Revised Background Groundwater Quality Report: Existing Wells For Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County, Utah

Prepared for:

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VIA FEDERAL EXPRESS

Dane L. Finerfrock, Co-Executive Secretary
Utah Water Quality Board
Utah Department of Environmental Quality
168 North 1950 West
P.O. Box 144810
Salt Lake City, UT 84114-4810

Dear Mr. Finerfrock:

Re: State of Utah Ground Water Discharge Permit No. UW370004 (the "GWDP") White Mesa Uranium Mill – Revised Background Groundwater Quality Report for Existing Wells

Reference is made to the *Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Mill Site, San Juan County*, December 2006 prepared by INTERA Inc. (the "Background Report"), pursuant to Part I.H.3 of the White Mesa Mill's GWDP, and filed with the Executive Secretary under cover of a letter dated December 29, 2006.

Reference is also made to your letter of August 10, 2007, with attached memorandum from URS Corporation dated August 9, 2007, in which you set out the findings of your completeness review of the Background Report. In your letter you request Denison to address the findings of this review, as set out in the URS memorandum, and revise and resubmit the Background Report accordingly.

Please find enclosed two copies of the Revised Background Report, prepared by INTERA Inc., which addresses the findings of your review.

Specifically, we have responded to URS's findings, as stated in their memorandum, as follows (URS's findings are indicated below in bold italics, followed by our response):

Finding 1.

Although wells MW-26 and MW-32 (formerly TW4-15 and TW4-17, respectively) were installed in July 2002, the oldest samples included in the Background Report database for these wells are from July 2005. Please include all available data for MW-26 and MW-32 in the statistical analysis or provide an explanation for why the 2002 to 2005 data were omitted.

All available data for MW-26 and MW-32 have been included in the statistical analysis. We added the 2002 data from split sampling that occurred then. In 2003-2004 these wells were only sampled as part of the chloroform remediation program. Chloroform sampling data for 2003 and 2004 for MW-26 and MW-32 were not added to the data base.

Finding 2a.

Approximately 300 individual analyses with reporting or detection limits exceeding Groundwater Quality Standards (GWQSs) are identified in Table 5a of the Background Report. It appears that these non-detected data, identified in Table 5a, were used in the statistical analyses, in that most are not listed in Appendix E (where the groundwater quality data excluded from statistical analysis are tabulated). High detection limits can lead to data that are insensitive to the actual concentration of a constituent in groundwater. Please remove insensitive non-detects prior to statistical analysis. Typically, a non-detect considered "insensitive" will be the maximum reporting limit in a dataset and will exceed other non-detects by, for example, an order of magnitude (e.g., <10 versus <1.0 µg/L). In some cases, insensitive non-detects may also exceed detectable values in a dataset (e.g., <10 versus 3.5 µg/L). Please document the insensitive non-detects that are not included in statistical calculations, including the rationale for categorizing them as insensitive.

Insensitive non-detects were removed per this guidance. Insensitive non-detects that were removed prior to statistical analysis are listed in Table 4a, which also contains a column stating the reasons for removal.

Finding 2b.

Continuing with non-detects: Section 2.0 of the Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Guidance (U.S. EPA, 1992) provides methods for handling non-detects in statistical analyses based on the proportion of non-detects in a data set. Please perform statistical analyses of the groundwater data again, using this guidance as a framework to handle the non-detects.

This guidance document was used in the revised Background Report. Please note that the results of statistical calculations presented in Tables 10a, 10b, 11 and 12 were completed by substituting one half of the detection limit for all cases of non-detect values. The underlying purpose of statistical results presented in those Tables was to provide an initial exploration of a large database and focus attention on features that required closer examination. All results presented in those Tables were not necessarily intended to be used in calculating proposed GWCL's, although they were used to calculate proposed GWCL's for those data sets that included fewer than fifteen percent non-detect values.

Statistical parameters used to calculate GWCL's were determined as follows, per EPA guidance (EPA, 1992 and 2000). After preparation of the database as described in Section 4 of the Report and illustrated by the flow sheet included as Figure 19 (the "Flow Sheet"), the data sets were divided into four separate groups, based on the percentage on non-detect values included in each set:

- data sets with 15 percent or fewer non-detect values,
- data sets with more than 15 and up to 50 percent non-detect values,
- data sets with more than 50 and up to 90 percent non-detect values, and
- data sets with more than 90 percent non-detect values.

If less than 15 percent of all sample values in a data set were non-detect, each non-detect value was replaced by one half of its detection or quantitation limit and the data set was tested for normality or log normality. Data sets that failed tests for normality were flagged for non-parametric analysis and, as stated above, normal or log normal data sets were then analyzed by standard parametric methods to determine the appropriate mean and standard deviation used to calculate a GWCL. These data sets were screened for trends using least squares regression with the p-value for significance set at 0.05.

After testing for normality or log normality and flagging data sets that failed these tests for non-parametric analysis, Cohen's Method was used to calculate a mean and standard deviation for data sets where non-detect values were more than 15 and up to 50 percent of the total set. Upon consideration, Atchison's Method was deemed inappropriate because it assumed that non-detects represent zero concentrations. While this assumption may be valid for organic constituents that are not present in a natural environment, it is likely not valid for inorganic constituents that are ubiquitous and would likely be detected everywhere if detection limits were low enough. Because of the relatively high number of non-detect values that occur within this group, screening for trends was conducted using both least squares regression and the Mann-Kendal test. If either screening method indicated a positive trend (or a negative trend in the case of pH) then the data set was flagged for further evaluation.

For data sets with more than 50 and up to 90 percent non-detect values and data sets that failed tests for normality or log normality, the mean and standard deviation are not considered to be representative of the data set and non-parametric methods were used instead. EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the highest historical value for the constituent. As a result, the highest historical value, after screening the data as set out in Section 4.0 of the Report, has been identified and is indicated where applicable on Table 16 of the Report. Screening for trends was conducted using the Mann-Kendal test. If a positive trend was indicated (or a negative trend in the case of pH) then the data set was flagged for further evaluation.

Finally, for data sets that had greater than 90 percent non-detects, EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the Poisson limit. As a result, the Poisson limit has been calculated and is indicated where applicable on Table 16.

Finding 3.

Please add a footnote to the "Result" column in Appendix E, which reads: "If the result was non-detect, the value listed here is one-half of the reporting or detection limit."

This change has been made.

Finding 4.

Regarding the internal consistency checks performed and documented in Tables 8 and 9, it is not clear if the total dissolved solids (TDS) and charge balance consistency checks were used to identify and possibly remove anomalous results from the data sets prior to statistical analysis. No criteria were provided in the report to discriminate and identify unacceptable analytical results based on either charge balance or TDS consistency checks. Undoubtedly, some of the values that would be flagged by these checks were removed as extreme values. However, please perform a systematic review of the information in Tables 8 and 9 to identify data quality issues, and thereby, improve the data sets. For charge imbalances greater than ±10 percent, please review the sample results for anomalous chloride and/or sulfate values. For TDS comparisons, please review the sample results for anomalous chloride, sulfate, and/or TDS values where the ratio of calculated to measured TDS is outside the range of 85-115 percent. When an anomalous sample is identified by either of these consistency checks, please compare the results of this anomalous sample to results for samples collected from the well at other times to determine which constituent(s) is (are) the cause of the anomaly. If the anomalous result is due to an erroneous chloride, sulfate, or TDS concentration, please remove it from the data set prior to statistical analysis.

Data have been reviewed following these guidelines and data that was removed as a result is listed in Appendix G.

Finding 5.

In Table 2.2-1, some constituents that are noted as having a statistically significant increasing trend are identified based on non-detects and associated changes in reporting limits (e.g., selenium in MW-18 and arsenic in MW-19). Please flag, footnote, or remove these occurrences from Table 2.2-1, as they could mislead the reader. In the text of Section 2.2, DMC does identify the apparent trends that are an artifact of non-detects. Please make Table 2.2-1 consistent with the text by identifying in the table (with a symbol and footnote) those trends that are due solely to changes in the detection limits over time. Please also indicate, classify, or otherwise discriminate the non-detected from the detected values shown in the regression analysis graphs in Appendices B, C, and F. An example is closed versus opened symbols.

Increasing trends in Table 2.2.1 (now Table 7.1-1) that are based on non-detect values have been placed in a separate table (Table 7.1-2), and explained separately from the trends listed in Table 7.1-1. Appendix D includes time concentration plots with linear regression for all wells and constituents that display a significant upward trend. These plots use separate symbols to discriminate between the non-detect and detected values. Non-detect and detected values in graphs from Appendices B, C, and E remain undifferentiated but are presented for their value in data exploration.

Finding 6.

For those constituents identified as having a log normal distribution in the summary statistics (Tables 11A and 11B), please provide the geometric standard deviation.

The geometric mean and standard deviation or log normally distributed data have been set out on a new Table 12.

Finding 7.

An analysis of variance (ANOVA) is mentioned in a footnote of Section 2.2 (page 5), but no additional detail is provided. Please clarify how trends were identified as statistically significant, and provide detailed results of this ANOVA evaluation as a new appendix of the report.

The reference to ANOVA was probably too general. We did not need to complete a full ANOVA in order to calculate least squared regression coefficients. More specifically, we used the least squares regression functions within the scatter plot module in STATISTICA to estimate correlation coefficients (R^2) and p-values to explore for potential trends in data. A p-value that was equal to or less than 0.05 was considered to be significant. In many areas of research, the p-level of .05 is customarily treated as a "border-line acceptable" error level (Statsoft, 2005). A discussion of these points has been included in the revised Report.

Finding 8.

It is stated in Section 6.2 that at least 20 samples are needed for the Shapiro-Wilk test to have sufficient power to reject the hypothesis of normality. Please provide a reference for this statement and the impact of using the Shapiro-Wilk test on data sets of less than 20.

The following quote is from U.S. EPA, 2002, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, EPA 540-R-01-003 OSWER 9285.7-41 September 2002, Office of Emergency and Remedial Response U.S. Environmental Protection Agency, Washington, DC 20460

> "Tests for the distribution of the data (such as the Shapiro-Wilk test for normality) often fail if there are insufficient data, if the data contain multiple populations, or if there is a high proportion of non-detects in the sample.[6] Tests for normality lack statistical power for small sample sizes. In this context, — "small" may be defined roughly as less than 20 samples, either on site or in background areas. Some standard tests for a particular distribution against all alternatives, such as the Lilliefors form of the Kolmogorov-Smirnoff test, require as many as 50 samples. Therefore, for small sample sizes or when the distribution cannot be determined, non-parametric tests should be used to avoid incorrectly assuming the data are normally distributed when there is not enough information to test this assumption."

Please see our response to Finding 9 below regarding the use of the Shapiro-Wilk test on data sets of less than 20.

Finding 9.

Please provide citation/documentation for the applicability of methods and the selection of values/criteria used in the statistical analysis (e.g., regression coefficient of 0.5 for trend analysis, number of samples ≥ 20 for Shapiro-Wilk test, p-value of 0.0500 for Shapiro-Wilk test significance, ± 3 times the height of the box-and-whisker plot box for extreme values, etc.).

Using a regression coefficient (R^2) of 0.5 to divide "good" correlations from "poor" correlations is merely a rule of thumb, and was not used in statistical analysis.

While we generally followed EPA guidance in *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities* (EPA, 1989 and 1992), there were specific instances where clear guidance was not available in those documents or, for that matter, in any EPA Guidance document. For example, the following quotes from EPA (1992) appear to contradict the quotation from EPA (2002) presented in response to Finding 8, above:

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"The Shapiro-Wilk test of Normality can be used for sample sizes up to 50."
And
"The [Shapiro-Wilk W] coefficients can be found for any sample size from 3 up to 50 in Table A-1 of Appendix A."

However, all statistical procedures require judgment in selecting tests and criteria to return meaningful results. Thus, while we note "For the Shapiro-Wilk test to have sufficient power to reject hypothesis of normality (or log normality), the sample number, or "n" should be at least 20", we applied the test to all data sets that had fewer than 50 percent non-detects, including those with less than 20 data points.

As noted, we chose a p-value of 0.05 for the Shapiro-Wilk test. To determine whether to reject the null hypothesis of normality, it is necessary to examine the probability associated with the test statistic (i.e., p-value). If this value is less than the level of significance you choose (such as 0.05 for 95%), then the null hypothesis is rejected, and you can conclude that the data do not come from a normal distribution. This level was chosen as reasonable (commonly used) and more appropriate than a higher value (i.e., 0.1) because it would identify more data sets as normal. A normal distribution allows the use of parametric statistics which is more powerful than the non-parametric approach used for those data sets testing non-normal.

The size of the box in box and whisker plots was set such that the height of the box (H) represents the 25th (LBV) and 75th (UBV) percentile range of the data set with the median value plotted within. This range is similar to that described by one standard deviation for normally distributed data. Extreme values were identified as being more than 3 times above or below the width of the box. This is roughly equivalent to values that are four standard deviations above or below the mean in normally distributed data, or above or below 99.994% of all other data.

Finding 10.

Please evaluate the results of the groundwater quality statistical analysis in the context of the subsurface environment conceptual site model (CSM) for the White Mesa Mill Site (e.g., the potential impact on background groundwater quality due to the relatively large increase in groundwater levels observed on the east side of the study area beginning in 1994).

As stated in the Background Groundwater Quality Report, water levels have increased dramatically in the following monitor wells generally located on the east side of the site: MW-1, MW-4, MW-11, MW-17, MW-18, and MW-19. Monitor wells on the west side of the site (MW-2, MW-3, MW-5, MW-12, MW-14, and MW-15) have exhibited moderate increases or no increase at all. Water level increases are believed to be, at least in part, the result of installation of wildlife ponds in the early 1990's and the recharge of existing wildlife ponds. Three ponds appear on Figure 2 along the eastern margin of the site. Section 12 of the revised Report discusses the effect of water level rises on concentrations of chloride and uranium in monitor wells across the site. Less mobile constituents do not move as freely as chloride and uranium and therefore effects of changes in groundwater levels are less evident in resulting concentration levels.

Finding 11.

Please add a summary table providing the mean and standard deviation values DMC proposes to use to establish the GWCL for each well and each constituent listed in Table 2 of the Permit. This summary table must also include a column listing the distribution selected (e.g., normal, lognormal, or non-parametric) and a comment/rationale column to identify those constituents where a mean and standard deviation are not appropriate to establish the GWCL. For these occurrences, please provide an alternative GWCL with brief justification. This summary table will streamline modification of the Permit GWCLs and will focus subsequent efforts on evaluating those constituents where statistical measures may not be appropriate for establishing compliance limits.

Please see Table 16 of the revised Report, which presents the results of GWCL calculations based on the Flow Sheet.

Finding 12.

Please add a summary table to Section 1.0 or 2.0 listing the wells included (and not included) in the Background Report, the range of sampling dates and number of samples used for each well for the statistical analysis.

Please see Table 1 of the revised Report, listing the wells included (and not included) in the Background Report, the range of sampling dates and number of samples used for each well for the statistical analysis.

Finding 13.

Please add the well names and sampling dates to the individual charge balance records listed in Table 9.

Table 8 of the revised Report has been revised to reflect this change.

Finding 14.

Please add a flow chart and accompanying explanatory text (as numbered or bulleted items) presenting each step in the data validation and statistical analysis process. This could be included as an appendix.

The Flow Sheet has been included as Figure 19.

Finding 15.

Sections 2.2 and 2.3 seem out of place. Please move to and consolidate with the Conclusions section.

This change has been incorporated into the revised Report.

Finding 16.

Similar to Appendix E, which provides all data excluded from the data set, please include an appendix table that lists all data modified prior to statistical analysis. The table should include the original value, the changed value to be used in the analysis, and the basis for the change.

This table is included as Appendix F of the revised Report.

Finding 17.

Please provide electronic copies on CD of the input and output files for all Statistica software runs.

A CD that includes an electronic copy of Denison's groundwater database and all input and output files for all analyses is included.

If you have any questions regarding the foregoing, or require any further information, please contact me at 303-389-4130 or Steve Landau at 303-389-4132.

Yours truly,

David C. Frydenlund
Vice President Regulatory Affairs and Counsel

cc: Ron F. Hochstein
Harold R. Roberts
Steven D. Landau
David E. Turk
Daniel W. Erskine, INTERA Inc.

REFERENCES

Denison Mines (USA) Corp. (DMC) 2006. *Background Groundwater Quality Report: Existing Wells.* Prepared for Denison Mines (USA) Corp., Denver, CO. December 2006.

Denison Mines (USA) Corp. (DMC) 2007. *Addendum, Evaluation of Available Pre-Operational and Regional Background Data.* Prepared for Denison Mines (USA) Corp., Denver, CO. April 19, 2007.

U.S. Environmental Protection Agency (U.S. EPA) 1992. *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Guidance.* Office of Solid Waste, Washington, D.C. July 1992.

U.S. Environmental Protection Agency (U.S. EPA) 2002. *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites.* Office of Emergency and Remedial Response U.S. Environmental Protection Agency Washington, DC 20460, September 2002.

StatSoft, Inc, 2005,. STATISTICA (data analysis software system), version 7.1. www.statsoft.com.

Revised Background Groundwater Quality Report: Existing Wells For Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site, San Juan County, Utah

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October 2007

EXECUTIVE SUMMARY

Denison Mines (USA) Corp.'s (DUSA's) White Mesa Uranium Mill (the Mill) is located approximately 5 miles south of Blanding, Utah. Licensed by the U.S. Nuclear Regulatory Commission (NRC) in 1980, the Mill has processed over 4 million tons of conventionally-mined and alternate feed uranium ores for the recovery of over 25 million pounds of U_3O_8 and 34 million pounds of vanadium to date.

In August 2004, Utah became an Agreement State for uranium mills and, as a result, became the primary regulator of the Mill. In March 2005, the Co-Executive Secretary of the Utah Water Quality Board (the "Executive Secretary") issued Groundwater Discharge Permit No. UGW370004 (GWDP) for the Mill, which is intended to tailor the state's groundwater protection program to the Mill facility.

While background groundwater quality at the Mill site had been established prior to commencement of operations and accepted by NRC, Part I.H.3 of the GWDP requires that DUSA prepare this background groundwater quality report to evaluate all historic data for the purposes of establishing background groundwater quality at the site and developing groundwater compliance limits (GWCLs) under the GWDP.

The first version of this report was submitted to the Executive Secretary on December 29, 2006. After review of that version of the report, the Executive Secretary requested that certain revisions be made and that this revised report be re-submitted. The revisions relate primarily to the manner of evaluating the available data and the statistical methods to be employed in calculating GWCLs. In addition, some missing historic data has been located and four new quarters of data have been added to the database. This has resulted in changes to the database and to the resulting statistics and analysis. However, our conclusions have not changed.

Prior to review and acceptance of the conclusions in this report relating to background at the Mill site, the GWCLs were set on an interim basis in the GWDP. In this regard, the limits were established as fractions of the state groundwater quality standards (GWQSs) for drinking water, depending on the quality of water in each monitoring well at the site. The GWDP contemplates that upon approval of this report, the Executive Secretary will re-open the GWDP and modify the GWCLs to account for natural variations in groundwater quality not caused by current or historic operations at the facility. Specifically, the GWDP contemplates that, upon acceptance of background groundwater quality at the site, the GWCL for each constituent in each well will be set as the mean plus two standard deviations, based on historical data for the constituent, on a well-by-well basis. The GWDP contemplates that groundwater monitoring and compliance at the Mill will be performed on a well-by-well, or intra-well, basis due to natural variations in groundwater across the site.

However, the Executive Secretary and DUSA have agreed that calculating the GWCL as the mean plus two standard deviations is only appropriate for normally or log-normally distributed constituents, where the number of non-detects is 50 percent or less. Therefore, in accordance with Environmental Protection Agency (EPA) Guidance (1992) the constituent data sets were divided into different categories based on the percent non-detects and the distributional characteristics of the data, and the GWCLs were calculated for each category in the manner recommended by such guidance.

Because the Mill has been in operation for over 25 years, it is important that care be taken in reviewing historical groundwater monitoring data to ensure that monitoring results have not been impacted by Mill activities. This is particularly important in the case of the Mill because historic data show constituent concentrations in excess of GWQSs and increasing and decreasing trends in a number of constituents both upgradient and far downgradient of the Mill site, as well as at the Mill site itself. It is therefore not possible to conclude that a constituent concentration in excess of its respective GWQS or an increasing trend necessarily represents an impact from milling activities.

In evaluating historic data, we have used the following approach to determine whether groundwater has been impacted by Mill activities:

- If historic data for a constituent in a well do not demonstrate a statistically-significant upward trend, then the proposed GWCL for that constituent is accepted as representative of background, regardless of whether or not the proposed GWCL exceeds the state GWQS for that constituent. This is because the monitoring results for the constituent have been consistently representative since commencement of Mill activities or installation of the well; and

- If historic data for a constituent in a well represent a statistically-significant upward trend, then that data is further evaluated to determine whether the trend is the result of natural causes or Mill activities. In performing our evaluations, we reviewed spatial and temporal distributions of the constituents and other factors we considered relevant in order to make our determinations.

After applying the foregoing approach, we have concluded that there have been no impacts to groundwater from Mill activities. We base this conclusion on a number of factors, including the following[1]:

- There are a number of exceedances of GWQSs in upgradient and far downgradient wells at the site, which cannot be considered to have been impacted by Mill operations to date. Exceedances of GWQSs in monitoring wells nearer to the site itself are therefore consistent with natural background in the area. In situations where the constituent that exceeds the GWQS is not trending upward, the proper conclusion is that it is representative of natural background.

- There are numerous cases of both increasing and decreasing trends in constituents in upgradient, far downgradient, and Mill site wells, which provide evidence that there are natural forces at work that are impacting groundwater quality across the entire site.

- In almost all cases where there are increasing trends in constituents in wells at the site, there are increasing trends in those constituents in upgradient wells. Furthermore, and more importantly, in no case is there any evidence in the wells in question of increasing trends in chloride, which is considered the most mobile and best indicator of potential tailings cell leakage at the site. We consider the combination of these factors to be conclusive evidence that all increasing trends at the site are caused by natural forces and not by Mill activities.

As a result, we have concluded that the GWCLs proposed in this report, calculated in the manner recommended by EPA Guidance (1992) and agreed to by the Executive Secretary, are appropriate. However, proposed GWCLs for trending constituents should be re-evaluated upon GWDP renewal to determine if they are still appropriate at the time of renewal.

[1] Although there has been some impact at the Mill site from the chloroform and related organic contamination, which is the subject of a separate investigation, this contamination is related to activities that pre-dated the construction of the Mill and is limited to a defined area upgradient and cross gradient from the Mill's tailings cells.

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Glossary

µg/L	micrograms per liter
CCD	counter current decantation
DOE	U.S. Department of Energy
DMT	Discharge Minimization Technology
DUSA	Denison Mines (USA) Corp.
EFN	Energy Fuels Nuclear, Inc.
Eh	redox potential
EPA	U.S. Environmental Protection Agency
GWCL	groundwater compliance limit
GWDP	Groundwater Discharge Permit No. UGW370004
GWQS	groundwater quality standard
HDPE	high density polyethylene
MDL	method detection limit
mg/L	milligrams per liter
msl	mean sea level
Mill	White Mesa Uranium Mill
NRC	U.S. Nuclear Regulatory Commission
POC	point of compliance
QA/QC	quality assurance and quality control
TDS	total dissolved solids
UDEQ	Utah Department of Environmental Quality

1.0 INTRODUCTION

This report on background groundwater quality was prepared to meet the requirements stated in Part I, Section H.3 of Utah Groundwater Discharge Permit No. UGW370004 (GWDP) issued on March 8, 2005, for the Denison Mines (USA) Corp. (DUSA), White Mesa Uranium Mill (the Mill) (Figure 1). This document will focus on "existing" groundwater monitoring wells MW-1, MW-2, MW-3, MW-5, MW-11, MW-12, MW-14, MW-15, MW-17, MW-18, MW19, MW-26, and MW-32. See Figure 2 for a map showing monitoring well locations. Data from newly installed monitoring wells (MW-3A, MW-23, MW-24, MW-25, MW-27, MW-28, MW-29, MW-30, and MW-31) are the subject of the *Addendum: Background Groundwater Quality Report: New Wells For Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site, San Juan County, Utah* (June 1, 2007).

The first version of this report was submitted to the Co-Executive Secretary of the Utah Water Quality Board (the "Executive Secretary") on December 29, 2006. After review of that version of this report, the Executive Secretary requested that certain revisions be made to the report and that this revised report be re-submitted to the Executive Secretary.

As required by the GWDP, this report addresses all available historic data, which includes all pre-operational and operational data, for the compliance monitoring wells under the GWDP that were in existence at the date of issuance of the GWDP. The addendum to this report, entitled *Addendum: Evaluation of Available Pre-Operational and Regional Background Data* (April 19, 2007), focuses on all pre-operational site data and all available regional data to develop the best available set of background data that could not conceivably have been influenced by Mill operations.

This report is organized as follows:

Section 1: Introduction and Summary of Issues to be Addressed

Section 2: Summary of Historical Operations and Environmental Setting

Section 3: Available Sources of Data and Methods Used to Compile Data into a Database Format

Section 4: Quality Assurance Evaluation and Description of Steps Taken to Document the Validity of Data Used in Statistical Analyses

Section 5: Calculation of Exploratory Statistics

Section 6: Testing for Trends and Calculating the GWCL

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Section 11: Analysis of Constituents that Require Further Evaluation

Section 12: Additional Evaluation of Uranium Trends

Section 13: Calculation of Groundwater Compliance Limits (GWCLs)

Section 14: Conclusions

Section 15: References

Figures and Tables follow Section 15. Box and Whisker plots are included in Appendix A, Probability Plots in Appendix B, and Histograms in Appendix C. Time concentration trends were evaluated using a number of statistical procedures as described in subsequent sections. Graphs illustrating data trends over time for each parameter in each well are presented in Appendix D. Appendix E contains histograms and probability plots for data with 15 to 50 percent non-detected values using detected values only. Appendix F is data that have been modified prior to statistical analysis. Appendices G and H are included electronically as data that have been removed prior to statistical analysis and statistical input and output files, respectively.

It should be noted that the manner of evaluating the available data and the statistical methods to be employed have changed in this version of the report, compared to the first version of the report. In addition, some missing historic data has been located and four new quarters of data (the third and fourth quarters of 2006 and the first and second quarters of 2007) have been added to the database. Therefore, the data used to compile a number of figures and tables in this report have changed, with resulting changes to the Figures and Tables.

1.1 Summary of Issues to be Addressed and Approach Used

The Mill is an existing facility that has been in operation since 1980 (see Section 2.0 of this report for a discussion of the Mill, its historical operations, and environmental setting). It is, therefore, important that care be taken in reviewing historic groundwater monitoring data to ensure that monitoring results to be used to determine background groundwater quality at the site have not been impacted by Mill activities. Further, it is necessary to determine what parameters within the monitoring data set may allow early identification of uranium milling–related groundwater impacts so that responsible and expeditious corrective actions can be undertaken, while screening out spatial and temporal patterns and identifying impacts from sources over which DUSA has no control and no responsibility or ability to abate.

It is well established that groundwater in the perched zone at the Mill site is highly variable. That is why the monitoring program set forth in the GWDP is on an intra-well basis.

There are also natural forces that have resulted in upward and downward trends in a number of constituents in groundwater at the Mill site, as well as upgradient and far downgradient of the Mill site itself. See Table 16 for a listing of all statistically-significant trends for each monitoring well. The existence of such trends both upgradient and far downgradient of the Mill site is evidence that such trends can result from natural causes unrelated to uranium milling at the site. See Section 8.0 for a discussion of the influences that can be at play at the site.

Because water quality varies naturally from well to well and natural influences have caused increasing and decreasing trends at the site, it is not possible to conclude that an upward trend in a constituent necessarily represents an impact from milling activities. Rather, each upward trend must be evaluated to determine whether it has been caused by natural influences or by Mill activities.

In evaluating the historic data, we have used the following approach:

- If historic data for a constituent in a well do not demonstrate a statistically-significant upward trend, then the proposed GWCL for that constituent (see Section 13.0) is accepted as representative of background, regardless of whether or not the proposed GWCL exceeds the state groundwater quality standard (GWQS) for that constituent (see Table 1 for a listing of the GWQS for each groundwater monitoring constituent under the GWDP). This is because the monitoring results for the constituent can be considered to have been consistently representative since commencement of Mill activities or installation of the well; and

- If historic data for a constituent in a monitoring well represent a statistically-significant upward trend, or downward trend in the case of pH (either using least squares regression or the Mann-Kendall test [see Section 6.4], depending on the circumstances), then that data is further evaluated to determine whether the trend is the result of natural causes or Mill activities. If it is concluded that the trend results from natural causes, then the proposed GWCL calculated in the manner described in Section 13.0 will be appropriate.

As will be discussed in detail below, after applying the foregoing approach, we have concluded that there have been no impacts to groundwater from Mill activities. There have been some detected chloroform and related organic contamination at the Mill site, which is the subject of a separate investigation and remedial action, but that contamination is the result of pre-Mill activities (see Section 7.3 for a discussion of organics detected at the site).

1.2 Application of Approach to the Database

The database that was assembled from historic monitoring results is large, representing over 31,000 data entries (See Section 3.0). After performing a quality assurance evaluation and data validation of the existing and historical on-site groundwater quality data in accordance with the requirements of Part I.H.3 of the GWDP (See Section 4.0), a database consisting of historical groundwater monitoring data for “existing” GWDP wells and constituents was developed. This GWDP database has over 11,000 records. See Section 4.0 for a discussion of the quality assurance and quality control (QA/QC) issues that were addressed in assembling the database.

From that database, a proposed GWCL was calculated for each constituent in each well in accordance with the GWDP and EPA Guidance (USEPA, 1989, 1992), as depicted on a flow sheet (the "Flow Sheet") developed between the Executive Secretary and DUSA (see Figure 19). As required by the Flow Sheet, the manner of calculating a proposed GWCL varied, depending on the data set for each constituent in each well. Part I.B of the Permit contemplates that background groundwater quality will be determined on a well-by-well basis, as defined by the mean plus two standard deviations concentration. However, as discussed in more detail in Sections 6.0 and 13.0, calculating the GWCL as the mean plus two standard deviations is only appropriate for normally or log-normally distributed constituents, where the number of non-detects is 50 percent or less. Therefore, in accordance with EPA Guidance (1992), as set out on the Flow Sheet, the data set was divided into the following categories:

- Normally or log-normally distributed, with 0-15 percent non-detects. For those constituents, the mean and standard deviation have been calculated in regular manner and GWCL calculated as the mean plus two standard deviations.

- Normally or log-normally distributed, with >15-50 percent non-detects. For those constituents, the mean and standard deviation have been estimated using Cohen's method and the GWCLs were calculated as the Cohen's mean plus second Cohen's standard deviation.

- All constituents having >50-90 percent non-detects or with 50 percent or fewer non-detects that are non-parametrically distributed. In these cases, the GWCL has been calculated as the greater of a) the highest historical value for the constituent (the non-parametric method suggested in those circumstances by EPA Guidance (1992)), and b) the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2) (which is the basis for the existing GWCLs in the GWDP).

- All constituents having greater than 90 percent non-detects. For those constituents, the GWCL is calculated as the greater of a) the Poisson limit (as suggested in EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2).

Tests for normality were performed (See Section 5.2), and the data was divided into the foregoing categories (see Section 6.1). The results of this analysis and the proposed

GWCLs for each constituent in each well are summarized in Table 16. See Section 13.0 for a detailed analysis of the calculation of the proposed GWCLs.

Linear regression and Mann-Kendall trend analyses were performed on each constituent in each well, as appropriate. For constituents that are normally or log-normally distributed with 15 percent or fewer non-detects, linear regression analysis alone was performed. For constituents that are normally or log-normally distributed with >15-50 percent non-detects, Mann-Kendall analysis as well as linear regression were performed. For all other constituents, Mann-Kendall analysis was performed.

Data plots for all constituents are set out in Appendix D. Linear regression results for those constituents with at least eight valid data points are also set out on those data plots, even for those constituents where Mann-Kendall analysis alone is justified. In those cases, the linear regression analysis is provided as a visual aid in viewing the data and should be considered as "exploratory statistics" only. Rising trends identified by either linear regression (for normally or log-normally distributed constituents having 50 percent or fewer non-detects) or Mann-Kendall (for all non-parametric constituents and all constituents with greater than 15 percent non-detects) were flagged for further investigation. See Sections 4.0, 5.0 and 6.0 for a full discussion of the statistical approaches used in this report.

1.3 Conclusions

Tables 7.1-1 and 7.1-2 set out those constituents that have a proposed GWCL in excess of the state GWQS and/or demonstrate a statistically-significant upward trend (decreasing in the case of pH), using either linear regression, where appropriate, or Mann-Kendall analysis (see Section 6.4 for a detailed discussion of the linear regression and Mann-Kendall methods of trend analysis) and, therefore, require further evaluation (see Section 11). All other constituents have a proposed GWCL that is less than their respective GWQS and do not demonstrate increasing trends (decreasing in the case of pH). For those constituents, the proposed GWCLs set out in Table 16 should be considered to be appropriate.

Even though there are a number of increasing trends in various constituents at the site, we have concluded that none of the trends identified in Tables 7.1-1 or 7.1-2 are caused by Mill activities, for the following reasons:

- Chloride is unquestionably the best indicator parameter, and there are no significant trends in chloride in any of the wells.

- There are no noteworthy correlations between chloride and uranium in wells with increasing trends in uranium, other than in upgradient wells MW-19 and MW-18, which we have concluded are not related to any potential tailings seepage. It is inconceivable to have an increasing trend in any other parameter caused by seepage from the Mill tailings without a corresponding increase in chloride.

- There are significant increasing trends upgradient in MW-1, MW-18 or MW-19 in uranium, sulfate, total dissolved solids (TDS), iron, selenium, thallium, ammonia and fluoride and far downgradient in MW-3 in uranium and selenium, sulfate, TDS and pH (decreasing trend). This provides very strong evidence that natural forces at the site are causing increasing trends in these constituents (decreasing in pH) in other wells and supports the conclusion that natural forces are also causing increasing trends in other constituents as well.

- On a review of the spatial distribution of constituents identified on Table 7.1-1 (see Section 11.2), it is quite apparent that the constituents of concern are dispersed across the site and not located in any systematic manner that would suggest a tailings plume.

After extensive analysis of the data, we have therefore concluded that there have been no impacts to groundwater from Mill activities and that the proposed GWCLs set out in Table 16 are appropriate. However, proposed GWCLs for trending constituents should be re-evaluated upon GWDP renewal to determine if they are still appropriate at the time of renewal.

2.0 SUMMARY OF HISTORICAL OPERATIONS AND ENVIRONMENTAL SETTING

The Mill is a permitted uranium mill with a vanadium co-product recovery circuit located within the Colorado Plateau physiographic province approximately 5 miles south of the city of Blanding, Utah (Figure 1). Mill construction began in 1979, and conventionally-mined uranium ore was first processed in May 1980. Over its 25-year operating history, the Mill has processed over 4 million tons of conventionally-mined and alternate feed uranium ores for the recovery of 25 million pounds of U_3O_8 and 34 million pounds of vanadium to date.

Uranium ore is received at the Mill and stockpiled for processing. The ore is initially fed to an 18-foot diameter semi-autogenous grinding mill and then stored in slurry form in one of three pulp storage tanks. The Mill utilizes a two-stage leach process where overflow solution from the No. 1 counter current decantation (CCD) thickener is combined in an "acid kill" step with feed from the pulp storage tanks. The slurry from this first stage leach is separated in the pre-leach thickener with the solids going to the second stage leach and the clarified solution going to the solvent extraction circuits. Concentrated sulfuric acid, steam, and sodium chlorate oxidizer are added in the second stage leach. This slurry is subsequently fed to the eight-stage CCD circuit where the underflow is discharged to tailings. The overflow from the CCD circuit is fed to the uranium solvent extraction circuit where the uranium is purified and removed from the solution. For uranium ores which also contain vanadium, the waste solution, or raffinate, from the uranium solvent extraction is fed to the vanadium solvent extraction circuit where the vanadium is removed from the solution. The solution remaining after the vanadium is removed is discharged to the tailings. If no vanadium is present in the ores, the solution remaining after the uranium is removed is discharged to the tailings.

The uranium and vanadium which are purified in the respective solvent extraction circuits are precipitated, dried and packaged.

2.1 Current Conditions and Operating Status

The Mill was in standby status from November 1999 to April 2002. During the standby period, the Mill received and stockpiled alternate feed materials from the Ashland 1 and

Linde formerly utilized sites remedial action program sites, as well as other sources of alternate feed materials.

During the period from April 2002 to May 2003, the Mill processed 266,690 tons of alternate feed materials. Subsequently the Mill entered standby mode but continued to stockpile alternate feed materials.

The Mill is currently operating, having commenced operations in March 2005, with the processing of alternate feed materials. DUSA expects to commence processing conventionally-mined ores in 2008.

2.2 Tailings Cells

Three flexible membrane-lined cells, Cells 1, 2, and 3, are used to contain tailings. Tailings Cell 2 was completed in May of 1980, Tailings Cell 1 was completed in June of 1981, and Tailings Cell 3 was completed in September of 1982 (Roberts, personal communication, 2007). As a result, all tailings, both liquids and solids, generated prior to June 1981 were deposited into Tailings Cell 2. In September 1981, after completion of Tailings Cell 1, tailings solutions were placed in both tailings cells 1 and 2, but all solids were placed into Tailings Cell 2. Tailings Cell 3 was not put into use until after September 1982.

A fourth cell constructed in 1989, Cell 4A, does not currently contain any tailings solids, although it did contain some crystallized residue from tailings solutions that were placed in the cell in 1990. The cell had not been used since 1990 and, as a result, damage occurred to the seams in the liner due to thermal stress from years of exposure to direct sunlight. DUSA removed the crystals from Cell 4A in 2006, deposited them in Cell 3, and is in the process of relining Cell 4A.

The Mill conducts on-going tailings reclamation by the following processes. As each cell is filled with tailings, tailings solutions are separated from tailings solids and pumped to the evaporation pond (Cell 1). Tailings solids are allowed to dry in place. As each cell reaches final capacity, reclamation will begin with the placement of interim cover over the tailings. Tailings Cell 2 is full and almost completely covered with interim cover and does not take any more tailings at this time. As additional cells are excavated, the overburden is used to reclaim previous cells. This sequential reclamation process is intended to reduce total reclamation time and reduce potential for impact to human health and the environment.

Tailings placed in Cells 2 and 3 typically drain and consolidate to a total moisture content of 20-30 weight percent (DOE, 2004). Tailings solutions are continually decanted off the surface as the tailings are placed and, upon cell closure, internal drainage is removed via an under drain (slimes drain) system consisting of a perforated pipe installed above the liner (D'Appolonia, 9/29/1981). All solutions are pumped to Cell 1 or another active tailings cell for evaporation as tailings solids drain down to field capacity, thereby limiting the amount of available free water and reducing potential for impact to groundwater.

Tailings cells were designed to U.S. Nuclear Regulatory Commission (NRC) specifications after more than twenty five years of North American experience in uranium milling. The Mill was among the last uranium mills built before the decline in uranium prices in the 1980s essentially ended uranium mining in the United States. As a result, the Mill was state-of-the-art in 1980 and was built to a higher standard than all other uranium mills that were operating at the time in the United States.

This high standard is evident in the design of the tailings cells. During construction, each of the cells was excavated on a slope toward the dike. Tailings Cells 1, 2 and 3 were lined with a compacted soil layer overlain by a permeable sand layer, overlain, in turn, by a 30 mil PVC liner. The permeable sand layer is more than two times more permeable than the dike material and the underlying compacted soil layer, thereby acting as a sub-drain (D'Appolonia, 5/1/1981).

The sub-drain includes a perforated pipe connected to a riser pipe constructed against the dike to collect any potential leakage. The tailings are generally deposited into the upslope side of the cells in order to concentrate the tailings water at the low end of the cell, nearest to the sub-drain leak detection pipe for early detection of any potential leaks. The riser pipe is monitored daily for potential leakage. In the event of detection of tailings seepage in the sub-drain, a pump can be attached to the riser pipe and the seepage can be pumped back into the tailings cells. Both the sub-drain and the PVC liner installation were inspected by D'Appolonia, the now defunct Energy Fuels Nuclear, Inc. (EFN), which was the initial Mill operator and owner, and B.F. Goodrich representatives (D'Appolonia, 1982). When constructed in 1989, Tailings Cell 4A had a 40 ml high density polyethylene (HDPE) liner, underlain by a one foot thick clay secondary liner.

There is a leak detection system between these two liners and a slimes drain system on top of the HDPE liner.

2.3 Geologic Setting and Stratigraphy

The Mill is located near the western edge of the Blanding Basin within the Canyonlands section of the Colorado Plateau physiographic province. Broad, generally horizontal uplift and subsequent erosion have produced topography consisting of high plateaus, mesas, buttes, monuments, and deep canyons incised into the relatively flat-lying Mesozoic and Paleozoic sedimentary rocks.

Northeast of the Mill site, igneous intrusions forming the core of the Abajo Mountains have disturbed the classic flat-lying Colorado Plateau stratigraphy, resulting in uncharacteristic local folding and faulting of sedimentary rocks. The Abajo's rise to more than 11,000 feet above mean sea level (msl), and have likely provided a source of sediments to the Mill site (5,600 feet above msl) during intrusion and disturbance of older rocks.

Quaternary deposits overlie the sequence of Mesozoic rocks present in the region. The Cretaceous Mancos Shale and Dakota Sandstone represent the local top of the Mesozoic section in the region and are underlain by the Lower Cretaceous Burro Canyon Formation. This unit is underlain in turn by the Jurassic Morrison Formation (includes the Brushy Basin, Westwater Canyon, Recapture, and Salt Wash Members), Summerville Formation, Entrada Sandstone, and the Navajo Sandstone. The Navajo is underlain by the Jurassic Kayenta Formation, which in turn is underlain by Triassic Chinle and Moenkopi Formations. Paleozoic sedimentary rocks underlie these Mesozoic units.

Cretaceous geologic units that stratigraphically overlie the Burro Canyon Formation regionally (Mancos Shale and Dakota Sandstone) have been removed by erosion in the vicinity of the Mill. Thus, the lower Cretaceous Burro Canyon Formation (already present during the Mid-Tertiary Albajo igneous intrusive event) is directly overlain by Quaternary deposits at the Mill site. The Quaternary colluvial/alluvial sediments are typically coarse-grained deposits that contain little water. The Burro Canyon Formation is described as interbedded conglomerate and grayish-green shale with light-brown sandstone lenses deposited in a fluvial environment (Aubrey, 1989). The average thickness of the unit is approximately 75 feet (U.S. Department of Energy [DOE], 2004).

2.4 Hydrogeologic Setting

The Burro Canyon Formation hosts the uppermost occurrence of groundwater at the site. All compliance monitoring wells at the site are completed in the Burro Canyon Formation. Groundwater in this unit is perched (i.e., isolated from groundwater that occurs in geologic units that underlie the Burro Canyon Formation). Perched water is supported by the relatively impermeable, underlying, fine-grained Brushy Basin Member of the Morrison Formation. The permeability of the Burro Canyon Formation is generally low. Some conglomeratic zones may exist east to northeast of the tailings cells, potentially explaining a relatively continuous zone of higher permeability. The saturated thickness of the perched groundwater zone ranges from approximately 82 feet in the northeast portion of the site to less than 5 feet in the southwest portion of the site (DOE, 2004). Groundwater isopleths based on water level data collected in June 2007, (Figure 3) indicate that flow in the perched zone is generally from northeast to southwest, although in the eastern portion of the site the gradient has a more southerly component.

Groundwater in the regional Entrada/Navajo aquifer is under artesian pressure (upward flow gradient) providing a hydrologic barrier to any potential seepage from overlying geologic units. Perched groundwater within the Burro Canyon Formation is characterized by low yields and is generally of poor quality, containing moderate to high concentrations of chloride, sulfate, and TDS (Hunt, 1996).

3.0 AVAILABLE SOURCES OF DATA AND METHODS USED TO COMPILE DATA

Although the Mill is designed as a facility that does not discharge to groundwater, DUSA is subject to the GWDP issued by the Utah Department of Environmental Quality (UDEQ), which specifically tailors the implementation of state groundwater regulations to the Mill site. Utah requires that every operating uranium mill in the state have a groundwater discharge permit, regardless of whether or not the facility discharges to groundwater.

3.1 Requirements for Background Groundwater Quality Report

Part I, Section H.3 of the GWDP specifies the following requirements for the background groundwater quality report for the existing wells:

- Compilation of all available groundwater quality data for all existing wells at the facility.
- Evaluation and validation of existing and historic on-site groundwater quality data. The evaluation and validation includes:
  - Identification of records containing zero concentration values and either deleting those values from the data set or providing justification for including them.
  - Evaluation of the adequacy of minimum detection limits used, particularly with respect to the corresponding GWQS for each contaminant.
  - Determination of the adequacy of laboratory and analytical methods used.
  - Determination of the consistency of laboratory units of reporting.
  - Evaluation of internal consistency between specific and composite types of groundwater quality data (e.g., charge balance of major ions and/or equivalence of measured and calculated TDS, if all major ions are reported), and identifying data that are inconsistent.

- Description of methods used in statistical analysis including any special statistical needs for management of data sets with a large proportion of non-detectable values.
- Provide descriptive summary statistics for each well and contaminant listed in Table 2 of the GWDP.
- Conduct distributional testing for each specified well and contaminant, and justify the use of parametric or nonparametric statistical methods for each.
- Evaluate temporal and spatial groundwater quality to determine if there are trends or significant changes over time or with distance across the site.

3.2 Data Compilation

Analytical data for groundwater were compiled from hard-copy reports, electronic reports, and spreadsheet files. Available sources included the Mill's semi-annual effluent reports to regulatory agencies (compiled from 1981 through June 2007), split sampling reports documenting joint DUSA-UDEQ sampling events (compiled from May 1999, November and December 2000, November 2001, and September 2002), and background groundwater and Discharge Minimization Technology (DMT) monitoring reports under the GWDP from the first quarter of 2005 through the second quarter of 2007. Other documents from which data were obtained are the Mill groundwater background (D'Appolonia, 1981), point of compliance (POC), and hydrologic evaluation (Titan, 1994) reports; the groundwater POC report (Dames and Moore, 1978), 2000 DUSA groundwater background studies, and 1999 to 2002 UDEQ results from four split sampling periods.

All available groundwater concentration data from 1979 through the second quarter of 2007 were compiled into one database. Integrating different sources into a single database was a logistical challenge because analyses were performed by different laboratories over the years using various methods and reporting protocols.

Table 1 lists the existing wells and monitoring parameters evaluated in this report. This table also provides the associated GWQS and GWCL specified for each well and parameter in Table 2 of the GWDP. The table also lists the range of sampling dates and the number of times each well has been sampled.

Table 2 of this report lists organic constituents reported as detected concentrations. See Section 7.3 for a discussion of organic constituents.

Compiled groundwater quality data include chemical concentrations, field measurements (such as pH), and other variables listed below. There are approximately 31,000 records containing up to 40 fields that were populated where information was available. All information has been compiled in a standard database format ("flat files") as a table in Excel. Each record includes the following elements (if data were available):

- Monitoring well identification
- Sampling date
- Date the data was reviewed in the database
- Constituent name and parameter code
- Analytical result
- Result qualifier (U=non-detected, J=detected, but not quantifiable, D=reporting limit increased due to sample matrix interference, B=detected in blank)
- Detection limit (or detectable activity), reporting limit, or practical quantitation limit
- Units of measurement
- Sampling method (BAIL, PERIPUMP, MICROPG)
- Laboratory name or identification of field measurement
- Analytical method
- Date of analysis
- Any additional comments

Upon completion of the database, values were checked against the laboratory reports for accuracy and consistency. Of the 31,000 total records, over 11,000 of them were actual sample results for the wells and constituents listed in the GWDP. Of these 11,000 permit records, approximately 94 percent of the data were reviewed during this accuracy check and errors in analytical results, qualifiers, detection limits, and units were corrected. The remaining 6 percent of the data could not be verified because of missing laboratory reports. A further discussion of data quality issues follows in Section 4.0.

4.0 QUALITY ASSURANCE EVALUATION AND DATA VALIDATION

Information on quality of data is critical to decisions that have to be made to protect human health and the environment. As an example, analyses of samples collected in 1981 and 1982 report concentrations of total suspended solids as high as 981 mg/L. This may indicate improper filtration in the field and could result in artificially elevated metals concentrations. In addition, it is unclear whether other data within the data set were filtered or unfiltered and, in the absence of Mill site knowledge from as much as 25 years ago, it may be difficult to determine. As a result, the presence of aluminum, iron, or manganese at concentrations greater than 50 micrograms per liter (µg/L) (0.05 mg/L) should be viewed with caution and may indicate the potential for over-estimating concentrations of trace metals, which are known to adsorb on colloids and suspended particulates of the oxi-hydroxides formed from these metals.

Information on more recent sampling protocols and practices is described in Section 2.6 of the facility Groundwater and DMT Performance Standard Monitoring report submitted to UDEQ on August 31, 2005. Documentation of recent protocols and practices indicates a strong commitment to improved sampling and analysis techniques on the part of DUSA and its field personnel.

Documentation of the QA/QC procedures for older samples is sparse. Further, while descriptions of data validation procedures can be found in various reports, it was unclear which data had undergone full validation because electronic data deliverables were not available and few validation flags or qualifiers were included in the reports from which the data were collected. Therefore, this assessment also includes a review of the compiled data for inconsistencies and calculations to check for internal consistency of the data.

To evaluate the consistency and accuracy of the existing database, all data were reviewed against available laboratory reports from 1978 to 2007. The original database was updated with a column showing the date the data were reviewed. Approximately 94 percent of the data in the database (for permit constituents and existing wells) were checked against the corresponding laboratory reports. The remaining 6 percent of the data could not be verified; however, these data were left in the database and were included in the statistical analyses.

Inconsistencies and data quality issues became apparent during the review of laboratory reports. For example, in many cases, the detection limit was not included in the lab report. In instances where there is a less-than value for the non-detect, that value is assumed to be the detection limit (i.e. <1.0, 1.0 is assumed to be the detection limit).

Much metals data were not distinguished as being total or dissolved. We assumed all metals data were dissolved unless otherwise noted as total. This assumption was based on groundwater sampling protocol at the Mill and discussions with DUSA personnel who were familiar with the sampling program.

Some data quality issues were specific to uranium. For example, there were several instances where the detection limit for uranium was in mass (mg/L) and the value was reported in activity (picocuries per liter). This suggests that the lab determined the value of uranium in mass then converted the mass value to activity assuming secular equilibrium. However, there was nothing found in the records to document this, other than personal communications indicating that the Mill in-house lab (variably known as Wamco, EFN, UMETCO, and CORE) did not have the capability to count uranium activity, and therefore the activity results from that lab were converted from mass.

Other early uranium data reported "uranium as U" values as mg/L, and "uranium as U_3O_8" values as µg/L. All units were converted to µg/L for statistical analysis and comparison. When these values reported in mg/L were converted to µg/L, the values were three orders of magnitude greater than the surrounding and subsequent values in the data set. This is most likely a laboratory reporting error. There were several lab reports that reported uranium as U with a hand-written "$_3O_8$"after the U. Where this issue could not be resolved by additional supporting information to indicate which atomic mass was represented, the U_3O_8 data was removed from the statistical evaluation.

In addition to these data quality issues, there are several records in the database for which there are no corresponding laboratory reports on file. While these data were entered into the database at some point, they cannot be verified (we cannot be sure how the values were obtained). However, these data were still included in the statistical analysis.

Other data quality issues include errors in the laboratory reports either with units, missing information (qualifiers, sample dates, etc), or values that may have been reported by the laboratory incorrectly. These errors were either corrected or excluded from the database according to the procedures listed in Section 4.1.

These data quality issues are not unique to the Mill but are typical of environmental data collected over long periods. Methods of analysis have improved during the period of record and compliance standards have followed improved detection limits to lower values. At the same time, most members of the public, including mine and mill operators, have incorporated an increased awareness of environmental issues as we deal with a legacy of previous practices that were acceptable in a less populous environment. Although early data collection and reporting procedures do not meet today's standards, they were the product of the best understanding of the time and were widely used by investigators to characterize many types of environmental concerns.

4.1 Preparation of the Data Set for Statistical Analysis

In order to perform meaningful statistical analysis, these data quality issues, and all those listed in Part I, Section H.3 of the GWDP, had to be addressed. With the intent of providing a traceable analysis methodology, an untouched version of the complete database was maintained for reference, while separate worksheets for statistical analysis were prepared.

The first version of this report was submitted to the Executive Secretary on December 29, 2006. After review of that version of the report, the Executive Secretary requested that certain revisions be made and that this revised report be re-submitted to the Executive Secretary.

The revisions included changes to the manner of evaluating the available data and the statistical methods to be employed. The Executive Secretary and DUSA agreed on the manner in which the data would be evaluated, characterized, and interpreted and the manner in which GWCLs would be calculated from the data. The agreed approach is consistent with EPA Guidance (1989, 1992) and is reflected in the flow sheet entitled *Groundwater Data Preparation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah* (the "Flow Sheet"), a copy of which is included as Figure 19. The relevant statistics and other information necessary to implement the Flow Sheet and develop GWCLs for the site, on a well-by-well basis are set out in Table 16.

This revised report reflects the approach to data evaluation set out in the UDEQ approved Flow Sheet and also incorporates other requests for revision by the Executive Secretary. Also, we have added four quarters of new data that has become available since the date of the first version of this report (the third and fourth quarters of 2006 and the first and second quarters of 2007), as well as some recently found data for MW-26 and MW-32 from 2002. As a result, the database has changed somewhat in this version of the report, compared to the first version of the report, and a number of figures and tables in this report, and some of the resulting analyses, have been updated and changed accordingly.

The first portion of the Flow Sheet requires the performance of a number of data validation steps, which are discussed in Sections 4.1.1 to 4.1.9 below.

4.1.1 Screen for Negative Values

The initial step was to screen the data set for negative values. If a negative value was related to a radiological constituent, the value was retained since a negative result is possible with radiological analysis. In some cases it was apparent that a minus sign was used to indicate a result was "less than" a minimum detection limit when the result was associated with a "U" qualifier (non-detect) and the result was the same magnitude as the detection limit. In this case, the minus sign was removed and the result and qualifier were retained. If no qualifier or detection limit was indicated, the data point was removed from analysis and placed in a table containing all removed data points (Appendix G, data compact disc).

4.1.2 Screen for Zero Values

In the next step, the data set was screened for zero values. Again, if a zero value was associated with a radiological constituent the value was retained. If the zero was associated with a non-radiological constituent with a detection limit and a "U" qualifier, the original laboratory report was reviewed to confirm the zero value or to enter the method detection limit (MDL) as the value with a U qualifier. When an MDL for a zero value could not be verified in a laboratory report, the value was removed from the database prior to statistical analysis. These and all removed values are contained in Appendix G.

4.1.3 Screen for Truncated Values

Integer values were examined for the potential of representing truncated data. This circumstance with questionable significant figures can reveal a problem with reporting units. For example, a U-natural concentration of 5 mg/L was reported and inspection of surrounding values indicated a more likely value of 0.005 mg/L (5 μg/L). When it was possible to identify a truncated value, the non-truncated version of the value was used (0.005 mg/L instead of 5 mg/L). Appendix F contains a record or all data that were modified prior to statistical analysis.

4.1.4 Screen for Inconsistent Units

Over the entire sampling record, some data sets contained different reporting units for the same constituent. In some cases, some results appeared to be in one unit while the detection, reporting, or practical quantitation limits were reported in another unit. In order to make adequate comparisons to the monitoring requirements of the GWDP, this discrepancy was examined and, if the correct value could be confirmed by inspection of similar values from the same laboratory, units were converted to match the units for each constituent within the GWQS and GWCL listed in Table 2 of the GWDP. Otherwise, the data were excluded from statistical analysis. If such values could be verified, the change was made to the database.

4.1.5 Checks for Internal Consistency of the Data

The GWDP specified an evaluation of the internal consistency of the data. The following comparisons provided quantifiable methods for evaluating internal consistency.

- TDS calculated from total constituent mass versus measured TDS. Samples that had results for calcium, chloride, magnesium, potassium, sodium, sulfate, total alkalinity, and measured TDS were evaluated for comparability. The goal for dilute waters ranges from 85 to 115 percent. Table 7 shows the data used to make the comparisons, which had an average ratio of 0.981 (98.1 percent) and a standard deviation of 0.104 (10.4 percent). If perfect, the ratio would be 1.0, so a ratio of 0.981 reflects good internal consistency. The ratios ranged from 0.435 (43.5 percent) to 1.377 (137.7 percent). If the sum of calcium, chloride, magnesium, potassium, sodium, sulfate, total alkalinity did not fall within the range of 85 to 115 percent of measured TDS, and the chloride, sulfate or TDS associated with the calculated TDS are anomalous compared to other values for the same constituent in that well then the anomalous chloride, sulfate, and/or TDS values were removed from analysis and placed in a table containing all removed data points (Appendix F, data compact disc).

- Charge balance of major cations (Ca, Mg, K, Na) and anions (HCO^{3-}, Cl, SO_4). This can be done only for samples in which the major cations (calcium, magnesium, potassium, and sodium) and anions (bicarbonate or total alkalinity, chloride, and sulfate) have been analyzed. In this regard, the older data are incomplete for some of the major ions. The goal for diluted waters ranges from -5.0 to +5.0 percent. Table 8 shows the data used to make the comparisons, which had an average difference of -0.46 percent. 74 percent of the values fell within the -5.0 to +5.0 percent range, and 93 percent of the values fell within the -10.0 to +10.0 percent range, indicating fair internal consistency in the analysis. If the charge balance did not fall within the range of -5.0 to +5.0, and the chloride, sulfate or TDS associated with the charge balance are anomalous compared to other values for the same constituent in that well then the anomalous chloride, sulfate, and/or TDS values were removed from analysis and placed in a table containing all removed data points (Appendix F, data compact disc).

4.1.6 Screen for Duplicate Records

If identical sampling dates, laboratories, and analytical methods for the same constituent and the same well were noted containing similar but different results, the entries were considered duplicate samples. For the purpose of this report, the primary sample was retained and the duplicate sample was removed prior to statistical analysis. When duplicate records having the same sampling date and identical results were identified, one of the records was deleted, assuming that one of the values was a duplicate entry.

When available, the relative percent difference between field duplicates was calculated to provide an estimate of sampling and analytical precision. Results, summarized in Table 9, indicate that most analyses are within acceptable limits and that the data set is usable for determining background groundwater quality.

