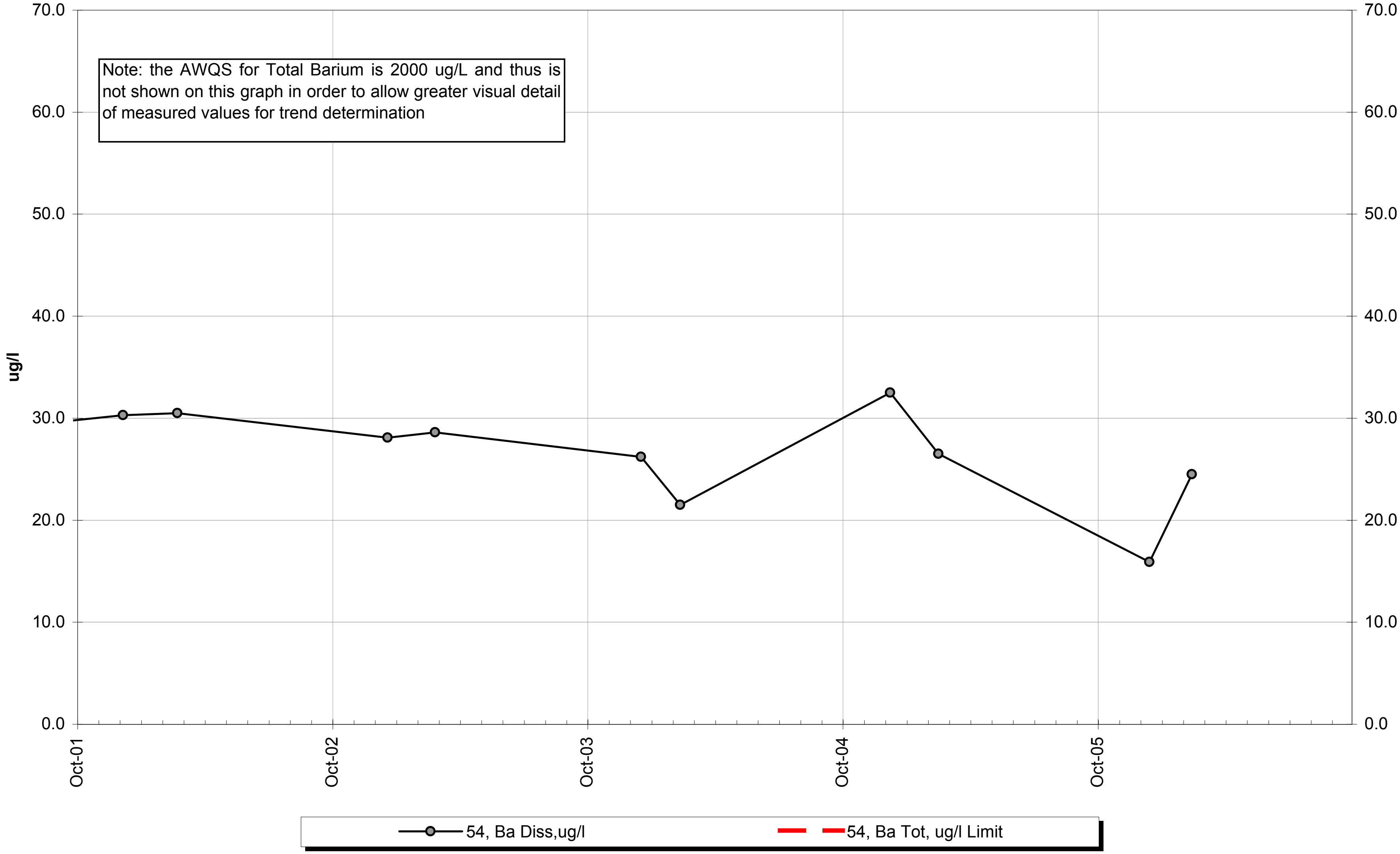
Site 54 -Total Sulfate



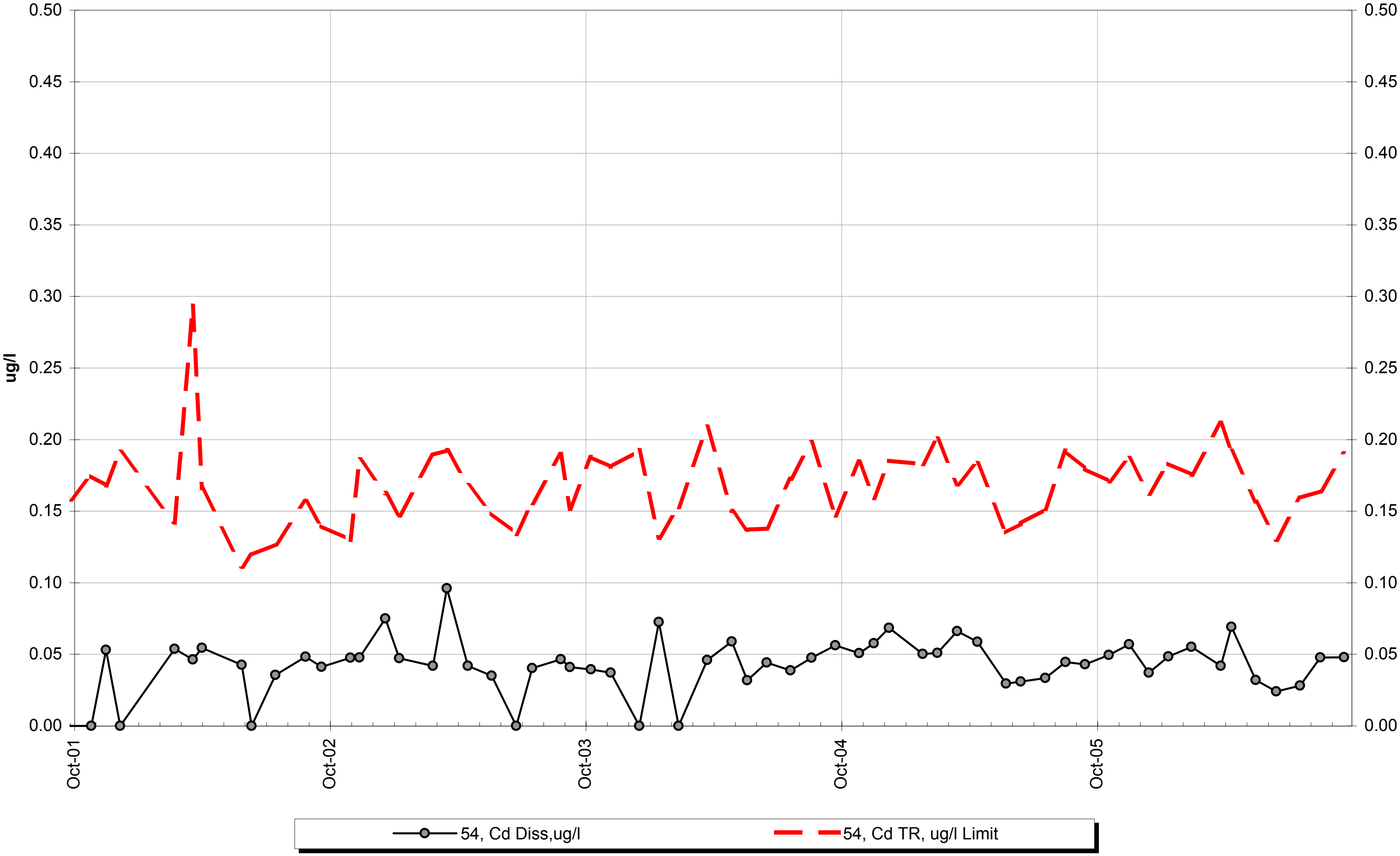


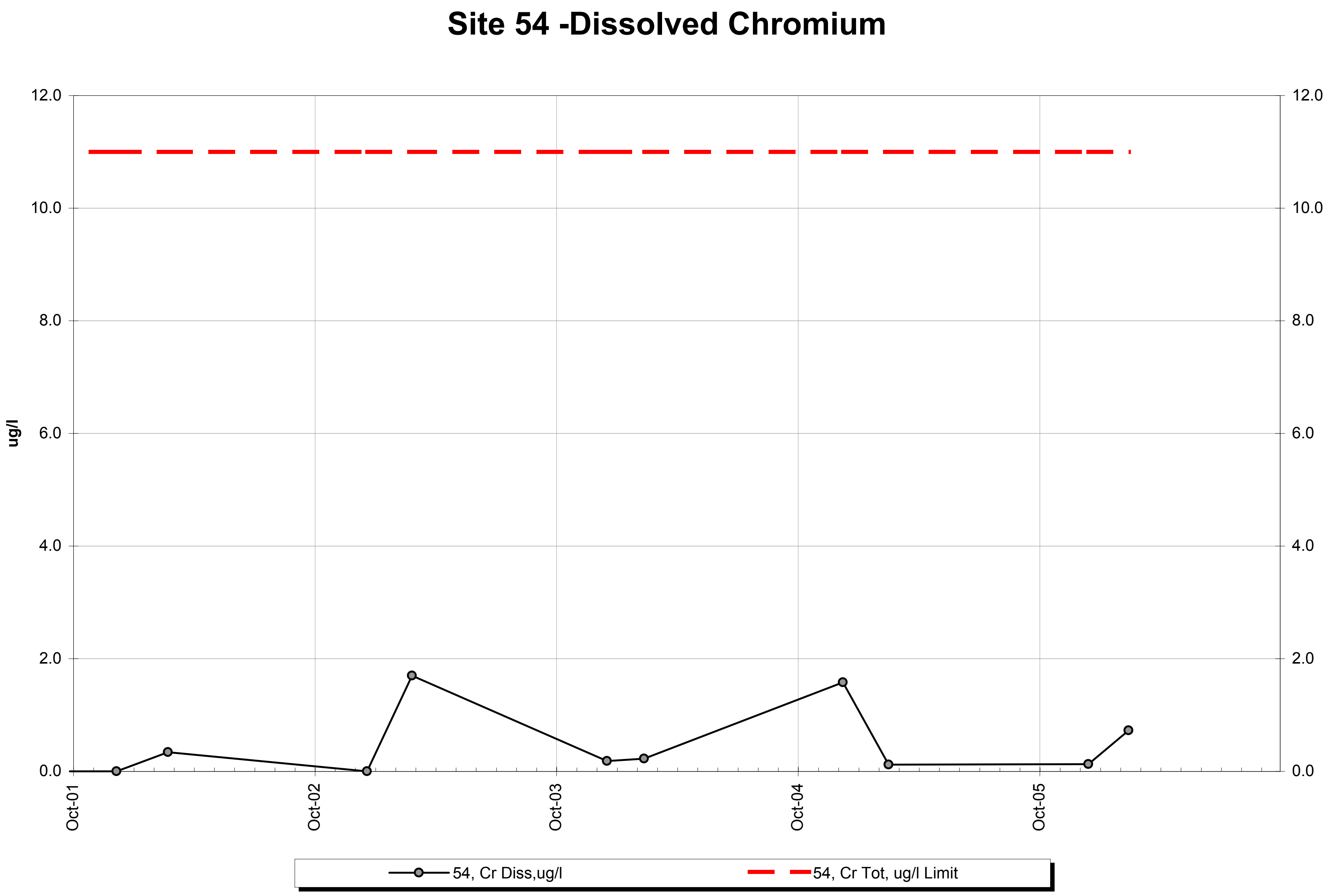
Site 54 -Dissolved Arsenic
Note: The AWQS for total arsenic is 10 ug/L and thus is not shown on this graph in order to allow greater visual detail of plotted values for trend determination
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
54, As Diss,ug/l
54, As Tot, ug/l Limit

Site 54 -Dissolved Barium

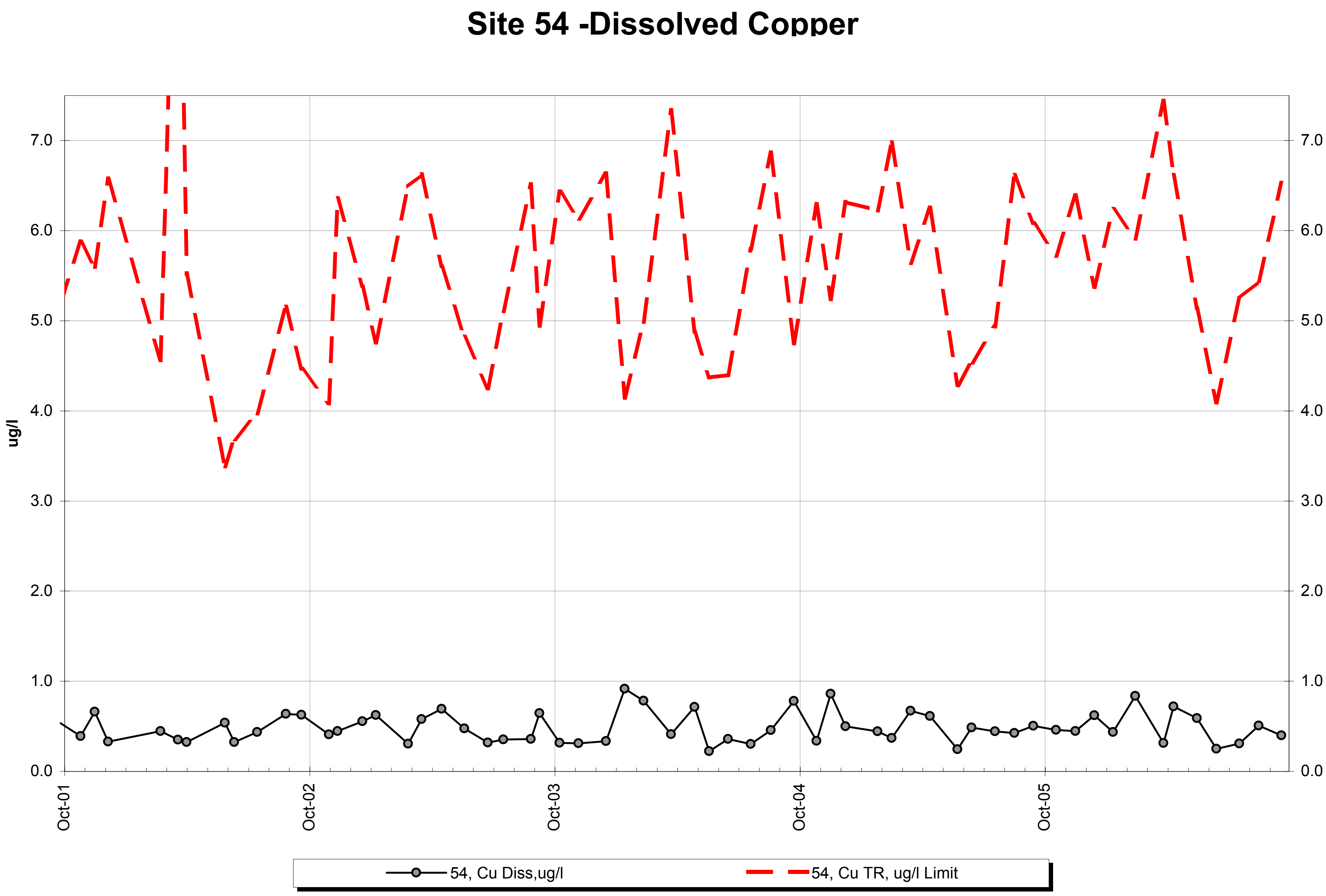


Site 54 -Dissolved Cadmium

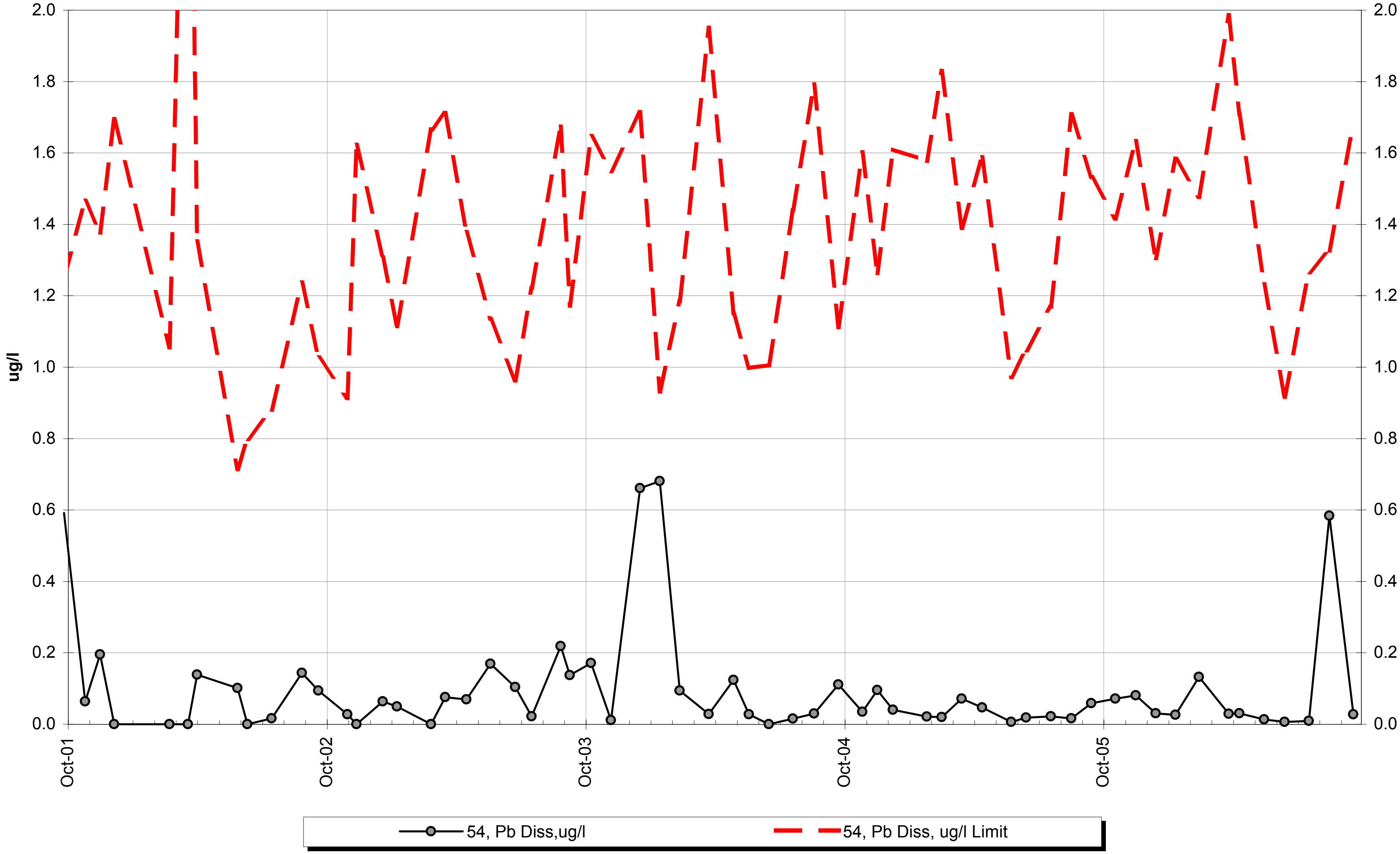




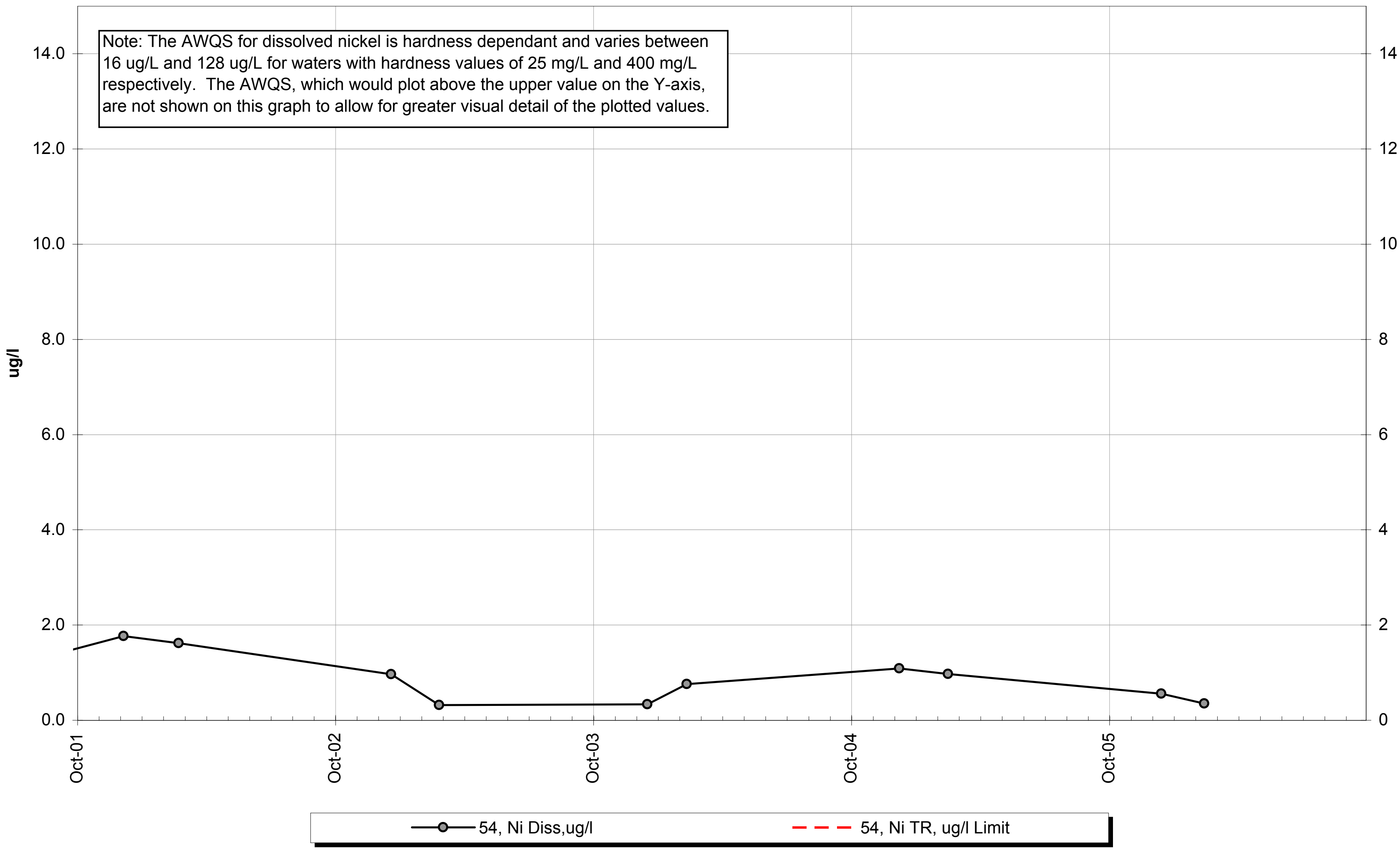
Site 54 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
54, Cr Diss,ug/l
54, Cr Tot, ug/l Limit


Site 54 -Dissolved Copper
ug/l
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
54, Cu Diss,ug/l
54, Cu TR, ug/l Limit

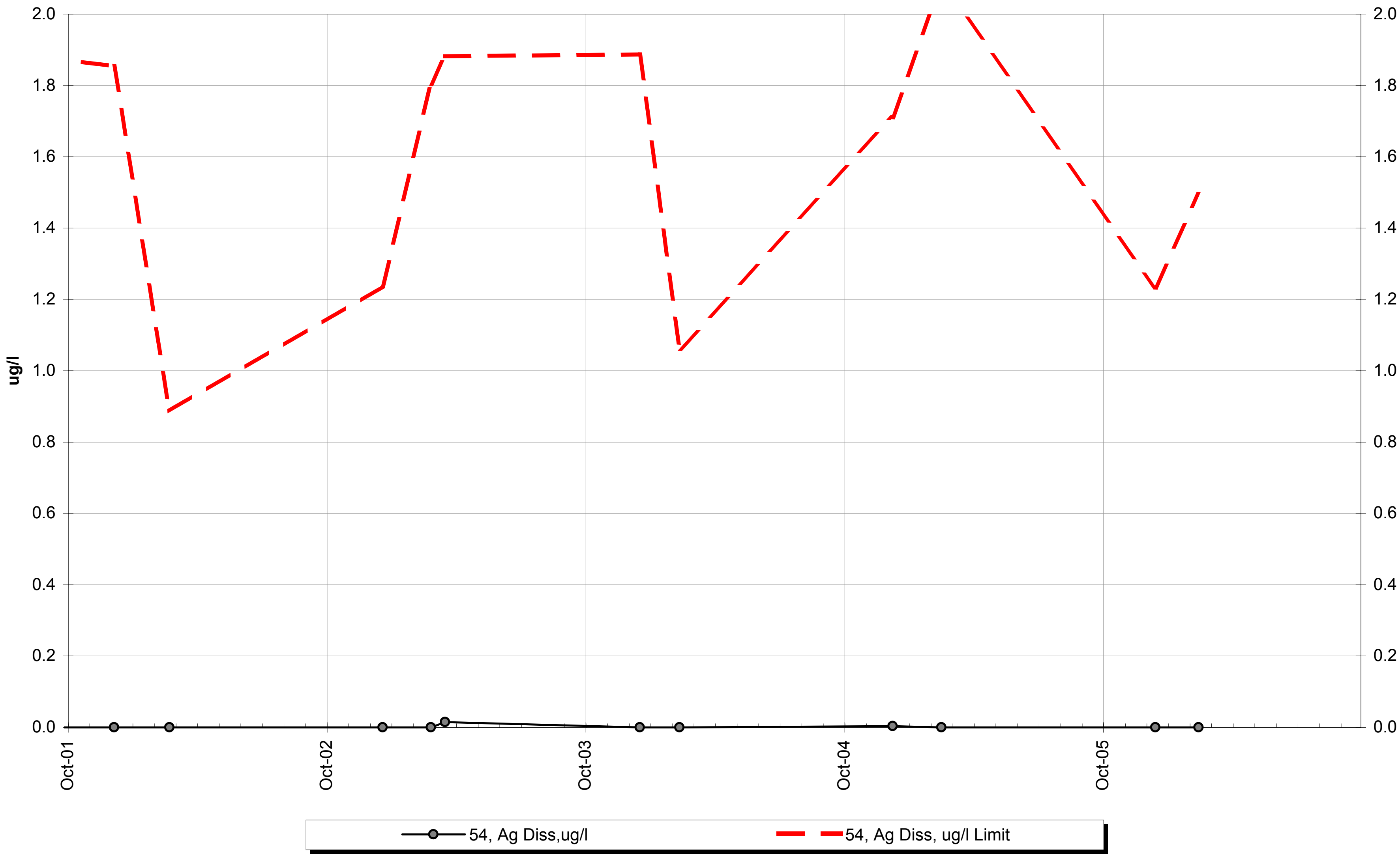
Site 54 -Dissolved Lead



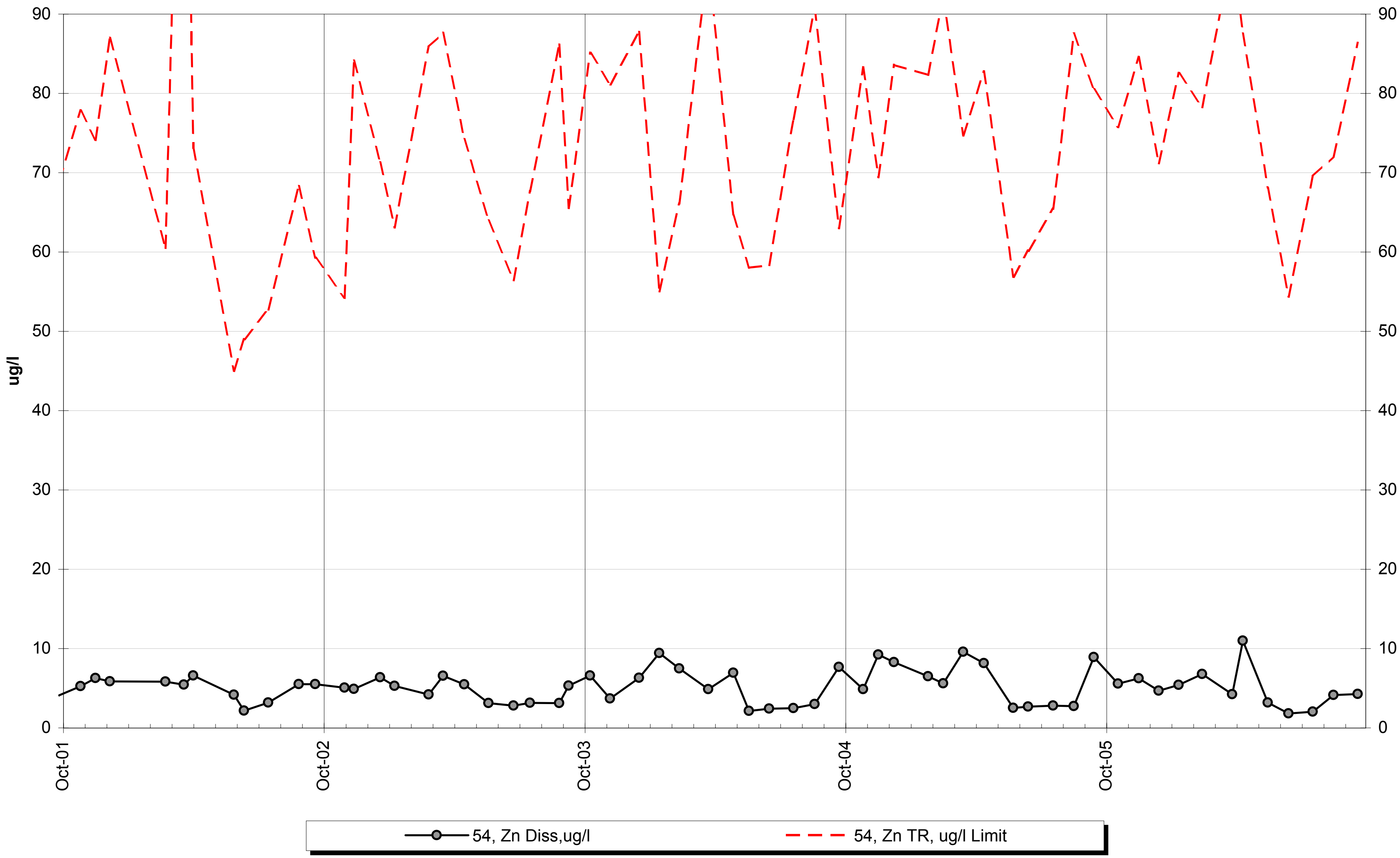
Site 54 -Dissolved Nickel



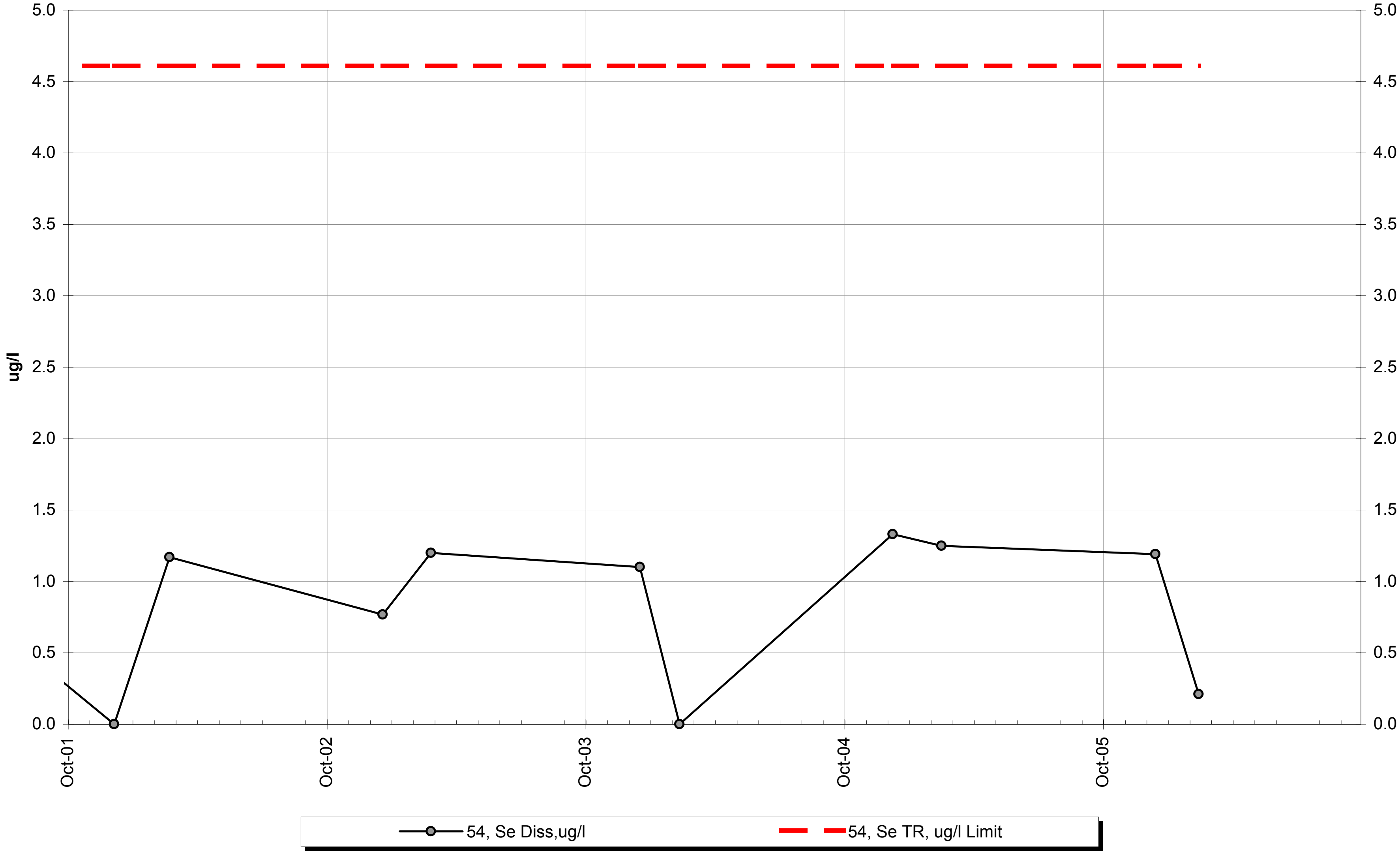
Site 54 -Dissolved Silver



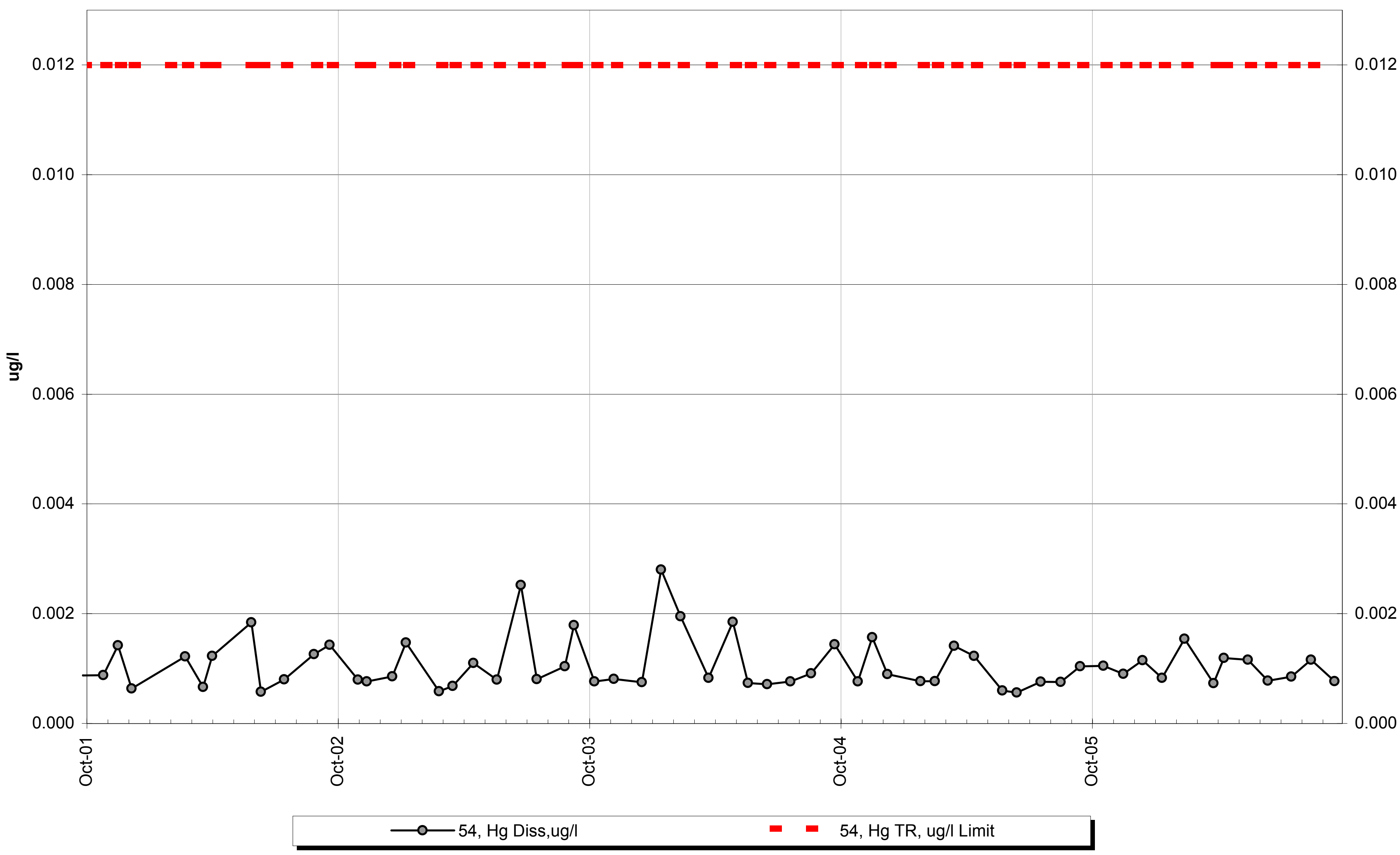
Site 54 -Dissolved Zinc



Site 54 -Dissolved Selenium



Site 54 -Dissolved Mercury



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	**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
b	**WY2002**	127.0	124.0	148.0		155.0	165.0	176.0	64.0	87.8	100.0	112.0	97.1
c	**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
d	**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
e	**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
f	**WY2006**	115.0	126.0	115.0	134.0	127.0	164.0	131.0	96.5	79.4	102.0	106.0	131.0
	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	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
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	0	-1	1
S_k	3	3	-5	2	-5	-7	-5	1	-5	4	-1	7

	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
$Z_k = S_k/\sigma_S$	0.56	0.56	-0.94	0.49	-0.94	-1.32	-0.94	0.19	-0.94	0.75	-0.19	1.32
Z^2_k	0.32	0.32	0.88	0.24	0.88	1.73	0.88	0.04	0.88	0.56	0.04	1.73

ΣZ_k= -1.39

ΣZ^2_k= 8.50

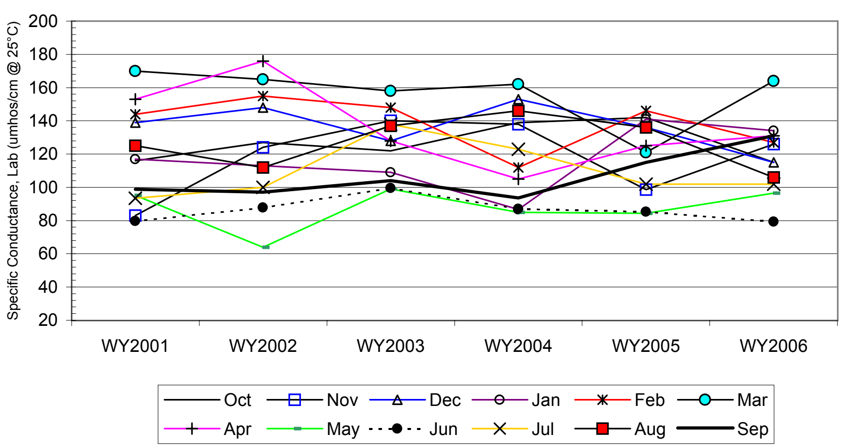
Z-bar=ΣZ_k/K= -0.12

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

Σn 71

ΣS_k -8

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	8.34	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity
p	**0.683**		$\chi^2_h < \chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k) 328.33	Z_{calc} -0.39	@α/2=2.5% Z= 1.96	H_0 (No trend) ACCEPT
	p **0.350**		H_A (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.23		2.69
0.050	-2.04	**-0.40**	2.00
0.100	-1.70		1.05
0.200	-1.50		0.50

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	**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
b	**WY2002**	7.4	7.5	7.9		7.3	7.6	7.5	6.8	7.2	8.0	7.8	8.1
c	**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
d	**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
e	**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
f	**WY2006**	6.8	7.1			7.3	7.4	7.4	7.1	7.1	6.7	6.8	7.0
	n	6	6	5	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	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	1	1	1	1	1	-1	-1	-1
f-a	-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
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
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
f-e	-1	-1		-1	-1	-1	-1	-1	1	-1	1	-1
S_k	5	-2	2	2	7	5	5	-1	1	-9	-7	-9

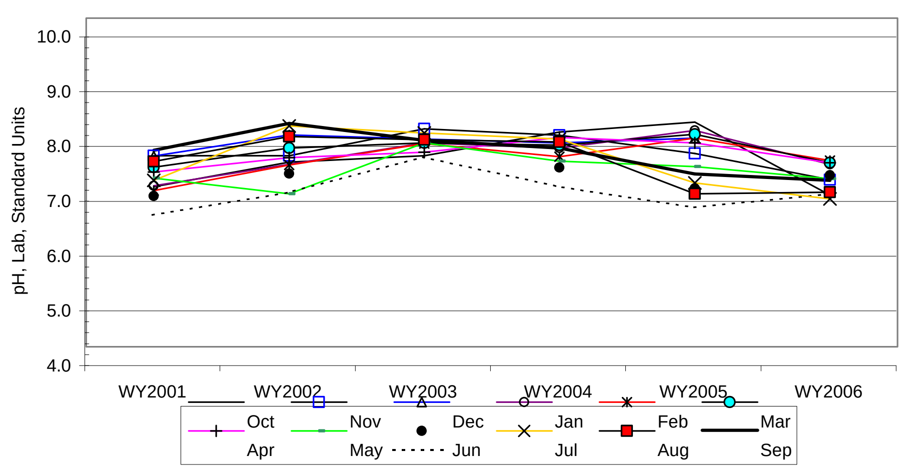
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
s^2_S=	28.33	27.33	16.67	16.67	28.33	28.33	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	-0.38	0.49	0.49	1.32	0.94	0.94	-0.19	0.19	-1.69	-1.32	-1.69
Z^2_k	0.88	0.15	0.24	0.24	1.73	0.88	0.88	0.04	0.04	2.86	1.73	2.86

ΣZ_k= 0.03
ΣZ^2_k= 12.52
Z-bar=ΣZ_k/K= 0.00

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

Σn 70
ΣS_k -1

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=	12.52	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.326**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 0.00	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
315.67	**p** **0.500**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

a	Lower Limit	Sen's Slope	Upper Limit
0.010	-0.10		0.08
0.050	-0.07	**0.00**	0.06
0.100	-0.06		0.04
0.200	-0.04		0.02

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	**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
b	**WY2002**	43.9	43.4	51.8		51.9	55.1	55.8	24.2	35.8	38.2	42.1	37.6
c	**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
d	**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
e	**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
f	**WY2006**	44.4	44.3	39.7	46.4	43.7	53.3	46.2	41.3	31.0	40.7	44.2	48.5
	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
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	7	-3	2	1	-9	-3	7	-1	3	1	9

	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
$Z_k = S_k/\sigma_S$	1.32	1.32	-0.56	0.49	0.19	-1.69	-0.56	1.32	-0.19	0.56	0.19	1.69
Z^2_k	1.73	1.73	0.32	0.24	0.04	2.86	0.32	1.73	0.04	0.32	0.04	2.86

ΣZ_k= 4.06

ΣZ^2_k= 12.20

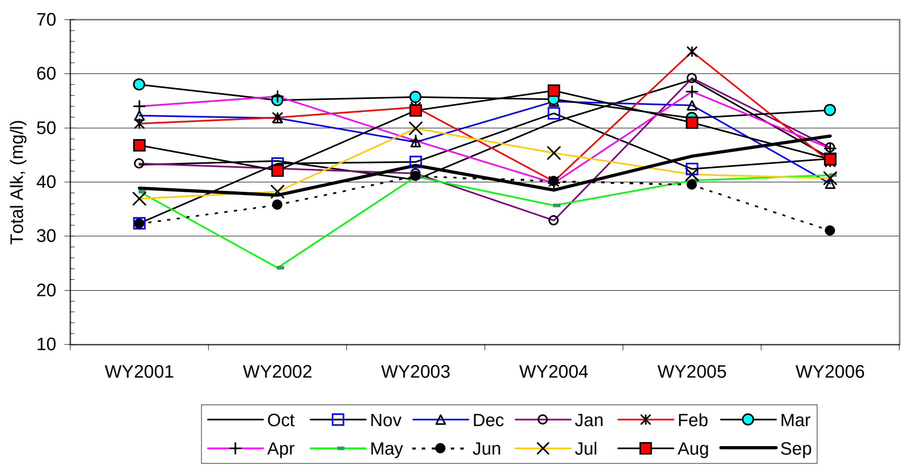
Z-bar=ΣZ_k/K= 0.34

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

Σn 71

ΣS_k 21

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	10.83	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.457**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$ 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	-0.70		1.44
0.050	-0.42	**0.52**	1.08
0.100	-0.27		0.88
0.200	0.12		0.71

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	**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
b	**WY2002**	5.3	6.3	5.9		5.8	5.5	6.6	4.2	2.2	3.2	5.5	5.5
c	**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
d	**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
e	**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
f	**WY2006**	5.6	6.2	4.7	5.4	6.8	4.2	11.0	3.2	1.8	2.1	4.1	4.3
	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
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	5	3	-5	0	1	-5	13	-5	-7	-9	1	5

	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	0.56	-0.94	0.00	0.19	-0.94	2.44	-0.94	-1.32	-1.69	0.19	0.94
Z^2_k	0.88	0.32	0.88	0.00	0.04	0.88	5.96	0.88	1.73	2.86	0.04	0.88

ΣZ_k= -0.56

ΣZ^2_k= 15.35

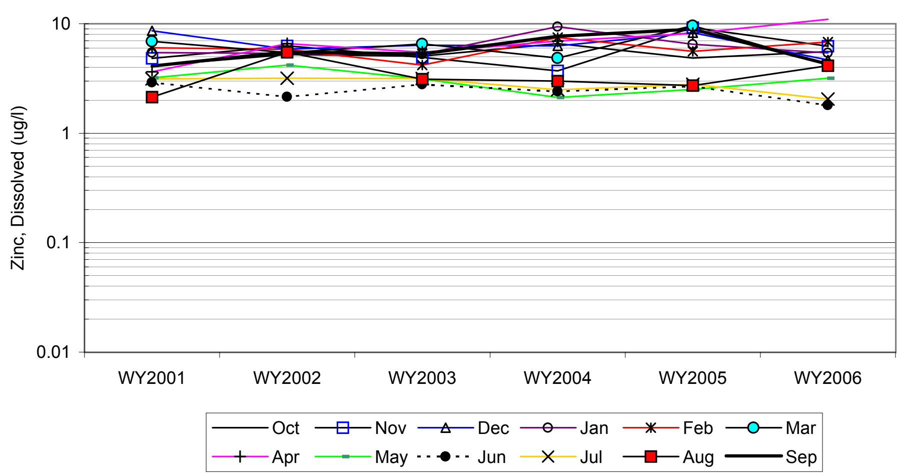
Z-bar=$\Sigma Z_k/K$= -0.05

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

Σn 71

ΣS_k -3

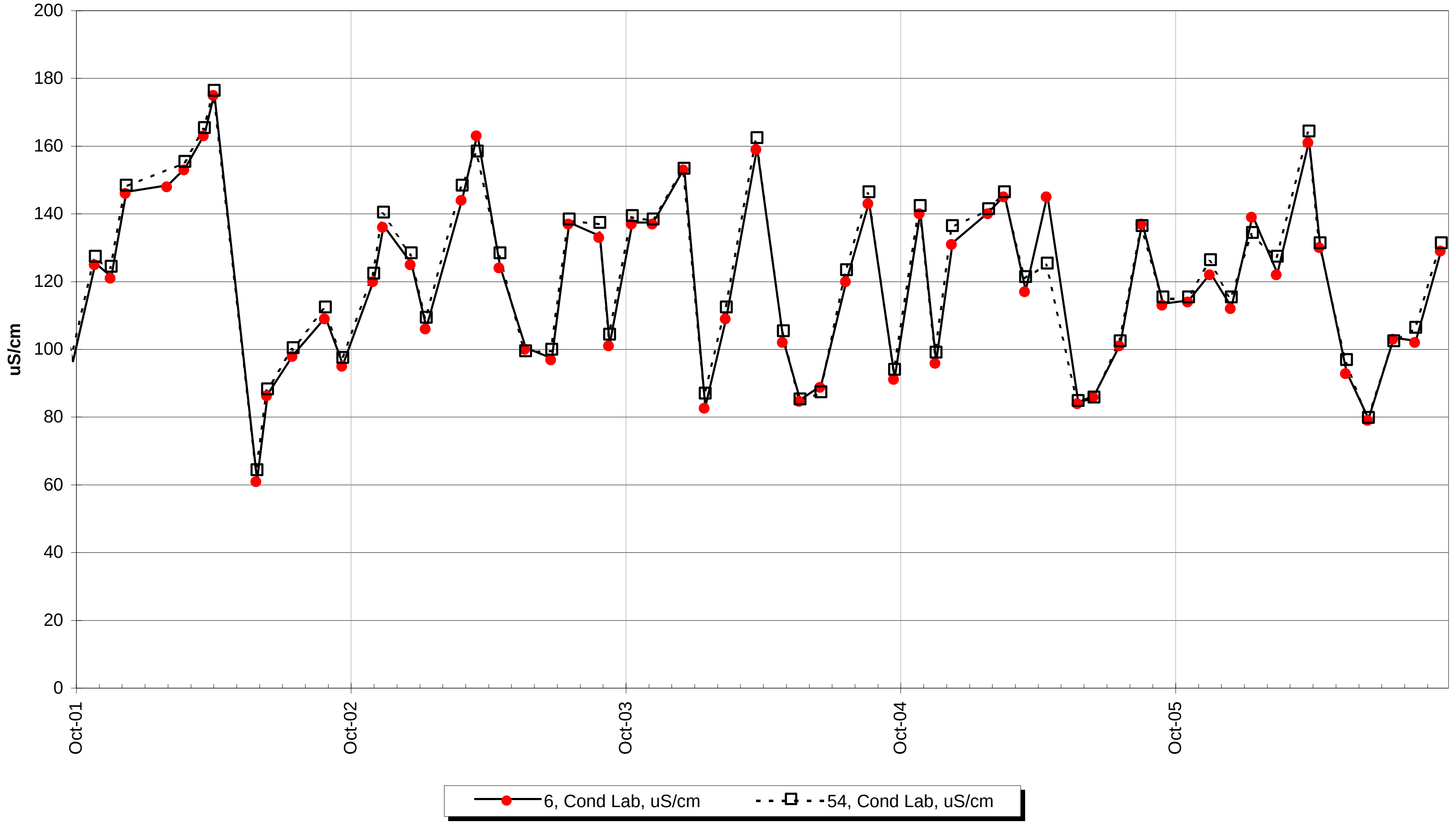
$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	15.33	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.168**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.11	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
328.33	**p** **0.456**		H_A (± trend)	REJECT



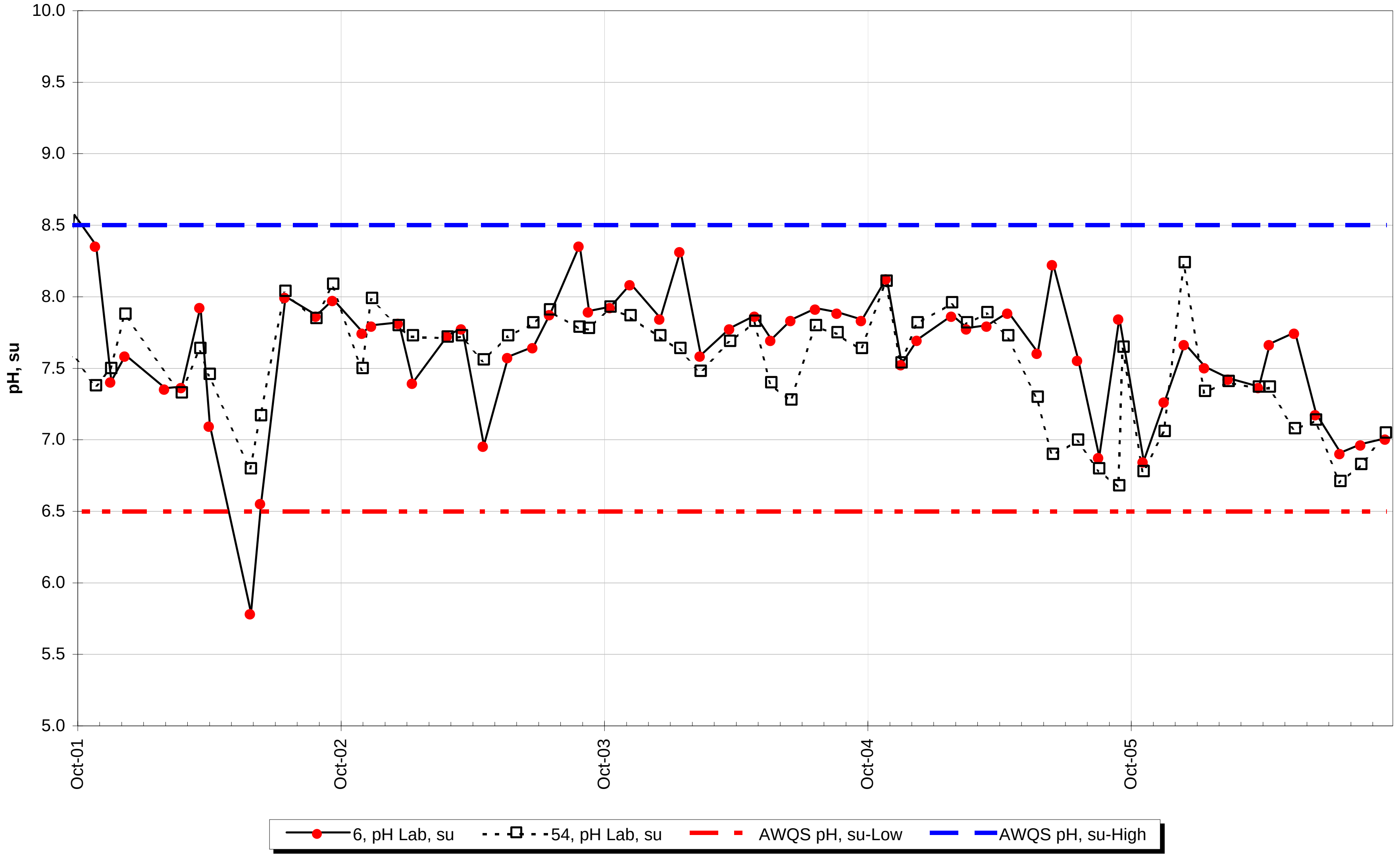
Seasonal-Kendall Slope Confidence Intervals

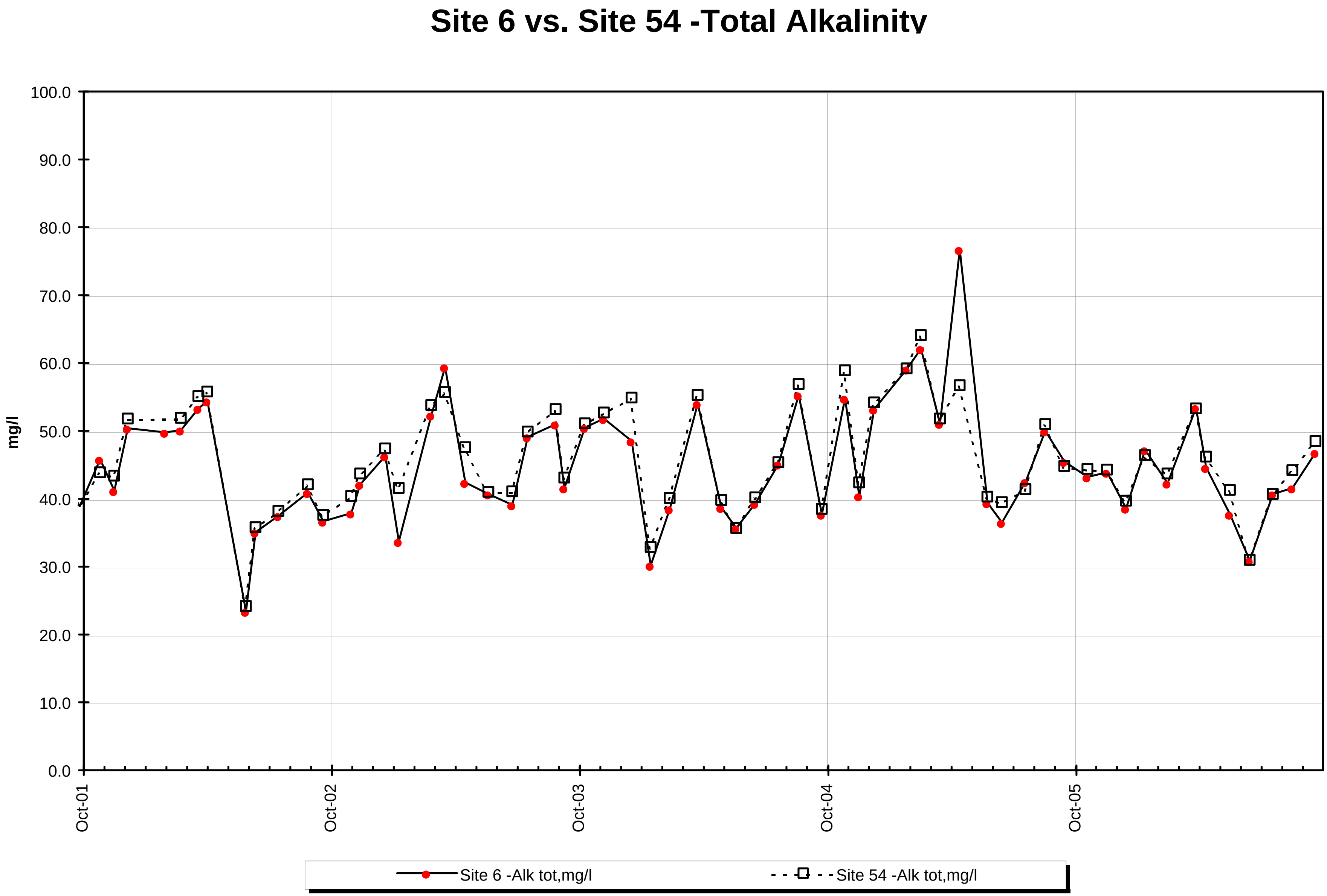
α	Lower Limit	Slope	Upper Limit
0.010	-0.18		0.29
0.050	-0.12	**-0.01**	0.18
0.100	-0.09		0.15
0.200	-0.07		0.05

Site 6 vs Site 54 -Conductivity

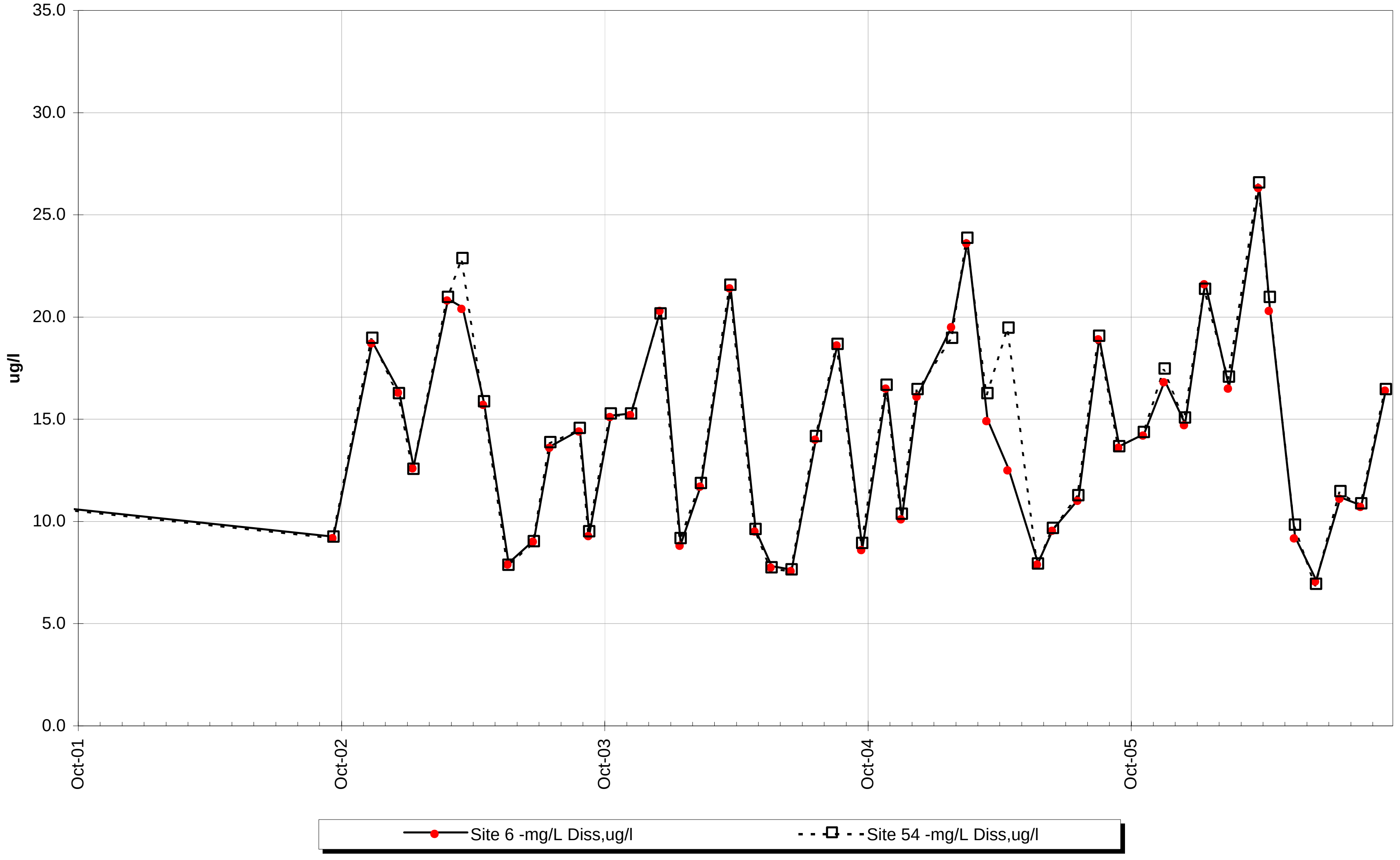


Site 6 vs. Site 54 -Lab pH

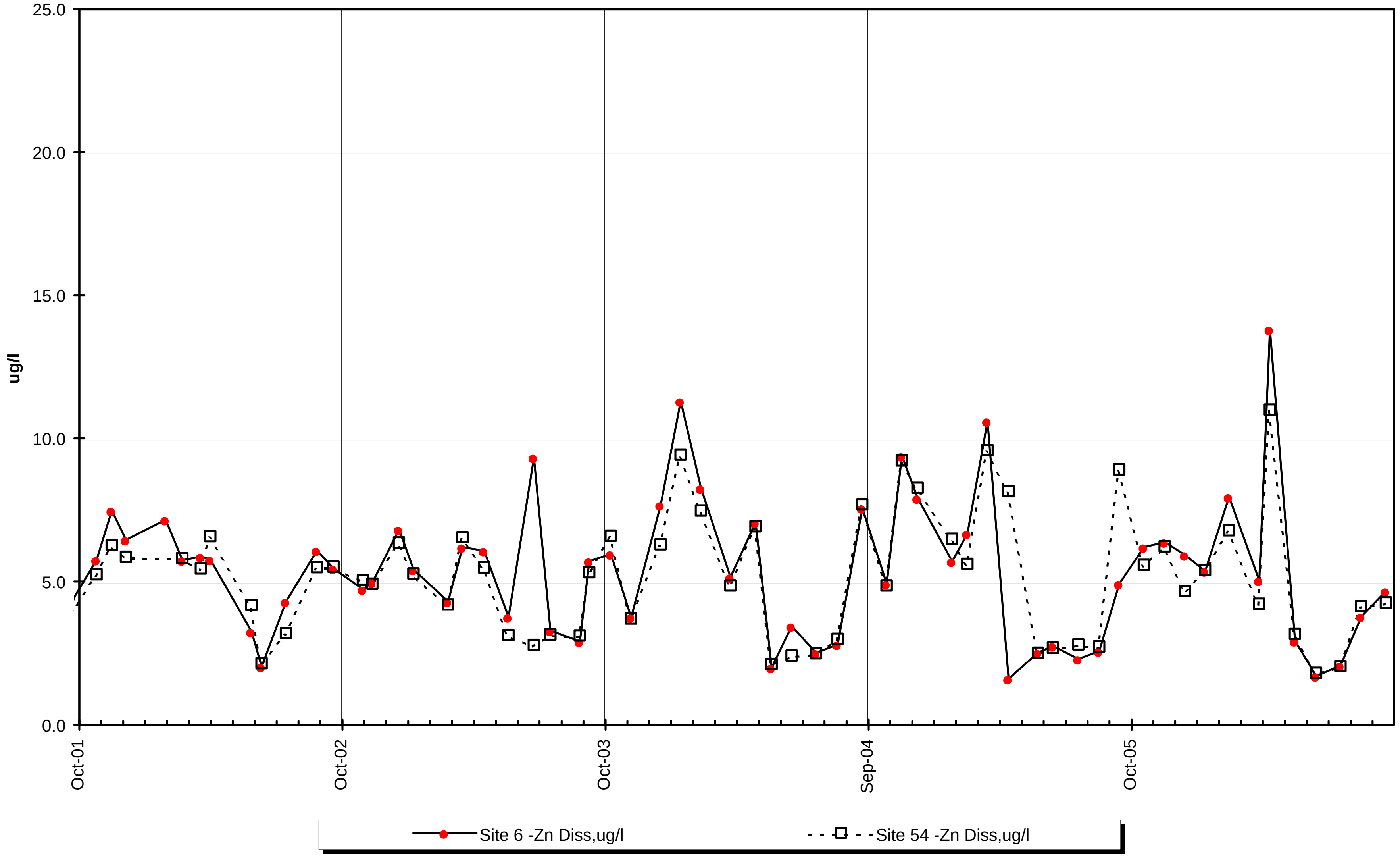



Site 6 vs. Site 54 -Total Alkalinity
mg/l
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 6 -Alk tot,mg/l
Site 54 -Alk tot,mg/l

Site 6 vs. Site 54 -Total Sulfate



Site 6 vs. Site 54 -Dissolved Zinc



Wilcoxon-signed-ranks test

Exact Form

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

	X	**Y**	Differences		
Site	#6	#54			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	114.0	115.0	-1.0	1.0	-3
Nov	122.0	126.0	-4.0	4.0	-9.5
Dec	112.0	115.0	-3.0	3.0	-6.5
Jan	139.0	134.0	5.0	5.0	11.5
Feb	122.0	127.0	-5.0	5.0	-11.5
Mar	161.0	164.0	-3.0	3.0	-6.5
Apr	130.0	131.0	-1.0	1.0	-3
May	92.8	96.5	-3.7	3.7	-8
Jun	79.0	79.4	-0.4	0.4	-1
Jul	103.0	102.0	1.0	1.0	3
Aug	102.0	106.0	-4.0	4.0	-9.5
Sep	129.0	131.0	-2.0	2.0	-5
Median	118.0	120.5	-2.5	3.0	

n	**m**
12	12

N= 12

ΣR= -49

α
5.0%
W'α,n
17

W^+=
14.5
p-test
2.61%

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	#6	#54	Differences		
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	6.84	6.77	0.07	0.07	4
Nov	7.26	7.05	0.21	0.21	8
Dec	7.66				
Jan	7.50	7.33	0.17	0.17	6
Feb	7.42	7.40	0.02	0.02	1
Mar	7.36	7.36	0.00		
Apr	7.66	7.36	0.30	0.30	9
May	7.74	7.07	0.67	0.67	10
Jun	7.17	7.13	0.04	0.04	2.5
Jul	6.90	6.70	0.20	0.20	7
Aug	6.96	6.82	0.14	0.14	5
Sep	7.00	7.04	-0.04	0.04	-2.5
Median	7.31	7.07	0.14	0.16	

n	**m**
11	10

N= 10

ΣR= 50

α
95.0%
W'α,n
43

W^+=
52.5
p-test
0.997

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**	Differences		
Site	#6	#54			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	43.2	44.4	-1.2	1.2	-6
Nov	43.9	44.3	-0.4	0.4	-3
Dec	38.6	39.7	-1.1	1.1	-5
Jan	47.2	46.4	0.8	0.8	4
Feb	42.3	43.7	-1.4	1.4	-7
Mar	53.4	53.3	0.1	0.1	1
Apr	44.6	46.2	-1.6	1.6	-8
May	37.7	41.3	-3.6	3.6	-11
Jun	30.9	31.0	-0.1	0.1	-2
Jul	40.7	40.7	0.0		
Aug	41.6	44.2	-2.6	2.6	-10
Sep	46.8	48.5	-1.7	1.7	-9
Median	42.8	44.3	-1.2	1.2	

n	**m**
12	11

N= 11

ΣR= -56

α
95.0%
W'α,n
51

W^+=
5
p-test
0.49%

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	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	14.2	14.3	-0.1	0.1	-1.5
Nov	16.8	17.4	-0.6	0.6	-10
Dec	14.7	15.0	-0.3	0.3	-6.5
Jan	21.6	21.3	0.3	0.3	5
Feb	16.5	17.0	-0.5	0.5	-8
Mar	26.3	26.5	-0.2	0.2	-4
Apr	20.3	20.9	-0.6	0.6	-10
May	9.2	9.8	-0.6	0.6	-10
Jun	7.1	6.9	0.2	0.2	3
Jul	11.1	11.4	-0.3	0.3	-6.5
Aug	10.7	10.8	-0.1	0.1	-1.5
Sep	16.4	16.4	0.0		
Median	15.6	15.7	-0.3	0.3	

n	**m**
12	11

N= 11

$\Sigma R=$ -50

α
5.0%
W'α,n
13

$W^{+}=$
8
p-test
1.22%

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	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	6.20	5.58	0.62	0.62	8
Nov	6.38	6.23	0.15	0.15	4
Dec	5.93	4.67	1.26	1.26	11
Jan	5.37	5.40	-0.03	0.03	-2
Feb	7.96	6.79	1.17	1.17	10
Mar	5.04	4.22	0.82	0.82	9
Apr	13.80	11.00	2.80	2.80	12
May	2.93	3.18	-0.25	0.25	-5
Jun	1.70	1.81	-0.11	0.11	-3
Jul	2.07	2.05	0.02	0.02	1
Aug	3.78	4.14	-0.36	0.36	-6
Sep	4.67	4.27	0.40	0.40	7
Median	5.21	4.47	0.27	0.38	

n	**m**
12	12

N= 12

ΣR= 46

α
5.0%
W'α,n
17

W^+=
62
p-test
96.80%

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

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 2006” report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 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-05 though Sept-06.				

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. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). No statistically significant ($\alpha/2=2.5\%$) trends are identified.

Site 49-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.62	+		
pH, Lab	6	0.87	+		
Alkalinity, Total	6	0.52	+		
Zinc, Dissolved	6	0.12	-		

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

Table of Results for Water Year 2006

Site 49 "Upper Bruin Creek"

Sample Date/Parameter	10/18/05	11/16/05	12/14/05	1/11/06	2/13/06	3/27/06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/19/06	**Median**
Water Temp (°C)	4.9	2.2	2.4	1.3	1.2	0.6	1.1	3.7	9.0	9.1	9.0	7.7	3.1
Conductivity-Field(µmho)	138	133	109	136	146	188	160	117	120	131	92	105	132
Conductivity-Lab (µmho)	133	141	129	151	139	193	148	118	124	143	111	140	140
pH Lab (standard units)	7.52 J	7.63	7.80 R	7.75 J	7.67	7.45	7.81 J	7.51	7.51 J	7.56	7.42	7.09 J	7.54
pH Field (standard units)	8.04	7.83	7.83	7.57	7.28	8.04	7.93	7.54	7.41	8.25	8.31	8.12	7.88
Total Alkalinity (mg/L)	59.3	58.0	52.8	62.6	55.6	77.8	58.9	53.4	51.2	60.7	52.0	57.3	57.7
Total Sulfate (mg/L)	9.5	11.3	9.8	15.2	12.9	20.3	15.5	8.4	8.8	11.7	6.9	10.5	10.9
Hardness (mg/L)	71.0	78.0	64.1	78.2	71.5	101.0	82.1	66.8	65.1	75.4	61.6	77.7	73.5
Dissolved As (ug/L)	0.183	0.147	0.192	0.113	0.266 U	0.017 J	0.156	0.134	0.151	0.164	0.171	0.171	0.160
Dissolved Ba (ug/L)			7.4		9.7								8.6
Dissolved Cd (ug/L)	0.033	0.030	0.020	0.033 U	0.022 U	0.030	0.018	0.021	0.022 U	0.019	0.023	0.034	0.023
Dissolved Cr (ug/L)			0.228 J		1.510								0.869
Dissolved Cu (ug/L)	0.447	0.392	0.688 U	0.451 U	0.805	0.381 U	0.485	0.515	0.480 U	0.455	0.539	0.520	0.483
Dissolved Pb (ug/L)	<0.0040	<0.0040	0.0087 U	0.0130 U	0.0653	0.0058 J	0.0058 U	0.0062 U	0.0032 U	0.0118 U	0.0138 U	0.0193 U	0.0075
Dissolved Ni (ug/L)			0.944 U		0.592								0.768
Dissolved Ag (ug/L)			<0.002		0.004 J								0.002
Dissolved Zn (ug/L)	3.04 U	2.16 U	1.73 U	1.73 U	1.62 U	1.77 U	1.09	1.22 U	1.48 U	0.99 U	3.62 J	2.05	1.73
Dissolved Se (ug/L)			0.548		<0.116								0.303
Dissolved Hg (ug/L)	0.001740 U	0.001290 U	0.002150	0.001250 U	0.002400	0.001300 U	0.001620	0.001660 U	0.001970 U	0.001860	0.002140	0.001700 U	0.001720

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
49	01/11/2006	2:40:00 PM				
			pH Lab, su	7.75	J	Hold Time Violation
			Cd Diss, ug/l	0.0329	U	Field Blank Contamination
			Cu Diss, ug/l	0.451	U	Field Blank Contamination
			Pb Diss, ug/l	0.013	U	Field Blank Contamination
			Zn Diss, ug/l	1.73	U	Field Blank Contamination
			Hg Diss, ug/l	0.00125	U	Field Blank Contamination
49	10/18/2005	1:22:00 PM				
			pH Lab, su	7.52	J	Hold Time Violation
			Zn Diss, ug/l	3.04	U	Field Blank Contamination
			Hg Diss, ug/l	0.00174	U	Field Blank Contamination
49	11/16/2005	12:50:00 PM				
			Zn Diss, ug/l	2.16	U	Field Blank Contamination
			Hg Diss, ug/l	0.00129	U	Field Blank Contamination
49	12/14/2005	1:08:00 PM				
			pH Lab, su	7.8	R	Hold Time Violation
			Cr Diss, ug/l	0.228	J	Duplicate RPD
			Cu Diss, ug/l	0.688	U	Field Blank Contamination
			Pb Diss, ug/l	0.00874	U	Field Blank Contamination
			Ni Diss, ug/l	0.944	U	Field Blank Contamination
			Zn Diss, ug/l	1.73	U	Field Blank Contamination
49	02/13/2006	2:18:00 PM				
			As Diss, ug/l	0.266	U	Field Blank Contamination
			Cd Diss, ug/l	0.0221	U	Field Blank Contamination
			Ag Diss, ug/l	0.00373	J	Below Quantitative Range
			Zn Diss, ug/l	1.62	U	Field Blank Contamination
49	03/27/2006	1:09:00 PM				
			As Diss, ug/l	0.0165	J	Below Quantitative Range
			Cu Diss, ug/l	0.381	U	Field Blank Contamination
			Pb Diss, ug/l	0.0058	J	Below Quantitative Range
			Zn Diss, ug/l	1.77	U	Field Blank Contamination
			Hg Diss, ug/l	0.0013	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

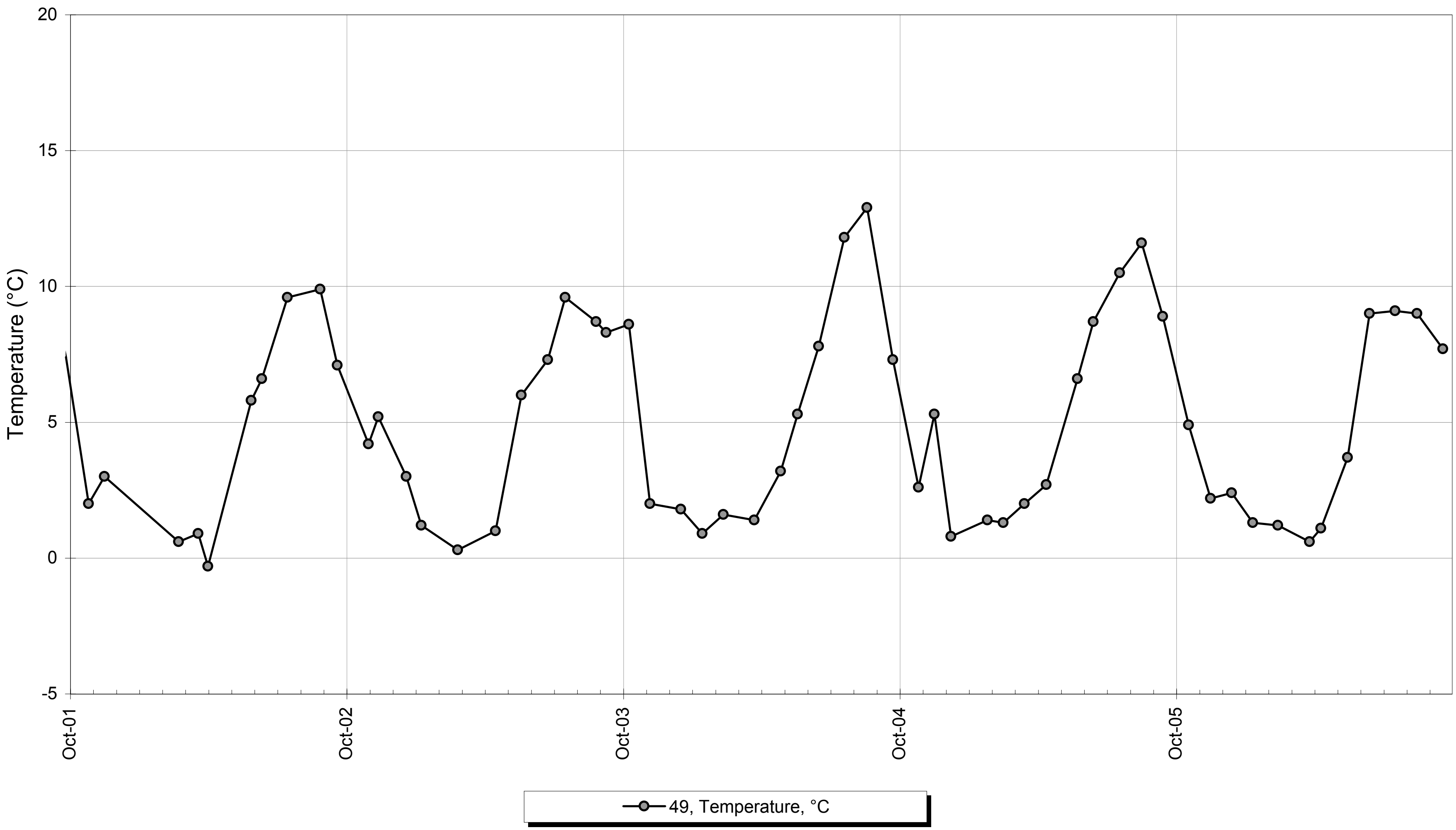
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

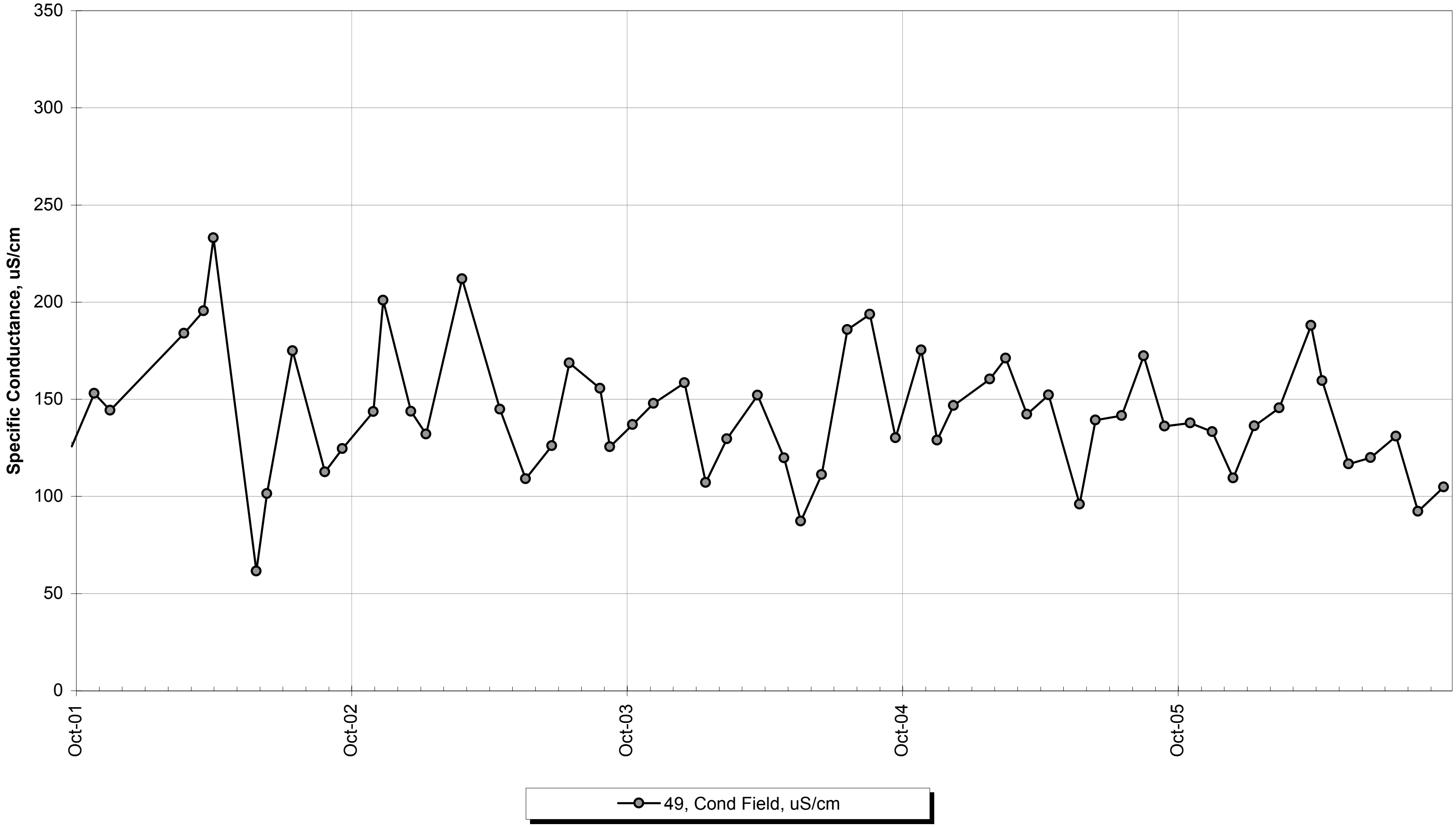
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
49	04/11/2006	2:03:00 PM				
			pH Lab, su	7.81	J	Outside Hold Time
			Pb Diss, ug/l	0.00576	U	Field Blank Contamination
49	05/16/2006	1:03:00 PM				
			Pb Diss, ug/l	0.00616	U	Field Blank Contamination
			Zn Diss, ug/l	1.22	U	Field Blank Contamination
			Hg Diss, ug/l	0.00166	U	Field Blank Contamination
49	06/14/2006	8:50:00 AM				
			pH Lab, su	7.51	J	Hold Time Violation
			Cd Diss, ug/l	0.022	U	Field Blank Contamination
			Cu Diss, ug/l	0.48	U	Field Blank Contamination
			Pb Diss, ug/l	0.00324	U	Field Blank Contamination
			Zn Diss, ug/l	1.48	U	Field Blank Contamination
			Hg Diss, ug/l	0.00197	U	Field Blank Contamination
49	07/18/2006	12:56:00 PM				
			Pb Diss, ug/l	0.0118	U	Field Blank Contamination
			Zn Diss, ug/l	0.991	U	Field Blank Contamination
49	08/16/2006	2:50:00 PM				
			Pb Diss, ug/l	0.0138	U	Field Blank Contamination
			Zn Diss, ug/l	3.62	J	LCS Recovery
49	09/19/2006	1:52:00 PM				
			pH Lab, su	7.09	J	Hold Time Violation
			Pb Diss, ug/l	0.0193	U	Method Blank Contamination
			Hg Diss, ug/l	0.0017	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

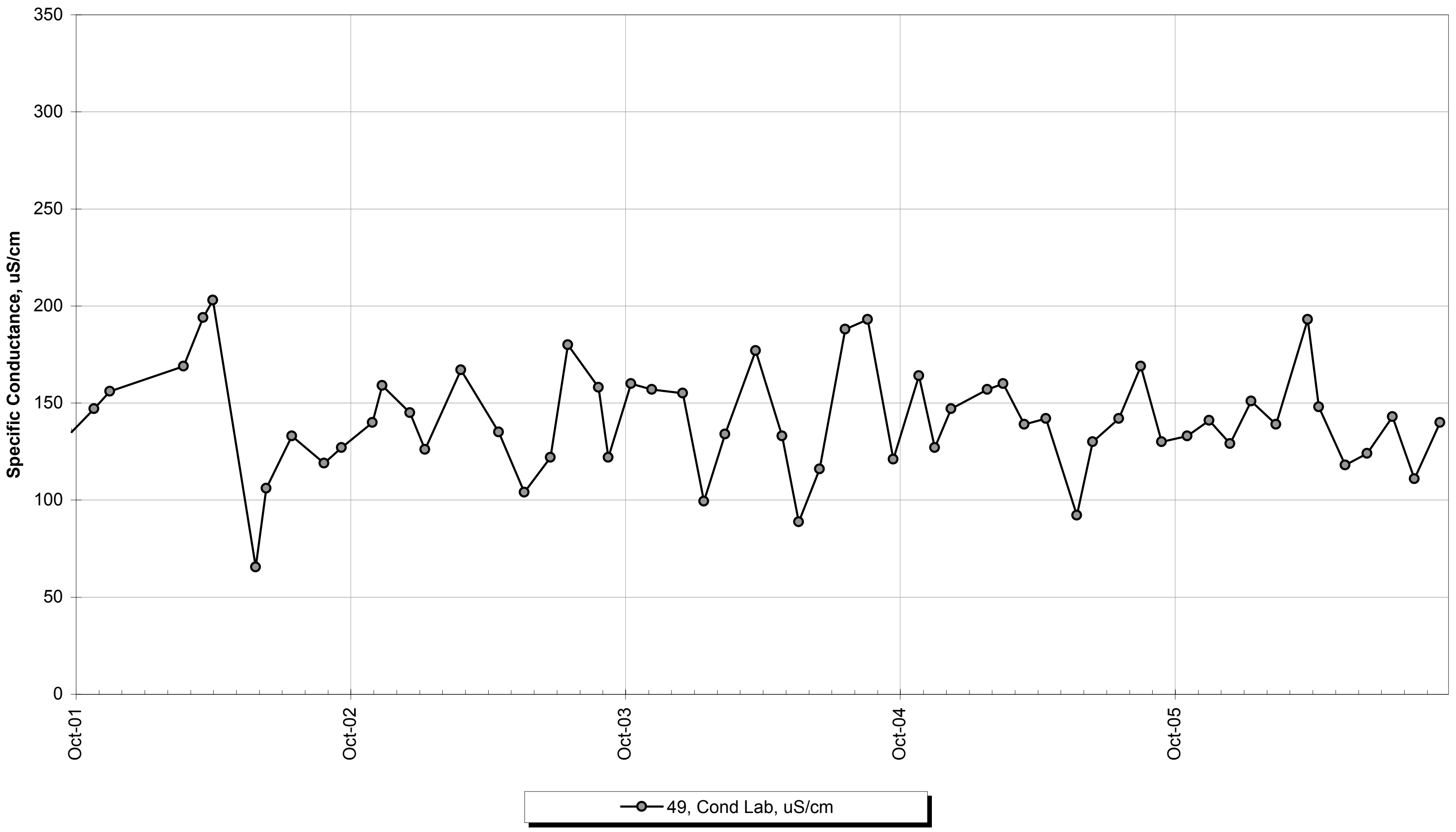
Site 49 -Water Temperature

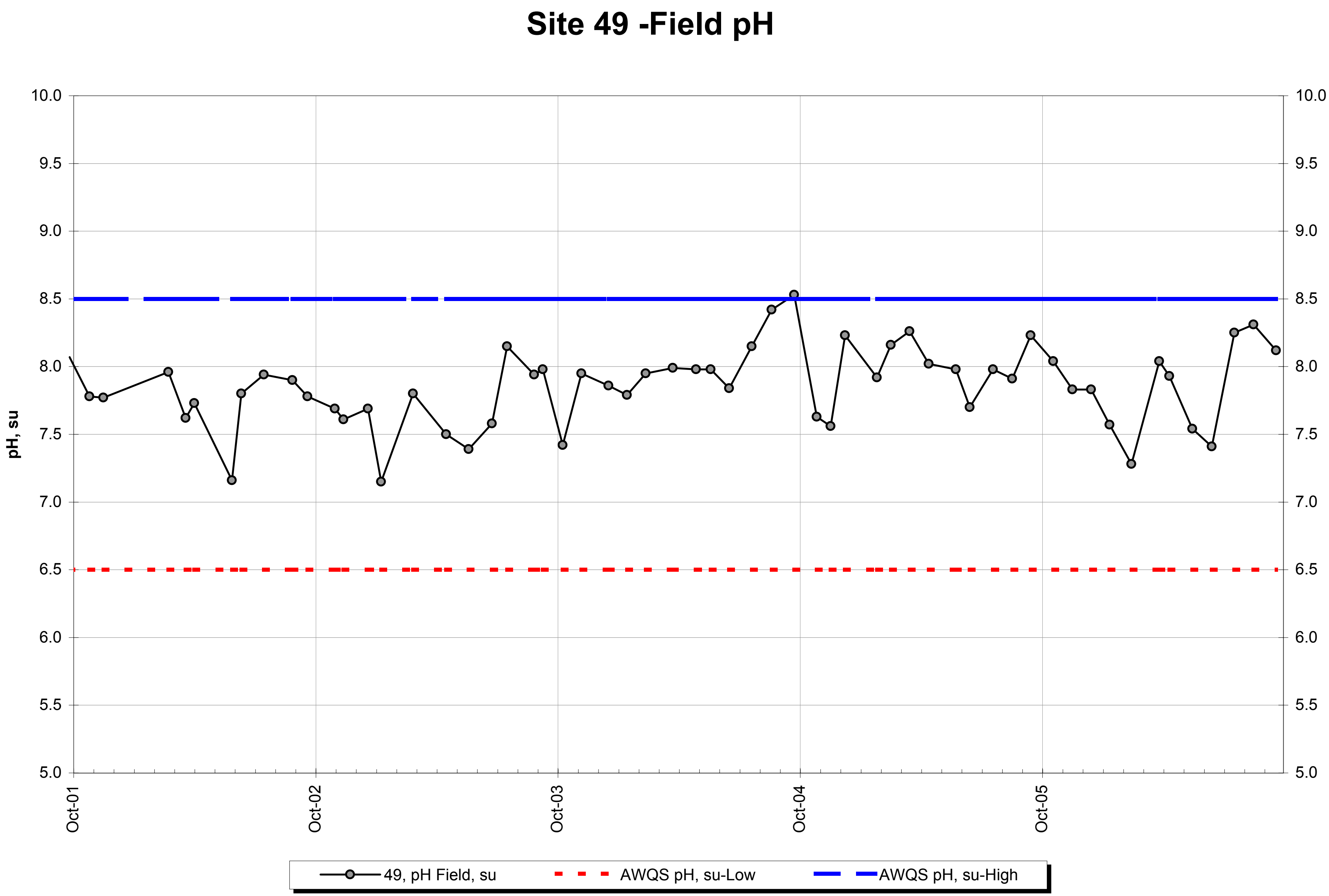


Site 49 -Conductivity-Field

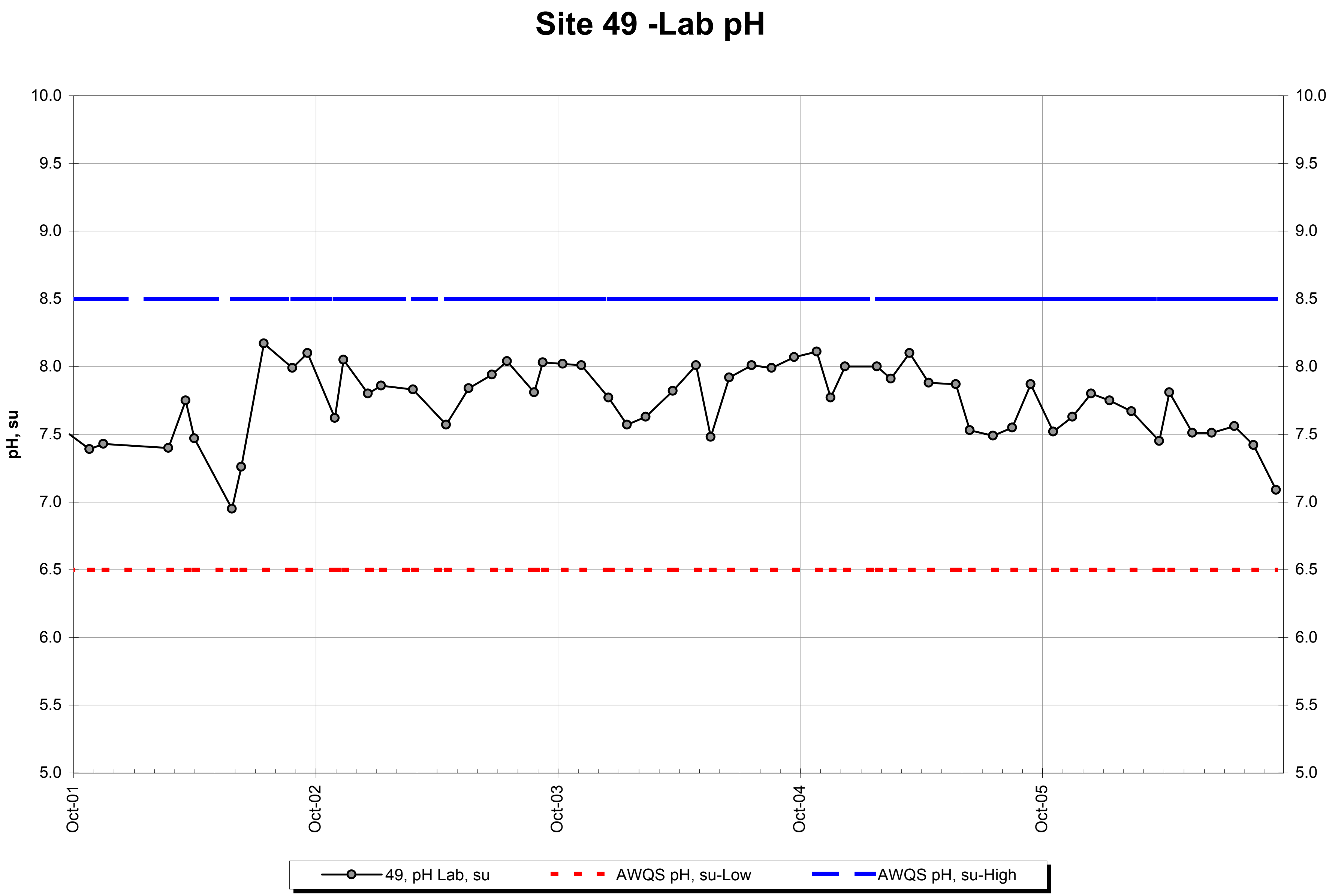


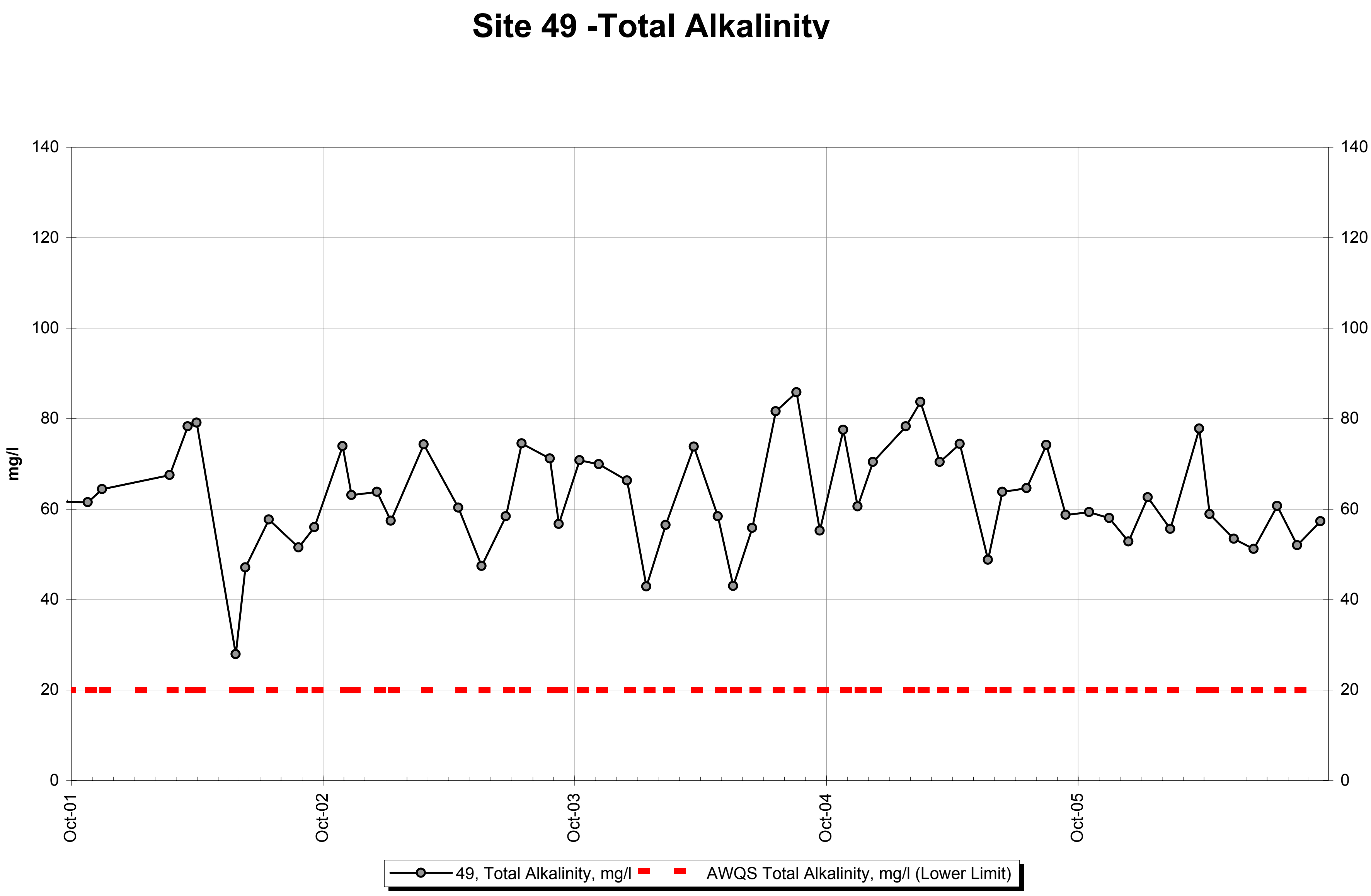
Site 49 -Conductivity-Lab



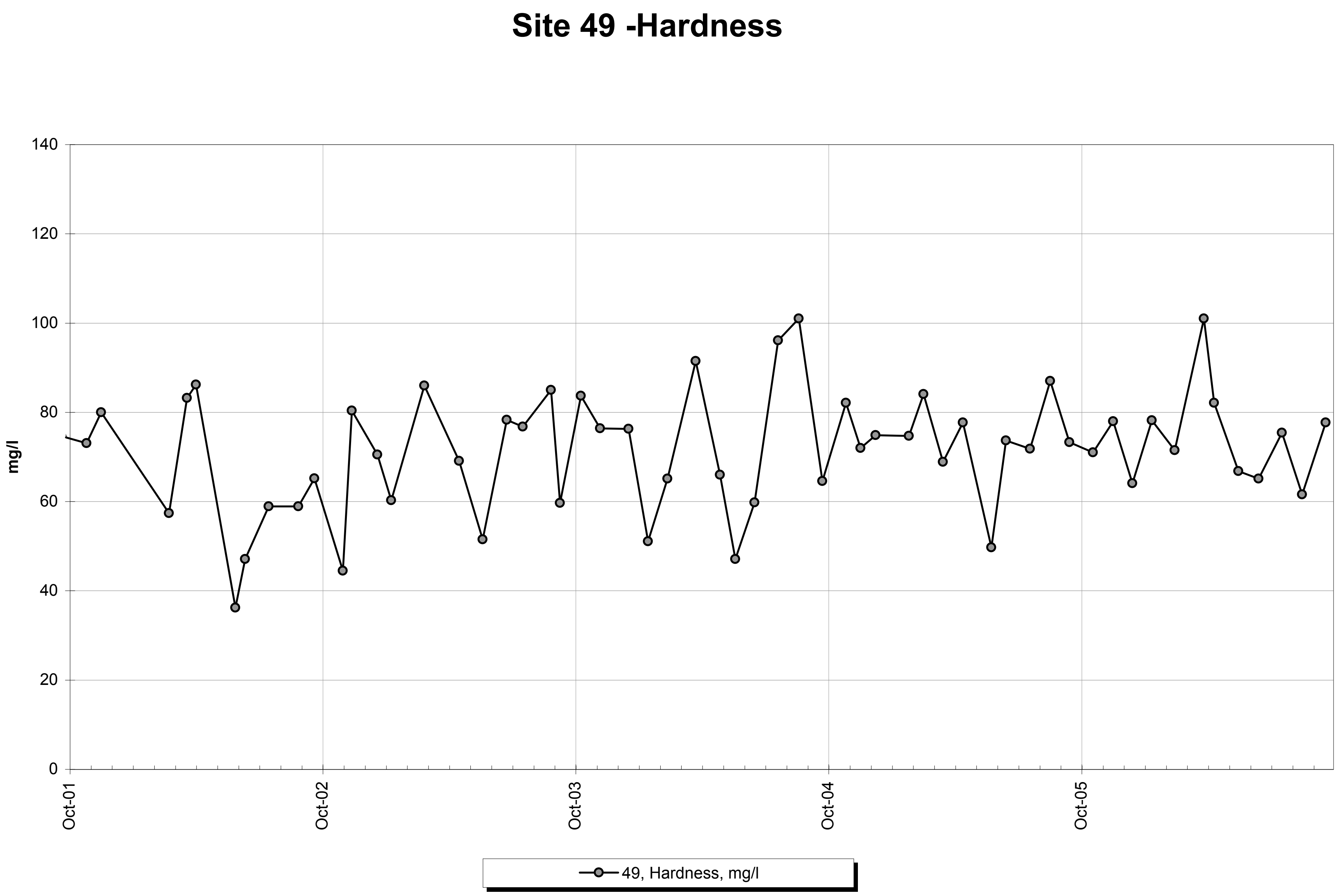


Site 49 -Field pH
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
pH, su
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
49, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High


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-01
Oct-02
Oct-03
Oct-04
Oct-05
49, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

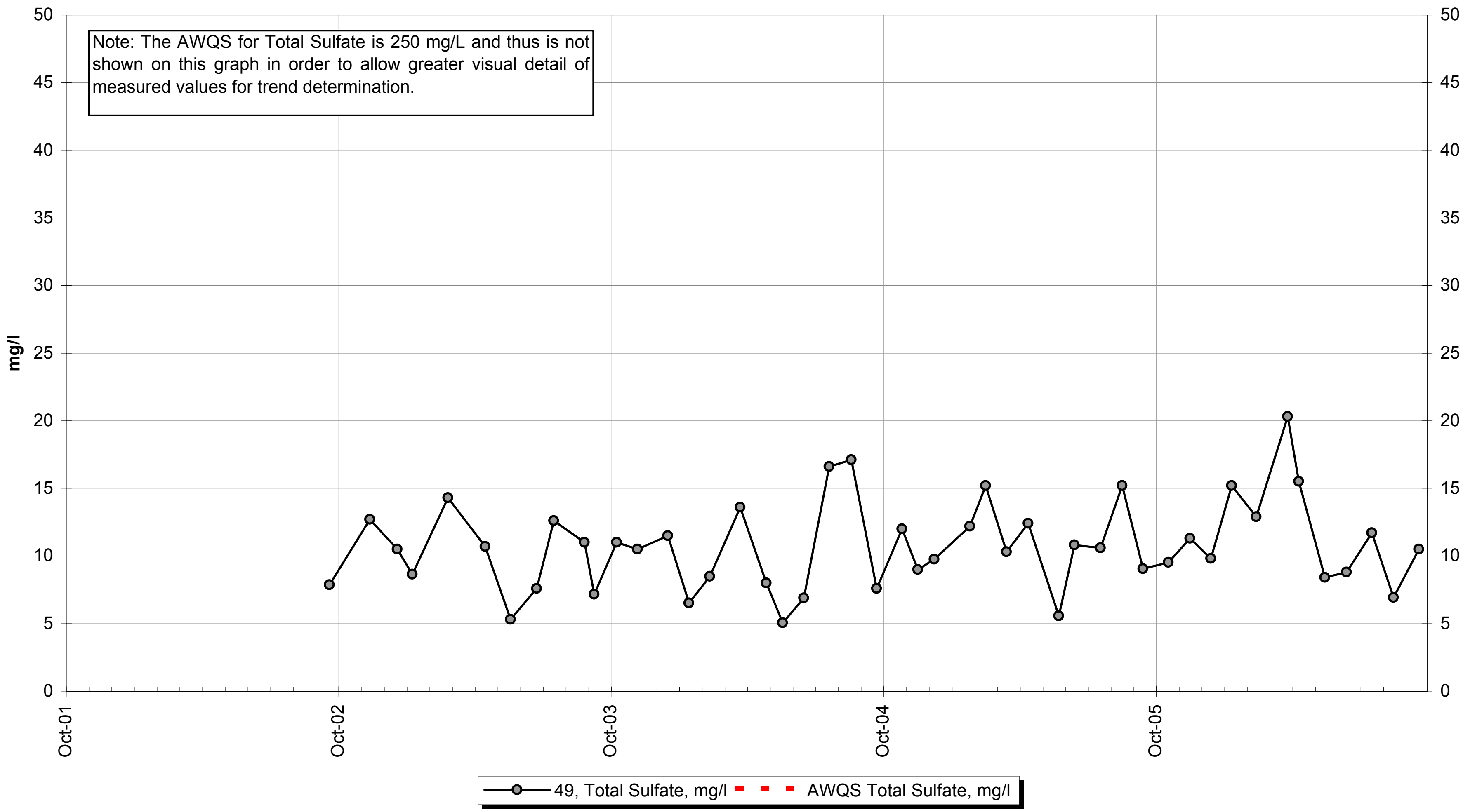


Site 49 -Total Alkalinity
mg/l
0
20
40
60
80
100
120
140
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
49, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

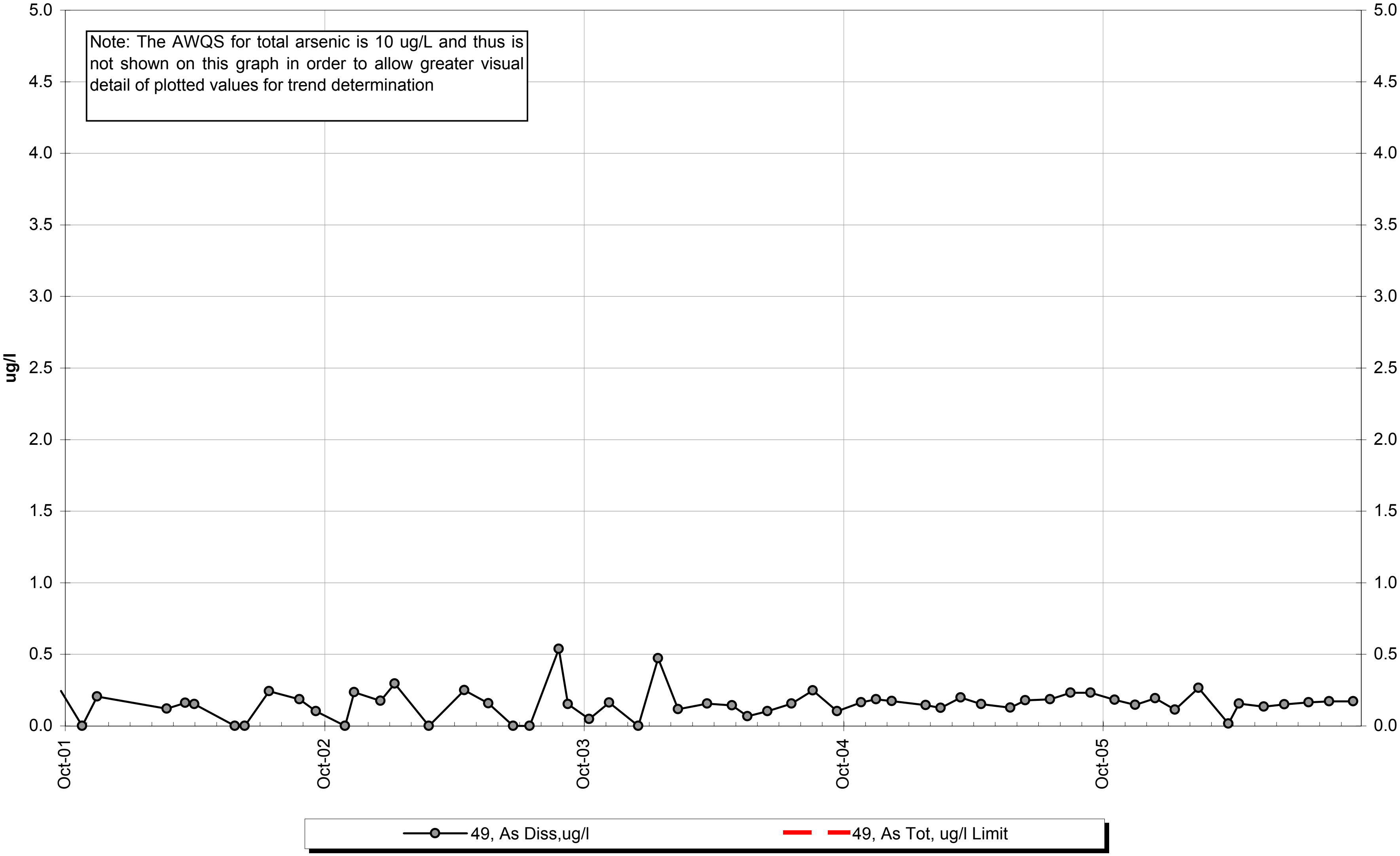


Site 49 -Hardness
140
120
100
80
60
40
20
0
mg/l
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
49, Hardness, mg/l

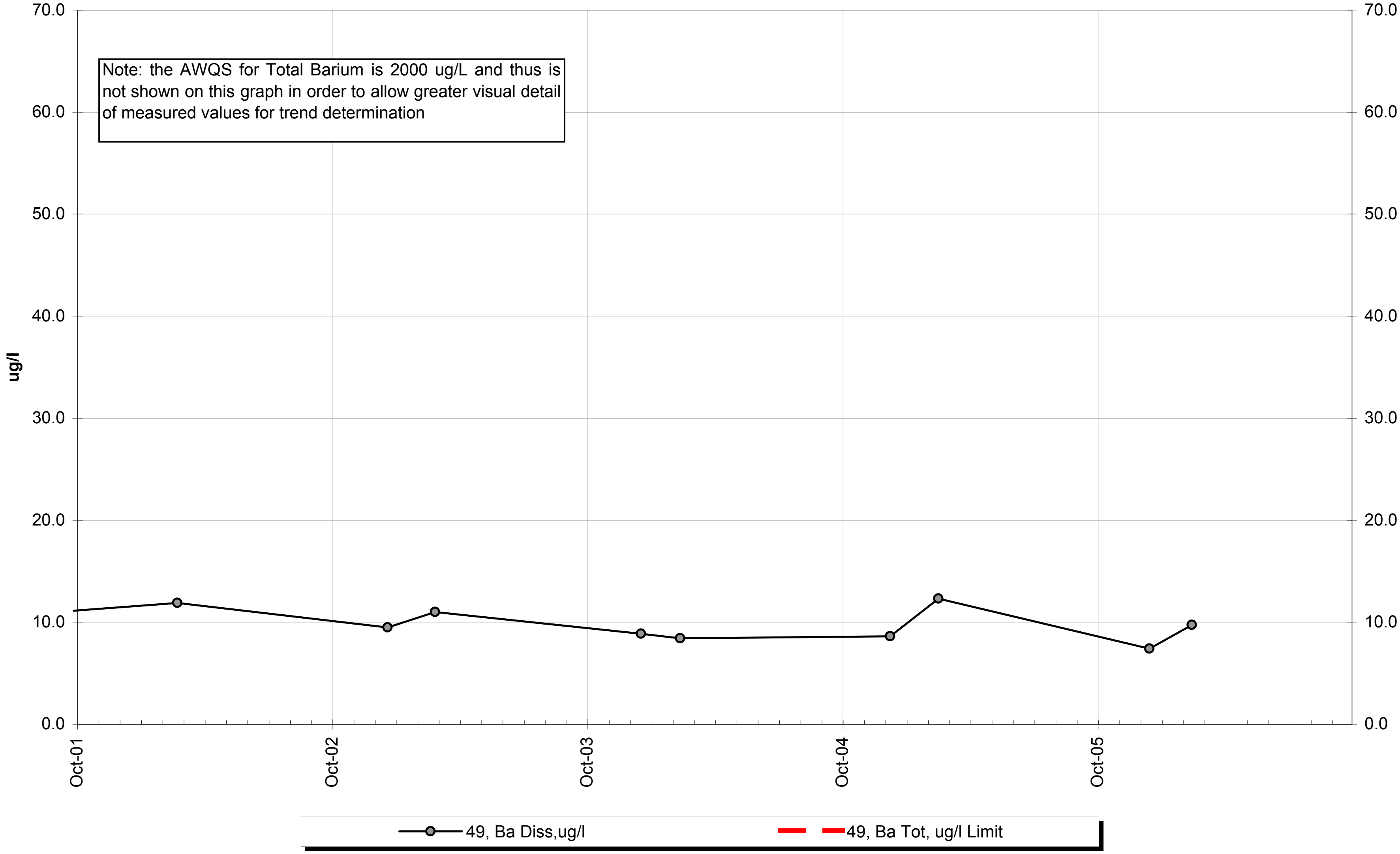
Site 49 -Total Sulfate



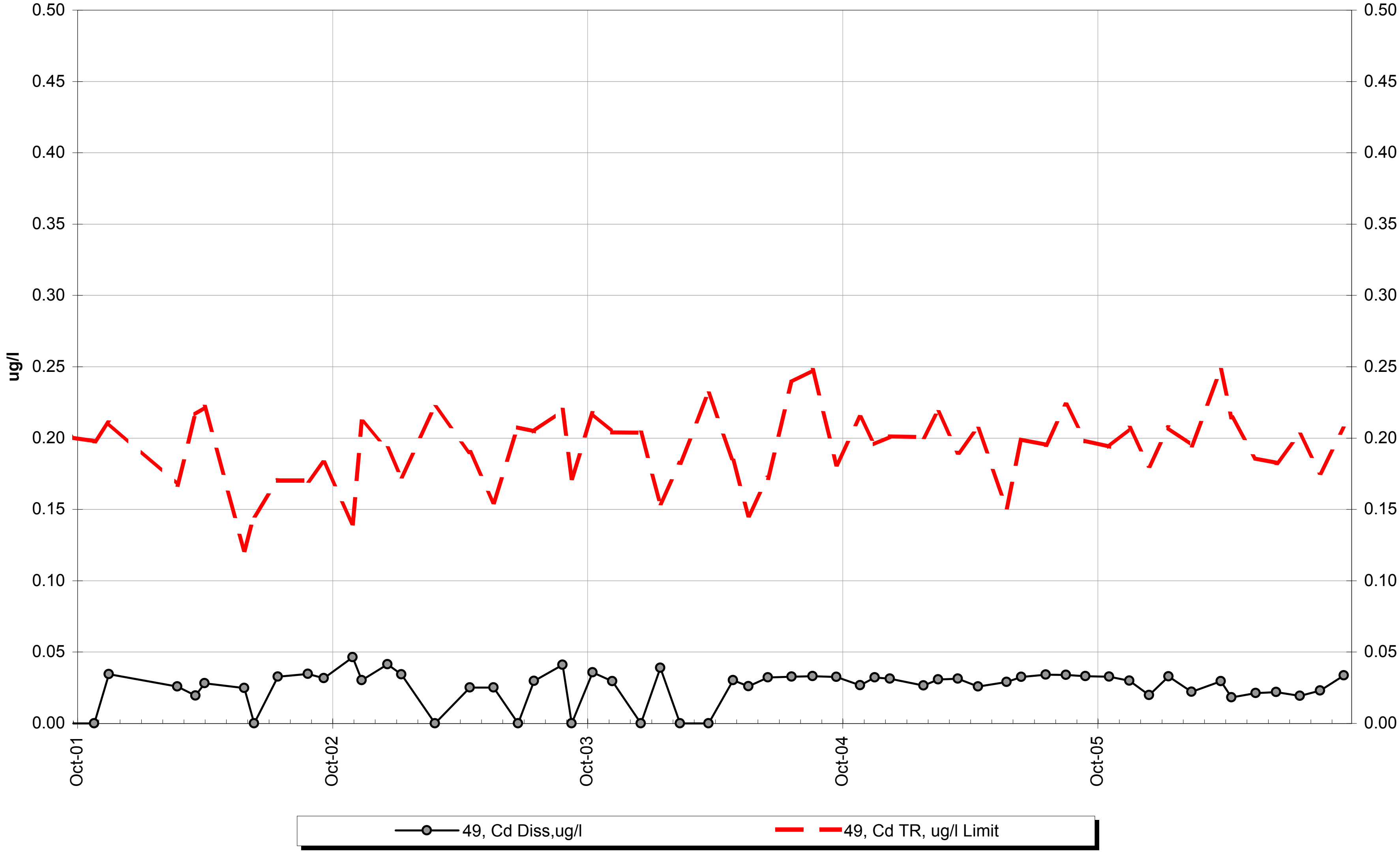
Site 49 -Dissolved Arsenic



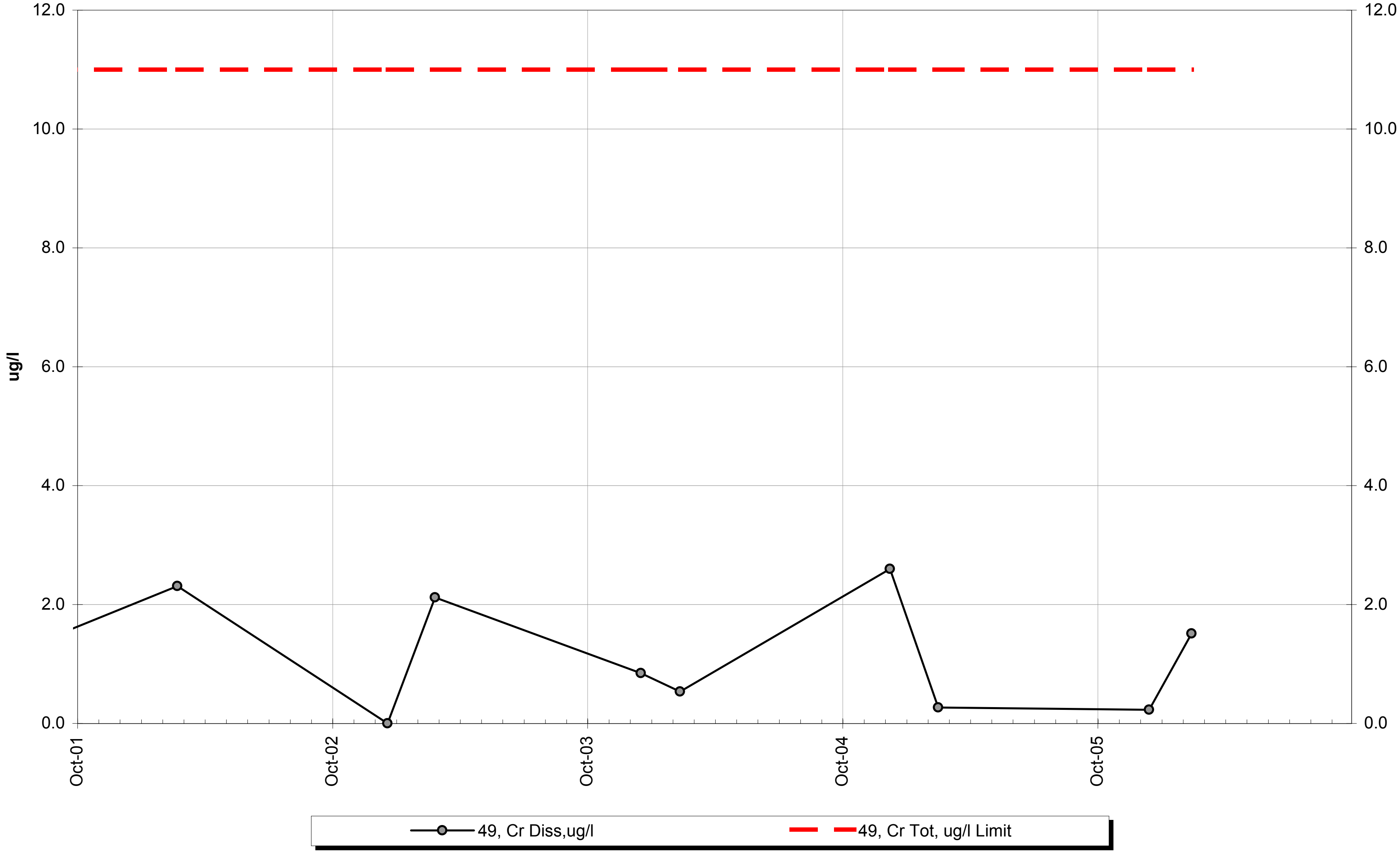
Site 49 -Dissolved Barium



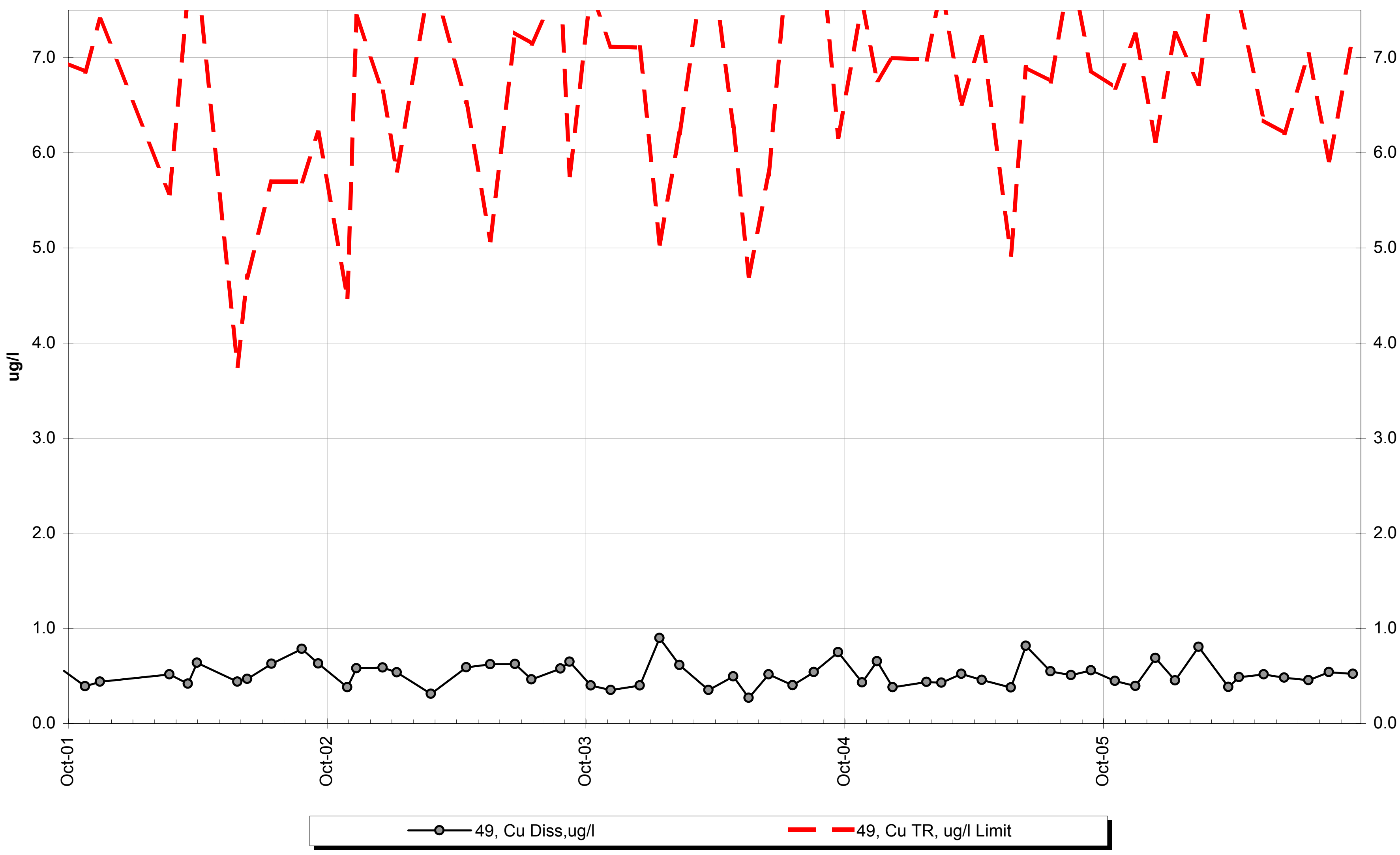
Site 49 -Dissolved Cadmium



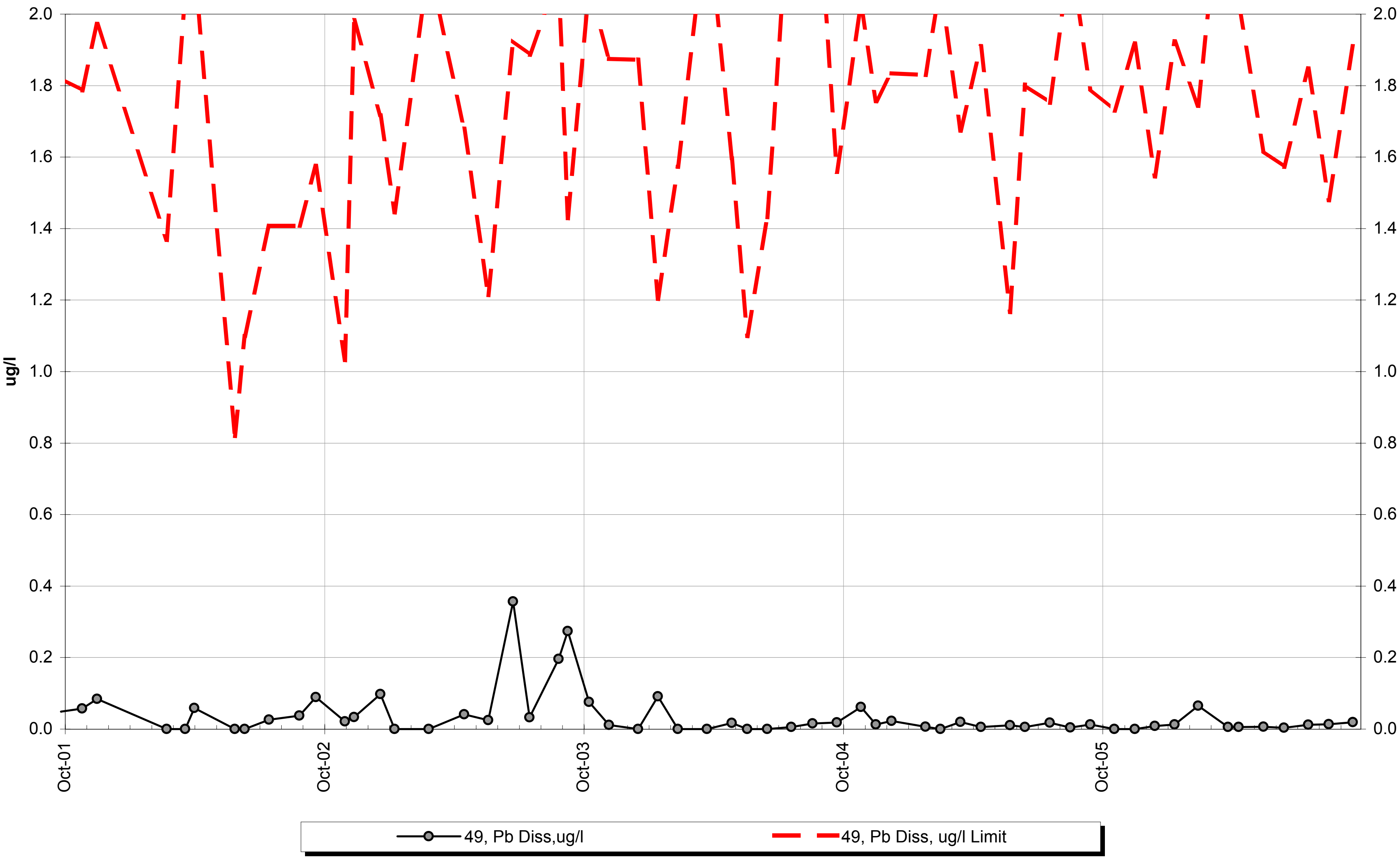
Site 49 -Dissolved Chromium

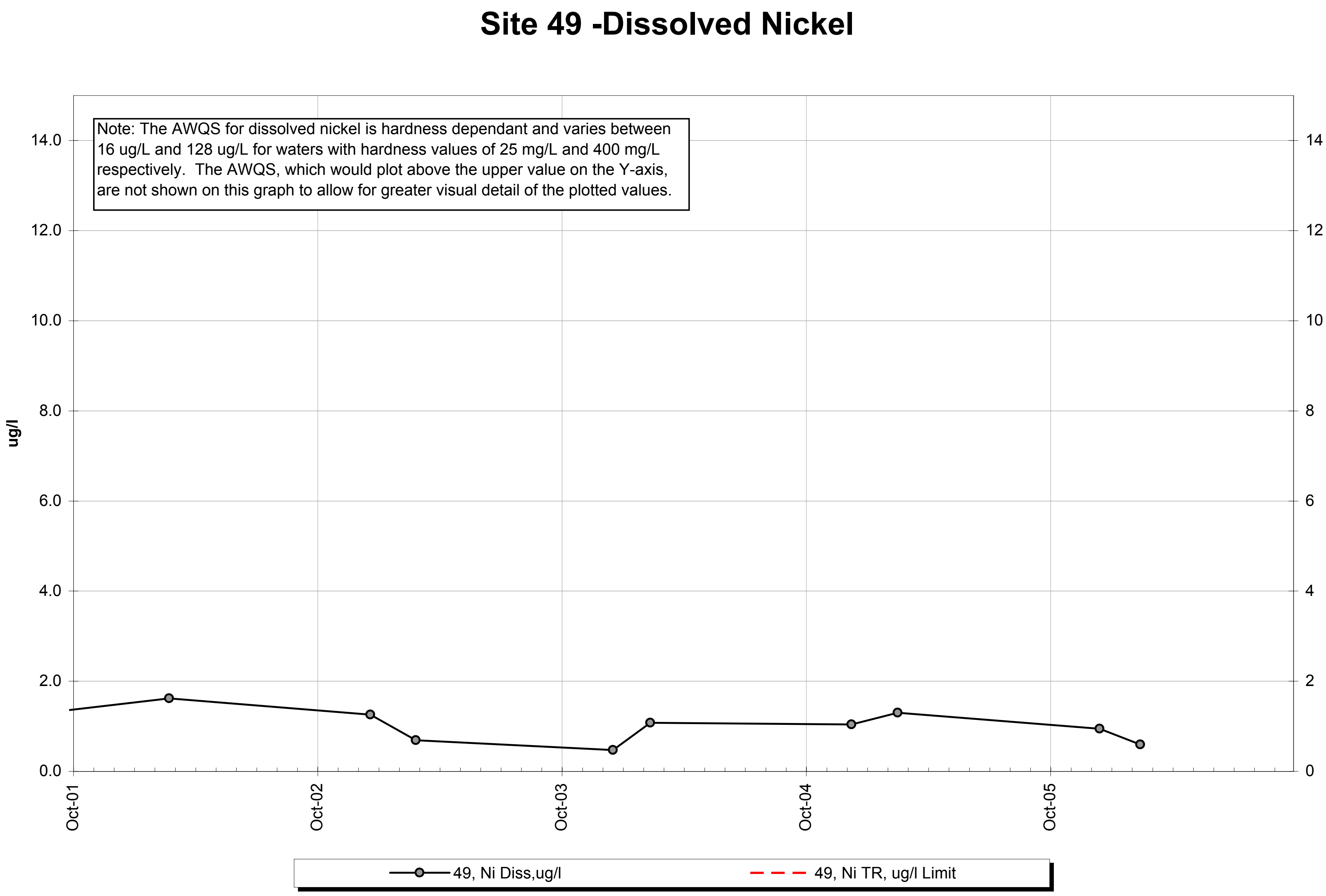


Site 49 -Dissolved Copper



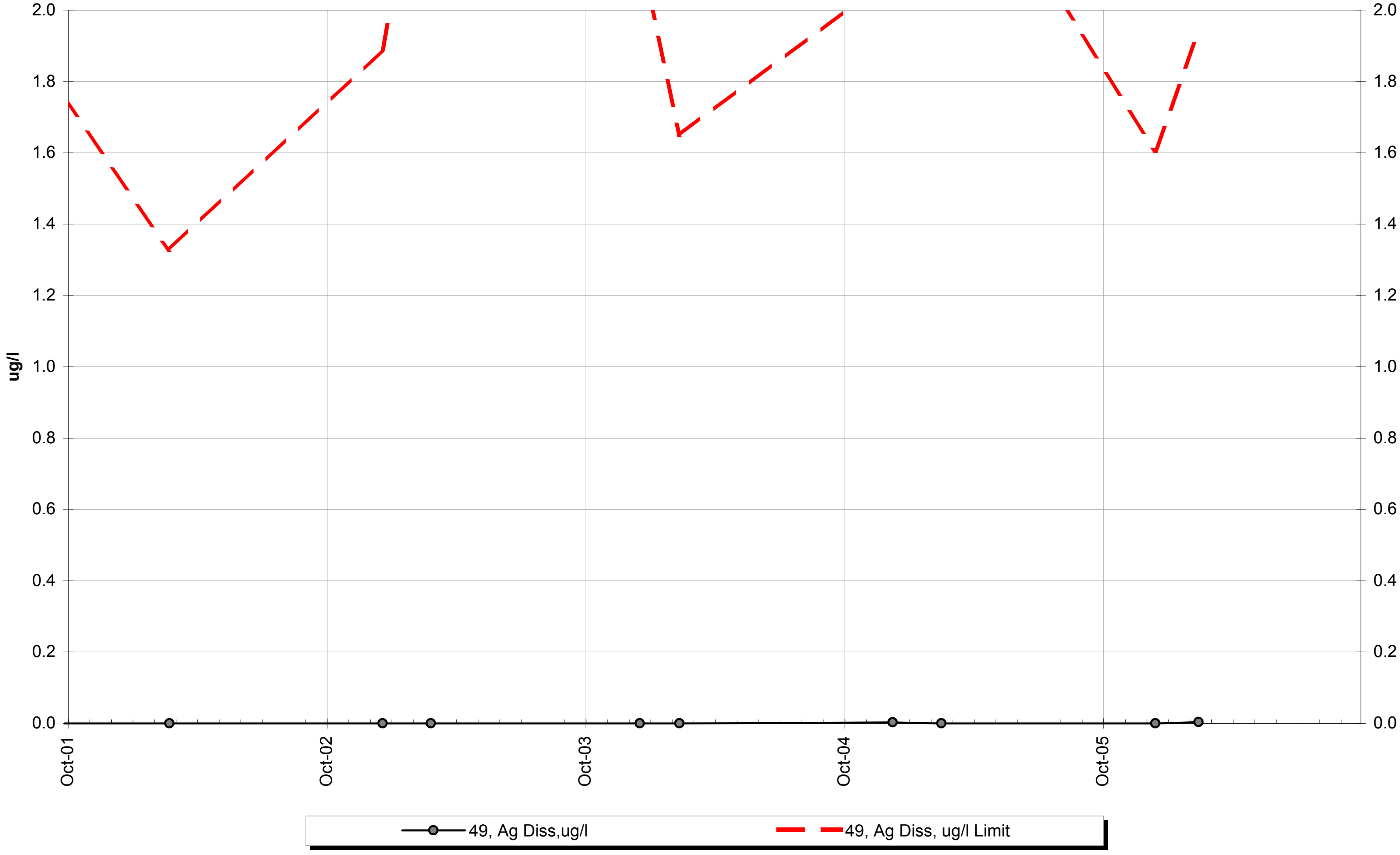
Site 49 -Dissolved Lead



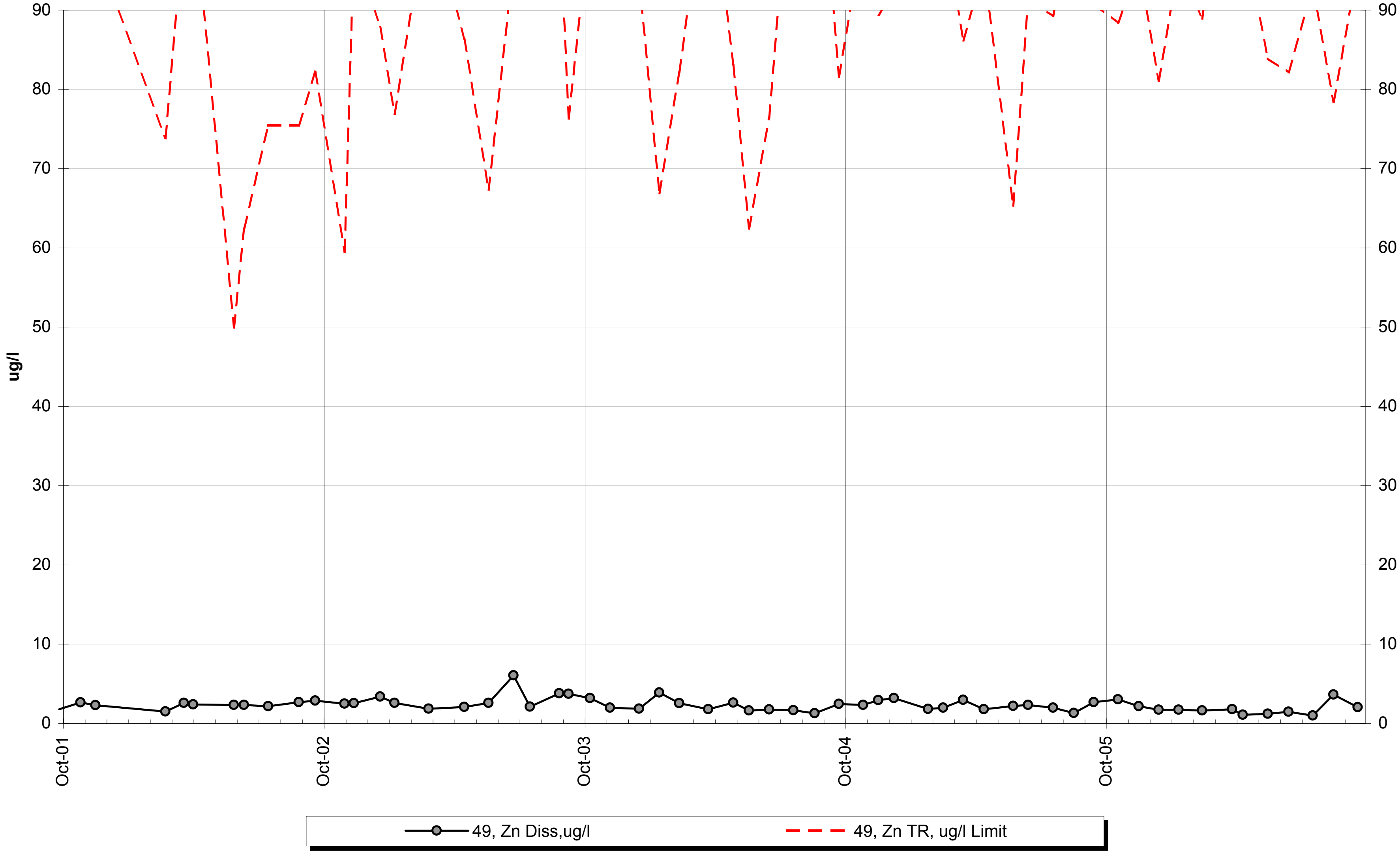


Site 49 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater 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-01
Oct-02
Oct-03
Oct-04
Oct-05
49, Ni Diss,ug/l
49, Ni TR, ug/l Limit

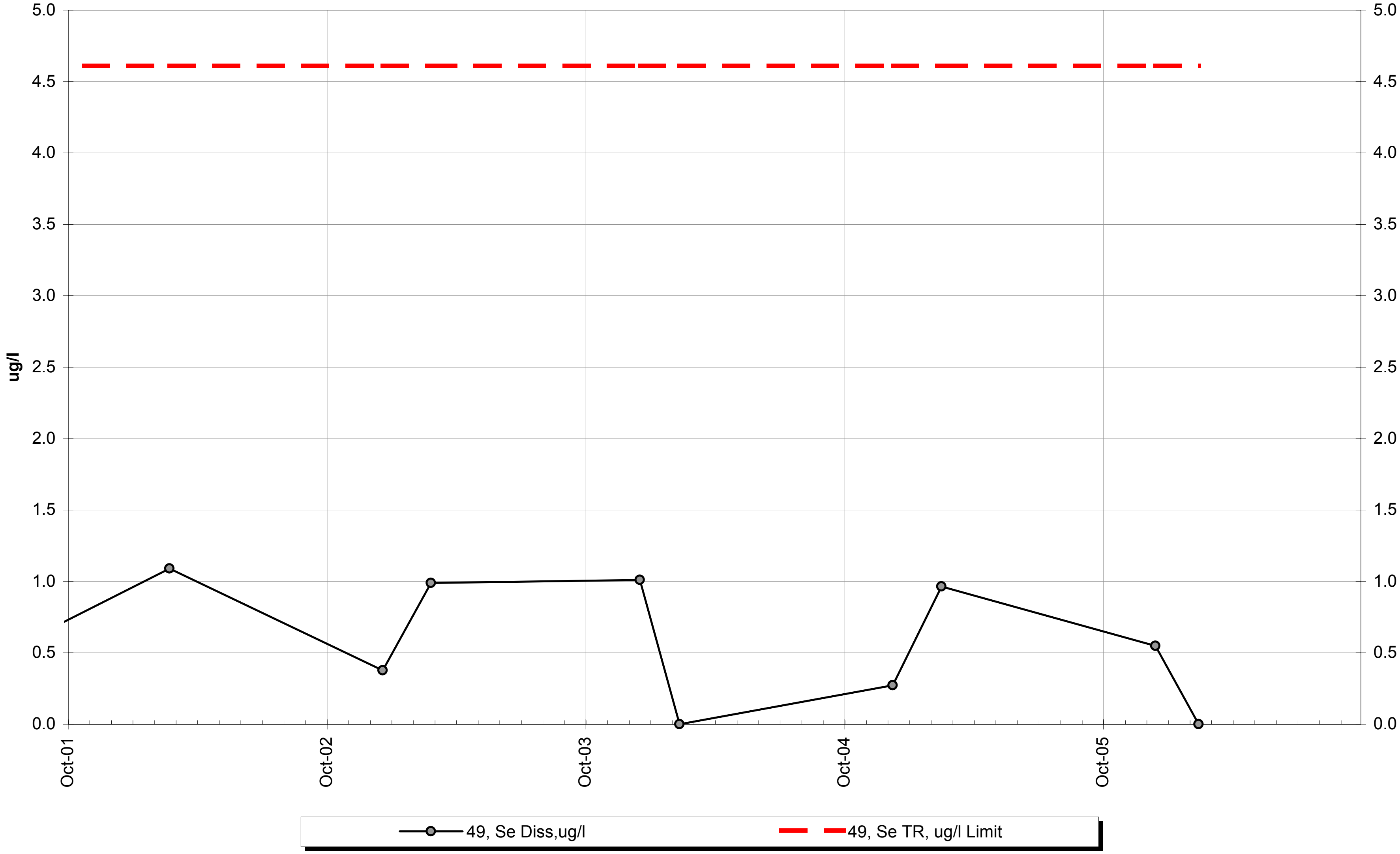
Site 49 -Dissolved Silver

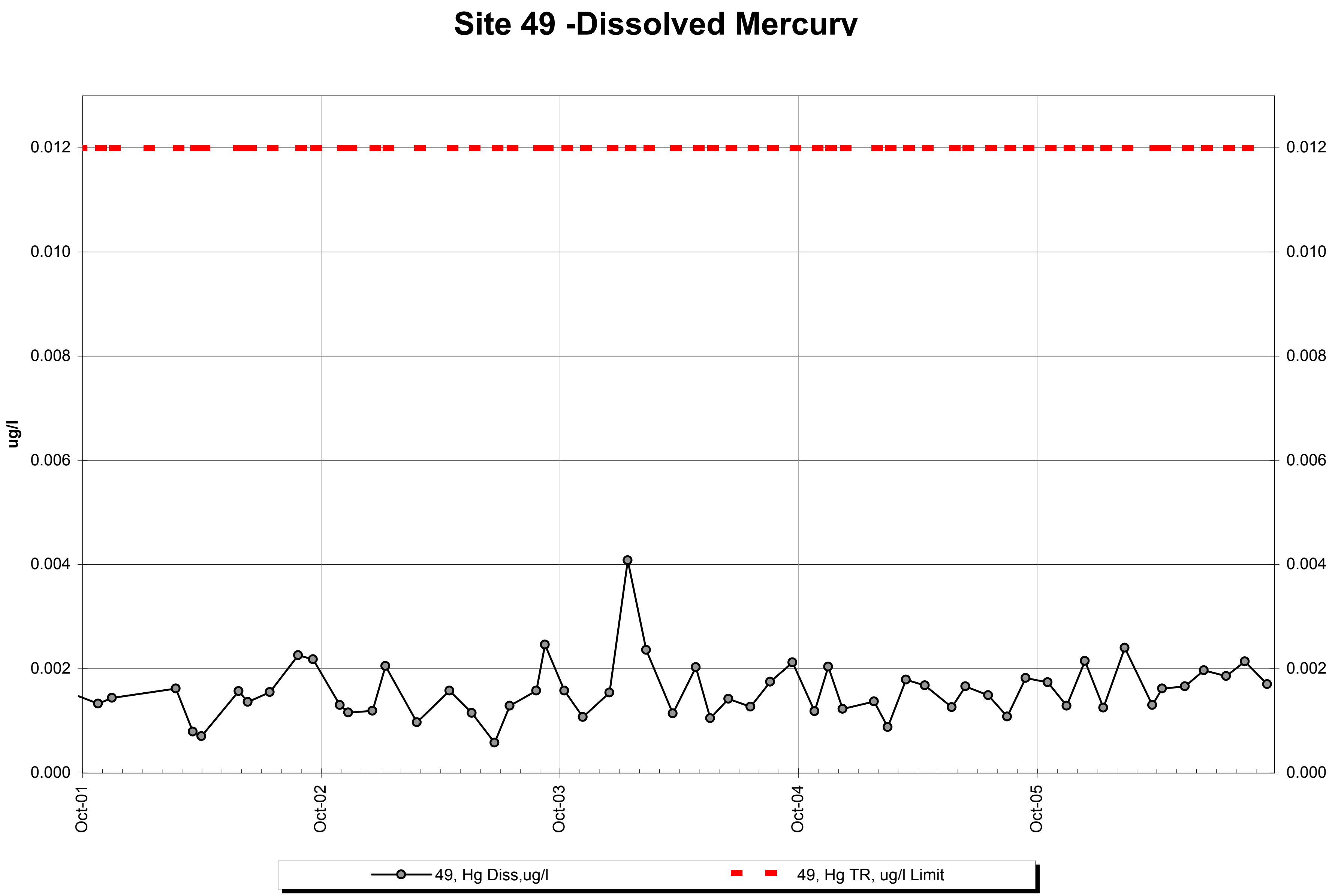


Site 49 -Dissolved Zinc



Site 49 -Dissolved Selenium




Site 49 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
49, Hg Diss,ug/l
49, Hg TR, ug/l Limit

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	**WY2001**	129.0	103.0	160.0	146.0			163.0	124.0	83.7	134.0	179.0	135.0
b	**WY2002**	147.0	156.0			169.0	194.0	203.0	65.5	106.0	133.0	119.0	127.0
c	**WY2003**	140.0	159.0	145.0	126.0	167.0		135.0	104.0	122.0	180.0	158.0	122.0
d	**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
e	**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
f	**WY2006**	133.0	141.0	129.0	151.0	139.0	193.0	148.0	118.0	124.0	143.0	111.0	140.0
	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	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	1	-1	-1
d-a	1	1	-1	-1			-1	-1	1	1	1	-1
e-a	1	1	-1	1			-1	-1	1	1	-1	-1
f-a	1	1	-1	1			-1	-1	1	1	-1	1
c-b	-1	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	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	-6	2	-6	-2	-3	1	11	5	-3	1

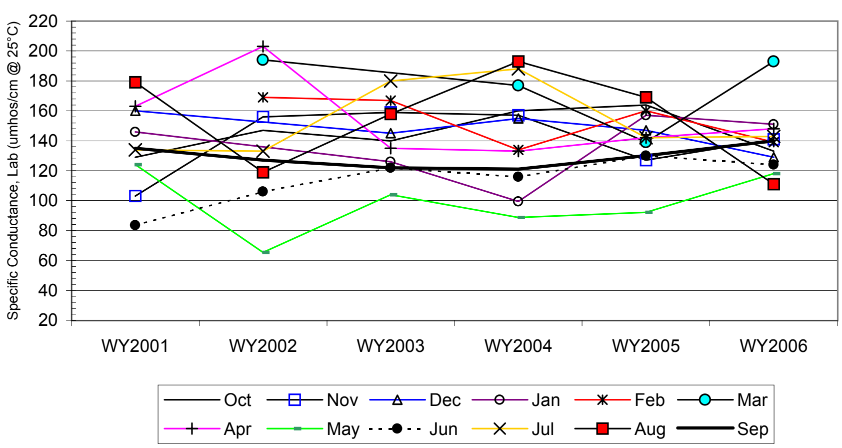
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	0.19	-1.47	0.49	-1.47	-0.68	-0.56	0.19	2.07	0.94	-0.56	0.19
Z^2_k	0.88	0.04	2.16	0.24	2.16	0.46	0.32	0.04	4.27	0.88	0.32	0.04

ΣZ_k= 0.25
ΣZ^2_k= 11.80
Z-bar=ΣZ_k/K= 0.02

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

Σn 67
ΣS_k 6

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	11.79	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.379**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc}	0.30	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
285.33 **p**	**0.616**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.50		4.22
0.050	-2.48	**0.90**	3.38
0.100	-2.00		2.96
0.200	-1.30		2.05

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	**WY2001**	7.4	7.6	7.6	7.5			7.8	6.8	6.9	7.8	7.4	7.5
b	**WY2002**	7.4	7.4			7.4	7.8	7.5	7.0	7.3	8.2	8.0	8.1
c	**WY2003**	7.6	8.1	7.8	7.9	7.8		7.6	7.8	7.9	8.0	7.8	8.0
d	**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
e	**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
f	**WY2006**	7.5	7.6	7.8	7.8	7.7	7.5	7.8	7.5	7.5	7.6	7.4	7.1
	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	1	0	0	0	1	0	0	0	2	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	1	1	1
d-a	1	1	1	1			1	1	1	1	1	1
e-a	1	1	1	1			1	1	1	-1	1	1
f-a	1	-1	1	1			0	1	1	-1	0	-1
c-b	1	1			1		1	1	1	-1	-1	-1
d-b	1	1			1	1	1	1	1	-1	0	-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	1	1
e-c	1	-1	1	1	1		1	1	-1	-1	-1	-1
f-c	-1	-1	0	-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	-1	5	4	4	0	4	9	3	-7	-3	-5

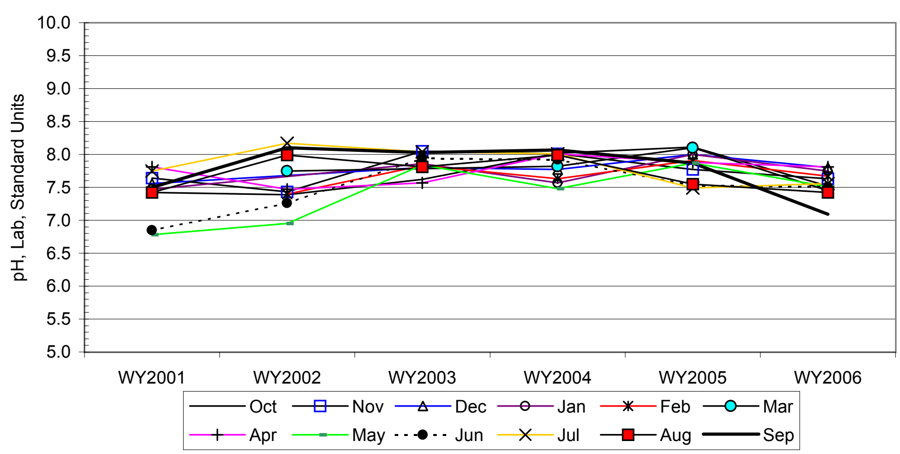
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	1.32	-0.19	1.22	0.98	0.98	0.00	0.75	1.69	0.56	-1.32	-0.56	-0.94
Z^2_k	1.73	0.04	1.50	0.96	0.96	0.00	0.56	2.86	0.32	1.73	0.32	0.88

ΣZ_k= 4.50
ΣZ^2_k= 11.86
Z-bar=$\Sigma Z_k/K$= 0.37

Tie Extent	t_1	t_2	t_3	t_4	t_5
Count	4	0	0	0	0

Σn 67
ΣS_k 20

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		10.17	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity
	p	**0.515**			$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
$\Sigma VAR(S_k)$	Z_{calc}	1.12	@α/2=2.5% Z=	1.96	H_0 (No trend) ACCEPT
285.33	p	**0.870**			H_A (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.04		0.09
0.050	-0.02	**0.03**	0.07
0.100	0.00		0.07
0.200	0.01		0.05

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	**WY2001**	46.9	47.3	71.8	63.0			66.7	55.4	38.2	59.3	76.7	61.6
b	**WY2002**	61.5	64.4			67.5	78.3	79.1	27.9	47.1	57.7	51.5	56.0
c	**WY2003**	73.9	63.1	63.8	57.4	74.3		60.3	47.4	58.4	74.5	71.2	56.7
d	**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
e	**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
f	**WY2006**	59.3	58.0	52.8	62.6	55.6	77.8	58.9	53.4	51.2	60.7	52.0	57.3
	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
c-a	1	1	-1	-1			-1	-1	1	1	-1	-1
d-a	1	1	-1	-1			-1	-1	1	1	1	-1
e-a	1	1	-1	1			1	-1	1	1	-1	-1
f-a	1	1	-1	-1			-1	-1	1	1	-1	-1
c-b	1	-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	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	-4	0	-2	-2	-5	3	7	3	-1	-1

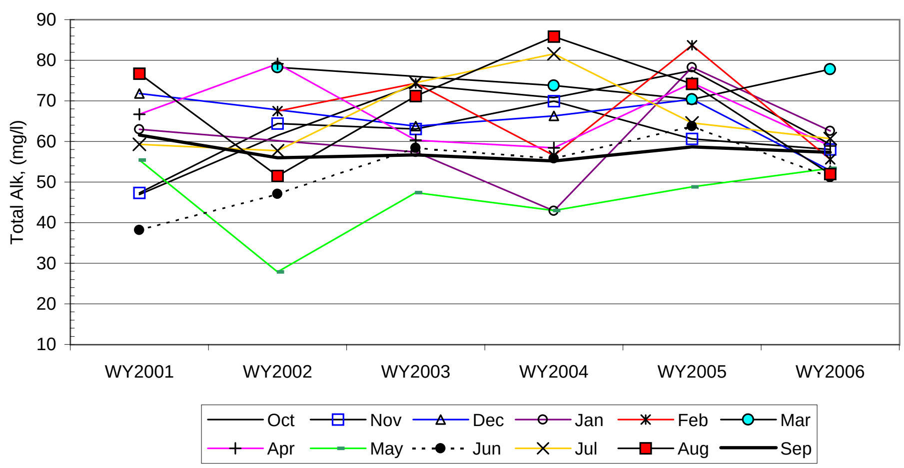
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	16.67	8.67	28.33	28.33	28.33	28.33	28.33	28.33
$Z_k = S_k/\sigma_S$	0.94	-0.19	-0.98	0.00	-0.49	-0.68	-0.94	0.56	1.32	0.56	-0.19	-0.19
Z^2_k	0.88	0.04	0.96	0.00	0.24	0.46	0.88	0.32	1.73	0.32	0.04	0.04

ΣZ_k=	-0.27
ΣZ^2_k=	5.90
Z-bar=ΣZ_k/K=	-0.02

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

Σn	67
ΣS_k	2

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	5.89	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.881**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc}	0.06	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
285.33 p	**0.524**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.60		2.24
0.050	-1.30	**0.16**	1.71
0.100	-0.84		1.05
0.200	-0.48		0.77

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	**WY2001**	2.0	2.7	3.9	1.7			1.3	1.8	2.1	1.7	1.2	1.8
b	**WY2002**	2.7	2.3			1.5	2.6	2.4	2.3	2.3	2.2	2.7	2.9
c	**WY2003**	2.5	2.6	3.4	2.6	1.9		2.1	2.6	6.1	2.1	3.8	3.7
d	**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
e	**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
f	**WY2006**	3.0	2.2	1.7	1.7	1.6	1.8	1.1	1.2	1.5	1.0	3.6	2.1
	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
c-a	1	-1	-1	1			1	1	1	1	1	1
d-a	1	-1	-1	1			1	-1	-1	-1	1	1
e-a	1	1	-1	1			1	1	1	1	1	1
f-a	1	-1	-1	1			-1	-1	-1	-1	1	1
c-b	-1	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	0	-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	-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	-3	-8	0	2	-2	-3	-5	-4	-7	5	-1

	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	-0.56	-1.96	0.00	0.49	-0.68	-0.56	-0.94	-0.75	-1.32	0.94	-0.19
Z^2_k	0.88	0.32	3.84	0.00	0.24	0.46	0.32	0.88	0.56	1.73	0.88	0.04

ΣZ_k= -4.59

ΣZ^2_k= 10.15

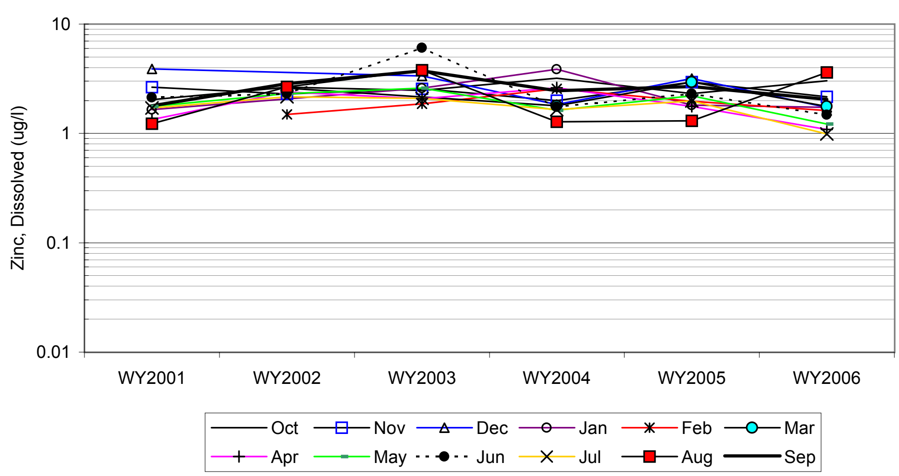
Z-bar=ΣZ_k/K= -0.38

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

Σn 67

ΣS_k -21

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	8.40	@α=5% $\chi^2_{(K-1)}$=	19.68	Test for station homogeneity	
p	**0.677**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -1.18	@α/2=2.5% Z=	1.96	**H_0** (No trend)	ACCEPT
285.33	**p** **0.118**			**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.19		0.05
0.050	-0.13	**-0.06**	0.02
0.100	-0.12		0.00
0.200	-0.10		-0.04

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 2006" report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 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-05 though Sept-06.				