4.1.7 Comparison of Reporting Limits to Groundwater Quality Standards

Available data on reporting limits from DUSA reports (1978 to 2007) were compared with the GWQS to evaluate whether reporting limits were adequate to ensure compliance with standards (Table 3).

Insensitive non-detects were removed per the following UDEQ guidance:

> *"Typically, a non-detect considered "insensitive" will be the maximum reporting limit in a dataset and will exceed other non-detects by, for example, an order of magnitude (e.g., <10 versus <1.0 µg/L). In some cases, insensitive non-detects may also exceed detectable values in a dataset (e.g., <10 versus 3.5 µg/L). Please document the insensitive non-detects that are not included in statistical calculations, including the rationale for categorizing them as insensitive."*

Insensitive non-detects that were removed prior to statistical analysis are listed in Appendix F, which also contains a column stating the reasons for removal.

Most cases of reporting limit values in Table 3 that exceed standards do not correspond to non-detection of the constituent during analysis, but occurred when dilution of the sample was necessary to accommodate higher than expected concentrations of a constituent. Another circumstance leading to high reporting limits, known as matrix interference, is when higher than expected concentrations of another constituent in the sample interferes with the measurement of a constituent concentration.

Table 4a presents individual records for non-detect results whose reporting limits exceeded GWQS for each constituent. If a result exceeded the GWQS it necessarily also exceeded the GWCL; however, some non-detect reporting limits only exceeded the GWCL. Table 4b lists the non-detect records exceeding GWCLs. The GWQS are included for comparison. Table 5 presents the information in Tables 4a and 4b by listing the total times a reporting limit exceeded the GWQSs and/or GWCLs by well, constituent, and year. This shows that beryllium, cadmium, lead, molybdenum, thallium, and vanadium account for the majority of times a reporting limit exceeded the GWQS. Beryllium, cadmium (with a few exceptions, all below GWQS/GWCL), lead, molybdenum, thallium, and vanadium were largely undetected in all other samples when the reporting limit was less than the GWQS and GWCL, indicating that, in spite of instances when detection levels exceeded standards, these constituents are typically below standards in site groundwater. Non-detected values with an MDL exceeding the GWQS were excluded from the database prior to statistical analysis for having a detection limit that is insensitive to the GWQS.

The non-detect reporting limit for mercury never exceeded the GWQS. However, mercury values reported as non-detected exceeded the GWCL 15 times. In all of the instances between 1999 and 2002, the reporting limit only exceeded the 0.5 μg/L GWCL for monitoring wells with Class II water. This has subsequently been rectified, and from 2002-2006 no reporting limit exceeded the GWQS.

Table 5 also reveals that most instances of reporting limits that exceed the GWQS occurred in the early analyses from 1981 to 1985, in 1989, in 1994, between 1999 and 2002, and between 2005 and 2007. It is interesting to note that during the period 1995 to 1998, no reporting limits were in excess of the GWQS, but some did exceed the GWCL. However, this period is prior to the issuance of the GWDP and the establishment of GWCLs.

4.1.8 Need for at Least Eight Data Points

EPA Guidance (1992) suggests that a minimum of eight data points be used in calculating descriptive statistics or performing trend analyses or distributional testing. For those constituent data sets that have fewer than eight data points, after performing the foregoing data screening analysis, descriptive statistics or trend analyses were not performed for purposes of compiling Table 16 and calculating GWCLs in accordance with the Flow Sheet. For those constituents, the GWCLs were set using the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2), until such time as at least eight data points are available. However, exploratory statistics for these constituents have been included in Tables 10a and 10b (see Section 5.0).

4.2 Analytical Methods

Over the years, a number of analytical laboratories have analyzed samples from the Mill. In many cases, laboratory reports for early data were not located and analytical methods were not specified in the available electronic data. Energy Laboratories has conducted the analysis of groundwater samples from the Mill for the past 13 years, employing industry standard methods, generally EPA methods, for analyses. Table 6 summarizes the current analytical methods used by Energy Laboratories for the various analytical constituent groups. Methods listed in Table 6 are considered appropriate for the groundwater constituents from the Mill based on wide consensus among regulatory agencies. EPA, the American Society for Testing and Materials, the U.S. Nuclear Regulatory Commission, and most states recommend methodologies similar to those listed in Table 6.

5.0 CALCULATION OF EXPLORATORY STATISTICS

Statistics in and of themselves are just a tool to focus attention on the relative likelihood or probability of various events. As such, statistical analysis of a data set can alert an investigator to an unlikely event within the data set but has no power to mark an event as unequivocally true or false. Further, the probability that statistical analysis provides for an event is a function of how the data set is defined. For example, data may be available for a constituent in samples of groundwater from one monitoring well taken 12 times a year for sixteen years for a total of 192 data records. It is possible to perform statistical analysis on some or all of these data and get the following entirely consistent results, among others:

- The total data set exhibits no trends
- One six month sub-set exhibits a highly significant rising trend (seasonal variation)
- One six month sub-set exhibits a highly significant declining trend (seasonal variation)
- One three year sub-set exhibits a highly significant rising trend (Climate? Contamination?)
- One three year sub-set exhibits a highly significant declining trend (Climate? Contamination?)

There are many possible permutations that can be imagined. Another possibility is a positive or negative trend that could result from one period of data that is very different from other data. Is the resulting trend real or is it the result of error in the data? Statistical analysis cannot tell you the answer, only the relative probability of that particular set of events. Statistical analysis does flag events that have a low probability of occurring. Examination of those events may allow identification of data records for possible error. However, it is important to realize that definition of the data set for analysis is in many ways up to the judgment of the investigators. Therefore all data sets that form the basis of this study were subject to exploratory statistical procedures used to identify trends and calculate GWCLs with an aim to learn as much as possible about each data set and allow readers to form their own opinion regarding possible alternate assessments of the data.

Exploratory descriptive summary statistics were calculated for compliance wells and parameters listed in the GWDP (Tables 10, 11, and 12). Table 10 is divided into two parts: Table 10a gives summary statistics for those data sets with parameters that were detected in more than 50 percent of the samples that were analyzed; Table 10b provides summary statistics for data sets where parameters were detected in 50 percent or fewer of the samples analyzed. Table 11 presents the results of the Shapiro-Wilk test for normality. Table 12 provides the geometric mean and geometric standard deviation for constituents that were found to conform to a log-normal distribution. This division is based on analysis in EPA *Guidance for Data Quality Assessment* (EPA, 1996), which states:

> *"If the degree of censoring (the percentage of data below the detection limit) is relatively low, reasonably good estimates of means, variances and upper percentiles can be obtained. However, if the rate of censoring is very high (greater than 50%) then little can be done statistically except to focus on some upper quantile of the contaminant distribution, or on some proportion of measurements above a certain critical level that is at or above the censoring limit."*

Further, the high proportion of non-detections for certain constituents may reflect the relative importance of that constituent in overall risk to human health and the environment. As described in following sections, a number of groundwater constituents tend to be readily removed from groundwater and immobilized on the aquifer matrix. These constituents tend to be relatively immobile whether they come from ambient, natural sources or if they originate in uranium mill process solutions. For this reason, they make poor indicators of impact from milling related processes. Given the size and complexity of the Mill database, the separation of the data into two parts (Tables 10a and 10b) is intended to allow clearer focus on constituents that could provide more timely indication of potential impact to groundwater from milling processes.

Summary statistics were calculated for constituents detected in less than 50 percent of the samples; however, these values should be regarded with caution because of the large proportion of non-detections that were replaced with proxy values of one-half the reporting limit per EPA guidance. A simple substitution using one-half the reporting limit was employed for this initial summary of the data; more advanced methods of handling non-detections were employed for this report, and are described in Section 6.0.

It should be noted that, while the exploratory statistics set out in Tables 10a and 10b form the basis for a number of the necessary statistical evaluations and provide useful information, not all of the statistics set out in those tables are consistent with, or used in, calculating GWCLs in accordance with the Flow Sheet. See Section 6.0 for a discussion of the calculation of GWCLs.

In addition to summary statistics, box-and-whisker plots were constructed for compliance wells and parameters listed in the GWDP to determine whether outliers or extremes were present in the data set.

If at least eight records were available for any given well and constituent pair, then statistical analysis also included the following:

- Distributional testing to confirm that data fit a normal distribution using histograms, normal probability plots, and the Shapiro-Wilk test; if data were not normally distributed, the data set was log transformed and tested again.
- Time-concentration trends were evaluated using both linear regression and the Mann-Kendall test for non-parametrically distributed data.

Regression analysis and Mann-Kendall results should be viewed with caution for data sets where parameters of interest were detected in 50 percent or less of samples analyzed. Apparent trends within this subset of the data may not be real. See the discussion in Section 6.4.

5.1 Statistical Plots, Outliers, and Extremes

Box-and-whisker plots (Appendix A) were constructed using STATISTICA data analysis software (version 7.1, Statsoft Inc., 2005). These plots are used to describe and compare data distributions and highlight disparate results known as extreme values. An extreme is an observation that does not conform to the pattern established for other observations. Such values may be mistakes, such as transcription or reporting errors, or may be the result of instrument or laboratory errors. Extremes may also represent inherent variability in the measured parameter. Extreme values were checked against the laboratory reports to determine if there was indeed an error in transcription or reporting. If an error was found, the value was corrected in the database. If no error could be identified, the extreme value was removed from the database prior to statistical analysis. Figure 4 graphically presents the methodology employed for identifying extremes.

The height of the box (H) represents the 25^{th} and 75^{th} percentile range of the data set with the median value plotted within. The whiskers represent the limits of the data between 5 and 95 percent of all values. The default outlier coefficient of 1.5 was selected. This identified an outlier as being above or below more than 1.5 times the width of the box.

Extreme values were identified as being more than 3 times above or below the width of the box. This is roughly equivalent to values that are four (4) standard deviations above or below the mean for normally distributed data, or above or below 99.994 percent of all other data. Once identified, extreme values were flagged in the original data set. A new data set was created omitting the extremes. Table 14 lists the data records with extreme values that were excluded from trend analyses. Because the exercise of identifying extremes is somewhat circular, with a new set of extremes appearing every time the old ones are eliminated from the data set, a decision rule was applied to limit potential abuse. The first pass of identifying and eliminating extremes was used as a limiting control on this technique. Any subsequent extremes that were identified were retained for analysis unless eliminated for another reason.

Extremes were excluded from the calculation of GWCLs.

5.2 Distributional Testing

Most statistical tests assume that data represent a normal distribution. However, EPA guidance suggests that a log-normal distribution is a more appropriate default statistical model for most groundwater data (EPA, 1992) and even this assumption commonly fails, requiring the use of non-parametric methods. Parametric statistical methods are preferred due to higher statistical power, but non-parametric methods have to be used when normality or log-normality cannot be verified. It is important to identify the distribution of the data because data that do not fit assumptions made in designing statistical operations can lead to false conclusions.

Histograms were generated for each constituent in each well with greater than 50 percent detected values. One half of the MDL was substituted for non-detected values in the zero to 50 percent non-detects category for exploratory purposes (Appendix C).

Histograms for 15 to 50 percent non detect category were also produced using detected values only (Appendix E). The Shapiro-Wilk test (Shapiro and Wilk, 1965) was performed for population distribution. The histograms were generated using untransformed data and log transformed data (Appendix C). The Shapiro-Wilk test is "one of the most powerful tests available for detecting departures from a hypothesized normal or log-normal density function" (Gilbert, 1987). For the Shapiro-Wilk test to have sufficient power to reject hypothesis of normality (or log normality), the sample number, or "n" should be at least 20 (EPA, 2002).

Probability plots (Appendix B) show the concentration of a constituent in each sample in a manner that also shows how well the data set for the constituent fits a normal or log-normal distribution. The concentrations of some naturally-occurring constituents follow a log-normal distribution, so the original data was also log transformed and then plotted to assess the fit to a log-normal distribution qualitatively (distributional tests such as the Shapiro-Wilk test provide a quantitative measure of how well the data fit a particular distribution).

Normal probability plots are also useful for visually identifying outliers and evaluating the possible presence of multiple populations within a data set. A probability plot consists of a graph of values ordered from lowest to highest and plotted against a standard normal distribution function. The horizontal axis is scaled in units of concentration (for example, mg/L), and the vertical axis is scaled in units of the normal distribution function (normal quantile). The horizontal scale can be plotted either as a linear scale (concentration versus normal quantile) or as a logarithmic scale (the logarithm of concentration versus normal quantile). Populations of data that plot as a straight line in a linear scale are referred to as normally distributed, and populations that plot as a straight line in a logarithmic scale are referred to as log-normally distributed.

5.3 Trends in Concentrations

Temporal trends in data were evaluated graphically using time-concentration plots including linear regression (Table 16 and Appendix D) and using the Mann Kendall test (Table 16) (see Section 6.4). Although extreme values were excluded from the trend analysis, additional outliers that were not obvious on the box and whisker plots are apparent in the normal probability plots and in the time-concentration plots and should be evaluated further and possibly excluded in subsequent evaluations.

5.4 Descriptive Summary Statistics

Summary statistics for each data set are presented in Tables 10a and 10b, 11 and 12. For purposes of this report, a data set is defined as all of the analysis results for a single constituent in a single monitoring well. Table 10 is divided into two parts. Table 10a consists of data sets in which the constituent was detected in 50 percent or more of all analyses performed. Table 10b consists of data sets in which the constituent was detected in less than 50 percent of all analyses performed. Within these separate tables, data sets were divided into greater than eight valid N and less than eight valid N.

Descriptive summary statistics and information presented in Tables 10, 11, and 12 include the following:

- Constituent name
- Number of detections
- Number of samples
- Detection rate as a percentage
- Arithmetic mean
- Geometric mean (the backtransformed mean of the logtransformed data)
- Geometric standard deviation
- Standard deviation
- Minimum reported concentration
- Maximum reported concentration
- 25th percentile of sample population
- 50th percentile of sample population
- 75th percentile of sample population
- Estimated skew of population distribution (skew greater than 1 indicates a right-skewed population; skew less than −1 indicates a left-skewed population)
- Shapiro-Wilk test for normality results with corresponding distributions

6.0 TESTING FOR TRENDS AND CALCULATING THE GWCL

Issues related to treatment of non-detects and appropriate analyses of non-normal data sets require additional statistical procedures before determining if trends exist within data sets and calculating GWCLs for each constituent in each monitoring well. These steps are laid out in the Flow Sheet approved by UDEQ prior to DUSA undertaking this revision of the Background Report. The previous procedures have moved from the beginning of the Flow Sheet up to the point of classifying data sets based on the percentage of non-detects. The next set of steps in the Flow Sheet requires the classification of each data set for each constituent in each well into categories based on the percent of non-detects in the database and whether or not the data set is normally distributed, log-normally distributed or non-parametrically distributed; and then, once classified, the calculation of more appropriate statistics for determining trends and calculating the GWCLs. Under EPA Guidance (1992), the descriptive statistics to be used in calculating GWCLs and the manner of analyzing for trends varies depending on such classification.

6.1 Classifications of Constituent Data Sets

For purposes of this report, a data set is defined as all of the analysis results for a single constituent in a single monitoring well. In accordance with the Flow Sheet and EPA Guidance (1992), data were divided into four groups:

- <u>Normally or log-normally distributed, with 0-15 percent non-detects.</u>

  For those constituents, the mean and standard deviation have been calculated in regular manner and GWCL calculated as the mean plus two standard deviations.

- <u>Normally or log-normally distributed, with >15-50 percent non-detects.</u>

  For those constituents, the mean and standard deviation have been estimated using Cohen's method and the GWCLs were calculated as the Cohen's mean plus two Cohen's standard deviations.

- All constituents having >50-90 percent non-detects or constituents with 50 percent or fewer non-detects but are non-parametrically distributed.

  In those cases, the GWCL has been calculated as the greater of: a) the highest historical value for the constituent (the non-parametric method suggested in those circumstances by EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2) (which is the basis for the existing GWCLs in the GWDP).

- All constituents having greater than 90 percent non-detects.

  For those constituents, the GWCL is calculated as the greater of: a) the Poisson limit (as suggested in EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4.5(B)(2) or 4.6(B)(2).

6.2 Percentage of Non-Detects

For all constituent data sets, the percentage of non-detects was calculated, after the data had been screened as described in Section 4.0 above. The number of data points and the percent detects for each constituent in each well is tabulated in Table 16.

6.3 Calculation of Statistics used to Determine GWCLs

6.3.1 Normally or log-normally distributed, with 0-15 percent non-detects.

For these constituents, the geometric mean and standard deviation have been calculated in regular manner and are indicated where applicable in Table 16.

6.3.2 Normally or log-normally distributed, with >15-50 percent non-detects.

For these constituents, the EPA Guidance (1992) and the Flow Sheet require that a further test must be performed to determine which of Cohen's method or Atchison's method of dealing with non-detects is more appropriate. Two types of probability plots were constructed to determine whether to use Cohen's or the Atchison's method to estimate the mean and standard deviation of the constituents with 15 to 50 percent non-detected values. The first is a censored probability plot in which the non-detected values were plotted as half of the detection limit (Appendix B). The second is a probability plot in which only the detected values were plotted (Appendix E). If the censored probability plot was more linear than the detects only plot, then Cohen's method was chosen to estimate the mean and standard deviation. If the opposite was true, then Atchison's method would be more appropriate. All constituents were more linear when plotted as censored probability plots, and therefore Cohen's method was used to estimate the mean and standard deviation for all normally or log-normally distributed constituents in the 15 to 50 percent non-detected category and are indicated where applicable in Table 16.

6.3.3 All constituents having >50-90 percent non-detects or any constituent with 50 percent or fewer non-detects but that is non-parametric.

In this case, the mean and standard deviation are not considered to be representative of the data set and non-parametric methods must be used instead. EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the highest historical value for the constituent. As a result, the highest historical value, after screening the data as set out in Section 4.0, has been identified and is indicated where applicable on Table 16.

6.3.4 All constituents having greater than 90 percent non-detects.

For these constituents, EPA Guidance (1992) and the Flow Sheet require that the most appropriate statistic for purposes of calculating GWCLs is the Poisson limit. As a result, the Poisson limit has been calculated and is indicated where applicable on Table 16.

6.4 Regression and Mann-Kendall Analysis

In order to be confident in using the descriptive statistics derived in accordance with the Flow Sheet and set out in Table 16, we must be certain that the wells sampled have not been impacted by Mill operations. One test is to determine whether or not there are any upward trends (decreasing pH) in any of the constituents. A constituent data set that has been consistent over time and that has not demonstrated a statistically-significant upward trend (decreasing pH), is strong evidence that the constituent has not been impacted by Mill activities. For this reason, the Flow Sheet requires that a trend analysis be performed on each constituent data set.

In this report, all constituent data sets have been plotted in Appendix D. Non-detects are indicated as red squares and detected values are indicated as blue circles. Temporal trends in these data were evaluated using either linear regression or the Mann-Kendall test, as appropriate.

Linear regression is the best test for normally or log-normally distributed data, where there are 50 percent or fewer non-detects. The correlation coefficient (R) represents the linear relationship between two variables. R Square (R^2) shows how closely X and Y are related. By taking the square of the R value, all values of R^2 are positive (values of R can range from -1 to +1), and fall between 0 (no correlation) and 1 (perfect correlation). The R^2 value is a measure of the strength of the predictive capability of the regression line. An R^2 value of 0 indicates that the regression line has no predictive ability at all. An R^2 value of 1 indicates that the regression line fits the data perfectly and, therefore, has the highest possible predictive capability. Generally, an R^2 value less than 0.5 is considered to be a poor correlation, and the linear regression line is not considered to be a reliable representation of the data (i.e., it explains less than half of the data).

The significance of a correlation coefficient of a particular strength or fit will change depending on the size of the sample from which it was computed. In this report, linear regression trends are considered to be statistically-significant if there are enough data points to make a determination and enough of those points fall within the calculated variance of the data set. Least squares regression analysis of the data was performed in order to determine whether the association between the variables is statistically-significant at the 95 percent level. In Appendix D, significant regressions are noted by a red R^2 value.

The statistical significance (p-level) of a result is an estimated measure of the degree to which it is "true" (in the sense of "representative of the population"). More technically, the value of the p-level represents a decreasing index of the reliability of a result. The higher the p-level, the less we can believe that the observed relation between variables in the sample is a reliable indicator of the relation between the respective variables in the population. Specifically, the p-level represents the probability of error that is involved in accepting our observed result as valid, that is, as "representative of the population." For example, the p-level of .05 (i.e.,1/20) indicates that there is a 5 percent probability that the relation between the variables found in our sample is a "fluke." In other words, assuming that in the population there was no relation between those variables whatsoever, and we were repeating experiments like ours one after another, we could expect that in approximately every 20 replications of the experiment there would be one in which the relation between the variables in question would be equal or stronger than in ours. In many areas of research, the p-level of .05 is customarily treated as a "border-line acceptable" error level (Statsaft, 2005).

The Mann-Kendall test is a nonparametric test for trends in data over time. The test is particularly useful for determining trends in data that have a large number of non-detects, or in data that do not follow a normal or log-normal distribution. The Mann-Kendall test calculates a slope between each point in the data set and every other point. The difference in positive slopes to negative slopes is used to calculate the Z-Score. The Z-Score is then compared to the confidence level to determine the direction and strength of the trend. For all analyses in this report, a 95 percent confidence interval was used. If the Z-Score is higher than the comparison value then an upward trend is said to exist. If the Z-Score is less than the negative comparison value then a downward trend is said to exist. If the Z-Score is between the two comparison values then no trend is said to exist. For example, arsenic in MW-1 was only detected 27.7 percent of the time, with N=65. The Z-Score for arsenic in MW-1 is -2.13. At the 95 percent confidence level the comparison value is 1.65. Since the Z-Score is less than the negative comparison value (-2.13<-1.65) a downward trend is said to exist. The Mann-Kendall test determined that significantly increasing trends are found in MW-1 for sulfate, MW-3 for selenium, and MW-14 for uranium, among others. Significantly decreasing trends were noted in various wells for arsenic, cadmium, and vanadium, among others.

In accordance with the Flow Sheet, linear regression analysis was performed for normally or log-normally distributed data sets with 50 percent or fewer non-detects (Appendix D). The R^2 values for each statistically-significant linear regression for those data sets that are normally or log-normally distributed is indicated on Table 16. For such linear regression analysis, all non-detects were included at half the detection limit. For all data sets with greater than 50 percent non-detects and all non-parametric data sets, trend analysis was performed using the Mann-Kendall test. The Z values for each such data set are indicated on Table 16.

As a visual cue, linear regression lines have been drawn on all data plots for all constituents in Appendix D, even though the linear regression line may not be significant or the percentage of non-detects may exceed 50 percent or the data may be non-parametric. Only those linear regression results that are statistically-significant (as indicated by a red R^2 in Appendix D) for normally or log-normally distributed data sets with 50 percent or fewer non-detects are indicated on Table 16. For normally or log-normally distributed data sets in the >15 to 50 percent non-detects category, Table 16 indicates an increasing trend (decreasing in the case of pH) if there is either a statistically-significant linear regression trend or a statistically-significant Mann-Kendall result. For all other constituents, the Mann-Kendall result is indicated.

It should be noted that statistically-significant upward and downward trends are indicated in Table 16 in upgradient wells MW-1, MW-18, and MW-19, as well as in far down-gradient well MW-3. The upward trends indicated in Table 16 are discussed in detail in Section 11.0 below.

6.5 Use of Statistics for Deriving GWCLs

If a determination is made that there are no impacts from Mill activities that would indicate the descriptive statistics in Table 16 are not representative of background, these statistics can be used to derive GWCLs for each constituent in each well in accordance with the UDEQ approved Flow Sheet. The derivation of GWCLs using these descriptive statistics, in accordance with the Flow Sheet, is described in more detail in Section 13.0.

In order to determine whether or not there are any impacts from Mill operations, various analyses are performed in Sections 7.0 (Results of Statistical Evaluation), Section 8.0 (Spatial and Temporal Analyses), Section 10.0 (Spatial and Temporal Distribution of Indicators of Potential Impact), Section 11.0 (Analysis of Constituents that Require Further Review), and Section 12.0 (Additional Evaluation of Uranium Trends).

7.0 RESULTS OF STATISTICAL EVALUATION

7.1 Identification of Constituents that Require Further Review

The following tables set out those constituents that have a proposed GWCL (see Table 16 and Section 13.0) in excess of the state GWQS and/or demonstrate a statistically-significant upward trend (decreasing in the case of pH), using either linear regression, where appropriate, or Mann-Kendall analysis and therefore require further evaluation. It should be noted that we have included in the following tables all trends that are statistically-significant, even though they may contain a slight trend or an R^2 value that approaches zero in the case of linear regression, or a Z value that approaches 1.85 in the case of Mann-Kendall analysis (see Section 6.4 for a discussion of these two approaches to trend analysis). All other constituents have a proposed GWCL that is less than their respective GWQS and do not demonstrate increasing trends (decreasing in the case of pH). For those constituents, the proposed GWCLs set out in Table 16 should be considered to be appropriate (see Section 13.0).

Of the following two tables, Table 7.1-1 sets out those constituents that require further analysis. These constituents are addressed in detail in Section 11.0. All of the constituents on Table 7.1-2 meet the cutoff criteria for further evaluation described above, but are essentially non-detect and either have a proposed GWCL that exceeds the GWQS due to the non-parametric method used to calculate the GWCL or have a statistically-significant rising trend due to changing minimum detection limits over time. All of the constituents in Table 7.1-2 can therefore be ignored and, other than the brief discussion relating to Cadmium and Nickel set out below, no further analysis of them is warranted.

Table 7.1-1

Constituents Requiring Special Evaluation

Monitoring Well	Constituents that have a Statistically-significant Increasing Trend (decreasing for pH)[2]	Constituents That Have a Proposed GWCL in Excess of the Applicable GWQS[1]
MW-1 (upgradient well)	Sulfate	Tetrahydrofuran
	TDS	
	Iron	
MW-2	Sulfate	
	TDS	
MW-3 (far downgradient well)	Selenium	Manganese
	Sulfate	Uranium
	TDS	Tetrahydrofuran
	Uranium	
	pH	
MW-5	Fluoride	
	Iron	
MW-11	Ammonia	
	Manganese	
	Sulfate	
	TDS	
MW-12	Selenium	Manganese
	Uranium	
MW-14	Ammonia	Manganese
	Selenium	Uranium
	Uranium	
MW-15	Selenium	Selenium
	Uranium	Uranium
MW-17	Selenium	Manganese
	Sulfate	Uranium
	Uranium	
MW-18 (upgradient well)	Sulfate	Uranium
	Thallium	
	Uranium	
MW-19 (upgradient well)	Ammonia	Thallium
	Fluoride	
	Selenium	
MW-26	Nitrate & Nitrate as N	Manganese
	pH	Uranium
	Uranium	
MW-32	Manganese	Iron
	Sulfate	Manganese
	TDS	

Notes

1. Taken from Table 16, extremes excluded.
2. Taken from Appendix D and includes all statistically-significant (p values less than 0.05) positively sloped regression lines, regardless of slope and magnitude of R^2, provided that there is a sufficient number of data points to result in a statistically-significant determination and all statistically-significant Mann-Kendall upward trends (Z values greater than 1.85). In performing the regression and Mann-Kendall analyses, extremes were excluded.

Table 7.1-2
Constituents That Have a Proposed GWCL in Excess of the Respective GWQS or a Rising Trend But are Essentially Non-detect and Can Be Ignored

Monitoring Well	Constituents that have a statistically-significant increasing trend (decreasing for pH)	Constituents that have a proposed GWCL in Excess of the GWQS
MW-1		Cadmium
		Lead
MW-2	Silver	Cadmium
		Lead
MW-3	Silver	Cadmium
		Lead
MW-5	Nickel	Cadmium
	Chromium	
MW-11	Molybdenum	
	Selenium	
MW-12	Nickel	Cadmium
MW-14	Arsenic	
	Nickel	
MW-15	Nickel	
MW-17	Arsenic	
	Molybdenum	
MW-18	Molybdenum	
	Nickel	
MW-19	Molybdenum	
	Nickel	

7.2 Constituents Identified in Table 7.1-2

7.2.1 Cadmium

The proposed GWCLs for cadmium in MW-1, MW-2. MW-3. MW-5 and MW-12 exceed the GWQS for cadmium. In each case there is no rising trend in cadmium, and in fact there are statistically significant downward trends in cadmium in MW-1, MW-2, MW-3 and MW-5, having Mann-Kendall Z values of -3.22, -3.9, -4.03 and -4.49, respectively.

From a review of the plots for cadmium in these wells (see Appendix D), it is evident that, while there appears to have been some detections of cadmium in samples taken in the late 1970s and early 1980s, cadmium has been low or non-detect in these wells since that time. The one exception appears to be in far downgradient MW-3, which has had detections at approximately half the GWQS since then.

The early high detections of cadmium in these wells, which appear to have systematically ended in the early 1980s for each of these wells, suggests that the high results could have been due to variations in sampling or analytical techniques.

7.2.2 Nickel

Generally weak rising trends in nickel are indicated in MW-5, MW-12, MW-14 and MW-15, and MW-18 with Z values of 3.46, 1.84, 1.7 2.23, and 2.18, respectively. A review of the plots for nickel in these wells (see Appendix D) suggests that any rising trend is likely the result of changing minimum detection limits over time. As a result, we do not consider these to be real rising trends in nickel in these wells.

7.3 Organic Constituents

Organic constituents present in groundwater in the vicinity of MW-4 (see Figure 2 for the location of MW-4) have been identified as impacting groundwater beneath the Mill site and are currently being removed by active remediation. The source of these constituents is believed to be discharge of laboratory chemicals to historic septic leach fields that pre-date Mill operations. Agreements between Utah and DUSA have ensured that this impact will not threaten human health or the environment. These constituents, currently undergoing remediation, do not represent direct impact by the milling process and they are currently being contained on site. Therefore, with the exception of a brief discussion in the following paragraphs, the remainder of this document will focus on potential impacts from the uranium processing activities and the tailings cells that represent the only potential source of impact at the Mill that might not be as easily controlled.

Analysis for organic constituents generally commenced in 1980. Several organic compounds have been detected, most notably chloroform in MW-4. Chloroform was detected at 4,700 µg/L in the second quarter of 1999 in a sample of groundwater from MW-4.

Trace amounts of chloroform (0.9 µg/L, estimated concentration near the reporting limit) and vinyl chloride were detected in the second-quarter 1999 sample from MW-3 (UDEQ split-sample data). Trace amounts of chloroform (1.2 µg/L) were also detected in upgradient well MW-1. Tetrahydrofuran was noted as a tentatively identified compound in samples from MW-3, MW-12, and upgradient well MW-1. In the second quarter of 1999, no organic constituents (other than phthalate blank contaminants) were detected in wells MW-2, MW-5, MW-11, MW-12, MW-14, MW-15, MW-17, MW-18, and MW-19.

UDEQ collected split samples in the third quarter of 2002 and found trace amounts of tetrachlorethene in samples from upgradient well MW-1 (0.4 µg/L, estimated), and side-gradient well MW-2 (0.2 µg/L, estimated); however, a chloroform concentration of 5190 µg/L was measured in a sample of groundwater from MW-4.

Table 2 lists the wells, sampling dates, constituents and results for all detected organic compounds in DUSA samples. The laboratory detection limit is included, if known, and results that exceed the associated GWCL are highlighted.

Chloroform and tetrahydrofuran are the constituents that exceed the GWCL. Chloroform concentrations are centered around wells MW-4 and MW-26. Figure 5 is a map showing the spatial distribution of chloroform based on data from 2007 sampling. Tetrahydrofuran results also exceed GWCLs in several other wells. Tetrahydrofuran results that exceed standards are from samples of groundwater in monitoring wells MW-1, MW-12, MW-26, MW-3, and MW-5, which in most cases are located at a significant distance from the area of obvious chloroform concentrations. This group of wells is widely distributed across the site and includes upgradient (MW-1), and far downgradient (MW-3) locations. The tetrahydrofuran in all wells other than MW-26 is believed to have come from glues used in certain well casings and is currently under investigation. This source would explain why tetrahydrofuran is found in upgradient (MW-1) and far downgradient (MW-3) wells. The one detection of tetrahydrofuran in MW-26 is likely due to cross contamination or from contaminants in the chloroform plume. There are no significant rising trends in tetrahydrofuran in any of the wells, which is also consistent with the explanation that the tetrahydrofuran concentrations have come from remnants of glues used in the casings of the wells. Since tetrahydrofuran appears to be consistently present in some wells and exceeds the GWGS in MW-1 and MW-1, GWCLs for tetrahydrofuran are set out in Table 16.

Other organic constituents that have been detected include oil and grease, dichloromethane, chloromethane, and total organic carbon. Acetone, benzene, carbon tetrachloride, naphthalene, toluene, and xylenes have been detected one time each in MW-26. These constituents should not be ignored but are not considered representative of groundwater conditions for the following reasons:

- Analysis for oil and grease occurred only in 1980, 1981 and 1982. Similarly, total organic carbon analysis only occurred in 1979, 1980, 1981, 1982, and 1983, and was detected upgradient in MW-1. Since little is known about the sampling protocols from that time, and since oil and grease were also detected upgradient in MW-1, these results should be discounted.
- Acetone, benzene, carbon tetrachloride, naphthalene, toluene, and xylenes each have only one detectable result, all in MW-26. As a result, these constituent concentrations are likely false positives or contaminants in the chloroform plume, but are worthy of continued attention.
- Dichloromethane is present at very low concentrations with limited distribution in MW-26 only and is also likely a contaminant in the chloroform plume.
- The chloromethane detections are all close to, and of the same order of magnitude as, the detection limit. Detected concentrations of this constituent are also from samples taken from wells distributed across the site (including upgradient wells MW-1 and MW-19) with no apparent relation to the known area of chloroform detections. Chloromethane has also been detected a number of times in field blanks. Therefore, these detections are likely due to field or laboratory sampling errors and are not significant. A review of the data plots for chloromethane in Appendix D indicate no significant trends in chloromethane.
- The source of groundwater concentrations of the other organic constituents is currently unclear, but given that they have been measured only in isolated cases, generally in non-recurring situations, including in above-gradient wells, they are likely a field or lab sampling error and are not directly related to the milling process or the tailings cells. The detection of dichloromethane in MW-26 may be from the same source as the chloroform contamination.

7.3.1 Chloroform Plume Contaminated Wells and Chloroform Pumping Wells

MW-26 and MW-32 are both monitoring wells under the chloroform investigation and MW-26 has clearly been impacted by the chloroform plume. As discussed in Section 7.3, these impacts include increased concentrations of chloroform and other constituents, in addition, as well as increased concentrations of nitrate and nitrite (see for example Appendix K of the Chloroform Monitoring report for the Second Quarter of 2007). In addition, MW-26 is a pumping well under the chloroform investigation. Other monitoring wells under the GWDP may have been or may become impacted by the chloroform plume.

This raises two concerns. The first is that the chloroform plume is being addressed under a separate Notice of Violation and increased concentrations of any constituents in any of those wells should be addressed under that Notice of Violation and not result in a parallel out-of-compliance situation under the GWDP. Secondly, chloroform pumping wells are being manipulated and the impact on the quality of the water in those wells from the pumping is uncertain and cannot be predicted with enough certainty to establish compliance standards under the GWDP. For example, pumping wells are intended to pull water in from areas of the perched aquifer that would normally flow into other wells. In fact, the pumping wells are having the effect of drawing down water levels in other wells (see for example Figure 2 of Appendix D of the second quarter 2007 Chloroform Monitoring report). This water may be associated with its own background quality that will impact the water quality in the pumping well. Any increasing or decreasing trends in constituents in chloroform pumping wells, such as MW-26, are therefore not unexpected and should be given little, if any, weight in analyzing potential impacts to groundwater from Mill activities. These impacts should be subject to the chloroform NOV and not result in parallel out-of-compliance situations under the GWDP.

For this reason, we believe that MW-26 should continue to be monitored under the GWDP, but that DUSA should not be subject to any out of compliance situations under the GWDP relating to MW-26. By becoming a pumping well under the chloroform investigation, MW-26 should cease to be a monitoring well under the GWDP. Also, to the extent that any other chloroform plume contaminants may be impacting MW-32 or any other monitoring well under the GWDP.

For this reason, we have not proposed any GWCLs in Table 16 for any constituents in MW-26.

8.0 SPATIAL AND TEMPORAL ANALYSIS

A major purpose of the statistical evaluation presented in this document, and specifically of this spatial and temporal analysis of groundwater monitoring data, is to determine what parameters within the monitoring data set may allow early identification of uranium milling-related groundwater impacts so that responsible and expeditious corrective actions can be undertaken. Conversely, it is necessary to screen out spatial and temporal patterns identifying impacts from sources over which DUSA has no control and no responsibility or ability to abate.

As described in the GWDP statement of basis, general experience from a number of similar uranium milling facilities has identified constituents and sources that are likely to provide a characteristic signature of milling impacts. Because tailings impoundments represent by far the largest volume and highest concentration potential source term, regulatory interest and groundwater monitoring at the Mill have prudently focused on these features as bellwether indicators of groundwater impacts. As the largest potential source of impact, if groundwater concentrations exhibit no spatial or temporal relationship to the tailings impoundments, both regulators and the Mill operators gain confidence that the milling process does not pose a risk to human health and the environment. Therefore, this analysis devotes particular attention to any indicators of a spatial or temporal relationship between tailings impoundments and groundwater quality distribution and trends.

Spatial and temporal trends exist in many large monitoring data sets that, like data reviewed here, record decades of measurements of groundwater properties in samples from monitoring wells distributed across several square miles. Groundwater quality within the Burro Canyon Formation is variable on a regional scale, hosting water types ranging from groundwater suitable for stock watering or other agricultural processes to saline brines (Hunt, 1996).

Furthermore, temporal trends within a groundwater data set that spans decades can be related to a number of factors. In addition to the occurrence of climatic variability and similar cyclic natural phenomenon during the period of record, potential causes of temporal trends in groundwater data include changes in off-site activities as the larger surrounding community grows and land use changes.

Changes in flow systems due to changes in land use are considered part of the natural variability in groundwater quality. Such changes are not the product of addition of pollutants that can be remediated; they are the result of a new adjustment to changing hydrogeologic conditions. Although changes in a hydrogeologic system may result from human activity, in this case humans are simply one agent of hydrogeologic change among many.

Off-site changes in groundwater flow regime that may occur (evidence that at least one such process is affecting groundwater conditions at the Mill is presented later in this Section) require establishment of new hydrologic and geochemical conditions. As the system moves toward a new equilibrium condition, natural constituent mass previously stored within sedimentary matrix material will likely be destabilized. This may be mass stored for millennia in the vadose zone that is liberated by increasing water levels or it may be mass bleeding off from fine-grained sediments that was previously masked by dilution during a period of higher groundwater flow. Destabilization can result from numerous other processes, including a number of different chemical reactions responding to new conditions.

8.1 Spatial Variability of Groundwater Quality at the Mill

The spatial distribution of constituent concentrations in the perched groundwater system at the Mill is variable and may not represent a homogeneous flow system. A map of monitoring wells depicting concentrations of TDS present in samples of groundwater collected in 1983 (the oldest full set of data) and, for comparison, a map depicting concentrations in samples collected from the same monitoring wells in 2006 and 2007 are included in Figure 6. These maps display relative concentration at each well by setting the area of the symbol (circle) in direct proportion to the magnitude of the concentration. TDS is chosen as a broad indicator of groundwater quality across the site; the distribution of other constituents is discussed in subsequent sections.

These maps highlight the variability of TDS concentrations between different monitoring wells and the relative stability of TDS concentrations measured at each well over time. Data collected in 1983 ranges from 1,193 mg/L TDS at MW-1 to 5,004 mg/L TDS at MW-3, while data collected in 2006 and 2007 range from 1,385 mg/L TDS at MW-1 to 5,080 mg/L TDS at MW-3. Note that relative concentrations at each well are similar from 1983 to the 2006/2007 data. Varied TDS concentrations also show no apparent relation with a given well's proximity to the tailings cells. Concentrations of constituents in groundwater samples from Mill site monitoring wells that exhibit no significant trends over the more than 20 years of sampling record are likely the result of natural, ambient processes related to interaction between the water and the sedimentary matrix that hosts it. See Section 11.0 for discussion of any upward trends in TDS at the site.

8.2 Conceptual Framework

Ambient concentrations of constituents in groundwater are typically controlled by the spatial distribution of various naturally-occurring minerals and by the type of geologic materials that host groundwater that monitoring wells are completed in. The perched groundwater system at the Mill occurs within the Burro Canyon Formation, which is described as interbedded conglomerate and grayish-green shale with light-brown sandstone lenses deposited in a fluvial environment (Aubrey, 1989). Mineralogical information is available for the Burro Canyon Formation on a regional basis and a general model of the distribution of sedimentary facies in a fluvial environment can provide insight into conditions in groundwater within the unit.

8.2.1 Mineralogy

The following geochemically important minerals have been identified as occurring regionally within the Burro Canyon Formation: quartz, illite-smectite, kaolinite, calcite, siderite, hematite, and pyrite (Altinok, 1998). Quartz and the clay minerals illite-smectite and kaolinite are widely distributed in the Burro Canyon Formation. Quartz is typically non-reactive but clay minerals are known to be a source of potentially hazardous metals (uranium, nickel, lead, etc.) and semi-metals (arsenic, molybdenum, selenium, etc.) in many geologic settings around the world (Rai and Zachara, 1984).

Calcite and siderite contribute to alkalinity, tending to increase the pH of solutions in contact with these solid phases. In addition, siderite can contribute iron to solution. Hematite and pyrite can also contribute iron and exert strong control over the redox state of groundwater when they are present. In particular, the oxidation of pyrite in sediments can be a major contributor to TDS as sulfide oxidizes to sulfate. This reaction also provides acidity that favors increased concentrations of metals in solution.

8.2.2 Sedimentary Facies

An understanding of the different fluvial sedimentary facies present in the Burro Canyon Formation provides a conceptual framework for understanding the spatial differences in groundwater quality across the Mill site. Over the period that water levels have been measured in the Burro Canyon Formation at the Mill site, the direction of groundwater flow has been consistently from the northeast toward the southwest. The geochemical variability of groundwater samples from monitoring wells at the site and their apparent constant concentration over time suggest that, in spite of the continuity of hydraulic heads, local regimes representing different local geochemical sources of groundwater constituents persist within the Burro Canyon Formation. Local geochemical sources may be related to the distribution of sedimentary facies within the Burro Canyon Formation in the vicinity of the Mill.

Fluvial environments such as those represented by the Burro Canyon Formation comprise lens-like interfingering of the following deposit types (sedimentary facies):

- Channel floor deposits comprising coarse sand or gravel
- Point bar deposits of fine-grained sand
- Flood plain deposits comprising silt and mud

As sediment deposition occurs over time, these deposit types are distributed back and forth across the larger stream channel, producing the characteristic discontinuous lens-like nature of a fluvial geologic unit. The different mineralogy and associated hydraulic properties of facies may explain a variable, but relatively stable, water quality regime within a fluvial geologic system.

In general, groundwater moves relatively quickly through the coarse channel sand and gravel but much more slowly through silt and clay flood plain deposits. For these reasons, groundwater in fluvial environments has the potential to exhibit different geochemical types within what is identified as one geologic unit. Hydraulic heads can be maintained within the unit but the bulk of groundwater flow may be restricted to the gravel and sand facies. Note that all fluvial facies, including coarse-grained lenses, are discontinuous across relatively small areas, reducing total flow through the unit. These observations are consistent with the Utah Division of Oil, Gas & Mining Environmental

Handbook's description of the Burro Canyon Formation as having very low to low permeability and containing waters which range from fresh to briny (Hunt, 1996).

Sandy and gravelly sediment within the fluvial facies typically contain a high proportion of quartz and other relatively non-reactive minerals. Groundwater in contact with these minerals tends to have lower TDS content than groundwater in contact with clay minerals found in silt and clay facies. The lower groundwater velocities through the latter facies provide longer residence time allowing for more chemical interaction, which typically translates to a higher TDS. Silts and clays also provide more surface area and have greater sorption capacity than coarser sediments typically resulting in higher retention of metals and semi-metals during deposition. These metals can be remobilized and samples of groundwater from site monitoring wells completed in or near silt and clay lenses can be expected to exhibit higher metals and TDS concentrations than samples from monitoring wells completed in sand or gravel lenses.

8.3 Water Level Changes

In spite of stability of overall TDS concentrations across the site, groundwater levels have risen dramatically in some monitoring wells during the period from the early- to mid-1990s to the present. Trends in water level elevations with time are presented in Figure 7. The monitoring wells at the site can be divided into two distinct groups based on these plots: wells that currently exhibit a strong upward trend (MW-1, MW-11, MW-17, MW-18, and MW-19) and those that exhibit little to moderate upward trend (MW-2, MW-3, MW-5, MW-12, MW-14, and MW-15).

Of those monitoring wells with a record of water level measurements dating back to the early 1980s, MW-4 provides the most obvious record of change in water level trend that affected most or all of the monitoring wells in the first group. The trend-line inflection point observed in 1994 data records the beginning of a sharp increase in water levels. Water levels in this well have risen more than 25 feet since 1994. The inflection point and continued rising water levels is similar, although less dramatic, in data from MW-17, MW-18, and MW-19.

The spatial distribution of changes in water levels during the period from 1994 to 2001 (more recent water level data is affected by pumping of wells in the vicinity of MW-4 to recover chloroform) is shown in Figure **8,** which reveals that water level increases have occurred preferentially in monitoring wells on the east side of the site while western monitoring wells are relatively unchanged. Moderate rises can be observed in monitoring wells in the west-central part of the site, perhaps indicating a transition zone.

Reasons for water level increases and the uneven spatial distribution are currently unclear. DUSA and UDEQ have concluded that seepage from stock watering ponds upgradient of the Mill site are contributing to increases. Another contributing factor could be that regional increases in precipitation observed during the late 1980s and early 1990s (Diaz and Anderson, 1995) have contributed and increases may reflect a slug of water from one or more years of high recharge.

One thing appears certain however; higher water levels do not originate as seepage from the Mill tailings cells. The largest groundwater level changes have occurred in MW-19, MW-18, and MW-4 on the northern and eastern boundaries of the Mill site and changes diminish toward the tailings cells. This distribution could be related to the distribution of fluvial facies across the site. A possibility worthy of further consideration is that coarse-grained fluvial facies are more prevalent on the east side of the Mill site. If so, head differences from whatever source would be translated more quickly through more transmissve sediments.

Data documenting this apparent regional scale change in groundwater levels provides evidence that groundwater at the Mill site is being affected by off-site changes to the groundwater flow regime. As described above, any change in the flow regime has the potential to destabilize constituent mass and instigate geochemical processes that will affect natural water quality. Changes to groundwater quality at the Mill site will occur as a result of observed water level increases and trends in constituent concentrations that result will have an impact on groundwater compliance.

9.0 TRACERS OF POTENTIAL GROUNDWATER IMPACT

Natural variability and trends produced by natural processes should be incorporated into determination of the numerical values that will represent background concentrations, but in some cases it may be difficult to separate natural trends from trends produced as a result of milling related processes. The purpose of the following discussion is to provide a framework for understanding the natural variability of groundwater quality at the site and a logical structure for differentiating between trends and spatial distributions resulting from natural processes and similar trends that could result from potential tailings impact.

A common hurdle facing regulators and operators addressing the potential for groundwater impacts is defining what might indicate an impact (i.e., how will we know that an impact has occurred). Recognizing the importance of constituent concentrations in tailings impoundment solutions as indicators of potential groundwater impact, UDEQ provided a concise summary of available data characterizing these solutions in Table 5 of the statement of basis for the Mill GWDP. Table 15 provides a summary of the measured concentrations of several key constituents, excerpted from UDEQ's more comprehensive list.

The ideal constituent parameters to indicate impacts from tailings solutions would be:

1. The constituent would move with the same velocity as transporting water.

2. It would be present in source solutions at easily measurable concentrations.

3. It would not be common in ambient groundwater.

A retardation factor is a measure of the rate of movement of a constituent relative to groundwater. A retardation factor of 10 indicates that the constituent will move through the aquifer at a rate that is 10 times slower than the velocity of groundwater. As described by the GWDP, retardation is a function of a constituent's soil-water partitioning coefficient as follows:

$$R = 1 + \rho_b/\eta * K_d \qquad \text{(Eq. 1)}$$

Where R is the retardation factor, ρ_b is the bulk density of the aquifer matrix (grams per cubic centimeter), η is the effective porosity of the aquifer matrix, and K_d is the distribution coefficient of the constituent. The distribution coefficient is the ratio of the constituent concentration adsorbed to the aquifer media (usually reported as milligrams per kilogram) to the constituent concentration dissolved in groundwater (usually reported as mg/L). Thus the units of K_d are liters per kilogram or milliliters per gram. A number of factors contribute to the mobility and/or potential for attenuation of a constituent and the sum of these factors are expressed in the distribution coefficient.

A primary control on constituent mobility is the particular ionic species of each constituent that forms, given the specific conditions that are present in the aqueous environment. The types of ionic species and complexes that form in groundwater depend, among other things, on anion and cation availability and on pH and redox potential (Eh) conditions in site groundwater.

As noted in the GWDP statement of basis, transport characteristics of common constituents in groundwater can be separated into groups exhibiting broadly similar behavior. Using the classification scheme from the GWDP, the following sections review the transport characteristics of constituents present in tailings solutions. This review is useful because it allows us to focus on those parameters that would present the first indication of impact from tailings cells.

The strategy employed in evaluating the spatial variability in groundwater quality at the Mill is to compare concentrations and concentration ratios of these first indicators to the concentrations and ratios of the same constituents observed in site monitoring wells. If first indicators of tailings impact are not present, water quality variability is most likely the result of other sources and processes.

9.1 Anions

Of the constituents listed in Table 15, chloride has chemical properties that lend themselves most readily to transport by water. Chloride is often chosen as a tracer of groundwater flow because common chloride minerals are highly soluble in water and have little tendency to crystallize from solution. Since chloride participates in relatively few chemical reactions, concentrations move along a groundwater flow path with little attenuation (retardation) in concentrations. A retardation factor of one (no retardation) is commonly assumed for chloride in most groundwater systems.

As one of the few constituents found in groundwater systems with a retardation factor approaching one, chloride meets at least two specifications of an ideal indicator of potential tailings solution impact to groundwater. It is common in ambient groundwater (ranging from less than 1.0 mg/L at MW-23 on the downgradient margin of Cell 3 to 94 mg/L in upgradient monitoring well MW-19, after extremes are removed), but the average chloride concentration in tailings impoundment solutions of 4,600 mg/L is sufficient to guarantee that any seepage from tailings impoundments would be measurable in groundwater before any substantial volume had entered the system. Thus, chloride is a primary indicator of potential tailings impact.

Other useful chemical indicator species listed in Table 15 include ammonia, nitrate, fluoride, sulfate, and TDS. TDS is useful primarily because it is the sum of the anionic species present (the bulk of anions in most systems consist of bicarbonate/carbonate, chloride, nitrate, and sulfate) and associated cations (total positive cation charge must equal total negative charge from anions to maintain the electrical neutrality of water).

None of these parameters provides the utility of chloride as a tracer in groundwater at the Mill site. The utility of ammonia and nitrate as tracers is reduced in systems where both are present in large amounts. This is because both are redox-sensitive members of the natural nitrogen cycle and, as such, are subject to transformative redox reactions that mask the original abundance of either. Note also that near surface transformation products can easily be masked by the presence of the large nitrogen reservoir in the atmosphere (nitrogen gas accounts for approximately 78 percent of ambient air).

Sulfate is present in tailings solutions at high concentrations but is present in ambient groundwater at proportionally higher concentrations than chloride. Further, the solubility of common calcium sulfate minerals is much lower than the most common chloride minerals, limiting the amount of sulfate that can remain dissolved and retarding sulfate concentrations along a flow path. However, given the high concentrations of sulfate in the Mill's tailings cells of approximately 65,000 mg/L, it should still be considered to be a good indicator parameter.

Other than chloride, the constituent with most promise for indicating potential impacts from tailings solutions is fluoride. Referring to a periodic chart of chemical elements, fluoride is in the same elemental period occupied by chloride and, for this reason exhibits similar chemical properties. Fluoride is present in tailings impoundment solutions at an average concentration of nearly 1,500 mg/L. Fluoride is present in natural groundwater at concentrations ranging from less than detection to more than 100 mg/L, but concentrations are typically near one mg/L. However, unlike chloride, the common trace mineral apatite is known to act as a solubility control that can reduce fluoride concentrations along a flow path. Thus, while fluoride concentrations should be monitored, fluoride should be secondary to chloride as an indicator of impact.

9.2 Metals

Most metals are soluble and transportable at low pH but exhibit progressively higher retardation coefficients as pH values rise above the 3 to 4.5 range. Experience at a large number of uranium mill tailings facilities in the western United States indicates that low pH in tailings solutions rarely persists more than a few hundreds of feet in any transport direction from a source due to the high neutralization potential generally observed in alkaline soils from arid regions of the western United States. These soil properties account for the small "acid halo" commonly observed around many older tailings impoundments that were constructed before liners were required. Some exceptions occur, but most metals are essentially immobile under neutral pH conditions encountered outside of the acid halo and do not serve as useful indicators.

Table 5 of the GWDP statement of basis lists uranium ore related constituents that have been observed in ore deposits near the Mill. Some of these constituents may serve as indicators of impact at the Mill but caution should be used when assigning observed concentrations of these constituents in groundwater to a mill tailings impoundment source. Noting that uranium mills tend to be located in regions with nearby uranium ore, we also have to understand that many of the same characteristics that make a constituent a good indicator of tailings seepage may also allow transport from other nearby sources.

Aside from uranium and associated radionuclides present in the uranium-238 decay series, constituents detailed in Table 2 of the GWDP statement of basis that are present in the uranium milling process and generally considered to be of greatest concern (i.e. present the highest levels of potential risk) are arsenic, chromium, lead, molybdenum, nickel, and selenium. Of these, the redox sensitive metals and metalloids that form oxyanion complexes (arsenic, molybdenum, and selenium) may be the most prone to transport. However, as discussed below, they still are significantly less mobile than chloride and fluoride.

As described by the GWDP, anions generally exhibit lower K_d values than metals. This is due to pH dependant behavior; positively charged cations are more mobile in an acidic environment , anionic species tend to be mobile at higher pH values because they have to compete for positive adsorption surfaces with much more abundant contributors to alkalinity (i.e. bicarbonate and carbonate anions).

Dissolved nickel is present in oxidizing, acidic environments as the cation Ni^{2+}. However, it is strongly adsorbed by Fe/Mn oxides and hydroxides (Rai and Zachara, 1984) that are likely present in abundance in the Burro Canyon Formation.

Arsenic can occur in the environment in several oxidation states (−3, 0, +3 and +5) but in natural waters is mostly found in inorganic form as anionic arsenite (As[III]) or arsenate (As [V]). Under oxidizing conditions, anionic arsenic can be mobile across a range of pH values because it has to compete for positive adsorption surfaces with much more abundant contributors to alkalinity (i.e. bicarbonate and carbonate anions). In reduced systems where sulfur is present, oxidation processes using sulfate as an electron acceptor precipitate highly insoluble sulfides. Arsenic substitutes readily for sulfur in sulfide, which removes arsenic from groundwater by coprecipitation. In addition, arsenic forms its own sulfide minerals (arsenopyrite and enargite, for example), further reducing arsenic concentrations in groundwater.

Under oxidizing conditions, the dominant molybdenum species above a pH of 5 is molybdate ion (MoO_4^{2-}). Many of the metallic elements have molybdates of low solubility. The sulfide mineral molybdenite, also with a low solubility, forms under reducing conditions.

Selenium occurs in solution as selenate or selenite species under oxidizing Eh conditions. These anionic species are adsorbed under acid conditions and desorb as conditions become more neutral. If conditions become reducing, selenides become more stable and selenium precipitates as ferroselite or substitutes for sulfur in pyrite.

9.3 Frequency of Detection and Mobility of Constituents in Nature

We know that a number of chemical constituents present at high concentrations in tailings solutions have transport properties that would allow early detection of milling related impacts to groundwater and we note that the Tailings cells have been in place for over 25 years with little defined impact. These facts suggest that constituents present at lower concentrations in tailings solutions and with higher potential for attenuation would not be likely to provide the required early warning of impact. In order to illustrate this and to identify constituents with high potential to provide early warning of impact, constituents listed in Table 2 of the GWDP can be separated into three groups as presented in Table 13.

Table 13 is essentially a list of the frequency with which a particular constituent from Table 2 of the GWDP has been detected in site monitoring wells. The monitoring wells that have had detectable concentrations of a parameter on more than half of the occasions that an analysis for the parameter was performed are listed in horizontal rows. The constituents that have been most commonly detected in samples of site groundwater are listed near the top of the table and those that have been rarely detected are listed near the bottom.

Based on this table, it is possible to divide the constituents that make up the GWDP into three groups. The upper, orange part of the list of constituents, with a ubiquitous presence across the site, includes all the major anionic species commonly found in groundwater and discussed above as potential tracers of mill process impact to groundwater. In addition, this upper part of the list includes uranium. This placement among commonly detected constituents indicates that, of the trace constituents on the GWDP list, these parameters are likely the most mobile in the groundwater environment beneath the Mill site and possibly the most mobile of the constituents of greatest concern.

Nitrate species, in the next group down, have been consistently detected in less than half of historical monitoring wells. Molybdenum and arsenic, the two other species that, like selenium, form oxyanions, have been detected less frequently than typically insoluble, redox-sensitive iron and manganese species. Constituents even lower on the list are rarely detected in groundwater beneath the Mill site. The point here is not to propose that sampling of the rarely-detected species be discontinued but to identify the more mobile constituents as indicators of milling related impact.

In summary, for the reasons listed above, lack of a rising trend in chloride indicates that there has been no impact from tailings; however, a rising trend in chloride could also be due to some natural influences (see Section 12.0). Chloride is the best indicator, followed by fluoride, then sulfate (due to mobility and abundance in tailings) of the metals and uranium is probably the most mobile and has the best indicator parameters for metals. Any potential seepage from tailings impoundments would be expected to exhibit rising concentrations of chloride and possibly fluoride, sulfate, and uranium.

While uranium may be the most mobile of trace (metal) elements, it is typically retarded behind chloride and would likely not be expressed in groundwater until some time later than chloride concentrations had begun to rise. This is because uranium is a metal cation and behaves as other metals with respect to pH. As stated above, metals are soluble and transportable at low pH but exhibit progressively higher retardation coefficients as pH values rise above the 3 to 4.5 range. Experience at a large number of uranium mill tailings facilities in the western United States indicates that low pH in tailings solutions rarely persists more than a few hundreds of feet in any transport direction from a source due to the high neutralization potential generally observed in alkaline soils from arid regions of the western United States.