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 Kendall analyses are presented on the pages following this interpretive section. The table above summarizes the results on the data collected between Oct-00 and Sep-06 (WY2001-WY2006). No significant trends are identified.

Site 46-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.81	+		
pH, Lab	6	0.19	-		
Alkalinity, Total	6	0.84	+		
Zinc, Dissolved	6	0.07	-		

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

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 whose 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 2006 data set. Additional tables summarizing results for Water Years 2000-2004 can also be found following this interpretive section. For alkalinity, sulfate, 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 specific conductance and pH are both identified as being very significantly (p=0.01 and p=0.99 respectively) different. The median value for conductivity for Site 49 and Site 46 are 140-uS/cm and 146-uS/cm respectively and the median of the differences is -2.0-uS/cm. The small but significant difference appears to be related to a minor (~2.5uS/cm) drop in the median conductance at Site 49 while values are relatively stable at Site 46. The median values for pH for Site 49 and Site 46 are 7.54 su and 7.36 su respectively and the median of differences, Site 49 minus Site 46, is 0.17 su. A similar difference was noted for WY 2005. Inspection of the Site 46 X-Y shows a similar pattern for the past two water years. During the first half of the water year (Oct-Apr) pH ranges between 7.5 to 8.0 and then drops slightly during the latter half of the water year to a 7.0 to 7.5 range. Additional comparative X-Y graphs of field pH indicate a slightly greater degree of variation between the sites and a smaller magnitude in the differences. Given the small magnitude and the inconsistency between field and lab 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. KGCMC proposes to collect additional data over the 2007 water year in an attempt to more fully understand the above noted inconsistencies. This expanded data will include duplicate lab pH determinations and limited analysis for total constituents that may anomalously impact the laboratory pH. Additionally, duplicate statistical testing will be presented for both field and lab values. This data will be presented in the 2007 annual report.

Site 46 vs Site 49 - WY2006, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site 49 median	Site 46 median	Median of Differences
Conductivity, Lab	**0.01**	**140**	**146**	**-2.0**
pH, Lab	**0.99**	**7.54**	**7.36**	**0.17**
Alkalinity, Total	0.02	57.7	60.3	-2.0
Sulfate, Total	0.29	10.9	11.2	-0.1
Zinc, Dissolved	0.97	1.73	1.50	0.25

Table of Results for Water Year 2006

Site 46 "Lower Bruin Creek"

Sample Date/Parameter	10/18/05	11/16/05	12/14/05	1/11/06	2/13/06	3/27/06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/19/06	**Median**
Water Temp (°C)	4.9	2.1	2.5	1.5	1.0	0.5	0.9	3.4	9.0	9.4	8.9	7.7	3.0
Conductivity-Field(μmho)	140	137	111	135	153	187	169	119	116	131	107	96	133
Conductivity-Lab (μmho)	135	146	130	149	146	191	150	121	126	145	116	148	146
pH Lab (standard units)	7.12 J	7.39	7.71 R	7.84 J	7.52	7.66	7.67 J	7.16	7.33 J	7.07	7.14	7.04 J	7.36
pH Field (standard units)	8.20	8.07	7.82	7.26	7.58	8.02	7.69	7.27	7.36	7.81	8.28	8.15	7.82
Total Alkalinity (mg/L)	60.8	59.8	51.9	63.0	59.6	73.6	62.4	56.3	53.3	62.0	54.1	64.8	60.3
Total Sulfate (mg/L)	9.5	11.5 J	9.7	14.3	12.9	19.3	15.6	8.9	8.9	11.8	7.3	10.9	11.2
Hardness (mg/L)	73.6	80.1	66.7	78.7	75.2	100.0	83.4	67.4	65.2	78.0	64.6	82.2	76.6
Dissolved As (ug/L)	0.309	0.283	0.304	0.088	0.240 U	0.042 J	0.197	0.163	0.188	0.181	0.200	0.258	0.199
Dissolved Ba (ug/L)			7.0		10.7								8.8
Dissolved Cd (ug/L)	0.030	0.024	0.017	0.020 U	0.025 U	0.028	0.026	0.018	0.019 U	0.020	0.018	0.026	0.022
Dissolved Cr (ug/L)			0.246 J		0.891								0.569
Dissolved Cu (ug/L)	0.469	0.384	0.647 U	0.412 U	0.733	0.338 U	0.801	0.519	0.485 U	0.484	0.506	0.478	0.485
Dissolved Pb (ug/L)	0.0116 U	0.0086 U	0.0145 U	0.0150 U	0.0136 U	0.0606	0.0119 U	0.0153 U	0.0065 U	0.0072 U	0.0413 U	0.0316	0.0141
Dissolved Ni (ug/L)			0.775 U		0.441								0.608
Dissolved Ag (ug/L)			<0.002		<0.002								0.001
Dissolved Zn (ug/L)	2.54 U	1.78 U	1.29 U	2.11 U	1.42 U	1.56 U	1.53	1.13 U	1.19 U	1.07 U	1.99 UJ	1.47	1.50
Dissolved Se (ug/L)			0.574		0.158 J								0.366
Dissolved Hg (ug/L)	0.001520 U	0.001340 U	0.001810	0.001270 U	0.002290	0.001170 U	0.001800	0.001740 U	0.001920 U	0.001860	0.001840	0.001590 U	0.001770

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
46	01/11/2006	1:30:00 PM				
			pH Lab, su	7.84	J	Hold Time Violation
			Cd Diss, ug/l	0.02	U	Field Blank Contamination
			Cu Diss, ug/l	0.412	U	Field Blank Contamination
			Pb Diss, ug/l	0.015	U	Field Blank Contamination
			Zn Diss, ug/l	2.11	U	Field Blank Contamination
			Hg Diss, ug/l	0.00127	U	Field Blank Contamination
46	10/18/2005	11:29:00 AM				
			pH Lab, su	7.12	J	Hold Time Violation
			Pb Diss, ug/l	0.0116	U	Field Blank Contamination
			Zn Diss, ug/l	2.54	U	Field Blank Contamination
			Hg Diss, ug/l	0.00152	U	Field Blank Contamination
46	11/16/2005	10:26:00 AM				
			SO4 Tot, mg/l	11.5	J	Receipt Temperature
			Pb Diss, ug/l	0.00864	U	Field Blank Contamination
			Zn Diss, ug/l	1.78	U	Field Blank Contamination
			Hg Diss, ug/l	0.00134	U	Field Blank Contamination
46	12/14/2005	11:48:00 AM				
			pH Lab, su	7.71	R	Hold Time Violation
			Cr Diss, ug/l	0.246	J	Duplicate RPD
			Cu Diss, ug/l	0.647	U	Field Blank Contamination
			Pb Diss, ug/l	0.0145	U	Field Blank Contamination
			Ni Diss, ug/l	0.775	U	Field Blank Contamination
			Zn Diss, ug/l	1.29	U	Field Blank Contamination
46	02/13/2006	12:56:00 PM				
			As Diss, ug/l	0.24	U	Field Blank Contamination
			Cd Diss, ug/l	0.0246	U	Field Blank Contamination
			Pb Diss, ug/l	0.0136	U	Field Blank Contamination
			Zn Diss, ug/l	1.42	U	Field Blank Contamination
			Se Diss, ug/l	0.158	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

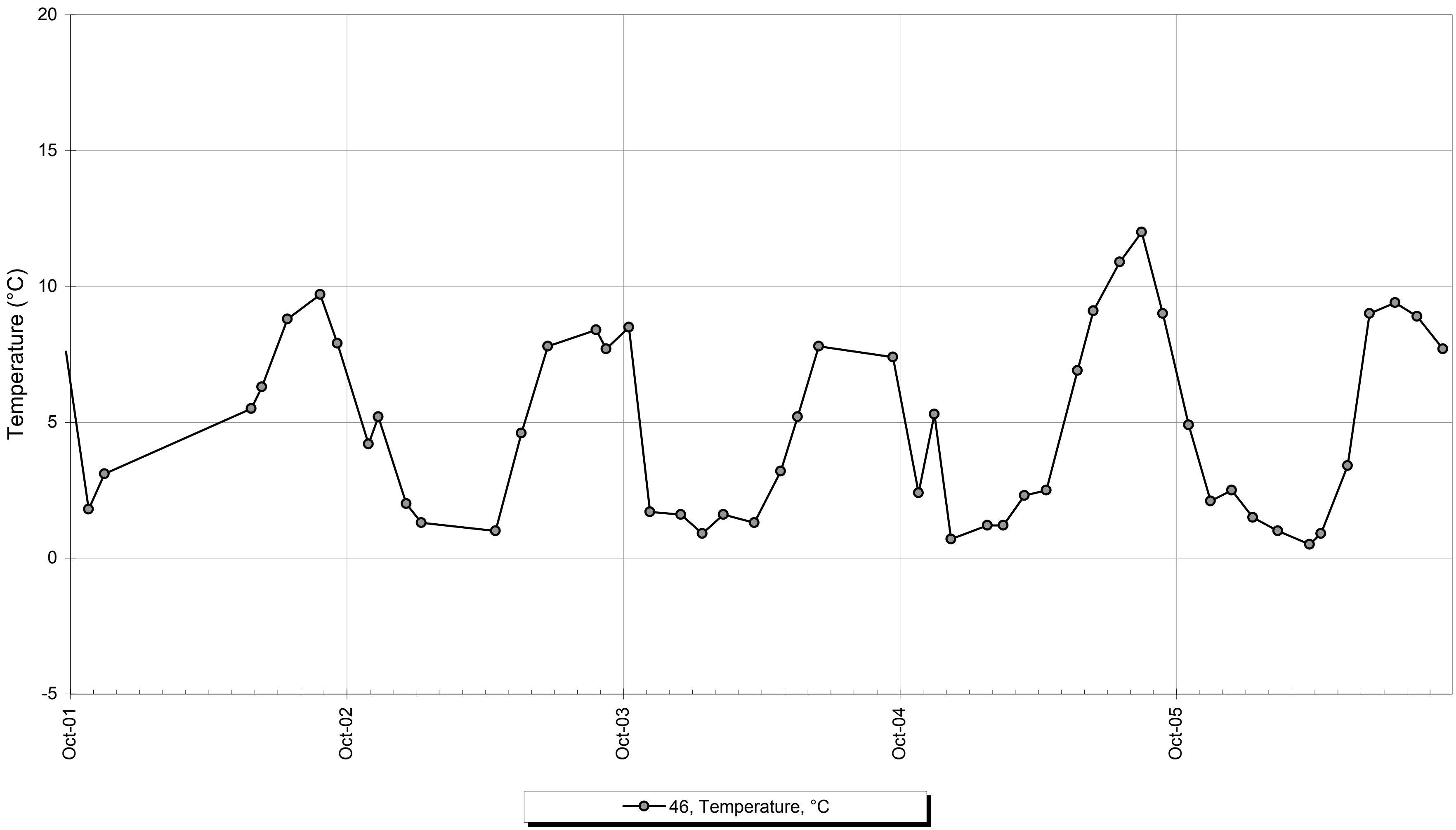
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

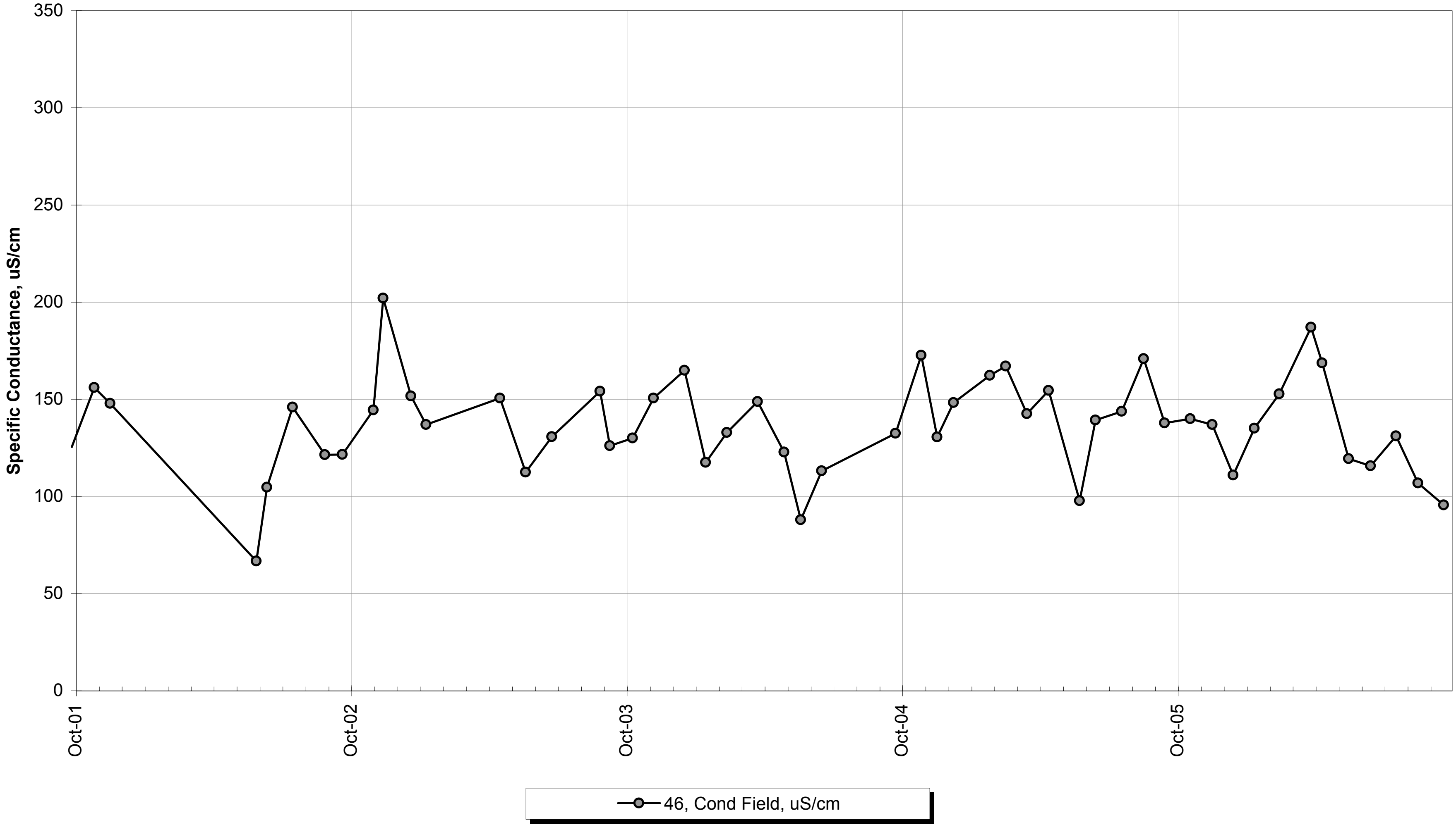
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
46	03/27/2006	12:04:00 PM				
			As Diss, ug/l	0.0416	J	Below Quantitative Range
			Cu Diss, ug/l	0.338	U	Field Blank Contamination
			Zn Diss, ug/l	1.56	U	Field Blank Contamination
			Hg Diss, ug/l	0.00117	U	Field Blank Contamination
46	04/11/2006	12:02:00 PM				
			pH Lab, su	7.67	J	Outside Hold Time
			Pb Diss, ug/l	0.0119	U	Field Blank Contamination
46	05/16/2006	10:55:00 AM				
			Pb Diss, ug/l	0.0153	U	Field Blank Contamination
			Zn Diss, ug/l	1.13	U	Field Blank Contamination
			Hg Diss, ug/l	0.00174	U	Field Blank Contamination
46	06/14/2006	7:55:00 AM				
			pH Lab, su	7.33	J	Hold Time Violation
			Cd Diss, ug/l	0.0189	U	Field Blank Contamination
			Cu Diss, ug/l	0.485	U	Field Blank Contamination
			Pb Diss, ug/l	0.00649	U	Field Blank Contamination
			Zn Diss, ug/l	1.19	U	Field Blank Contamination
			Hg Diss, ug/l	0.00192	U	Field Blank Contamination
46	07/18/2006	9:56:00 AM				
			Pb Diss, ug/l	0.00723	U	Field Blank Contamination
			Zn Diss, ug/l	1.07	U	Field Blank Contamination
46	08/16/2006	12:41:00 PM				
			Pb Diss, ug/l	0.0413	U	Field Blank Contamination
			Zn Diss, ug/l	1.99	UJ	Field Blank Contamination, LC
46	09/19/2006	1:18:00 PM				
			pH Lab, su	7.04	J	Hold Time Violation
			Hg Diss, ug/l	0.00159	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

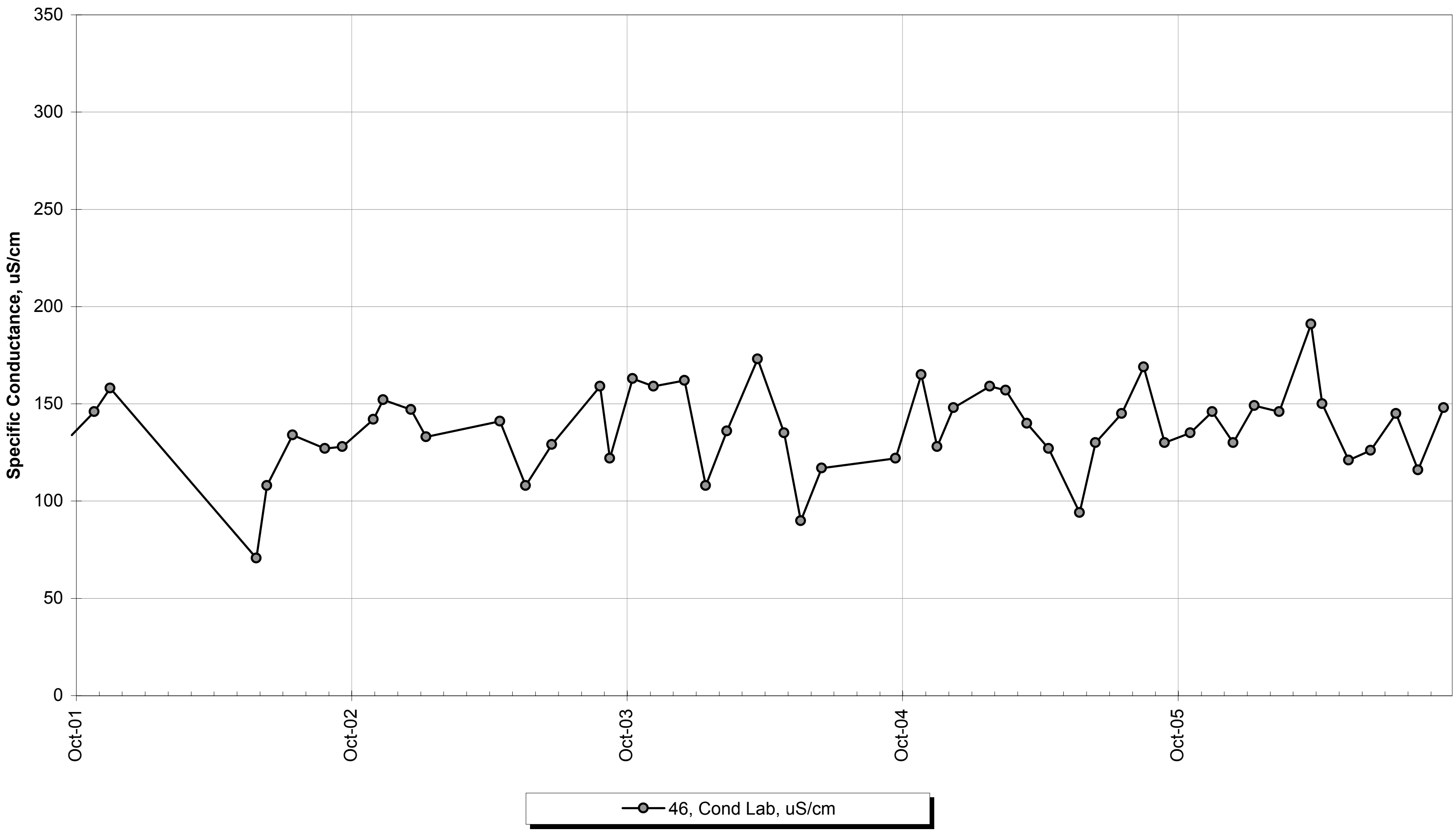
Site 46 -Water Temperature

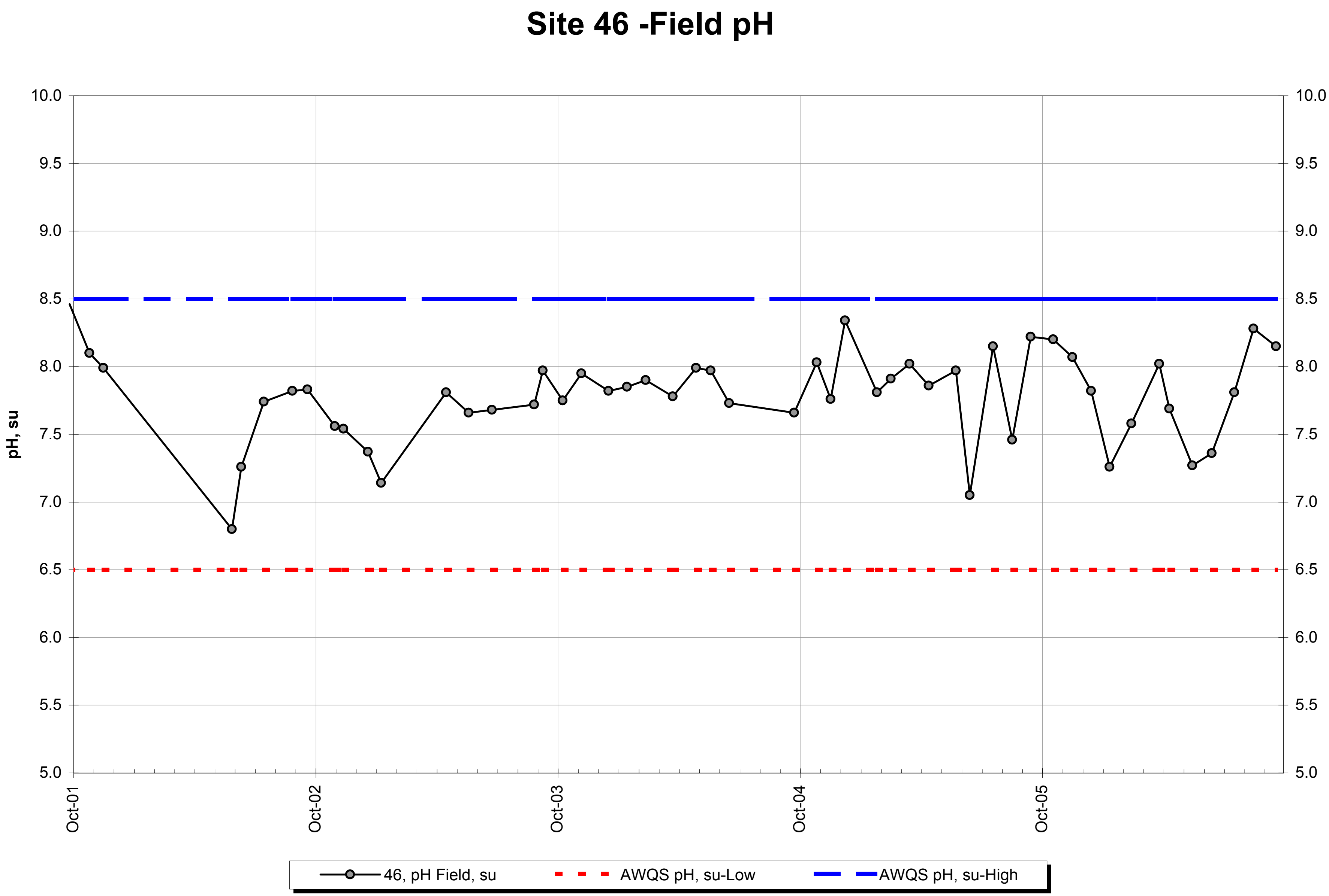


Site 46 -Conductivity-Field

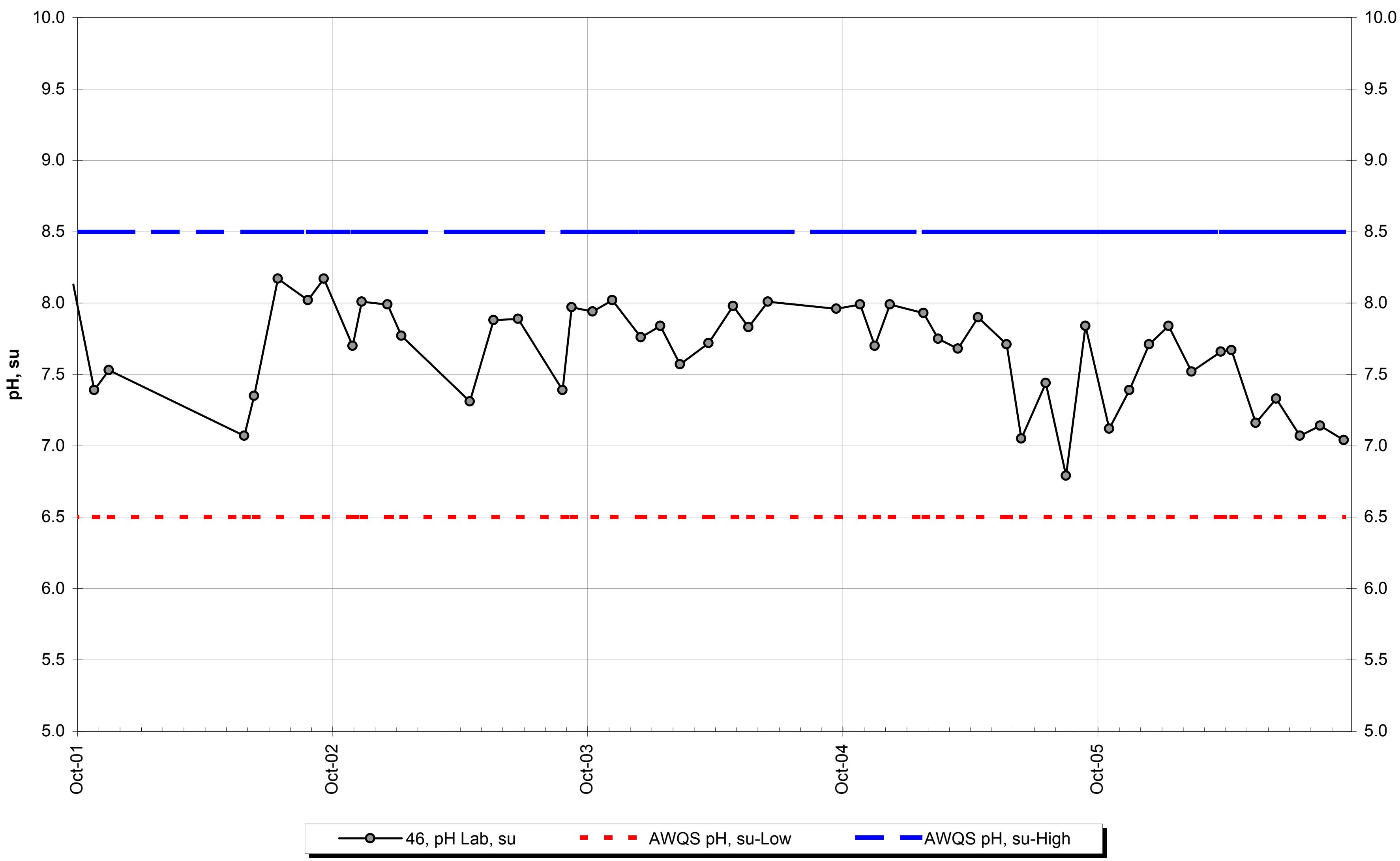


Site 46 -Conductivity-Lab

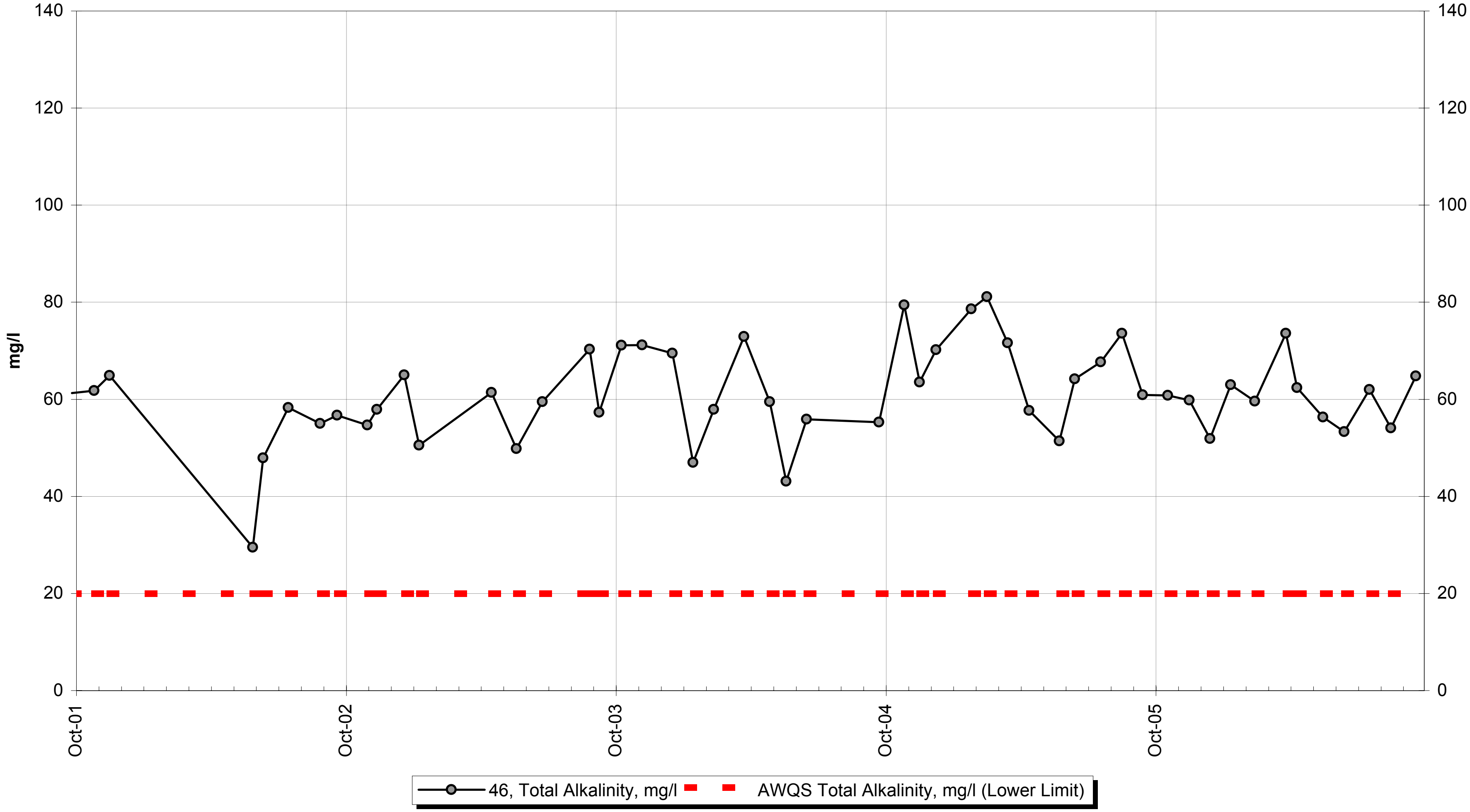



Site 46 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
46, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

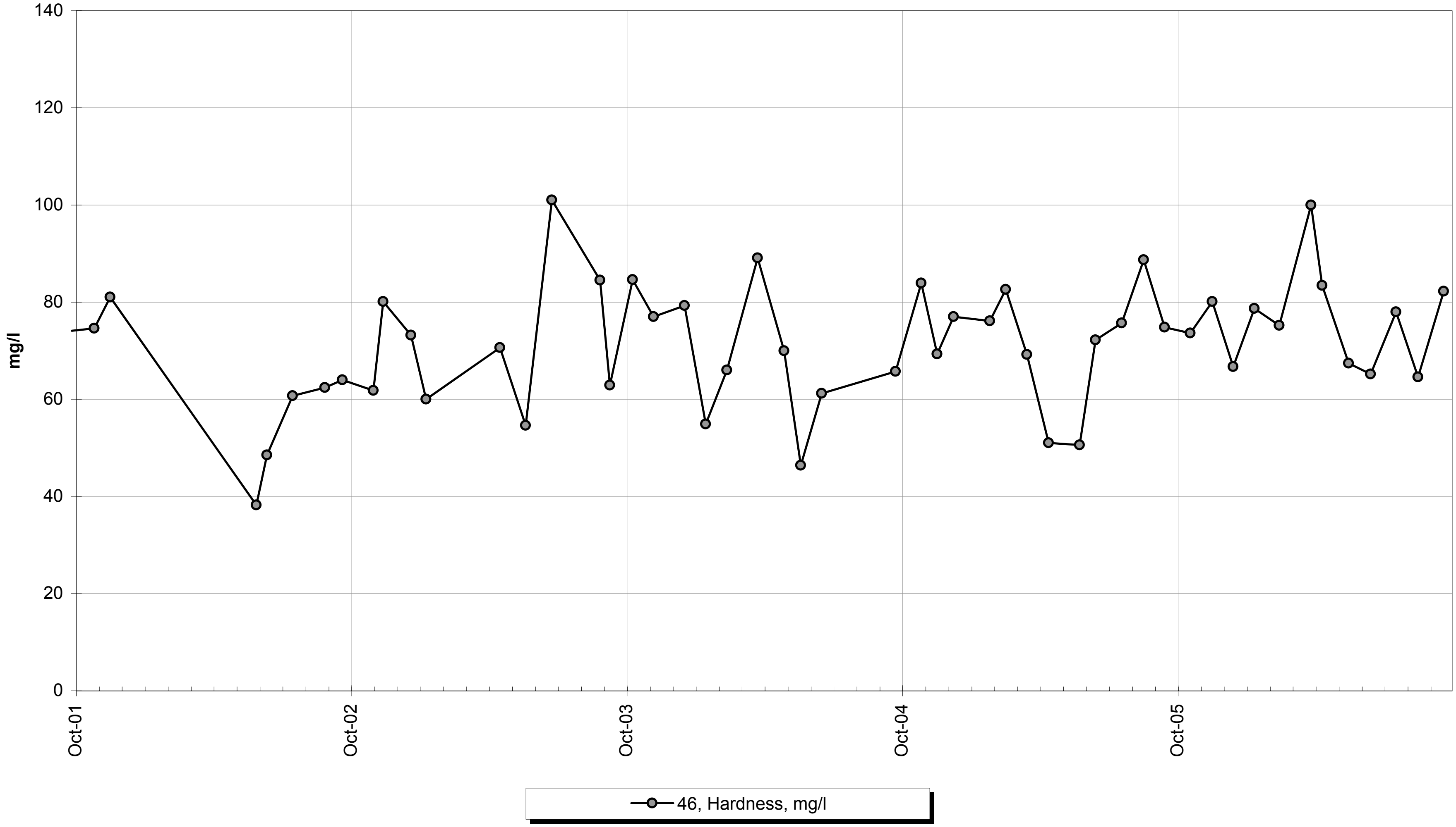
Site 46 -Lab pH



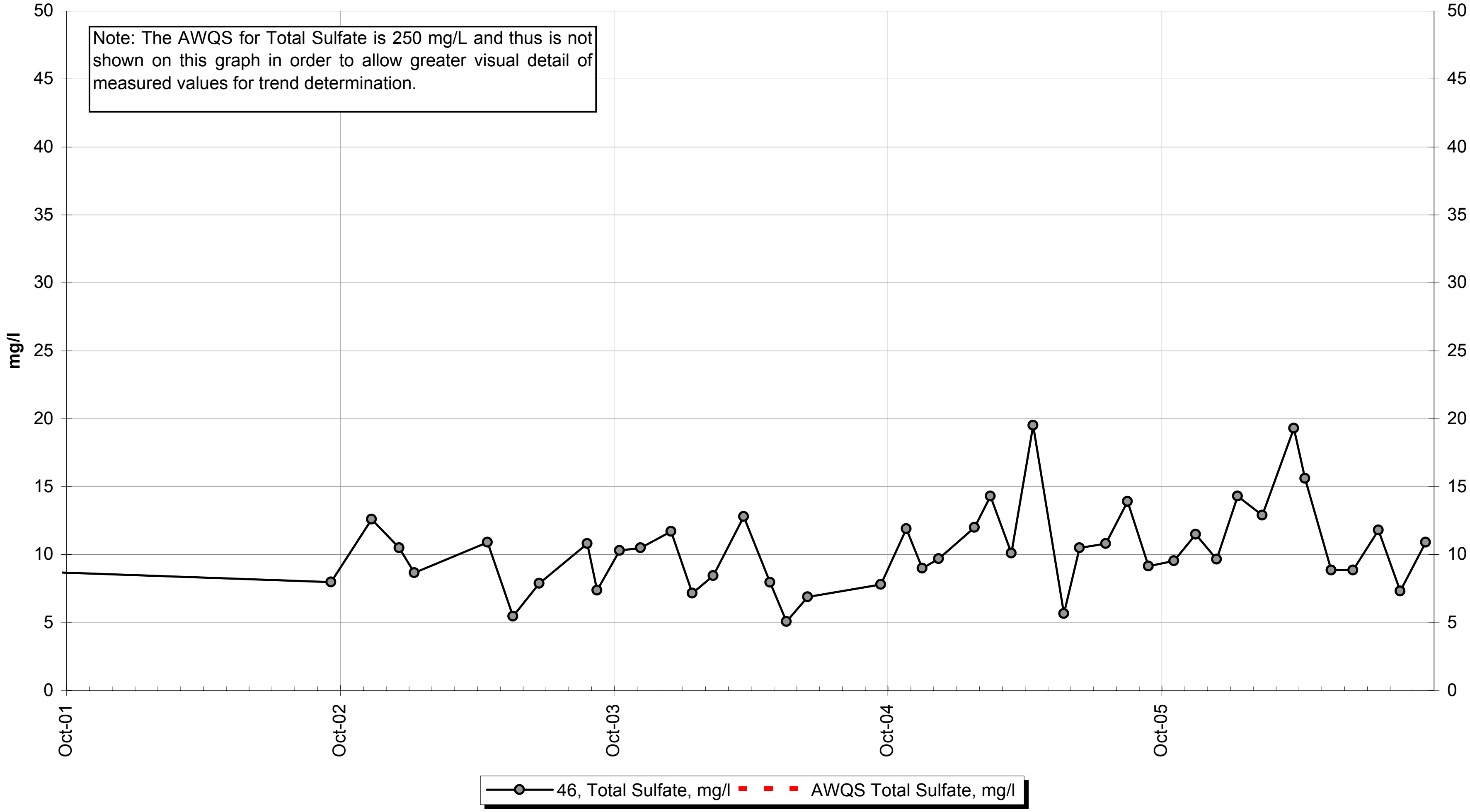
Site 46 -Total Alkalinity

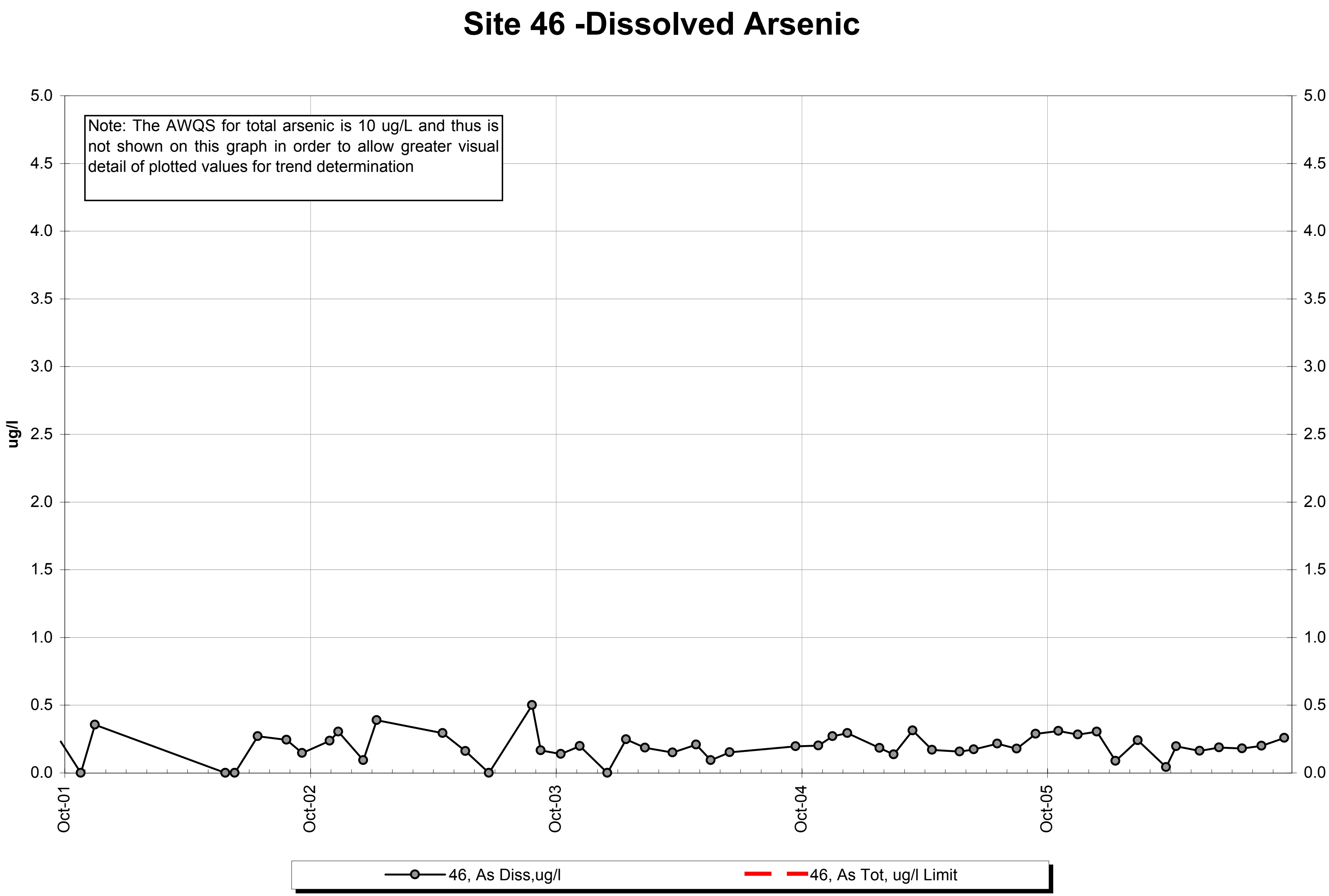


Site 46 -Hardness



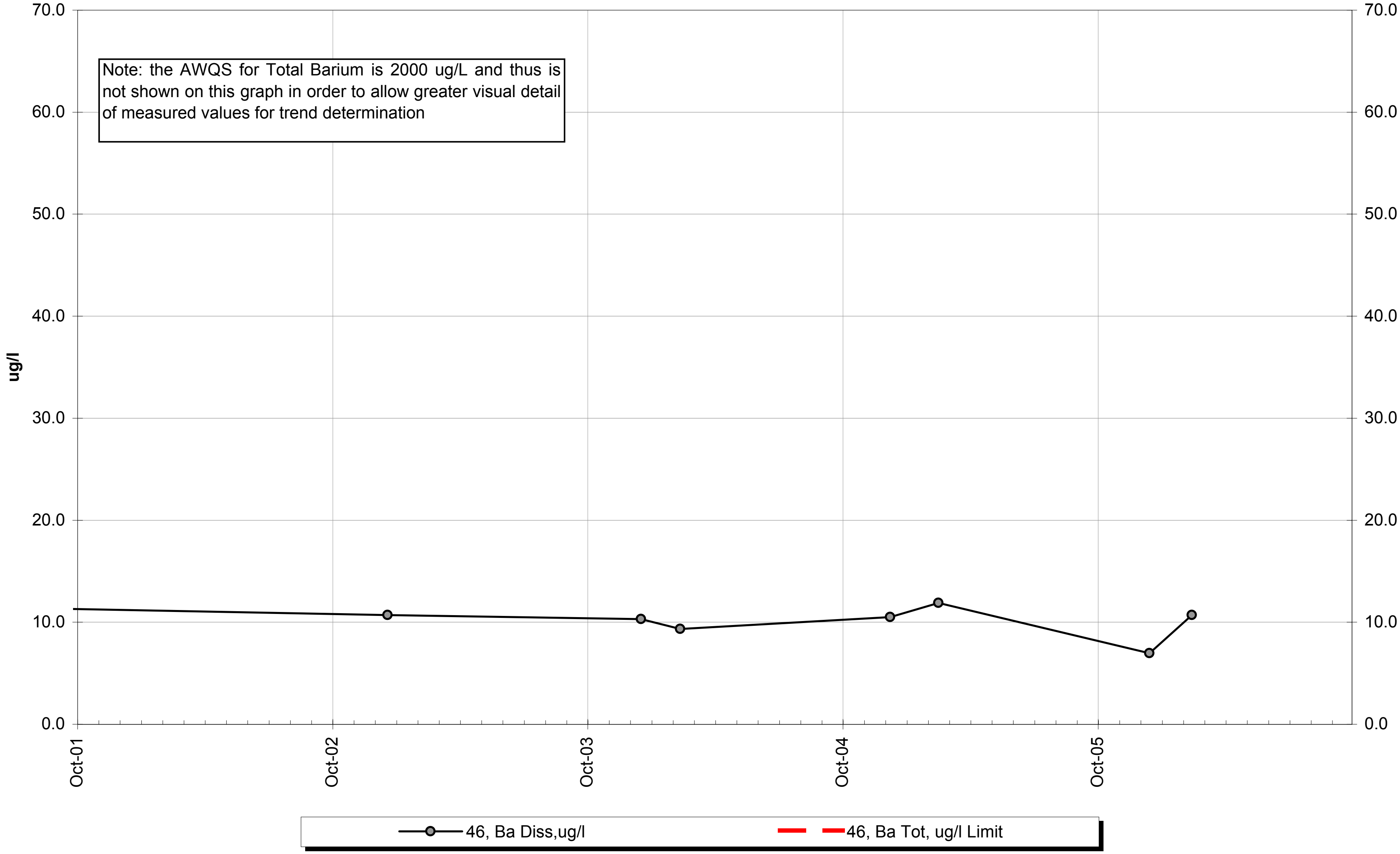
Site 46 -Total Sulfate

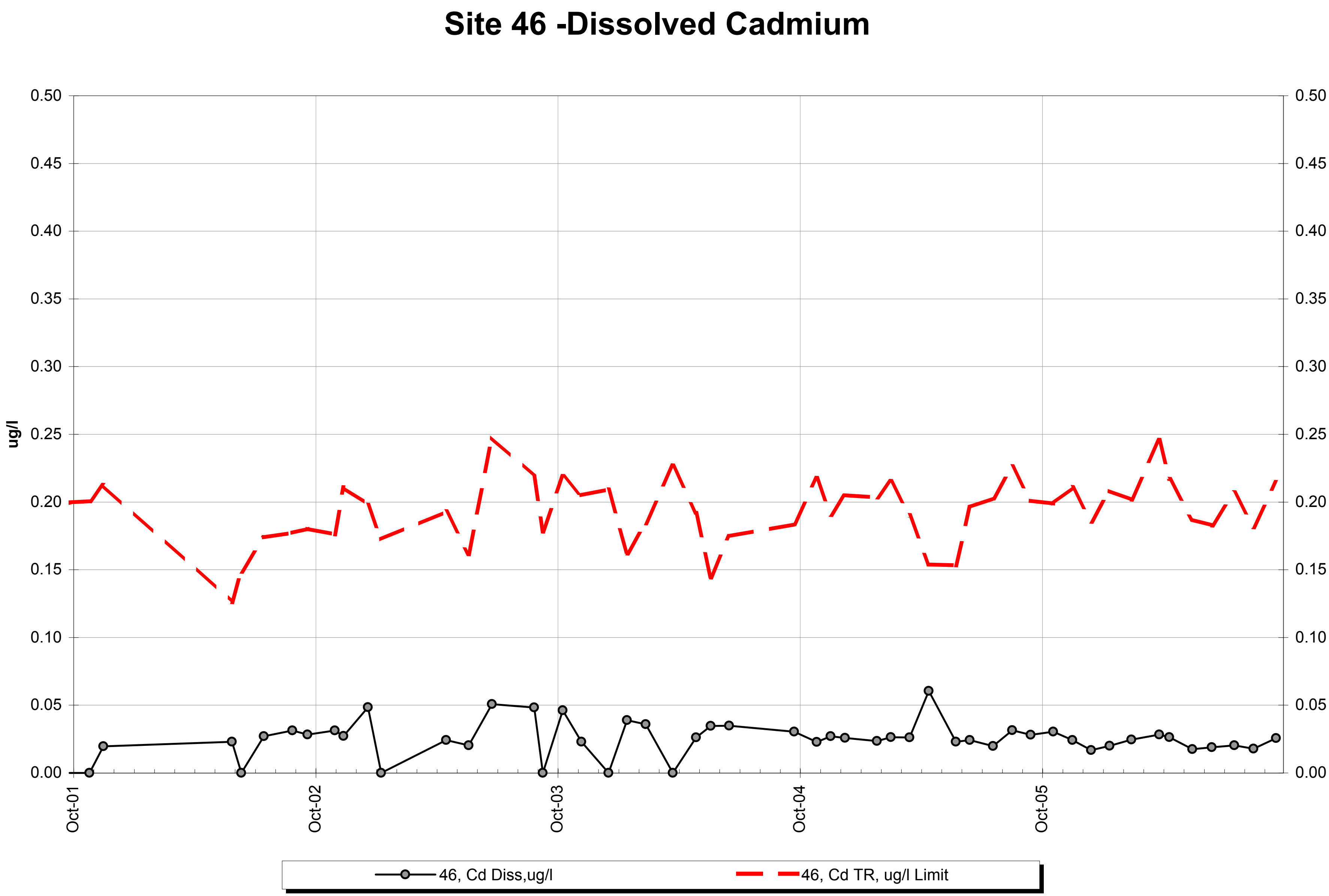




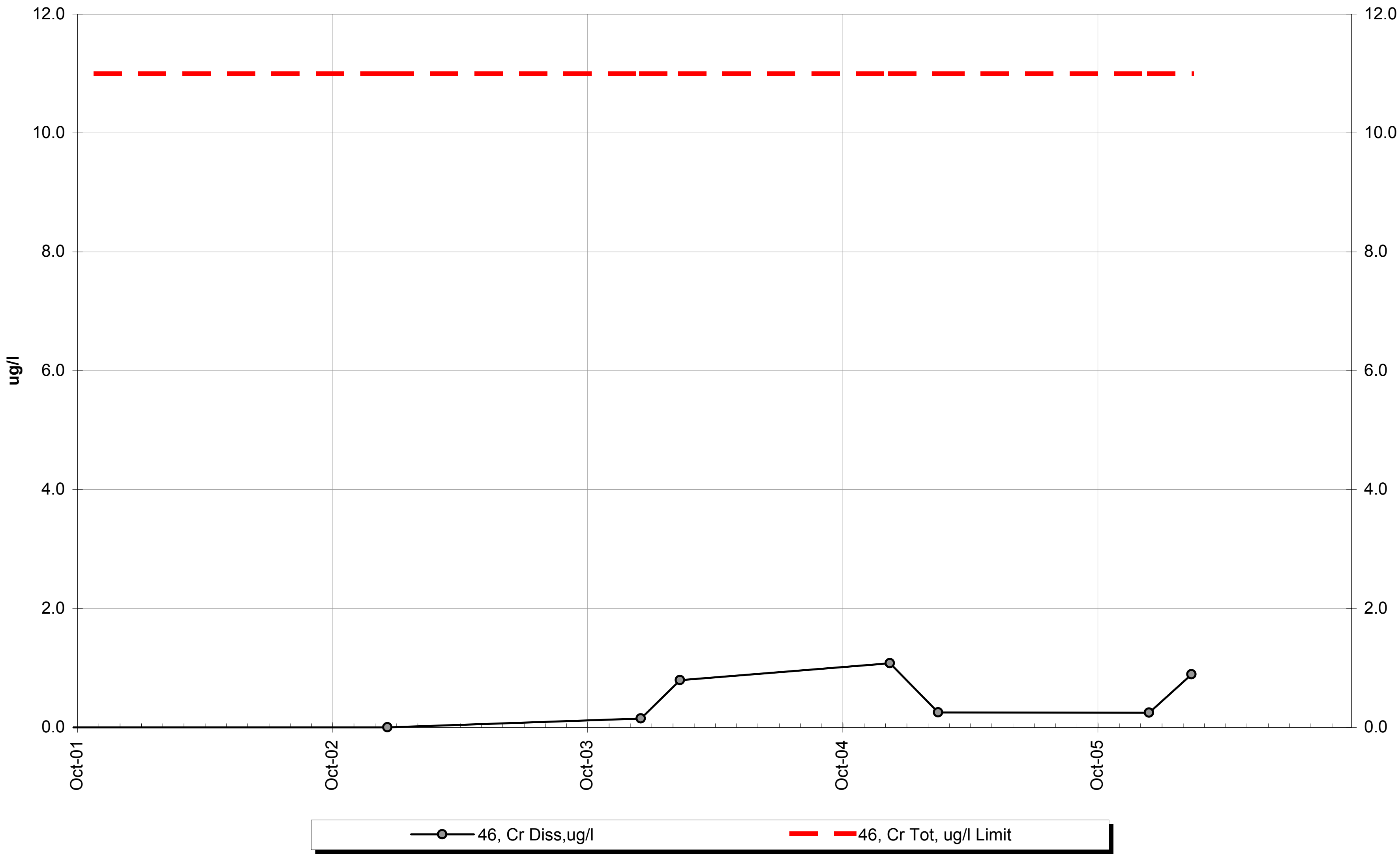
Site 46 -Dissolved Arsenic
Note: The AWQS for total arsenic is 10 ug/L and thus is not shown on this graph in order to allow greater visual detail of plotted values for trend determination
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
46, As Diss,ug/l
46, As Tot, ug/l Limit

Site 46 -Dissolved Barium

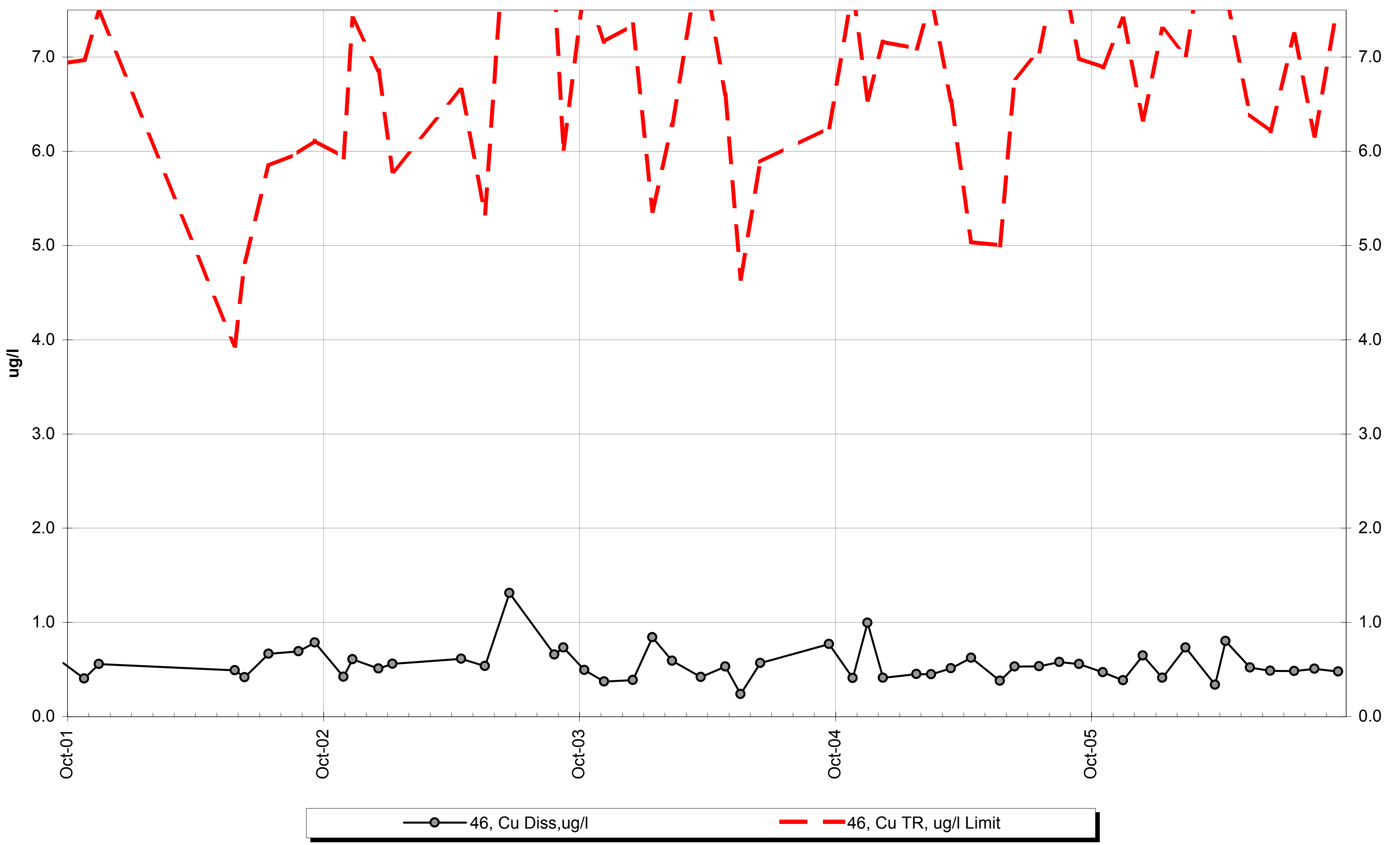



Site 46 -Dissolved Cadmium
ug/l
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
46, Cd Diss,ug/l
46, Cd TR, ug/l Limit

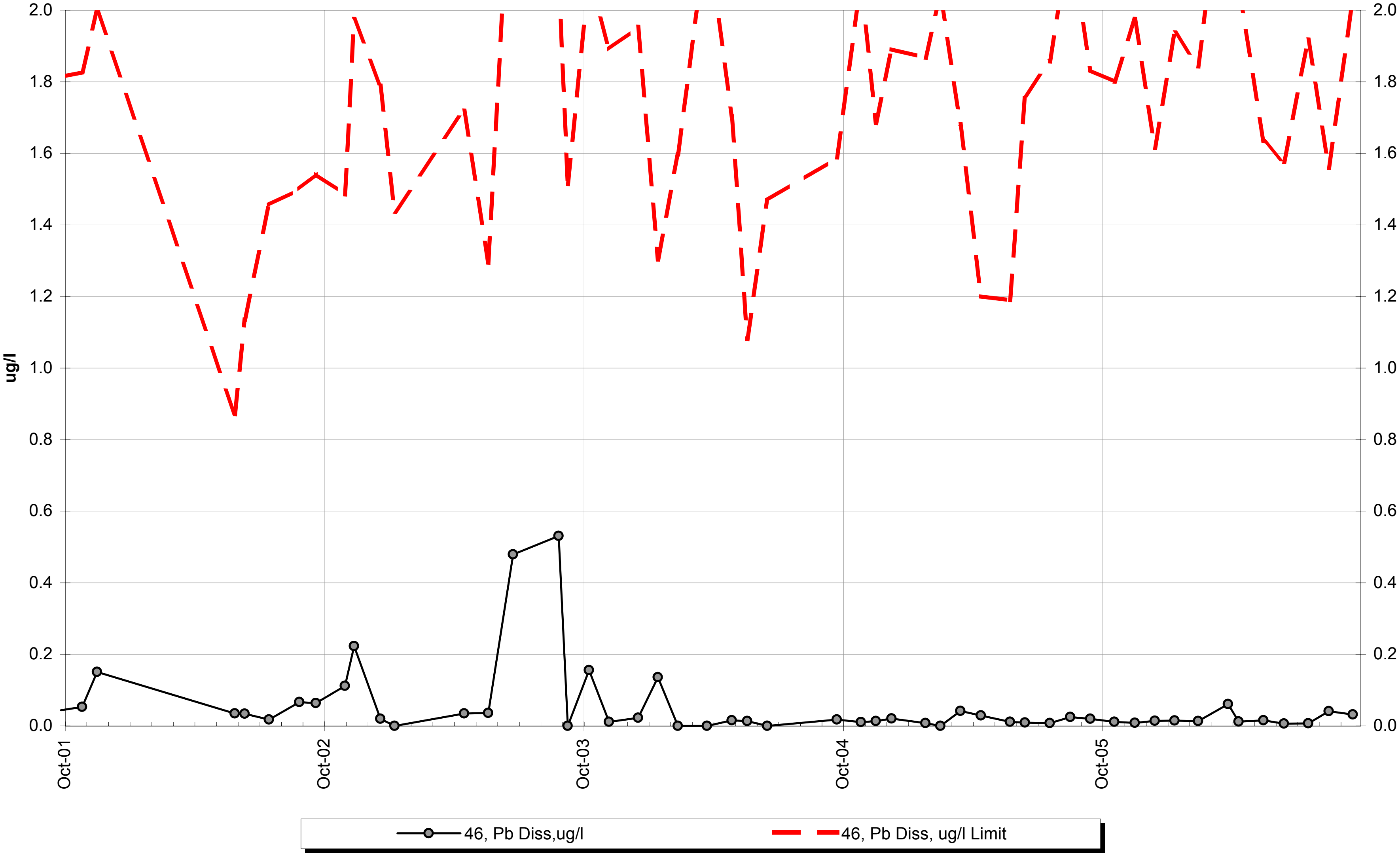
Site 46 -Dissolved Chromium



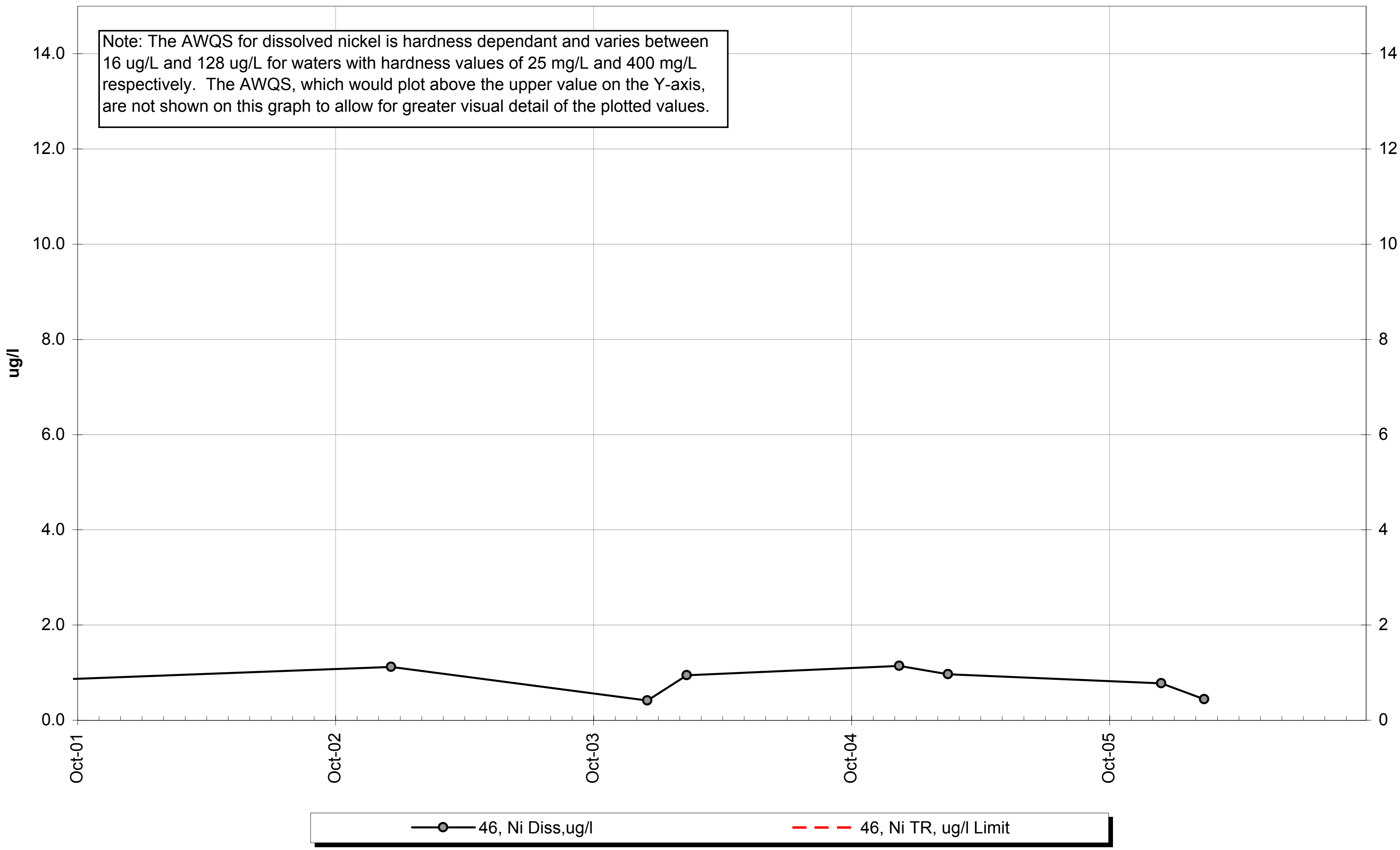
Site 46 -Dissolved Copper



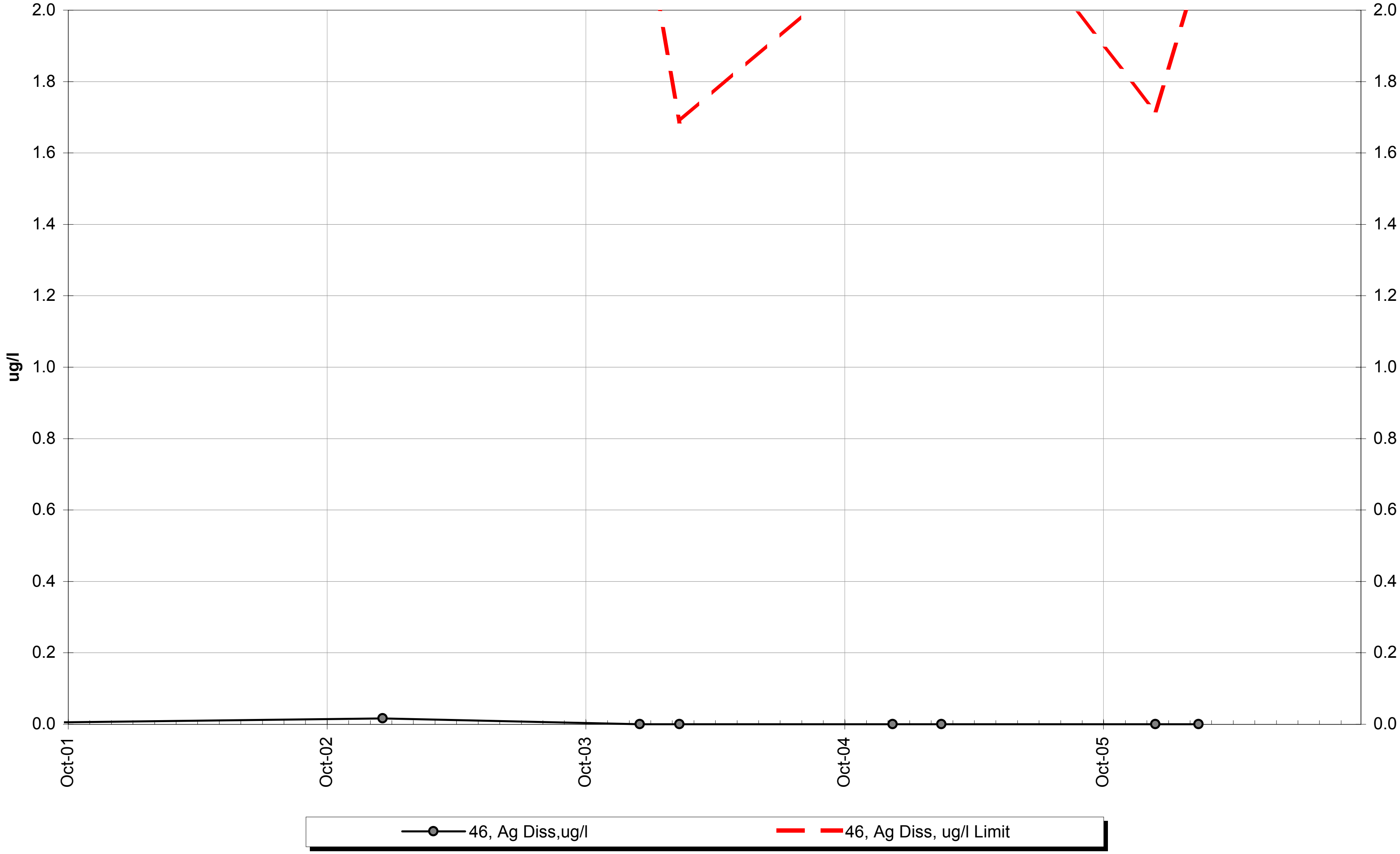
Site 46 -Dissolved Lead

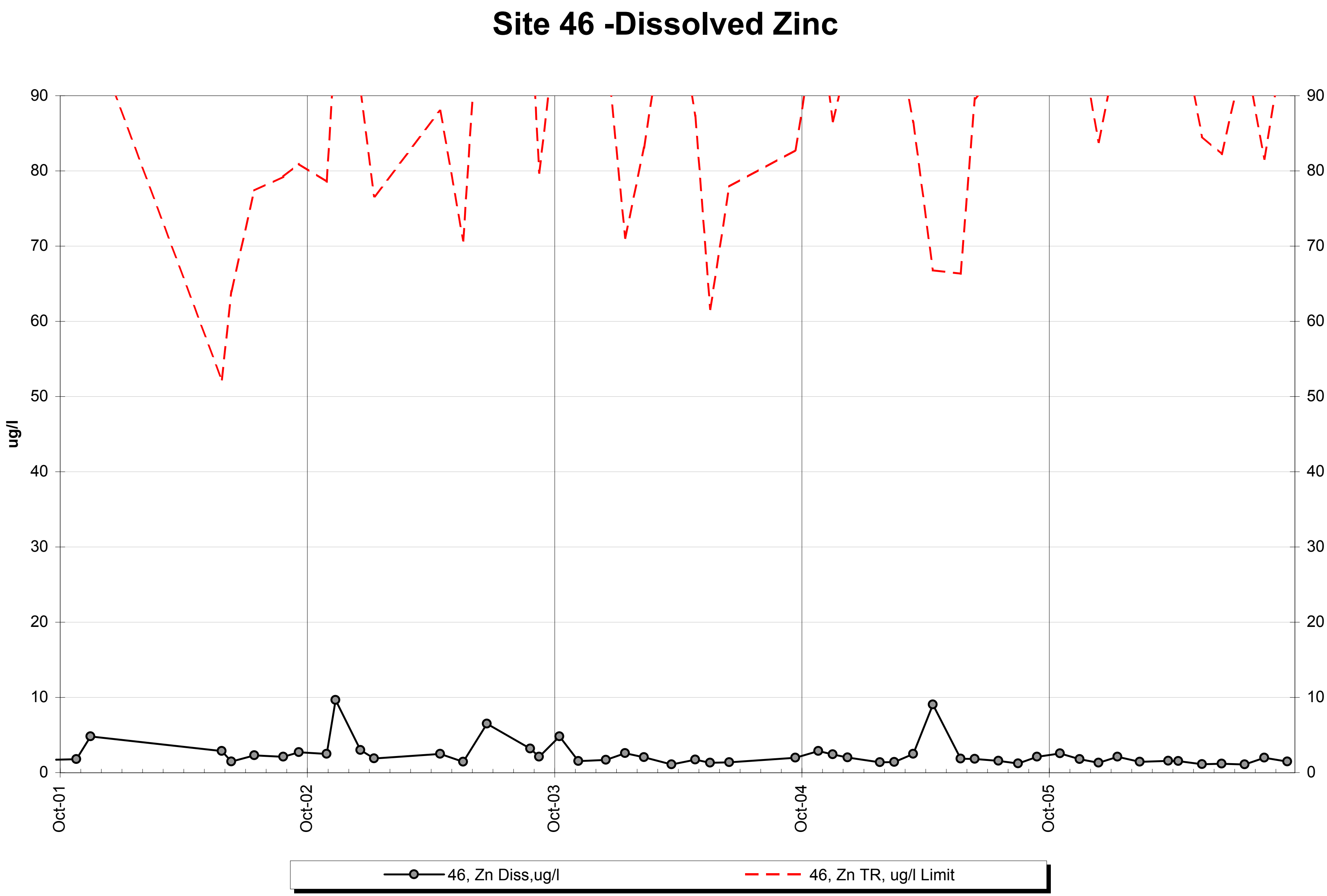


Site 46 -Dissolved Nickel

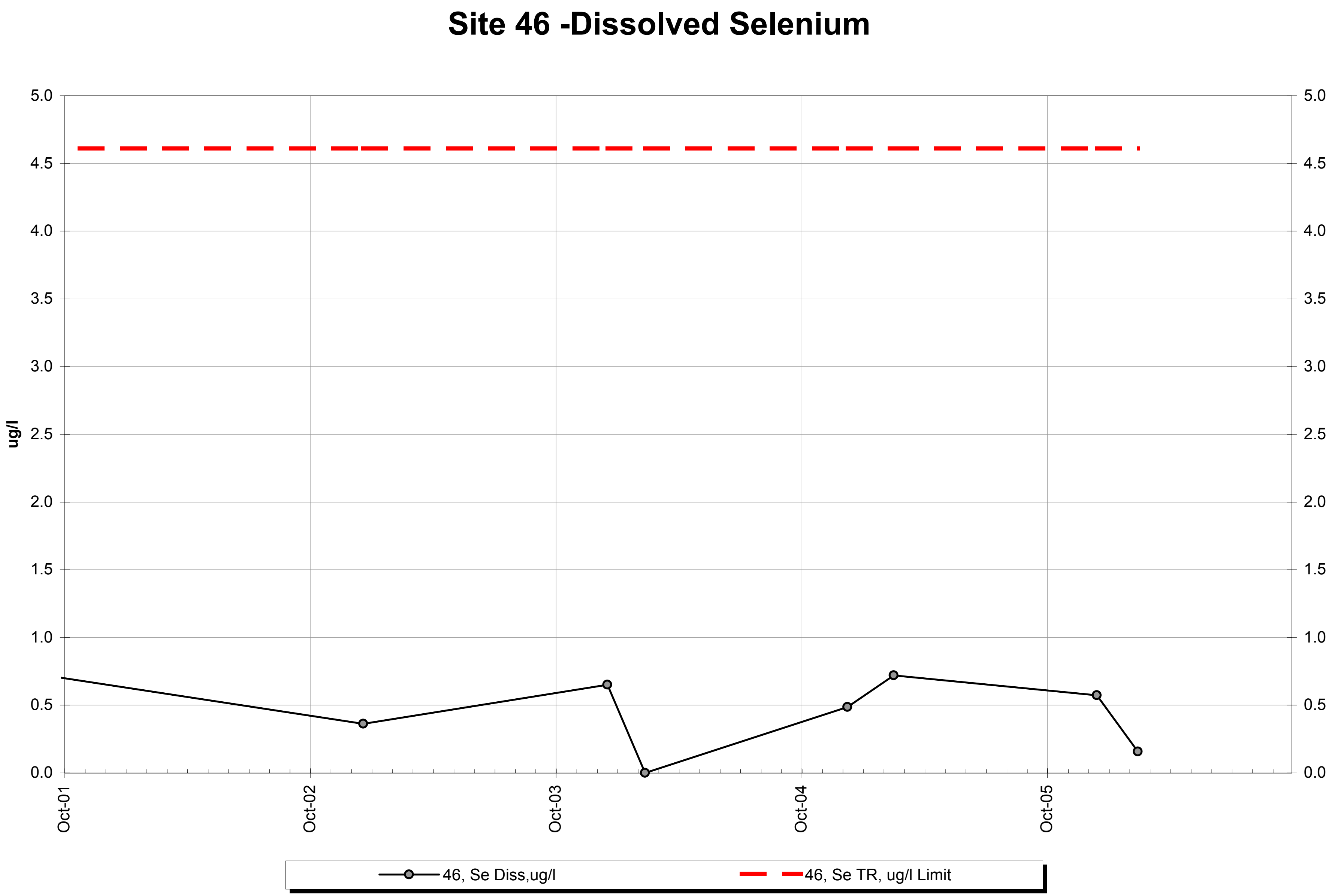


Site 46 -Dissolved Silver

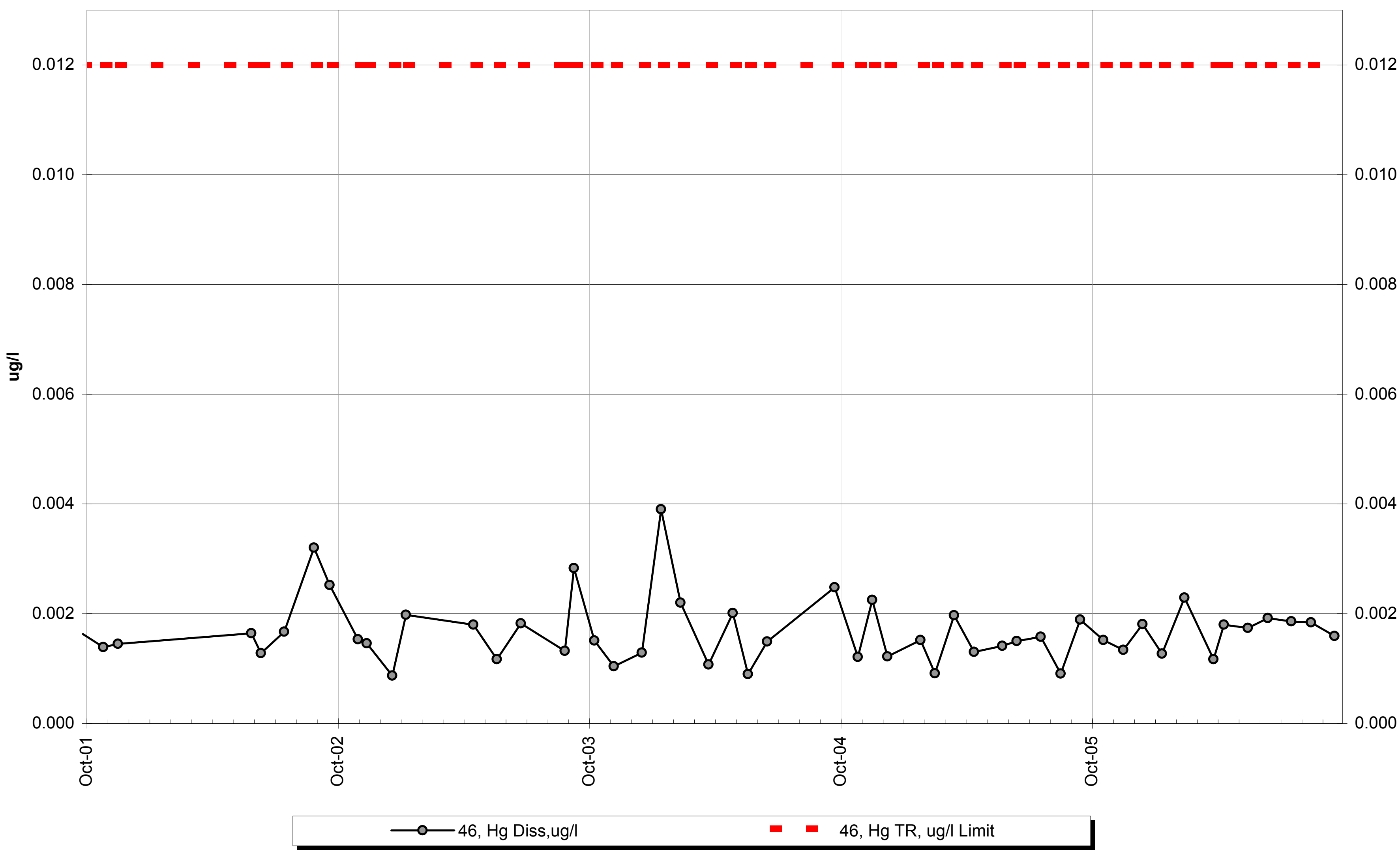




Site 46 -Dissolved Zinc
ug/l
90
80
70
60
50
40
30
20
10
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
46, Zn Diss,ug/l
46, Zn TR, ug/l Limit


Site 46 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
46, Se Diss,ug/l
46, Se TR, ug/l Limit

Site 46 -Dissolved Mercury



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	**WY2001**	131.0	110.0	159.0	148.0	164.0		189.0	126.0	88.6	137.0		134.0
b	**WY2002**	146.0	158.0						70.6	108.0	134.0	127.0	128.0
c	**WY2003**	142.0	152.0	147.0	133.0			141.0	108.0	129.0		159.0	122.0
d	**WY2004**	163.0	159.0	162.0	108.0	136.0	173.0	135.0	89.8	117.0			122.0
e	**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
f	**WY2006**	135.0	146.0	130.0	149.0	146.0	191.0	150.0	121.0	126.0	145.0	116.0	148.0
	n	6	6	5	5	4	3	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	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		-1
c-a	1	1	-1	-1			-1	-1	1			-1
d-a	1	1	1	-1	-1		-1	-1	1			-1
e-a	1	1	-1	1	-1		-1	-1	1	1		-1
f-a	1	1	-1	1	-1		-1	-1	1	1		1
c-b	-1	-1						1	1		1	-1
d-b	1	1						1	1			-1
e-b	1	-1						1	1	1	1	1
f-b	-1	-1						1	1	1	-1	1
d-c	1	1	1	-1			-1	-1	-1			0
e-c	1	-1	1	1			-1	-1	1		1	1
f-c	-1	-1	-1	1			1	1	-1		-1	1
e-d	1	-1	-1	1	1	-1	-1	1	1			1
f-d	-1	-1	-1	1	1	1	1	1	1			1
f-e	-1	1	-1	-1	-1	1	1	1	-1	0	-1	1
S_k	5	1	-4	2	-2	1	-4	1	9	3	0	2

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	8.67	3.67	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	0.94	0.19	-0.98	0.49	-0.68	0.52	-0.98	0.19	1.69	1.02	0.00	0.38
Z^2_k	0.88	0.04	0.96	0.24	0.46	0.27	0.96	0.04	2.86	1.04	0.00	0.14

ΣZ_k= 2.77

ΣZ^2_k= 7.89

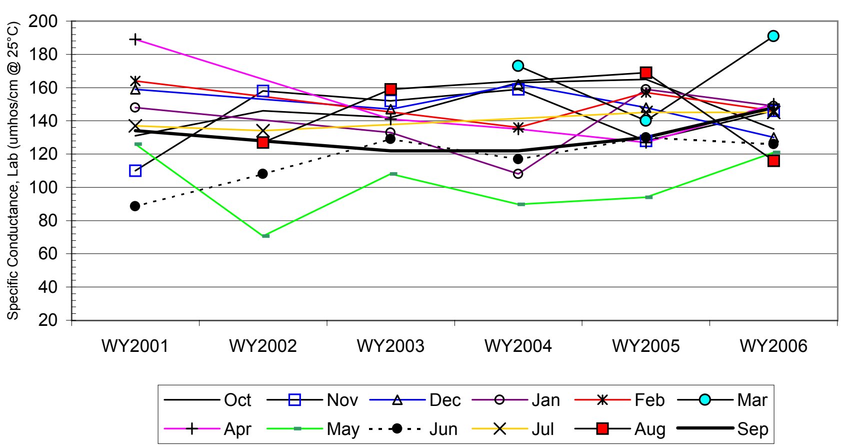
Z-bar=$\Sigma Z_k/K$= 0.23

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

Σn 60

ΣS_k 14

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	7.24	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.779**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$ 221.33	Z_{calc} 0.87	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.809**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.00		5.00
0.050	-2.08	**0.90**	4.37
0.100	-1.00		3.84
0.200	0.00		2.76

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	**WY2001**	7.3	7.6	7.1	7.1	6.6		7.7	7.2	7.5	7.9		8.1
b	**WY2002**	7.4	7.5						7.1	7.4	8.2	8.0	8.2
c	**WY2003**	7.7	8.0	8.0	7.8			7.3	7.9	7.9		7.4	8.0
d	**WY2004**	7.9	8.0	7.8	7.8	7.6	7.7	8.0	7.8	8.0			8.0
e	**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
f	**WY2006**	7.1	7.4	7.7	7.8	7.5	7.7	7.7	7.2	7.3	7.1	7.1	7.0
	n	6	6	5	5	4	3	5	6	6	4	4	6

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
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

	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	1			-1
d-a	1	1	1	1	1		1	1	1			-1
e-a	1	1	1	1	1		1	1	-1	-1		-1
f-a	-1	-1	1	1	1		-1	-1	-1	-1		-1
c-b	1	1						1	1		-1	-1
d-b	1	1						1	1			-1
e-b	1	1						1	-1	-1	-1	-1
f-b	-1	-1						1	-1	-1	-1	-1
d-c	1	1	-1	1			1	-1	1			-1
e-c	1	-1	0	1			1	-1	-1		-1	-1
f-c	-1	-1	-1	1			1	-1	-1		-1	-1
e-d	1	-1	1	1	1	-1	-1	-1	-1			-1
f-d	-1	-1	-1	0	-1	-1	-1	-1	-1			-1
f-e	-1	-1	-1	-1	-1	-1	-1	-1	1	-1	1	-1
S_k	5	-1	1	7	2	-3	0	-1	-3	-4	-4	-13

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	8.67	3.67	16.67	28.33	28.33	8.67	8.67	28.33
Z_k = S_k/σ_S	0.94	-0.19	0.24	1.71	0.68	-1.57	0.00	-0.19	-0.56	-1.36	-1.36	-2.44
Z^2_k	0.88	0.04	0.06	2.94	0.46	2.45	0.00	0.04	0.32	1.85	1.85	5.96

ΣZ_k= -4.09

ΣZ^2_k= 16.84

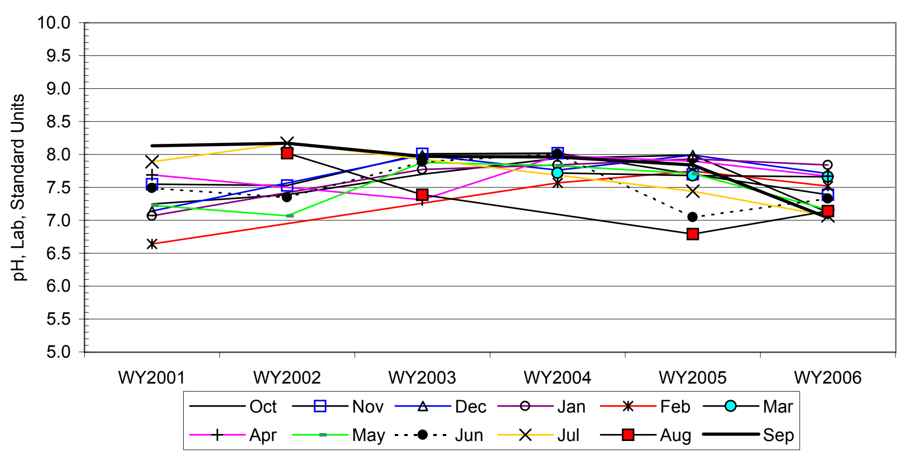
Z-bar=ΣZ_k/K= -0.34

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

Σn 60

ΣS_k -14

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=	15.45	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.163**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.87	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
221.33	p **0.191**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.09		0.07
0.050	-0.07	**-0.02**	0.04
0.100	-0.06		0.02
0.200	-0.04		0.00

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	**WY2001**	56.6	49.9	71.6	65.0	70.4		80.4	56.7	40.3	60.0		61.3
b	**WY2002**	61.8	64.9						29.5	47.9	58.3	55.0	56.7
c	**WY2003**	54.7	57.9	65.0	50.5			61.4	49.8	59.5		70.3	57.3
d	**WY2004**	71.1	71.2	69.5	47.0	57.9	72.9	59.5	43.1	55.9			55.3
e	**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
f	**WY2006**	60.8	59.8	51.9	63.0	59.6	73.6	62.4	56.3	53.3	62.0	54.1	64.8
	n	6	6	5	5	4	3	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
c-a	-1	1	-1	-1			-1	-1	1			-1
d-a	1	1	-1	-1	-1		-1	-1	1			-1
e-a	1	1	-1	1	1		-1	-1	1	1		-1
f-a	1	1	-1	-1	-1		-1	-1	1	1		1
c-b	-1	-1						1	1		1	1
d-b	1	1						1	1			-1
e-b	1	-1						1	1	1	1	1
f-b	-1	-1						1	1	1	-1	1
d-c	1	1	1	-1			-1	-1	-1			-1
e-c	1	1	1	1			-1	1	1		1	1
f-c	1	1	-1	1			1	1	-1		-1	1
e-d	1	-1	1	1	1	-1	-1	1	1			1
f-d	-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	3	-4	0	0	1	-4	3	7	2	0	3

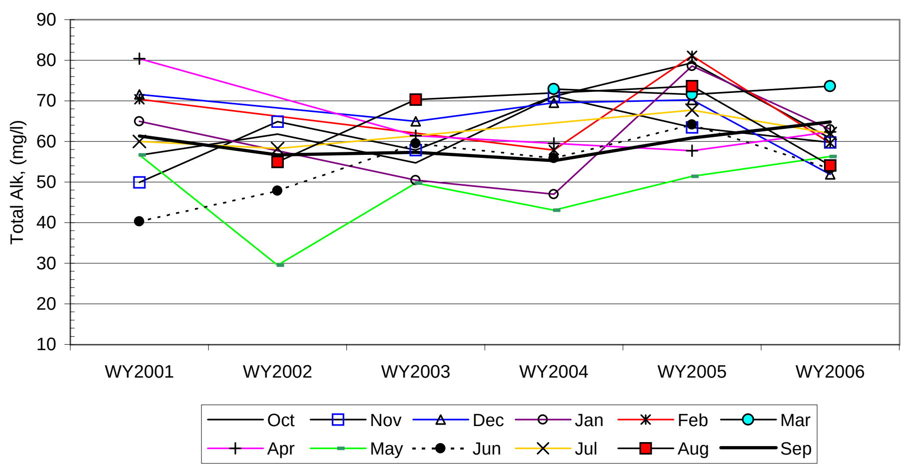
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	8.67	3.67	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	0.94	0.56	-0.98	0.00	0.00	0.52	-0.98	0.56	1.32	0.68	0.00	0.56
Z^2_k	0.88	0.32	0.96	0.00	0.00	0.27	0.96	0.32	1.73	0.46	0.00	0.32

ΣZ_k= 3.19
ΣZ^2_k= 6.22
Z-bar=$\Sigma Z_k/K$= 0.27

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

Σn 60
ΣS_k 16

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	5.37	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.912**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 1.01	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
221.33	p **0.843**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.05		2.60
0.050	-0.36	**0.82**	2.03
0.100	-0.17		1.95
0.200	0.35		1.50

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	**WY2001**	1.7	2.8	2.2	1.3	1.9		2.1	1.5	1.7	1.9		1.7
b	**WY2002**	1.8	4.8						2.9	1.5	2.3	2.1	2.7
c	**WY2003**	2.5	9.7	3.0	1.9			2.5	1.4	6.5		3.2	2.1
d	**WY2004**	4.8	1.5	1.7	2.6	2.1	1.1	1.7	1.3	1.4			2.0
e	**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
f	**WY2006**	2.5	1.8	1.3	2.1	1.4	1.6	1.5	1.1	1.2	1.1	2.0	1.5
	n	6	6	5	5	4	3	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
c-a	1	1	1	1			1	-1	1			1
d-a	1	-1	-1	1	1		-1	-1	-1			1
e-a	1	-1	-1	1	-1		1	1	1	-1		1
f-a	1	-1	-1	1	-1		-1	-1	-1	-1		-1
c-b	1	1						-1	1		1	-1
d-b	1	-1						-1	-1			-1
e-b	1	-1						-1	1	-1	-1	-1
f-b	1	-1						-1	-1	-1	-1	-1
d-c	1	-1	-1	1			-1	-1	-1			-1
e-c	1	-1	-1	-1			1	1	-1		-1	0
f-c	1	-1	-1	1			-1	-1	-1		-1	-1
e-d	-1	1	1	-1	-1	1	1	1	1			1
f-d	-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	-5	-6	4	-2	1	-2	-7	-5	-4	-2	-4

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	28.33	28.33	16.67	16.67	8.67	3.67	16.67	28.33	28.33	8.67	8.67	28.33
$Z_k = S_k/\sigma_S$	1.69	-0.94	-1.47	0.98	-0.68	0.52	-0.49	-1.32	-0.94	-1.36	-0.68	-0.75
Z^2_k	2.86	0.88	2.16	0.96	0.46	0.27	0.24	1.73	0.88	1.85	0.46	0.56

ΣZ_k= -5.43

ΣZ^2_k= 13.32

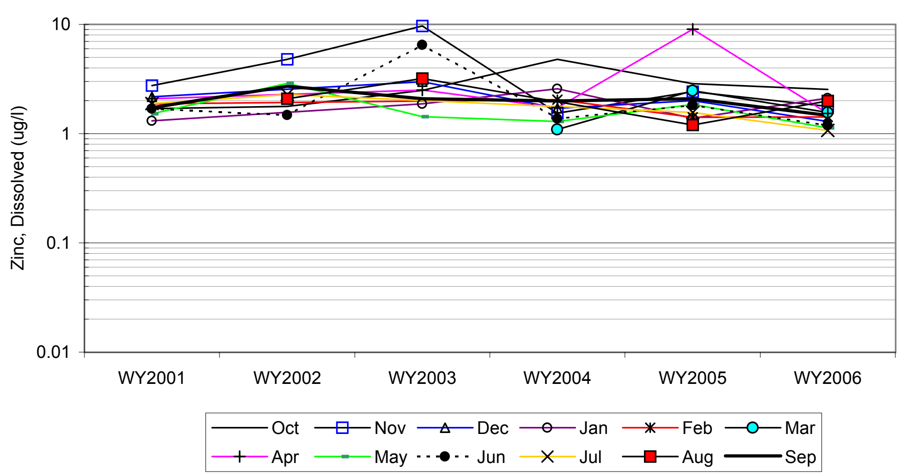
Z-bar=$\Sigma Z_k/K$= -0.45

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

Σn 60

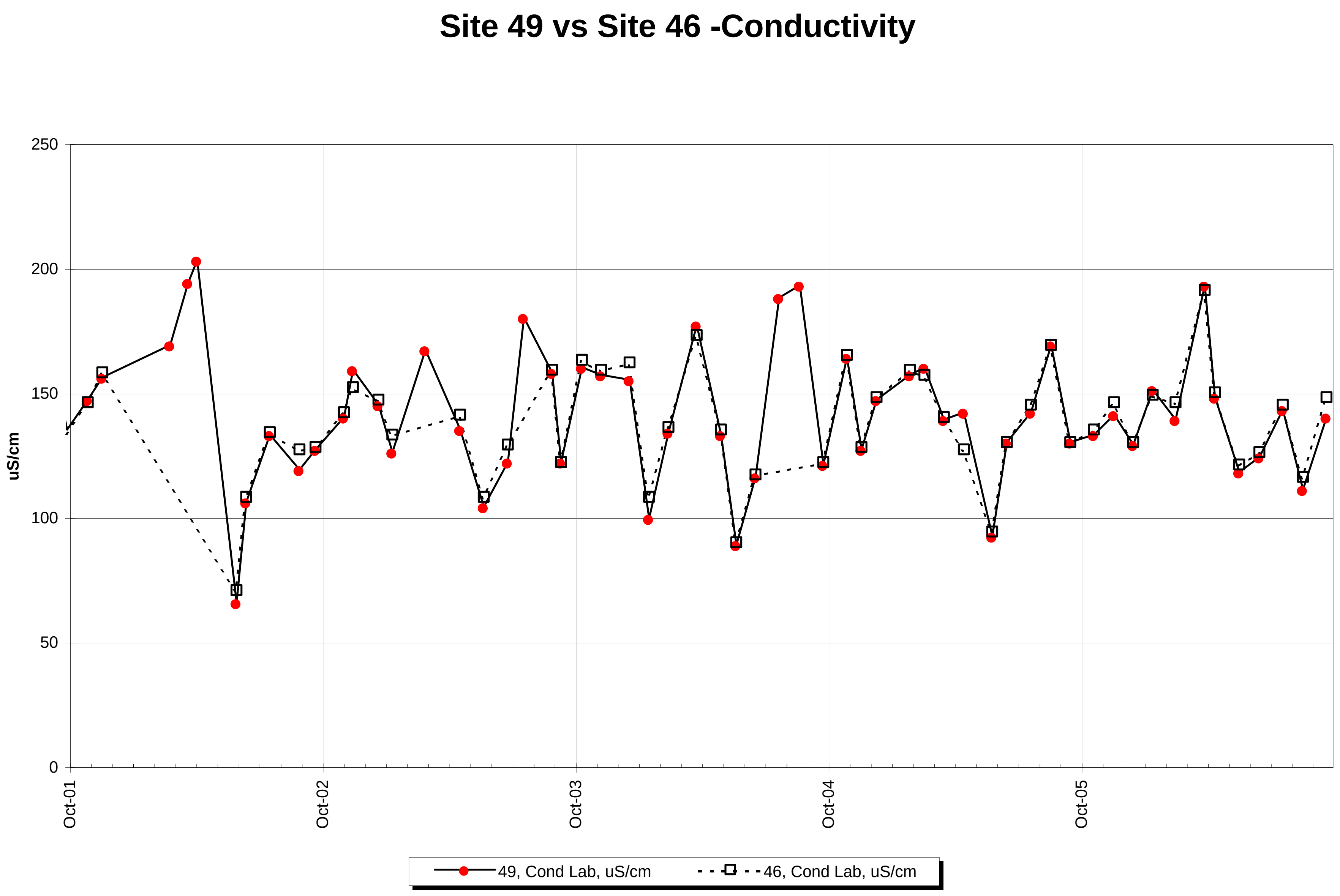
ΣS_k -23

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	10.86	@α=5% $\chi^2_{(K-1)}$= 19.68	Test for station homogeneity	
p	**0.455**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} -1.48	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
221.33	**p** **0.070**		H_A (± trend)	REJECT



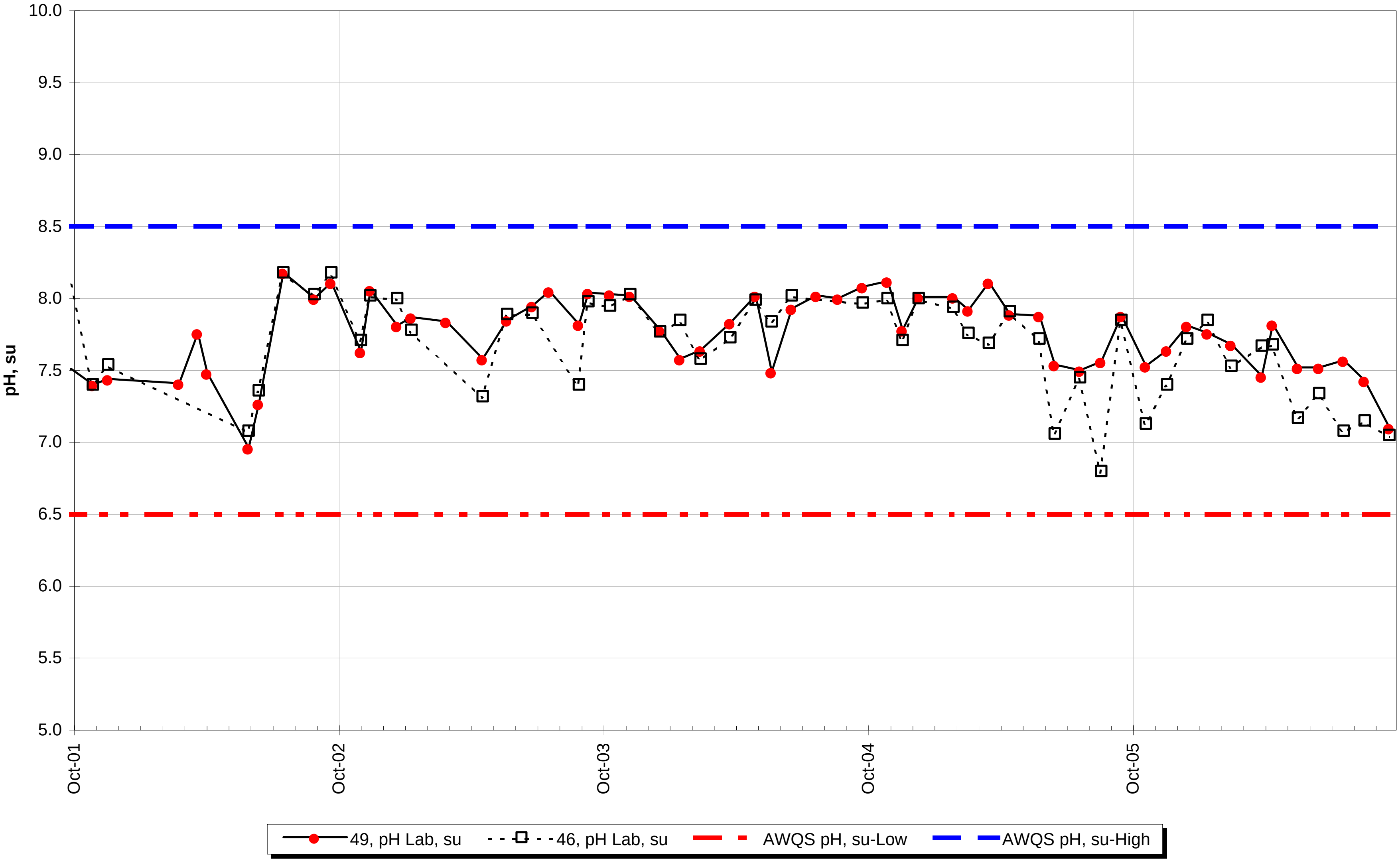
Seasonal-Kendall Slope Confidence Intervals

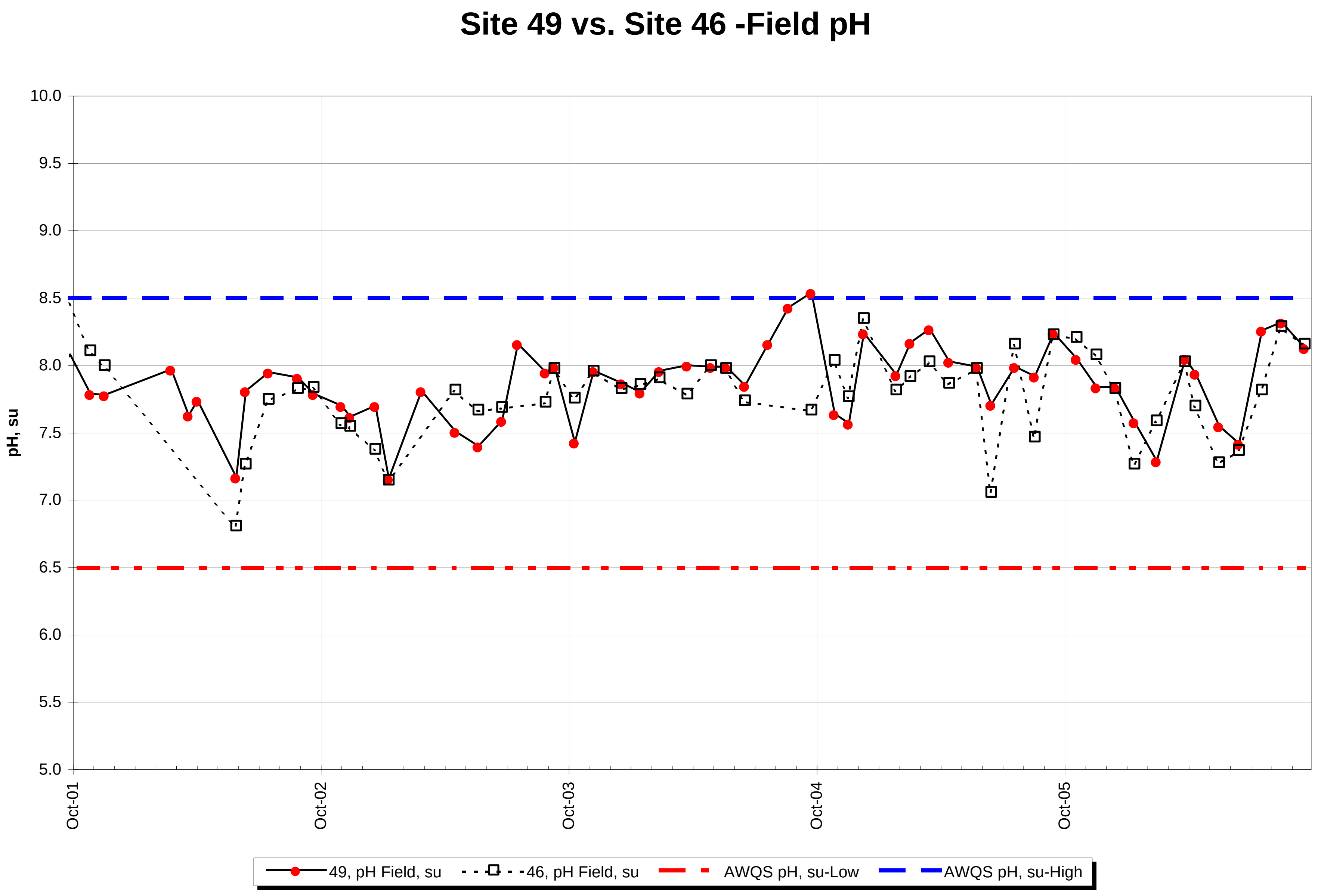
α	Lower Limit	Slope	Upper Limit
0.010	-0.21		0.06
0.050	-0.17	**-0.09**	0.00
0.100	-0.13		-0.04
0.200	-0.11		-0.07



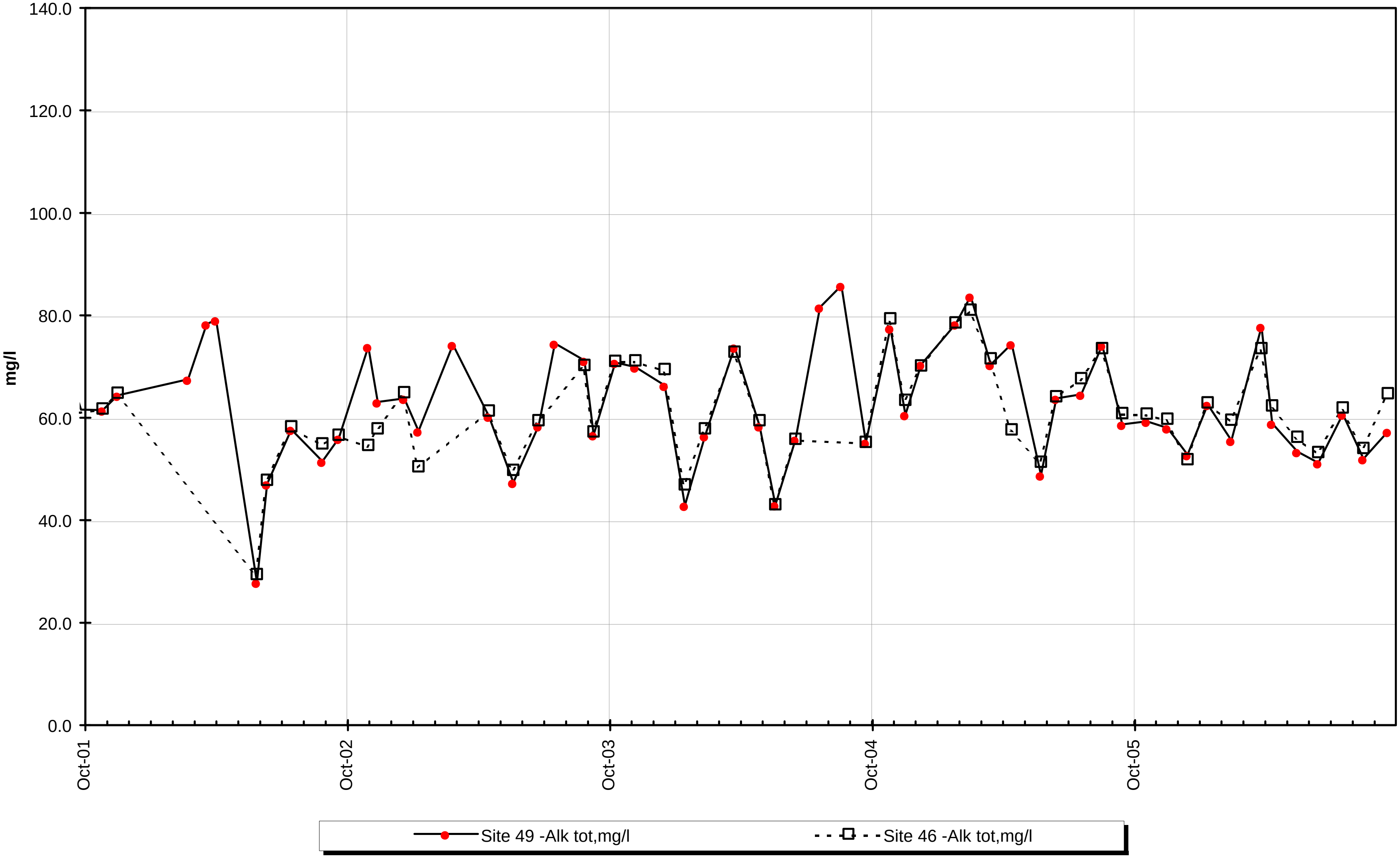
Site 49 vs Site 46 -Conductivity
uS/cm
250
200
150
100
50
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
49, Cond Lab, uS/cm
46, Cond Lab, uS/cm

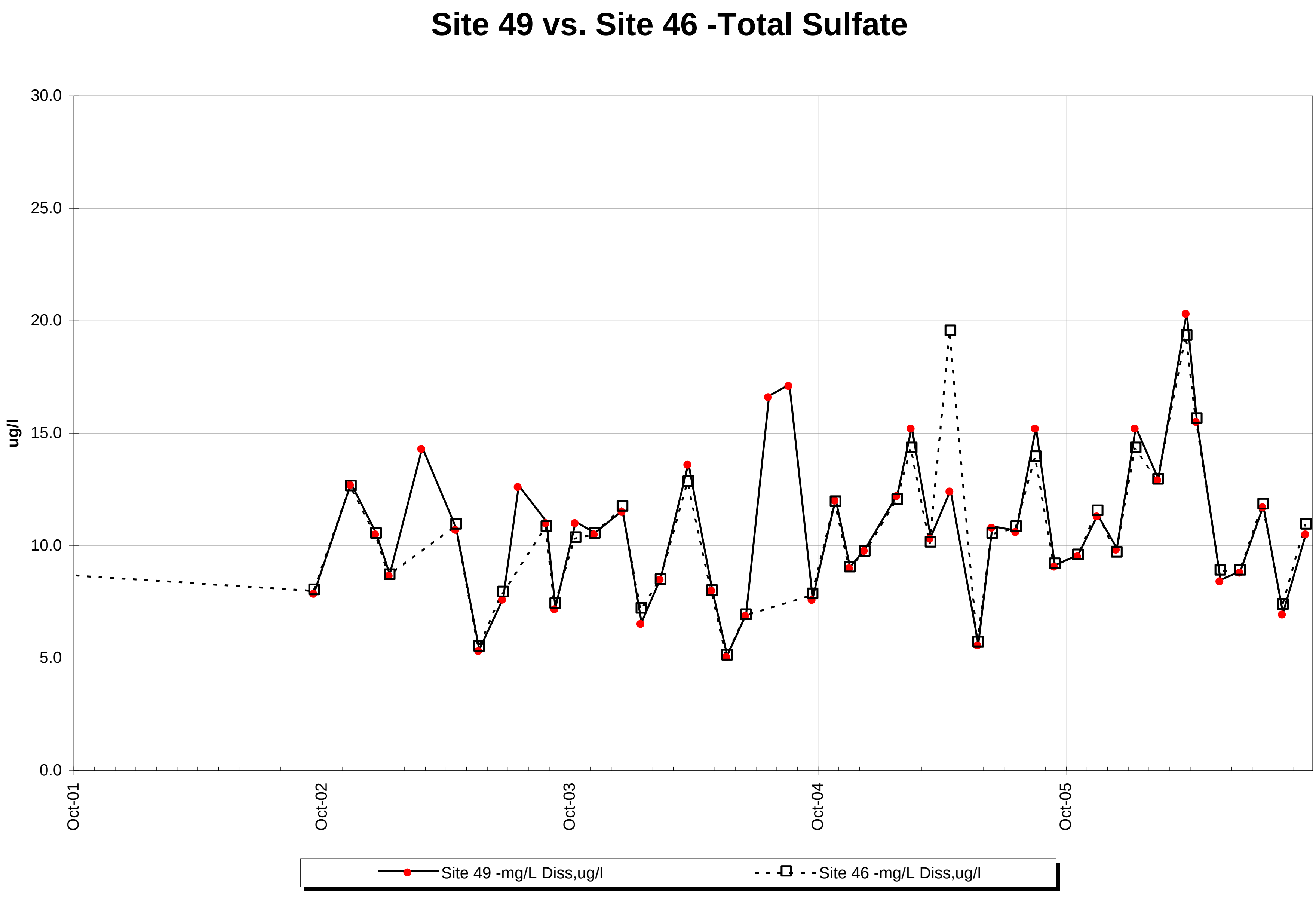
Site 49 vs. Site 46 -Lab pH




Site 49 vs. 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-01
Oct-02
Oct-03
Oct-04
Oct-05
49, pH Field, su
46, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

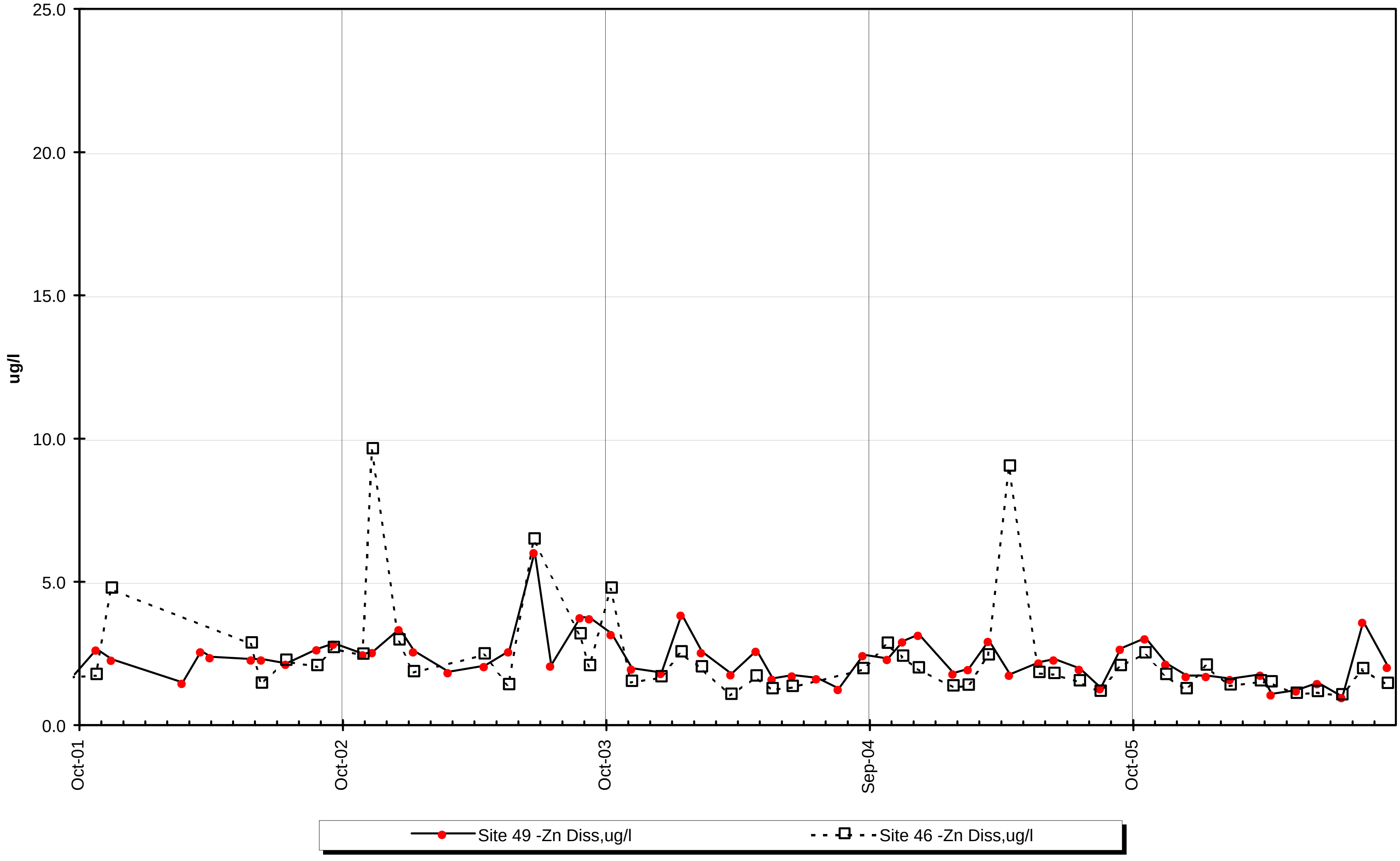
Site 49 vs. Site 46 -Total Alkalinity





Site 49 vs. Site 46 -Total Sulfate
ug/l
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 49 -mg/L Diss,ug/l
Site 46 -mg/L Diss,ug/l

Site 49 vs. Site 46 -Dissolved Zinc



Wilcoxon-signed-ranks test

Exact Form

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

	X	**Y**	Differences		
Site	#49	#46			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	133.0	135.0	-2.0	2.0	-4.5
Nov	141.0	146.0	-5.0	5.0	-9.5
Dec	129.0	130.0	-1.0	1.0	-1
Jan	151.0	149.0	2.0	2.0	4.5
Feb	139.0	146.0	-7.0	7.0	-11
Mar	193.0	191.0	2.0	2.0	4.5
Apr	148.0	150.0	-2.0	2.0	-4.5
May	118.0	121.0	-3.0	3.0	-8
Jun	124.0	126.0	-2.0	2.0	-4.5
Jul	143.0	145.0	-2.0	2.0	-4.5
Aug	111.0	116.0	-5.0	5.0	-9.5
Sep	140.0	148.0	-8.0	8.0	-12
Median	139.5	145.5	-2.0	2.0	

n	**m**
12	12

N= 12

$\Sigma R=$ -60

α
5.0%
W'α,n
17

$W^{+}=$
9
p-test
0.81%

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**	Differences		
Site	#49	#46			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	7.52	7.12	0.40	0.40	11
Nov	7.63	7.39	0.24	0.24	8
Dec	7.80	7.71	0.09	0.09	2
Jan	7.75	7.84	-0.09	0.09	-3
Feb	7.67	7.52	0.15	0.15	5
Mar	7.45	7.66	-0.21	0.21	-7
Apr	7.81	7.67	0.14	0.14	4
May	7.51	7.16	0.35	0.35	10
Jun	7.51	7.33	0.18	0.18	6
Jul	7.56	7.07	0.49	0.49	12
Aug	7.42	7.14	0.28	0.28	9
Sep	7.09	7.04	0.05	0.05	1
Median	7.54	7.36	0.17	0.20	

n	**m**
12	12

N= 12

$\Sigma R=$ 58

α
95.0%
W'α,n
59

$W^{+}=$
68
p-test
99.19%

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**	Differences		
Site	#49	#46			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	59.3	60.8	-1.5	1.5	-4
Nov	58.0	59.8	-1.8	1.8	-5
Dec	52.8	51.9	0.9	0.9	2
Jan	62.6	63.0	-0.4	0.4	-1
Feb	55.6	59.6	-4.0	4.0	-10
Mar	77.8	73.6	4.2	4.2	11
Apr	58.9	62.4	-3.5	3.5	-9
May	53.4	56.3	-2.9	2.9	-8
Jun	51.2	53.3	-2.1	2.1	-6.5
Jul	60.7	62.0	-1.3	1.3	-3
Aug	52.0	54.1	-2.1	2.1	-6.5
Sep	57.3	64.8	-7.5	7.5	-12
Median	57.7	60.3	-2.0	2.1	

n	**m**
12	12

N= 12

$\Sigma R=$ -52

α
95.0%
W'$_{\alpha,n}$
59

$W^{+}=$
13
p-test
2.12%

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	#49	#46			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	9.5	9.5	0.0	0.0	-1
Nov	11.3	11.5	-0.2	0.2	-6
Dec	9.8	9.7	0.2	0.2	5
Jan	15.2	14.3	0.9	0.9	10
Feb	12.9	12.9	0.0		
Mar	20.3	19.3	1.0	1.0	11
Apr	15.5	15.6	-0.1	0.1	-3
May	8.4	8.9	-0.5	0.5	-9
Jun	8.8	8.9	-0.1	0.1	-2
Jul	11.7	11.8	-0.1	0.1	-4
Aug	6.9	7.3	-0.4	0.4	-7
Sep	10.5	10.9	-0.4	0.4	-8
Median	10.9	11.2	-0.1	0.2	

n	m
12	11

N= 11

ΣR= -14

α
5.0%
W'α,n
13

W^{+}=
26
p-test
28.86%

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	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	3.04	2.54	0.50	0.50	10
Nov	2.16	1.78	0.38	0.38	6.5
Dec	1.73	1.29	0.44	0.44	8.5
Jan	1.73	2.11	-0.38	0.38	-6.5
Feb	1.62	1.42	0.20	0.20	3
Mar	1.77	1.56	0.21	0.21	4
Apr	1.09	1.53	-0.44	0.44	-8.5
May	1.22	1.13	0.09	0.09	2
Jun	1.48	1.19	0.29	0.29	5
Jul	0.99	1.07	-0.08	0.08	-1
Aug	3.62	1.99	1.63	1.63	12
Sep	2.05	1.47	0.58	0.58	11
Median	1.73	1.50	0.25	0.38	

n	**m**
12	12

N= 12

ΣR= 46

α
5.0%
W' α,n
17

W^{+}=
62
p-test
96.80%

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

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 2006" report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 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-05 though Sept-06.				

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 mostly likely be the result of the limited aquifer sampled at this site.

Site 57-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	5	**<0.01**	**-**	**-10.6**	**-2.7**
pH, Lab	5	0.10	-		
Alkalinity, Total	5	0.27	-		
Zinc, Dissolved	5	0.97	+		

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

Table of Results for Water Year 2006

Site 57 "MW-23-00-03"

Sample Date/Parameter	10/18/05	11/16/05	Dec-05	Jan-06	Feb-06	Mar-06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/20/06	**Median**
Water Temp (°C)	5.8	5.3	NOT SCHEDULED FOR SAMPLING				5.3	6.2	6.1	6.0	6.9	5.9	6.0
Conductivity-Field(µmho)	418	388					436	419	387	449	348	433	419
Conductivity-Lab (µmho)	360	361					369	374	411	386	375	365	372
pH Lab (standard units)	7.27 J	7.38					7.59 J	7.20	7.21 J	7.23	7.18	7.23	7.23
pH Field (standard units)	7.67	7.52					7.79	7.61	7.26	7.81	7.87	7.57	7.64
Total Alkalinity (mg/L)	160.0	144.0					151.0	152.0	159.0	149.0	154.0	146.0	151.5
Total Sulfate (mg/L)	52.2	52.4 J					61.7	59.4	66.0	60.1	58.5	50.0	59.0
Hardness (mg/L)	203.0	205.0					211.0	214.0	224.0	217.0	219.0	206.0	212.5
Dissolved As (ug/L)	0.742	0.774					0.587	0.798	0.603	0.606	0.606	0.634	0.620
Dissolved Ba (ug/L)	28.9	29.1					29.4	35.1	27.0	22.2	22.2	31.0	29.0
Dissolved Cd (ug/L)	0.204	0.203					0.186	0.242	0.194	0.167	0.154	0.193	0.194
Dissolved Cr (ug/L)	0.503 J	0.451					0.920 U	5.900	0.474	0.377	0.892 J	0.237	0.489
Dissolved Cu (ug/L)	0.654	0.551					0.652	2.000	0.962	1.320	0.665	0.776	0.721
Dissolved Pb (ug/L)	1.01	1.54					0.95	1.33	1.08	0.96	0.72	0.51	0.98
Dissolved Ni (ug/L)	1.66	1.70					1.66	1.86	0.42	0.41	1.35 J	1.76	1.66
Dissolved Ag (ug/L)	<0.002	<0.002					<0.003	0.007	<0.003	<0.003	<0.003	<0.003	0.002
Dissolved Zn (ug/L)	10.30 U	9.54					5.97	22.70	8.08	11.30	12.40 J	5.76	9.92
Dissolved Se (ug/L)	0.767 J	0.749					0.838	0.991	1.120	1.170	0.932	0.833	0.885
Dissolved Hg (ug/L)	0.000435 U	0.000380 U					0.000403 U	0.001170 UJ	0.000883 U	0.000903	0.000434 U	0.000363 U	0.000435

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

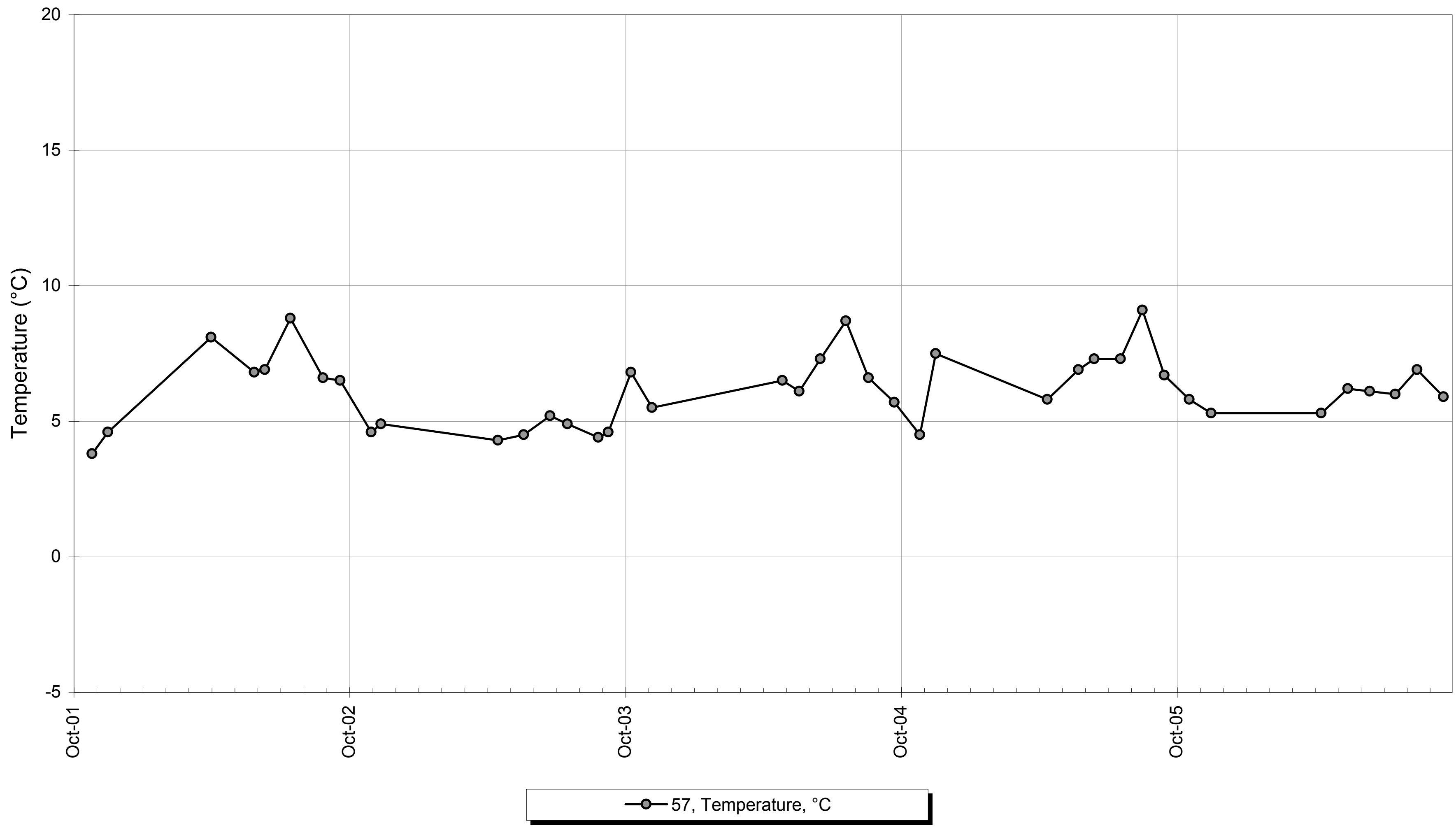
Qualified Data by QA Reviewer

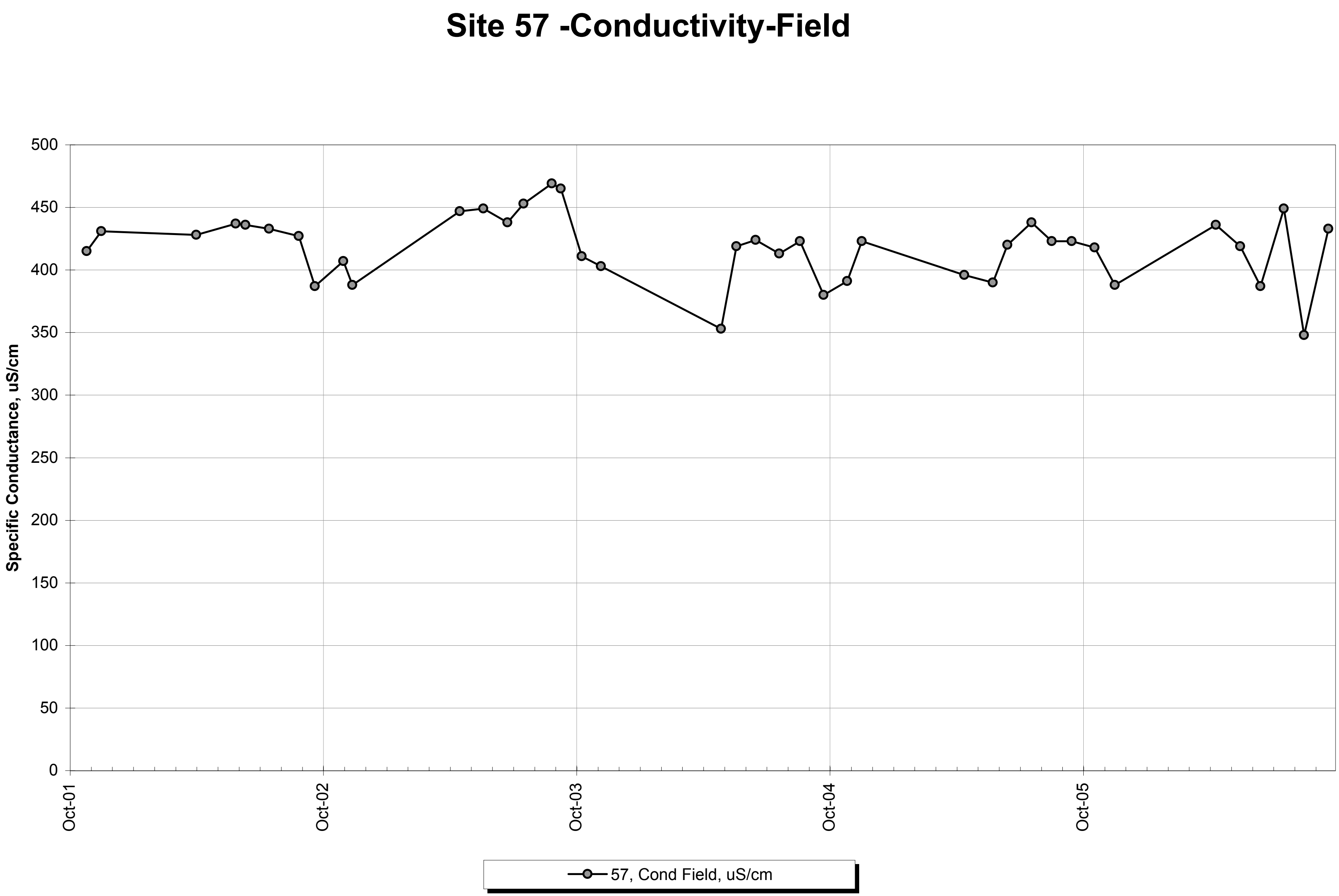
Date Range 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
57	10/18/2005	1:26:00 PM				
			pH Lab, su	7.27	J	Hold Time Violation
			Cr Diss, ug/l	0.503	J	Duplicate RPD
			Zn Diss, ug/l	10.3	U	Field Blank Contamination
			Se Diss, ug/l	0.767	J	Matrix Spike Recoveries
			Hg Diss, ug/l	0.000435	U	Field Blank Contamination
57	11/16/2005	1:04:00 PM				
			SO4 Tot, mg/l	52.4	J	Receipt Temperature
			Hg Diss, ug/l	0.00038	U	Field Blank Contamination
57	04/11/2006	1:34:00 PM				
			pH Lab, su	7.59	J	Outside Hold Time
			Cr Diss, ug/l	0.92	U	Field Blank Contamination
			Hg Diss, ug/l	0.000403	U	Field Blank Contamination
57	05/16/2006	1:28:00 PM				
			Hg Diss, ug/l	0.00117	UJ	Field Blank Contamination, Co
57	06/14/2006	8:30:00 AM				
			pH Lab, su	7.21	J	Hold Time Violation
			Hg Diss, ug/l	0.000883	U	Field Blank Contamination
57	08/16/2006	2:28:00 PM				
			Cr Diss, ug/l	0.892	J	LCS Recovery
			Ni Diss, ug/l	1.35	J	LCS Recovery
			Zn Diss, ug/l	12.4	J	LCS Recovery
			Hg Diss, ug/l	0.000434	U	Field Blank Contamination
57	09/20/2006	8:20:00 AM				
			Hg Diss, ug/l	0.000363	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

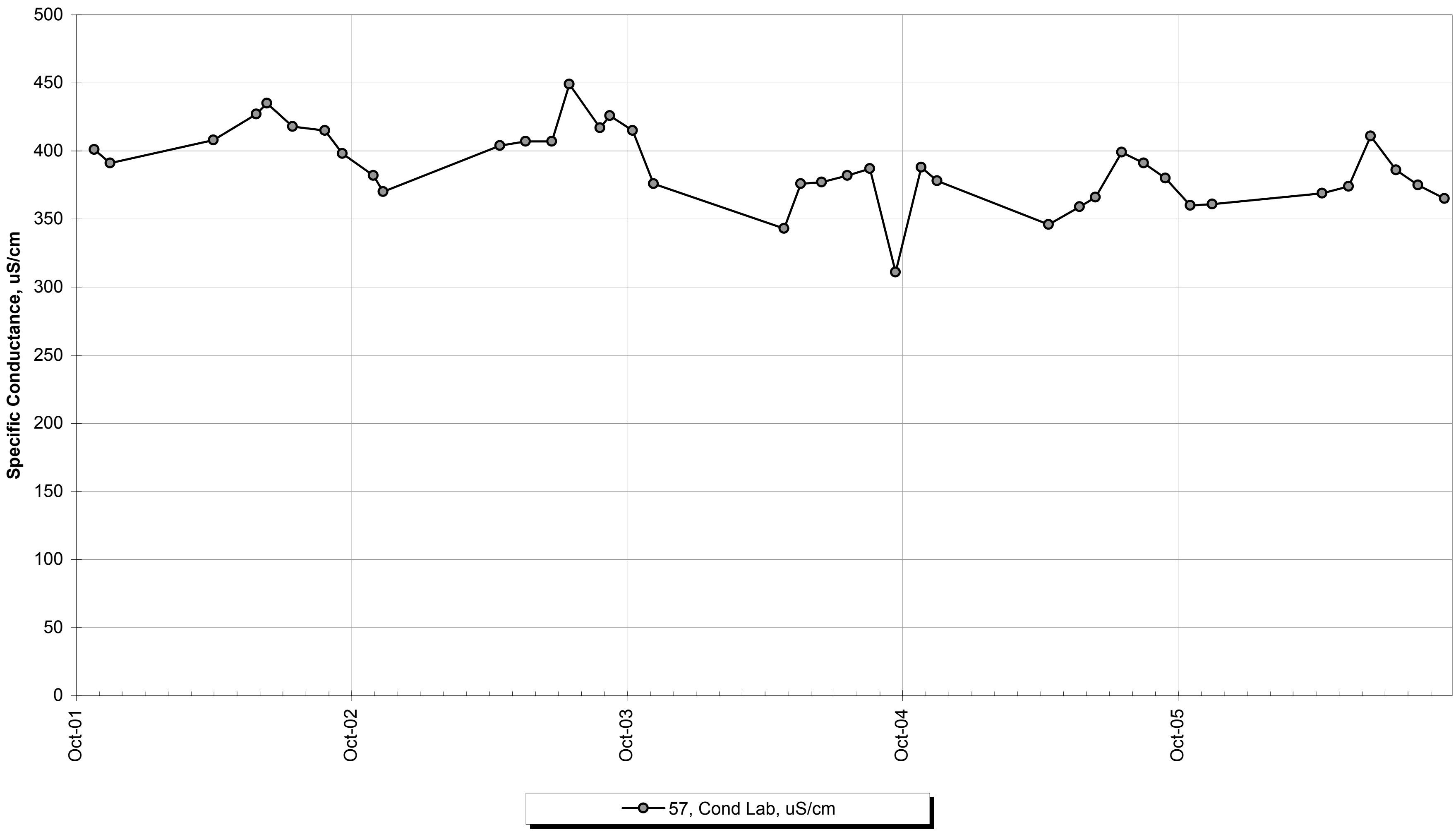
Site 57 -Water Temperature

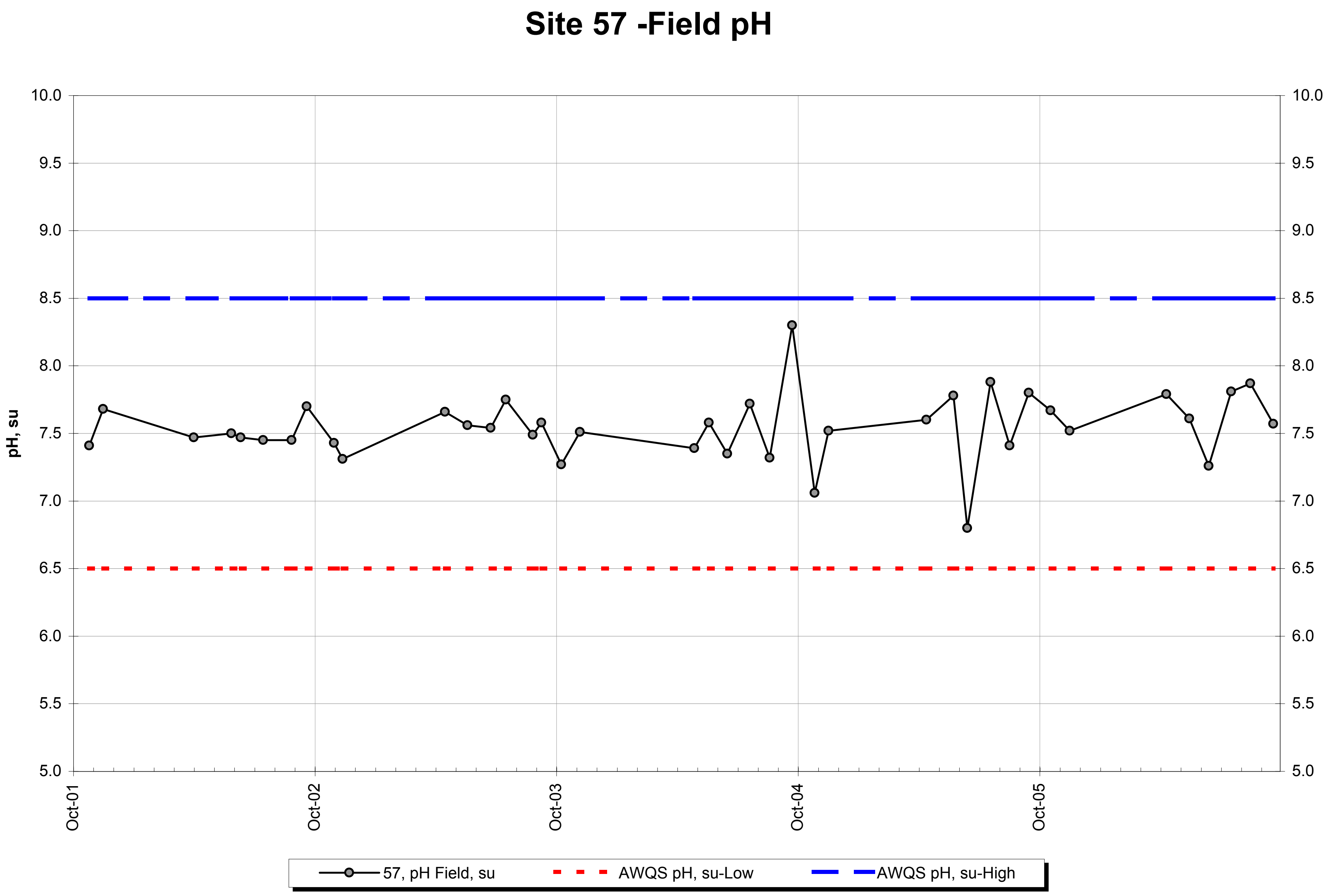




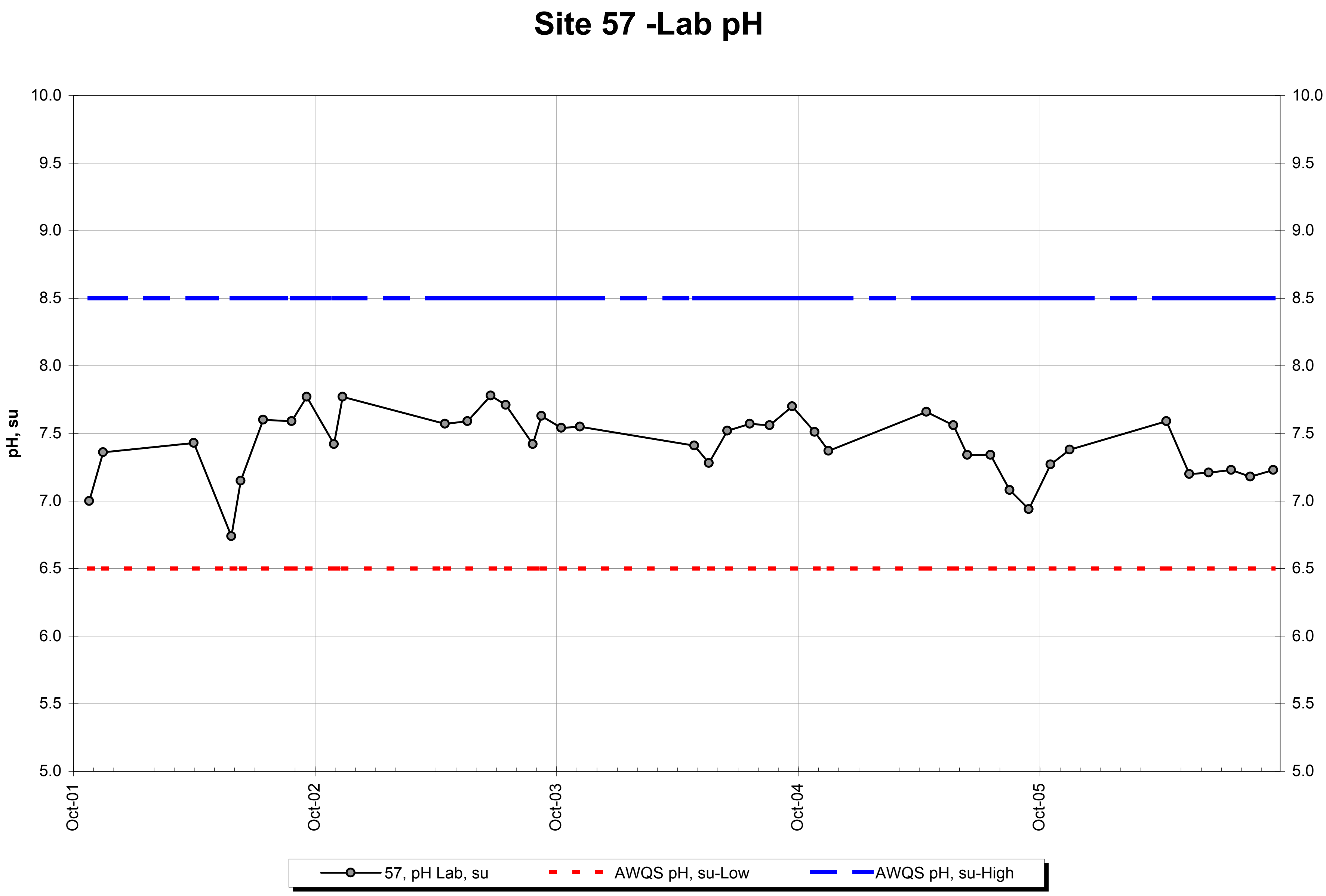
Site 57 -Conductivity-Field
Specific Conductance, uS/cm
500
450
400
350
300
250
200
150
100
50
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, Cond Field, uS/cm

Site 57 -Conductivity-Lab



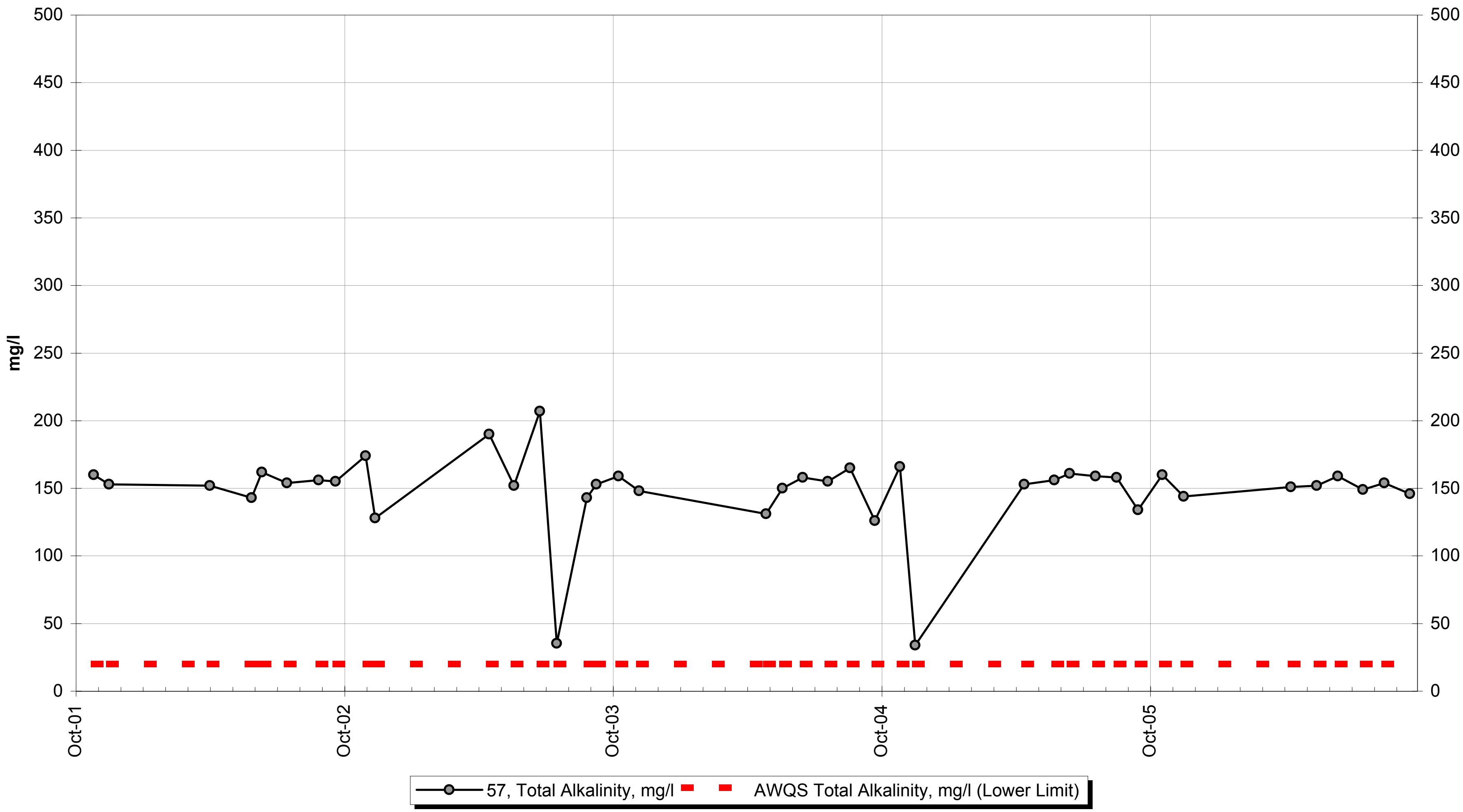


Site 57 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

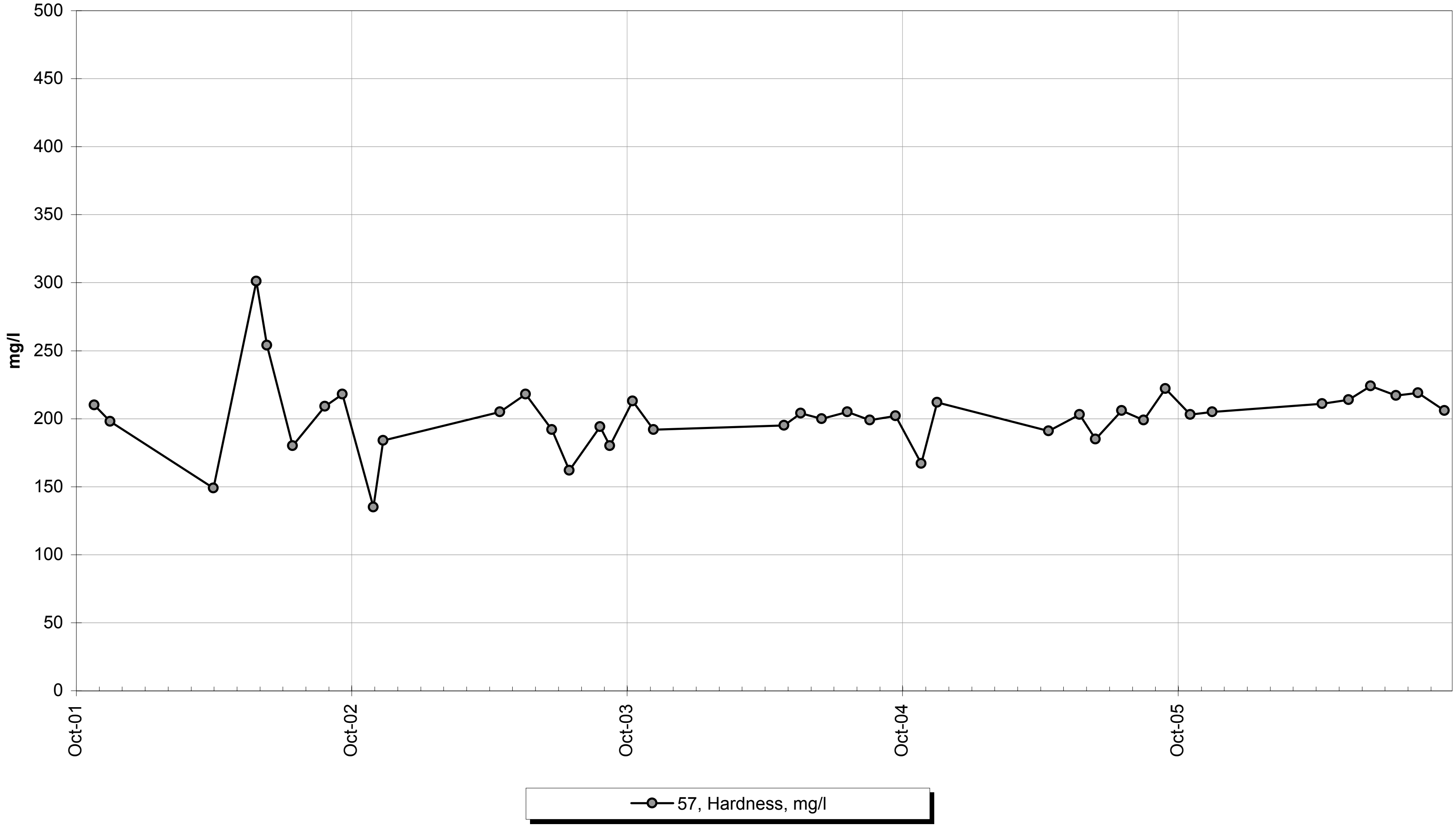


Site 57 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

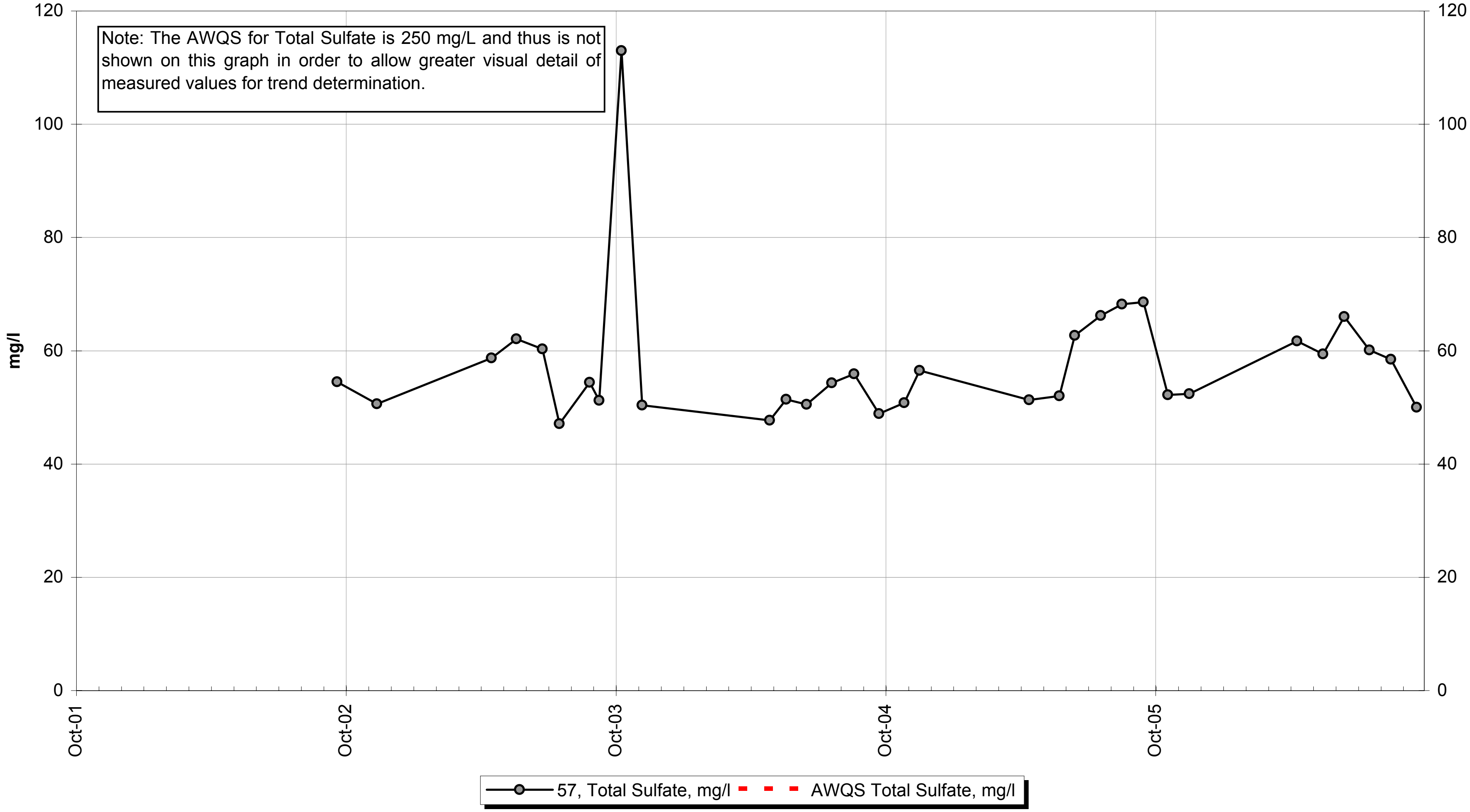
Site 57 -Total Alkalinity

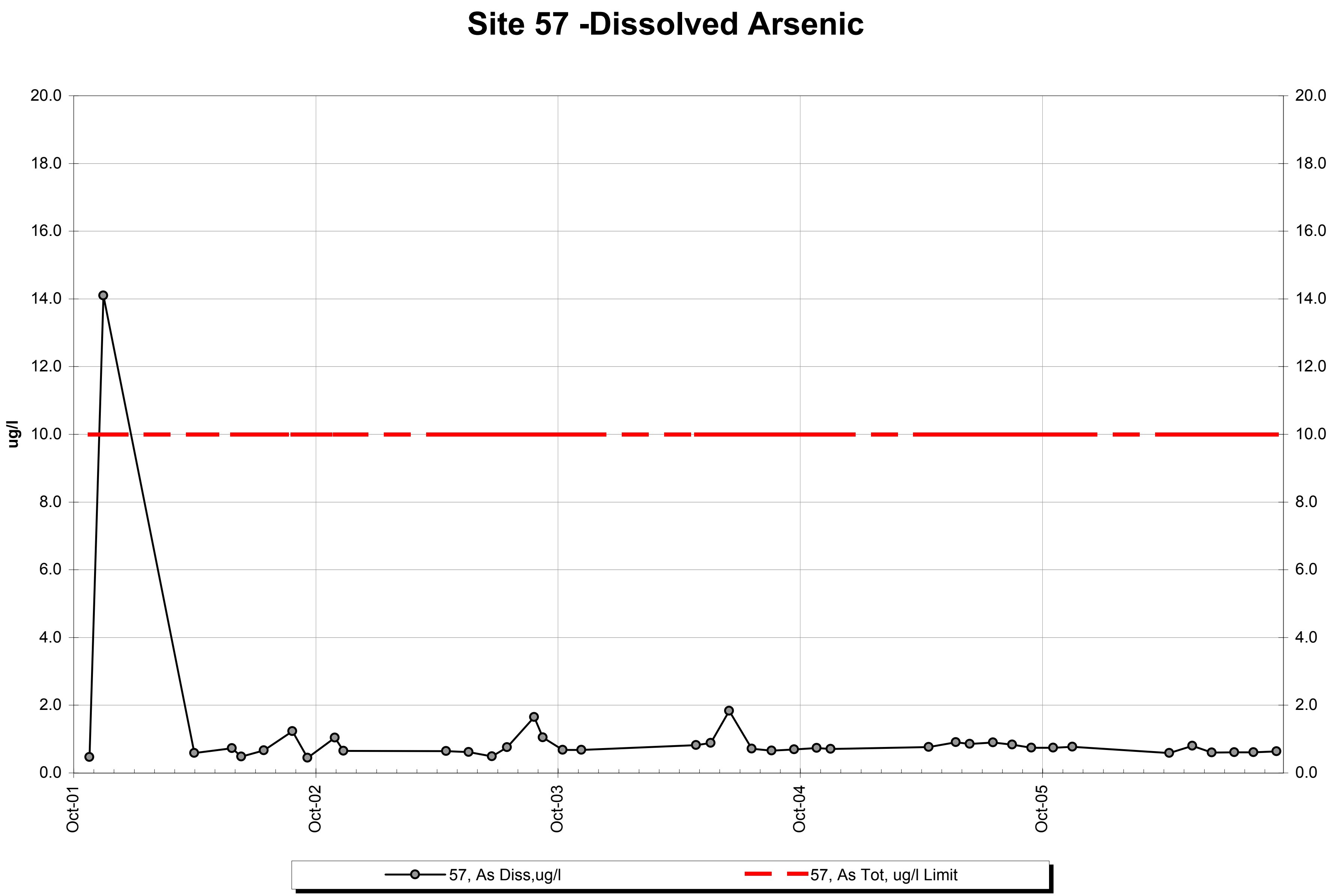


Site 57 -Hardness

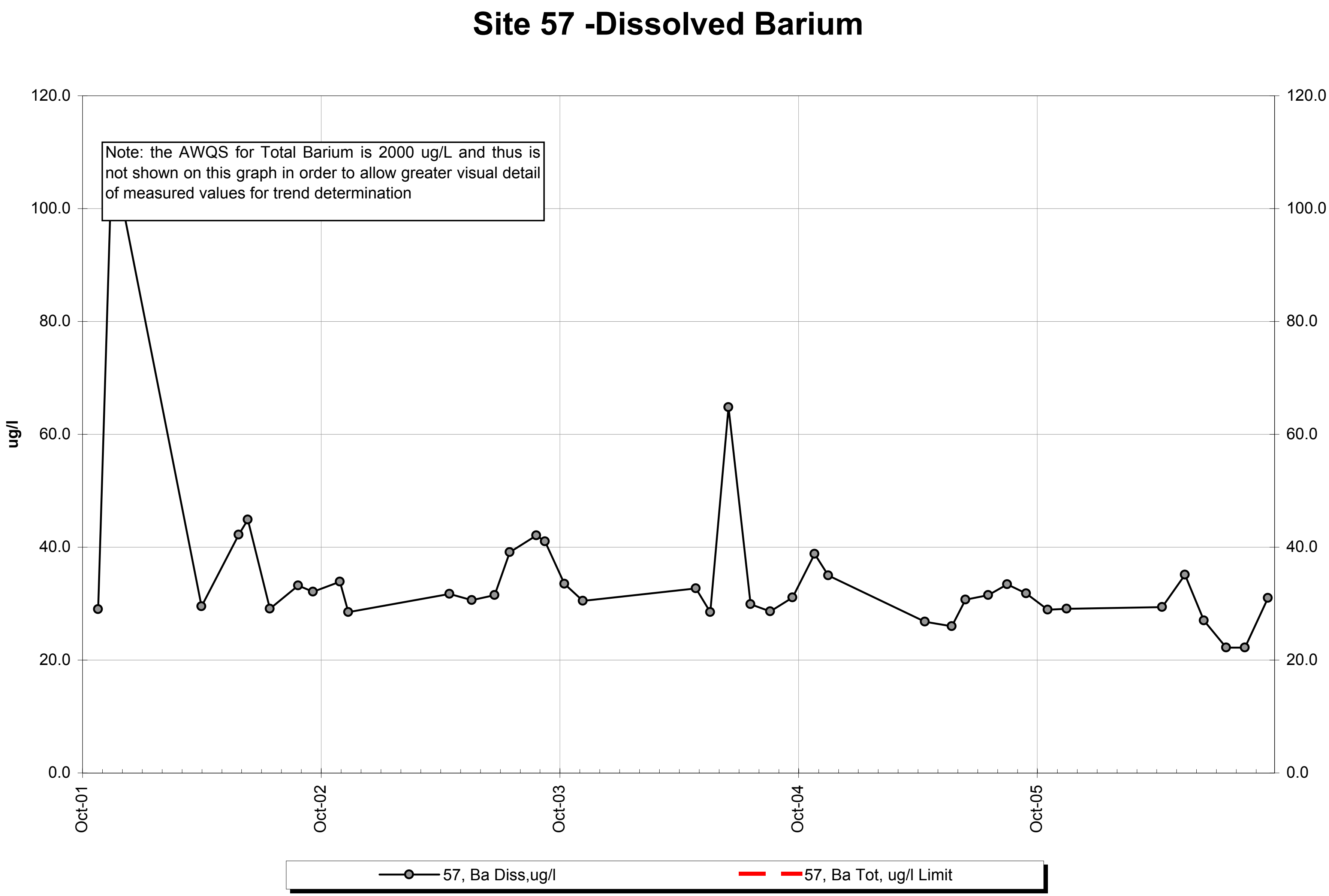


Site 57 -Total Sulfate

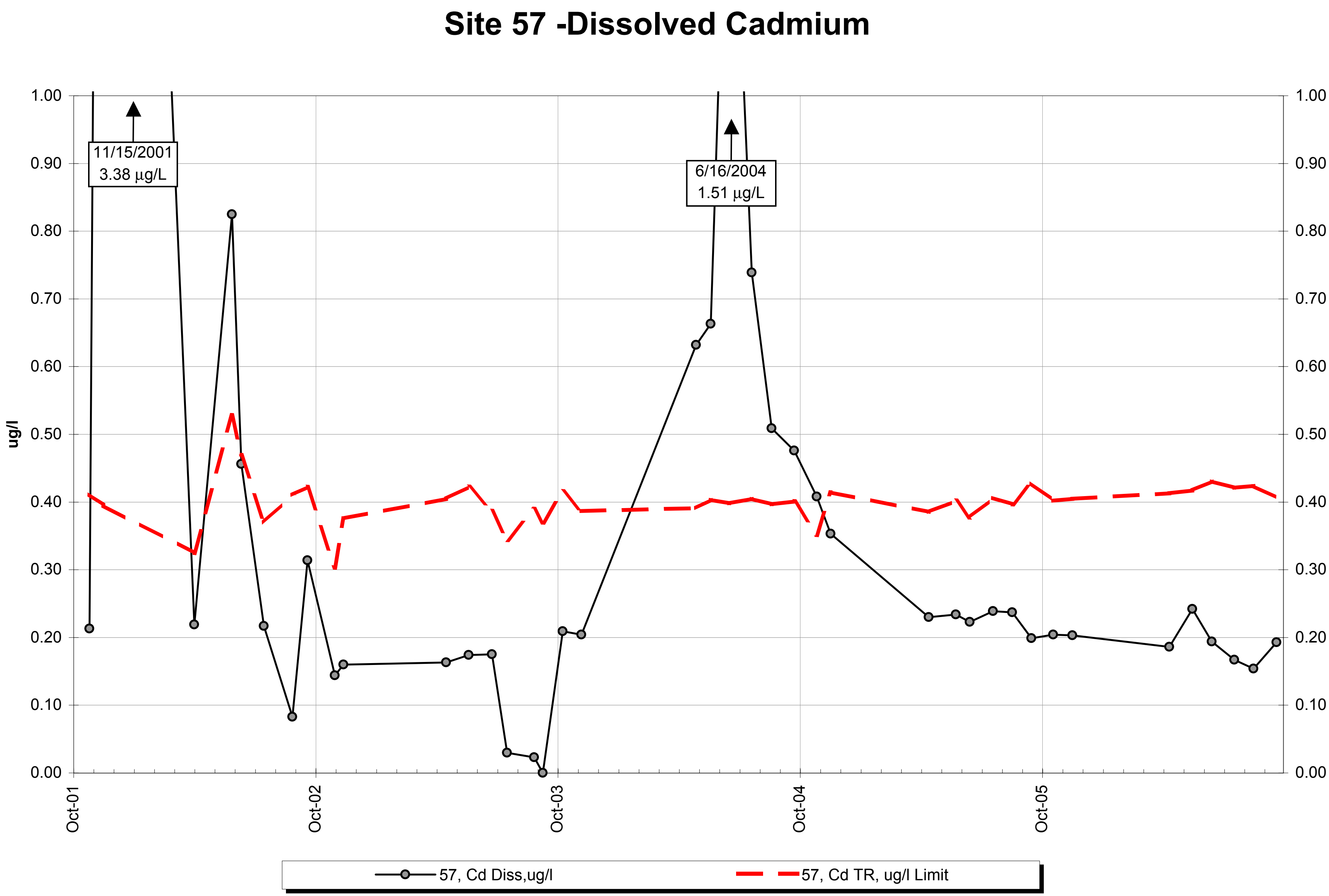




Site 57 -Dissolved Arsenic
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
ug/l
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, As Diss,ug/l
57, As Tot, ug/l Limit

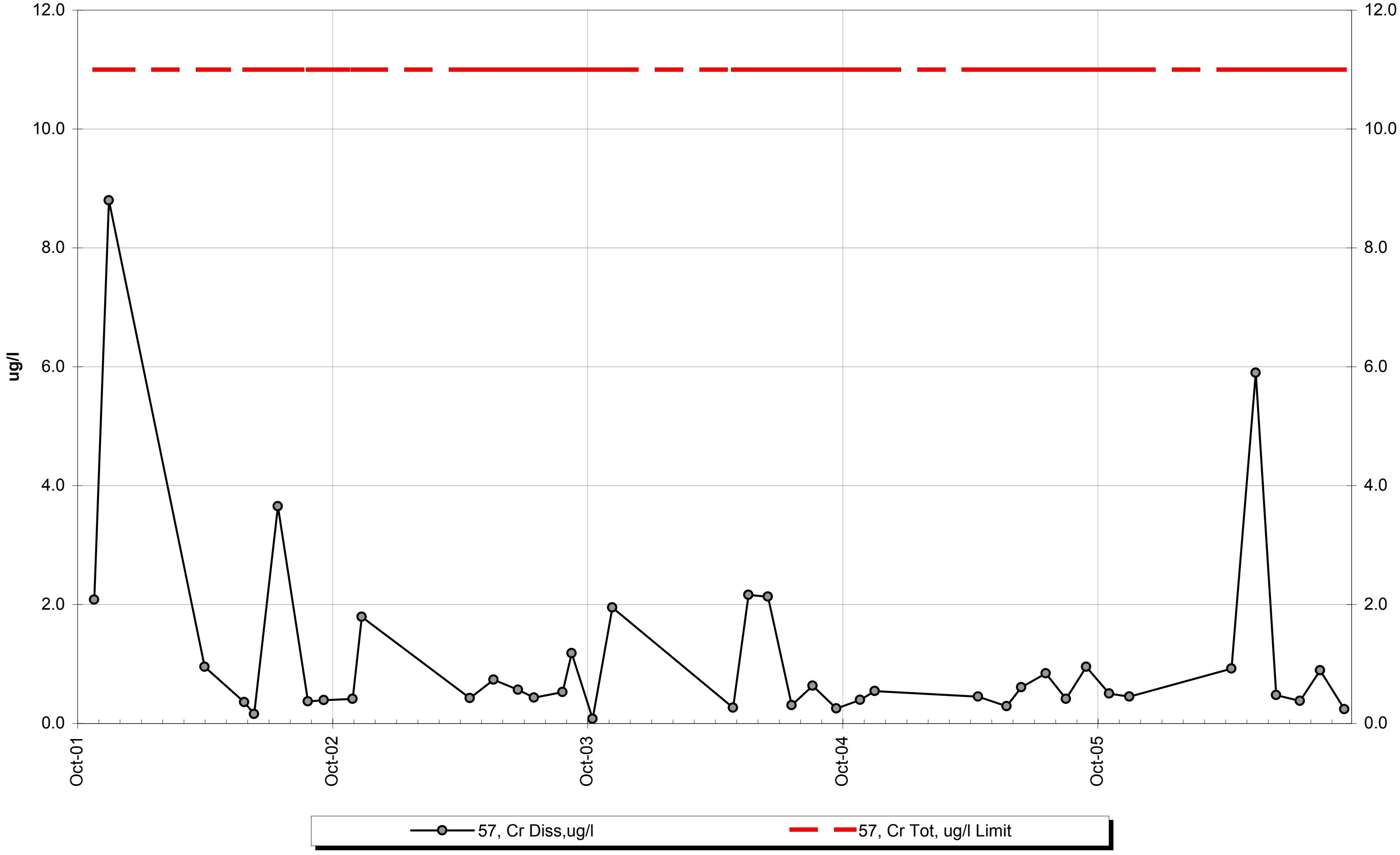


Site 57 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, Ba Diss,ug/l
57, Ba Tot, ug/l Limit

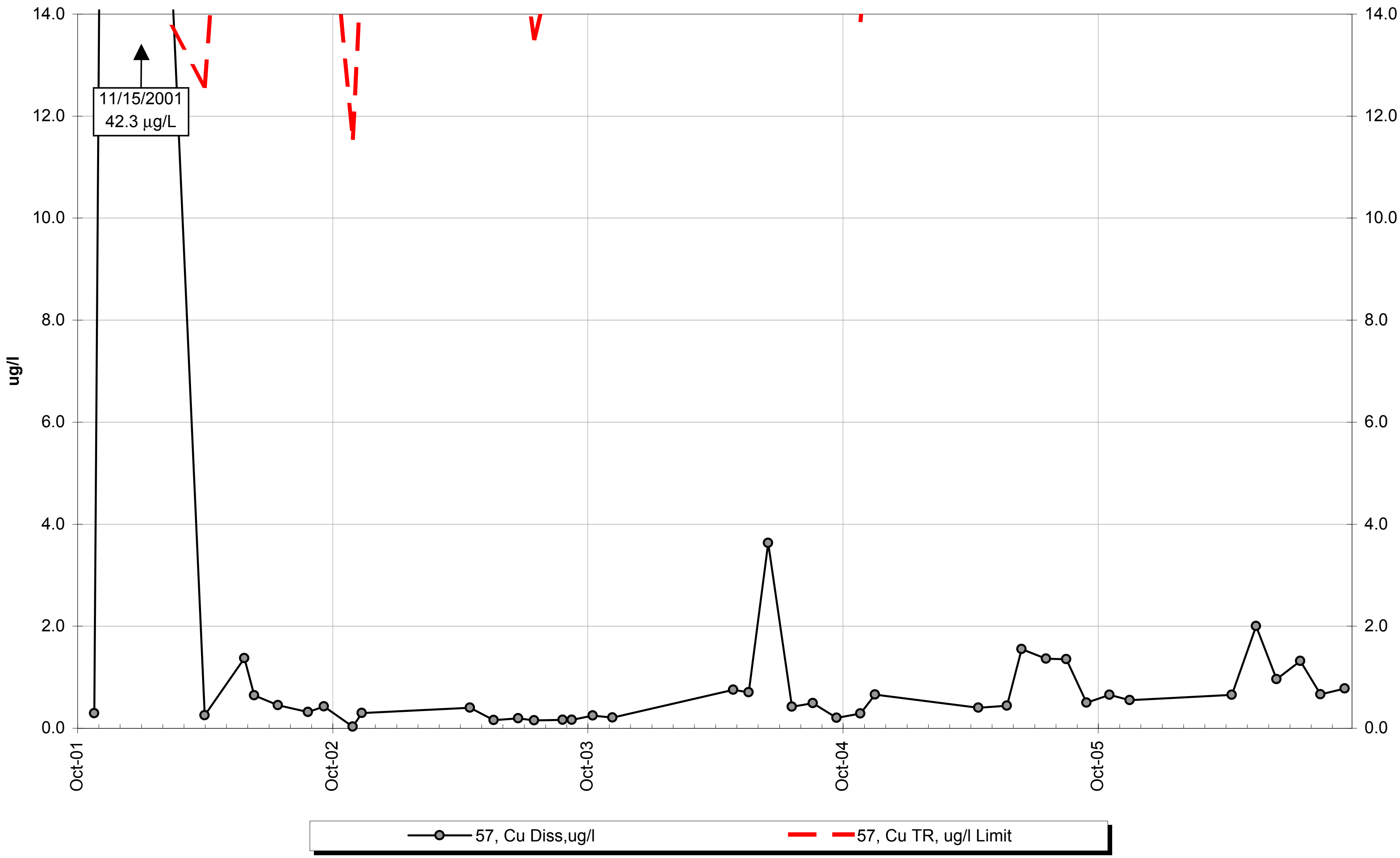


Site 57 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
11/15/2001
3.38 µg/L
6/16/2004
1.51 µg/L
57, Cd Diss,ug/l
57, Cd TR, ug/l Limit

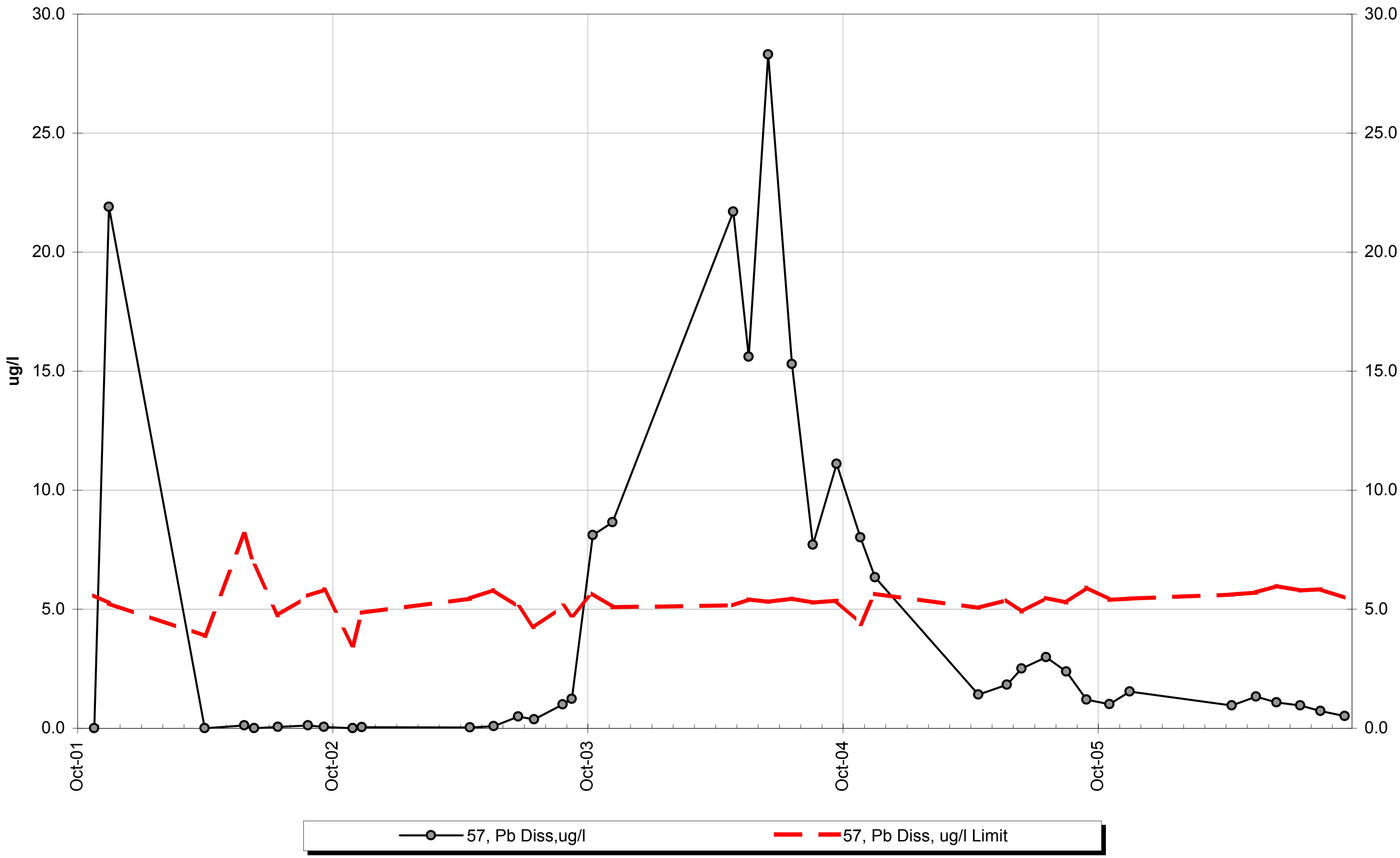
Site 57 -Dissolved Chromium



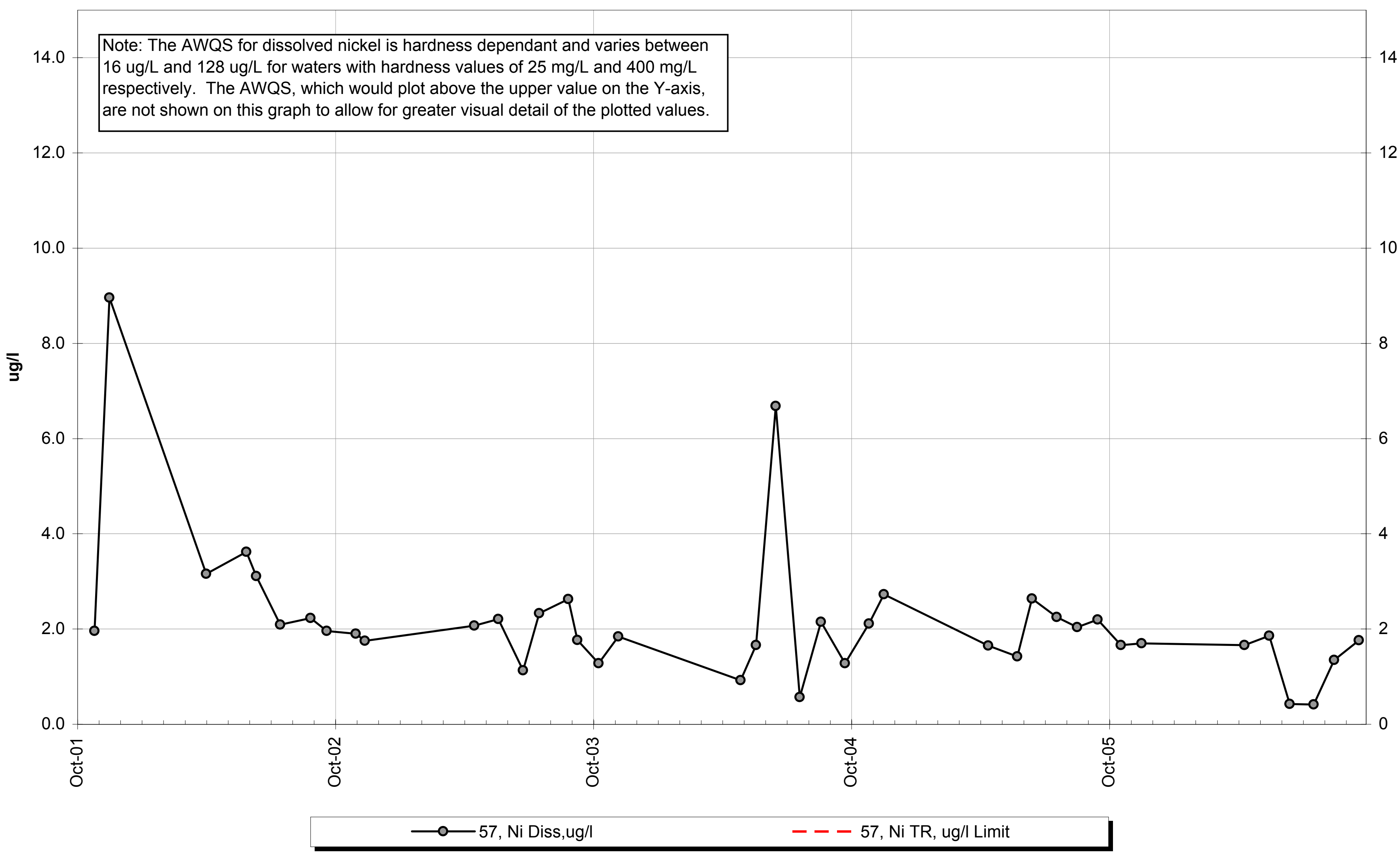
Site 57 -Dissolved Copper

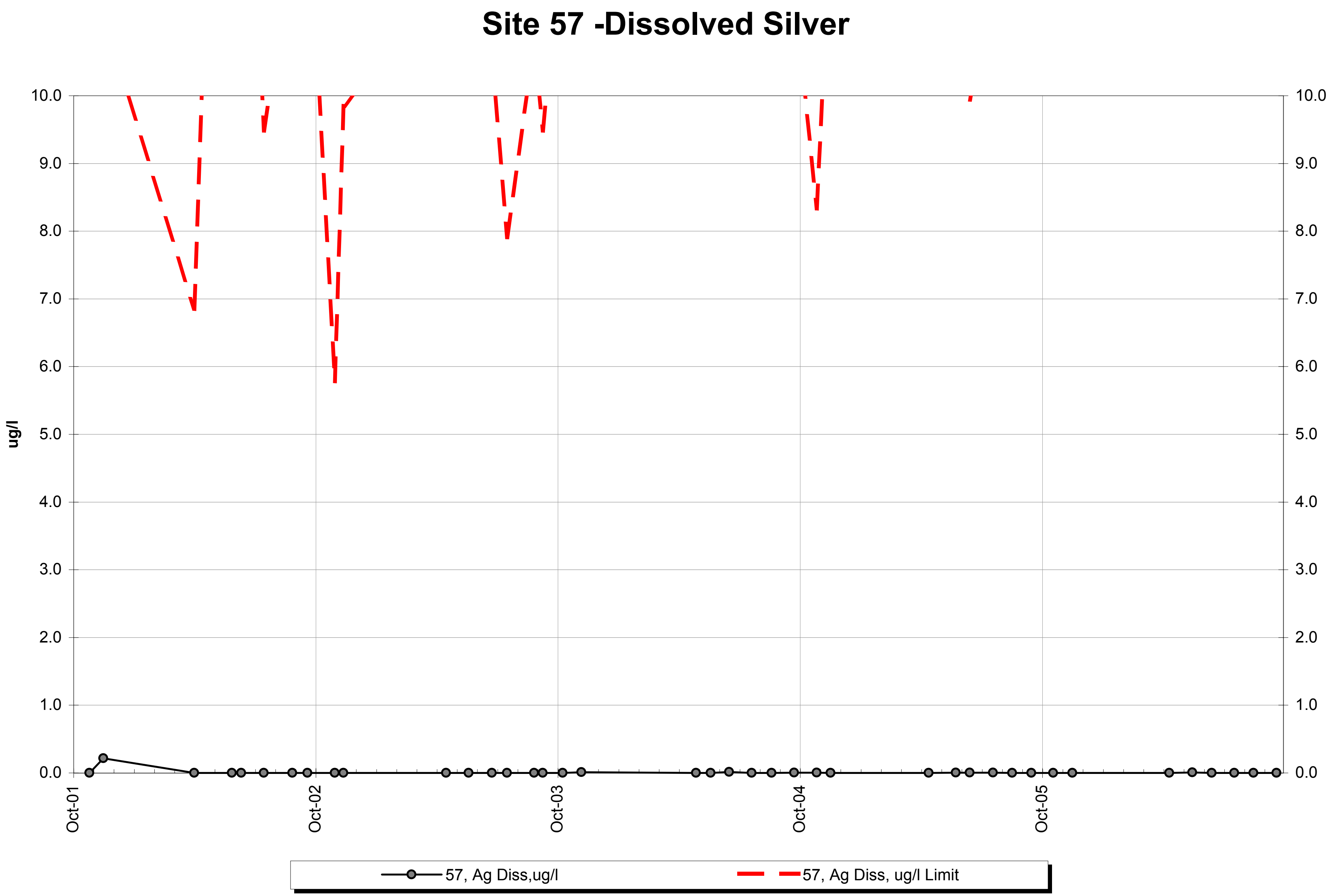


Site 57 -Dissolved Lead



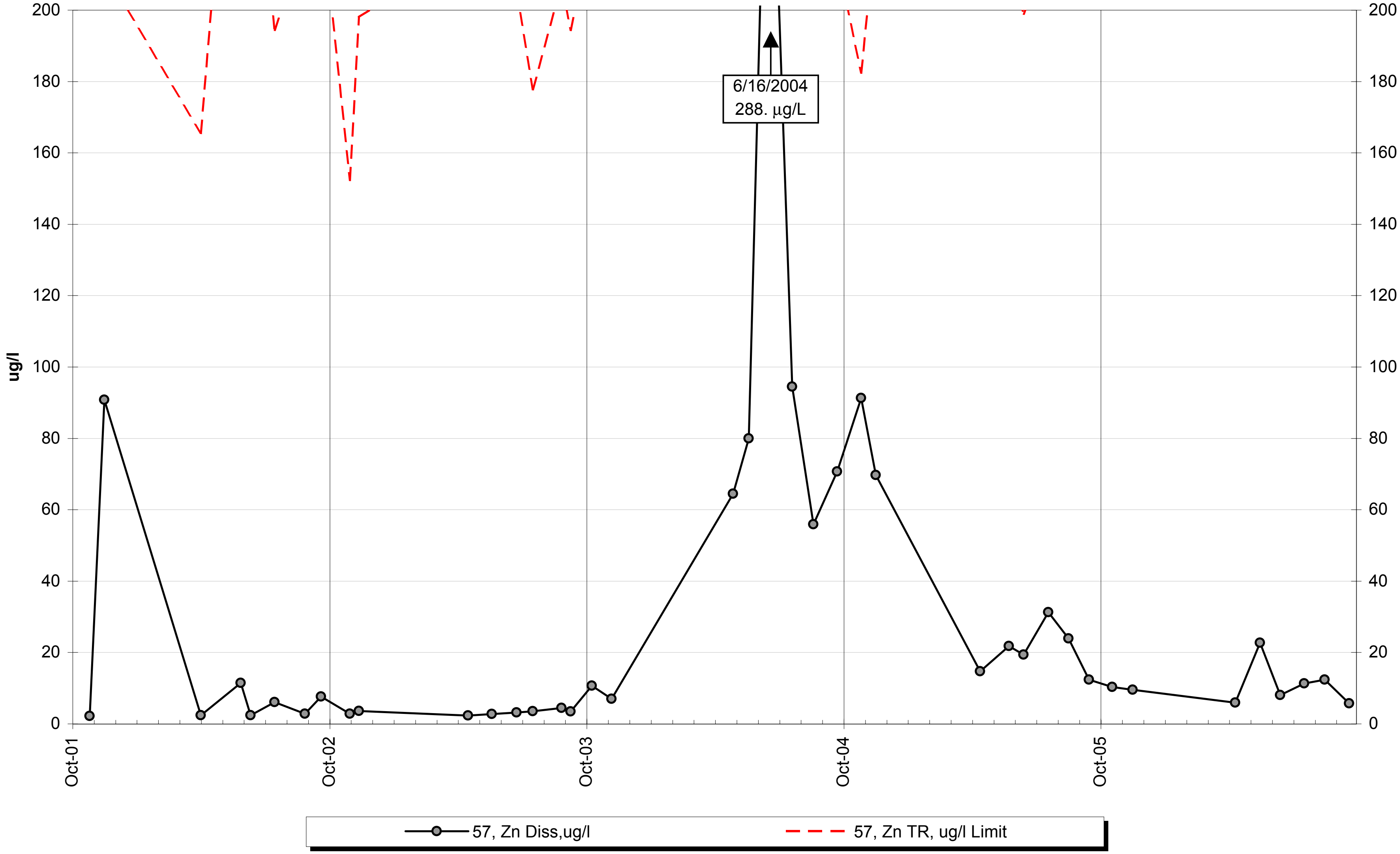
Site 57 -Dissolved Nickel



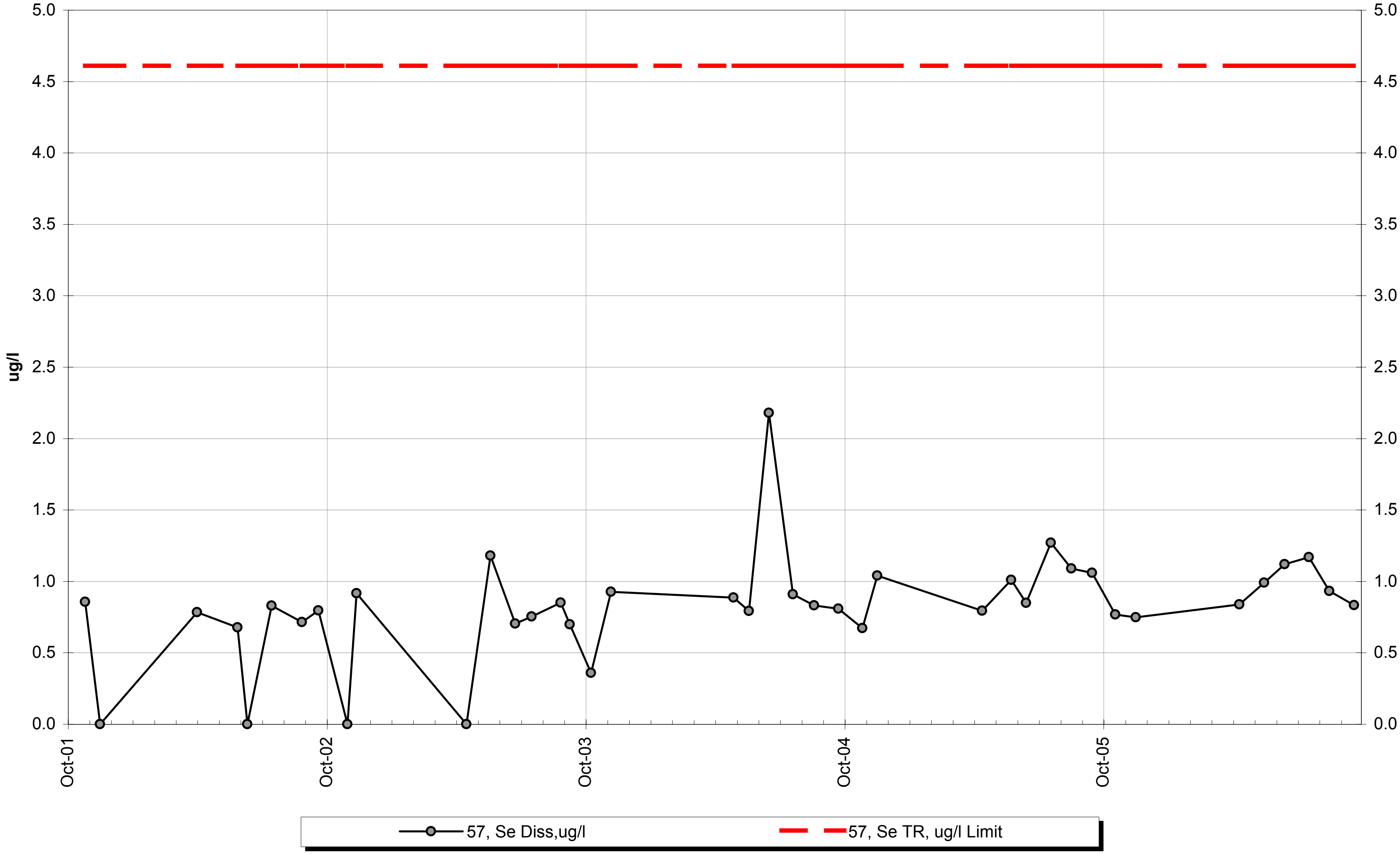


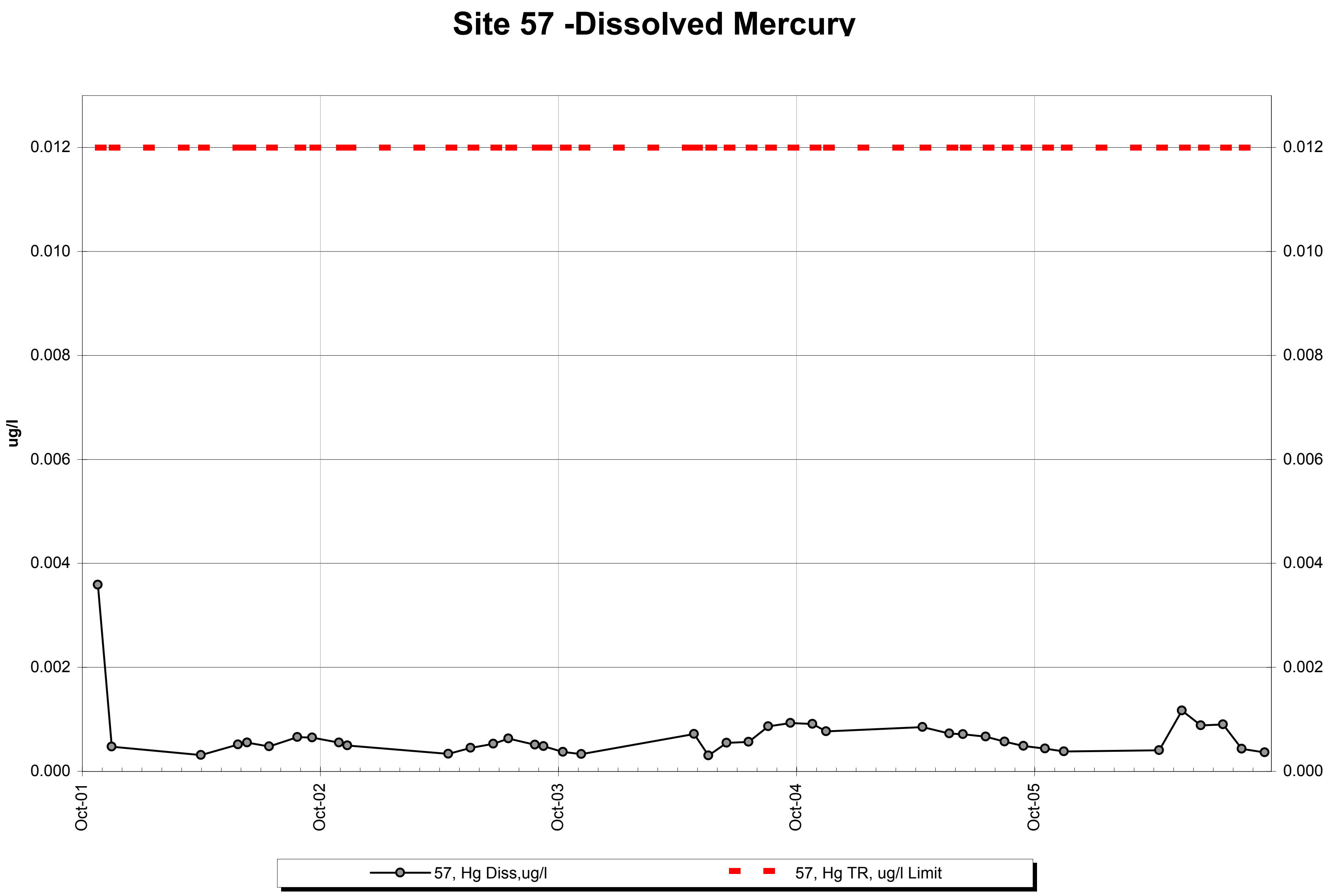
Site 57 -Dissolved Silver
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, Ag Diss,ug/l
57, Ag Diss, ug/l Limit

Site 57 -Dissolved Zinc



Site 57 -Dissolved Selenium





Site 57 -Dissolved Mercury
ug/l
0.000
0.002
0.004
0.006
0.008
0.010
0.012
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
57, Hg Diss,ug/l
57, Hg TR, ug/l Limit

Site **#57** 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	**WY2001**												
b	**WY2002**	401.0	391.0					408.0	427.0	435.0	418.0	415.0	398.0
c	**WY2003**	382.0	370.0					404.0	407.0	407.0	449.0	417.0	426.0
d	**WY2004**	415.0	376.0					343.0	376.0	377.0	382.0	387.0	311.0
e	**WY2005**	388.0	378.0					346.0	359.0	366.0	399.0	391.0	380.0
f	**WY2006**	360.0	361.0					369.0	374.0	411.0	386.0	375.0	365.0
	n	5	5	0	0	0	0	5	5	5	5	5	5

	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												
c-a												
d-a												
e-a												
f-a												
c-b	-1	-1					-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
f-b	-1	-1					-1	-1	-1	-1	-1	-1
d-c	1	1					-1	-1	-1	-1	-1	-1
e-c	1	1					-1	-1	-1	-1	-1	-1
f-c	-1	-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
f-e	-1	-1					1	1	1	-1	-1	-1
S_k	-4	-4	0	0	0	0	-4	-8	-4	-4	-6	-4

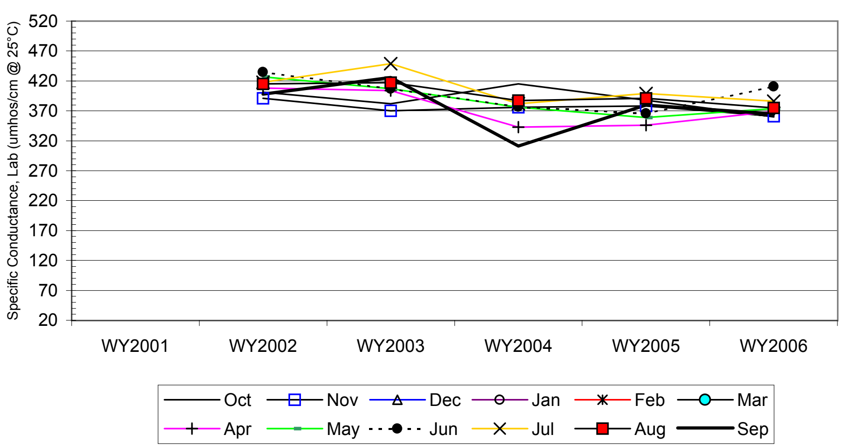
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	16.67
$Z_k = S_k/\sigma_S$	-0.98	-0.98					-0.98	-1.96	-0.98	-0.98	-1.47	-0.98
Z^2_k	0.96	0.96					0.96	3.84	0.96	0.96	2.16	0.96

ΣZ_k= -9.31
ΣZ^2_k= 11.76
Z-bar=ΣZ_k/K= -1.16

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

Σn 40
ΣS_k -38

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	0.93	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.996**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -3.20	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
133.33	**p** **0.001**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-19.43		-6.00
0.050	-16.50	**-10.63**	-7.42
0.100	-14.40		-7.50
0.200	-13.21		-8.04
		-2.7%	

Site **#57** 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	**WY2001**												
b	**WY2002**	7.0	7.4					7.4	6.7	7.2	7.6	7.6	7.8
c	**WY2003**	7.4	7.8					7.6	7.6	7.8	7.7	7.4	7.6
d	**WY2004**	7.5	7.6					7.4	7.3	7.5	7.6	7.6	7.7
e	**WY2005**	7.5	7.4					7.7	7.6	7.3	7.3	7.1	6.9
f	**WY2006**	7.3	7.4					7.6	7.2	7.2	7.2	7.2	7.2
	n	5	5	0	0	0	0	5	5	5	5	5	5

	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												
c-a												
d-a												
e-a												
f-a												
c-b	1	1					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
f-b	1	1					1	1	1	-1	-1	-1
d-c	1	-1					-1	-1	-1	-1	1	1
e-c	1	-1					1	-1	-1	-1	-1	-1
f-c	-1	-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
f-e	-1	1					-1	-1	-1	-1	1	1
S_k	2	0	0	0	0	0	4	0	-2	-8	-6	-6

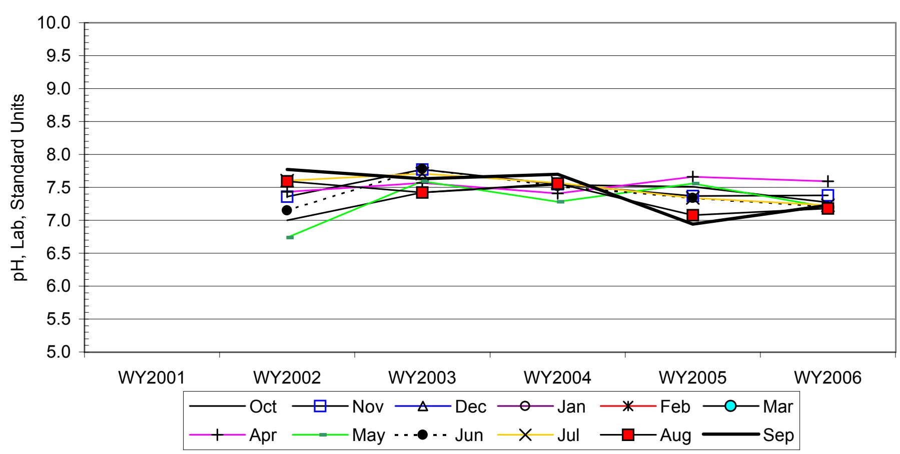
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	16.67
$Z_k = S_k/\sigma_S$	0.49	0.00					0.98	0.00	-0.49	-1.96	-1.47	-1.47
Z^2_k	0.24	0.00					0.96	0.00	0.24	3.84	2.16	2.16

ΣZ_k= -3.92
ΣZ^2_k= 9.60
Z-bar=ΣZ_k/K= -0.49

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

Σn 40
ΣS_k -16

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	7.68	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.362**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 133.33	Z_{calc} -1.30	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.097**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.14		0.03
0.050	-0.13	**-0.06**	0.00
0.100	-0.13		-0.01
0.200	-0.10		-0.02

Site #57 — Seasonal Kendall analysis for Total Alk, (mg/l)

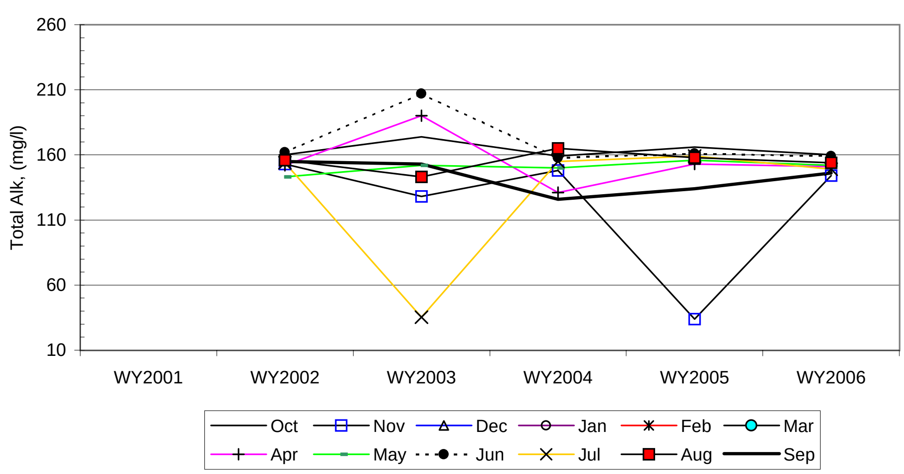
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**	160.0	153.0					152.0	143.0	162.0	154.0	156.0	155.0
c	**WY2003**	174.0	128.0					190.0	152.0	207.0	35.3	143.0	153.0
d	**WY2004**	159.0	148.0					131.0	150.0	158.0	155.0	165.0	126.0
e	**WY2005**	166.0	33.9					153.0	156.0	161.0	159.0	158.0	134.0
f	**WY2006**	160.0	144.0					151.0	152.0	159.0	149.0	154.0	146.0
	n	5	5	0	0	0	0	5	5	5	5	5	5
	t_1	1	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
	b-a												
	c-a												
	d-a												
	e-a												
	f-a												
	c-b	1	-1					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
	f-b	0	-1					-1	1	-1	-1	-1	-1
	d-c	-1	1					-1	-1	-1	1	1	-1
	e-c	-1	-1					-1	1	-1	1	1	-1
	f-c	-1	1					-1	0	-1	1	1	-1
	e-d	1	-1					1	1	1	1	-1	1
	f-d	1	-1					1	1	1	-1	-1	1
	f-e	-1	1					-1	-1	-1	-1	-1	1
	S_k	-1	-4	0	0	0	0	-2	5	-4	2	0	-4
	σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	16.67
	$Z_k = S_k/\sigma_S$	-0.24	-0.98					-0.49	1.22	-0.98	0.49	0.00	-0.98
	Z^2_k	0.06	0.96					0.24	1.50	0.96	0.24	0.00	0.96

ΣZ_k=	-1.96
ΣZ^2_k=	4.92
Z-bar=ΣZ_k/K=	-0.24

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

Σn	40
ΣS_k	-8

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	4.44	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.728**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -0.61	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
133.33	p **0.272**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.43		2.00
0.050	-2.25	**-0.50**	0.58
0.100	-2.00		0.50
0.200	-2.00		0.00

Site **#57** 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	**WY2001**												
b	**WY2002**	2.2	90.8					2.4	11.5	2.4	6.1	2.9	7.7
c	**WY2003**	2.9	3.6					2.3	2.7	3.2	3.5	4.4	3.5
d	**WY2004**	10.7	7.0					64.5	80.0	288.0	94.5	55.9	70.7
e	**WY2005**	91.3	69.7					14.7	21.8	19.4	31.3	23.9	12.4
f	**WY2006**	10.3	9.5					6.0	22.7	8.1	11.3	12.4	5.8
	n	5	5	0	0	0	0	5	5	5	5	5	5

	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												
c-a												
d-a												
e-a												
f-a												
c-b	1	-1					-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
f-b	1	-1					1	1	1	1	1	-1
d-c	1	1					1	1	1	1	1	1
e-c	1	1					1	1	1	1	1	1
f-c	1	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
f-e	-1	-1					-1	1	-1	-1	-1	-1
S_k	6	0	0	0	0	0	2	4	4	2	4	0

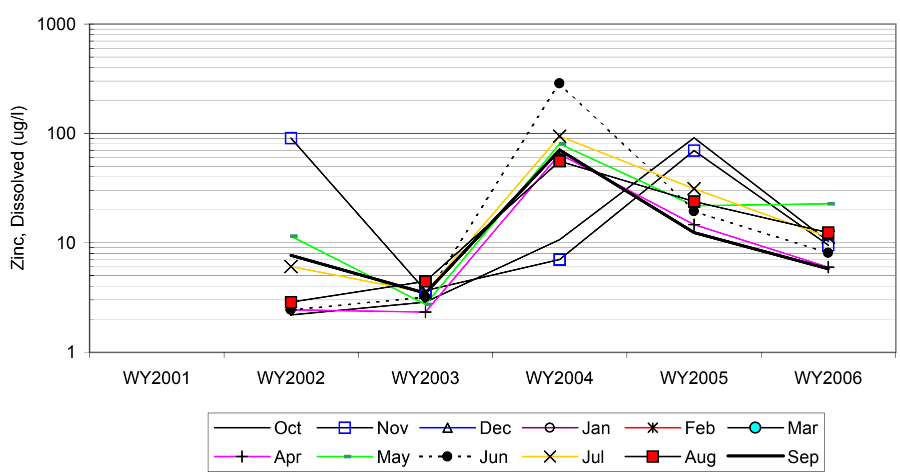
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	16.67
$Z_k = S_k/\sigma_S$	1.47	0.00					0.49	0.98	0.98	0.49	0.98	0.00
Z^2_k	2.16	0.00					0.24	0.96	0.96	0.24	0.96	0.00

ΣZ_k= 5.39
ΣZ^2_k= 5.52
Z-bar=ΣZ_k/K= 0.67

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

Σn 40
ΣS_k 22

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	1.89	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.966**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 1.82	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
133.33	**p** **0.966**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.37		4.98
0.050	0.72	**1.61**	3.42
0.100	0.83		2.71
0.200	1.22		2.47

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 2006” report. The table includes all the required FWMP analyte 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 it’s 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 2006 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-05 though Sept-06.				

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. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Kendall analyses are presented in detail on the pages following this interpretive section. The table below summarizes the results on the data collected between May-02 and Sep-06 (WY2002-WY2006). No statistically significant ($\alpha/2$=2.5%) trends are identified

Site 56-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	5	0.50	o		
pH, Lab	5	0.03	-		
Alkalinity, Total	5	0.93	+		
Zinc, Dissolved	5	0.50	o		

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

A comparison of median values for alkalinity, lab pH, lab conductivity, sulfate, and dissolved zinc between Site 46 and Site 49 has been conducted as specified in the Statistical Information Goals for Site 46. 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 2006 data set.

The only significant difference identified by the typical one-tailed test was for alkalinity. The median values for alkalinity for Site 49 and Site 46 are 152 mg/l and 59.1 mg/l respectively. The median difference, Site 49 minus Site 46, is 91.7 mg/l. It should be noted that if a two-tailed signed-rank test was applied to the dataset for these sites a very 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 cast in terms without regard to the direction of the difference (H_a: median [D]?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 - WY2006, summary statistics for median analysis.

Parameter	Signed Ranks p-value	Site 57 median	Site 56 median	Median of Differences
Conductivity, Lab	1.00	372	135	238
pH, Lab	0.95	7.23	7.18	0.06
Alkalinity, Total	**1.00**	**152**	**59.1**	**91.7**
Sulfate, Total	1.00	59.0	9.8	46.3
Zinc, Dissolved	1.00	9.92	0.55	9.05

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 may 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 and 6. 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 2006

Site 56 "MW-D-00-01"

Sample Date/Parameter	10/18/05	11/16/05	Dec-05	Jan-06	Feb-06	Mar-06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/20/06	**Median**
Water Temp (°C)	5.8	2.5	NOT SCHEDULED FOR SAMPLING				1.6	3.9	7.8	9.7	10.0	8.2	6.8
Conductivity-Field(µmho)	131	140					248	124	121	128	113	150	130
Conductivity-Lab (µmho)	129	150					177	126	120	141	124	147	135
pH Lab (standard units)	6.92 J	7.24					7.37 J	7.16	7.19 J	7.48	7.12	7.16	7.18
pH Field (standard units)	7.21	7.25					7.40	6.82	6.86	7.35	7.80	7.00	7.23
Total Alkalinity (mg/L)	56.8	62.8					76.3	57.4	49.1	60.3	57.9	61.0	59.1
Total Sulfate (mg/L)	9.0	11.9 J					17.8	9.2	8.1	11.5	8.1	10.4	9.8
Hardness (mg/L)	68.7	80.7					100.0	69.4	60.8	78.0	69.5	78.3	73.8
Dissolved As (ug/L)	0.121	0.149					0.121	0.123	0.150	0.141	0.142	0.192	0.142
Dissolved Ba (ug/L)	11.1	11.5					13.1	8.0	7.0	9.2	8.3	13.8	10.2
Dissolved Cd (ug/L)	0.018	0.016					0.019	0.009	0.010 U	0.014	0.013	0.030	0.015
Dissolved Cr (ug/L)	0.193 J	0.126 J					0.700 U	1.810	0.129 J	0.187 J	0.439 J	<0.018	0.190
Dissolved Cu (ug/L)	0.613	0.478					0.657	0.609	0.518 U	0.505	0.567	1.060	0.588
Dissolved Pb (ug/L)	0.0059 U	0.0092 U					0.0060 U	0.0186 U	0.0156 U	0.0052 U	0.0083 U	0.0885	0.0087
Dissolved Ni (ug/L)	0.642	0.759					1.270	0.557	0.190 U	0.213 U	0.505 J	0.835	0.600
Dissolved Ag (ug/L)	<0.002	0.002 J					<0.003	0.008	<0.003	<0.003	<0.003	<0.003	0.002
Dissolved Zn (ug/L)	0.42 U	1.33 U					0.50	0.36 U	0.60 U	0.41 U	0.87 UJ	0.98	0.55
Dissolved Se (ug/L)	0.506 J	0.652					1.210	0.526	0.583	0.636	0.569	0.749	0.610
Dissolved Hg (ug/L)	0.001320 U	0.000965 U					0.000930 U	0.001500 UJ	0.001860 U	0.001720	0.001490 U	0.003360	0.001495

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
56	10/18/2005	11:28:00 AM				
			pH Lab, su	6.92	J	Hold Time Violation
			Cr Diss, ug/l	0.193	J	Duplicate RPD
			Pb Diss, ug/l	0.00585	U	Field Blank Contamination
			Zn Diss, ug/l	0.42	U	Field Blank Contamination
			Se Diss, ug/l	0.506	J	Matrix Spike Recoveries
			Hg Diss, ug/l	0.00132	U	Field Blank Contamination
56	11/16/2005	11:12:00 AM				
			SO4 Tot, mg/l	11.9	J	Receipt Temperature
			Cr Diss, ug/l	0.126	J	Below Quantitative Range
			Pb Diss, ug/l	0.00917	U	Field Blank Contamination
			Ag Diss, ug/l	0.00204	J	Below Quantitative Range
			Zn Diss, ug/l	1.33	U	Field Blank Contamination
			Hg Diss, ug/l	0.000965	U	Field Blank Contamination
56	04/11/2006	12:17:00 PM				
			pH Lab, su	7.37	J	Outside Hold Time
			Cr Diss, ug/l	0.7	U	Field Blank Contamination
			Pb Diss, ug/l	0.00604	U	Field Blank Contamination
			Hg Diss, ug/l	0.00093	U	Field Blank Contamination
56	05/16/2006	11:05:00 AM				
			Pb Diss, ug/l	0.0186	U	Field Blank Contamination
			Zn Diss, ug/l	0.355	U	Field Blank Contamination
			Hg Diss, ug/l	0.0015	UJ	Field Blank Contamination, Co
56	06/14/2006	8:05:00 AM				
			pH Lab, su	7.19	J	Hold Time Violation
			Cd Diss, ug/l	0.00992	U	Field Blank Contamination
			Cr Diss, ug/l	0.129	J	Below Quantitative Range
			Cu Diss, ug/l	0.518	U	Field Blank Contamination
			Pb Diss, ug/l	0.0156	U	Field Blank Contamination
			Ni Diss, ug/l	0.19	U	Field Blank Contamination
			Zn Diss, ug/l	0.604	U	Field Blank Contamination
			Hg Diss, ug/l	0.00186	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

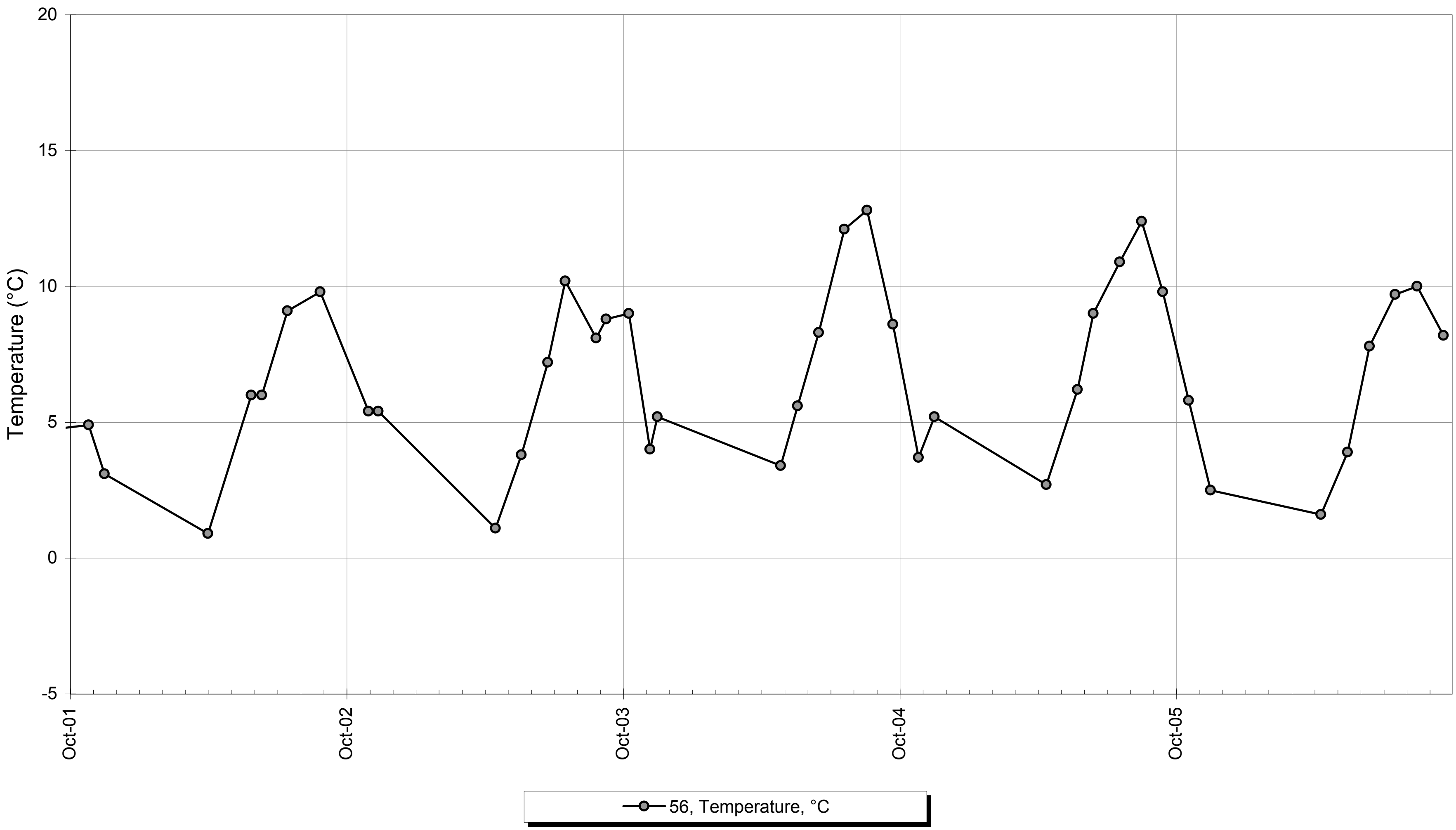
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

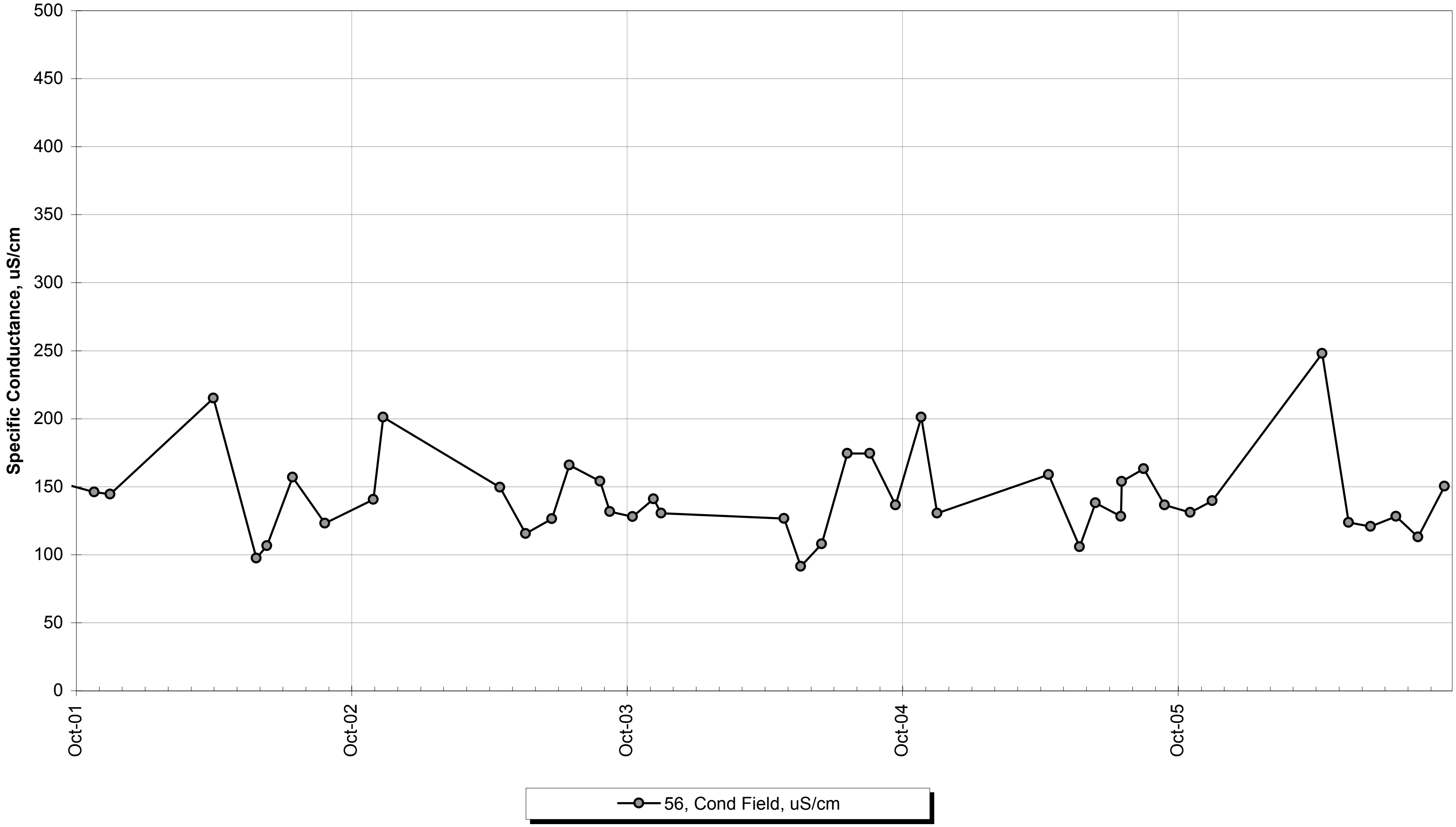
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
56	07/18/2006	10:06:00 AM				
			Cr Diss, ug/l	0.187	J	Duplicate RPD
			Pb Diss, ug/l	0.00516	U	Field Blank Contamination
			Ni Diss, ug/l	0.213	U	Field Blank Contamination
			Zn Diss, ug/l	0.407	U	Field Blank Contamination
56	08/16/2006	12:49:00 PM				
			Cr Diss, ug/l	0.439	J	LCS Recovery
			Pb Diss, ug/l	0.00829	U	Field Blank Contamination
			Ni Diss, ug/l	0.505	J	LCS Recovery
			Zn Diss, ug/l	0.867	UJ	Field Blank Contamination, LC
			Hg Diss, ug/l	0.00149	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

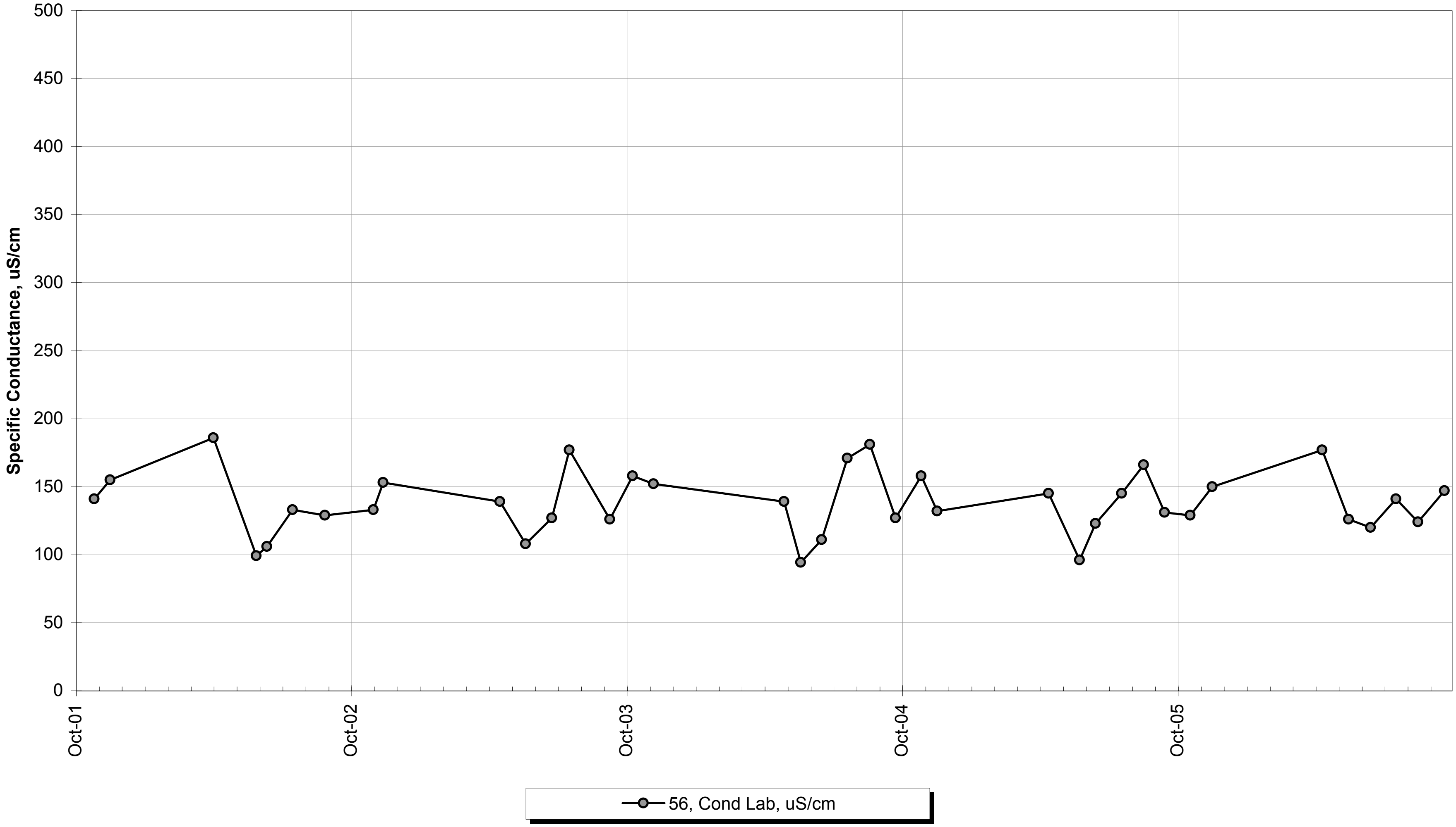
Site 56 -Water Temperature



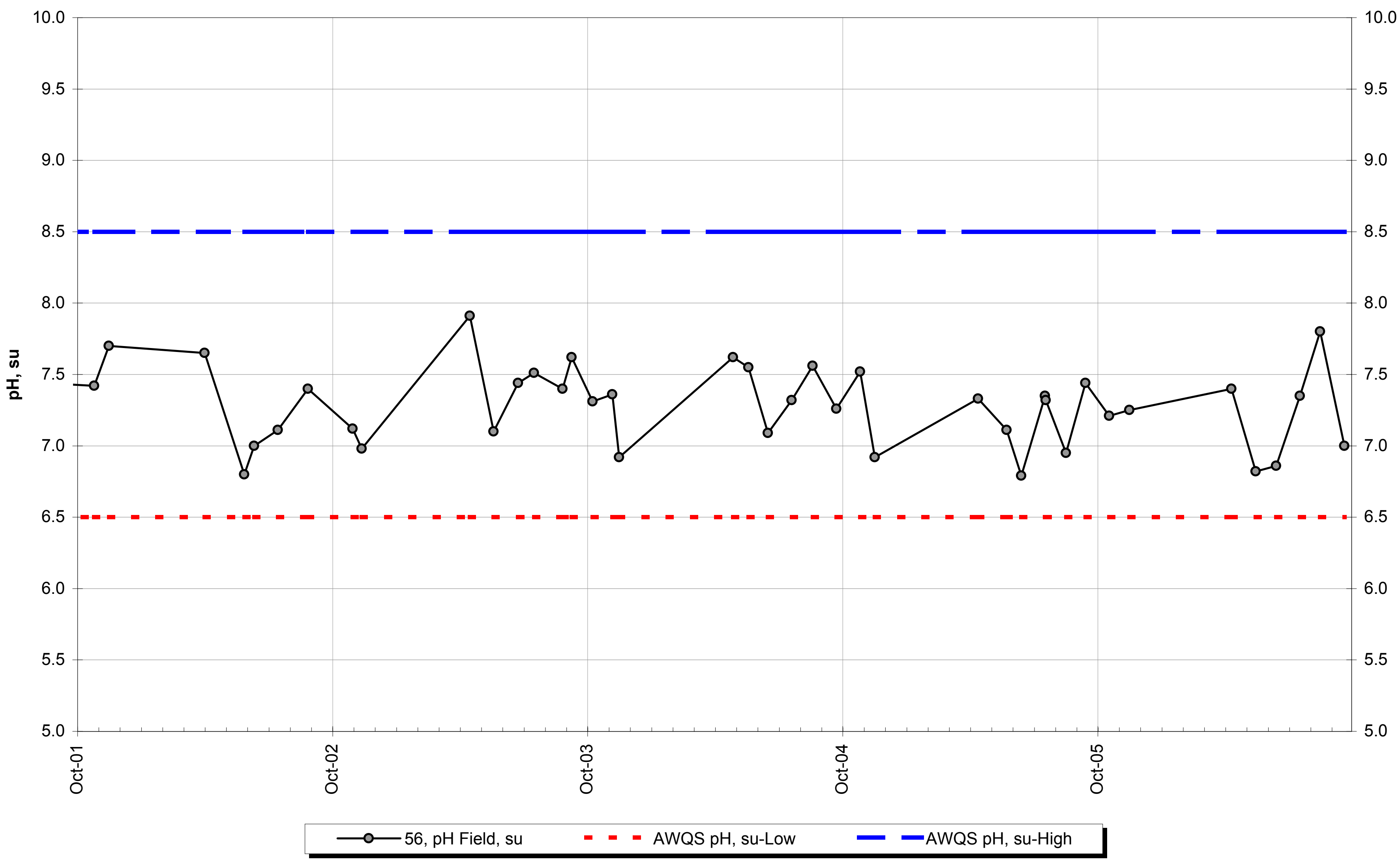
Site 56 -Conductivity-Field

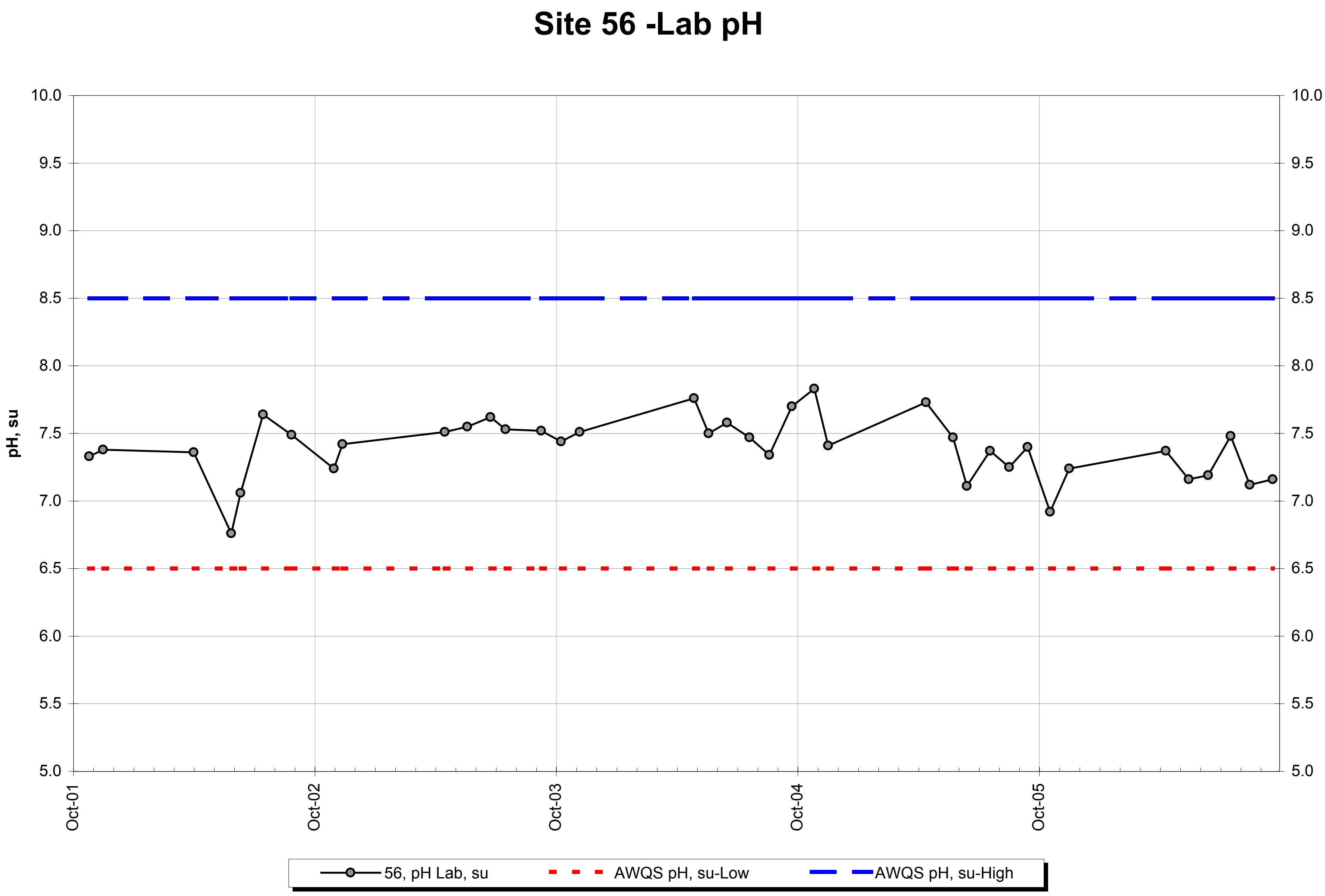


Site 56 -Conductivity-Lab



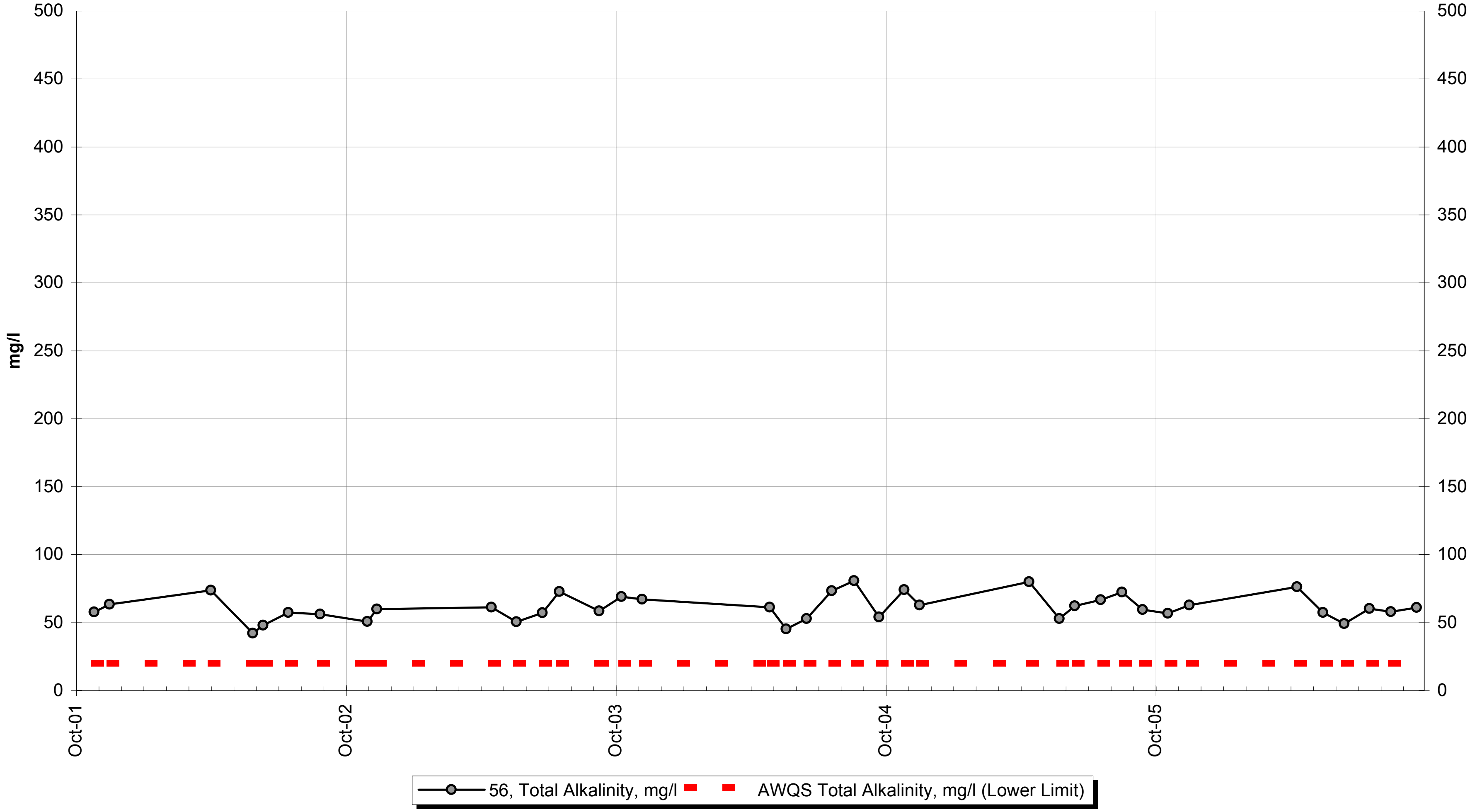
Site 56 -Field pH



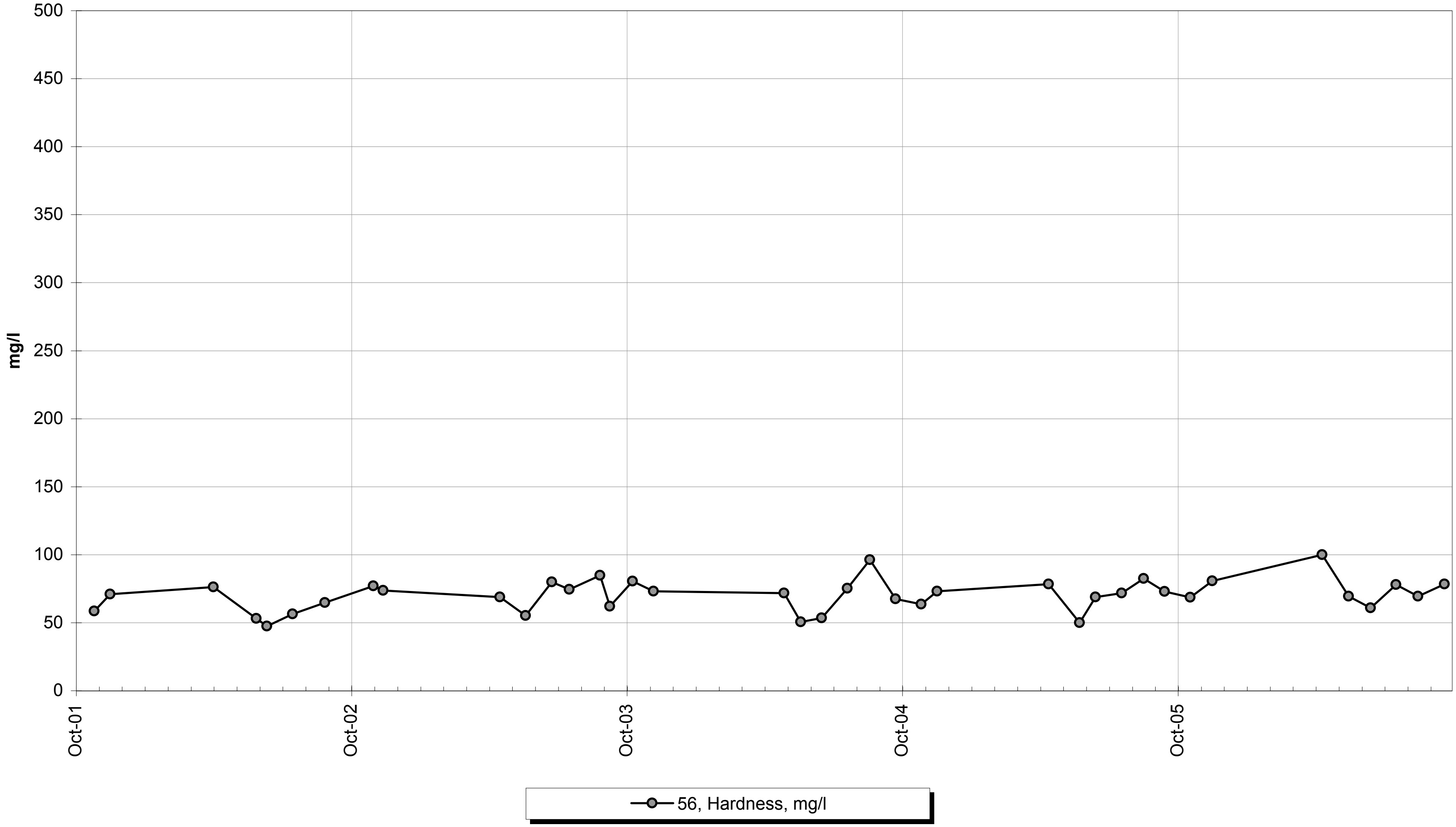


Site 56 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
56, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

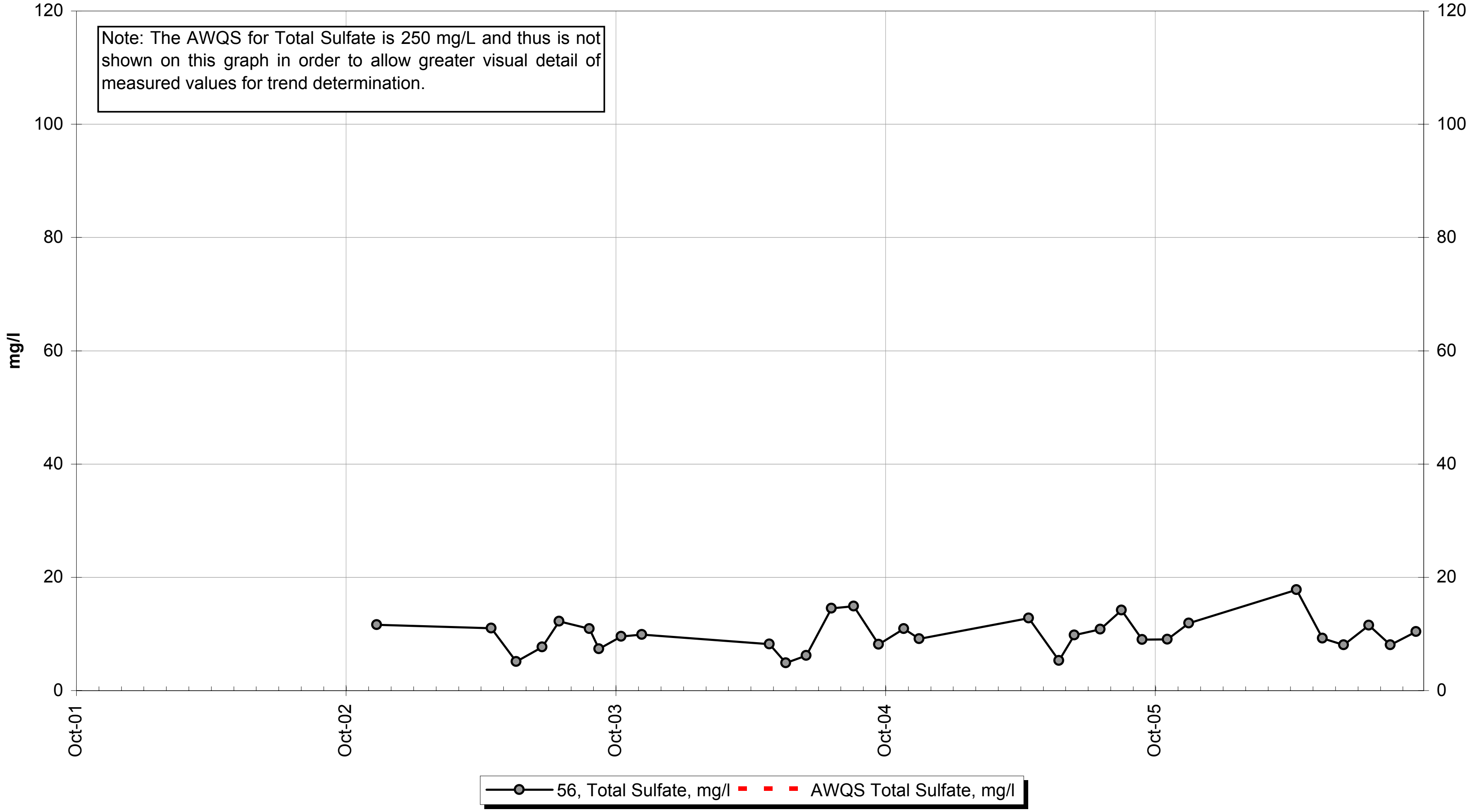
Site 56 -Total Alkalinity

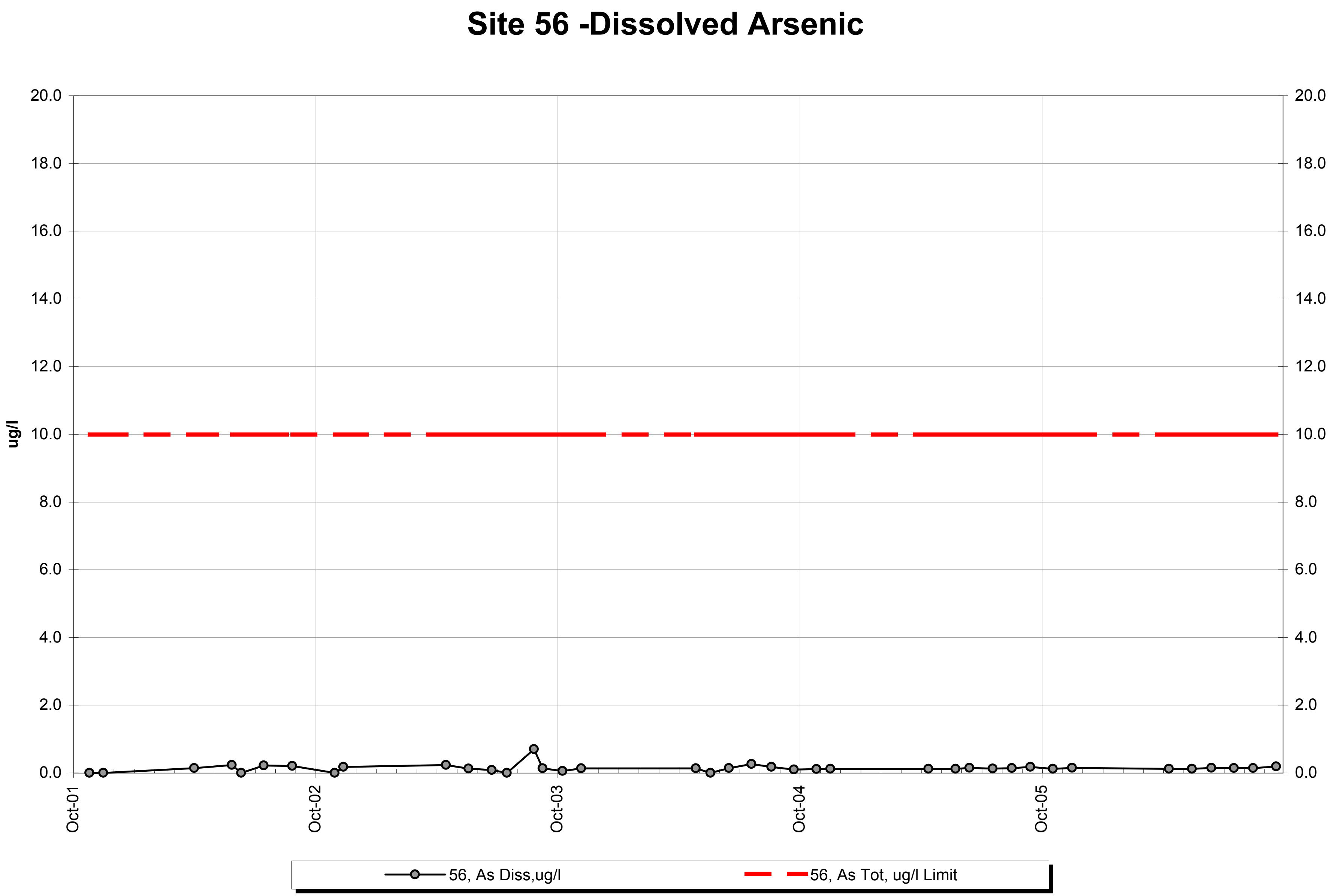


Site 56 -Hardness

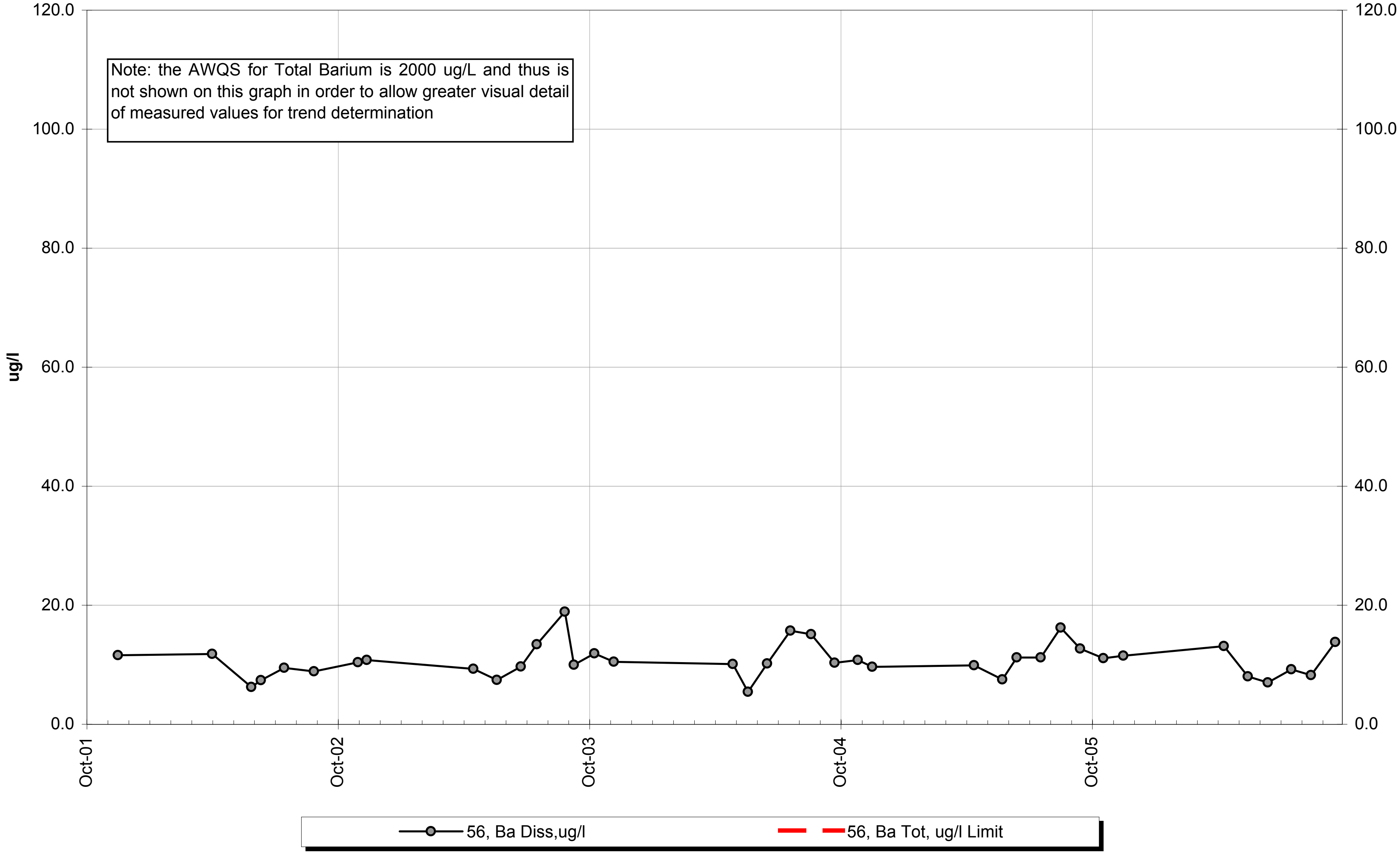


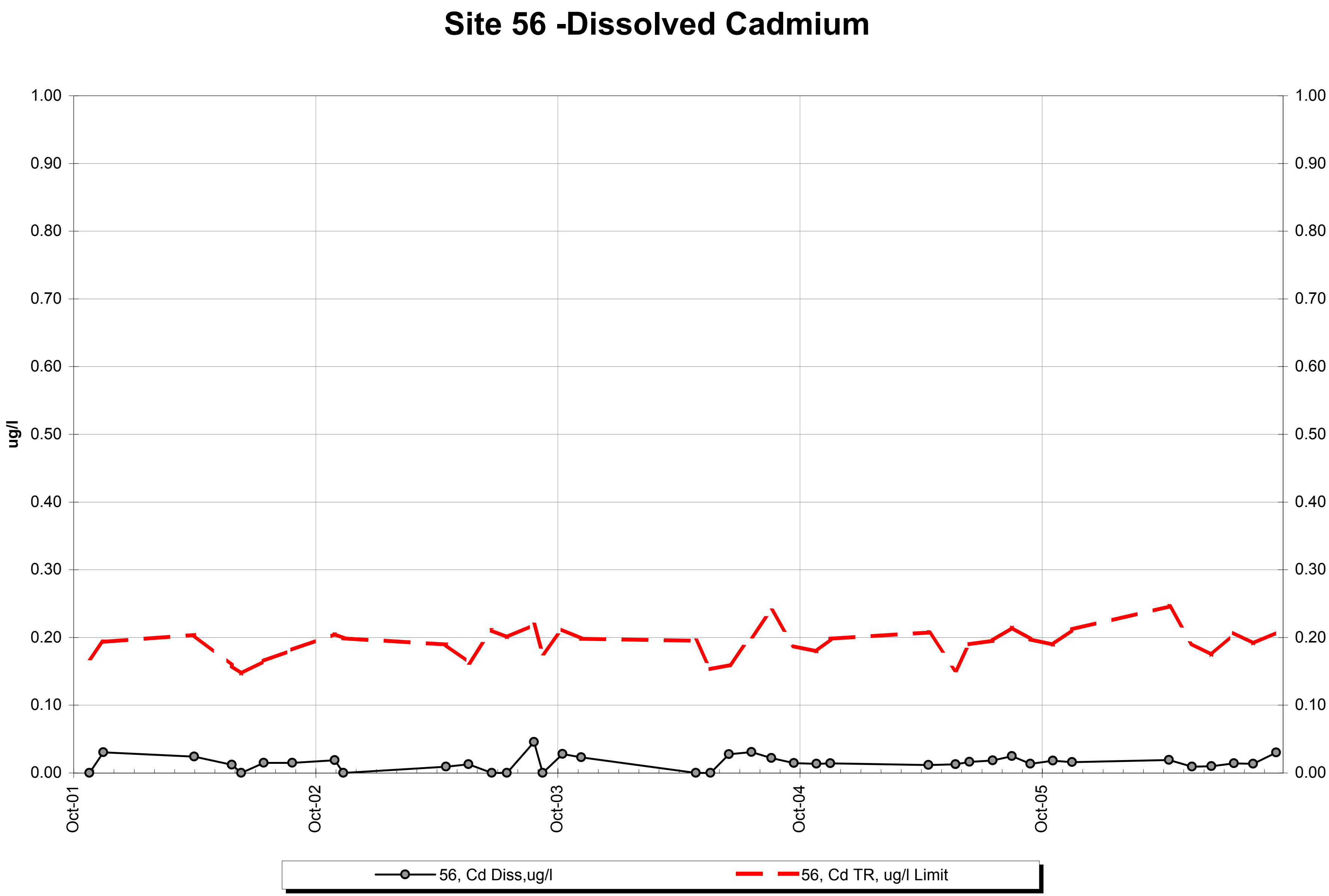
Site 56 -Total Sulfate



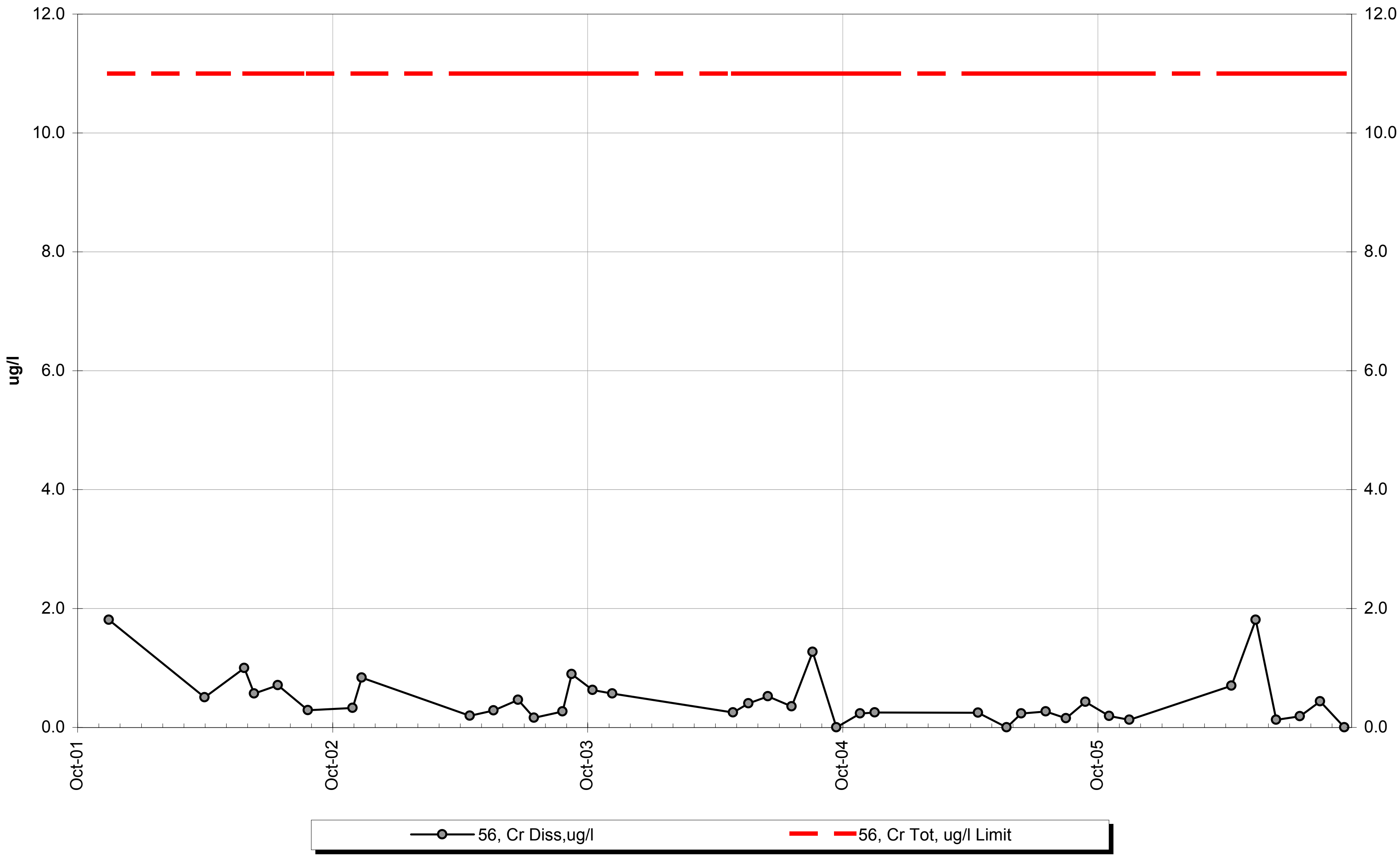

Site 56 -Dissolved Arsenic
ug/l
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
56, As Diss,ug/l
56, As Tot, ug/l Limit

Site 56 -Dissolved Barium

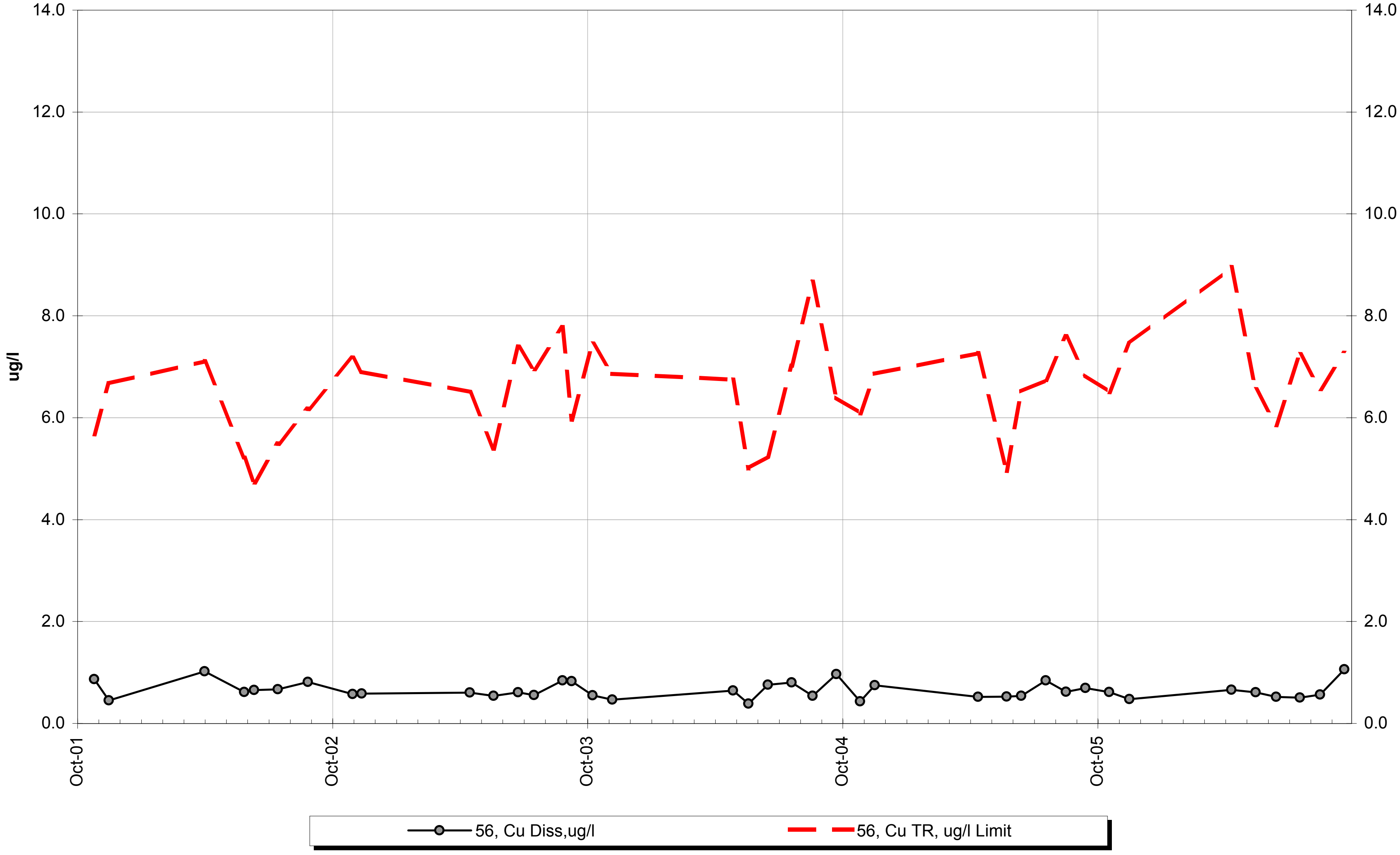



Site 56 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
56, Cd Diss,ug/l
56, Cd TR, ug/l Limit

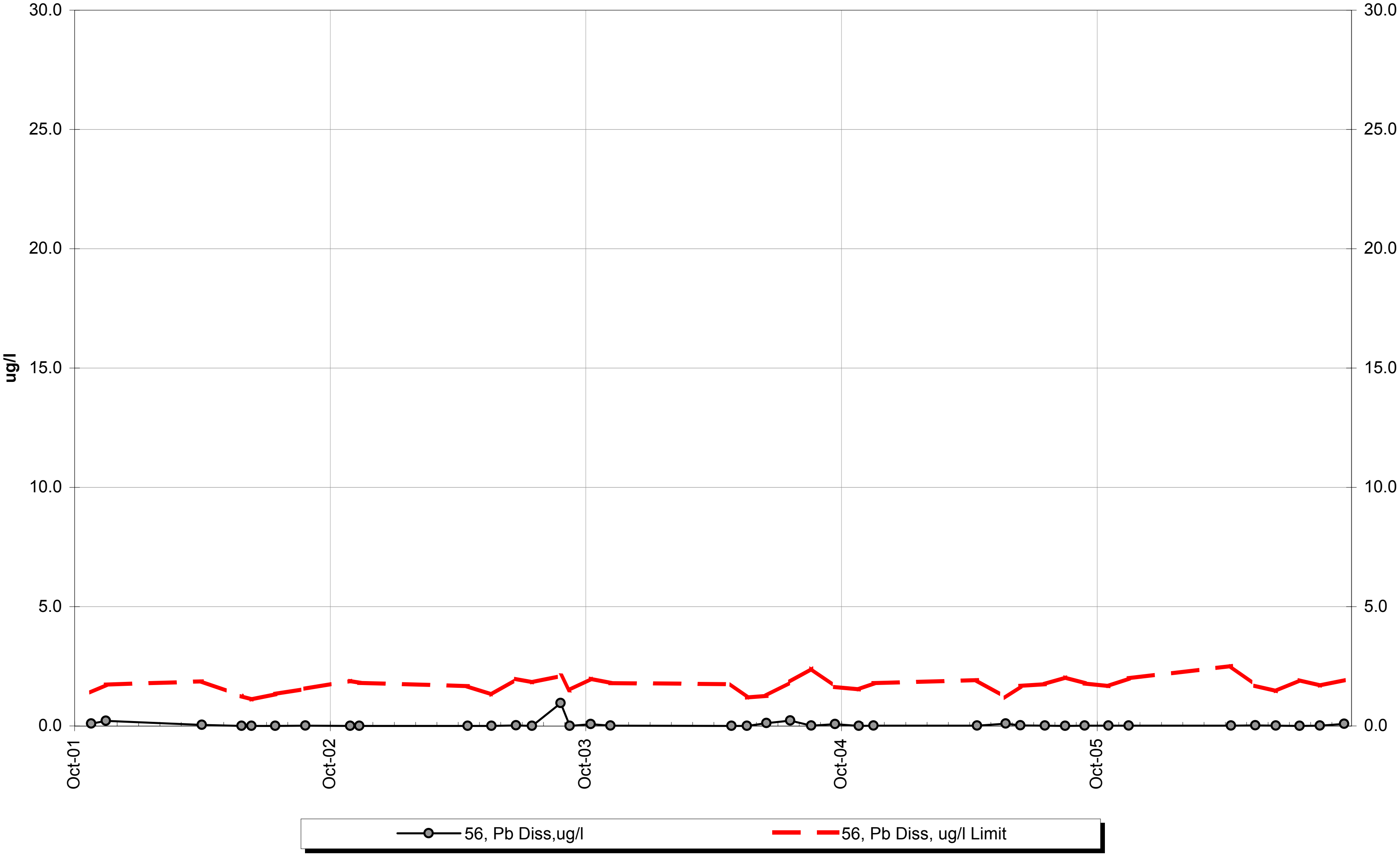
Site 56 -Dissolved Chromium



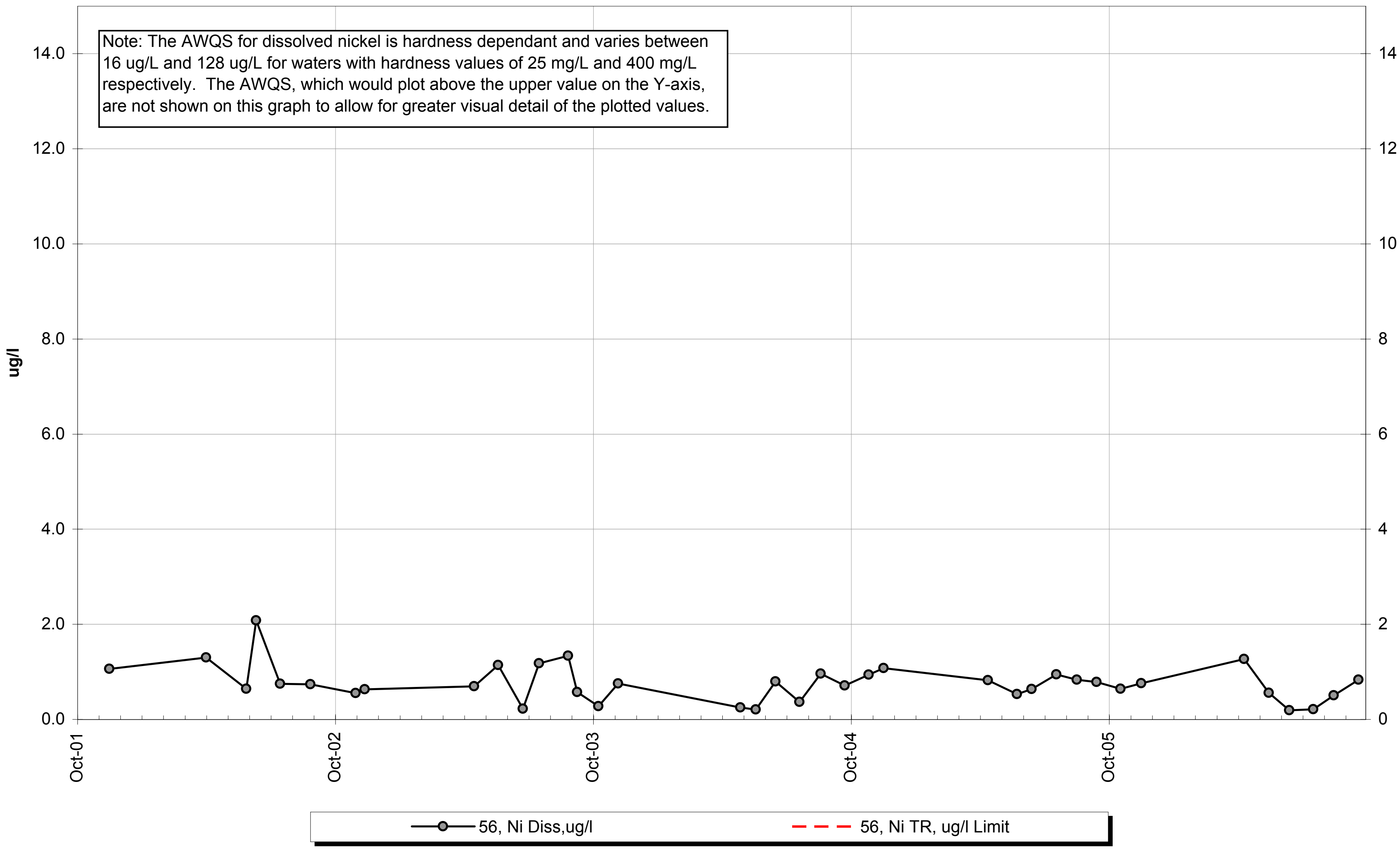
Site 56 -Dissolved Copper

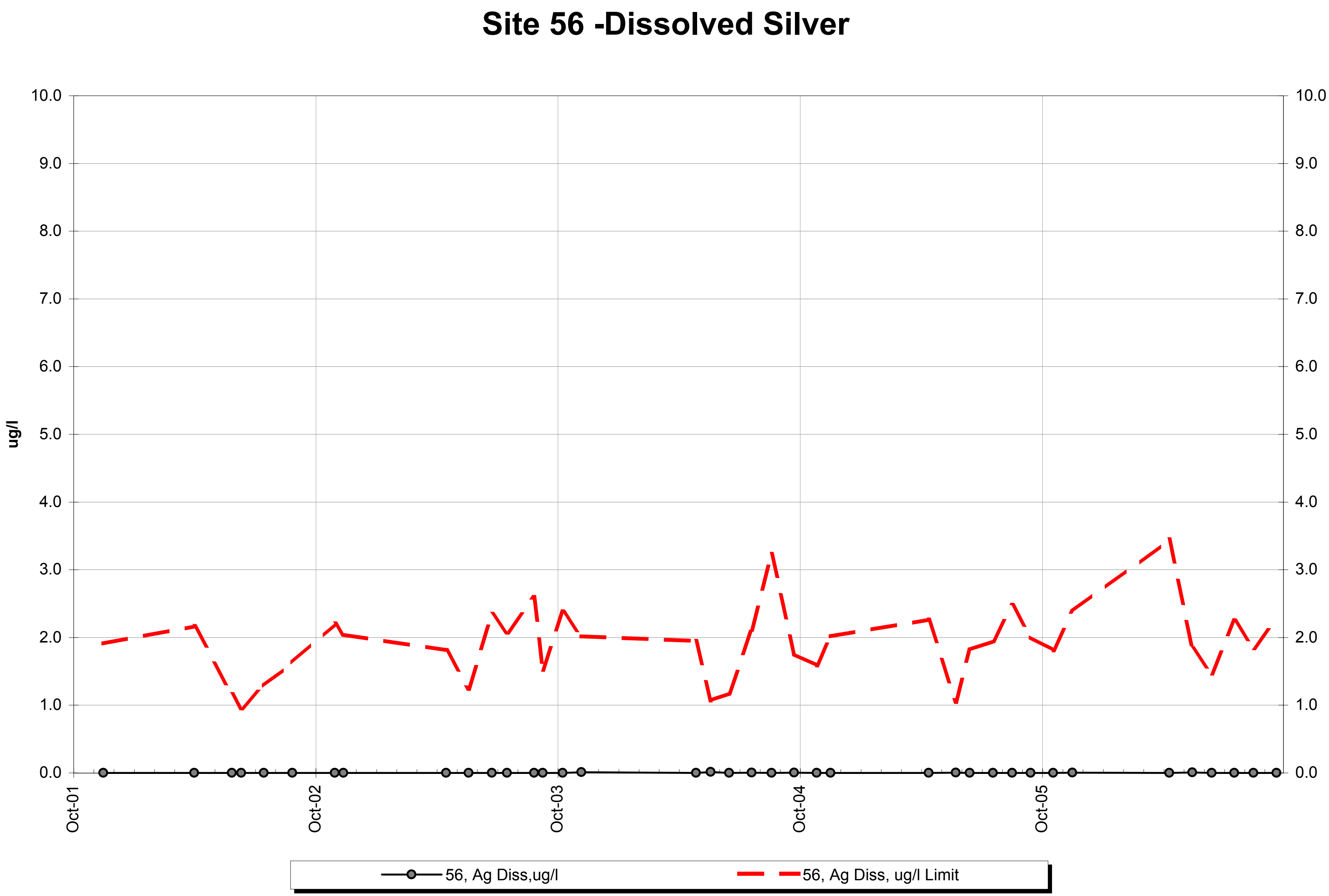


Site 56 -Dissolved Lead



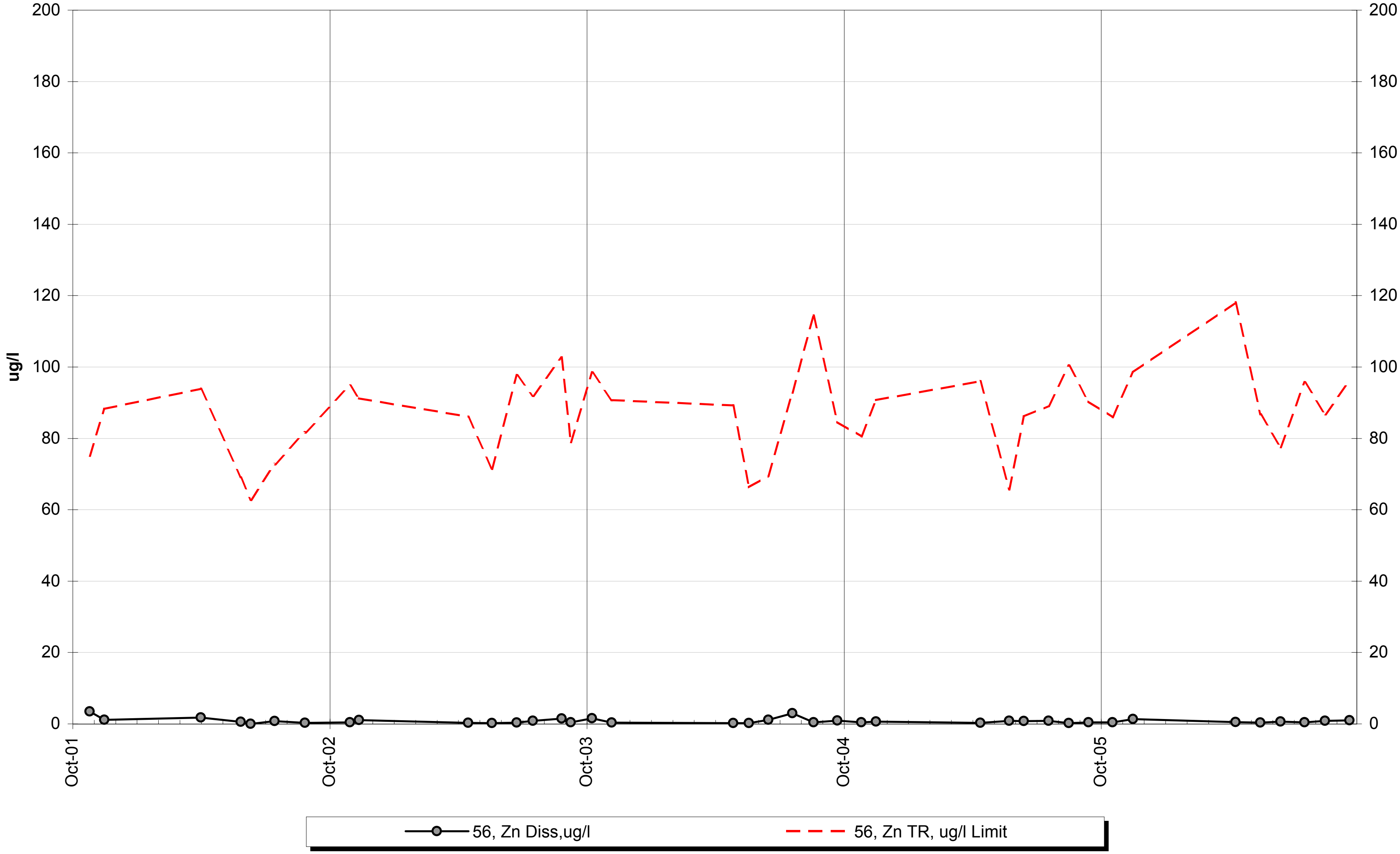
Site 56 -Dissolved Nickel

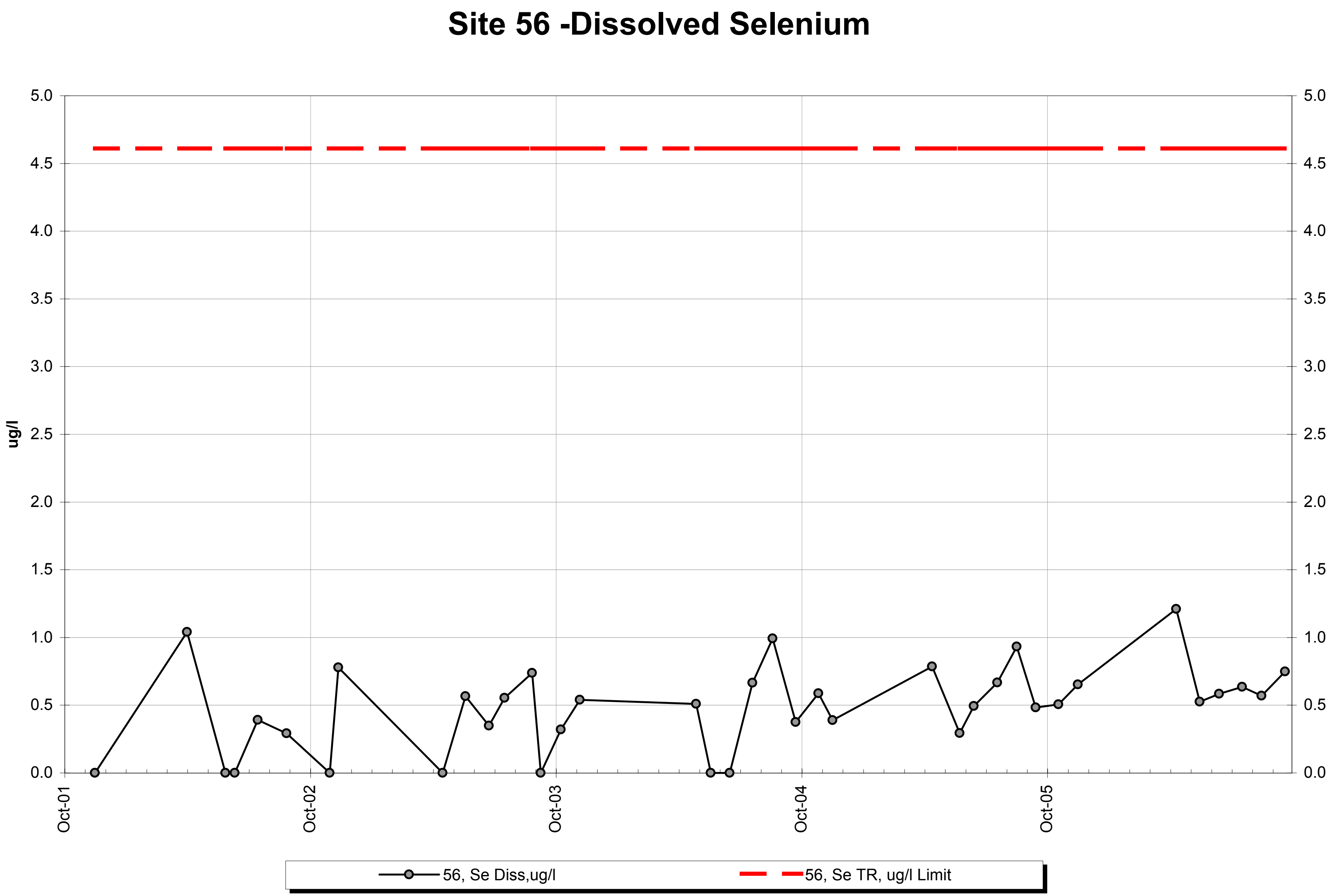




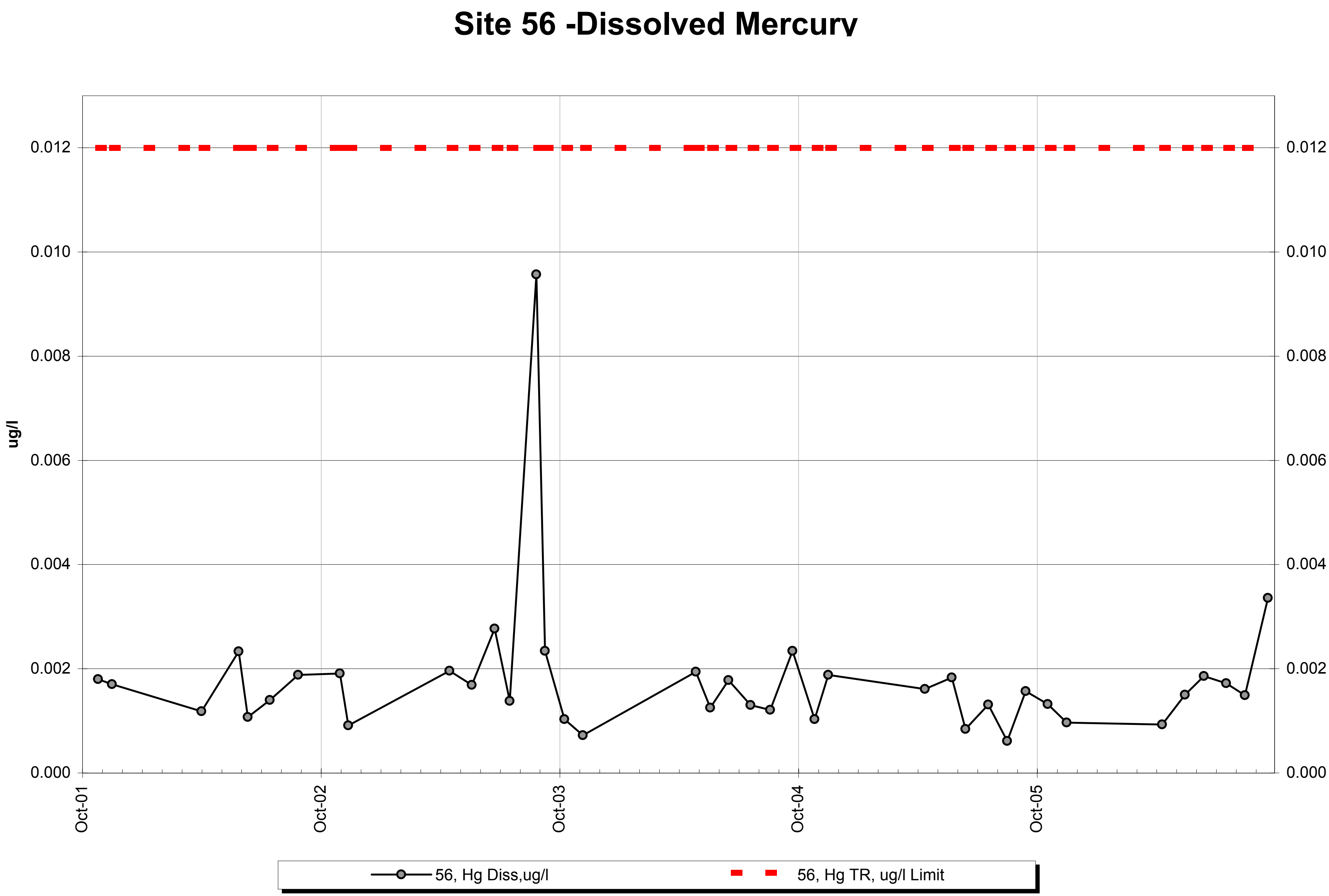
Site 56 -Dissolved Silver
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
56, Ag Diss,ug/l
56, Ag Diss, ug/l Limit

Site 56 -Dissolved Zinc





Site 56 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
56, Se Diss,ug/l
56, Se TR, ug/l Limit


Site 56 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
56, Hg Diss,ug/l
56, Hg TR, ug/l Limit

Site **#56** 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	**WY2001**												
b	**WY2002**	141	155					186	99.1	106	133	129	
c	**WY2003**	133	153					139	108	127	177	154.1	126
d	**WY2004**	158	152					139	94.3	111	171	181	127
e	**WY2005**	158	132					145	96	123	145	166	131
f	**WY2006**	129	150					177	126	120	141	124	147
	n	5	5	0	0	0	0	5	5	5	5	5	4

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
t_1	1	0	0	0	0	0	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

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

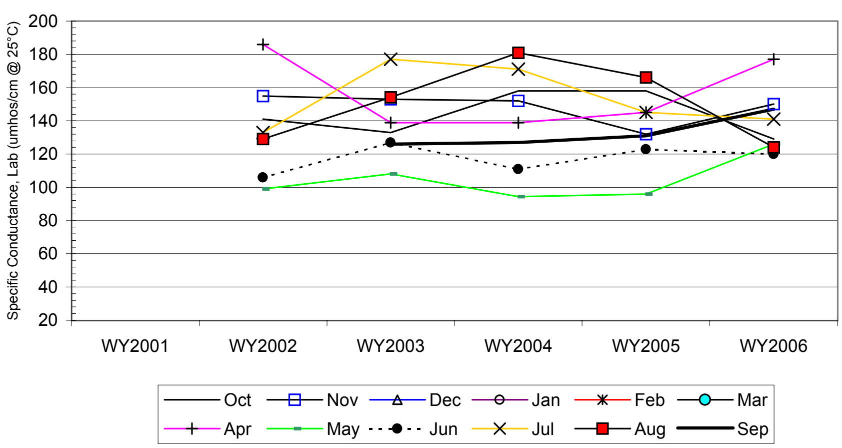
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	8.67
$Z_k = S_k/\sigma_S$	-0.24	-1.96					0.24	0.49	0.49	-0.49	0.00	2.04
Z^2_k	0.06	3.84					0.06	0.24	0.24	0.24	0.00	4.15

ΣZ_k= 0.57
ΣZ^2_k= 8.83
Z-bar=$\Sigma Z_k/K$= 0.07

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

Σn 39
ΣS_k 0

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	8.79	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity
p	**0.268**		$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 0.00	@α/2=2.5% Z= 1.96	H_0 (No trend) ACCEPT
125.33	p **0.500**		H_A (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.41		5.67
0.050	-2.00	0.00	4.00
0.100	-1.36		3.09
0.200	-1.19		2.36

Site **#56** 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	**WY2001**												
b	**WY2002**	7.3	7.4					7.4	6.8	7.1	7.6	7.5	
c	**WY2003**	7.2	7.4					7.5	7.6	7.6	7.5	7.4	7.5
d	**WY2004**	7.4	7.5					7.8	7.5	7.6	7.5	7.3	7.7
e	**WY2005**	7.8	7.4					7.7	7.5	7.1	7.4	7.3	7.4
f	**WY2006**	6.9	7.2					7.4	7.2	7.2	7.5	7.1	7.2
	n	5	5	0	0	0	0	5	5	5	5	5	4

	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												
c-a												
d-a												
e-a												
f-a												
c-b	-1	1					1	1	1	-1	-1	
d-b	1	1					1	1	1	-1	-1	
e-b	1	1					1	1	1	-1	-1	
f-b	-1	-1					1	1	1	-1	-1	
d-c	1	1					1	-1	-1	-1	-1	1
e-c	1	-1					1	-1	-1	-1	-1	-1
f-c	-1	-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
f-e	-1	-1					-1	-1	1	1	-1	-1
S_k	0	-2	0	0	0	0	2	-2	0	-6	-10	-4

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	8.67
$Z_k = S_k/\sigma_S$	0.00	-0.49					0.49	-0.49	0.00	-1.47	-2.45	-1.36
Z^2_k	0.00	0.24					0.24	0.24	0.00	2.16	6.00	1.85

ΣZ_k= -5.77

ΣZ^2_k= 10.73

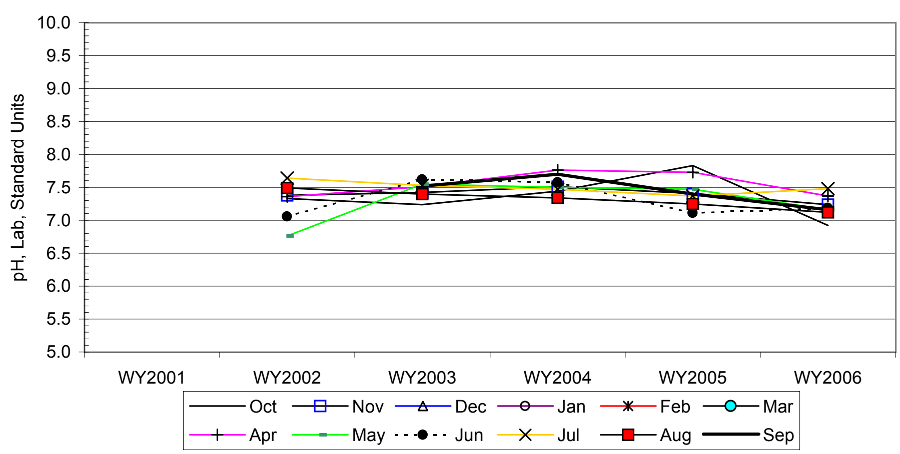
Z-bar=$\Sigma Z_k/K$= -0.72

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

Σn 39

ΣS_k -22

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	6.57	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.475**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 125.33	Z_{calc} -1.88	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
	p **0.030**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.09		0.01
0.050	-0.09	**-0.06**	-0.03
0.100	-0.09		-0.03
0.200	-0.08		-0.04

Site **#56** 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	**WY2001**												
b	**WY2002**	57.7	63.4					73.8	42.1	48.0	57.4	56.2	
c	**WY2003**	50.7	59.9					61.3	50.5	57.2	72.7		58.5
d	**WY2004**	69.1	67.1					61.2	45.3	52.8	73.4	80.8	54.1
e	**WY2005**	74.2	62.8					80.0	52.9	62.3	66.8	72.3	59.5
f	**WY2006**	56.8	62.8					76.3	57.4	49.1	60.3	57.9	61.0
	n	5	5	0	0	0	0	5	5	5	5	4	4

	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												
c-a												
d-a												
e-a												
f-a												
c-b	-1	-1					-1	1	1	1		
d-b	1	1					-1	1	1	1	1	
e-b	1	-1					1	1	1	1	1	
f-b	-1	-1					1	1	1	1	1	
d-c	1	1					-1	-1	-1	1		-1
e-c	1	1					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
f-e	-1	0					-1	1	-1	-1	-1	1
S_k	2	-1	0	0	0	0	2	8	2	0	0	4

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	15.67					16.67	16.67	16.67	16.67	8.67	8.67
$Z_k = S_k/\sigma_S$	0.49	-0.25					0.49	1.96	0.49	0.00	0.00	1.36
Z^2_k	0.24	0.06					0.24	3.84	0.24	0.00	0.00	1.85

ΣZ_k= 4.54

ΣZ^2_k= 6.47

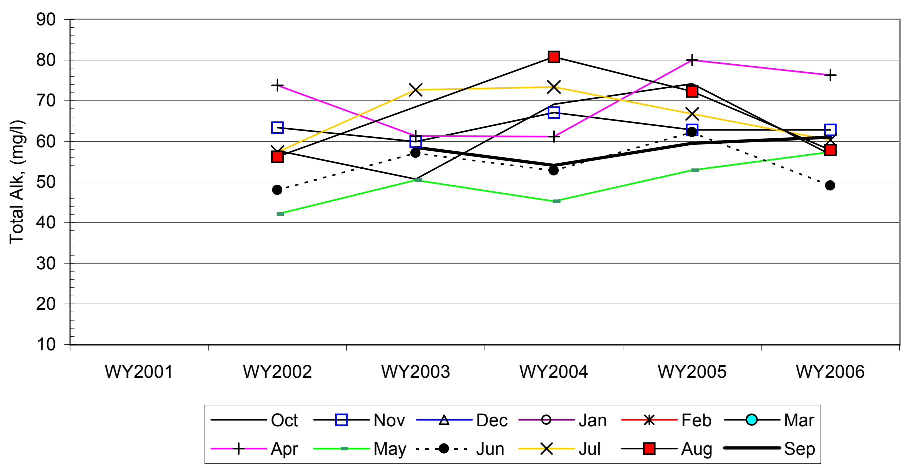
Z-bar=ΣZ_k/K= 0.57

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

Σn 38

ΣS_k 17

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	3.90	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p	**0.791**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} 1.48	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
116.33	p **0.931**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.11		3.53
0.050	-0.09	**1.08**	2.39
0.100	0.29		2.06
0.200	0.56		1.73

Site **#56** 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	**WY2001**												
b	**WY2002**	3.5	1.1					1.8	0.6	-0.2	0.8	0.3	
c	**WY2003**	0.4	1.1					0.3	0.2	0.3	0.8	1.5	0.4
d	**WY2004**	1.6	0.4					0.2	0.2	1.1	3.0	0.4	0.9
e	**WY2005**	0.4	0.6					0.3	0.9	0.8	0.8	0.2	0.4
f	**WY2006**	0.4	1.3					0.5	0.4	0.6	0.4	0.9	1.0
	n	5	5	0	0	0	0	5	5	5	5	5	4

	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												
c-a												
d-a												
e-a												
f-a												
c-b	-1	-1					-1	-1	1	1	1	
d-b	-1	-1					-1	-1	1	1	1	
e-b	-1	-1					-1	1	1	1	-1	
f-b	-1	1					-1	-1	1	-1	1	
d-c	1	-1					-1	-1	1	1	-1	1
e-c	1	-1					1	1	1	-1	-1	-1
f-c	1	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
f-e	-1	1					1	-1	-1	-1	1	1
S_k	-4	0	0	0	0	0	0	0	4	-2	0	2

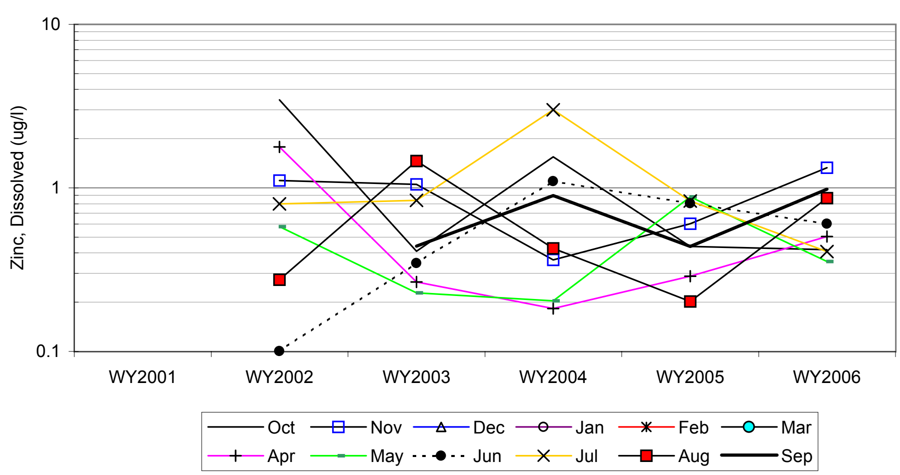
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=	16.67	16.67					16.67	16.67	16.67	16.67	16.67	8.67
$Z_k = S_k/\sigma_S$	-0.98	0.00					0.00	0.00	0.98	-0.49	0.00	0.68
Z^2_k	0.96	0.00					0.00	0.00	0.96	0.24	0.00	0.46

ΣZ_k= 0.19
ΣZ^2_k= 2.62
Z-bar=$\Sigma Z_k/K$= 0.02

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

Σn 39
ΣS_k 0

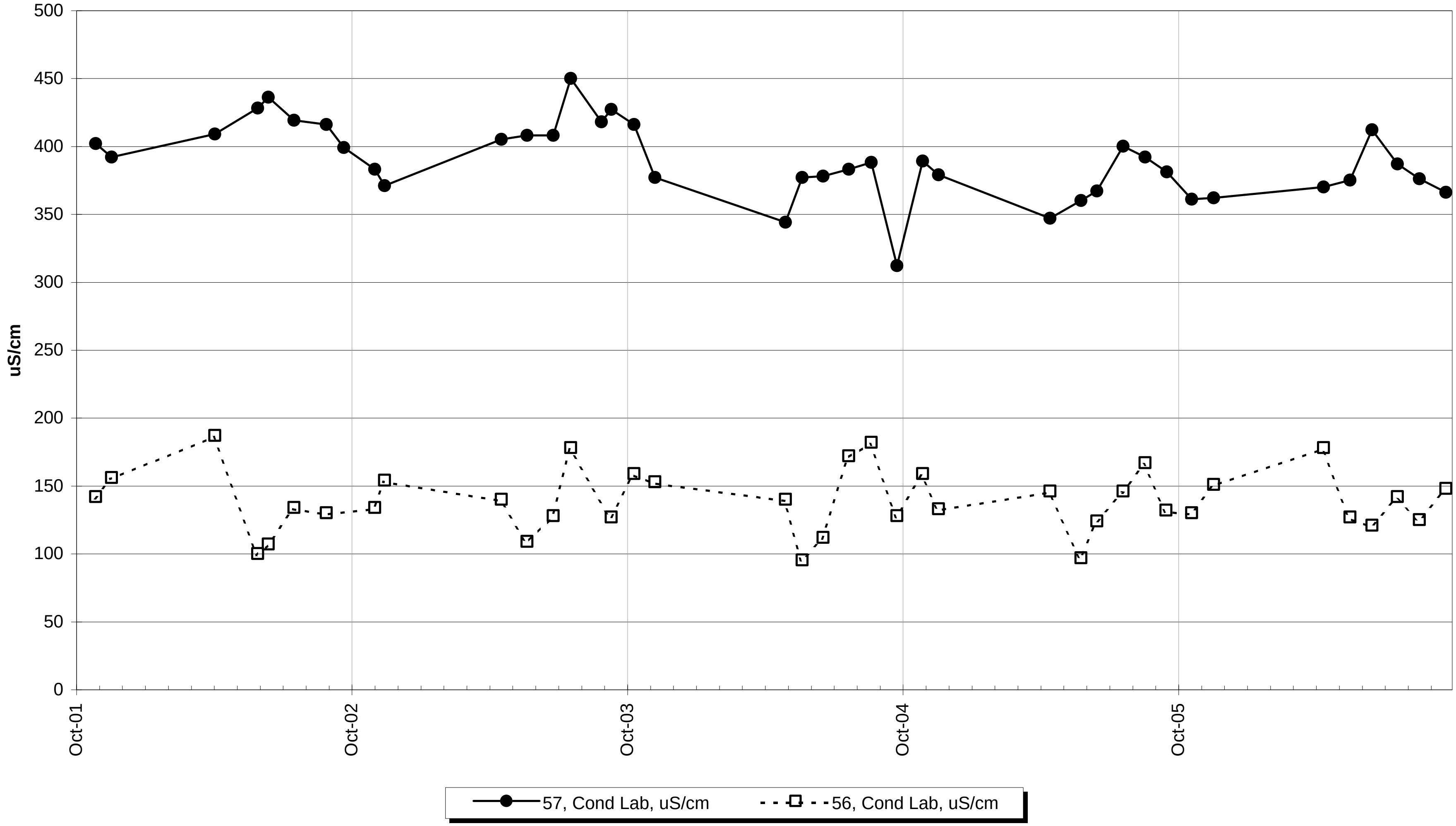
$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$= 2.62	@α=5% $\chi^2_{(K-1)}$= 14.07	Test for station homogeneity	
p **0.918**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 125.33	Z_{calc} 0.00 / **p** **0.500**	@α/2=2.5% Z= 1.96	**H_0** (No trend) ACCEPT / **H_A** (± trend) REJECT



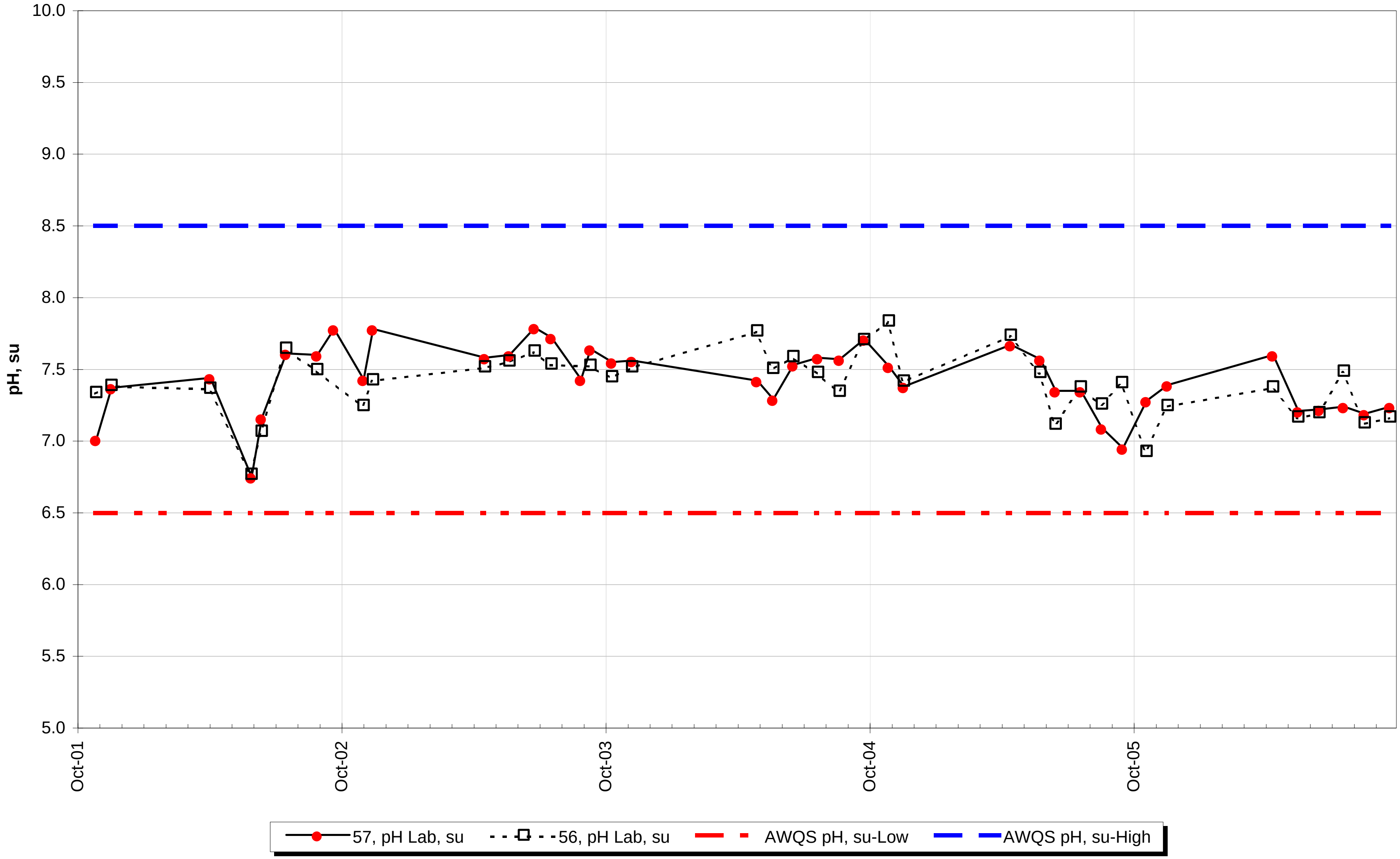
Seasonal-Kendall Slope Confidence Intervals

α	**Lower Limit**	**Slope**	**Upper Limit**
0.010	-0.20		0.09
0.050	-0.15	**0.00**	0.08
0.100	-0.09		0.04
0.200	-0.05		0.03

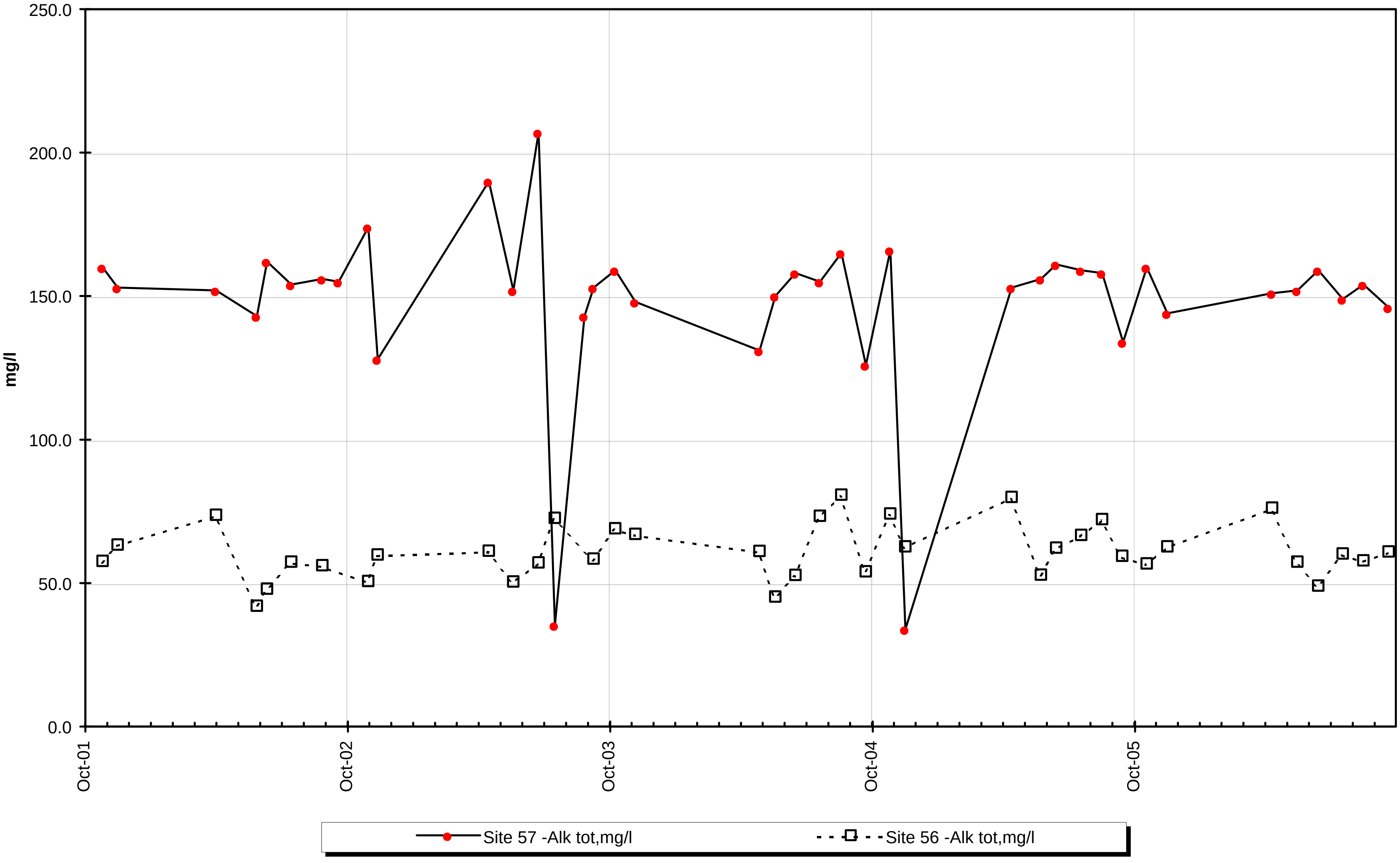
Site 57 vs Site 56 -Conductivity



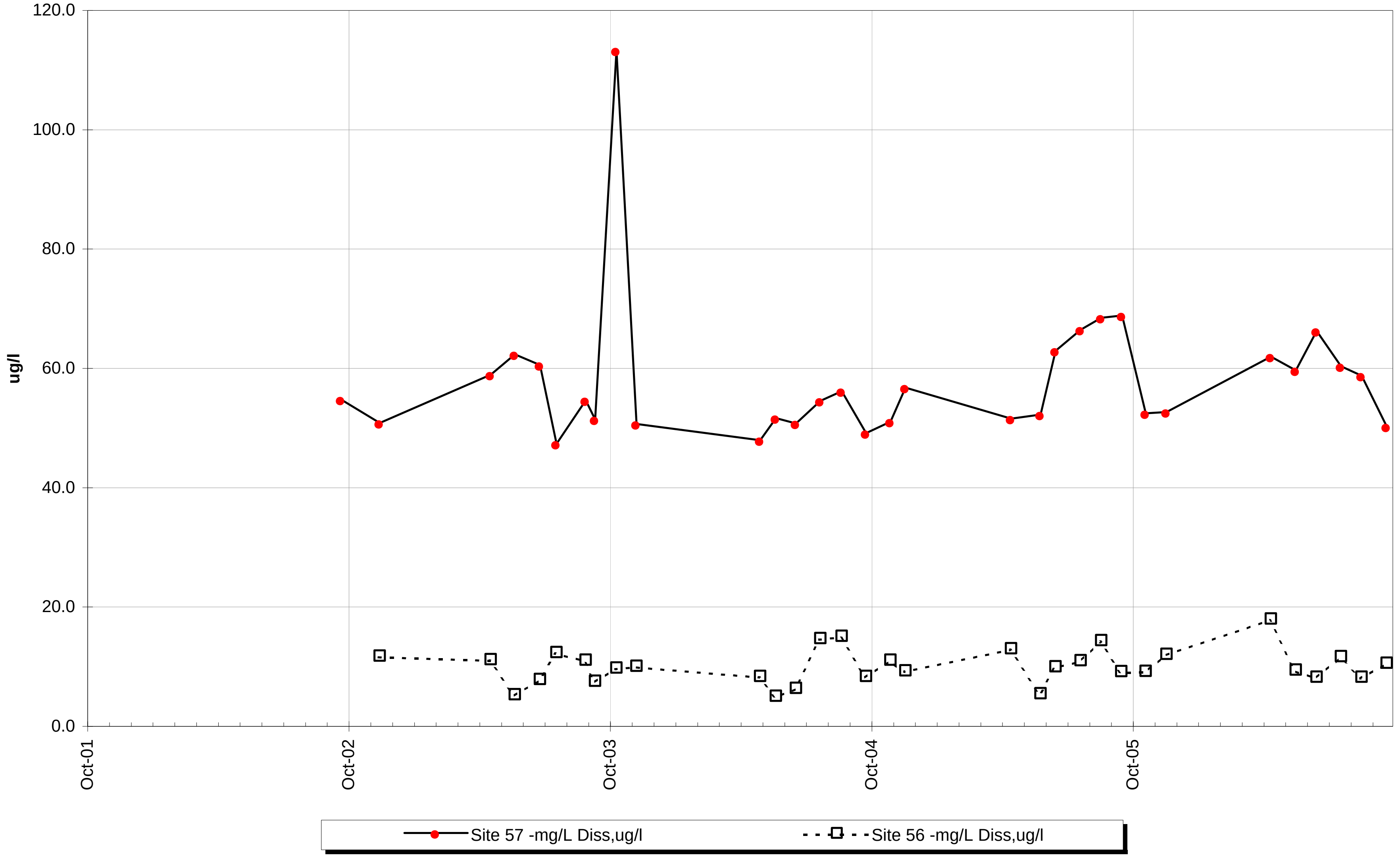
Site 57 vs. Site 56 -Lab pH

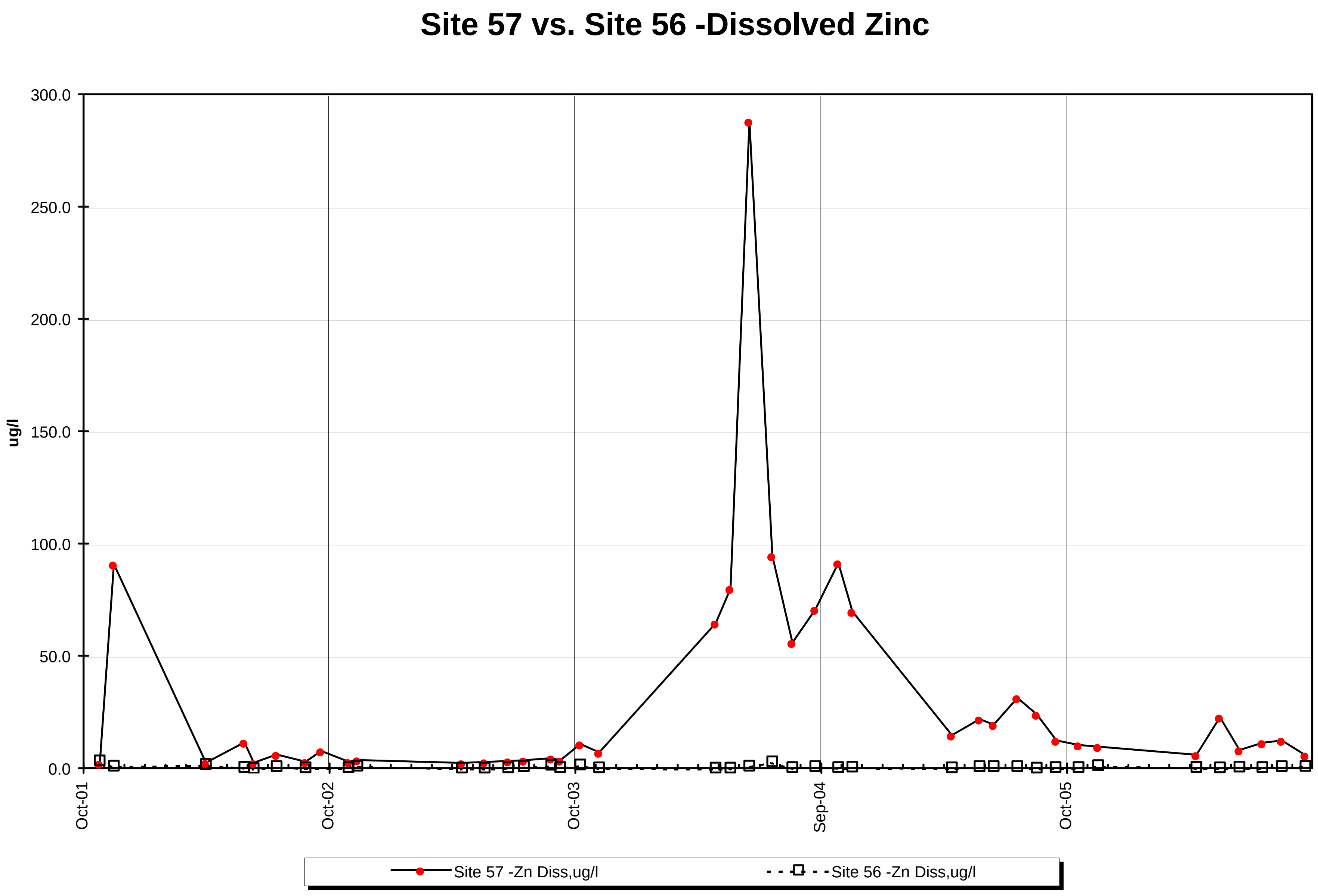


Site 57 vs. Site 56 -Total Alkalinity



Site 57 vs. Site 56 -Total Sulfate





Site 57 vs. Site 56 -Dissolved Zinc
ug/l
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Oct-01
Oct-02
Oct-03
Sep-04
Oct-05
Site 57 -Zn Diss,ug/l
Site 56 -Zn Diss,ug/l

Wilcoxon-signed-ranks test

Exact Form

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

	X	**Y**			
Site	#57	#56	Differences		
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	360.0	129.0	231.0	231.0	4
Nov	361.0	150.0	211.0	211.0	2
Dec					
Jan					
Feb					
Mar					
Apr	369.0	177.0	192.0	192.0	1
May	374.0	126.0	248.0	248.0	6
Jun	411.0	120.0	291.0	291.0	8
Jul	386.0	141.0	245.0	245.0	5
Aug	375.0	124.0	251.0	251.0	7
Sep	365.0	147.0	218.0	218.0	3
Median	371.5	135.0	238.0	238.0	

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	Differences		
Site	#57	#56			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	7.27	6.92	0.35	0.35	8
Nov	7.38	7.24	0.14	0.14	5
Dec					
Jan					
Feb					
Mar					
Apr	7.59	7.37	0.22	0.22	6
May	7.20	7.16	0.04	0.04	2
Jun	7.21	7.19	0.02	0.02	1
Jul	7.23	7.48	-0.25	0.25	-7
Aug	7.18	7.12	0.06	0.06	3
Sep	7.23	7.16	0.07	0.07	4
Median	7.23	7.18	0.06	0.11	

n	m
8	8

N= 8

$\Sigma R =$ 22

α
95.0%
W'α,n
29

$W^{+}=$
29
p-test
94.53%

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	#57	#56			
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	160.0	56.8	103.2	103.2	7
Nov	144.0	62.8	81.2	81.2	2
Dec					
Jan					
Feb					
Mar					
Apr	151.0	76.3	74.7	74.7	1
May	152.0	57.4	94.6	94.6	5
Jun	159.0	49.1	109.9	109.9	8
Jul	149.0	60.3	88.7	88.7	4
Aug	154.0	57.9	96.1	96.1	6
Sep	146.0	61.0	85.0	85.0	3
Median	151.5	59.1	91.7	91.7	

n	**m**
8	8

N= 8

$\Sigma R=$ 36

α
95.0%
W'α,n
29

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

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	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	52.2	9.0	43.2	43.2	3
Nov	52.4	11.9	40.5	40.5	2
Dec					
Jan					
Feb					
Mar					
Apr	61.7	17.8	43.9	43.9	4
May	59.4	9.2	50.2	50.2	6
Jun	66.0	8.1	58.0	58.0	8
Jul	60.1	11.5	48.6	48.6	5
Aug	58.5	8.1	50.5	50.5	7
Sep	50.0	10.4	39.6	39.6	1
Median	59.0	9.8	46.3	46.3	

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

	X	**Y**			
Site	#57	#56	Differences		
Year	WY2006	WY2006	**D**	**|D|**	**Rank**
Oct	10.30	0.42	9.88	9.88	5
Nov	9.54	1.33	8.21	8.21	4
Dec					
Jan					
Feb					
Mar					
Apr	5.97	0.50	5.47	5.47	2
May	22.70	0.36	22.35	22.35	8
Jun	8.08	0.60	7.48	7.48	3
Jul	11.30	0.41	10.89	10.89	6
Aug	12.40	0.87	11.53	11.53	7
Sep	5.76	0.98	4.78	4.78	1
Median	9.92	0.55	9.05	9.05	

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	

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 2006" report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 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. The datum is for total sulfate from the May-2006 sample and has a value of 252 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
05/16/06	Sulfate, Total mg/L	252	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 preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). For datasets with a statistically significant trend a Seasonal-Sen's Slope estimate statistic has also been calculated. No statistically significant (a/2=2.5%) trends are present in the datasets for conductivity, pH, and dissolved zinc. Total alkalinity indicates a very 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-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.09	-		
pH, Lab	6	0.24	-		
Alkalinity, Total	6	0.68	+		
Zinc, Dissolved	6	0.47	-		

(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. Currently, steep slopes preclude constructing an oxygen-limiting soil cover on the site and thus in-situ reclamation is not an option for this site. Consequently, as previously noted, KGCMC intends to incrementally haul the material from this site to the 920 portal for underground disposal or placement at one of the active surface disposal facilities.