10.0 SPATIAL AND TEMPORAL DISTRIBUTION OF INDICATORS OF POTENTIAL IMPACT

The purpose of this section is to examine the spatial and temporal distribution of groundwater parameters that occur at the site and to determine if evidence is available to determine whether water quality variability across the site could be related to impact from the milling operation. If there have been groundwater impacts from the uranium milling process and that impact is included in calculation of standards, the proposed GWCLs could be established at a value too high to provide early warning of potential problems.

On the other hand, concentration trends in natural background that are not accounted for in the GWCL may cause unnecessary corrective actions to be taken and could limit the effectiveness of any action that might be employed. Another factor to consider is that, assuming a normal distribution, setting the GWCL at a value of two standard deviations above the mean, virtually guarantees that each well will be out of compliance in about five percent of all concentration values measured in groundwater samples from that well. This factor is in addition to spatial and temporal changes known to be migrating onto the site with currently unknown implications (i.e., changes in groundwater levels that clearly originate off site.)

Figures 9 through 14 plot constituent concentration values that were present in groundwater samples taken in 1983 (1982 in the case of fluoride in two wells) compared to values from samples taken in 2006/2007 (2002 for gross alpha). Although these plots represent a comparison of snap shots for each constituent, they do show the spatial distribution of the constituents during these periods and give an idea of temporal changes in concentrations. For a full discussion of linear trends in constituents over time, see Section 11.0 and Table 7.1-1

10.1 Chloride

Figure 9 is a plot of the chloride concentration values that were present in groundwater samples taken in 1983 for comparison with concentration values from samples of as many of the same wells with data available in samples from 2006 and 2007. Like the similar plots of TDS concentration presented in Figure 6, these plots indicate the relative magnitude of concentration values by the relative size (area) of the bubble for each well. Note that, as with TDS concentrations, the chloride values are similar from 1983 to 2006-2007, indicating that, in spite of the variable magnitude of concentrations across the site, these comparative snap shots demonstrate that there has been little change in concentrations in samples from each well. As discussed in Section 11.0, there are no statistically-significant rising chloride trends at the site.

The values plotted for 1983 are only for those wells that were present on the site in 1983. The values plotted for 2006/2007 present a similar plot for all available 2006/2007 data, and while similarities are notable, higher values are present at some recently installed wells giving the impression that something has changed. This is related to the common phenomenon in placement of monitoring wells—they tend to be located adjacent to potential sources of impact. However, the older wells almost completely surround the new wells and the older wells have not changed significantly. If there had been recent impact that produced higher concentrations at the newer wells, it is hard to imagine that older wells could have avoided some impact. Most of the new wells have been located at the downgradient edge of the tailings cells. Therefore, although it may appear that there are higher concentrations at the downgradient edge of the cells, the most likely explanation is that more data has revealed a wider range of groundwater quality at the site and that additional wells at random locations around the site would show similar results.

The concentrations of other species of interest are presented in similar two plot series showing snapshots of groundwater quality across the site. Fluoride concentrations are presented in Figure 10. Figure 11 is for sulfate concentrations during the same periods. Figures 12, 13, and 14 present gross alpha concentrations, selenium concentrations, and uranium concentrations, respectively. These constituents are discussed below.

10.2 Fluoride

Fluoride concentrations are variable from location to location (Figure 10). In 1982/1983 the highest concentration was 0.80 mg/L fluoride in MW-5, just downgradient of Cell 3. In 2006/2007 the highest concentration of fluoride was 1.18 mg/L in upgradient monitoring well MW-19. The lowest concentrations measured in 2006/2007 (0.2 mg/L) was in a sample from monitoring well MW-14 located just downgradient of Cell 4. See Section 11.0 for an analysis of statistically-significant fluoride trends in individual wells at the site.

10.3 Sulfate

The sulfate concentration plots (Figure 11) closely resemble the TDS plots (Figure 6), highlighting the variability of sulfate concentrations between different monitoring wells and the relative stability of sulfate concentrations measured at each well over time. Data collected in 1983 ranges from 667 mg/L sulfate at MW-1 to 3,226 mg/L sulfate at MW-3, while data collected in 2006/2007 ranges from 756 mg/L sulfate at MW-19 to 3,320 mg/L sulfate at MW-3. Like TDS plots (Figure 6), relative concentrations at each well are similar from 1983 to 2006/2007 data, indicating that there is no significant trend in sulfate data for the site as a whole over that time period. See Section 10.2 for an analysis of statistically-significant sulfate trends in individual wells at the site.

10.4 Gross Alpha

Gross alpha concentrations are often related to the uranium or thorium decay chains, but a large number of other radionuclides decay by the spontaneous emission of alpha particles. Radionuclides having atomic numbers of 58 (cesium) or higher can decay by this mechanism (Faure, 1977). In addition, some radionuclides with low atomic number, such as helium, lithium, and beryllium decay by this mechanism. Thus, gross alpha may not be a good indicator of milling impact to groundwater. Figure 12 shows gross alpha including uranium and radon. We have compared the 1983 data to 2002 data because, after 2002, gross alpha was measured without uranium and radon. Distribution of gross alpha concentrations in 2002 (Figure 12) show no spatial relationship to tailings cells or mill buildings. Comparison of 2002 concentrations to those measured in 1983 indicate no significant changes.

10.5 Selenium

Selenium is also a redox-sensitive constituent and significant evidence of rising selenium concentration in upgradient monitoring well MW-19 and in far downgradient monitoring well MW-3 (see Section 11.0) would be difficult to explain as being related to tailings cells or the milling process stream. MW-19 is more than 1,500 feet upgradient of the Mill and as much as 2,000 feet upgradient of the first tailings cell. MW-3 is located approximately 3,000 feet downgradient of the closest tailings cell, Cell 4A, and as much as 4,000 feet (or three quarters of a mile) downgradient of the closest active tailings cell. In comparing the distribution of selenium in 1983 and in 2006/2007 (Figure 13), note that the highest concentration of selenium is found in MW-15, which was not in existence in 1983. This relatively high concentration of selenium is MW-15 is indicative of variable water quality at the site combined with natural influences that have caused increasing trends in selenium in certain wells at the site (see Section 11.0).

10.6 Uranium

In comparing uranium distributions from 1983 to 2006/2007, it is notable that, for the wells that existed in 1983, MW-1, MW-2, MW-5, MW-11, and MW-12, there has generally been little change. As discussed in Section 11.0, however, there have been increasing trends in uranium, most notably in upgradient well MW-18 but also in MW-12, MW-14, MW-15, MW-17, MW-26, and far downgradient MW-3. The rising trends in uranium are attributable to natural causes (see Sections 11.0 and 12.0). It is noteworthy from Figure 14 that the highest concentrations of uranium are distributed across the site, both upgradient and downgradient, as well as close to the tailings cells themselves, which further supports our conclusion that uranium concentrations at the site have not been impacted by Mill activities.

Once again, it is necessary to recall that monitoring wells tend to be located adjacent to potential sources of impact and not in locations that might demonstrate that concentration changes are more widespread.

10.7 Spatial Distribution of Coincident Constituents

Table 7.1-1 identifies the constituents that either have increasing trends or have data sets where the proposed GWCL exceeds the GWQS. These occurrences, which are plotted on Figure 15, are also distributed randomly across the site with no apparent relationship to the tailings cells. See Section 11.0 for a full analysis of these constituents. These observations support evidence given in the spatial analysis presented in Section 10.0 that observed concentrations are natural and the trends in data sets are due to natural processes. There is no evidence that any concentration in the overall data set is due to impact from uranium milling processes.

11.0 ANALYSIS OF CONSTITUENTS THAT REQUIRE FURTHER REVIEW

Each of the constituents included in Table 7.1-1 is discussed in turn in the following sections.

11.1 Thallium

A rising trend in thallium is indicated in MW-18, based on a linear regression analysis. In addition, the proposed GWCL for thallium in MW-19 exceeds the GWQS for thallium. As MW-18 and MW-19 are upgradient of the Mill site, this upward trend and exceedance are the result of natural background influences.

11.2 Sulfate

There are upward trends in sulfate in MW-1 and MW-2, represented by Z values of 4.47 and 2.19, respectively. These trends may have been influenced by the fact that these monitoring wells were developed using fresh water (see Appendix D). Among the lowest values ever recorded are the first sampling events after well installation and then values rise and stabilize at higher values over the next year or more. Note that other wells display the same pattern. For example MW-3, which is far downgradient, has the same type of pattern in time concentration plots.

There are also increasing trends in sulfate in MW-11 and MW-17, represented by Z values of 5.95 and 2.17, respectively, and MW-32, represented by an R^2 value of 0.79. While still low, in the case of MW-17, these Z and R^2 values suggest a better fit of the regression plot to the data than is the case with MW-1 and MW-2. MW-32 has a high R^2 value, due in large part to one data point collected in September 2002, less than 2 months after the well was developed. As a result, this low initial sample result may not be representative. If this data point is removed, the trend in MW-32 would no longer be significant. However, the most significant increasing trend that represents the highest percentage increase in sulfate is in upgradient well MW-18, which has an R^2 of 0.49. Sulfate is a good indicator parameter for tailings cell leakage although, due to its prevalence in the natural formations, it is not considered as good an indicator parameter as chloride (See Section 9.0). The fact that the most pronounced increasing trend in sulfate at the Mill site is in upgradient well MW-18 is strong evidence that the other increasing trends in sulfate at the Mill site are also due to natural causes. This is supported by the fact that there are no supportable increasing trends in chloride at the Mill site.

11.3 Total Dissolved Solids

There are upward trends in TDS in MW-1, MW-2, MW-3, MW-11, and MW-32. This is to be expected given the increasing trends in sulfate in those monitoring wells and since sulfate constitutes the largest component of TDS. Because we have concluded that the increasing trends in sulfate are due to natural causes, we also conclude that these increasing trends in TDS are attributed solely to natural causes.

11.4 Uranium

There are statistically-significant increasing trends in uranium in MW-12, MW-18, MW-3, MW-14, MW-15, MW-17, and MW-26. These will be addressed in turn:

- The most dramatic and significant increasing trend in uranium at the site is in upgradient well MW-18, which has a relatively steep slope and an R^2 of 0.89. This is conclusive evidence that natural forces at the site are causing increasing trends in uranium. See Sections 8.0 and 12.0 for a discussion of possible natural influences at the site.

- The R^2 for the regression analysis for MW-3 is 0.24, which suggests a moderate fit of the regression plot to the data. Since MW-3 is far downgradient of the site, we consider MW-3 to be a good representative well for natural backgroundwater quality at the site at this time. It is extremely unlikely that tailings solutions over the last 30 years could have impacted MW-3, which is some 3,000 feet downgradient of the tailings cells, without significant impacts having been observed at the other much closer monitoring wells. An increasing trend in uranium in MW-3, along with the increasing trend in MW-18, supports our conclusion that natural forces are causing increasing uranium trends across the site.

- There are increasing trends in uranium in MW-12, MW-14, MW-15 (Z values of 5.08, 4.65 and 4.03 for MW-12, MW-14 and MW-15, respectively), and in

MW-17, and MW-26 (R^2 values of 0.11 and 0.38, respectively). However, there are no increasing trends in chloride or fluoride in any of those wells, which would be expected if these rising trends in uranium were caused by seepage of tailings solutions (see Section 9.0). In some circumstances, uranium may approach the mobility of chloride in groundwater, but it cannot exceed it. It is, therefore, not possible for uranium to be trending upwards in these wells without a corresponding and linked increase in chloride. This fact, together with the fact that uranium is increasing significantly in upgradient well MW-18 as well as in far downgradient well MW-3 (which also are not associated with increasing chloride), is conclusive proof that the uranium trends in these wells are not being impacted by Mill activities. As discussed in Section 7.4, since MW-26 is a chloroform pumping well, any trends in MW-26 should be considered likely to be the result of such pumping and should be discounted.

See Section 12.0 for a more detailed analysis of the rising trends in uranium at the site.

11.5 Selenium

Selenium is common across the site; however, a number of rising trends require further analysis. As indicated in Table 16, statistically-significant increasing trends in selenium are suggested in MW-3, MW-12, MW-14, MW-15, MW-17, and MW-19. The Z values for these wells are 4.8, 3.46, 3.29, 5.31, 3.18, and 1.14, respectively, and the R^2 values for MW-15 and MW-19 are 0.67 and 0.37, respectively. On a review of the plots for selenium in Appendix D, it is likely that the upward trends in selenium in MW-14 and MW-17 are caused by non-detects and the changing reporting limits over time. The trends in selenium in those wells should, therefore, be questioned. This leaves statistically-significant increasing trends in selenium in upgradient well MW-19, far downgradient well MW-3, and in MW-12 and MW-15 with the most significant of these being in MW-15. However, combining the fact that increasing trends in selenium are found in both upgradient and far downgradient monitoring wells with the fact that there is no increasing trend in chloride or fluoride (other than an increasing trend in fluoride in upgradient MW-19) in any of these wells, or in sulfate in any of MW-12, MW-14, MW-15, or MW-19, we conclude that the increasing trends in selenium in all of these wells and the relatively high concentration of selenium in MW-15 are due to natural causes and not Mill activities.

11.6 Manganese

Table 7.1-1 indicates that the proposed GWCL for manganese will exceed the GWQS for manganese in the following monitoring wells: MW-3, MW-12, MW-14, MW-17, MW-26, and MW-32.

The manganese concentration in a 1981 sample from far downgradient monitoring well MW-3 was 3,590 µg/L. Since that time, concentrations in samples from MW-3 have exhibited a significant decreasing trend (R^2=0.23) such that analysis results from the most recent sampling event returned a value of 848 µg/L. The high manganese value in 1981 occurred long before any tailings seepage could have infiltrated to groundwater and traveled more than three quarters of a mile in the subsurface to impact this well. Thus, declining manganese concentrations at this location must have a source other than tailings seepage and should be considered background or baseline to the site.

Since manganese sampling began at MW-14 in 1991, concentrations in samples have remained relatively constant in a range from a low of 1,590 µg/L in July 2006 to a high of 2,290 µg/L in September 2002. This range of values, considerably lower than early values of over 3,000 µg/L in MW-3, and the consistency of MW-14 manganese concentrations over 15 years of record indicate that these concentrations are also background/baseline to the site.

Manganese concentrations in MW-17 have been decreasing over time. The proposed GWCL exceeds the GWQS as a result of earlier higher detections.

Although the proposed GWCL for manganese in MW-26 exceeds the GWQS (see Table 16), there is not a significant upward rising trend (Z=0.33). Lack of a rising trend and consistently elevated concentrations of manganese indicate that the manganese in MW-26 is baseline for the site.

Manganese concentrations in groundwater samples from MW-32 exhibit a significant upward trend (R^2=0.61) from 3,660 µg/L in results from the first sampling event in September of 2002 to 5,470 µg/L in results from the most recent sampling event in June 2007. MW-32 is located a short distance downgradient of identified elevated chloroform concentrations. Manganese has been cited as an electron acceptor during the biodegradation of chlorinated solvents (Wilson, 1996). Microorganisms feed on the energy released from removal of electrons from the chlorinated solvent and their transfer to electron acceptors. Such a transfer would result in the reduction of relatively immobile oxidized manganese (IV) to more mobile reduced manganese (II). Such a process may explain the rising manganese trend in groundwater samples from MW-32.

A significant rising manganese trend also occurs in monitoring well MW-11(R^2=0.51); however, concentrations of manganese in samples from this well are well below the GWQS and over an order of magnitude below concentrations found in samples from other wells at the site (see Appendix D). Further, there are no upward trends in chloride or fluoride in MW-11.

For these reasons, we conclude that upward trends in manganese are not caused by activities at the Mill.

11.7 Ammonia

There are rising trends in ammonia in MW-11, MW-14, and MW-19 with Z values for MW-11 and MW-19 of 2.66 and 2.06, respectively, and R^2 values of 0.017 and 0.52 for MW-14 and MW-19, respectively. In each case, the concentrations are greater than an order of magnitude less than the respective GWQS. As the most significant rising trend in ammonia is in upgradient MW-19, and the concentrations in all of these wells are generally low (with the trend in MW-14 being very weak), we have concluded that these rising trends are caused by natural background influences.

11.8 pH

There are decreasing trends in pH in MW-3 and MW-26, with Z value of -2.94 for MW-3 and an R^2 value of 0.67 for MW-26. The trend in MW-26 appears to be influenced heavily by one data point collected in September 2002, less than 2 months after the well was developed. As a result, this low initial sample result may not be representative. For both wells, the pH ranges within the GWQS range of 6.5-8.5. Further, as discussed in Section 7.4, since MW-26 is a chloroform pumping well, any trends in MW-26 should be considered likely to be the result of such pumping and should be discounted.

11.9 Fluoride

Fluoride exhibits a rising trend in each of MW-5 and MW-19, having R^2 values of 0.14 and 0.57, respectively. As there is a significant rising trend upgradient in MW-19, which in fact has a higher R^2 value and as there are no increasing trends in chloride or sulfate in MW-5, we have concluded that this relatively weak trend in fluoride in MW-5 and the trend in upgradient MW-19 a due to natural background influences.

11.10 Nitrate and Nitrite

There is a rising trend in nitrate and nitrite in MW-26 (R^2=0.55). MW-26 is a pumping well associated with the chloroform contamination investigation at the Mill site. The chloroform plume is also associated with a nitrate and nitrate plume, both of which originated from the historic sanitary and lab waste leachfields that pre-dated Mill operations. We have concluded that this rising trend in nitrate and nitrite is associated with that plume.

11.11 Iron

There is a rising trend in iron concentrations in samples of groundwater from MW-1 and MW-5 and the proposed GWCL for iron in MW-32 exceeds the GWQL for iron. The highest observed value in upgradient monitoring well MW-1 is 3,570 µg/L. while, the highest observed concentration of iron in MW-5 was 417 µg/L; two orders of magnitude lower than the GWQS. The variability of iron concentrations in samples from all three wells suggests that colloidal iron may be influencing concentrations. This may even occur as submicron particles entrained during sampling disturbances in the well bore that are too small to be filtered out. If so, concentrations of trace metals measured in samples from these wells should be regarded with caution because trace metals are known to adsorb on colloidal iron particles. The fact that iron concentrations are flagged at upgradient locations as well as in monitoring wells adjacent to the tailings impoundments suggest that they are not related to seepage from tailings impoundments.

11.12 Tetrahydrofuran

The proposed GWCLs for tetrahydrofuran in upgradient MW-1 and for downgradient MW-3 exceed the GWGS for tetrahydrofuran. There are no statistically-significant rising trends in tetrahydrofuran at the site.

Tetrahydrofuran has been observed in a number of the older wells at the site (MW-1, MW-2, MW-3, MW-5, and MW-12), which include wells that are both upgradient and far downgradient of the Mill site. There has also been one detection in MW-26, which is believed to be the result of iron contamination in sampling or possibly the influence of contaminants in the chloroform plume.

DUSA believes that the tetrahydrofuran arises from glues used in these older well casings that have not been used in more recent wells. That would explain why this constituent is detected in upgradient MW-19 and far downgradient MW-3 and has not been detected in newer wells.

For these reasons, and particularly the fact that the highest observations on upgradient and far downgradient, we have concluded that the tetrahydrofuran results are not due to Mill activities (other than the installation of the wells) but are localized to those wells.

11.13 Spatial Analysis of Identified Constituents

Evidence of widespread, natural variability in groundwater quality is clear from the lack of any systematic pattern to the occurrence of other constituents flagged for additional scrutiny. All monitoring wells, including those located far enough upgradient of the tailings impoundments to preclude impact by tailings seepage and those located far downgradient, had at least two constituent data sets with either significantly rising trends or proposed GWCLs higher than the GWDP (Figure 15). Interestingly, no two monitoring wells contained the same suite of flagged constituents and typically, individual constituents were as likely to be flagged in upgradient or far downgradient wells as they were to be flagged in monitoring wells located adjacent to the tailings impoundments.

MW-1 and MW-2 both have a rising trend in sulfate and TDS. MW-1 is located far enough upgradient of the tailings impoundments to preclude impact by tailings seepage, indicating that rising trends in these constituents are not related to seepage from tailings impoundments. MW-1 also has a rising trend in iron while MW-2 does not. Data from the next monitoring well to the east of MW-1, upgradient well MW-18, also displays rising concentrations of sulfate, but exhibits rising trends in thallium and uranium as well. Still further to the east, data from samples of groundwater in upgradient well MW-19 display significant rising trends in ammonia, fluoride, and selenium, suggesting that significant rising trends in these constituents in data from MW-26 (a chloroform pumping well – see Section 7.4), MW-11, MW-5, MW-12, MW-14, MW-15, and MW-17 are unrelated to tailings seepage as well.

Like upgradient monitoring wells MW-1, MW-18, and MW-19, data from samples of groundwater in far downgradient monitoring well MW-3 displays significantly rising concentrations of selenium, sulfate, TDS, and uranium and a significantly decreasing trend in pH. In addition, it has a proposed GWCL for manganese that exceeds the GWQS. The highest manganese concentrations in samples from this well occurred in data from the early 1980s before any potential seepage from tailings impoundments could reasonably be expected to have traveled the nearly 5,000 feet from Tailings Cell 2, which was the nearest impoundment existing at the time. Thus, manganese concentrations in the range of 4,000 µg/L are unlikely to represent tailings seepage.

Figure 15 indicates that the only flagged constituents that occur in the area of the tailings impoundments that do not also occur in locations that preclude any impact by tailings seepage are a rising trend in nitrate plus nitrite at MW-26. This well is located in the area impacted by discharge of organic laboratory chemicals to historic septic leach fields that pre-date Mill operations. Nitrate plus nitrite concentrations are clearly related to that source. Further, MW-26 is in service as an extraction well for ongoing chloroform remediation. Water levels have declined and groundwater from a wide area is being pulled toward the cone of depression caused by pumping. Therefore, MW-26 is no longer appropriate to use as a tailings impoundment monitoring well.

Chloride is unquestionably the best indicator parameter, and there are no significant trends in chloride in any of the wells.

There are significant increasing trends upgradient in MW-1, MW-18, or MW-19 in uranium, sulfate, TDS, iron, selenium, thallium, ammonia, and fluoride. At far downgradient in monitoring well MW-3 there significant increasing trends in uranium, selenium, sulfate, TDS and pH (decreasing trend). This provides very strong evidence that natural forces at the site are causing increasing trends in these constituents (decreasing in pH) in other wells and supports the conclusion that natural forces are also causing increasing trends in other constituents as well.

On a review of the spatial distribution of constituents identified on Table 7.1-1, it is quite apparent that the constituents of concern are dispersed across the site and not located in any manner that would suggest a tailings plume. Even though there are a number of increasing trends in various constituents at the site, we have concluded that none of these trends are caused by Mill activities.

12.0 ADDITIONAL EVALUATION OF URANIUM TRENDS

This section of the report examines the spatial and temporal distribution of uranium concentrations in further detail. This detail is warranted, first, because uranium is a primary concern at a uranium milling facility; second, because uranium is among the most mobile of trace (metal) elements in groundwater, therefore acting as a surrogate for less mobile trace constituents; and last, because rising trends in uranium concentrations have sparked concerns that the tailings impoundments could be leaking.

Previous sections of this report have discussed which constituents that are present in the tailings solutions would provide the best early warning of potential impact to groundwater beneath tailings impoundments and concluded that chloride, sulfate, and fluoride would be the best tracers of potential impact. This is because each of these constituents is present in tailings solutions at concentrations that are orders of magnitude higher than ambient concentrations in groundwater and travel in groundwater with little (sulfate) to no retardation (chloride and fluoride). Clearly, any potential seepage from tailings impoundments would carry high levels of these constituents no matter what other constituents were present. Chloride is as mobile as fluoride and exists in tailings solutions at far higher concentrations; therefore, it provides the highest potential to detect potential seepage from the tailings impoundments. Interestingly, there are no rising trends in chloride concentration in samples of groundwater from any site monitoring well.

From measured concentrations of uranium and chloride in the tailings solutions (Table 15) we know that the average value of uranium in these solutions is estimated to be 93.6 mg/L while the average value of chloride is estimated to be 4,608.44 mg/L. If uranium concentrations in wells adjacent to tailings cells represented impact from tailings solution, abundant experience from other uranium mill tailings sites and general experience in numerous groundwater investigations in the last 30 years indicates that cell seepage could not transport uranium more quickly than chloride (see Section 9.0). Thus, any uranium concentrations from tailings cell seepage impacting groundwater would have to be accompanied by corresponding increases in chloride concentrations.

In general, uranium is retarded behind chloride during groundwater transport. Therefore, if a location has been impacted by tailings solutions and uranium exhibits an increasing trend in concentration due to that impact, it should be accompanied by an increasing chloride trend. Further, if the uranium concentration increases two-fold over the period of record, the chloride concentration would have to increase by the same amount or more. Figure 18 provides a series of time concentration plots with chloride (in mg/L) and uranium (in µg/L) data plotted in the same plot. These plots provide the best way to visualize any coincident trends in chloride and uranium. From a review of these plots, it is clear that no wells appear to have increasing trends in chloride and uranium other than in upgradient wells MW-18 and MW-19, which are discussed in detail below.

Plots of uranium concentrations versus chloride concentrations can also provide useful information. In such plots, lower values of uranium should be associated with lower values of chloride and higher values of uranium should be associated with higher values of chloride, forming a linear trend of correlated values. If no linear trend exists in a plot of uranium versus chloride, we can conclude that the groundwater sampled has not been impacted by solutions in the tailings cells. Note that it is a lack of correlation that allows a positive logical conclusion. If a correlation exists, the conclusion would be that tailings impact could not be ruled out based on the correlation alone but there may be other reasons for the correlation. For example, other natural influences could be impacting both uranium and chloride in a similar manner or both uranium and chloride could be exhibiting a decreasing trend.

Figure 17 is a series of plots of chloride versus uranium for monitoring wells MW-2, MW-5, MW-11, MW-12, MW-14, MW-15, and MW-17 adjacent to tailings cells, upgradient monitoring wells MW-1, MW-18, and MW-19, and far downgradient monitoring well MW-3. Plots typically show a "scatter gun" random distribution of data pairs that is elongated along the x-axis, indicating that there is a larger percentage of variation in uranium data than there is in chloride data. This condition is common because uranium concentrations in these samples of groundwater are much lower than chloride concentrations and are, therefore, more difficult to measure accurately. Note, however, as indicated by reviewing Figure 18, there does appear to be a correlation between chloride and uranium data from monitoring wells MW-18 and MW-19. This correlation is interesting because, while significantly-significant rising trends in uranium have been identified in MW-18, no statistically-significant increasing trend in chloride has been identified in data from any site monitoring wells. Examination of the time concentration plots in Figure 18 provides an explanation for the apparent contradiction, as discussed below.

12.1 Upgradient Monitoring wells

Focusing first on the chloride and uranium concentrations in samples from upgradient monitoring well MW-19 (indicated in Figure 18)—note that sampling at this location began in early 1993. Sometime in late 1994 or early 1995, concentrations of chloride began to rise from an average of 63 mg/L in 1993-1994 and uranium began to rise from 11 μg/L on average during the same time period. Concentrations of both constituents peaked in late 2000 or early 2001 at 88 mg/L for chloride and 24 μg/L for uranium and have generally been declining since that time. Thus, no statistically-significant rising trend occurs in data for either constituent. The correlation between these constituents occurs because their concentrations rose and fell in tandem.

Moving to the chloride and uranium concentrations in samples from upgradient monitoring well MW-18 (Figure 18), chloride rose from a 1993-1994 average of 39 mg/L to the most recent value of 50 mg/L while uranium rose from a 1993-1994 average of 11 μg/L to its most recent value of 47 μg/L. Both chloride and uranium concentrations in samples from MW-18 have maintained an upward trend for the last eleven years but only the uranium trend tested as statistically-significant because uranium concentrations rose by 327 percent during that period while chloride only rose 28 percent from the average 1993-1994 concentration of 39 mg/L.

12.2 Groundwater Level Increases

Regardless of whether an increasing trend exists in each individual constituent, data from both MW-18 and MW-19 exhibit an upward trend in chloride versus uranium plots. However, both wells are located so far upgradient that these trends could not be due to potential seepage from the tailings impoundments—so what might cause uranium and chloride concentrations to rise and fall in tandem? One possible explanation relates to the rise in water levels seen in these monitoring wells over the period from 1993 to the present. During that time, the water level in MW-19 has risen 35 feet, from 5,569 feet above msl to 5,604 feet above msl (Figure 7). At the same time, the water level in MW-18 has risen 19 feet, from 5,565 feet above msl to 5,584 feet msl.

Note that the water level in MW-18 was four feet lower than the water level in MW-19 in 1993 but currently it is twenty feet lower (Figure 7). MW-19 is located directly north of the wildlife ponds located directly northwest of the Mill site and is indicated in Figure 2. MW-18 is located approximately 1,000 feet west and slightly north of MW-19 (Figure

2). Higher water levels close to the wildlife ponds suggest that water level increases are due to the recharge from the ponds.

Monitoring began at MW-18 and MW-19 in 1993 and water levels have been rising in these wells since that time. However, monitoring began at MW-1, located approximately 700 feet west and slightly north of MW-18 (Figure 2), in 1979. The hydrograph for MW-1 (Figure 7) indicates that water levels were fairly constant and near 5,572 feet above msl at this location, until sometime in 1998 when they began to rise to their current value of 5,579 feet above msl. The time delay before water levels began to rise and the modest increase of seven feet compared to larger increases in monitoring wells MW-18 and MW-19, lend support to water level increases due to recharge of the wildlife ponds.

As described in Section 8.0, changes in groundwater flow regime that may occur, such as those resulting from installation or recharge of the wildlife ponds, require establishment of new hydrologic and geochemical conditions. As the system moves toward a new equilibrium condition, natural constituent mass previously stored within sedimentary matrix material will likely be destabilized. This may be mass stored for millennia in the vadose zone that is liberated by increasing water levels, or it may be mass bleeding off from fine-grained sediments that was previously masked by dilution during a period of higher groundwater flow. Destabilization can result from numerous other processes, including a number of different chemical reactions responding to new conditions.

An explanation for co-variation of chloride and uranium in MW-18 and MW-19 that is supported by available data involves uranium mineralization in the Burro Canyon Formation that is destabilized by rising water levels, causing uranium to dissolve and enter groundwater. The presence of uranium deposits in the Burro Canyon Formation has been documented by the US Geological Survey (Haynes et al., 1972). While a uranium deposit is defined as uranium mineralization that is present in a quantity that could be mined for economic gain, sufficient uranium mineralization to cause an increase of 35 µg/L of uranium in MW-18 could be considerably smaller.

On the other hand, chloride is not likely to come from dissolution of mineralization—it is much more likely to come from the wildlife ponds themselves. The wildlife ponds contain whatever runoff water flows to them from upgradient during precipitation events, but are kept full with water from the public water supply (Recapture Reservoir).

Upgradient agriculture and winter road maintenance likely contribute chloride to the wildlife ponds along with whatever chloride concentration is present in the water from Recapture Reservoir (likely less than the near 90 mg/L found in MW-19). Because the White Mesa Mill is located in an area where annual evaporation exceeds precipitation, the chloride in wildlife ponds will build up over time. Water has no way to exit the ponds except by evaporation and seepage to the subsurface. Chloride is not removed by evaporation, thus all the chloride that has entered the ponds over the years is still there or has joined seepage as it exits the pond bottom.

More importantly, evidence from research on groundwater recharge rates in the southwestern United States indicates that a zone of chloride enrichment exists at some level in the vadose zone beneath semi-arid landscapes such as those in the vicinity of the White Mesa Mill. Using chloride mass balance, researchers demonstrated that there has been little to no recharge over much of the regional southwest since the Pleistocene (Phillips, 1996; Walvoord, 2003). This was demonstrated by measuring chloride concentration profiles in residual pore water in the vadose zone at numerous locations across the southwest. Figure 16 (from Walvoord, 2003) is an example of the result of these measurements. Note that in this study, pore water concentrations are typically in the range of 2,000-3,000 mg/L at a depth of 5-10 meters (15-30 feet) below the surface.

Figures 7 and 18 indicate that rising water levels beginning in 1993 carried a slug of chloride and uranium through MW-19. Although water levels in MW-19 are still rising, it appears that this slug could have peaked in about 2001 because the bulk of the soluble chloride and uranium between the wildlife pond and the well was depleted. The same slug now appears to be moving through MW-18. However, the chloride concentrations at MW-18 are diluted by molecular diffusion and advective dispersion. The uranium concentration at MW-18 has likely increased by additional mass encountered in the distance between MW-19 and MW-18. Figures 7 and 18 indicate that water levels just beginning to rise in MW-1 may be beginning to affect chloride and uranium concentrations at that location as both have risen steadily (albeit, at very low levels) in the last three measurements.

Similar processes may be at work at the location of monitoring well MW-26 but, if so, they are obscured by the short period of record and activities related to chloroform remediation. MW-26 is an extraction well and water levels are falling at this location. While uranium data displays an increasing trend, chloride, which is in a range similar to that seen in MW-18, does not display an increasing trend. It is unclear how the presence of chloroform-related constituents and pumping from this well have altered the groundwater system at this location (see Section 7.4).

12.3 Monitoring wells Adjacent to the Tailings Impoundments

Another wildlife pond exists on the southeastern edge of the site, and the closest monitoring wells (MW-11, MW14, and MW17) have also seen an increase in water levels (Figures 2 and 7). MW-14 and MW-17 have also seen rising trends in uranium (Figure 17), but none has a rising trend in chloride or a trend in the chloride-uranium plots (Figure 17). It is unclear why the uranium in these wells is not associated with chloride as seen in wells near the northern-most wildlife ponds. One possibility is that the southern pond was constructed in an arroyo bottom where, as described by Phillips (1995), recharge to groundwater likely does occur and vadose zone chloride would likely be depleted.

It appears that water levels began to rise in the early 1990s in MW-11, for a total rise of about 10 feet (Figure 7). The water level rise in MW-14 may have begun around the same time but the total rise has been less than two feet. The total water level rise in MW-17 has been near eight feet beginning in 1999. The water level change in MW-11 has been the largest and it has arguably been occurring for the longest, but chloride and uranium appear to have remained relatively constant at between 30-35 mg/L and less than 4 μg/L, respectively (Figure 18). Uranium has climbed from near 40 μg/L in MW-14 to near 70 mg/L while chloride has been constant at near 20 mg/L. At MW-17, uranium concentrations appear to have climbed to a high near 40 μg/L in the 2000-2001 time frame and subsequently declined while chloride remained relatively constant near 30 mg/L (Figure 18).

While groundwater levels have risen less than one foot in MW-12 and MW-15 (Figure 7), groundwater samples from these wells also exhibit rising trends in uranium concentrations (Figure 18). Interestingly, while uranium concentrations rose from 3 μg/L in 1983 to a 2007 value of 19.4 μg/L in samples from MW-12, chloride concentrations exhibit a significantly declining trend (Table 16) from 80.5 mg/L in 1983 to the 2007 value of 61 mg/L in that well. Uranium concentrations are highly variable in samples from MW-15 but generally increase by about 30 percent from near 38 μg/L in 1990 to near 50 μg/L in 2007 while chloride has been relatively constant near 40 mg/L.

12.4 Far Downgradient Monitoring wells.

Like data from MW-12, MW-14, MW-15, and MW-17, data from far downgradient monitoring well MW-3 does not display co-variant chloride and uranium concentrations but does exhibit a rising trend in uranium concentrations. Uranium concentrations have increased from 14 μg/L in 1979 to 30.2 μg/L in 2007. Chloride concentrations were measured at 62 mg/L in 1979 and 63 mg/L 2007. Nevertheless, a slight but significant decreasing trend in chloride concentration was calculated using Mann-Kendall (Table 16). No trends in groundwater levels have been observed.

12.5 General Observations

While chloride-uranium time concentration trends and scatter plots for wells other than MW-18 and MW-19, as presented in Figures 17 and 18, indicate no noteworthy correlation between chloride and uranium in most wells and no spatial relationship between the distribution of uranium concentrations in groundwater and tailings cells or processing facilities, there is additional useful information to be extracted from evaluation of uranium and chloride concentrations at the site, which can be summarized as follows:

- Because of its well documented fate and transport characteristics and presence at high concentrations in the tailings impoundments, monitoring of chloride concentrations in groundwater provides the highest potential for early detection of potential seepage from the tailings impoundments. However, uranium is also a good indicator parameter and a constituent of concern at a uranium mill, and for these reasons uranium is also a good trace element. While it may be possible that the first indication of potential tailings seepage could be rising chloride concentrations alone, it is improbable that rising uranium concentrations without a corresponding rise in chloride concentrations could result from potential tailings seepage.
- MW-18 and MW-19, which exhibit co-variance of chloride and uranium, are more than three quarters of a mile upgradient of the nearest tailings impoundment. Their location precludes the possibility that concentrations of constituents in these wells are the result of potential tailings seepage. The co-variance of chloride and uranium in upgradient wells is most likely due to rising groundwater levels originating as seepage from the wildlife ponds on the northeastern boundary of the site.

- The wildlife pond on the southeastern boundary of the site also contributes to rising groundwater levels and rising uranium concentration in some wells may be associated with the water levels, but rising chloride concentrations are not associated with rising uranium concentrations.
- In fact, the chloride and uranium concentrations are highly variable from one well to another (Table 16) in the areas adjacent to the tailings impoundments.
- While samples of groundwater from MW-5 has average chloride concentrations that are among the highest observed (52 mg/L) and uranium concentrations among the lowest observed (1 µg/L), both data sets tested as having statistically significant negative trends (Table 16).
- The next well to the east, MW-11, has no apparent trends but similar average uranium concentration (1 µg/L). However, the average chloride concentration is more than 30 percent less than MW-5 at 33 mg/L.
- The difference in chloride concentration in groundwater samples from these two wells has been consistent for over 25 years of sampling.
- There is no systematic variation in either chloride or uranium concentrations or in trends in concentration or water levels that might suggest impact from tailings impoundments.

The observations detailed above demonstrate that uranium trends in monitoring wells at the site do not have associated increases in chloride concentrations that would be expected if potential tailings seepage were impacting groundwater. Further, wells that exhibit increasing trends in uranium bear no spatial relationship to the tailings cells. Upgradient as well as far downgradient wells have increasing uranium trends.

Based on the discussion of retardation and potential use of constituents as tracers of milling impact to groundwater in Section 9.0 and numerous studies of trace element behavior (Yu et al., 2001), uranium has potential to be the most mobile of the trace element (i.e. present at the parts per billion level) constituents that are present in the uranium milling process and generally considered to be of greatest concern. If chloride and uranium have not impacted groundwater in the 26 years that the Mill has been operational, it is unlikely that less mobile trace element constituents in tailings fluids have or will impact groundwater.

The distribution of uranium has been demonstrated above to be unrelated to tailings cells or milling processes at the site. Therefore, we conclude that current variability in groundwater concentrations represent natural variability in the Burro Canyon Formation and should be incorporated into calculations of GWCLs. A corollary conclusion is that trends in concentrations observed, for example, in selenium concentrations measured in groundwater samples from upgradient monitoring well MW-19 and a downgradient well MW-3, also represent natural variability and should be factored into compliance monitoring.

13.0 CALCULATION OF GWCLS

Part I.B of the GWDP contemplates that background groundwater quality will be determined on a well-by-well basis, as defined by the mean plus two standard deviations concentration. However, calculating the GWCL as the mean plus two standard deviations is only appropriate for normally or log-normally distributed constituents where the number of non-detects is 50 percent or less (EPA Guidance, 1992).

This is recognized in the Flow Sheet where the manner of calculating the GWCL for each constituent depends on the percentage of non-detects in the data set for the constituent, whether the data set is normally or log-normally distributed or non-parametric and whether or not the data set has been impacted by Mill activities or is representative of background. The Flow Sheet contemplates that each data set will be screened for any statistically-significant upward trends (decreasing pH) to help determine if there may have been any impacts from Mill operations on the data set.

If there are no statistically-significant upward (decreasing pH) trends, then the Flow Sheet specifies the manner of calculating GWCLs. If there are any such trends, then an analysis must be performed to determine if the trend is the result of Mill activities or natural background influences. If it is concluded that the trend is the result of natural background influences, then an appropriate GWCL must be developed for the constituent, bearing in mind that the GWCL not be established such that it will be violated in due course as a result of increasing concentrations of the constituent that are solely due to natural causes.

In accordance with the Flow Sheet, trend analysis was completed for each constituent in each well (Section 6.1 and Appendix D). Statistically-significant upward trends (downward in the case of pH) were identified in Table 16 and tabulated in Table 7.1-1. These trends were evaluated carefully in Section 11.0 and we have concluded that none of them are the result of Mill activities. This analysis, together with the analysis in Sections 10.0 (Spatial and Temporal Distribution of Indicators of Potential Impact) and 12.0 (Additional Valuation of Uranium Trends) and elsewhere in this report, all lead to the conclusion that Mill activities have not impacted groundwater at the site (other than the chloroform contamination caused by pre-Mill activities discussed in Section 7.3).

As a result, it is appropriate to calculate the GWCLs in accordance with the Flow Sheet, as discussed below.

13.1 Constituents That Do Not Exhibit a Statistically-significant Rising (Decreasing for pH) Trend

In accordance with the Flow Sheet, constituent databases that do not exhibit a statistically-significant upward trend (decreasing pH), have been divided into the following categories and the proposed GWCLs calculated as follows:

- Normally or log-normally distributed, with 0-15 percent non-detects. For these constituents, the mean and standard deviation have been calculated in regular manner and the GWCLs were calculated as the mean plus two standard deviations.

- Normally or log-normally distributed, with >15-50 percent non-detects. For these constituents, the mean and standard deviation have been estimated using Cohen's method and the GWCLs were calculated as the Cohen's mean plus two Cohen's standard deviations.

- All constituents having >50-90 percent non-detects or any constituent with 50 percent or fewer non-detects but that is non-parametric. In these cases, the GWCL has been calculated as the greater of: a) the highest historical value for the constituent (the non-parametric method suggested in those circumstances by EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4-4.5(B)(2) or 4.6(B)(2) (which is the basis for the existing GWCLs in the GWDP).

- All constituents having greater than 90 percent non-detects. For these constituents, the GWCL has been calculated as the greater of: a) the Poisson limit (as suggested in EPA Guidance [1992]), and b) the fractional approach under UAC R317-6-4-4.5(B)(2) or 4.6(B)(2).

The proposed GWCLs for all constituents in the foregoing categories are set out in Table 16.

13.2 Constituents with a Statistically-Significant Rising (Decreasing pH) Trends

For those constituents with a rising (decreasing pH) trend, the Flow Sheet indicates that a modified approach to determining the GWCLs should be considered in order to recognize the fact that GWCLs set at absolute values are subject to being violated as a result of such trends, solely due to natural background causes.

We have reviewed each of these data sets and have concluded that a reasonable approach would be to set the GWCL as the highest of: a) the Flow Sheet manner of calculating GWCLs for the various categories described in Section 13.1 above for non-trending constituents; b) the highest historical value; and c) the fractional approach under R317-6-4-4.5(B)(2) or 4.6 (B)(2).

If natural influences continue to cause a rising trend (decreasing pH) in any constituents that lead to a violation of any of the proposed GWCLs, then the fact that they are subject to natural background influences should be taken into account in evaluating any out-of-compliance situations. Specifically, Part I-G.4 of the GWDP should be amended to contemplate an investigation as to whether or not an "out-of-compliance" situation has been caused by natural influences, and to provide that a remedial action would not necessarily be required under the GWDP. If it is not possible to make such an amendment to the GWDP, then further thought should be given to getting GWCLs for upward trending constituents.

In addition, the proposed GWCLs set out in Table 16 for trending constituents should be re-evaluated upon GWDP renewal to determine if they are still appropriate at the time of renewal.

Accordingly, Table 16 indicates the proposed GWCLs for these trending constituents.

13.3 Qualifications

13.3.1 Change of Water Quality Classification

Table 1 of the GWDP lists the Groundwater Classification for each monitoring well at the Mill site, based on the historic average TDS for each well. Part 1A on page 4 of the Statement of Basis for the GWDP states that:

> *"The Executive Secretary has established a general policy that allows groundwater classification to be based on a statistical construct of the mean total dissolved solids (TDS) concentration plus the second standard deviation ($X+2\sigma$). Using a well-by-well approach, this $X+2\sigma$ value would be derived from available data from each individual well. Inherent in this approach is the assumption that the TDS data used for this basis is composed solely of data*

representative of background or natural conditions at the site, and not groundwater quality altered by the facility in question.

In determination of the background TDS concentrations, the Executive Secretary typically considers concentration trend or time series analysis. Spatial analysis of the data may also be considered to evaluate proximity of the reported concentrations to possible contamination sources…

. . .

Evaluations of this kind will be submitted shortly by IUC in the Background Groundwater Quality Report (Part I.H.3), and reviewed by the Executive Secretary. Pending this submittal, the Executive Secretary has decided to base the well-by-well groundwater classification on the average TDS concentration available, and omit any consideration of concentration variance. This approach is conservative, in that it will result in a generally lower concentration basis for the classification decision. At some future date, when such evaluations are available and found acceptable by the Executive Secretary, the background TDS concentrations will be revised, and the Permit re-opened and modified, pursuant to Part IV.N.2 or 3 of the Permit."

In addition, under UAC R317-6-3.6, Class III water is defined as having one or both of the following characteristics: a) TDS greater than 3,000 mg/L and less than 10,000 mg/L, or b) one or more contaminants that exceed the groundwater quality standards listed in Table 1. Table 1 lists the groundwater quality standard for uranium at 0.03 mg/L.

The Flow Sheet contemplates that in certain circumstances the GWCL for a constituent is the greater of the historic value and a fraction of the GWQS in accordance with UAC R317-6-4-4.5(B)(2) or 4.6 (B)(2). For Class II water, the fraction is one-quarter and for Class III water the fraction is one half. In order to properly apply the Flow Sheet it is, therefore, necessary to determine if the background groundwater quality data for a monitoring well that is currently classified as Class II should be re-classified as Class III water. This would be the case if the well has a mean plus two standard deviations TDS that exceeds 3,000 mg/L or a proposed GWCL for a constituent that exceeds its GWQS.

On a review of the data for all monitoring wells currently classified as having Class II water (MW-1, MW-18, MW-19, MW-5 and MW-11) set out in Table 16, we have concluded that the classification of the following wells should be changed from Class II to Class III water, for the reasons set out below:

- MW-18, either because the mean plus two standard deviations TDS is 3,199 mg/L, or the proposed GWCL ($X+2\sigma$) for uranium is 55.1 µg/L.

- MW-19 because the mean plus two standard deviations TDS is 4,257 mg/L.

Accordingly, in calculating proposed GWCLs in Table 16 for MW-18 and MW-19, where the proposed GWCL is to be a fraction of the GWQS, we have assumed that the fraction is based on the well having Class III water. We also note that the proposed GWCLs for cadmium and lead in MW-1 and cadmium in MW-5 exceed the respective GWQSs. Consideration should be given as to whether or not it would be appropriate to also reclassify those wells from Class II to Class III water (Table 16 does not assume a re-classification of MW-1 or MW-5)

13.3.2 pH

Neither the GWDP nor the Flow Sheet specifically address the fact that decreases in pH levels at acid leach uranium mills are the concern, not increases in pH levels. As a result, the mean plus two standard deviations is going the wrong direction. Therefore, in Table 16 the proposed GWCLs for pH are <mean minus two standard deviations where appropriate (otherwise the GWCL in the GWDP when appropriate).

13.3.3 Upgradient Wells

Neither the GWDP nor the Flow Sheet distinguishes between upgradient and far downgradient wells, on the one hand, and Mill site wells, on the other hand. The GWDP and the Flow Sheet both require that GWCLs be set for each constituent in upgradient wells and that exceedances of those GWCLs would result in out-of-compliance status under the GWDP. However, by their very nature, upgradient and far downgradient wells measure background. DUSA should not be held responsible for changes in background. Some further thought should be given to distinguishing consequences for out of compliance status for upgradient and far downgradient wells as compared to the other monitoring wells. While the Executive Secretary may not consider MW-3 to be far enough downgradient at this time, given the construction of Cell 4A, to be accorded this status, other wells such as MW-20 and MW-22 that could be added to the monitoring network in the future certainly should be considered to be far enough downgradient to be considered background.

13.3.4 Special Consideration for Chloroform Plume Contaminated Wells and Chloroform Pumping Wells

MW-26 and MW-32 are both monitoring wells under the Chloroform investigation and MW-26 has been impacted by the chloroform plume. These impacts include increased concentrations of chloroform and nitrate and nitrite and other chemicals (see Section 7.3). In addition, MW-26 is a pumping well under the chloroform investigation. Other monitoring wells under the GWDP may have been or may become impacted by the chloroform plume.

For the reasons set out in Section 7.4, we believe that MW-26 should continue to be monitored under the GWDP but that DUSA should not be subject to any out of compliance situations under the GWDP relating to MW-26. In addition, any constituent originating in the chloroform plume that impacts MW-32 and would result in an out-of-compliance situation, should not be considered a violation under the GWDP. For those reasons, we have not proposed any GWCLs for MW-26.

14.0 CONCLUSIONS

This Background Groundwater Quality report has been prepared in accordance with the requirements of Part I.H.3 of the GWDP to evaluate all historic data for the purposes of establishing background groundwater quality at the site and developing GWCLs under the GWDP.

In preparing this report, we have compiled a database of over 31,000 entries, have performed QA/QC analysis on the database, have performed statistical analysis of the data, have analyzed the data and the statistical results as required by Part I.H.3 of the GWDP, and have made such other determinations as we have considered necessary in order to establish background groundwater quality at the site.

In examining groundwater data collected over a period of more than 25 years, we performed statistical analyses on more than 350 data sets representing over 11,000 data records for monitoring wells and constituents listed in the GWDP. Data sets that exhibited significantly rising trends or had proposed GWCLs higher than the GWQS were flagged for additional scrutiny. In addition, constituents that were deemed to have high potential to serve as early indicators of impact from potential tailings seepage received further scrutiny.

A major theme that emerged during the course of this study was the wide variability in groundwater quality exhibited by measurements of samples taken from different monitoring wells. In Section 12.0, an analysis of the co-variance and spatial distribution of early indicators chloride and uranium across the site highlighted the variety of behaviors and relationships exhibited by these constituents in adjacent site monitoring wells. In several cases the concentration of chloride was stable over a long period of record but different from the concentration of chloride in the monitoring well just to the east or west, which had also been stable over the same period of record. Based on this analysis it was possible to conclude that there is no systematic variation in either chloride or uranium concentrations or in trends in concentration or water levels that might suggest impact from tailings impoundments.

As stated in Section 11.0, further evidence of widespread natural variability in groundwater quality is clear from the lack of any systematic pattern to the occurrence of other constituents flagged for additional scrutiny. Figure 15 is a summary of constituents and wells that were flagged for further scrutiny. All monitoring wells, including those located far enough upgradient of the tailings impoundments to preclude impact by tailings seepage and those located far downgradient, had at least two constituent data sets with either significantly rising trends or proposed GWCLs that were higher than the respective GWQS (Figure 15). Interestingly, no monitoring well contained the same suite of flagged constituents and, typically, individual constituents were as likely to be flagged in upgradient or far downgradient wells as they were to be flagged in monitoring wells located adjacent to the tailings impoundments.

Thus, after extensive analysis of the data, we have concluded that there have been no impacts to groundwater from Mill activities. Additional conclusions are as follows:

- MW-26 is in service as an extraction well for ongoing chloroform remediation. Water levels have declined and groundwater from a wide area is being pulled toward the cone of depression caused by pumping. Therefore, MW-26 is no longer appropriate to use as a tailings impoundment monitoring well.

- Even though there are a number of increasing trends in various constituents at the site, we have concluded that none of these trends are caused by Mill activities, for the following reasons:

    - Chloride is unquestionably the best indicator parameter, and there are no significant trends in chloride in any of the wells.

    - There are no noteworthy correlations between chloride and uranium in wells with increasing trends in uranium, other than in upgradient wells MW-19 and MW-18, which we have concluded are not related to any potential tailings seepage. It is inconceivable to have an increasing trend in any other parameter caused by seepage from the Mill tailings without a corresponding increase in chloride.

    - There are significant increasing trends upgradient in MW-1, MW-18, or MW-19 in uranium, sulfate, TDS, iron, selenium, thallium, ammonia, and fluoride and in far downgradient in MW-3 in uranium, selenium, sulfate, TDS and pH (decreasing trend). This provides very strong evidence that natural forces at the site are causing increasing trends in these constituents (decreasing in pH) in other wells and supports the conclusion that natural forces are also causing increasing trends in other constituents as well.

- On a review of the spatial distribution of constituents identified on Table 7.1-1, it is quite apparent that the constituents of concern are dispersed across the site and not located in any manner that would suggest a tailings plume.

As there have been no impacts to groundwater from Mill activities, we have concluded that the GWCLs set out in Table 16 are appropriate at this time. However, the proposed GWCLs for trending constituents should be re-evaluated upon GWDP renewal to determine if they are still appropriate at the time of renewal.