Table of Results for Water Year 2006

Site 13 "Mine Adit Discharge Creek"

Sample Date/Parameter	10/18/05	11/16/05	Dec-05	Jan-06	Feb-06	Mar-06	4/11/06	5/16/06	6/14/06	7/18/06	8/16/06	9/19/06	**Median**
Water Temp (°C)	5.9	3.0	NOT SCHEDULED FOR SAMPLING					5.3	8.5	10.0	10.2	8.4	8.4
Conductivity-Field(μmho)	671	644						762	710	752	569	359	671
Conductivity-Lab (μmho)	585	580						664	700	665	555	688	664
pH Lab (standard units)	7.34 J	7.41						7.43	7.59 J	7.51	7.18	7.16 J	7.41
pH Field (standard units)	7.92	8.13						7.67	7.65	8.15	8.13	8.03	8.03
Total Alkalinity (mg/L)	132.0	134.0						162.0	171.0	174.0	120.0	160.0	160.0
Total Sulfate (mg/L)	239.0	222.0 J						252.0	245.0	230.0	212.0	247.0	239.0
Hardness (mg/L)	362.0	358.0						433.0	426.0	419.0	353.0	445.0	419.0
Dissolved As (ug/L)	0.162	0.184						0.124	<0.033	0.152	0.111	0.210	0.152
Dissolved Ba (ug/L)	23.8	20.6						18.7	0.1 U	19.7	21.2	24.7	20.6
Dissolved Cd (ug/L)	0.043	0.035						0.028	0.006 U	0.020	0.055	0.019	0.028
Dissolved Cr (ug/L)	0.387 J	<0.058						6.200	<0.056	0.139 J	1.610 J	<0.018	0.139
Dissolved Cu (ug/L)	0.525	0.375						1.320	0.107 U	1.010	0.634	0.395	0.525
Dissolved Pb (ug/L)	0.0256 U	0.0180 U						0.0085 U	0.0359 U	0.0127 U	0.0259 U	0.0221 U	0.0221
Dissolved Ni (ug/L)	1.540	1.510						1.570	0.060 U	0.493	1.460 J	1.910	1.510
Dissolved Ag (ug/L)	<0.002	<0.002						0.005 J	<0.003	<0.003	<0.003	<0.003	0.002
Dissolved Zn (ug/L)	18.50	12.70						10.30	1.18 U	5.83	27.40 J	9.02	10.30
Dissolved Se (ug/L)	0.182 J	<0.116						<0.116	<0.116	0.544	0.205 J	0.309 J	0.182
Dissolved Hg (ug/L)	0.001140 U	0.000768 U						0.000748 UJ	0.000678 U	0.001150	0.000940 U	0.000867 U	0.000867

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 10/01/2005 to 09/30/2006

Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
13	10/18/2005	12:25:00 PM				
			pH Lab, su	7.34	J	Hold Time Violation
			Cr Diss, ug/l	0.387	J	Duplicate RPD
			Pb Diss, ug/l	0.0256	U	Field Blank Contamination
			Se Diss, ug/l	0.182	J	Below Quantitative Range, M
			Hg Diss, ug/l	0.00114	U	Field Blank Contamination
13	11/16/2005	11:35:00 AM				
			SO4 Tot, mg/l	222	J	Receipt Temperature
			Pb Diss, ug/l	0.018	U	Field Blank Contamination
			Hg Diss, ug/l	0.000768	U	Field Blank Contamination
13	05/16/2006	12:12:00 PM				
			Pb Diss, ug/l	0.00846	U	Field Blank Contamination
			Ag Diss, ug/l	0.00513	J	Below Quantitative Range
			Hg Diss, ug/l	0.000748	UJ	Field Blank Contamination, Co
13	06/14/2006	9:30:00 AM				
			pH Lab, su	7.59	J	Hold Time Violation
			Ba Diss, ug/l	0.0785	U	Field Blank Contamination
			Cd Diss, ug/l	0.00639	U	Field Blank Contamination
			Cu Diss, ug/l	0.107	U	Field Blank Contamination
			Pb Diss, ug/l	0.0359	U	Field Blank Contamination
			Ni Diss, ug/l	0.0597	U	Field Blank Contamination
			Zn Diss, ug/l	1.18	U	Field Blank Contamination
			Hg Diss, ug/l	0.000678	U	Field Blank Contamination
13	07/18/2006	10:52:00 AM				
			Cr Diss, ug/l	0.139	J	Below Quantitative Range
			Pb Diss, ug/l	0.0127	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

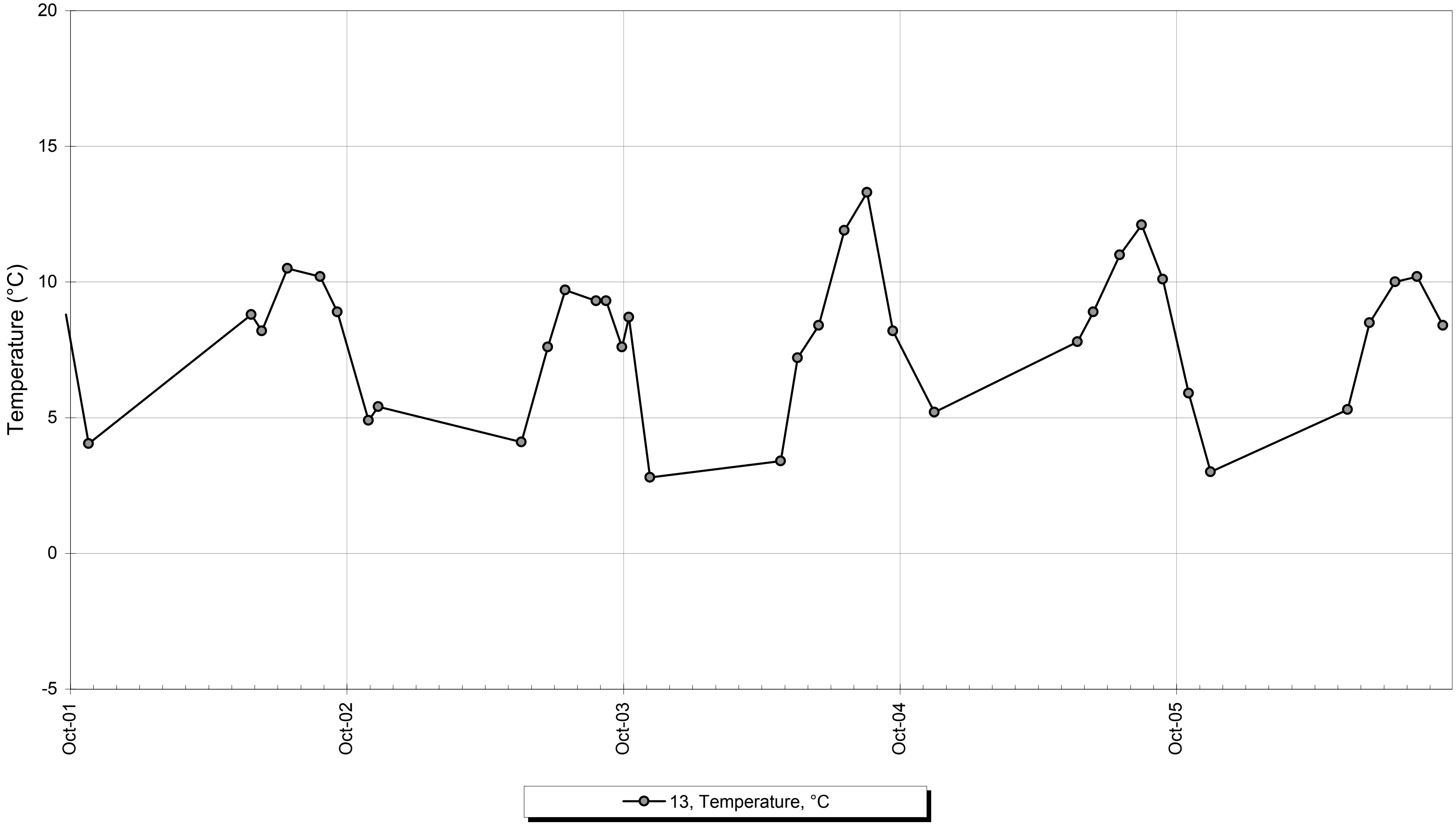
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

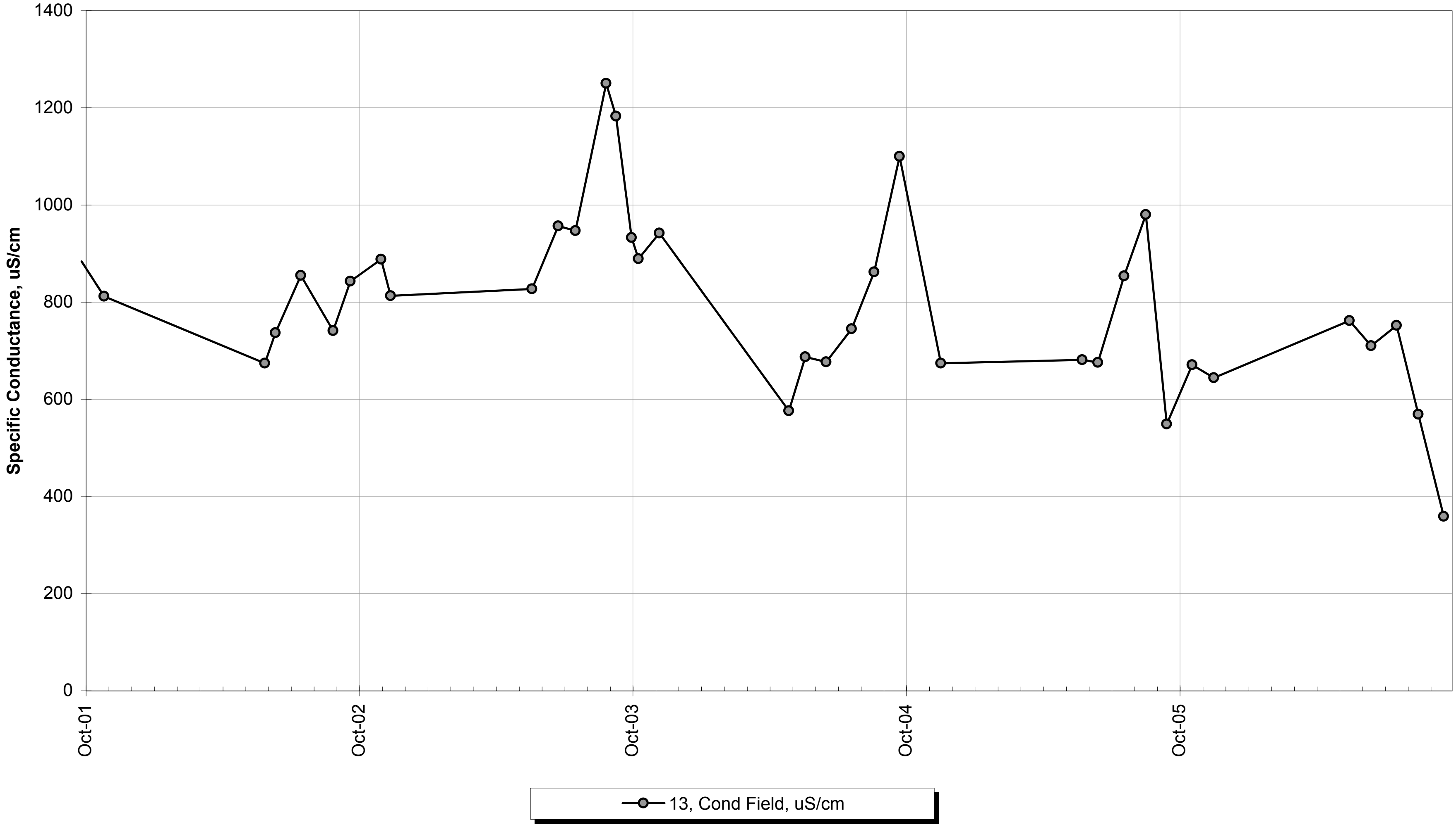
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
13	08/16/2006	1:20:00 PM				
			Cr Diss, ug/l	1.61	J	LCS Recovery
			Pb Diss, ug/l	0.0259	U	Field Blank Contamination
			Ni Diss, ug/l	1.46	J	LCS Recovery
			Zn Diss, ug/l	27.4	J	LCS Recovery
			Se Diss, ug/l	0.205	J	Below Quantitative Range
			Hg Diss, ug/l	0.00094	U	Field Blank Contamination
13	09/19/2006	2:06:00 PM				
			pH Lab, su	7.16	J	Hold Time Violation
			Pb Diss, ug/l	0.0221	U	Method Blank Contamination
			Se Diss, ug/l	0.309	J	Below Quantitative Range
			Hg Diss, ug/l	0.000867	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

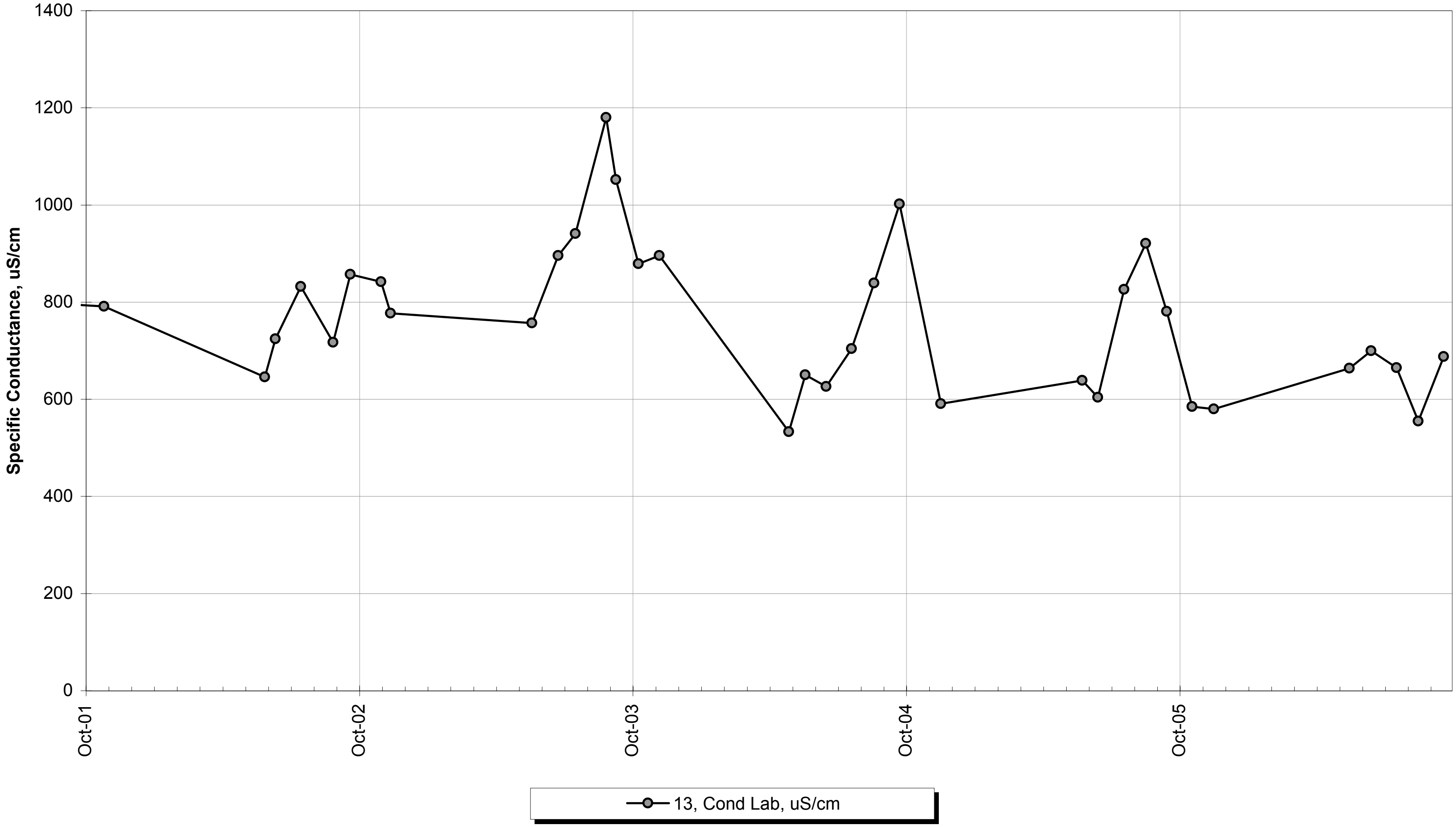
Site 13 -Water Temperature

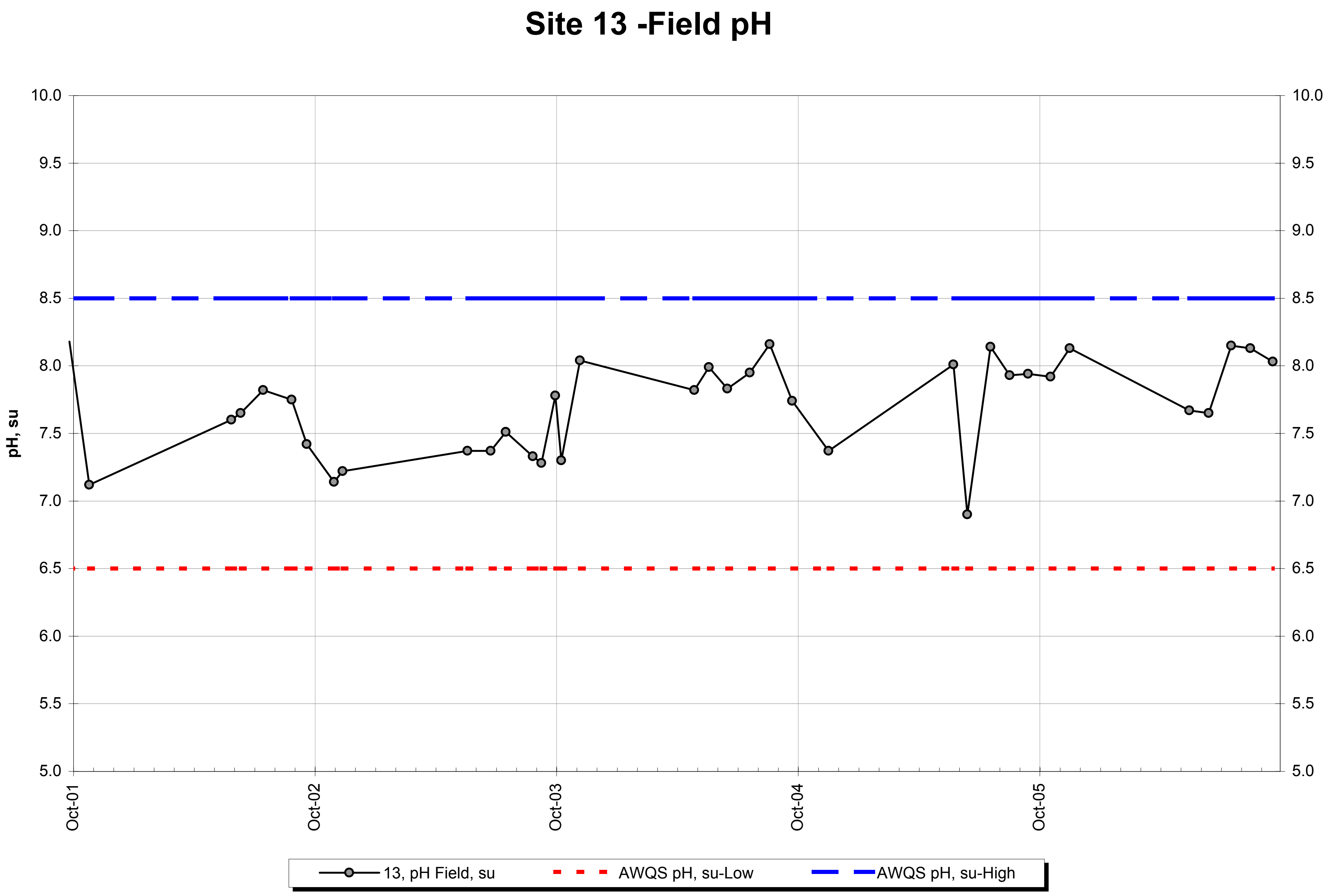


Site 13 -Conductivity-Field



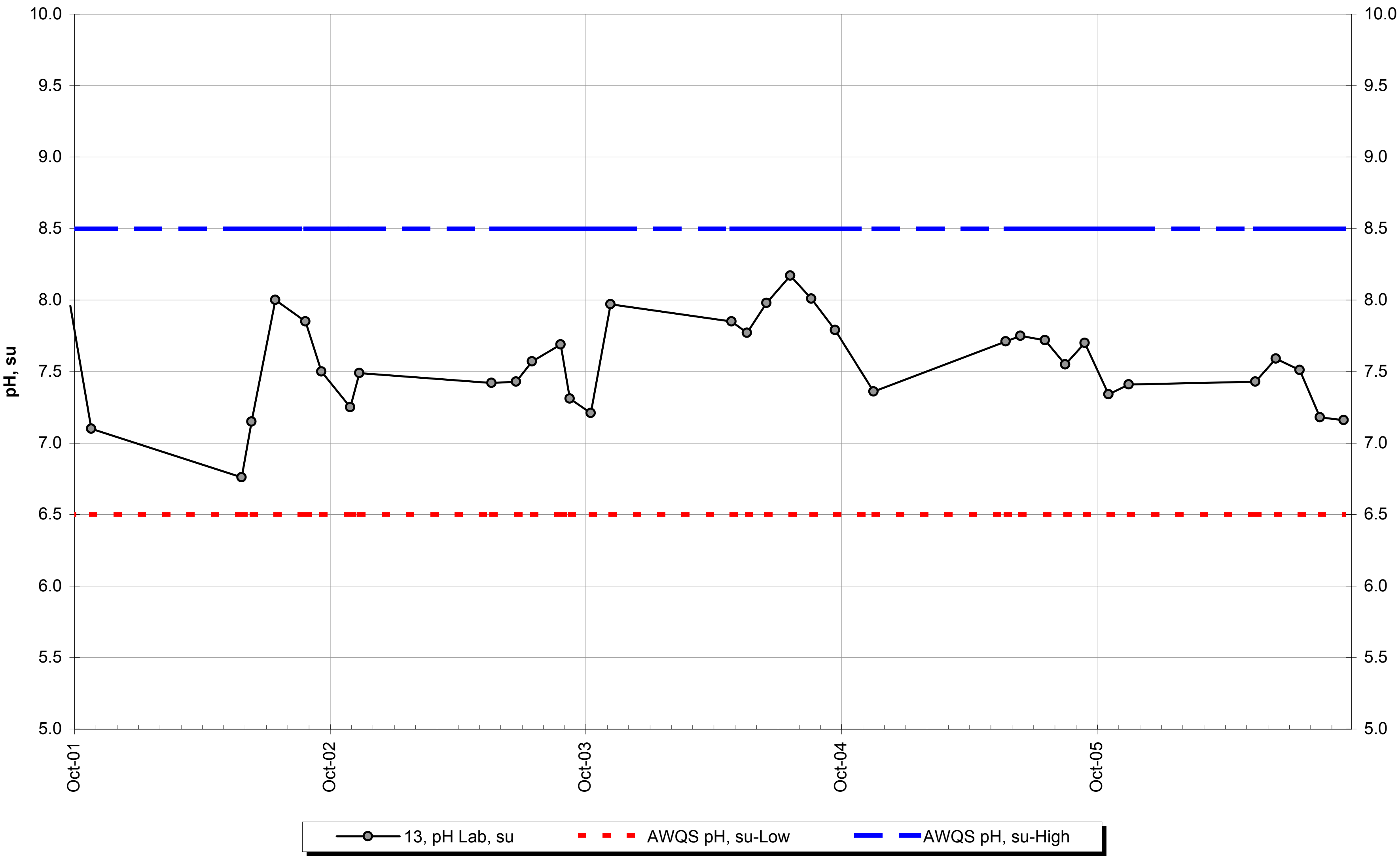
Site 13 -Conductivity-Lab



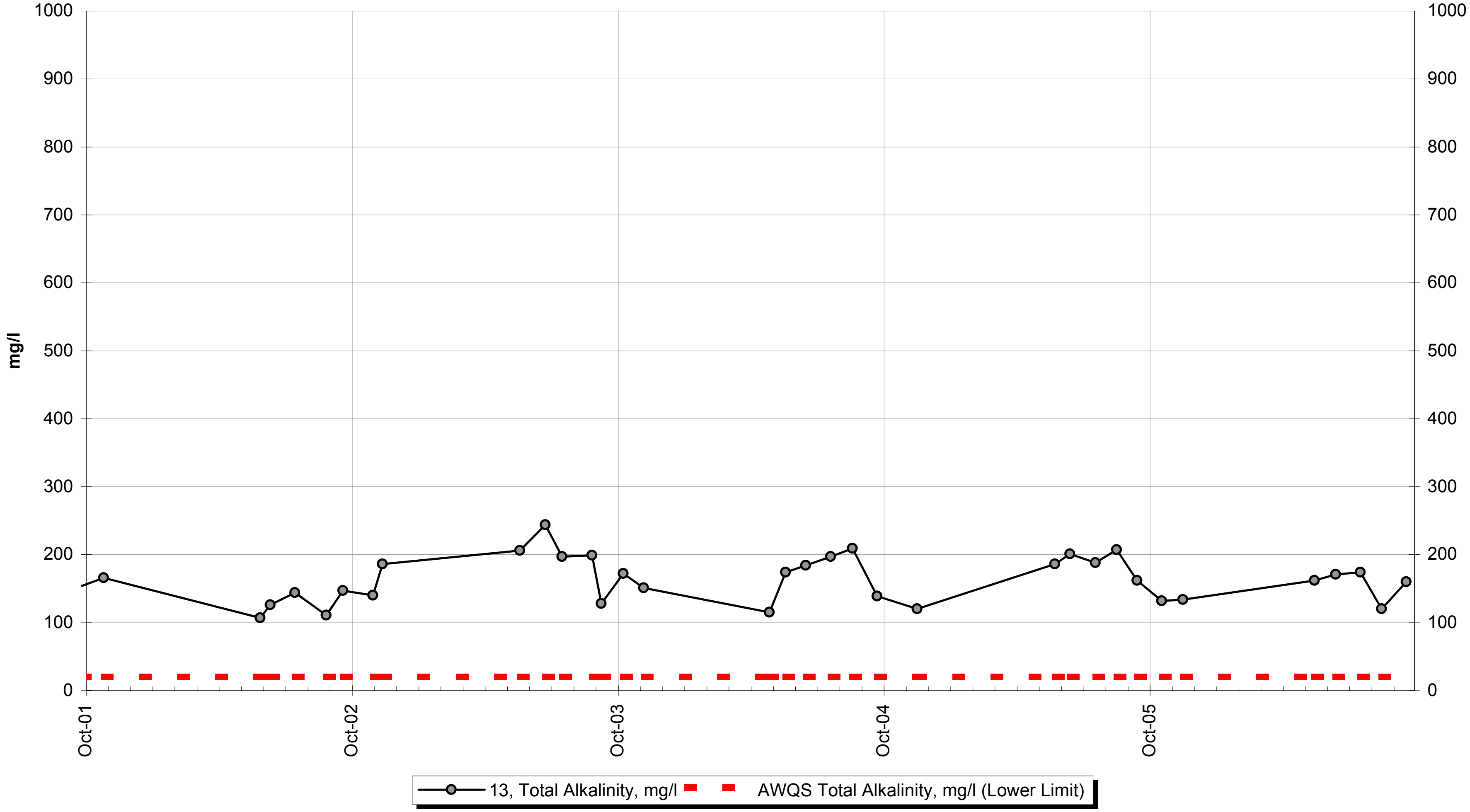


Site 13 -Field pH
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
pH, su
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
13, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

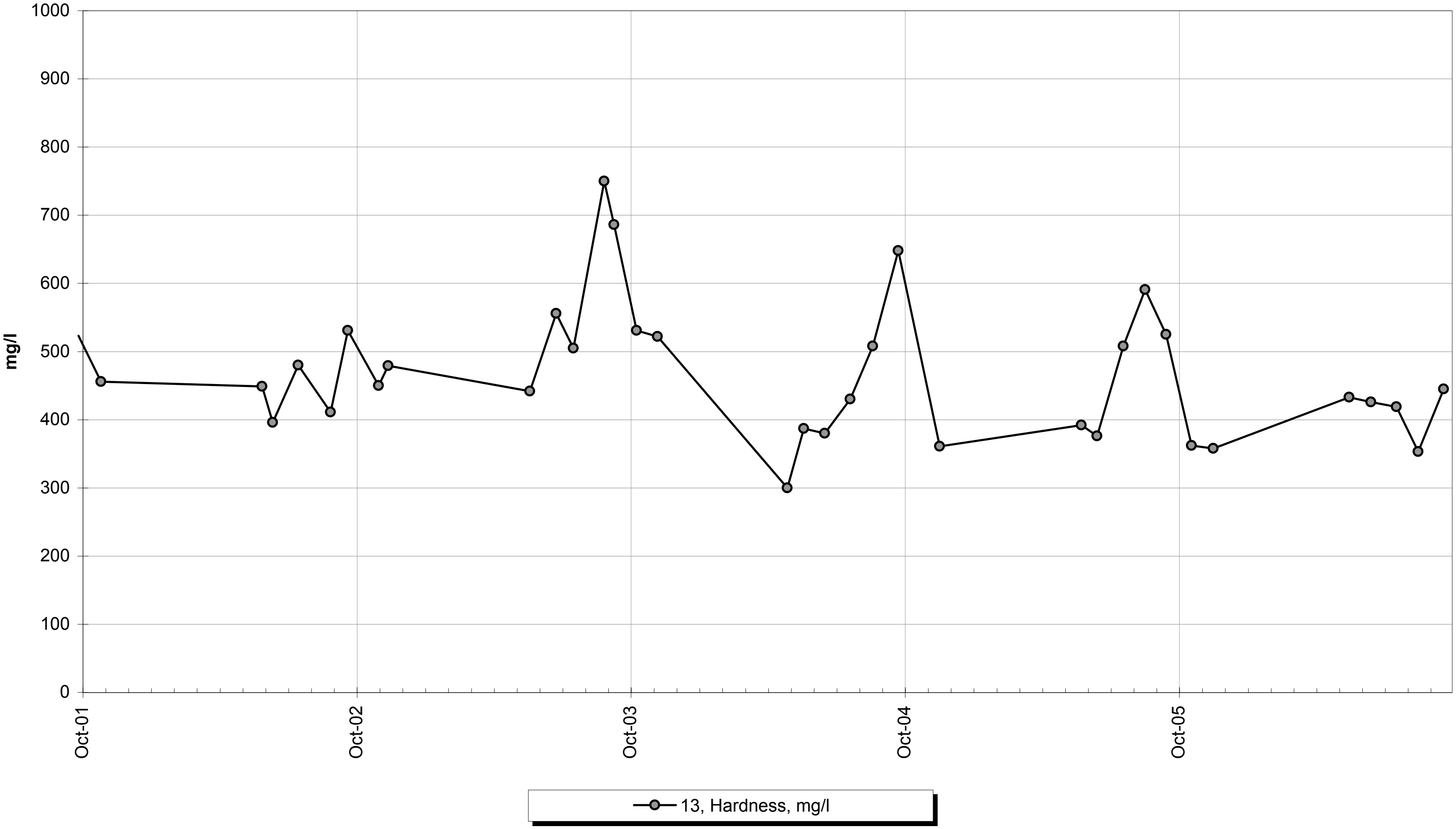
Site 13 -Lab pH

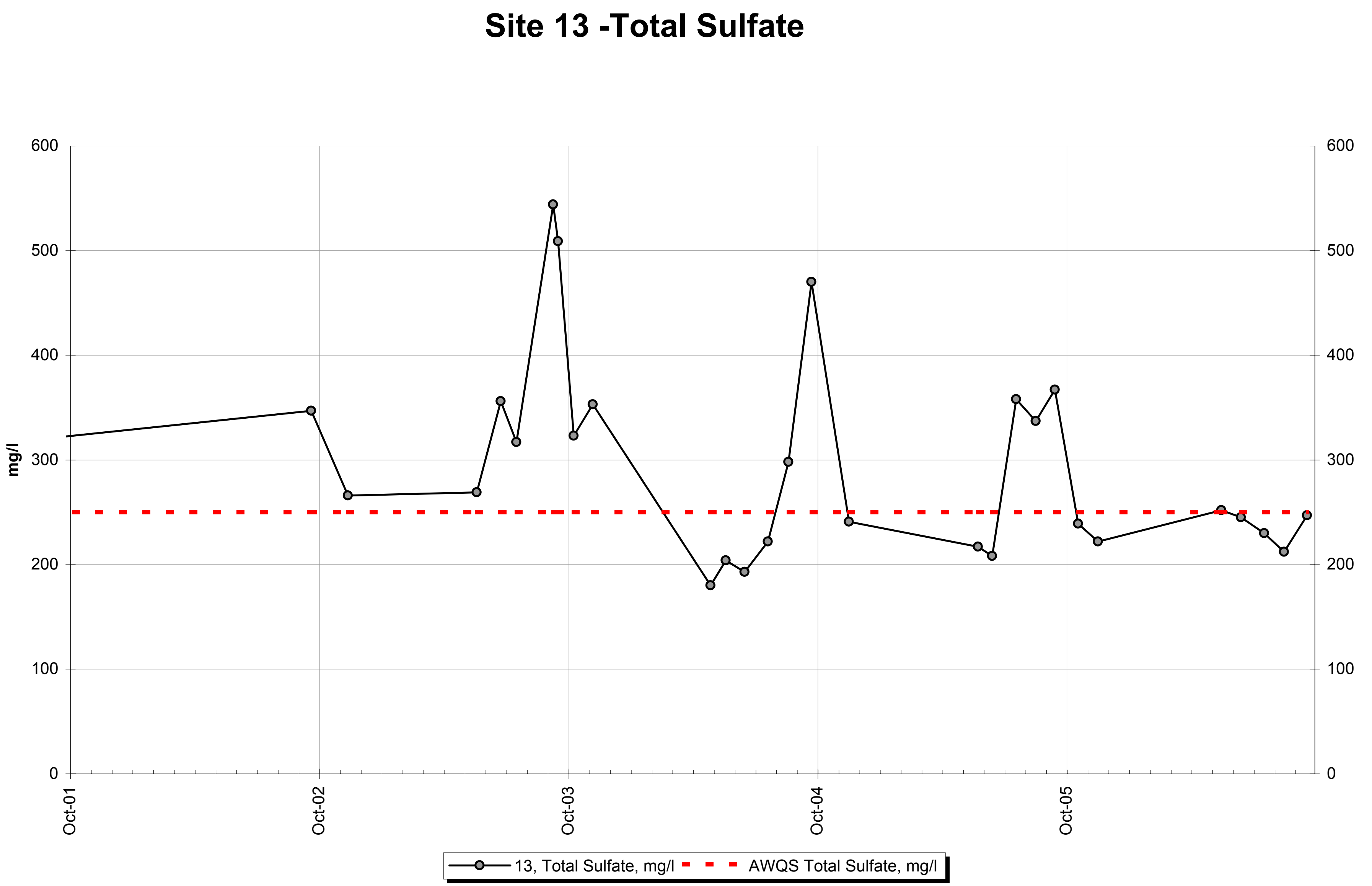


Site 13 -Total Alkalinity



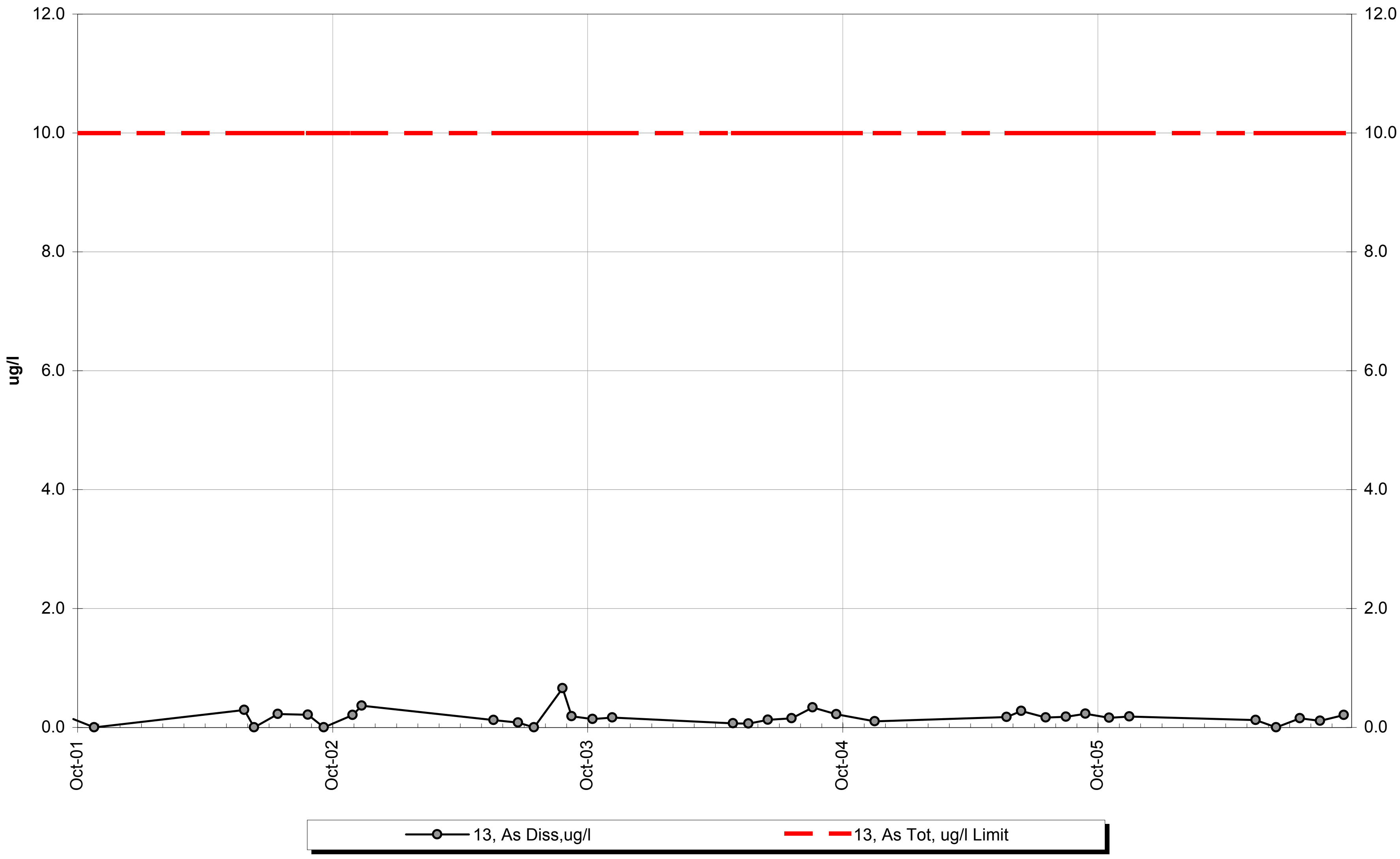
Site 13 -Hardness



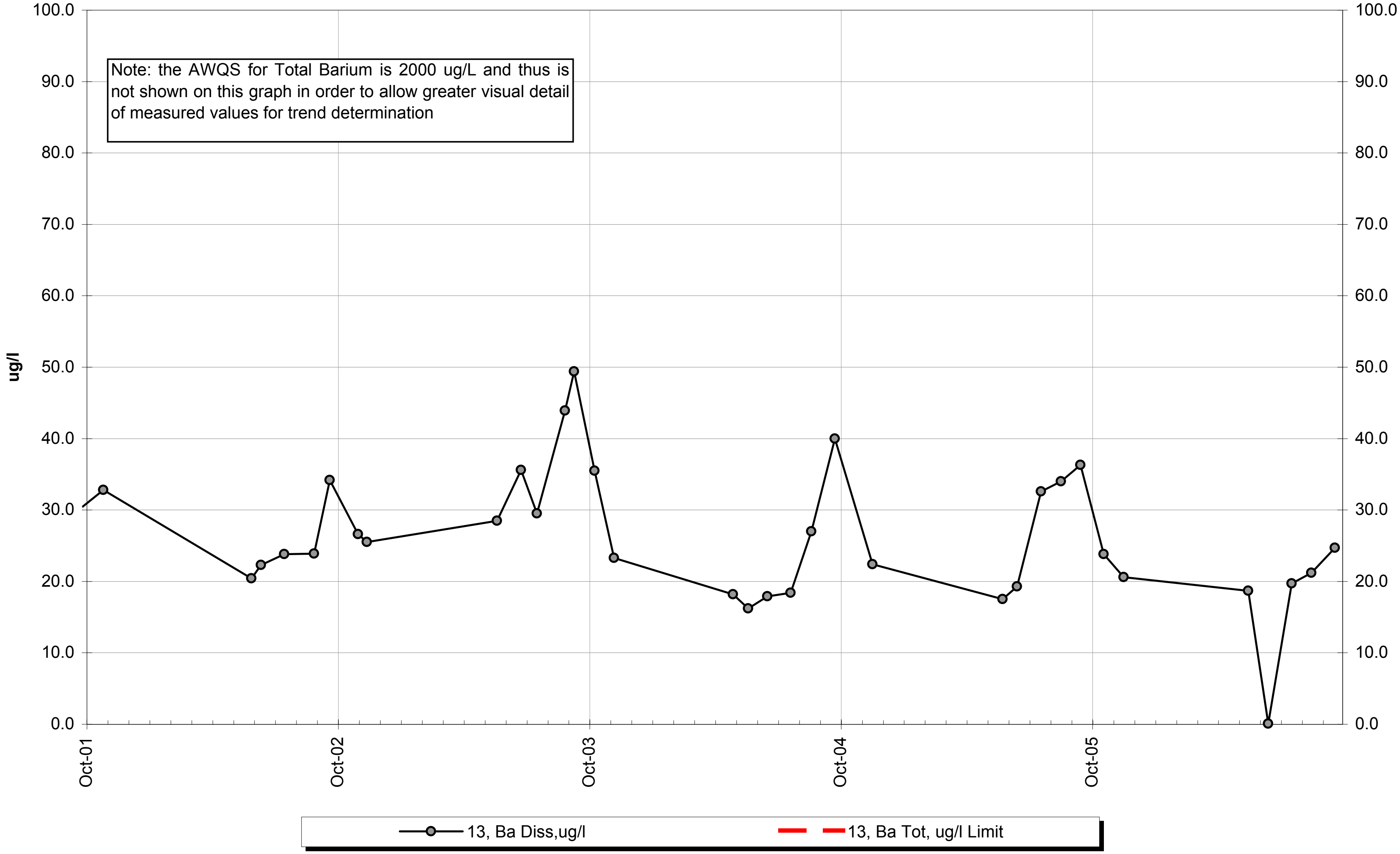


Site 13 -Total Sulfate
mg/l
600
500
400
300
200
100
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
13, Total Sulfate, mg/l
AWQS Total Sulfate, mg/l

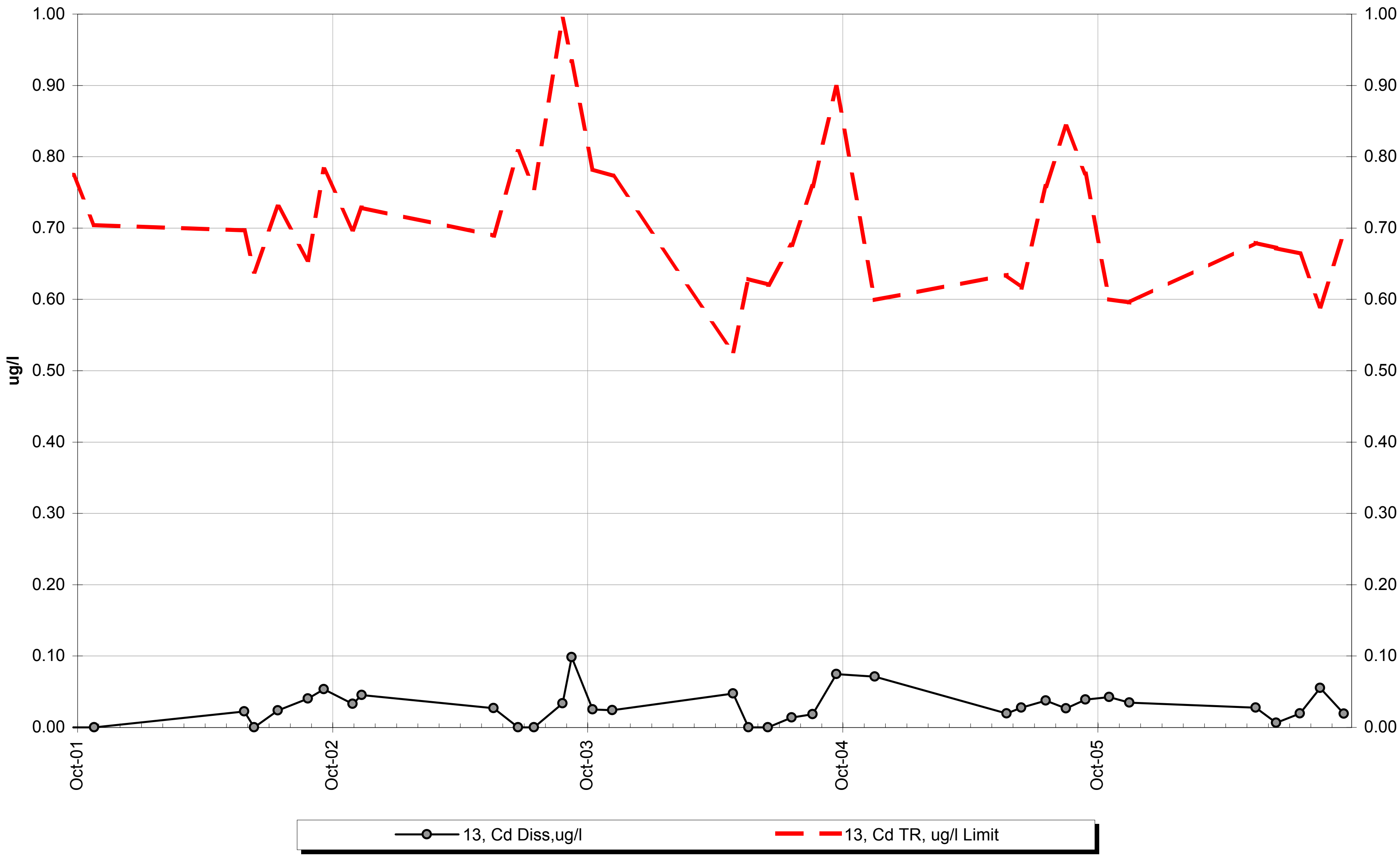
Site 13 -Dissolved Arsenic

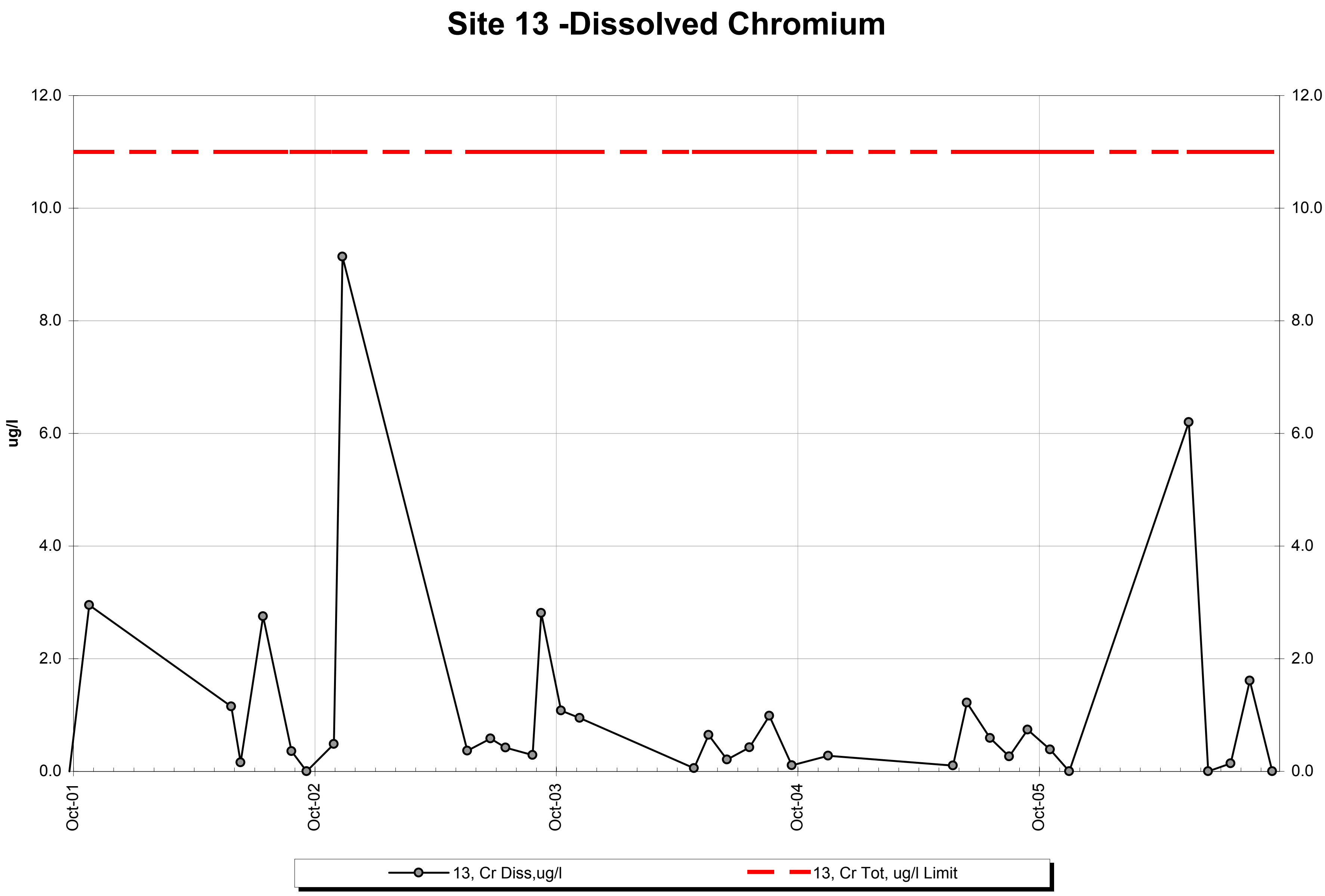


Site 13 -Dissolved Barium

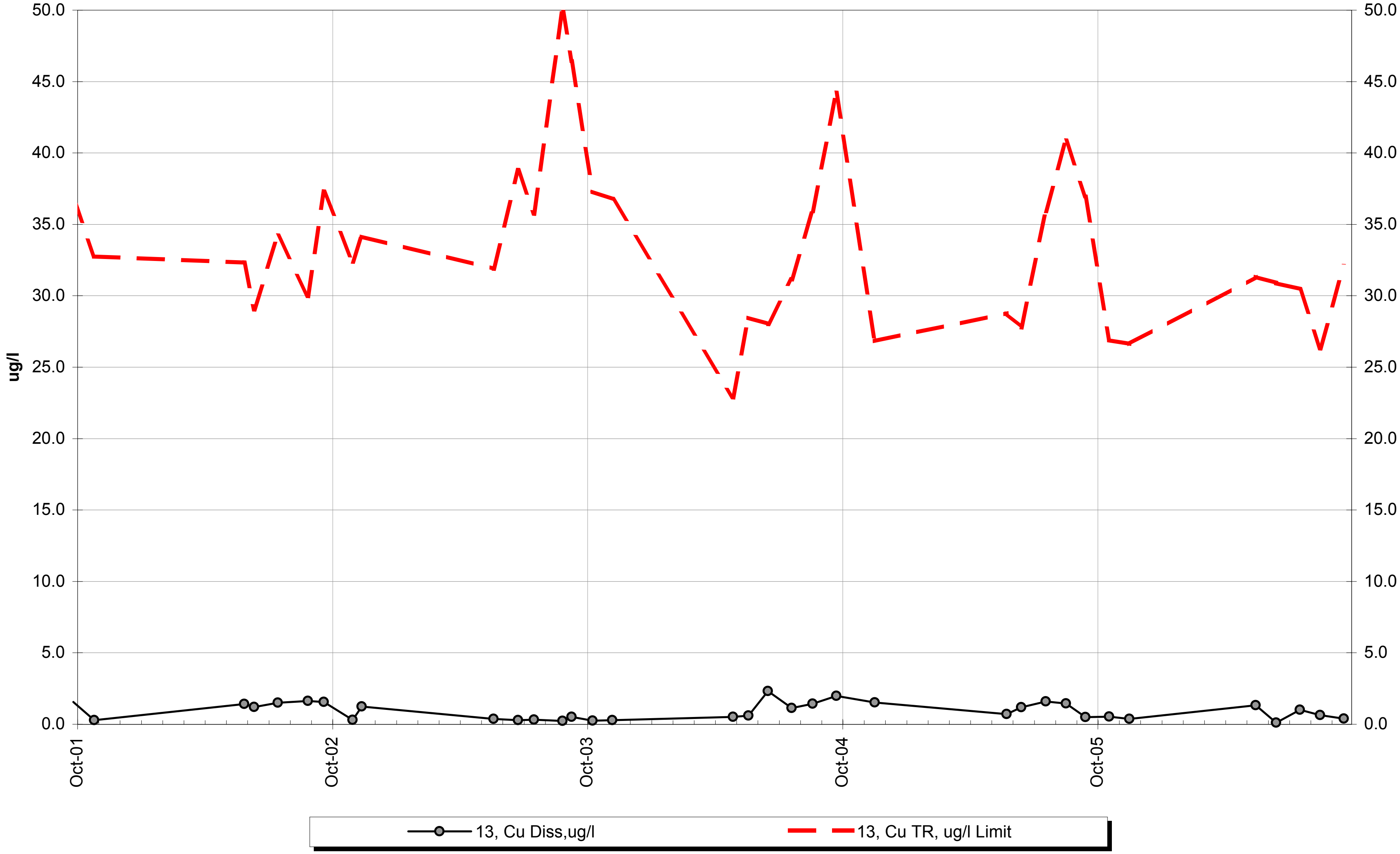


Site 13 -Dissolved Cadmium

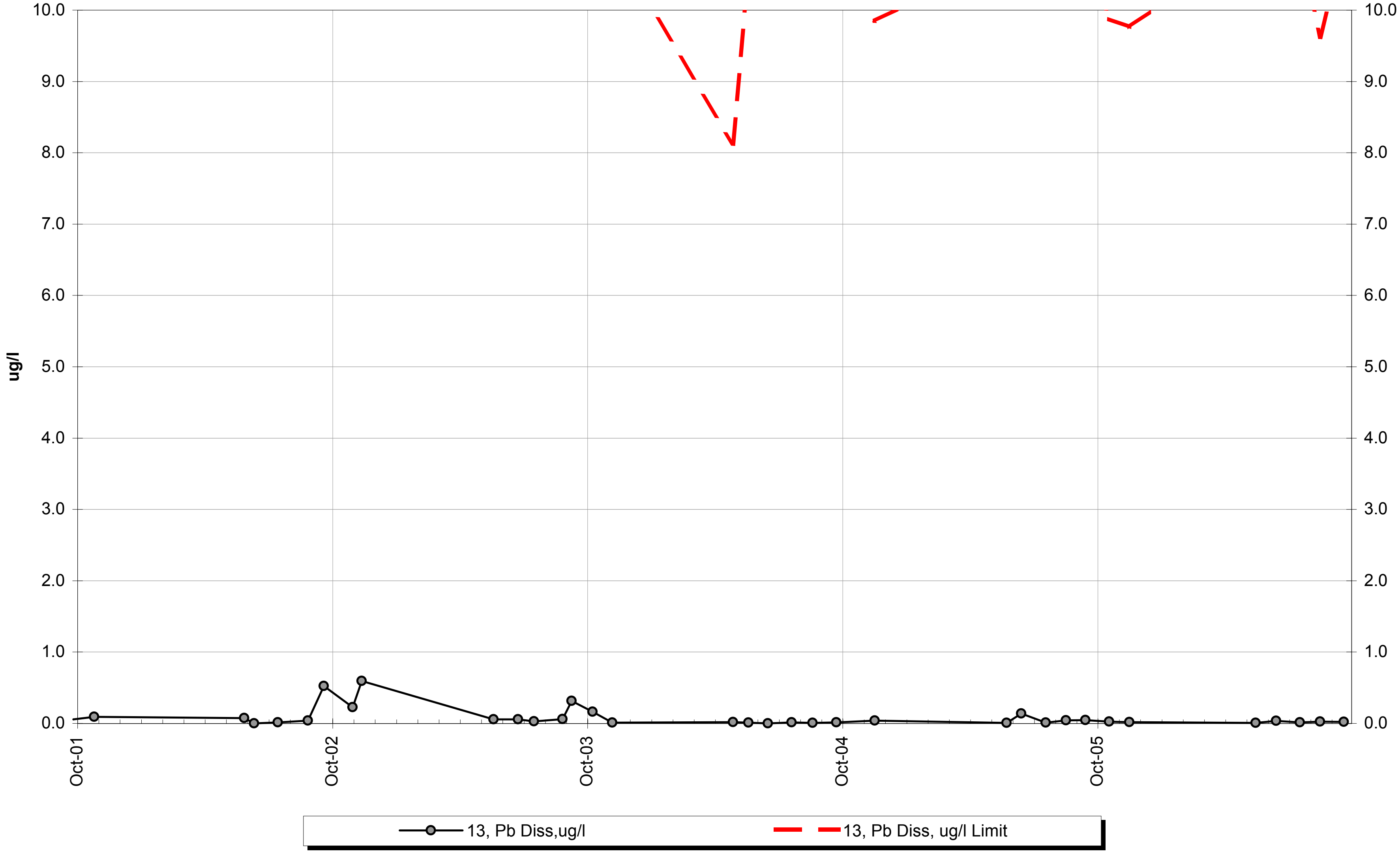



Site 13 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
13, Cr Diss,ug/l
13, Cr Tot, ug/l Limit

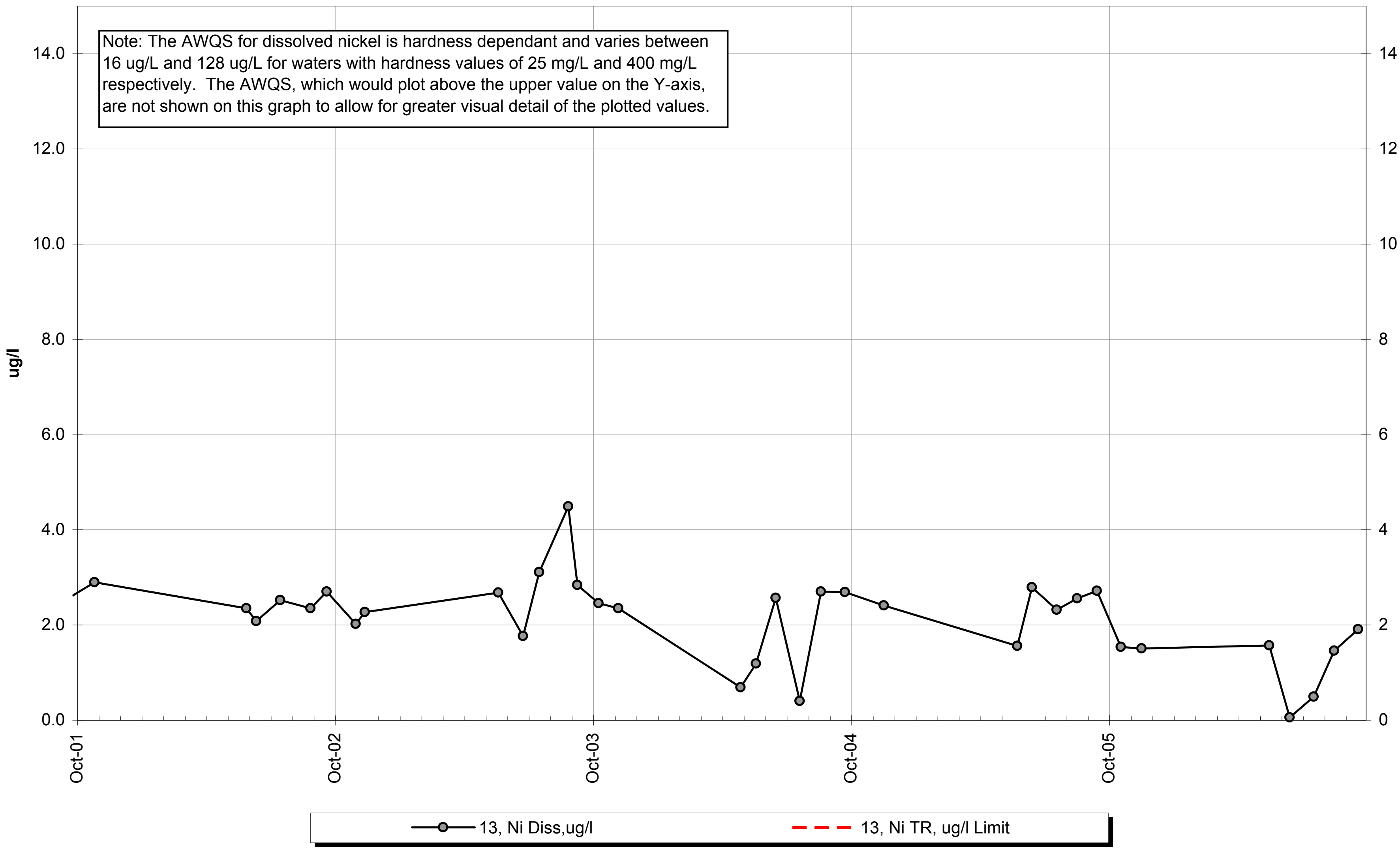
Site 13 -Dissolved Copper



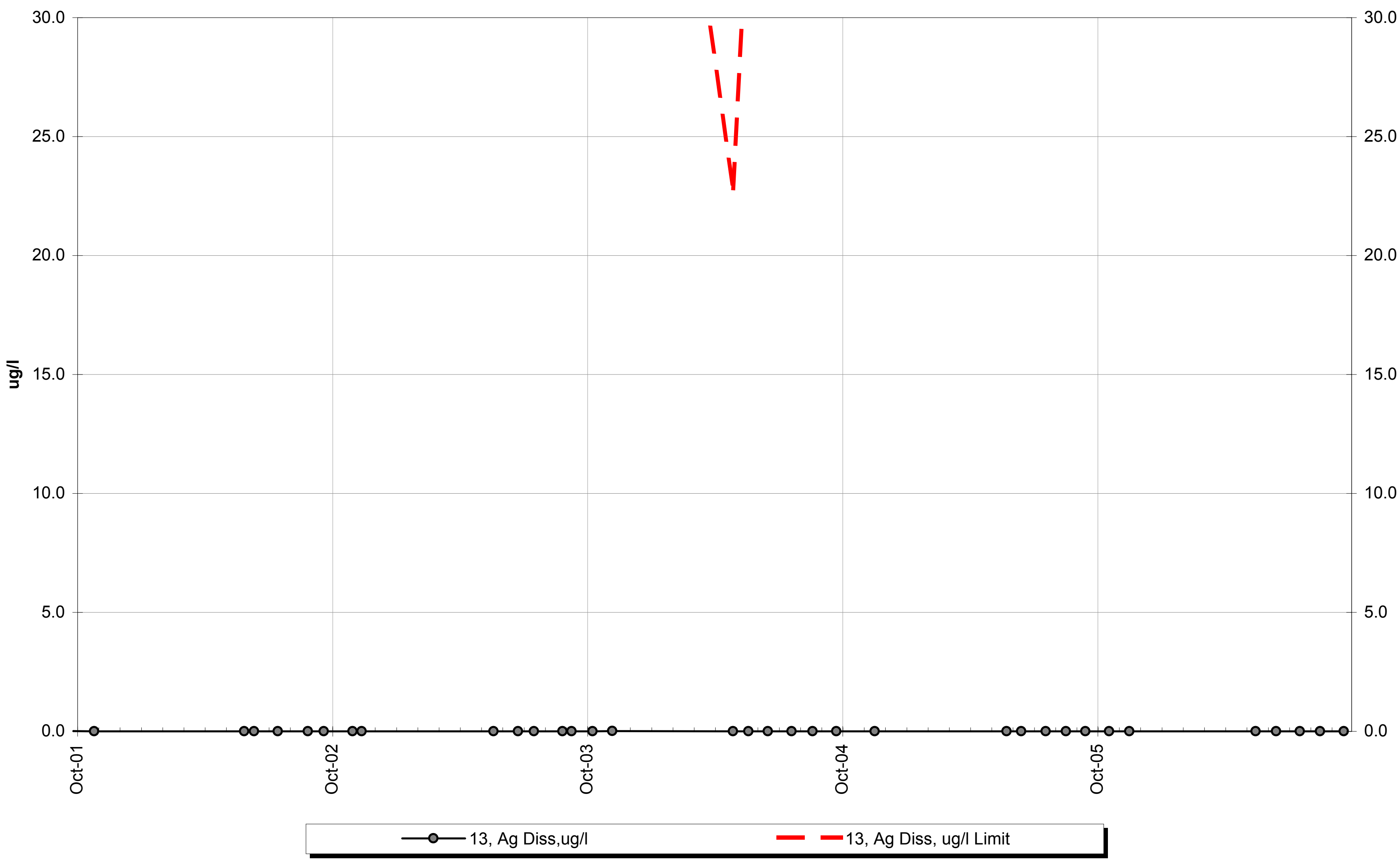
Site 13 -Dissolved Lead



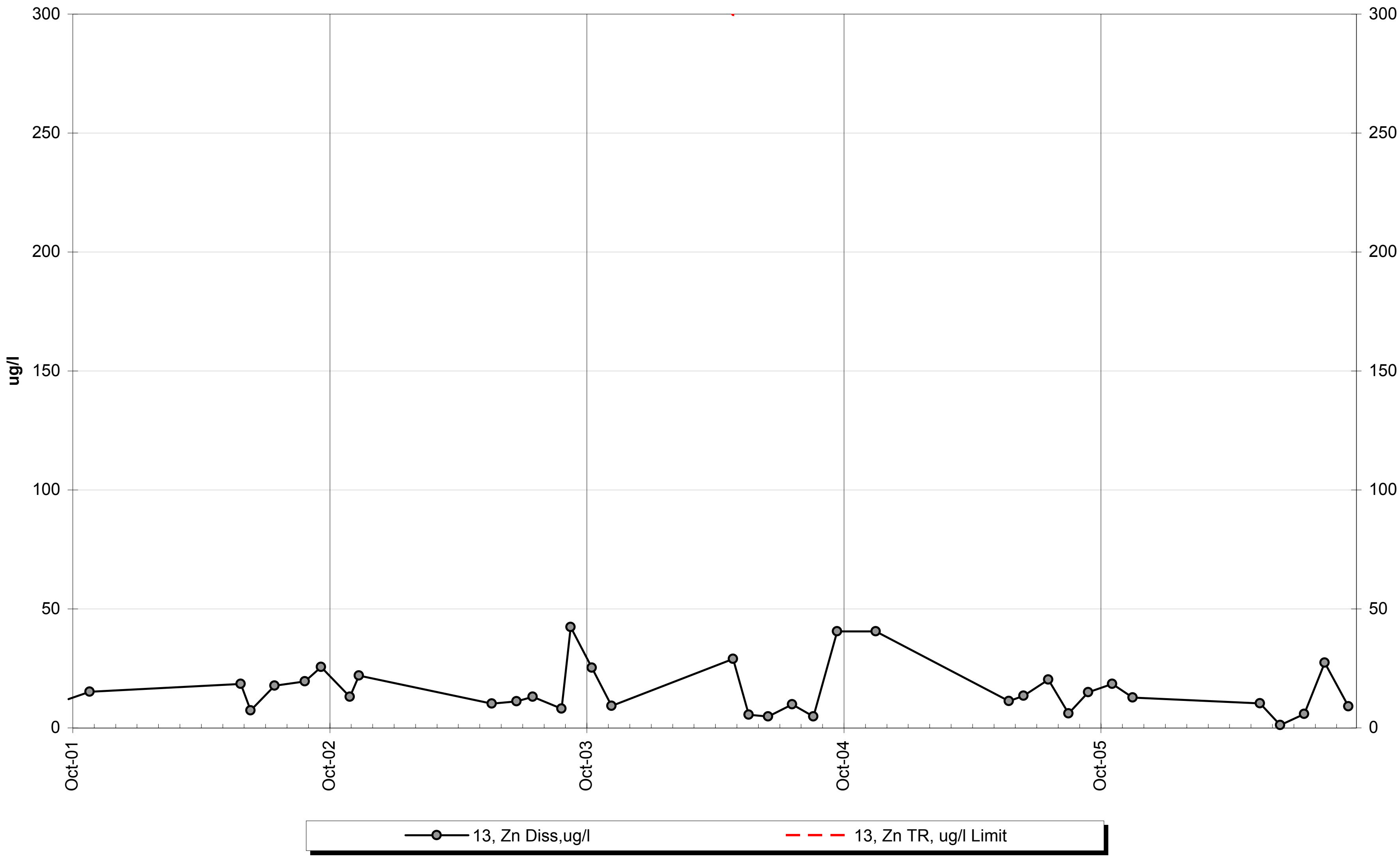
Site 13 -Dissolved Nickel



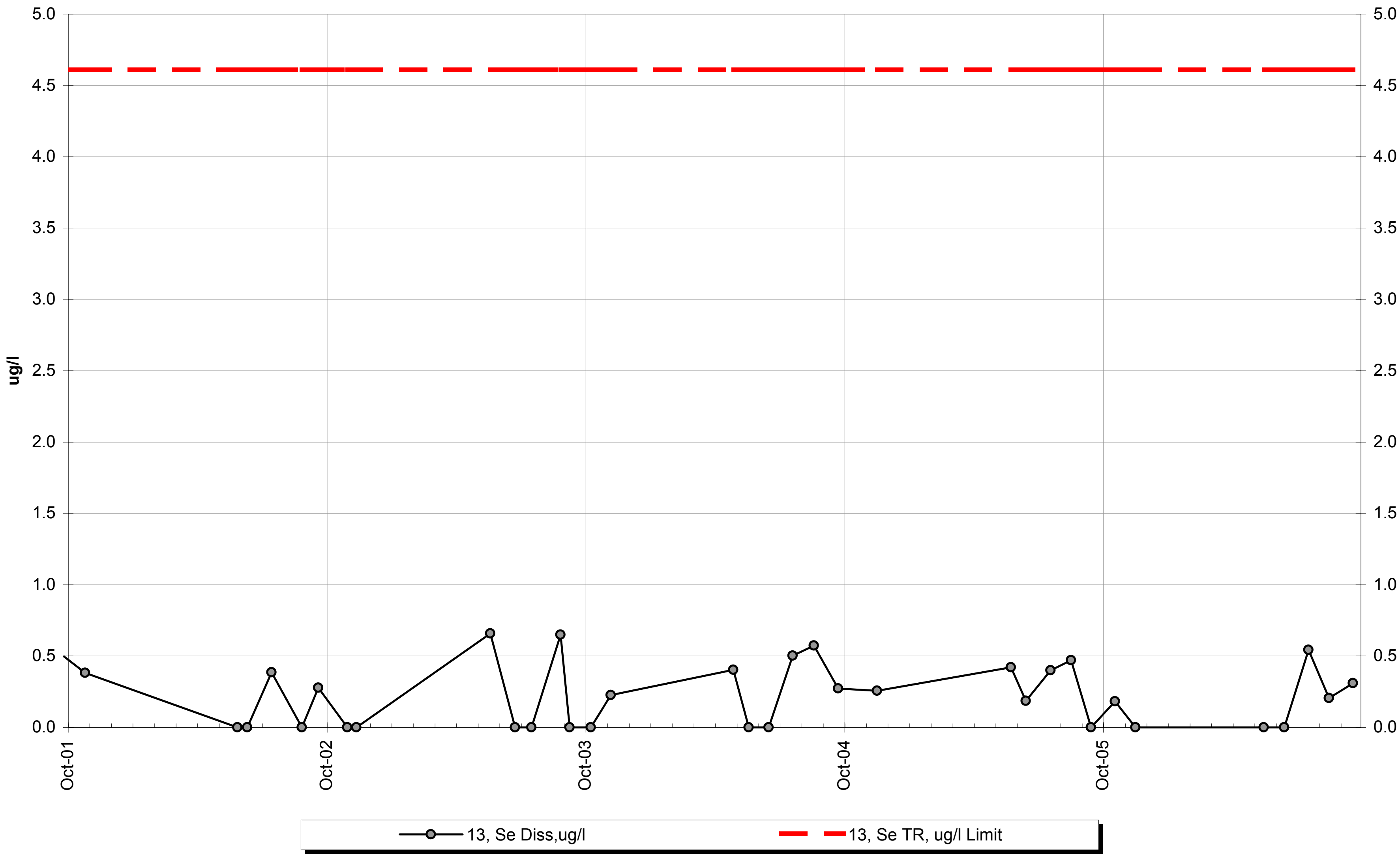
Site 13 -Dissolved Silver

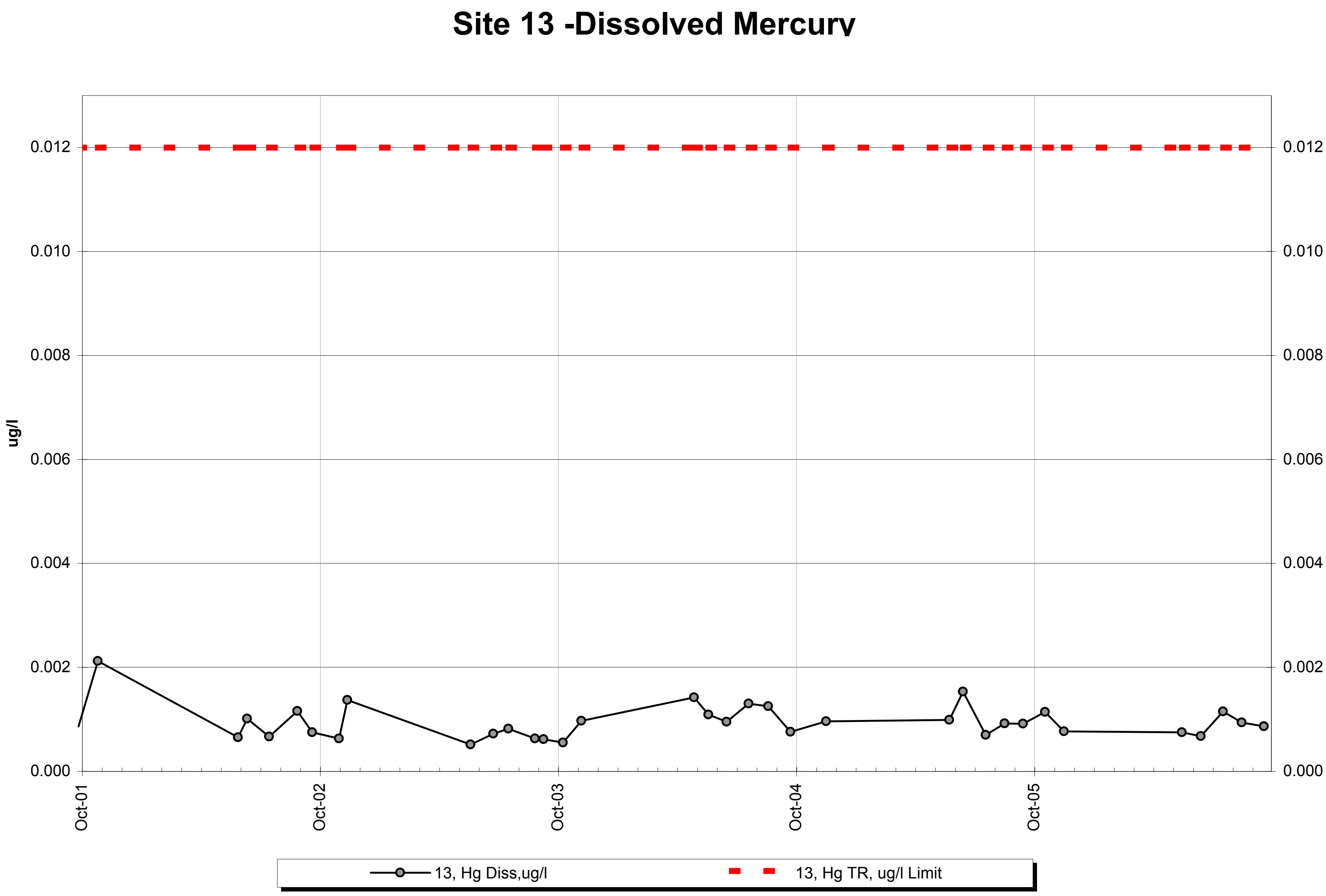


Site 13 -Dissolved Zinc



Site 13 -Dissolved Selenium





Site 13 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
13, Hg Diss,ug/l
13, Hg TR, ug/l Limit

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	**WY2001**	674.0	490.0						653.0	687.0	902.0		794.0
b	**WY2002**	791.0							646.0	724.0	832.0	717.0	857.0
c	**WY2003**	842.0	777.0						757.0	896.0	941.0	1180.0	1052.0
d	**WY2004**	879.0	896.0					533.0	650.0	626.0	704.0	839.0	1002.0
e	**WY2005**		591.0						639.0	604.0	826.0	921.0	781.0
f	**WY2006**	585.0	580.0						664.0	700.0	665.0	555.0	688.0
	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
c-a	1	1						1	1	1		1
d-a	1	1						-1	-1	-1		1
e-a		1						-1	-1	-1		-1
f-a	-1	1						1	1	-1		-1
c-b	1							1	1	1	1	1
d-b	1							1	-1	-1	1	1
e-b								-1	-1	-1	1	-1
f-b	-1							1	-1	-1	-1	-1
d-c	1	1						-1	-1	-1	-1	-1
e-c		-1						-1	-1	-1	-1	-1
f-c	-1	-1						-1	-1	-1	-1	-1
e-d		-1						-1	-1	1	1	-1
f-d	-1	-1						1	1	-1	-1	-1
f-e		-1						1	1	-1	-1	-1
S_k	2	0	0	0	0	0	0	-1	-3	-9	-2	-5

	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
$Z_k = S_k/\sigma_S$	0.49	0.00						-0.19	-0.56	-1.69	-0.49	-0.94
Z^2_k	0.24	0.00						0.04	0.32	2.86	0.24	0.88

ΣZ_k= -3.38

ΣZ^2_k= 4.57

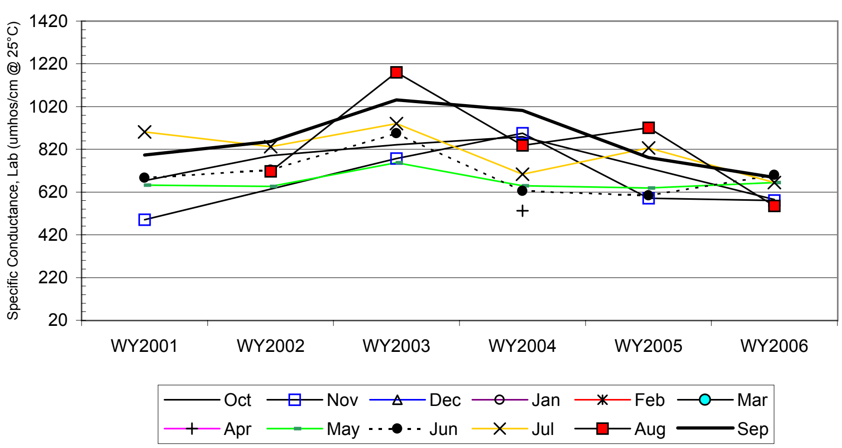
Z-bar=ΣZ_k/K= -0.48

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

Σn 40

ΣS_k -18

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	2.94	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
p	**0.816**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc} -1.33	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
163.33	p **0.092**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-49.87		16.52
0.050	-41.14	**-14.40**	2.10
0.100	-32.70		-1.81
0.200	-21.50		-3.41

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	**WY2001**	7.3	7.7						7.0	7.6	7.8		8.0
b	**WY2002**	7.1							6.8	7.2	8.0	7.9	7.5
c	**WY2003**	7.3	7.5						7.4	7.4	7.6	7.7	7.3
d	**WY2004**	7.2	8.0					7.9	7.8	8.0	8.2	8.0	7.8
e	**WY2005**		7.4						7.7	7.8	7.7	7.6	7.7
f	**WY2006**	7.3	7.4						7.4	7.6	7.5	7.2	7.2
	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
c-a	-1	-1						1	-1	-1		-1
d-a	-1	1						1	1	1		-1
e-a		-1						1	1	-1		-1
f-a	1	-1						1	-1	-1		-1
c-b	1							1	1	-1	-1	-1
d-b	1							1	1	1	1	1
e-b								1	1	-1	-1	1
f-b	1							1	1	-1	-1	-1
d-c	-1	1						1	1	1	1	1
e-c		-1						1	1	1	-1	1
f-c	1	-1						1	1	-1	-1	-1
e-d		-1						-1	-1	-1	-1	-1
f-d	1	-1						-1	-1	-1	-1	-1
f-e		1						-1	-1	-1	-1	-1
S_k	2	-4	0	0	0	0	0	7	3	-5	-6	-7

	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
$Z_k = S_k/\sigma_S$	0.49	-0.98						1.32	0.56	-0.94	-1.47	-1.32
Z^2_k	0.24	0.96						1.73	0.32	0.88	2.16	1.73

ΣZ_k= -2.34

ΣZ^2_k= 8.02

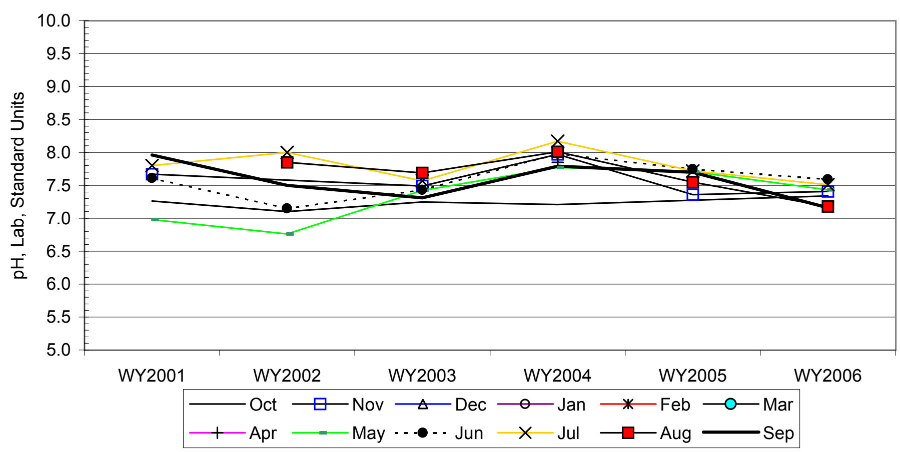
Z-bar=ΣZ_k/K= -0.33

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

Σn 40

ΣS_k -10

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=	7.24	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
p	**0.299**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$ / 163.33	Z_{calc} -0.70	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
	p **0.241**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.09		0.07
0.050	-0.08	**-0.02**	0.05
0.100	-0.07		0.03
0.200	-0.06		0.00

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	**WY2001**	142.0	113.0						135.0	173.0	178.0		154.0
b	**WY2002**	166.0							107.0	126.0	144.0	111.0	147.0
c	**WY2003**	140.0	186.0						206.0	244.0	197.0	199.0	128.0
d	**WY2004**	172.0	151.0					115.0	174.0	184.0	197.0	209.0	139.0
e	**WY2005**		120.0						186.0	201.0	188.0	207.0	162.0
f	**WY2006**	132.0	134.0						162.0	171.0	174.0	120.0	160.0
	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	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
c-a	-1	1						1	1	1		-1
d-a	1	1						1	1	1		-1
e-a		1						1	1	1		1
f-a	-1	1						1	-1	-1		1
c-b	-1							1	1	1	1	-1
d-b	1							1	1	1	1	-1
e-b								1	1	1	1	1
f-b	-1							1	1	1	1	1
d-c	1	-1						-1	-1	0	1	1
e-c		-1						-1	-1	-1	1	1
f-c	-1	-1						-1	-1	-1	-1	1
e-d		-1						1	1	-1	-1	1
f-d	-1	-1						-1	-1	-1	-1	1
f-e		1						-1	-1	-1	-1	-1
S_k	-2	0	0	0	0	0	0	3	1	0	2	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
$Z_k = S_k/\sigma_S$	-0.49	0.00						0.56	0.19	0.00	0.49	0.56
Z^2_k	0.24	0.00						0.32	0.04	0.00	0.24	0.32

ΣZ_k= 1.32

ΣZ^2_k= 1.15

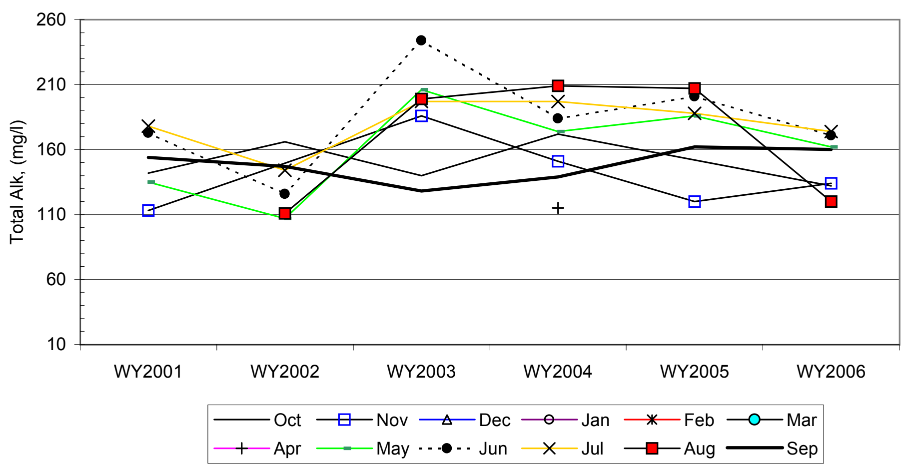
Z-bar=$\Sigma Z_k/K$= 0.19

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

Σn 40

ΣS_k 7

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.90	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
	p	**0.989**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	0.47	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
163.33	p	**0.681**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-6.43		10.00
0.050	-3.35	**2.13**	6.67
0.100	-2.00		5.08
0.200	-0.88		3.79

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	**WY2001**	19.5	20.9						7.3	4.9	5.2		12.1
b	**WY2002**	15.2							18.5	7.3	17.7	19.5	25.6
c	**WY2003**	13.1	22.0						10.2	11.1	13.1	8.1	42.4
d	**WY2004**	25.3	9.3					29.0	5.5	4.8	9.9	4.7	40.5
e	**WY2005**		40.5						11.3	13.5	20.3	6.0	15.0
f	**WY2006**	18.5	12.7						10.3	1.2	5.8	27.4	9.0
	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
c-a	-1	1						1	1	1		1
d-a	1	-1						-1	-1	1		1
e-a		1						1	1	1		1
f-a	-1	-1						1	-1	1		-1
c-b	-1							-1	1	-1	-1	1
d-b	1							-1	-1	-1	-1	1
e-b								-1	1	1	-1	-1
f-b	1							-1	-1	-1	1	-1
d-c	1	-1						-1	-1	-1	-1	-1
e-c		1						1	1	1	-1	-1
f-c	1	-1						1	-1	-1	1	-1
e-d		1						1	1	1	1	-1
f-d	-1	1						1	-1	-1	1	-1
f-e		-1						-1	-1	-1	1	-1
S_k	0	0	0	0	0	0	0	1	-1	1	0	-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
$Z_k = S_k/\sigma_S$	0.00	0.00						0.19	-0.19	0.19	0.00	-0.56
Z^2_k	0.00	0.00						0.04	0.04	0.04	0.00	0.32

ΣZ_k= -0.38

ΣZ^2_k= 0.42

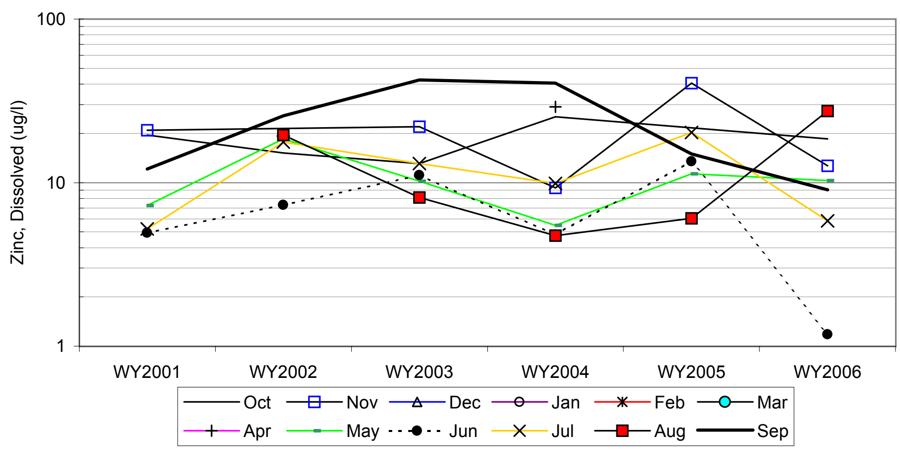
Z-bar=ΣZ_k/K= -0.05

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

Σn 40

ΣS_k -2

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=		0.40	@α=5% $\chi^2_{(K-1)}$= 12.59	Test for station homogeneity	
	p	**0.999**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.08	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
163.33	p	**0.469**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-2.42		1.69
0.050	-1.96	**-0.12**	1.11
0.100	-1.67		0.83
0.200	-1.11		0.57

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 2006" report. The table includes all the required FWMP analyte 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. 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-06.				

The data for Water Year 2006 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 su (i.e. Sites 27, 29, and 32).

Sample Date	Parameter	Value	Standard	Standard Type
05/17/06	pH Lab, su	5.70	6.5 - 8.5	Aquatic Life
05/17/06	pH Field, su	6.29	6.5 - 8.5	Aquatic Life
09/20/06	pH Lab, su	6.19	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 are apparent. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between May-02 and Sep-06 (WY2002-WY2006). No statistically significant ($\alpha/2=2.5\%$) trends are identified.

Site 58-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	5	0.50	+		
pH, Lab	5	0.30	-		
Alkalinity, Total	5	0.50	-		
Zinc, Dissolved	5	0.43	-		

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

Table of Results for Water Year 2006

Site 58 "MW-T-00-01C"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							4.4	NOT SCHEDULED FOR SAMPLING			10.4	7.4
Conductivity-Field(µmho)								64				57	61
Conductivity-Lab (µmho)								61				57	59
pH Lab (standard units)								5.70				6.19	5.95
pH Field (standard units)								6.29				6.19	6.24
Total Alkalinity (mg/L)								24.5				25.0	24.8
Total Sulfate (mg/L)								1.5				1.2	1.4
Hardness (mg/L)								26.2				25.1	25.7
Dissolved As (ug/L)								0.206				0.270	0.238
Dissolved Ba (ug/L)								8.5				12.7	10.6
Dissolved Cd (ug/L)								<0.003				<0.004	0.002
Dissolved Cr (ug/L)								1.460				0.333	0.897
Dissolved Cu (ug/L)								0.119 U				0.227	0.173
Dissolved Pb (ug/L)								0.1280				0.1170	0.1225
Dissolved Ni (ug/L)								0.240				0.289	0.265
Dissolved Ag (ug/L)								<0.002				<0.003	0.001
Dissolved Zn (ug/L)								0.18 U				0.26	0.22
Dissolved Se (ug/L)								0.202 J				<0.139	0.136
Dissolved Hg (ug/L)								0.000819 UJ				0.001540 U	0.001180

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

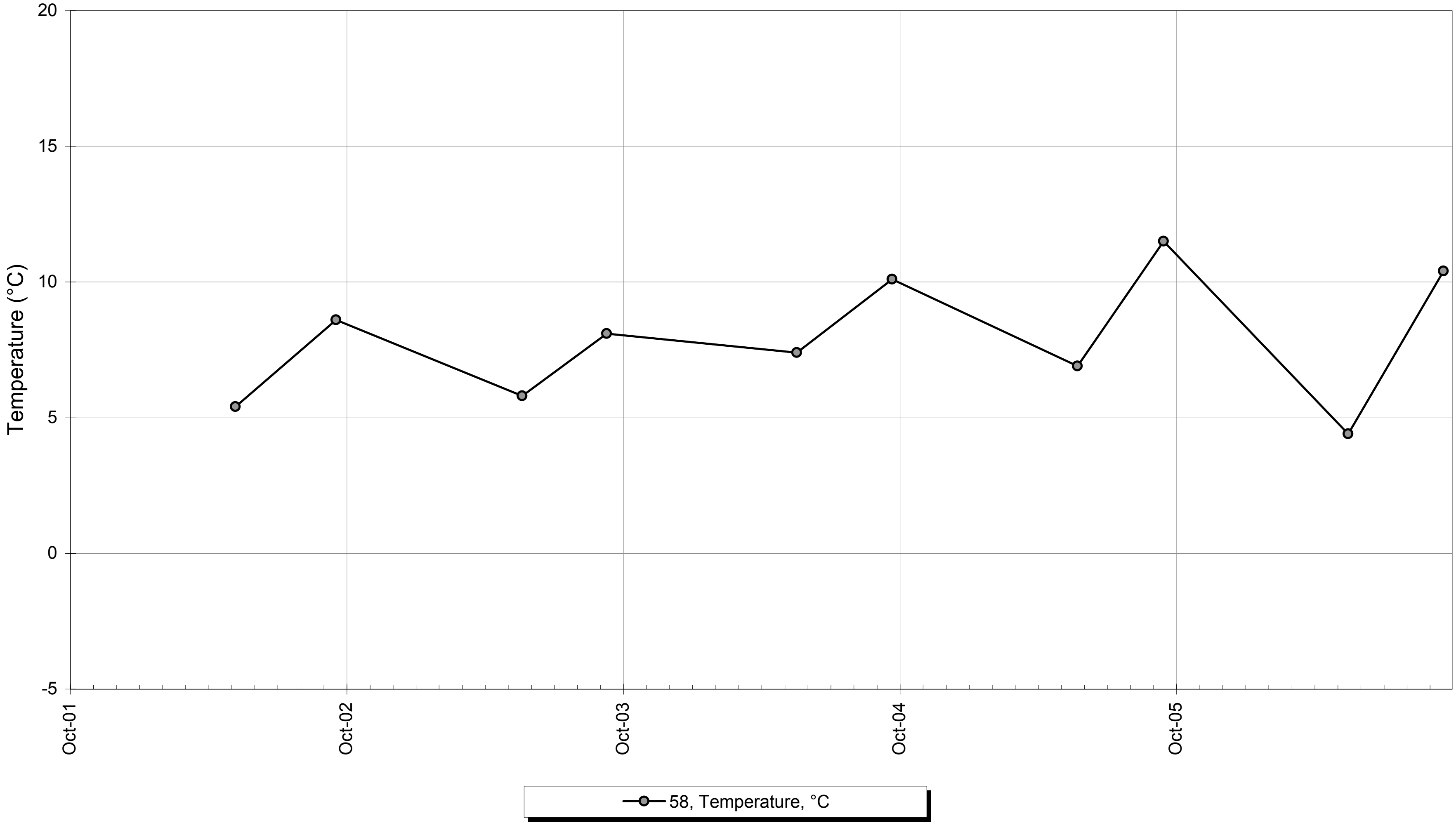
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

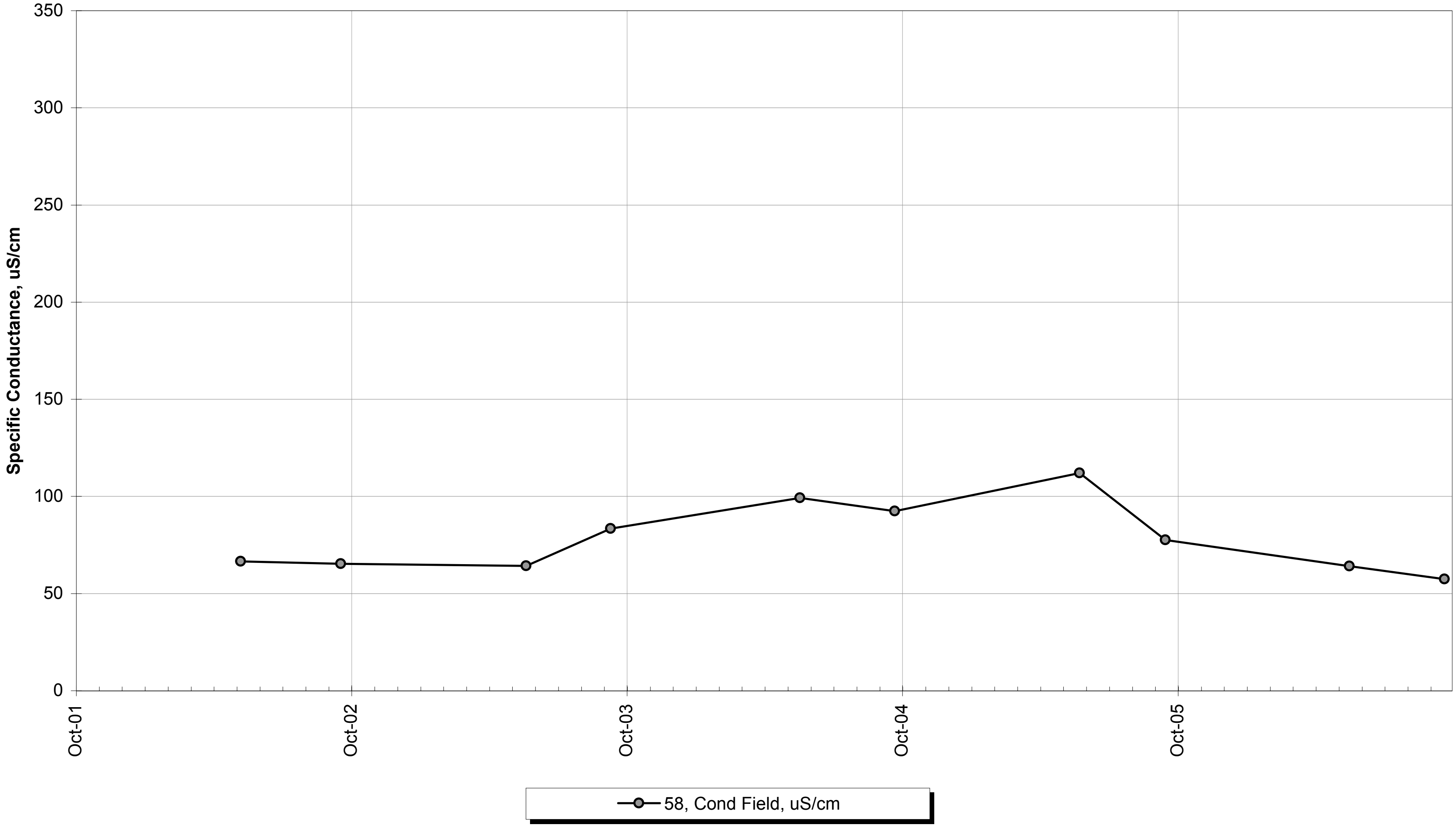
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
58	05/17/2006	1:25:00 PM				
			Cu Diss, ug/l	0.119	U	Field Blank Contamination
			Zn Diss, ug/l	0.183	U	Field Blank Contamination
			Se Diss, ug/l	0.202	J	Below Quantitative Range
			Hg Diss, ug/l	0.000819	UJ	Field Blank Contamination, Co
58	09/20/2006	10:25:00 AM				
			Hg Diss, ug/l	0.00154	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

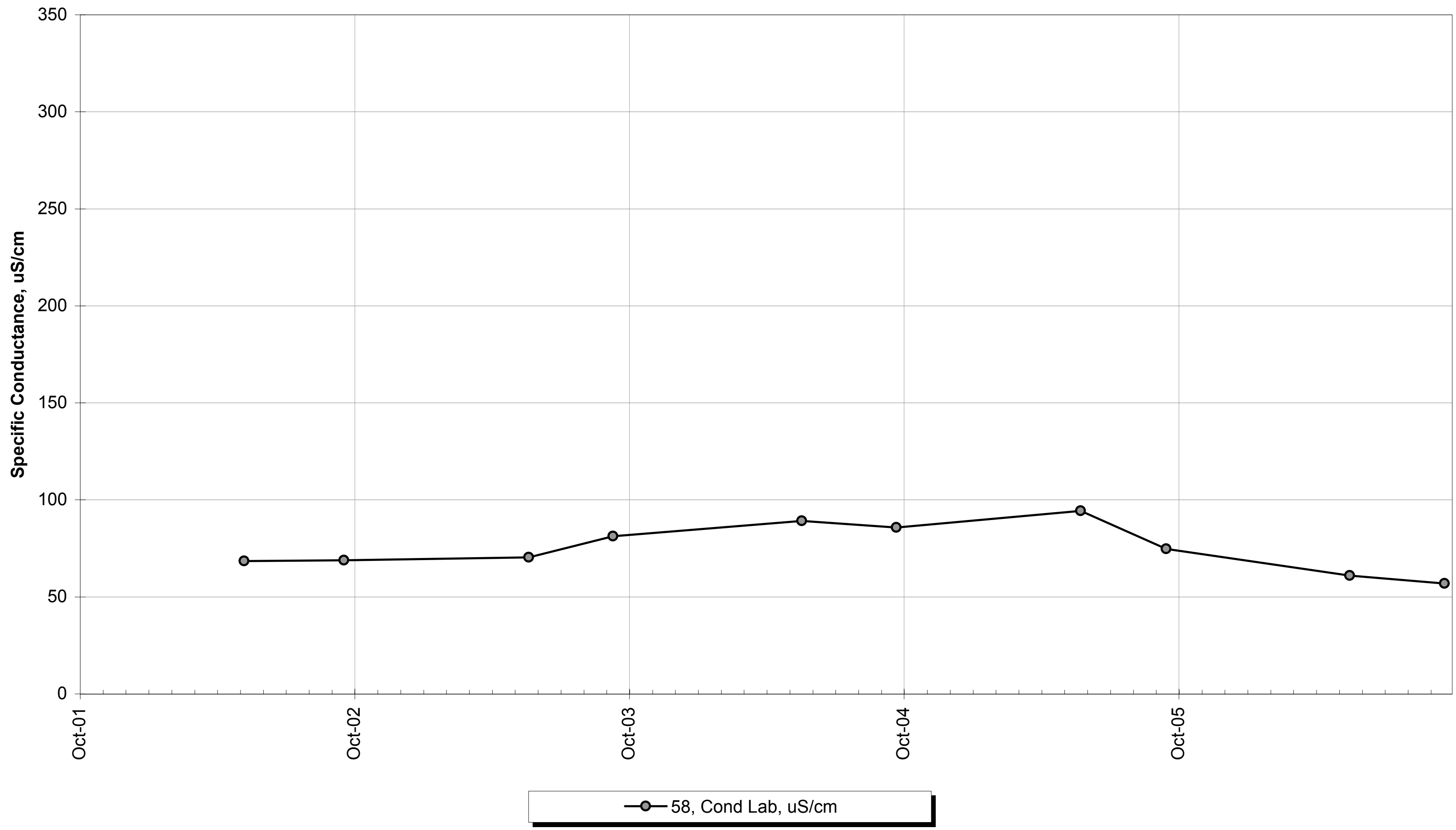
Site 58 -Water Temperature

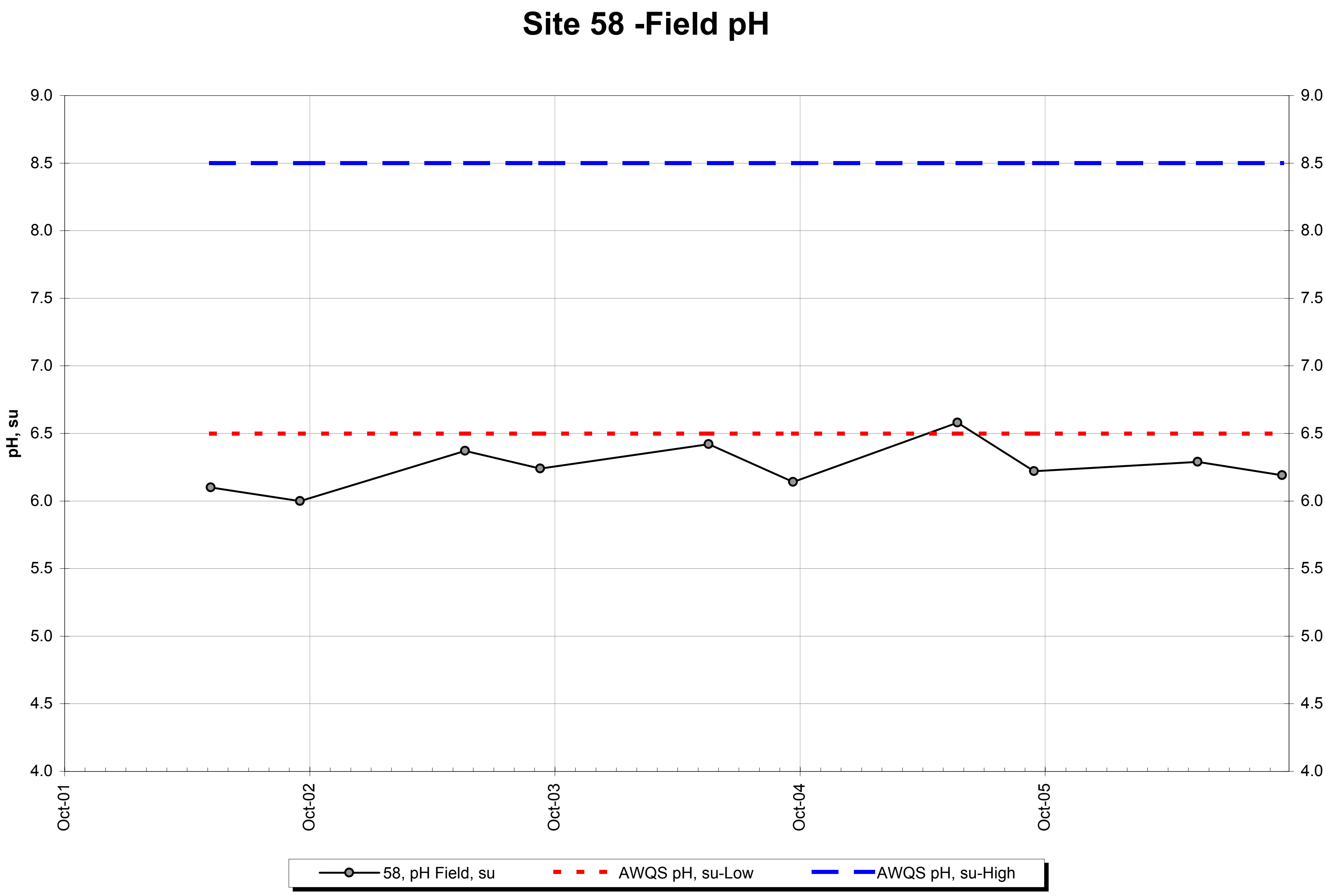


Site 58 -Conductivity-Field

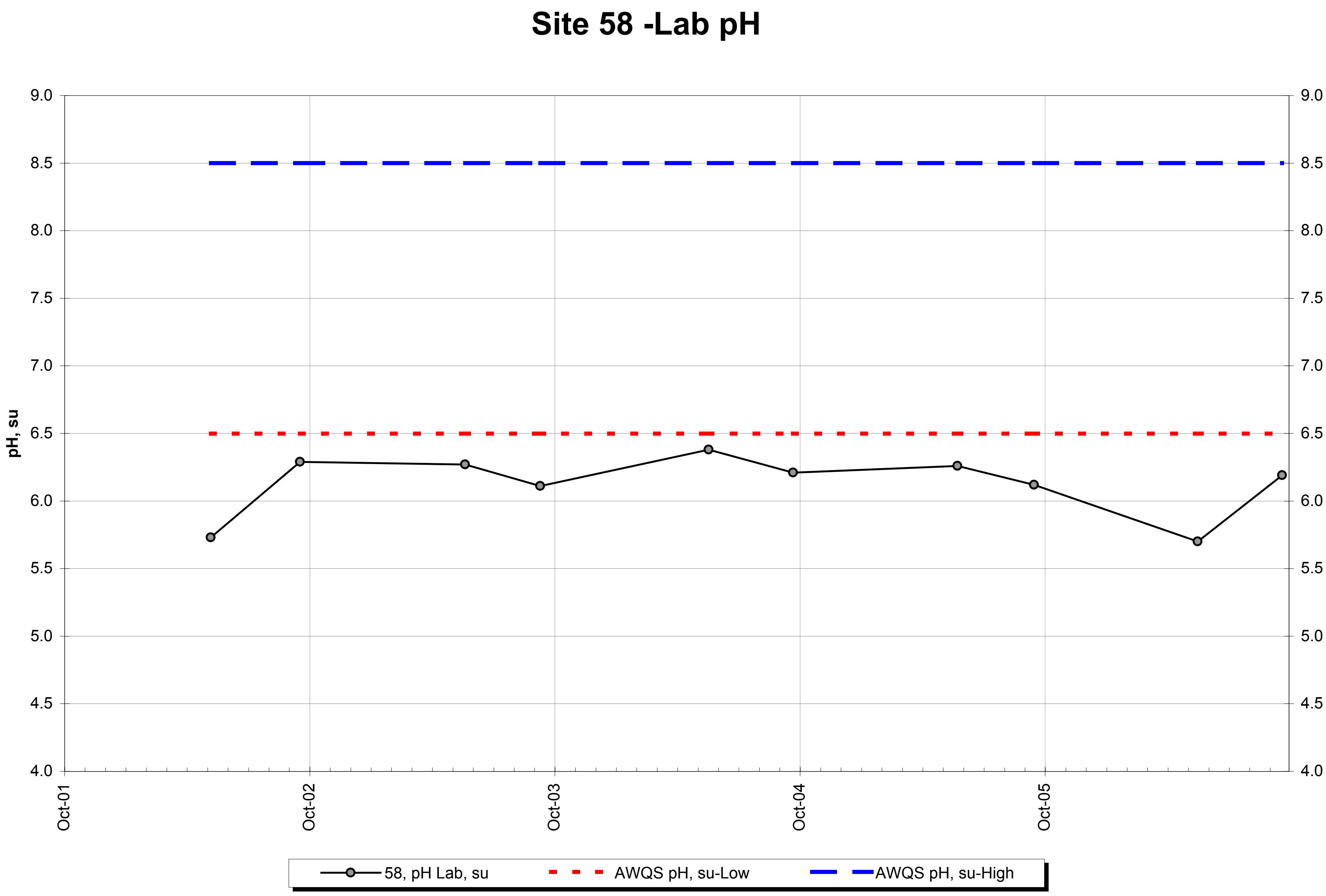


Site 58 -Conductivity-Lab



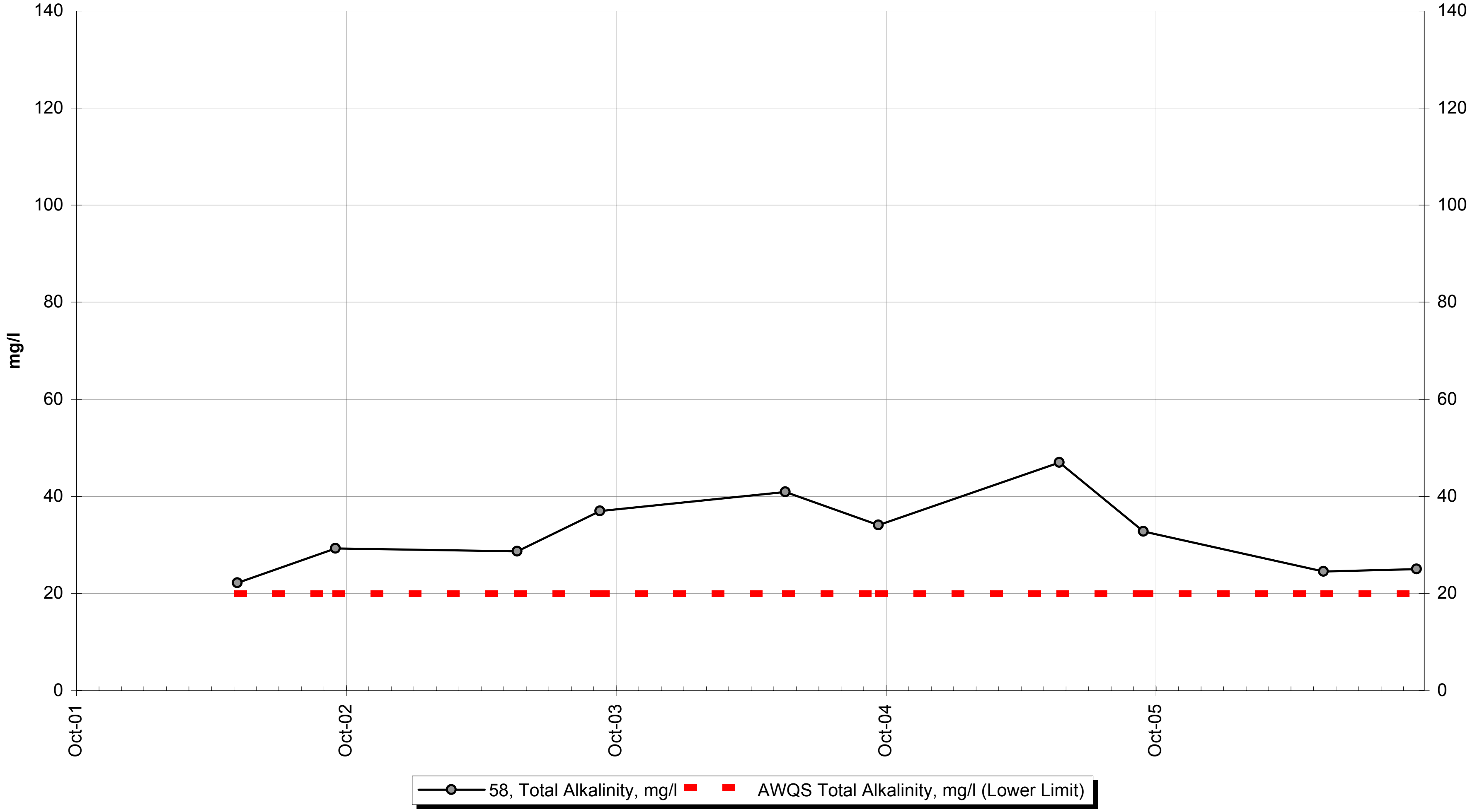


Site 58 -Field pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

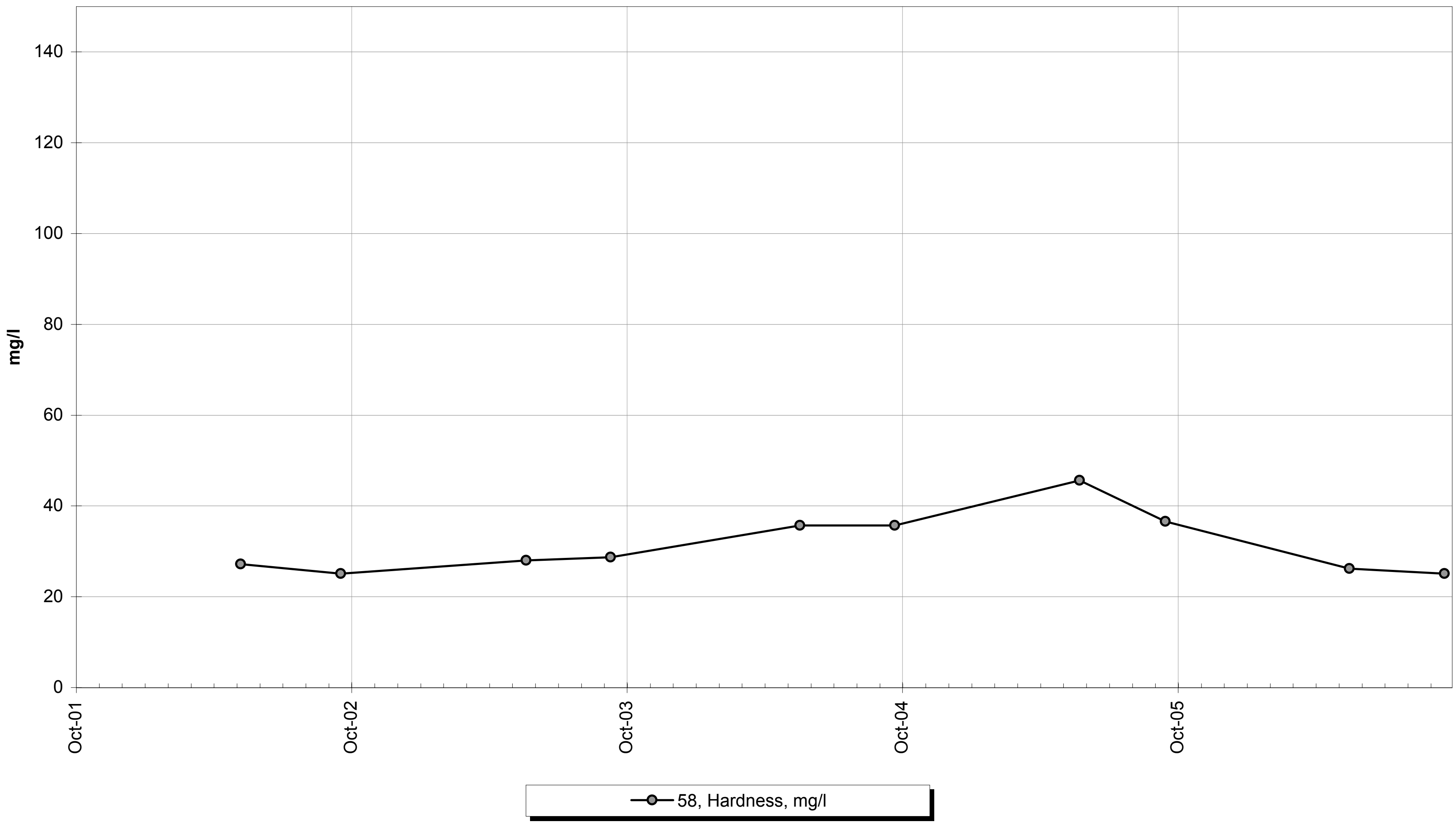


Site 58 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

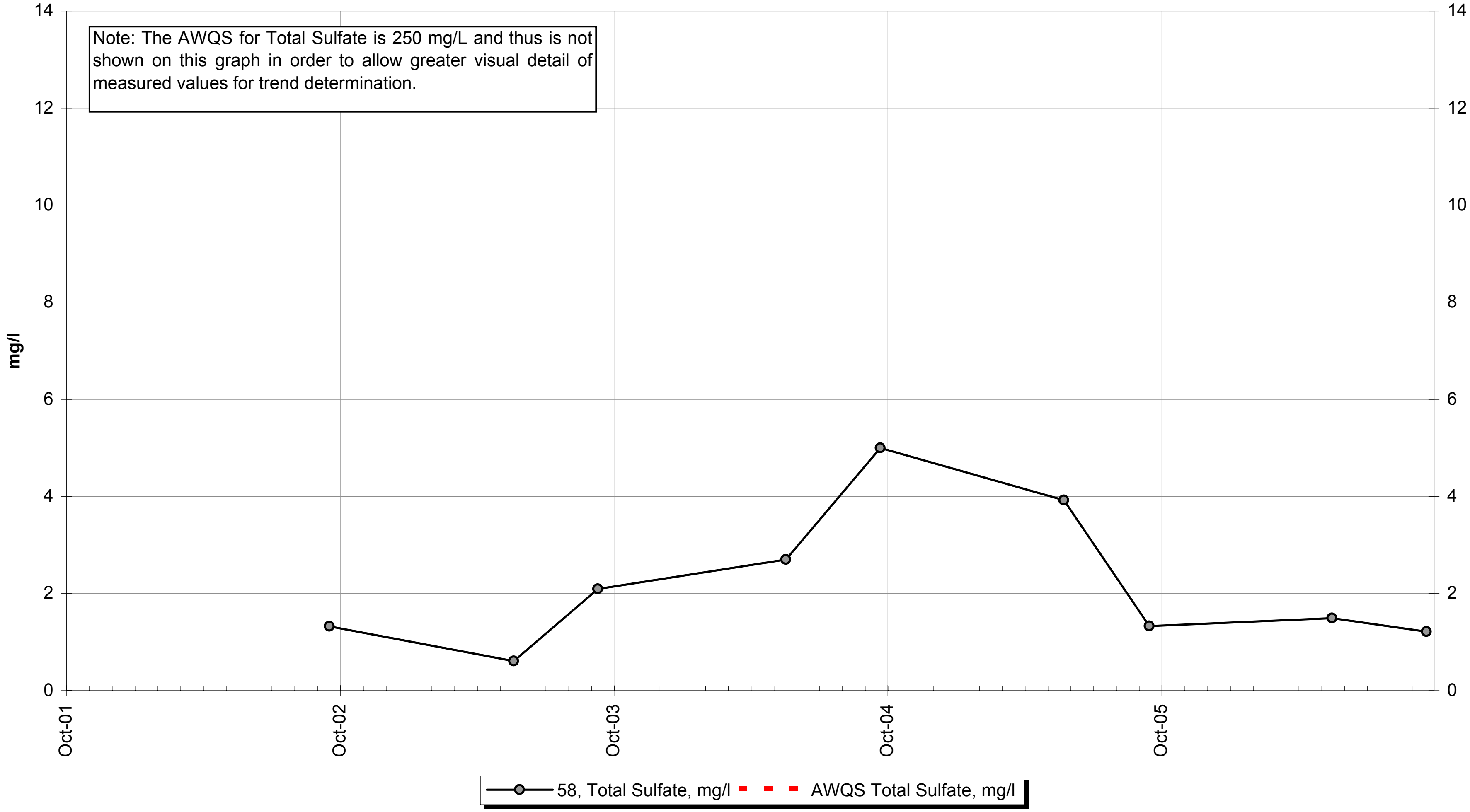
Site 58 -Total Alkalinity

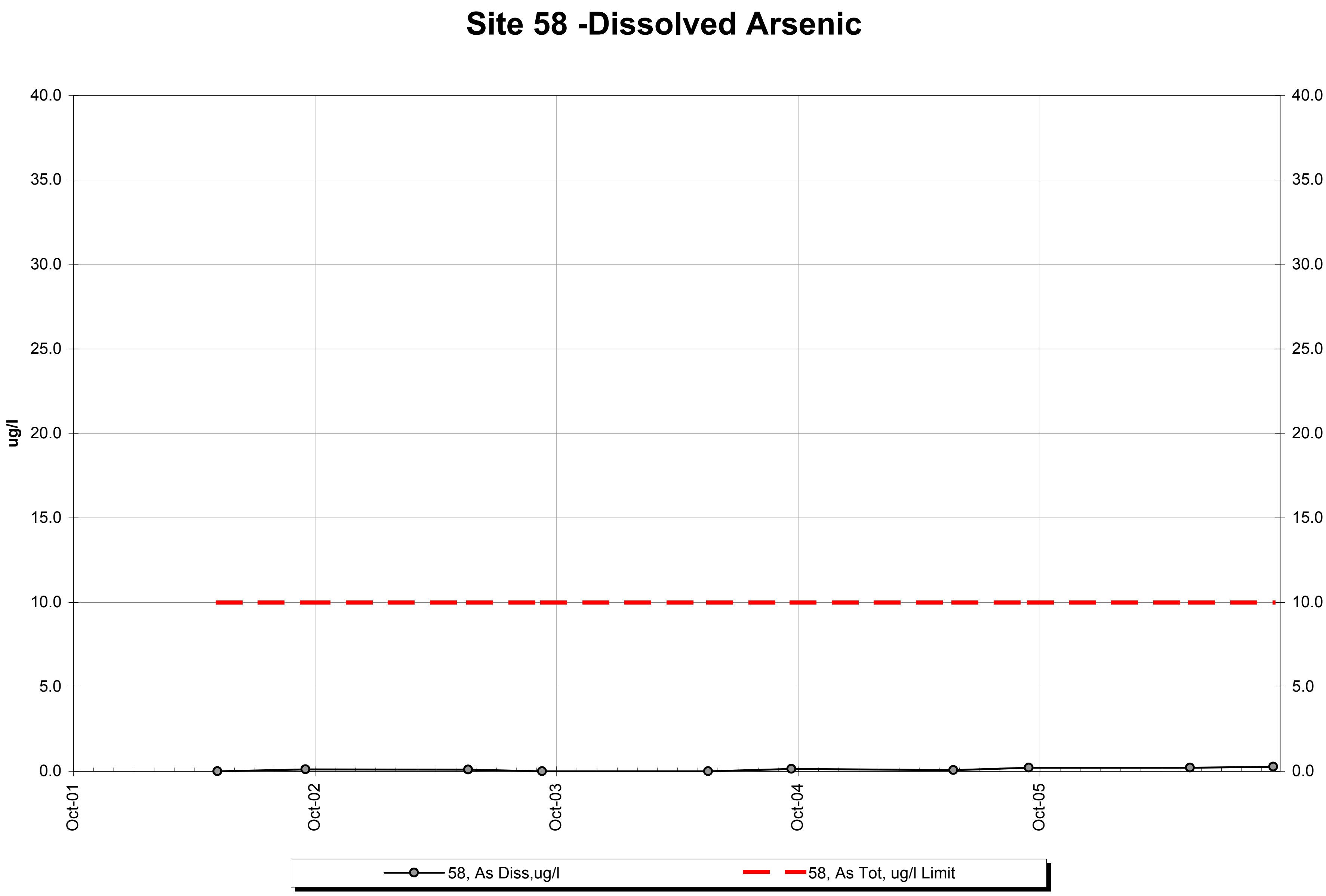


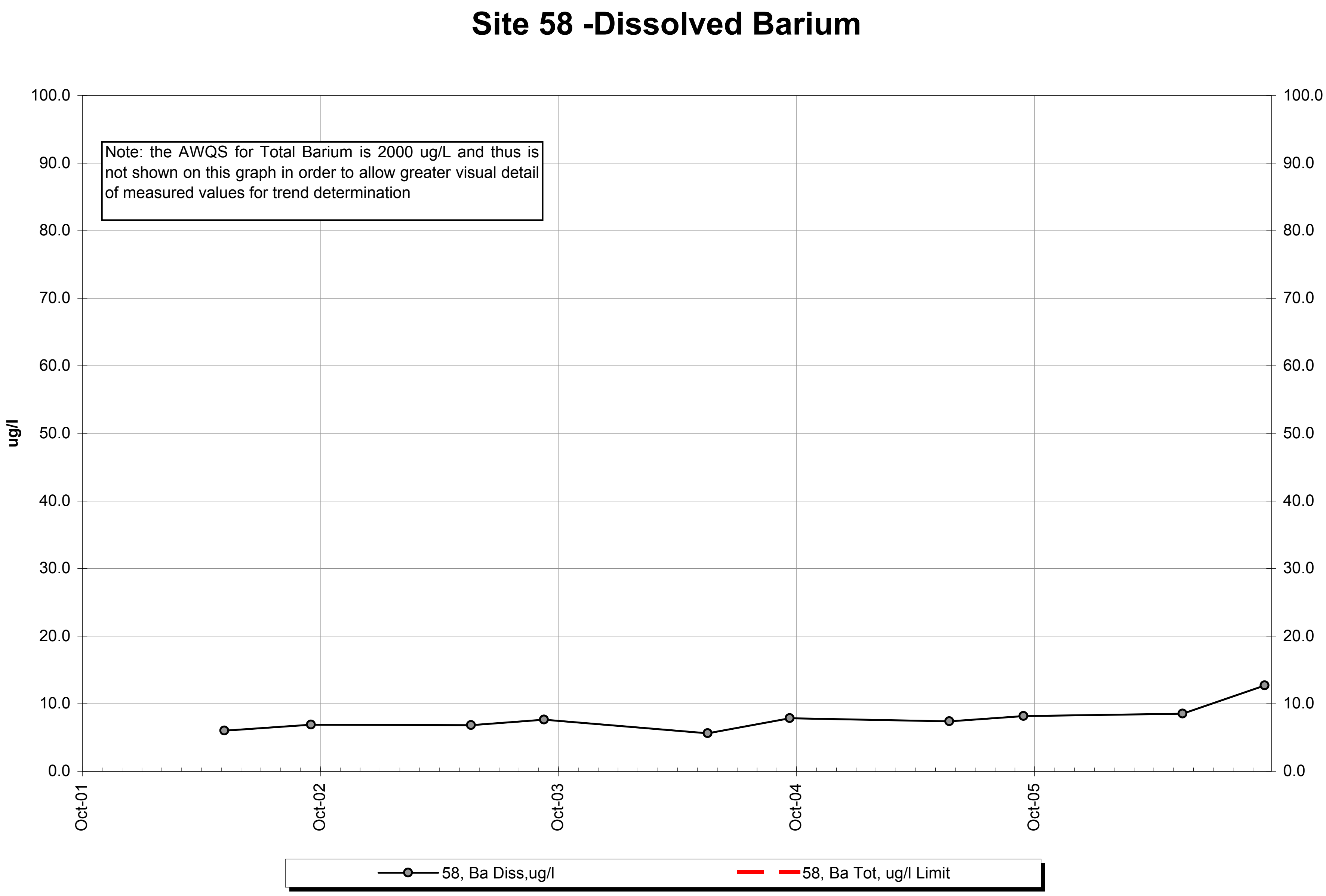
Site 58 -Hardness

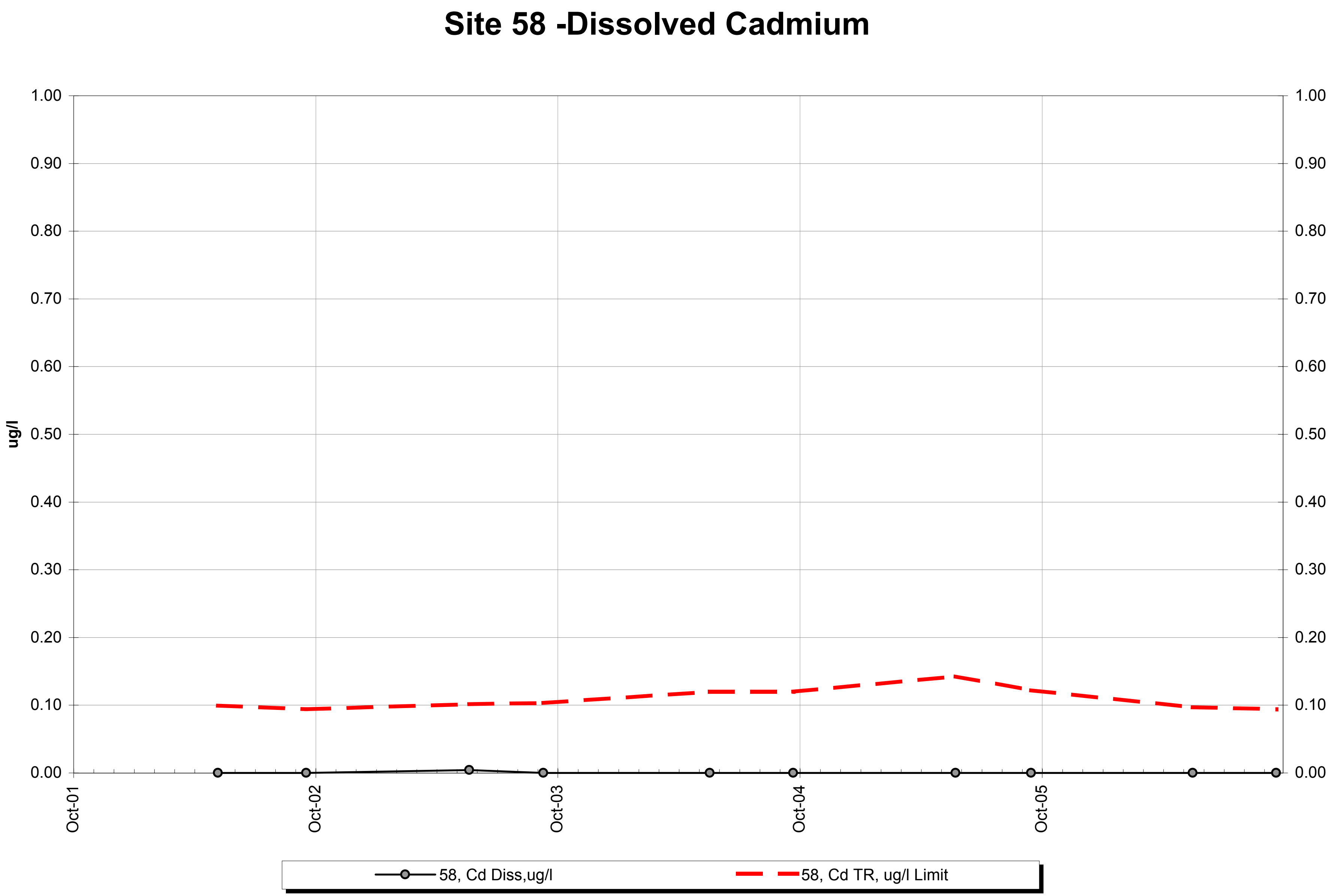


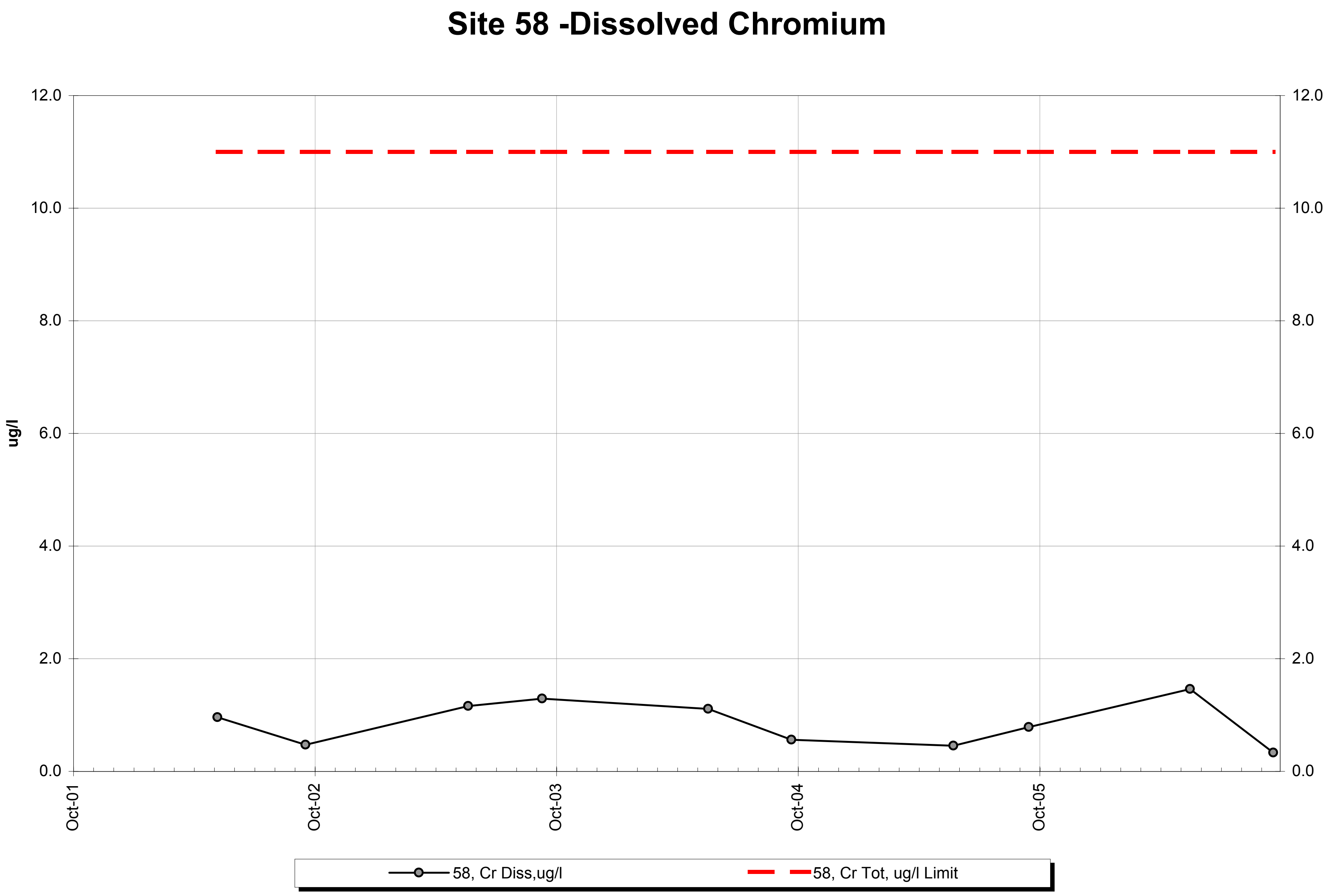
Site 58 -Total Sulfate




Site 58 -Dissolved Arsenic
ug/l
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, As Diss,ug/l
58, As Tot, ug/l Limit

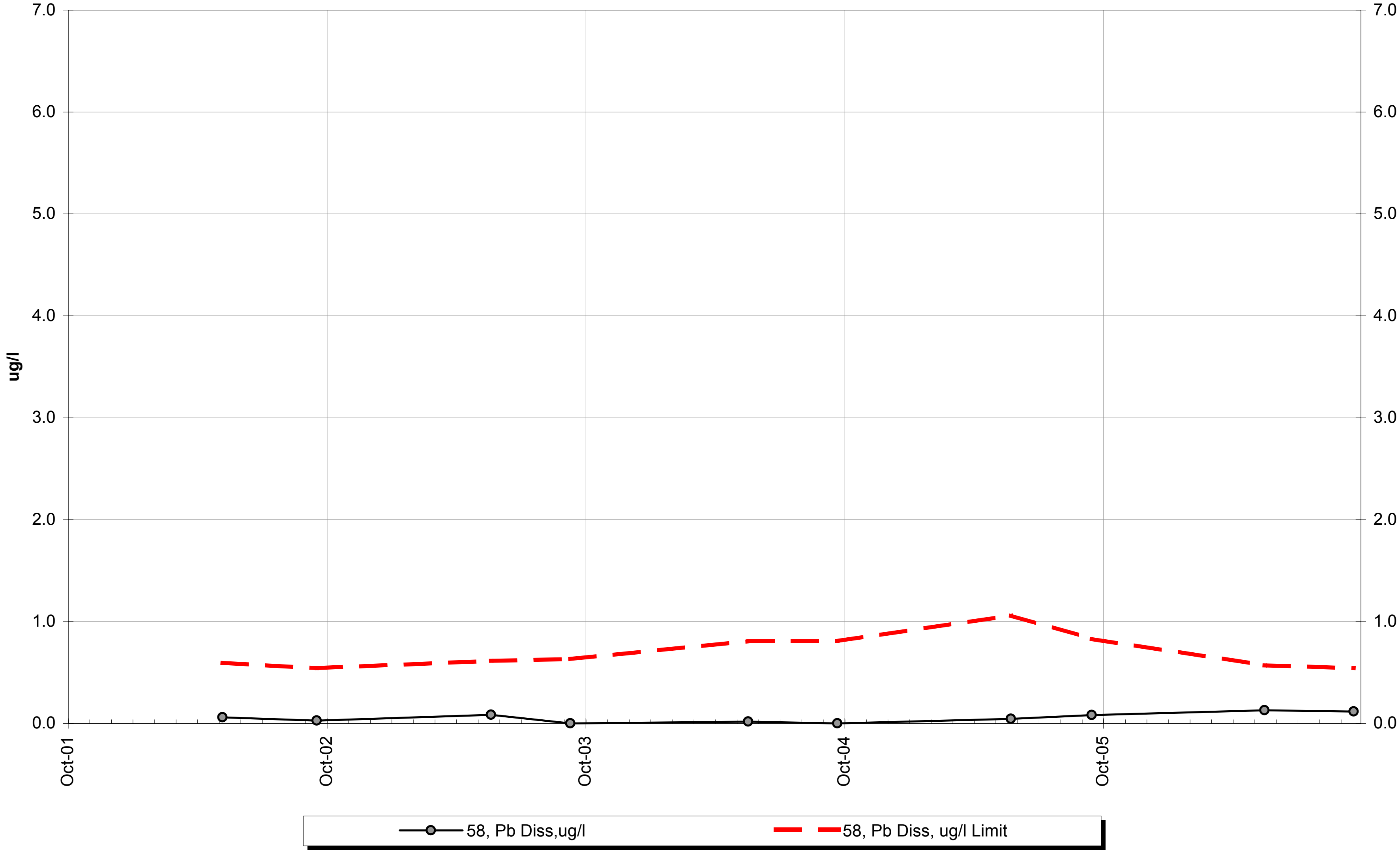

Site 58 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, Ba Diss,ug/l
58, Ba Tot, ug/l Limit


Site 58 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
58, Cd Diss,ug/l
58, Cd TR, ug/l Limit

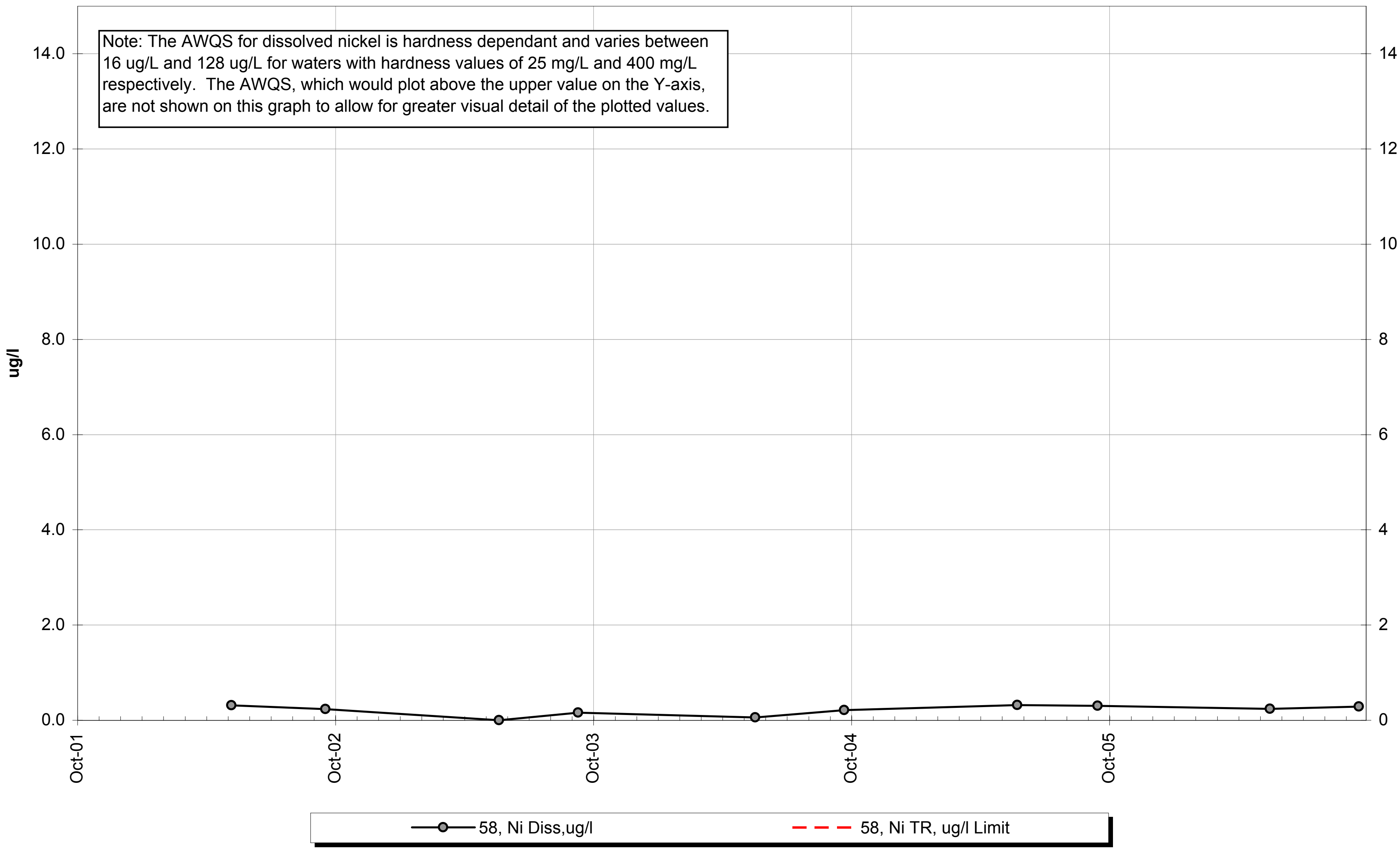

Site 58 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, Cr Diss,ug/l
58, Cr Tot, ug/l Limit

Site 58 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
58, Cu Diss,ug/l
58, Cu TR, ug/l Limit

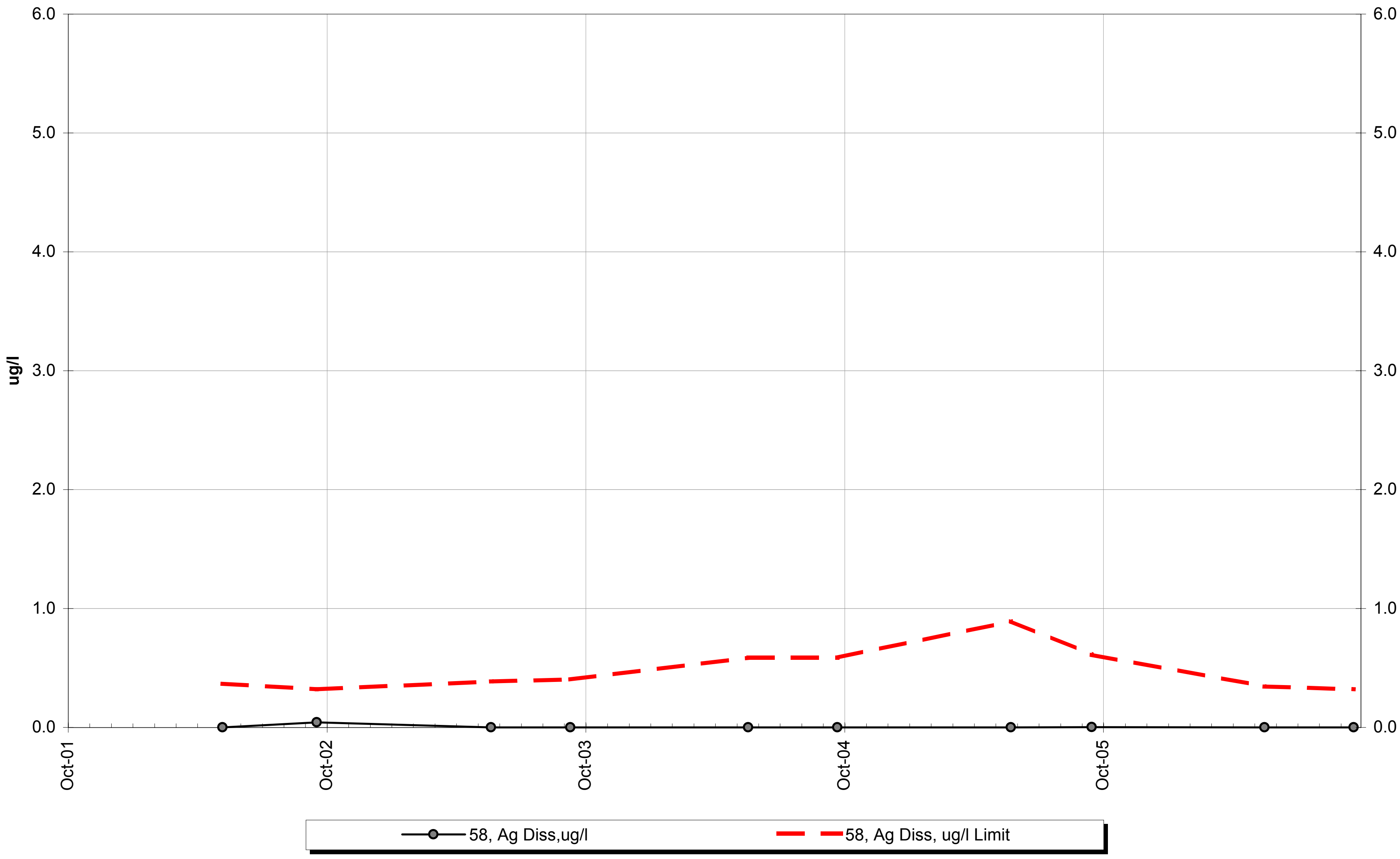
Site 58 -Dissolved Lead



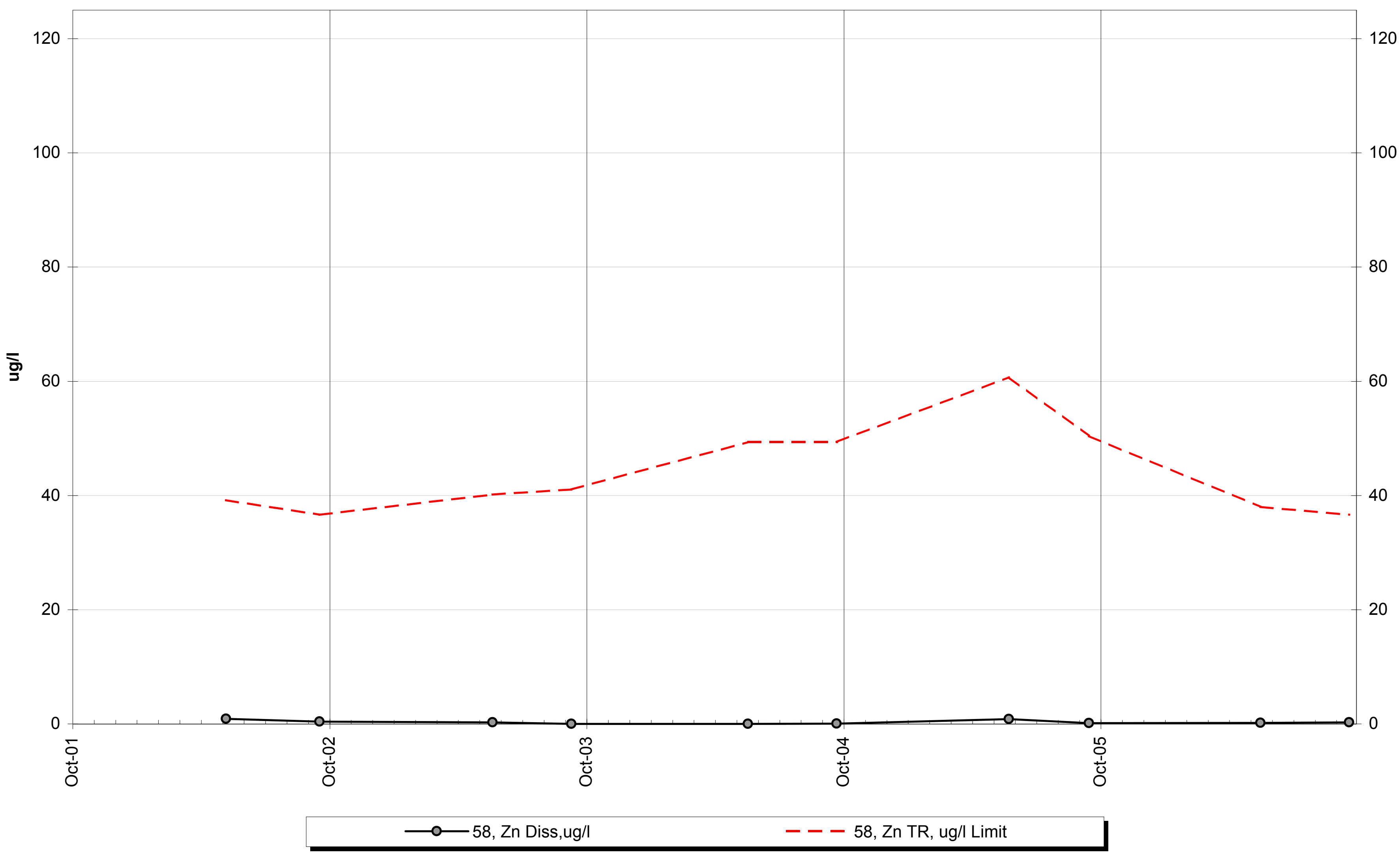
Site 58 -Dissolved Nickel

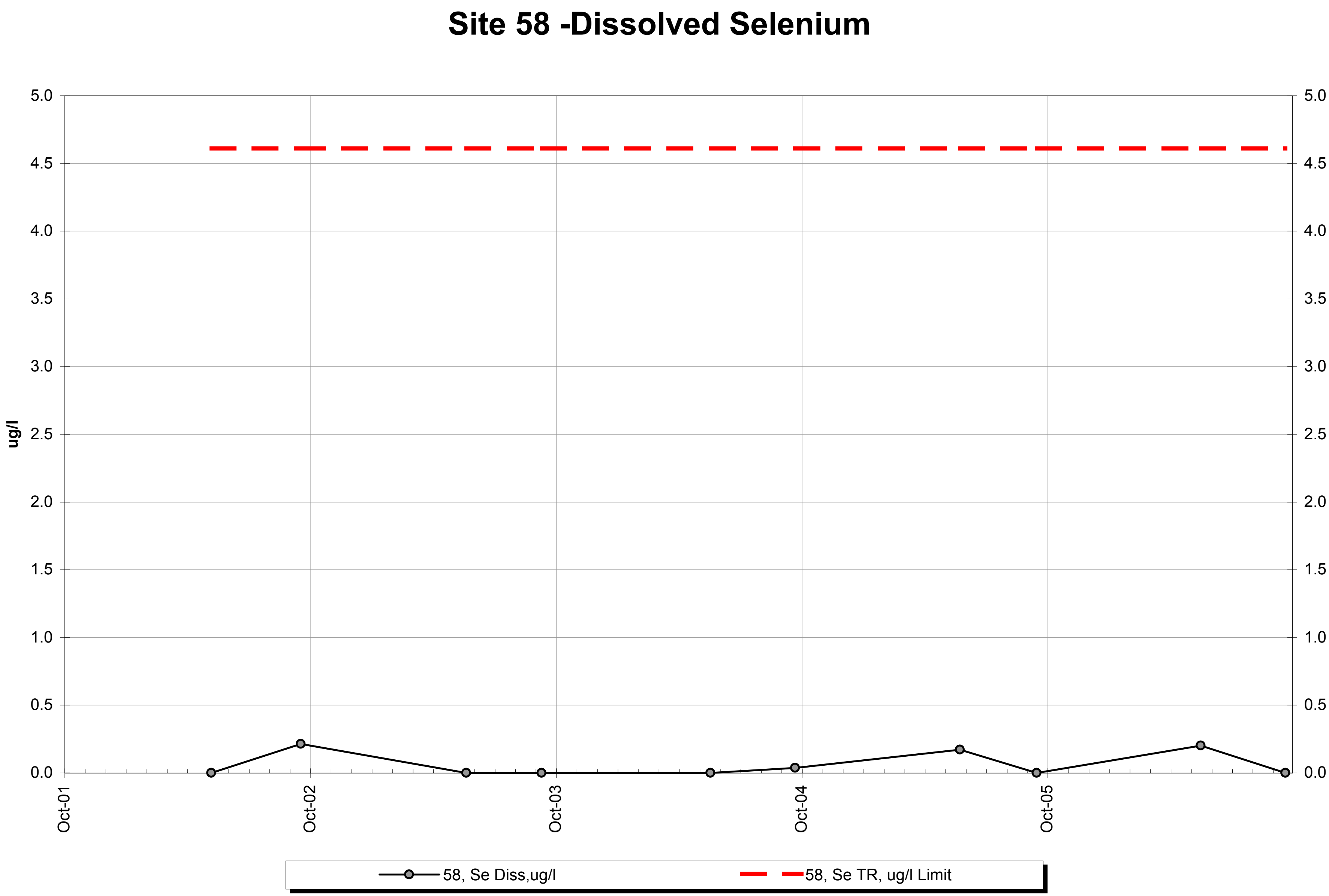


Site 58 -Dissolved Silver



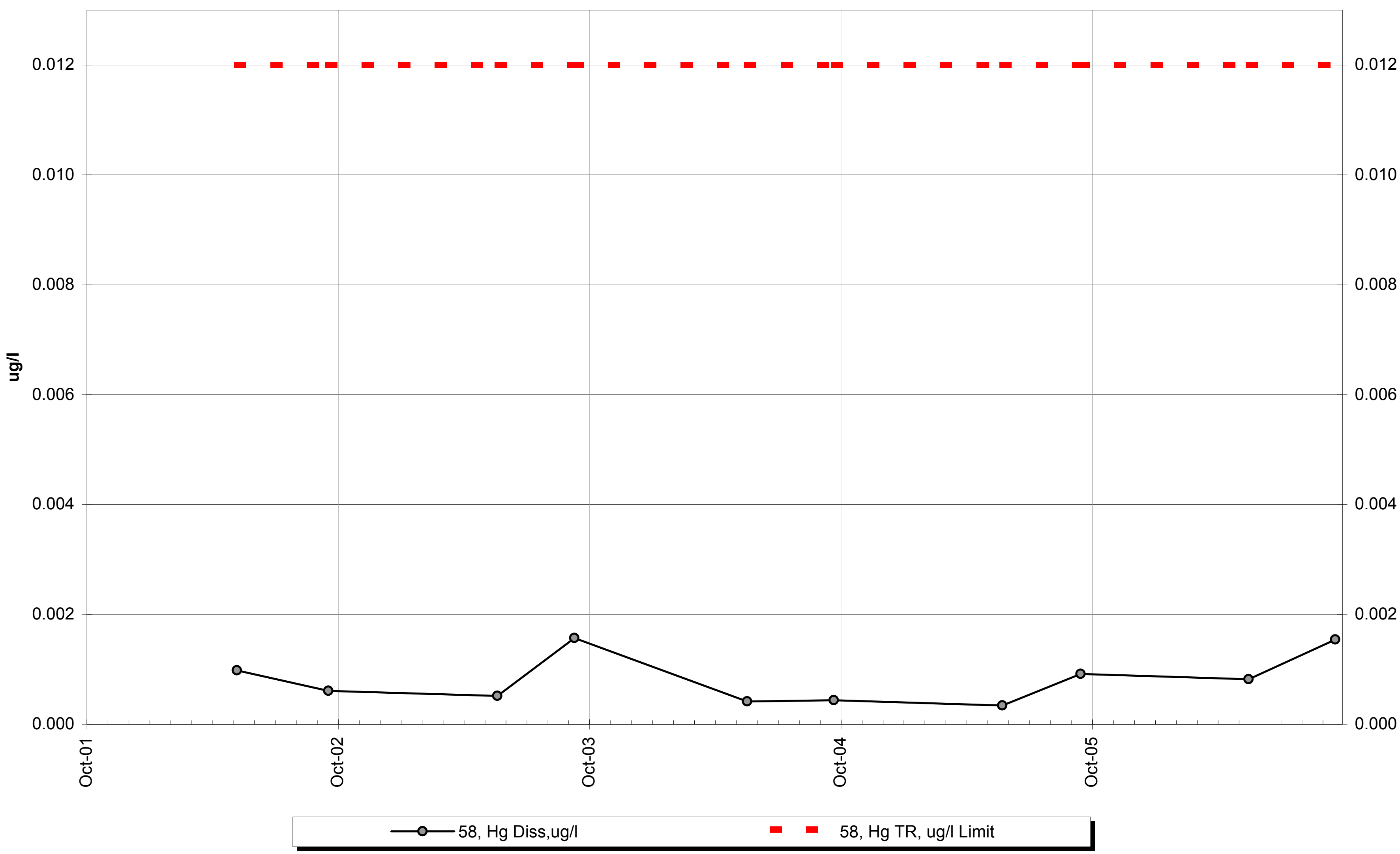
Site 58 -Dissolved Zinc





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-01
Oct-02
Oct-03
Oct-04
Oct-05
58, Se Diss,ug/l
58, Se TR, ug/l Limit

Site 58 -Dissolved Mercury



Site **#58** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

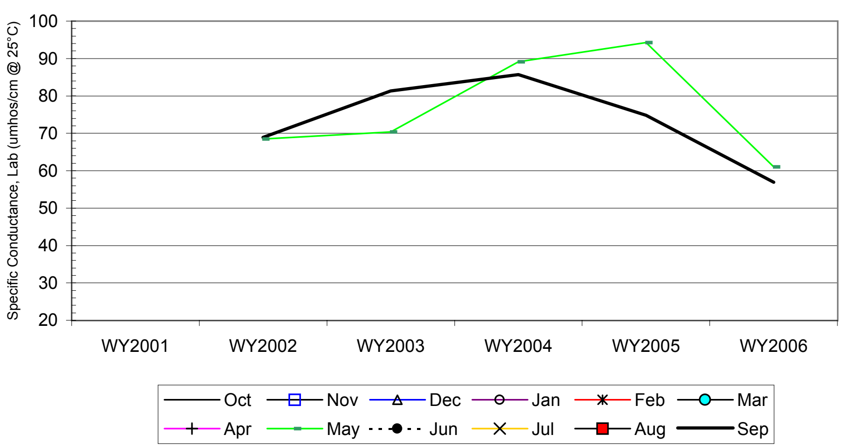
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**								68.5				68.9
c	**WY2003**								70.4				81.3
d	**WY2004**								89.1				85.7
e	**WY2005**								94.3				74.8
f	**WY2006**								61.0				56.9
	n	0	0	0	0	0	0	0	5	0	0	0	5
	t_1	0	0	0	0	0	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												
	c-a												
	d-a												
	e-a												
	f-a												
	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	2	0	0	0	-2
	σ^2_S=								16.67				16.67
	$Z_k = S_k/\sigma_S$								0.49				-0.49
	Z^2_k								0.24				0.24

ΣZ_k= 0.00
ΣZ^2_k= 0.48
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 10
ΣS_k 0

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=	0.48	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
p	**0.488**			$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) Z_{calc}	0.00	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
33.33 p	**0.500**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-14.30		9.82
0.050	-10.20	**0.01**	7.59
0.100	-6.67		4.96
0.200	-3.18		3.01

Site **#58** 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	**WY2001**												
b	**WY2002**								5.7				6.3
c	**WY2003**								6.3				6.1
d	**WY2004**								6.4				6.2
e	**WY2005**								6.3				6.1
f	**WY2006**								5.7				6.2
	n	0	0	0	0	0	0	0	5	0	0	0	5

	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												
c-a												
d-a												
e-a												
f-a												
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	-2	0	0	0	-2

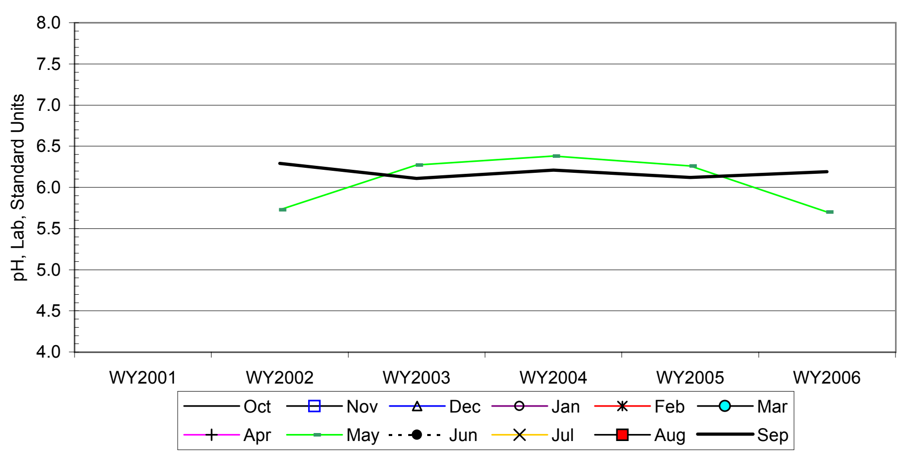
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								16.67				16.67
$Z_k = S_k/\sigma_S$								-0.49				-0.49
Z^2_k								0.24				0.24

ΣZ_k= -0.98
ΣZ^2_k= 0.48
Z-bar=$\Sigma Z_k/K$= -0.49

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

Σn 10
ΣS_k -4

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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) 33.33	Z_{calc} -0.52	@α/2=2.5% Z= 1.96	**H_0** (No trend) ACCEPT
	p **0.302**		**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.19		0.11
0.050	-0.11	**-0.01**	0.06
0.100	-0.08		0.02
0.200	-0.05		0.00

Site **#58** Seasonal Kendall analysis for Total Alk, (mg/l)

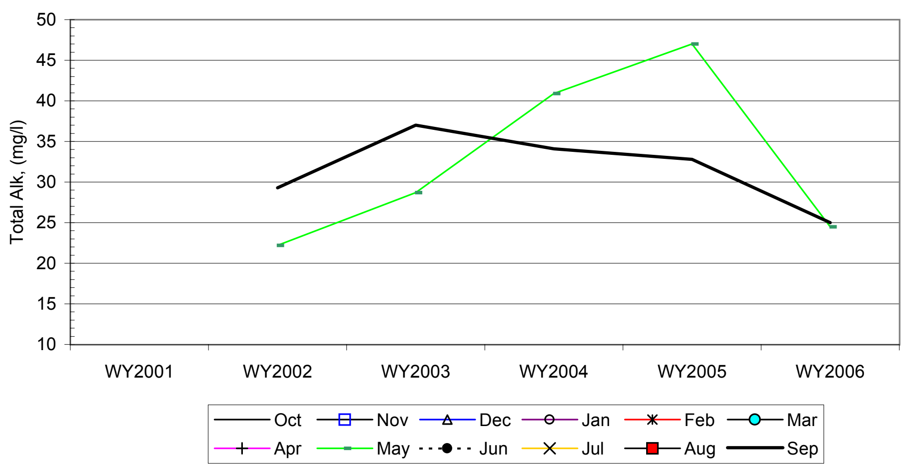
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**								22.2				29.3
c	**WY2003**								28.7				37.0
d	**WY2004**								40.9				34.1
e	**WY2005**								47.0				32.8
f	**WY2006**								24.5				25.0
	n	0	0	0	0	0	0	0	5	0	0	0	5
	t_1	0	0	0	0	0	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												
	c-a												
	d-a												
	e-a												
	f-a												
	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	4	0	0	0	-4
	σ^2_S=								16.67				16.67
	$Z_k = S_k/\sigma_S$								0.98				-0.98
	Z^2_k								0.96				0.96

ΣZ_k= 0.00
ΣZ^2_k= 1.92
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 10
ΣS_k 0

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		1.92	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.166**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	0.00	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
33.33	**p**	**0.500**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-6.88		8.11
0.050	-3.72	**-0.25**	6.40
0.100	-2.66		4.99
0.200	-1.70		1.70

Site **#58** 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	**WY2001**												
b	**WY2002**								0.9				0.4
c	**WY2003**								0.3				-0.1
d	**WY2004**								-0.1				0.1
e	**WY2005**								0.9				0.1
f	**WY2006**								0.2				0.3
	n	0	0	0	0	0	0	0	5	0	0	0	5

	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												
c-a												
d-a												
e-a												
f-a												
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	-4	0	0	0	2

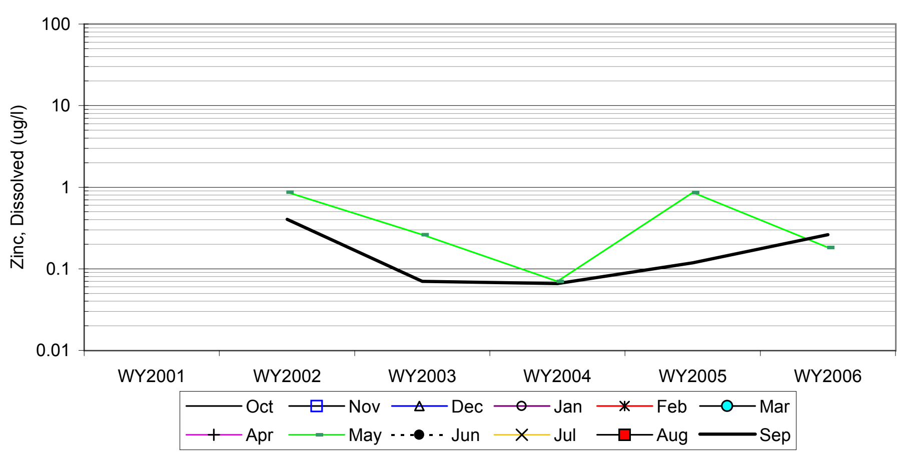
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								16.67				16.67
$Z_k = S_k/\sigma_S$								-0.98				0.49
Z^2_k								0.96				0.24

ΣZ_k= -0.49
ΣZ^2_k= 1.20
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 10
ΣS_k -2

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	1.08	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.299**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k) 33.33	Z_{calc} -0.17	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.431**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.53		0.16
0.050	-0.34	**-0.02**	0.13
0.100	-0.17		0.12
0.200	-0.13		0.07

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 2006" report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 have been compared to the strictest fresh water quality criterion for each applicable analyte. Five results exceeding these criteria have been identified, as listed in the table below. Four of these datum are for pH values, both lab and field, which are below the lower limit of 6.5 su listed in the AWQS. 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 (i.e. Sites 58, 29, and 32). The final exceedance is for a dissolved lead value of 0.988 µg/l which is slightly above the hardness dependant AWQS of 0.560 µg/l. All of the downgradient shallow wells (i.e. 27, 29, and 32) have a record of elevated dissolved lead values since the lead MDL was lowered below 10 ug/l in 1998. A complete discussion of possible causes and follow-up actions are covered in detail in the Site 32 interpretative report.

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
05/17/06	pH Lab, su	5.27		6.5 - 8.5	Aquatic Life
05/17/06	pH Field, su	5.91		6.5 - 8.5	Aquatic Life
09/20/06	pH Lab, su	5.39		6.5 - 8.5	Aquatic Life
09/20/06	pH Field, su	5.63		6.5 - 8.5	Aquatic Life
09/20/06	Lead, Dissolved ug/L	0.998	25.6	0.560	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 were apparent. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between May-01 and Sep-06 (WY2001-WY2006). No statistically significant ($\alpha/2=2.5\%$) trends are identified.

Site 27-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.25	-		
pH, Lab	6	0.09	-		
Alkalinity, Total	6	0.12	-		
Zinc, Dissolved	6	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 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 and dissolved zinc is slightly higher at Site 27 than at Site 58. However, the ranges were overlapped in WY2005. 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 a 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 2006

Site 27 "MW-2S"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							5.5	NOT SCHEDULED FOR SAMPLING			9.4	7.5
Conductivity-Field(µmho)								77				62	69
Conductivity-Lab (µmho)								65				73	69
pH Lab (standard units)								5.27				5.39	5.33
pH Field (standard units)								5.91				5.63	5.77
Total Alkalinity (mg/L)								25.2				25.8	25.5
Total Sulfate (mg/L)								1.8				2.2	2.0
Hardness (mg/L)								19.3				25.6	22.5
Dissolved As (ug/L)								2.540				7.420	4.980
Dissolved Ba (ug/L)								12.7				19.9	16.3
Dissolved Cd (ug/L)								<0.003				0.032	0.017
Dissolved Cr (ug/L)								7.380				0.335	3.858
Dissolved Cu (ug/L)								0.143 U				0.409	0.276
Dissolved Pb (ug/L)								0.0739 U				0.9980	0.5360
Dissolved Ni (ug/L)								1.420				2.510	1.965
Dissolved Ag (ug/L)								0.044				<0.003	0.023
Dissolved Zn (ug/L)								0.42 U				4.14	2.28
Dissolved Se (ug/L)								<0.116				0.219 J	0.139
Dissolved Hg (ug/L)								0.000960 UJ				0.001070 U	0.001015

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

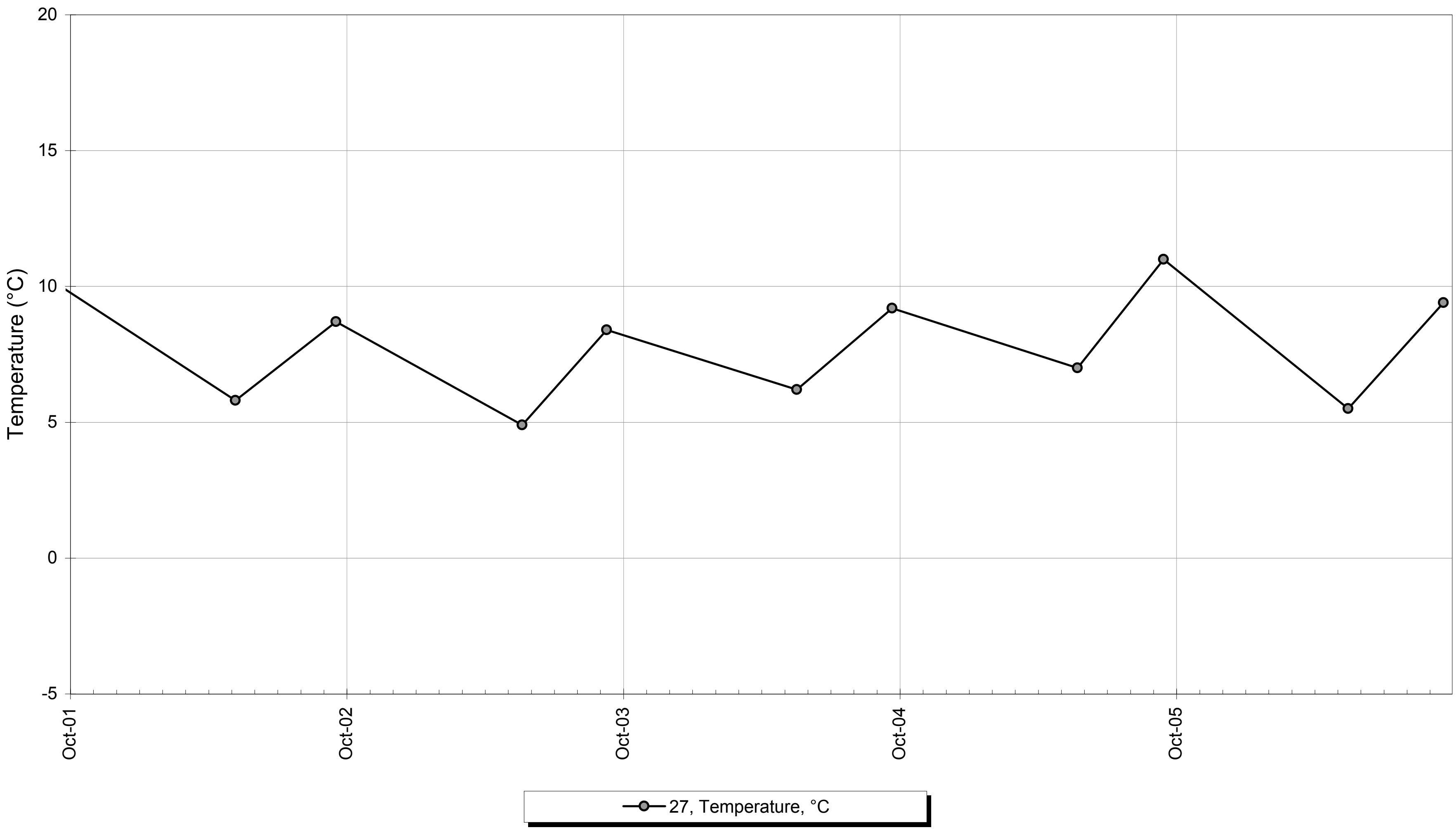
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

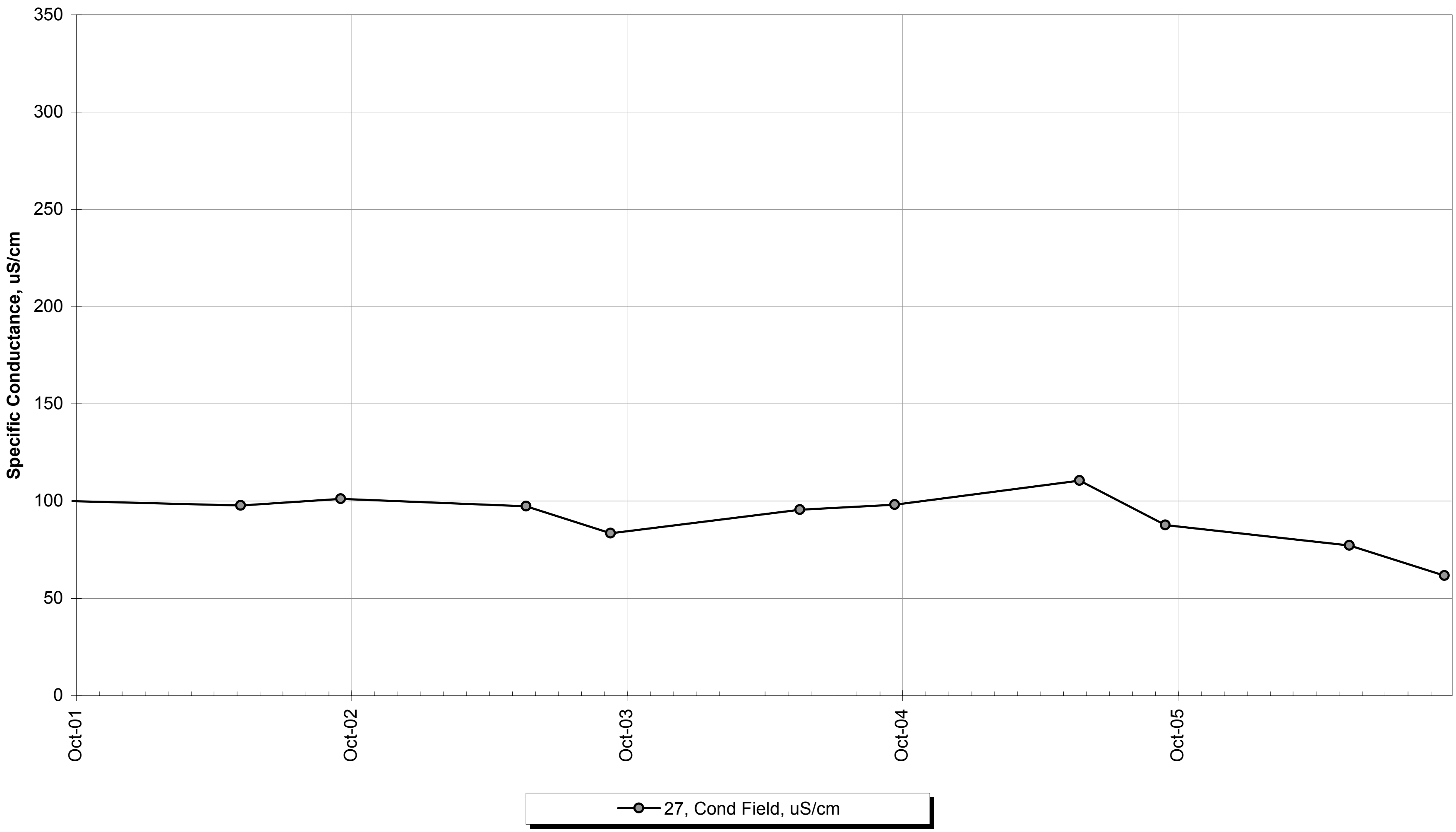
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
27	05/17/2006	10:57:00 AM				
			Cu Diss, ug/l	0.143	U	Field Blank Contamination
			Pb Diss, ug/l	0.0739	U	Field Blank Contamination
			Zn Diss, ug/l	0.423	U	Field Blank Contamination
			Hg Diss, ug/l	0.00096	UJ	Field Blank Contamination, Co
27	09/20/2006	12:10:00 PM				
			Se Diss, ug/l	0.219	J	Below Quantitative Range
			Hg Diss, ug/l	0.00107	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

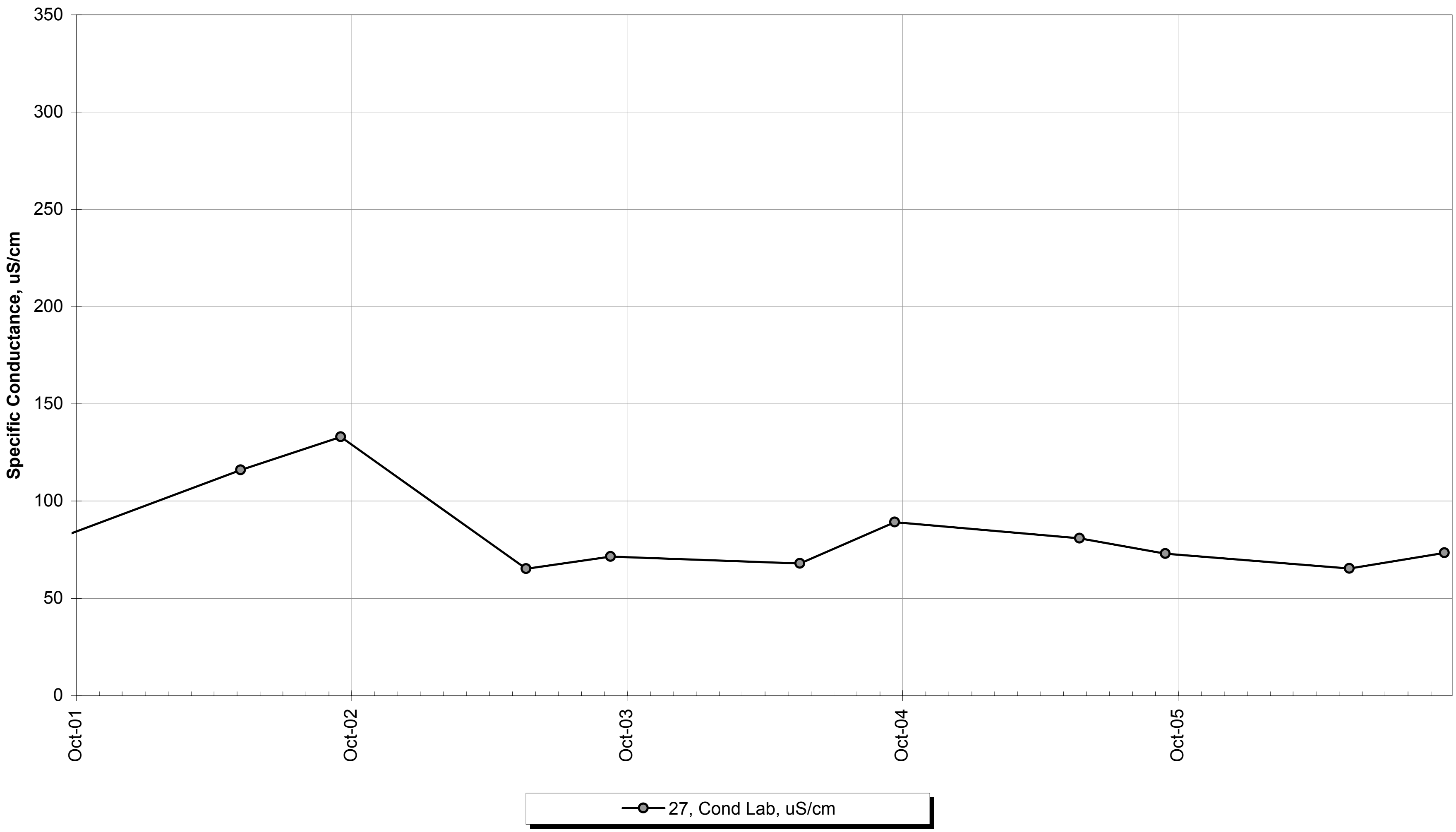
Site 27 -Water Temperature



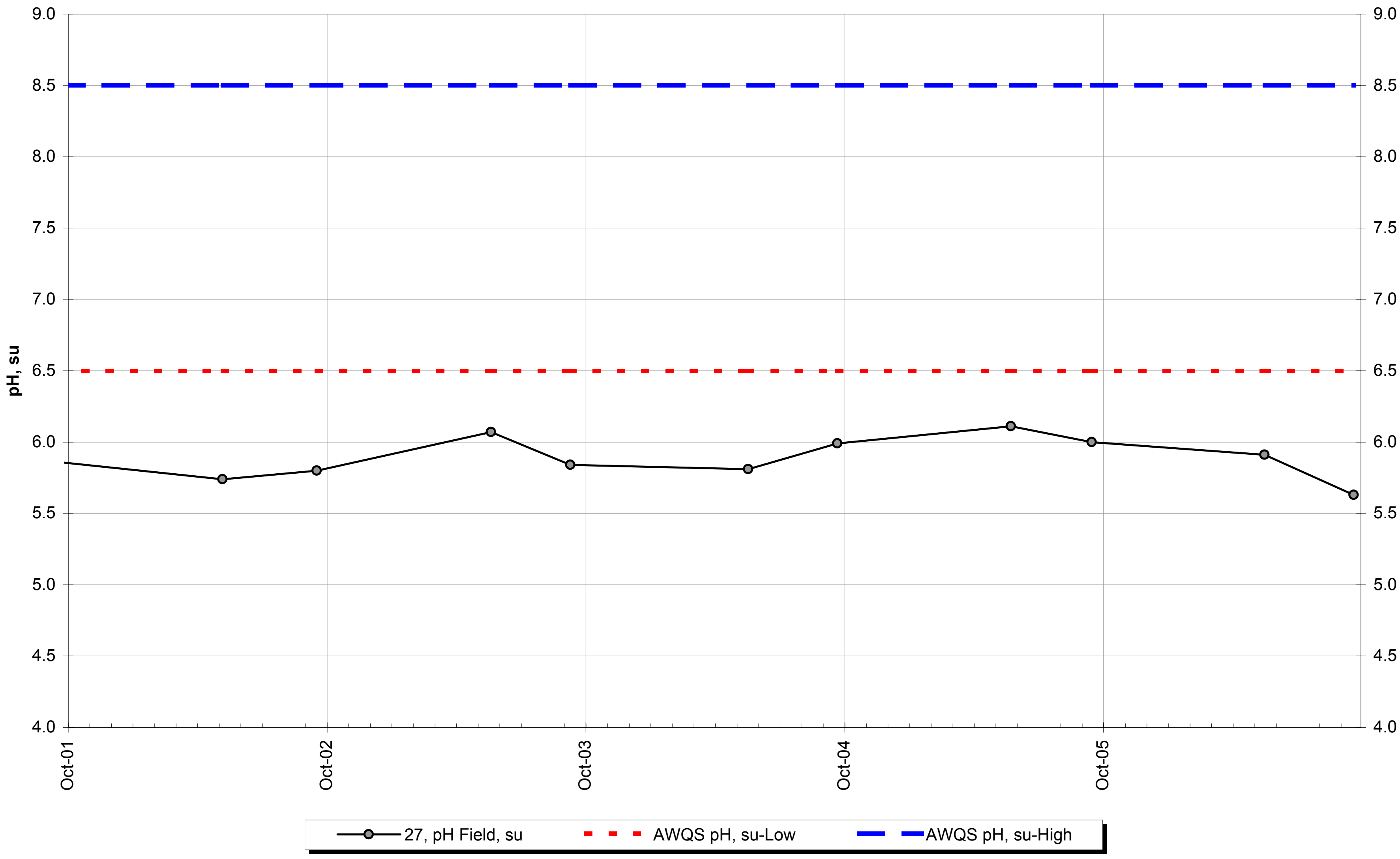
Site 27 -Conductivity-Field

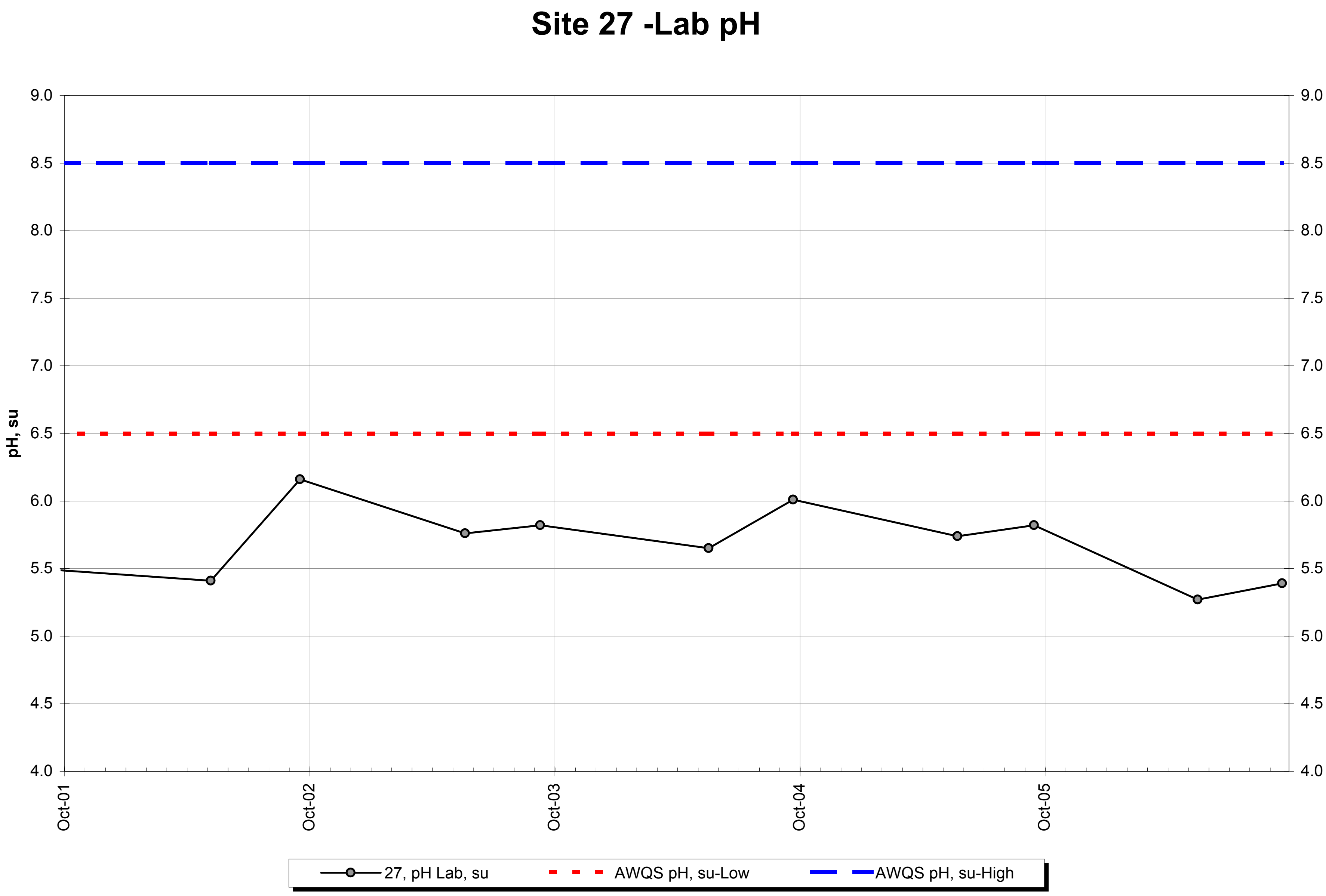


Site 27 -Conductivity-Lab



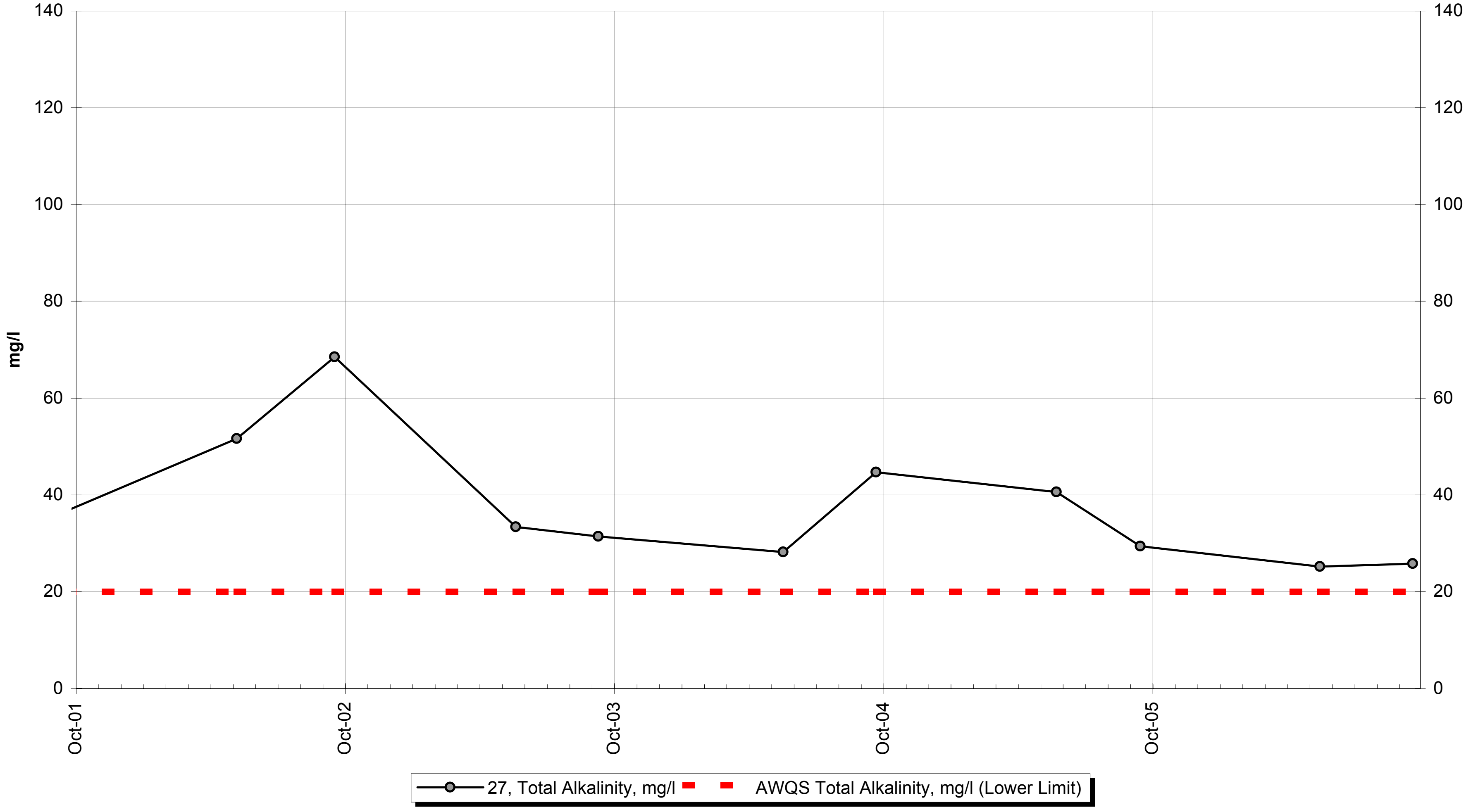
Site 27 -Field pH



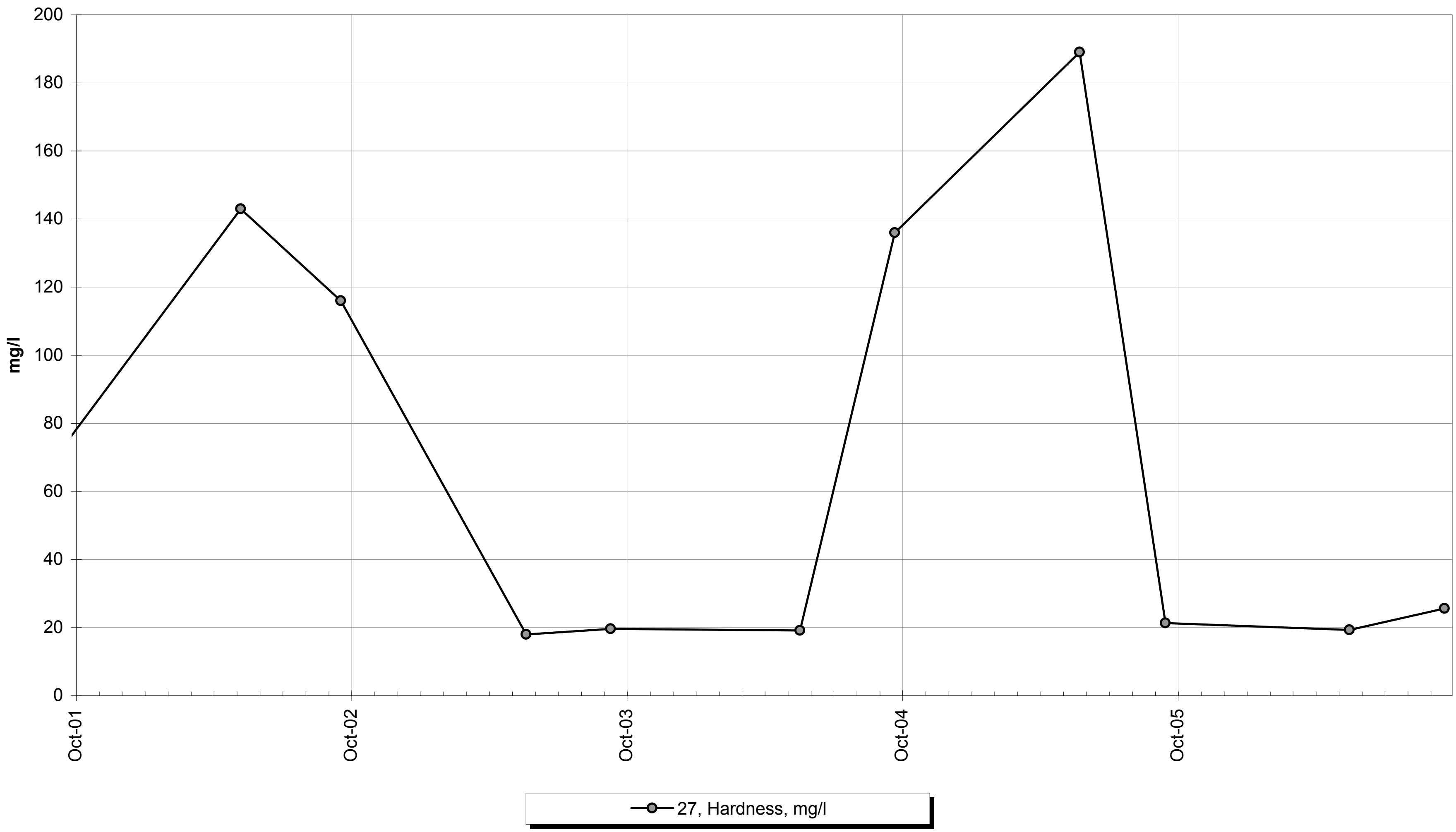


Site 27 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

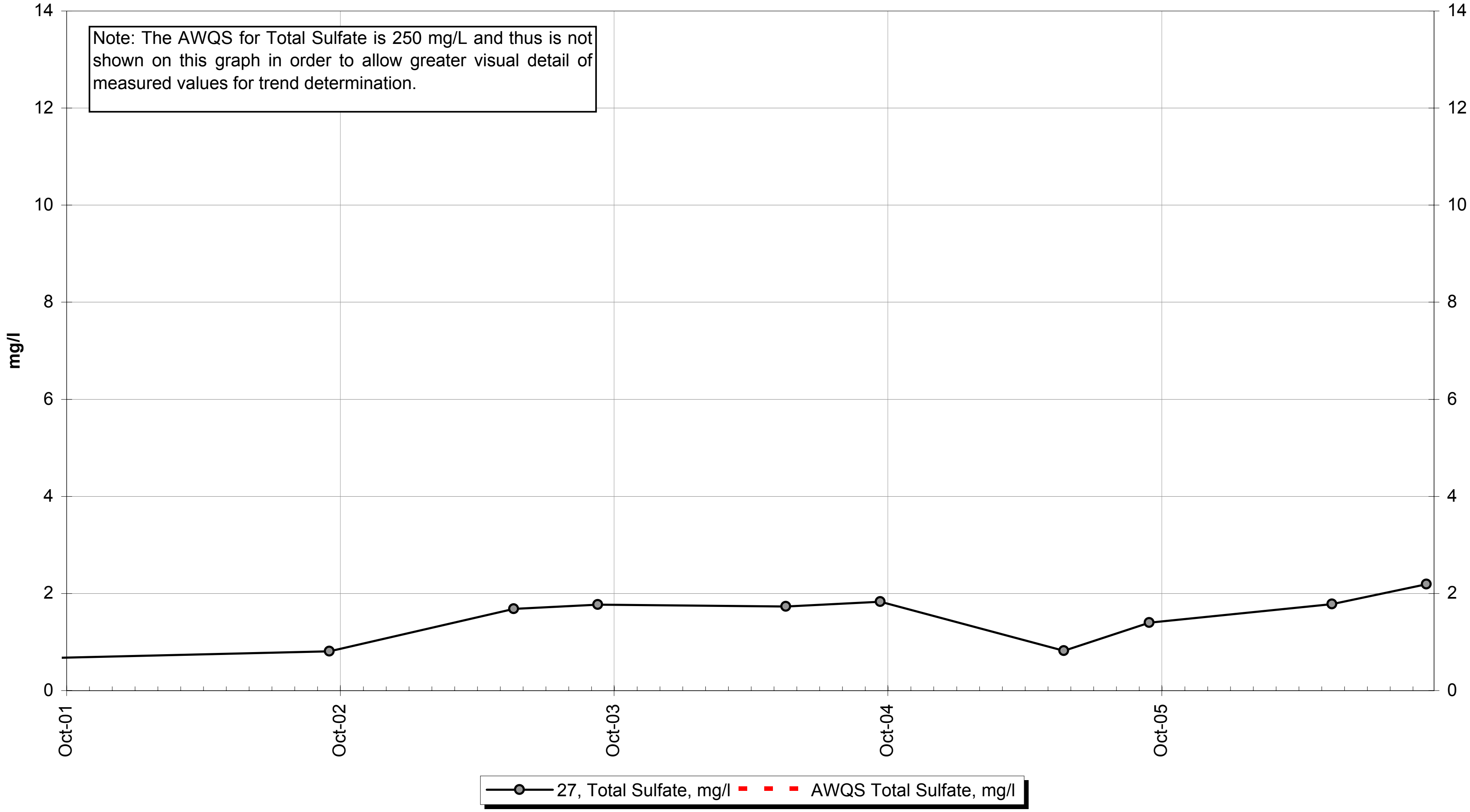
Site 27 -Total Alkalinity



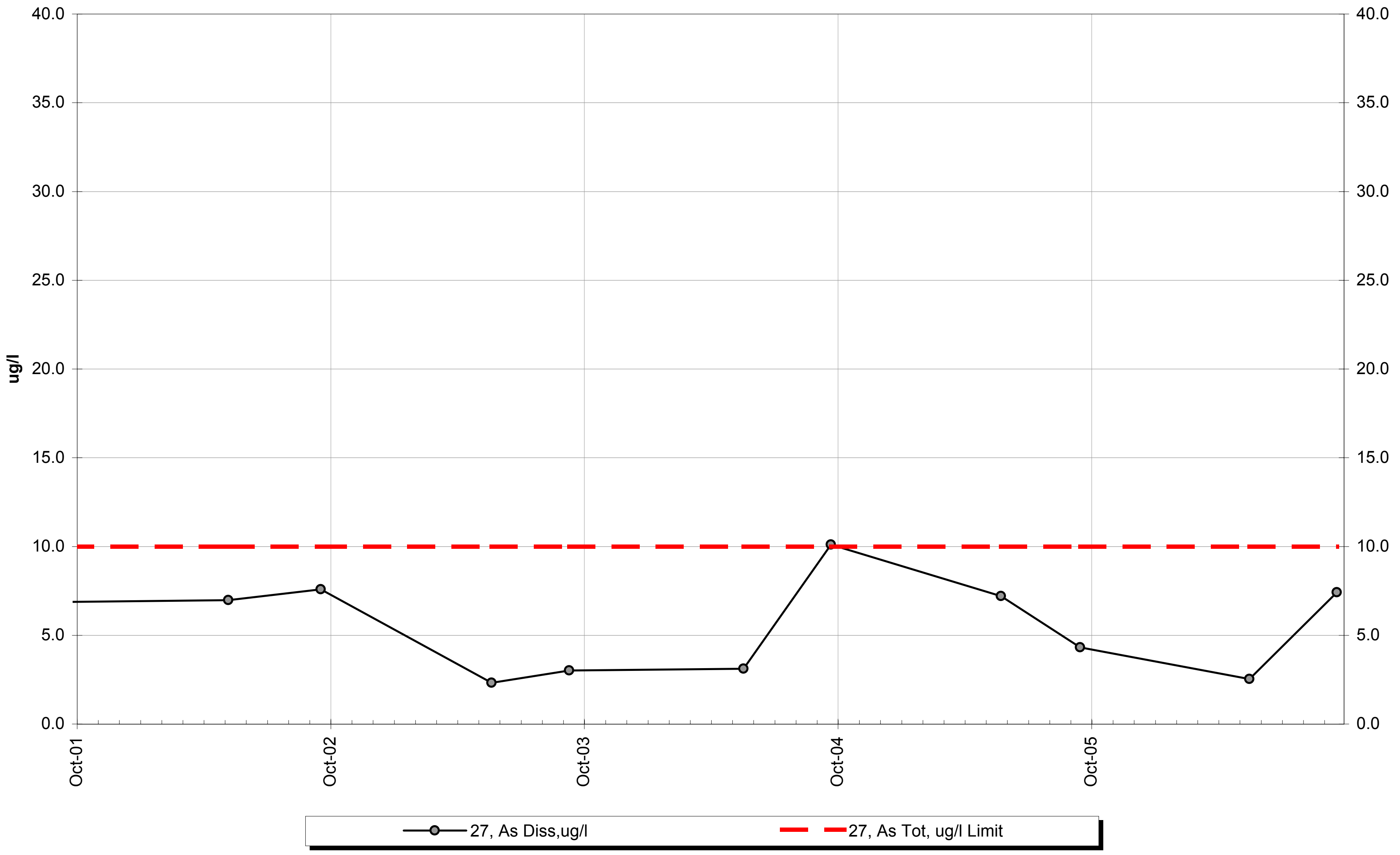
Site 27 -Hardness

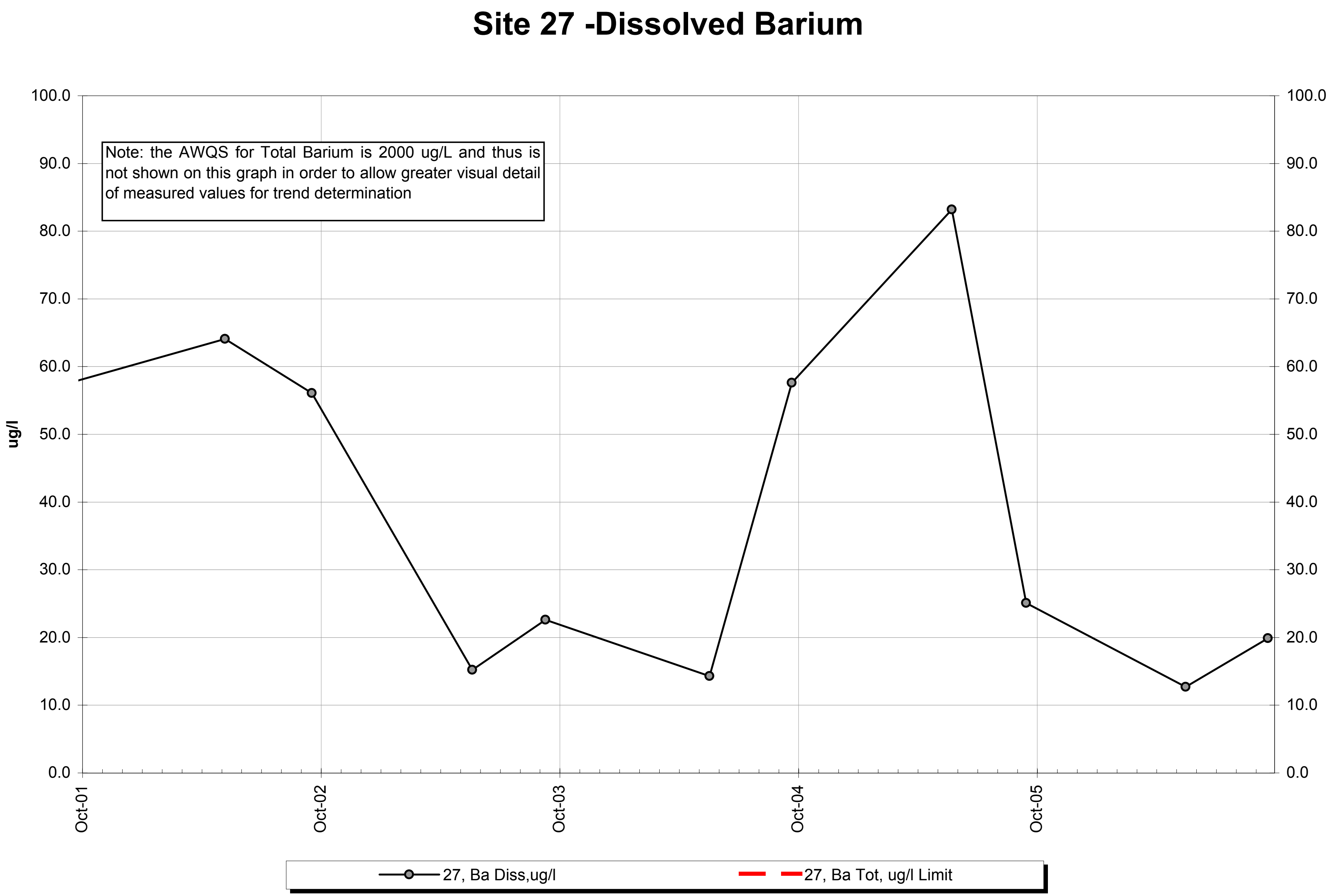


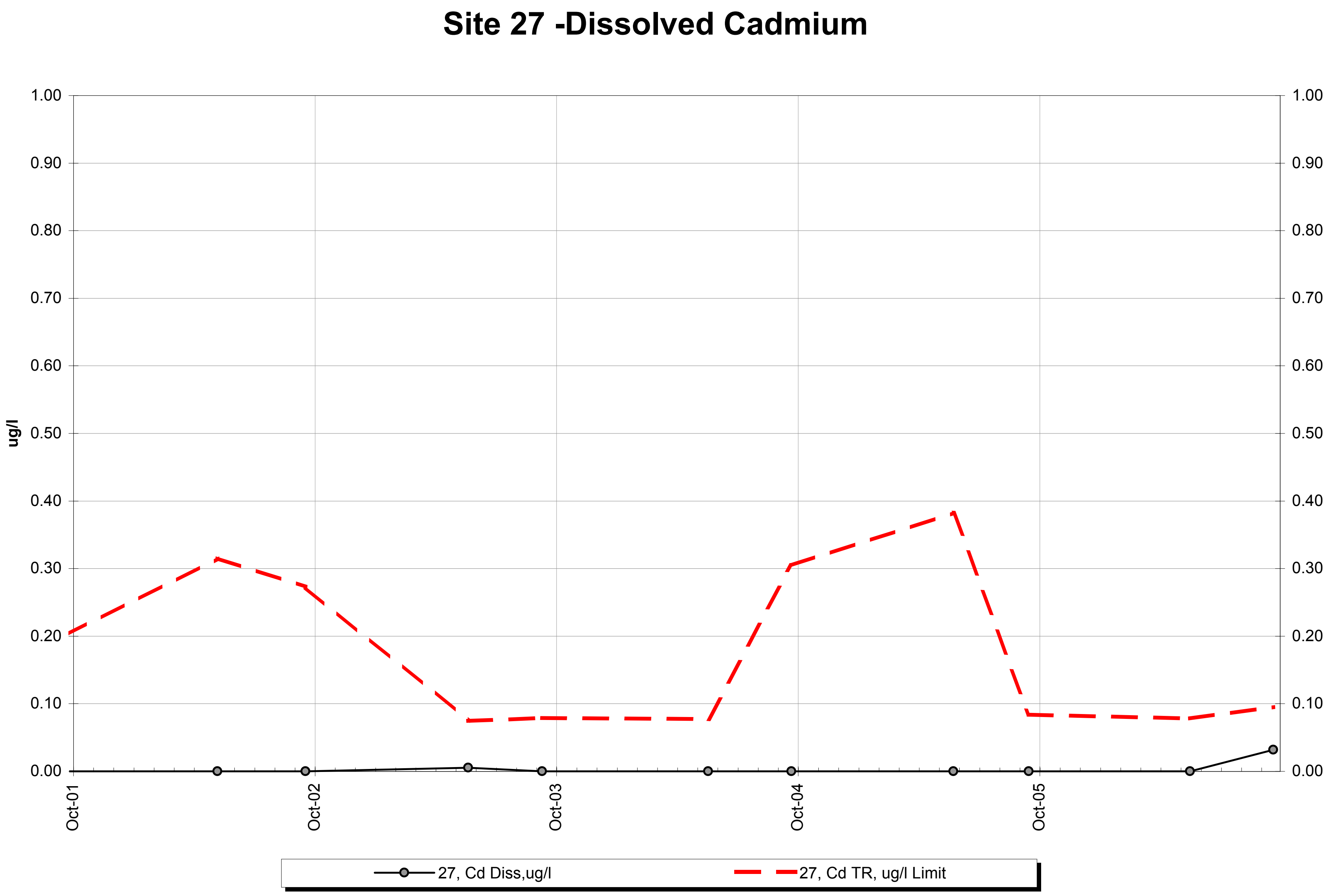
Site 27 -Total Sulfate



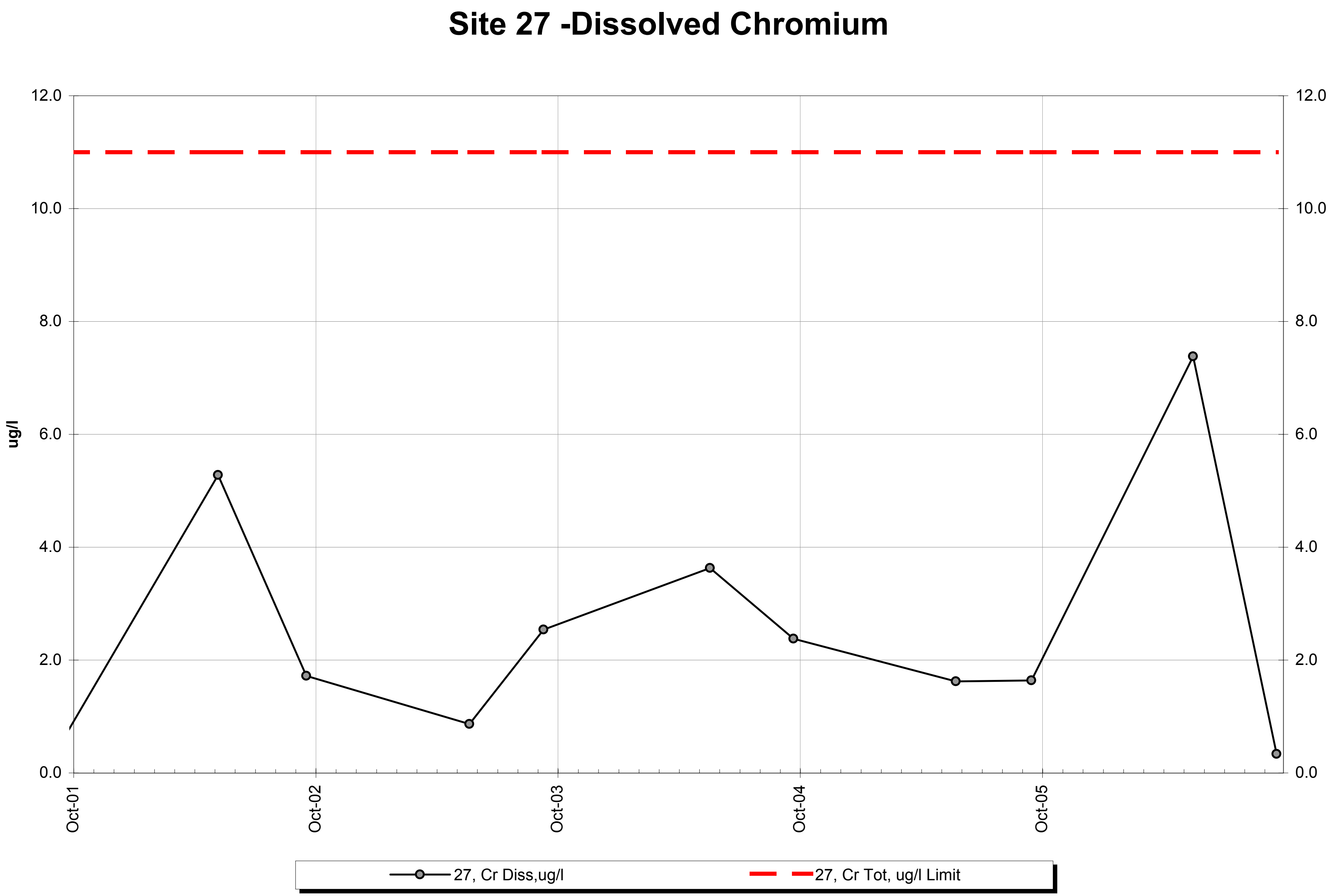
Site 27 -Dissolved Arsenic



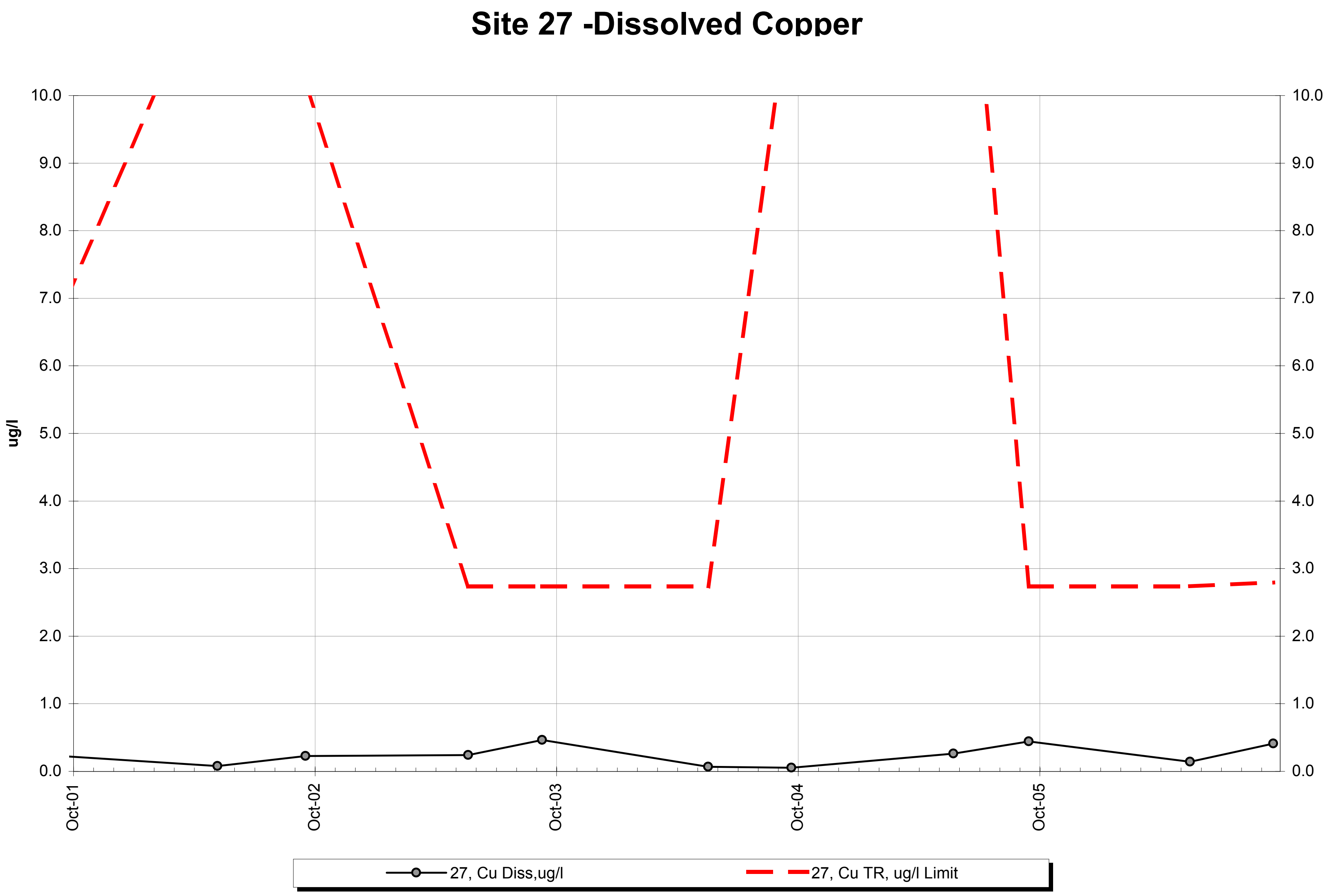

Site 27 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Ba Diss,ug/l
27, Ba Tot, ug/l Limit



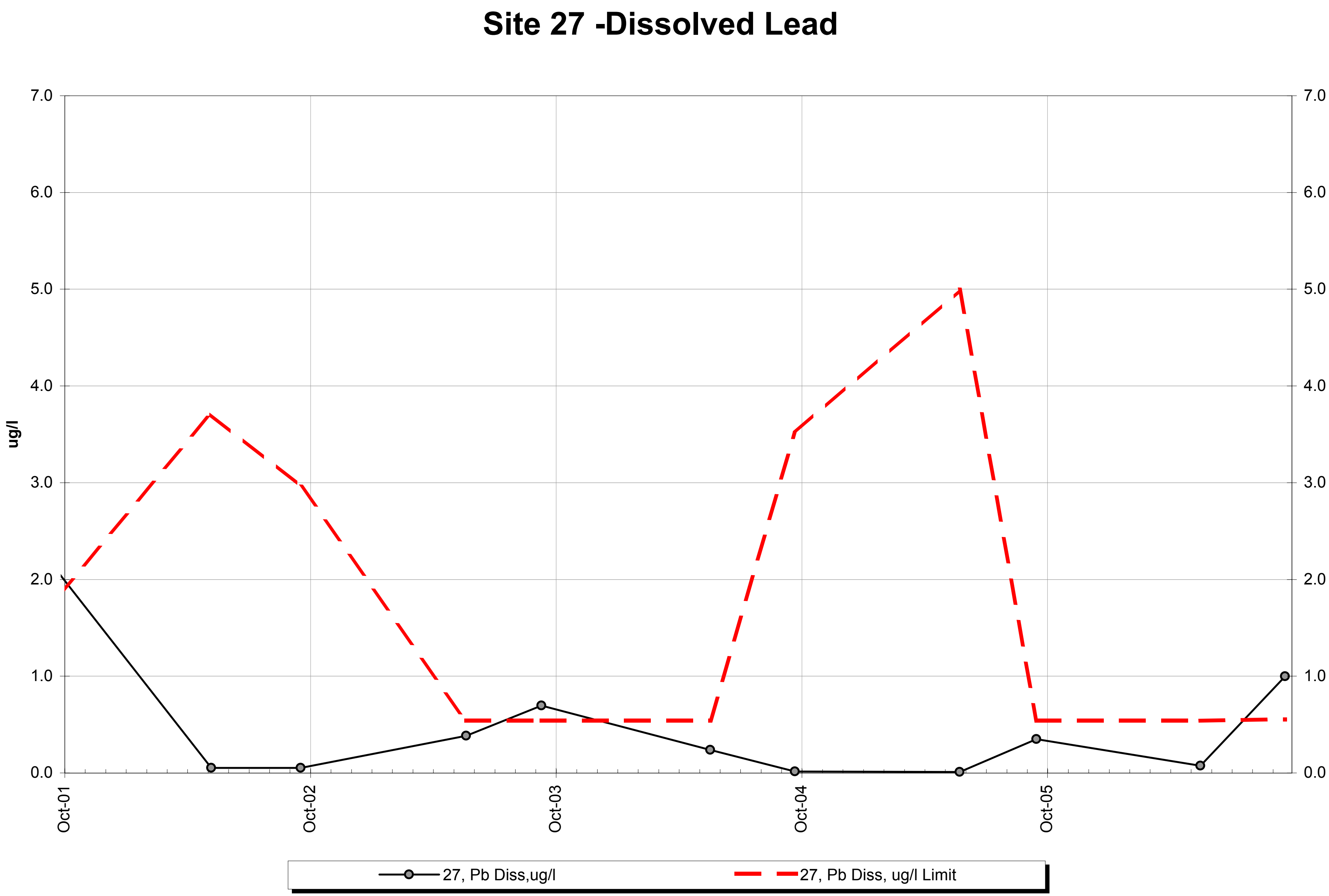
Site 27 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Cd Diss,ug/l
27, Cd TR, ug/l Limit

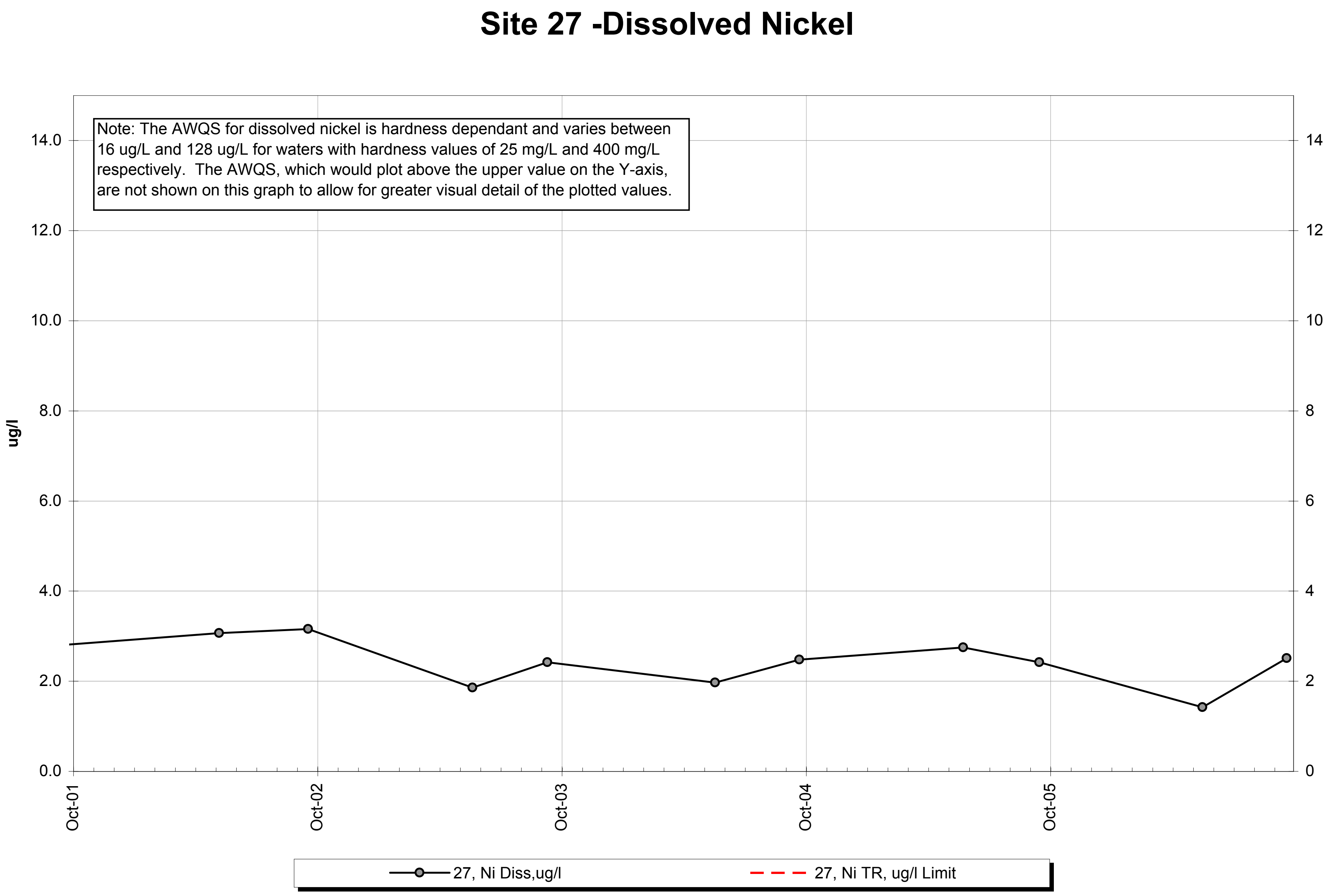


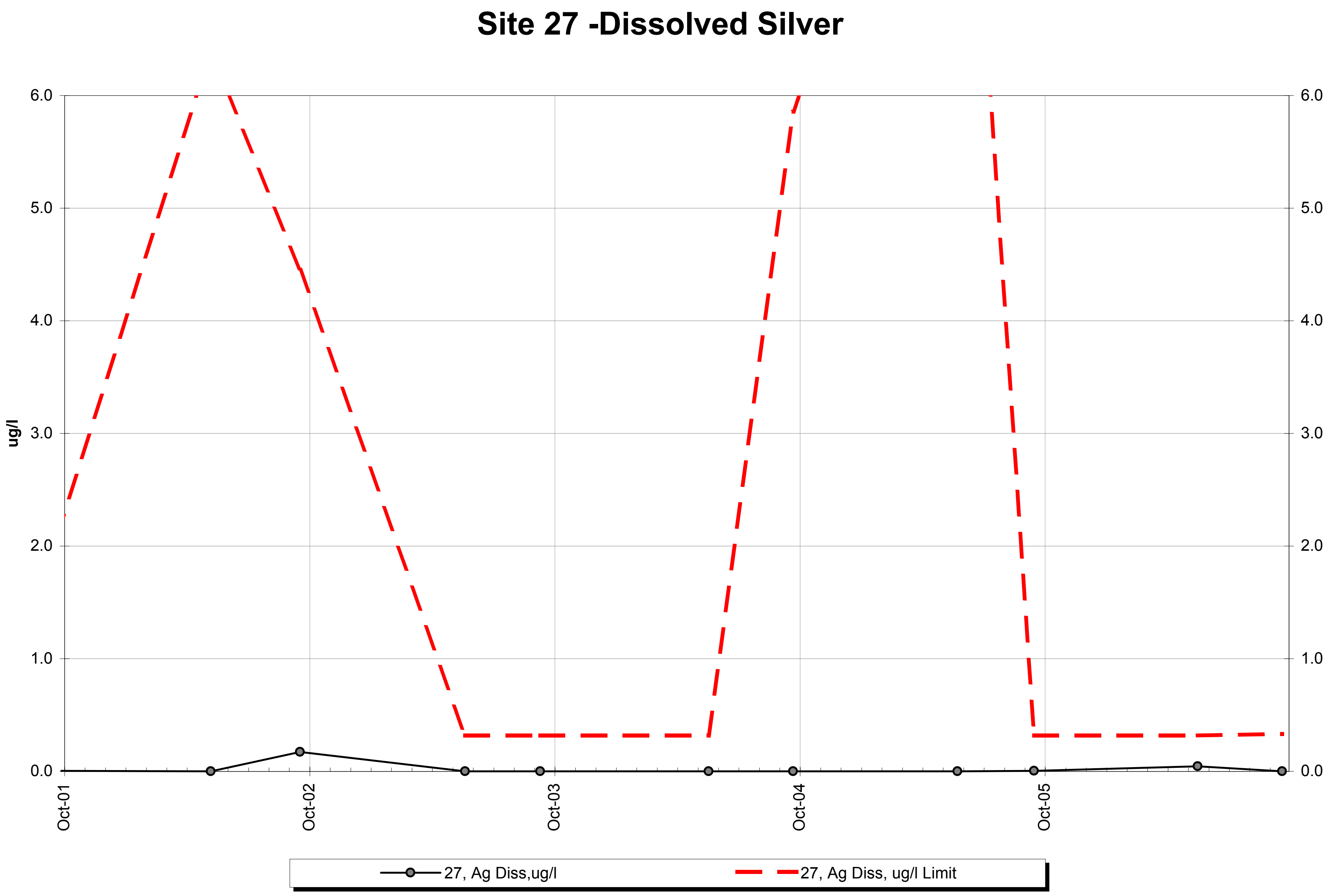
Site 27 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Cr Diss,ug/l
27, Cr Tot, ug/l Limit



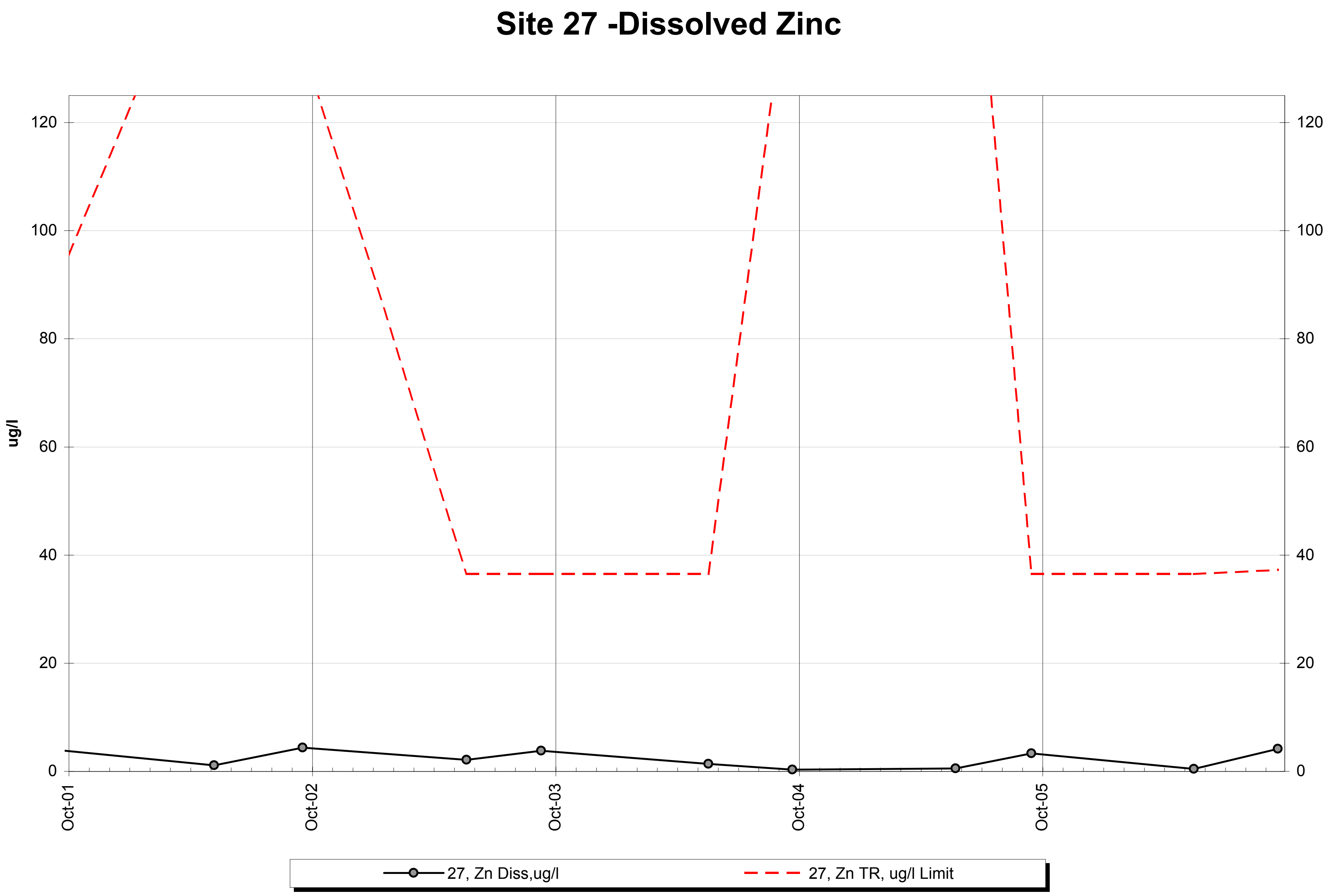
Site 27 -Dissolved Copper
ug/l
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Cu Diss,ug/l
27, Cu TR, ug/l Limit


Site 27 -Dissolved Lead
ug/l
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Pb Diss,ug/l
27, Pb Diss, ug/l Limit


Site 27 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Ni Diss,ug/l
27, Ni TR, ug/l Limit

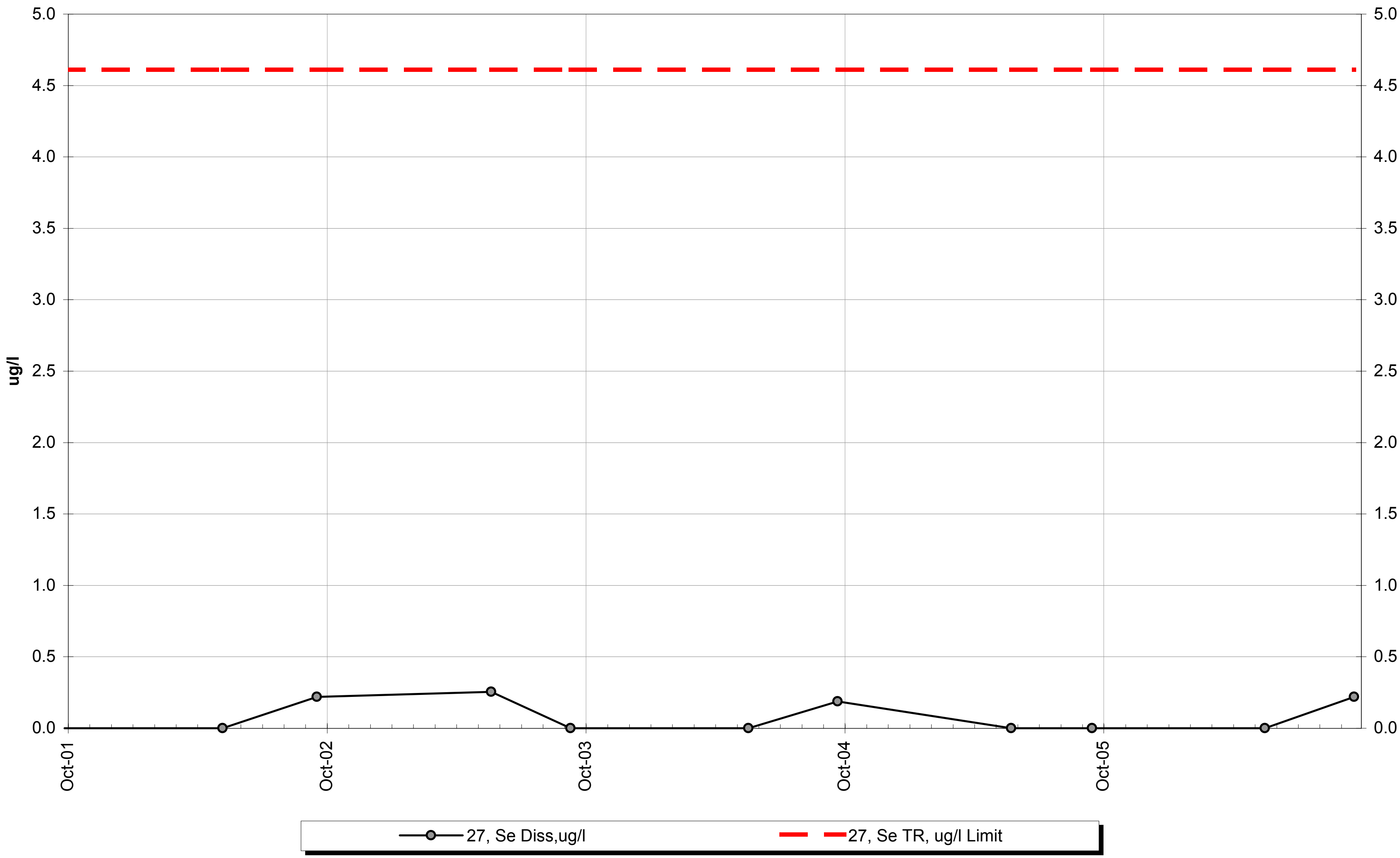


Site 27 -Dissolved Silver
ug/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Ag Diss,ug/l
27, Ag Diss, ug/l Limit

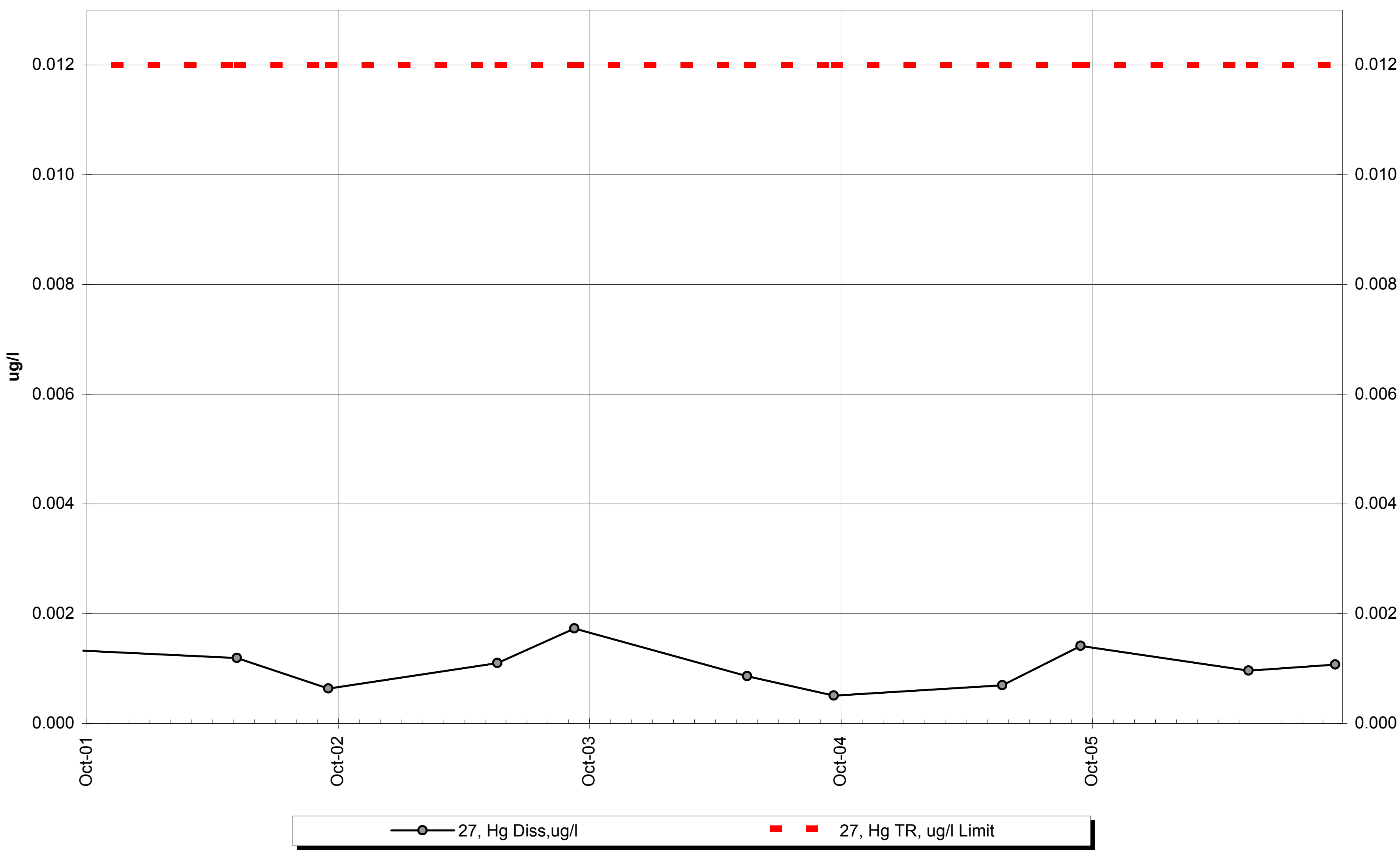


Site 27 -Dissolved Zinc
ug/l
0
20
40
60
80
100
120
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
27, Zn Diss,ug/l
27, Zn TR, ug/l Limit

Site 27 -Dissolved Selenium



Site 27 -Dissolved Mercury



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	**WY2001**								68.5				82.5
b	**WY2002**								116.0				133.0
c	**WY2003**								65.2				71.5
d	**WY2004**								67.9				89.1
e	**WY2005**								80.9				73.0
f	**WY2006**								65.4				73.4
	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	-3

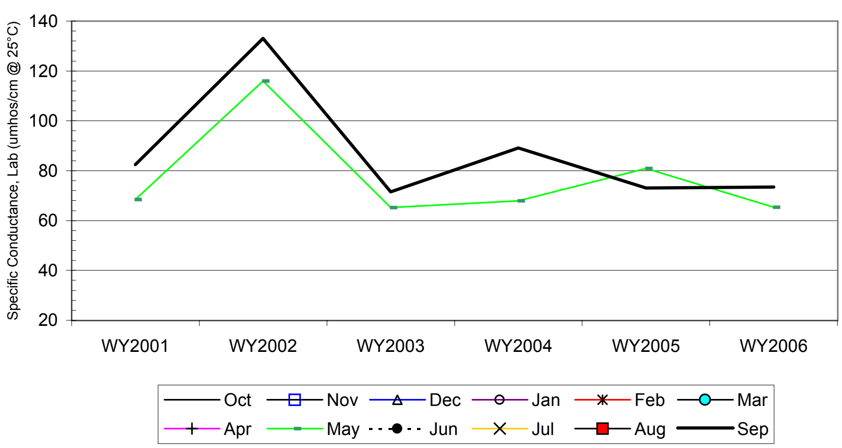
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-0.56				-0.56
Z^2_k								0.32				0.32

ΣZ_k= -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

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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} -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	-15.95		2.58
0.050	-13.08	**-1.45**	0.66
0.100	-11.02		0.34
0.200	-5.89		-0.16

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	**WY2001**								6.6				5.5
b	**WY2002**								5.4				6.2
c	**WY2003**								5.8				5.8
d	**WY2004**								5.7				6.0
e	**WY2005**								5.7				5.8
f	**WY2006**								5.3				5.4
	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				0
	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	-4
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-1.32				-0.75
	Z^2_k								1.73				0.56

ΣZ_k= -2.07

ΣZ^2_k= 2.29

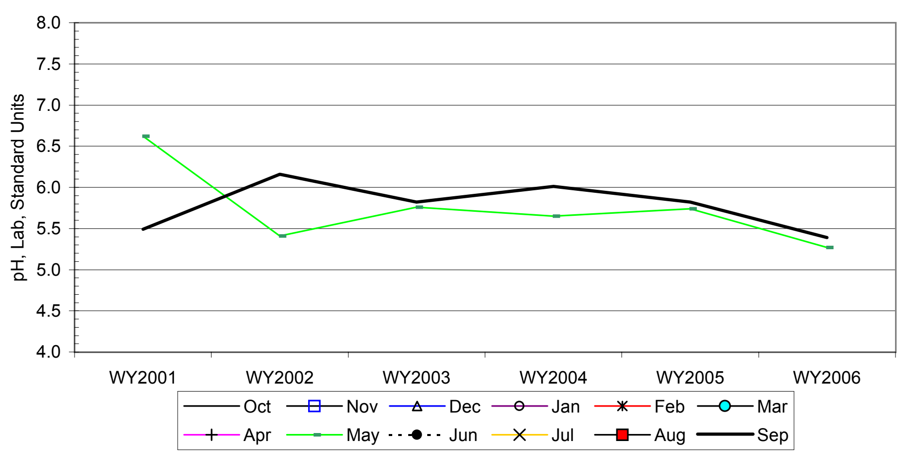
Z-bar=ΣZ_k/K= -1.03

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

Σn 12

ΣS_k -11

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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) 56.67	Z_{calc} -1.33	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
	p **0.092**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.32		0.11
0.050	-0.23	**-0.11**	0.02
0.100	-0.19		-0.01
0.200	-0.19		-0.03

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	**WY2001**								24.8				36.7
b	**WY2002**								51.6				68.5
c	**WY2003**								33.4				31.4
d	**WY2004**								28.2				44.7
e	**WY2005**								40.6				29.4
f	**WY2006**								25.2				25.8
	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	-1	0	0	0	-9

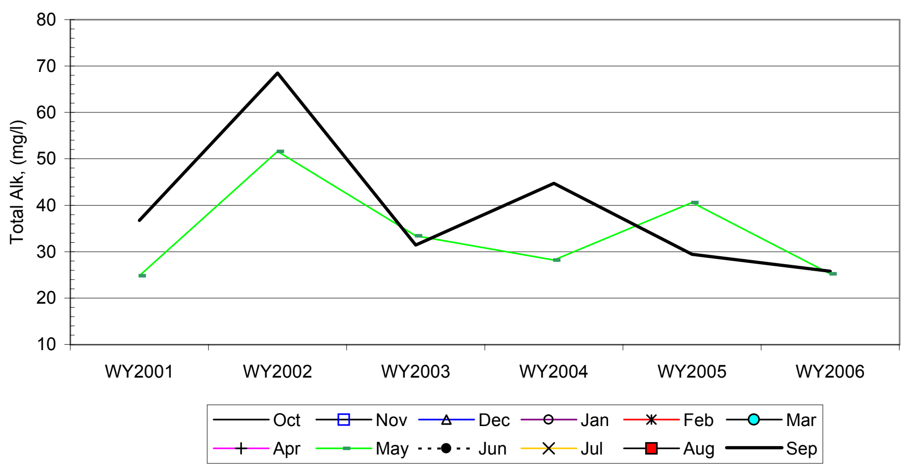
	May	Sep
σ^2_S=	28.33	28.33
$Z_k = S_k/\sigma_S$	-0.19	-1.69
Z^2_k	0.04	2.86

ΣZ_k= -1.88
ΣZ^2_k= 2.89
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

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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) 56.67	Z_{calc} -1.20	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
	p **0.116**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-11.85		3.37
0.050	-9.68	**-2.42**	0.28
0.100	-6.35		-1.09
0.200	-3.92		-1.77

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

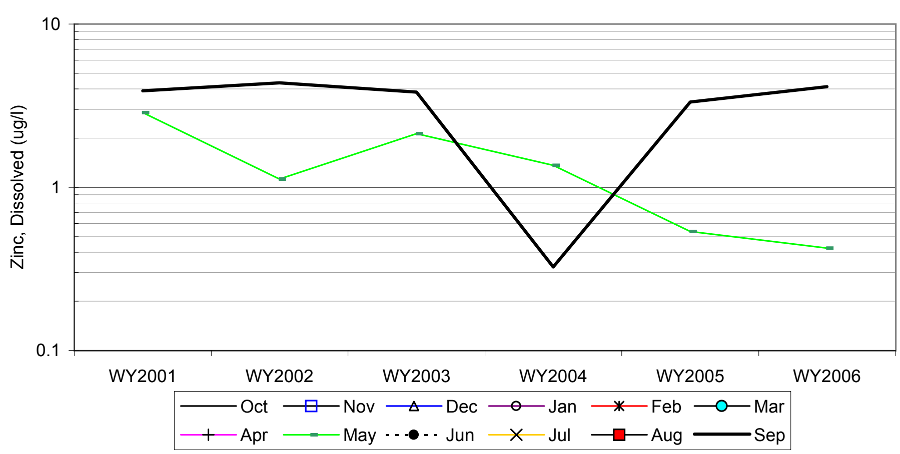
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								2.9				3.9
b	**WY2002**								1.1				4.4
c	**WY2003**								2.1				3.8
d	**WY2004**								1.4				0.3
e	**WY2005**								0.5				3.3
f	**WY2006**								0.4				4.1
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	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	-11	0	0	0	-3
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-2.07				-0.56
	Z^2_k								4.27				0.32

ΣZ_k=	-2.63
ΣZ^2_k=	4.59
Z-bar=$\Sigma Z_k/K$=	-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

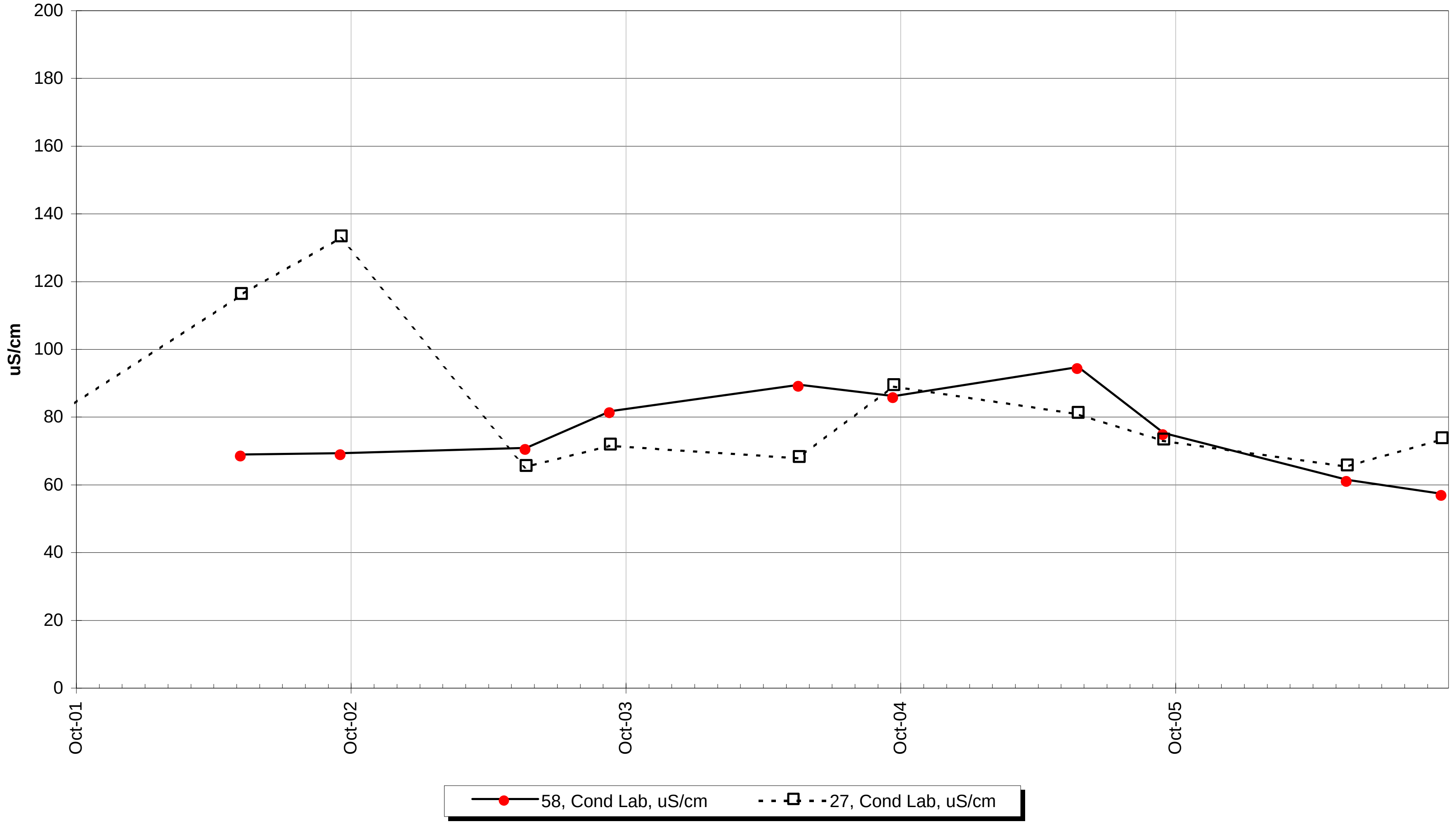
$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		1.13	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.288**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc}	-1.73	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	**p**	**0.042**		H_A (± trend)	REJECT



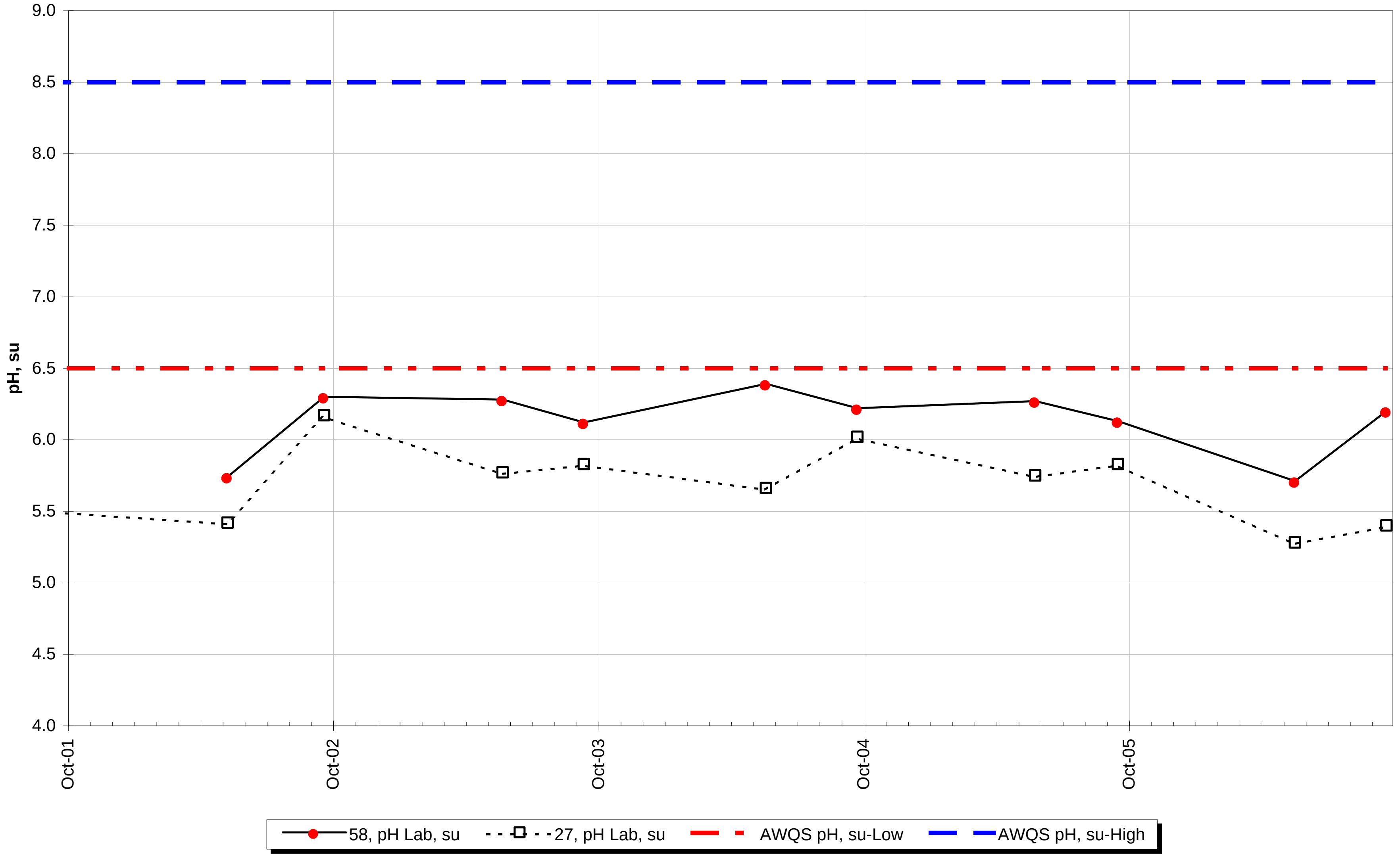
Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.79		0.09
0.050	-0.57	**-0.30**	-0.05
0.100	-0.53		-0.12
0.200	-0.49		-0.17

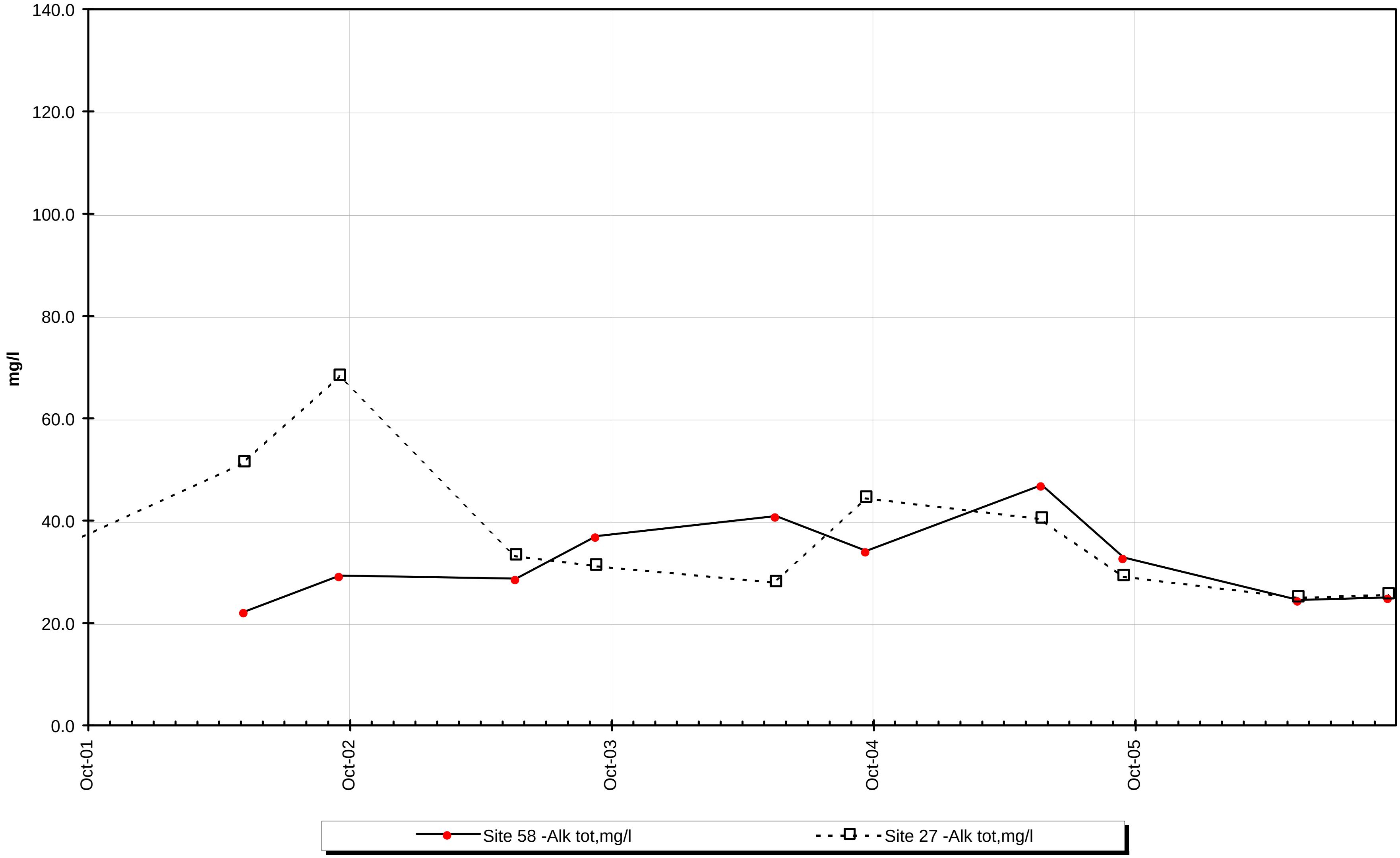
Site 58 vs Site 27 -Conductivity

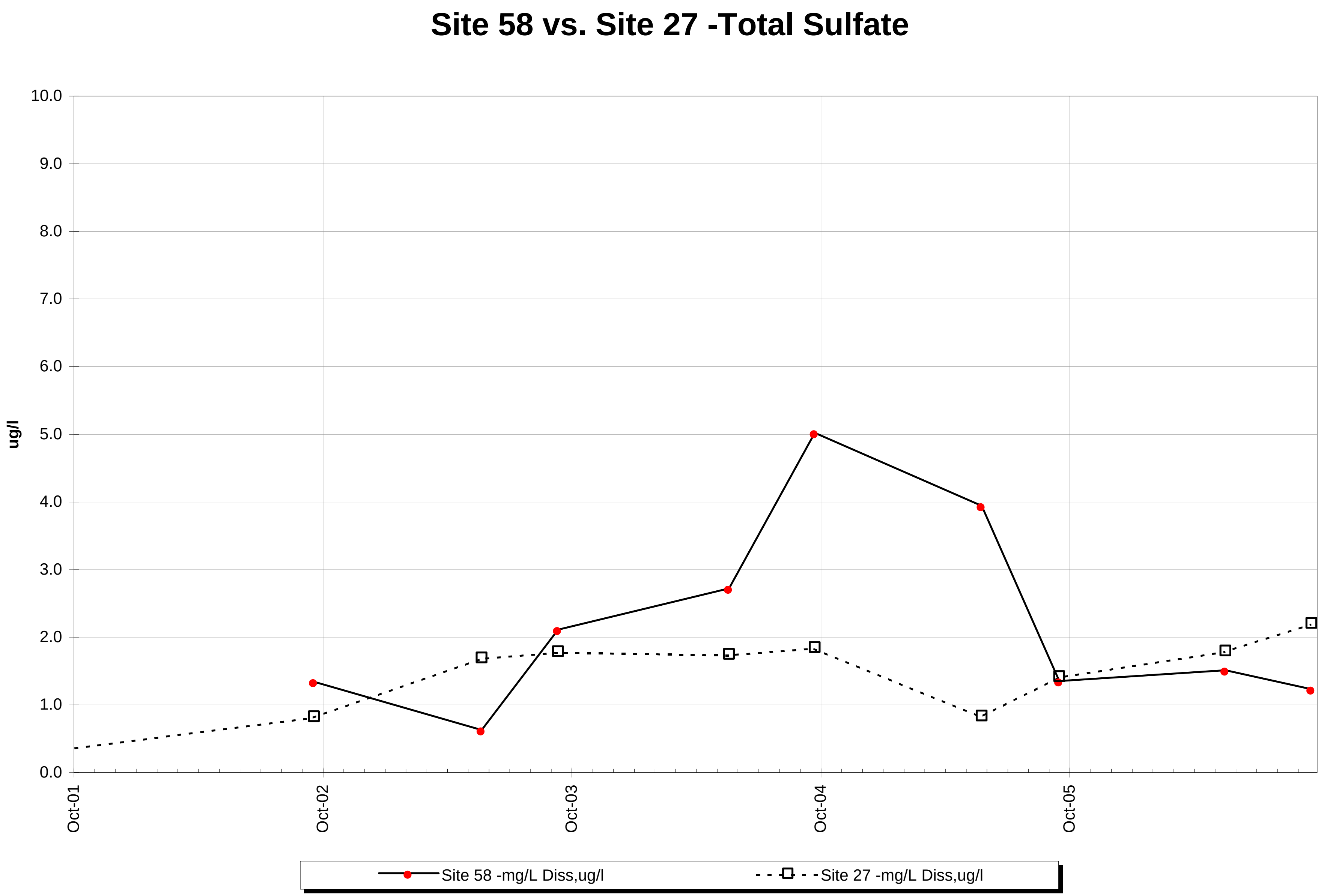


Site 58 vs. Site 27 -Lab pH

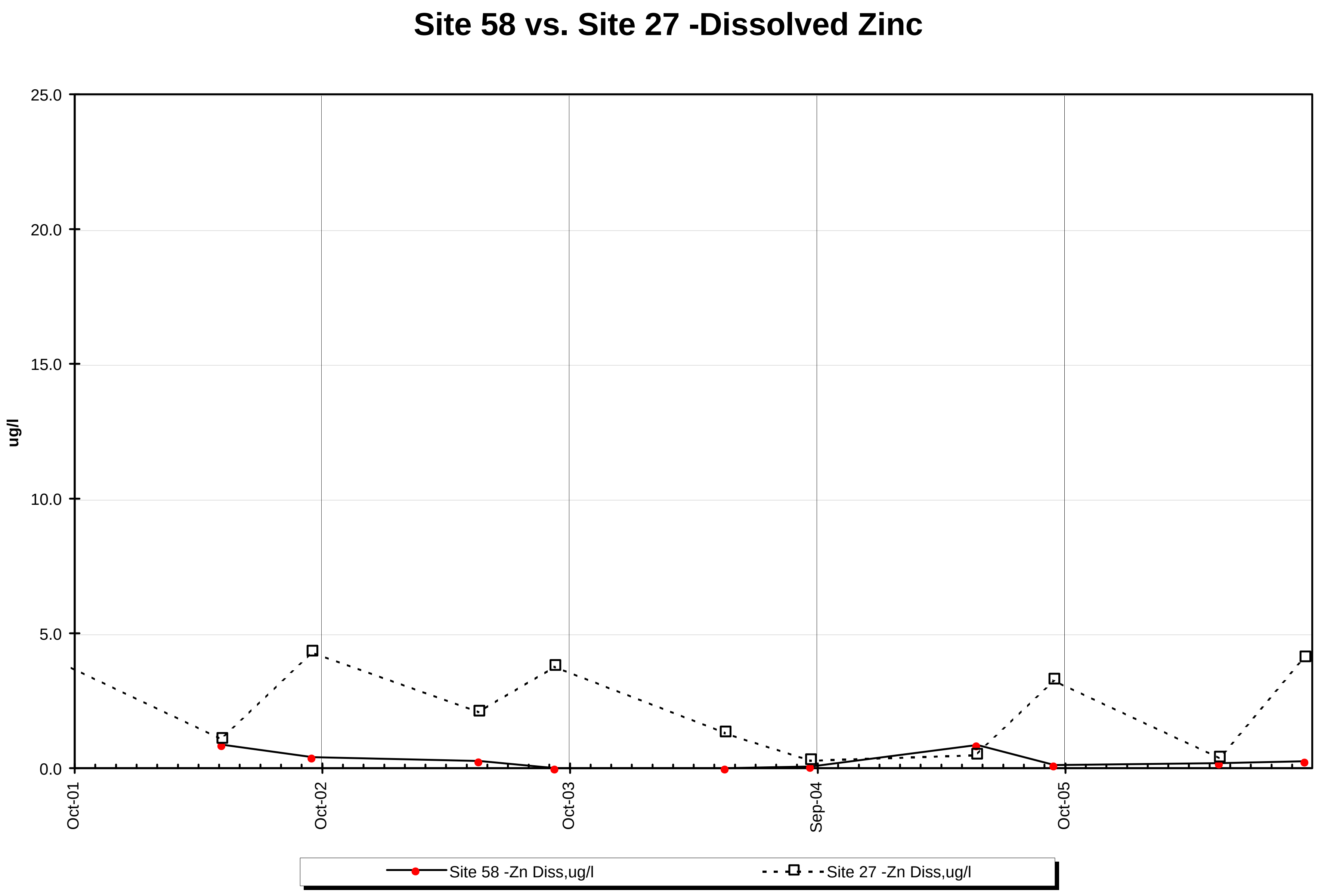


Site 58 vs. Site 27 -Total Alkalinity





Site 58 vs. Site 27 -Total Sulfate
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-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 58 -mg/L Diss,ug/l
Site 27 -mg/L Diss,ug/l



Site 58 vs. Site 27 -Dissolved Zinc
ug/l
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Sep-04
Oct-05
Site 58 -Zn Diss,ug/l
Site 27 -Zn Diss,ug/l

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 2006” report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 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 pH, both for lab and field, values the lower limit of 6.5 su listed in AWQS. 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 (i.e. Sites 58, 27, and 32). One exceedance is for total alkalinity in Sept-2006 for which Site 29 has a five year average of 44 mg/l. The Sept-2006 value is the lowest alkalinity record for Site 29 but is not atypical for wells completed in peat. One exceedance is for a dissolved arsenic value of 19.2 ug/l that is slightly above the recently lowered drinking water standard for total arsenic. Arsenic values over the past 10 years have varied between 5 to 23 ug/l and thus the Sept-2006 value falls within the range of historic norms for this site. The final exceedance is for a dissolved lead value of 1.31 ug/l which is just slightly above the hardness dependant AWQS of 1.20 ug/l. All of the downgradient shallow wells (i.e. 27, 29, and 32) have a record of elevated dissolved lead values since the lead MDL was lowered below 10 ug/l in 1998. A complete discussion of possible causes and follow-up actions are covered in detail in the Site 32 interpretative report.

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
05/17/06	pH Lab, su	5.23		6.5 - 8.5	Aquatic Life
05/17/06	pH Field, su	5.55		6.5 - 8.5	Aquatic Life
09/20/06	pH Lab, su	4.88		6.5 - 8.5	Aquatic Life
09/20/06	pH Field, su	5.23		6.5 - 8.5	Aquatic Life
09/15/05	Total Alkalinity, mg/L	12.4		>20	Aquatic Life, chronic
05/24/05	Arsenic Dissolved ug/L	19.8		10*	Drinking Water
09/15/05	Lead, Dissolved ug/L	1.31	50.9	1.20	Aquatic Life, chronic

* 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 preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). Alkalinity fails the monthly homogeneity test while no significant trends are identified for the other analytes. Total alkalinity fails the homogeneity due to opposite trends displayed by each seasonal dataset. The May (spring) samples show an increasing trend of low magnitude while the September (fall) samples show a mixed trend but with a pronounced decrease over the last three years.

Site 29-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.25	-		
pH, Lab	6	0.06	-		
Alkalinity, Total	6	Fails Test for Monthly Homogeneity			
Zinc, Dissolved	6	0.66	+		

(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 dissolved metals sampled at this site.

Table of Results for Water Year 2006

Site 29 "MW-3S"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							7.6	NOT SCHEDULED FOR SAMPLING			7.9	7.8
Conductivity-Field(µmho)								124				96	110
Conductivity-Lab (µmho)								115				64	90
pH Lab (standard units)								5.23				4.88	5.06
pH Field (standard units)								5.55				5.23	5.39
Total Alkalinity (mg/L)								55.0				12.4	33.7
Total Sulfate (mg/L)								<0.1				0.5	0.3
Hardness (mg/L)								50.9				19.9	35.4
Dissolved As (ug/L)								19.80				4.88	12.34
Dissolved Ba (ug/L)								21.5				12.8	17.2
Dissolved Cd (ug/L)								0.014				0.010 J	0.012
Dissolved Cr (ug/L)								8.490				0.822	4.656
Dissolved Cu (ug/L)								0.440				0.219	0.330
Dissolved Pb (ug/L)								1.3100				0.4510	0.8805
Dissolved Ni (ug/L)								1.690				1.470	1.580
Dissolved Ag (ug/L)								0.009				<0.003	0.005
Dissolved Zn (ug/L)								7.32				7.42	7.37
Dissolved Se (ug/L)								<0.116				<0.139	0.064
Dissolved Hg (ug/L)								0.000880 UJ				0.000767 U	0.000824

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

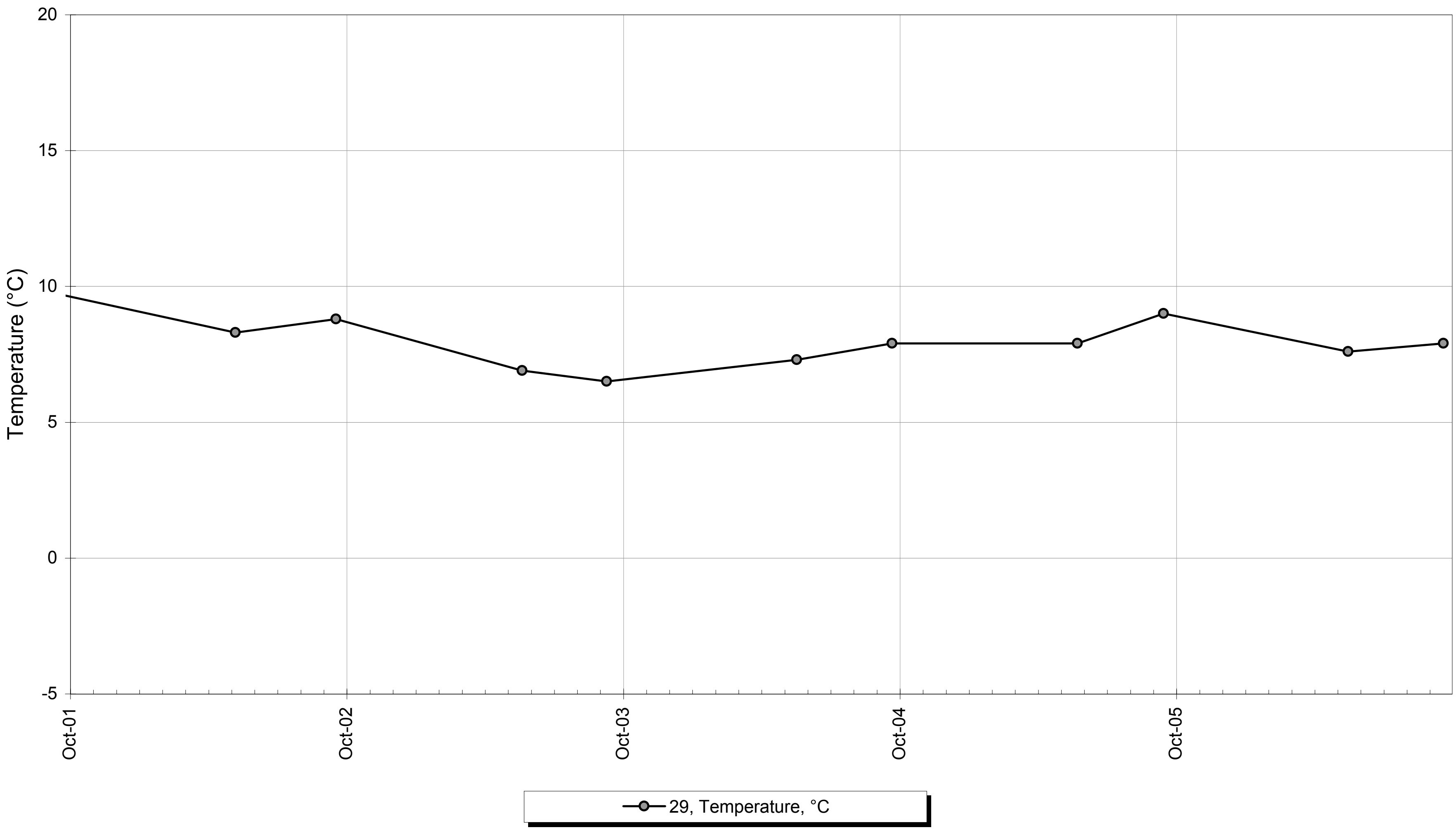
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

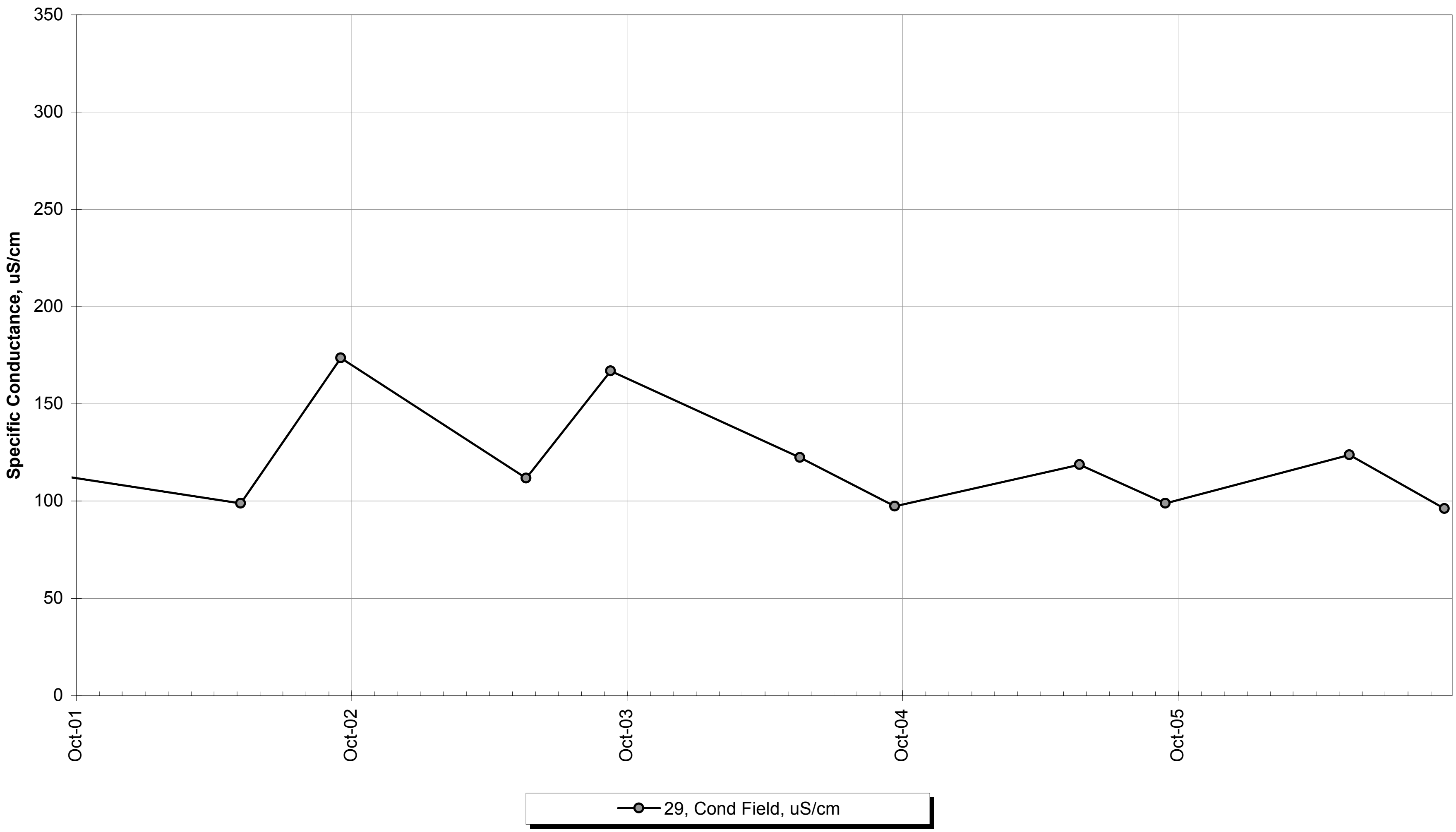
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
29	05/17/2006	1:03:00 PM				
			Hg Diss, ug/l	0.00088	UJ	Field Blank Contamination, Co
29	09/20/2006	10:55:00 AM				
			Cd Diss, ug/l	0.00996	J	Below Quantitative Range
			Hg Diss, ug/l	0.000767	U	Field Blank Contamination

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

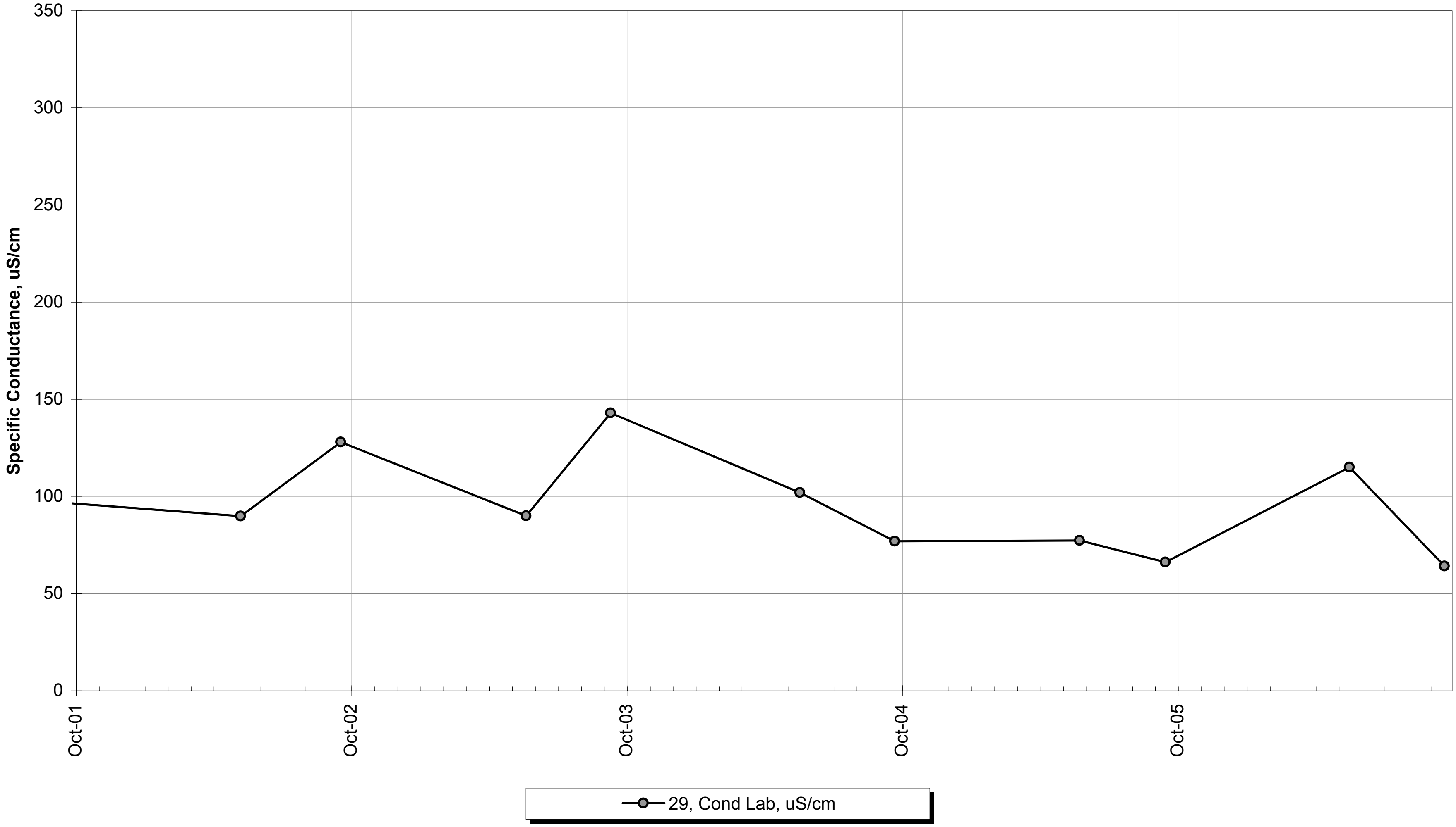
Site 29 -Water Temperature

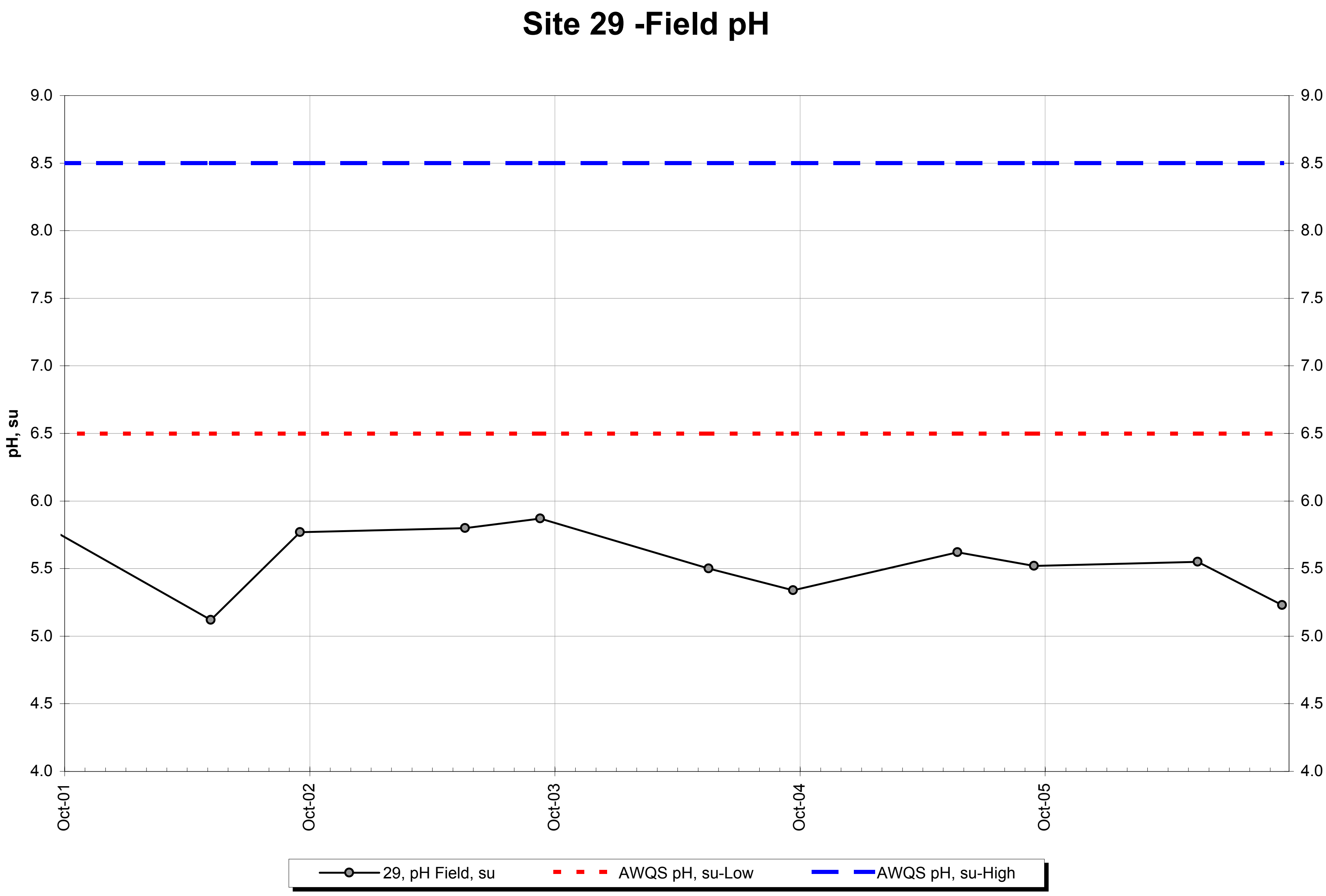


Site 29 -Conductivity-Field

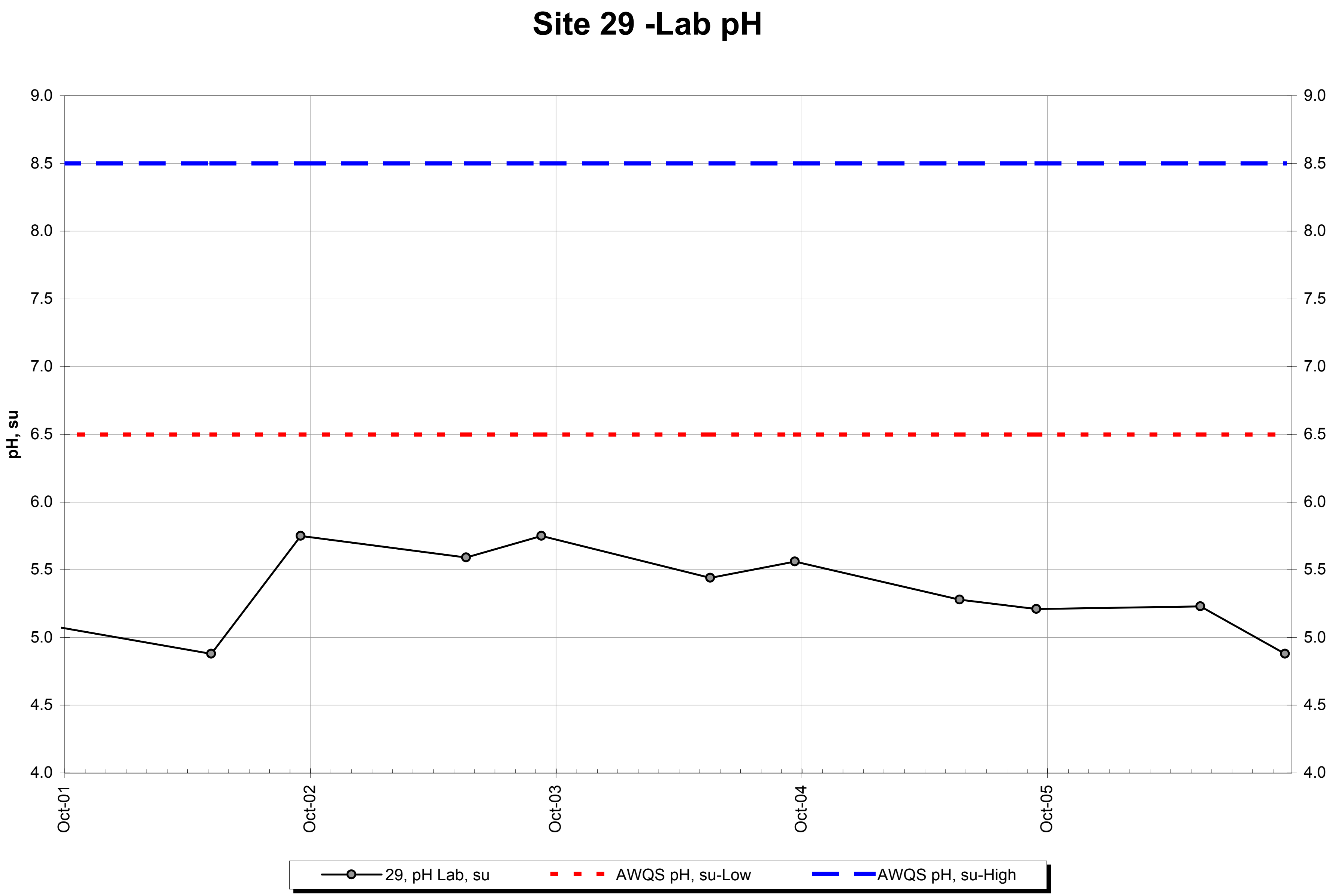


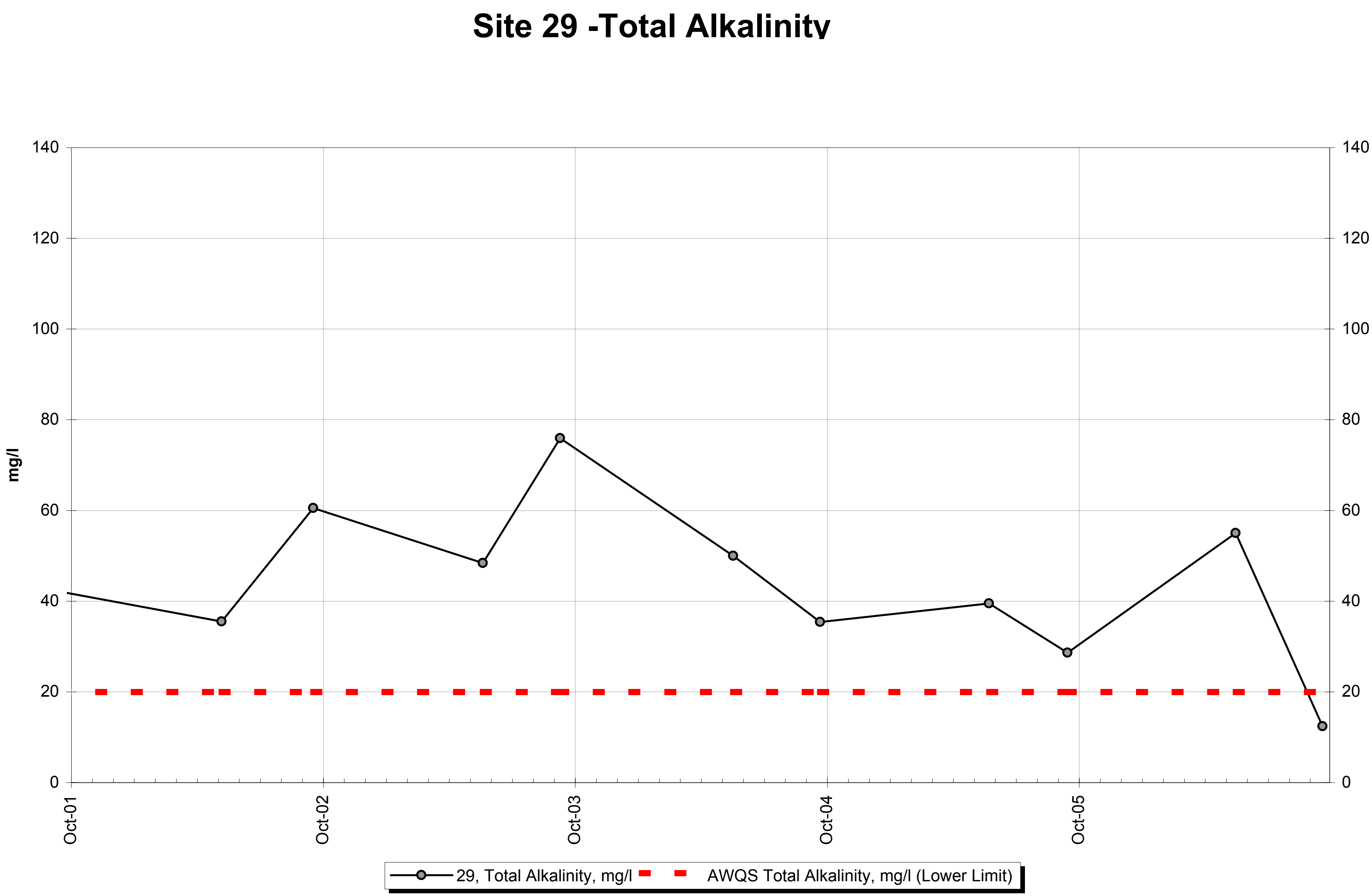
Site 29 -Conductivity-Lab



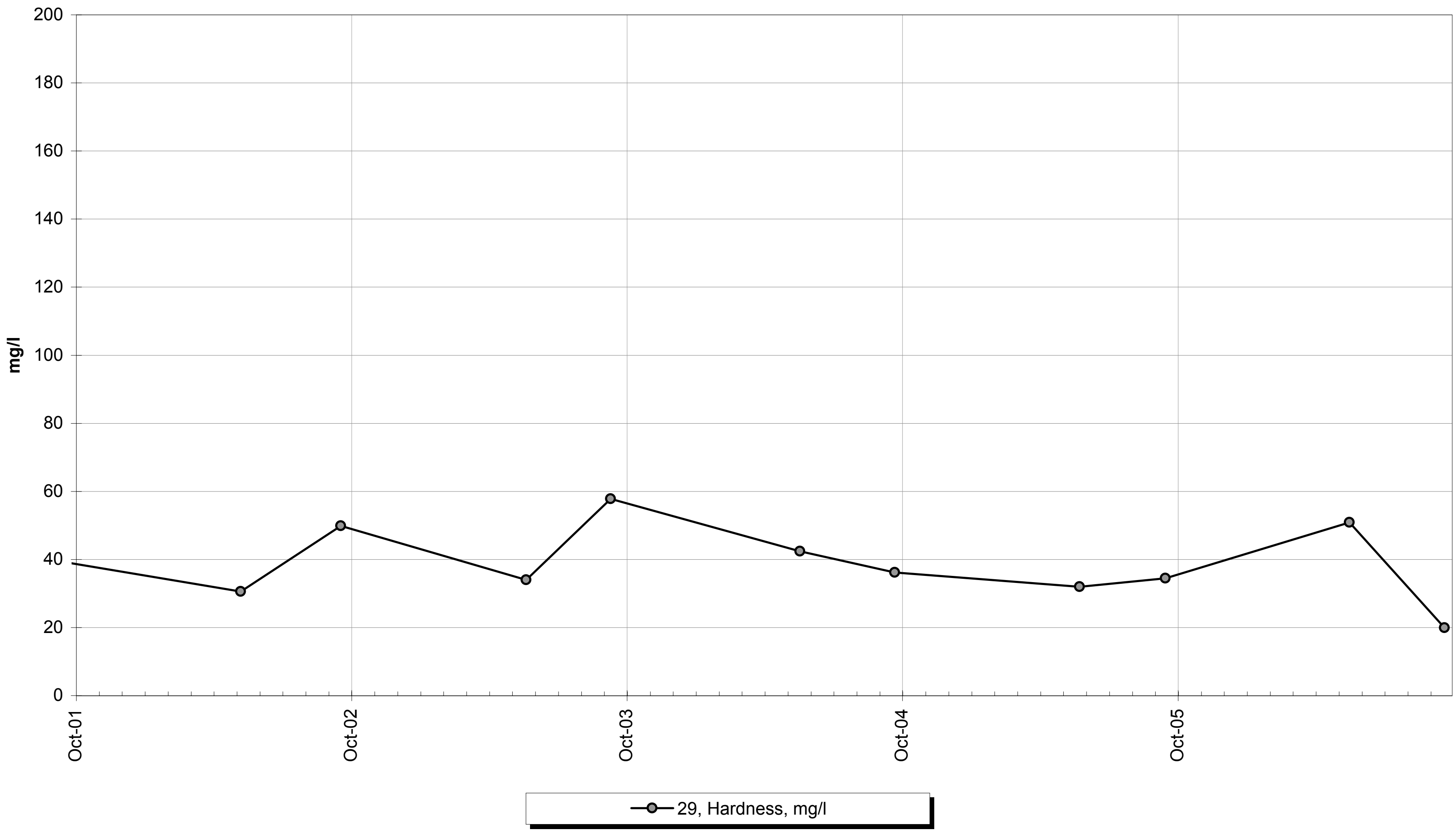


Site 29 -Field pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
29, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