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FIGURES

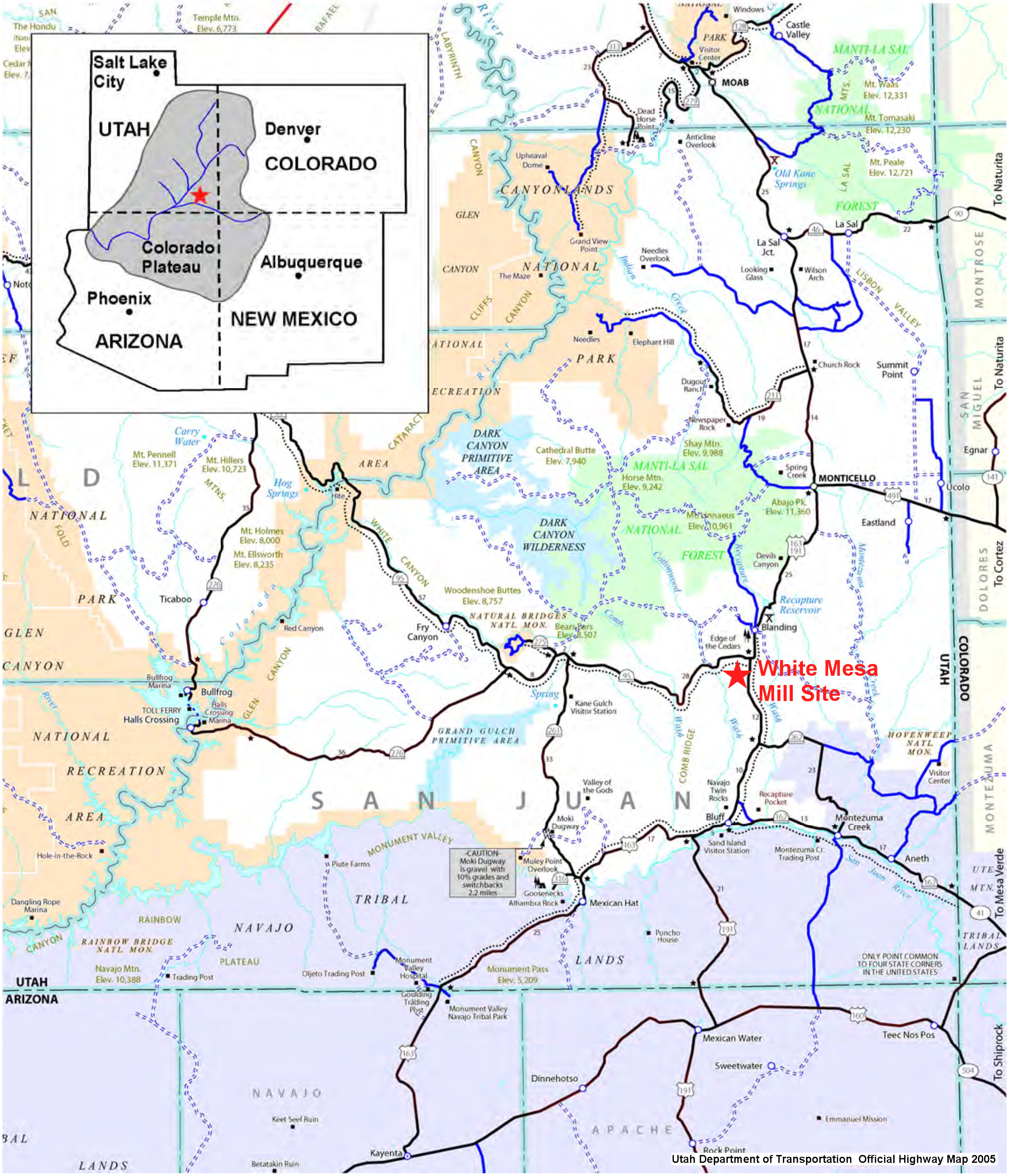


Figure 1
Regional Location Map of White Mesa Mill
Near Blanding, Utah

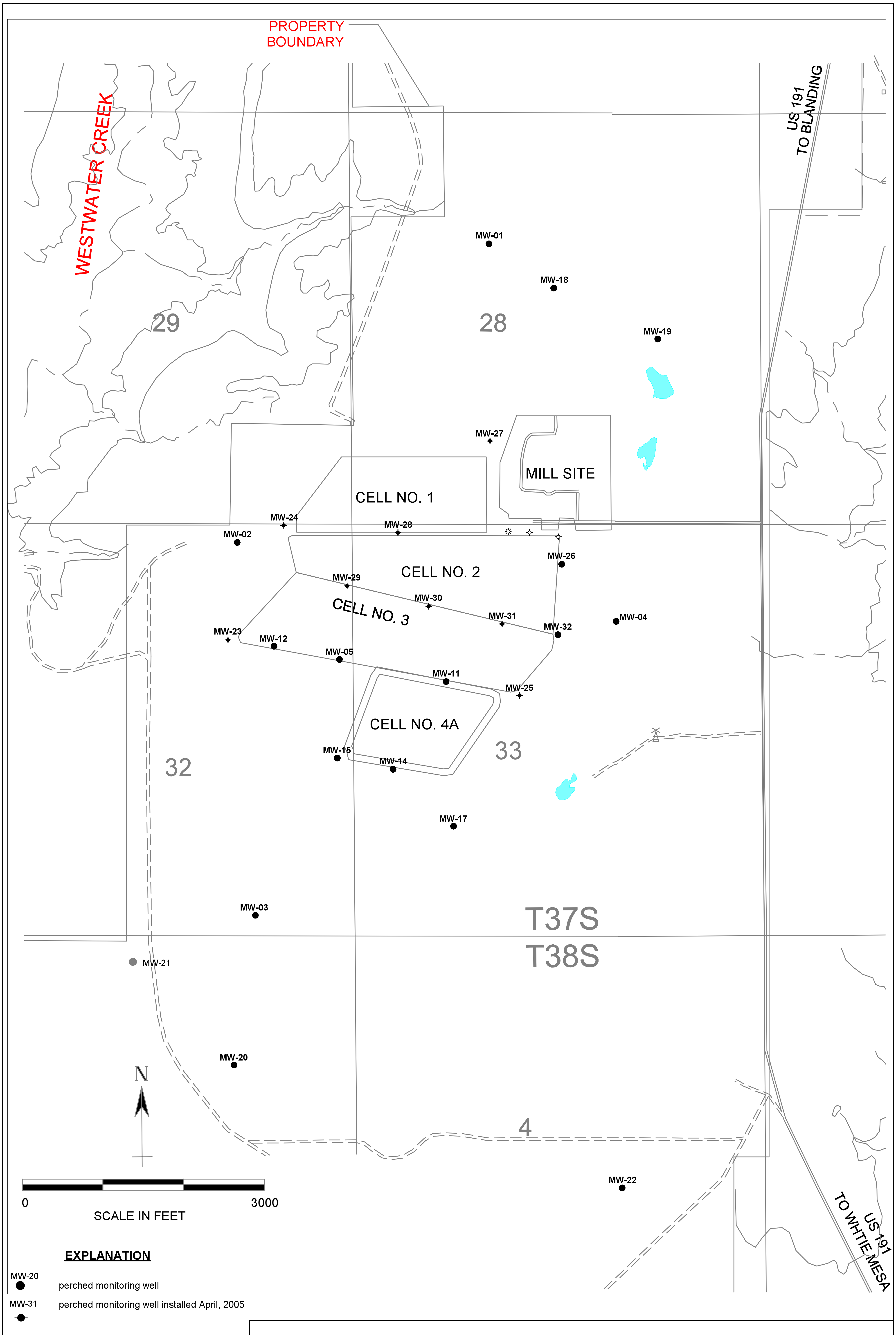
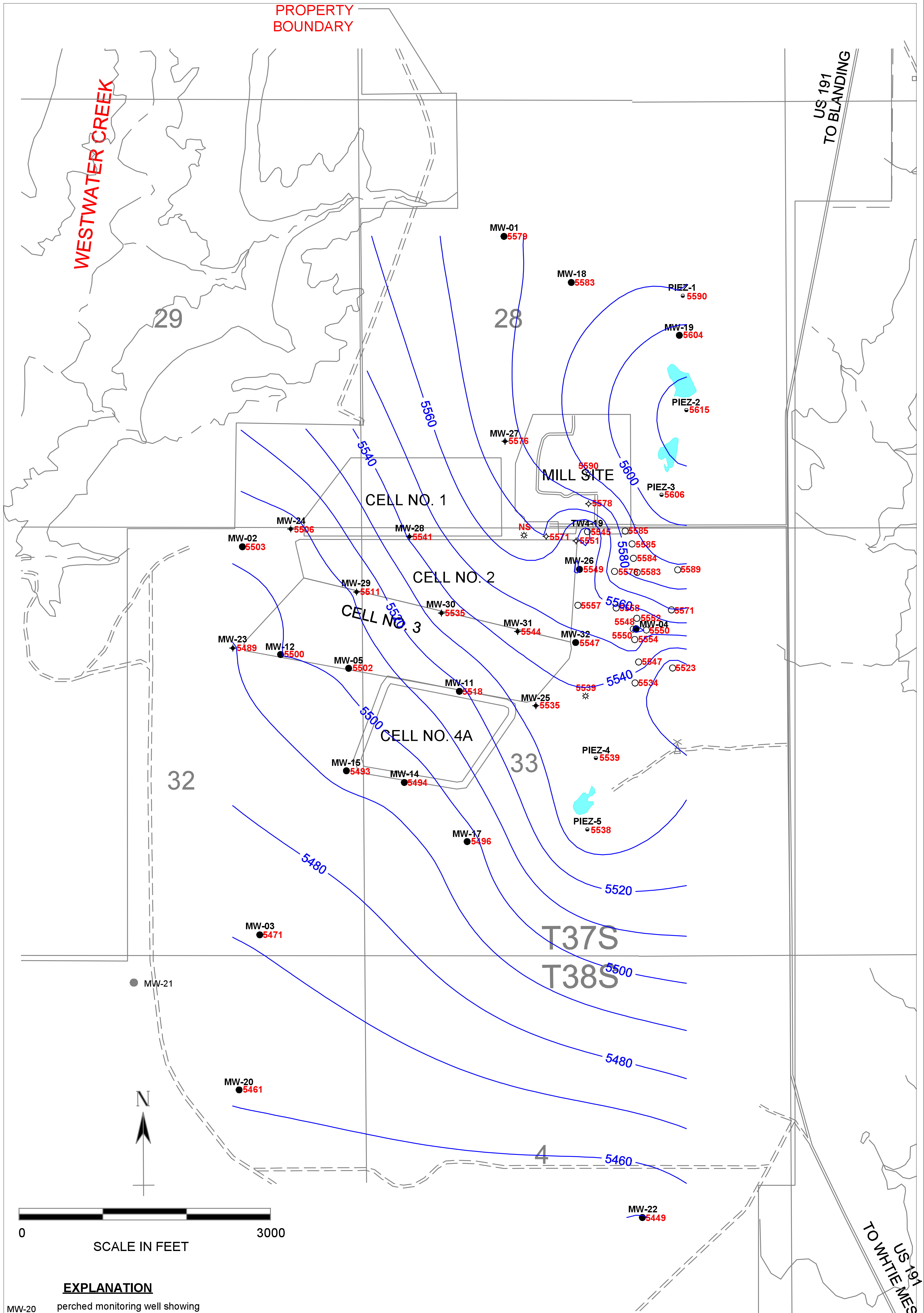


Figure 2
Site Map with Monitoring Well Locations
White Mesa Mill Site

INTERA

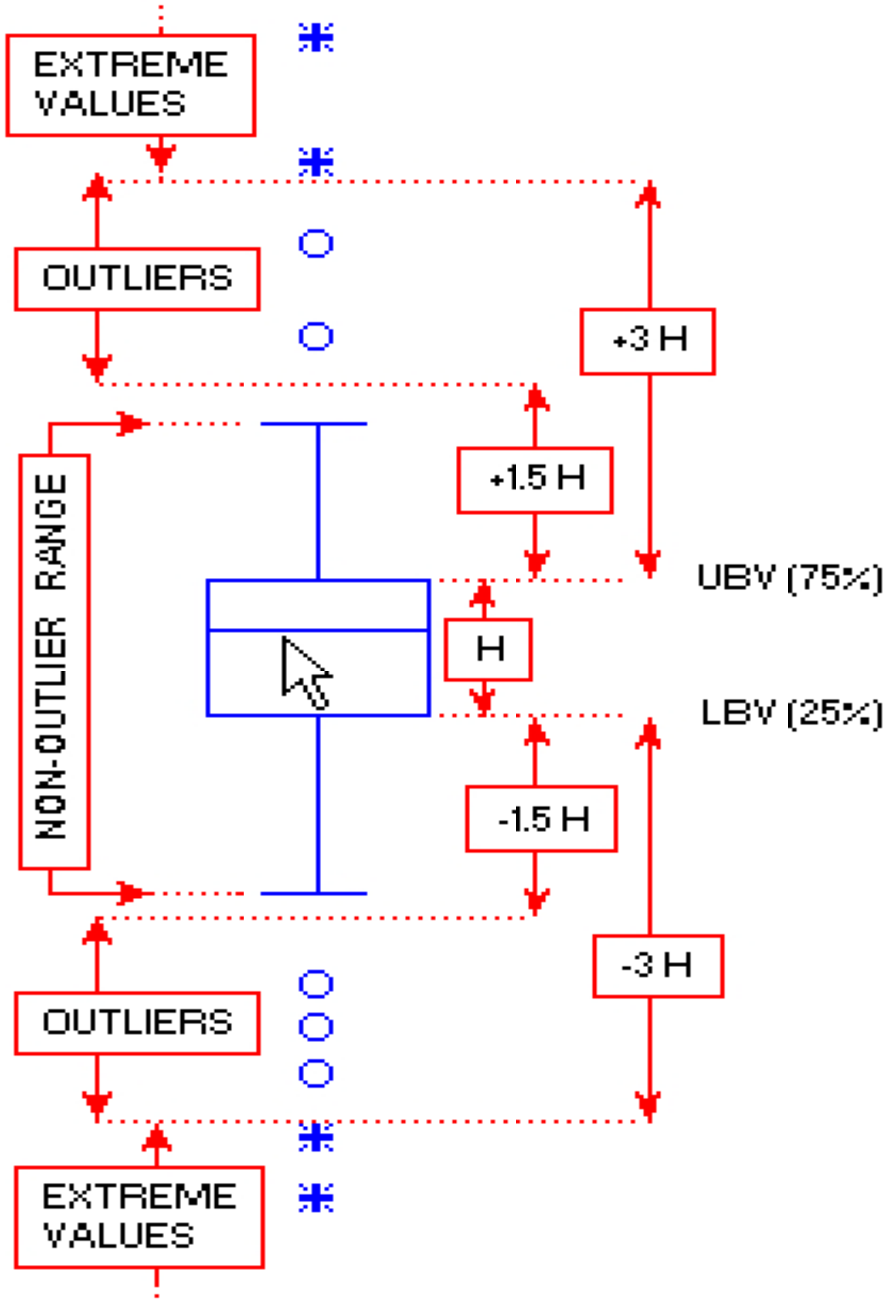


EXPLANATION

- MW-20 ● 5461 perched monitoring well showing elevation in feet amsl
- ○ 5550 temporary perched monitoring well showing elevation in feet amsl
- PIEZ-1 5590 perched piezometer showing elevation in feet amsl
- MW-31 5544 perched monitoring well installed April, 2005 showing elevation in feet amsl
- 5571 temporary perched monitoring well installed April, 2005 showing elevation in feet amsl
- 5539 temporary perched monitoring well installed May, 2007 showing approximate elevation in feet amsl

NOTES: Locations and elevations for TW4-23, TW4-24, and TW4-25 are approximate;
Water levels for all MW-series wells except MW-4, -17, -20, -22, -23, -24, -25, -28, and -32 are from Q1, 2007

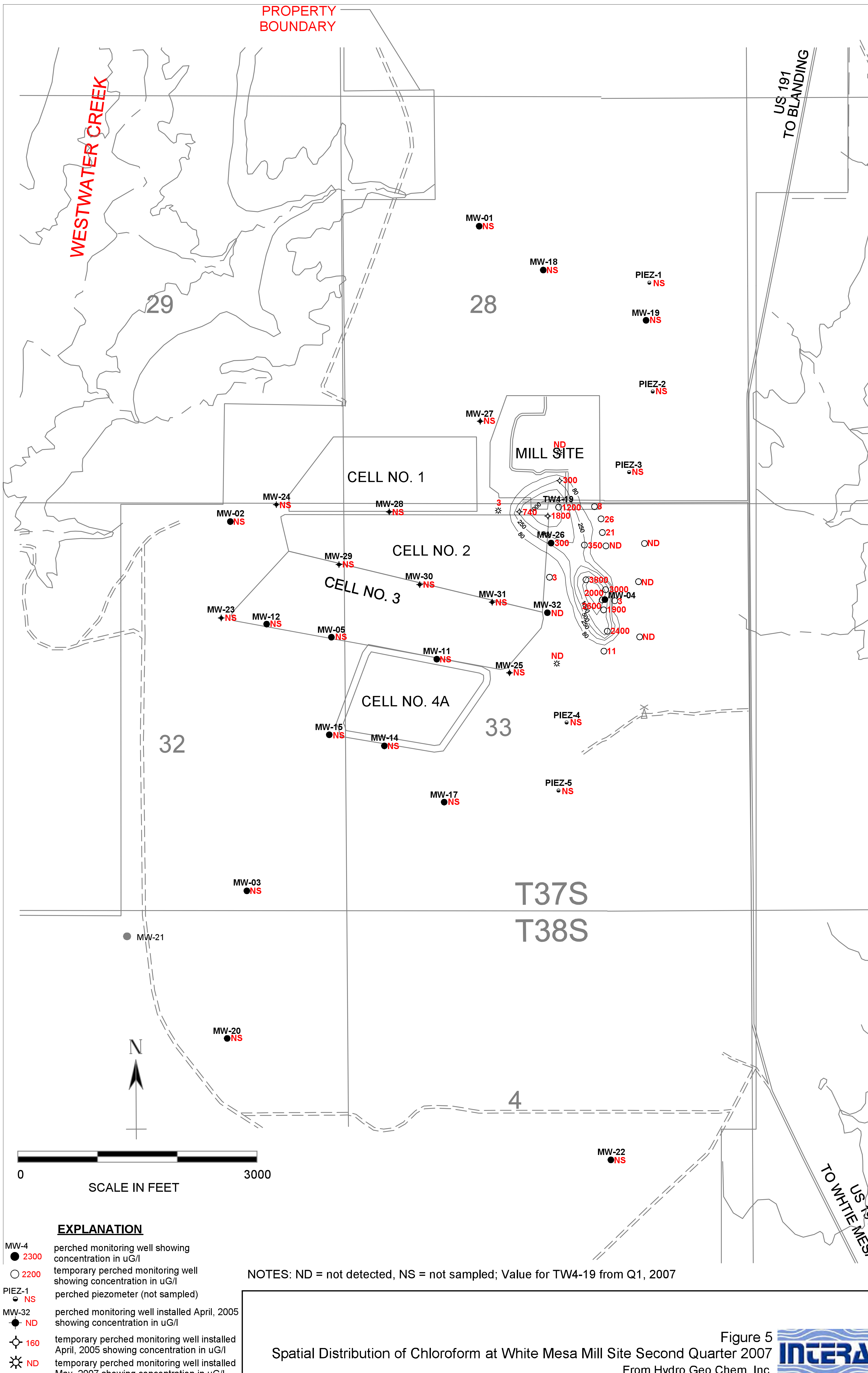
Figure 3
Groundwater Isopleth Map from Second Quarter 2007 White Mesa Mill Site
From Hydro Geo Chem, Inc.



(Statsoft, Inc., 2005) from the Statistica data analysis software system, version 7.1, www.statsoft.com

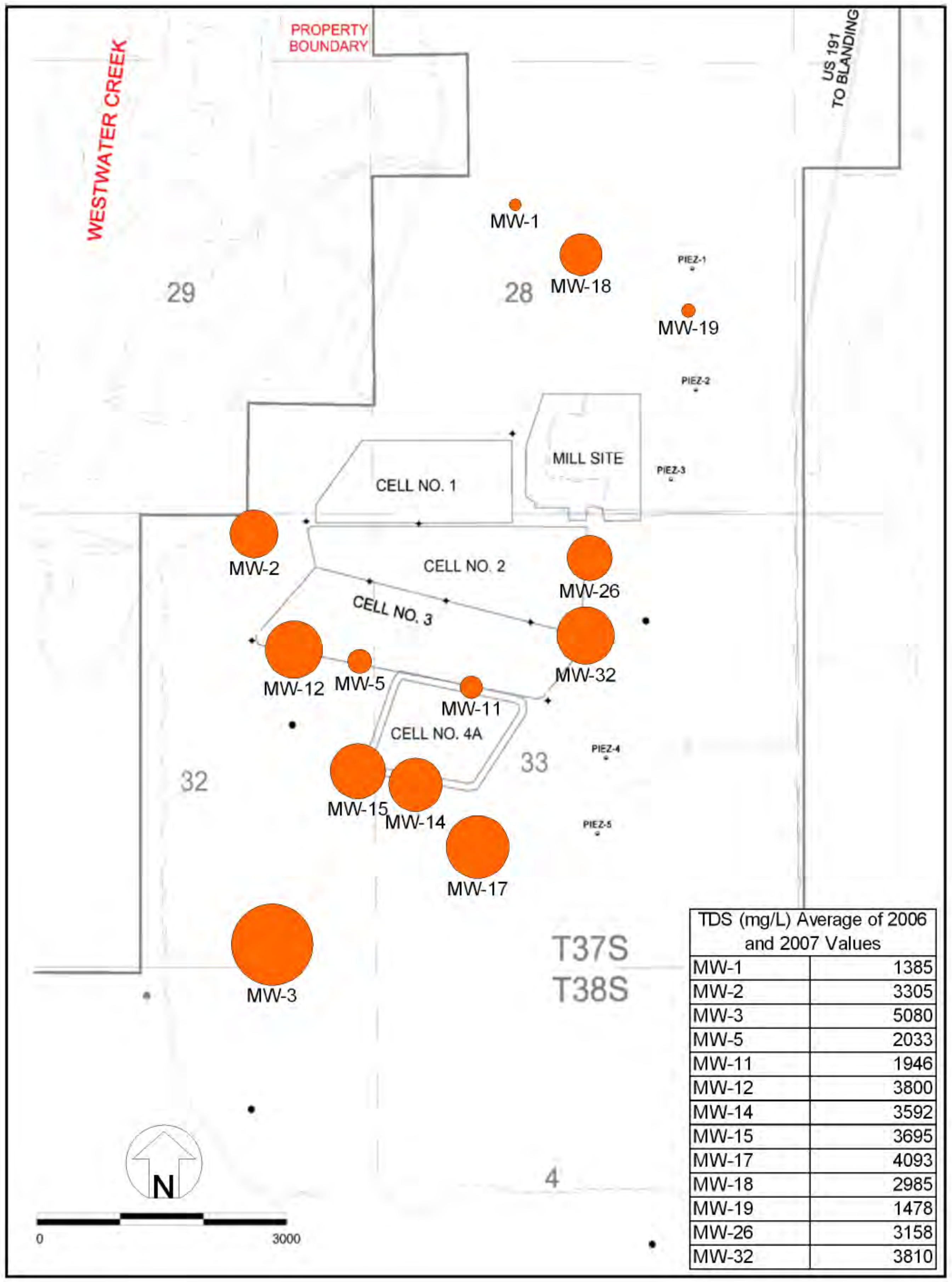
Figure 4
Generalized Box & Whisker Plot

INTERA

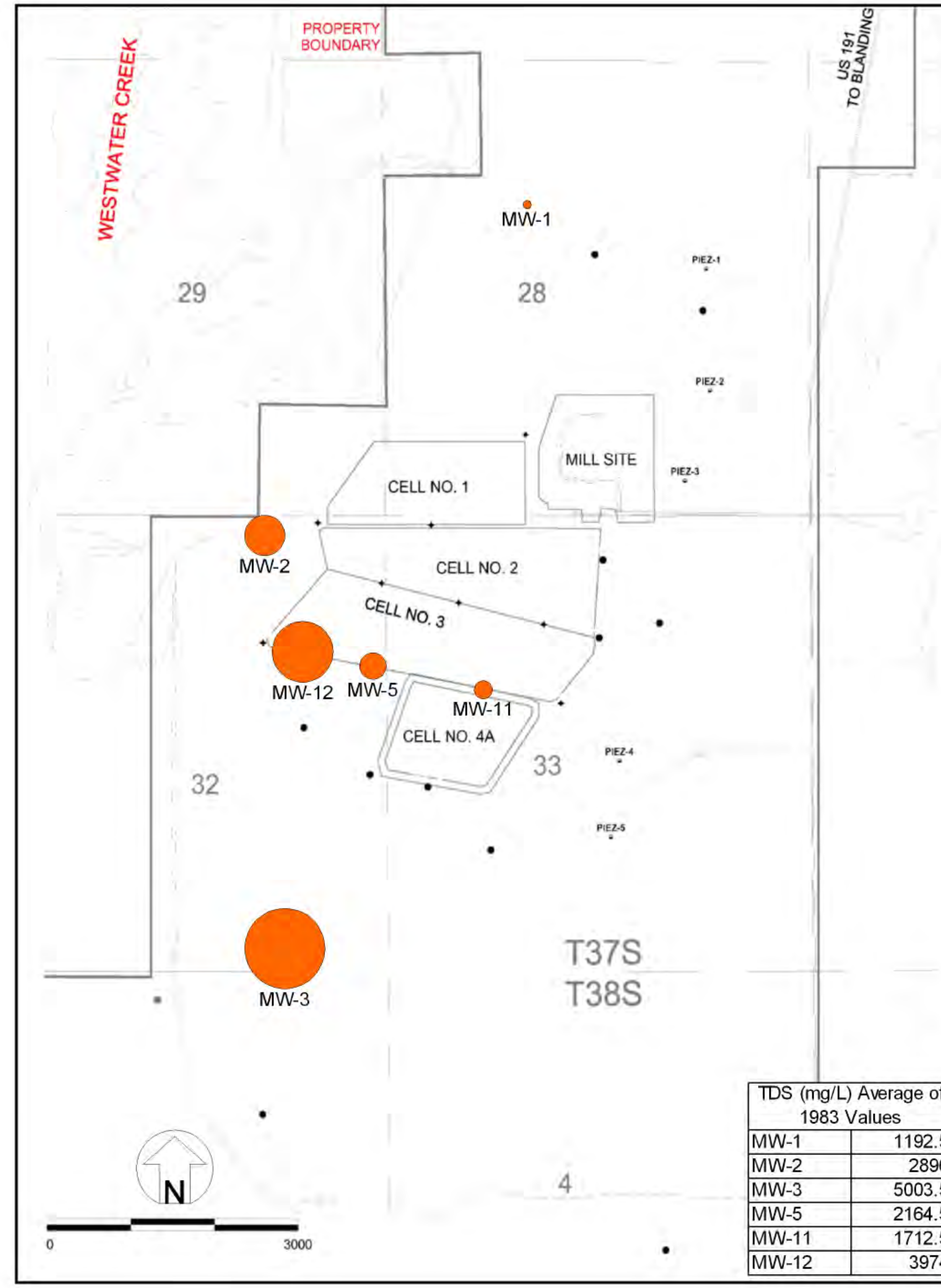


NOTES: ND = not detected, NS = not sampled; Value for TW4-19 from Q1, 2007

Figure 5
Spatial Distribution of Chloroform at White Mesa Mill Site Second Quarter 2007
From Hydro Geo Chem, Inc.



TDS (mg/L) Average of 2006 and 2007 Values	
MW-1	1385
MW-2	3305
MW-3	5080
MW-5	2033
MW-11	1946
MW-12	3800
MW-14	3592
MW-15	3695
MW-17	4093
MW-18	2985
MW-19	1478
MW-26	3158
MW-32	3810



TDS (mg/L) Average of 1983 Values	
MW-1	1192.5
MW-2	2896
MW-3	5003.5
MW-5	2164.5
MW-11	1712.5
MW-12	3974

Figure 6
Map of monitoring wells depicting concentrations of total dissolved solids (TDS) present in samples of groundwater collected in 1983, 2006 and 2007.

INTERA

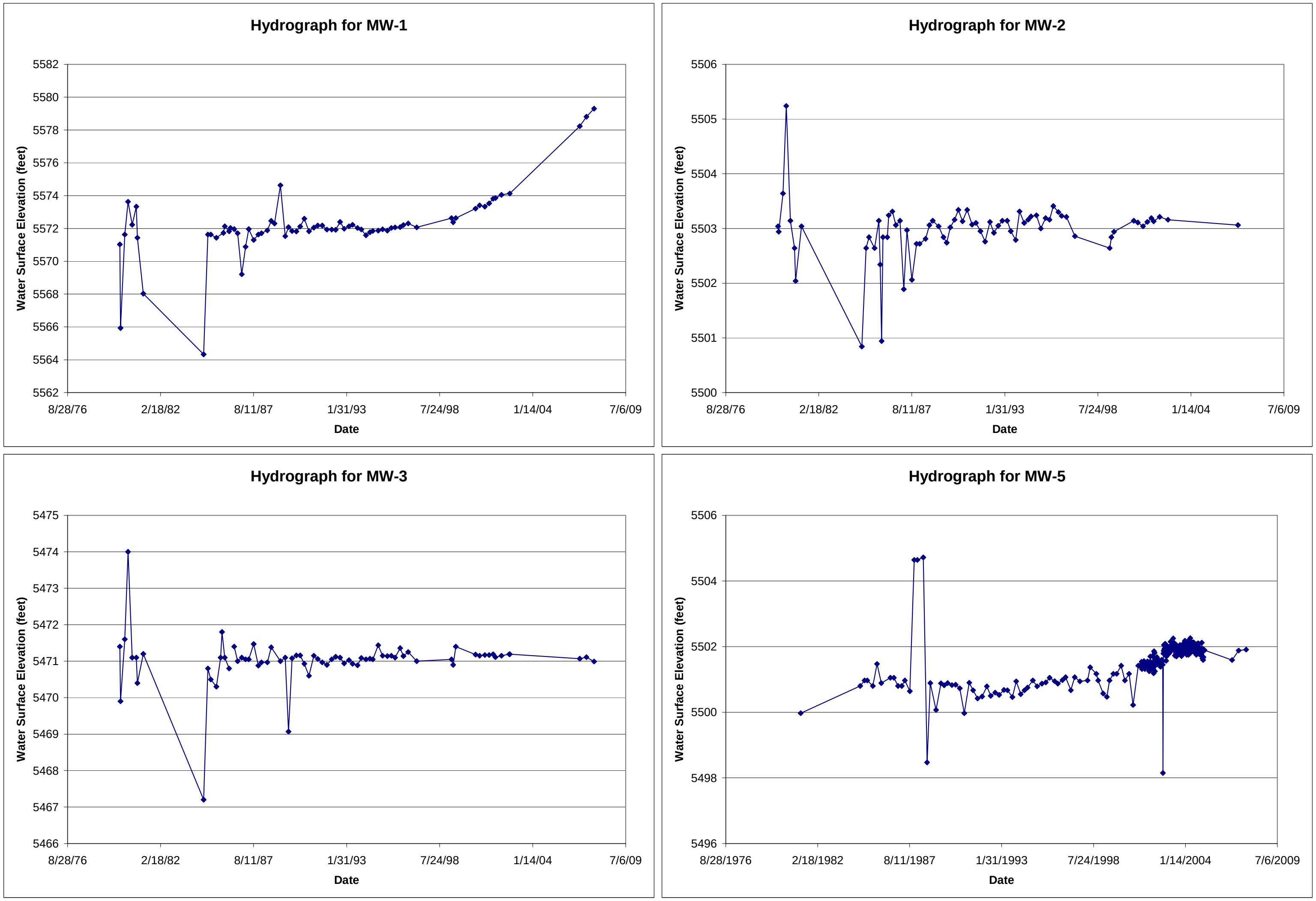
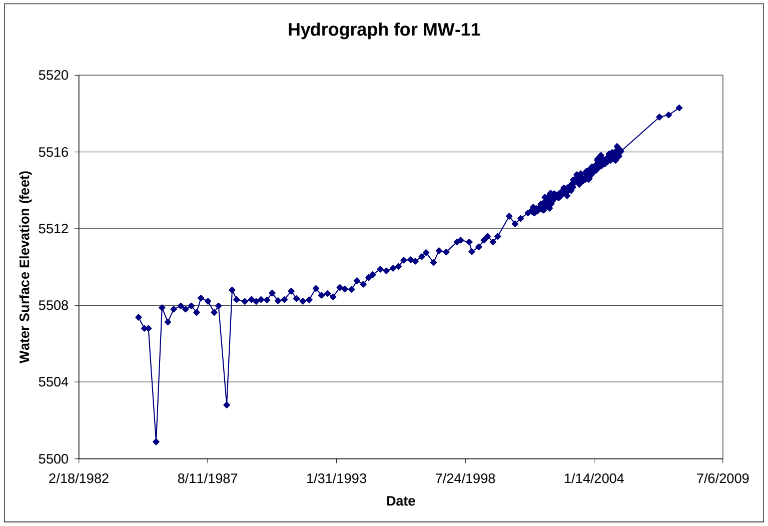
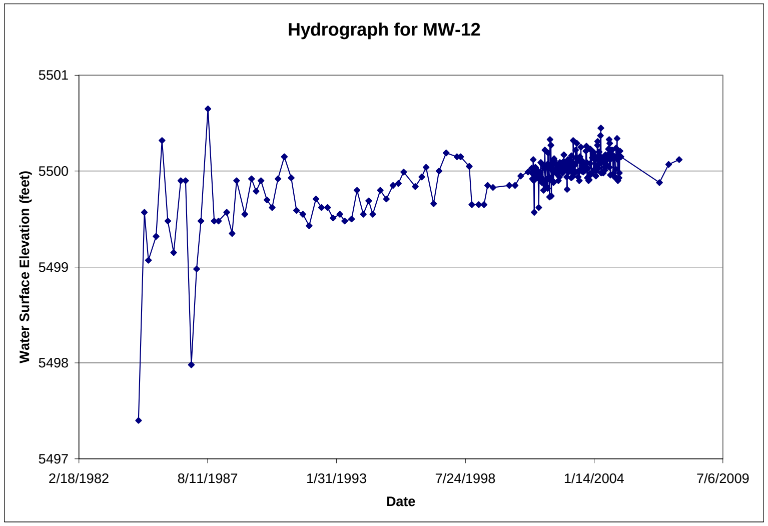
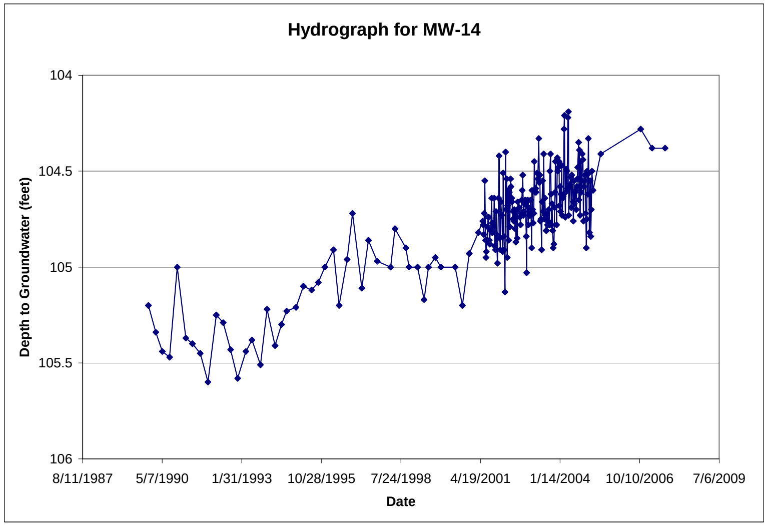


Figure 7
Hydrographs of Site Monitoring Wells
Showing Ground Water Trends Over Time







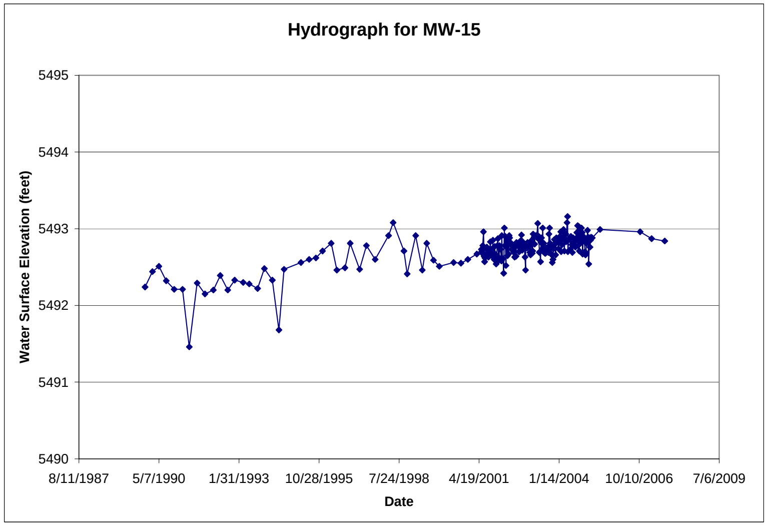
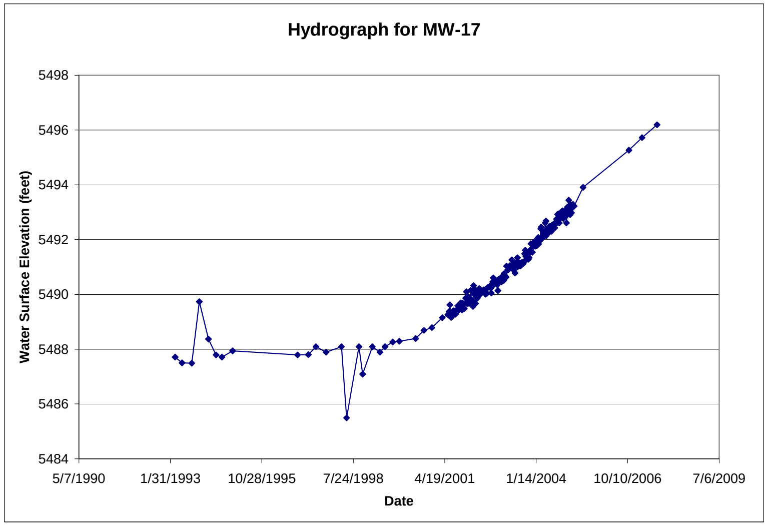
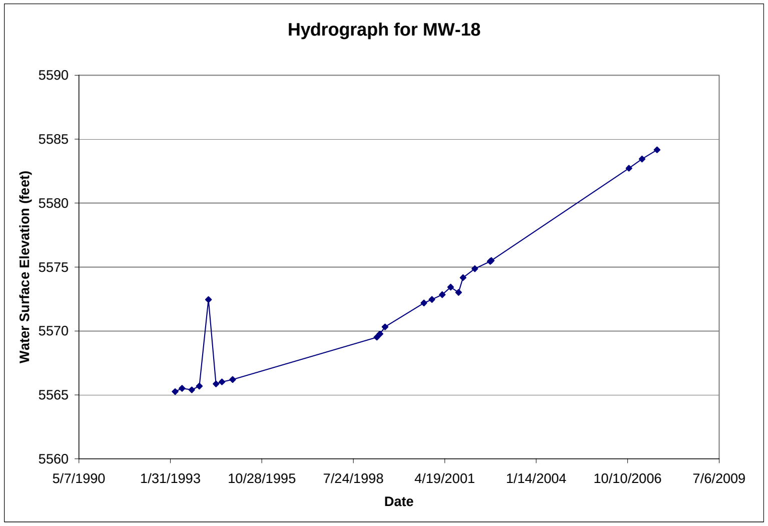
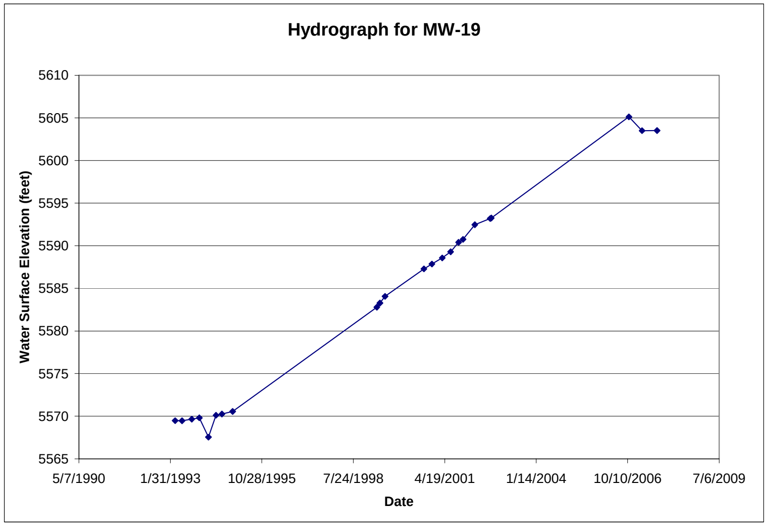


Figure 7
Hydrographs of Site Monitoring Wells
Showing Ground Water Trends Over Time







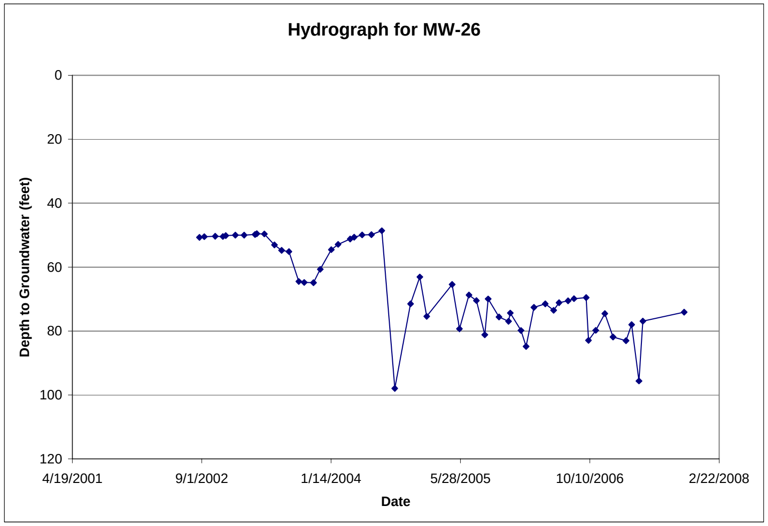


Figure 7
Hydrographs of Site Monitoring Wells
Showing Ground Water Trends Over Time

INTERA

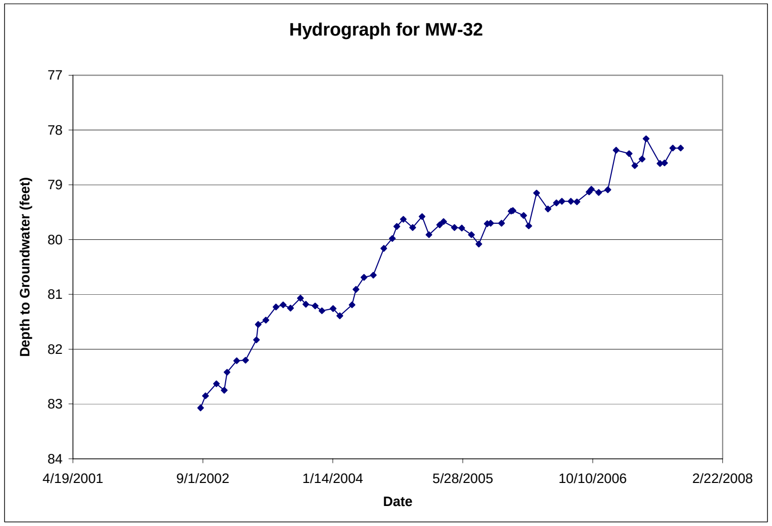
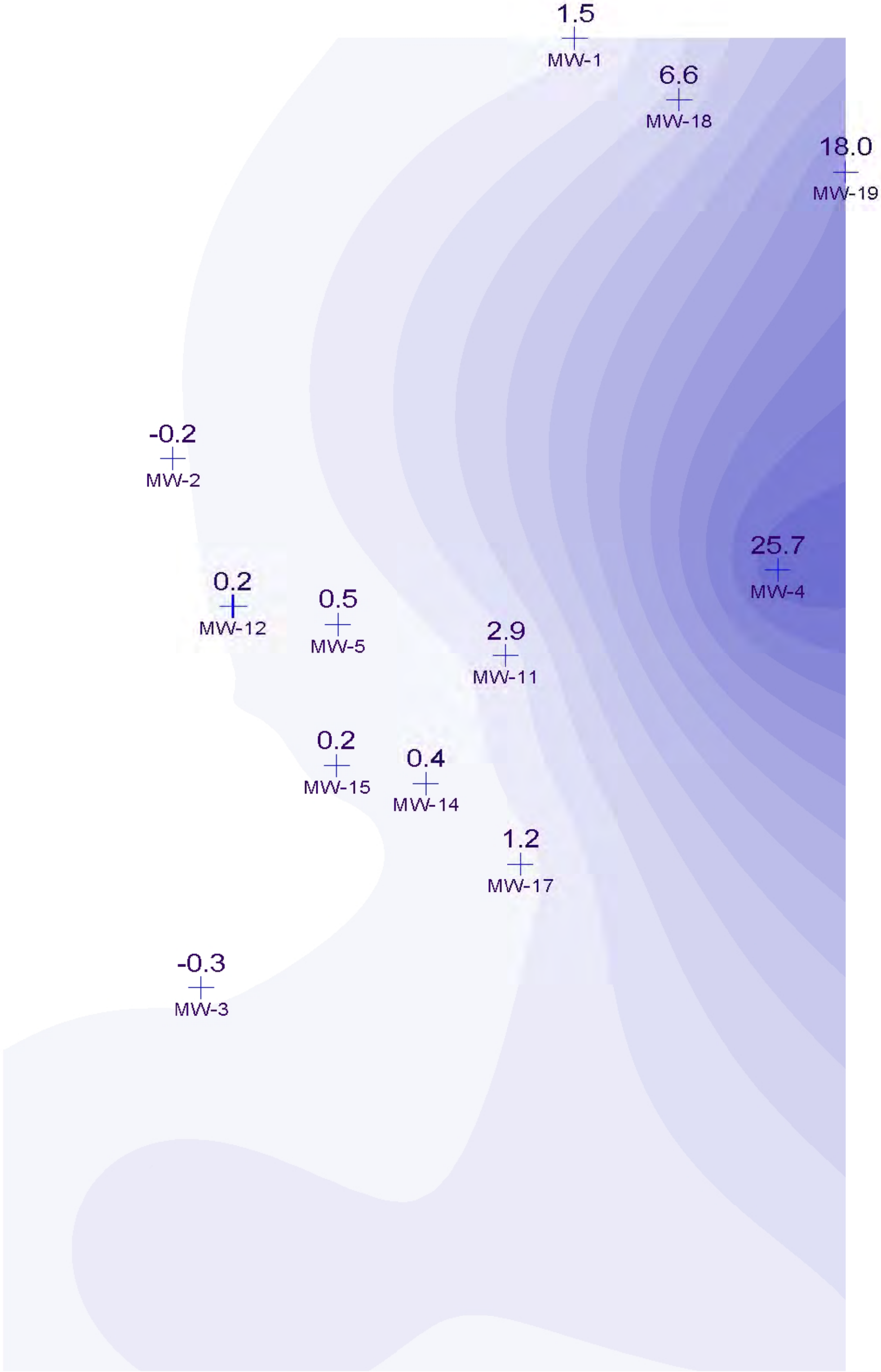


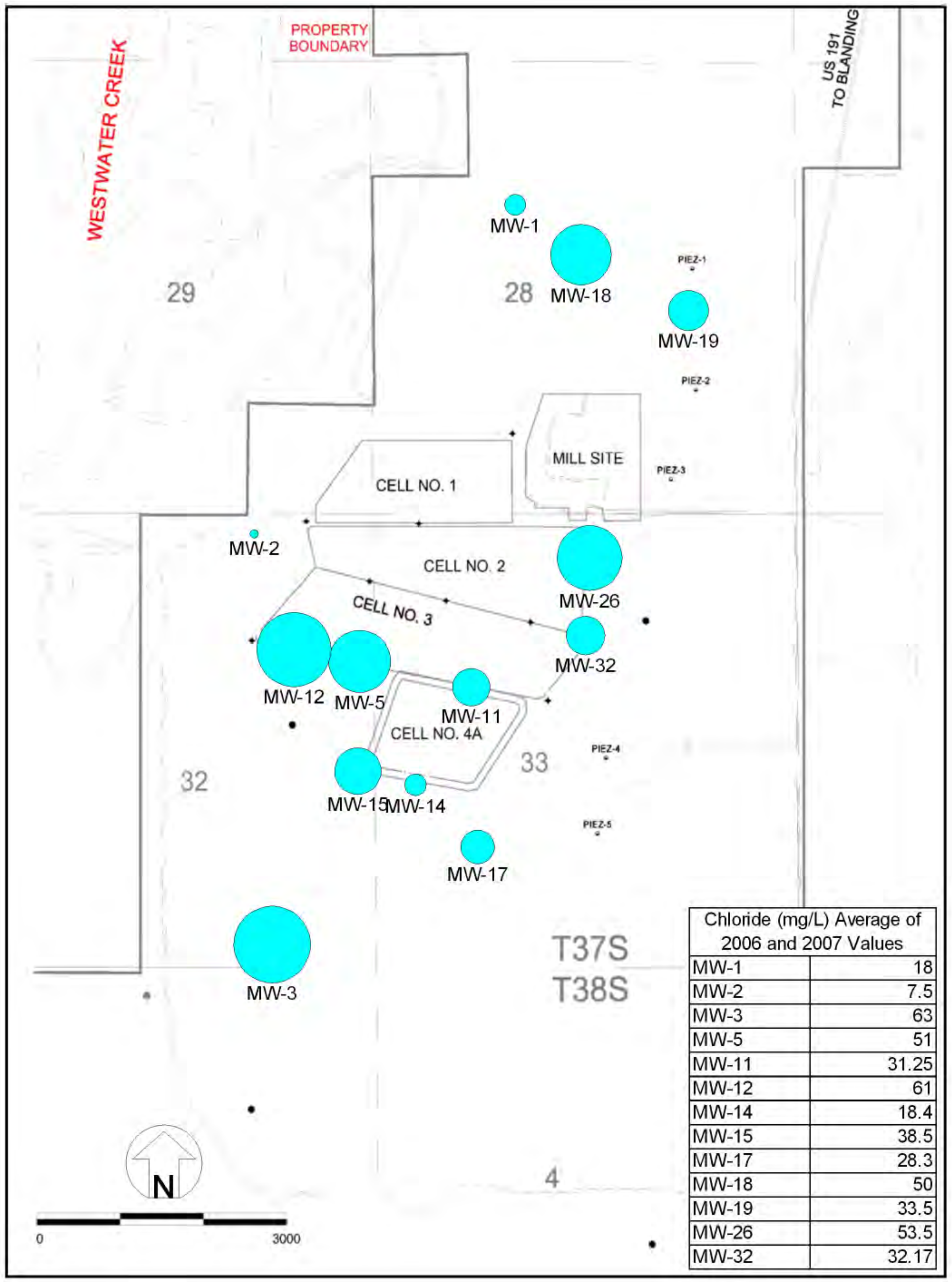
Figure 7
Hydrographs of Site Monitoring Wells
Showing Ground Water Trends Over Time



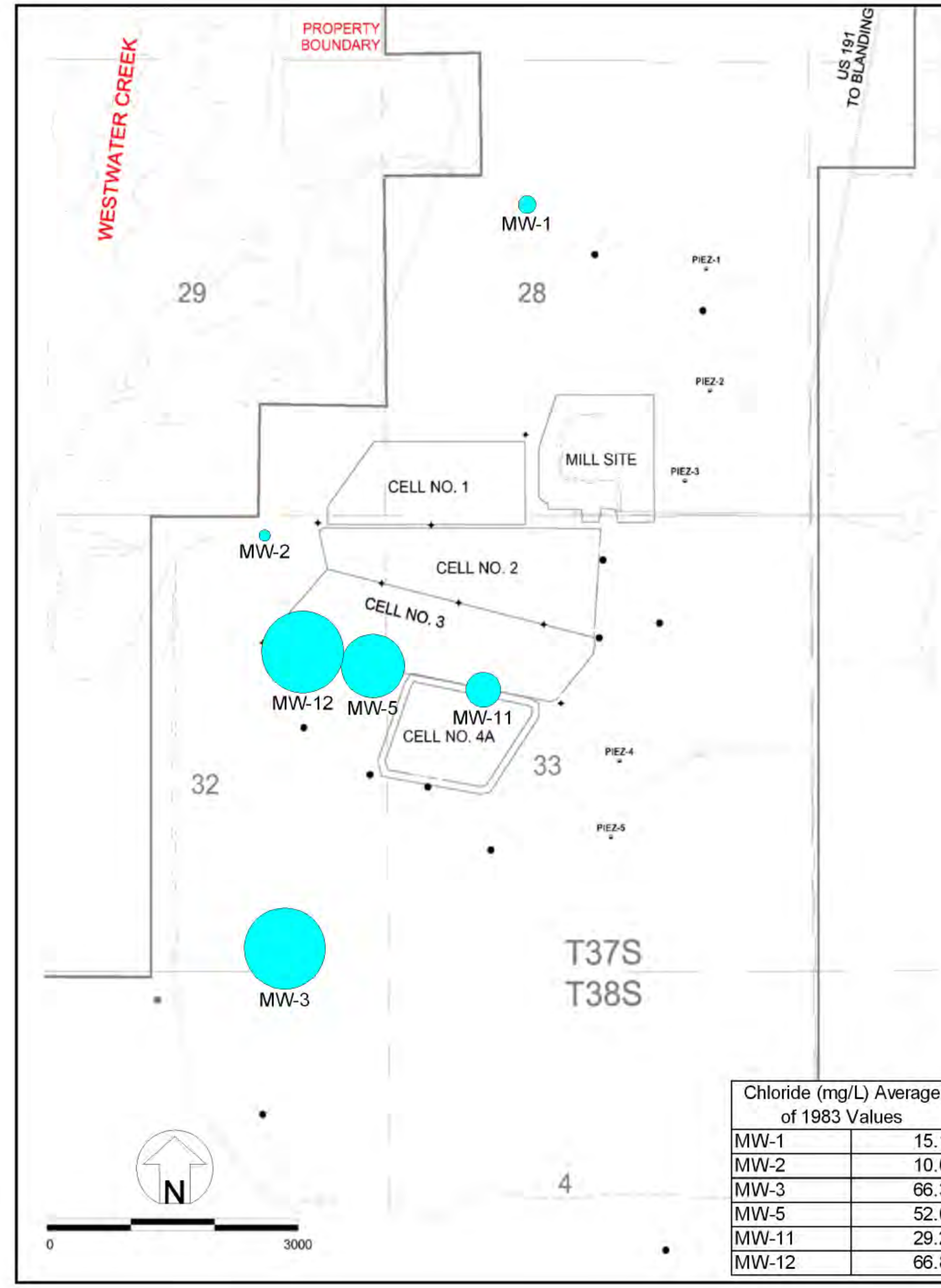
The number posted above each monitor well symbol is the difference in feet between the 2001 water level data available for each well and measurements taken in 1994.

Figure 8
Spatial Distribution of Water Level Changes from 1994 to 2001

INTERA



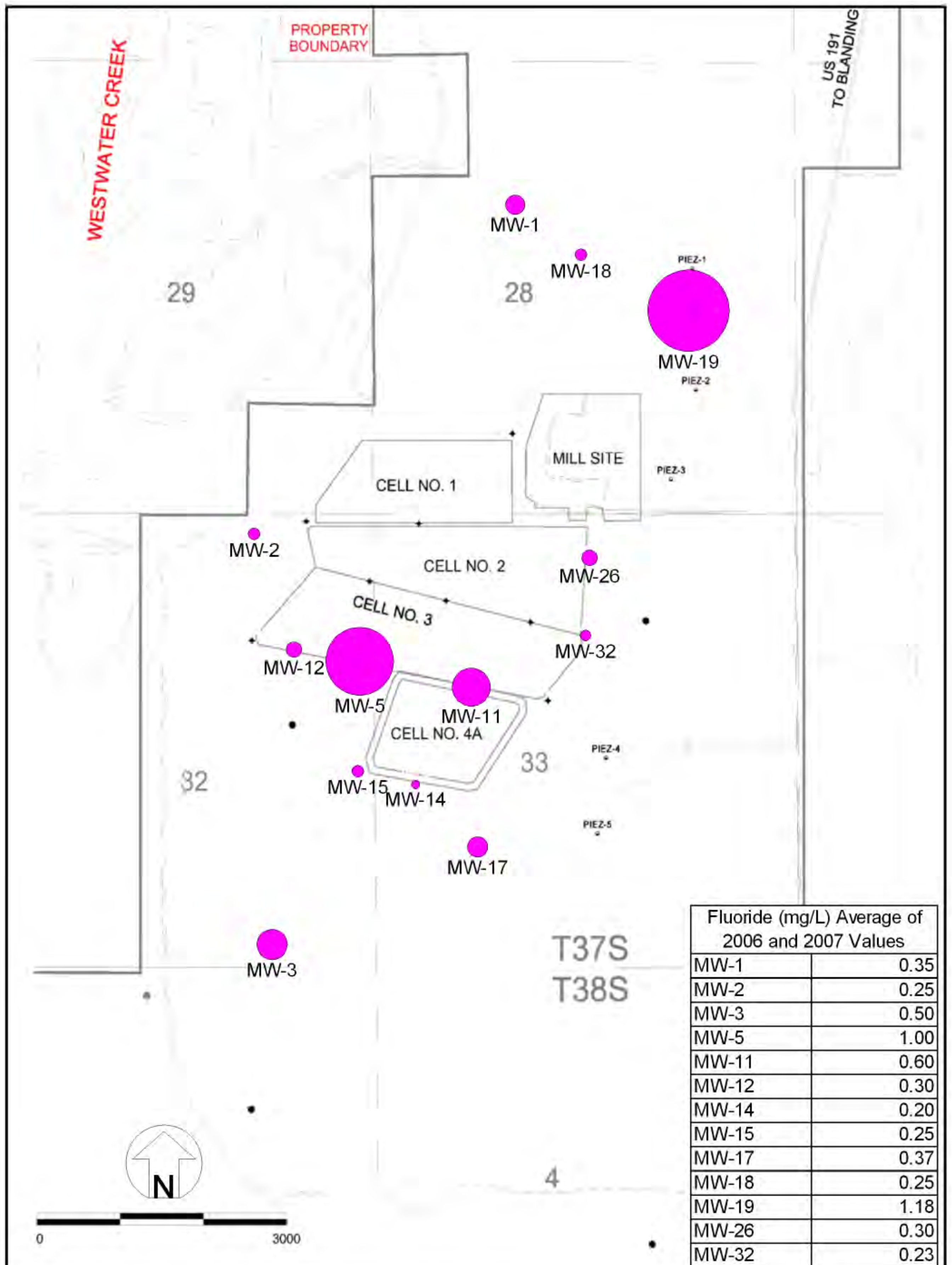
Chloride (mg/L) Average of 2006 and 2007 Values	
MW-1	18
MW-2	7.5
MW-3	63
MW-5	51
MW-11	31.25
MW-12	61
MW-14	18.4
MW-15	38.5
MW-17	28.3
MW-18	50
MW-19	33.5
MW-26	53.5
MW-32	32.17



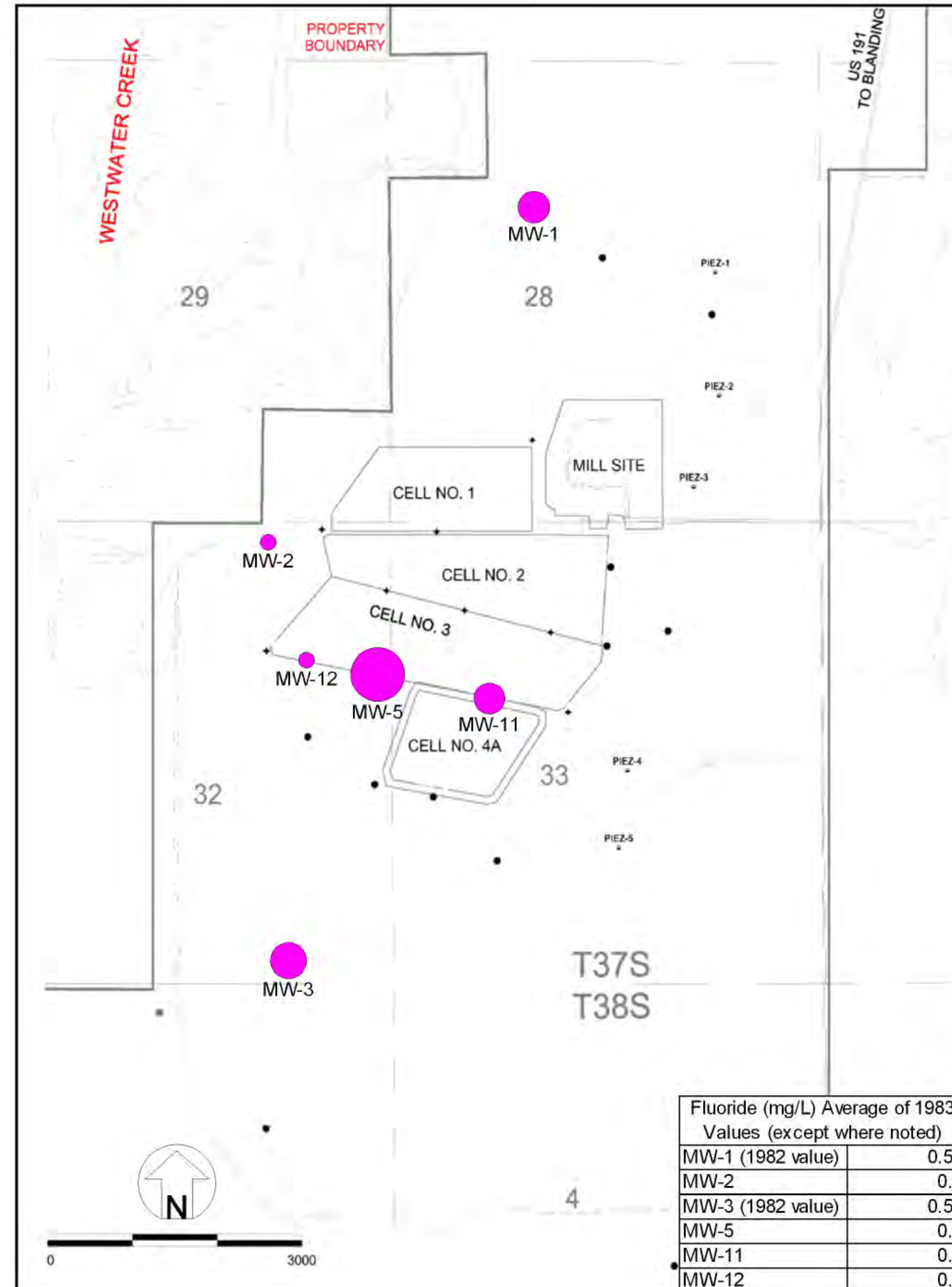
Chloride (mg/L) Average of 1983 Values	
MW-1	15.1
MW-2	10.0
MW-3	66.3
MW-5	52.0
MW-11	29.2
MW-12	66.8

Figure 9
Map of monitoring wells depicting concentrations of chloride present in samples of groundwater collected in 1983, 2006 and 2007.