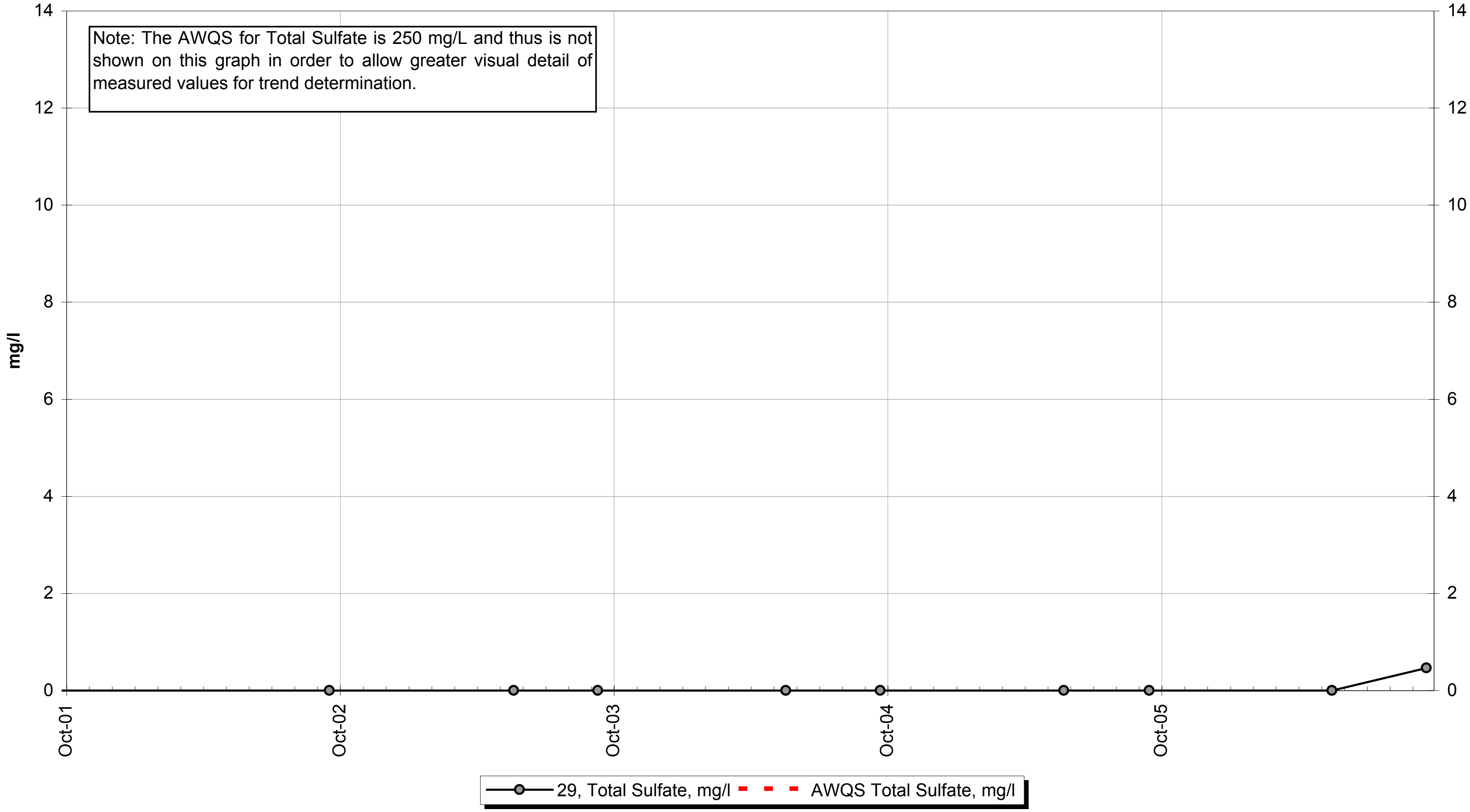

Site 29 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
29, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High


Site 29 -Total Alkalinity
mg/l
0
20
40
60
80
100
120
140
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
29, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

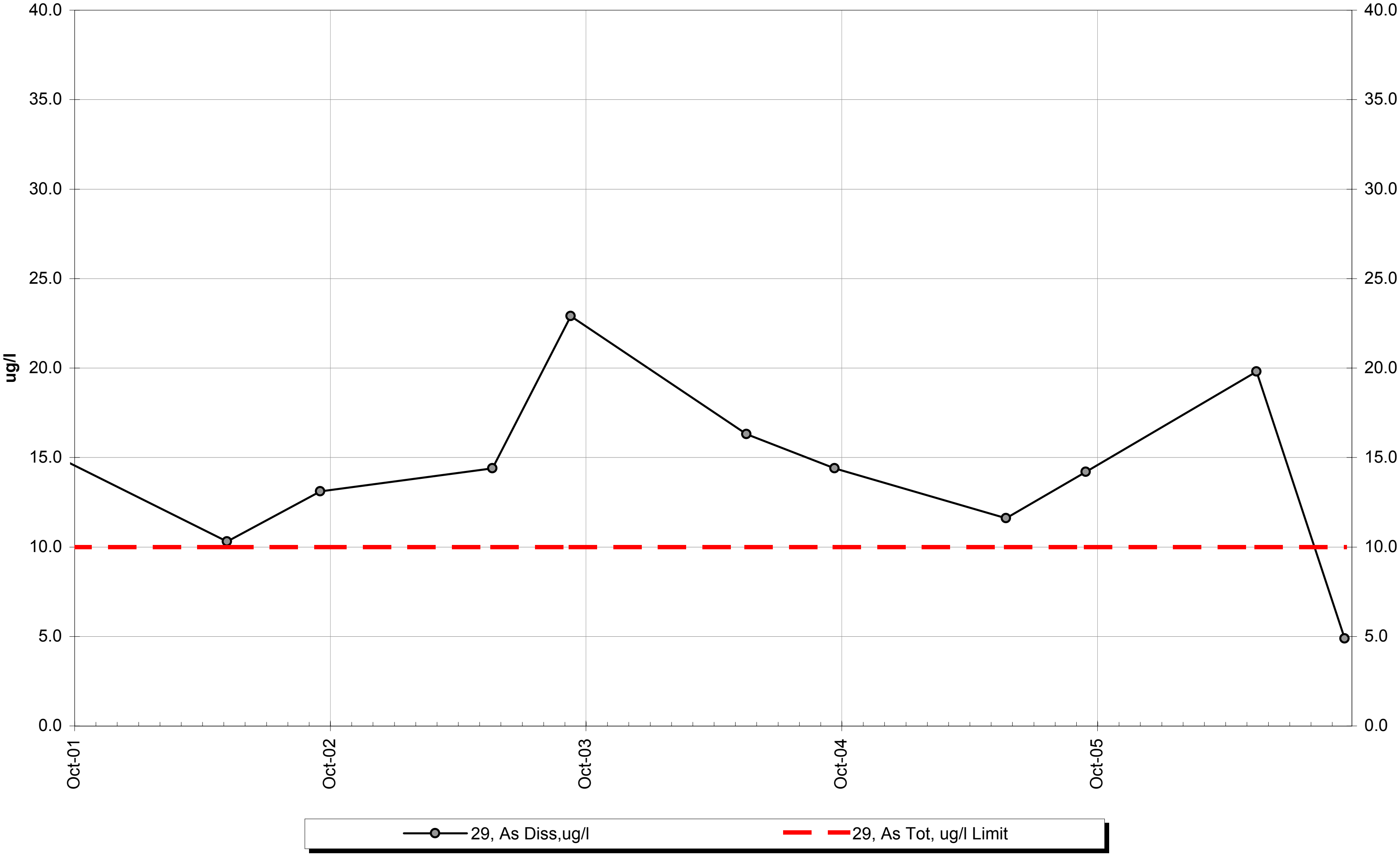
Site 29 -Hardness



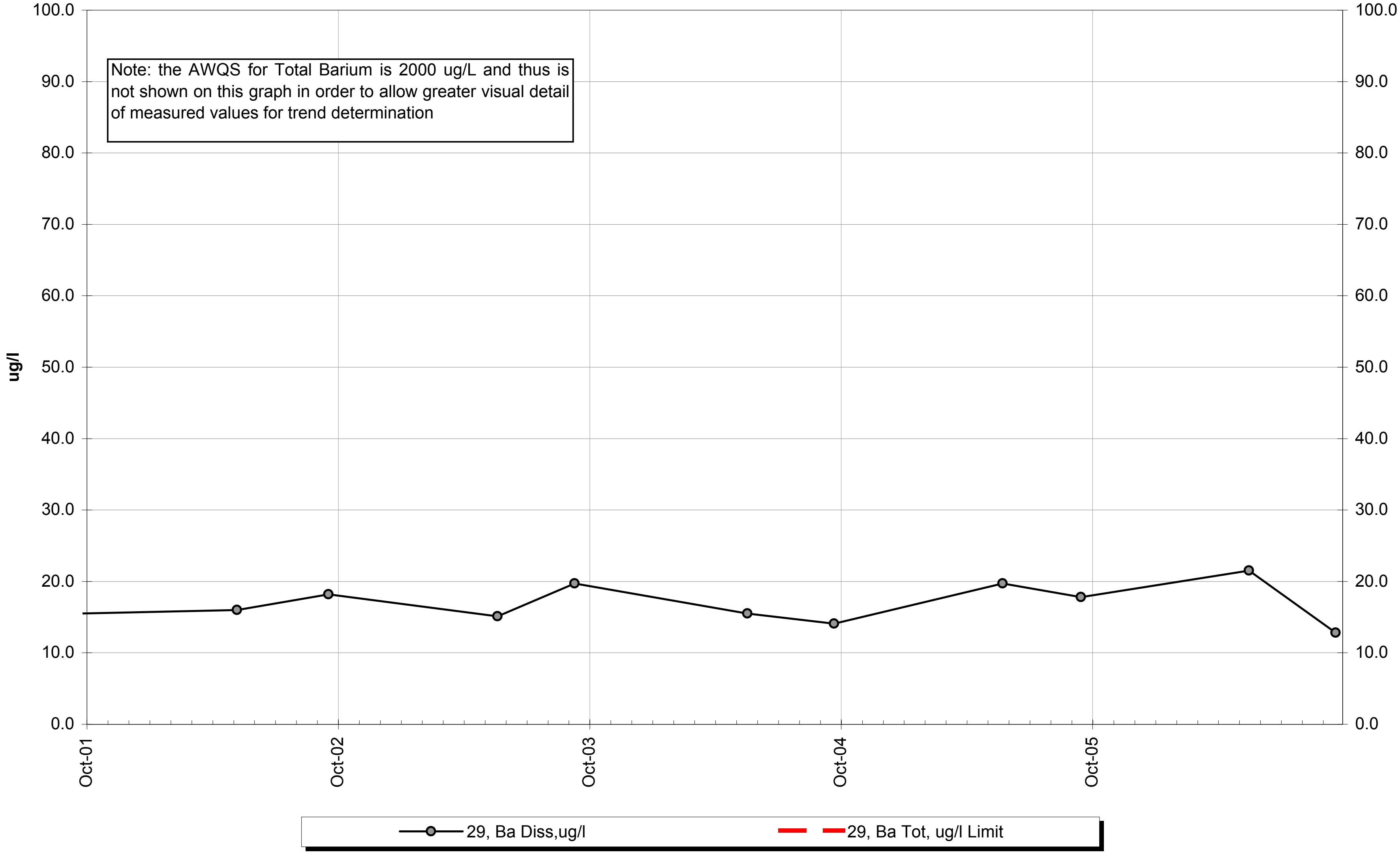
Site 29 -Total Sulfate



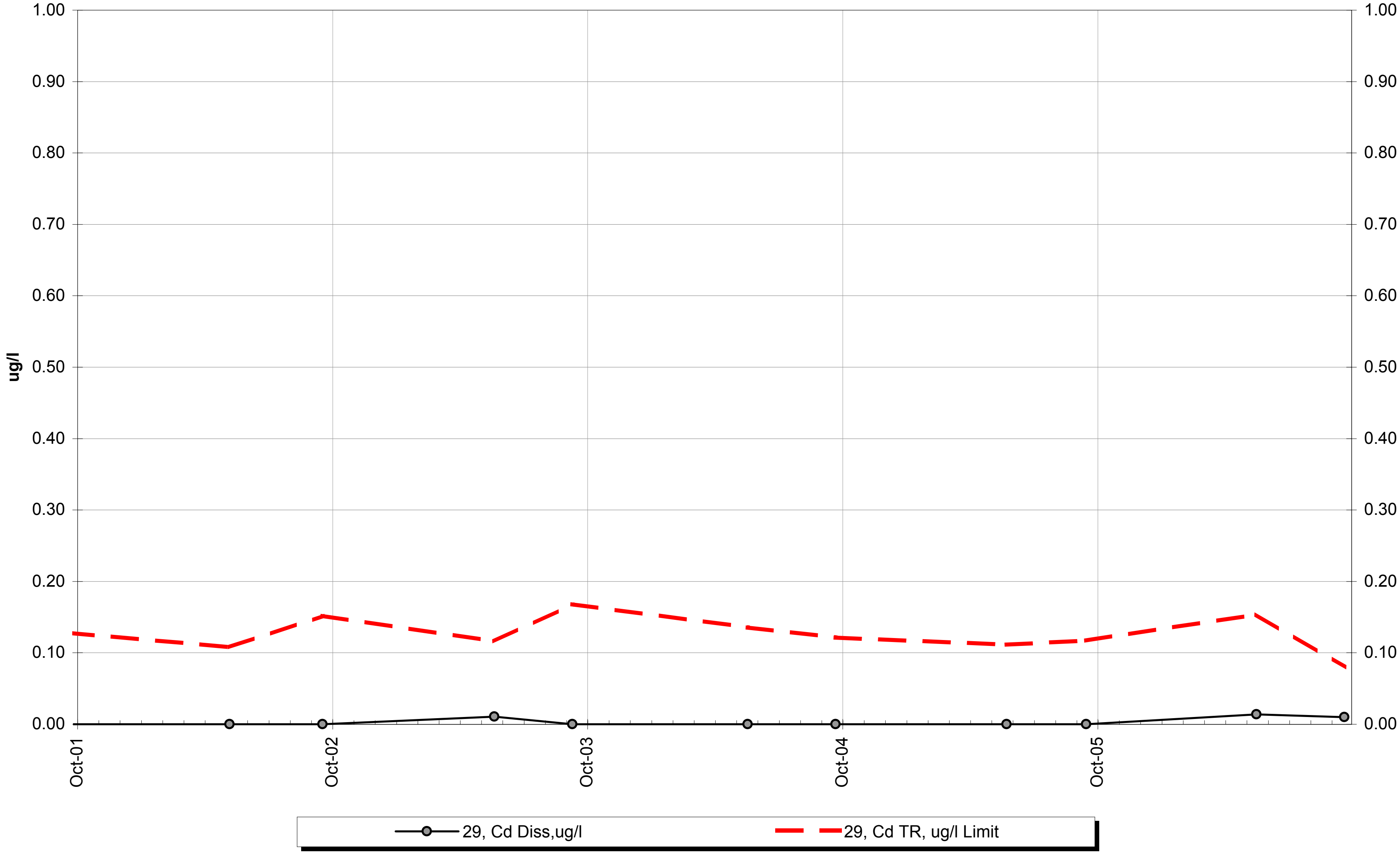
Site 29 -Dissolved Arsenic



Site 29 -Dissolved Barium

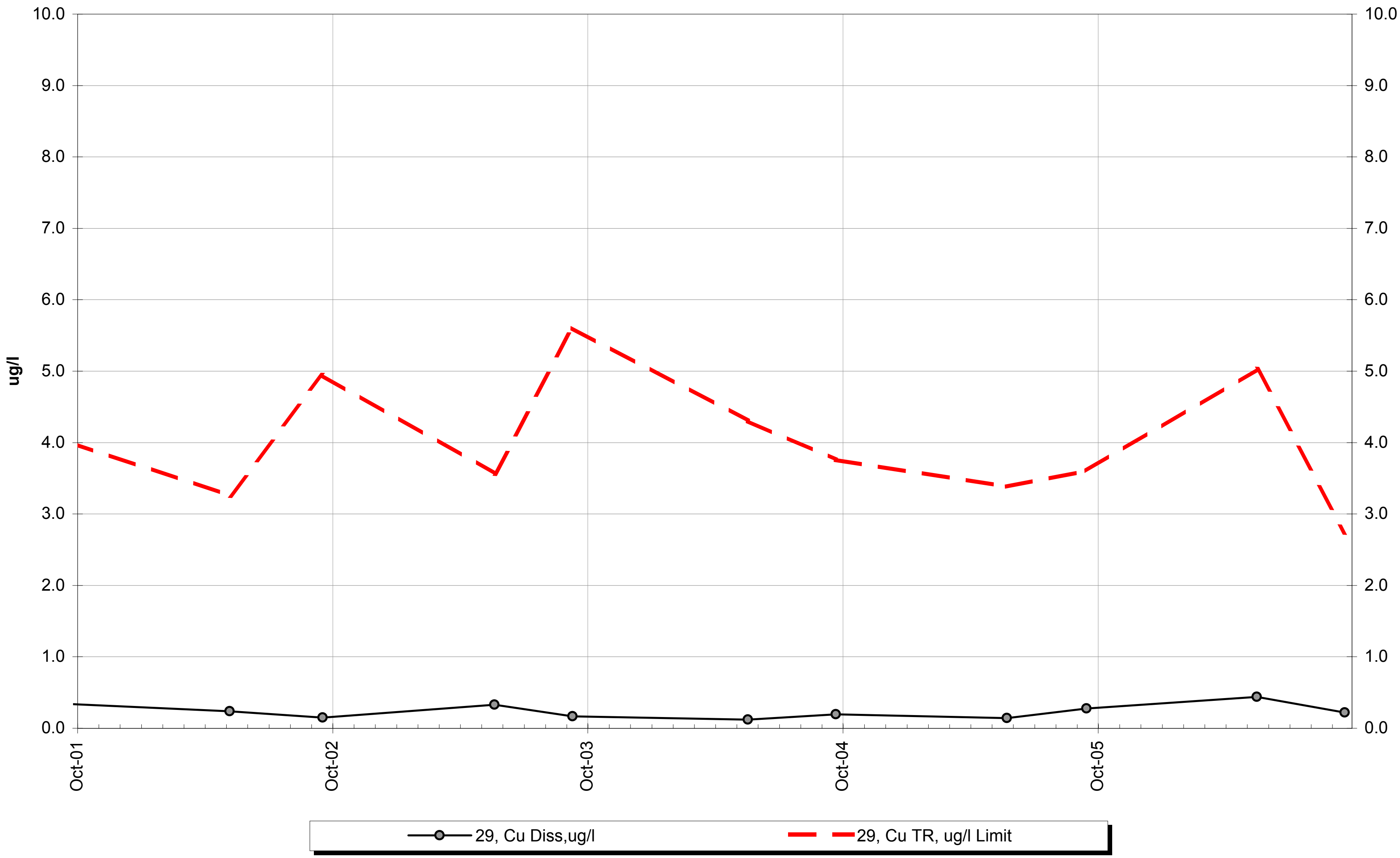


Site 29 -Dissolved Cadmium

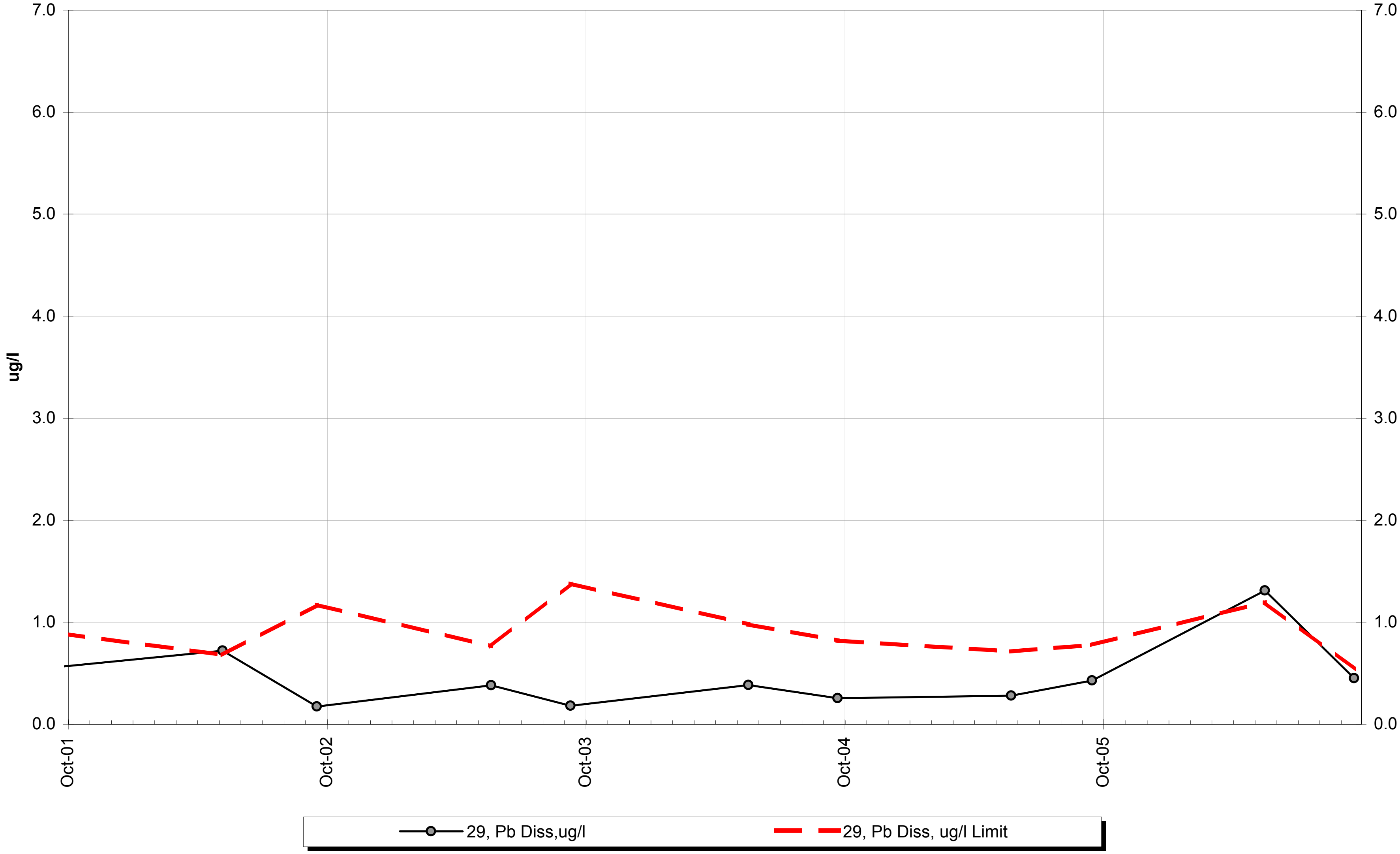



Site 29 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
29, Cr Diss,ug/l
29, Cr Tot, ug/l Limit

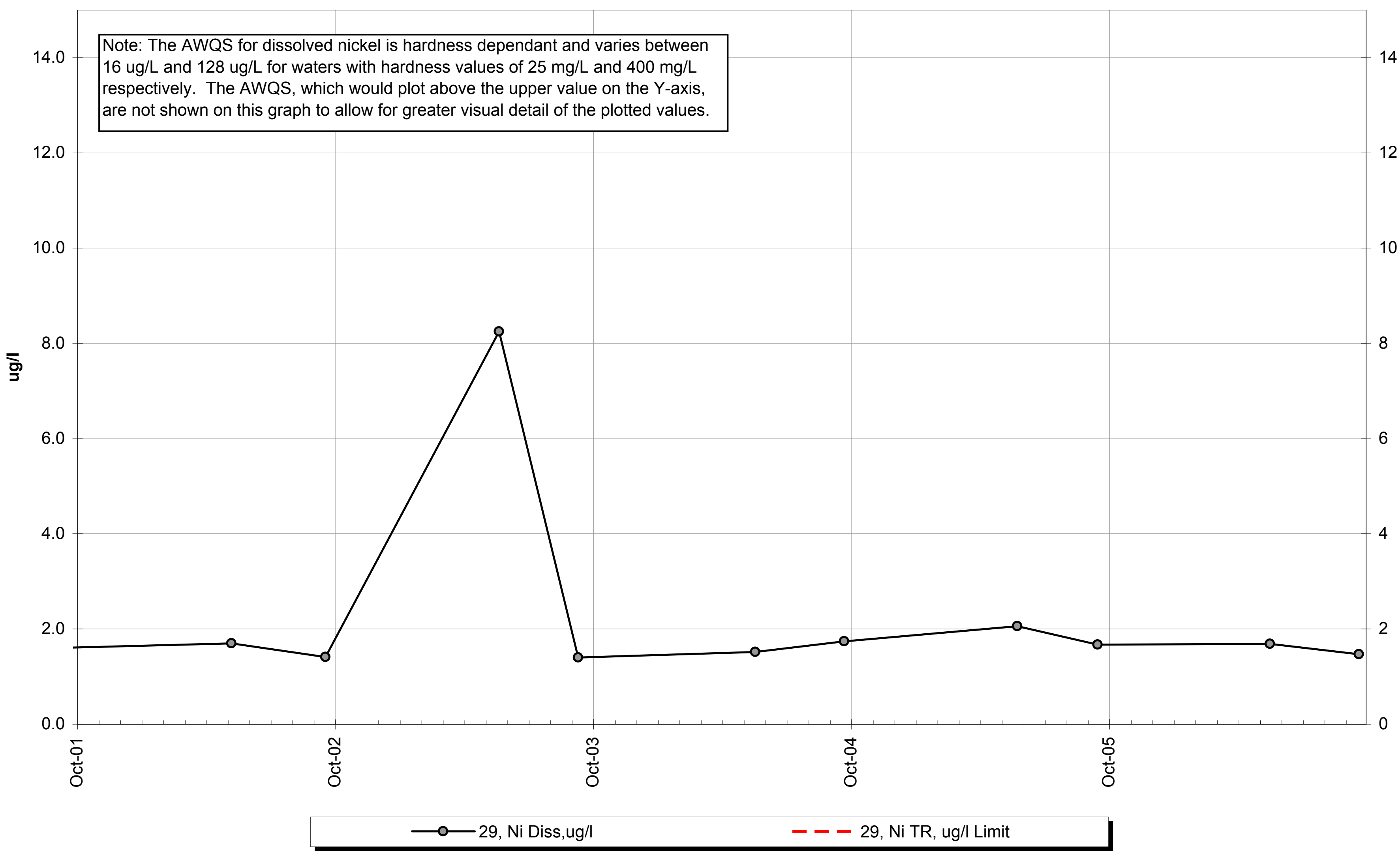
Site 29 -Dissolved Copper



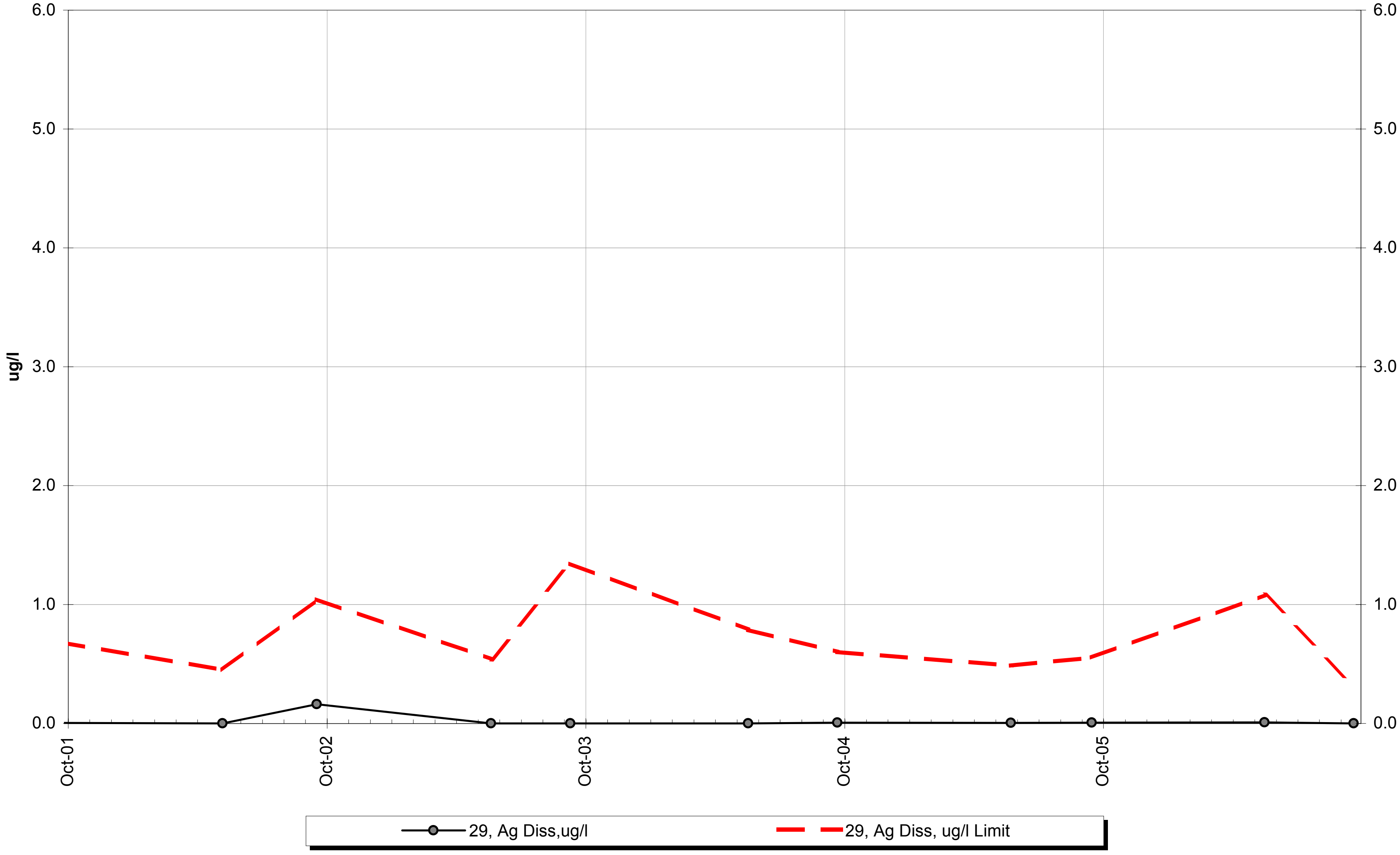
Site 29 -Dissolved Lead



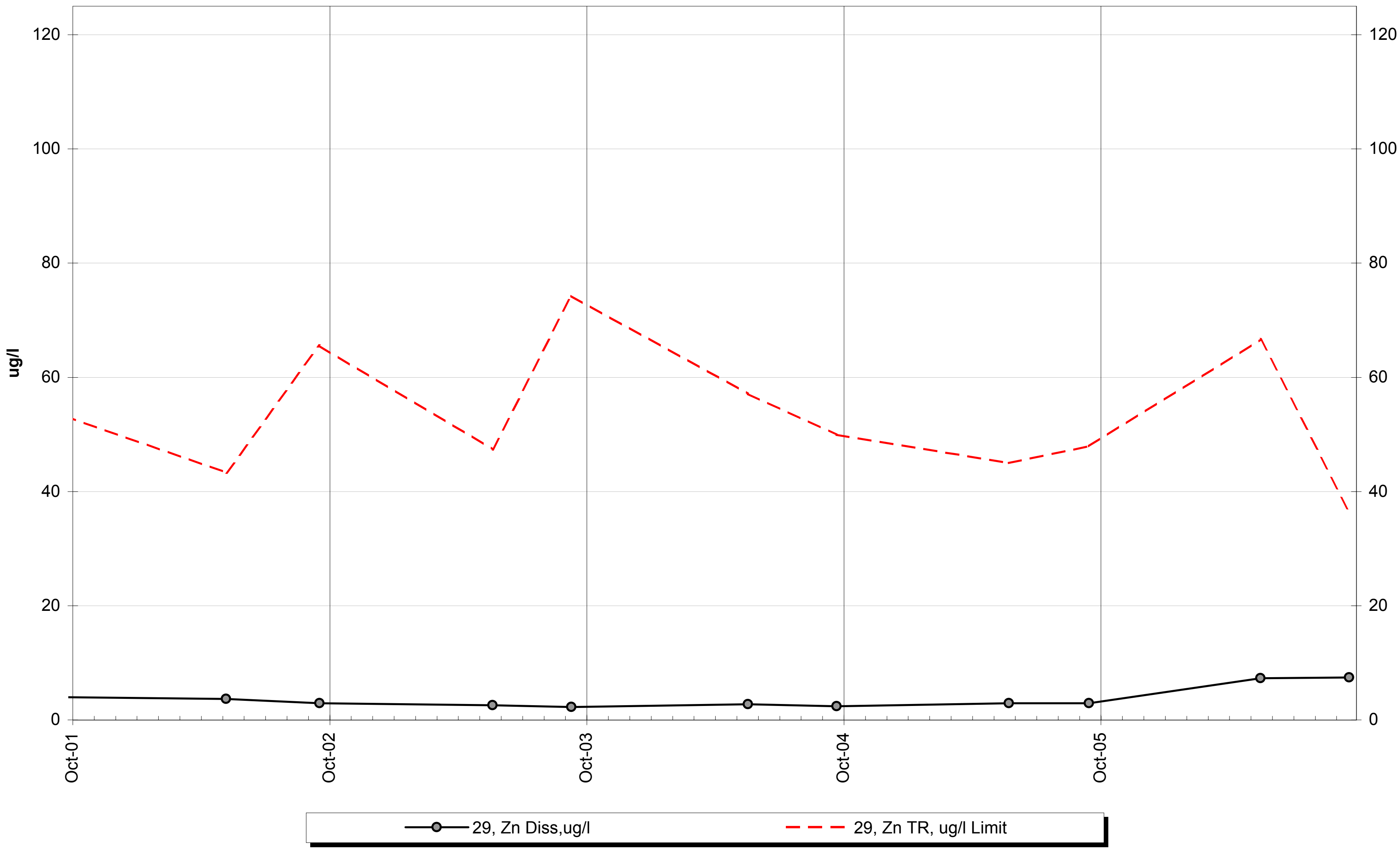
Site 29 -Dissolved Nickel



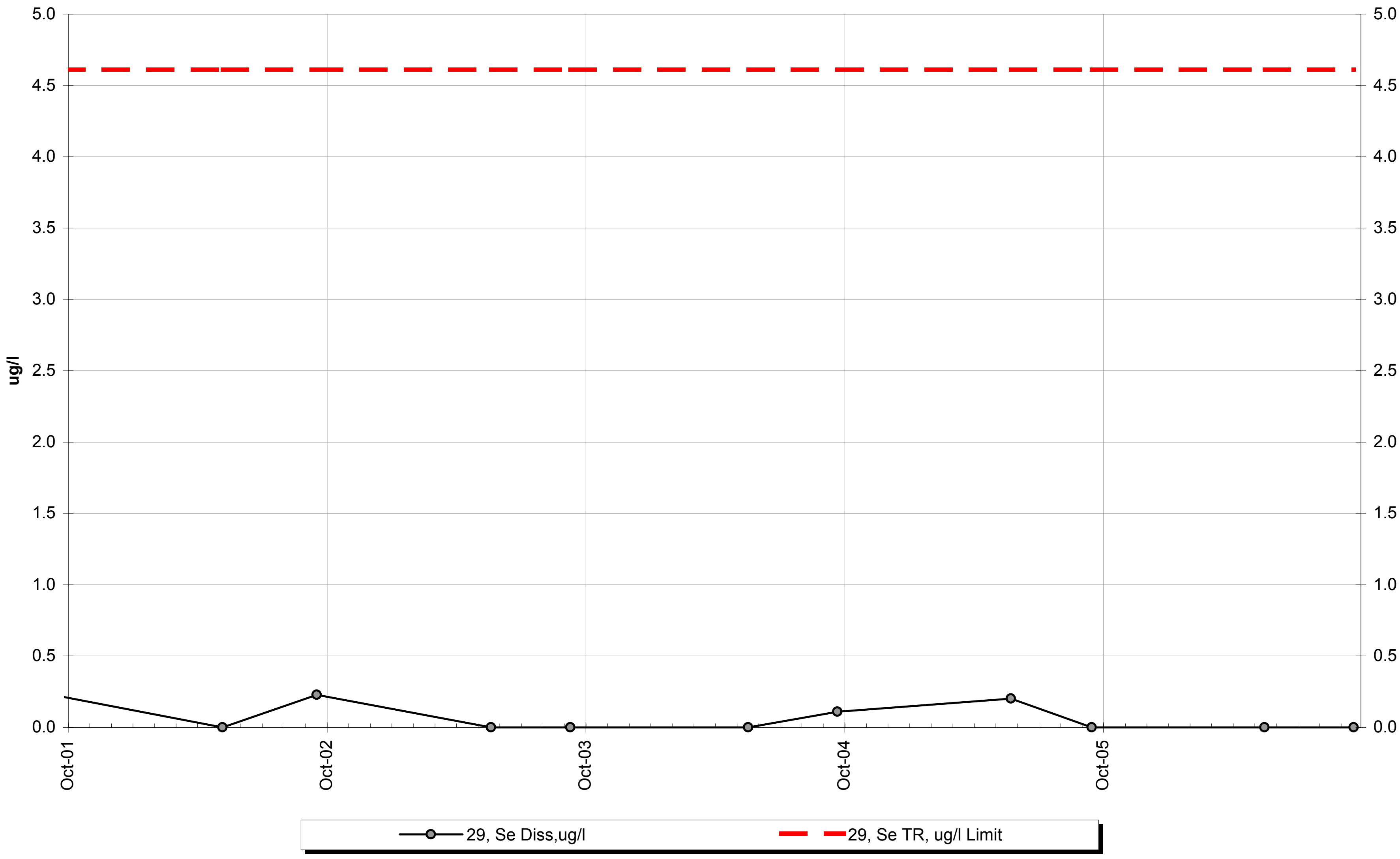
Site 29 -Dissolved Silver



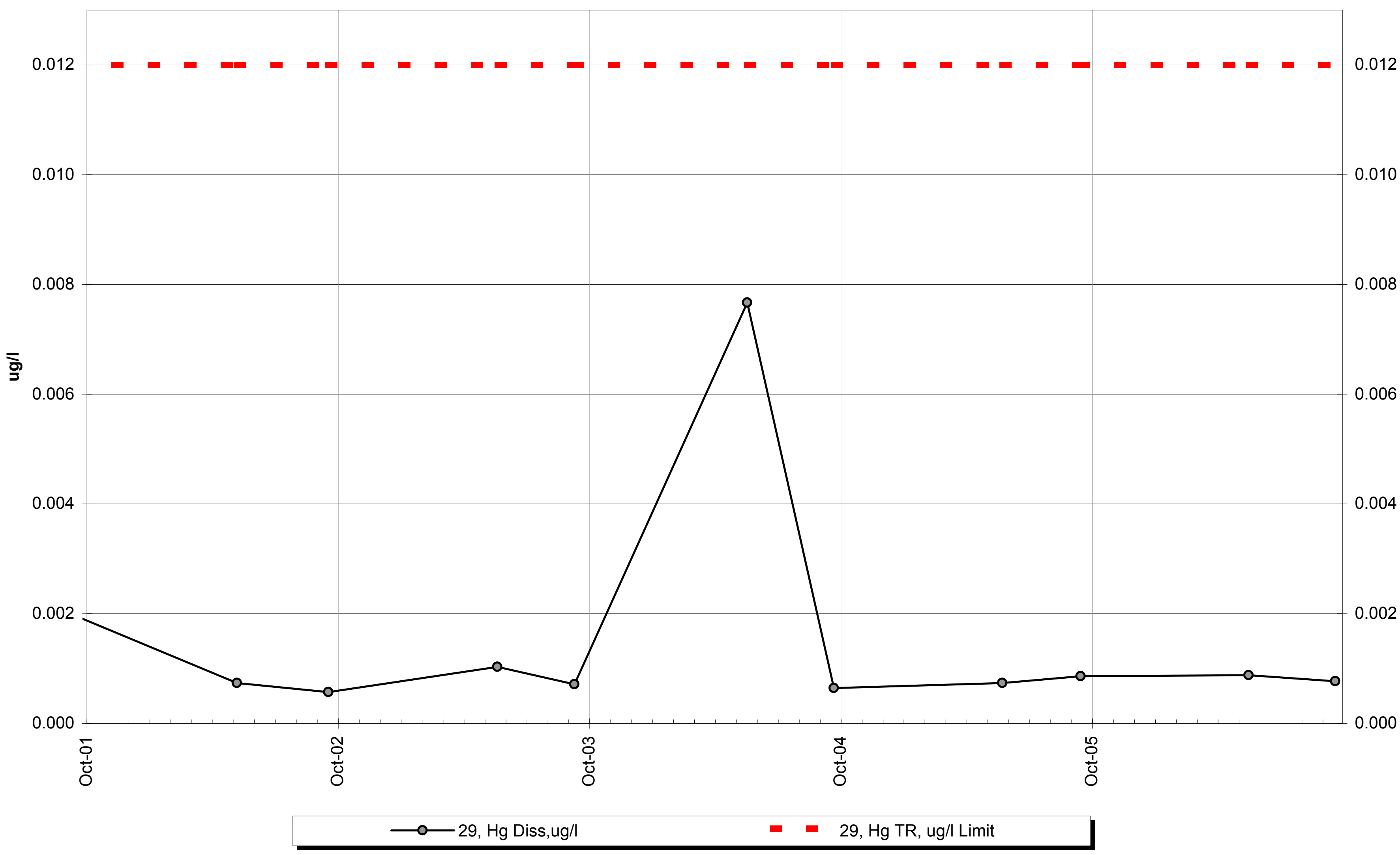
Site 29 -Dissolved Zinc



Site 29 -Dissolved Selenium



Site 29 -Dissolved Mercury



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

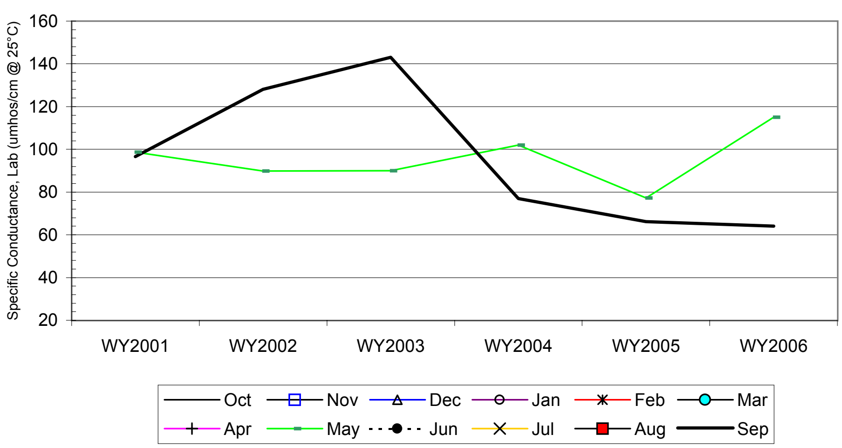
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								98.7				96.6
b	**WY2002**								89.9				128.0
c	**WY2003**								90.0				143.0
d	**WY2004**								102.0				76.9
e	**WY2005**								77.3				66.1
f	**WY2006**								115.0				64.1
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	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	3	0	0	0	-9
σ^2_S=									28.33				28.33
$Z_k = S_k/\sigma_S$									0.56				-1.69
Z^2_k									0.32				2.86

ΣZ_k=	-1.13
ΣZ^2_k=	3.18
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-bar)^2=	2.54	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
p	**0.111**		$\chi^2_h<\chi^2_{(K-1)}$	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	-19.50		6.45
0.050	-9.18	**-4.85**	3.79
0.100	-7.44		0.92
0.200	-6.51		-1.65

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

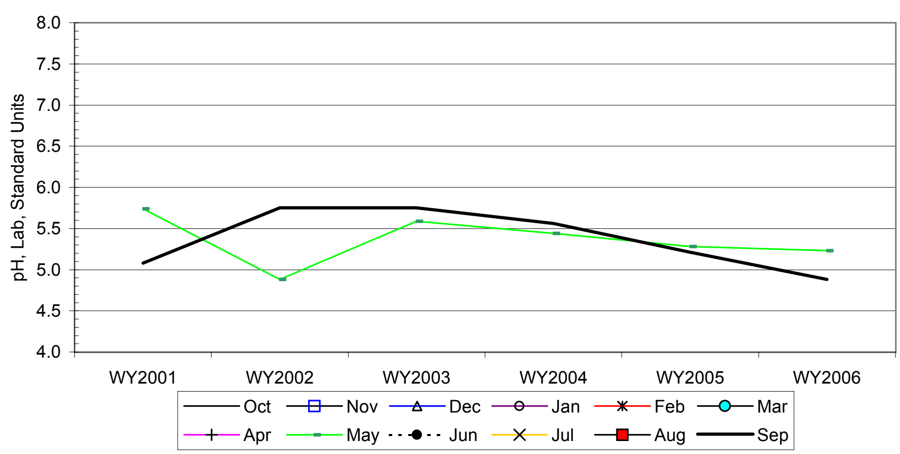
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								5.7				5.1
b	**WY2002**								4.9				5.8
c	**WY2003**								5.6				5.8
d	**WY2004**								5.4				5.6
e	**WY2005**								5.3				5.2
f	**WY2006**								5.2				4.9
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	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				0
	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	-6
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-1.32				-1.13
	Z^2_k								1.73				1.27

ΣZ_k= -2.44
ΣZ^2_k= 3.00
Z-bar=ΣZ_k/K= -1.22

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

Σn 12
ΣS_k -13

$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	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} -1.59	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	**p** **0.055**		**H_A** (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

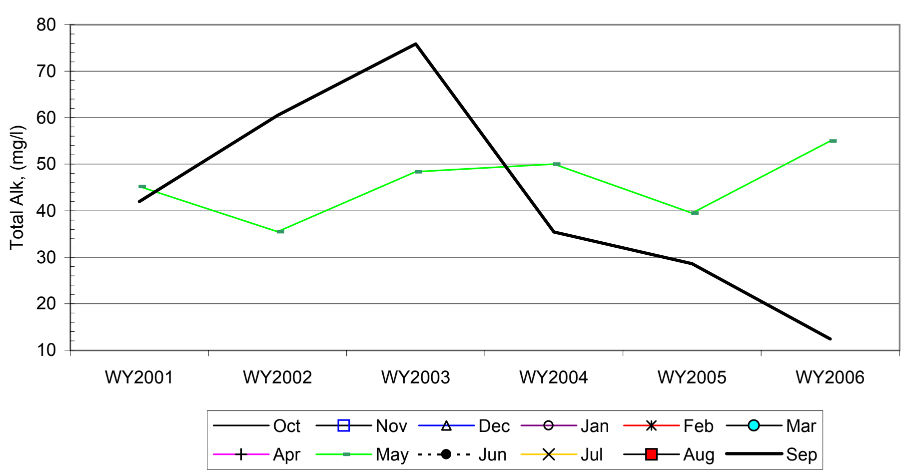
α	Lower Limit	Slope	Upper Limit
0.010	-0.26		0.07
0.050	-0.18	**-0.10**	-0.03
0.100	-0.16		-0.05
0.200	-0.15		-0.09

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	**WY2001**								45.2				42.0
b	**WY2002**								35.5				60.5
c	**WY2003**								48.4				75.9
d	**WY2004**								50.0				35.4
e	**WY2005**								39.5				28.6
f	**WY2006**								55.0				12.4
	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	-9
	Qm												
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								1.32				-1.69
	Z^2_k								1.73				2.86

ΣZ_k=	-0.38	Tie Extent	t_1	t_2	t_3	t_4	t_5	Σn	12
ΣZ^2_k=	4.59	Count	0	0	0	0	0	ΣS_k	-2
Z-bar=$\Sigma Z_k/K$=	-0.19								

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	4.52	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
p	**0.034**			$\chi^2_h<\chi^2_{(K-1)}$	**REJECT**
ΣVAR(S_k)	Z_{calc} -0.13	@α/2=2.5% Z=	1.96	H_0 (No trend)	NA
56.67	**p** **0.447**			H_A (± trend)	NA



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-11.90		4.30
0.050	-10.53	**-1.81**	2.01
0.100	-9.19		1.60
0.200	-6.07		1.60

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

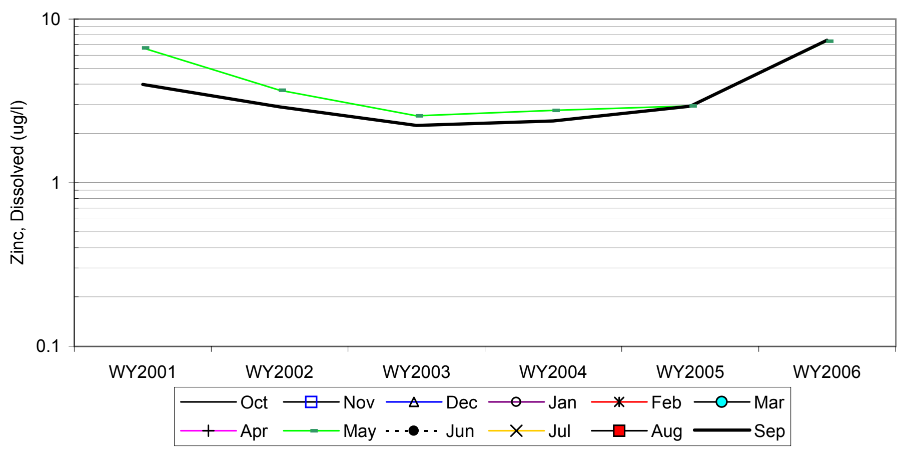
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								6.7				4.0
b	**WY2002**								3.7				2.9
c	**WY2003**								2.6				2.2
d	**WY2004**								2.8				2.4
e	**WY2005**								2.9				2.9
f	**WY2006**								7.3				7.4
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	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	3
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								0.19				0.56
	Z^2_k								0.04				0.32

ΣZ_k=	0.75
ΣZ^2_k=	0.35
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

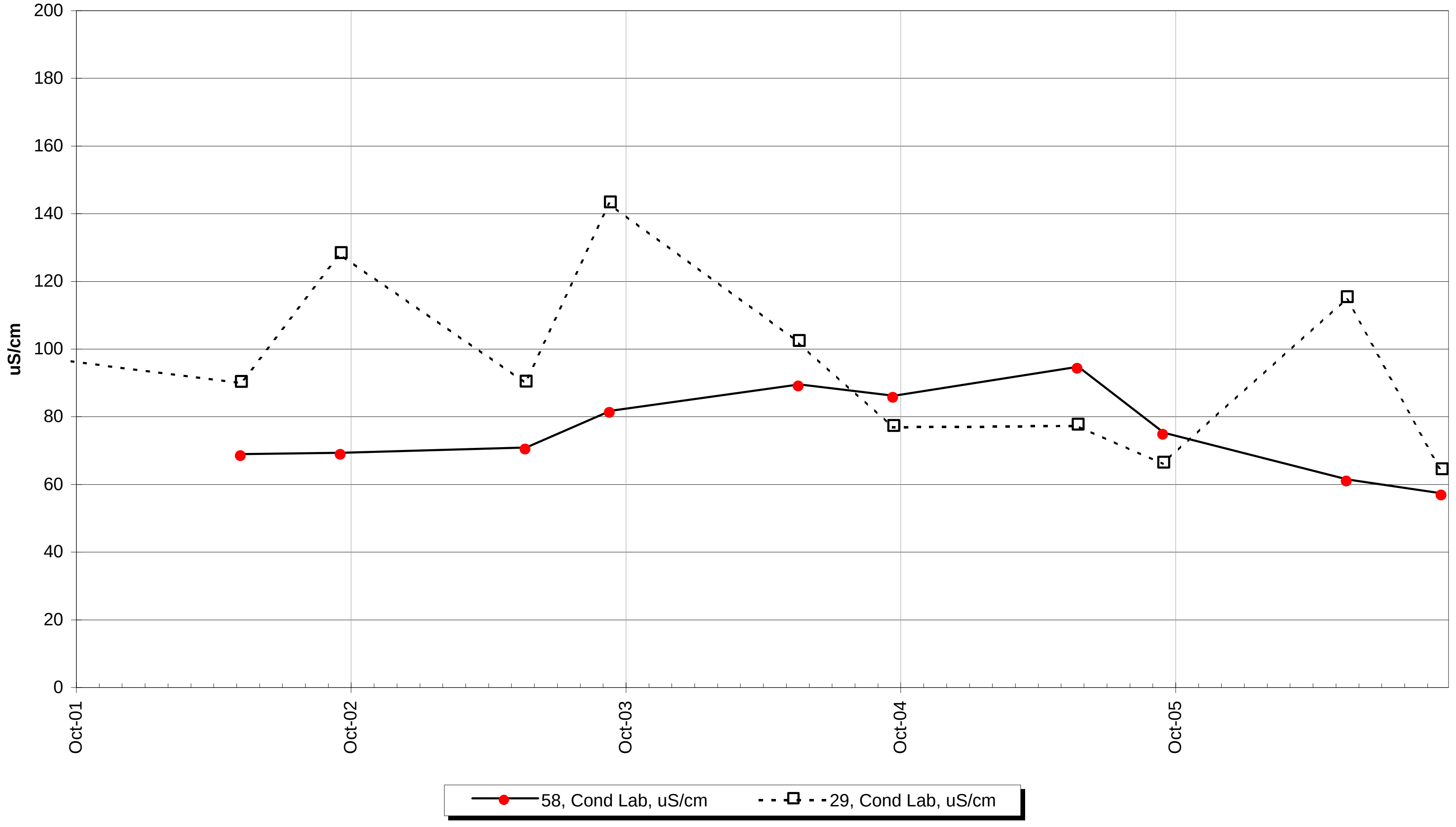
$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=	0.07	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity	
p	**0.790**			$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
$\Sigma VAR(S_k)$	Z_{calc} 0.40	@α/2=2.5% Z=	1.96	**H_0** (No trend)	ACCEPT
56.67	**p** **0.655**			**H_A** (± trend)	REJECT

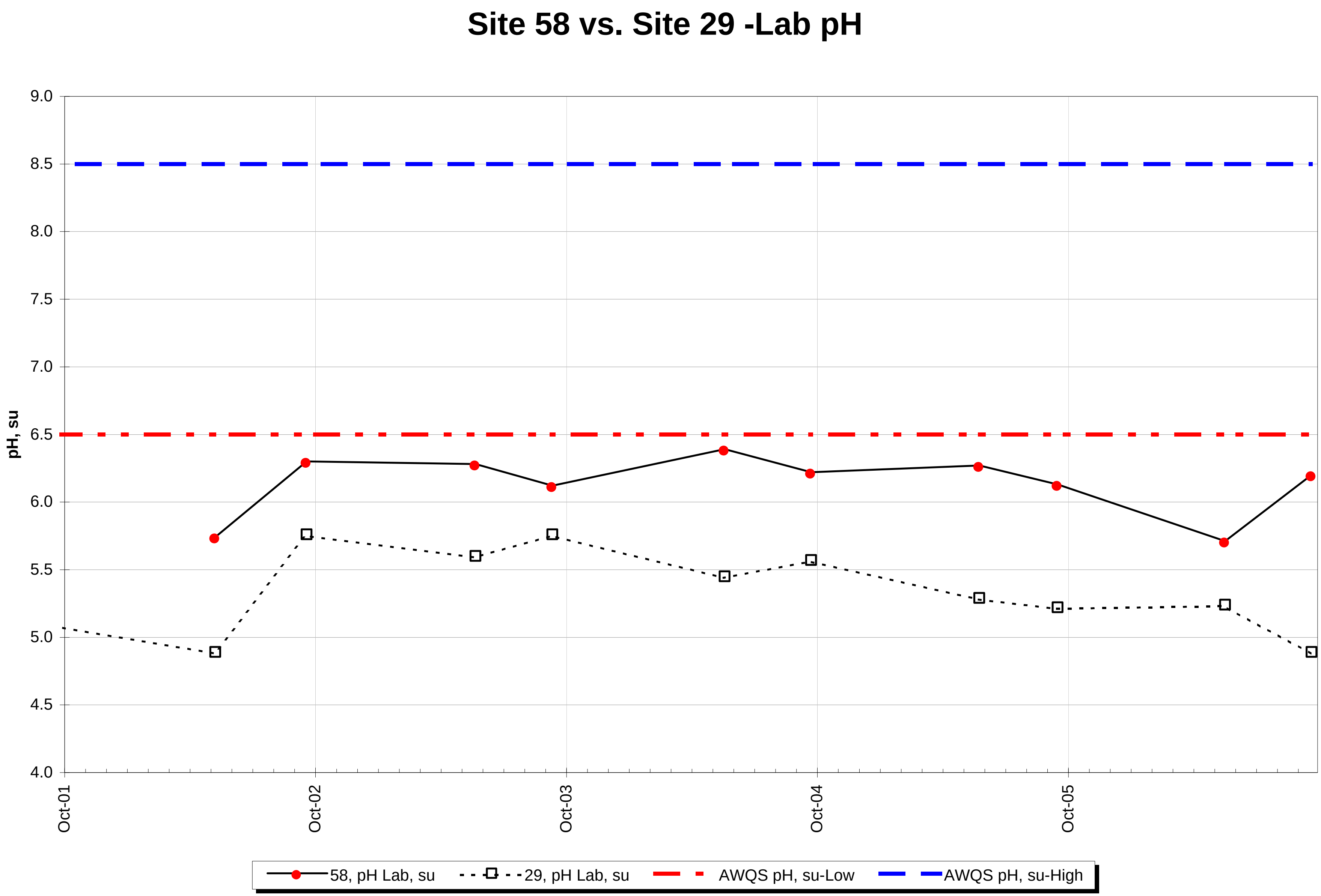


Seasonal-Kendall Slope Confidence Intervals

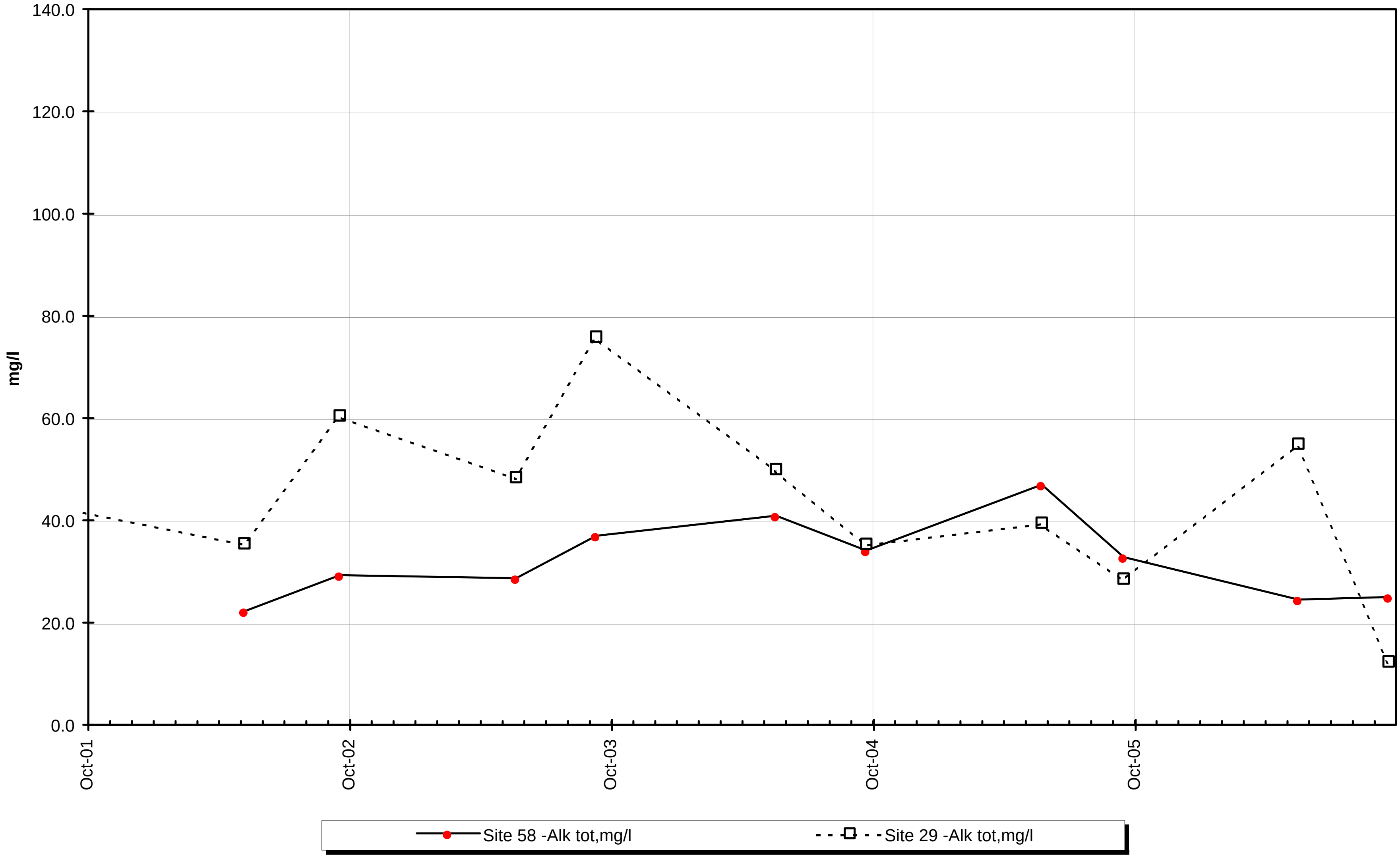
α	Lower Limit	Slope	Upper Limit
0.010	-0.92		1.07
0.050	-0.56	**0.14**	0.58
0.100	-0.43		0.32
0.200	-0.26		0.19

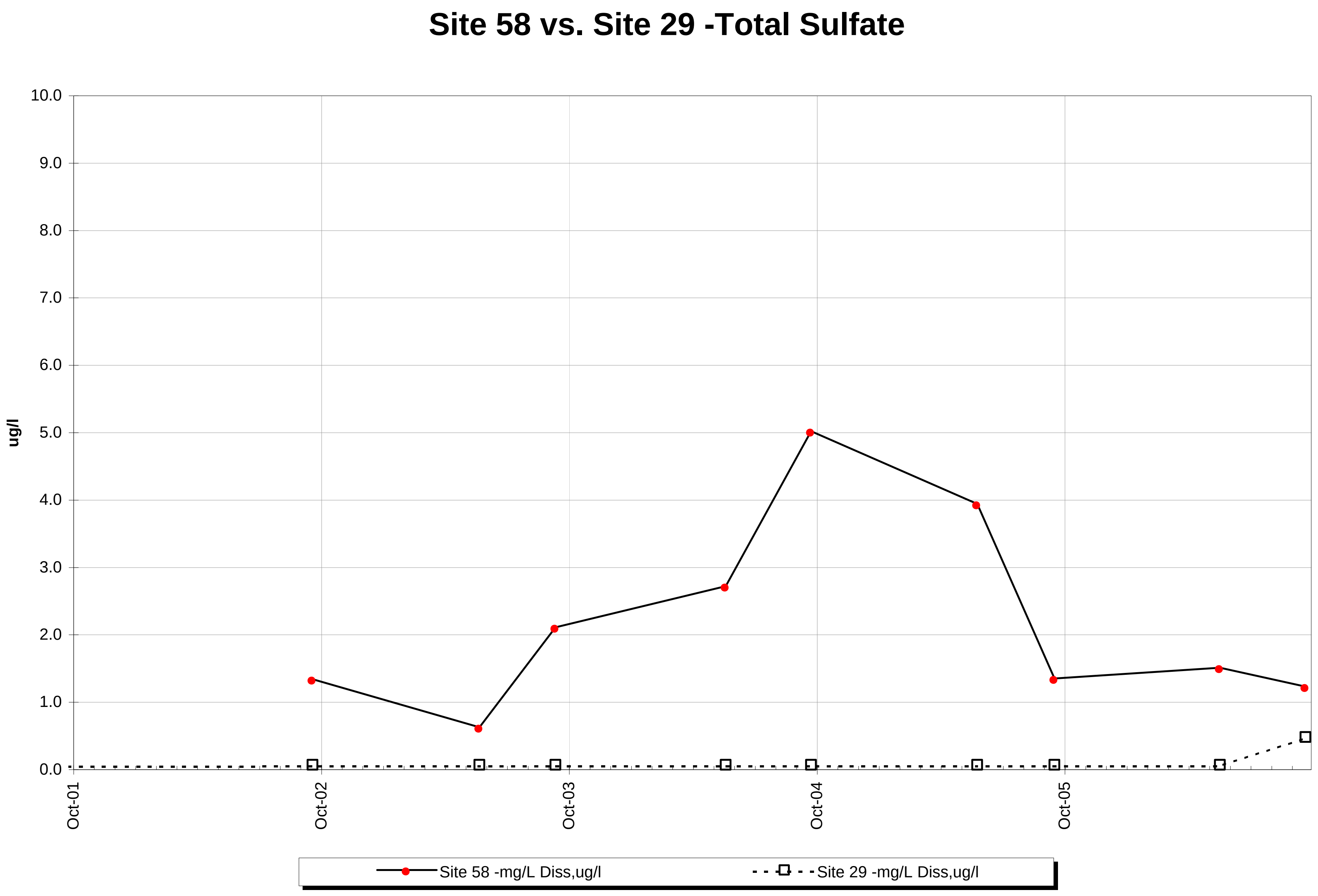
Site 58 vs Site 29 -Conductivity




Site 58 vs. 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-01
Oct-02
Oct-03
Oct-04
Oct-05
58, pH Lab, su
29, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

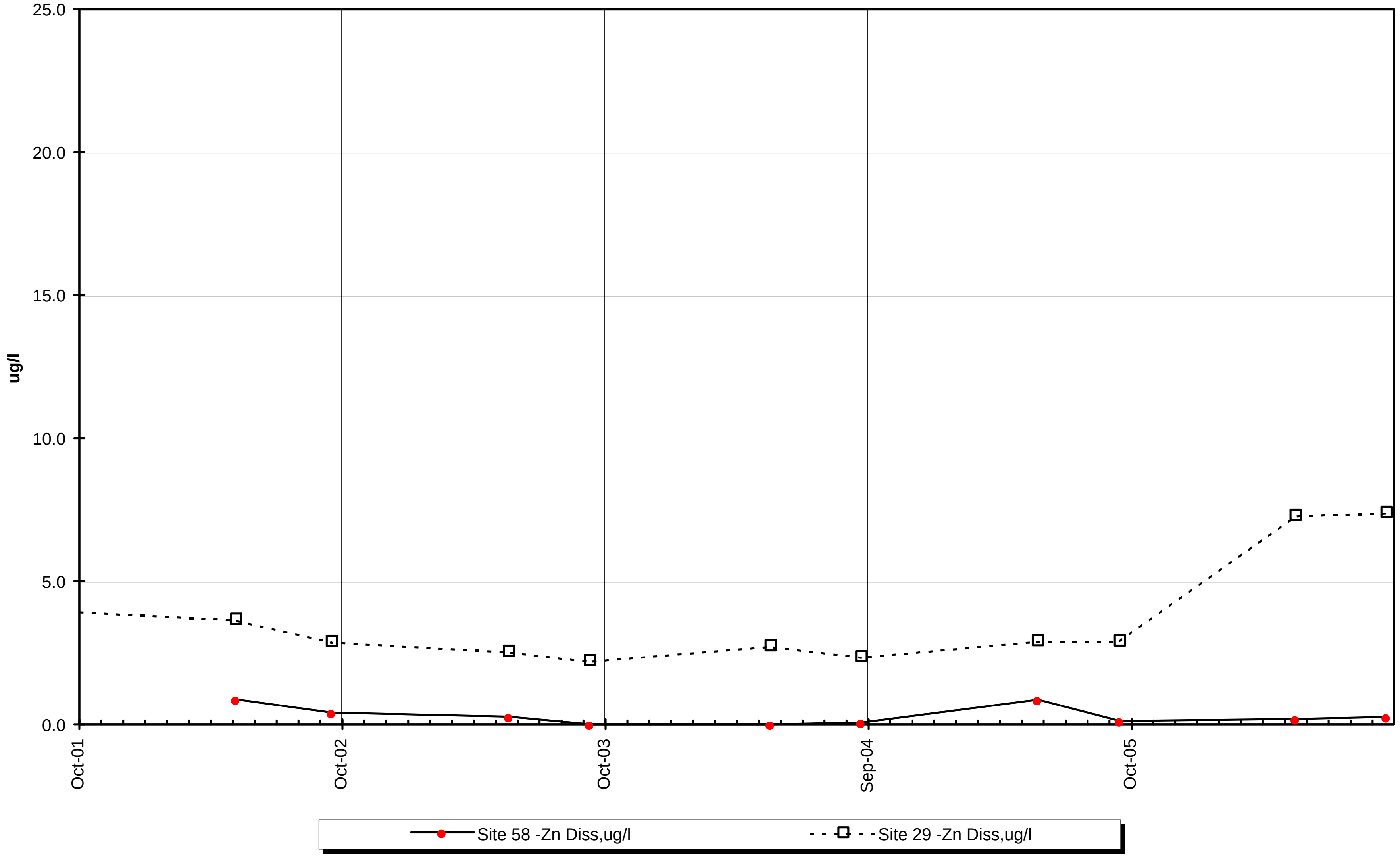
Site 58 vs. Site 29 -Total Alkalinity





Site 58 vs. Site 29 -Total Sulfate
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 58 -mg/L Diss,ug/l
Site 29 -mg/L Diss,ug/l

Site 58 vs. Site 29 -Dissolved Zinc



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 2006” report. The table includes all the required FWMP analyte 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 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-01 though Sept-06.				

The data for Water Year 2006 have been compared to the strictest fresh water quality criterion for each applicable analyte. Eight results exceeding these criteria have been

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
05/17/06	pH Lab, su	4.68		6.5 - 8.5	Aquatic Life
05/17/06	pH Field, su	5.4		6.5 - 8.5	Aquatic Life
09/20/06	pH Lab, su	4.67		6.5 - 8.5	Aquatic Life
09/20/06	pH Field, su	5.13		6.5 - 8.5	Aquatic Life
05/17/06	Total Alkalinity, mg/L	13.1		>20	Aquatic Life, chronic
09/20/06	Total Alkalinity, mg/L	2.0		>20	Aquatic Life, chronic
05/17/06	Lead, Dissolved ug/L	6.85	10.5	0.540	Aquatic Life, chronic
09/20/06	Lead, Dissolved ug/L	6.55	10.6	0.540	Aquatic Life, chronic

identified, as listed in the table above. Four of these datum are for pH, both lab and field, 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. Two exceedances are for total alkalinity in May-2006 and Sept-2006 for which Site 32 has a nine-year average value of 17 mg/l, which is below AWQS of 20 mg/l. The final two exceedances are for dissolved lead concentrations. The May-2006 sample had a dissolved lead concentration of 6.85 µg/l that exceeds the minimum hardness dependent AWQS standard of 0.541 ug/l. The September-2005 sample had a dissolved lead concentration of 6.55 µg/l that exceeds the hardness dependent AWQS standard of 0.541 ug/l. Due to the low hardness for this site 20 of the past 21 samples have returned lead values higher than the AWQS. The current year’s samples are the two highest values since the inception of a lower MDL for lead determinations that occurred in June-1998. KGCMC recognizes that the elevated dissolved lead levels for all the shallow tailings area wells (i.e. 28, 29, and 32) are anomalous and above wells with similar peat completions locate on the A-Road away from any mine related activities, and in a separate wetlands area. The most probable mechanism for dispersal of the lead away from the tailings pile would be as fugitive tailings dust transported during cold, descanting winds during winter or due to dust induced by truck traffic during dry summer conditions. During the 2007 water year KGCMC will undertake a series of studies to quantify conditions and magnitude of the release of tailings due to fugitive dust and report those findings in the annual 2007 FWMP report.

Site 32-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	0.25	-		
pH, Lab	6	0.07	-		
Alkalinity, Total	6	0.40	-		
Zinc, Dissolved	6	0.66	+		

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

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 lead which as discussed above shows a sharp increase for the two samples taken during the 2006 water year. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Kendall analyses are presented in detail on the pages following this interpretive section. The adjacent table summarizes the results on the data collected between May-01 and Sep-06 (WY2001-WY2006). No significant trends are identified.

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 9.6 µg/l, which is elevated with respect to Site 58 and the other shallow wells completed into peat (i.e. Site 27 and Site 29). The previously discussed mechanisms that may be elevating the dissolved lead levels would also be expected to increase dissolved zinc as well. In addition the lower pH at Site 32 with respect to the other shallow wells may exacerbate the elevated zinc concentration found there due to higher zinc solubility at a lower pH.

Table of Results for Water Year 2006

Site 32 "MW-5S"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							7.7	NOT SCHEDULED FOR SAMPLING			8.0	7.9
Conductivity-Field(µmho)								70				70	70
Conductivity-Lab (µmho)								57				57	57
pH Lab (standard units)								4.68				4.67	4.68
pH Field (standard units)								5.40				5.13	5.27
Total Alkalinity (mg/L)								13.1				2.0 J	7.6
Total Sulfate (mg/L)								<0.1				0.1 J	0.1
Hardness (mg/L)								10.5				10.6	10.6
Dissolved As (ug/L)								6.010				5.820	5.915
Dissolved Ba (ug/L)								25.9				30.3	28.1
Dissolved Cd (ug/L)								0.009 J				0.082	0.045
Dissolved Cr (ug/L)								6.820				1.550	4.185
Dissolved Cu (ug/L)								0.675				1.460	1.068
Dissolved Pb (ug/L)								6.850				6.550	6.700
Dissolved Ni (ug/L)								3.930				4.190	4.060
Dissolved Ag (ug/L)								0.019				<0.003	0.010
Dissolved Zn (ug/L)								10.80				15.30	13.05
Dissolved Se (ug/L)								0.144 J				0.343 J	0.244
Dissolved Hg (ug/L)								0.001210 UJ				0.001650 U	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

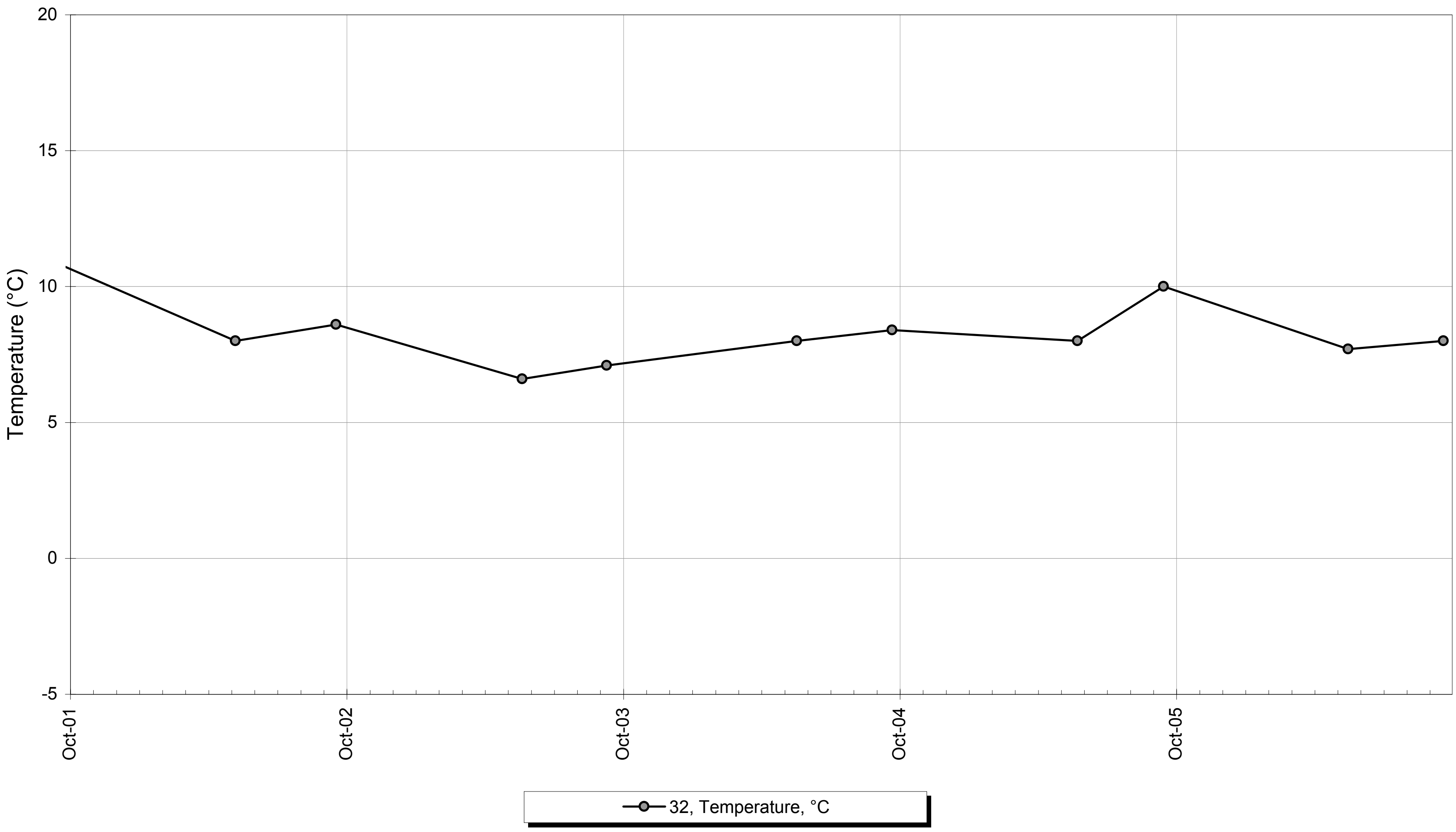
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

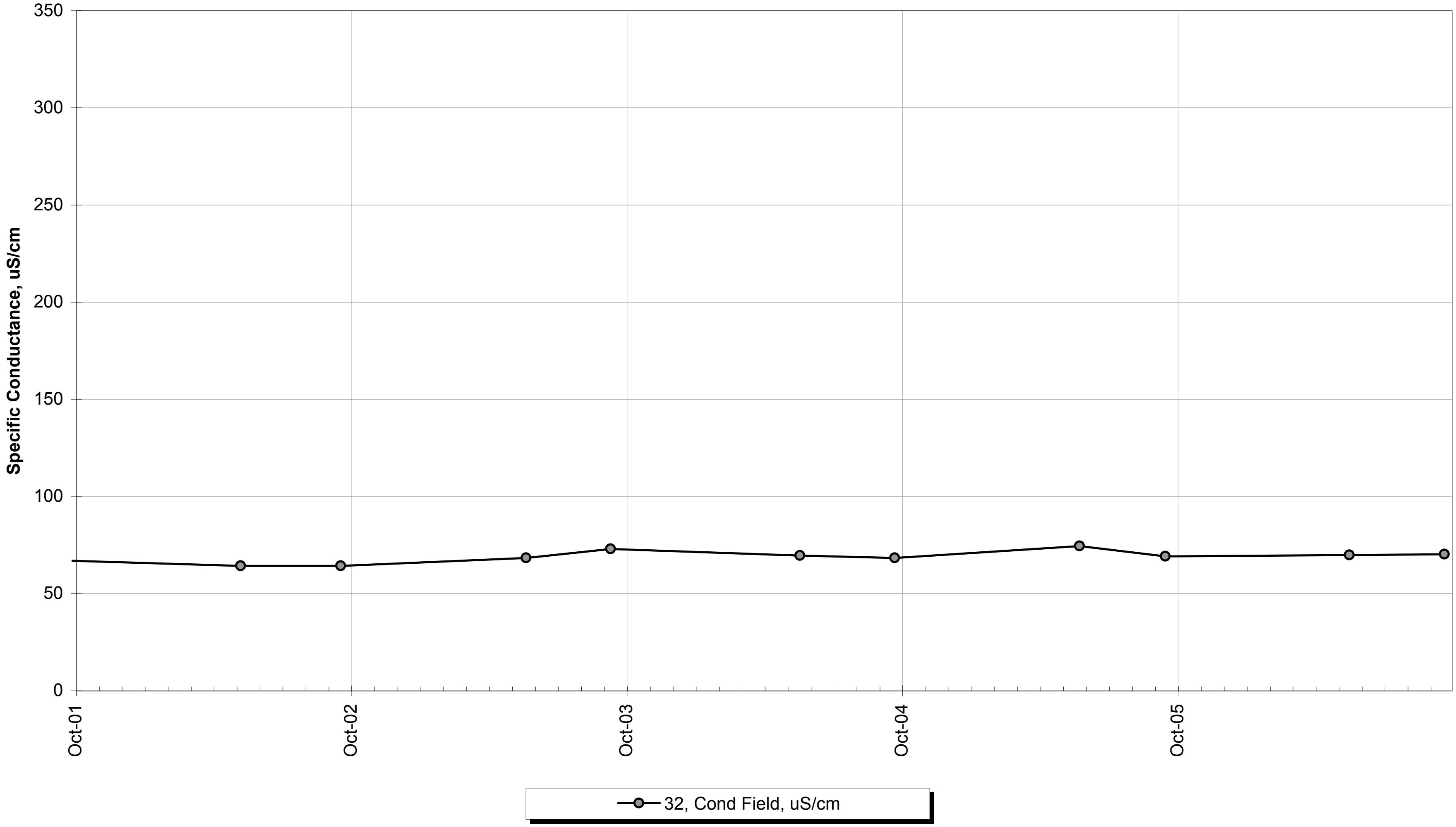
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
32	05/17/2006	12:39:00 PM				
			Cd Diss, ug/l	0.00888	J	Below Quantitative Range
			Se Diss, ug/l	0.144	J	Below Quantitative Range
			Hg Diss, ug/l	0.00121	UJ	Field Blank Contamination, Co
32	09/20/2006	11:40:00 AM				
			Alk Tot, mg/l	2	J	Below Quantitative Range
			SO4 Tot, mg/l	0.139	J	Below Quantitative Range
			Se Diss, ug/l	0.343	J	Below Quantitative Range
			Hg Diss, ug/l	0.00165	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

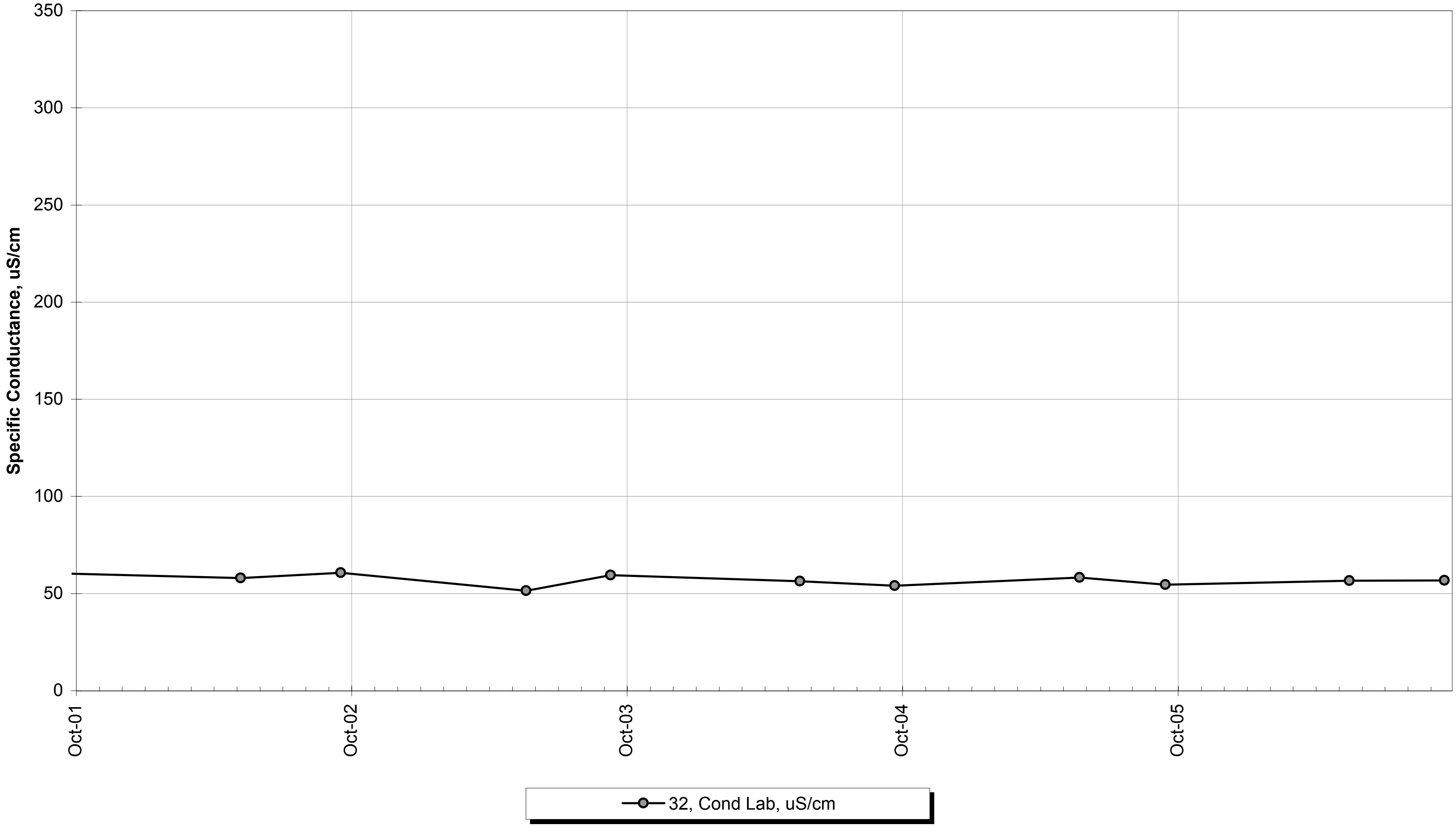
Site 32 -Water Temperature

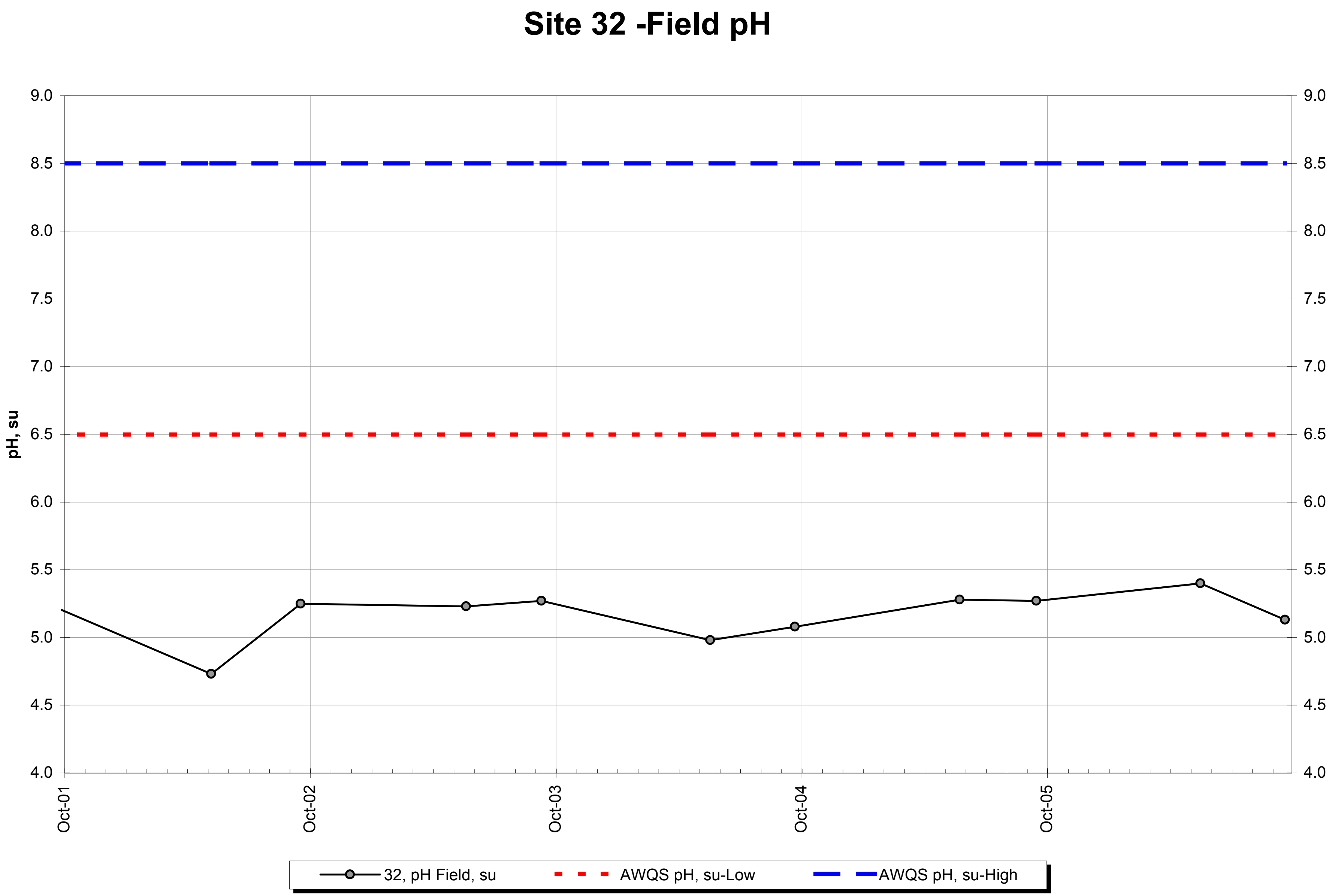


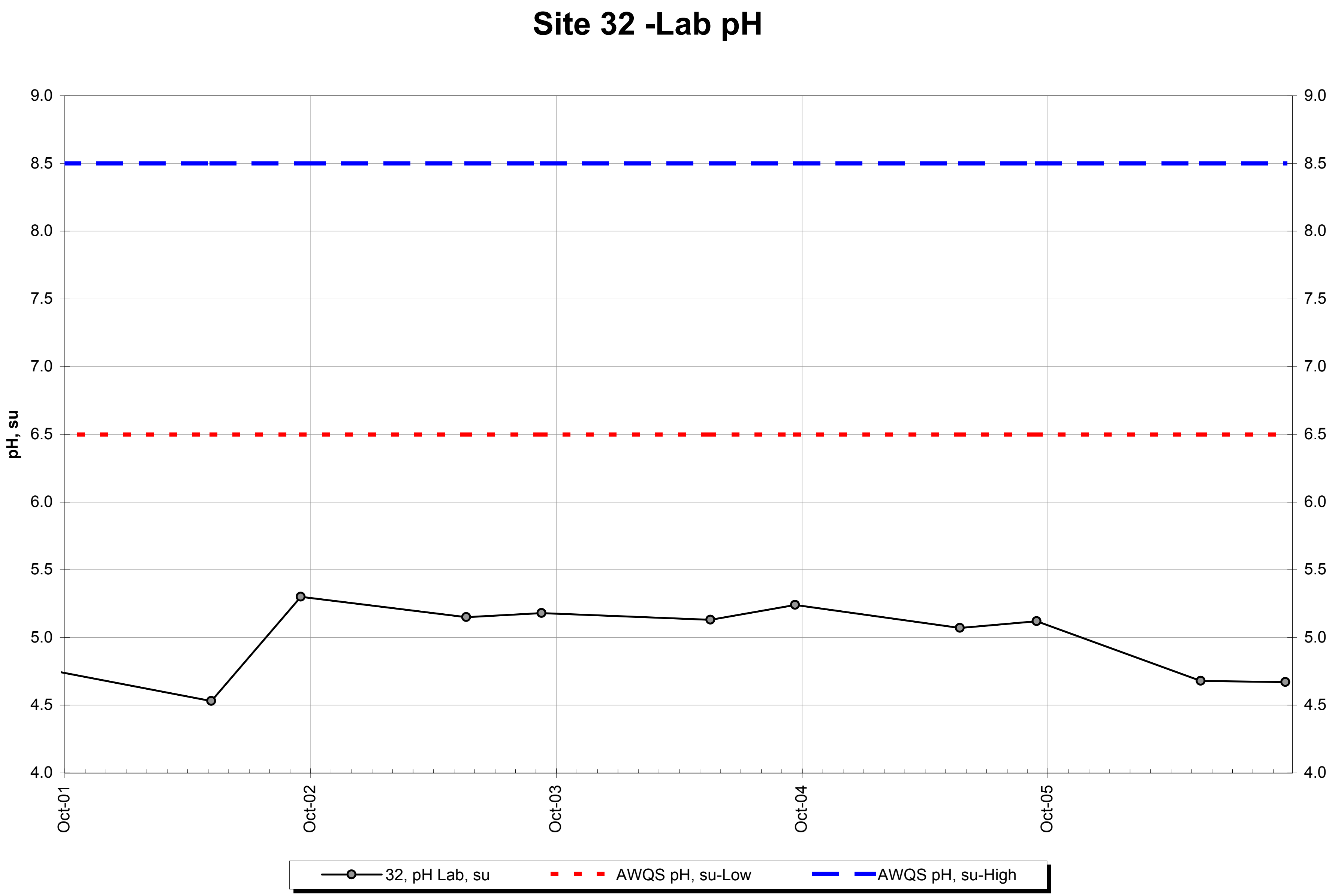
Site 32 -Conductivity-Field



Site 32 -Conductivity-Lab

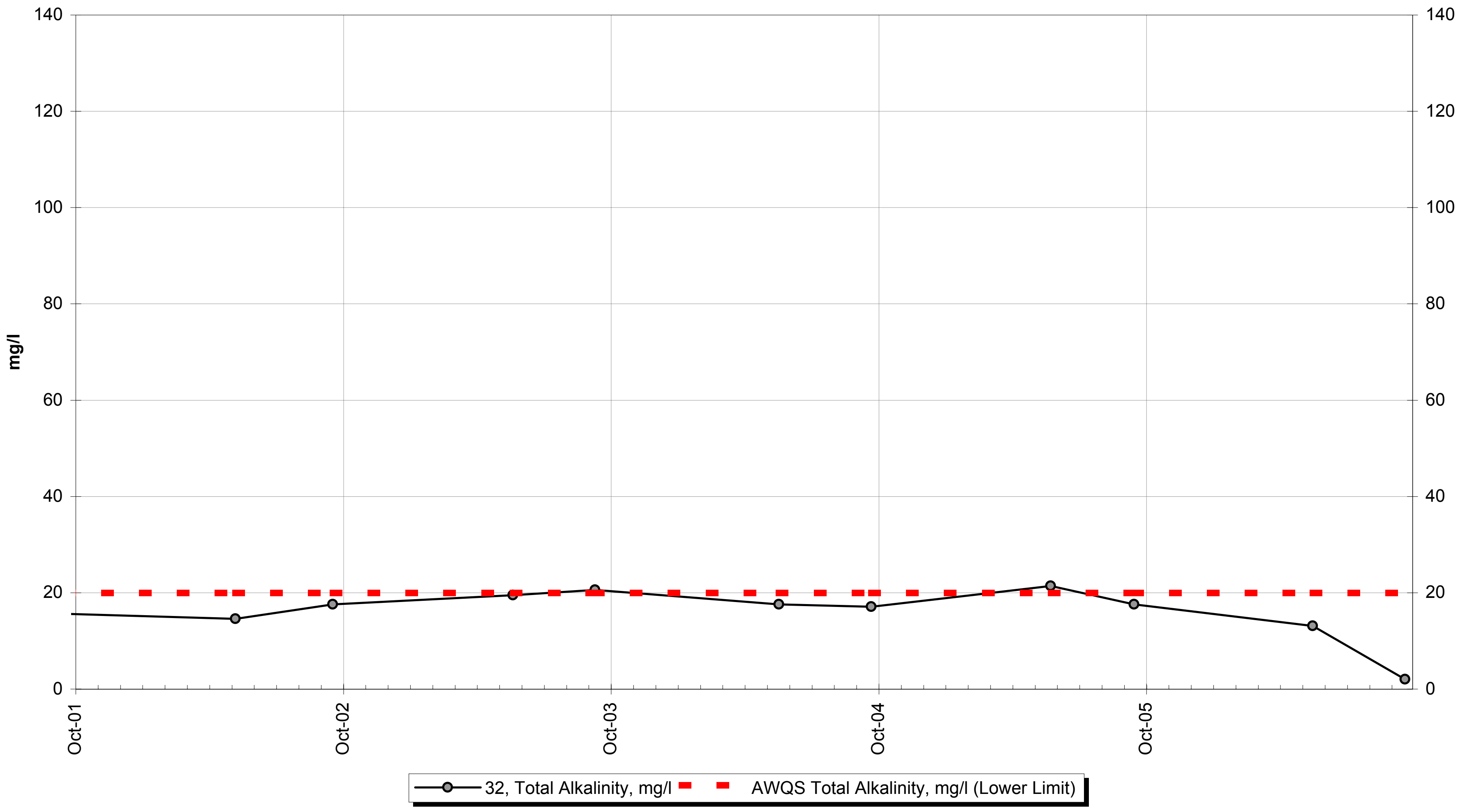



Site 32 -Field pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

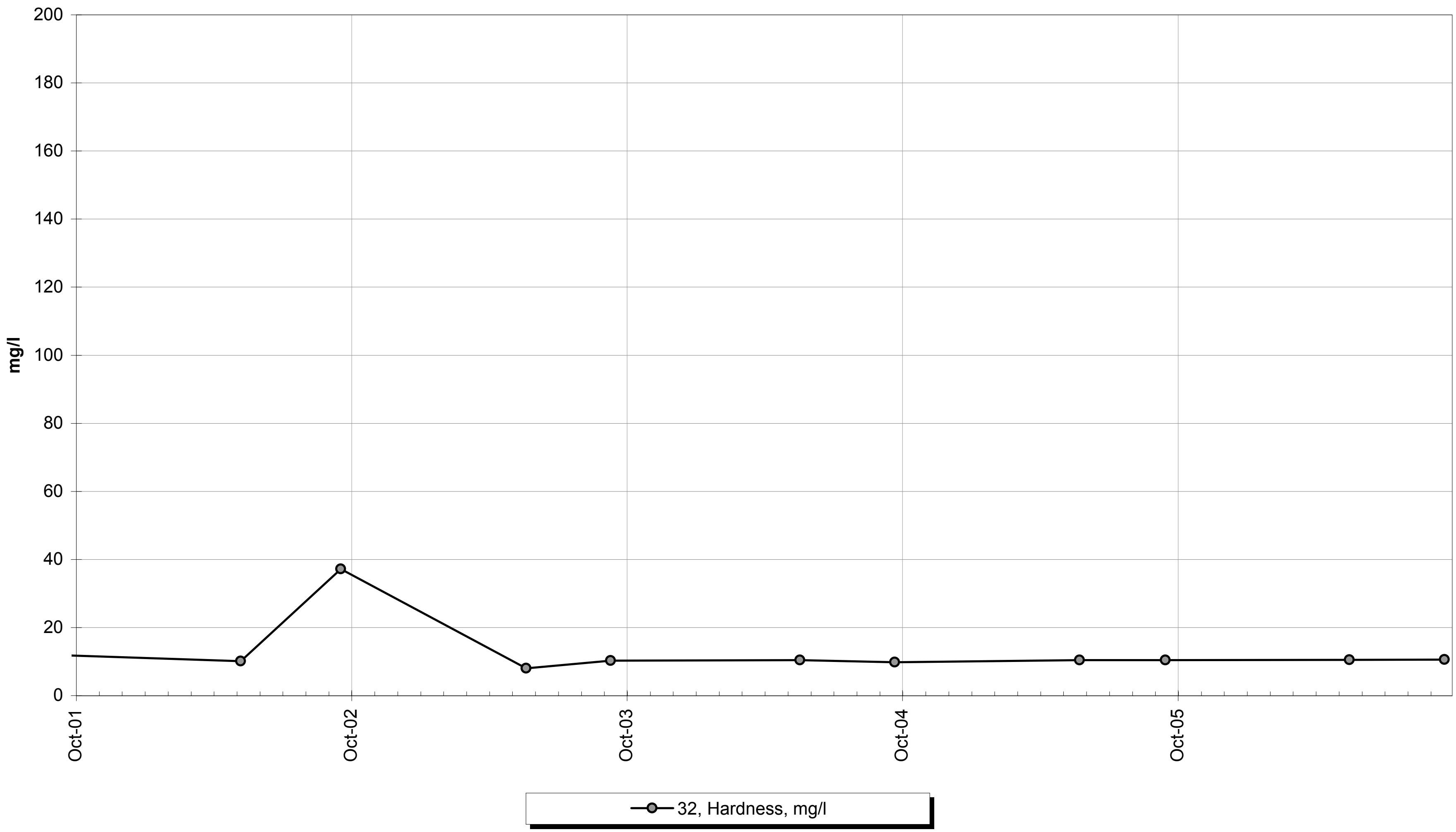


Site 32 -Lab pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

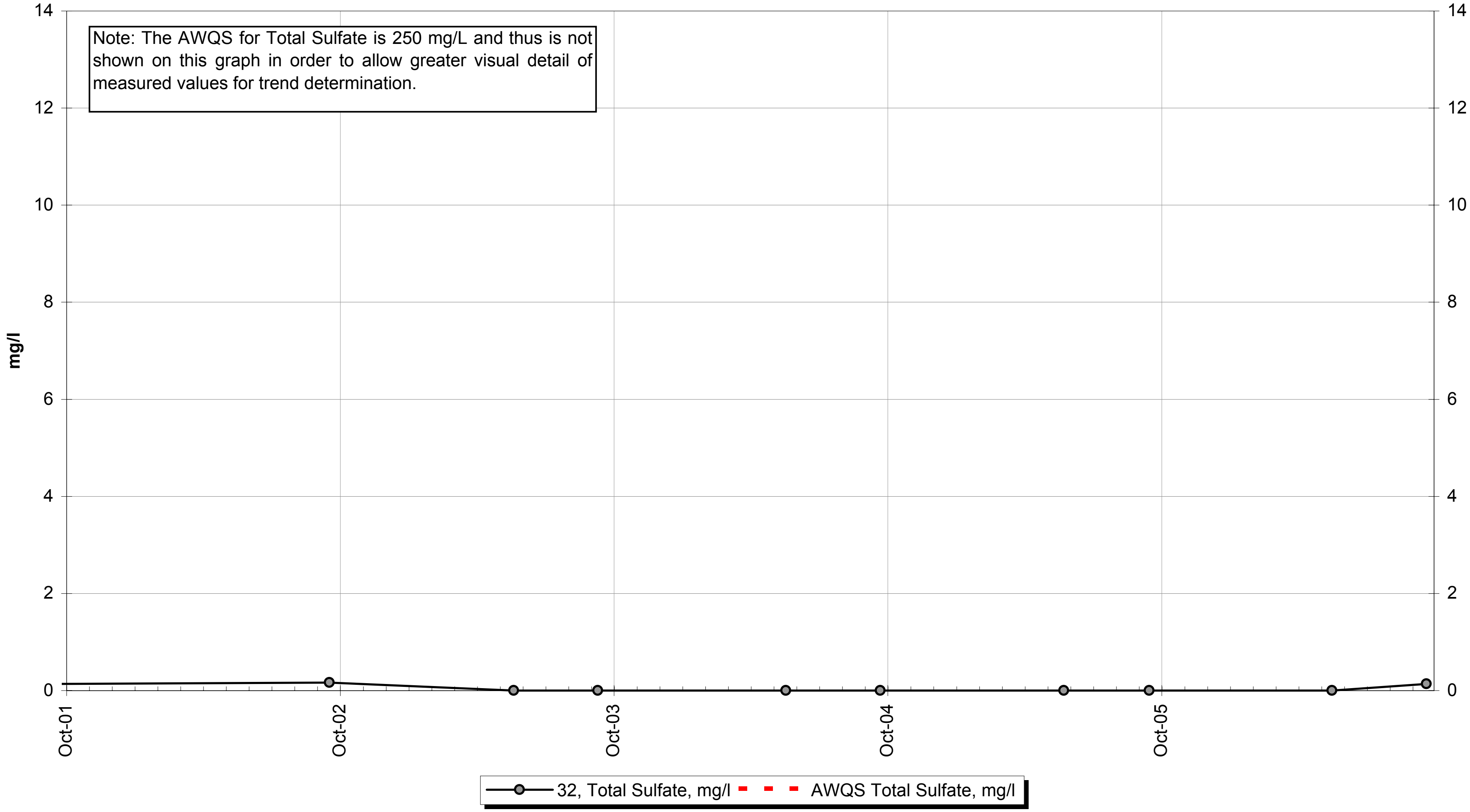
Site 32 -Total Alkalinity

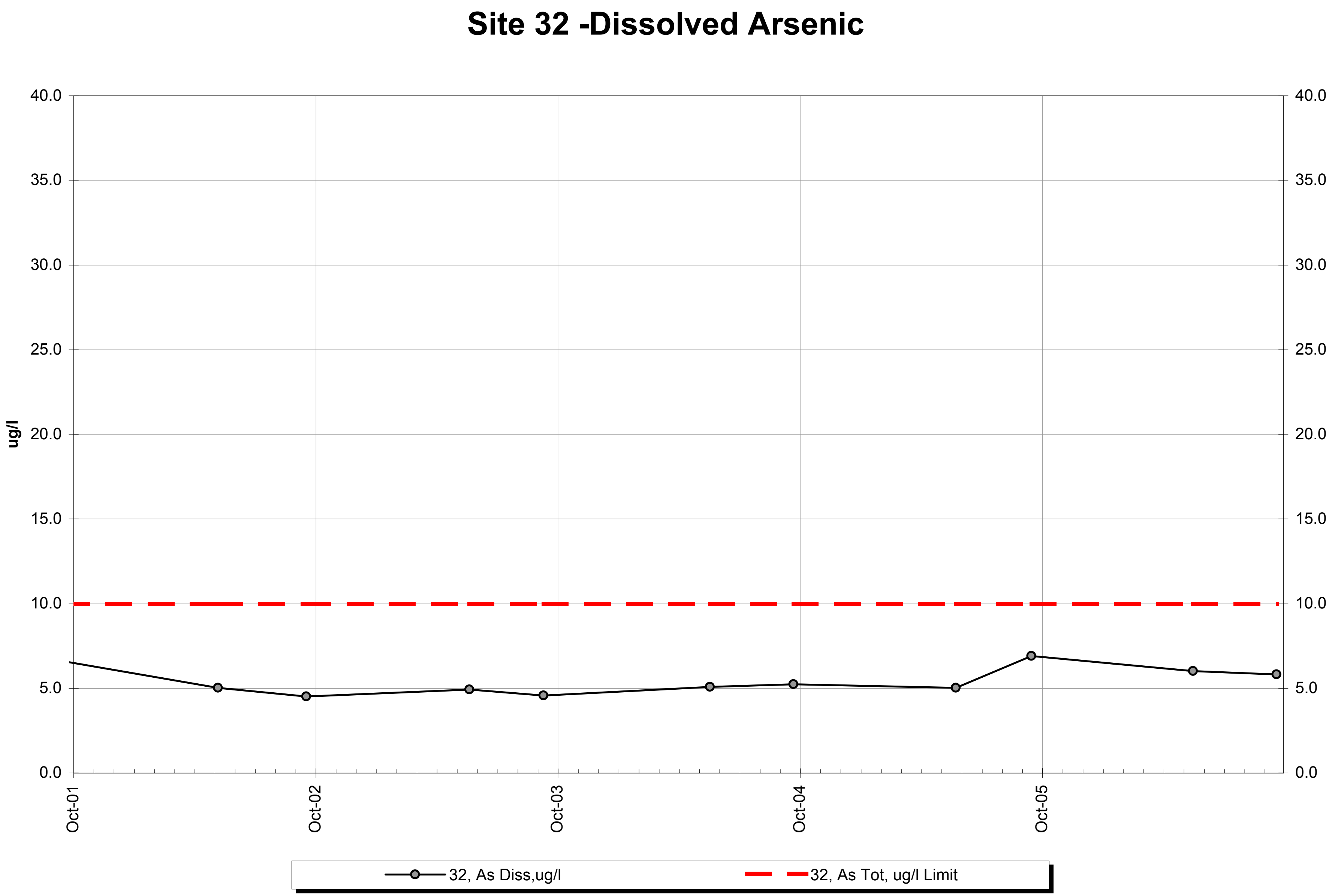


Site 32 -Hardness

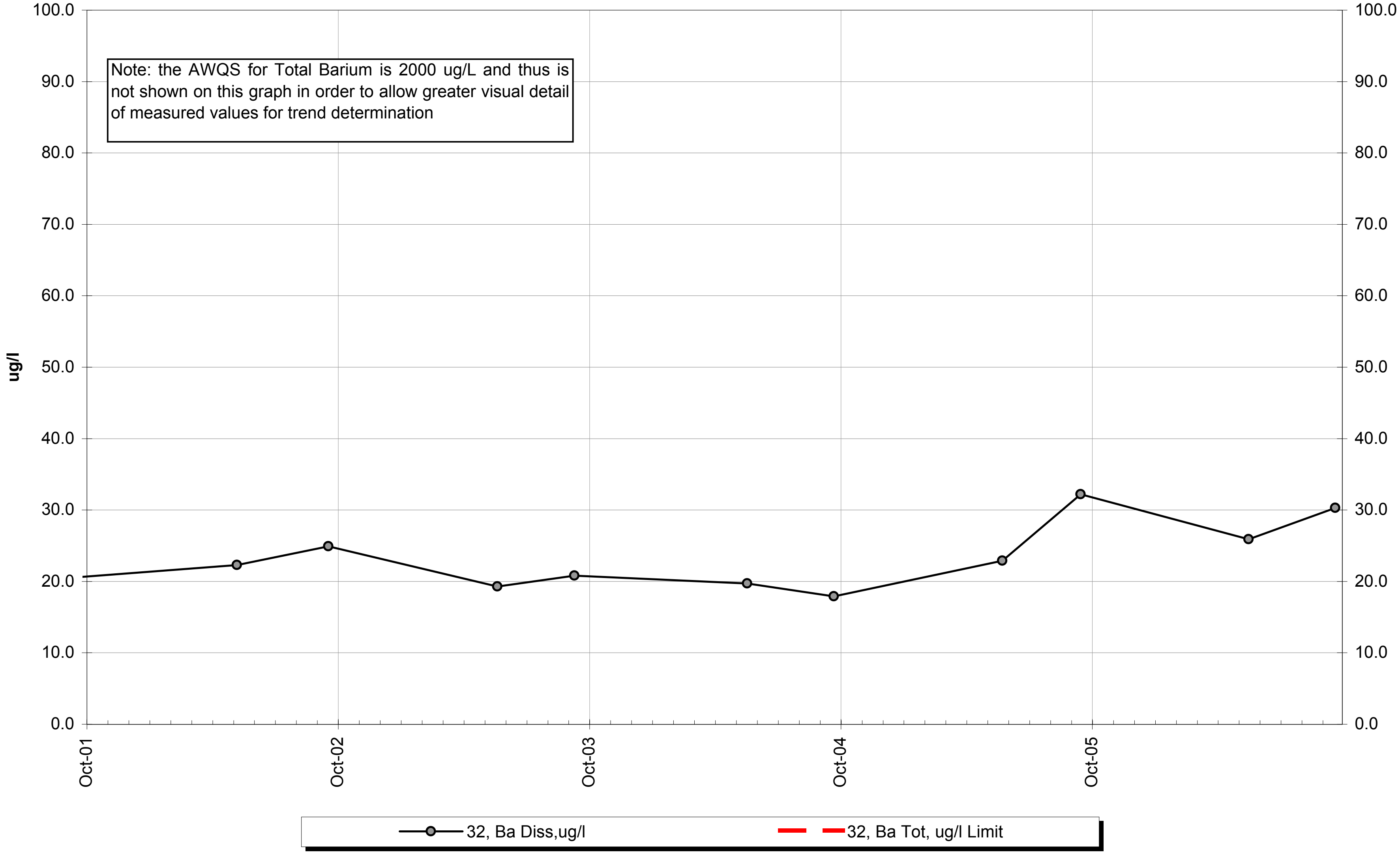


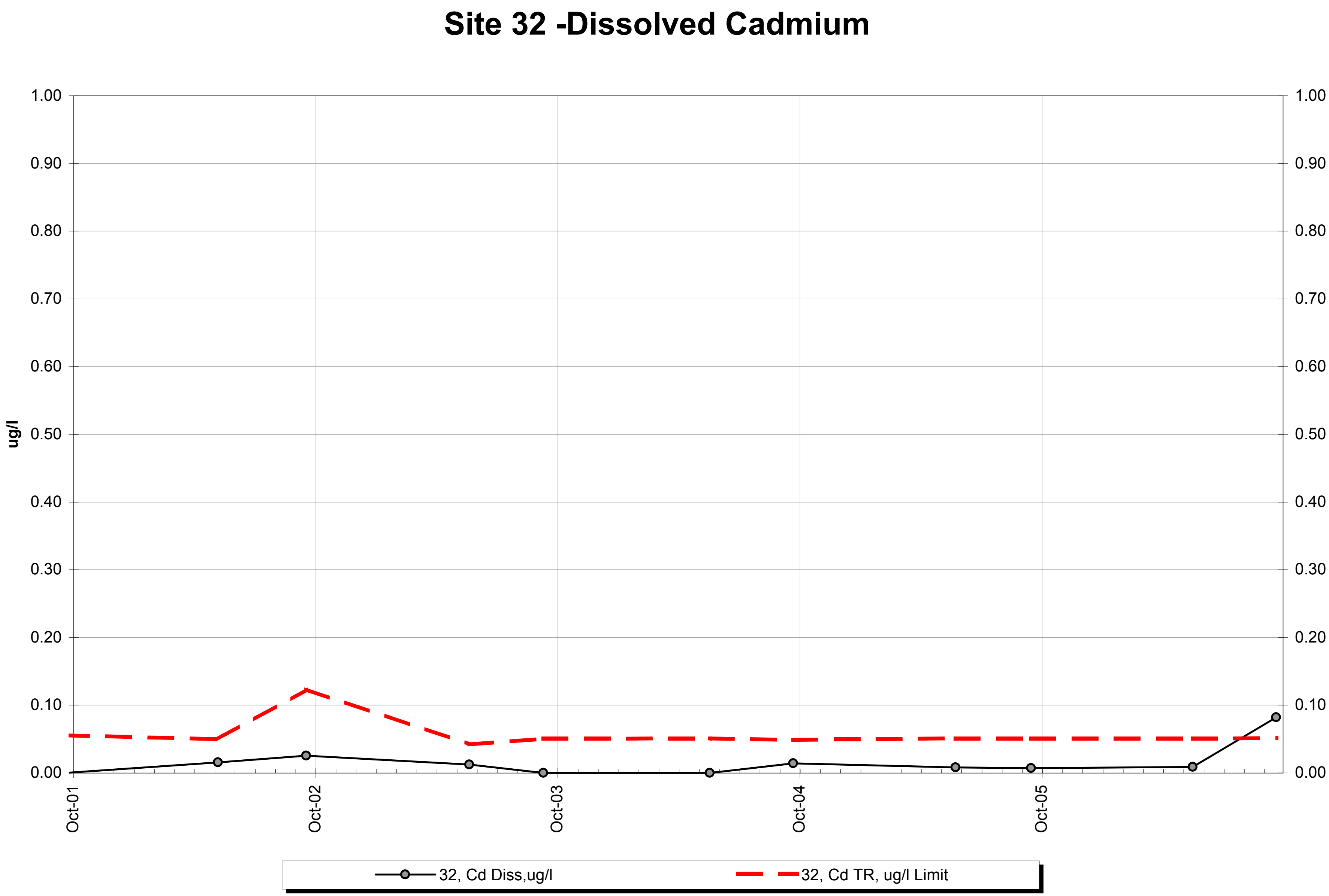
Site 32 -Total Sulfate




Site 32 -Dissolved Arsenic
ug/l
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, As Diss,ug/l
32, As Tot, ug/l Limit

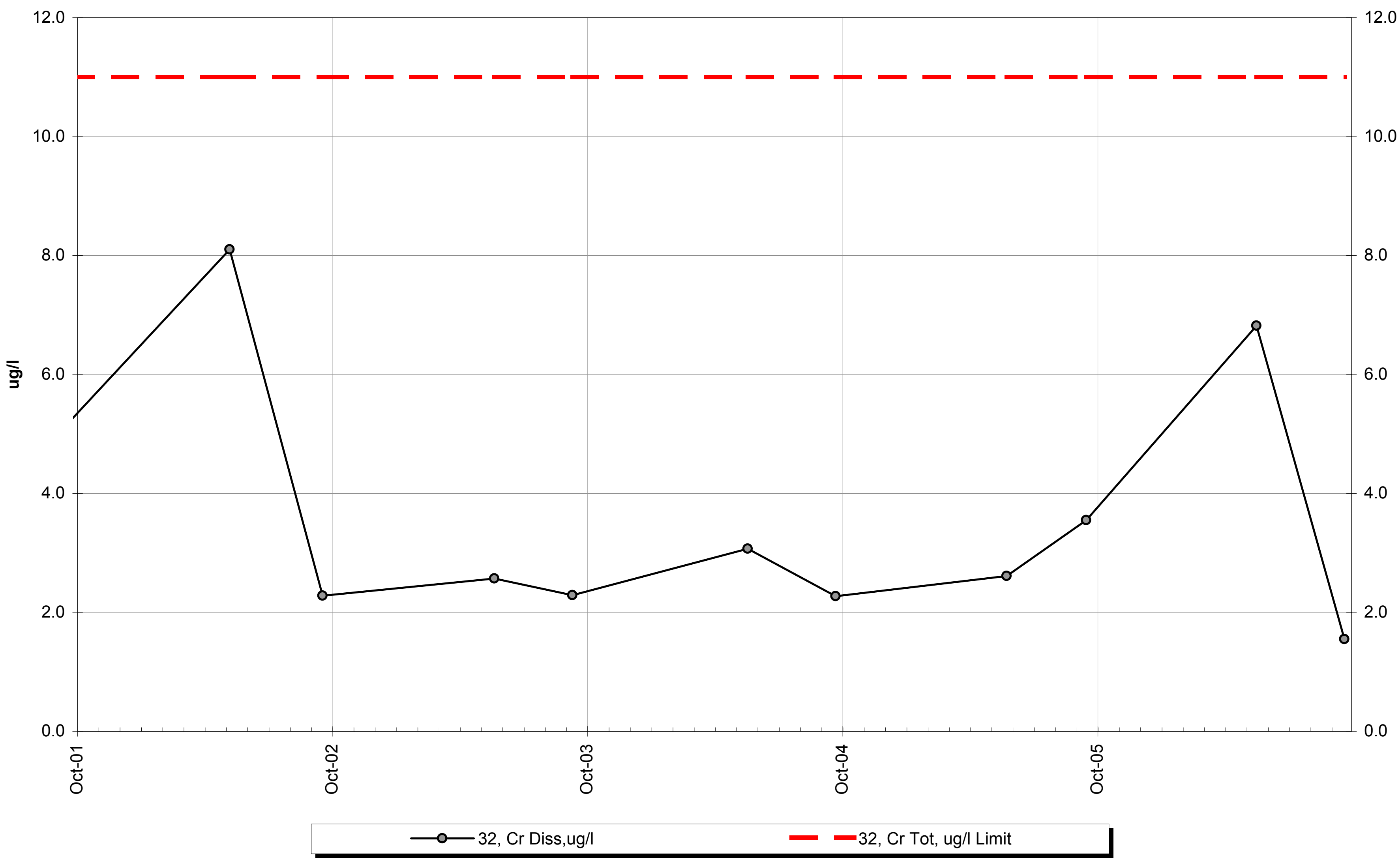
Site 32 -Dissolved Barium



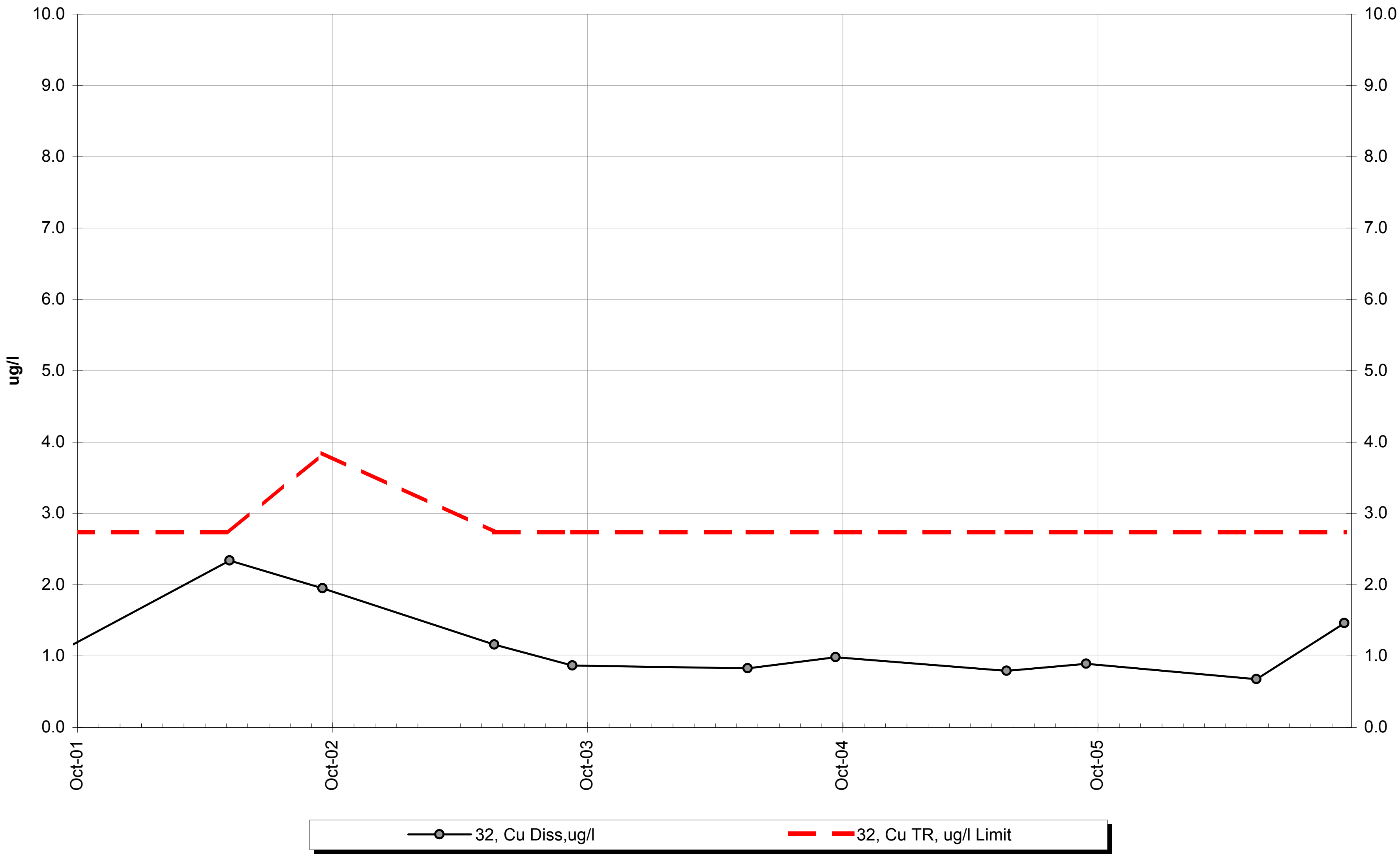


Site 32 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, Cd Diss,ug/l
32, Cd TR, ug/l Limit

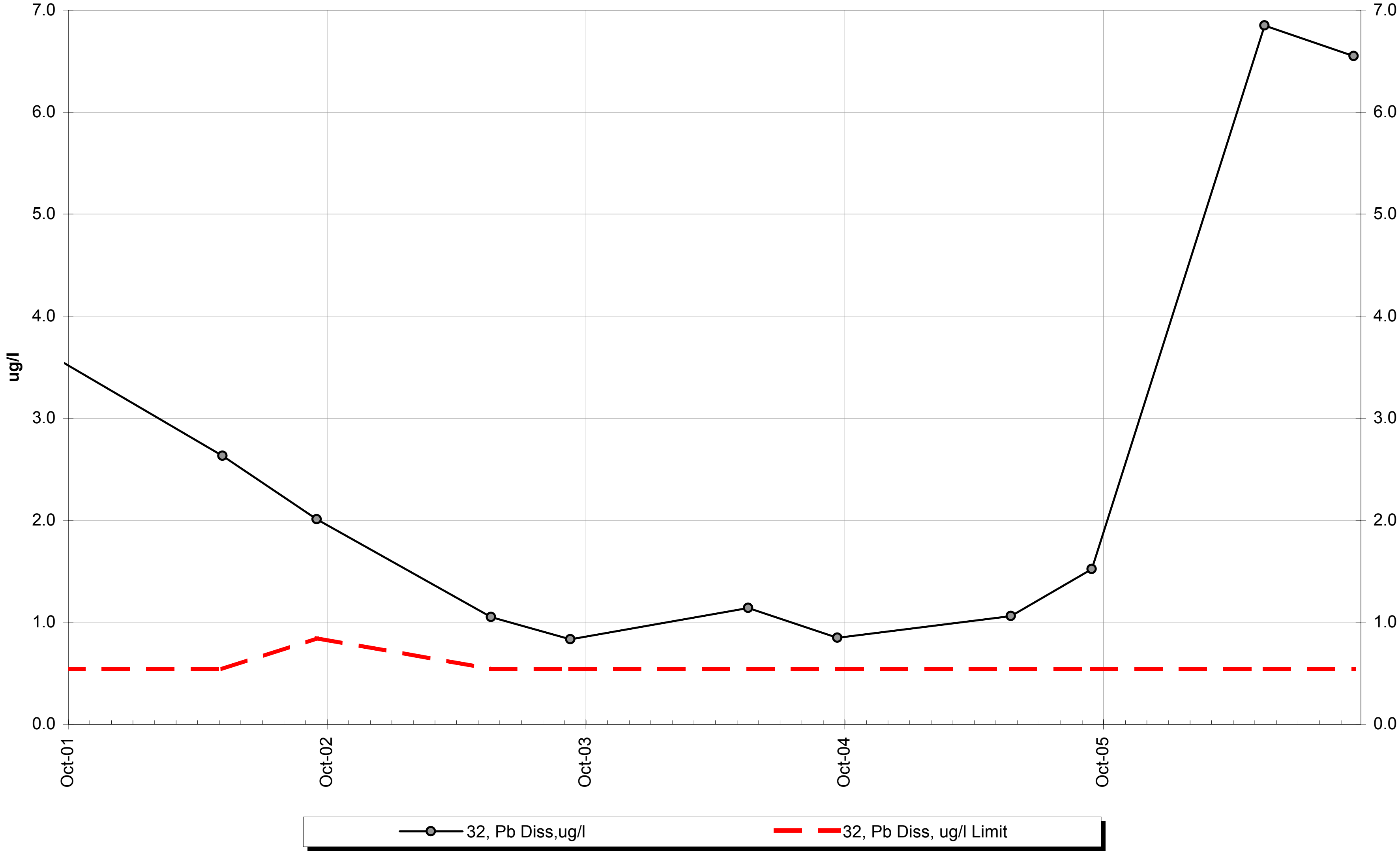
Site 32 -Dissolved Chromium



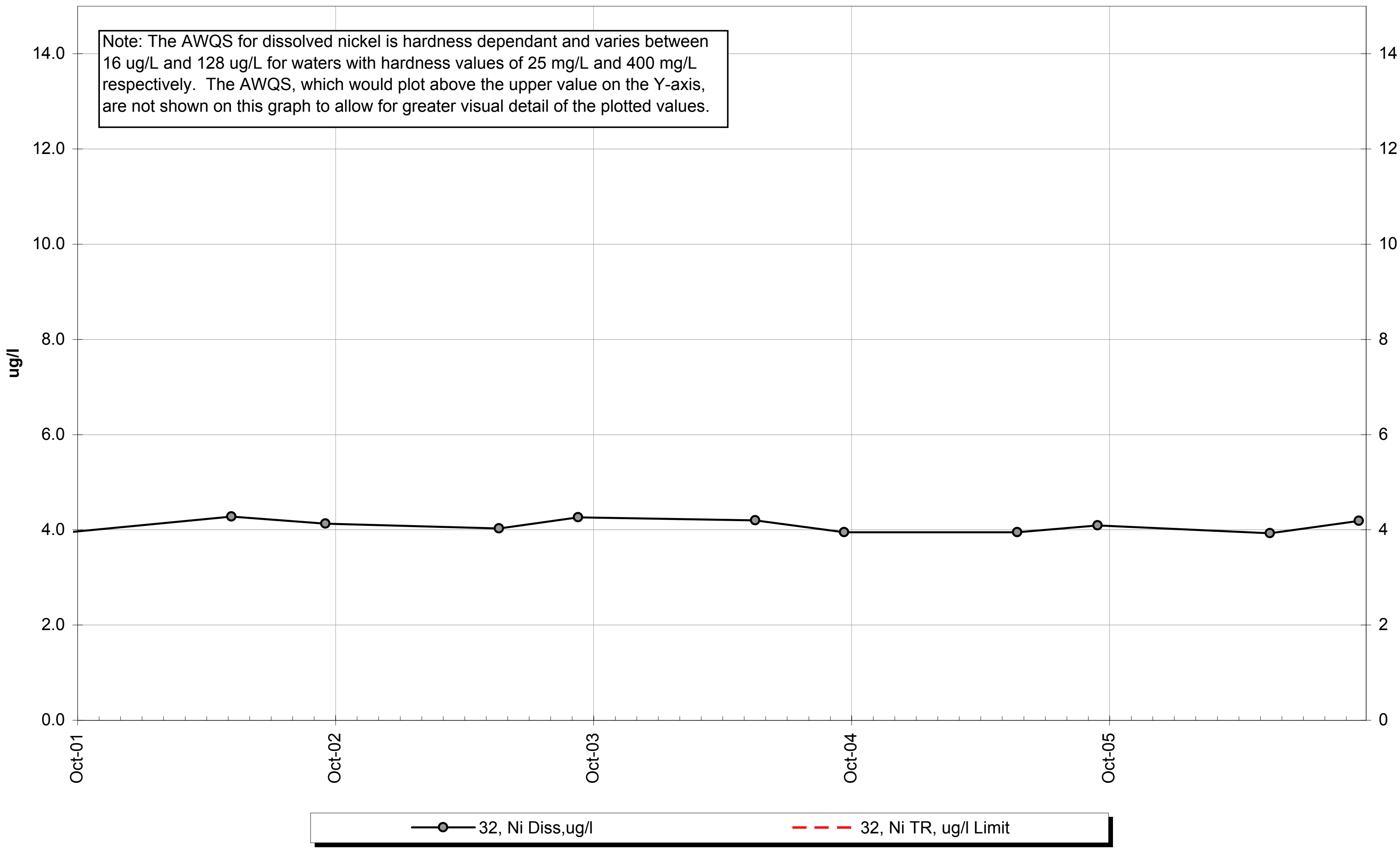
Site 32 -Dissolved Copper

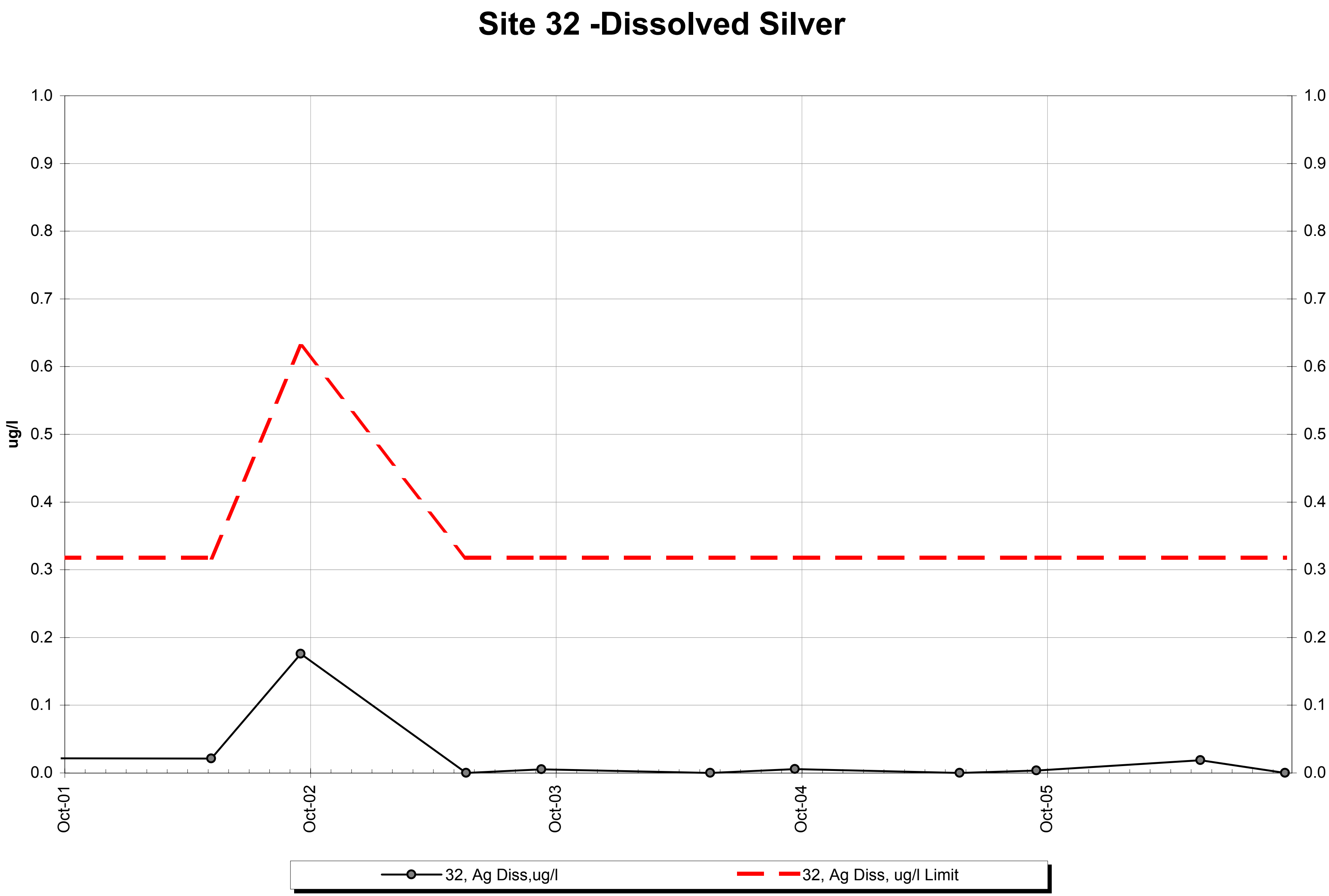


Site 32 -Dissolved Lead



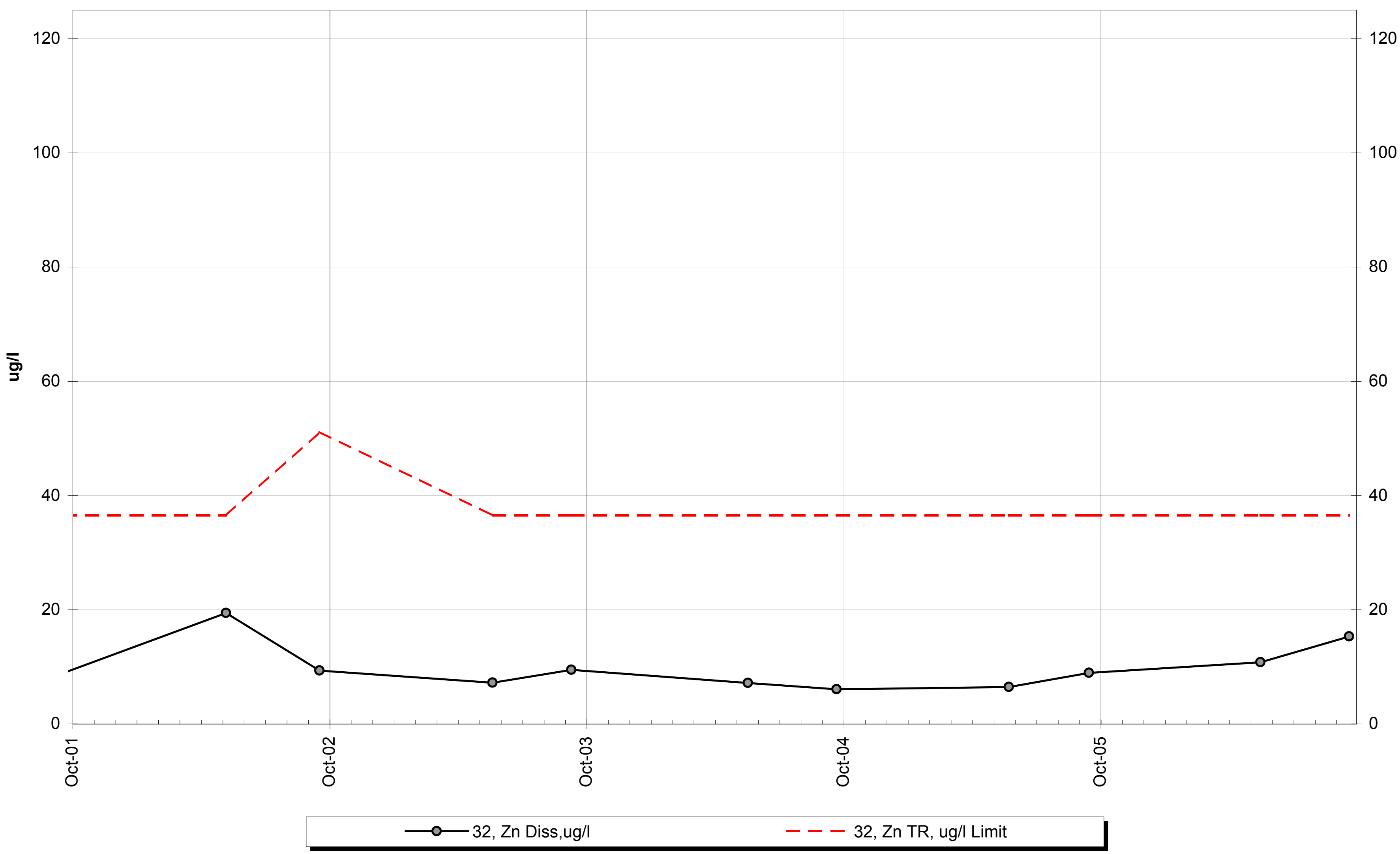
Site 32 -Dissolved Nickel

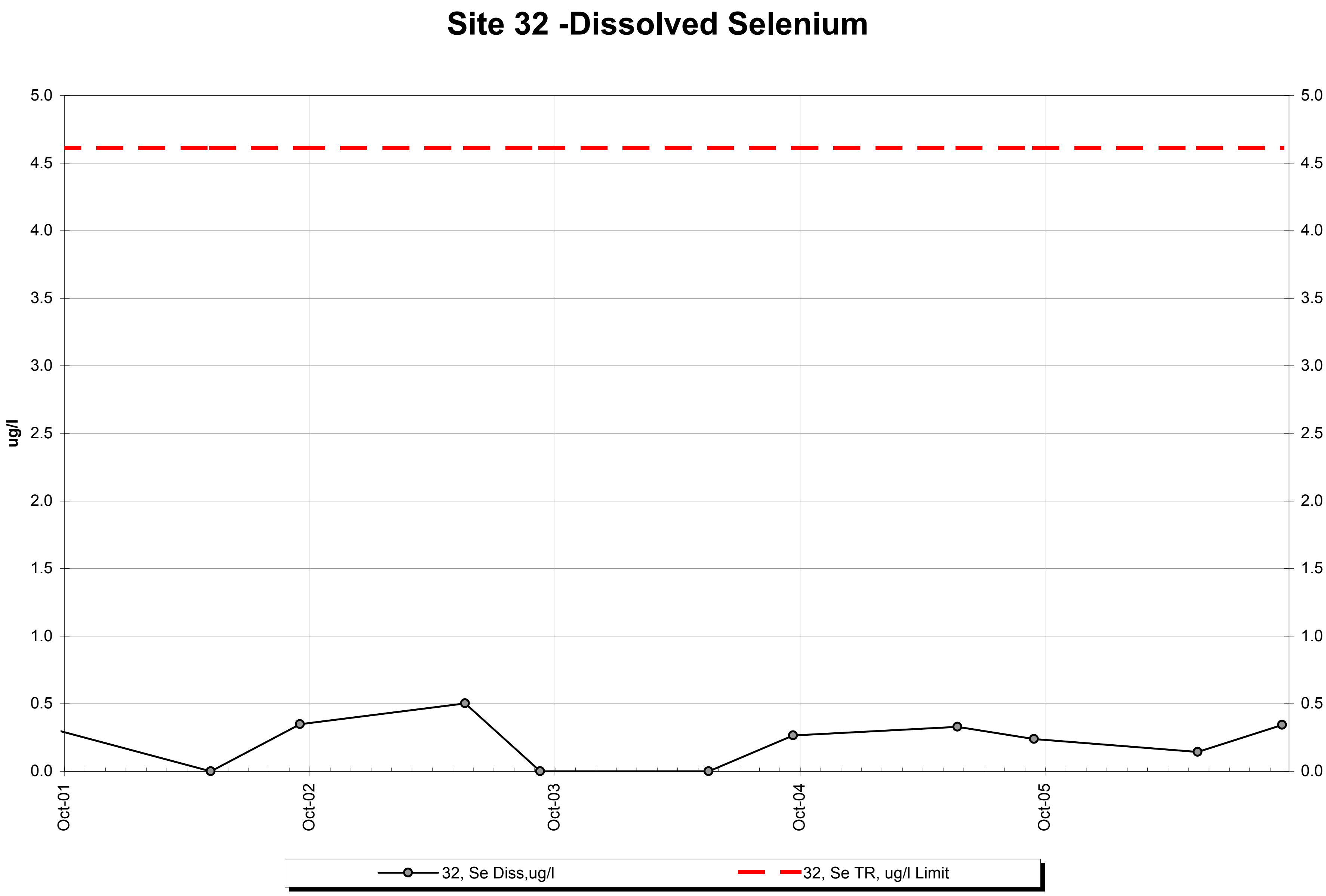


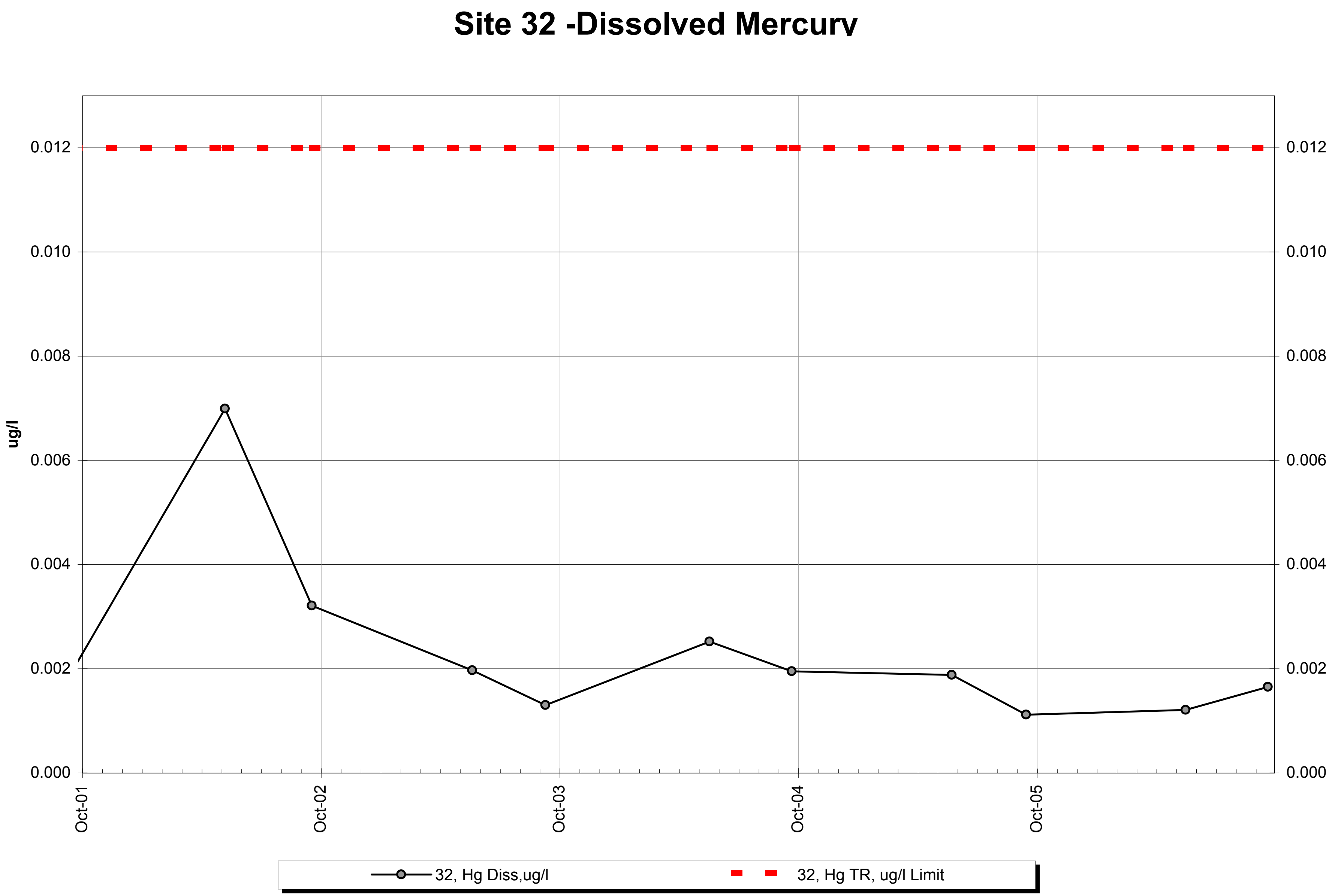


Site 32 -Dissolved Silver
ug/l
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, Ag Diss,ug/l
32, Ag Diss, ug/l Limit

Site 32 -Dissolved Zinc




Site 32 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
32, Se Diss,ug/l
32, Se TR, ug/l Limit



Site 32 -Dissolved Mercury
ug/l
0.000
0.002
0.004
0.006
0.008
0.010
0.012
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
32, Hg Diss,ug/l
32, Hg TR, ug/l Limit

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	**WY2001**								57.9				60.3
b	**WY2002**								58.0				60.7
c	**WY2003**								51.5				59.5
d	**WY2004**								56.4				54.1
e	**WY2005**								58.3				54.6
f	**WY2006**								56.6				56.7
	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	1	0	0	0	-7

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

ΣZ_k= -1.13

ΣZ^2_k= 1.76

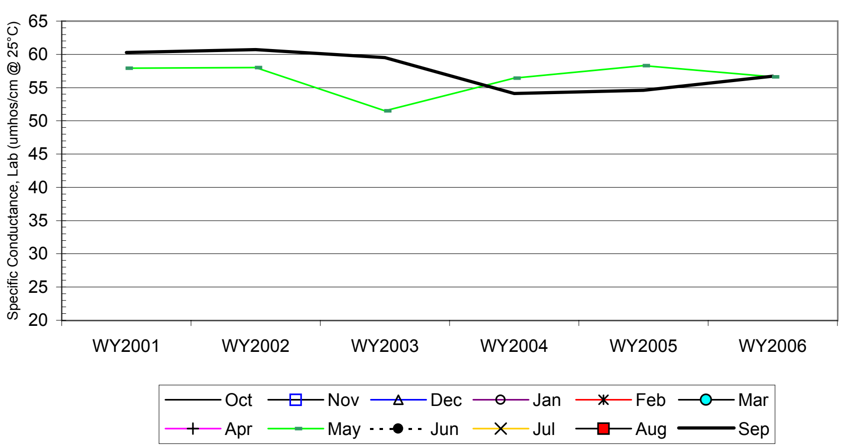
Z-bar=ΣZ_k/K= -0.56

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

Σn 12

ΣS_k -6

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		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}	-0.66	@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	-2.06		0.48
0.050	-1.48	**-0.45**	0.10
0.100	-1.16		0.10
0.200	-0.94		-0.20

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	**WY2001**								5.2				4.8
b	**WY2002**								4.5				5.3
c	**WY2003**								5.2				5.2
d	**WY2004**								5.1				5.2
e	**WY2005**								5.1				5.1
f	**WY2006**								4.7				4.7
	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	-7	0	0	0	-5

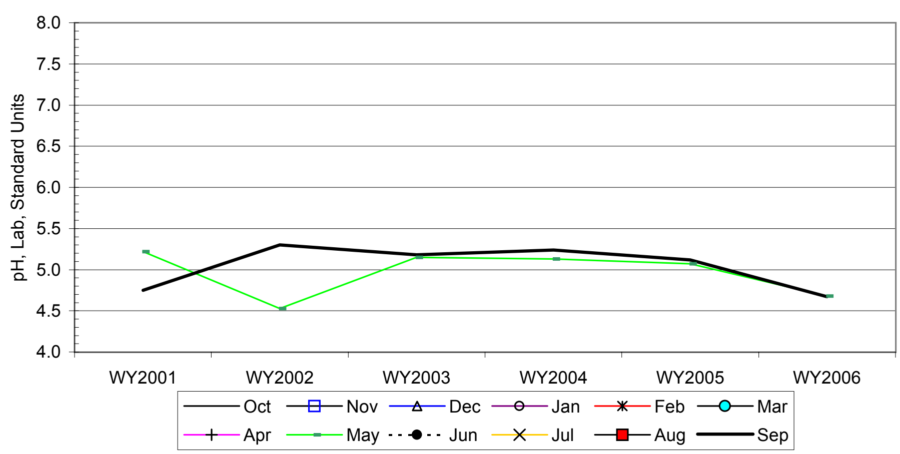
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-1.32				-0.94
Z^2_k								1.73				0.88

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

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		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	-0.17		0.08
0.050	-0.13	**-0.04**	-0.01
0.100	-0.12		-0.02
0.200	-0.07		-0.03

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

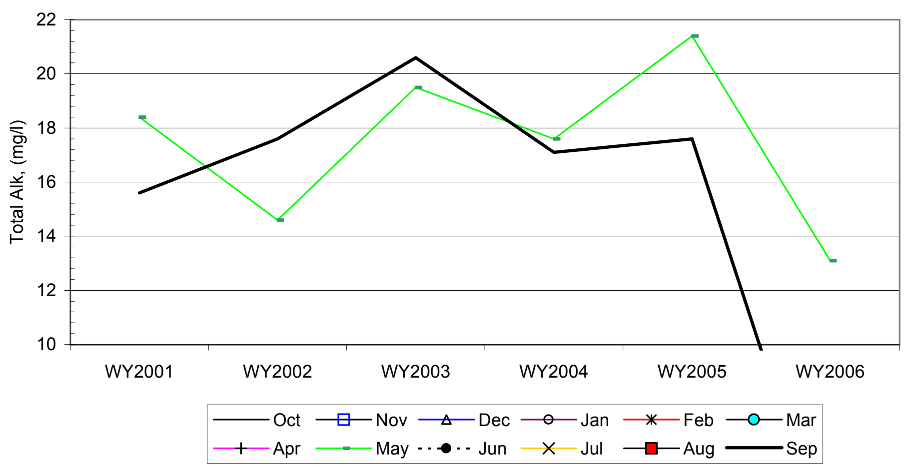
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								18.4				15.6
b	**WY2002**								14.6				17.6
c	**WY2003**								19.5				20.6
d	**WY2004**								17.6				17.1
e	**WY2005**								21.4				17.6
f	**WY2006**								13.1				2.0
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	0	0	0	0	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				0
	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	-2
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-0.19				-0.38
	Z^2_k								0.04				0.14

ΣZ_k= -0.56
ΣZ^2_k= 0.18
Z-bar=ΣZ_k/K= -0.28

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

Σn 12
ΣS_k -3

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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) 56.67	Z_{calc} -0.27	@α/2=2.5% Z=	1.96	H_0 (No trend)	ACCEPT
	p **0.395**			H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.73		1.37
0.050	-2.34	**-0.26**	0.59
0.100	-2.09		0.50
0.200	-1.57		0.50

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	**WY2001**								6.6				8.9
b	**WY2002**								19.4				9.3
c	**WY2003**								7.2				9.5
d	**WY2004**								7.2				6.1
e	**WY2005**								6.5				9.0
f	**WY2006**								10.8				15.3
	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	-1	0	0	0	5

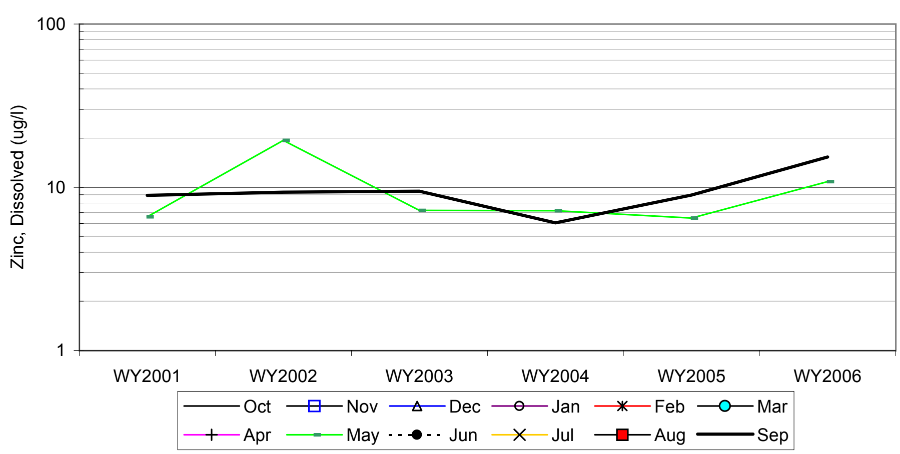
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								-0.19				0.94
Z^2_k								0.04				0.88

ΣZ_k= 0.75
ΣZ^2_k= 0.92
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

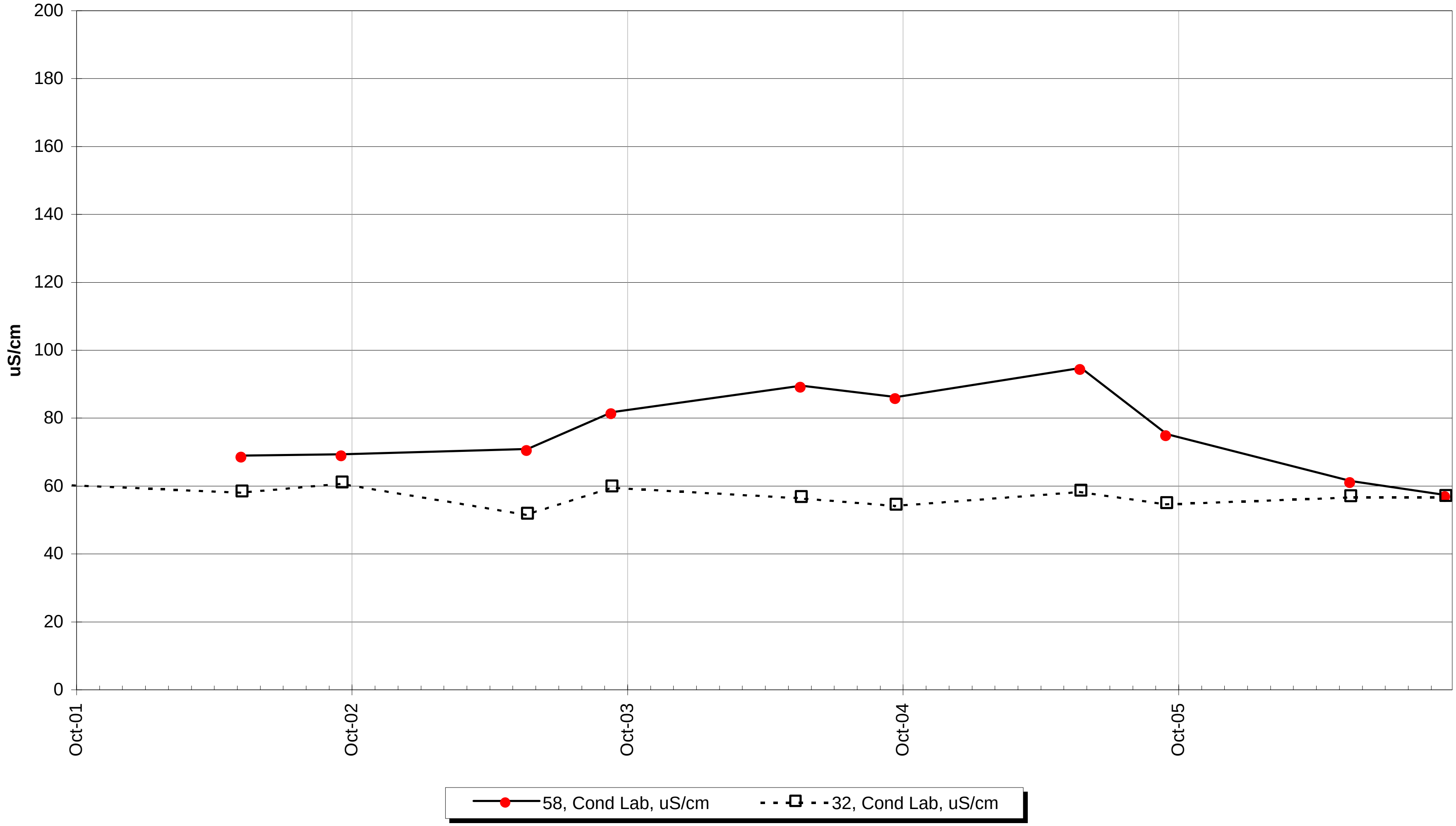
$\chi^2_h = \Sigma Z^2_k - K(\text{Z-bar})^2$=		0.64	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.425**		$\chi^2_h < \chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	0.40	@α/2=2.5% Z= 1.96	**H_0** (No trend)	ACCEPT
56.67	**p**	**0.655**		**H_A** (± trend)	REJECT

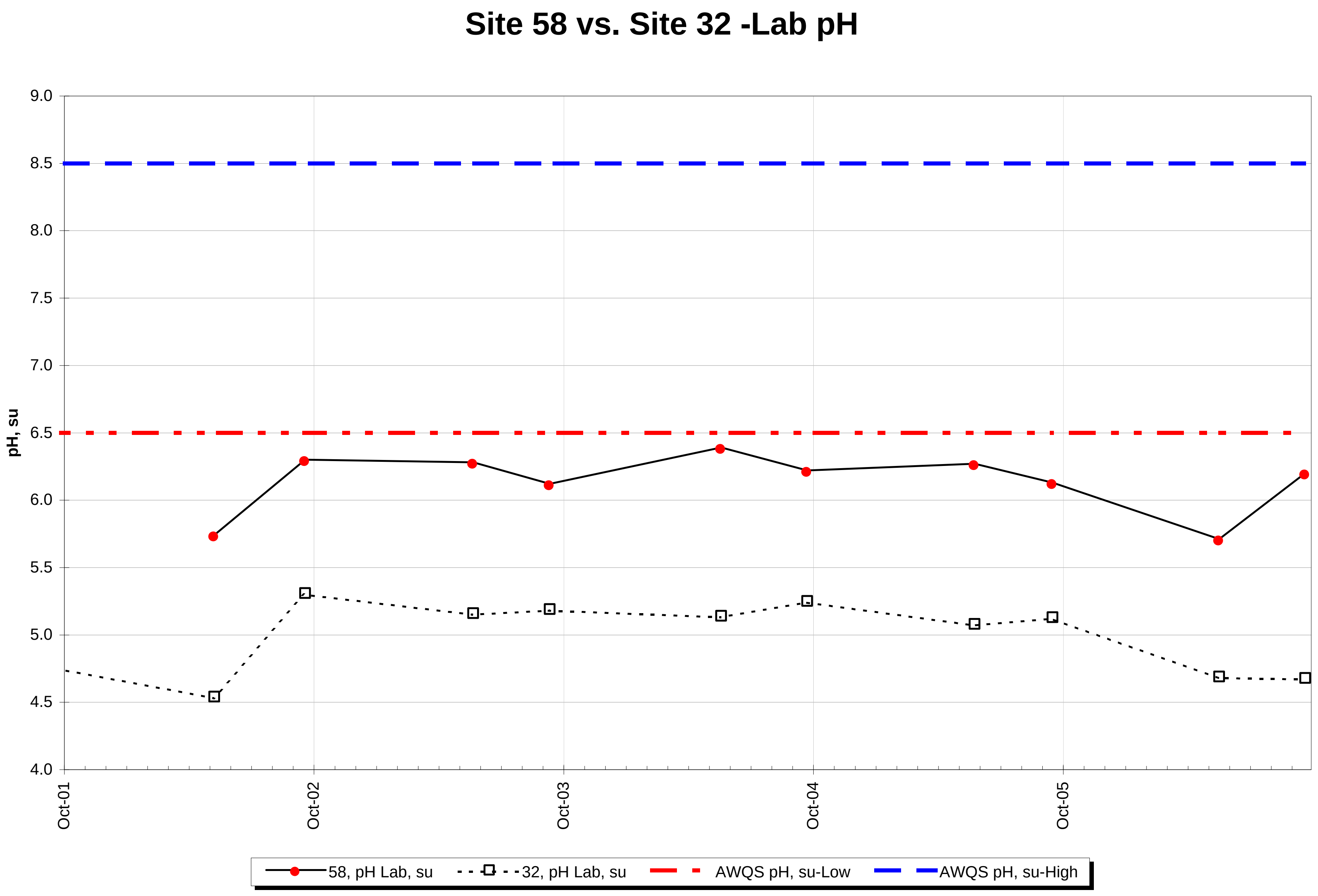


Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-1.48		1.74
0.050	-0.42	**0.15**	1.21
0.100	-0.23		0.77
0.200	-0.05		0.32

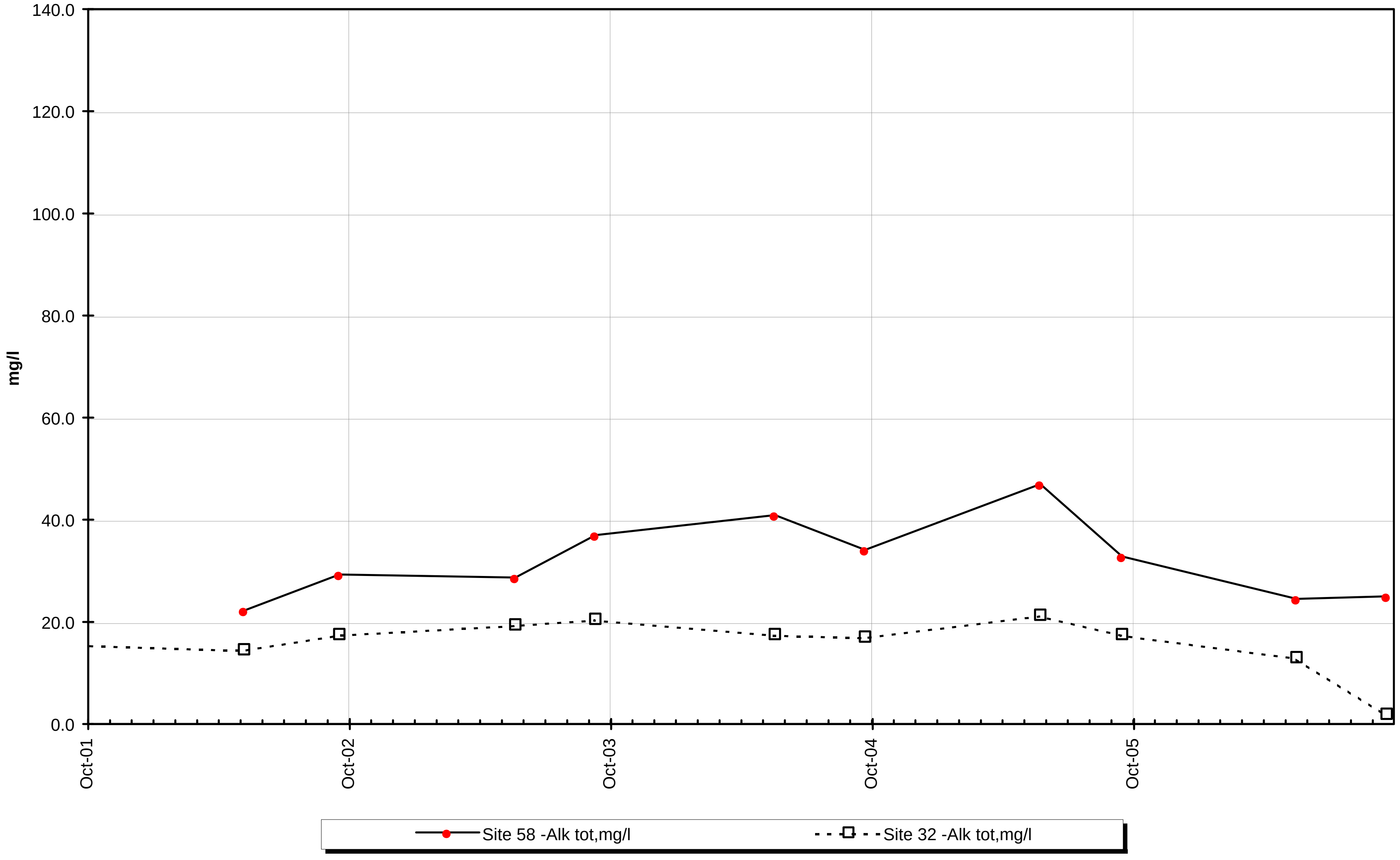
Site 58 vs Site 32 -Conductivity



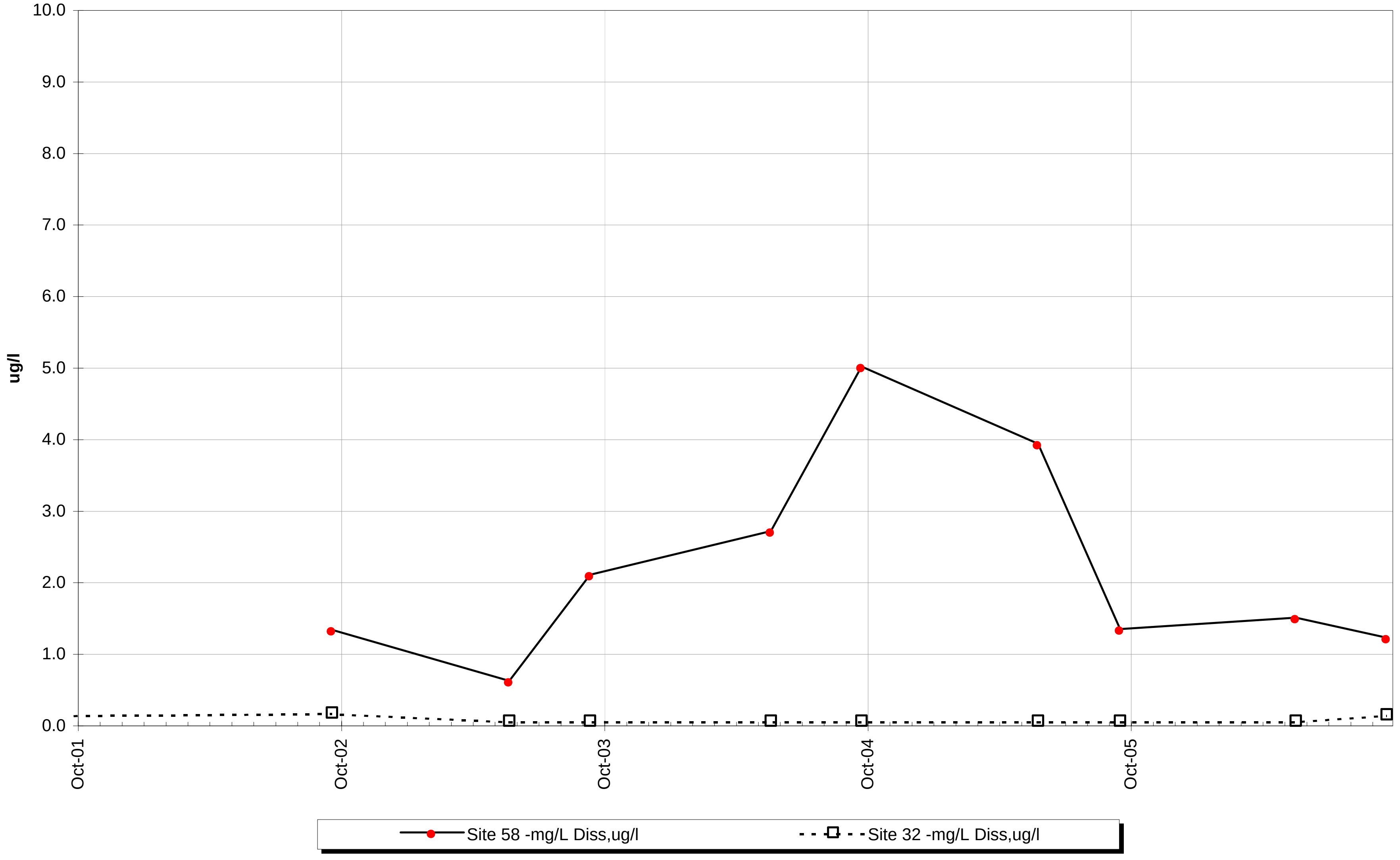


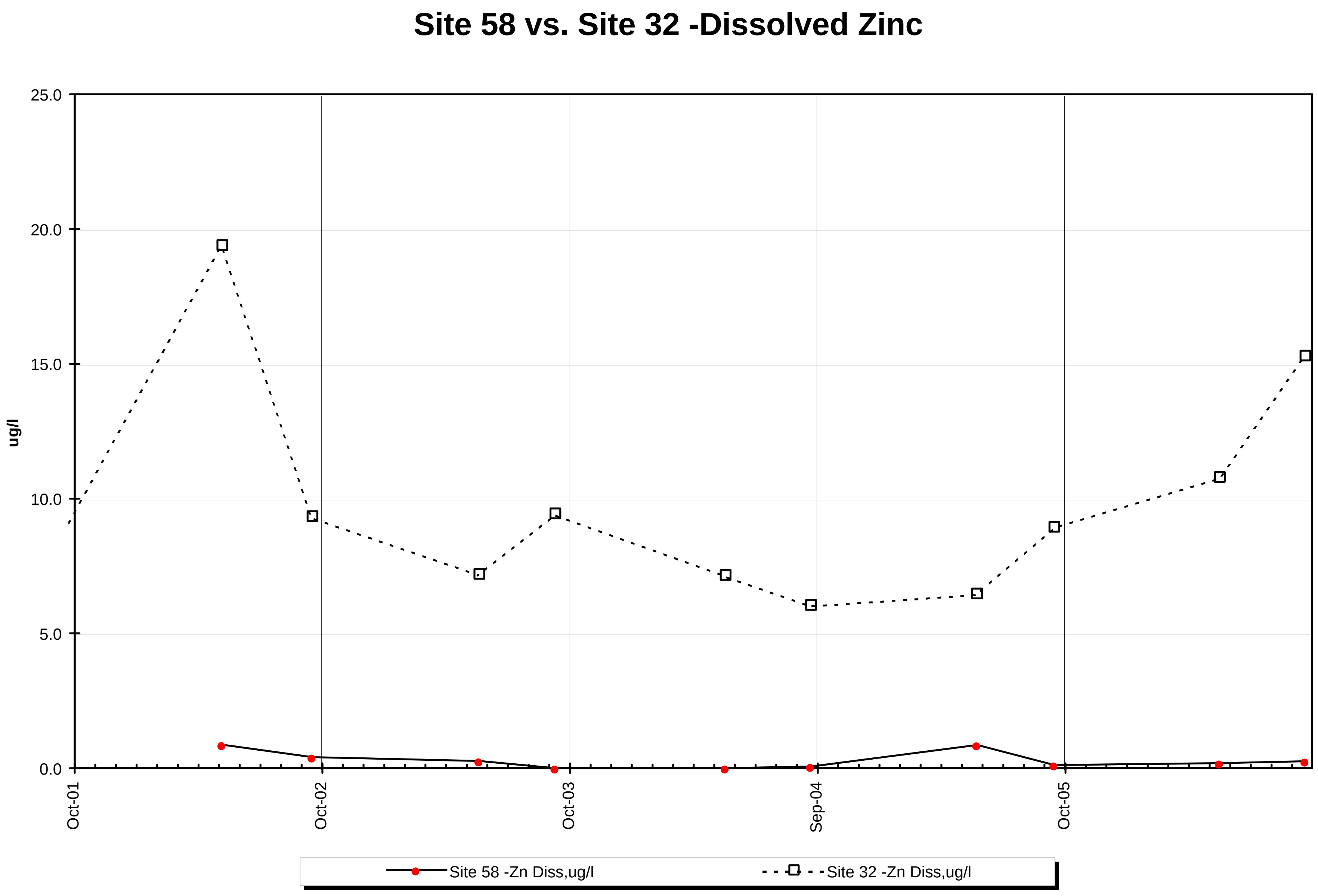
Site 58 vs. Site 32 -Lab pH
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
pH, su
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
58, pH Lab, su
32, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

Site 58 vs. Site 32 -Total Alkalinity



Site 58 vs. Site 32 -Total Sulfate





Site 58 vs. Site 32 -Dissolved Zinc
25.0
20.0
15.0
10.0
5.0
0.0
ug/l
Oct-01
Oct-02
Oct-03
Sep-04
Oct-05
Site 58 -Zn Diss,ug/l
Site 32 -Zn Diss,ug/l

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 2006” report. The table includes all the required FWMP analyte 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. 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-06.				