INTERA



Fluoride (mg/L) Average of 2006 and 2007 Values	
MW-1	0.35
MW-2	0.25
MW-3	0.50
MW-5	1.00
MW-11	0.60
MW-12	0.30
MW-14	0.20
MW-15	0.25
MW-17	0.37
MW-18	0.25
MW-19	1.18
MW-26	0.30
MW-32	0.23

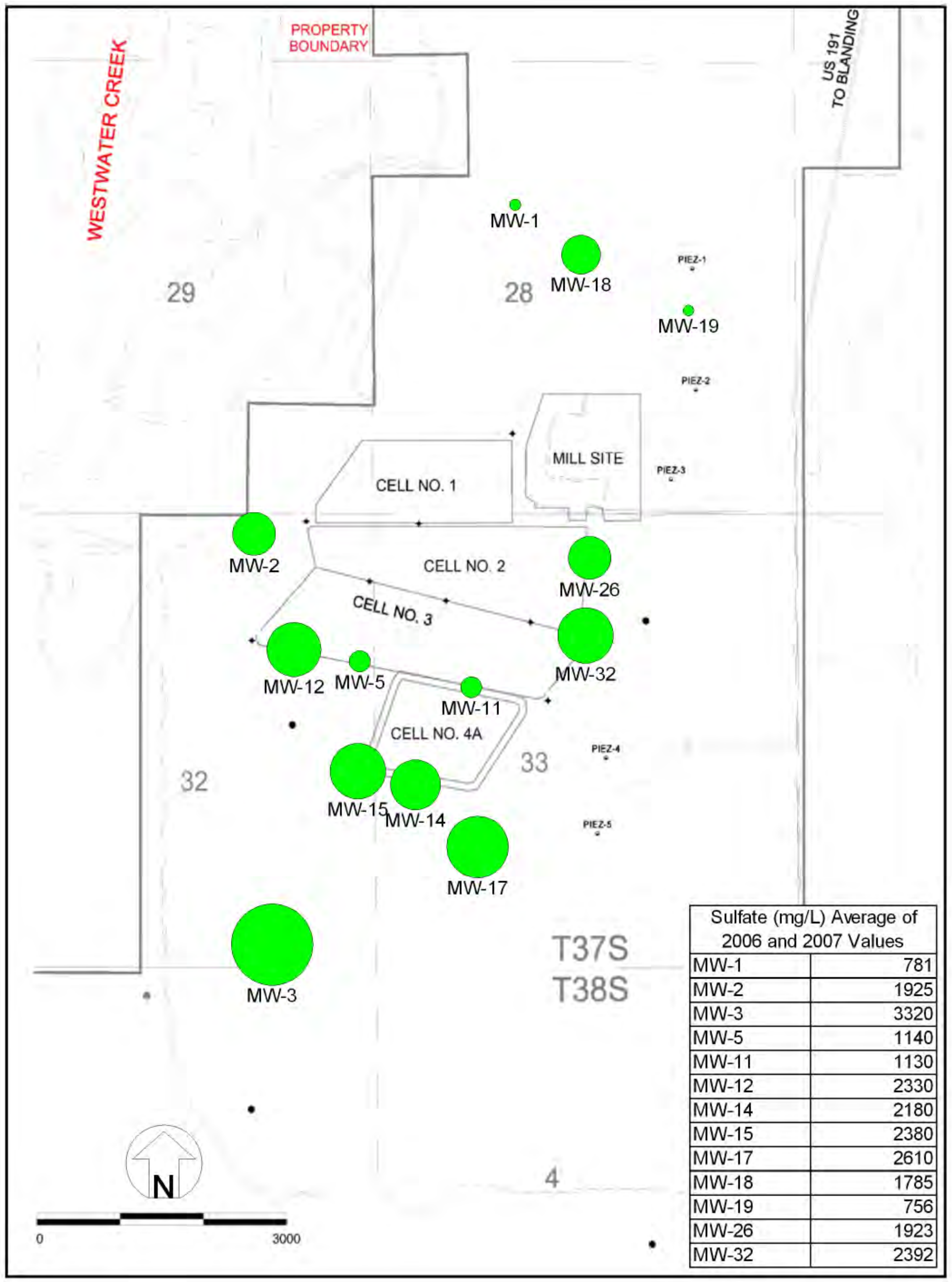


Fluoride (mg/L) Average of 1983 Values (except where noted)	
MW-1 (1982 value)	0.51
MW-2	0.3
MW-3 (1982 value)	0.57
MW-5	0.8
MW-11	0.5
MW-12	0.3

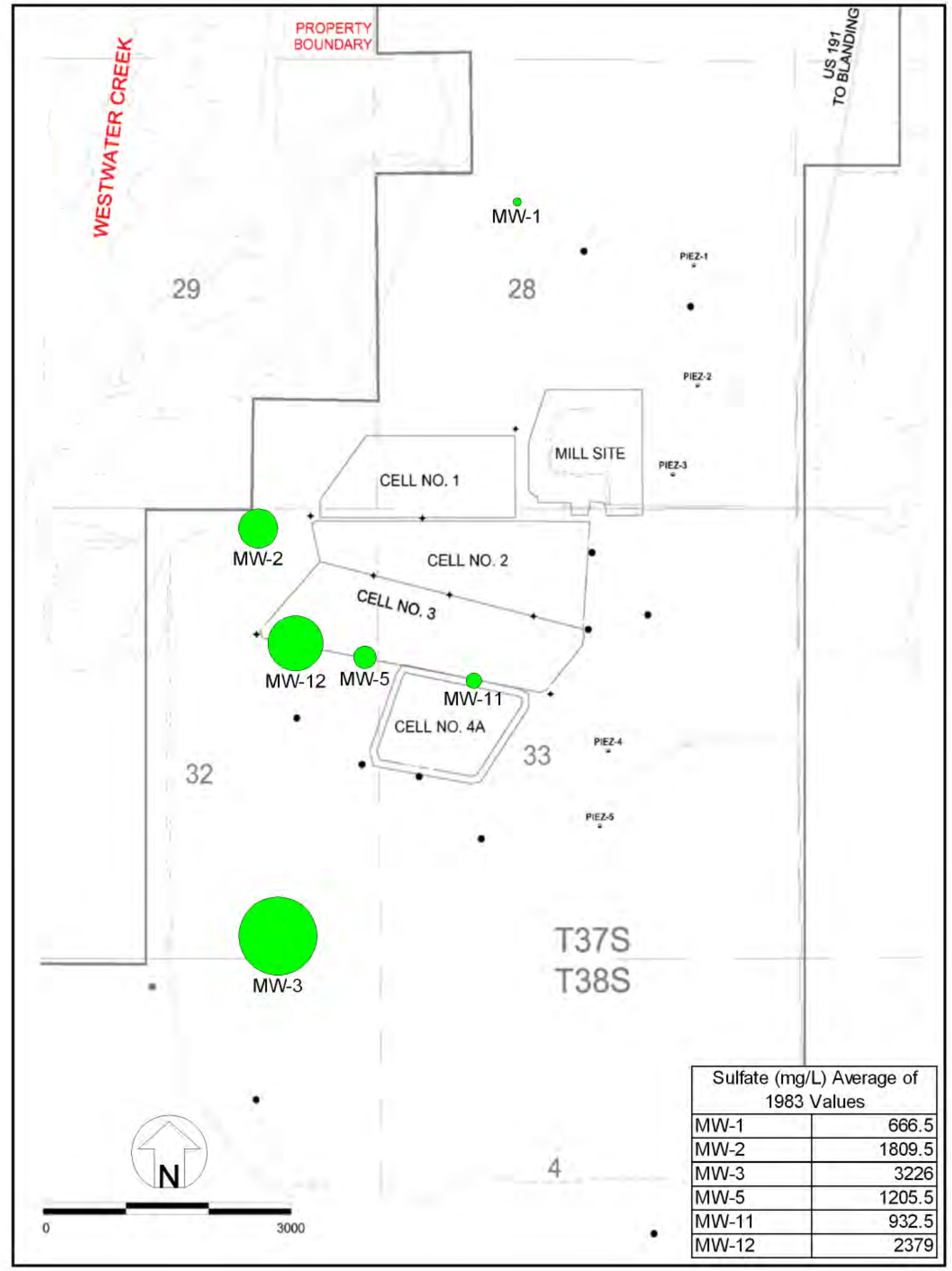
Note:
Non Detects were represented as one half the detection limit.

Figure 10
Map of monitoring wells depicting concentrations of fluoride present in samples of groundwater collected in 1983, 2006 and 2007.

INTERA



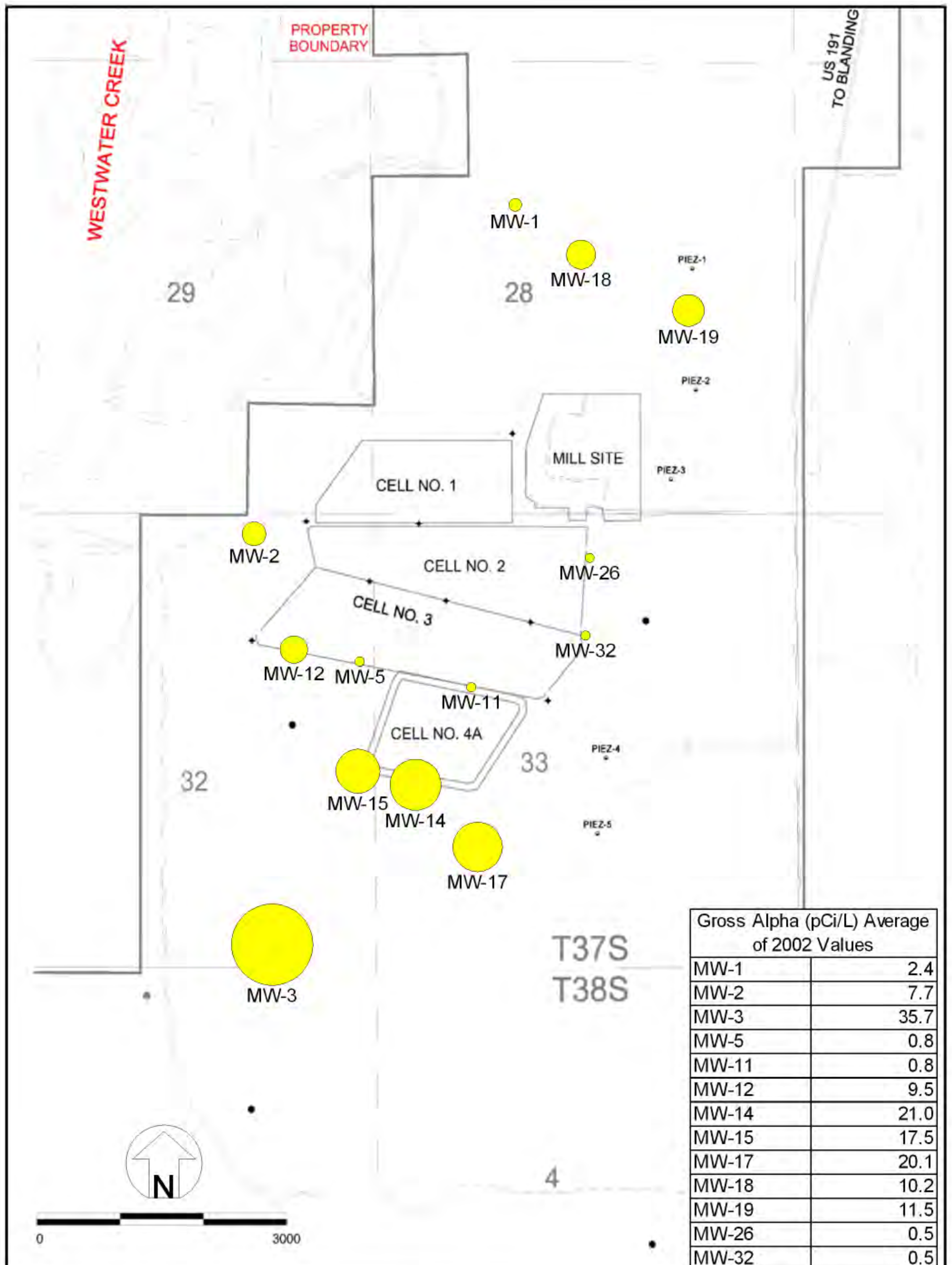
Sulfate (mg/L) Average of 2006 and 2007 Values	
MW-1	781
MW-2	1925
MW-3	3320
MW-5	1140
MW-11	1130
MW-12	2330
MW-14	2180
MW-15	2380
MW-17	2610
MW-18	1785
MW-19	756
MW-26	1923
MW-32	2392



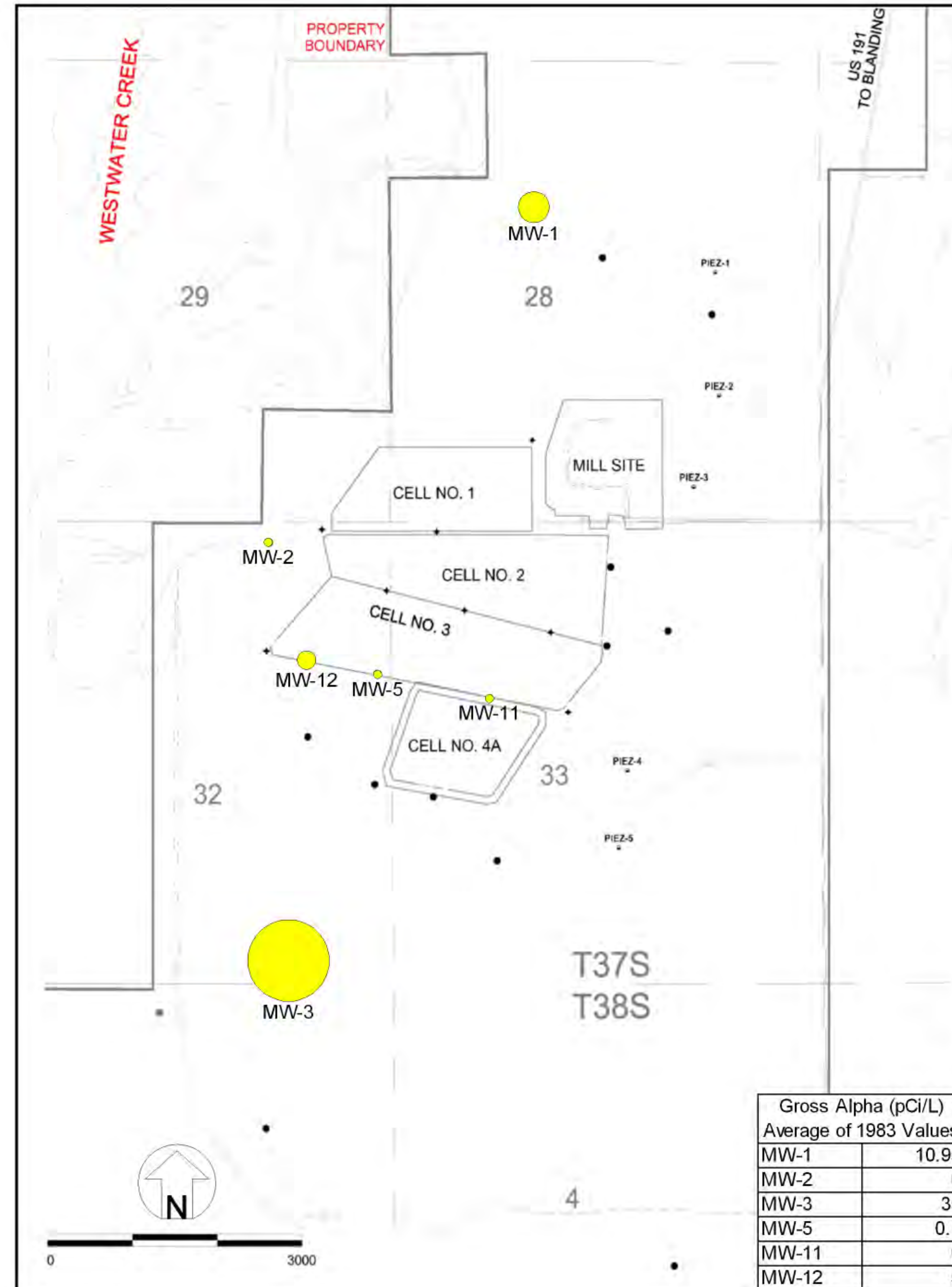
Sulfate (mg/L) Average of 1983 Values	
MW-1	666.5
MW-2	1809.5
MW-3	3226
MW-5	1205.5
MW-11	932.5
MW-12	2379

Figure 11
Map of monitoring wells depicting concentrations of sulfate present in samples of groundwater collected in 1983, 2006 and 2007.

INTERA



Gross Alpha (pCi/L) Average of 2002 Values	
MW-1	2.4
MW-2	7.7
MW-3	35.7
MW-5	0.8
MW-11	0.8
MW-12	9.5
MW-14	21.0
MW-15	17.5
MW-17	20.1
MW-18	10.2
MW-19	11.5
MW-26	0.5
MW-32	0.5

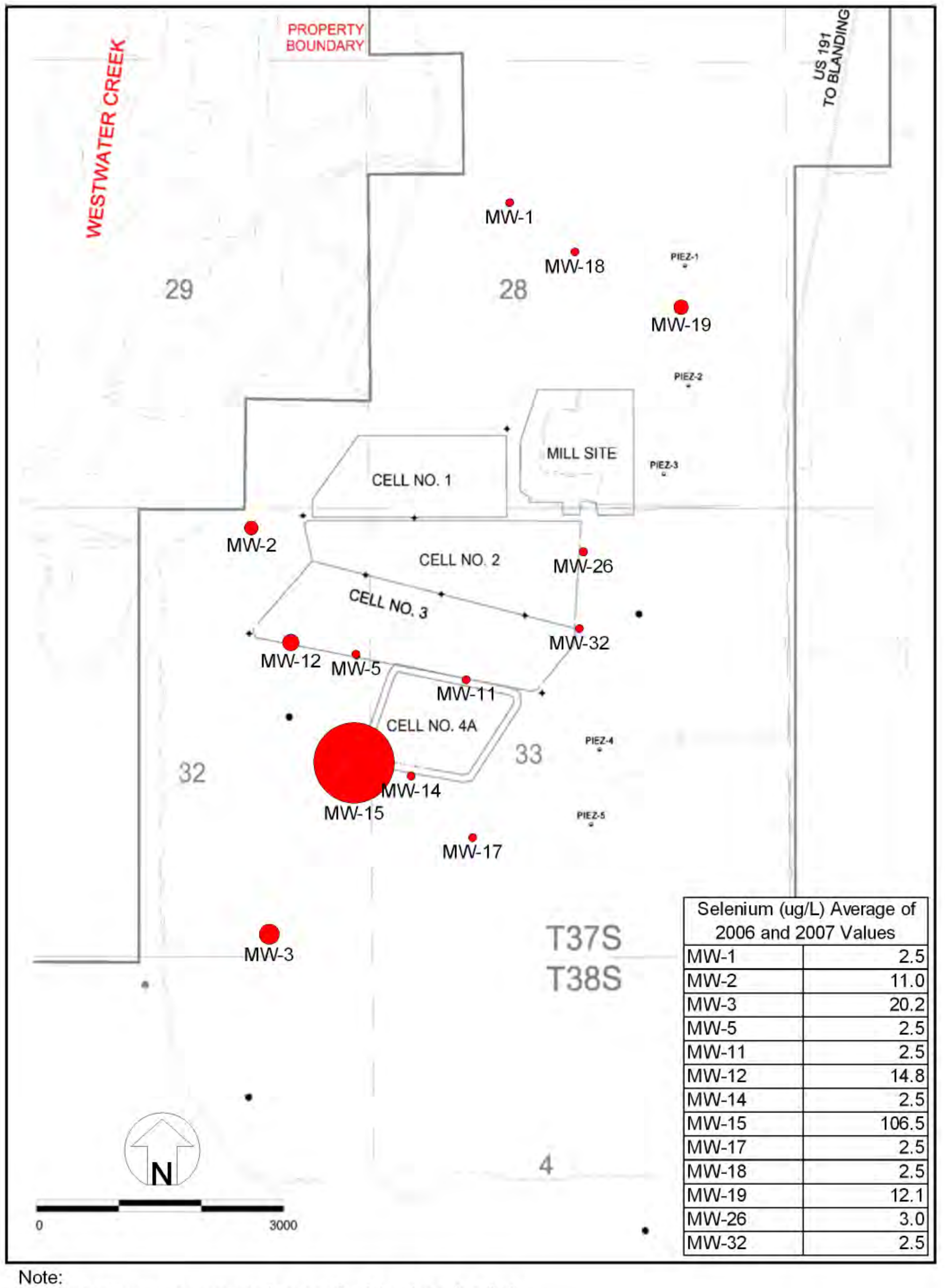


Gross Alpha (pCi/L) Average of 1983 Values	
MW-1	10.95
MW-2	0
MW-3	35
MW-5	0.1
MW-11	0
MW-12	5

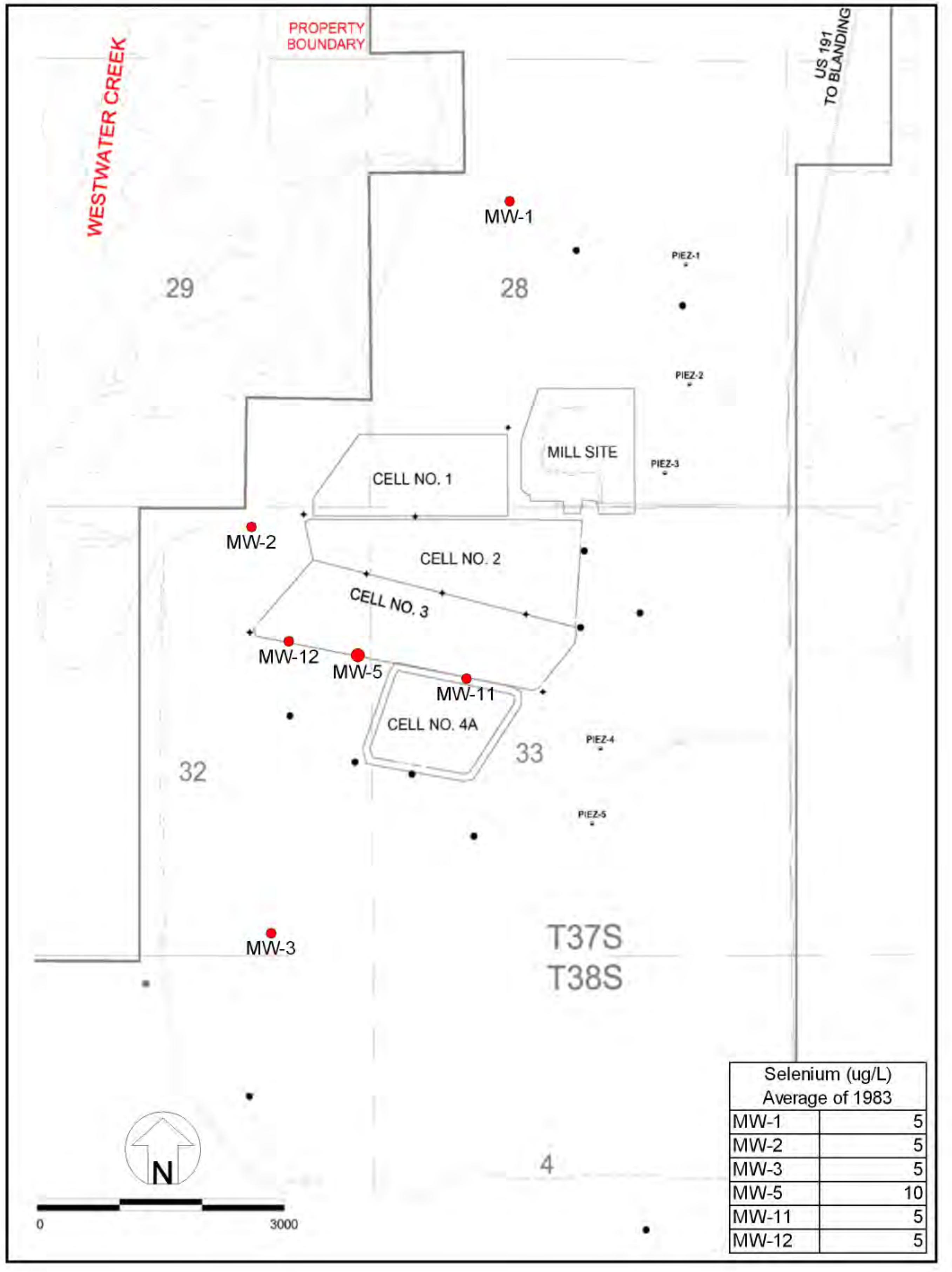
Note:
Non Detects were represented as one half the detection limit.

Figure 12
Map of monitoring wells depicting concentrations of gross alpha present in samples of groundwater collected in 1983 and 2002.

INTERA



Selenium (ug/L) Average of 2006 and 2007 Values	
MW-1	2.5
MW-2	11.0
MW-3	20.2
MW-5	2.5
MW-11	2.5
MW-12	14.8
MW-14	2.5
MW-15	106.5
MW-17	2.5
MW-18	2.5
MW-19	12.1
MW-26	3.0
MW-32	2.5

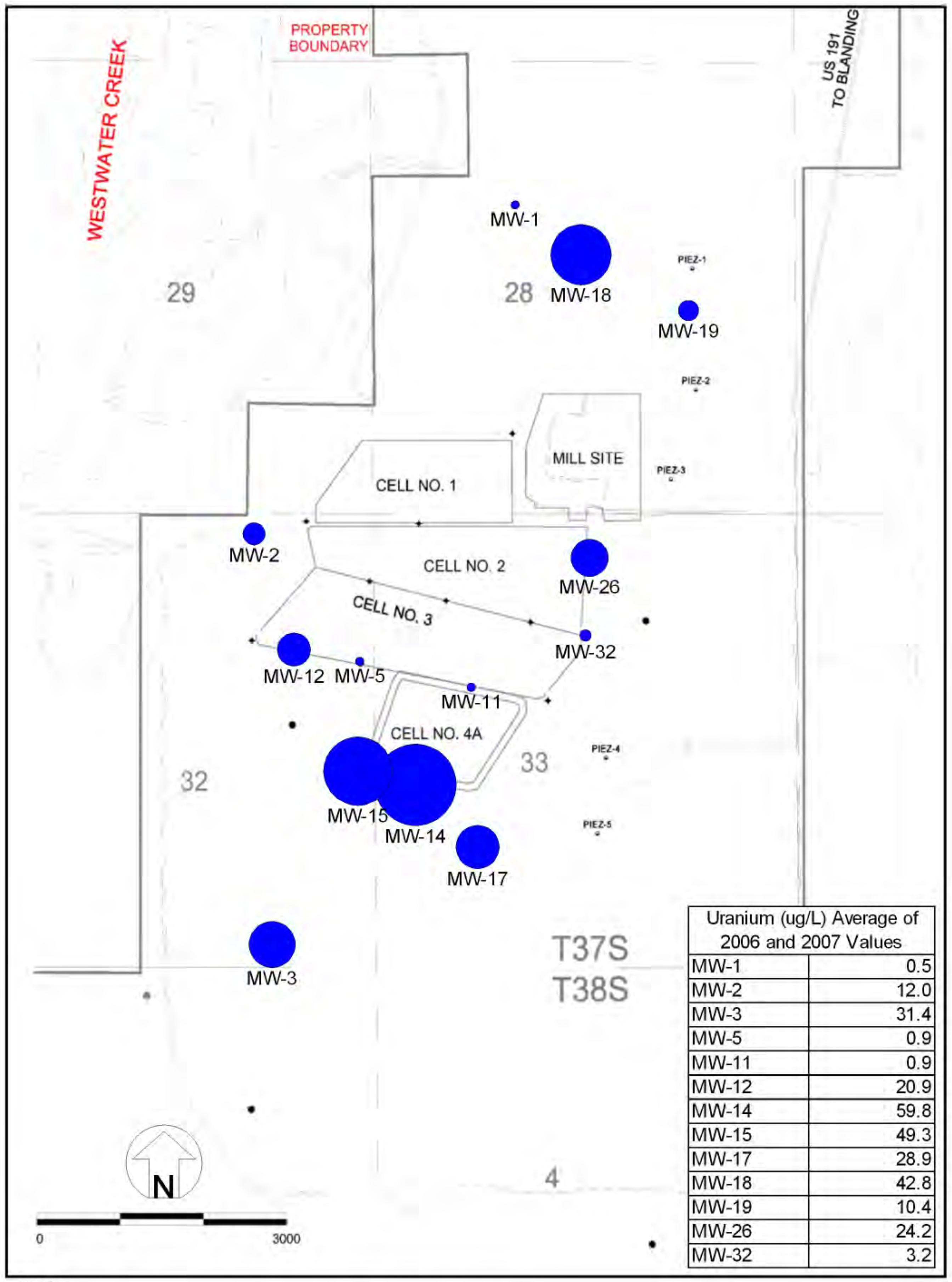


Selenium (ug/L) Average of 1983	
MW-1	5
MW-2	5
MW-3	5
MW-5	10
MW-11	5
MW-12	5

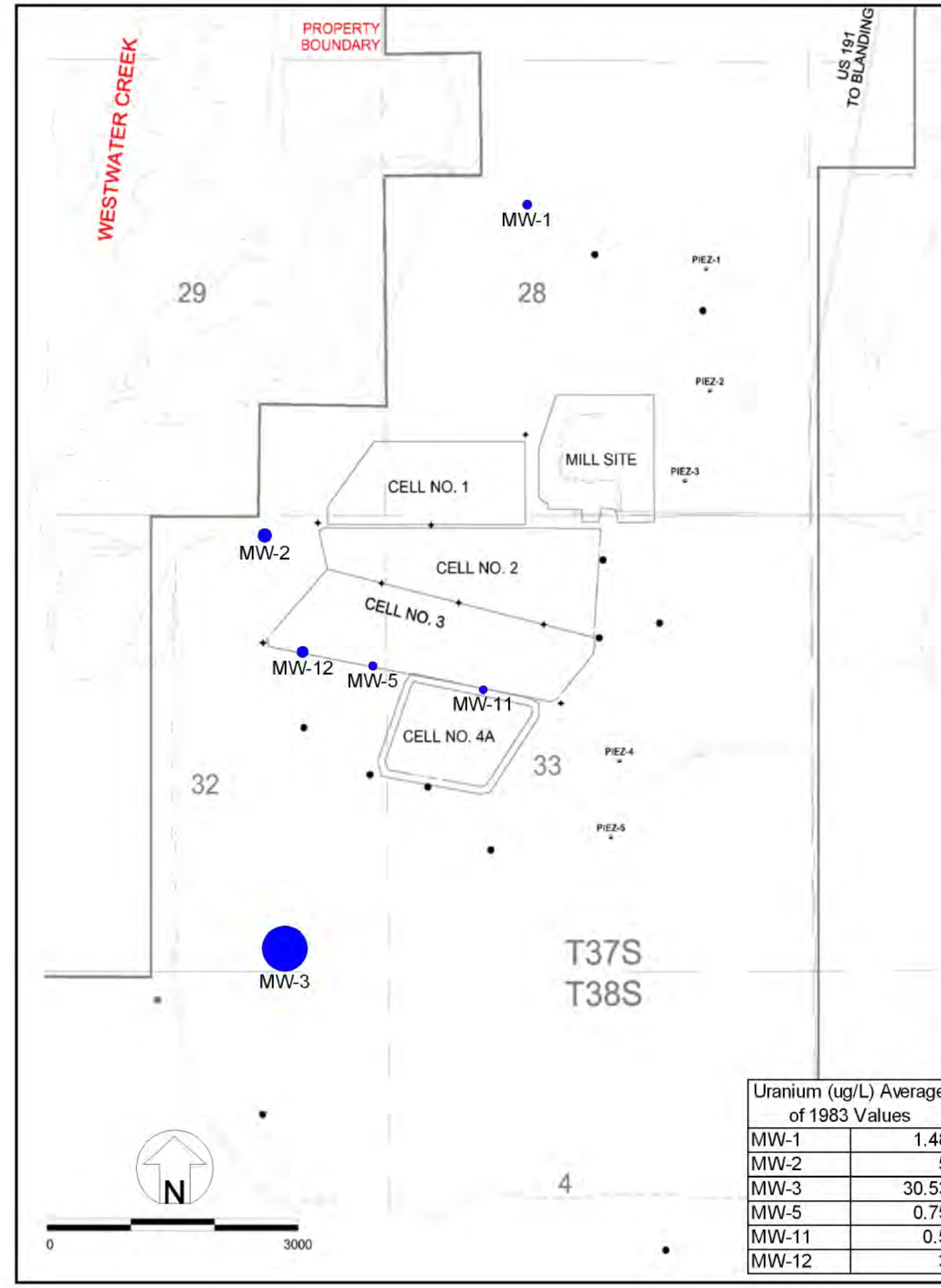
Note:
Non Detects were represented as one half the detection limit.

Figure 13
Map of monitoring wells depicting concentrations of selenium present in samples of groundwater collected in 1983, 2006 and 2007.

INTERA



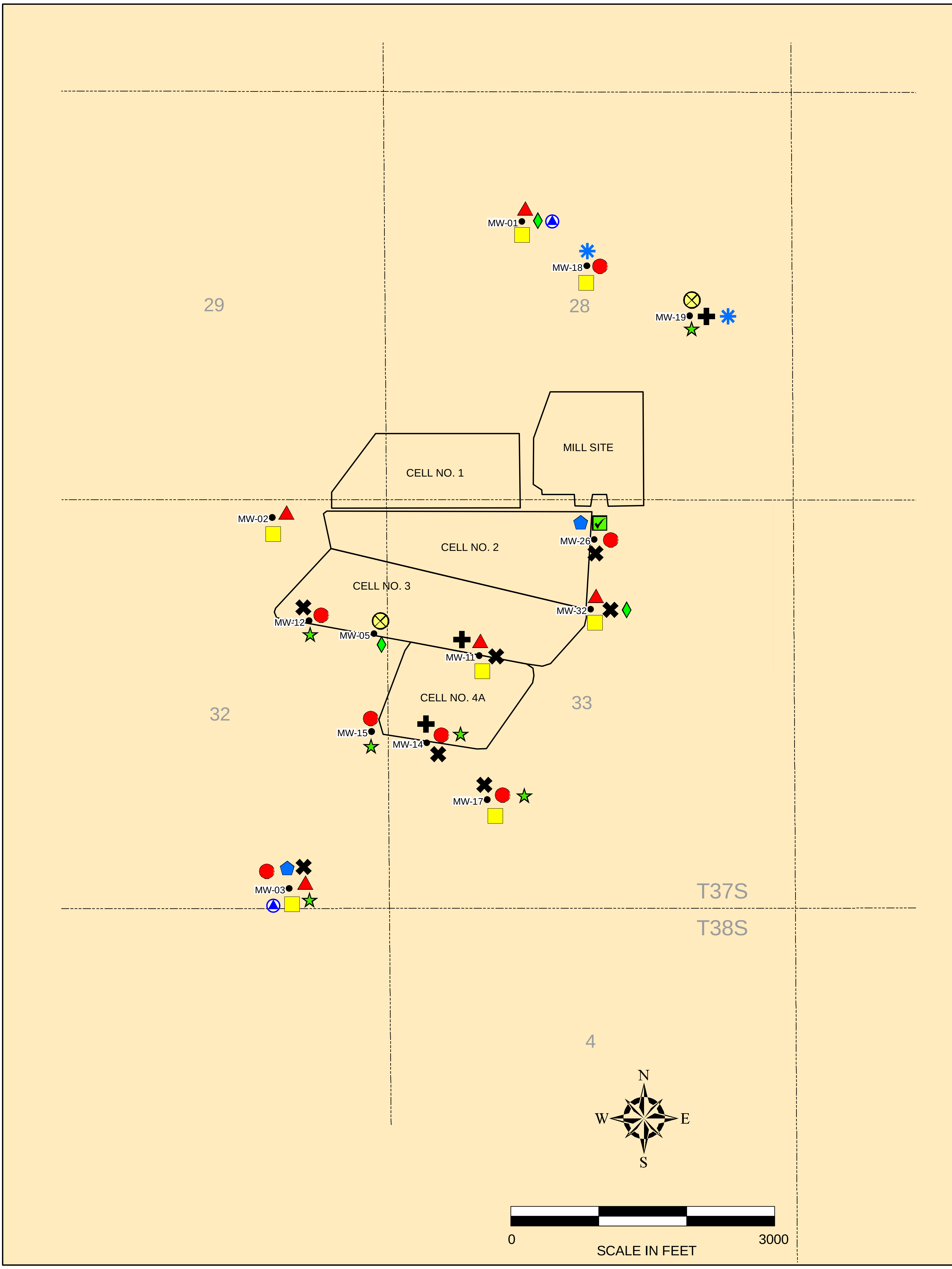
Uranium (ug/L) Average of 2006 and 2007 Values	
MW-1	0.5
MW-2	12.0
MW-3	31.4
MW-5	0.9
MW-11	0.9
MW-12	20.9
MW-14	59.8
MW-15	49.3
MW-17	28.9
MW-18	42.8
MW-19	10.4
MW-26	24.2
MW-32	3.2



Uranium (ug/L) Average of 1983 Values	
MW-1	1.48
MW-2	5
MW-3	30.53
MW-5	0.75
MW-11	0.5
MW-12	3

Note:
Non Detects were represented as one half the detection limit.

Figure 14
Map of monitoring wells depicting concentrations of uranium present in samples of groundwater collected in 1983, 2006 and 2007.



Constituents

Ammonia
Fluoride
Iron
Manganese
NO3
Selenium
Sulfate
TDS
Thallium
Uranium
pH
Tetrahydrofuran

Legend

Monitoring Well
Site Boundary

Figure 15
Map of Monitoring Wells Depicting Constituents
with a Rising Trend or Calculated GWCL Exceeds GWQS

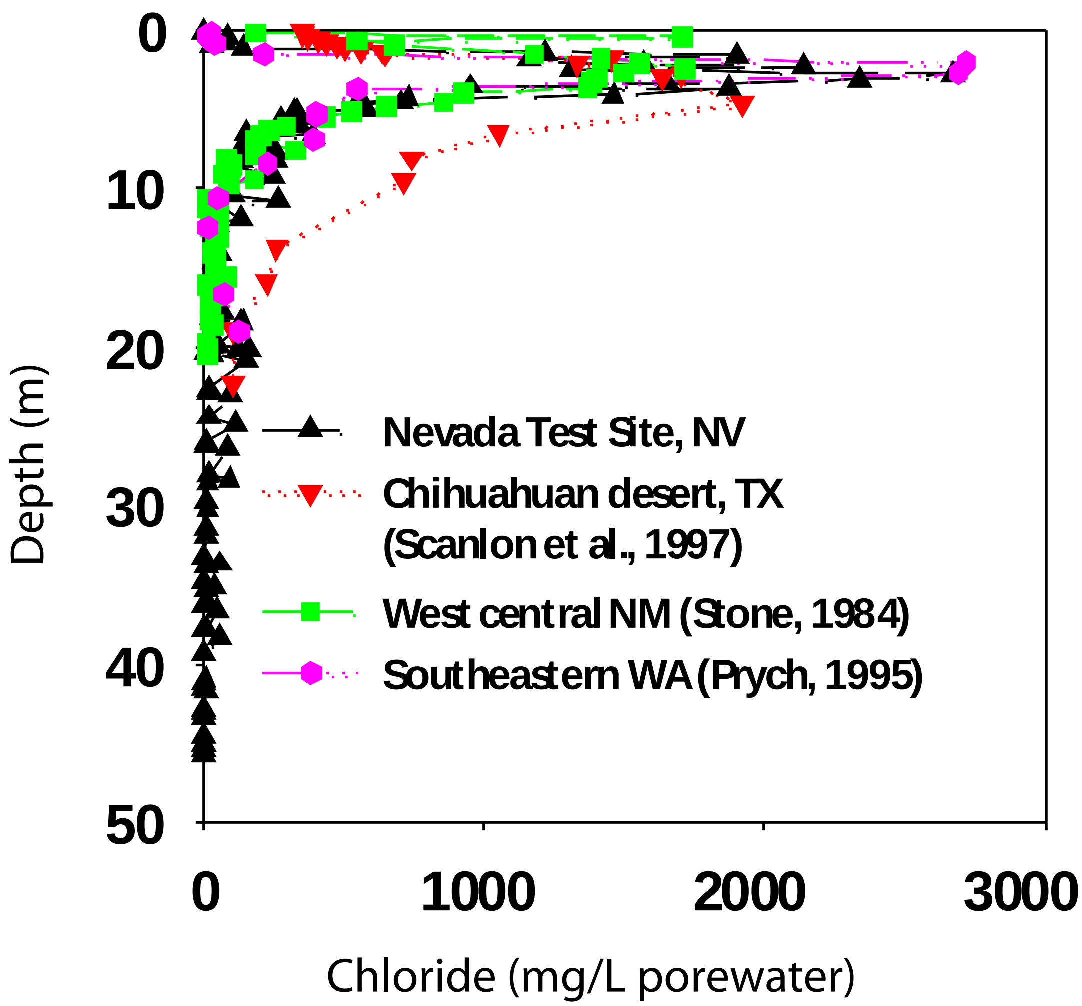


Figure 16
Chloride Profiles in Vadose Zones from
Across the Western US (from Walvoord *et al.*, 2003)

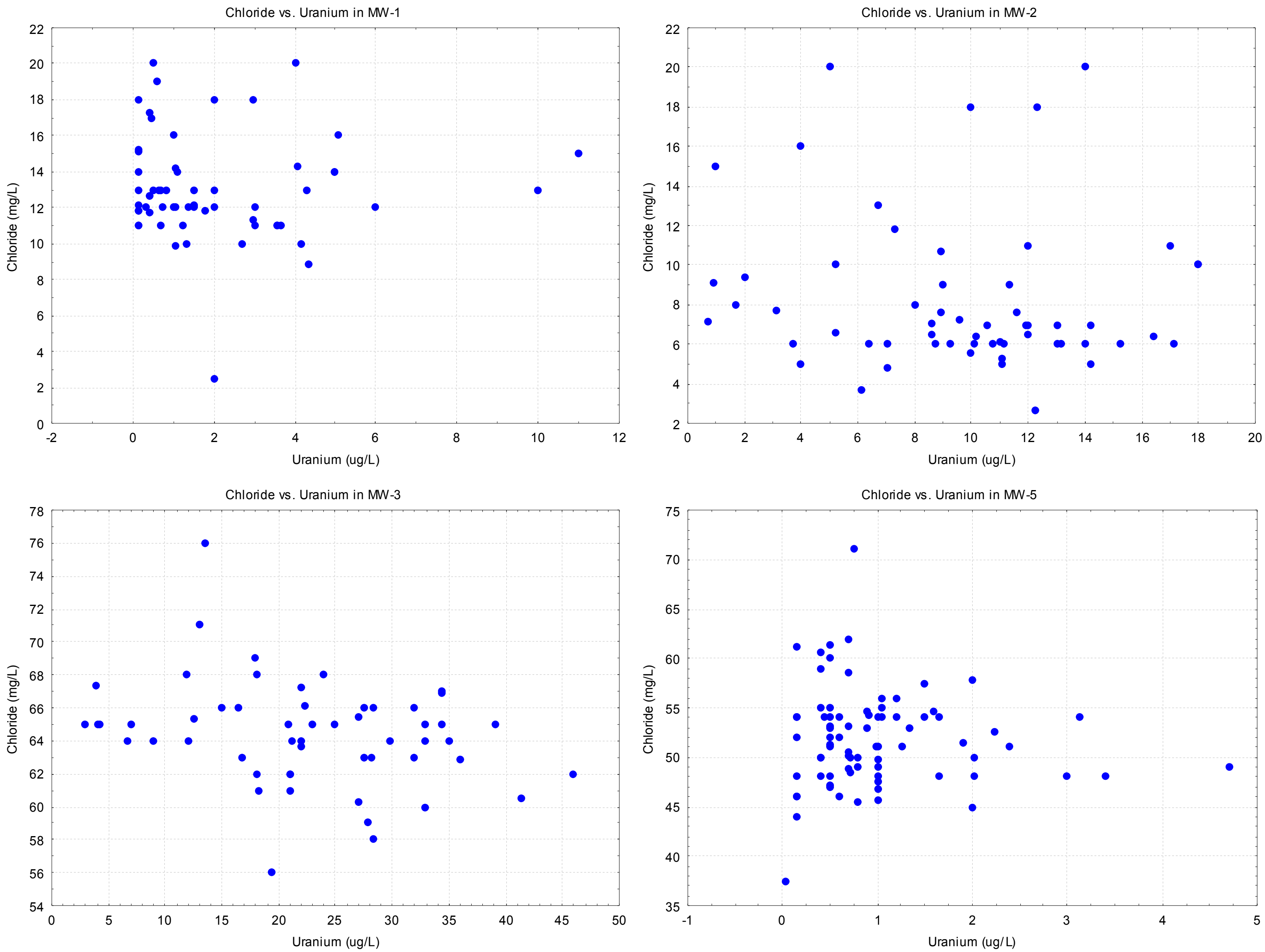


Figure 17
Scatterplots of Chloride vs. Uranium

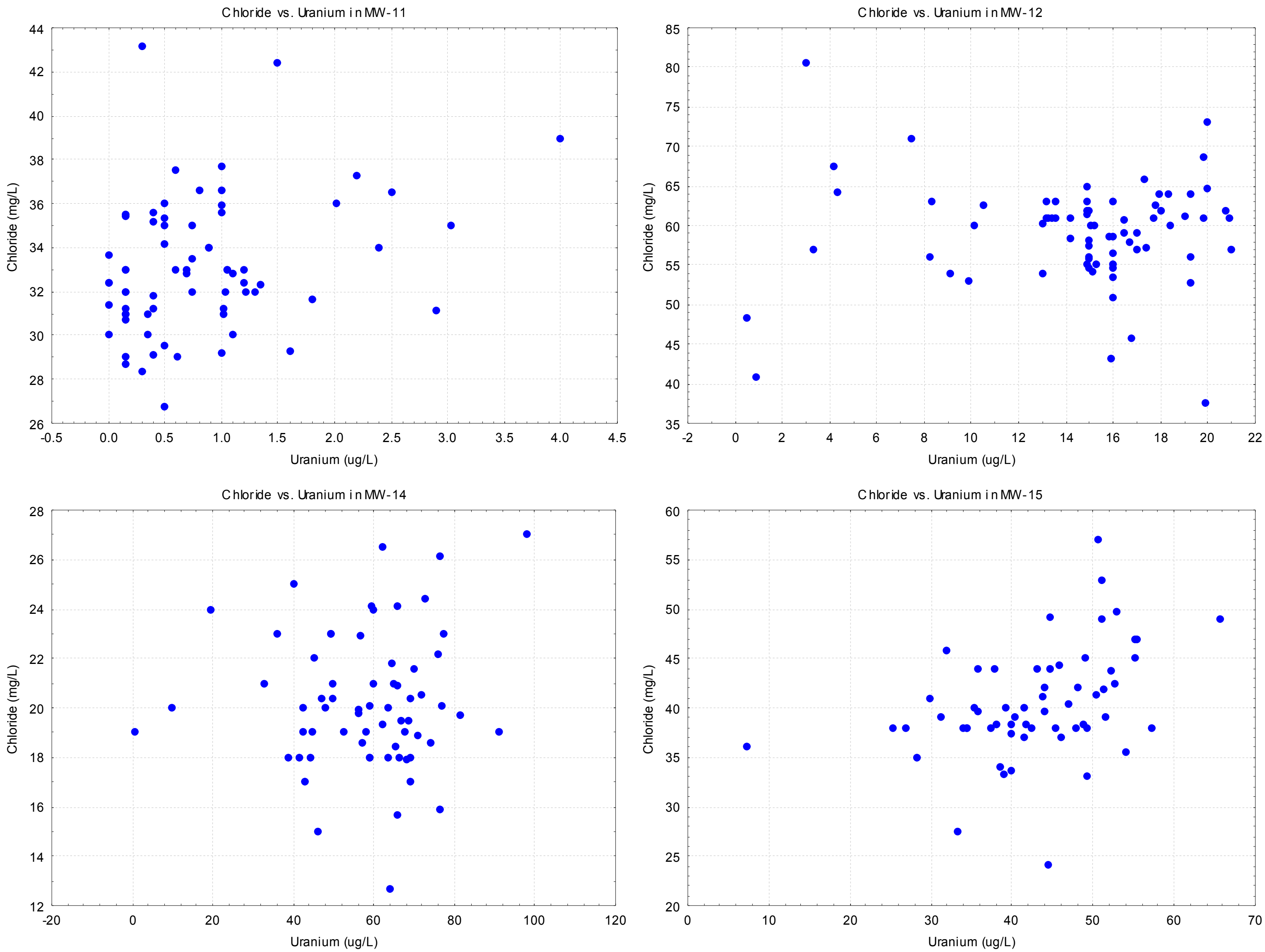


Figure 17
Scatterplots of Chloride vs. Uranium

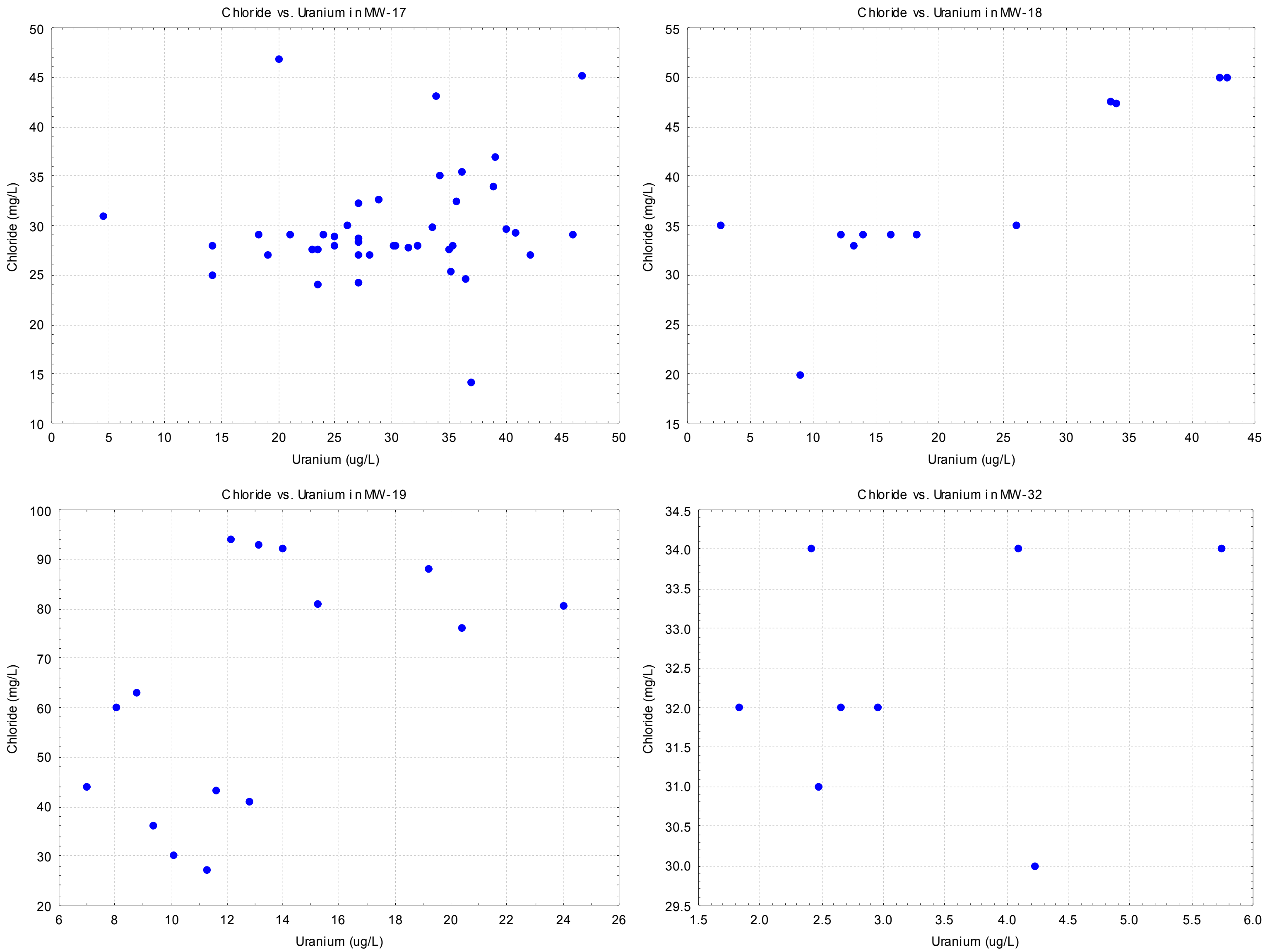


Figure 17
Scatterplots of Chloride vs. Uranium

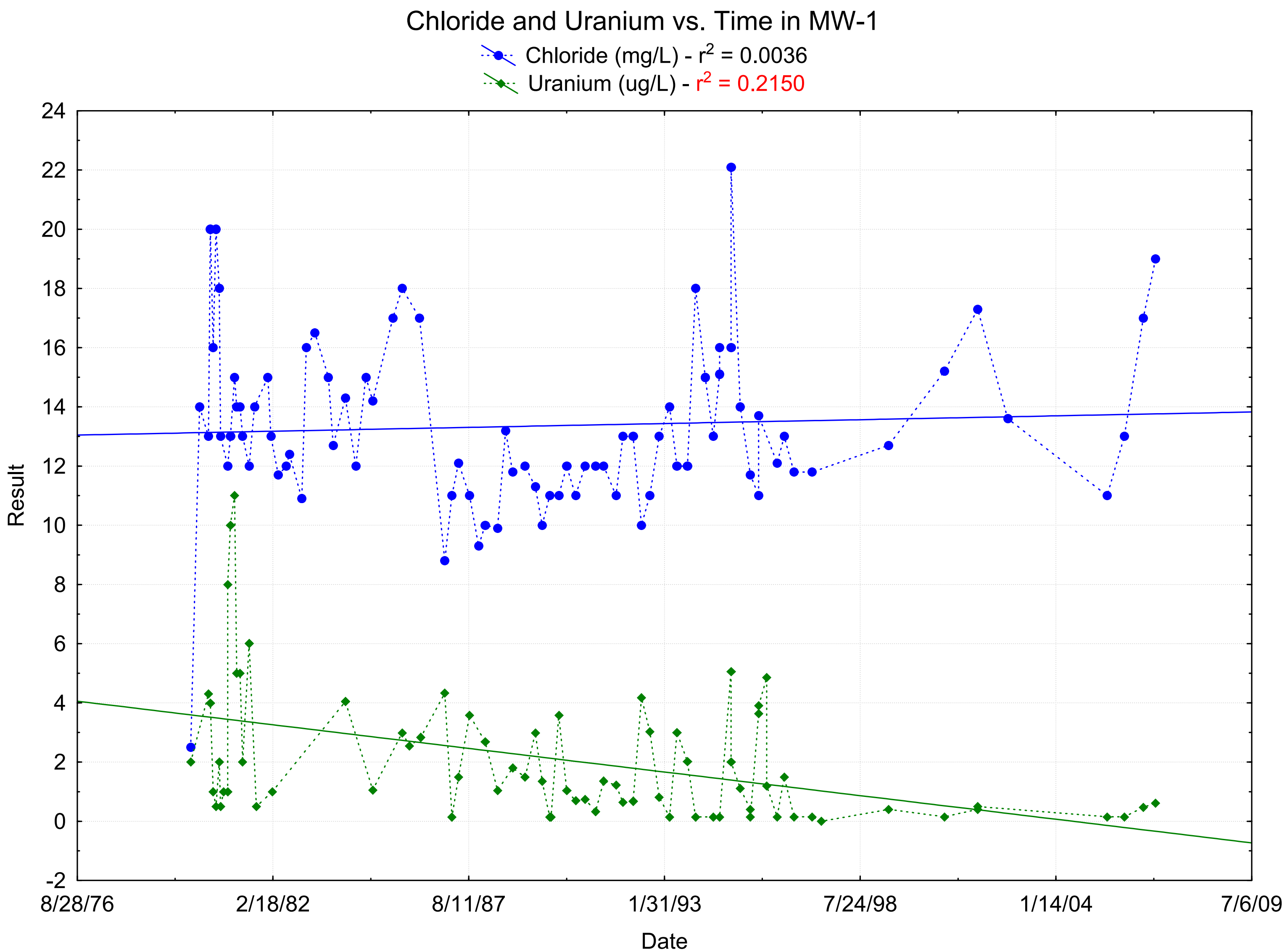
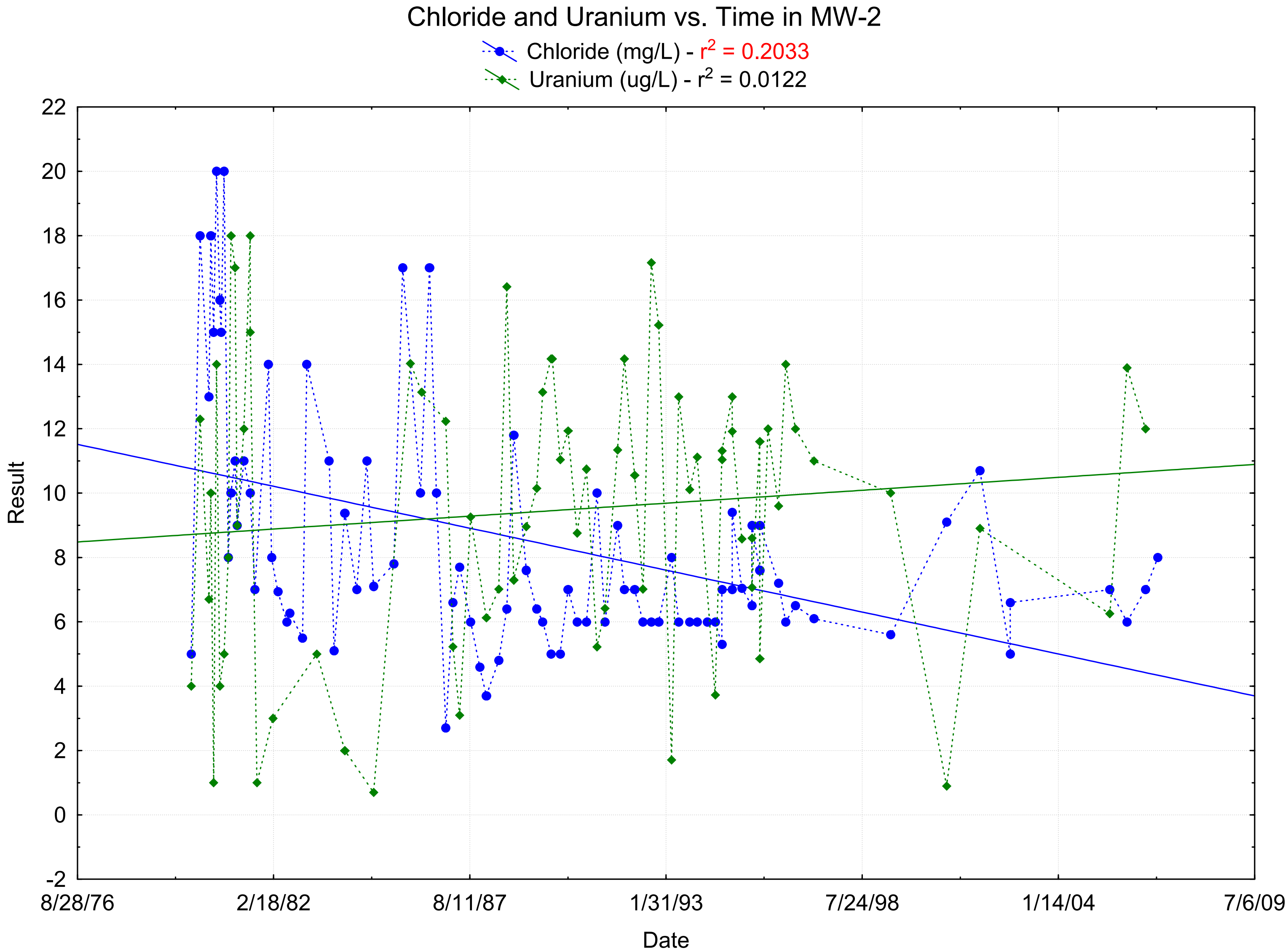


Figure 18
Linear Regressions of Chloride and Uranium vs. Time



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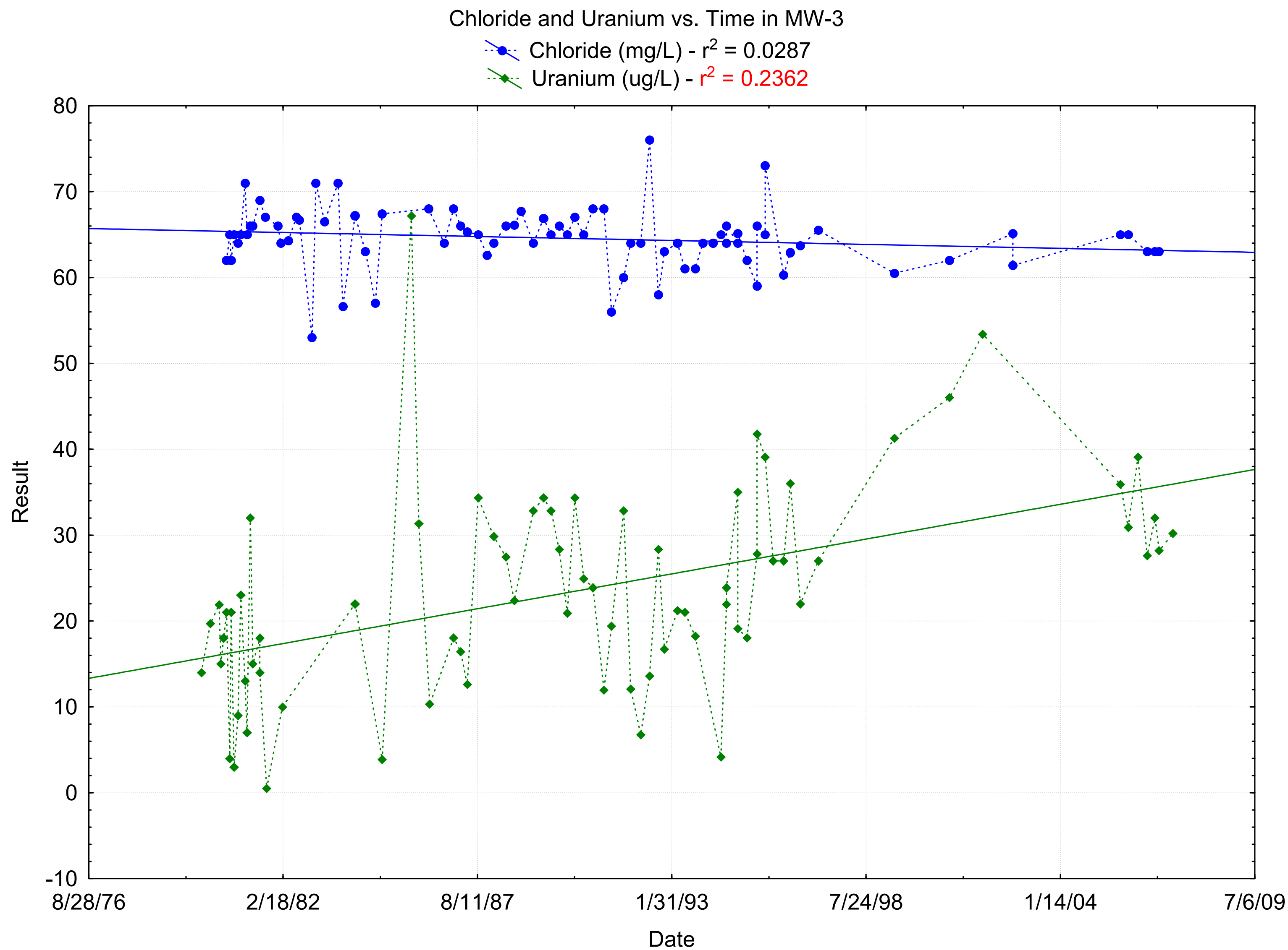

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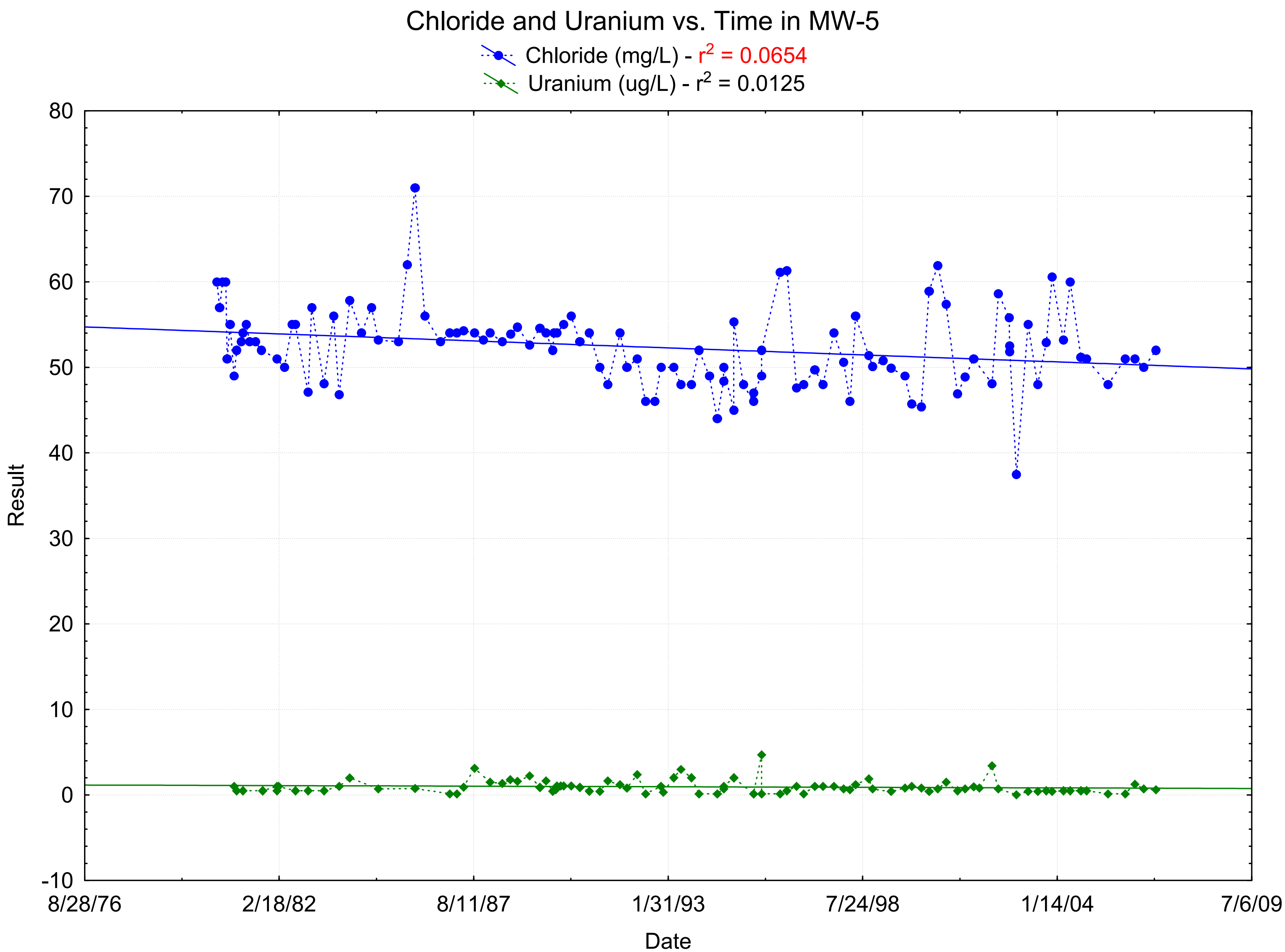

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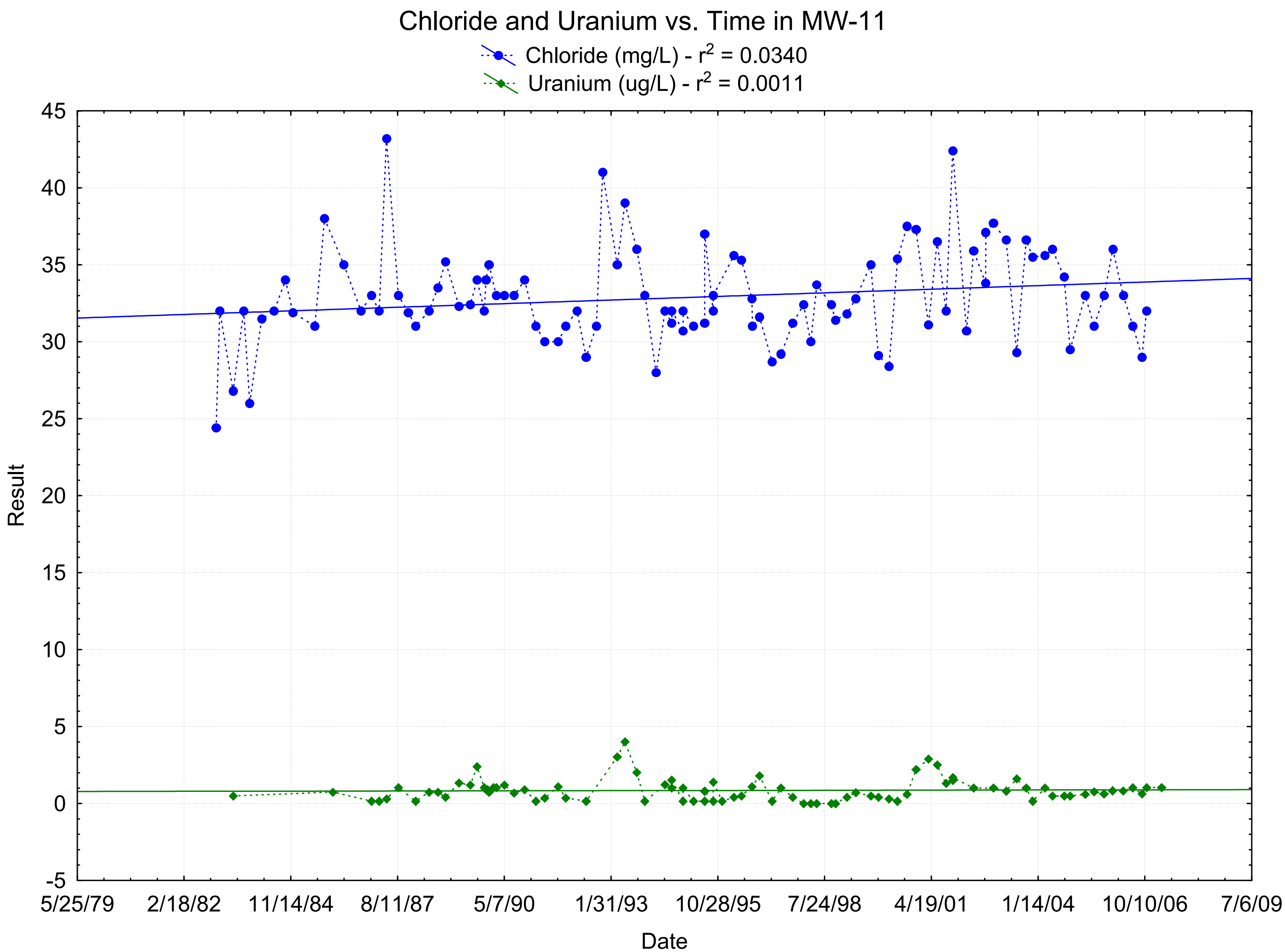
Linear Regressions of Chloride and Uranium vs. Time



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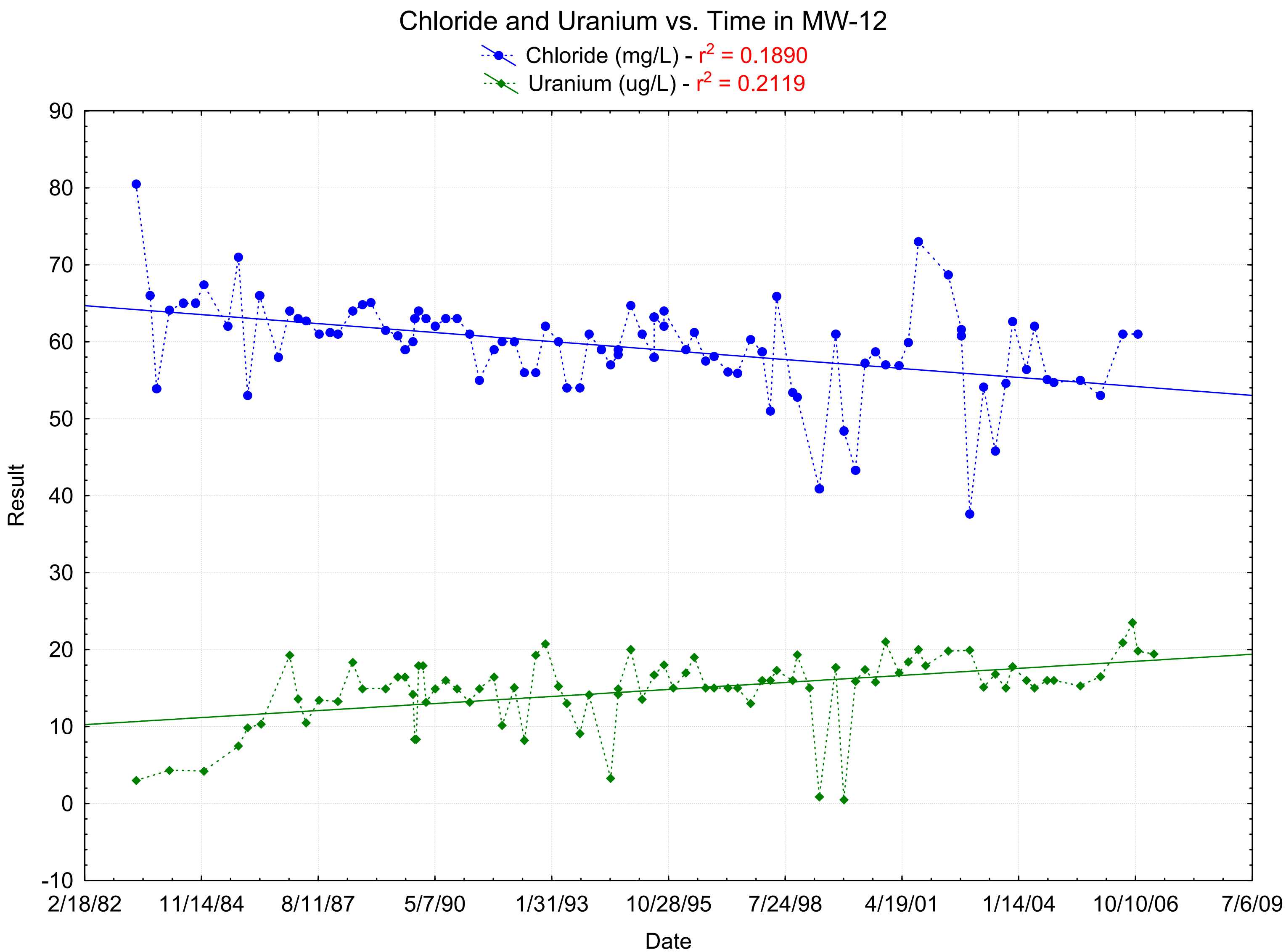

Figure 18
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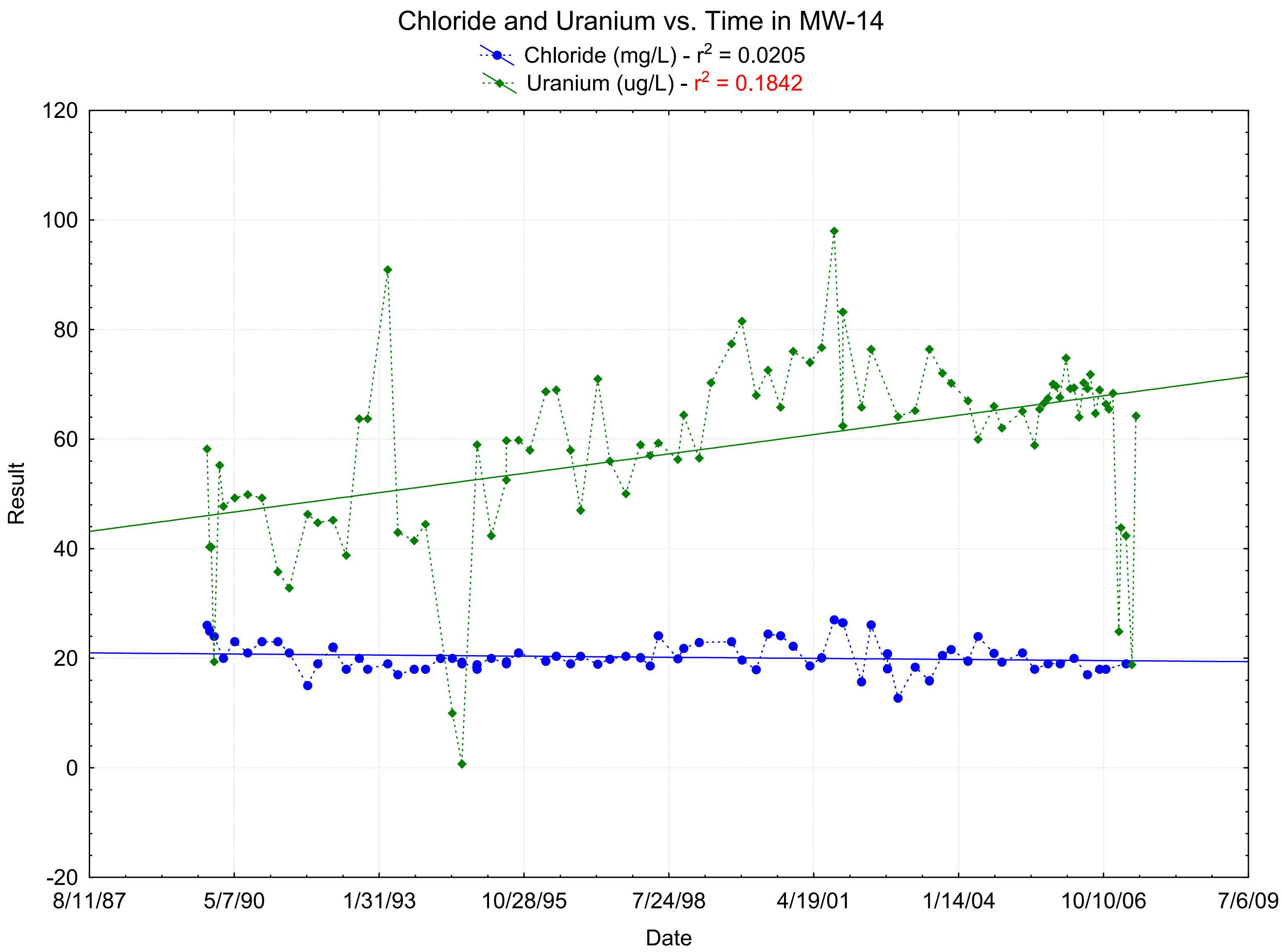

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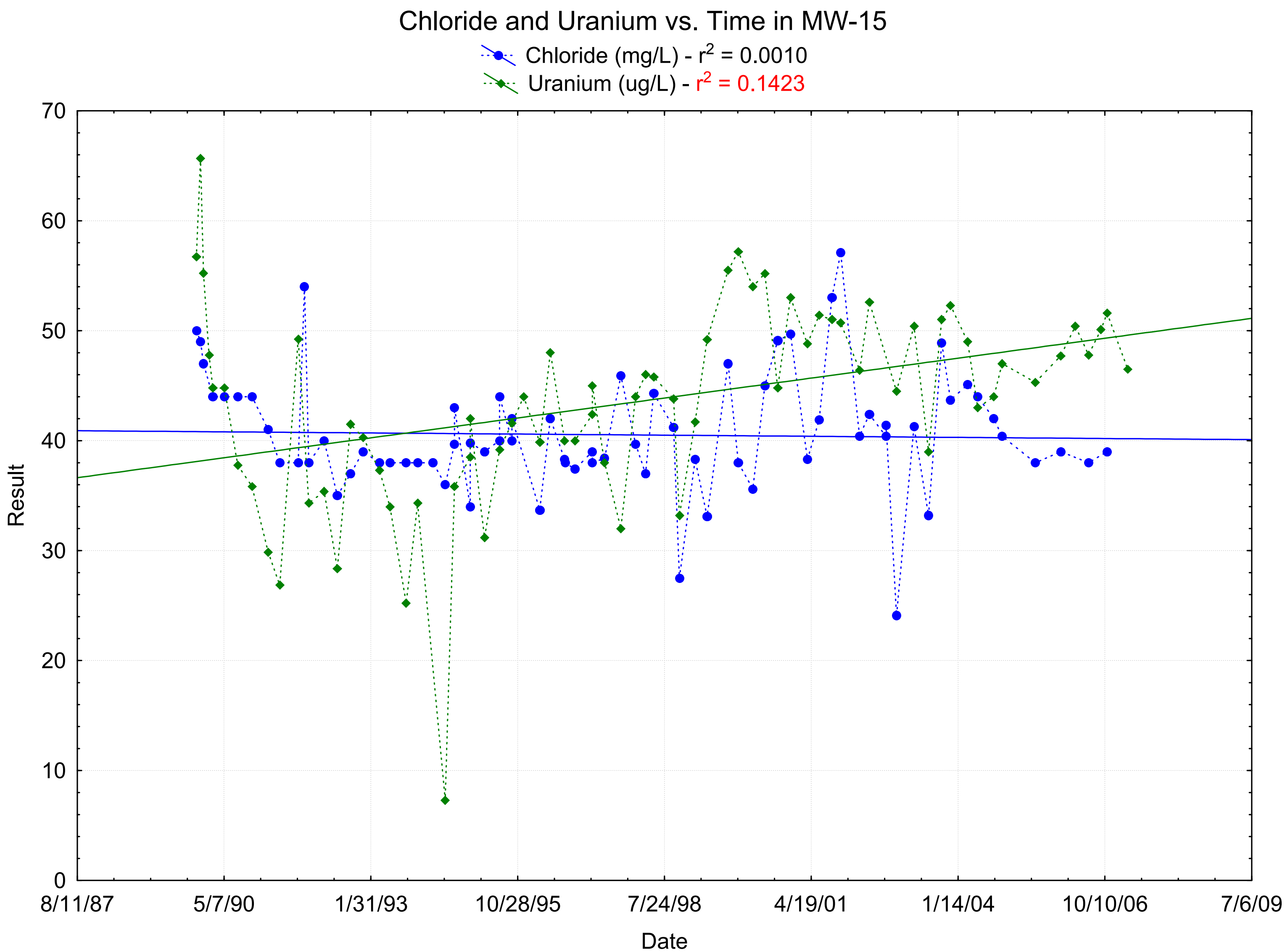
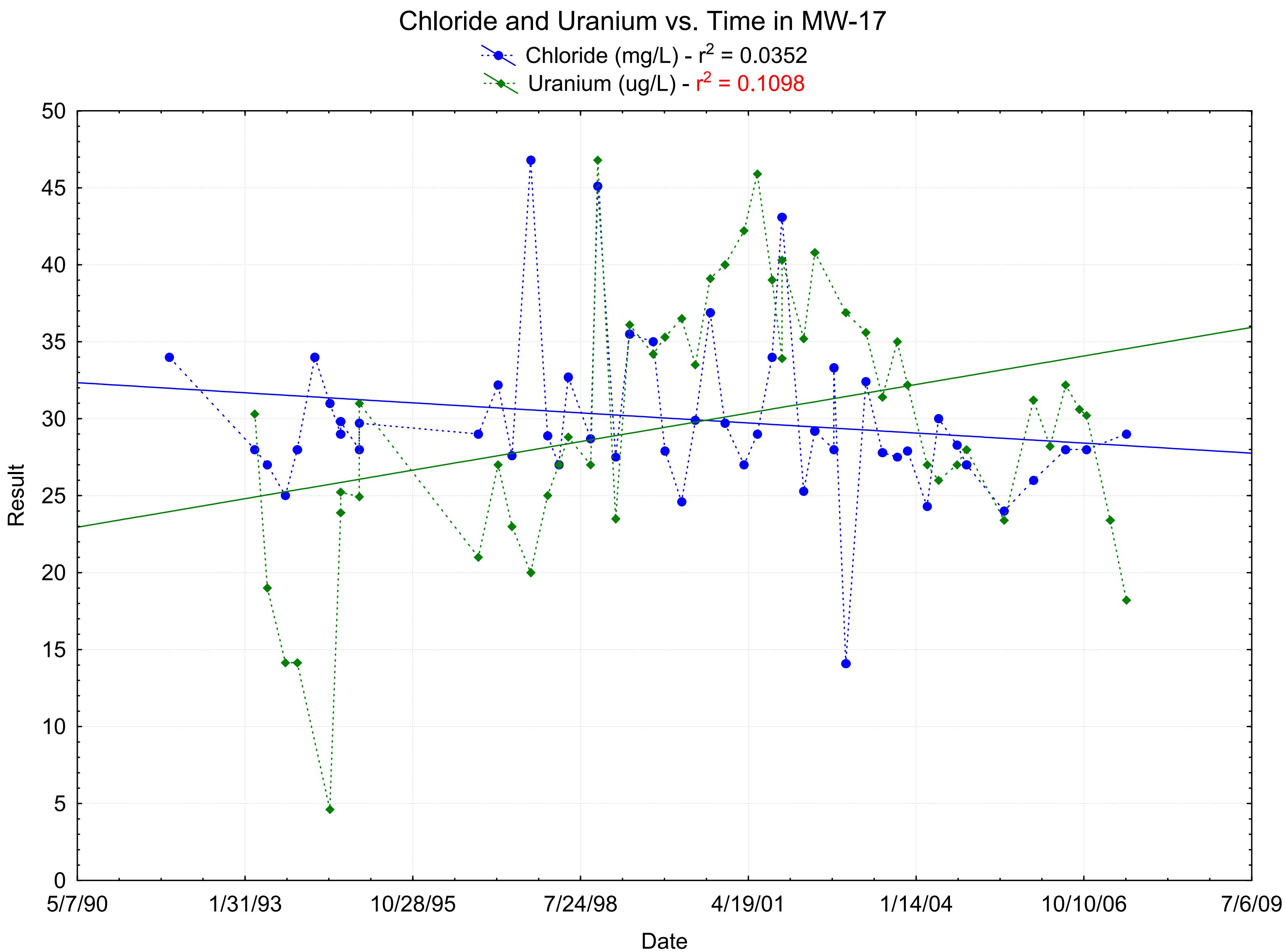


Figure 18
Linear Regressions of Chloride and Uranium vs. Time



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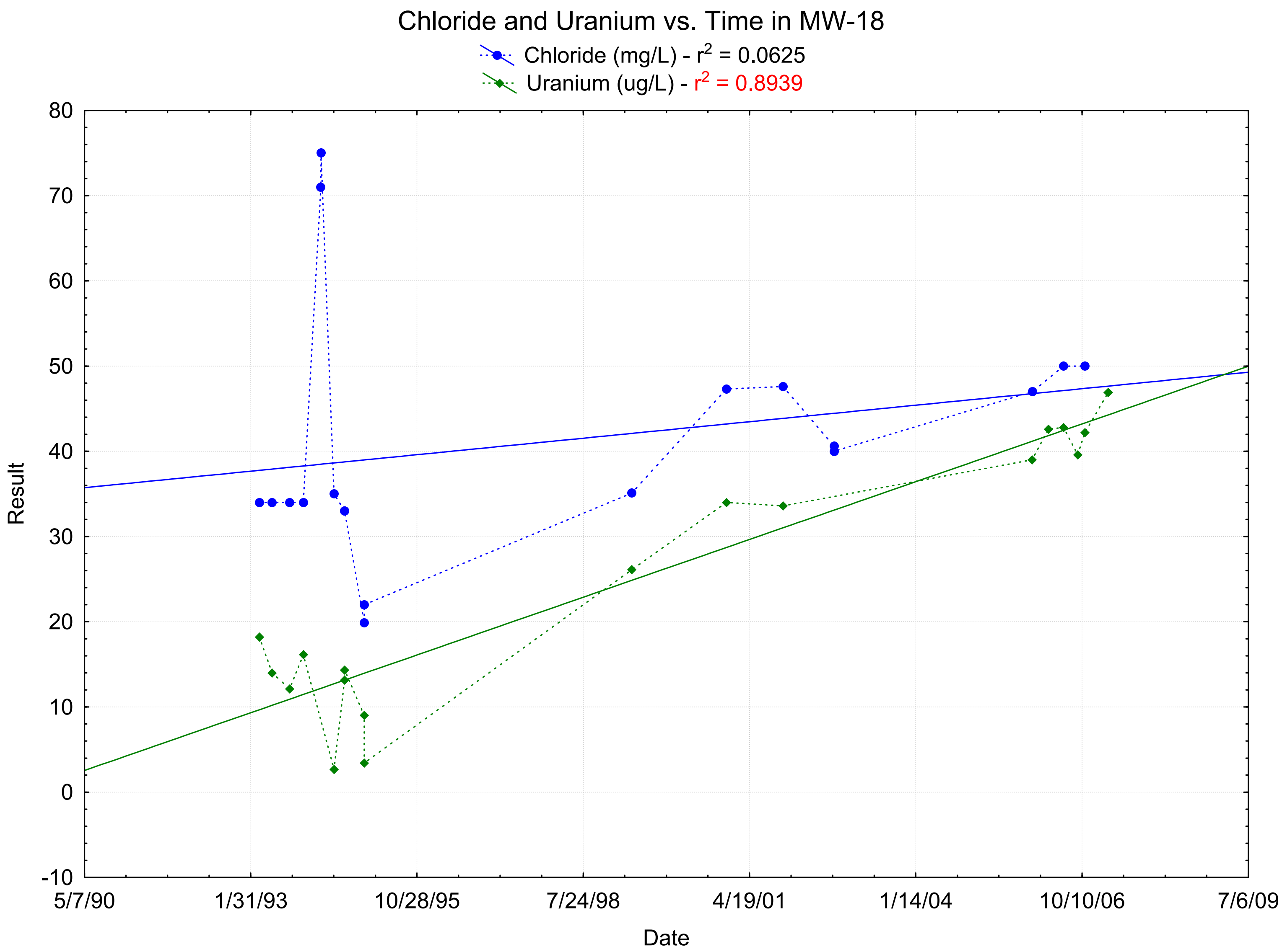

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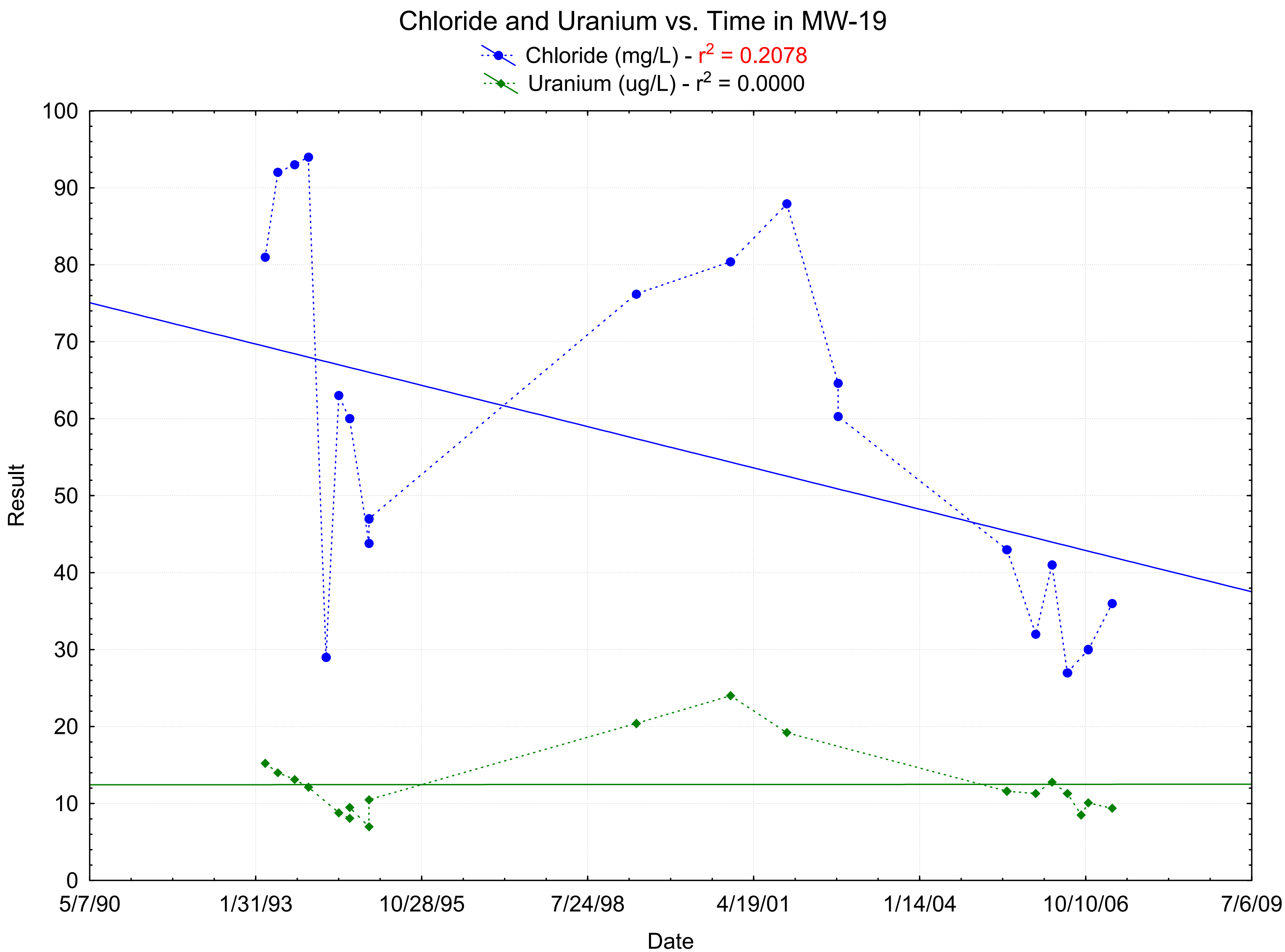

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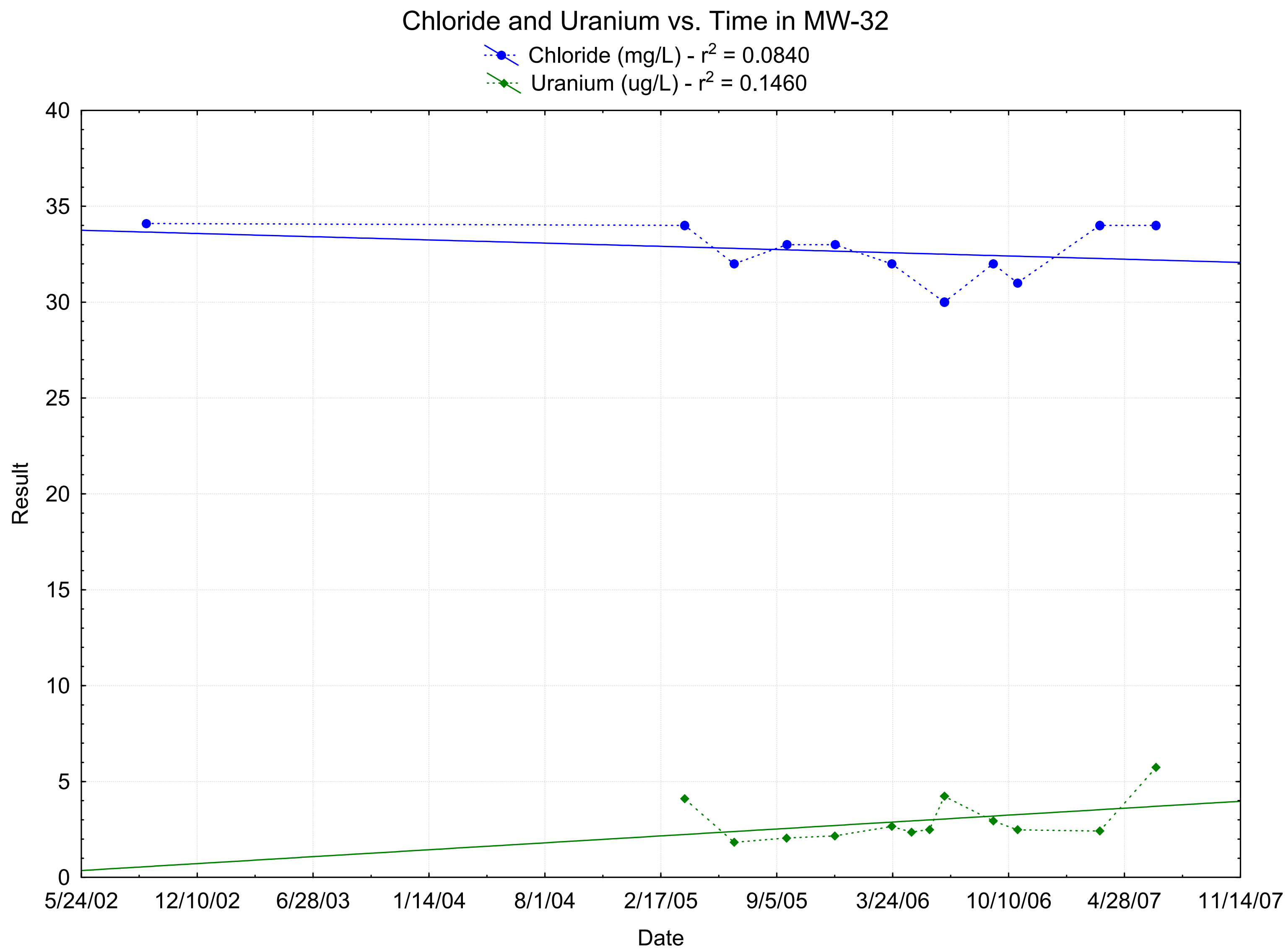

Figure 18
Linear Regressions of Chloride and Uranium vs. Time

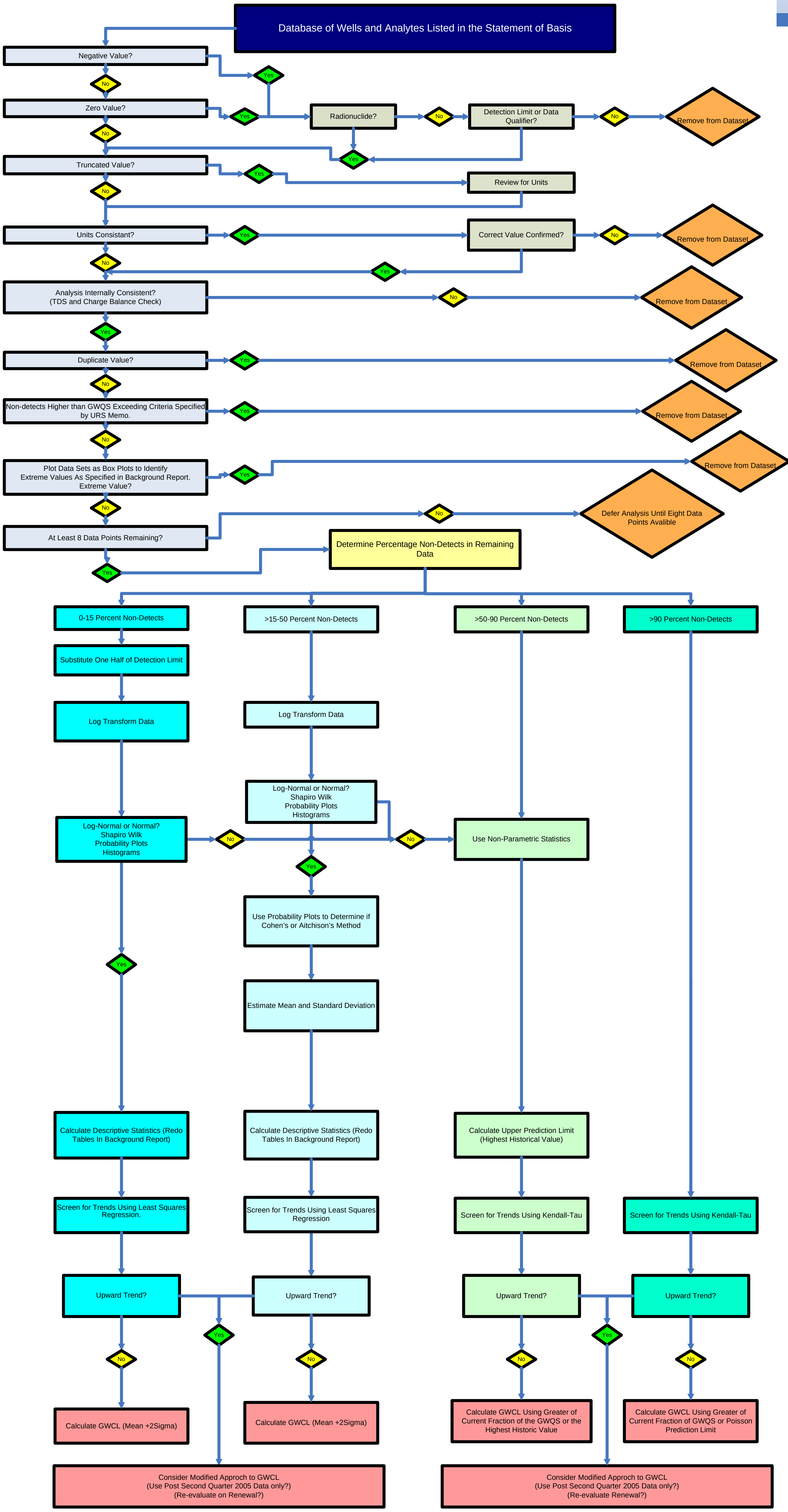

Figure 19
Groundwater Data Preperation and Statistical Process Flow for Calculating Groundwater Protection Standards, White Mesa Mill Site, San Juan County, Utah

TABLES

Table 1
Existing Wells, Monitoring Parameters, Groundwater Quality Standards and Groundwater Quality Compliance Limits, Background Groundwater Quality Report for White Mesa Mill, Utah

				MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32
Type	Contaminant	Units	GWQS	(Class II) GWCL	(Class III) GWCL	(Class III) GWCL	(Class II) GWCL	(Class II) GWCL	(Class III) GWCL	(Class III) GWCL	(Class III) GWCL	(Class III) GWCL	(Class II) GWCL	(Class II) GWCL	(Class III) GWCL	(Class III) GWCL
Nutrient	Ammonia, N	mg/L	25	6.25	12.5	12.5	6.25	6.25	12.5	12.5	12.5	12.5	6.25	6.25	12.5	12.5
Nutrient	Nitrate+Nitrite, N	mg/L	10	2.5	5	5	2.5	2.5	5	5	5	5	2.5	2.5	5	5
Metal	Arsenic	µg/L	50	12.5	25	25	12.5	12.5	25	25	25	25	12.5	12.5	25	25
Metal	Beryllium	µg/L	4	1	2	2	1	1	2	2	2	2	1	1	2	2
Metal	Cadmium	µg/L	5	1.25	2.5	2.5	1.25	1.25	2.5	2.5	2.5	2.5	1.25	1.25	2.5	2.5
Metal	Chromium	µg/L	100	25	50	50	25	25	50	50	50	50	25	25	50	50
Metal	Cobalt	µg/L	730	182.5	365	365	182.5	182.5	365	365	365	365	182.5	182.5	365	365
Metal	Copper	µg/L	1,300	325	650	650	325	325	650	650	650	650	325	325	650	650
Metal	Iron	µg/L	11,000	2,750	5,500	5,500	2,750	2,750	5,500	5,500	5,500	5,500	2,750	2,750	5,500	5,500
Metal	Lead	µg/L	15	3.75	7.5	7.5	3.75	3.75	7.5	7.5	7.5	7.5	3.75	3.75	7.5	7.5
Metal	Manganese	µg/L	800	200	400	400	200	200	400	400	400	400	200	200	400	400
Metal	Mercury	µg/L	2	0.5	1	1	0.5	0.5	1	1	1	1	0.5	0.5	1	1
Metal	Molybdenum	µg/L	40	10	20	20	10	10	20	20	20	20	10	10	20	20
Metal	Nickel	µg/L	100	25	50	50	25	25	50	50	50	50	25	25	50	50
Metal	Selenium	µg/L	50	12.5	25	25	12.5	12.5	25	25	25	25	12.5	12.5	25	25
Metal	Silver	µg/L	100	25	50	50	25	25	50	50	50	50	25	25	50	50
Metal	Thallium	µg/L	2	0.5	1	1	0.5	0.5	1	1	1	1	0.5	0.5	1	1
Metal	Tin	µg/L	4,000	1,000	2,000	2,000	1,000	1,000	2,000	2,000	2,000	2,000	1,000	1,000	2,000	2,000
Metal	Uranium	µg/L	30	7.5	15	15	7.5	7.5	15	15	15	15	7.5	7.5	15	15
Metal	Vanadium	µg/L	60	15	30	30	15	15	30	30	30	30	15	15	30	30
Metal	Zinc	µg/L	5,000	1,250	2,500	2,500	1,250	1,250	2,500	2,500	2,500	2,500	1,250	1,250	2,500	2,500
Radiologic	Gross Alpha minus Rn & U	pCi/L	15	3.75	7.5	7.5	3.75	3.75	7.5	7.5	7.5	7.5	3.75	3.75	7.5	7.5
Other	Fluoride	mg/L	4	1	2	2	1	1	2	2	2	2	1	1	2	2
Other	Chloride	mg/L	TBD	26.5	90.6	90.6	73.3	48.8	86.1	29.1	55.1	42.4	65.2	111	TBD	TBD
Other	Sulfate	mg/L	TBD	843	3,961	3,961	1,454	1,443	2,625	2,501	2,718	3,225	1,704	2,498	TBD	TBD
Other	TDS	mg/L	TBD	1,552	5,862	5,862	2,518	2,358	4,417	4,119	4,372	5,755	3,086	4,623	TBD	TBD
Other	Field pH	pH	6.5 to 8.5	6.9 to 8.2	6.1 to 7.5	6.1 to 7.6	7.0 to 8.2	7.0 to 8.5	6.3 to 7.6	6.2 to 7.6	6.2 to 8.0	6.3 to 7.9	6.3 to 8.2	6.5 to 8.6	TBD	TBD
VOC	Acetone	µg/L	700	175	350	350	175	175	350	350	350	350	175	175	350	350
VOC	Benzene	µg/L	5	1.25	2.5	2.5	1.25	1.25	2.5	2.5	2.5	2.5	1.25	1.25	2.5	2.5
VOC	2-Butanone (MEK)	µg/L	4	1	2	2	1	1	2	2	2	2	1	1	2	2
VOC	Carbon Tetrachloride	µg/L	5	1.25	2.5	2.5	1.25	1.25	2.5	2.5	2.5	2.5	1.25	1.25	2.5	2.5
VOC	Chloroform	µg/L	70	17.5	35	35	17.5	17.5	35	35	35	35	17.5	17.5	35	35
VOC	Chloromethane	µg/L	30	7.5	15	15	7.5	7.5	15	15	15	15	7.5	7.5	15	15
VOC	Dichloromethane	µg/L	5	1.25	2.5	2.5	1.25	1.25	2.5	2.5	2.5	2.5	1.25	1.25	2.5	2.5
VOC	Naphthalene	µg/L	100	25	50	50	25	25	50	50	50	50	25	25	50	50
VOC	Tetrahydrofuran	µg/L	46	11.5	23	23	11.5	11.5	23	23	23	23	11.5	11.5	23	23
VOC	Toluene	µg/L	1,000	250	500	500	250	250	500	500	500	500	250	250	500	500
VOC	Total Xylenes	µg/L	10,000	2.5	5	5	2.5	2.5	5	5	5	5	2.5	2.5	5	5
Well Sampling Start Date				10/31/1979	10/31/1979	10/31/1979	5/19/1980	12/16/1982	5/4/1983	10/31/1989	10/31/1989	11/6/1991	3/24/1993	3/29/1993	9/13/2002	9/13/2002
Well Sampling End Date				3/16/2007	10/24/2006	3/16/2007	3/15/2007	3/15/2007	3/16/2007	5/22/2007	3/15/2007	6/20/2007	3/16/2007	3/19/2007	6/20/2007	6/21/2007
Number of Samples				1,203	1,125	1,221	1,296	1,088	910	944	755	587	371	448	597	481

Notes:

GWQS = Groundwater quality standard
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
µg/L = Micrograms per liter

GWCL = Groundwater compliance limit
VOC = Volatile organic compound
MEK = Methyl ethyl ketone
TDS = Total dissolved solids

Class = Classification of groundwater based on TDS content
Class II = TDS from 500 to 3,000 mg/L
Class III = TDS from 3,000 to 10,000 mg/L
TBD = To be determined (defined as the value of the arithmetic mean plus two standard deviations)

Wells not included in the Background Report: MW-23, MW-24, MW-25, MW-27, MW-28, MW-29, MW-30, MW-31, MW-3A.