The data for Water Year 2006 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 6.14 su which is just below the AWQS limit of 6.50 su. The corresponding field pH is 6.57 su which is within the acceptable range.

Sample Date	Parameter	Value	Standard	Standard Type
05/17/06	pH Lab, su	6.14	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. A non-parametric statistical analysis for trend was preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal Kendall analyses are presented in detail on the pages following this interpretive section. The table below summarizes the results on the data collected between May-02 and Sep-06 (WY2002-WY2006). No statistically significant ($\alpha/2=2.5\%$) trends are identified

Site 59-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	5	0.24	-		
pH, Lab	5	0.43	-		
Alkalinity, Total	5	0.11	-		
Zinc, Dissolved	5	0.43	-		

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

Table of Results for Water Year 2006

Site 59 "MW-T-00-01A"													
Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							6.0	NOT SCHEDULED FOR SAMPLING			7.0	6.5
Conductivity-Field(µmho)								96				107	101
Conductivity-Lab (µmho)								98				102	100
pH Lab (standard units)								6.14				6.80	6.47
pH Field (standard units)								6.57				6.60	6.59
Total Alkalinity (mg/L)								41.8				42.3	42.1
Total Sulfate (mg/L)								4.0				4.1	4.0
Hardness (mg/L)								46.5				48.8	47.7
Dissolved As (ug/L)								0.133				0.155	0.144
Dissolved Ba (ug/L)								6.6				7.8	7.2
Dissolved Cd (ug/L)								0.014				0.014 J	0.014
Dissolved Cr (ug/L)								4.980				4.440	4.710
Dissolved Cu (ug/L)								0.154 U				0.096	0.125
Dissolved Pb (ug/L)								0.0074 U				0.0043 U	0.0059
Dissolved Ni (ug/L)								0.835				0.800	0.818
Dissolved Ag (ug/L)								<0.002				0.004 UJ	0.002
Dissolved Zn (ug/L)								1.02 U				0.42	0.72
Dissolved Se (ug/L)								0.311 J				0.331 J	0.321
Dissolved Hg (ug/L)								0.000403 UJ				0.000472 U	0.000438

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

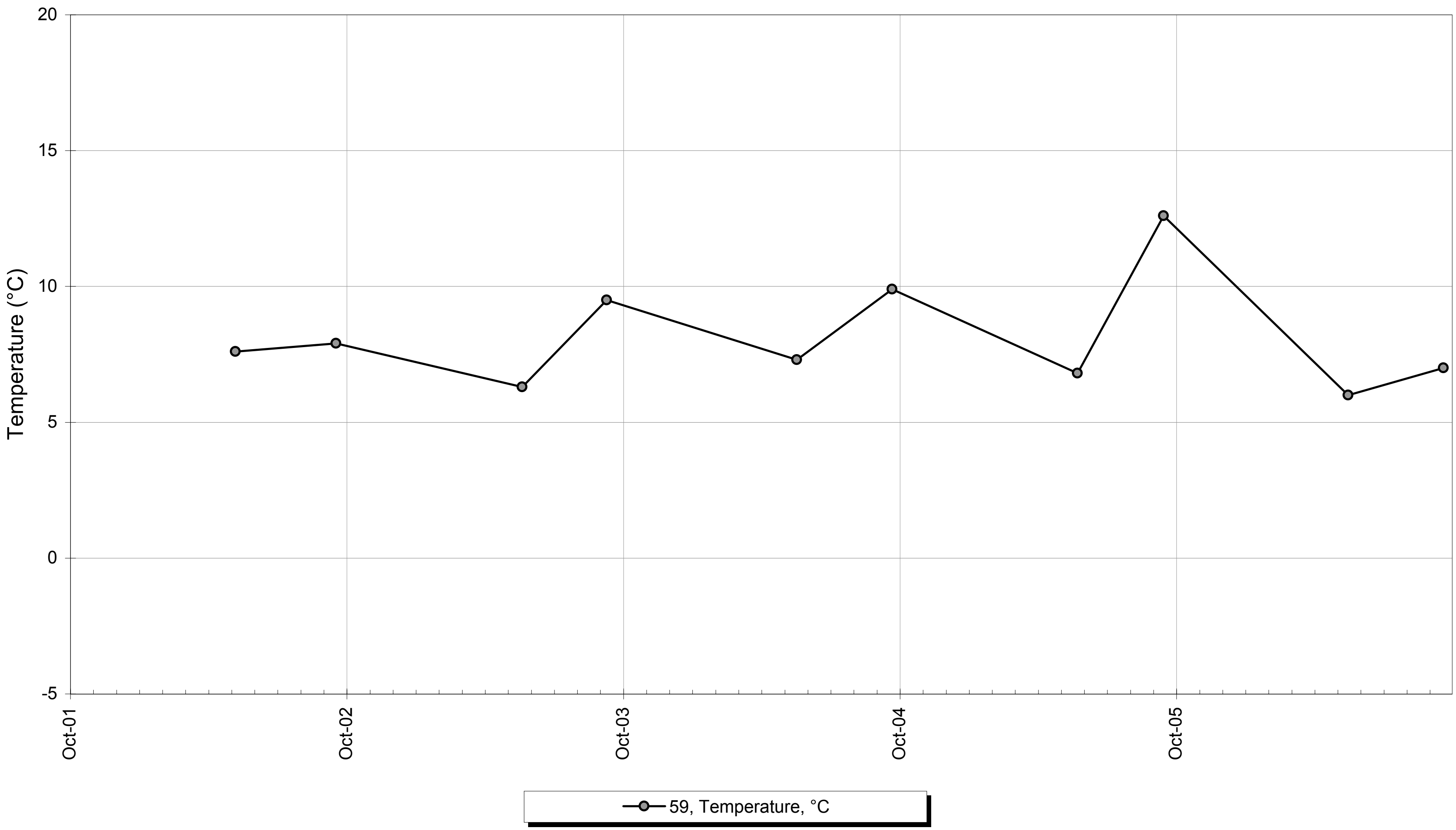
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

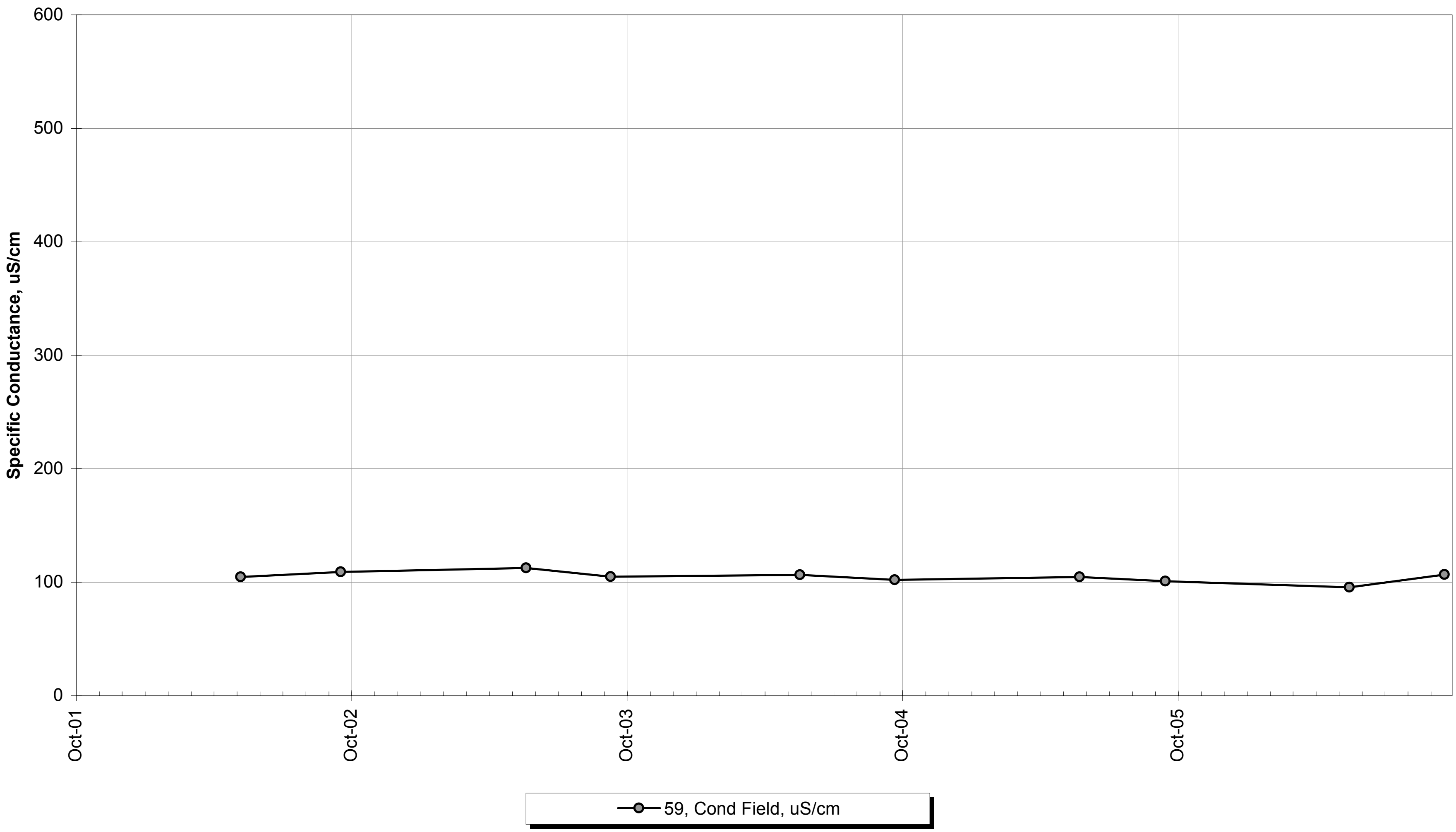
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
59	05/17/2006	1:29:00 PM				
			Cu Diss, ug/l	0.154	U	Field Blank Contamination
			Pb Diss, ug/l	0.00742	U	Field Blank Contamination
			Zn Diss, ug/l	1.02	U	Field Blank Contamination
			Se Diss, ug/l	0.311	J	Below Quantitative Range
			Hg Diss, ug/l	0.000403	UJ	Field Blank Contamination, Co
59	09/20/2006	10:08:00 AM				
			Cd Diss, ug/l	0.0139	J	LCS Recovery
			Pb Diss, ug/l	0.00429	U	Method Blank Contamination
			Ag Diss, ug/l	0.00365	UJ	Field Blank Contamination, LC
			Se Diss, ug/l	0.331	J	Below Quantitative Range
			Hg Diss, ug/l	0.000472	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

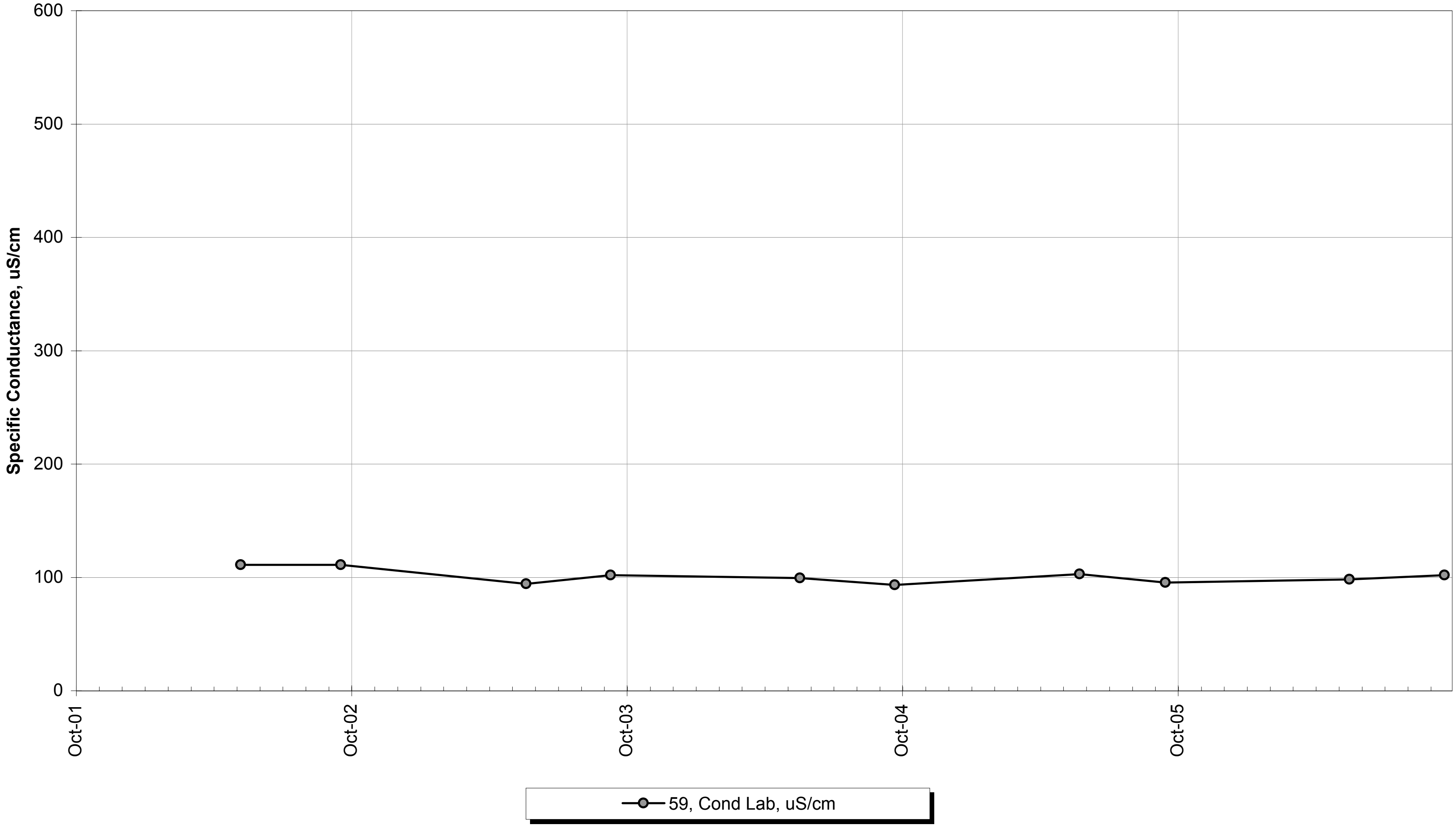
Site 59 -Water Temperature



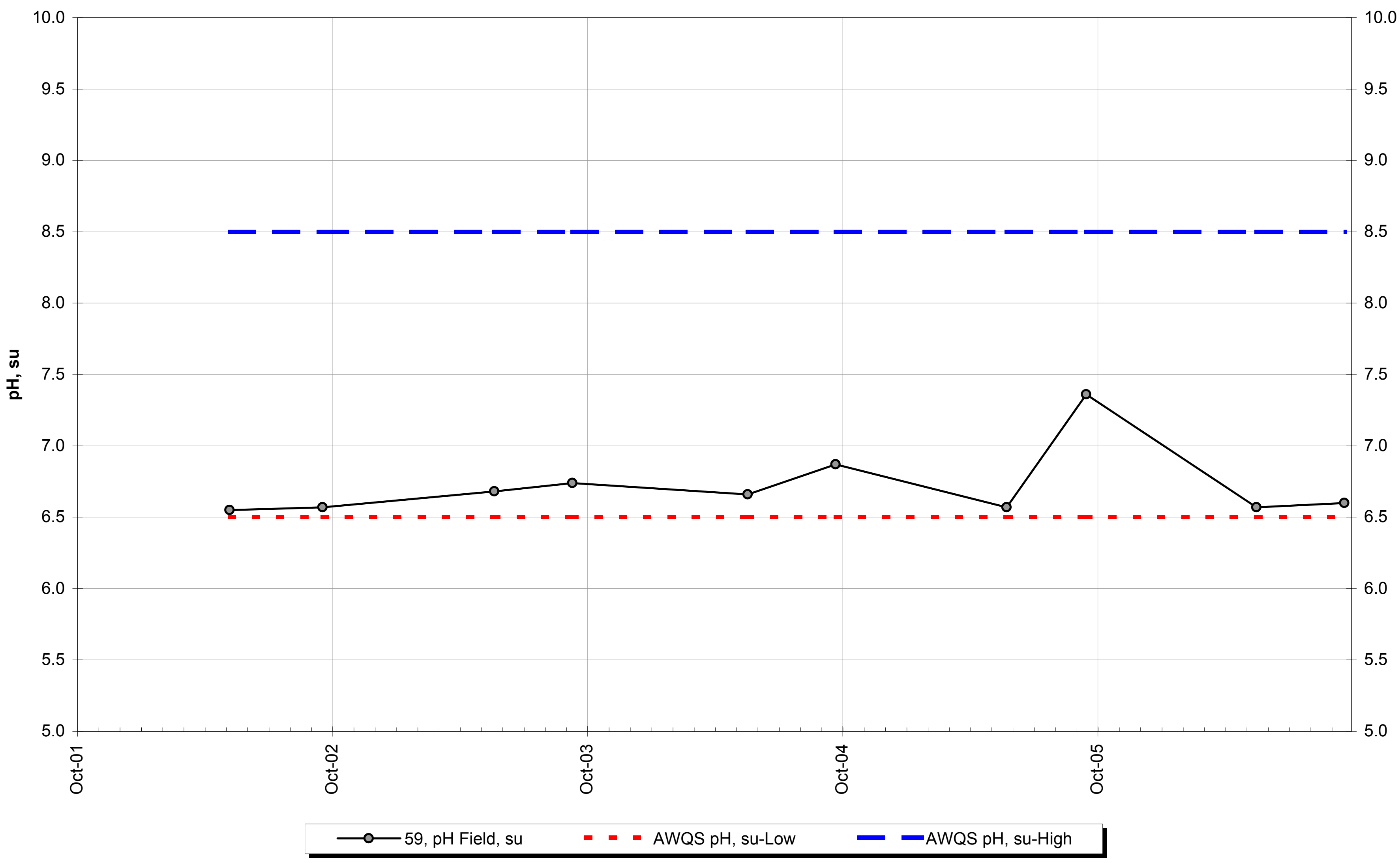
Site 59 -Conductivity-Field



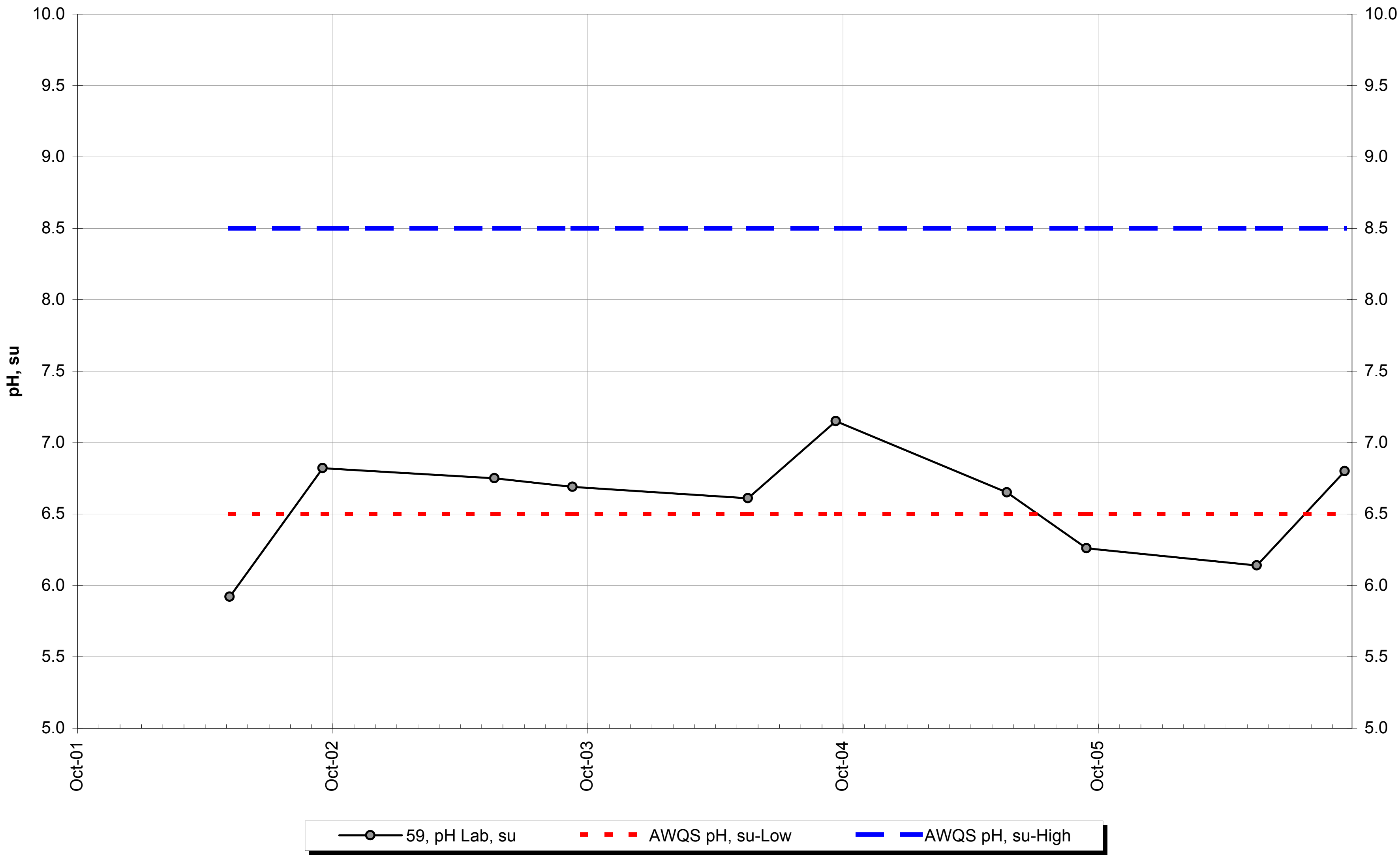
Site 59 -Conductivity-Lab



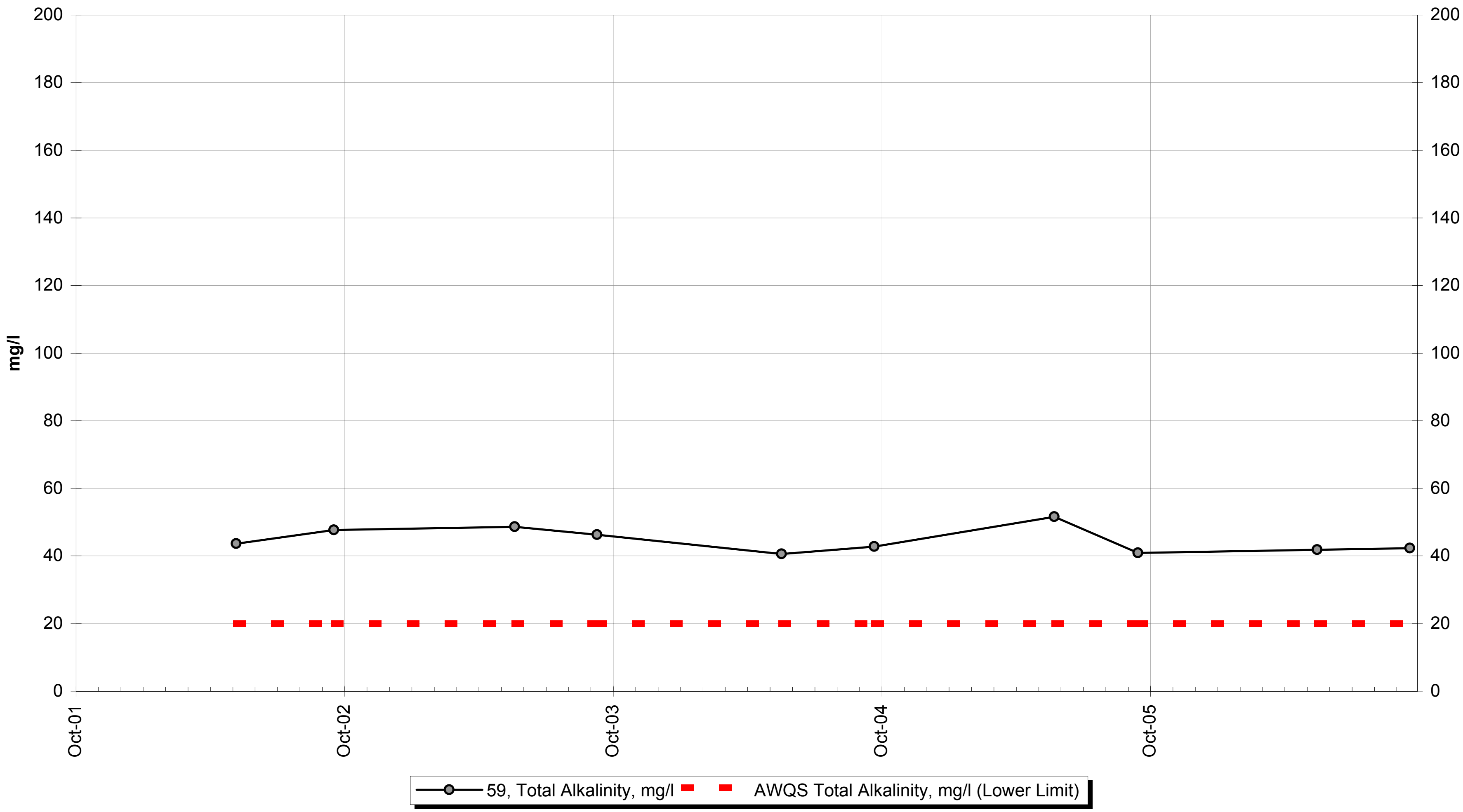
Site 59 -Field pH



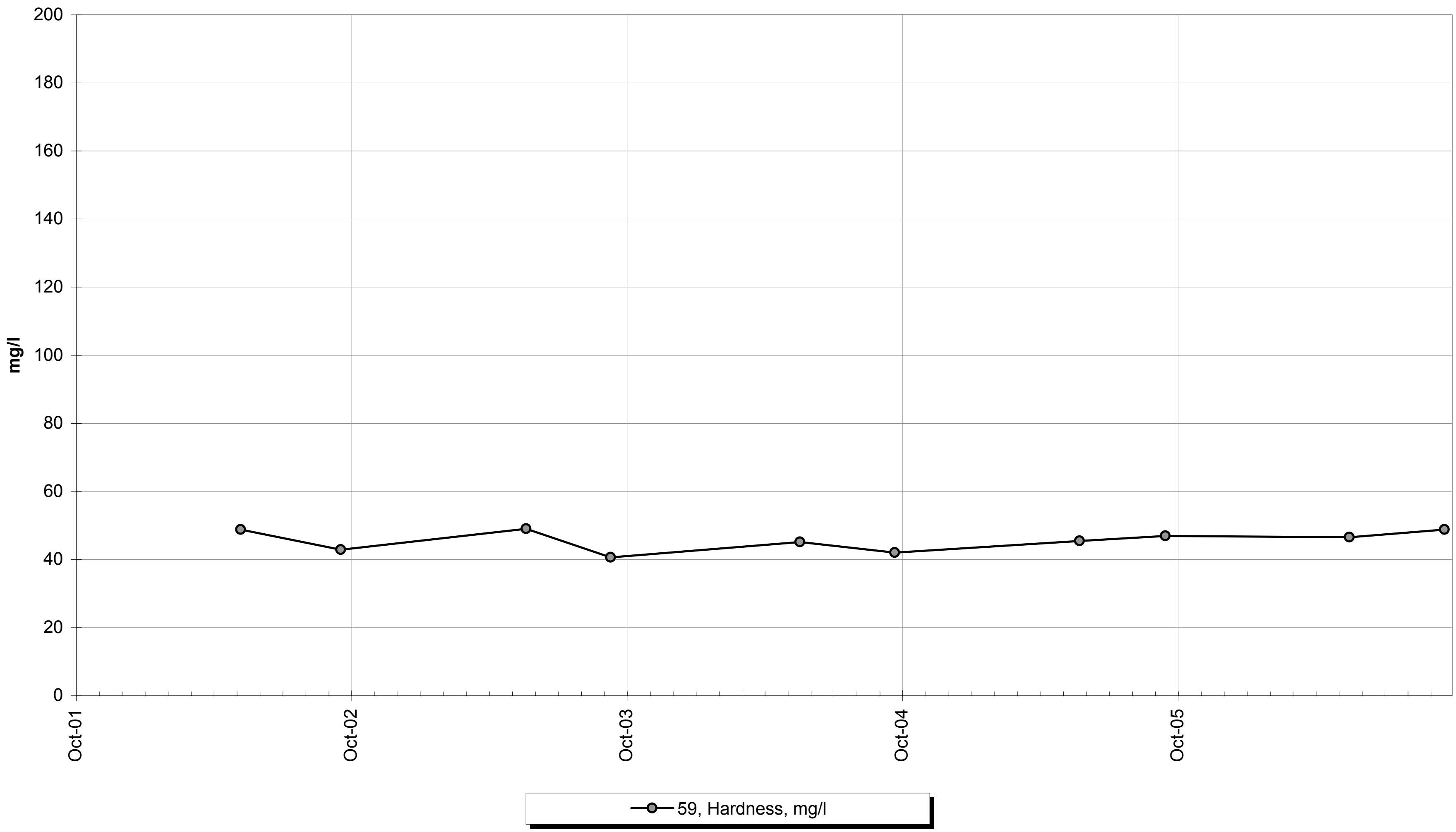
Site 59 -Lab pH



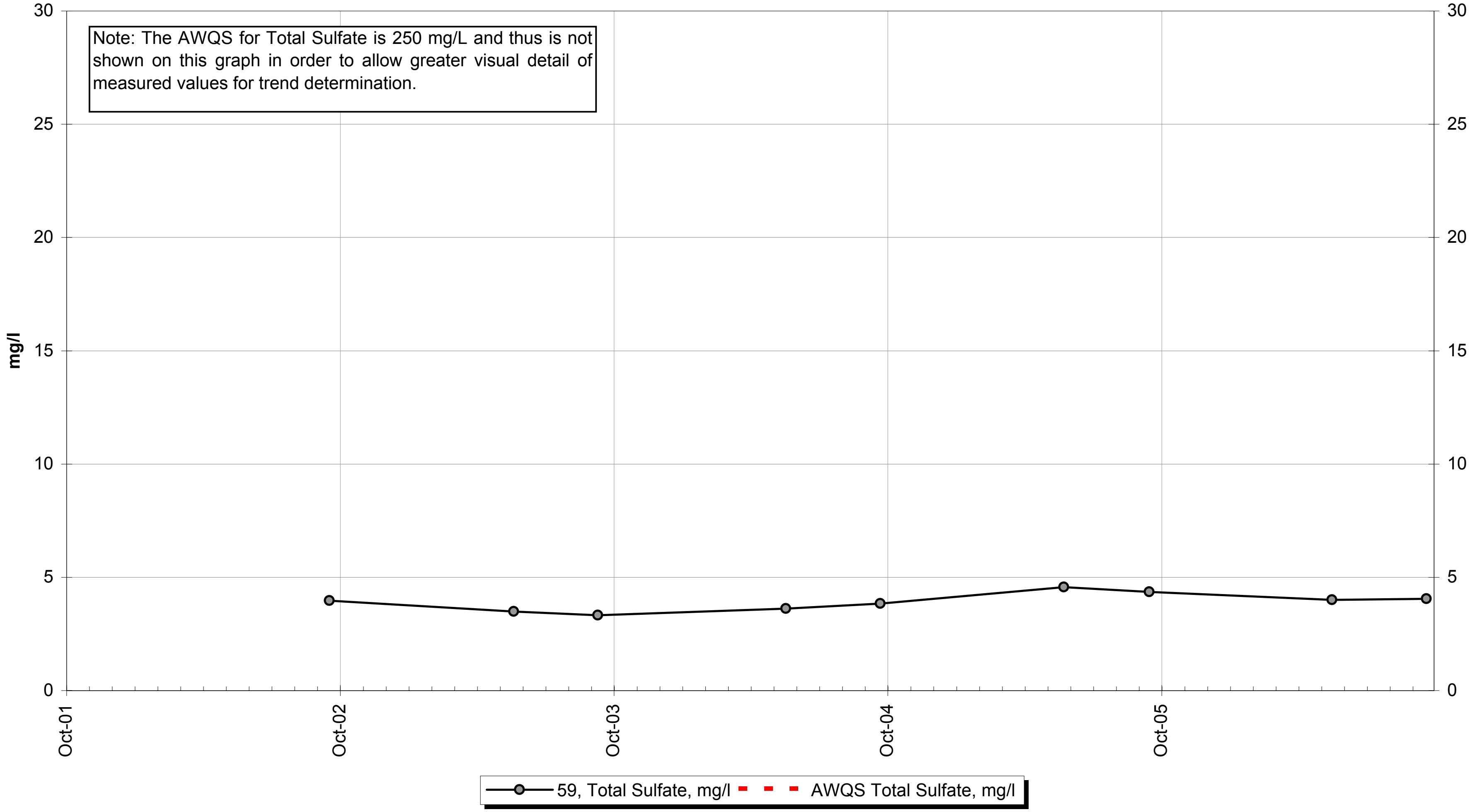
Site 59 -Total Alkalinity



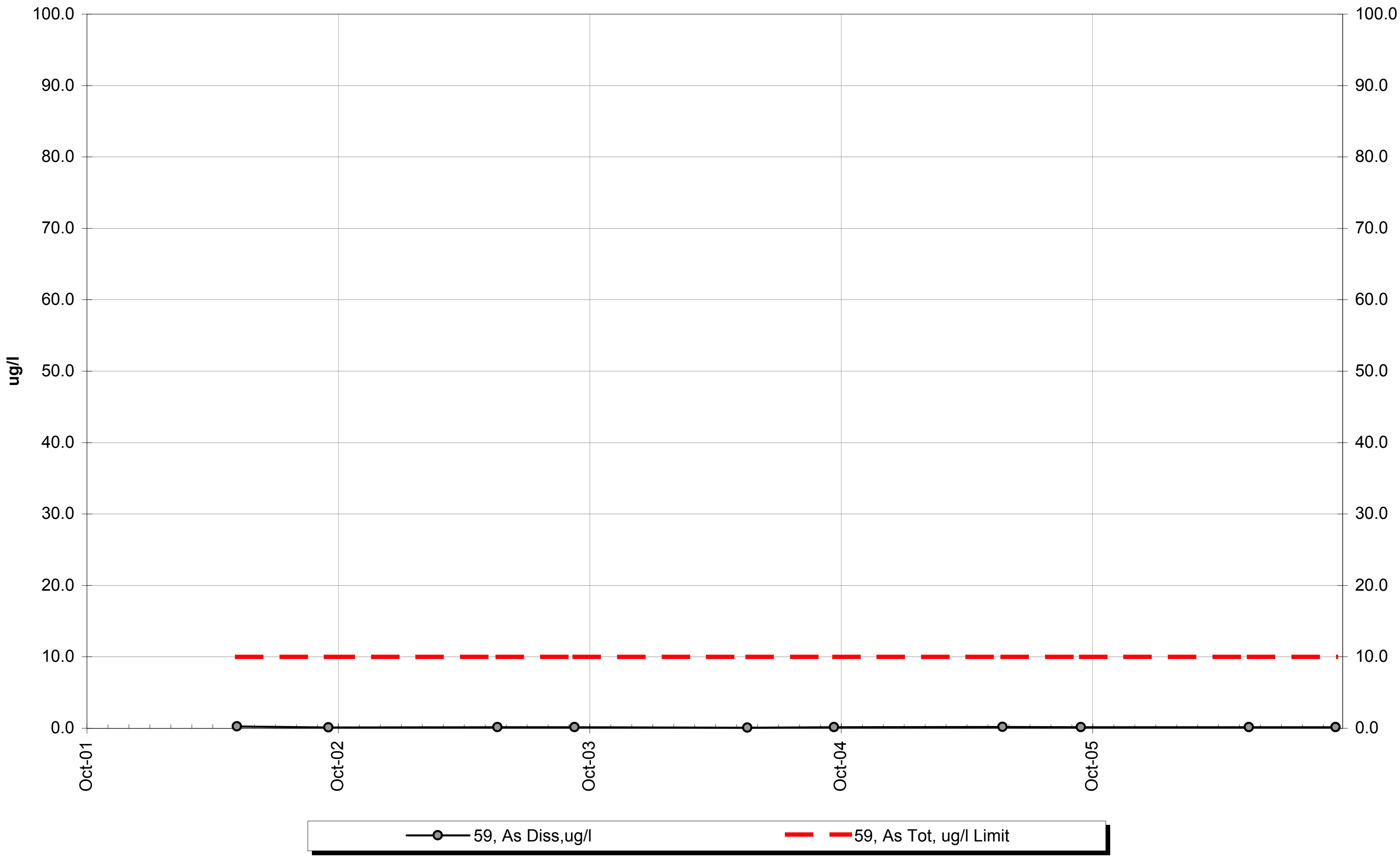
Site 59 -Hardness

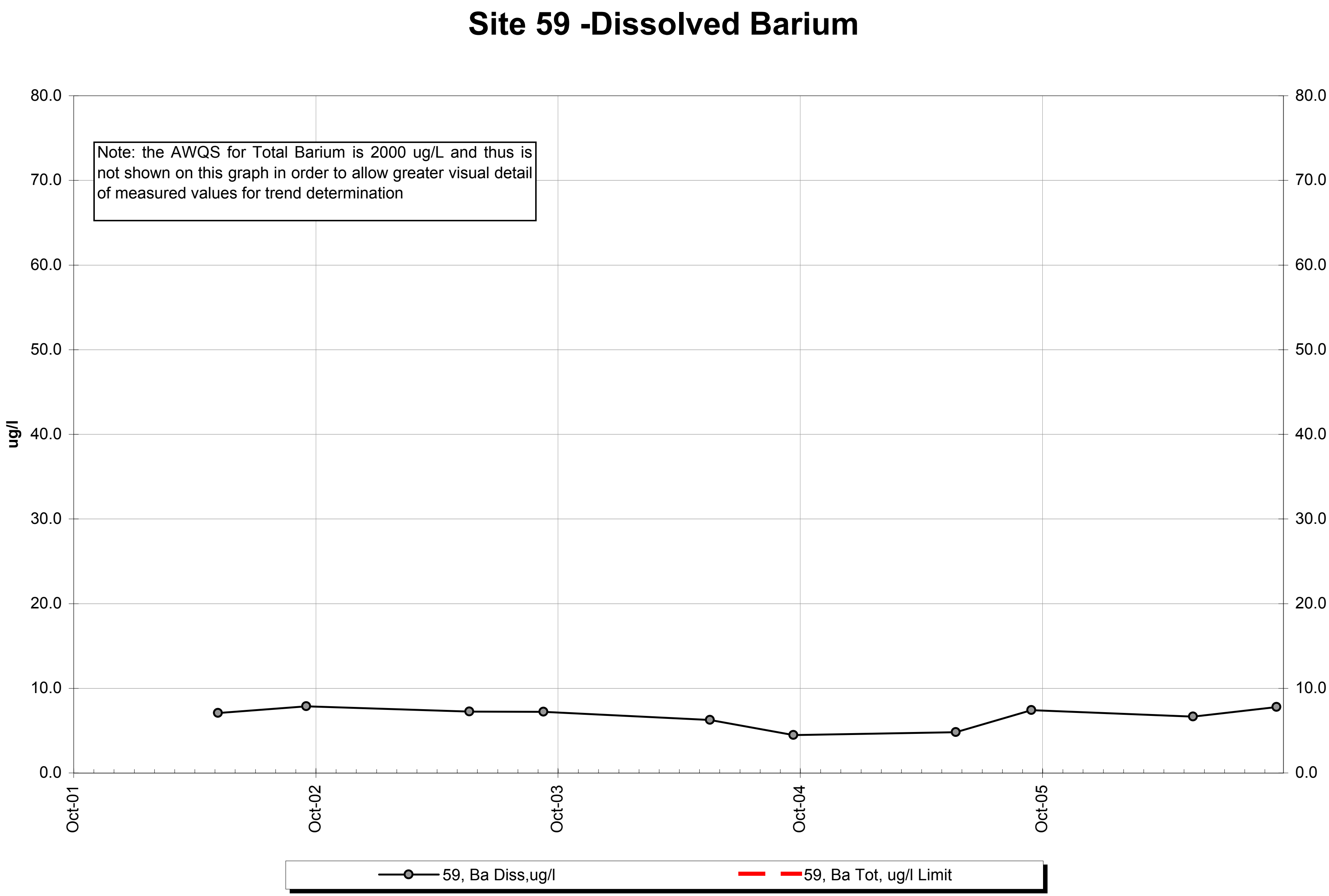


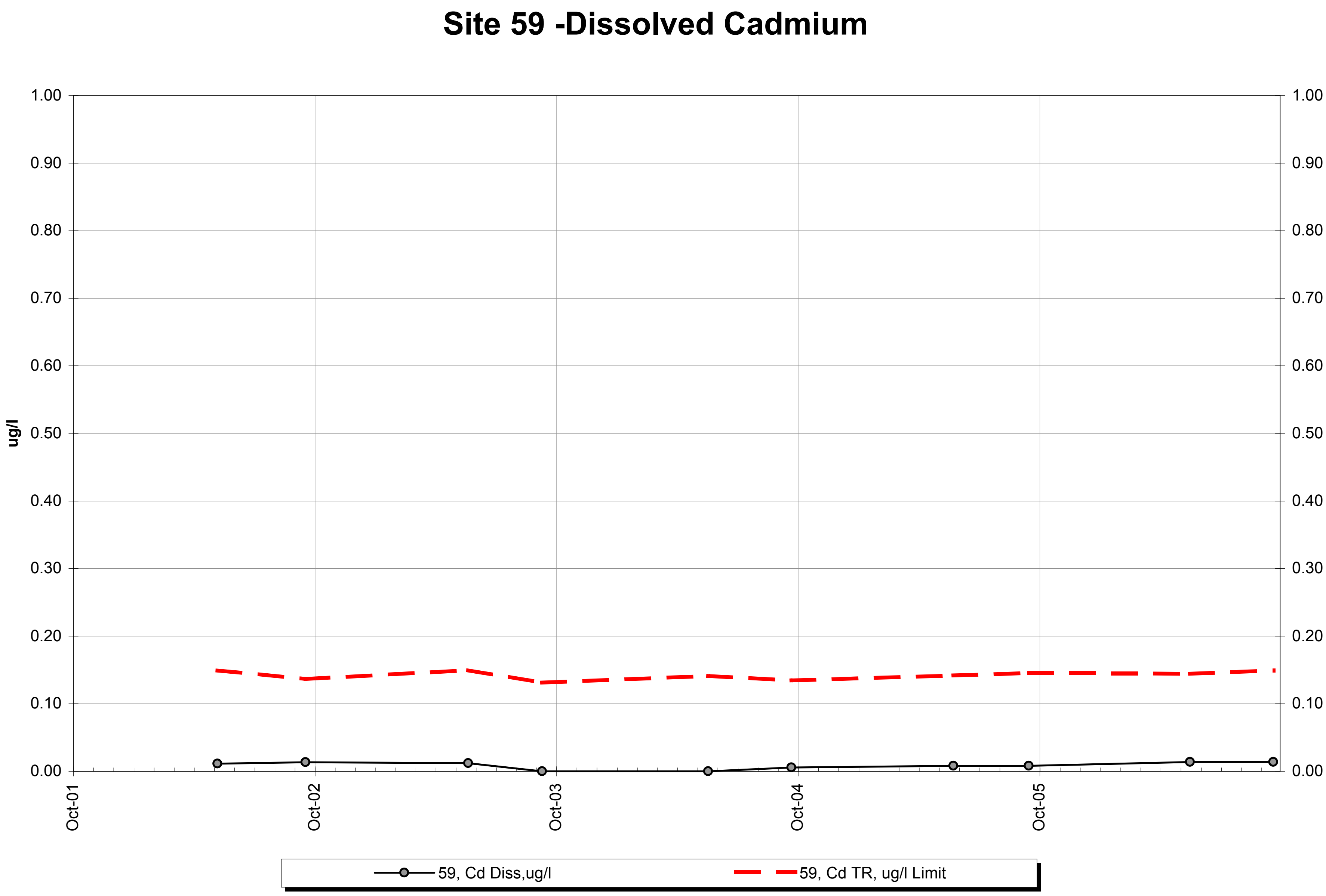
Site 59 -Total Sulfate



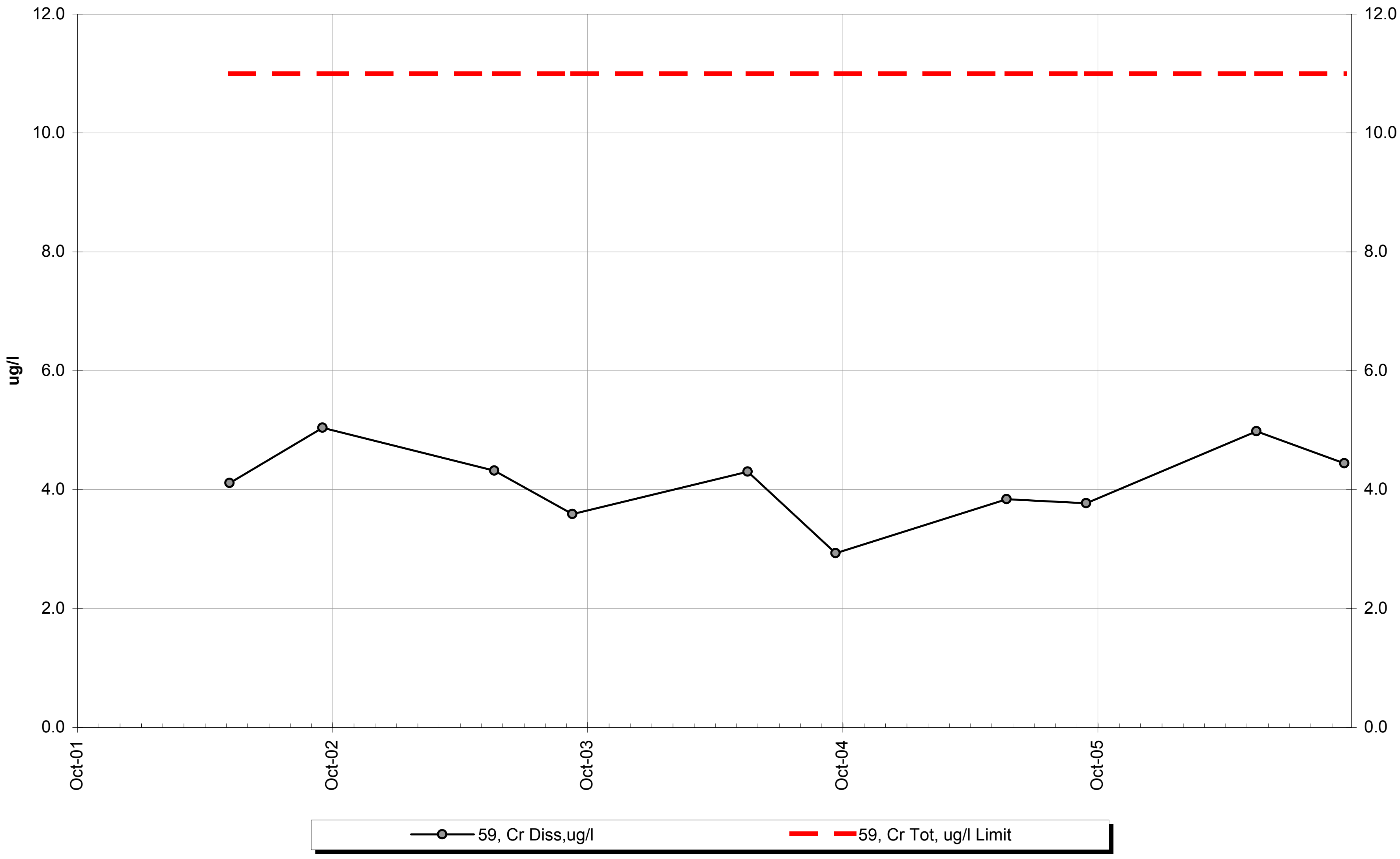
Site 59 -Dissolved Arsenic



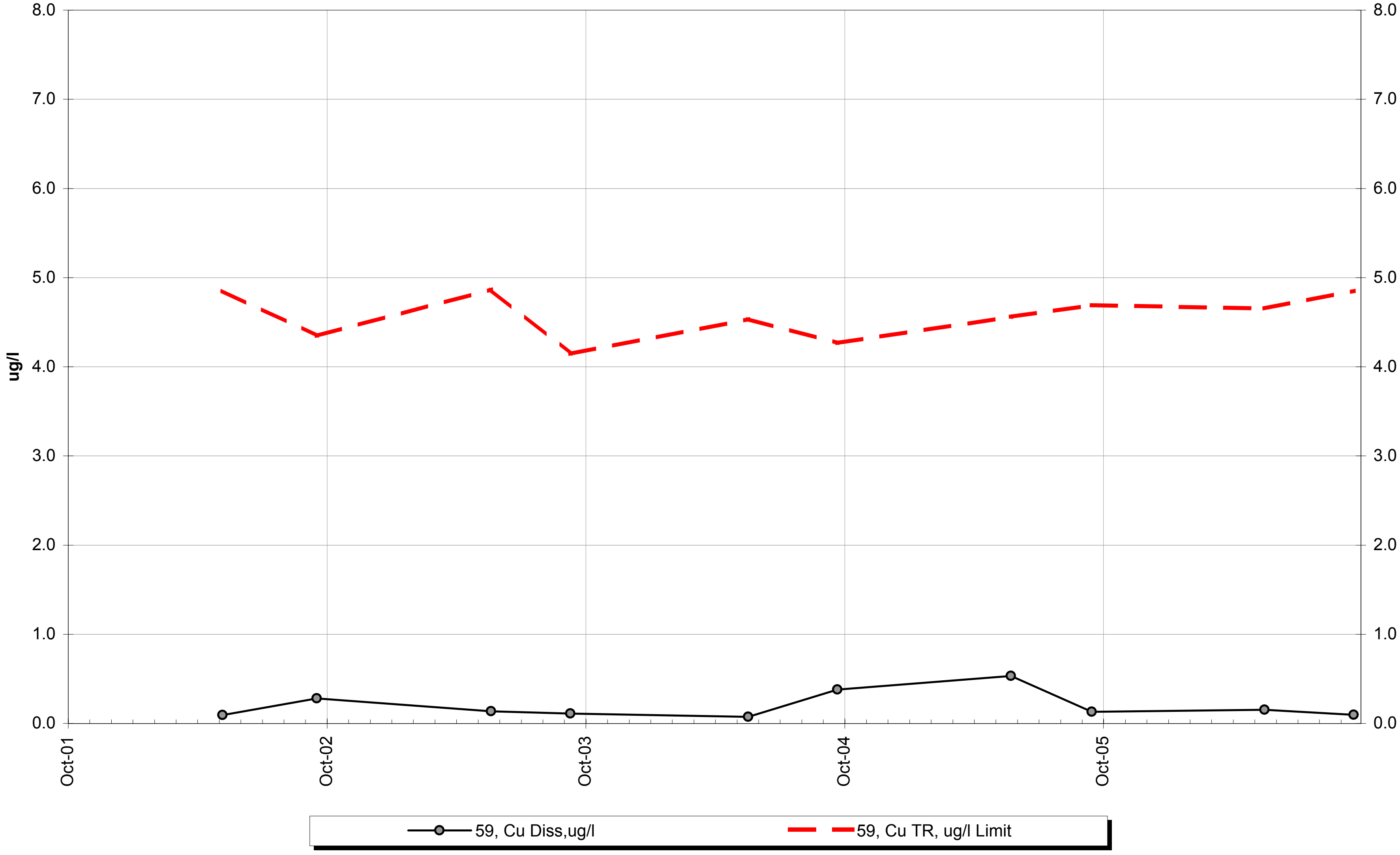

Site 59 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
59, Ba Diss,ug/l
59, Ba Tot, ug/l Limit


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-01
Oct-02
Oct-03
Oct-04
Oct-05
59, Cd Diss,ug/l
59, Cd TR, ug/l Limit

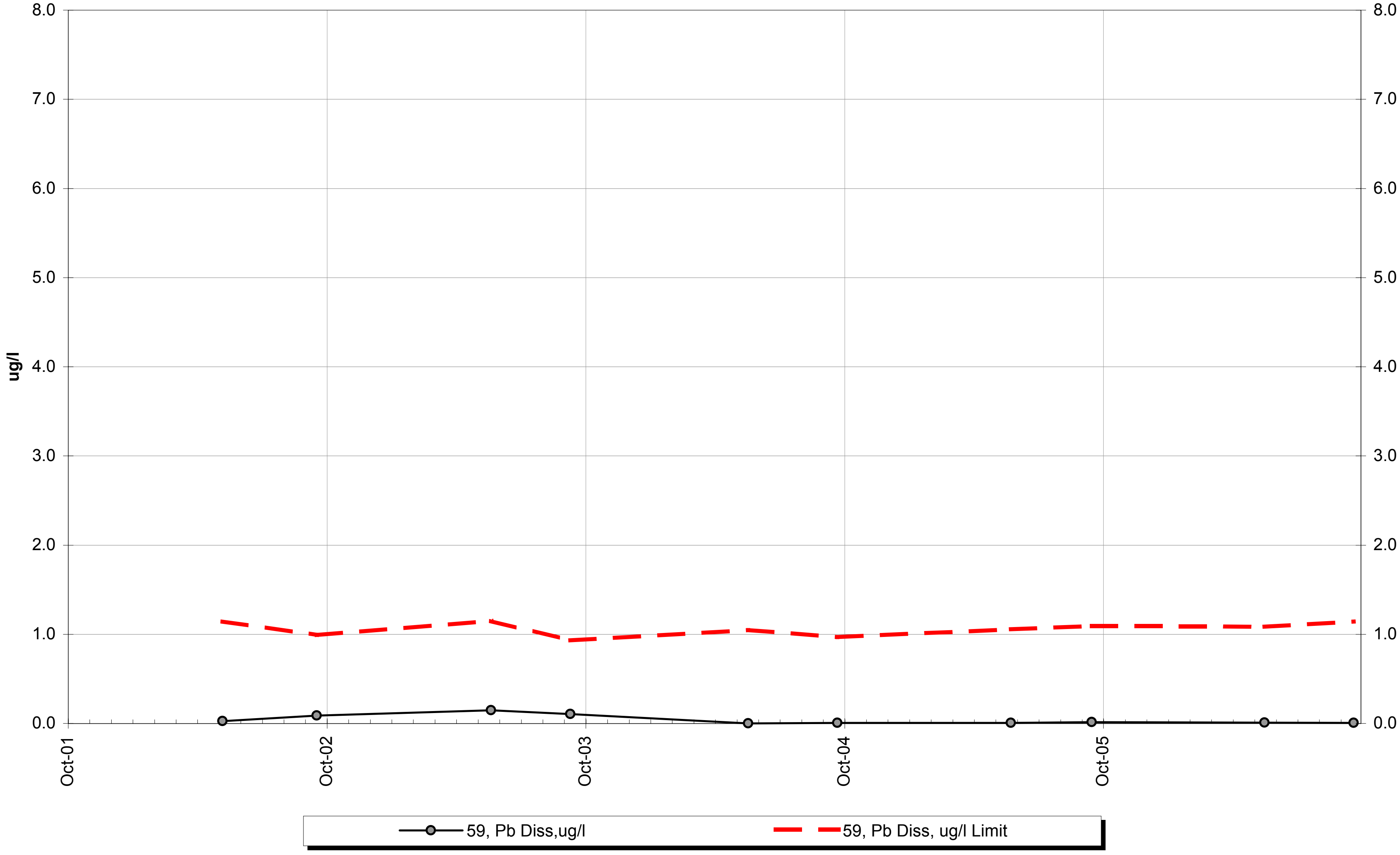
Site 59 -Dissolved Chromium



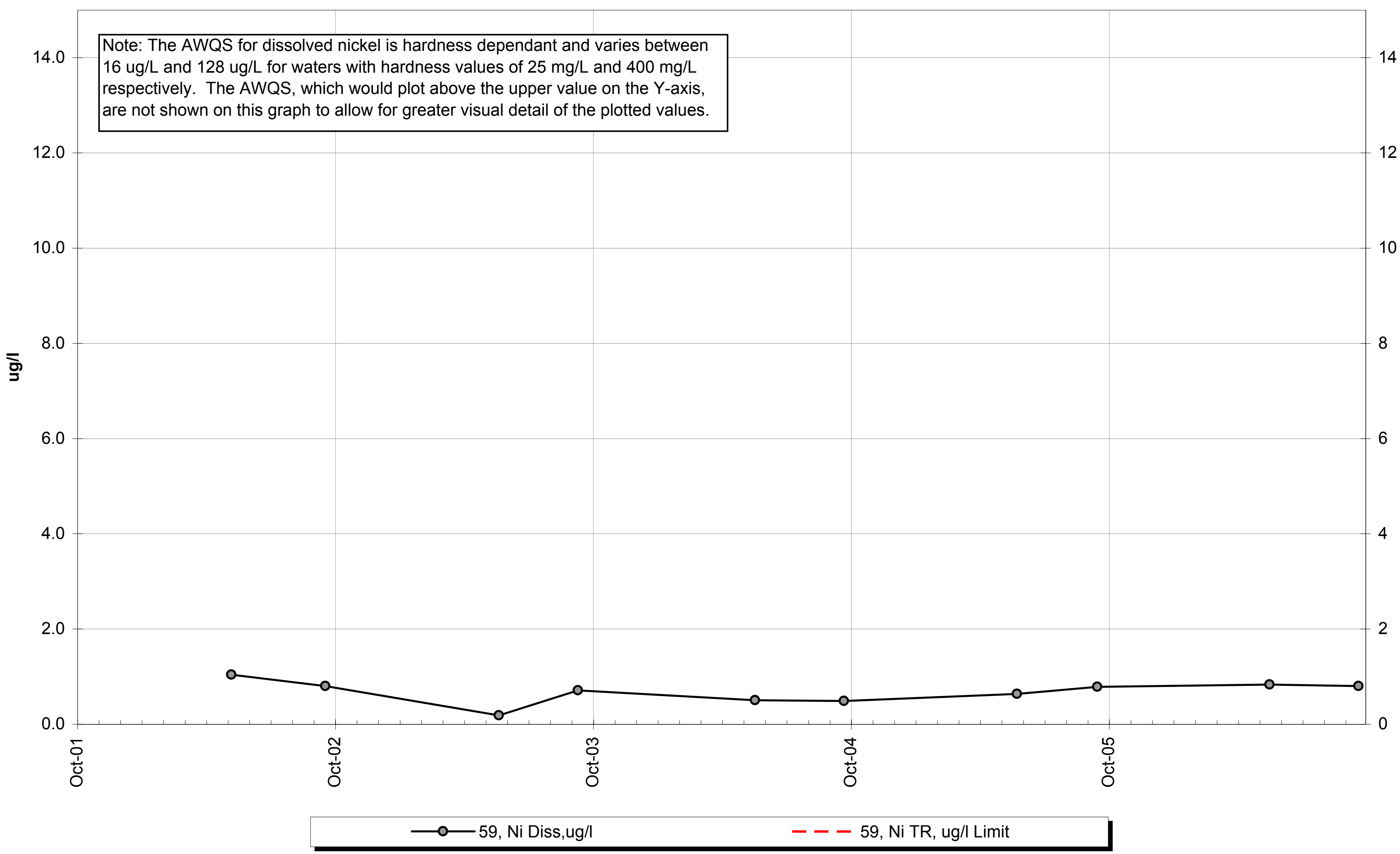
Site 59 -Dissolved Copper



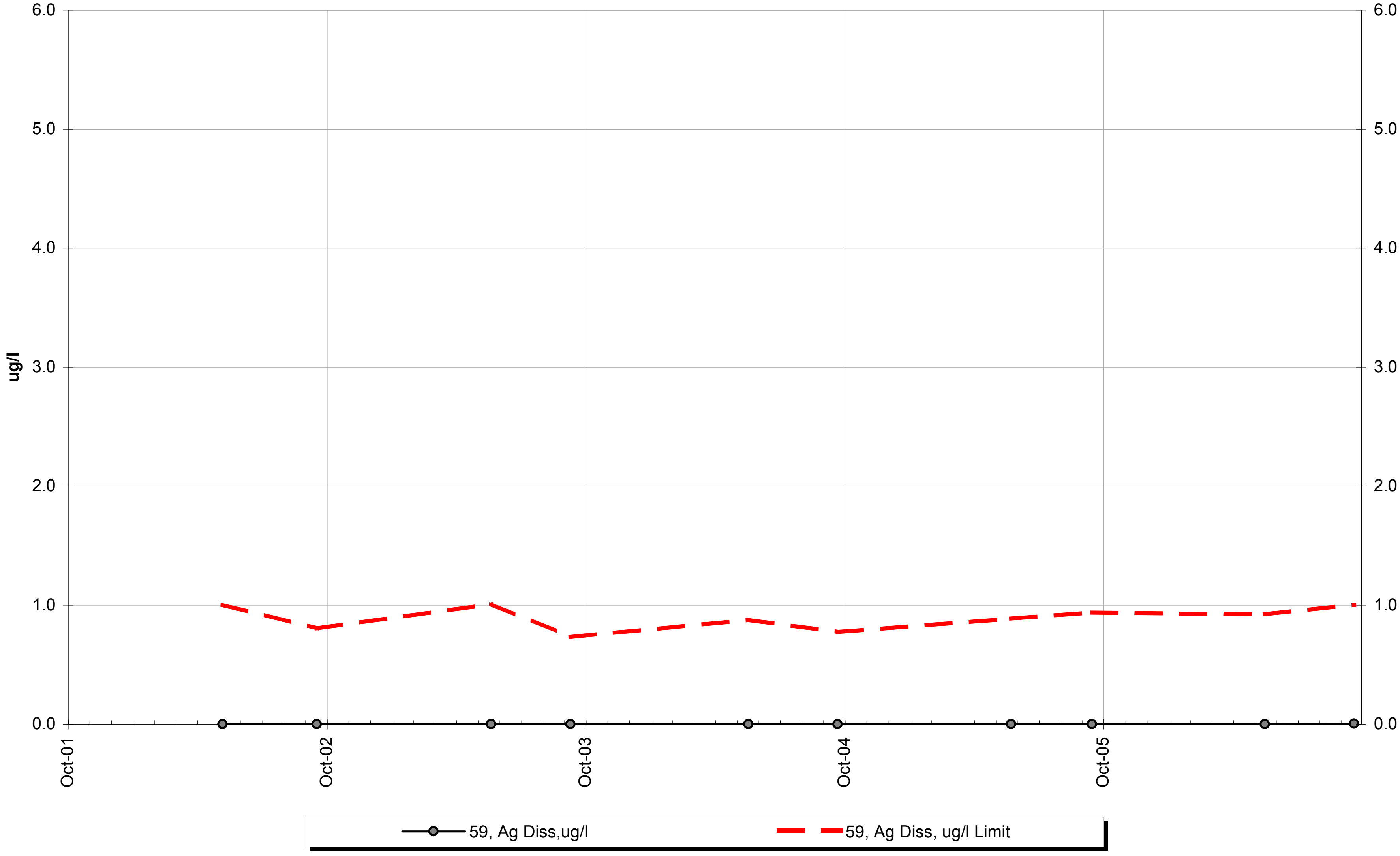
Site 59 -Dissolved Lead



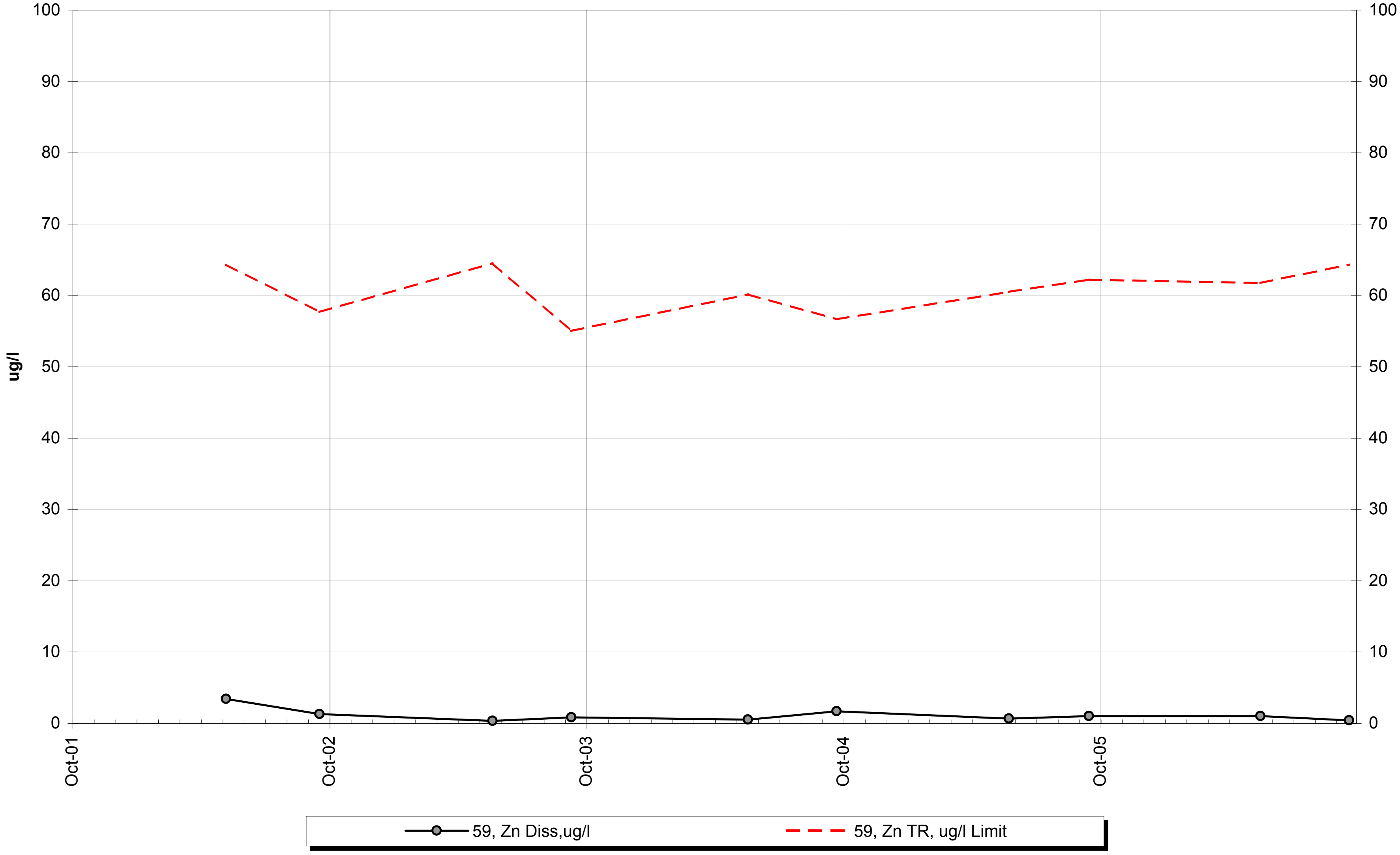
Site 59 -Dissolved Nickel

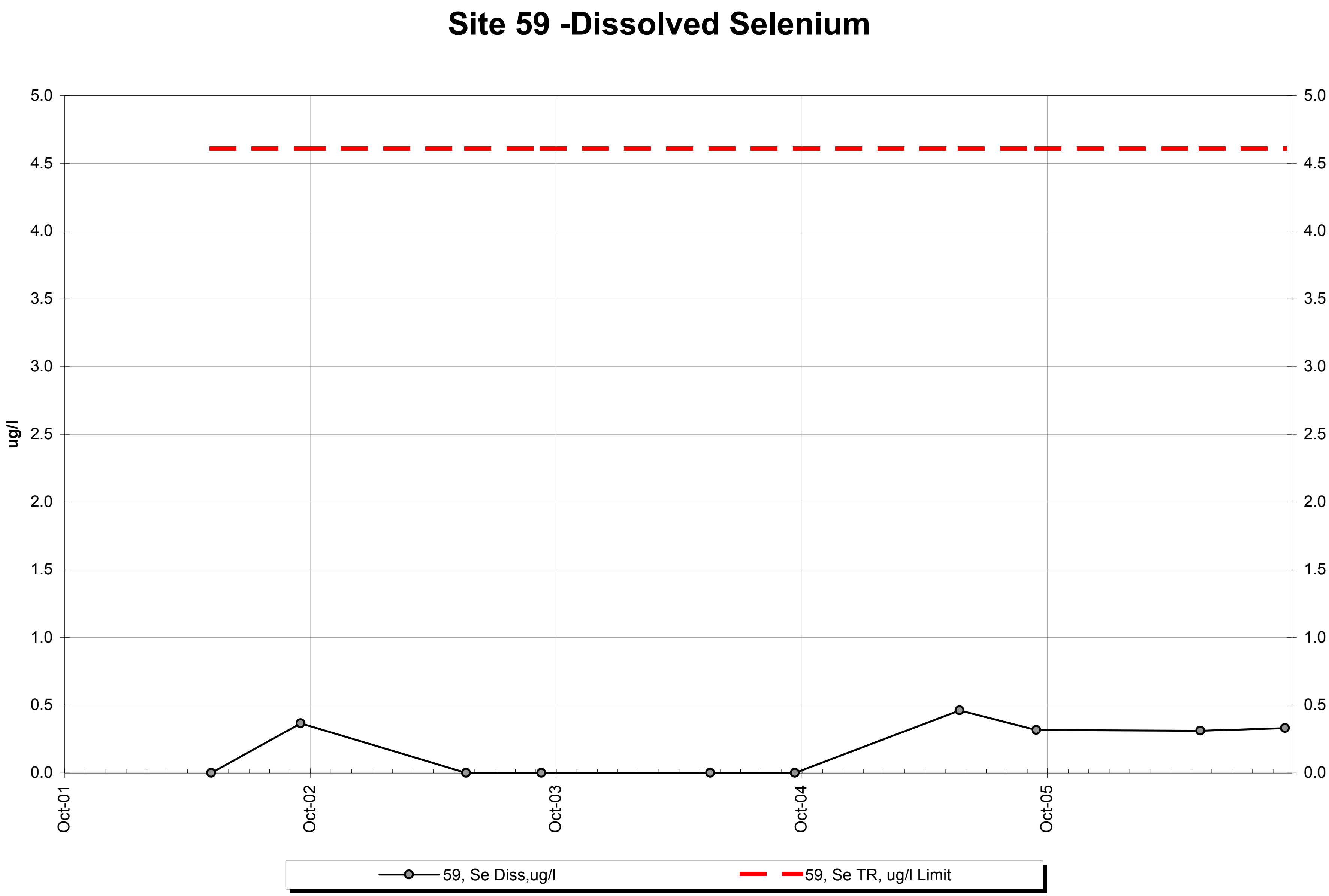


Site 59 -Dissolved Silver



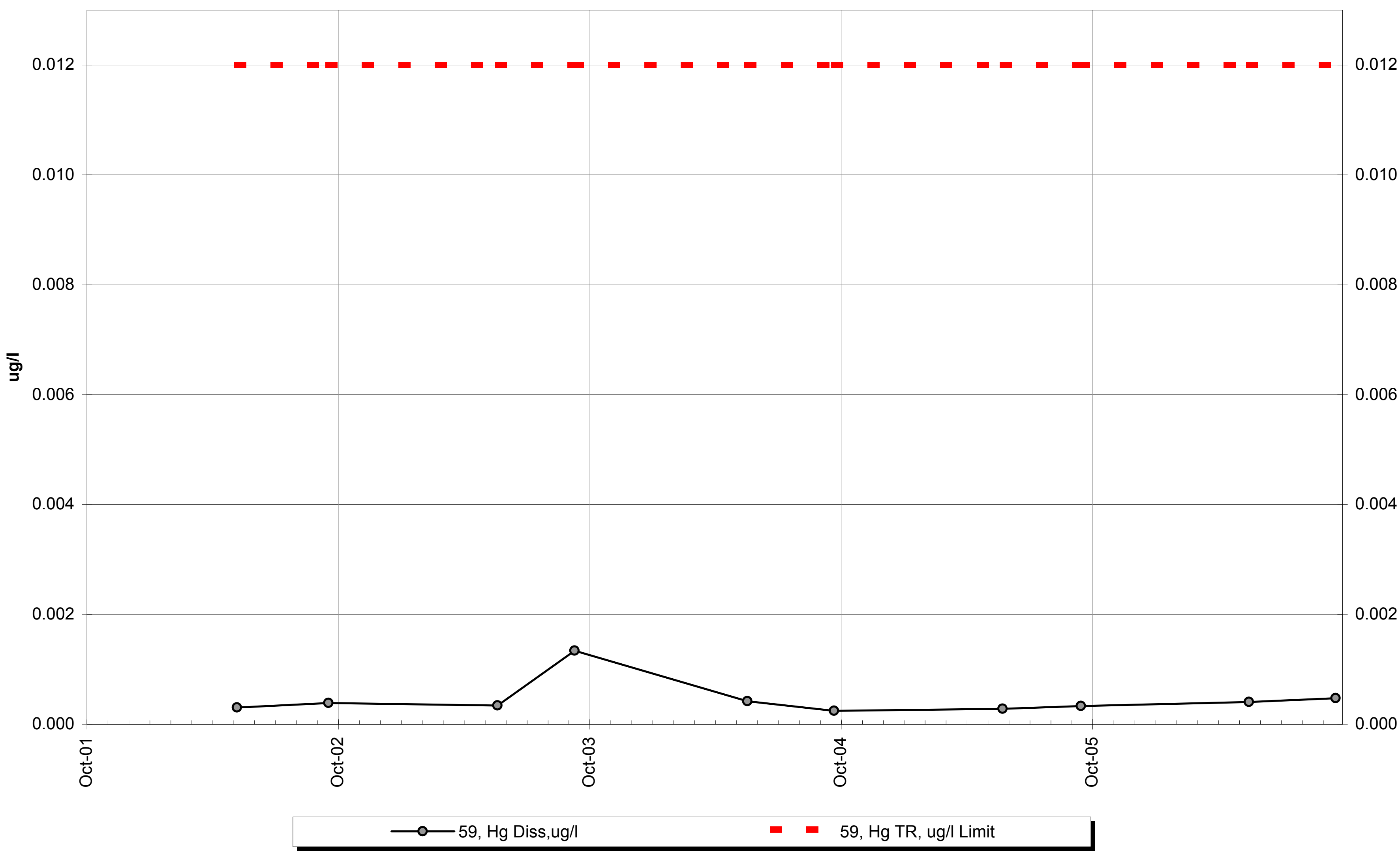
Site 59 -Dissolved Zinc





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-01
Oct-02
Oct-03
Oct-04
Oct-05
59, Se Diss,ug/l
59, Se TR, ug/l Limit

Site 59 -Dissolved Mercury



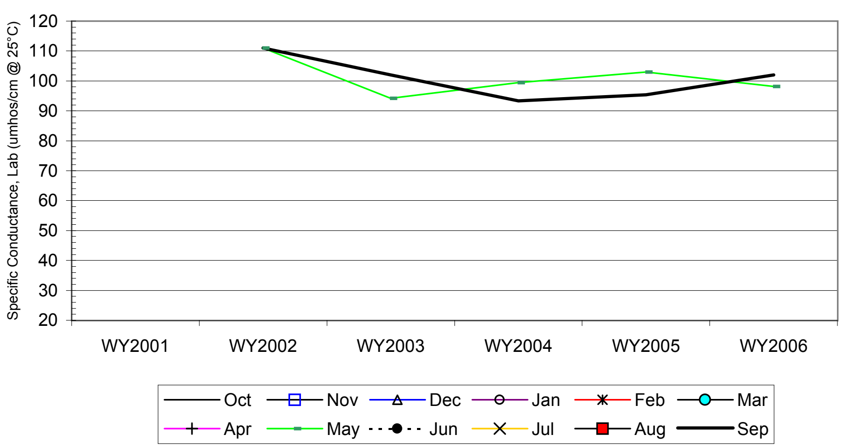
Site **#59** Seasonal Kendall analysis for Specific Conductance, Lab (umhos/cm @ 25°C)

Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**								111.0				111.0
c	**WY2003**								94.2				102.0
d	**WY2004**								99.4				93.3
e	**WY2005**								103.0				95.4
f	**WY2006**								98.2				102.0
	n	0	0	0	0	0	0	0	5	0	0	0	5
	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												
	c-a												
	d-a												
	e-a												
	f-a												
	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	-2	0	0	0	-3
	σ^2_S=								16.67				16.67
	$Z_k = S_k/\sigma_S$								-0.49				-0.73
	Z^2_k								0.24				0.54

ΣZ_k=	-1.22	Tie Extent	t_1	t_2	t_3	t_4	t_5
ΣZ^2_k=	0.78	Count	1	0	0	0	0
Z-bar=ΣZ_k/K=	-0.61						

Σn	10
ΣS_k	-5

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=		0.03	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity
	p	**0.862**			$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.69	@α/2=2.5% Z=	1.96	**H_0** (No trend) ACCEPT
33.33	p	**0.244**			**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-8.81		4.14
0.050	-5.65	**-2.46**	1.91
0.100	-5.08		0.93
0.200	-3.94		-0.34

Site **#59** Seasonal Kendall analysis for pH, Lab, Standard Units

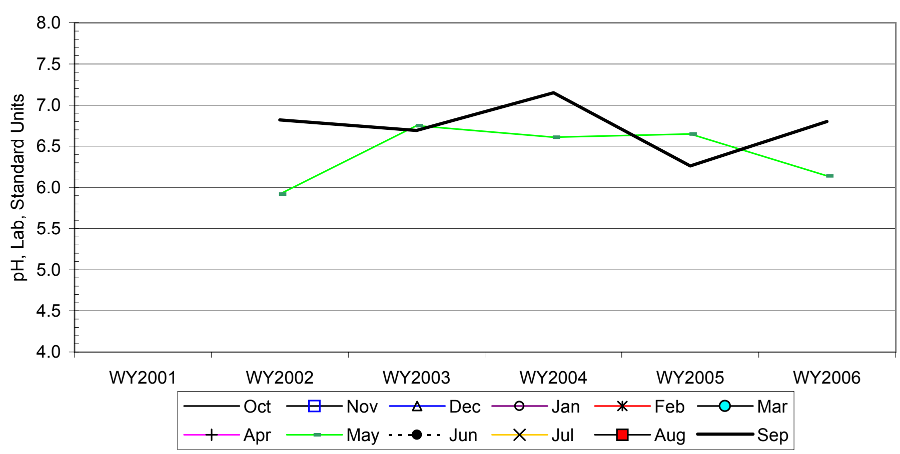
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**								5.9				6.8
c	**WY2003**								6.8				6.7
d	**WY2004**								6.6				7.2
e	**WY2005**								6.7				6.3
f	**WY2006**								6.1				6.8
	n	0	0	0	0	0	0	0	5	0	0	0	5
	t_1	0	0	0	0	0	0	0	0	0	0	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												
	c-a												
	d-a												
	e-a												
	f-a												
	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	0	0	0	0	-2
	σ^2_S=								16.67				16.67
	$Z_k = S_k/\sigma_S$								0.00				-0.49
	Z^2_k								0.00				0.24

ΣZ_k=	-0.49
ΣZ^2_k=	0.24
Z-bar=ΣZ_k/K=	-0.24

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

Σn	10
ΣS_k	-2

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.12	@α=5% $\chi^2_{(K-1)}$=	3.84	Test for station homogeneity
	p	**0.729**			$\chi^2_h<\chi^2_{(K-1)}$ ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.17	@α/2=2.5% Z=	1.96	**H_0** (No trend) ACCEPT
33.33	**p**	**0.431**			**H_A** (± trend) REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.23		0.32
0.050	-0.20	**-0.03**	0.14
0.100	-0.18		0.05
0.200	-0.16		0.04

Site **#59** Seasonal Kendall analysis for Total Alk, (mg/l)

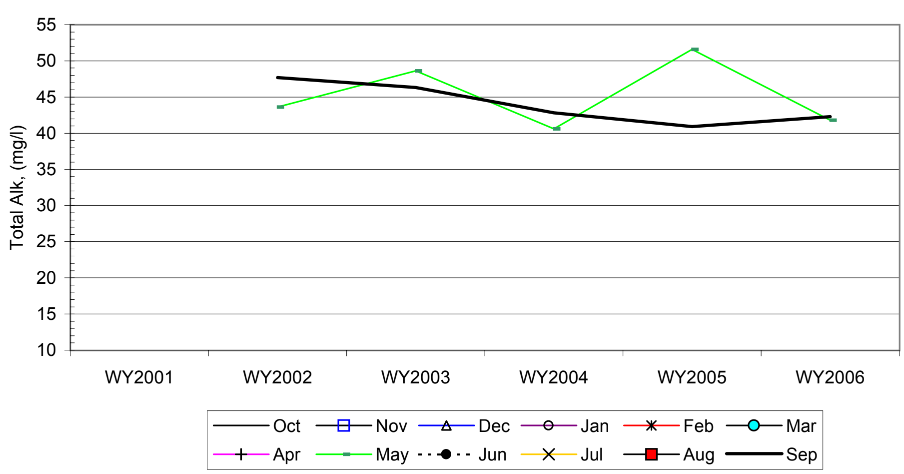
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**												
b	**WY2002**								43.6				47.7
c	**WY2003**								48.6				46.3
d	**WY2004**								40.6				42.8
e	**WY2005**								51.6				40.9
f	**WY2006**								41.8				42.3
	n	0	0	0	0	0	0	0	5	0	0	0	5
	t_1	0	0	0	0	0	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												
	c-a												
	d-a												
	e-a												
	f-a												
	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	0	0	0	0	-8
	σ^2_S=								16.67				16.67
	$Z_k = S_k/\sigma_S$								0.00				-1.96
	Z^2_k								0.00				3.84

ΣZ_k=	-1.96
ΣZ^2_k=	3.84
Z-bar=ΣZ_k/K=	-0.98

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

Σn	10
ΣS_k	-8

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		1.92	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.166**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-1.21	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
33.33	**p**	**0.113**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.27		1.47
0.050	-2.40	**-1.38**	0.39
0.100	-2.27		-0.31
0.200	-2.06		-0.95

Site **#59** 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	**WY2001**												
b	**WY2002**								3.4				1.3
c	**WY2003**								0.4				0.8
d	**WY2004**								0.5				1.7
e	**WY2005**								0.7				1.0
f	**WY2006**								1.0				0.4
	n	0	0	0	0	0	0	0	5	0	0	0	5

	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												
c-a												
d-a												
e-a												
f-a												
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	2	0	0	0	-4

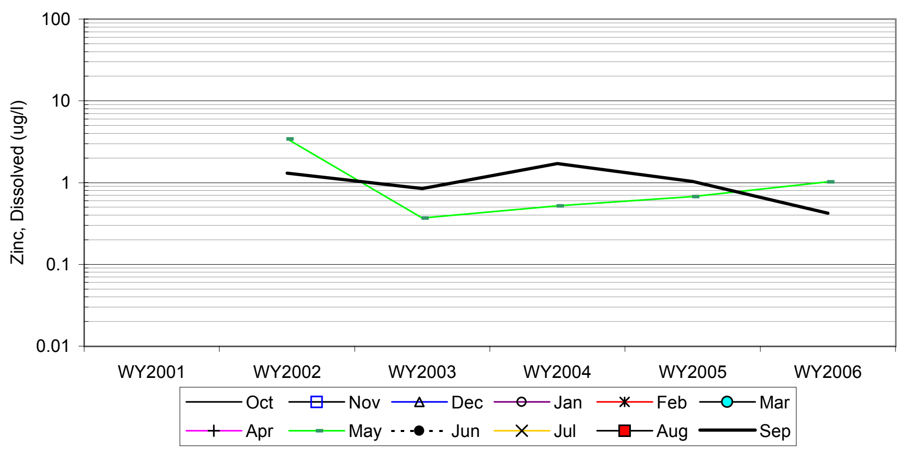
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								16.67				16.67
$Z_k = S_k/\sigma_S$								0.49				-0.98
Z^2_k								0.24				0.96

ΣZ_k=	-0.49
ΣZ^2_k=	1.20
Z-bar=ΣZ_k/K=	-0.24

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

Σn	10
ΣS_k	-2

$\chi^2_h=\Sigma Z^2_k$-K(Z-bar)^2=		1.08	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.299**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	-0.17	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
33.33	**p**	**0.431**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.85		0.21
0.050	-0.63	**-0.12**	0.16
0.100	-0.60		0.15
0.200	-0.52		0.12

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 2006” report. The table includes all the required FWMP analyte 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 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-01though Sept-06.				

The data for Water Year 2006 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. Two datum are 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. The other two datum are for dissolved arsenic values of 25.9 ug/l and 70.2 µg/l for May-2006 and September-2006 respectively which exceed the AWQS of 10 µg/l. This site has routinely returned arsenic values above the AWQS and has a median value of 74 µg/l based on sampling since October-1988.

Sample Date	Parameter	Value	Standard	Standard Type
05/17/06	pH Field, su	8.73	6.5 - 8.5	Aquatic Life
09/20/06	pH Field, su	8.61	6.5 - 8.5	Aquatic Life
05/17/06	Arsenic Dissolved ug/L	25.9	10*	Drinking Water
09/20/06	Arsenic Dissolved ug/L	70.2	10*	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 preformed for conductivity, pH, alkalinity, and dissolved zinc. Calculation details of the Seasonal 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-00 and Sep-06 (WY2001-WY2006). The dataset for lab conductivity is the only analyte that shows a statistically significant ($p<0.01$) trend and a slope estimate of -8.08 µS/cm•yr or a -3.8% 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 uS/cm.

Site 28-WY2006, summary statistics for trend analysis.

	Mann-Kendall test statistics			Sen's slope estimate	
Parameter	n(1)	p(2)	Trend	Q	Q(%)
Conductivity, Lab	6	**<0.01**	**-**	**-8.08**	**-3.8**
pH, Lab	6	0.35	-		
Alkalinity, Total	6	0.09	-		
Zinc, Dissolved	6	0.88	+		

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

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 181 µS/cm in May-2006. Thus, this trend appears to be within the range of variability experienced by this site in prior years.

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 generally similar except for the current water year which shows a pronounced spike of moderate amplitude. 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.

Table of Results for Water Year 2006

Site 28 "MW-2D"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	Jul-06	Aug-06	9/20/06	**Median**
Water Temp (°C)								5.1				7.3	6.2
Conductivity-Field(µmho)								168				228	198
Conductivity-Lab (µmho)								181				199	190
pH Lab (standard units)								8.00				7.48	7.74
pH Field (standard units)								8.73				8.61	8.67
Total Alkalinity (mg/L)								88.3				86.2	87.3
Total Sulfate (mg/L)								8.7				9.4	9.1
Hardness (mg/L)								38.4				73.9	56.2
Dissolved As (ug/L)								25.90				70.20	48.05
Dissolved Ba (ug/L)			NOT SCHEDULED FOR SAMPLING					3.6		NOT SCHEDULED FOR SAMPLING		6.5	5.1
Dissolved Cd (ug/L)								0.006 J				<0.004	0.004
Dissolved Cr (ug/L)								1.470				<0.018	0.740
Dissolved Cu (ug/L)								0.945				0.176	0.561
Dissolved Pb (ug/L)								0.1420				0.0132 U	0.0776
Dissolved Ni (ug/L)								0.335				0.391	0.363
Dissolved Ag (ug/L)								0.017				<0.003	0.009
Dissolved Zn (ug/L)								14.10				3.47	8.79
Dissolved Se (ug/L)								<0.116				<0.139	0.064
Dissolved Hg (ug/L)								0.000518 UJ				0.000330 U	0.000424

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

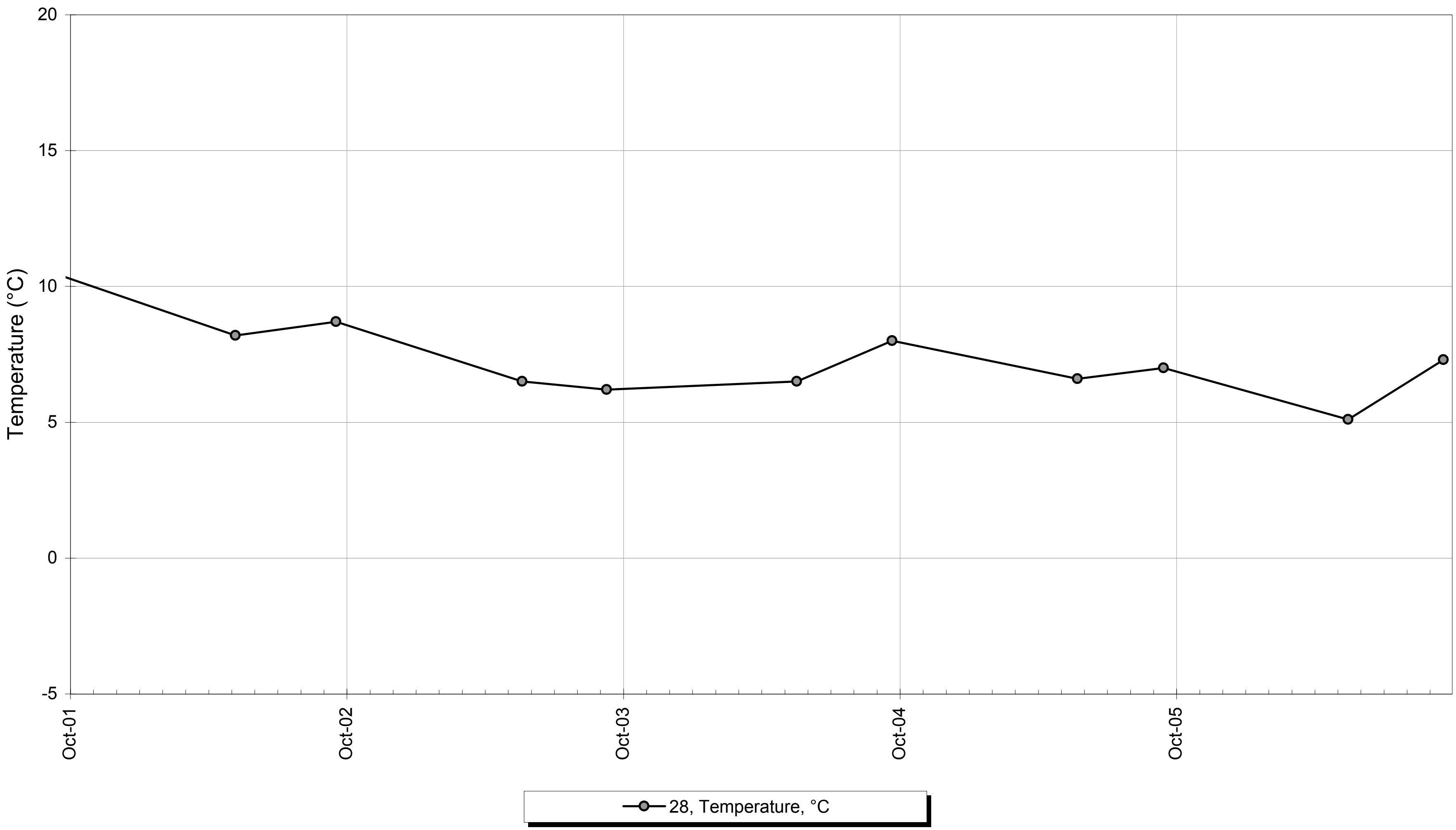
Qualified Data by QA Reviewer

Date Range 10/01/2005 to 09/30/2006

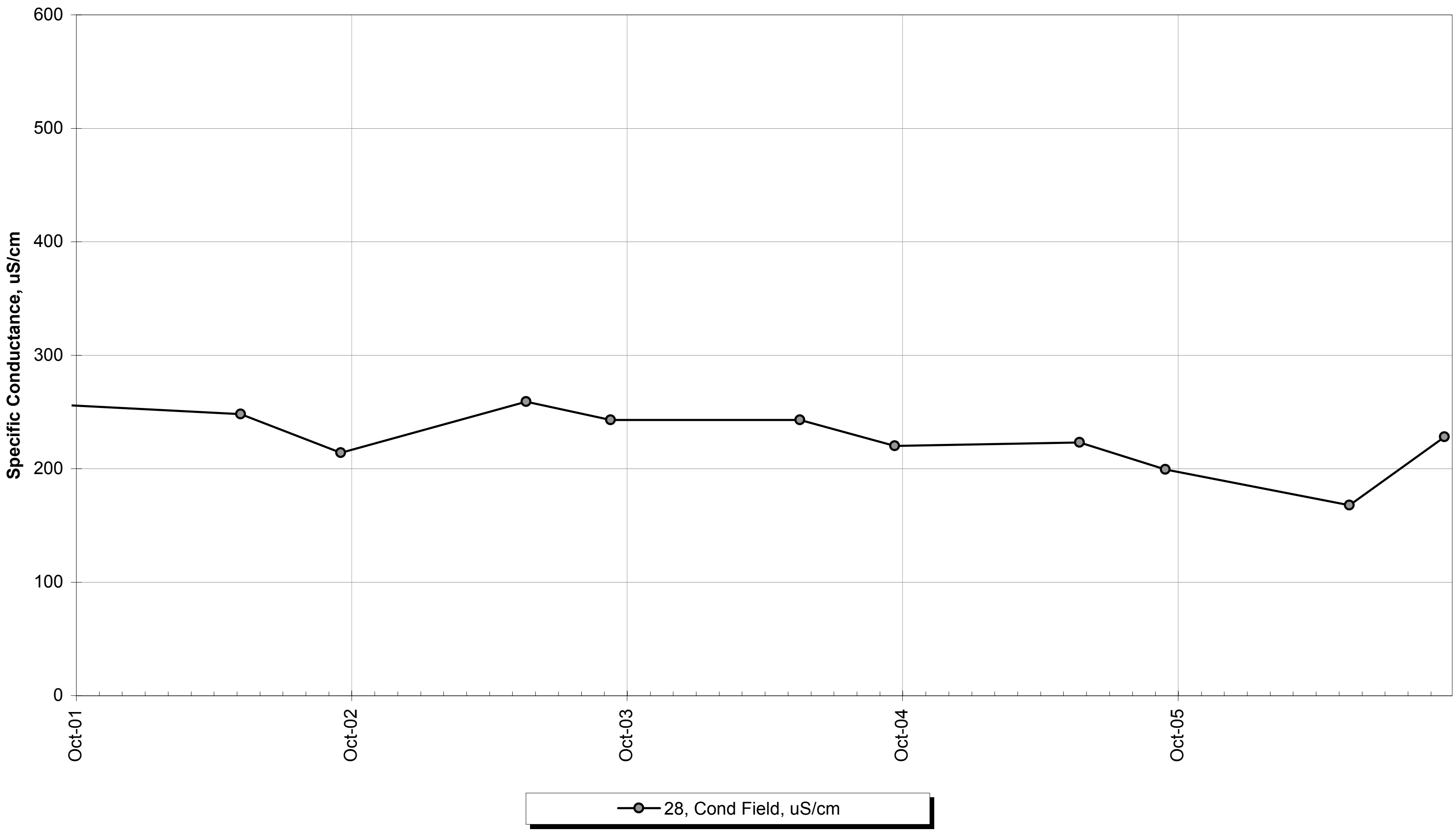
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
28	05/17/2006	10:45:00 AM				
			Cd Diss, ug/l	0.00557	J	Below Quantitative Range
			Hg Diss, ug/l	0.000518	UJ	Field Blank Contamination, Co
28	09/20/2006	12:30:00 PM				
			Pb Diss, ug/l	0.0132	U	Method Blank Contamination
			Hg Diss, ug/l	0.00033	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

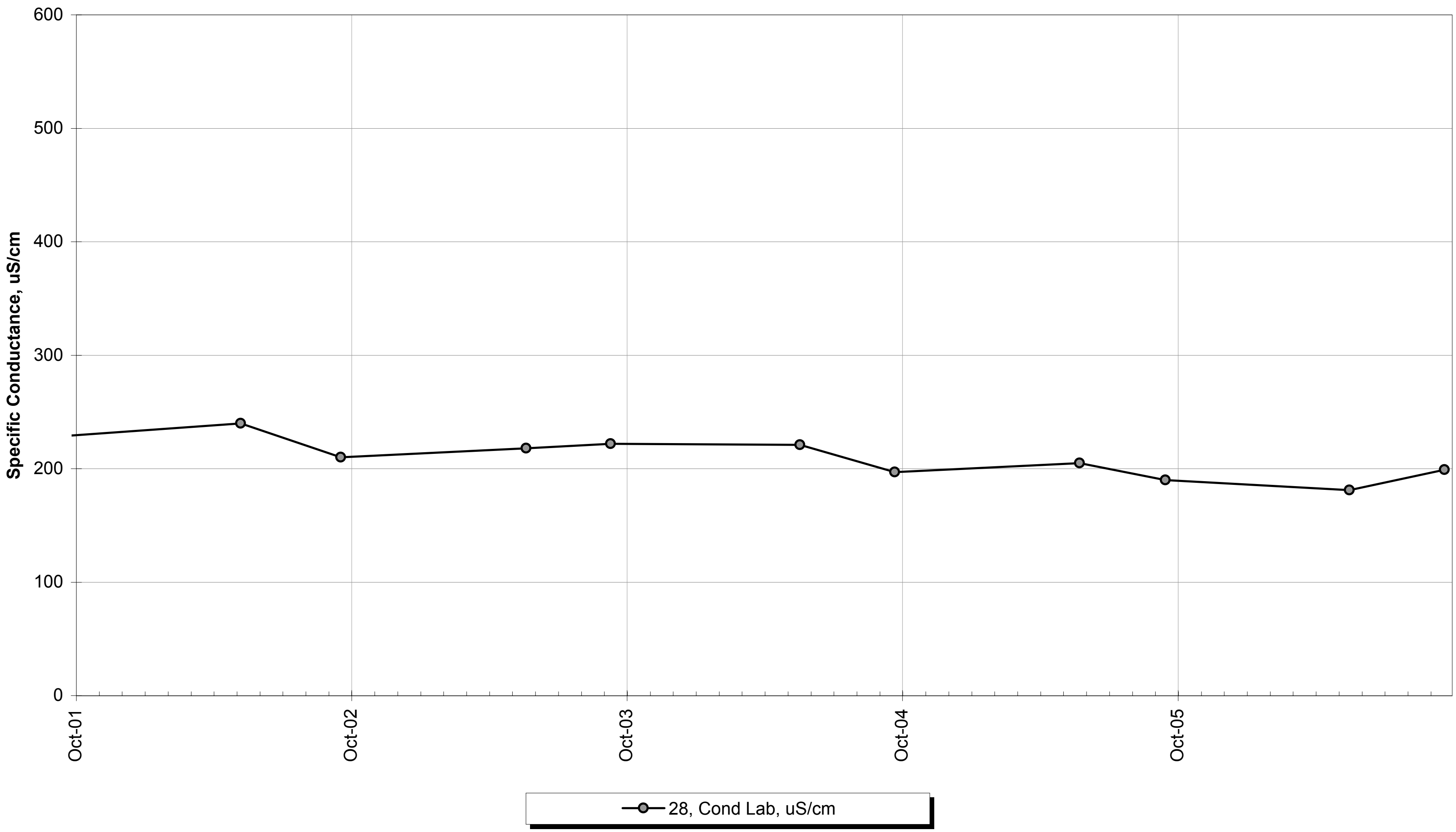
Site 28 -Water Temperature

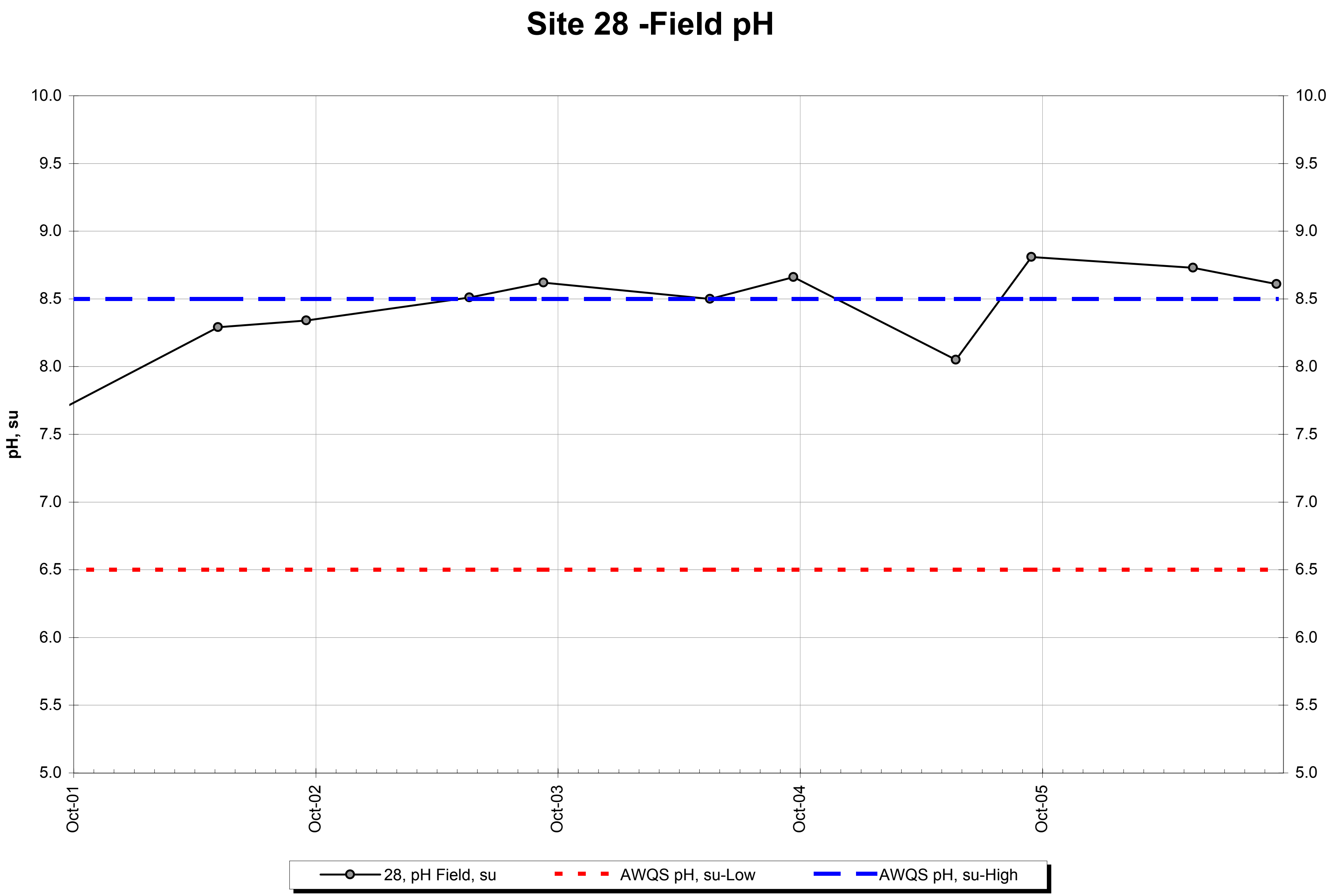


Site 28 -Conductivity-Field

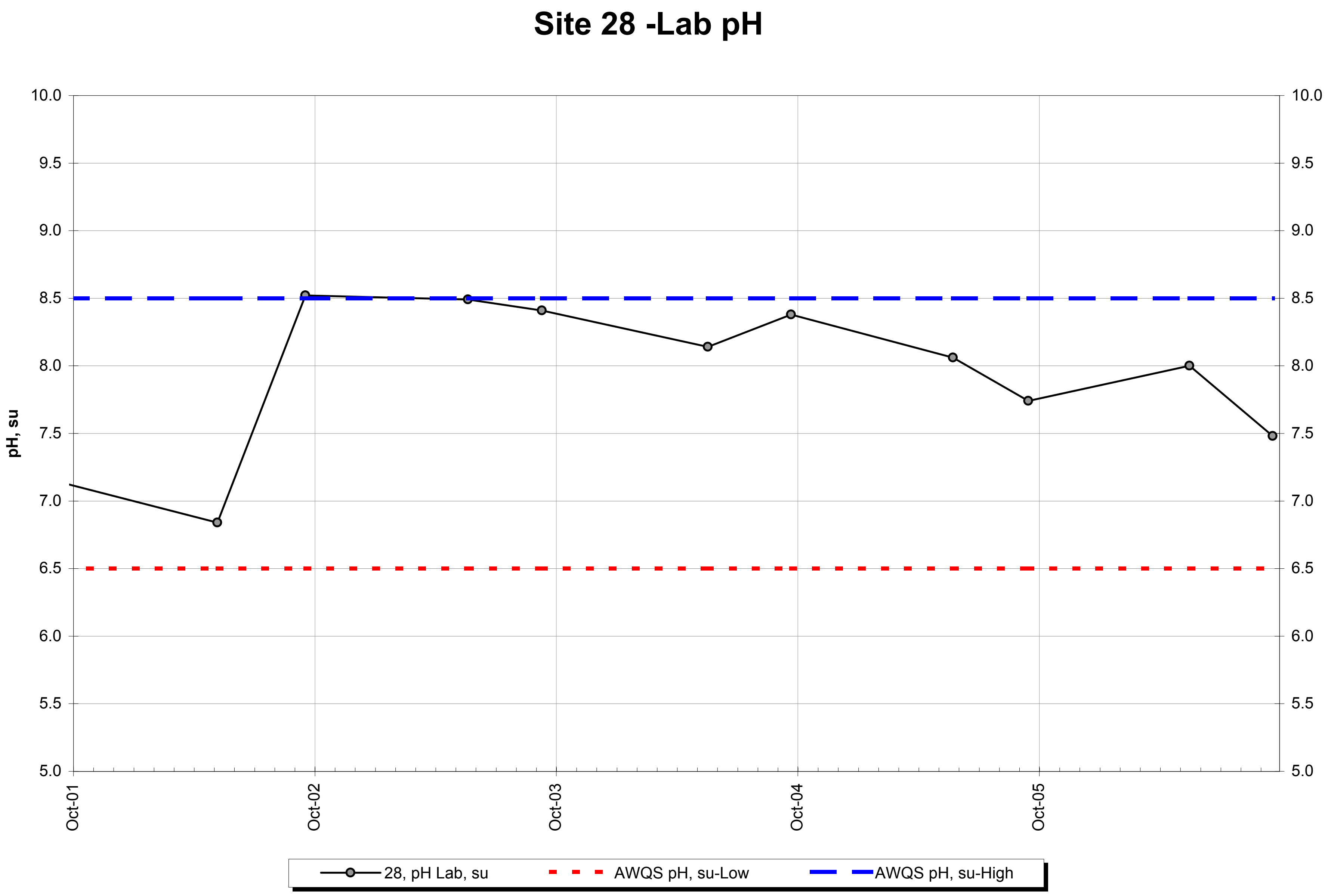


Site 28 -Conductivity-Lab

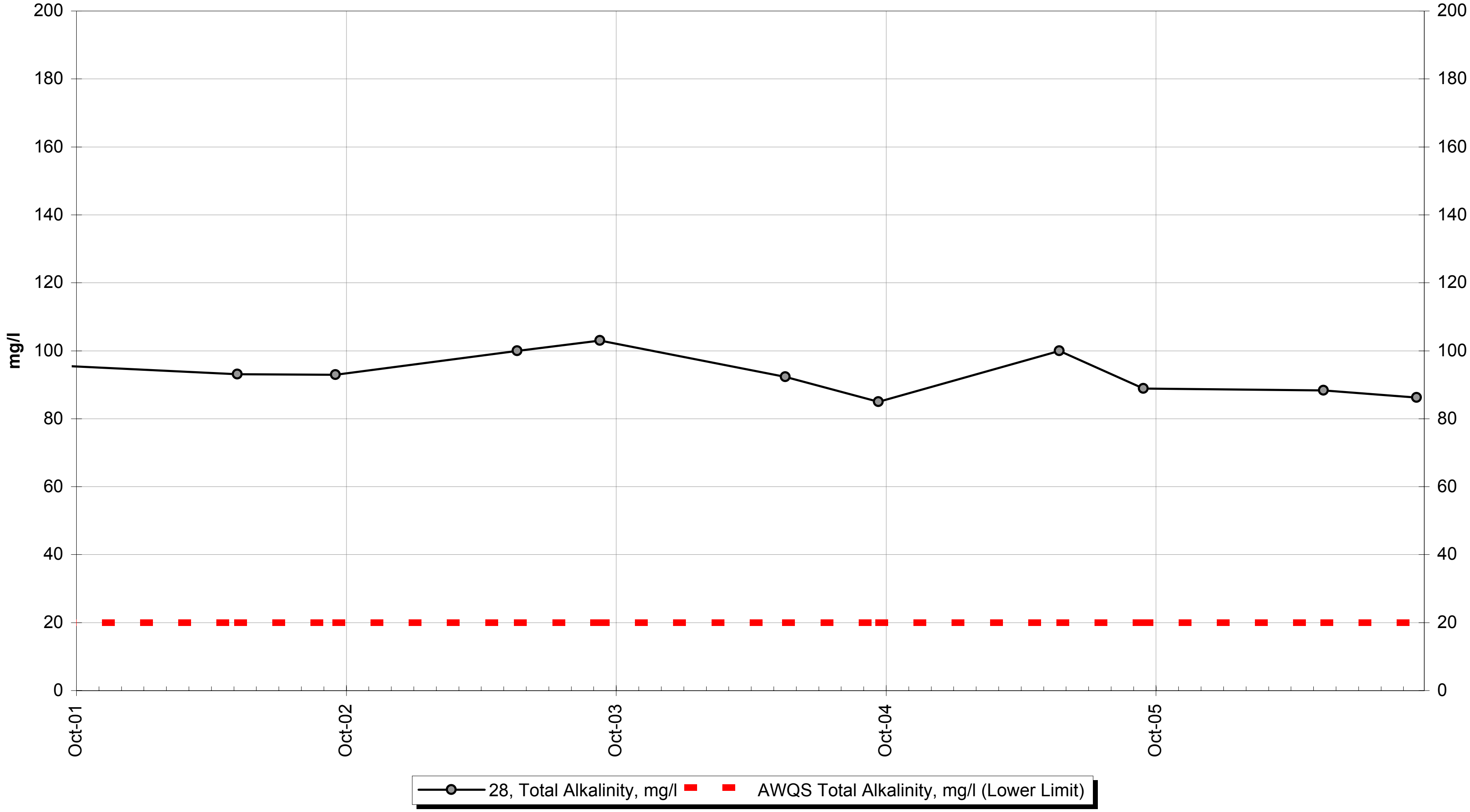




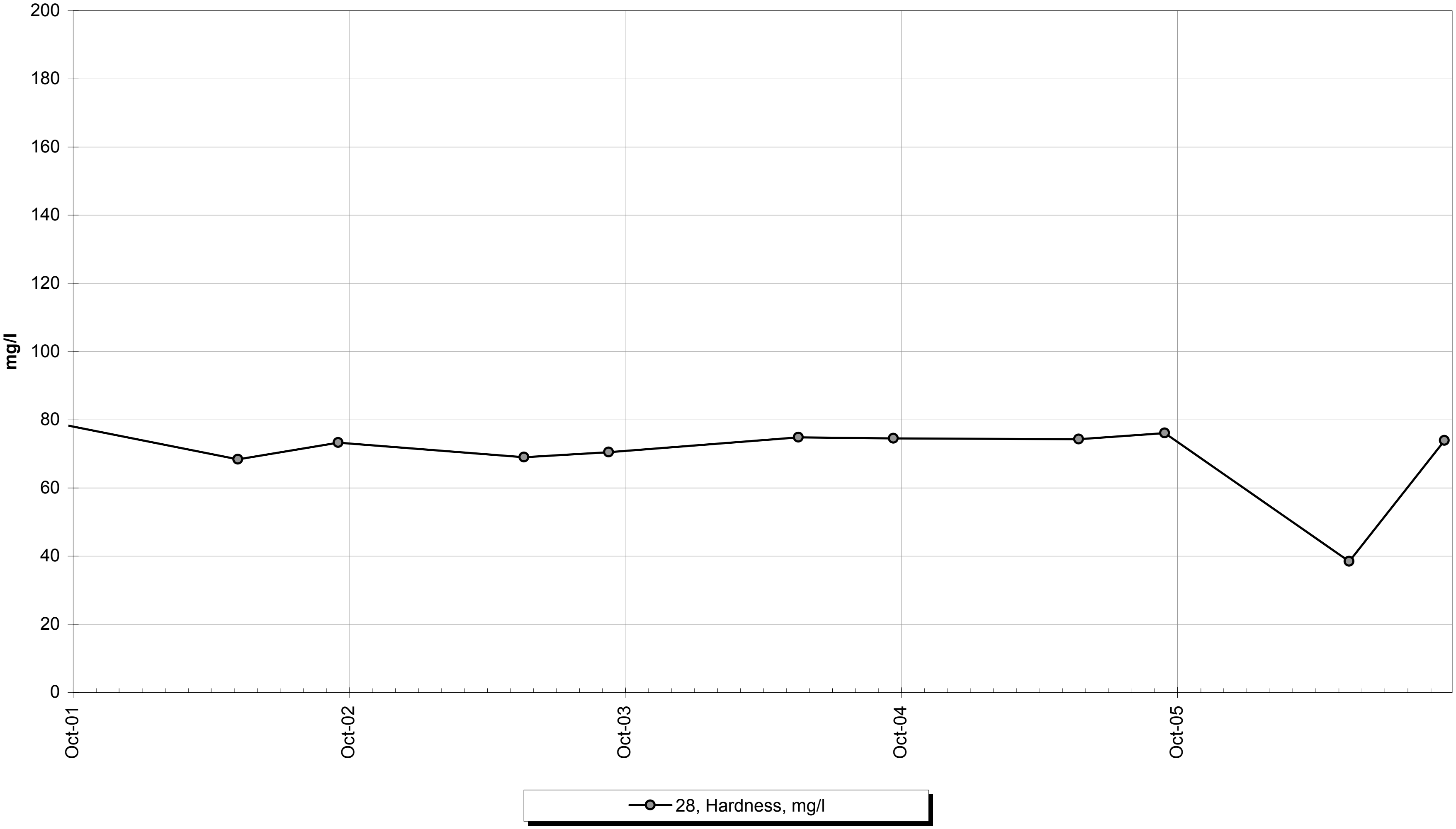
Site 28 -Field pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High


Site 28 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
28, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

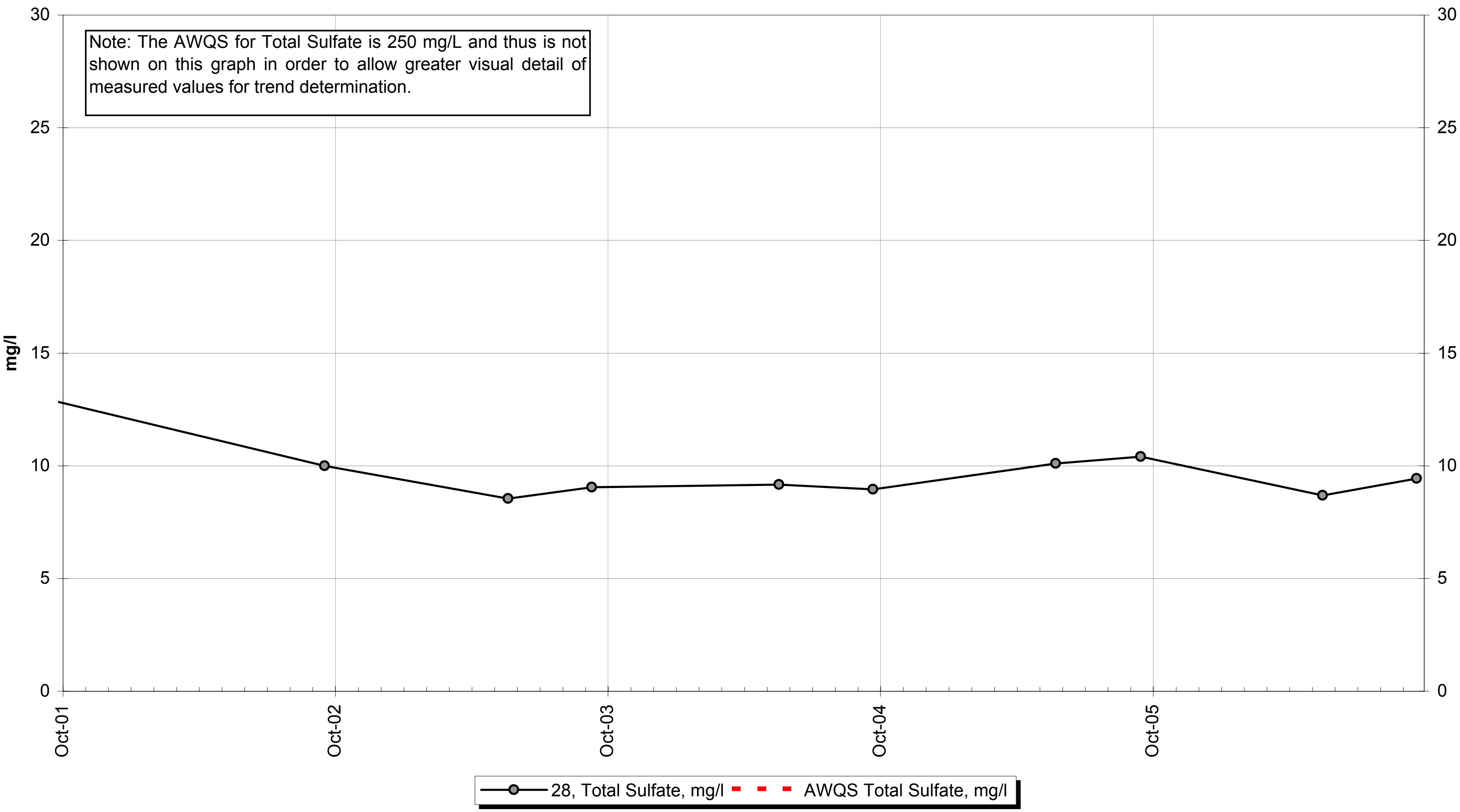
Site 28 -Total Alkalinity

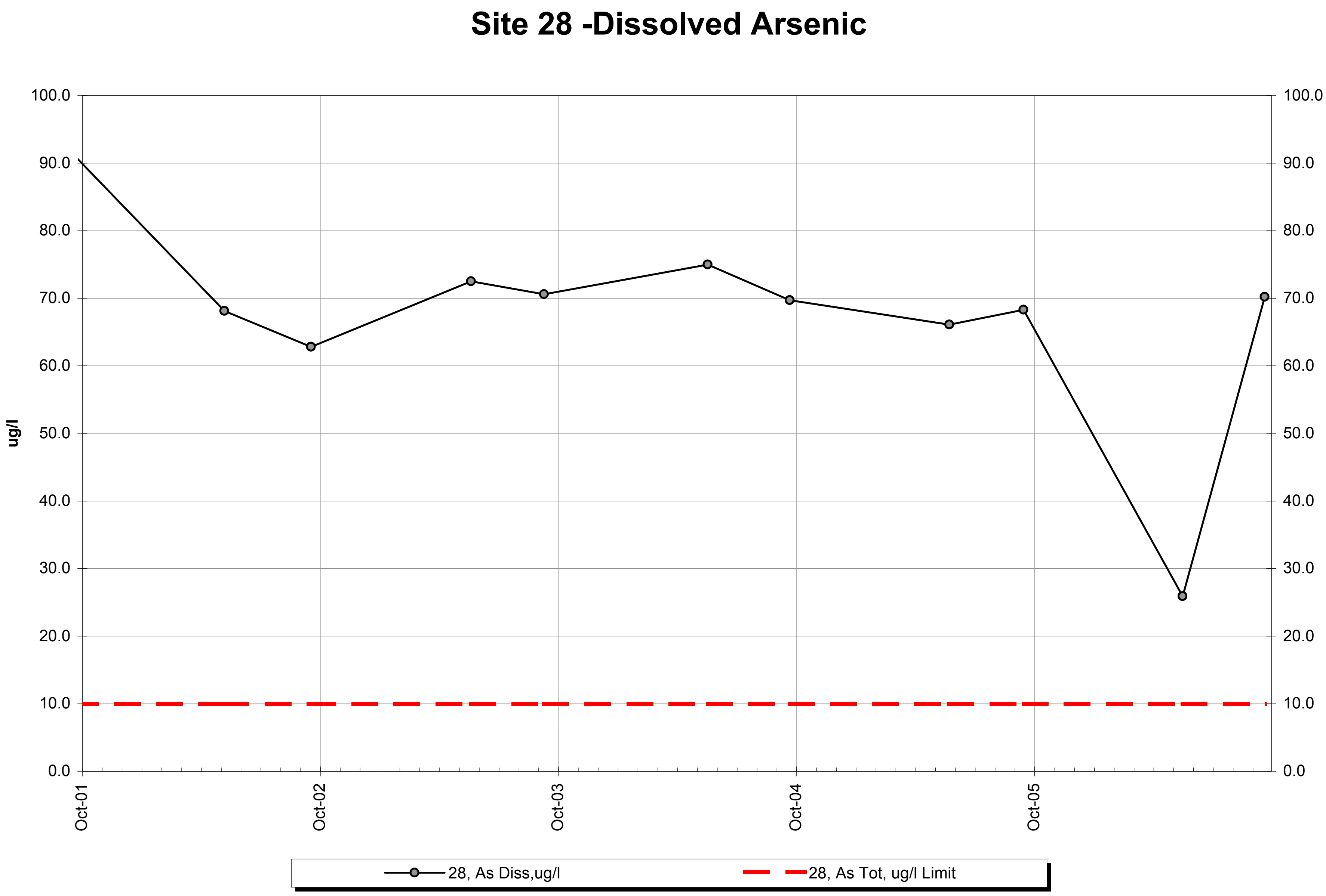


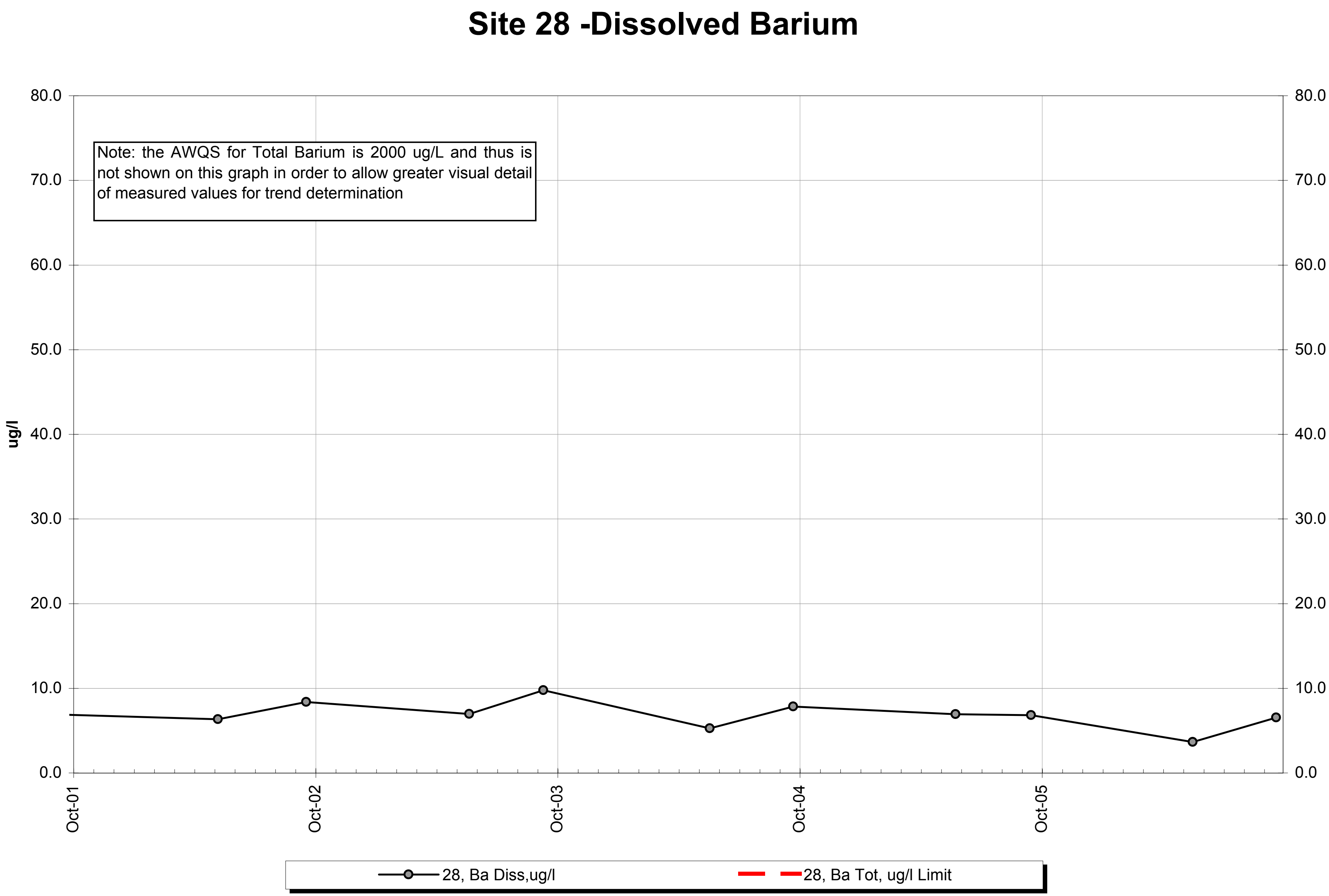
Site 28 -Hardness



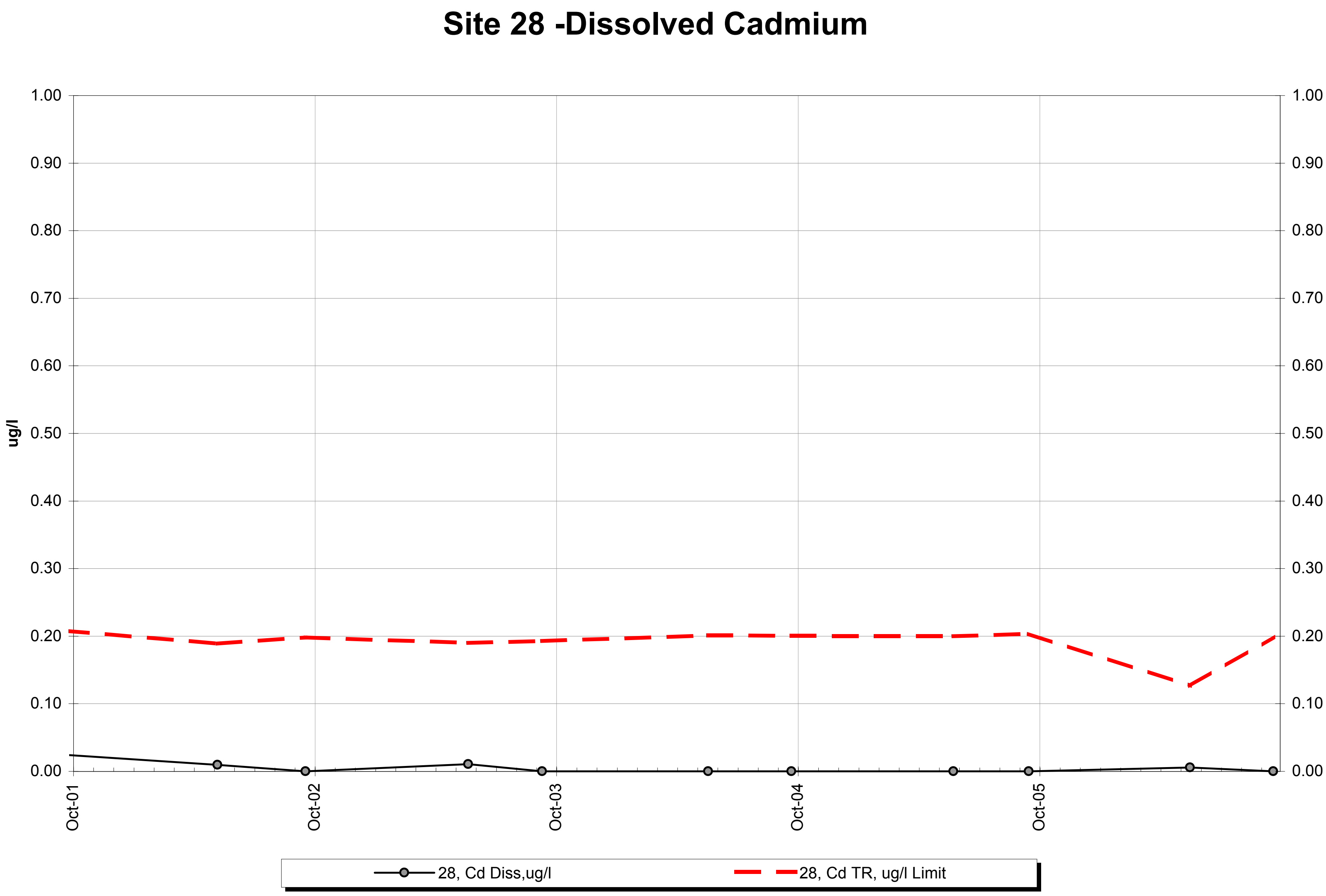
Site 28 -Total Sulfate

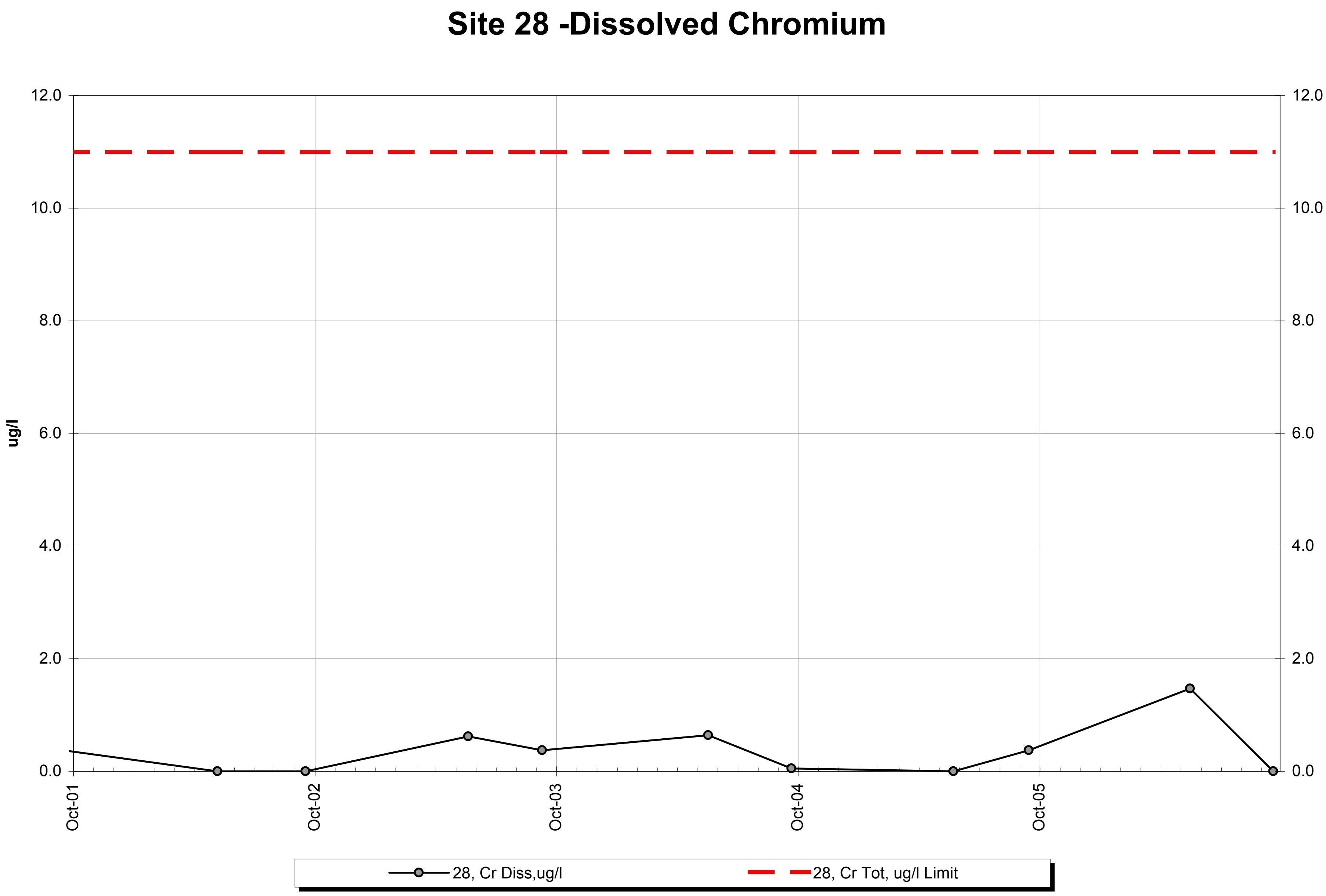



Site 28 -Dissolved Arsenic
ug/l
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, As Diss,ug/l
28, As Tot, ug/l Limit

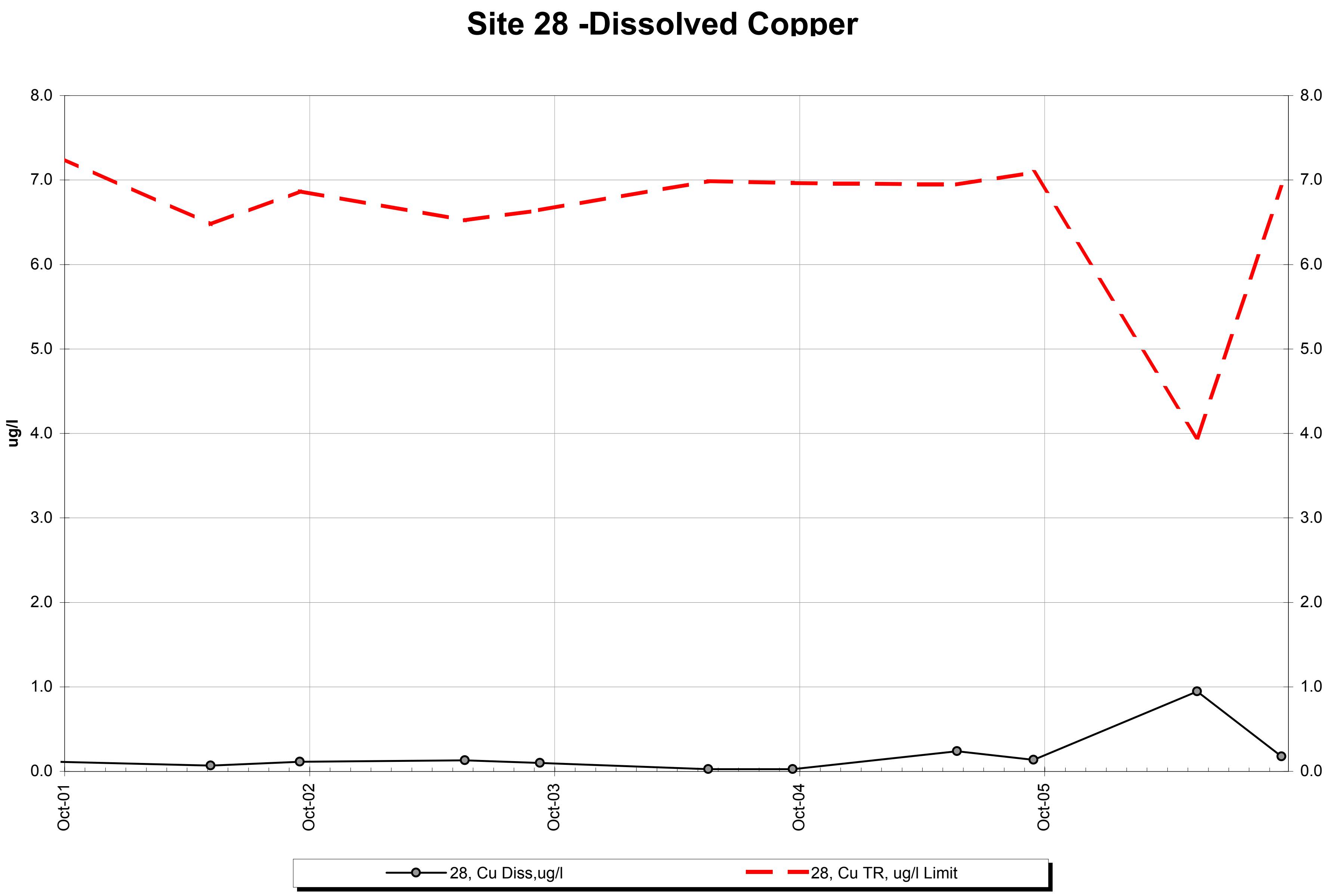


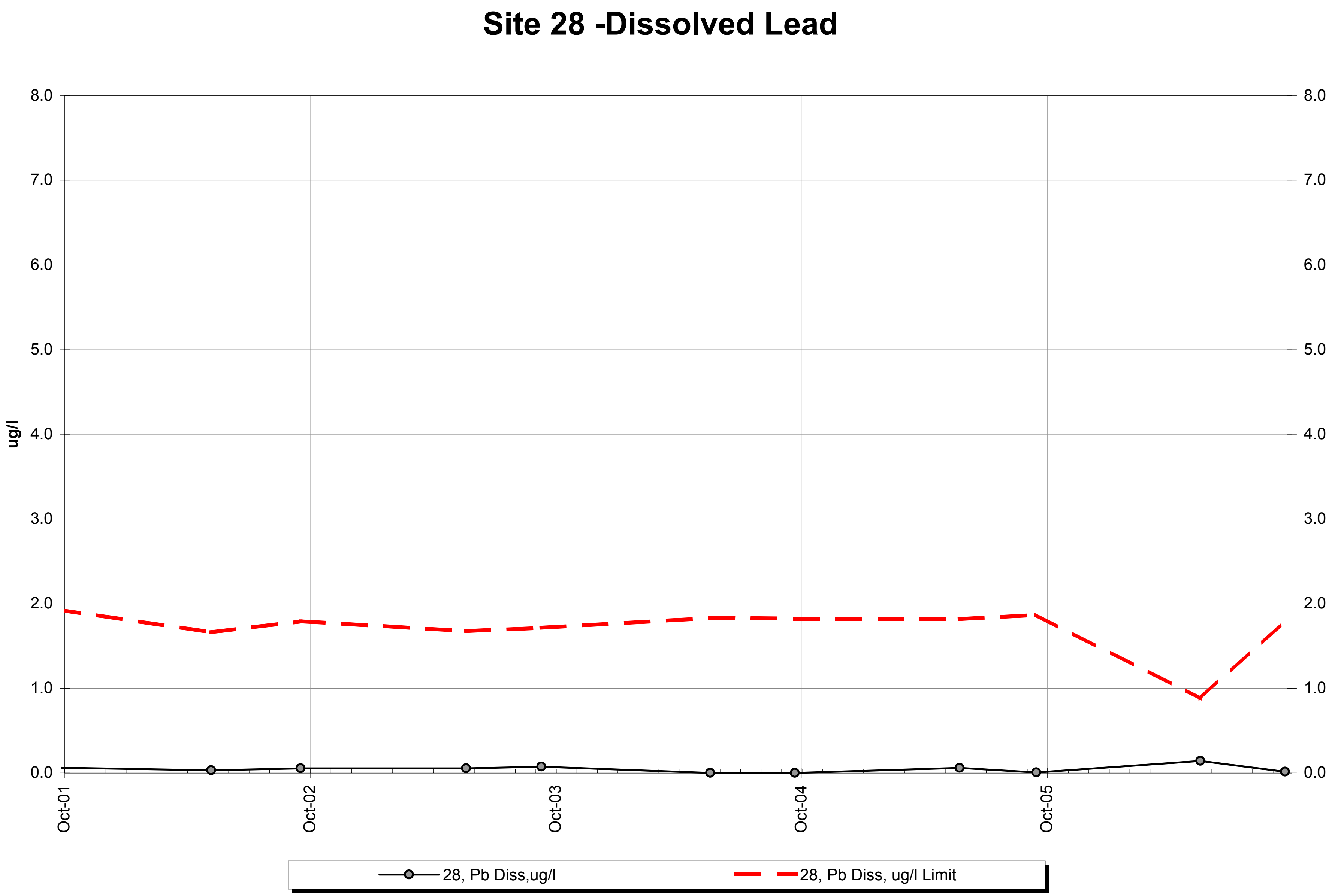
Site 28 -Dissolved Barium
Note: the AWQS for Total Barium is 2000 ug/L and thus is not shown on this graph in order to allow greater visual detail of measured values for trend determination
ug/l
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Ba Diss,ug/l
28, Ba Tot, ug/l Limit


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-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Cd Diss,ug/l
28, Cd TR, ug/l Limit