Table 2
Results for All Detected Compounds in DUSA Samples
Background Groundwater Quality Report for White Mesa Mill, Utah

Well	Class	Sdate	Lab	Chemical	Result	Qual	Detlim	GWQS	GWCL	Units	Exceeds GWCL?
MW-1	II	11/6/2001	Energy Labs	Chloromethane	2.6		1	30	7.5	µg/L	NO
MW-1	II	6/20/2005	Energy	Chloromethane	2		1	30	7.5	µg/L	NO
MW-1	II	12/13/2005	ENERGY	Chloromethane	1.2		1	30	7.5	µg/L	NO
MW-1	II	3/23/2006	ENERGY	Chloromethane	3.5		1	30	7.5	µg/L	NO
MW-1	II	3/23/2006	ENERGY	Chloromethane	3.5		1	30	7.5	µg/L	NO
MW-1	II	10/27/2006	Energy	Chloromethane	2.5		1	30	7.5	µg/L	NO
MW-1	**II**	**11/6/2001**	**Energy Labs**	**Tetrahydrofuran**	**18**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**6/20/2005**	**Energy**	**Tetrahydrofuran**	**85**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**12/13/2005**	**ENERGY**	**Tetrahydrofuran**	**58**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**3/23/2006**	**ENERGY**	**Tetrahydrofuran**	**48**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**3/23/2006**	**ENERGY**	**Tetrahydrofuran**	**48**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**6/25/2006**	**ENERGY**	**Tetrahydrofuran**	**60**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**3/16/2007**	**Energy Labs**	**Tetrahydrofuran**	**14**		**10**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**9/18/2006**	**Energy**	**Tetrahydrofuran**	**26**		**10**	**46**	**11.5**	**µg/L**	**YES**
MW-1	**II**	**10/27/2006**	**Energy**	**Tetrahydrofuran**	**16**		**10**	**46**	**11.5**	**µg/L**	**YES**
MW-11	II	11/6/2001	Energy Labs	Chloromethane	5.8		1	30	7.5	µg/L	NO
MW-11	II	6/21/2005	Energy	Chloromethane	2.4		1	30	7.5	µg/L	NO
MW-11	II	9/22/2005	ENERGY	Chloromethane	5.6		1	30	7.5	µg/L	NO
MW-11	II	3/21/2006	ENERGY	Chloromethane	4.7		1	30	7.5	µg/L	NO
MW-11	II	9/13/2006	Energy	Chloromethane	2.2		1	30	7.5	µg/L	NO
MW-11	II	10/25/2006	Energy	Chloromethane	2.2		1	30	7.5	µg/L	NO
MW-12	III	11/6/2001	Energy Labs	Chloromethane	2		1	30	15	µg/L	NO
MW-12	III	3/27/2006	ENERGY	Chloromethane	6.2		1	30	15	µg/L	NO
MW-12	III	6/22/2006	ENERGY	Chloromethane	1.7		1	30	15	µg/L	NO
MW-12	III	11/6/2001	Energy Labs	Tetrahydrofuran	21			46	23	µg/L	NO
MW-12	**III**	**6/22/2005**	**Energy**	**Tetrahydrofuran**	**24**		**1**	**46**	**23**	**µg/L**	**YES**
MW-12	III	12/13/2005	ENERGY	Tetrahydrofuran	12		1	46	23	µg/L	NO
MW-12	III	6/22/2006	ENERGY	Tetrahydrofuran	16		1	46	23	µg/L	NO
MW-12	**III**	**3/16/2007**	**Energy Labs**	**Tetrahydrofuran**	**38**		**10**	**46**	**23**	**µg/L**	**YES**
MW-12	III	9/15/2006	Energy	Tetrahydrofuran	18		10	46	23	µg/L	NO
MW-14	III	11/6/2001	Energy Labs	Chloromethane	5.4		1	30	15	µg/L	NO
MW-14	III	9/22/2005	ENERGY	Chloromethane	2.5		1	30	15	µg/L	NO
MW-14	III	9/13/2006	Energy	Chloromethane	3.3		1	30	15	µg/L	NO
MW-14	III	10/25/2006	Energy	Chloromethane	2.5		1	30	15	µg/L	NO
MW-15	III	11/6/2001	Energy Labs	Chloromethane	1.4		1	30	15	µg/L	NO
MW-15	III	6/21/2006	ENERGY	Chloromethane	1		1	30	15	µg/L	NO
MW-15	III	10/25/2006	Energy	Chloromethane	4		1	30	15	µg/L	NO
MW-17	III	11/6/2001	Energy Labs	Chloromethane	1.8		1	30	15	µg/L	NO
MW-17	III	12/13/2005	ENERGY	Chloromethane	1.1		1	30	15	µg/L	NO
MW-17	III	6/23/2006	ENERGY	Chloromethane	2.4		1	30	15	µg/L	NO
MW-17	III	10/26/2006	Energy	Chloromethane	3.7		1	30	15	µg/L	NO
MW-18	II	11/6/2001	Energy Labs	Chloromethane	2.5		1	30	7.5	µg/L	NO
MW-18	II	10/26/2006	Energy	Chloromethane	2.5		1	30	7.5	µg/L	NO
MW-19	II	11/5/2001	Energy Labs	Chloromethane	2.2		1	30	7.5	µg/L	NO
MW-19	II	10/26/2006	Energy	Chloromethane	3.9		1	30	7.5	µg/L	NO
MW-2	III	6/21/2005	Energy	Chloromethane	3.5		1	30	15	µg/L	NO
MW-2	III	10/24/2006	Energy	Chloromethane	2.1		1	30	15	µg/L	NO
MW-2	III	11/5/2001	Energy Labs	Tetrahydrofuran	19		1	46	23	µg/L	NO
MW-26	III	3/30/2005	Energy	Acetone	50	D	50	700	350	µg/L	NO
MW-26	III	3/30/2005	Energy	Benzene	2.5	D	2.5	5	2.5	µg/L	NO
MW-26	III	3/30/2005	Energy	Carbon tetrachloride	2.5	D	2.5	5	2.5	µg/L	NO
MW-26	**III**	**3/30/2005**	**Energy**	**Chloroform**	**230**	**D**	**2.5**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**6/21/2005**	**Energy**	**Chloroform**	**430**		**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**7/26/2005**	**ENERGY**	**Chloroform**	**260**	**D**	**50**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**8/24/2005**	**ENERGY**	**Chloroform**	**780**	**D**	**1**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**9/22/2005**	**ENERGY**	**Chloroform**	**810**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**10/26/2005**	**ENERGY**	**Chloroform**	**960**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**11/15/2005**	**ENERGY**	**Chloroform**	**1100**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**12/14/2005**	**ENERGY**	**Chloroform**	**1200**		**1**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**1/25/2006**	**ENERGY**	**Chloroform**	**1300**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**2/21/2006**	**ENERGY**	**Chloroform**	**860**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**3/22/2006**	**ENERGY**	**Chloroform**	**1200**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**4/25/2006**	**ENERGY**	**Chloroform**	**1200**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**5/26/2006**	**ENERGY**	**Chloroform**	**1100**	**D**	**50**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**6/20/2006**	**ENERGY**	**Chloroform**	**260**	**D**	**25**	**70**	**35**	**µg/L**	**YES**
MW-26	**III**	**7/11/2006**	**Energy**	**Chloroform**	**7800**	**D**	**500**	**70**	**35**	**µg/L**	**YES**

Table 2
Results for All Detected Compounds in DUSA Samples
Background Groundwater Quality Report for White Mesa Mill, Utah

Well	Class	Sdate	Lab	Chemical	Result	Qual	Detlim	GWQS	GWCL	Units	Exceeds GWCL?
MW-26	III	8/16/2006	Energy	Chloroform	980	D	500	70	35	µg/L	YES
MW-26	III	11/14/2006	Energy	Chloroform	950	D	25	70	35	µg/L	YES
MW-26	III	1/23/2007	Energy Labs	Chloroform	5700	D	100	70	35	µg/L	YES
MW-26	III	2/8/2007	Energy Labs	Chloroform	4400	D	100	70	35	µg/L	YES
MW-26	III	4/24/2007	Energy Labs	Chloroform	2100	D		70	35	µg/L	YES
MW-26	III	5/22/2007	Energy Labs	Chloroform	2400	D		70	35	µg/L	YES
MW-26	III	6/20/2007	Energy Labs	Chloroform	660	D	50	70	35	µg/L	YES
MW-26	III	9/12/2006	Energy	Chloroform	1200	D	25	70	35	µg/L	YES
MW-26	III	10/24/2006	Energy	Chloroform	1400	D	25	70	35	µg/L	YES
MW-26	III	12/13/2006	Energy	Chloroform	1100	D	50	70	35	µg/L	YES
MW-26	III	3/16/2007	Energy Labs	Chloroform	1600	D	250	70	35	µg/L	YES
MW-26	III	3/30/2005	Energy	Chloromethane	2.5	D	2.5	30	15	µg/L	NO
MW-26	III	6/21/2005	Energy	Chloromethane	5.5		2.5	30	15	µg/L	NO
MW-26	III	11/15/2005	ENERGY	Chloromethane	4.1	D	2.5	30	15	µg/L	NO
MW-26	III	1/25/2006	ENERGY	Chloromethane	5.4	D	2.5	30	15	µg/L	NO
MW-26	III	2/21/2006	ENERGY	Chloromethane	3.8	D	2.5	30	15	µg/L	NO
MW-26	III	3/22/2006	ENERGY	Chloromethane	4.7	D	2.5	30	15	µg/L	NO
MW-26	III	4/25/2006	ENERGY	Chloromethane	6.6	D	2.5	30	15	µg/L	NO
MW-26	III	12/13/2006	Energy	Chloromethane	2.6		1	30	15	µg/L	NO
MW-26	III	3/30/2005	Energy	2-Butanone (MEK)	50	D	50	4.0	2.0	µg/L	YES
MW-26	III	3/30/2005	Energy	Dichloromethane	2.5	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	6/21/2005	Energy	Dichloromethane	5.4		2.5	N/A	N/A	µg/L	N/A
MW-26	III	8/24/2005	ENERGY	Dichloromethane	11		1	N/A	N/A	µg/L	N/A
MW-26	III	9/22/2005	ENERGY	Dichloromethane	5.9	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	10/26/2005	ENERGY	Dichloromethane	9.8	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	11/15/2005	ENERGY	Dichloromethane	7.6	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	12/14/2005	ENERGY	Dichloromethane	12		1	N/A	N/A	µg/L	N/A
MW-26	III	1/25/2006	ENERGY	Dichloromethane	6.9	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	2/21/2006	ENERGY	Dichloromethane	4.8	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	3/22/2006	ENERGY	Dichloromethane	4.6	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	4/25/2006	ENERGY	Dichloromethane	14	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	5/26/2006	ENERGY	Dichloromethane	11	D	5	N/A	N/A	µg/L	N/A
MW-26	III	6/20/2006	ENERGY	Dichloromethane	2.5	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	8/16/2006	Energy	Dichloromethane	12	D	5	N/A	N/A	µg/L	N/A
MW-26	III	11/14/2006	Energy	Dichloromethane	15	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	2/8/2007	Energy Labs	Dichloromethane	25		1	N/A	N/A	µg/L	N/A
MW-26	III	4/24/2007	Energy Labs	Dichloromethane	33			N/A	N/A	µg/L	N/A
MW-26	III	5/22/2007	Energy Labs	Dichloromethane	28			N/A	N/A	µg/L	N/A
MW-26	III	6/20/2007	Energy Labs	Dichloromethane	37		1	N/A	N/A	µg/L	N/A
MW-26	III	9/12/2006	Energy	Dichloromethane	25	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	10/24/2006	Energy	Dichloromethane	31	D	2.5	N/A	N/A	µg/L	N/A
MW-26	III	12/13/2006	Energy	Dichloromethane	13		1	N/A	N/A	µg/L	N/A
MW-26	III	3/16/2007	Energy Labs	Dichloromethane	26		1	N/A	N/A	µg/L	N/A
MW-26	III	3/30/2005	Energy	Naphthalene	2.5	D	2.5	100	50	µg/L	NO
MW-26	III	3/30/2005	Energy	Tetrahydrofuran	2.5	D	2.5	46	23	µg/L	NO
MW-26	III	12/14/2005	ENERGY	Tetrahydrofuran	55		1	46	23	µg/L	YES
MW-26	III	3/30/2005	Energy	Toluene	2.5	D	2.5	1000	500	µg/L	NO
MW-26	III	3/30/2005	Energy	Xylenes (total)	2.5	D	2.5	10000	5	µg/L	NO
MW-3	III	11/6/2001	Energy Labs	Chloromethane	2.2		1	30	15	µg/L	NO
MW-3	III	9/23/2005	ENERGY	Chloromethane	5.2		20	30	15	µg/L	NO
MW-3	III	6/25/2006	ENERGY	Chloromethane	1.2		1	30	15	µg/L	NO
MW-3	III	9/14/2006	Energy	Chloromethane	2.2		1	30	15	µg/L	NO
MW-3	III	10/27/2006	Energy	Chloromethane	1.8		1	30	15	µg/L	NO
MW-3	III	11/6/2001	Energy Labs	Tetrahydrofuran	130			46	23	µg/L	YES
MW-3	III	12/13/2005	ENERGY	Tetrahydrofuran	13		1	46	23	µg/L	NO
MW-3	III	6/25/2006	ENERGY	Tetrahydrofuran	26		1	46	23	µg/L	YES
MW-3	III	3/16/2007	Energy Labs	Tetrahydrofuran	11		10	46	23	µg/L	NO
MW-3	III	9/14/2006	Energy	Tetrahydrofuran	46		10	46	23	µg/L	YES
MW-3	III	10/27/2006	Energy	Tetrahydrofuran	11		10	46	23	µg/L	NO
MW-32	III	9/22/2005	ENERGY	Chloromethane	1.7		1	30	15	µg/L	NO
MW-32	III	3/22/2006	ENERGY	Chloromethane	3.6		1	30	15	µg/L	NO
MW-32	III	9/13/2006	Energy	Chloromethane	3.6		1	30	15	µg/L	NO
MW-32	III	10/25/2006	Energy	Chloromethane	1.7		1	30	15	µg/L	NO
MW-5	II	11/6/2001	Energy Labs	Chloromethane	1.5		1	30	7.5	µg/L	NO
MW-5	II	6/21/2005	Energy	Chloromethane	3.2		1	30	7.5	µg/L	NO
MW-5	II	3/23/2006	ENERGY	Chloromethane	1.7		1	30	7.5	µg/L	NO
MW-5	II	6/23/2006	ENERGY	Chloromethane	2.7		1	30	7.5	µg/L	NO

Table 2
Results for All Detected Compounds in DUSA Samples
Background Groundwater Quality Report for White Mesa Mill, Utah

Well	Class	Sdate	Lab	Chemical	Result	Qual	Detlim	GWQS	GWCL	Units	Exceeds GWCL?
MW-5	II	10/27/2006	Energy	Chloromethane	2.9		1	30	7.5	µg/L	NO
MW-5	II	11/6/2001	Energy Labs	Tetrahydrofuran	10			46	11.5	µg/L	NO
MW-5	II	6/21/2005	Energy	Tetrahydrofuran	4.4		1	46	11.5	µg/L	NO
MW-5	**II**	**12/13/2005**	**ENERGY**	**Tetrahydrofuran**	**13**		**1**	**46**	**11.5**	**µg/L**	**YES**
MW-5	II	3/23/2006	ENERGY	Tetrahydrofuran	10		1	46	11.5	µg/L	NO
MW-5	II	6/23/2006	ENERGY	Tetrahydrofuran	7.8		1	46	11.5	µg/L	NO

Notes:

Well = Monitoring well name

CLASS = Class designation based on water quality; Class II waters have TDS less than 3,000 mg/L; Class III waters have TDS between 3,000 and 10,000 mg/L

SDATE = Sampling date

LAB = Laboratory that performed the chemical analysis

QUAL = Result qualifier, where "D" indicates dilution for analysis

DETLIM = Detection limit

GWQS = Groundwater Quality Standard

GWCL = Groundwater Compliance Limit, based on classification of groundwater (CLASS)

µg/L = Micrograms per liter

mg/L = Milligrams per liter

ppm = parts per million

EXCEEDS GWCL? = Boldface font highlights exceedances; NA means Not Applicable

Table 3
Comparison of DUSA Reporting Limits (1979 to 2007) to Groundwater Quality Standards, Background Groundwater Quality Report for White Mesa Mill, Utah

Type	Constituent	GWQS	DUSA Min RL	DUSA Max RL	Units
Nutrient	Ammonia, N	25	0.01	0.5	mg/L
Nutrient	Nitrate+Nitrite, N	10	0.1	0.8	mg/L
Metal	Arsenic	50	1	10	µg/L
Metal	Beryllium	4	0.2	1	µg/L
Metal	Cadmium	5	0.1	5	µg/L
Metal	Chromium	100	1	50	µg/L
Metal	Cobalt	730	10	10	µg/L
Metal	Copper	1,300	1	20	µg/L
Metal	Iron	11,000	10	223	µg/L
Metal	Lead	15	1	10	µg/L
Metal	Manganese	800	0.2	10	µg/L
Metal	Mercury	2	0.0003	1	µg/L
Metal	Molybdenum	40	1	20	µg/L
Metal	Nickel	100	1	50	µg/L
Metal	Selenium	50	1	10	µg/L
Metal	Silver	100	1	10	µg/L
Metal	Thallium	2	0.001	1.1	µg/L
Metal	Uranium	30	0.0003	10	µg/L
Metal	Vanadium	60	1	100	µg/L
Metal	Zinc	5,000	1	30	µg/L
Radiologic	Gross Alpha	15	1	11.3	pCi/L
Organics	Acetone	700	1	100	µg/L
Organics	Benzene	5	1	5	µg/L
Organics	2-Butanone (MEK)	4.0	1	100	µg/L
Organics	Carbon Tetrachloride	5	1	5	µg/L
Organics	Chloroform	70	1	500	µg/L
Organics	Chloromethane	30	1	20	µg/L
Organics	Dichloromethane	5	1	5	µg/L
Organics	Naphthalene	100	1	5	µg/L
Organics	Tetrahydrofuran	46	1	25	µg/L
Organics	Toluene	1,000	1	5	µg/L
Organics	Xylenes (total)	10,000	1	5	µg/L
Other	Fluoride	4	0.01	0.5	mg/L
Other	Chloride	TBD	0.1	10	mg/L
Other	Sulfate	TBD	0.1	100	mg/L
Other	TDS	TBD	1	10	mg/L
Other	Field pH	6.5 to 8.5			s.u

Notes:

GWQS = Groundwater Quality Standard
UDEQ = Utah Department of Environmental Quality
DUSA = Denison Mines (USA) Corp.
Max RL = Maximum reporting limit in database
Min RL = Minimum reporting limit in database
mg/L = Milligrams per liter
µg/L = Micrograms per liter
pCi/L = Picocuries per liter

Table 4a
Records of "Non-Detects" that have a Detection limit Insensitive to the GWQS*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard

These records were removed from the database prior to statistical analyses.

Well	Date	Constituent	Results	Unit	Qualifier	Detection Limit	GWQS	Ground Water Class
MW-1	8/18/1994	Beryllium	10	ug/L	U	10	4	II
MW-1	11/6/2001	Beryllium	10	ug/L	U	10	4	II
MW-1	12/28/1981	Cadmium	10	ug/L	U	10	5	II
MW-1	4/22/1983	Cadmium	10	ug/L	U	10	5	II
MW-1	8/18/1994	Cadmium	10	ug/L	U	10	5	II
MW-1	6/18/1981	Lead	50	ug/L	U	50	15	II
MW-1	8/14/1981	Lead	50	ug/L	U	50	15	II
MW-1	9/1/1981	Lead	50	ug/L	U	50	15	II
MW-1	12/28/1981	Lead	50	ug/L	U	50	15	II
MW-1	1/28/1982	Lead	50	ug/L	U	50	15	II
MW-1	11/6/2001	Lead	50	ug/L	U	50	15	II
MW-1	9/9/2002	Lead	50	ug/L	U	50	15	II
MW-1	5/19/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	6/16/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	7/16/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	8/19/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	9/1/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	10/1/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	11/13/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	12/10/1980	Molybdenum	50	ug/L	U	50	40	II
MW-1	1/22/1981	Molybdenum	50	ug/L	U	50	40	II
MW-1	2/12/1981	Molybdenum	50	ug/L	U	50	40	II
MW-1	3/19/1981	Molybdenum	50	ug/L	U	50	40	II
MW-1	4/14/1981	Molybdenum	50	ug/L	U	50	40	II
MW-1	6/18/1981	Molybdenum	100	ug/L	U	100	40	II
MW-1	8/14/1981	Molybdenum	100	ug/L	U	100	40	II
MW-1	9/1/1981	Molybdenum	100	ug/L	U	100	40	II
MW-1	12/28/1981	Molybdenum	100	ug/L	U	100	40	II
MW-1	1/28/1982	Molybdenum	100	ug/L	U	100	40	II
MW-1	4/22/1983	Molybdenum	100	ug/L	U	100	40	II
MW-1	8/18/1994	Molybdenum	100	ug/L	U	100	40	II
MW-1	11/6/2001	Molybdenum	100	ug/L	U	100	40	II
MW-1	9/9/2002	Molybdenum	100	ug/L	U	100	40	II
MW-1	11/15/1989	Thallium	10	ug/L	U	10	2	II
MW-1	11/6/2001	Thallium	10	ug/L	U	10	2	II
MW-1	9/9/2002	Thallium	10	ug/L	U	10	2	II
MW-1	6/18/1981	Vanadium	100	ug/L	U	100	60	II
MW-1	8/14/1981	Vanadium	100	ug/L	U	100	60	II
MW-1	9/1/1981	Vanadium	100	ug/L	U	100	60	II
MW-1	12/28/1981	Vanadium	500	ug/L	U	500	60	II
MW-1	1/28/1982	Vanadium	100	ug/L	U	100	60	II
MW-1	4/22/1983	Vanadium	100	ug/L	U	100	60	II
MW-1	6/28/1985	Vanadium	200	ug/L	U	200	60	II
MW-1	11/6/2001	Vanadium	100	ug/L	U	100	60	II
MW-1	9/9/2002	Vanadium	100	ug/L	U	100	60	II
MW-11	12/15/1989	Beryllium	10	ug/L	U	10	4	II
MW-11	8/23/1994	Beryllium	10	ug/L	U	10	4	II
MW-11	11/6/2001	Beryllium	10	ug/L	U	10	4	II
MW-11	5/24/1983	Cadmium	10	ug/L	U	10	5	II
MW-11	8/23/1994	Cadmium	10	ug/L	U	10	5	II
MW-11	2/18/1999	Lead	50	ug/L	U	50	15	II
MW-11	11/6/2001	Lead	50	ug/L	U	50	15	II
MW-11	9/10/2002	Lead	50	ug/L	U	50	15	II
MW-11	5/24/1983	Molybdenum	100	ug/L	U	100	40	II
MW-11	8/23/1994	Molybdenum	100	ug/L	U	100	40	II
MW-11	11/6/2001	Molybdenum	100	ug/L	U	100	40	II
MW-11	9/10/2002	Molybdenum	100	ug/L	U	100	40	II
MW-11	12/15/1989	Thallium	10	ug/L	U	10	2	II
MW-11	11/6/2001	Thallium	10	ug/L	U	10	2	II
MW-11	9/10/2002	Thallium	10	ug/L	U	10	2	II
MW-11	5/24/1983	Vanadium	100	ug/L	U	100	60	II

Table 4a
Records of "Non-Detects" that have a Detection limit Insensitive to the GWQS*

These records were removed from the database prior to statistical analyses.

Well	Date	Constituent	Results	Unit	Qualifier	Detection Limit	GWQS	Ground Water Class
MW-11	6/28/1985	Vanadium	200	ug/L	U	200	60	II
MW-11	11/6/2001	Vanadium	100	ug/L	U	100	60	II
MW-11	9/10/2002	Vanadium	100	ug/L	U	100	60	II
MW-12	12/18/1989	Beryllium	10	ug/L	U	10	4	III
MW-12	8/24/1994	Beryllium	10	ug/L	U	10	4	III
MW-12	11/28/2000	Beryllium	10	ug/L	U	10	4	III
MW-12	11/6/2001	Beryllium	10	ug/L	U	10	4	III
MW-12	8/24/1994	Cadmium	10	ug/L	U	10	5	III
MW-12	2/18/1999	Lead	50	ug/L	U	50	15	III
MW-12	11/28/2000	Lead	50	ug/L	U	50	15	III
MW-12	11/6/2001	Lead	50	ug/L	U	50	15	III
MW-12	9/10/2002	Lead	50	ug/L	U	50	15	III
MW-12	5/4/1983	Molybdenum	100	ug/L	U	100	40	III
MW-12	8/24/1994	Molybdenum	100	ug/L	U	100	40	III
MW-12	11/28/2000	Molybdenum	100	ug/L	U	100	40	III
MW-12	11/6/2001	Molybdenum	100	ug/L	U	100	40	III
MW-12	9/10/2002	Molybdenum	100	ug/L	U	100	40	III
MW-12	12/18/1989	Thallium	10	ug/L	U	10	2	III
MW-12	11/6/2001	Thallium	10	ug/L	U	10	2	III
MW-12	9/10/2002	Thallium	10	ug/L	U	10	2	III
MW-12	5/4/1983	Vanadium	100	ug/L	U	100	60	III
MW-12	6/28/1985	Vanadium	200	ug/L	U	200	60	III
MW-12	11/28/2000	Vanadium	100	ug/L	U	100	60	III
MW-12	11/6/2001	Vanadium	100	ug/L	U	100	60	III
MW-12	9/10/2002	Vanadium	100	ug/L	U	100	60	III
MW-14	12/18/1989	Beryllium	10	ug/L	U	10	4	III
MW-14	8/24/1994	Beryllium	10	ug/L	U	10	4	III
MW-14	11/28/2000	Beryllium	10	ug/L	U	10	4	III
MW-14	11/6/2001	Beryllium	10	ug/L	U	10	4	III
MW-14	8/24/1994	Cadmium	10	ug/L	U	10	5	III
MW-14	9/10/2002	Chloride	18.1	mg/L	U	2000	5	III
MW-14	2/18/1999	Lead	50	ug/L	U	50	15	III
MW-14	11/28/2000	Lead	50	ug/L	U	50	15	III
MW-14	11/6/2001	Lead	50	ug/L	U	50	15	III
MW-14	9/10/2002	Lead	50	ug/L	U	50	15	III
MW-14	8/24/1994	Molybdenum	100	ug/L	U	100	40	III
MW-14	11/28/2000	Molybdenum	100	ug/L	U	100	40	III
MW-14	11/6/2001	Molybdenum	100	ug/L	U	100	40	III
MW-14	9/10/2002	Molybdenum	100	ug/L	U	100	40	III
MW-14	12/18/1989	Thallium	10	ug/L	U	10	2	III
MW-14	11/6/2001	Thallium	10	ug/L	U	10	2	III
MW-14	9/10/2002	Thallium	10	ug/L	U	10	2	III
MW-14	12/8/1994	Uranium	90.00	ug/L	U	90.00	30	III
MW-14	11/28/2000	Vanadium	100	ug/L	U	100	60	III
MW-14	11/6/2001	Vanadium	100	ug/L	U	100	60	III
MW-14	9/10/2002	Vanadium	100	ug/L	U	100	60	III
MW-15	11/28/1989	Beryllium	10	ug/L	U	10	4	III
MW-15	12/18/1989	Beryllium	10	ug/L	U	10	4	III
MW-15	8/24/1994	Beryllium	10	ug/L	U	10	4	III
MW-15	11/6/2001	Beryllium	10	ug/L	U	10	4	III
MW-15	8/24/1994	Cadmium	10	ug/L	U	10	5	III
MW-15	11/6/2001	Lead	50	ug/L	U	50	15	III
MW-15	9/10/2002	Lead	50	ug/L	U	50	15	III
MW-15	8/24/1994	Molybdenum	100	ug/L	U	100	40	III
MW-15	11/6/2001	Molybdenum	100	ug/L	U	100	40	III
MW-15	9/10/2002	Molybdenum	100	ug/L	U	100	40	III
MW-15	11/28/1989	Thallium	10	ug/L	U	10	2	III
MW-15	12/18/1989	Thallium	10	ug/L	U	10	2	III
MW-15	11/6/2001	Thallium	10	ug/L	U	10	2	III
MW-15	9/10/2002	Thallium	10	ug/L	U	10	2	III
MW-15	11/6/2001	Vanadium	100	ug/L	U	100	60	III
MW-15	9/10/2002	Vanadium	100	ug/L	U	100	60	III
MW-17	8/24/1994	Beryllium	10	ug/L	U	10	4	III

Table 4a
Records of "Non-Detects" that have a Detection limit Insensitive to the GWQS*

These records were removed from the database prior to statistical analyses.

Well	Date	Constituent	Results	Unit	Qualifier	Detection Limit	GWQS	Ground Water Class
MW-17	11/6/2001	Beryllium	10	ug/L	U	10	4	III
MW-17	8/24/1994	Cadmium	10	ug/L	U	10	5	III
MW-17	11/6/2001	Lead	50	ug/L	U	50	15	III
MW-17	9/10/2002	Lead	50	ug/L	U	50	15	III
MW-17	8/24/1994	Molybdenum	100	ug/L	U	100	40	III
MW-17	11/6/2001	Molybdenum	100	ug/L	U	100	40	III
MW-17	9/10/2002	Molybdenum	100	ug/L	U	100	40	III
MW-17	11/6/2001	Thallium	10	ug/L	U	10	2	III
MW-17	9/10/2002	Thallium	10	ug/L	U	10	2	III
MW-17	11/6/2001	Vanadium	100	ug/L	U	100	60	III
MW-17	9/10/2002	Vanadium	100	ug/L	U	100	60	III
MW-18	8/19/1994	Beryllium	10	ug/L	U	10	4	II
MW-18	11/6/2001	Beryllium	10	ug/L	U	10	4	II
MW-18	8/19/1994	Cadmium	10	ug/L	U	10	5	II
MW-18	11/6/2001	Lead	50	ug/L	U	50	15	II
MW-18	9/9/2002	Lead	50	ug/L	U	50	15	II
MW-18	8/19/1994	Molybdenum	100	ug/L	U	100	40	II
MW-18	11/6/2001	Molybdenum	100	ug/L	U	100	40	II
MW-18	9/9/2002	Molybdenum	100	ug/L	U	100	40	II
MW-18	11/6/2001	Thallium	10	ug/L	U	10	2	II
MW-18	9/9/2002	Thallium	10	ug/L	U	10	2	II
MW-18	11/6/2001	Vanadium	100	ug/L	U	100	60	II
MW-18	9/9/2002	Vanadium	100	ug/L	U	100	60	II
MW-19	8/19/1994	Beryllium	10	ug/L	U	10	4	II
MW-19	11/5/2001	Beryllium	10	ug/L	U	10	4	II
MW-19	8/19/1994	Cadmium	10	ug/L	U	10	5	II
MW-19	12/1/2000	Lead	3	ug/L	U	30	15	II
MW-19	11/5/2001	Lead	50	ug/L	U	50	15	II
MW-19	9/10/2002	Lead	50	ug/L	U	50	15	II
MW-19	8/19/1994	Molybdenum	100	ug/L	U	100	40	II
MW-19	11/5/2001	Molybdenum	100	ug/L	U	100	40	II
MW-19	9/10/2002	Molybdenum	100	ug/L	U	100	40	II
MW-19	11/5/2001	Thallium	10	ug/L	U	10	2	II
MW-19	9/10/2002	Thallium	10	ug/L	U	10	2	II
MW-19	11/5/2001	Vanadium	100	ug/L	U	100	60	II
MW-19	9/10/2002	Vanadium	100	ug/L	U	100	60	II
MW-2	8/23/1994	Beryllium	10	ug/L	U	10	4	III
MW-2	11/5/2001	Beryllium	10	ug/L	U	10	4	III
MW-2	12/28/1981	Cadmium	10	ug/L	U	10	5	III
MW-2	5/4/1983	Cadmium	10	ug/L	U	10	5	III
MW-2	8/23/1994	Cadmium	10	ug/L	U	10	5	III
MW-2	6/24/1981	Lead	50	ug/L	U	50	15	III
MW-2	8/11/1981	Lead	50	ug/L	U	50	15	III
MW-2	9/1/1981	Lead	50	ug/L	U	50	15	III
MW-2	12/28/1981	Lead	50	ug/L	U	50	15	III
MW-2	1/28/1982	Lead	50	ug/L	U	50	15	III
MW-2	11/5/2001	Lead	50	ug/L	U	50	15	III
MW-2	9/10/2002	Lead	50	ug/L	U	50	15	III
MW-2	6/16/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	7/16/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	8/19/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	9/1/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	10/1/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	11/13/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	12/10/1980	Molybdenum	50	ug/L	U	50	40	III
MW-2	1/22/1981	Molybdenum	50	ug/L	U	50	40	III
MW-2	2/11/1981	Molybdenum	50	ug/L	U	50	40	III
MW-2	4/21/1981	Molybdenum	50	ug/L	U	50	40	III
MW-2	6/24/1981	Molybdenum	100	ug/L	U	100	40	III
MW-2	8/11/1981	Molybdenum	100	ug/L	U	100	40	III
MW-2	9/1/1981	Molybdenum	100	ug/L	U	100	40	III
MW-2	12/28/1981	Molybdenum	100	ug/L	U	100	40	III
MW-2	1/28/1982	Molybdenum	100	ug/L	U	100	40	III

Table 4a
Records of "Non-Detects" that have a Detection limit Insensitive to the GWQS*

These records were removed from the database prior to statistical analyses.

Well	Date	Constituent	Results	Unit	Qualifier	Detection Limit	GWQS	Ground Water Class
MW-2	5/4/1983	Molybdenum	100	ug/L	U	100	40	III
MW-2	8/23/1994	Molybdenum	100	ug/L	U	100	40	III
MW-2	11/5/2001	Molybdenum	100	ug/L	U	100	40	III
MW-2	9/10/2002	Molybdenum	100	ug/L	U	100	40	III
MW-2	11/16/1989	Thallium	10	ug/L	U	10	2	III
MW-2	11/5/2001	Thallium	10	ug/L	U	10	2	III
MW-2	9/10/2002	Thallium	10	ug/L	U	10	2	III
MW-2	6/24/1981	Vanadium	100	ug/L	U	100	60	III
MW-2	8/11/1981	Vanadium	100	ug/L	U	100	60	III
MW-2	9/1/1981	Vanadium	100	ug/L	U	100	60	III
MW-2	12/28/1981	Vanadium	500	ug/L	U	500	60	III
MW-2	1/28/1982	Vanadium	100	ug/L	U	100	60	III
MW-2	5/4/1983	Vanadium	100	ug/L	U	100	60	III
MW-2	6/28/1985	Vanadium	200	ug/L	U	200	60	III
MW-2	11/5/2001	Vanadium	100	ug/L	U	100	60	III
MW-2	9/10/2002	Vanadium	100	ug/L	U	100	60	III
MW-26	9/13/2002	Lead	50	ug/L	U	50	15	III
MW-26	9/13/2002	Molybdenum	100	ug/L	U	100	40	III
MW-26	9/13/2002	Thallium	10	ug/L	U	10	2	III
MW-26	9/13/2002	Vanadium	100	ug/L	U	100	60	III
MW-3	11/28/1989	Beryllium	10	ug/L	U	10	4	III
MW-3	8/18/1994	Beryllium	10	ug/L	U	10	4	III
MW-3	11/6/2001	Beryllium	10	ug/L	U	10	4	III
MW-3	12/28/1981	Cadmium	10	ug/L	U	10	5	III
MW-3	4/21/1983	Cadmium	10	ug/L	U	10	5	III
MW-3	8/18/1994	Cadmium	10	ug/L	U	10	5	III
MW-3	6/24/1981	Lead	50	ug/L	U	50	15	III
MW-3	8/18/1981	Lead	50	ug/L	U	50	15	III
MW-3	9/1/1981	Lead	50	ug/L	U	50	15	III
MW-3	12/28/1981	Lead	50	ug/L	U	50	15	III
MW-3	1/27/1982	Lead	50	ug/L	U	50	15	III
MW-3	11/6/2001	Lead	50	ug/L	U	50	15	III
MW-3	9/12/2002	Lead	50	ug/L	U	50	15	III
MW-3	6/16/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	7/16/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	8/19/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	9/1/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	10/1/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	11/11/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	12/10/1980	Molybdenum	50	ug/L	U	50	40	III
MW-3	1/22/1981	Molybdenum	50	ug/L	U	50	40	III
MW-3	2/12/1981	Molybdenum	50	ug/L	U	50	40	III
MW-3	3/18/1981	Molybdenum	50	ug/L	U	50	40	III
MW-3	4/13/1981	Molybdenum	50	ug/L	U	50	40	III
MW-3	6/24/1981	Molybdenum	100	ug/L	U	100	40	III
MW-3	8/18/1981	Molybdenum	100	ug/L	U	100	40	III
MW-3	9/1/1981	Molybdenum	100	ug/L	U	100	40	III
MW-3	12/28/1981	Molybdenum	100	ug/L	U	100	40	III
MW-3	1/27/1982	Molybdenum	100	ug/L	U	100	40	III
MW-3	4/21/1983	Molybdenum	100	ug/L	U	100	40	III
MW-3	8/18/1994	Molybdenum	100	ug/L	U	100	40	III
MW-3	11/6/2001	Molybdenum	100	ug/L	U	100	40	III
MW-3	9/12/2002	Molybdenum	100	ug/L	U	100	40	III
MW-3	11/28/1989	Thallium	10	ug/L	U	10	2	III
MW-3	11/6/2001	Thallium	10	ug/L	U	10	2	III
MW-3	9/12/2002	Thallium	10	ug/L	U	10	2	III
MW-3	6/24/1981	Vanadium	100	ug/L	U	100	60	III
MW-3	8/18/1981	Vanadium	100	ug/L	U	100	60	III
MW-3	9/1/1981	Vanadium	100	ug/L	U	100	60	III
MW-3	12/28/1981	Vanadium	500	ug/L	U	500	60	III
MW-3	1/27/1982	Vanadium	100	ug/L	U	100	60	III
MW-3	4/21/1983	Vanadium	100	ug/L	U	100	60	III
MW-3	6/28/1985	Vanadium	200	ug/L	U	200	60	III

Table 4a
Records of "Non-Detects" that have a Detection limit Insensitive to the GWQS*

These records were removed from the database prior to statistical analyses.

Well	Date	Constituent	Results	Unit	Qualifier	Detection Limit	GWQS	Ground Water Class
MW-3	11/6/2001	Vanadium	100	ug/L	U	100	60	III
MW-3	9/12/2002	Vanadium	100	ug/L	U	100	60	III
MW-32	9/13/2002	Lead	50	ug/L	U	50	15	III
MW-32	9/13/2002	Molybdenum	100	ug/L	U	100	40	III
MW-32	9/13/2002	Thallium	10	ug/L	U	10	2	III
MW-32	9/13/2002	Vanadium	100	ug/L	U	100	60	III
MW-5	11/1/1989	Beryllium	10	ug/L	U	10	4	II
MW-5	12/15/1989	Beryllium	10	ug/L	U	10	4	II
MW-5	8/24/1994	Beryllium	10	ug/L	U	10	4	II
MW-5	11/28/2000	Beryllium	10	ug/L	U	10	4	II
MW-5	11/6/2001	Beryllium	10	ug/L	U	10	4	II
MW-5	12/28/1981	Cadmium	10	ug/L	U	10	5	II
MW-5	5/24/1983	Cadmium	10	ug/L	U	10	5	II
MW-5	8/24/1994	Cadmium	10	ug/L	U	10	5	II
MW-5	6/18/1981	Lead	50	ug/L	U	50	15	II
MW-5	8/18/1981	Lead	50	ug/L	U	50	15	II
MW-5	9/1/1981	Lead	50	ug/L	U	50	15	II
MW-5	12/28/1981	Lead	50	ug/L	U	50	15	II
MW-5	1/26/1982	Lead	50	ug/L	U	50	15	II
MW-5	2/18/1999	Lead	50	ug/L	U	50	15	II
MW-5	11/28/2000	Lead	50	ug/L	U	50	15	II
MW-5	11/6/2001	Lead	50	ug/L	U	50	15	II
MW-5	9/10/2002	Lead	50	ug/L	U	50	15	II
MW-5	5/19/1980	Molybdenum	50	ug/L	U	500	40	II
MW-5	6/16/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	7/16/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	8/19/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	9/1/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	10/1/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	11/11/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	12/9/1980	Molybdenum	50	ug/L	U	50	40	II
MW-5	1/22/1981	Molybdenum	50	ug/L	U	50	40	II
MW-5	2/11/1981	Molybdenum	50	ug/L	U	50	40	II
MW-5	3/17/1981	Molybdenum	50	ug/L	U	50	40	II
MW-5	4/21/1981	Molybdenum	50	ug/L	U	50	40	II
MW-5	6/18/1981	Molybdenum	100	ug/L	U	100	40	II
MW-5	8/18/1981	Molybdenum	100	ug/L	U	100	40	II
MW-5	9/1/1981	Molybdenum	100	ug/L	U	100	40	II
MW-5	12/28/1981	Molybdenum	100	ug/L	U	100	40	II
MW-5	1/26/1982	Molybdenum	100	ug/L	U	100	40	II
MW-5	5/24/1983	Molybdenum	100	ug/L	U	100	40	II
MW-5	8/24/1994	Molybdenum	100	ug/L	U	100	40	II
MW-5	11/28/2000	Molybdenum	100	ug/L	U	100	40	II
MW-5	11/6/2001	Molybdenum	100	ug/L	U	100	40	II
MW-5	9/10/2002	Molybdenum	100	ug/L	U	100	40	II
MW-5	11/1/1989	Thallium	10	ug/L	U	10	2	II
MW-5	12/15/1989	Thallium	10	ug/L	U	10	2	II
MW-5	11/6/2001	Thallium	10	ug/L	U	10	2	II
MW-5	9/10/2002	Thallium	10	ug/L	U	10	2	II
MW-5	6/18/1981	Vanadium	100	ug/L	U	100	60	II
MW-5	8/18/1981	Vanadium	100	ug/L	U	100	60	II
MW-5	9/1/1981	Vanadium	100	ug/L	U	100	60	II
MW-5	12/28/1981	Vanadium	50	ug/L	U	500	60	II
MW-5	1/26/1982	Vanadium	100	ug/L	U	100	60	II
MW-5	5/24/1983	Vanadium	100	ug/L	U	100	60	II
MW-5	6/28/1985	Vanadium	200	ug/L	U	200	60	II
MW-5	11/28/2000	Vanadium	100	ug/L	U	100	60	II
MW-5	11/6/2001	Vanadium	100	ug/L	U	100	60	II
MW-5	9/10/2002	Vanadium	100	ug/L	U	100	60	II

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-1	8/18/1994	Beryllium	10	ug/L	U	10	II	4	1
MW-1	11/6/2001	Beryllium	10	ug/L	U	10	II	4	1
MW-1	6/16/1980	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	7/16/1980	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	12/10/1980	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	3/19/1981	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	9/1/1981	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	12/28/1981	Cadmium	10	ug/L	U	10	II	5	1.25
MW-1	1/28/1982	Cadmium	2	ug/L	U	2	II	5	1.25
MW-1	4/22/1983	Cadmium	10	ug/L	U	10	II	5	1.25
MW-1	11/15/1989	Cadmium	5	ug/L	U	5	II	5	1.25
MW-1	8/18/1994	Cadmium	10	ug/L	U	10	II	5	1.25
MW-1	11/6/2001	Cadmium	5	ug/L	U	5	II	5	1.25
MW-1	9/9/2002	Cadmium	5	ug/L	U	5	II	5	1.25
MW-1	11/6/2001	Chromium	50	ug/L	U	50	II	100	25
MW-1	9/9/2002	Chromium	50	ug/L	U	50	II	100	25
MW-1	6/20/2005	Chromium	50	ug/L	U	50	II	100	25
MW-1	5/19/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	7/16/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	8/19/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	10/1/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	11/13/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	12/10/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-1	1/22/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-1	2/12/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-1	3/19/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-1	4/14/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-1	6/18/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-1	8/14/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-1	9/1/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-1	12/28/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-1	1/28/1982	Lead	50	ug/L	U	50	II	15	3.75
MW-1	4/22/1983	Lead	10	ug/L	U	10	II	15	3.75
MW-1	6/13/1984	Lead	5	ug/L	U	5	II	15	3.75
MW-1	11/6/2001	Lead	50	ug/L	U	50	II	15	3.75
MW-1	9/9/2002	Lead	50	ug/L	U	50	II	15	3.75
MW-1	5/11/1999	Mercury	1	ug/L	U	1	II	2	0.5
MW-1	11/6/2001	Mercury	1	ug/L	U	1	II	2	0.5
MW-1	9/9/2002	Mercury	1	ug/L	U	1	II	2	0.5
MW-1	5/19/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	6/16/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	7/16/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	8/19/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	9/1/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	10/1/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	11/13/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	12/10/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	1/22/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	2/12/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	3/19/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	4/14/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-1	6/18/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	8/14/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	9/1/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	12/28/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	1/28/1982	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	4/22/1983	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	8/18/1994	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	11/6/2001	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	6/20/2005	Molybdenum	20	ug/L	U	20	II	40	10
MW-1	9/9/2002	Molybdenum	100	ug/L	U	100	II	40	10
MW-1	8/18/1994	Nickel	50	ug/L	U	50	II	100	25
MW-1	6/28/1995	Nickel	50	ug/L	U	50	II	100	25
MW-1	9/20/1995	Nickel	50	ug/L	U	50	II	100	25
MW-1	12/11/1995	Nickel	50	ug/L	U	50	II	100	25
MW-1	3/28/1996	Nickel	50	ug/L	U	50	II	100	25
MW-1	6/7/1996	Nickel	50	ug/L	U	50	II	100	25
MW-1	9/16/1996	Nickel	50	ug/L	U	50	II	100	25
MW-1	3/20/1997	Nickel	50	ug/L	U	50	II	100	25
MW-1	11/6/2001	Nickel	50	ug/L	U	50	II	100	25

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-1	9/9/2002	Nickel	50	ug/L	U	50	II	100	25
MW-1	11/15/1989	Thallium	10	ug/L	U	10	II	2	0.5
MW-1	5/11/1999	Thallium	1	ug/L	U	1	II	2	0.5
MW-1	11/30/2000	Thallium	1	ug/L	U	1	II	2	0.5
MW-1	11/6/2001	Thallium	10	ug/L	U	10	II	2	0.5
MW-1	9/9/2002	Thallium	1	ug/L	U	1	II	2	0.5
MW-1	9/9/2002	Thallium	10	ug/L	U	10	II	2	0.5
MW-1	6/20/2005	Thallium	1	ug/L	U	1	II	2	0.5
MW-1	5/19/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	6/16/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	7/16/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	8/19/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	9/1/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	10/1/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	11/13/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	12/10/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-1	1/22/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-1	2/12/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-1	3/19/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-1	4/14/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-1	6/18/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-1	8/14/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-1	9/1/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-1	12/28/1981	Vanadium	500	ug/L	U	500	II	60	15
MW-1	1/28/1982	Vanadium	100	ug/L	U	100	II	60	15
MW-1	4/22/1983	Vanadium	100	ug/L	U	100	II	60	15
MW-1	6/28/1985	Vanadium	200	ug/L	U	200	II	60	15
MW-1	11/30/2000	Vanadium	30	ug/L	U	30	II	60	15
MW-1	11/6/2001	Vanadium	100	ug/L	U	100	II	60	15
MW-1	9/9/2002	Vanadium	30	ug/L	U	30	II	60	15
MW-1	6/20/2005	Vanadium	20	ug/L	U	20	II	60	15
MW-1	9/9/2002	Vanadium	100	ug/L	U	100	II	60	15
MW-11	12/15/1989	Beryllium	10	ug/L	U	10	II	4	1
MW-11	8/23/1994	Beryllium	10	ug/L	U	10	II	4	1
MW-11	11/6/2001	Beryllium	10	ug/L	U	10	II	4	1
MW-11	5/24/1983	Cadmium	10	ug/L	U	10	II	5	1.25
MW-11	8/23/1994	Cadmium	10	ug/L	U	10	II	5	1.25
MW-11	11/6/2001	Cadmium	5	ug/L	U	5	II	5	1.25
MW-11	9/10/2002	Cadmium	5	ug/L	U	5	II	5	1.25
MW-11	6/28/1985	Chromium	50	ug/L	U	50	II	100	25
MW-11	11/6/2001	Chromium	50	ug/L	U	50	II	100	25
MW-11	9/10/2002	Chromium	50	ug/L	U	50	II	100	25
MW-11	3/30/2005	Chromium	50	ug/L	U	50	II	100	25
MW-11	5/11/1999	Gross Alpha	4	pCi/L	U	4	II	15	3.75
MW-11	6/12/1984	Lead	5	ug/L	U	5	II	15	3.75
MW-11	2/18/1999	Lead	50	ug/L	U	50	II	15	3.75
MW-11	11/6/2001	Lead	50	ug/L	U	50	II	15	3.75
MW-11	9/10/2002	Lead	50	ug/L	U	50	II	15	3.75
MW-11	5/11/1999	Mercury	1	ug/L	U	1	II	2	0.5
MW-11	11/6/2001	Mercury	1	ug/L	U	1	II	2	0.5
MW-11	9/10/2002	Mercury	1	ug/L	U	1	II	2	0.5
MW-11	5/24/1983	Molybdenum	100	ug/L	U	100	II	40	10
MW-11	8/23/1994	Molybdenum	100	ug/L	U	100	II	40	10
MW-11	11/6/2001	Molybdenum	100	ug/L	U	100	II	40	10
MW-11	3/30/2005	Molybdenum	20	ug/L	U	20	II	40	10
MW-11	9/10/2002	Molybdenum	100	ug/L	U	100	II	40	10
MW-11	8/23/1994	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/27/1995	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/15/1995	Nickel	50	ug/L	U	50	II	100	25
MW-11	12/7/1995	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/27/1996	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/6/1996	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/12/1996	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/22/1996	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/19/1997	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/11/1997	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/30/1997	Nickel	50	ug/L	U	50	II	100	25
MW-11	1/8/1998	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/16/1998	Nickel	50	ug/L	U	50	II	100	25
MW-11	5/12/1998	Nickel	50	ug/L	U	50	II	100	25

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-11	9/24/1998	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/3/1998	Nickel	50	ug/L	U	50	II	100	25
MW-11	2/18/1999	Nickel	50	ug/L	U	50	II	100	25
MW-11	5/11/1999	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/30/1999	Nickel	50	ug/L	U	50	II	100	25
MW-11	12/9/1999	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/17/2000	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/6/2000	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/3/2000	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/27/2000	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/27/2000	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/23/2001	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/12/2001	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/4/2001	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/6/2001	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/14/2002	Nickel	50	ug/L	U	50	II	100	25
MW-11	5/20/2002	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/10/2002	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/10/2002	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/21/2002	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/20/2003	Nickel	50	ug/L	U	50	II	100	25
MW-11	6/27/2003	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/24/2003	Nickel	50	ug/L	U	50	II	100	25
MW-11	11/24/2003	Nickel	50	ug/L	U	50	II	100	25
MW-11	3/19/2004	Nickel	50	ug/L	U	50	II	100	25
MW-11	5/27/2004	Nickel	50	ug/L	U	50	II	100	25
MW-11	9/14/2004	Nickel	50	ug/L	U	50	II	100	25
MW-11	12/15/1989	Thallium	10	ug/L	U	10	II	2	0.5
MW-11	5/11/1999	Thallium	1	ug/L	U	1	II	2	0.5
MW-11	11/6/2001	Thallium	10	ug/L	U	10	II	2	0.5
MW-11	9/10/2002	Thallium	1	ug/L	U	1	II	2	0.5
MW-11	9/10/2002	Thallium	10	ug/L	U	10	II	2	0.5
MW-11	3/30/2005	Thallium	1	ug/L	U	1	II	2	0.5
MW-11	5/24/1983	Vanadium	100	ug/L	U	100	II	60	15
MW-11	6/28/1985	Vanadium	200	ug/L	U	200	II	60	15
MW-11	11/6/2001	Vanadium	100	ug/L	U	100	II	60	15
MW-11	9/10/2002	Vanadium	30	ug/L	U	30	II	60	15
MW-11	3/30/2005	Vanadium	20	ug/L	U	20	II	60	15
MW-11	9/10/2002	Vanadium	100	ug/L	U	100	II	60	15
MW-12	12/18/1989	Beryllium	10	ug/L	U	10	III	4	2
MW-12	8/24/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-12	11/28/2000	Beryllium	10	ug/L	U	10	III	4	2
MW-12	11/6/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-12	11/1/1989	Cadmium	0.5	ug/L	U	5	III	5	2.5
MW-12	8/24/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-12	11/28/2000	Cadmium	5	ug/L	U	5	III	5	2.5
MW-12	11/6/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-12	9/10/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-12	2/18/1999	Lead	50	ug/L	U	50	III	15	7.5
MW-12	11/28/2000	Lead	50	ug/L	U	50	III	15	7.5
MW-12	11/6/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-12	9/10/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-12	5/4/1983	Molybdenum	100	ug/L	U	100	III	40	20
MW-12	8/24/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-12	11/28/2000	Molybdenum	100	ug/L	U	100	III	40	20
MW-12	11/6/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-12	9/10/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-12	12/18/1989	Thallium	10	ug/L	U	10	III	2	1
MW-12	11/6/2001	Thallium	10	ug/L	U	10	III	2	1
MW-12	9/10/2002	Thallium	10	ug/L	U	10	III	2	1
MW-12	5/4/1983	Vanadium	100	ug/L	U	100	III	60	30
MW-12	6/28/1985	Vanadium	200	ug/L	U	200	III	60	30
MW-12	11/28/2000	Vanadium	100	ug/L	U	100	III	60	30
MW-12	11/6/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-12	9/10/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-14	12/18/1989	Beryllium	10	ug/L	U	10	III	4	2
MW-14	8/24/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-14	11/28/2000	Beryllium	10	ug/L	U	10	III	4	2
MW-14	11/6/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-14	12/18/1989	Cadmium	5	ug/L	U	5	III	5	2.5

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-14	8/24/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-14	11/28/2000	Cadmium	5	ug/L	U	5	III	5	2.5
MW-14	11/6/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-14	9/10/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-14	9/10/2002	Chloride	18.1	mg/L	U	2000	III	5	2.5
MW-14	2/18/1999	Lead	50	ug/L	U	50	III	15	7.5
MW-14	11/28/2000	Lead	50	ug/L	U	50	III	15	7.5
MW-14	11/6/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-14	9/10/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-14	8/24/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-14	11/28/2000	Molybdenum	100	ug/L	U	100	III	40	20
MW-14	11/6/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-14	9/10/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-14	12/18/1989	Thallium	10	ug/L	U	10	III	2	1
MW-14	11/6/2001	Thallium	10	ug/L	U	10	III	2	1
MW-14	9/10/2002	Thallium	10	ug/L	U	10	III	2	1
MW-14	12/8/1994	Uranium	90.00	ug/L	U	90.00	III	30	15
MW-14	11/28/2000	Vanadium	100	ug/L	U	100	III	60	30
MW-14	11/6/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-14	9/10/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-15	11/28/1989	Beryllium	10	ug/L	U	10	III	4	2
MW-15	12/18/1989	Beryllium	10	ug/L	U	10	III	4	2
MW-15	8/24/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-15	11/6/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-15	11/28/1989	Cadmium	5	ug/L	U	5	III	5	2.5
MW-15	12/18/1989	Cadmium	5	ug/L	U	5	III	5	2.5
MW-15	8/24/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-15	11/6/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-15	9/10/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-15	11/28/1989	Chromium	10	ug/L	U	100	III	100	50
MW-15	11/6/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-15	9/10/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-15	8/24/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-15	11/6/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-15	9/10/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-15	11/28/1989	Thallium	10	ug/L	U	10	III	2	1
MW-15	12/18/1989	Thallium	10	ug/L	U	10	III	2	1
MW-15	11/6/2001	Thallium	10	ug/L	U	10	III	2	1
MW-15	9/10/2002	Thallium	10	ug/L	U	10	III	2	1
MW-15	11/6/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-15	9/10/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-17	8/24/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-17	11/6/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-17	8/24/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-17	11/6/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-17	9/10/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-17	11/6/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-17	9/10/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-17	8/24/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-17	11/6/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-17	9/10/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-17	11/6/2001	Thallium	10	ug/L	U	10	III	2	1
MW-17	9/10/2002	Thallium	10	ug/L	U	10	III	2	1
MW-17	11/6/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-17	9/10/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-18	8/19/1994	Beryllium	10	ug/L	U	10	II	4	1
MW-18	11/6/2001	Beryllium	10	ug/L	U	10	II	4	1
MW-18	8/19/1994	Cadmium	10	ug/L	U	10	II	5	1.25
MW-18	11/6/2001	Cadmium	5	ug/L	U	5	II	5	1.25
MW-18	9/9/2002	Cadmium	5	ug/L	U	5	II	5	1.25
MW-18	11/6/2001	Chromium	50	ug/L	U	50	II	100	25
MW-18	9/9/2002	Chromium	50	ug/L	U	50	II	100	25
MW-18	11/6/2001	Lead	50	ug/L	U	50	II	15	3.75
MW-18	9/9/2002	Lead	50	ug/L	U	50	II	15	3.75
MW-18	5/12/1999	Mercury	1	ug/L	U	1	II	2	0.5
MW-18	11/6/2001	Mercury	1	ug/L	U	1	II	2	0.5
MW-18	9/9/2002	Mercury	1	ug/L	U	1	II	2	0.5
MW-18	8/19/1994	Molybdenum	100	ug/L	U	100	II	40	10
MW-18	11/6/2001	Molybdenum	100	ug/L	U	100	II	40	10
MW-18	9/9/2002	Molybdenum	100	ug/L	U	100	II	40	10

Table 4b
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* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-18	8/19/1994	Nickel	50	ug/L	U	50	II	100	25
MW-18	11/6/2001	Nickel	50	ug/L	U	50	II	100	25
MW-18	9/9/2002	Nickel	50	ug/L	U	50	II	100	25
MW-18	5/12/1999	Thallium	1	ug/L	U	1	II	2	0.5
MW-18	12/1/2000	Thallium	1	ug/L	U	1	II	2	0.5
MW-18	11/6/2001	Thallium	10	ug/L	U	10	II	2	0.5
MW-18	9/9/2002	Thallium	1	ug/L	U	1	II	2	0.5
MW-18	9/9/2002	Thallium	10	ug/L	U	10	II	2	0.5
MW-18	12/1/2000	Vanadium	30	ug/L	U	30	II	60	15
MW-18	11/6/2001	Vanadium	100	ug/L	U	100	II	60	15
MW-18	9/9/2002	Vanadium	30	ug/L	U	30	II	60	15
MW-18	9/9/2002	Vanadium	100	ug/L	U	100	II	60	15
MW-19	8/19/1994	Beryllium	10	ug/L	U	10	II	4	1
MW-19	11/5/2001	Beryllium	10	ug/L	U	10	II	4	1
MW-19	8/19/1994	Cadmium	10	ug/L	U	10	II	5	1.25
MW-19	11/5/2001	Cadmium	5	ug/L	U	5	II	5	1.25
MW-19	9/10/2002	Cadmium	5	ug/L	U	5	II	5	1.25
MW-19	11/5/2001	Chromium	50	ug/L	U	50	II	100	25
MW-19	9/10/2002	Chromium	50	ug/L	U	50	II	100	25
MW-19	5/12/1999	Gross Alpha	5	pCi/L	U	5	II	15	3.75
MW-19	12/1/2000	Lead	3	ug/L	U	30	II	15	3.75
MW-19	11/5/2001	Lead	50	ug/L	U	50	II	15	3.75
MW-19	9/10/2002	Lead	50	ug/L	U	50	II	15	3.75
MW-19	5/12/1999	Mercury	1	ug/L	U	1	II	2	0.5
MW-19	11/5/2001	Mercury	1	ug/L	U	1	II	2	0.5
MW-19	9/10/2002	Mercury	1	ug/L	U	1	II	2	0.5
MW-19	8/19/1994	Molybdenum	100	ug/L	U	100	II	40	10
MW-19	11/5/2001	Molybdenum	100	ug/L	U	100	II	40	10
MW-19	9/10/2002	Molybdenum	100	ug/L	U	100	II	40	10
MW-19	8/19/1994	Nickel	50	ug/L	U	50	II	100	25
MW-19	11/5/2001	Nickel	50	ug/L	U	50	II	100	25
MW-19	9/10/2002	Nickel	50	ug/L	U	50	II	100	25
MW-19	5/12/1999	Thallium	1	ug/L	U	1	II	2	0.5
MW-19	12/1/2000	Thallium	1	ug/L	U	1	II	2	0.5
MW-19	11/5/2001	Thallium	10	ug/L	U	10	II	2	0.5
MW-19	9/10/2002	Thallium	1	ug/L	U	1	II	2	0.5
MW-19	9/10/2002	Thallium	10	ug/L	U	10	II	2	0.5
MW-19	12/1/2000	Vanadium	30	ug/L	U	30	II	60	15
MW-19	11/5/2001	Vanadium	100	ug/L	U	100	II	60	15
MW-19	9/10/2002	Vanadium	30	ug/L	U	30	II	60	15
MW-19	9/10/2002	Vanadium	100	ug/L	U	100	II	60	15
MW-2	8/23/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-2	11/5/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-2	12/28/1981	Cadmium	10	ug/L	U	10	III	5	2.5
MW-2	5/4/1983	Cadmium	10	ug/L	U	10	III	5	2.5
MW-2	11/16/1989	Cadmium	5	ug/L	U	5	III	5	2.5
MW-2	8/23/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-2	11/5/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-2	9/10/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-2	5/19/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-2	8/19/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-2	10/1/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-2	11/13/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-2	12/10/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-2	1/22/1981	Lead	10	ug/L	U	10	III	15	7.5
MW-2	2/11/1981	Lead	10	ug/L	U	10	III	15	7.5
MW-2	6/24/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-2	8/11/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-2	9/1/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-2	12/28/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-2	1/28/1982	Lead	50	ug/L	U	50	III	15	7.5
MW-2	5/4/1983	Lead	10	ug/L	U	10	III	15	7.5
MW-2	11/5/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-2	9/10/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-2	6/16/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	7/16/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	8/19/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	9/1/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	10/1/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	11/13/1980	Molybdenum	50	ug/L	U	50	III	40	20

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Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-2	12/10/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	1/22/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	2/11/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	4/21/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-2	6/24/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	8/11/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	9/1/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	12/28/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	1/28/1982	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	5/4/1983	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	8/23/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	11/5/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	9/10/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-2	11/16/1989	Thallium	10	ug/L	U	10	III	2	1
MW-2	11/5/2001	Thallium	10	ug/L	U	10	III	2	1
MW-2	9/10/2002	Thallium	10	ug/L	U	10	III	2	1
MW-2	5/19/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	6/16/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	7/16/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	8/19/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	9/1/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	10/1/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	11/13/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	12/10/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-2	1/22/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-2	2/11/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-2	4/21/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-2	6/24/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-2	8/11/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-2	9/1/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-2	12/28/1981	Vanadium	500	ug/L	U	500	III	60	30
MW-2	1/28/1982	Vanadium	100	ug/L	U	100	III	60	30
MW-2	5/4/1983	Vanadium	100	ug/L	U	100	III	60	30
MW-2	6/28/1985	Vanadium	200	ug/L	U	200	III	60	30
MW-2	11/5/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-2	9/10/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-26	9/13/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-26	9/13/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-26	9/13/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-26	9/13/2002	Thallium	10	ug/L	U	10	III	2	1
MW-26	9/13/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-3	11/28/1989	Beryllium	10	ug/L	U	10	III	4	2
MW-3	8/18/1994	Beryllium	10	ug/L	U	10	III	4	2
MW-3	11/6/2001	Beryllium	10	ug/L	U	10	III	4	2
MW-3	12/28/1981	Cadmium	10	ug/L	U	10	III	5	2.5
MW-3	4/21/1983	Cadmium	10	ug/L	U	10	III	5	2.5
MW-3	11/28/1989	Cadmium	5	ug/L	U	5	III	5	2.5
MW-3	8/18/1994	Cadmium	10	ug/L	U	10	III	5	2.5
MW-3	11/6/2001	Cadmium	5	ug/L	U	5	III	5	2.5
MW-3	9/12/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-3	5/1/1999	Gross Alpha	11	pCi/L	U	11	III	15	7.5
MW-3	11/30/2000	Gross Alpha	11.3	pCi/L	U	11.3	III	15	7.5
MW-3	5/19/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-3	8/19/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-3	9/1/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-3	11/11/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-3	12/10/1980	Lead	10	ug/L	U	10	III	15	7.5
MW-3	1/22/1981	Lead	10	ug/L	U	10	III	15	7.5
MW-3	2/12/1981	Lead	10	ug/L	U	10	III	15	7.5
MW-3	6/24/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-3	8/18/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-3	9/1/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-3	12/28/1981	Lead	50	ug/L	U	50	III	15	7.5
MW-3	1/27/1982	Lead	50	ug/L	U	50	III	15	7.5
MW-3	11/6/2001	Lead	50	ug/L	U	50	III	15	7.5
MW-3	9/12/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-3	6/16/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	7/16/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	8/19/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	9/1/1980	Molybdenum	50	ug/L	U	50	III	40	20