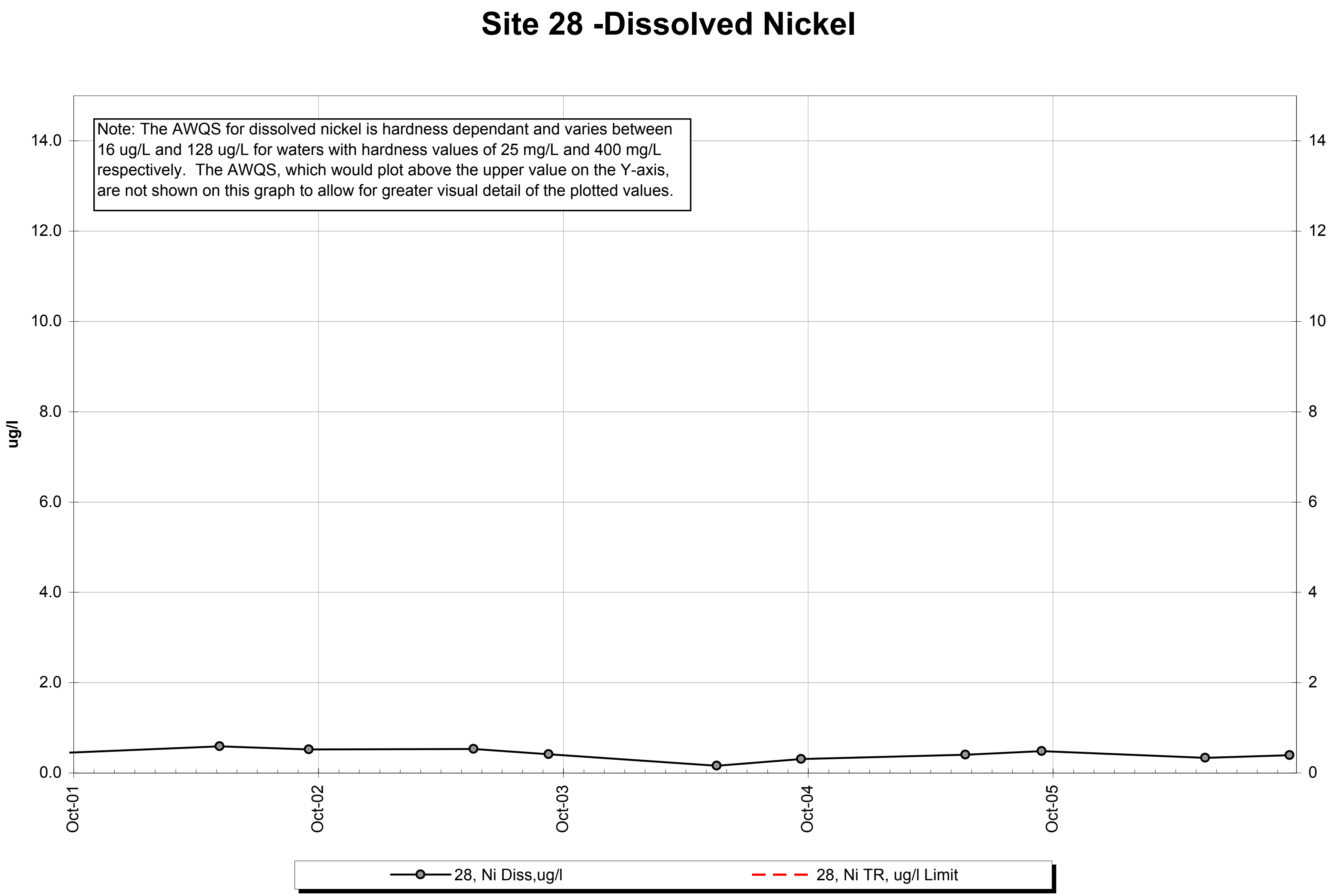


Site 28 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Cr Diss,ug/l
28, Cr Tot, ug/l Limit

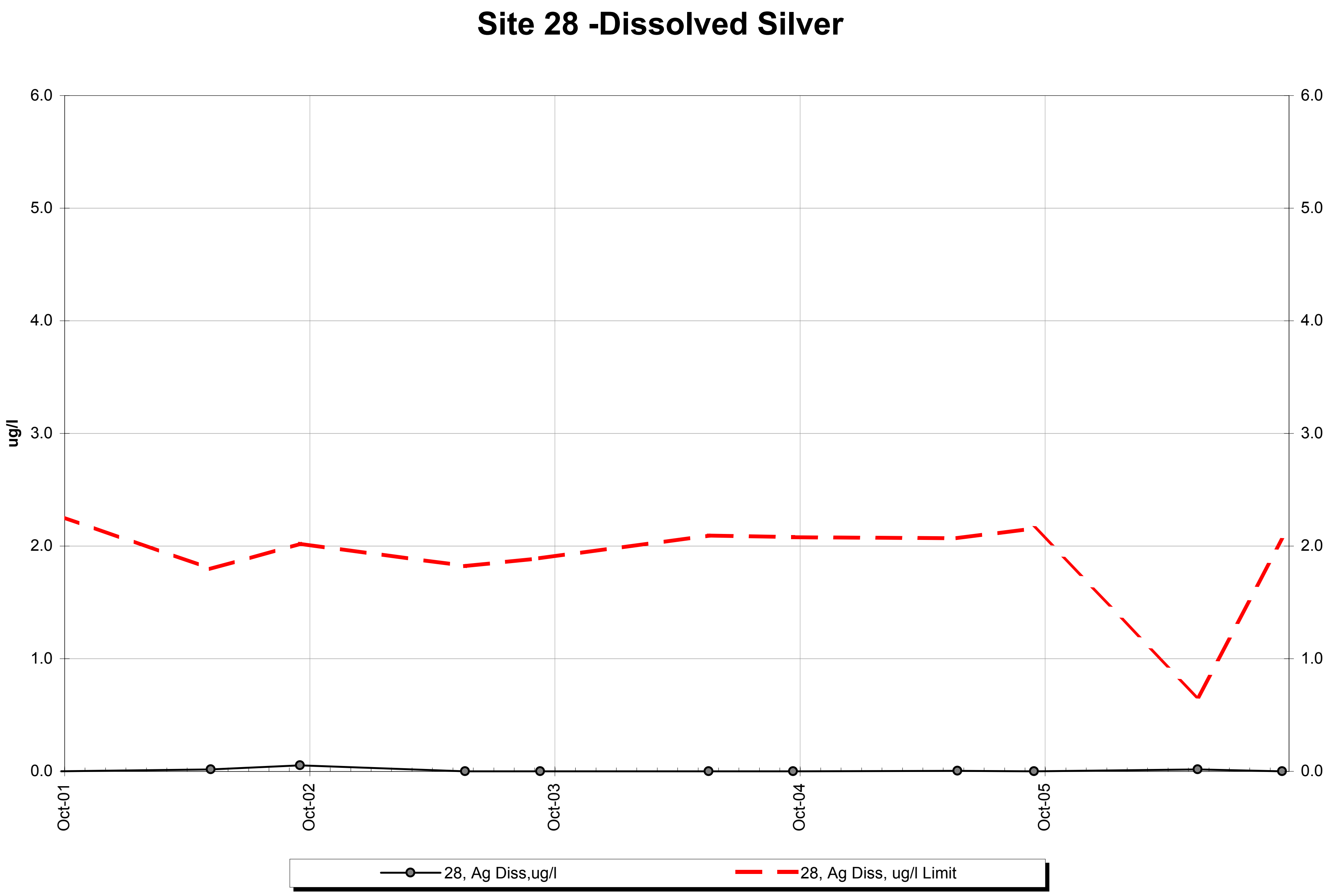

Site 28 -Dissolved Copper
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Cu Diss,ug/l
28, Cu TR, ug/l Limit



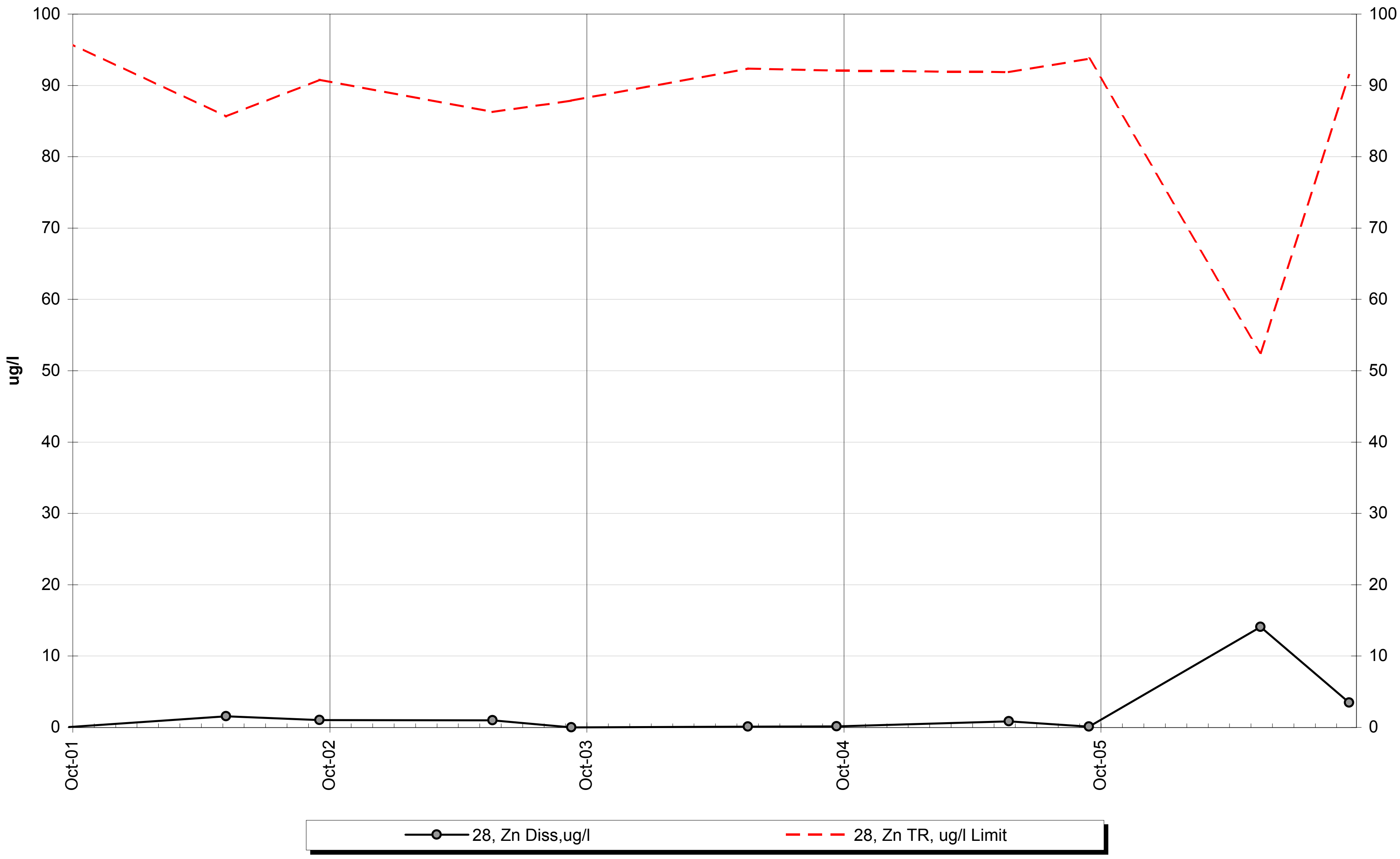
Site 28 -Dissolved Lead
ug/l
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Pb Diss,ug/l
28, Pb Diss, ug/l Limit

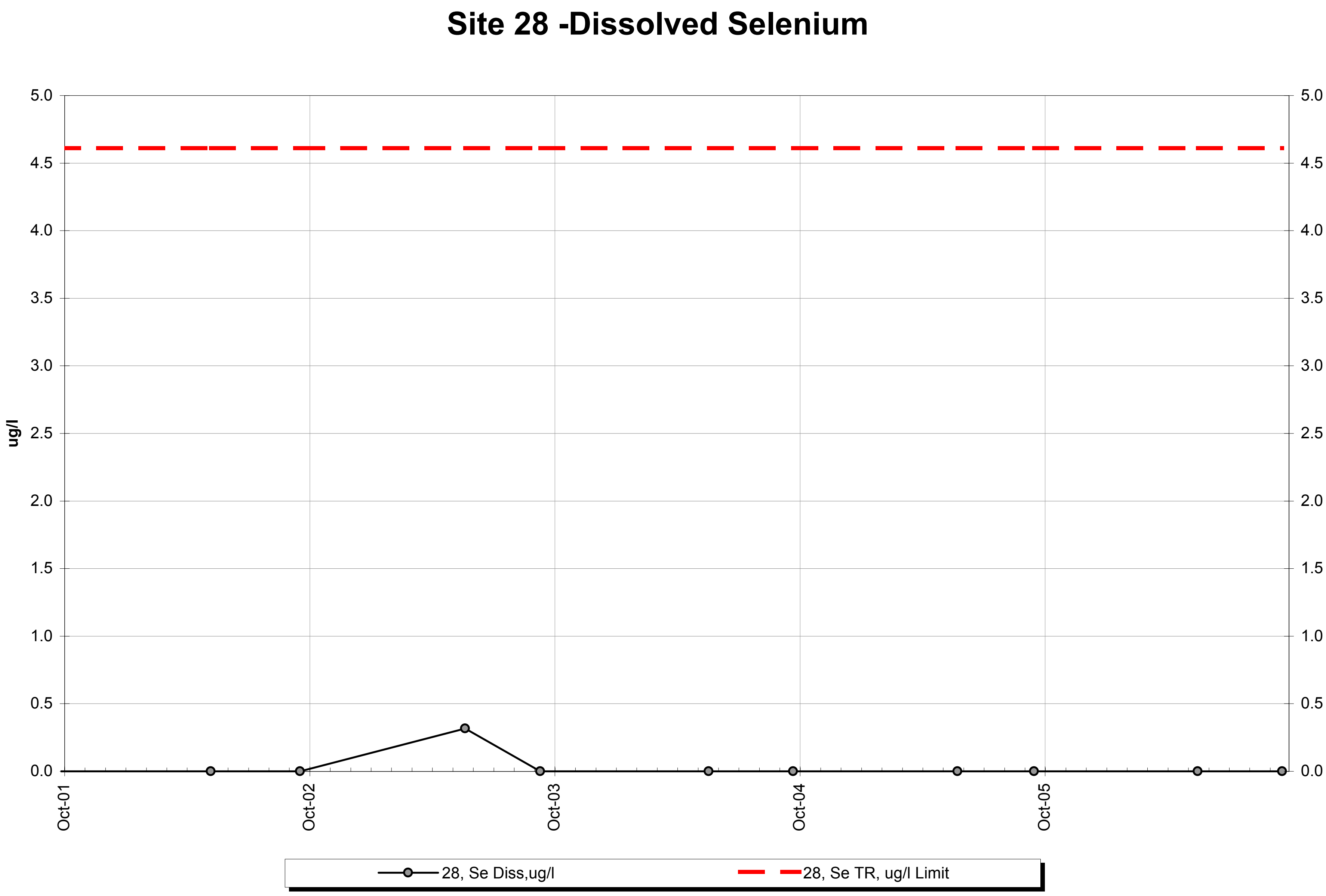


Site 28 -Dissolved Nickel
Note: The AWQS for dissolved nickel is hardness dependant and varies between 16 ug/L and 128 ug/L for waters with hardness values of 25 mg/L and 400 mg/L respectively. The AWQS, which would plot above the upper value on the Y-axis, are not shown on this graph to allow for greater 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-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Ni Diss,ug/l
28, Ni TR, ug/l Limit

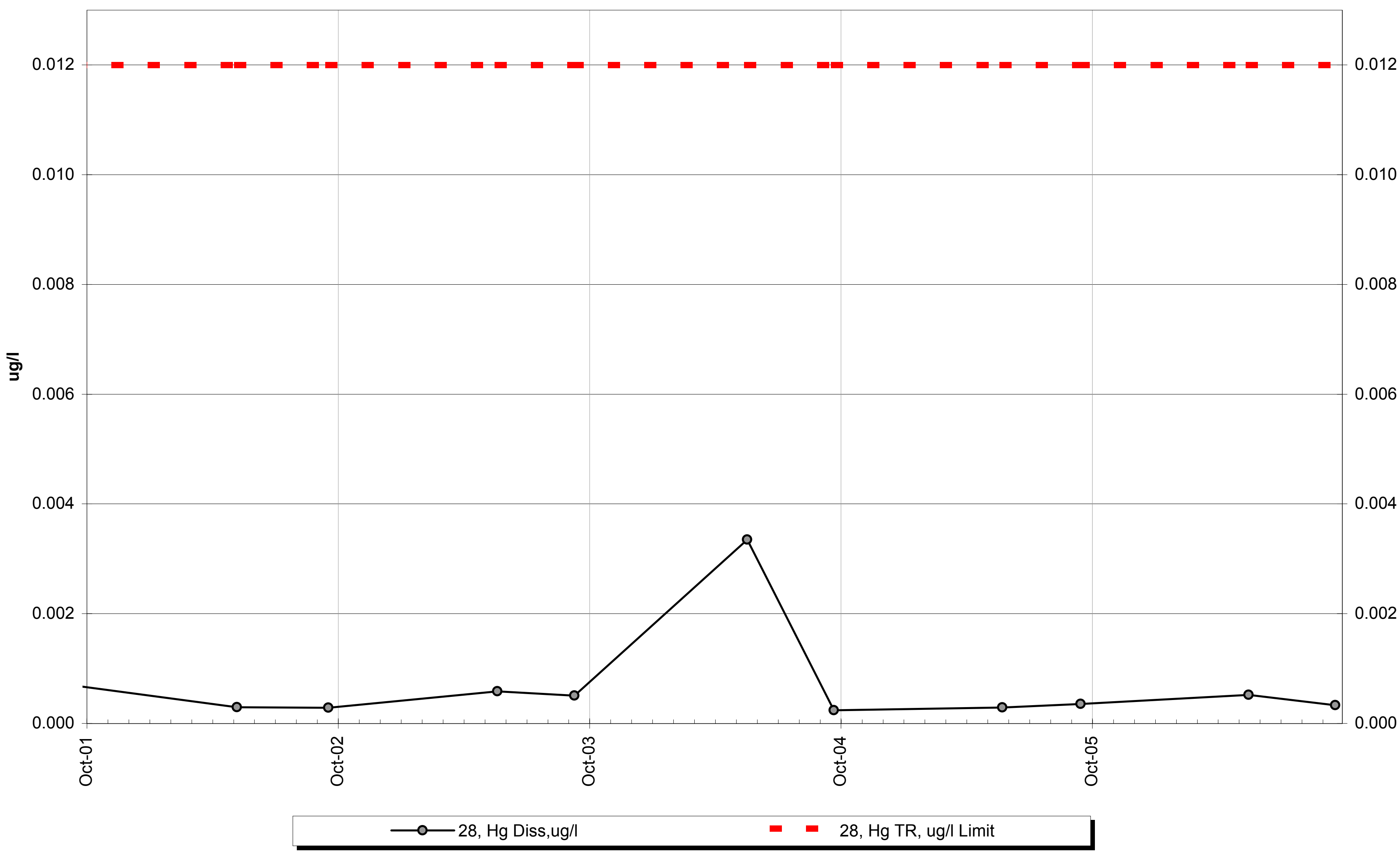

Site 28 -Dissolved Silver
ug/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Ag Diss,ug/l
28, Ag Diss, ug/l Limit

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-01
Oct-02
Oct-03
Oct-04
Oct-05
28, Se Diss,ug/l
28, Se TR, ug/l Limit

Site 28 -Dissolved Mercury



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

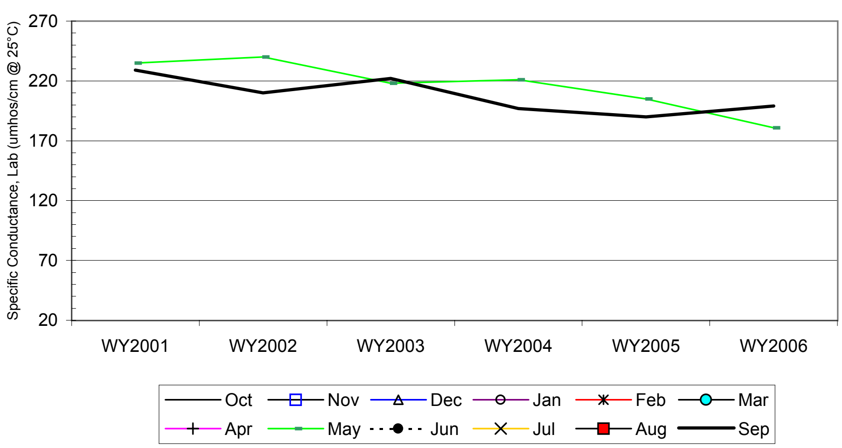
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								235.0				229.0
b	**WY2002**								240.0				210.0
c	**WY2003**								218.0				222.0
d	**WY2004**								221.0				197.0
e	**WY2005**								205.0				190.0
f	**WY2006**								181.0				199.0
	n	0	0	0	0	0	0	0	6	0	0	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	-11	0	0	0	-9
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-2.07				-1.69
	Z^2_k								4.27				2.86

ΣZ_k=	-3.76
ΣZ^2_k=	7.13
Z-bar=ΣZ_k/K=	-1.88

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

Σn	12
ΣS_k	-20

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		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
$\Sigma VAR(S_k)$	Z_{calc}	-2.52	@α/2=2.5% Z= 1.96	H_0 (No trend)	REJECT
56.67	p	**0.006**		H_A (± trend)	ACCEPT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-16.00		-3.78
0.050	-12.79	**-8.08**	-6.40
0.100	-11.51		-6.53
0.200	-10.69		-6.94
		-3.8%	

Site **#28** Seasonal Kendall analysis for pH, Lab, Standard Units

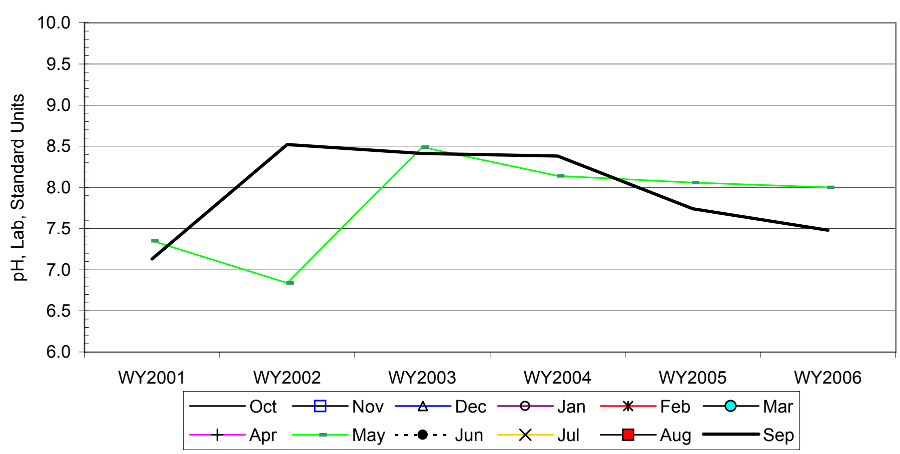
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								7.4				7.1
b	**WY2002**								6.8				8.5
c	**WY2003**								8.5				8.4
d	**WY2004**								8.1				8.4
e	**WY2005**								8.1				7.7
f	**WY2006**								8.0				7.5
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	0	0	0	0	0	0	0	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= -0.75
ΣZ^2_k= 0.92
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

$\chi^2_h=\Sigma Z^2_k - K(\text{Z-bar})^2$=		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}	-0.40	@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	-0.30		0.38
0.050	-0.26	**-0.06**	0.19
0.100	-0.21		0.15
0.200	-0.12		0.08

Site **#28** Seasonal Kendall analysis for Total Alk, (mg/l)

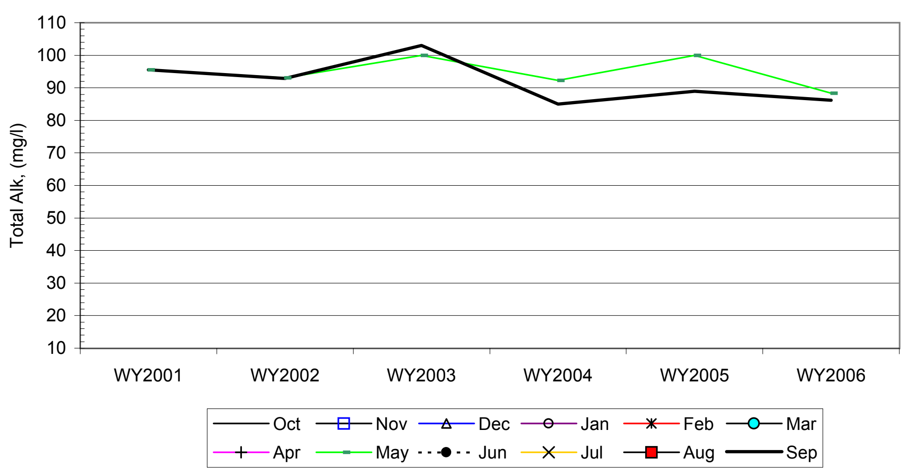
Row label	Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
a	**WY2001**								95.5				95.5
b	**WY2002**								93.1				92.9
c	**WY2003**								100.0				103.0
d	**WY2004**								92.3				85.0
e	**WY2005**								100.0				88.9
f	**WY2006**								88.3				86.2
	n	0	0	0	0	0	0	0	6	0	0	0	6
	t_1	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
	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								0				-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	-4	0	0	0	-7
	σ^2_S=								28.33				28.33
	$Z_k = S_k/\sigma_S$								-0.75				-1.32
	Z^2_k								0.56				1.73

ΣZ_k= -2.07
ΣZ^2_k= 2.29
Z-bar=ΣZ_k/K= -1.03

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

Σn 12
ΣS_k -11

$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=	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} -1.33	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	**p** **0.092**		H_A (± trend)	REJECT



Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-3.94		1.98
0.050	-2.85	**-1.55**	0.11
0.100	-2.56		-0.52
0.200	-2.07		-1.18

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	**WY2001**								0.5				-0.3
b	**WY2002**								1.6				1.0
c	**WY2003**								1.0				-0.1
d	**WY2004**								0.1				0.1
e	**WY2005**								0.8				0.1
f	**WY2006**								14.1				3.5
	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

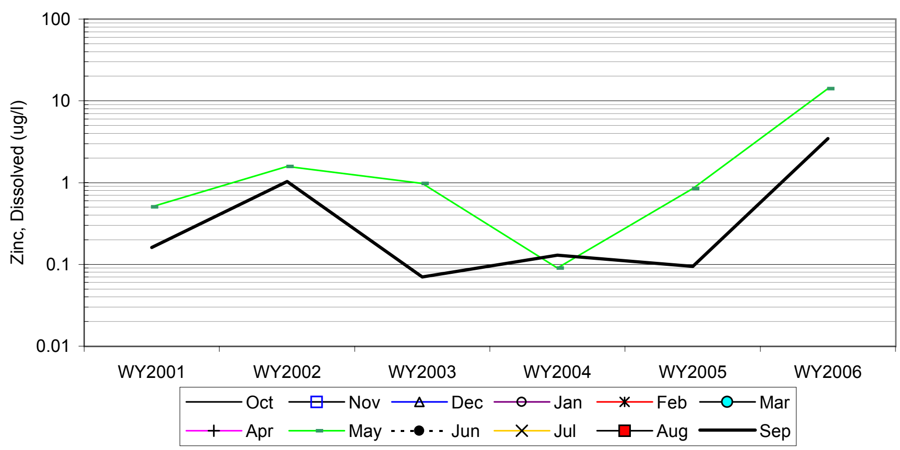
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
σ^2_S=								28.33				28.33
$Z_k = S_k/\sigma_S$								0.56				1.32
Z^2_k								0.32				1.73

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

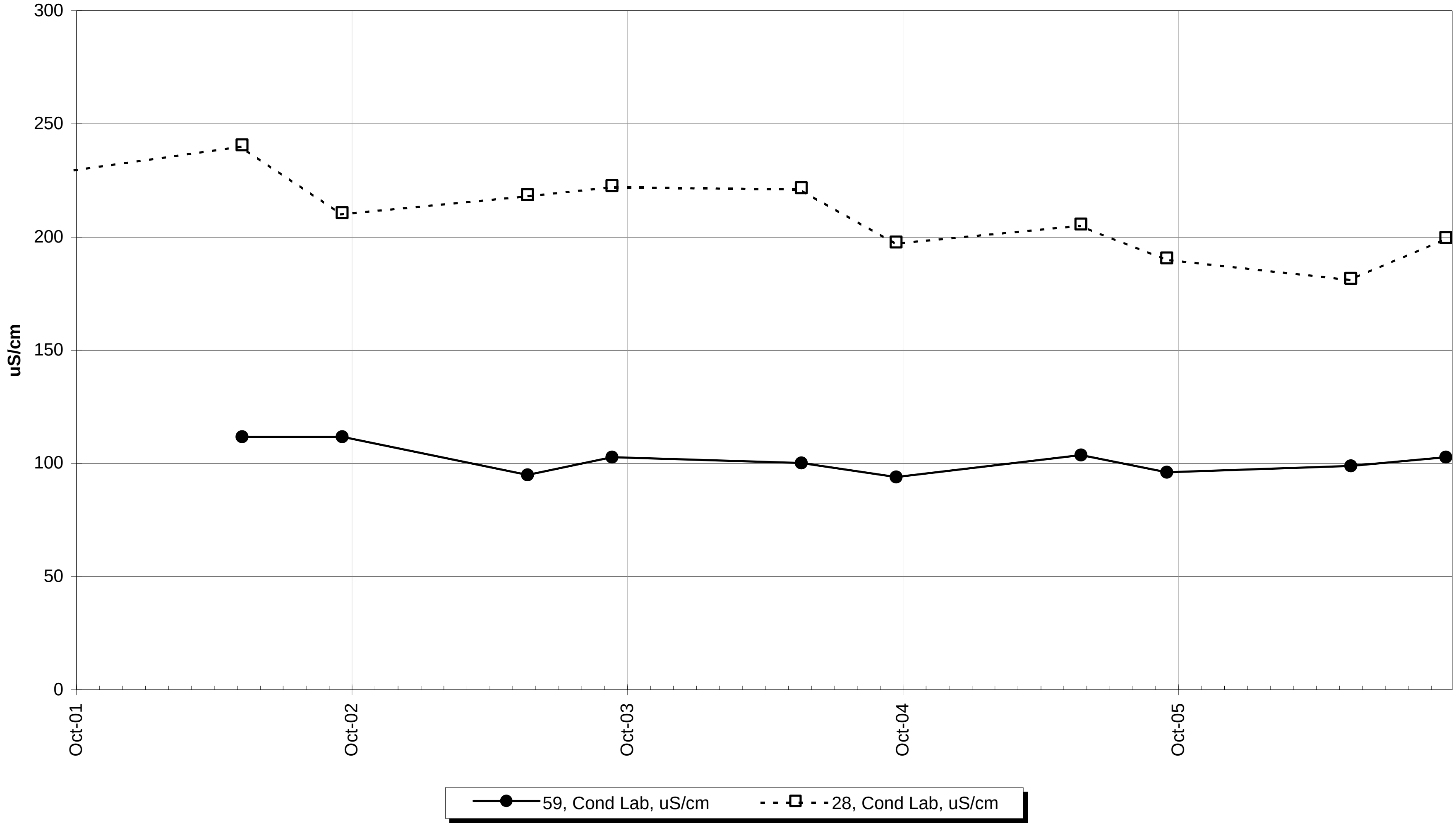
$\chi^2_h=\Sigma Z^2_k-K(\text{Z-bar})^2$=		0.28	@α=5% $\chi^2_{(K-1)}$= 3.84	Test for station homogeneity	
	p	**0.595**		$\chi^2_h<\chi^2_{(K-1)}$	ACCEPT
ΣVAR(S_k)	Z_{calc}	1.20	@α/2=2.5% Z= 1.96	H_0 (No trend)	ACCEPT
56.67	p	**0.884**		H_A (± trend)	REJECT



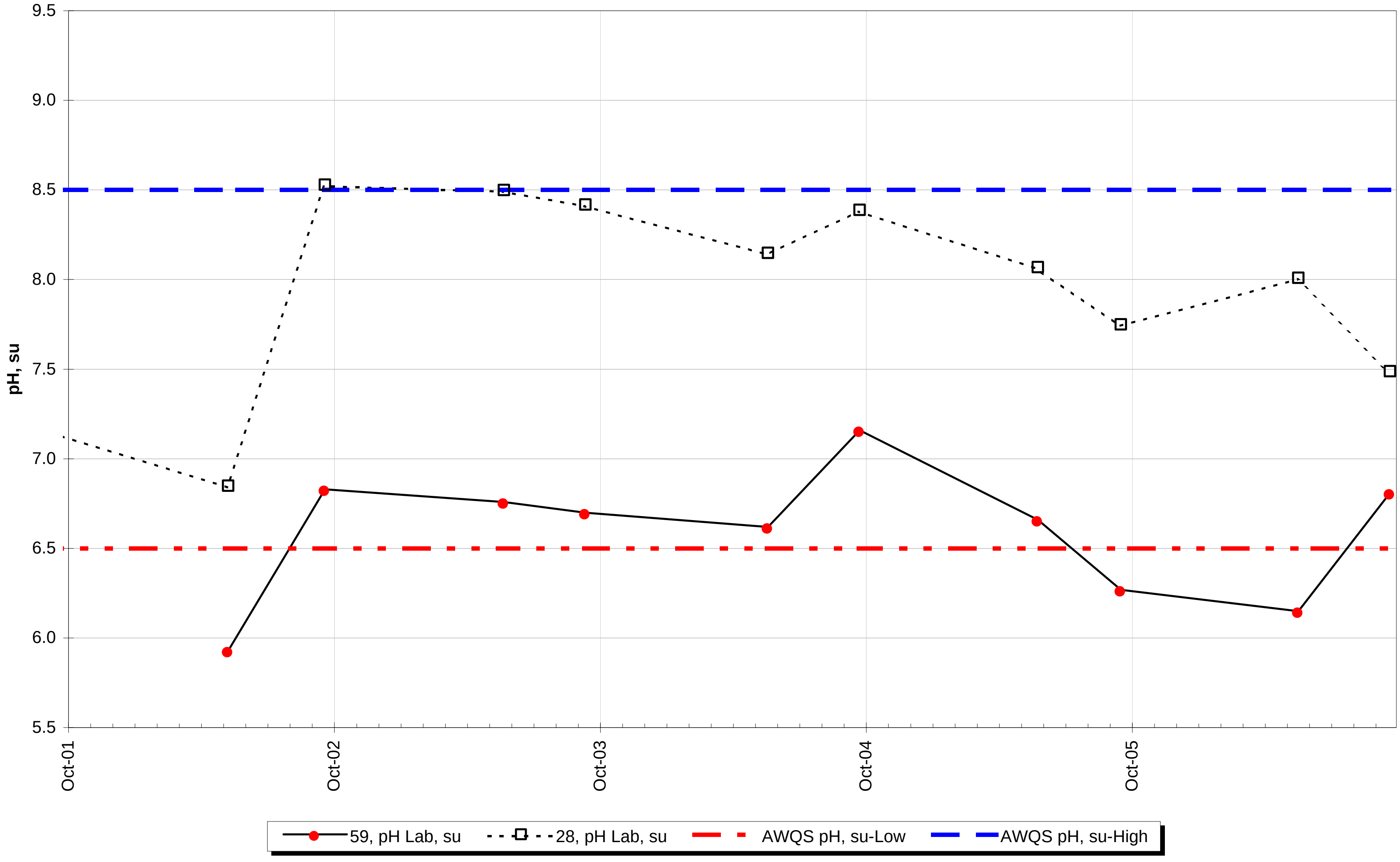
Seasonal-Kendall Slope Confidence Intervals

α	Lower Limit	Slope	Upper Limit
0.010	-0.29		1.59
0.050	-0.08	**0.19**	1.09
0.100	-0.01		0.76
0.200	0.09		0.63

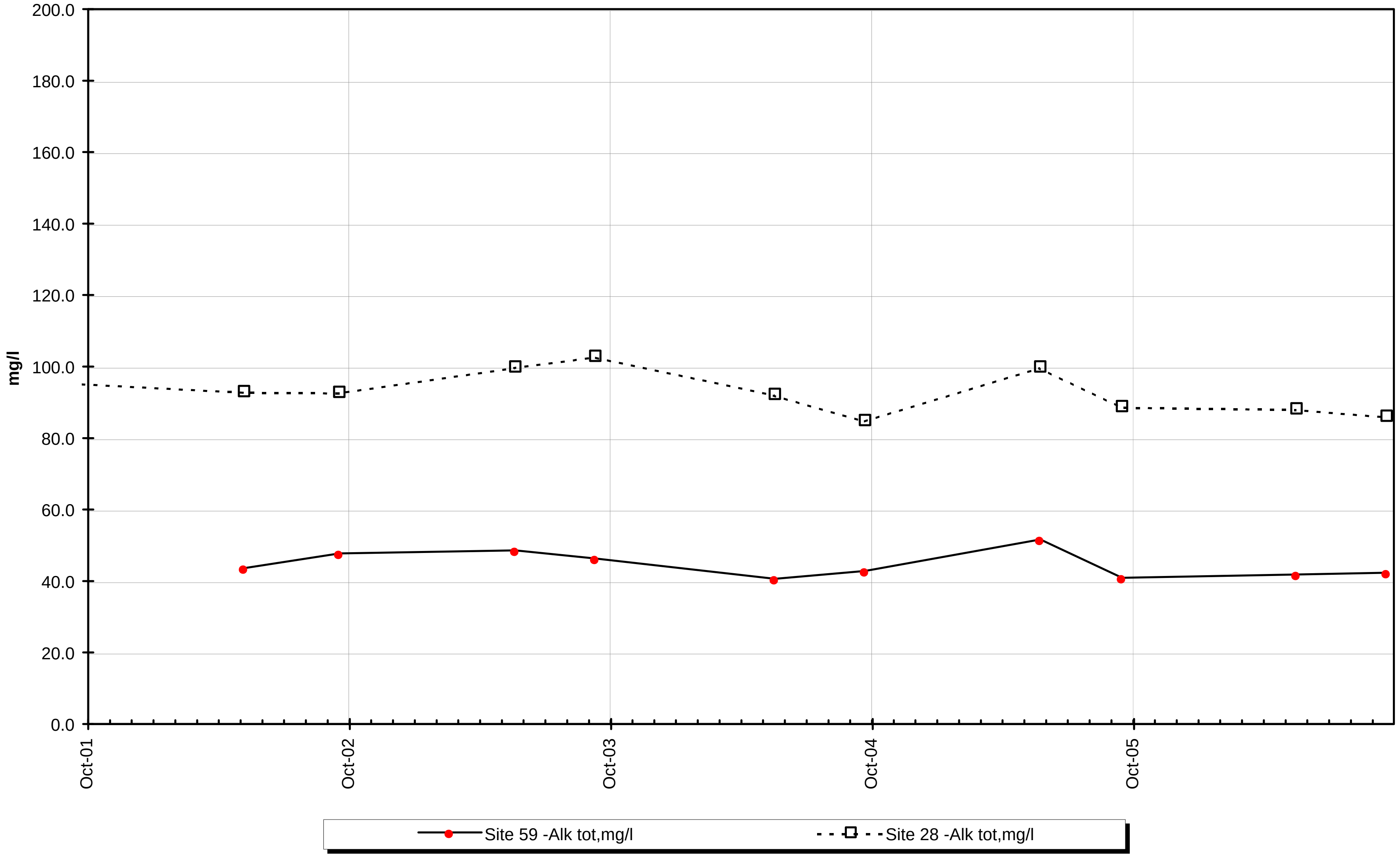
Site 59 vs Site 28 -Conductivity

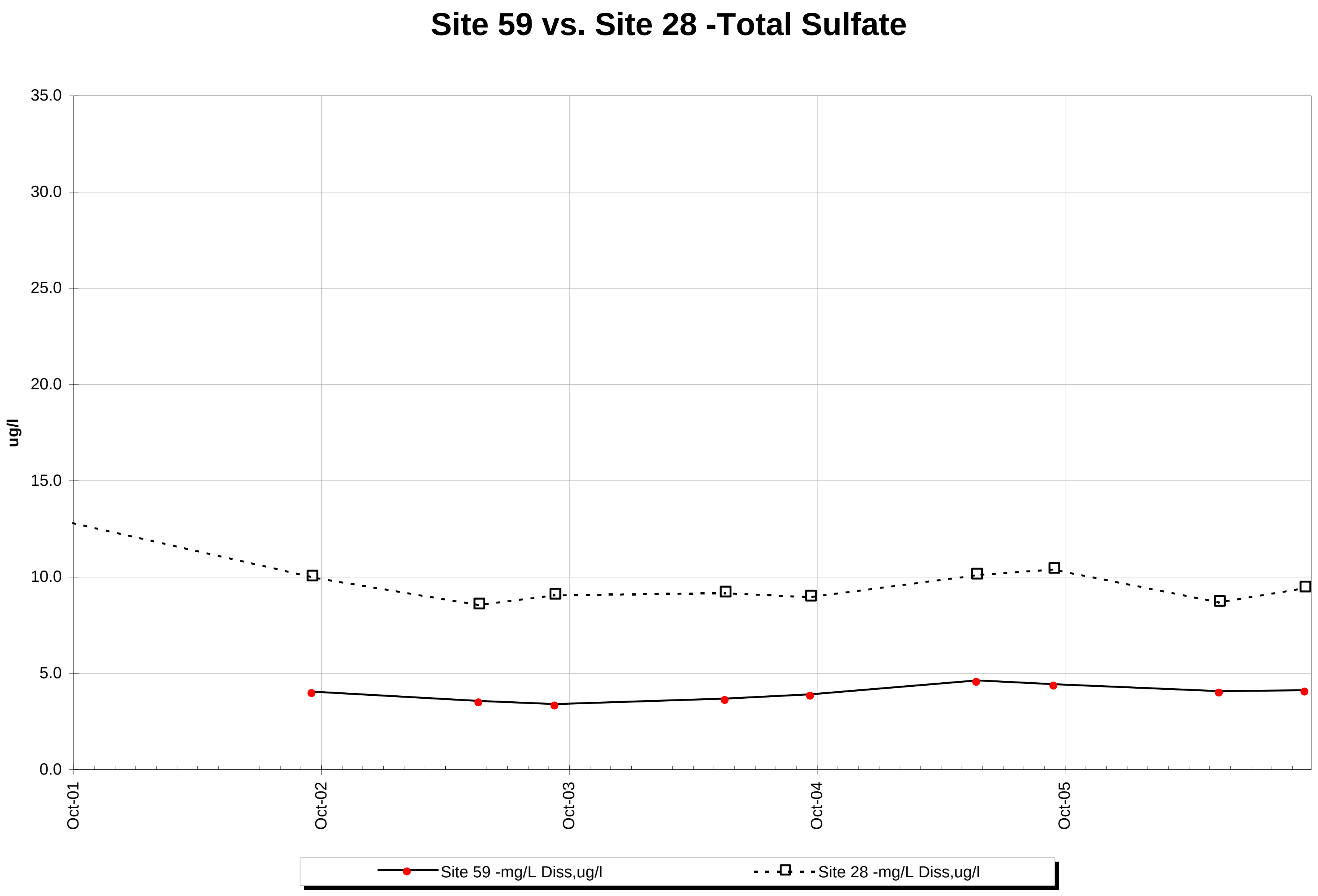


Site 59 vs. Site 28 -Lab pH

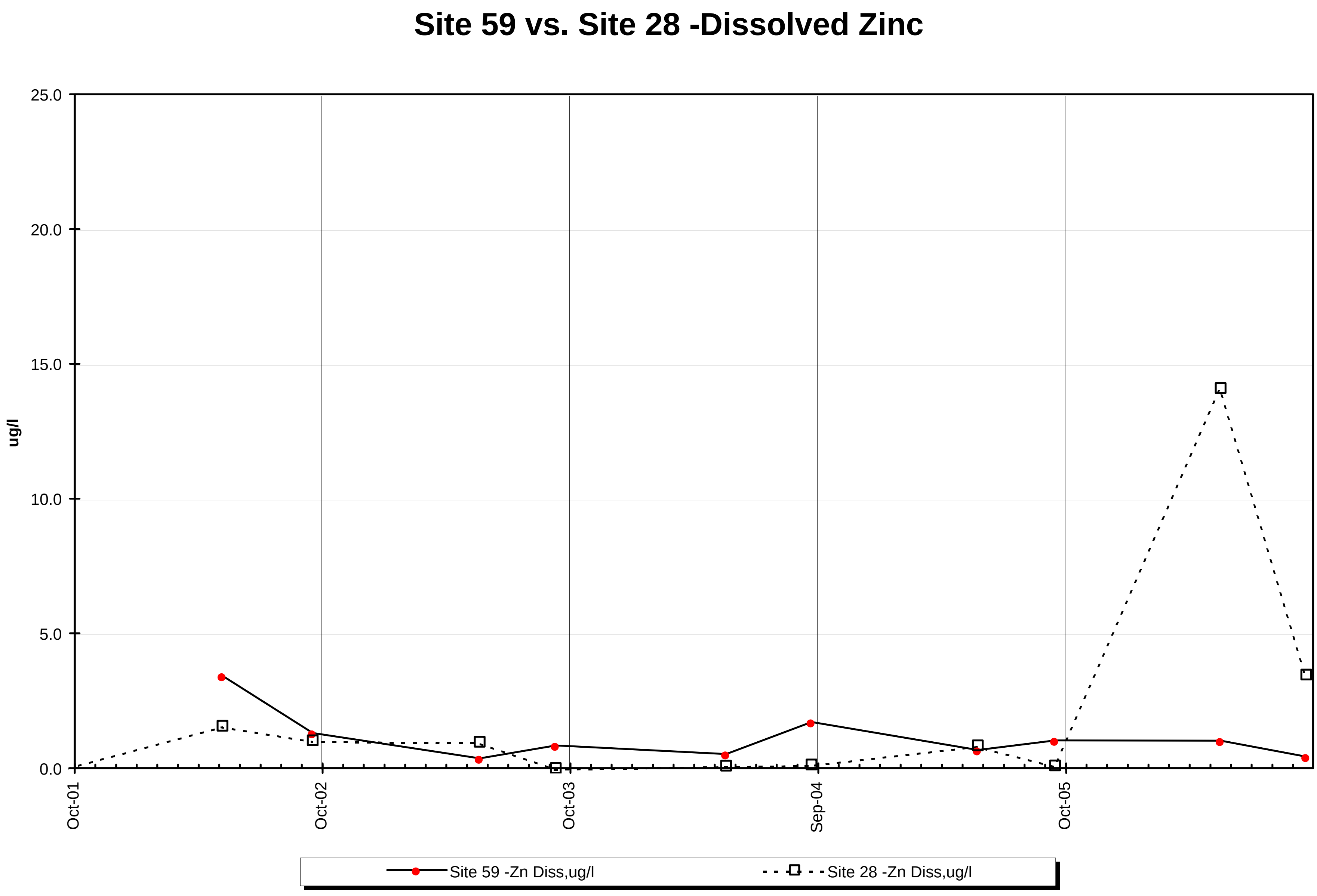


Site 59 vs. Site 28 -Total Alkalinity





Site 59 vs. Site 28 -Total Sulfate
ug/l
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Site 59 -mg/L Diss,ug/l
Site 28 -mg/L Diss,ug/l



Site 59 vs. Site 28 -Dissolved Zinc
25.0
20.0
15.0
10.0
5.0
0.0
ug/l
Oct-01
Oct-02
Oct-03
Sep-04
Oct-05
Site 59 -Zn Diss,ug/l
Site 28 -Zn Diss,ug/l

INTERPRETIVE REPORT
SITE 9 "TRIBUTARY CREEK"

The Tributary Creek site was initially located to monitor the effects on water quality caused by the originally planned, larger, closer wet tailings impoundment. It is approximately one mile downstream from the present dry tailings impoundment dam. The site was monitored from 1981 – 1993 when it was temporarily suspended by administrative agreement with the USFS. The site was re-activated in 2001 as a biological monitoring site for the Tailings Pile. KGCMC recommenced collection of water chemistry samples after receiving a suggestion to do so from ADNR-Office of Habitat Management and Permitting personnel. It was noted, that should the required annual biomonitoring show significant changes, an understanding of any related water chemistry variations would enhanced the interpretation of those results. During the 2006 water year, samples were collected in conjunction with the normal monthly FWMP sampling run during the months of May, July, and September and analyzed for Suite Q analytes.

The data collected during the current water year are listed in the following "Table of Results for Water Year 2006" report. The table includes all the FWMP analyte 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.

Routine water chemistry data collection was reinstated during the 2006 water year. All data collected at this site for the 2006 water year 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-06though Sept-06.				

The data for Water Year 2006 have been compared to the strictest fresh water quality criterion for each applicable analyte. One result exceeding these criteria has been

Sample Date	Parameter	Value	Hardness (mg/L)	Standard	Standard Type
09/20/06	Lead, Dissolved ug/L	1.48	44.3	1.030	Aquatic Life, chronic

identified, as listed in the table below. This datum is for the Sept-2006 dissolved lead sample and has a value of 1.48 μg/l that exceeds the hardness dependant AWQS of 1.03 μg/l. Given the current limited dataset for this site with modern detection limits KGCMC feels that no definitive interpretation of this exceedance can be made at this time. The values may be related to the slightly elevated values found at Site 27, MW-2S, which lies upgradient from this site. At that site dissolved lead values have ranged from less than detection (<0.1 μg /l) to a high of 2.3 μg/l since 1996 when detection limits for lead fell below 10 µg/l. KGCMC feels that as additional data are collected at this site with lower detection limit methods that a determination can be made as to if the lead values represent natural background or may be due to KGCMC activities.

X-Y plots have been generated to graphically present the data for each of the analytes that are listed in Suite Q. Given the short record, no clear determination can be made as to if any trends are present. Additional X-Y plots have been generated for analytes that are currently listed in Suite Q and were also analyzed during the prior monitoring period from 1981 to 1993. Only analytes and field parameters for which quantitative determinations with comparable detection limits are presented: these analytes include water temperature, conductivity, pH, hardness, alkalinity, and sulfate. No attempt has been made to error check the older data for outliers. For example, field pH shows several results from 1987-89 with values exactly at 6.50 su. Given the variability shown by the remainder of the data these values are suspect due to the unnatural consistency but are presented here for completeness. Comparison of the current years data with the older data set indicates that no major changes in water chemistry for the listed analytes appear to have occurred since monitoring was halted in September-1993.

KGCMC proposes to continue monitoring Site 9 during May, July, and September for the Suite Q analytes. This sampling will be in addition to the already scheduled July biomonitoring. KGCMC feels that this schedule will adequately characterize the water quality parameters while addressing safety concerns associated with winter access down the steep slope that leads to the site and the increased potential for bear encounters during salmon spawning season. KGCMC plans to continue data collection through the 2007 water year and will propose formal information goals for Site 9 in the WY2007 annual report.

During the WY2006 biomonitoring event, high turbidity levels were observed at Site 9 (Durst, 2007). The elevated levels were visually estimated to be above 100 NTU and appear to be related to stormwater runoff from the nearby B-Road. KGCMC followed-up with a field investigation conducted in late September-2006. Field observations indicated that a possible route for the increased turbidity observed at Site 9 may be due to several small streams which cross the B-Road between 1.2-mile and 2.0-mile. When precipitation levels are high enough to cause direct runoff from the B-Road into the adjacent ditch, these ditch flows are directed through a series of straw bales and can ultimately mix into the relative clean stream flows as they cross the road. The mix of the relative high-volume flow of the streams, typically 100s of gpm, with the low-volume (1-10gpm), but turbid flow in the ditch results in the turbidity being carried past any additional sediment control measures at the downhill culvert outfalls. Ultimately the mixed-source, high-flow culverts then carry the turbid water into Tributary Creek and produce the effect noted during the July-2006 biomonitoring event.

KGCMC immediately developed a plan to isolate these high-flow culverts that primarily carry water across the road from any ditch water that carries turbidity from road runoff. KGCMC intends to either re-grade the ditches to carry road runoff away from any perennial stream flows that cross the road or install duplicate culverts such that the high-flow streams are carried directly across the roadway while the ditch runoff is directed to sediment basins which ultimately discharge as far away from the stream as is practical. To monitor the success of this plan KGCMC intends to deploy an automated data-logger system that will continuously monitor conductivity and turbidity at Site 9. This data will be presented in next year's annual FWMP report.

Table of Results for Water Year 2006

Site 9 "Tributary Creek"

Sample Date/Parameter	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	5/17/06	Jun-06	7/18/06	Aug-06	9/20/06	**Median**
Water Temp (°C)	NOT SCHEDULED FOR SAMPLING							6.1	NOT SCHEDULED FOR SAMPLING	13.1	NOT SCHEDULED FOR SAMPLING	9.4	9.4
Conductivity-Field(µmho)								81.4		82.5		116.6	82.5
Conductivity-Lab (µmho)								83		95		90	90
pH Lab (standard units)								6.65		7.14		7.10	7.10
pH Field (standard units)								6.93		7.12		6.53	6.93
Total Alkalinity (mg/L)								14.1		24.5		20.2	20.2
Total Sulfate (mg/L)								18.9		15.9		16.0	16.0
Hardness (mg/L)								38.5		43.8		44.3	43.8
Dissolved As (ug/L)								0.512		1.370		0.887	0.887
Dissolved Ba (ug/L)								30.3		33.2		43.2	33.2
Dissolved Cd (ug/L)								0.0351		0.0255		0.0474	0.0351
Dissolved Cr (ug/L)								0.956		0.501		0.287	0.501
Dissolved Cu (ug/L)								1.910		1.640		1.920	1.910
Dissolved Pb (ug/L)								0.5970		0.5020		1.4800	0.5970
Dissolved Ni (ug/L)								2.620		2.330		3.220	2.620
Dissolved Ag (ug/L)								0.005		0.013		<0.003	0.005
Dissolved Zn (ug/L)								5.46		3.70		6.18	5.46
Dissolved Se (ug/L)								0.124		0.295 J		0.148 J	0.148
Dissolved Hg (ug/L)								0.003480		0.002970		0.003450	0.003450

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

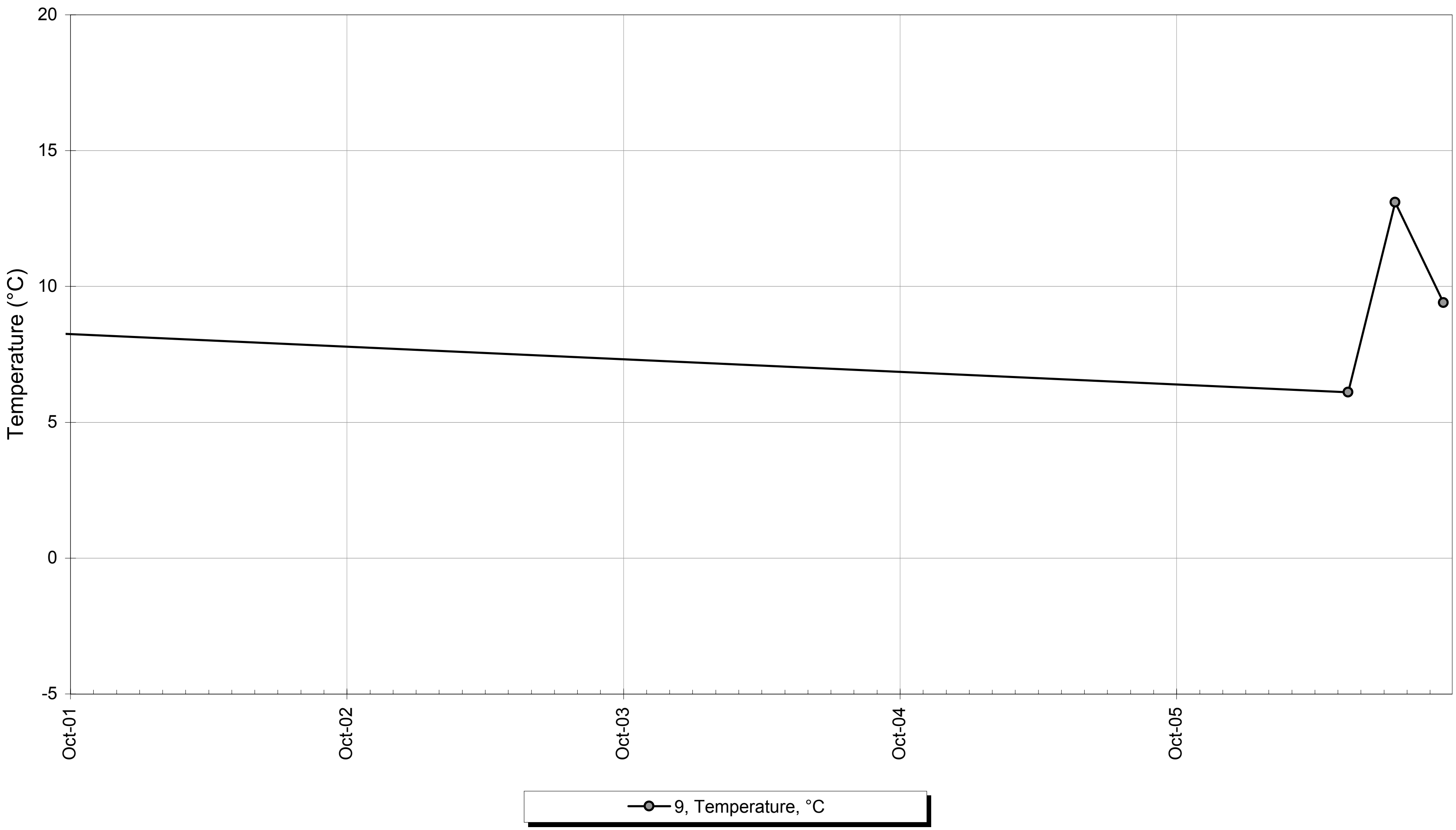
Qualified Data by QA Reviewer

Date Range: 10/01/2005 to 09/30/2006

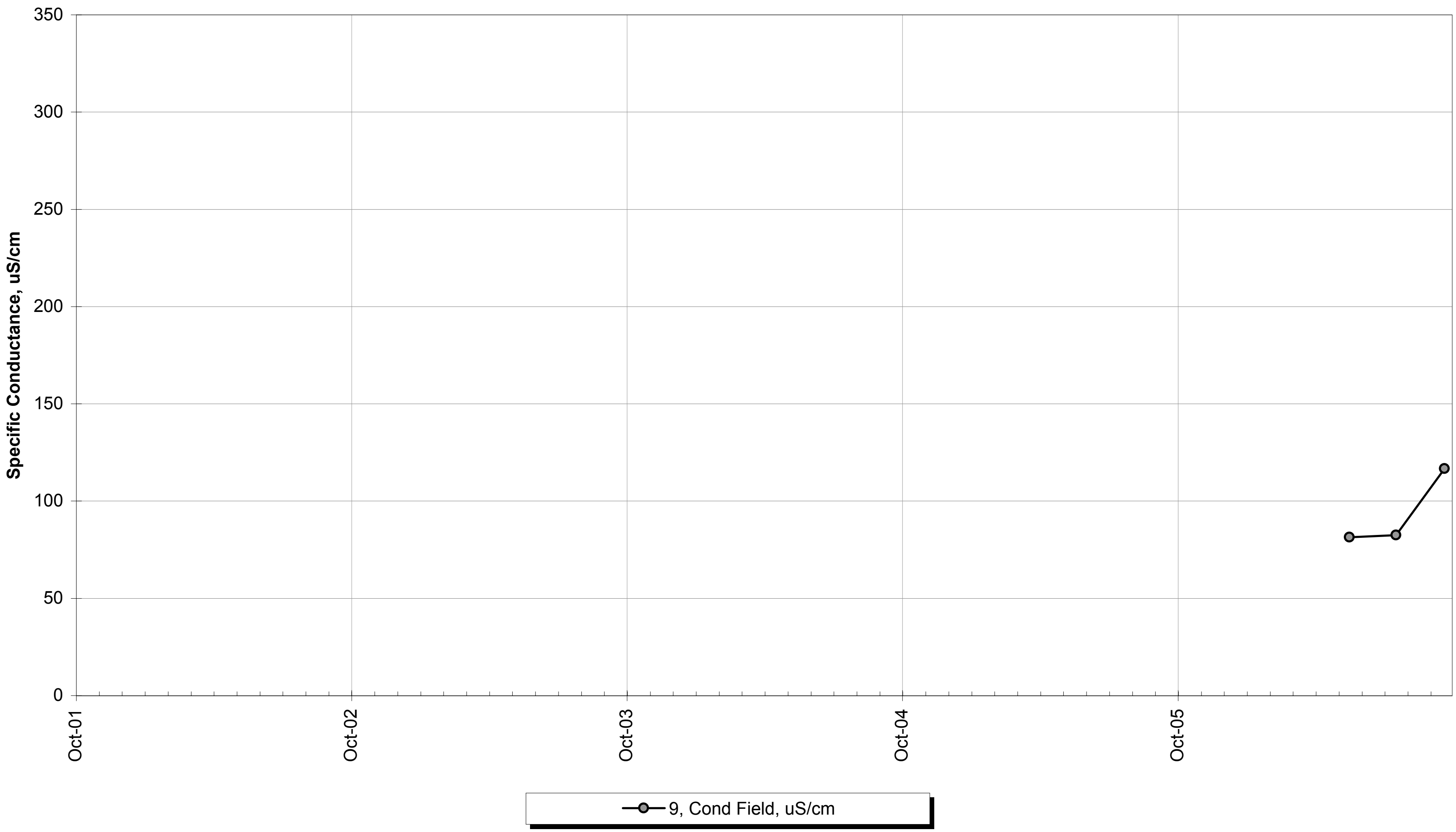
Site No.	Sample Date	Sample Time	Parameter	Value	Qualifier	Reason for Qualifier
9	07/18/2006	3:03:00 PM				
			Se Diss, ug/l	0.295	J	Below Quantitative Range
9	09/20/2006	1:20:00 PM				
			Se Diss, ug/l	0.148	J	Below Quantitative Range

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

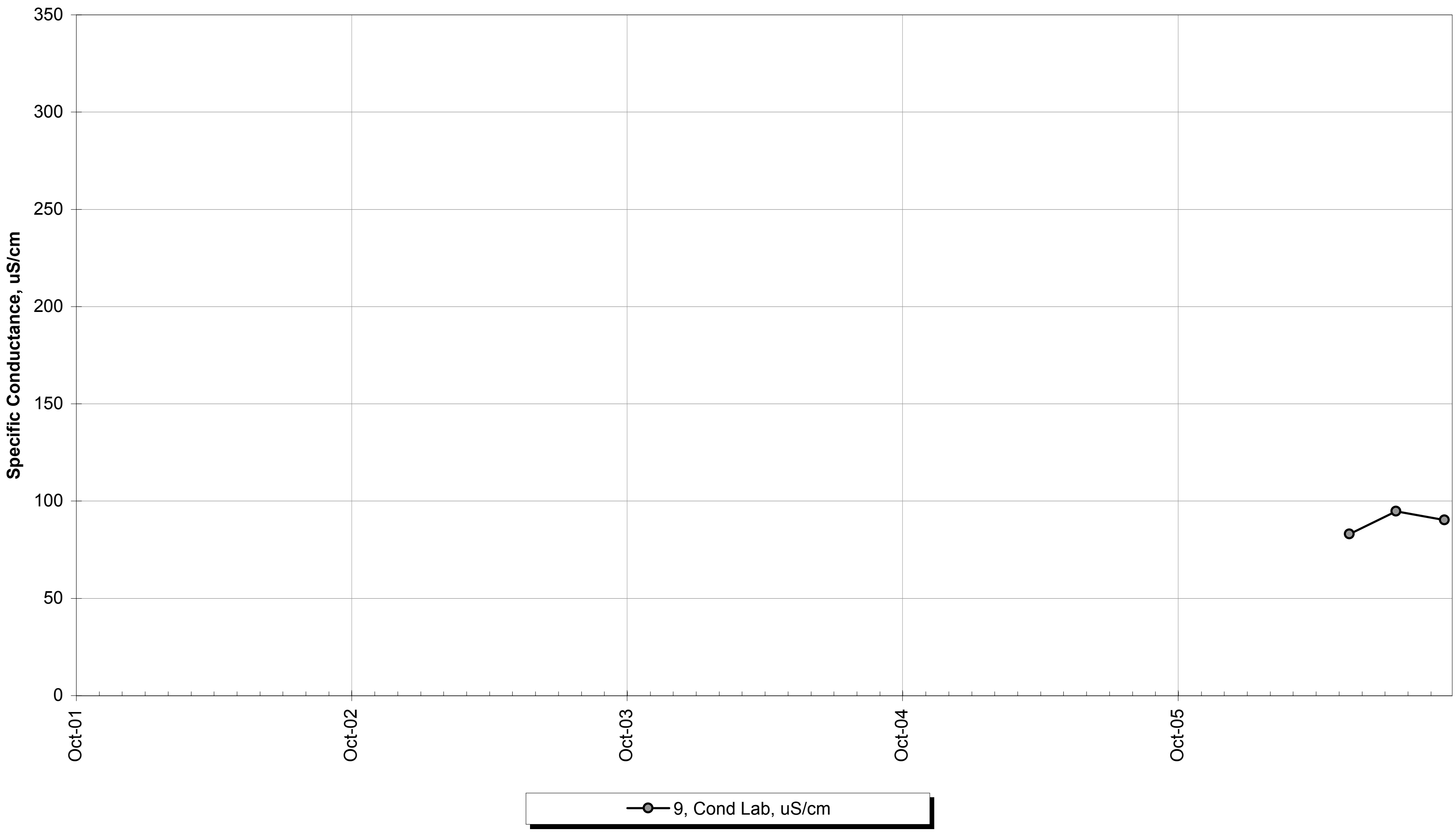
Site 9 -Water Temperature



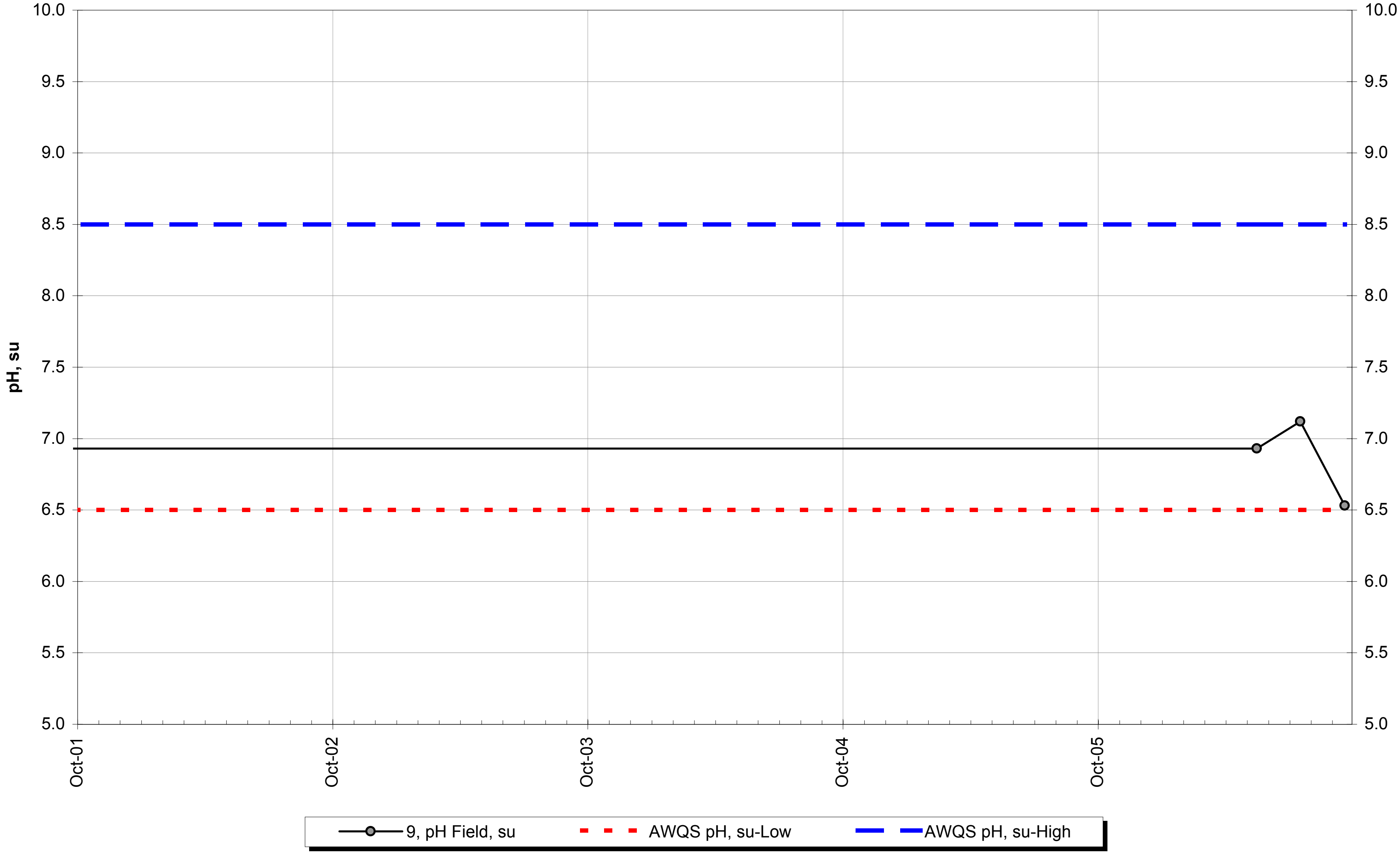
Site 9 -Conductivity-Field

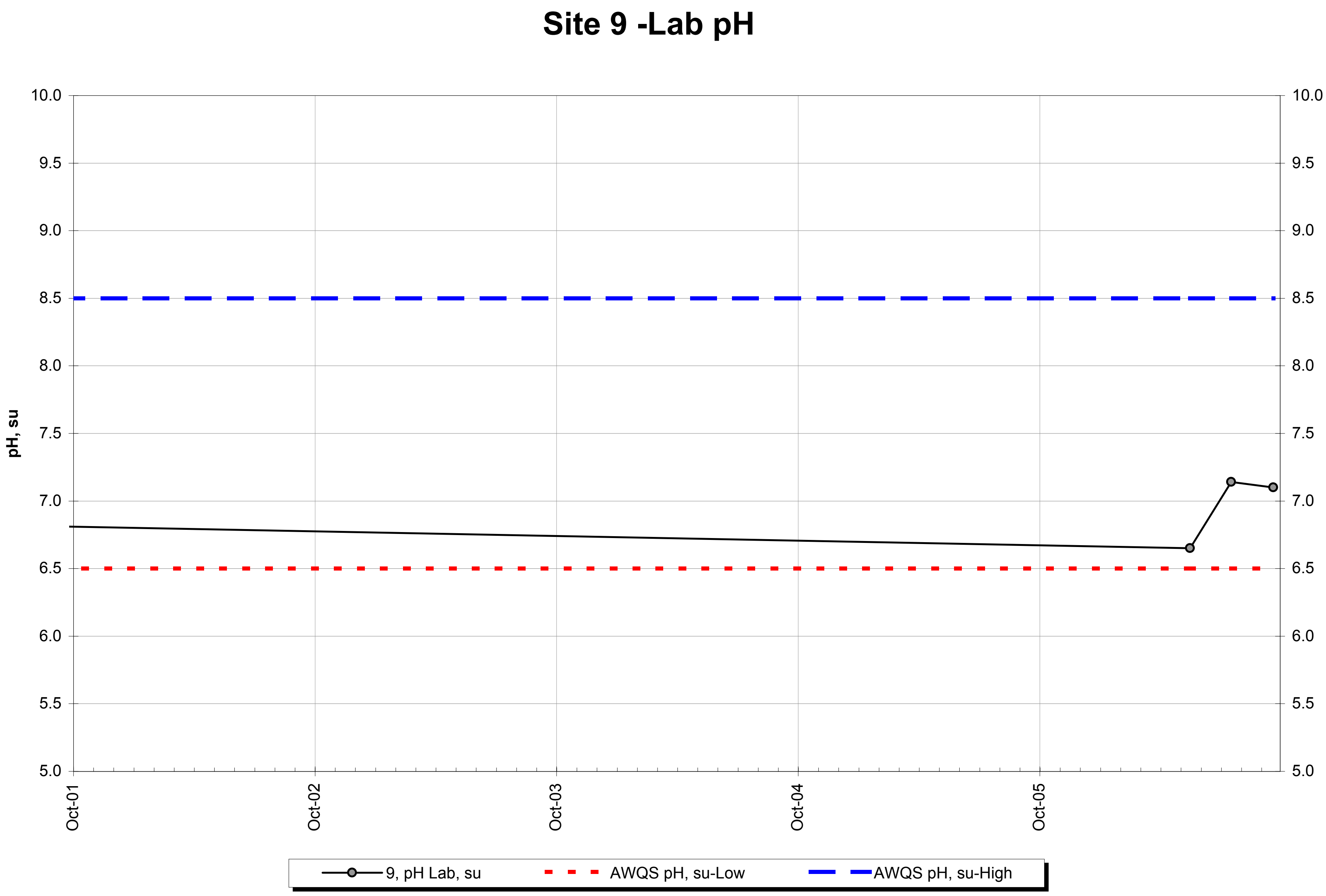


Site 9 -Conductivity-Lab

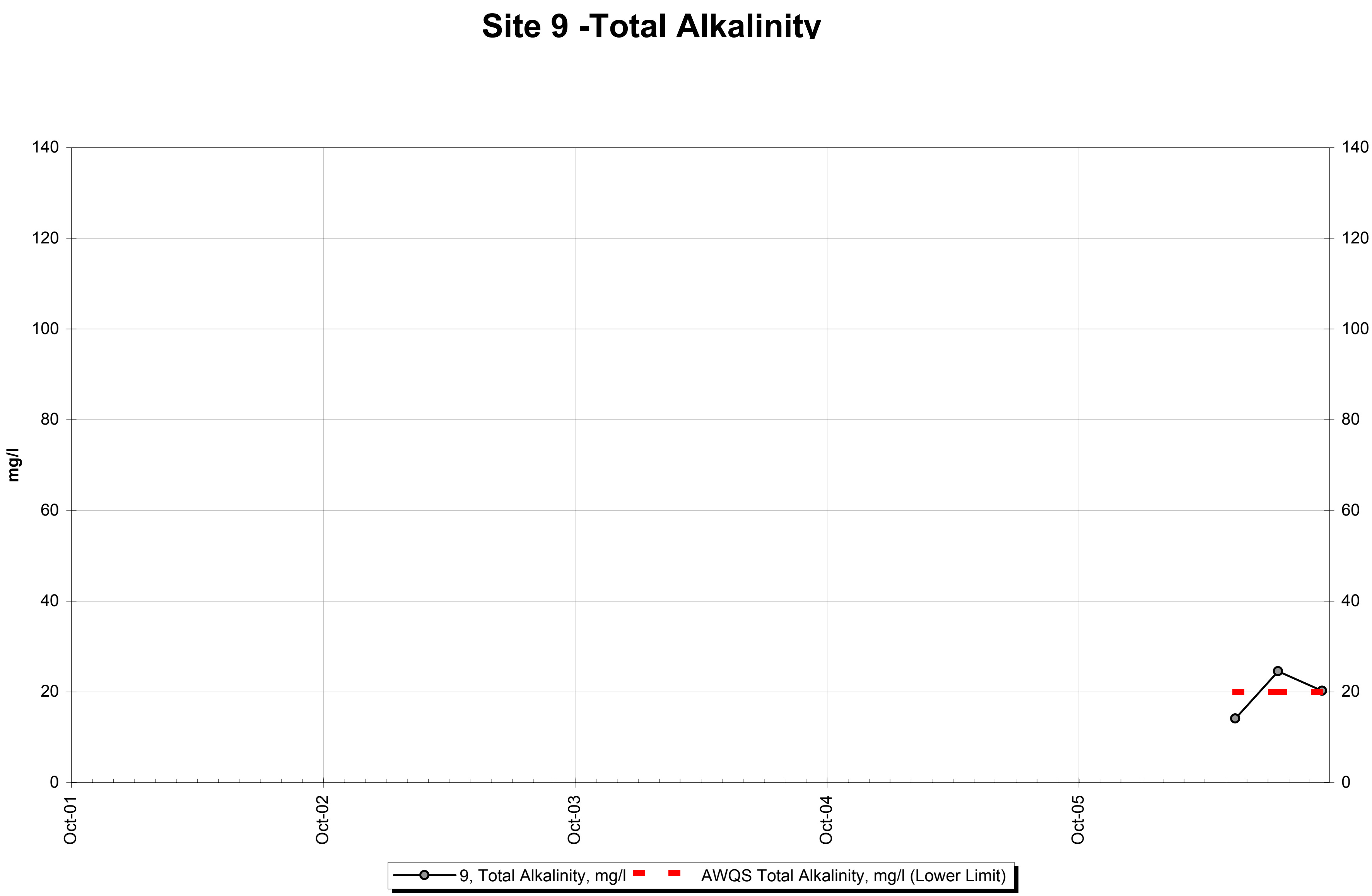


Site 9 -Field pH

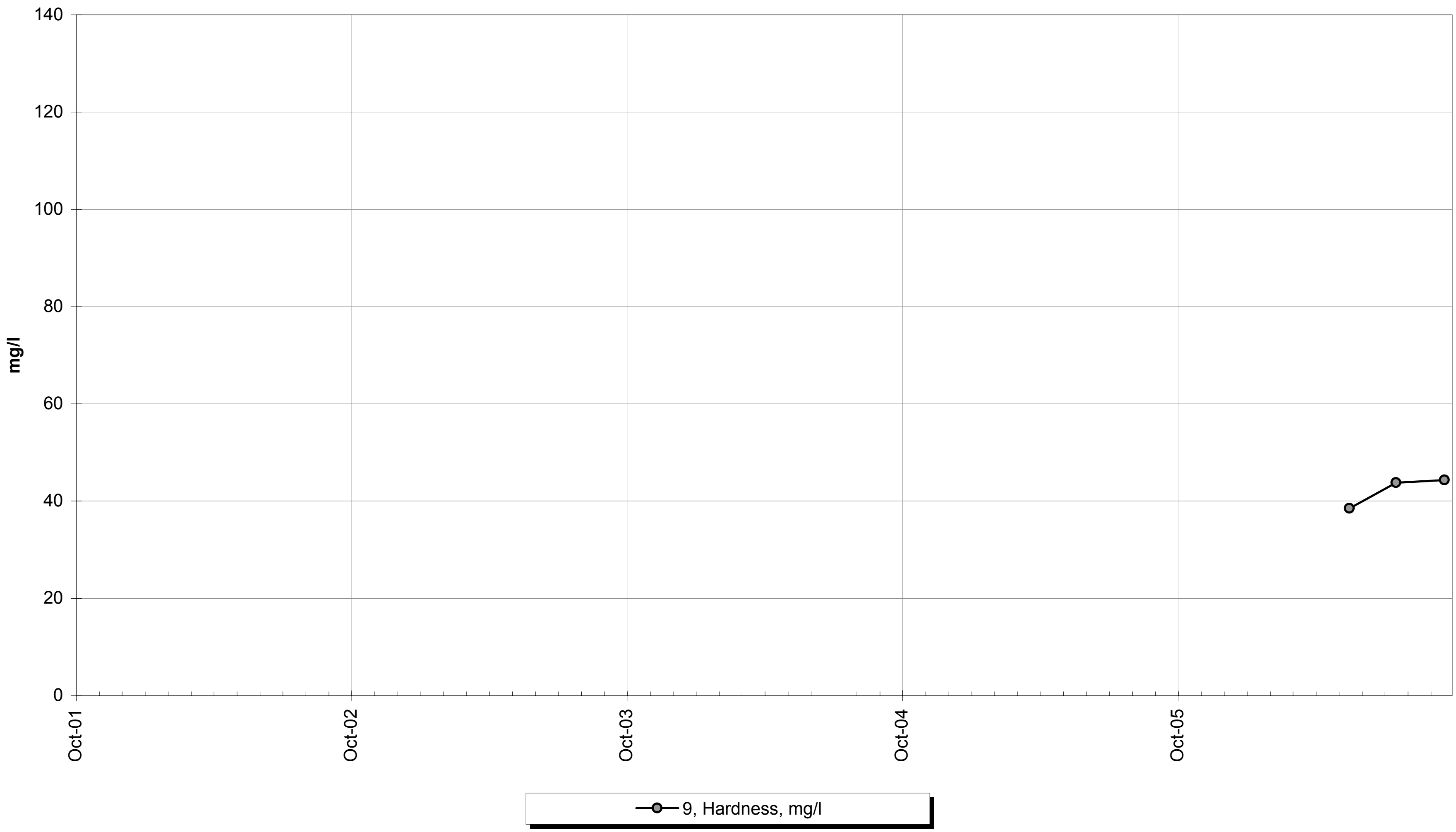




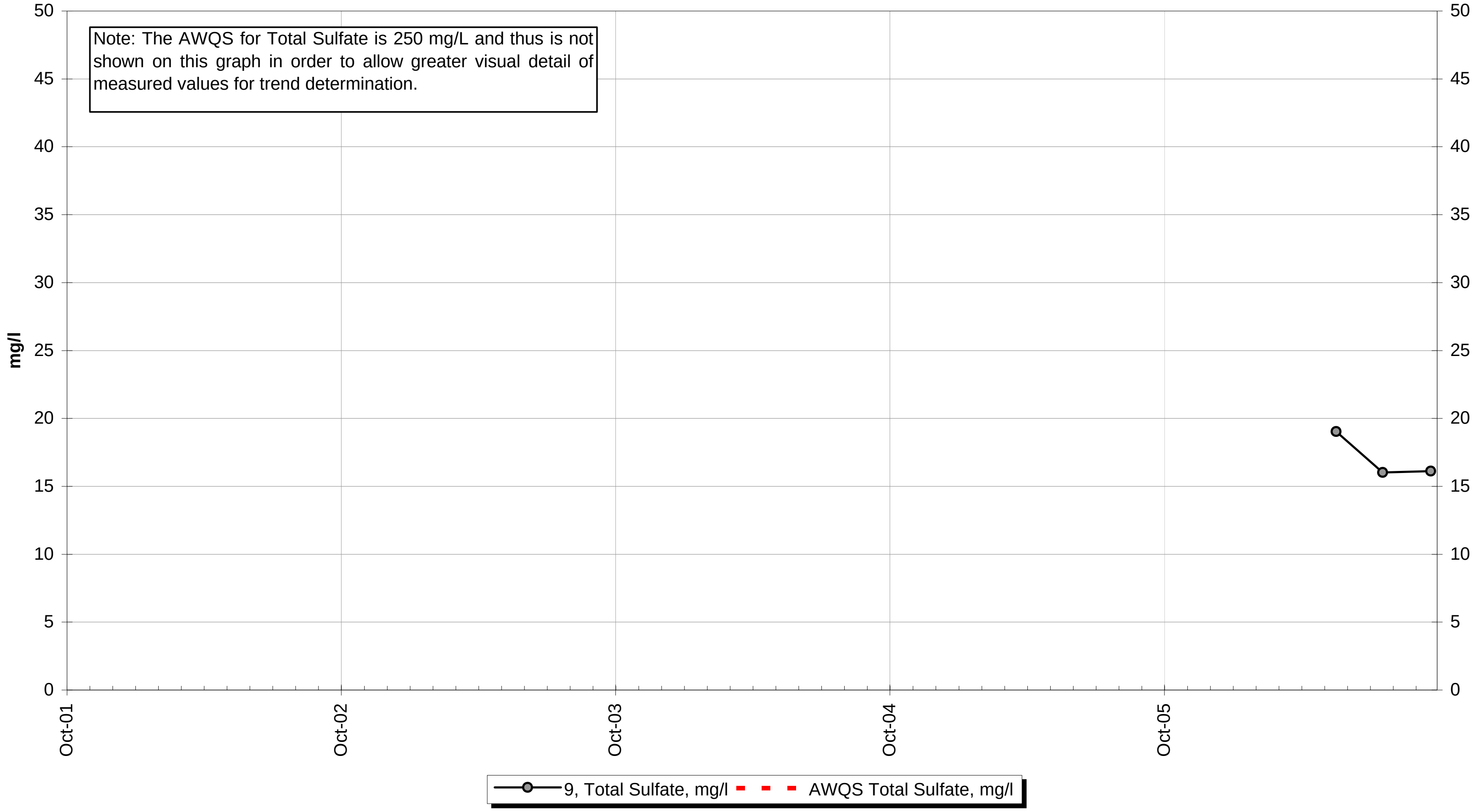
Site 9 -Lab pH
pH, su
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

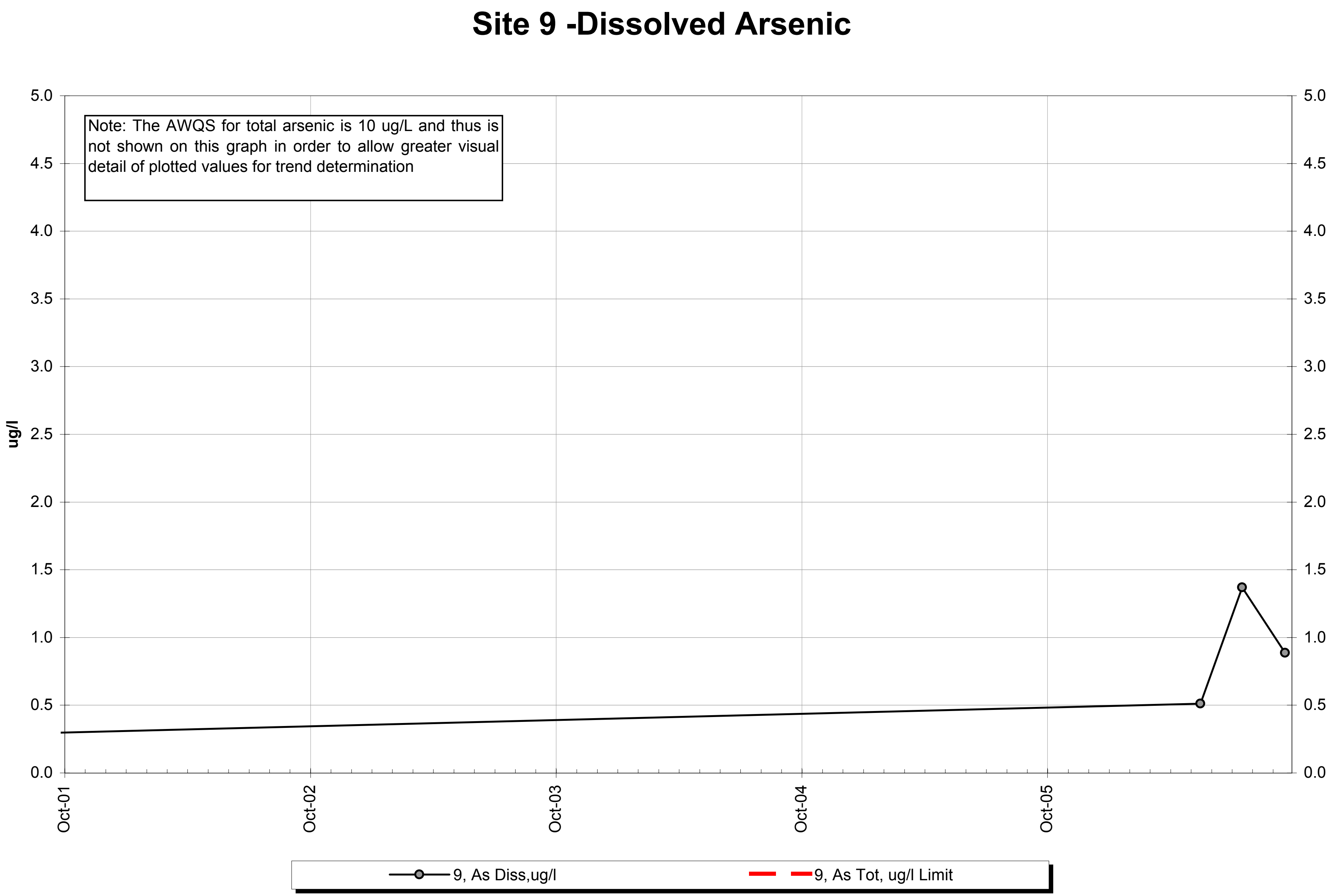

Site 9 -Total Alkalinity
mg/l
140
120
100
80
60
40
20
0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Total Alkalinity, mg/l
AWQS Total Alkalinity, mg/l (Lower Limit)

Site 9 -Hardness



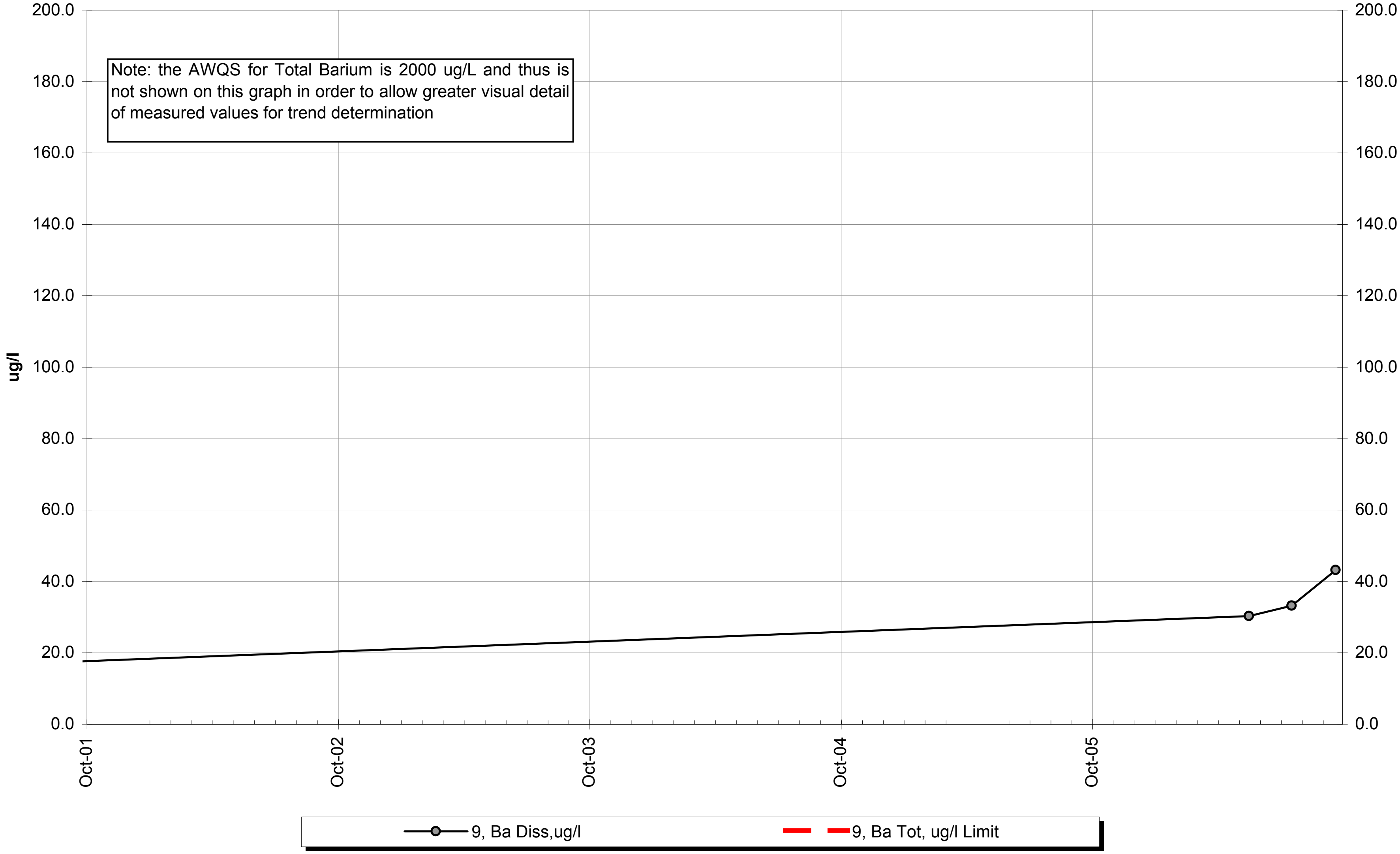
Site 9 -Total Sulfate

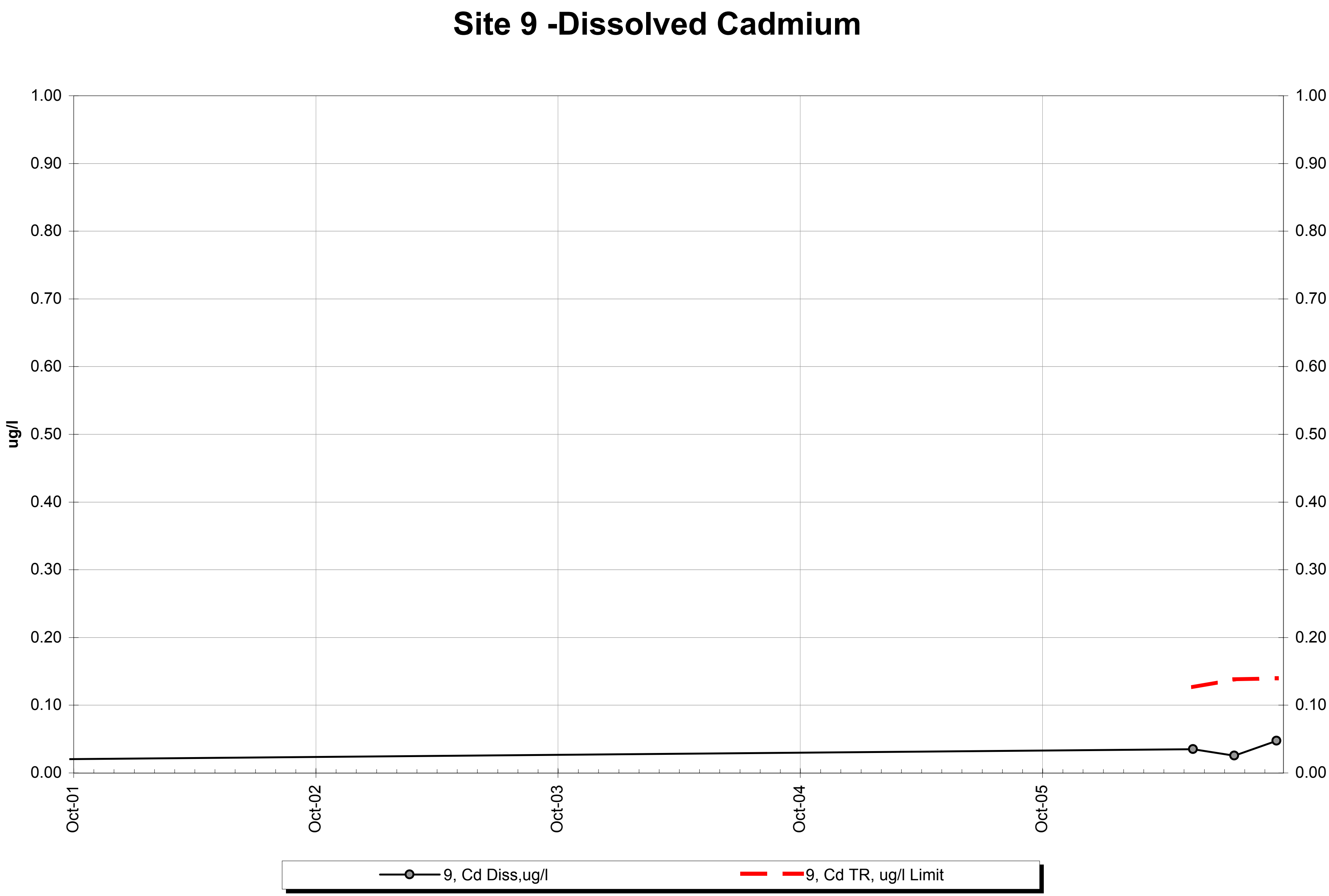




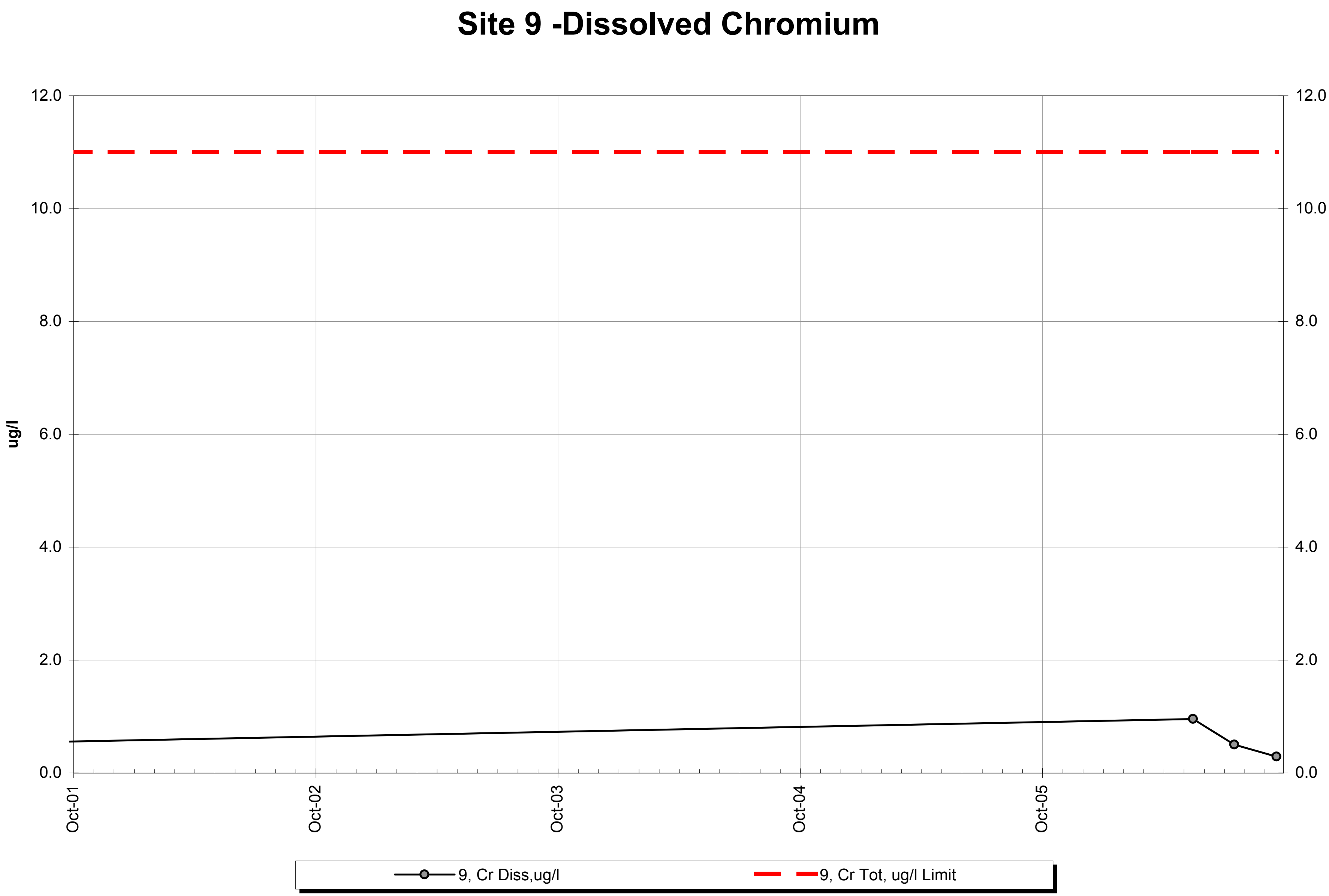
Site 9 -Dissolved Arsenic
Note: The AWQS for total arsenic is 10 ug/L and thus is not shown on this graph in order to allow greater visual detail of plotted values for trend determination
ug/l
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, As Diss,ug/l
9, As Tot, ug/l Limit

Site 9 -Dissolved Barium

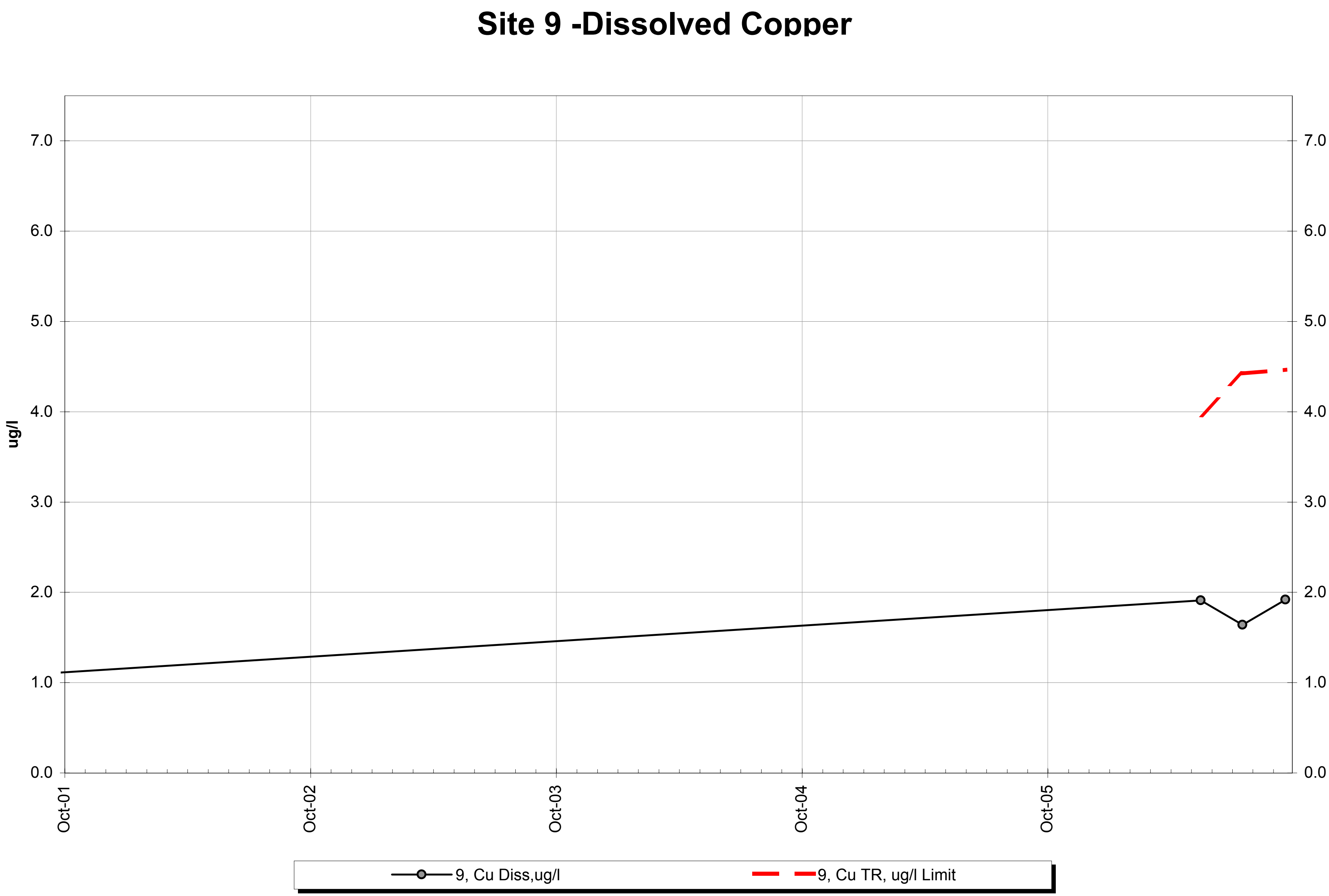


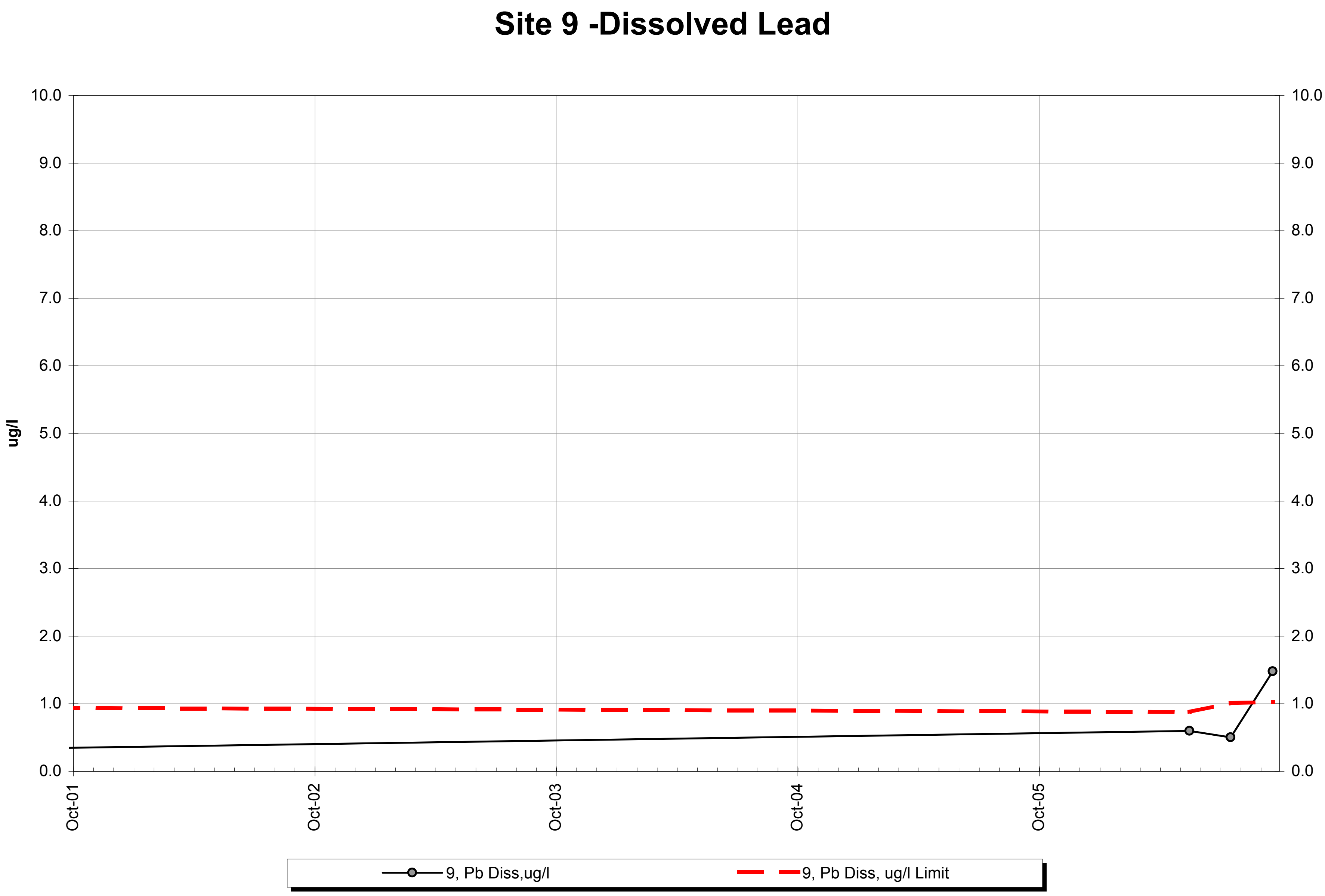


Site 9 -Dissolved Cadmium
ug/l
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Cd Diss,ug/l
9, Cd TR, ug/l Limit



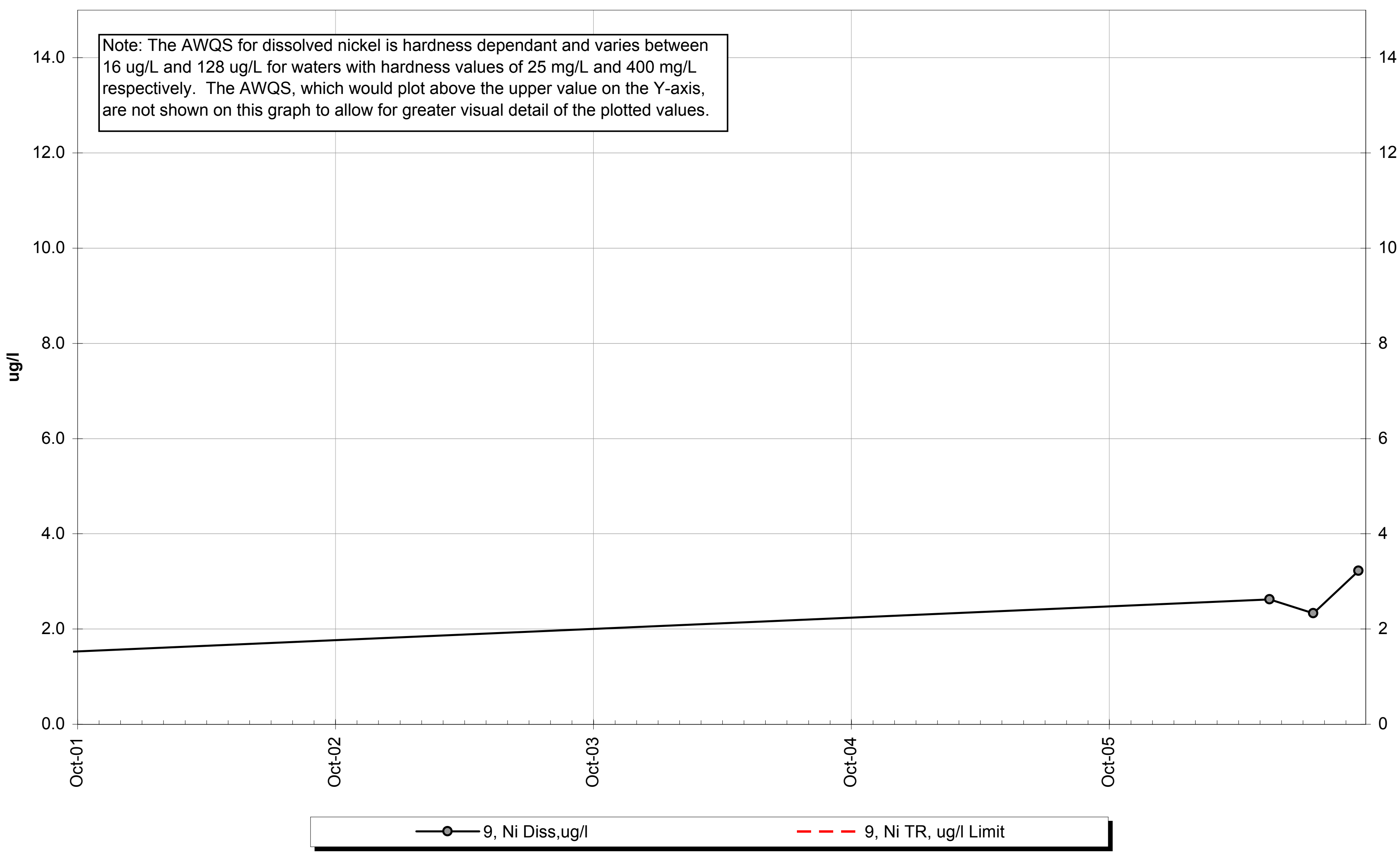
Site 9 -Dissolved Chromium
ug/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Cr Diss,ug/l
9, Cr Tot, ug/l Limit


Site 9 -Dissolved Copper
ug/l
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Cu Diss,ug/l
9, Cu TR, ug/l Limit



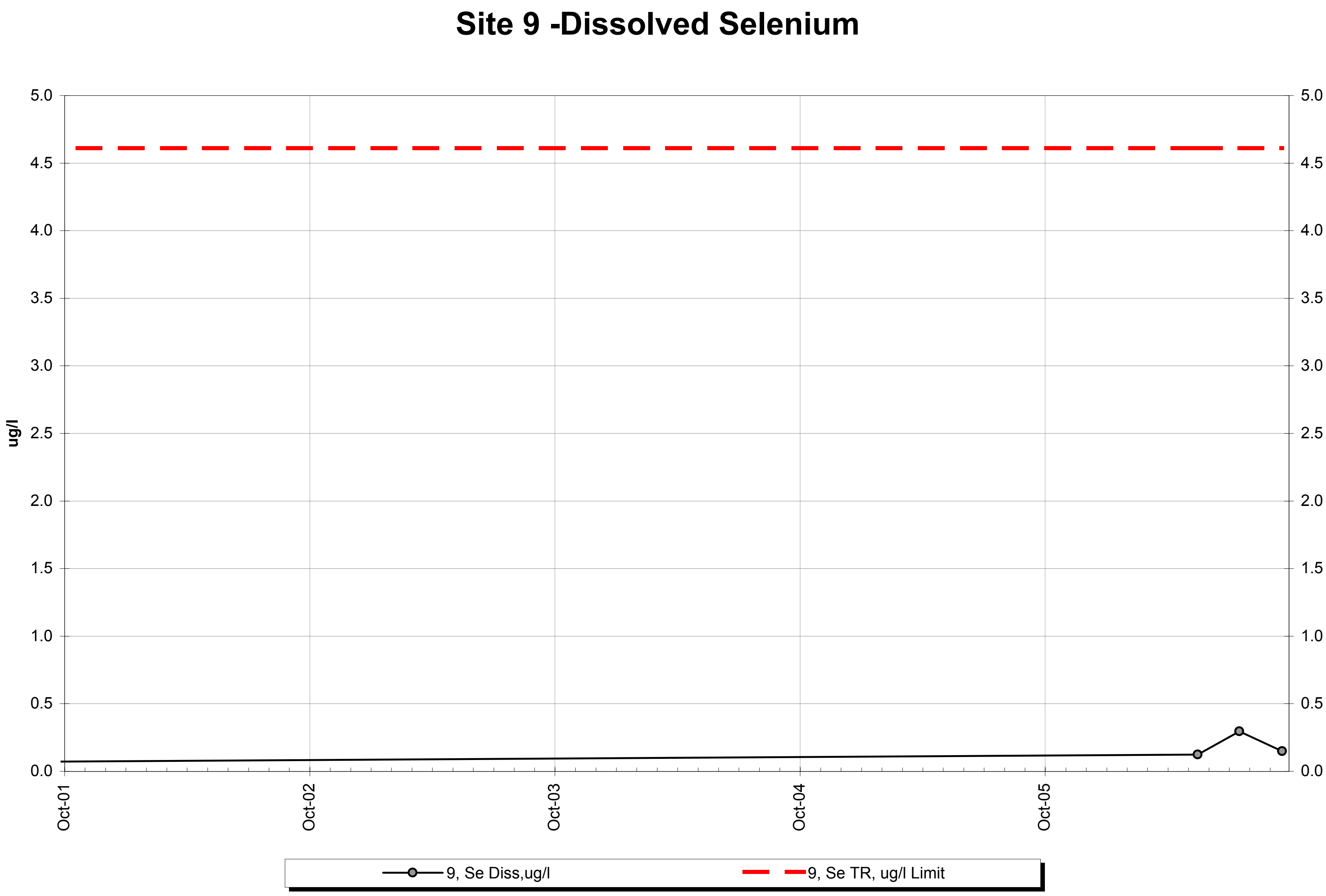
Site 9 -Dissolved Lead
ug/l
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Pb Diss,ug/l
9, Pb Diss, ug/l Limit

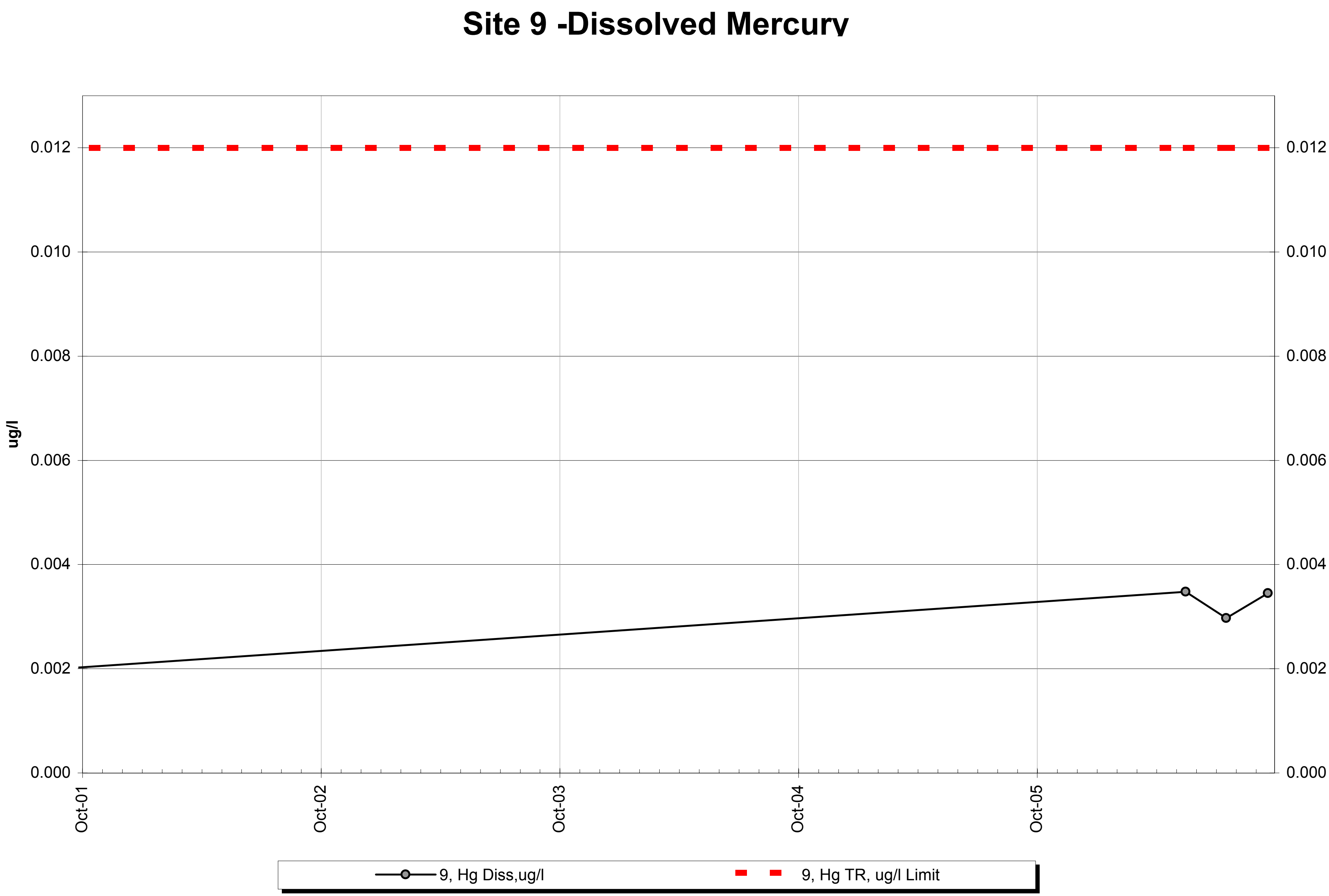
Site 9 -Dissolved Nickel




Site 9 -Dissolved Silver
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-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Ag Diss,ug/l
9, Ag Diss, ug/l Limit

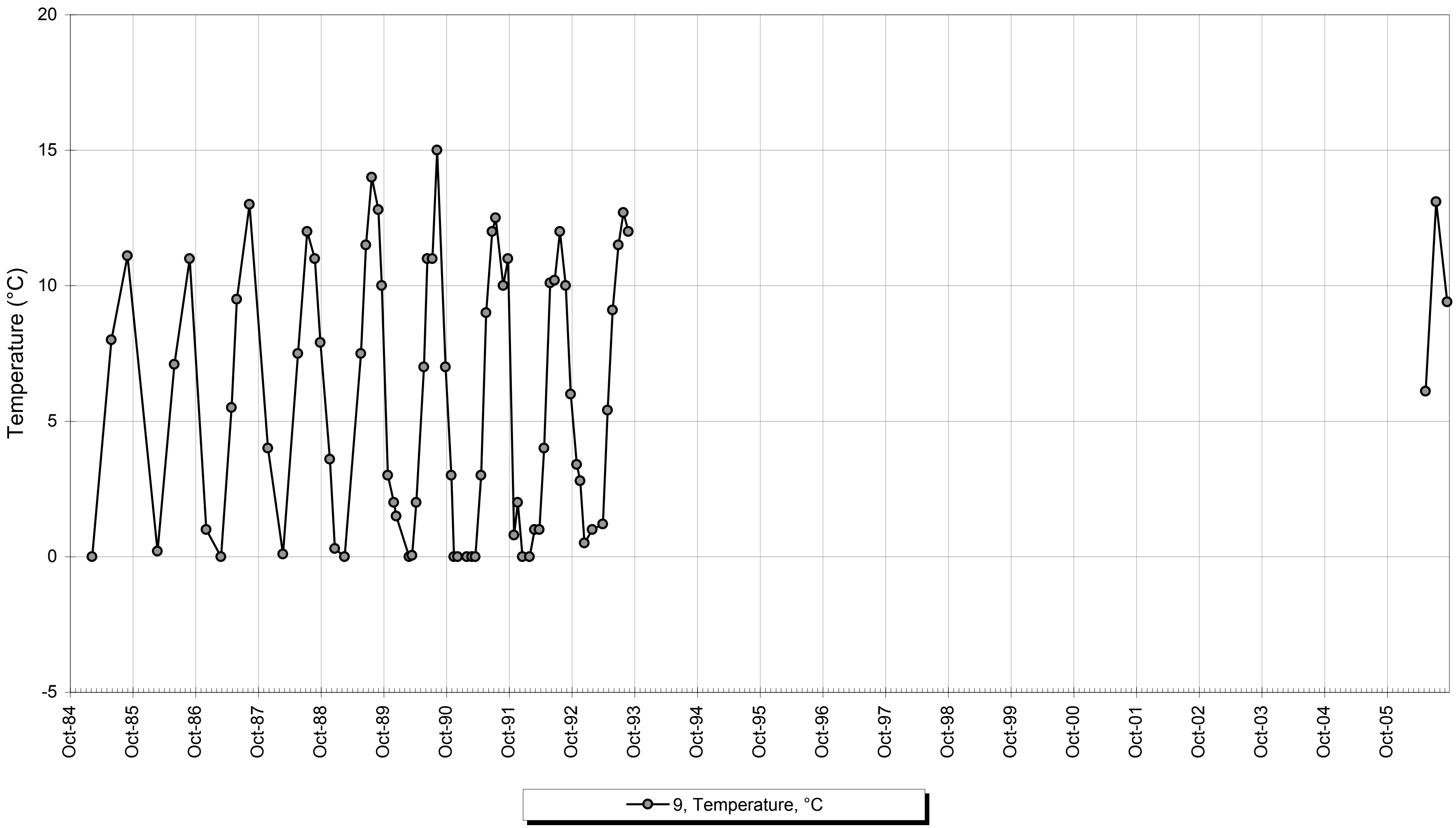
Site 9 -Dissolved Zinc
ug/l
0
10
20
30
40
50
60
70
80
90
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Zn Diss,ug/l
9, Zn TR, ug/l Limit


Site 9 -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-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Se Diss,ug/l
9, Se TR, ug/l Limit

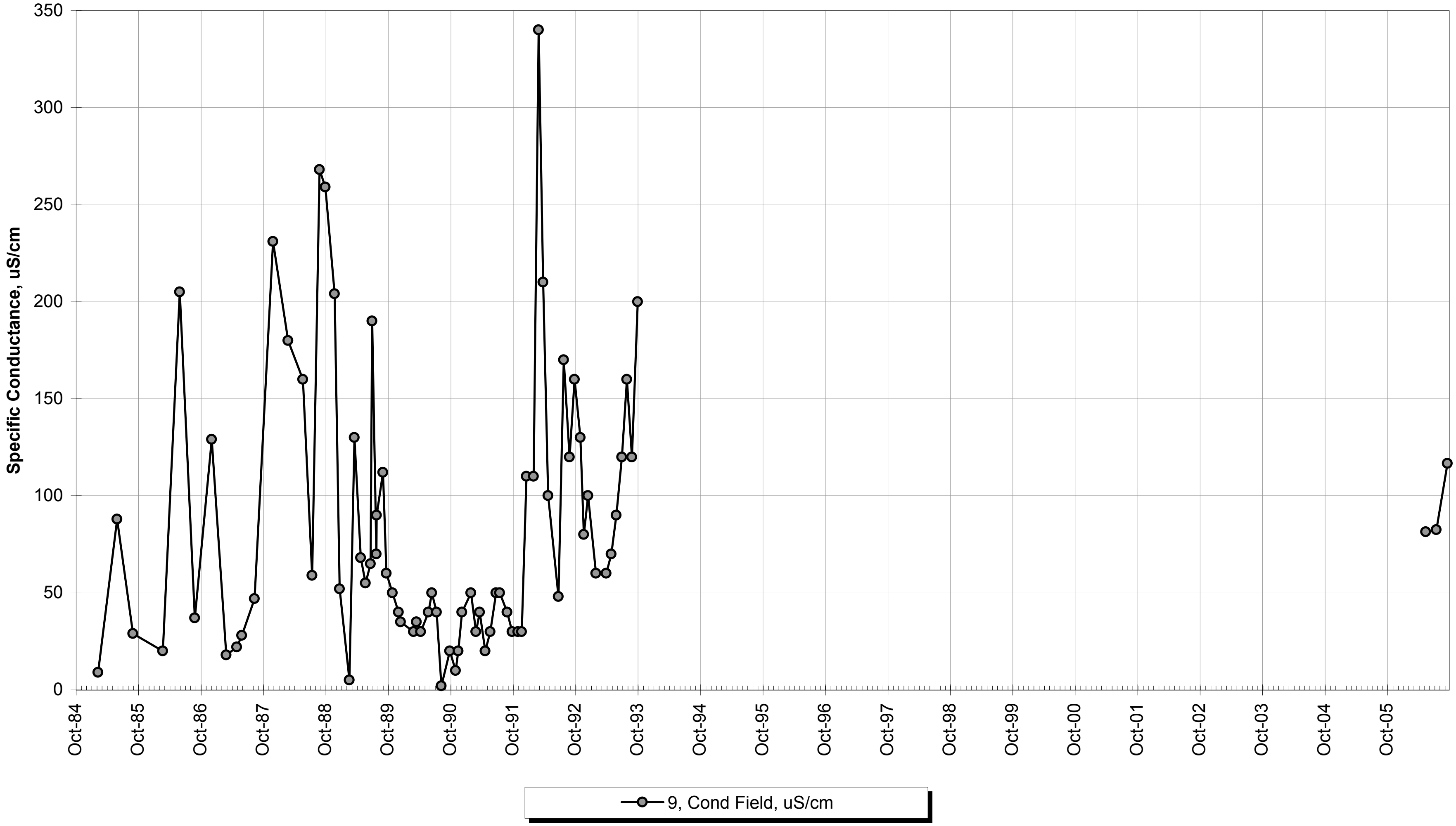


Site 9 -Dissolved Mercury
ug/l
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, Hg Diss,ug/l
9, Hg TR, ug/l Limit

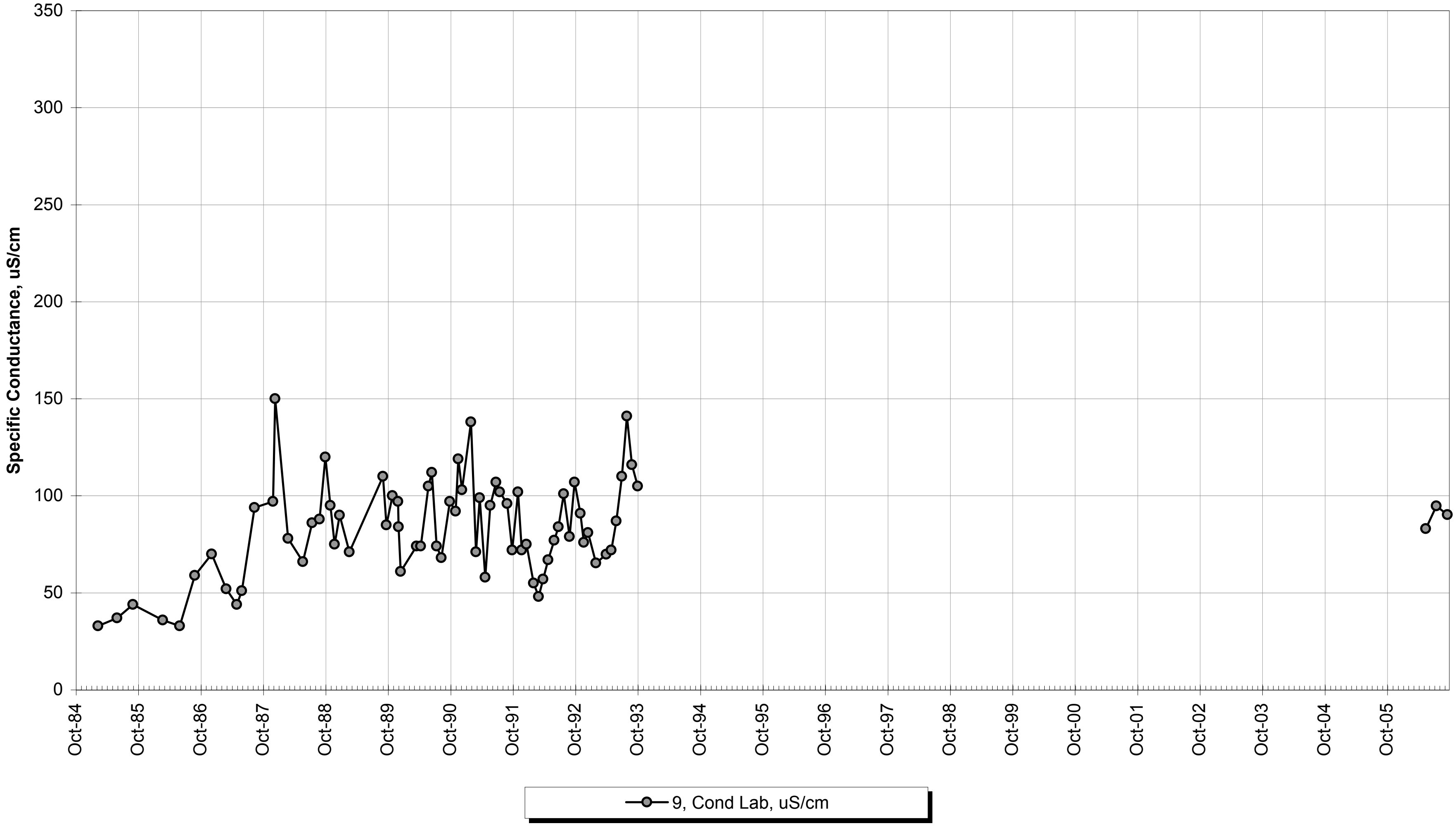
Site 9 -Water Temperature

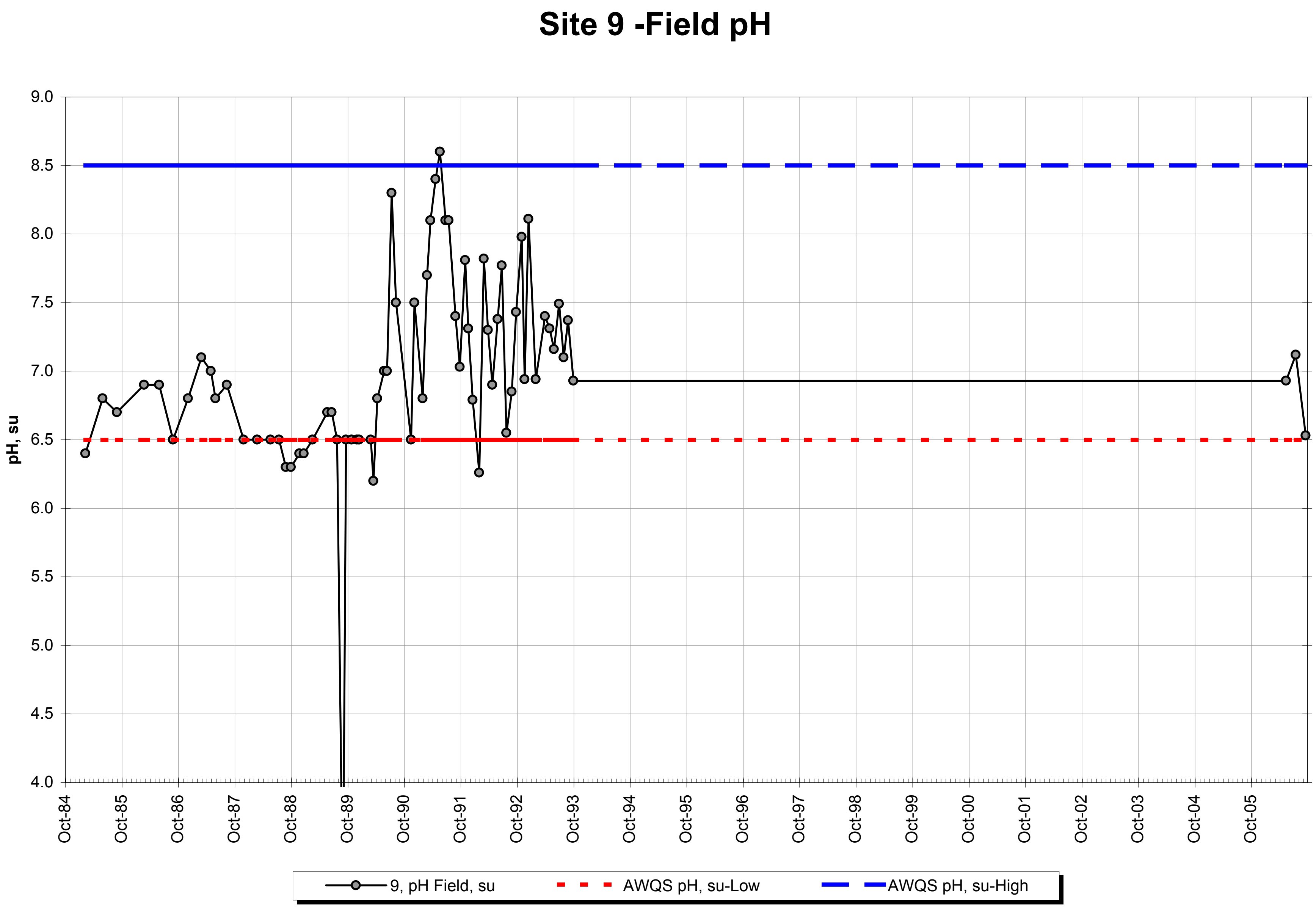


Site 9 -Conductivity-Field

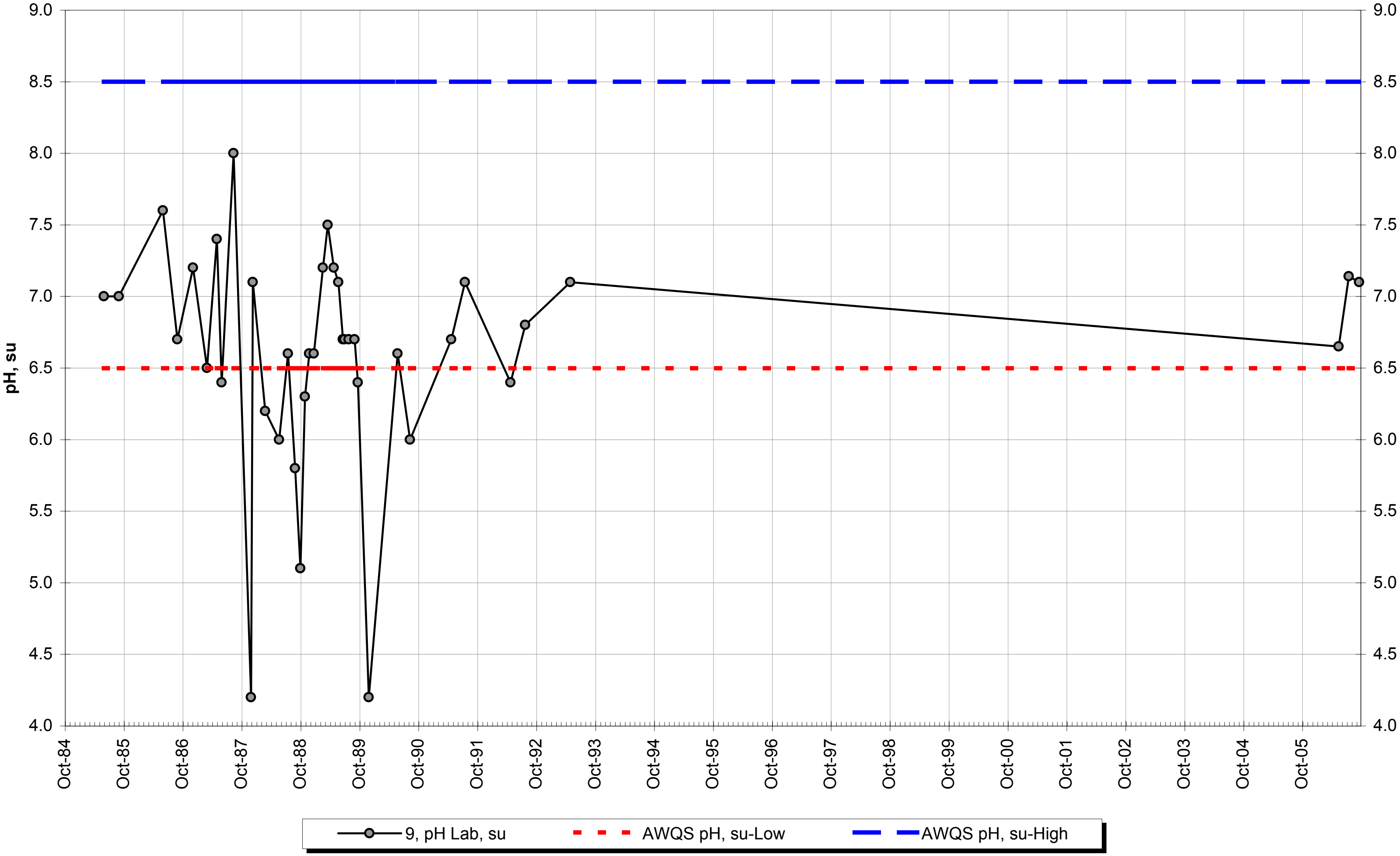


Site 9 -Conductivity-Lab



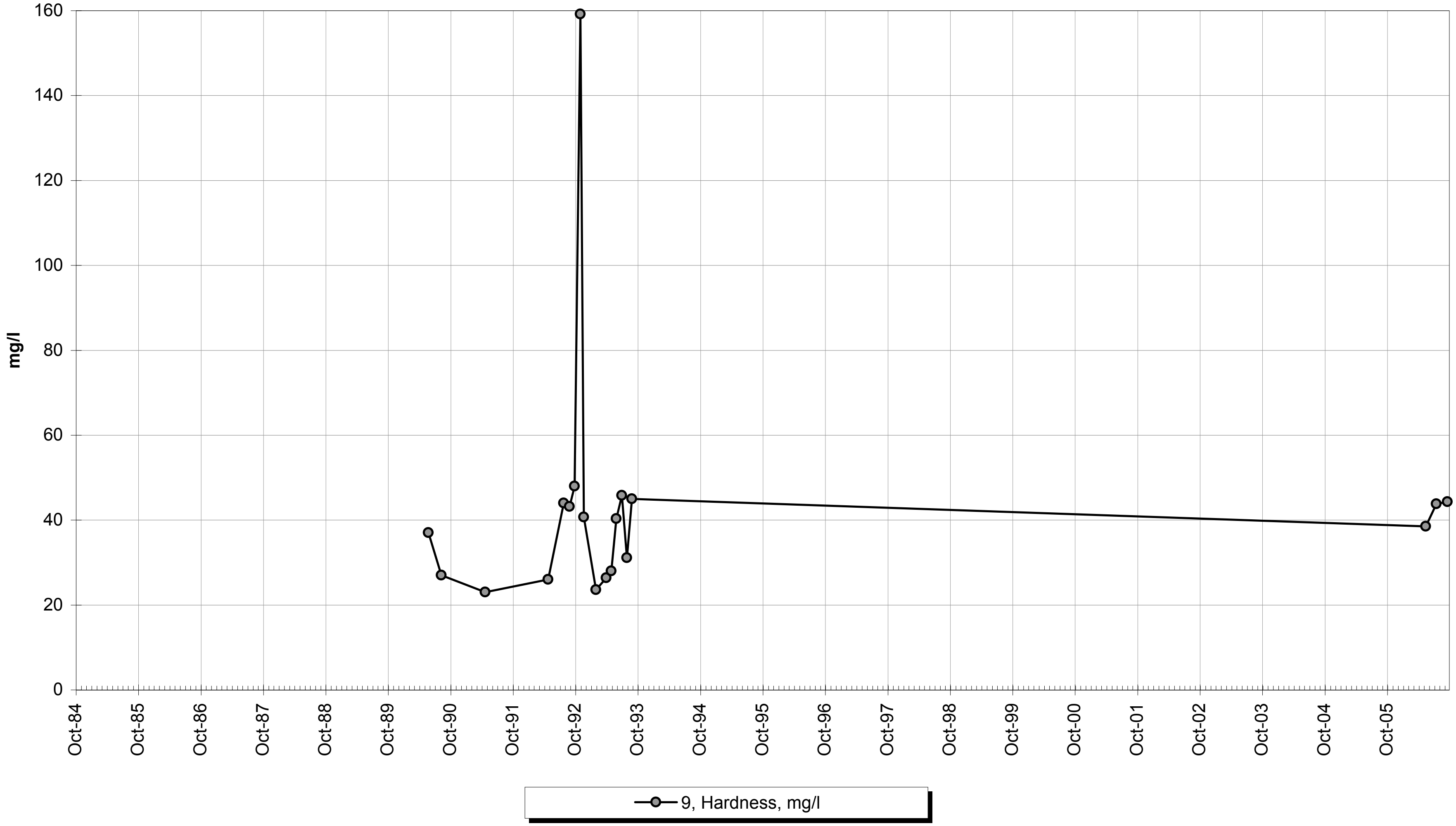

Site 9 -Field pH
pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-84
Oct-85
Oct-86
Oct-87
Oct-88
Oct-89
Oct-90
Oct-91
Oct-92
Oct-93
Oct-94
Oct-95
Oct-96
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, pH Field, su
AWQS pH, su-Low
AWQS pH, su-High

Site 9 -Lab pH

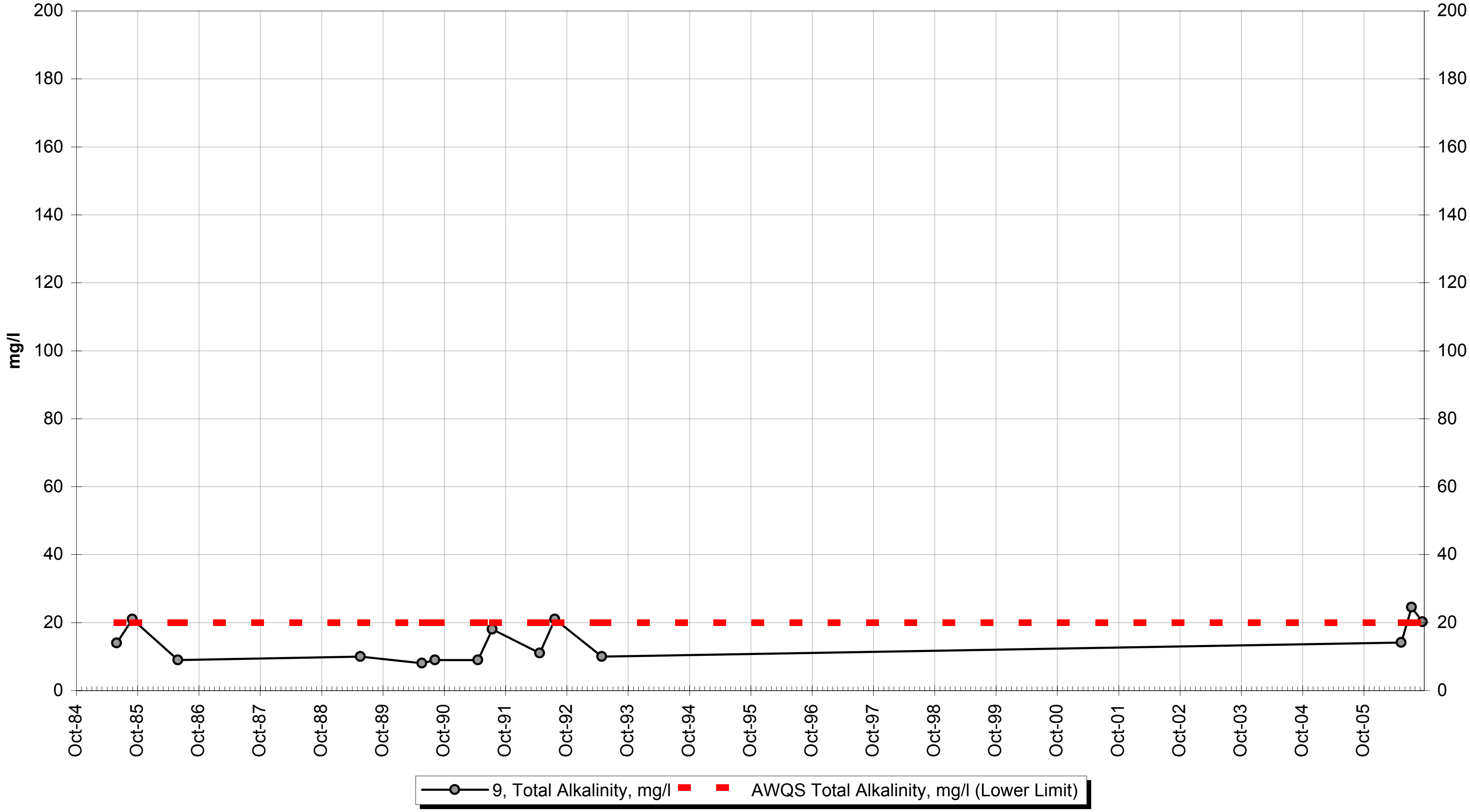


pH, su
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
Oct-84
Oct-85
Oct-86
Oct-87
Oct-88
Oct-89
Oct-90
Oct-91
Oct-92
Oct-93
Oct-94
Oct-95
Oct-96
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
9, pH Lab, su
AWQS pH, su-Low
AWQS pH, su-High

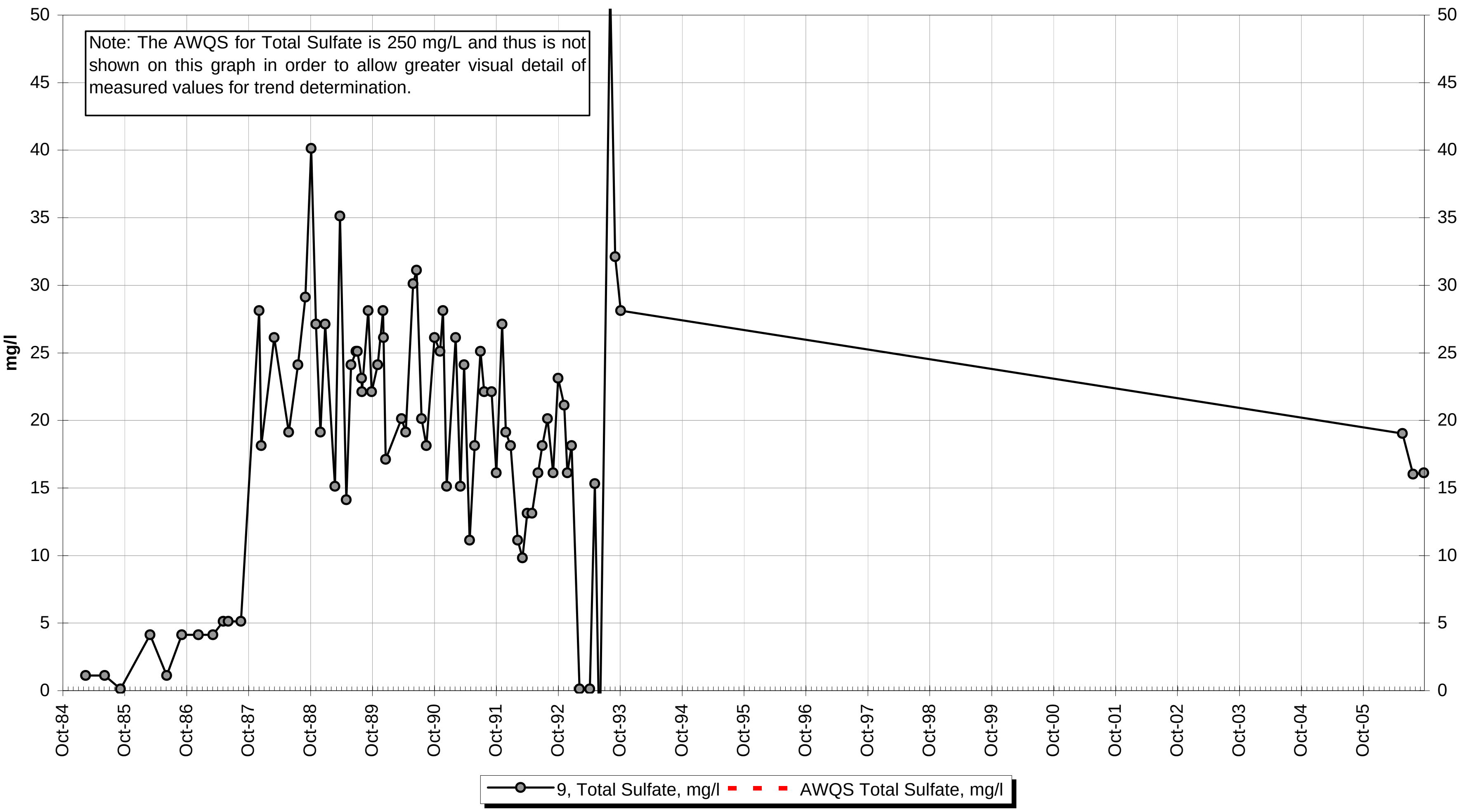
Site 9 -Hardness



Site 9 -Total Alkalinity



Site 9 -Total Sulfate



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	**10**	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	.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)

TR total recoverable
D dissolved
H some of the criteria for this parameter are hardness dependant
FWA Fresh Water Acute
FWC Fresh Water Chronic

DENOTES STRICTEST CRITERIA

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

Durst, James., and Laura L. Jacobs. 2007. Aquatic biomonitoring at Greens Creek Mine, 2006. Technical Report No. 07-02. Alaska Department of Natural Resources, Office of Habitat Management and Permitting, Juneau, Alaska. 85 pp.

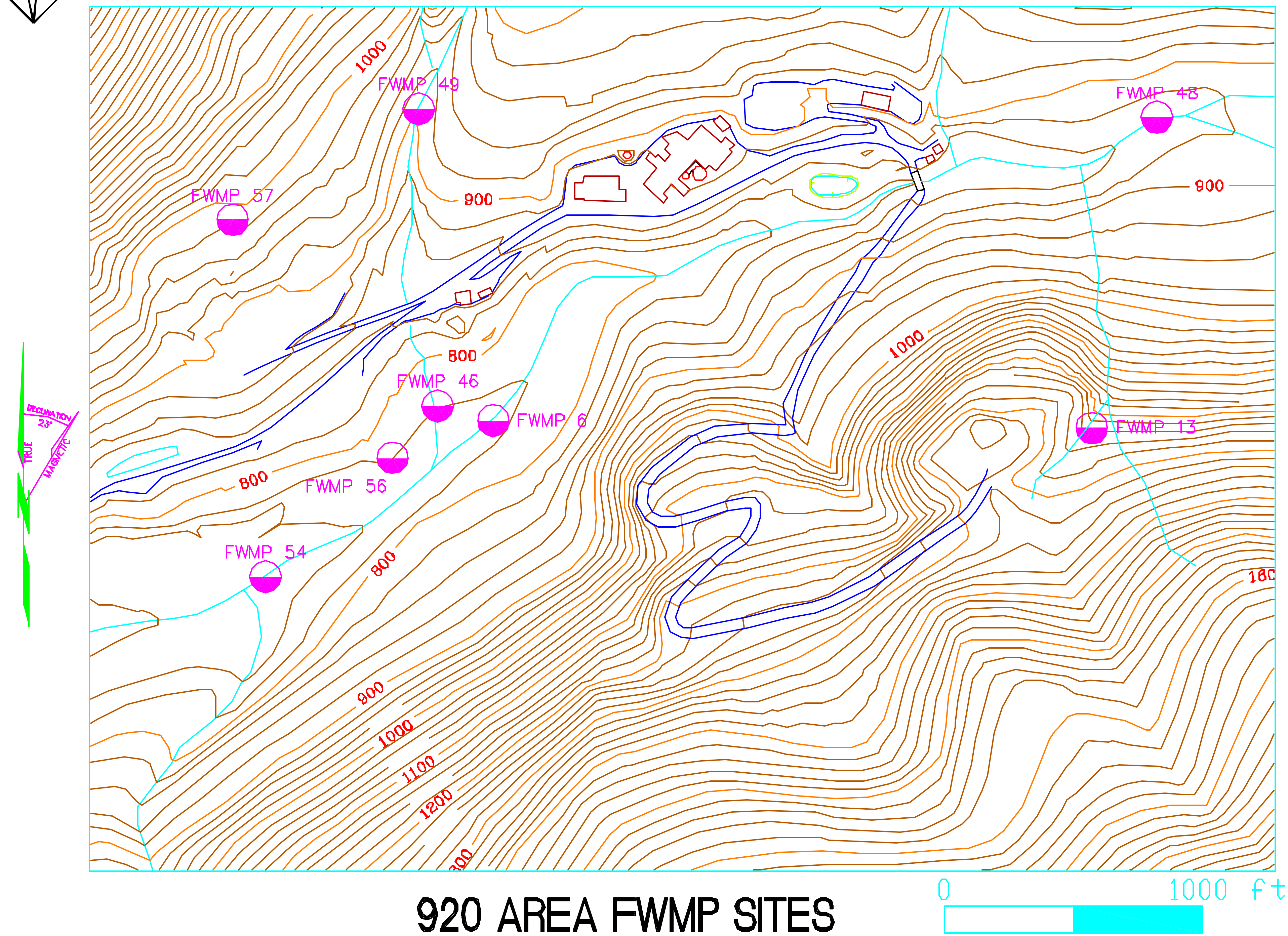
APPENDIX C

Map Sheets

C1-920 Area FWMP Sites

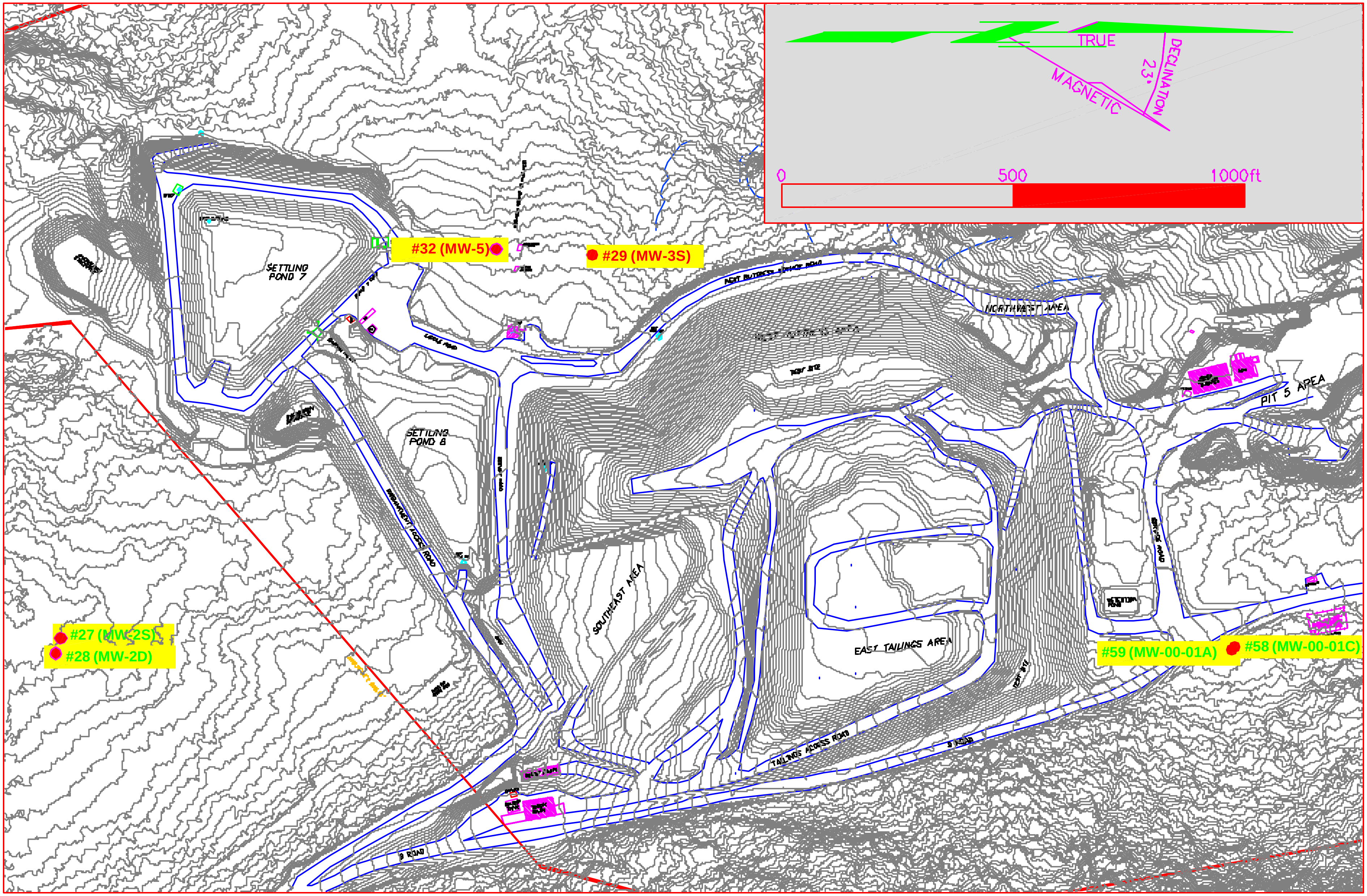
C2-Tailings Area FWMP Sites

KENNECOTT GREENS CREEK MINING COMPANY



920 AREA FWMP SITES

KENNECOTT GREENS CREEK MINING COMPANY



TAILS AREA FWMP SITES