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-3	10/1/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	11/11/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	12/10/1980	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	1/22/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	2/12/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	3/18/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	4/13/1981	Molybdenum	50	ug/L	U	50	III	40	20
MW-3	6/24/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	8/18/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	9/1/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	12/28/1981	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	1/27/1982	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	4/21/1983	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	8/18/1994	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	11/6/2001	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	9/12/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-3	11/28/1989	Thallium	10	ug/L	U	10	III	2	1
MW-3	11/6/2001	Thallium	10	ug/L	U	10	III	2	1
MW-3	9/12/2002	Thallium	1.1	ug/L	U	1.1	III	2	1
MW-3	9/12/2002	Thallium	10	ug/L	U	10	III	2	1
MW-3	5/19/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	7/16/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	8/19/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	9/1/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	10/1/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	11/11/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	12/10/1980	Vanadium	50	ug/L	U	50	III	60	30
MW-3	1/22/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-3	2/12/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-3	3/18/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-3	4/13/1981	Vanadium	50	ug/L	U	50	III	60	30
MW-3	6/24/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-3	8/18/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-3	9/1/1981	Vanadium	100	ug/L	U	100	III	60	30
MW-3	12/28/1981	Vanadium	500	ug/L	U	500	III	60	30
MW-3	1/27/1982	Vanadium	100	ug/L	U	100	III	60	30
MW-3	4/21/1983	Vanadium	100	ug/L	U	100	III	60	30
MW-3	6/28/1985	Vanadium	200	ug/L	U	200	III	60	30
MW-3	11/6/2001	Vanadium	100	ug/L	U	100	III	60	30
MW-3	9/12/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-31	6/21/2006	Vanadium	20	ug/L	U	20	II	60	15
MW-32	9/13/2002	Cadmium	5	ug/L	U	5	III	5	2.5
MW-32	9/13/2002	Lead	50	ug/L	U	50	III	15	7.5
MW-32	9/13/2002	Molybdenum	100	ug/L	U	100	III	40	20
MW-32	9/13/2002	Thallium	10	ug/L	U	10	III	2	1
MW-32	9/13/2002	Vanadium	100	ug/L	U	100	III	60	30
MW-3A	6/23/2005	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	9/25/2005	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	12/14/2005	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	3/27/2006	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	6/25/2006	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	9/19/2006	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	10/26/2006	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	3/14/2007	Chromium	25	ug/L	U	25	III	5	2.5
MW-3A	3/27/2006	Gross Alpha minus Rn & U	1	pCi/L	U	1000	III	15	7.5
MW-5	11/1/1989	Beryllium	10	ug/L	U	10	II	4	1
MW-5	12/15/1989	Beryllium	10	ug/L	U	10	II	4	1
MW-5	8/24/1994	Beryllium	10	ug/L	U	10	II	4	1
MW-5	11/28/2000	Beryllium	10	ug/L	U	10	II	4	1
MW-5	11/6/2001	Beryllium	10	ug/L	U	10	II	4	1
MW-5	12/28/1981	Cadmium	10	ug/L	U	10	II	5	1.25
MW-5	1/26/1982	Cadmium	2	ug/L	U	2	II	5	1.25
MW-5	5/24/1983	Cadmium	10	ug/L	U	10	II	5	1.25
MW-5	6/14/1984	Cadmium	5	ug/L	U	5	II	5	1.25
MW-5	11/1/1989	Cadmium	5	ug/L	U	5	II	5	1.25
MW-5	12/15/1989	Cadmium	5	ug/L	U	5	II	5	1.25
MW-5	8/24/1994	Cadmium	10	ug/L	U	10	II	5	1.25
MW-5	11/28/2000	Cadmium	5	ug/L	U	5	II	5	1.25
MW-5	11/6/2001	Cadmium	5	ug/L	U	5	II	5	1.25
MW-5	9/10/2002	Cadmium	5	ug/L	U	5	II	5	1.25

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-5	6/28/1985	Chromium	50	ug/L	U	50	II	100	25
MW-5	11/28/2000	Chromium	50	ug/L	U	50	II	100	25
MW-5	11/6/2001	Chromium	50	ug/L	U	50	II	100	25
MW-5	9/10/2002	Chromium	50	ug/L	U	50	II	100	25
MW-5	6/21/2005	Chromium	50	ug/L	U	50	II	100	25
MW-5	5/12/1999	Gross Alpha	4	pCi/L	U	4	II	15	3.75
MW-5	8/19/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-5	10/1/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-5	11/11/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-5	12/9/1980	Lead	10	ug/L	U	10	II	15	3.75
MW-5	1/22/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-5	2/11/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-5	3/17/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-5	4/21/1981	Lead	10	ug/L	U	10	II	15	3.75
MW-5	6/18/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-5	8/18/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-5	9/1/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-5	12/28/1981	Lead	50	ug/L	U	50	II	15	3.75
MW-5	1/26/1982	Lead	50	ug/L	U	50	II	15	3.75
MW-5	5/24/1983	Lead	10	ug/L	U	10	II	15	3.75
MW-5	6/14/1984	Lead	5	ug/L	U	5	II	15	3.75
MW-5	2/18/1999	Lead	50	ug/L	U	50	II	15	3.75
MW-5	11/28/2000	Lead	50	ug/L	U	50	II	15	3.75
MW-5	11/6/2001	Lead	50	ug/L	U	50	II	15	3.75
MW-5	9/10/2002	Lead	50	ug/L	U	50	II	15	3.75
MW-5	11/28/2000	Mercury	1	ug/L	U	1	II	2	0.5
MW-5	11/6/2001	Mercury	1	ug/L	U	1	II	2	0.5
MW-5	9/10/2002	Mercury	1	ug/L	U	1	II	2	0.5
MW-5	5/19/1980	Molybdenum	50	ug/L	U	500	II	40	10
MW-5	6/16/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	7/16/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	8/19/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	9/1/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	10/1/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	11/11/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	12/9/1980	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	1/22/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	2/11/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	3/17/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	4/21/1981	Molybdenum	50	ug/L	U	50	II	40	10
MW-5	6/18/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	8/18/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	9/1/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	12/28/1981	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	1/26/1982	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	5/24/1983	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	8/24/1994	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	11/28/2000	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	11/6/2001	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	9/10/2002	Molybdenum	100	ug/L	U	100	II	40	10
MW-5	8/24/1994	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/27/1995	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/19/1995	Nickel	50	ug/L	U	50	II	100	25
MW-5	12/8/1995	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/27/1996	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/6/1996	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/12/1996	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/22/1996	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/19/1997	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/11/1997	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/30/1997	Nickel	50	ug/L	U	50	II	100	25
MW-5	1/8/1998	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/16/1998	Nickel	50	ug/L	U	50	II	100	25
MW-5	5/12/1998	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/24/1998	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/3/1998	Nickel	50	ug/L	U	50	II	100	25
MW-5	2/18/1999	Nickel	50	ug/L	U	50	II	100	25
MW-5	5/12/1999	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/30/1999	Nickel	50	ug/L	U	50	II	100	25
MW-5	12/9/1999	Nickel	50	ug/L	U	50	II	100	25

Table 4b
Records of "Non-Detects" that have a Detection Limit insensitive to the Ground Water Compliance Limit*

* = per the State of Utah Division of Water Quality Ground Water Discharge Permit No. UGW370004, March 8, 2005
GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit

Well	Date	Constituent	Results	Units	Qualifier	Detection Limit	Ground Water Class	GWQS	GWCL
MW-5	3/17/2000	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/6/2000	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/3/2000	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/28/2000	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/28/2000	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/24/2001	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/13/2001	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/7/2001	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/6/2001	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/15/2002	Nickel	50	ug/L	U	50	II	100	25
MW-5	5/20/2002	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/10/2002	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/10/2002	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/21/2002	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/20/2003	Nickel	50	ug/L	U	50	II	100	25
MW-5	6/27/2003	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/24/2003	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/23/2003	Nickel	50	ug/L	U	50	II	100	25
MW-5	3/19/2004	Nickel	50	ug/L	U	50	II	100	25
MW-5	5/27/2004	Nickel	50	ug/L	U	50	II	100	25
MW-5	9/14/2004	Nickel	50	ug/L	U	50	II	100	25
MW-5	11/1/1989	Thallium	10	ug/L	U	10	II	2	0.5
MW-5	12/15/1989	Thallium	10	ug/L	U	10	II	2	0.5
MW-5	5/12/1999	Thallium	1	ug/L	U	1	II	2	0.5
MW-5	11/28/2000	Thallium	1	ug/L	U	1	II	2	0.5
MW-5	11/6/2001	Thallium	10	ug/L	U	10	II	2	0.5
MW-5	9/10/2002	Thallium	1	ug/L	U	1	II	2	0.5
MW-5	9/10/2002	Thallium	10	ug/L	U	10	II	2	0.5
MW-5	5/19/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	6/16/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	7/16/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	8/19/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	9/1/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	10/1/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	11/11/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	12/9/1980	Vanadium	50	ug/L	U	50	II	60	15
MW-5	1/22/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-5	2/11/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-5	3/17/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-5	4/21/1981	Vanadium	50	ug/L	U	50	II	60	15
MW-5	6/18/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-5	8/18/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-5	9/1/1981	Vanadium	100	ug/L	U	100	II	60	15
MW-5	12/28/1981	Vanadium	50	ug/L	U	500	II	60	15
MW-5	1/26/1982	Vanadium	100	ug/L	U	100	II	60	15
MW-5	5/24/1983	Vanadium	100	ug/L	U	100	II	60	15
MW-5	6/28/1985	Vanadium	200	ug/L	U	200	II	60	15
MW-5	11/28/2000	Vanadium	100	ug/L	U	100	II	60	15
MW-5	11/6/2001	Vanadium	100	ug/L	U	100	II	60	15
MW-5	9/10/2002	Vanadium	30	ug/L	U	30	II	60	15
MW-5	9/10/2002	Vanadium	100	ug/L	U	100	II	60	15

Table 5
Summary by Well, Year, and Constituent Where Reporting Limit of Non-Detection Exceeded GWQS GWCL; Background Groundwater Quality Report for White Mesa Mill, Utah

Well	>GWQS	>GWCL
MW-1	45	102
MW-2	43	65
MW-3	45	69
MW-5	53	136
MW-11	19	77
MW-12	22	26
MW-14	21	25
MW-15	16	21
MW-17	12	14
MW-18	12	27
MW-19	13	29
MW-26	4	8
MW-32	4	5

Constituent	>GWQS	>GWCL
Ammonia	0	0
Arsenic	0	0
Beryllium	33	33
Cadmium	20	64
Chloride	1	1
Chloromethane	0	0
Chromium	8	25
Cobalt	0	0
Copper	0	0
Fluoride	0	0
Gross Alpha	0	5
Iron	0	0
Lead	52	90
Manganese	0	0
Mercury	0	15
Molybdenum	109	111
Nickel	0	98
Nitrate + Nitrite	0	0
Selenium	0	0
Silver	0	0
Tetrahydrofuran	0	3
Thallium	34	51
Tin	0	0
Uranium	1	1
Vanadium	59	116
Zinc	0	0

Year	>GWQS	>GWCL
1980	30	84
1981	67	96
1982	12	14
1983	17	20
1984	0	4
1985	6	8
1986	0	0
1987	0	0
1988	0	0
1989	18	28
1990	0	0
1991	0	0
1992	0	0
1993	0	0
1994	34	39
1995	0	9
1996	0	11
1997	0	7
1998	0	10
1999	4	25
2000	13	36
2001	55	87
2002	53	100
2003	0	8
2004	0	6
2005	3	12
2006	5	9
2007	1	1

Notes:

GWQS = Ground Water Quality Standard
GWCL = Ground Water Compliance Limit (based on Permit # UGW370004)
Values in exceedence of the GWQS were removed from the database prior to statistical analysis as having an insensitive detection limit

Table 6
Energy Laboratories Analytical Methods Background Groundwater Quality Report for White Mesa Mill, Utah

Analyses	Method
Alkalinity as CaCO3 Carbonate as CO3 Bicarbonate as HCO3	A2320 B
Ammonia as N	A4500-NH3 G
Calcium, magnesium, potassium, sodium, iron	E200.7
Chloride	A4500-Cl B
Fluoride	A4500-F C
Gross Alpha	E900.1
Metals, other than iron	E200.8
Nitrate + Nitrite as N	E353.2
pH	A4500-H B
Sulfate	A4500-SO4 E
TDS	A2540 C
Turbidity	A2130 B
Uranium	E200.8 ASTM D2907
Volatile Organic Compounds	SW8260B

Table 7
Comparison of Calculated and Measured TDS for Samples with Complete Major-Ion Analysis

BOLD values indicate the removal of the value prior to statistical analysis, either due to an extreme or a calculated TDS imbalance.

Well	Date	Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-1	10/31/1979	160	64	2.5	8.9	16	106	220	627	577.4	92.09%
MW-1	1/31/1980	230	55	14	8.5	39	130	520	882	996.5	112.98%
MW-1	4/30/1980	262	130	13	0.78	49	160	520	1219	1134.78	93.09%
MW-1	5/19/1980	240	148	20	11	44	165	635	1275	1263	99.06%
MW-1	6/16/1980	242	156	16	8	39	166	632	1276	1259	98.67%
MW-1	7/16/1980	270	141	20	17	54	160	610	1182	1272	107.61%
MW-1	8/19/1980	270	132	18	17	54	158	612	1220	1261	103.36%
MW-1	9/1/1980	260	144	13	12	59	156	640	1285	1284	99.92%
MW-1	10/1/1980	260	148	30	15	39	162	570	1220	1224	100.33%
MW-1	11/13/1980	245	139	12	9	40	166	613	1166	1224	104.97%
MW-1	12/10/1980	250	135	13	9	49	168	620	1194	1244	104.19%
MW-1	1/22/1981	254	146	15	10	47	170	638	1273	1280	100.55%
MW-1	3/19/1981	265	146	14	9	53	175	658	1317	1320	100.23%
MW-1	4/14/1981	270	140	13	10	56	161	620	1330	1270	95.49%
MW-1	6/18/1981	260	156	12	10	46	162	626	1188	1272	107.07%
MW-1	8/14/1981	290	156	14	10	51	161	630	1197	1312	109.61%
MW-1	9/1/1981	187	38	**1**	5	19	23	**38**	**246**	311	**126.42%**
MW-1	1/28/1982	267	142	13	14	55	170	613	1199	1274	106.26%
MW-1	12/10/1982	277	143	10.9	6.4	51	170	653	1326	1311.3	98.89%
MW-1	4/22/1983	283	150	16.5	6	51	170	658	1160	1334.5	115.04%
MW-1	10/26/1983	289	140	12.7	6.1	54	170	675	1225	1346.8	109.94%
MW-1	6/13/1984	280	150	12	6	54	170	680	1400	1352	96.57%
MW-1	12/9/1992	258	152	13	6.65	63	182	654	1567	1328.65	84.79%
MW-1	3/24/1993	260	149	14	6.2	54	167	614	1295	1264.2	97.62%
MW-1	6/8/1993	270	150	12	7.3	55	170	676	1300	1340.3	103.10%
MW-1	9/22/1993	252	142	12	6.2	53	164	658	1300	1287.2	99.02%
MW-1	12/14/1993	250	167	18	8	63	170	752	1692	1428	84.40%
MW-1	3/24/1994	256	159	15	6.1	61.2	163.7	702	1210	1363	112.64%
MW-1	6/15/1994	251	130	13	7	55	170	670	1271	1296	101.97%
MW-1	8/18/1994	261	168	15.1	5.7	59	168	691	1357	1367.8	100.80%
MW-1	12/13/1994	260	153	16	6.3	54	167	705	1361	1361.3	100.02%
MW-1	11/30/2000	260	138	15.2	5.9	50.8	156	608	1270	1233.9	97.16%
MW-1	11/6/2001	251	158	17.3	6	59.2	158	691	1360	1340.5	98.57%
MW-1	9/9/2002	259	136	13.6	5.84	53.7	173	662	1292	1303.14	100.86%
MW-1	6/20/2005	245	123	11	5.8	51.8	166	637	1220	1239.6	101.61%
MW-1	6/25/2006	245	153	17	6.6	60.5	157	724	1320	1363.1	103.27%
MW-11	12/16/1982	340	36	24.4	5.7	8.8	550	926	1812	1890.9	104.35%
MW-11	5/24/1983	360	31	26.8	4.7	7.7	530	943	1728	1903.2	110.14%
MW-11	10/26/1983	353	28	26	5	6.7	540	922	1697	1880.7	110.82%
MW-11	6/12/1984	330	29	32	5	7	530	920	1700	1853	109.00%
MW-11	2/28/1991	301	33	31	6	8.7	522	967	1686	1868.7	110.84%
MW-11	11/12/1992	329	198	41	10.55	73	520	1507	2850	2678.55	93.98%
MW-11	3/30/1993	312	117	35	9.2	36	551	1162	2090	2222.2	106.33%
MW-11	6/10/1993	308	150	39	12.2	48	517	1309	2396	2383.2	99.47%
MW-11	9/29/1993	310	140	36	11.3	47	557	1307	2352	2408.3	102.39%
MW-11	12/15/1993	305	50	33	8	15	556	1054	2528	2021	79.94%
MW-11	3/30/1994	311	53.3	28	6.1	16.1	567.3	1020	1701	2001.8	117.68%
MW-11	6/20/1994	309	77	32	8	23	560	1118	1916	2127	111.01%
MW-11	8/23/1994	310	55.1	31.2	5.2	14.9	510	999	1896	1925.4	101.55%
MW-11	12/7/1994	310	45.6	30.7	6.1	11.7	561	983	1867	1948.1	104.34%
MW-11	11/27/2000	314	94	37.3	7.6	30.6	487	1140	2130	2110.5	99.08%
MW-11	11/6/2001	308	82.9	42.4	7	25.4	574	1150	2100	2189.7	104.27%
MW-11	9/10/2002	305	95.6	33.8	7.38	30	540	1220	2118	2231.78	105.37%
MW-11	6/21/2005	298	58.7	31	6.3	18.2	544	1090	1950	2046.2	104.93%
MW-12	10/27/1983	453	530	53.9	13	210	290	2338	3922	3887.9	99.13%
MW-12	6/12/1984	400	580	65	13	250	320	2400	4100	4028	98.24%
MW-12	2/28/1991	296	313	61	9.6	81	213	1850	3260	2823.6	86.61%
MW-12	12/9/1992	334	504	62	13.25	224	318	2343	4323	3798.25	87.86%
MW-12	3/31/1993	344	514	60	14.7	215	305	2096	3920	3548.7	90.53%
MW-12	6/10/1993	362	512	54	15.1	214	302	2154	4156	3613.1	86.94%
MW-12	9/29/1993	343	507	54	14.9	210	277	2234	3908	3639.9	93.14%
MW-12	12/16/1993	325	489	61	14.7	210	298	2261	4306	3658.7	84.97%
MW-12	3/30/1994	349	537	59	12	220	287	2251	3640	3715	102.06%
MW-12	6/20/1994	337	494	57	14	207	280	2187	3744	3576	95.51%
MW-12	8/24/1994	346	547	58.3	10.8	236	285	2187	3883	3670.1	94.52%
MW-12	12/8/1994	359	536	64.7	13	204	299	2421	4077	3896.7	95.58%
MW-12	11/28/2000	346	499	57	11.8	216	248	2000	3860	3377.8	87.51%
MW-12	9/10/2002	343	473	61.6	12.2	212	311	2250	3914	3662.8	93.58%

Table 7
Comparison of Calculated and Measured TDS for Samples with Complete Major-Ion Analysis

BOLD values indicate the removal of the value prior to statistical analysis, either due to an extreme or a calculated TDS imbalance.

Well	Date	Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-12	6/22/2005	330	466	55	11.4	203	262	2120	3680	3447.4	93.68%
MW-12	6/22/2006	346	522	61	14.9	220	318	2270	3860	3751.9	97.20%
MW-14	3/4/1991	361	306	23	7.9	41	265	1512	2684	2515.9	93.74%
MW-14	11/13/1992	406	474	18	11.5	157	358	2098	3833	3522.5	91.90%
MW-14	3/31/1993	392	498	19	13.2	150	352	1872	3630	3296.2	90.80%
MW-14	6/10/1993	384	500	17	13.6	155	349	2051	3728	3469.6	93.07%
MW-14	9/29/1993	378	498	18	13.9	151	355	2106	3708	3519.9	94.93%
MW-14	12/16/1993	387	477	18	13.6	148	353	2067	4062	3463.6	85.27%
MW-14	3/30/1994	390	505	20	11.2	153	344.7	2099	3260	3522.9	108.06%
MW-14	6/21/1994	383	499	20	13	152	350	2110	3512	3527	100.43%
MW-14	8/24/1994	393	537	19	9.4	175	313	2100	3623	3546.4	97.89%
MW-14	12/8/1994	388	527	18	11.4	143	327	2108	3683	3522.4	95.64%
MW-14	11/28/2000	380	494	22.2	10.8	154	289	1900	3590	3250	90.53%
MW-14	11/6/2001	382	527	26.5	11.4	170	257	2030	3650	3403.9	93.26%
MW-14	9/10/2002	379	476	2	11.4	153	354	2000	3654	3375.4	92.38%
MW-14	6/22/2005	364	483	18	11.4	156	314	2120	3560	3466.4	97.37%
MW-15	3/4/1991	356	365	41	9.4	120	466	1876	3356	3233.4	96.35%
MW-15	12/9/1992	357	431	39	10.1	172	478	2362	4233	3849.1	90.93%
MW-15	3/31/1993	363	422	38	11.5	158	503	2124	3835	3619.5	94.38%
MW-15	6/10/1993	358	451	38	11.7	165	488	2203	4084	3714.7	90.96%
MW-15	9/29/1993	357	430	38	14.6	163	496	2298	4052	3796.6	93.70%
MW-15	12/16/1993	355	446	38	12.2	169	467	2292	4530	3779.2	83.43%
MW-15	3/30/1994	371	436	38	10.7	165	477.7	2278	3120	3776.4	**121.04%**
MW-15	6/21/1994	257	453	36	11	161	480	2361	3860	3759	97.38%
MW-15	8/24/1994	367	475	39.7	8.2	188	400	2169	3517	3646.9	103.69%
MW-15	12/9/1994	342	434	34	9.4	143	467	2292	3943	3721.4	94.38%
MW-15	11/6/2001	343	458	57.1	10.8	178	377	2180	3920	3603.9	91.94%
MW-15	9/10/2002	356	382	40.4	9.68	156	535	2120	3940	3599.08	91.35%
MW-17	3/31/1993	384	406	28	17.8	200	615	2004	4607	3654.8	79.33%
MW-17	6/14/1993	385	388	27	17.7	188	641	2079	4636	3725.7	80.36%
MW-17	9/29/1993	383	375	25	18.7	180	724	2678	4592	4383.7	95.46%
MW-17	12/9/1993	385	372	28	18.6	177	688	2460	5296	4128.6	77.96%
MW-17	3/24/1994	336	456	34	7	97.1	192.7	1400	2426	2522.8	103.99%
MW-17	6/21/1994	438	410	31	16	200	680	2553	4534	4328	95.46%
MW-17	8/24/1994	395	481	29	11.4	237	575	2252	4519	3980.4	88.08%
MW-17	12/13/1994	398	387	28	13	167	638	2371	4556	4002	87.84%
MW-17	11/30/2000	394	403	29.7	12.2	209	586	2520	4290	4153.9	96.83%
MW-17	11/6/2001	392	474	43.1	13.8	246	661	2860	4670	4689.9	100.43%
MW-17	9/10/2002	395	408	28	13.4	211	566	2510	4624	4131.4	89.35%
MW-17	6/22/2005	361	310	24	12	162	517	2360	3750	3746	99.89%
MW-17	6/23/2006	430	338	28	15.8	200	582	2600	4200	4193.8	99.85%
MW-18	3/24/1993	324	415	34	7.1	92	185	1371	2655	2428.1	91.45%
MW-18	6/9/1993	325	445	34	7.6	96	192	1431	2720	2530.6	93.04%
MW-18	9/22/1993	323	437	34	7.8	97	198	1466	2700	2562.8	94.92%
MW-18	12/14/1993	328	419	34	7.4	95	193	1446	2940	2522.4	85.80%
MW-18	3/30/1994	213	208	75	10.4	72.7	448.7	1447	2299	2474.8	107.65%
MW-18	6/16/1994	246	424	35	7	95	190	1416	2557	2413	94.37%
MW-18	8/19/1994	330	443	33	5.6	104	183	1388	2466	2486.6	100.84%
MW-18	12/14/1994	291	297	19.9	6.6	68.1	212	1023	**1393**	1917.6	**137.66%**
MW-18	12/1/2000	337	467	47.3	7	88.3	180	1600	2770	2726.6	98.43%
MW-18	11/6/2001	312	432	47.6	7.8	73.8	155	1380	2460	2408.2	97.89%
MW-18	9/9/2002	336	453	40.6	7.51	93.2	192	1940	2846	3062.31	107.60%
MW-19	3/29/1993	194	245	81	12.7	88	432	1500	2625	2552.7	97.25%
MW-19	6/14/1993	205	316	92	11.8	111	438	1736	3144	2909.8	92.55%
MW-19	9/23/1993	208	305	93	13	115	476	1811	3172	3021	95.24%
MW-19	12/14/1993	206	287	94	12.8	102	475	1793	3694	2969.8	80.40%
MW-19	3/31/1994	398	405	29	13.3	205	653	2448	4190	4151.3	99.08%
MW-19	6/16/1994	223	166	63	11	61	430	1204	2067	2158	104.40%
MW-19	8/19/1994	234	162	60	6.9	52.4	380	1099	2037	1994.3	97.90%
MW-19	12/14/1994	255	103	43.8	6	37.3	346	853	1528	1644.1	107.60%
MW-19	12/1/2000	211	392	80.4	7.8	140	367	2080	3420	3278.2	95.85%
MW-19	11/5/2001	220	350	87.9	7.4	124	251	1570	2790	2610.3	93.56%
MW-19	9/10/2002	220	282	64.6	6.77	97.9	339	**167**	2706	1177.27	**43.51%**
MW-19	6/22/2005	215	207	43	5.8	68.1	264	1070	1920	1872.9	97.55%
MW-2	1/31/1980	296	55	18	10	36	215	**630**	1060	1260	118.87%
MW-2	4/30/1980	364	165	13	10	57	285	**650**	1828	1544	**84.46%**
MW-2	5/19/1980	370	192	18	15	63	346	1075	1983	2079	104.84%
MW-2	6/16/1980	340	236	15	11	73	361	1290	2364	2326	98.39%

Table 7
Comparison of Calculated and Measured TDS for Samples with Complete Major-Ion Analysis

BOLD values indicate the removal of the value prior to statistical analysis, either due to an extreme or a calculated TDS imbalance.

Well	Date	Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-2	7/16/1980	370	240	20	23	78	418	1400	2449	2549	104.08%
MW-2	8/19/1980	330	240	16	23	62	410	1345	2278	2426	106.50%
MW-2	9/1/1980	440	293	15	21	78	468	1550	2769	2865	103.47%
MW-2	10/1/1980	340	269	20	29	90	415	1535	2652	2698	101.73%
MW-2	11/13/1980	378	291	8	13	58	419	1425	2492	2592	104.01%
MW-2	12/10/1980	380	305	10	17	59	442	1520	2648	2733	103.21%
MW-2	1/22/1981	380	285	11	19	54	467	1530	2768	2746	99.21%
MW-2	2/11/1981	370	301	9	12	54	462	1550	2835	2758	97.28%
MW-2	4/21/1981	390	309	11	10	81	476	1660	3028	2937	96.99%
MW-2	6/24/1981	370	302	10	23	81	458	1690	2893	2934	101.42%
MW-2	8/11/1981	382	305	7	18	97	460	1705	2932	2974	101.43%
MW-2	9/1/1981	160	38	**3**	4	19	7	**25**	**207**	256	**123.67%**
MW-2	1/28/1982	367	325	8	26	244	483	1590	2769	3043	109.90%
MW-2	12/10/1982	388	300	5.5	10.2	90	480	1749	3056	3022.7	98.91%
MW-2	5/4/1983	375	320	25	9.5	87	470	1801	2820	3087.5	109.49%
MW-2	10/27/1983	389	310	5.1	6.5	92	500	1818	2972	3120.6	105.00%
MW-2	6/13/1984	350	330	7	10	84	500	1900	3200	3181	99.41%
MW-2	2/27/1991	349.35	298	10	11	91	477	1849	3154	3085.35	97.82%
MW-2	11/18/1992	345	334	6	12.25	104	467	1864	3357	3132.25	93.31%
MW-2	3/29/1993	349	355	8	11.9	99	504	1733	3122	3059.9	98.01%
MW-2	6/9/1993	345	355	6	12.8	98	491	1499	3288	2806.8	85.36%
MW-2	9/28/1993	284	325	6	13.6	95	472	1841	3176	3036.6	95.61%
MW-2	12/15/1993	343	332	6	12.7	94	478	1840	3800	3105.7	81.73%
MW-2	3/29/1994	347	341	6	9.6	97.1	470.3	1837	2770	3108	112.20%
MW-2	6/16/1994	338	325	6	12	92	480	1834	3043	3087	101.45%
MW-2	8/23/1994	338	351	5.3	9.1	90.7	500	1740	3133	3034.1	96.84%
MW-2	12/7/1994	346	322	7	10	87	453	1836	3165	3061	96.71%
MW-2	11/30/2000	326	298	9.1	9.8	81.8	440	1710	3130	2874.7	91.84%
MW-2	11/5/2001	319	360	10.7	10.3	109	549	1800	3150	3158	100.25%
MW-2	9/10/2002	320	293	10	9.99	93.2	530	1860	3158	3116.19	98.68%
MW-2	6/21/2005	306	313	7	9.7	84.6	473	1850	3060	3043.3	99.45%
MW-26	6/21/2005	337	424	52	10.1	154	234	1880	3200	3091.1	96.60%
MW-3	10/31/1979	228	243	12.6	16.7	75	282	930	2102	1787.3	85.03%
MW-3	1/31/1980	292	182	25	16	91	345	2100	2530	3051	120.59%
MW-3	4/30/1980	340	410	30	18	110	405	1900	3254	3213	98.74%
MW-3	5/19/1980	370	401	50	18	171	575	2430	4362	4015	92.04%
MW-3	6/16/1980	370	489	51	23	132	642	2625	4716	4332	91.86%
MW-3	7/16/1980	380	461	62	38	203	442	2450	4024	4036	100.30%
MW-3	8/19/1980	305	473	65	37	198	653	2975	4908	4706	95.88%
MW-3	9/1/1980	370	469	62	44	210	586	2800	4593	4541	98.87%
MW-3	10/1/1980	340	481	65	46	205	677	3050	4828	4864	100.75%
MW-3	11/11/1980	376	479	64	26	210	567	2750	4522	4472	98.89%
MW-3	12/10/1980	390	489	65	32	222	699	3060	4982	4957	99.50%
MW-3	1/22/1981	390	457	71	42	195	756	3012	5053	4923	97.43%
MW-3	2/12/1981	370	457	65	27	154	704	2780	4804	4557	94.86%
MW-3	3/18/1981	382	473	66	30	229	745	3150	5122	5075	99.08%
MW-3	4/13/1981	360	473	66	16	224	703	3030	5130	4872	94.97%
MW-3	6/24/1981	382	505	69	38	210	685	3040	5387	4929	91.50%
MW-3	8/18/1981	360	509	67	31	214	688	3050	5124	4919	96.00%
MW-3	9/1/1981	188	38	**3**	5	19	27	**42**	**256**	322	**125.78%**
MW-3	1/27/1982	382	481	64	58	229	757	3100	4990	5071	101.62%
MW-3	12/13/1982	399	480	53	16	185	810	3259	5366	5202	96.94%
MW-3	4/21/1983	430	470	66.5	22	260	770	3226	4880	5244.5	107.47%
MW-3	10/26/1983	457	450	56.6	21	210	800	3226	5127	5220.6	101.83%
MW-3	6/15/1984	370	470	63	21	230	780	3300	5300	5234	98.75%
MW-3	3/5/1991	204	407	68	25	234	708	2712	5268	4358	82.73%
MW-3	11/16/1992	352	437	63	24.3	244	736	3200	5727	5056.3	88.29%
MW-3	3/31/1993	324	466	64	25.7	239	729	2200	5385	4047.7	75.17%
MW-3	6/14/1993	410	466	61	28.2	238	649	1890	5616	3742.2	66.63%
MW-3	9/30/1993	402	453	61	32	241	755	2572	5496	4516	82.17%
MW-3	12/16/1993	331	457	64	28.2	244	734	2528	6186	4386.2	70.91%
MW-3	3/30/1994	358	476	64	21.4	249	736	2211	5000	4115.4	82.31%
MW-3	6/21/1994	406	443	65	27	237	740	2199	5334	4117	77.18%
MW-3	8/18/1994	296	581	64	20.1	237	698	2095	5281	3991.1	75.57%
MW-3	12/13/1994	371	458	64	22	219	702	2322	5432	4158	76.55%
MW-3	11/30/2000	491	434	62	19.9	218	807	2920	5320	4951.9	93.08%
MW-3	11/6/2001	440	470	82.5	20.2	244	882	3230	5380	5368.7	99.79%
MW-3	9/12/2002	430	443	65.1	21.7	226	813	3500	5394	5498.8	101.94%

Table 7
Comparison of Calculated and Measured TDS for Samples with Complete Major-Ion Analysis

BOLD values indicate the removal of the value prior to statistical analysis, either due to an extreme or a calculated TDS imbalance.

Well	Date	Alkalinity	Ca	Cl	K	Mg	Na	SO4	Measured TDS	Calculated TDS	Ratio
MW-3	6/25/2006	290	415	63	26.5	234	678	4030	5050	5736.5	113.59%
MW-5	5/19/1980	330	192	60	18	49	478	1290	2392	2417	101.05%
MW-5	6/16/1980	320	152	57	14	54	462	1200	2300	2259	98.22%
MW-5	7/16/1980	330	160	60	23	49	435	1100	2060	2157	104.71%
MW-5	8/19/1980	320	152	60	20	46	465	1150	2218	2213	99.77%
MW-5	9/1/1980	580	156	51	15	41	500	960	2172	2303	106.03%
MW-5	10/1/1980	340	152	55	20	42	443	1060	2096	2112	100.76%
MW-5	11/11/1980	300	152	49	10	29	428	1050	1960	2018	102.96%
MW-5	12/9/1980	320	176	52	13	27	460	1150	2105	2198	104.42%
MW-5	1/22/1981	310	161	53	13	30	467	1140	2072	2174	104.92%
MW-5	2/11/1981	295	176	54	10	37	487	1260	2192	2319	105.79%
MW-5	3/17/1981	310	168	55	13	51	473	1210	2256	2280	101.06%
MW-5	4/21/1981	320	176	53	13	46	467	1220	2309	2295	99.39%
MW-5	6/18/1981	330	168	53	12	41	437	1105	2114	2146	101.51%
MW-5	8/18/1981	340	168	52	12	48	426	1115	2119	2161	101.98%
MW-5	9/1/1981	177	28	**4**	4	12	38	**28**	**229**	291	**127.07%**
MW-5	1/26/1982	290	200	51	22	83	490	1260	2273	2396	105.41%
MW-5	12/13/1982	323	143	47.1	7.4	40	431	1182	2180	2173.5	99.70%
MW-5	5/24/1983	320	150	48.1	6.5	42	460	1228	2236	2254.6	100.83%
MW-5	10/27/1983	339	150	46.8	7	41	480	1183	2093	2246.8	107.35%
MW-5	6/14/1984	330	150	54	7	41	470	1200	2200	2252	102.36%
MW-5	33297	303	118	50	7.4	34	430	1028	1850	1970.4	106.51%
MW-5	33927	322	132	50	8	43	453	1055	2213	2063	93.22%

Table 8
Charge Balance of Major Canions and Anions

Well	Date	Ca	Na	Mg	K	Total Cation Charge	HCO3	Cl	SO4	Total Anion Charge	Percent Difference
MW-1	10/31/1979	3.19	4.61	1.32	0.23	**9.35**	-3.20	-0.07	-4.58	**-7.85**	**16.07%**
MW-1	1/31/1980	5.49	5.65	3.21	0.22	**14.57**	-4.61	-0.39	-10.83	**-15.83**	-8.62%
MW-1	4/30/1980	6.49	6.96	4.03	0.02	**17.50**	-5.24	-0.37	-10.83	**-16.44**	6.07%
MW-1	5/19/1980	7.39	7.18	3.62	0.28	**18.46**	-4.80	-0.56	-13.22	**-18.59**	-0.66%
MW-1	6/16/1980	7.78	7.22	3.21	0.20	**18.42**	-4.83	-0.45	-13.16	**-18.44**	-0.13%
MW-1	7/16/1980	7.04	6.96	4.44	0.43	**18.87**	-5.39	-0.56	-12.70	**-18.66**	1.16%
MW-1	8/19/1980	6.59	6.87	4.44	0.43	**18.34**	-5.39	-0.51	-12.74	**-18.64**	-1.65%
MW-1	9/1/1980	7.19	6.79	4.85	0.31	**19.13**	-5.20	-0.37	-13.32	**-18.89**	1.29%
MW-1	10/1/1980	7.39	7.05	3.21	0.38	**18.03**	-5.20	-0.85	-11.87	**-17.91**	0.65%
MW-1	11/13/1980	6.94	7.22	3.29	0.23	**17.68**	-4.90	-0.34	-12.76	**-18.00**	-1.82%
MW-1	12/10/1980	6.74	7.31	4.03	0.23	**18.31**	-5.00	-0.37	-12.91	**-18.27**	0.18%
MW-1	1/22/1981	7.29	7.39	3.87	0.26	**18.80**	-5.06	-0.42	-13.28	**-18.77**	0.18%
MW-1	3/19/1981	7.29	7.61	4.36	0.23	**19.49**	-5.29	-0.39	-13.70	**-19.39**	0.52%
MW-1	4/14/1981	6.99	7.00	4.61	0.26	**18.85**	-5.39	-0.37	-12.91	**-18.67**	0.99%
MW-1	6/18/1981	7.78	7.05	3.79	0.26	**18.87**	-5.20	-0.34	-13.03	**-18.57**	1.62%
MW-1	8/14/1981	7.78	7.00	4.20	0.26	**19.24**	-5.79	-0.39	-13.12	**-19.30**	-0.29%
MW-1	9/1/1981	1.90	1.00	1.56	0.13	**4.59**	-3.72	-0.03	-0.79	**-4.54**	1.06%
MW-1	1/28/1982	7.09	7.39	4.53	0.36	**19.36**	-5.33	-0.37	-12.76	**-18.46**	4.69%
MW-1	12/10/1982	7.14	7.39	4.20	0.16	**18.89**	-5.34	-0.31	-13.60	**-19.25**	-1.88%
MW-1	4/22/1983	7.49	7.39	4.20	0.15	**19.23**	-5.28	-0.47	-13.70	**-19.44**	-1.10%
MW-1	10/26/1983	6.99	7.39	4.44	0.16	**18.98**	-5.47	-0.36	-14.05	**-19.89**	-4.77%
MW-1	5/11/1999	7.04	7.13	4.38	0.15	**18.69**	-5.18	-0.36	-13.43	**-18.97**	-1.46%
MW-1	11/30/2000	6.89	6.79	4.18	0.15	**18.00**	-5.20	-0.43	-12.66	**-18.28**	-1.55%
MW-1	11/6/2001	7.88	6.87	4.87	0.15	**19.78**	-5.01	-0.49	-14.39	**-19.89**	-0.54%
MW-1	9/9/2002	6.79	7.53	4.42	0.15	**18.88**	-5.18	-0.38	-13.78	**-19.35**	-2.46%
MW-1	6/20/2005	6.14	7.22	4.26	0.15	**17.77**	-4.88	-0.31	-13.26	**-18.46**	-3.87%
MW-1	12/14/2005	7.73	7.39	4.80	0.16	**20.09**	-5.15	-0.37	-14.62	**-20.13**	-0.21%
MW-1	6/25/2006	7.64	6.83	4.98	0.17	**19.61**	-4.90	-0.48	-15.07	**-20.45**	-4.29%
MW-1	10/27/2006	8.53	6.92	5.28	0.17	**20.90**	-4.67	-0.54	-17.45	**-22.65**	-8.40%
MW-11	12/16/1982	1.80	23.92	0.72	0.15	**26.59**	-6.54	-0.69	-19.28	**-26.51**	0.31%
MW-11	5/24/1983	1.55	23.05	0.63	0.12	**25.35**	-5.95	-0.76	-19.63	**-26.34**	-3.88%
MW-11	10/26/1983	1.40	23.49	0.55	0.13	**25.56**	-6.59	-0.73	-19.20	**-26.52**	-3.73%
MW-11	5/11/1999	2.18	23.05	1.06	0.15	**26.45**	-6.18	-0.93	-19.67	**-26.78**	-1.25%
MW-11	11/27/2000	4.69	21.18	2.52	0.19	**28.59**	-6.26	-1.05	-23.73	**-31.05**	-8.61%
MW-11	11/6/2001	4.14	24.97	2.09	0.18	**31.37**	-6.15	-1.20	-23.94	**-31.28**	0.28%
MW-11	9/10/2002	4.77	23.49	2.47	0.19	**30.92**	-6.10	-0.95	-25.40	**-32.45**	-4.96%
MW-11	6/21/2005	2.93	23.66	1.50	0.16	**28.25**	-5.97	-0.87	-22.69	**-29.53**	-4.54%
MW-11	9/22/2005	2.53	23.97	1.26	0.16	**27.92**	-6.19	-0.93	-20.15	**-27.28**	2.29%
MW-11	12/13/2005	3.05	23.66	1.59	0.17	**28.48**	-6.15	-1.02	-22.28	**-29.44**	-3.37%
MW-11	3/21/2006	2.75	23.97	1.38	0.16	**28.26**	-6.24	-0.93	-23.32	**-30.49**	-7.89%
MW-11	6/20/2006	3.10	24.10	1.65	0.19	**29.04**	-6.13	-0.87	-23.94	**-30.95**	-6.58%
MW-11	9/13/2006	2.55	24.27	1.23	0.17	**28.22**	-6.23	-0.82	-22.07	**-29.11**	-3.17%
MW-11	10/25/2006	3.39	24.31	1.79	0.18	**29.67**	-6.19	-0.90	-24.98	**-32.08**	-8.11%
MW-11	3/15/2007	3.45	24.84	1.82	0.19	**30.30**	-6.15	0.00	-23.32	**-29.46**	2.77%
MW-12	5/4/1983	26.45	13.48	22.22	0.31	**62.46**	-8.31	-2.27	-50.38	**-60.96**	2.39%
MW-12	10/27/1983	26.45	12.61	17.28	0.33	**56.68**	-8.67	-1.52	-48.68	**-58.87**	-3.87%
MW-12	5/12/1999	23.65	12.05	17.77	0.31	**53.79**	-6.82	-1.15	-43.51	**-51.48**	4.28%
MW-12	11/28/2000	24.90	10.79	17.77	0.30	**53.76**	-6.92	-1.61	-41.64	**-50.16**	6.70%
MW-12	9/10/2002	23.60	13.53	17.44	0.31	**54.89**	-6.85	-1.74	-46.84	**-55.43**	-0.99%
MW-12	6/22/2005	23.25	11.40	16.70	0.29	**51.65**	-6.59	-1.55	-44.14	**-52.28**	-1.22%
MW-12	12/13/2005	27.15	11.79	18.76	0.33	**58.02**	-7.19	-1.49	-46.01	**-54.70**	5.73%
MW-12	6/22/2006	26.05	13.83	18.10	0.38	**58.37**	-6.92	-1.72	-47.26	**-55.90**	4.23%
MW-12	10/30/2006	26.00	13.61	18.43	0.34	**58.39**	-6.39	-1.72	-49.76	**-57.87**	0.89%
MW-14	5/11/1999	23.80	14.35	13.08	0.28	**51.52**	-7.51	-0.25	-45.18	**-52.94**	-2.75%
MW-14	11/28/2000	24.65	12.57	12.67	0.28	**50.17**	-7.59	-0.63	-39.56	**-47.77**	4.78%
MW-14	11/6/2001	26.30	11.18	13.99	0.29	**51.76**	-7.64	-0.75	-42.26	**-50.65**	2.14%
MW-14	9/10/2002	23.75	15.40	12.59	0.29	**52.03**	-7.57	-0.06	-41.64	**-49.27**	5.32%
MW-14	6/22/2005	24.10	13.66	12.84	0.29	**50.89**	-7.29	-0.51	-44.14	**-51.94**	-2.06%
MW-14	9/22/2005	25.45	14.27	13.25	0.30	**53.26**	-7.51	-0.54	-41.85	**-49.89**	6.34%
MW-14	12/13/2005	27.35	13.44	14.48	0.31	**55.58**	-7.60	-0.54	-44.35	**-52.49**	5.57%
MW-14	3/21/2006	24.55	14.05	12.75	0.30	**51.65**	-7.70	-0.56	-43.93	**-52.20**	-1.05%
MW-14	6/20/2006	22.46	13.44	12.84	0.31	**49.04**	-7.44	-0.48	-43.10	**-51.02**	-4.02%
MW-14	9/13/2006	26.45	13.35	13.58	0.32	**53.70**	-7.83	-0.51	-45.39	**-53.73**	-0.05%
MW-14	10/25/2006	25.30	14.57	13.00	0.30	**53.17**	-7.56	-0.51	-48.51	**-56.57**	-6.39%
MW-14	3/14/2007	24.90	13.22	12.92	0.31	**51.35**	-7.47	-0.54	-46.01	**-54.02**	-5.20%
MW-15	5/11/1999	20.36	20.75	11.44	0.25	**52.79**	-7.26	-0.93	-43.72	**-51.91**	1.66%
MW-15	11/6/2001	22.86	16.40	14.65	0.28	**54.18**	-6.87	-1.61	-45.39	**-53.86**	0.58%

Table 8
Charge Balance of Major Canions and Anions

Well	Date	Ca	Na	Mg	K	Total Cation Charge	HCO3	Cl	SO4	Total Anion Charge	Percent Difference
MW-15	9/10/2002	19.06	23.27	12.84	0.25	**55.42**	-7.11	-1.14	-44.14	**-52.39**	5.46%
MW-15	6/23/2005	20.56	20.84	13.08	0.25	**54.72**	-7.16	-1.07	-49.97	**-58.20**	-6.35%
MW-15	12/13/2005	21.81	20.97	13.99	0.27	**57.03**	-7.19	-1.10	-48.72	**-57.01**	0.03%
MW-15	6/21/2006	20.71	18.96	13.50	0.27	**53.44**	-7.24	-1.07	-47.47	**-55.78**	-4.39%
MW-15	10/25/2006	22.41	19.53	14.32	0.26	**56.51**	-7.01	-1.10	-51.63	**-59.75**	-5.72%
MW-17	5/12/1999	18.46	24.92	14.65	0.31	**58.35**	-7.87	-1.00	-51.42	**-60.29**	-3.33%
MW-17	11/30/2000	20.11	25.49	17.20	0.31	**63.11**	-7.88	-0.84	-52.47	**-61.19**	3.05%
MW-17	11/6/2001	23.65	28.75	20.24	0.35	**73.00**	-7.83	-1.22	-59.54	**-68.59**	6.04%
MW-17	9/10/2002	20.36	24.62	17.36	0.34	**62.69**	-7.90	-0.79	-52.26	**-60.95**	2.77%
MW-17	6/22/2005	15.47	22.49	13.33	0.31	**51.60**	-7.21	-0.68	-49.13	**-57.02**	**-10.52%**
MW-17	12/13/2005	19.91	26.88	17.12	0.35	**64.26**	-8.24	-0.73	-56.00	**-64.98**	-1.12%
MW-17	6/23/2006	16.87	25.32	16.46	0.40	**59.04**	-8.60	-0.79	-54.13	**-63.52**	-7.59%
MW-17	10/26/2006	17.67	25.88	15.14	0.34	**59.02**	-8.24	-0.79	-55.59	**-64.62**	-9.49%
MW-17	6/20/2007	19.01	27.71	16.29	0.37	**63.38**	-8.44	-0.82	-53.30	**-62.56**	1.30%
MW-18	5/12/1999	21.01	8.00	6.67	0.16	**35.84**	-6.52	-0.99	-27.90	**-35.41**	1.21%
MW-18	12/1/2000	23.30	7.83	7.27	0.18	**38.58**	-6.74	-1.33	-33.31	**-41.38**	-7.26%
MW-18	11/6/2001	21.56	6.74	6.07	0.20	**34.57**	-6.23	-1.34	-28.73	**-36.30**	-5.00%
MW-18	9/9/2002	22.61	8.35	7.67	0.19	**38.82**	-6.72	-1.15	-40.39	**-48.25**	**-24.31%**
MW-18	6/21/2006	26.65	7.66	9.96	0.26	**44.52**	-7.19	-1.41	-35.39	**-44.00**	1.16%
MW-18	10/26/2006	25.70	7.79	9.63	0.22	**43.33**	-6.87	-1.41	-38.93	**-47.21**	-8.95%
MW-19	5/12/1999	21.86	18.40	9.63	0.25	**50.13**	-4.00	-2.15	-43.10	**-49.24**	1.77%
MW-19	12/1/2000	19.56	15.96	11.52	0.20	**47.25**	-4.21	-2.27	-43.30	**-49.78**	-5.37%
MW-19	11/5/2001	17.47	10.92	10.20	0.19	**38.78**	-4.39	-2.48	-32.69	**-39.56**	-2.02%
MW-19	9/10/2002	14.07	14.75	8.06	0.17	**37.05**	-4.39	-1.82	-3.48	**-9.69**	**73.84%**
MW-19	6/22/2005	10.33	11.48	5.60	0.15	**27.57**	-4.29	-1.21	-22.28	**-27.78**	-0.79%
MW-19	12/13/2005	10.33	8.31	5.63	0.15	**24.41**	-4.56	-0.90	-17.86	**-23.32**	4.48%
MW-19	6/21/2006	7.69	5.92	4.20	0.13	**17.94**	-3.56	-0.76	-12.14	**-16.46**	8.25%
MW-19	10/26/2006	7.78	5.65	4.23	0.12	**17.78**	-4.47	-0.85	-11.87	**-17.19**	3.35%
MW-19	3/19/2007	5.04	17.83	2.55	0.15	**25.58**	-4.88	-1.02	-21.24	**-27.14**	-6.09%
MW-2	10/31/1979	4.79	6.70	1.65	0.19	**13.32**	-5.11	-0.14	-5.00	**-10.25**	**23.06%**
MW-2	1/31/1980	5.49	9.35	2.96	0.26	**18.06**	-5.92	-0.51	-13.12	**-19.54**	-8.20%
MW-2	4/30/1980	8.23	12.40	4.69	0.26	**25.58**	-7.28	-0.37	-13.53	**-21.18**	**17.21%**
MW-2	5/19/1980	9.58	15.05	5.18	0.38	**30.20**	-7.39	-0.51	-22.38	**-30.28**	-0.27%
MW-2	6/16/1980	11.78	15.70	6.01	0.28	**33.77**	-6.80	-0.42	-26.86	**-34.08**	-0.93%
MW-2	7/16/1980	11.98	18.18	6.42	0.59	**37.17**	-7.39	-0.56	-29.15	**-37.10**	0.17%
MW-2	8/19/1980	11.98	17.83	5.10	0.59	**35.50**	-6.60	-0.45	-28.00	**-35.06**	1.25%
MW-2	9/1/1980	14.62	20.36	6.42	0.54	**41.93**	-8.80	-0.42	-32.27	**-41.49**	1.05%
MW-2	10/1/1980	13.42	18.05	7.41	0.74	**39.62**	-6.80	-0.56	-31.96	**-39.32**	0.76%
MW-2	11/13/1980	14.52	18.23	4.77	0.33	**37.85**	-7.56	-0.23	-29.67	**-37.45**	1.07%
MW-2	12/10/1980	15.22	19.23	4.85	0.43	**39.74**	-7.60	-0.28	-31.65	**-39.53**	0.51%
MW-2	1/22/1981	14.22	20.31	4.44	0.49	**39.46**	-7.60	-0.31	-31.85	**-39.77**	-0.77%
MW-2	2/11/1981	15.02	20.10	4.44	0.31	**39.87**	-7.39	-0.25	-32.27	**-39.92**	-0.12%
MW-2	4/21/1981	15.42	20.70	6.67	0.26	**43.05**	-7.80	-0.31	-34.56	**-42.67**	0.87%
MW-2	6/24/1981	15.07	19.92	6.67	0.59	**42.25**	-7.39	-0.28	-35.19	**-42.86**	-1.45%
MW-2	8/11/1981	15.22	20.01	7.98	0.46	**43.67**	-7.60	-0.20	-35.50	**-43.30**	0.85%
MW-2	9/1/1981	1.90	0.30	1.56	0.10	**3.87**	-3.20	-0.08	-0.52	**-3.80**	1.70%
MW-2	1/28/1982	16.22	21.01	20.08	0.66	**57.97**	-7.33	-0.23	-33.10	**-40.65**	**29.87%**
MW-2	12/10/1982	14.97	20.88	7.41	0.26	**43.52**	-7.39	-0.16	-36.41	**-43.96**	-1.02%
MW-2	5/4/1983	15.97	20.44	7.16	0.24	**43.81**	-7.24	-0.71	-37.50	**-45.45**	-3.72%
MW-2	10/27/1983	15.47	21.75	7.57	0.17	**44.96**	-7.39	-0.14	-37.85	**-45.39**	-0.96%
MW-2	5/11/1999	16.12	20.40	7.27	0.26	**44.05**	-6.57	-0.16	-37.48	**-44.21**	-0.35%
MW-2	11/30/2000	14.87	19.14	6.73	0.25	**40.99**	-6.52	-0.26	-35.60	**-42.38**	-3.39%
MW-2	11/5/2001	17.96	23.88	8.97	0.26	**51.08**	-6.38	-0.30	-37.48	**-44.15**	**13.56%**
MW-2	9/10/2002	14.62	23.05	7.67	0.26	**45.60**	-6.36	-0.28	-38.72	**-45.37**	0.51%
MW-2	6/21/2005	15.62	20.57	6.96	0.25	**43.40**	-6.11	-0.20	-38.52	**-44.83**	-3.28%
MW-2	12/14/2005	16.42	21.01	7.61	0.26	**45.29**	-6.70	-0.17	-39.97	**-46.85**	-3.42%
MW-2	6/20/2006	15.72	20.44	8.15	0.29	**44.60**	-6.28	-0.20	-39.14	**-45.62**	-2.27%
MW-2	10/24/2006	17.77	21.18	8.48	0.29	**47.72**	-4.82	-0.23	-41.01	**-46.06**	3.48%
MW-26	6/21/2005	21.16	10.18	12.67	0.26	**44.27**	-6.74	-1.47	-39.14	**-47.34**	-6.95%
MW-26	9/22/2005	24.00	9.26	13.58	0.26	**47.11**	-6.70	-1.49	-38.52	**-46.71**	0.84%
MW-26	12/14/2005	24.75	9.57	13.99	0.27	**48.58**	-6.70	-1.49	-39.35	**-47.55**	2.12%
MW-26	3/22/2006	24.90	9.18	13.82	0.27	**48.17**	-6.75	-1.44	-39.97	**-48.16**	0.02%
MW-26	6/20/2006	23.85	8.44	13.82	0.29	**46.40**	-6.65	-1.47	-38.10	**-46.22**	0.39%
MW-26	9/12/2006	24.35	8.57	13.33	0.28	**46.53**	-6.49	-1.38	-36.85	**-44.72**	3.89%
MW-26	10/24/2006	26.50	8.44	14.07	0.28	**49.29**	-6.80	-1.61	-43.72	**-52.13**	-5.76%
MW-26	3/16/2007	25.35	7.39	14.40	0.27	**47.41**	-6.47	-1.64	-41.22	**-49.33**	-4.05%
MW-26	6/20/2007	25.35	9.00	14.56	0.30	**49.22**	-6.72	-1.52	-40.39	**-48.63**	1.20%

Table 8
Charge Balance of Major Canions and Anions

Well	Date	Ca	Na	Mg	K	Total Cation Charge	HCO3	Cl	SO4	Total Anion Charge	Percent Difference
MW-3	10/31/1979	12.13	12.27	6.17	0.43	**30.99**	-4.56	-0.36	-19.36	**-24.27**	**21.68%**
MW-3	1/31/1980	18.21	15.01	7.49	0.41	**41.12**	-5.83	-0.71	-43.72	**-50.26**	**-22.23%**
MW-3	4/30/1980	20.46	17.62	9.05	0.46	**47.59**	-6.80	-0.85	-39.56	**-47.20**	0.81%
MW-3	5/19/1980	20.01	25.01	14.07	0.46	**59.55**	-7.39	-1.41	-50.59	**-59.39**	0.27%
MW-3	6/16/1980	24.40	27.93	10.86	0.59	**63.78**	-7.39	-1.44	-54.65	**-63.48**	0.47%
MW-3	7/16/1980	23.01	19.23	16.70	0.97	**59.91**	-7.60	-1.75	-51.01	**-60.36**	-0.76%
MW-3	8/19/1980	23.60	28.40	16.29	0.95	**69.25**	-6.10	-1.83	-61.94	**-69.87**	-0.90%
MW-3	9/1/1980	23.40	25.49	17.28	1.13	**67.30**	-7.39	-1.75	-58.29	**-67.43**	-0.20%
MW-3	10/1/1980	24.00	29.45	16.87	1.18	**71.50**	-6.80	-1.83	-63.50	**-72.13**	-0.89%
MW-3	11/11/1980	23.90	24.66	17.28	0.66	**66.51**	-7.51	-1.81	-57.25	**-66.57**	-0.08%
MW-3	12/10/1980	24.40	30.40	18.27	0.82	**73.89**	-7.80	-1.83	-63.71	**-73.34**	0.75%
MW-3	1/22/1981	22.81	32.88	16.05	1.07	**72.81**	-7.80	-2.00	-62.71	**-72.51**	0.41%
MW-3	2/12/1981	22.81	30.62	12.67	0.69	**66.79**	-7.39	-1.83	-57.88	**-67.10**	-0.47%
MW-3	3/18/1981	23.60	32.41	18.84	0.77	**75.62**	-7.60	-1.86	-65.58	**-75.05**	0.76%
MW-3	4/13/1981	23.60	30.58	18.43	0.41	**73.02**	-7.19	-1.86	-63.08	**-72.14**	1.21%
MW-3	6/24/1981	25.20	29.80	17.28	0.97	**73.25**	-7.60	-1.95	-63.29	**-72.84**	0.56%
MW-3	9/1/1981	1.90	1.17	1.56	0.13	**4.76**	-3.75	-0.08	-0.87	**-4.71**	1.05%
MW-3	1/27/1982	24.00	32.93	18.84	1.48	**77.26**	-7.60	-1.81	-64.54	**-73.95**	4.28%
MW-3	12/13/1982	23.95	35.23	15.22	0.41	**74.82**	-7.59	-1.49	-67.85	**-76.93**	-2.83%
MW-3	4/21/1983	23.45	33.49	21.39	0.56	**78.90**	-7.28	-1.88	-67.16	**-76.32**	3.28%
MW-3	10/26/1983	22.46	34.80	17.28	0.54	**75.07**	-8.59	-1.60	-67.16	**-77.35**	-3.03%
MW-3	5/11/1999	21.71	32.88	19.75	0.55	**74.89**	-8.05	-1.71	-67.66	**-77.42**	-3.38%
MW-3	11/30/2000	21.66	35.10	17.94	0.51	**75.21**	-9.80	-1.75	-60.79	**-72.34**	3.81%
MW-3	11/6/2001	23.45	38.36	20.08	0.52	**82.41**	-8.80	-2.33	-67.25	**-78.37**	4.90%
MW-3	9/12/2002	22.11	35.36	18.60	0.56	**76.62**	-8.90	-1.84	-72.87	**-83.60**	-9.11%
MW-3	9/23/2005	22.01	33.06	18.60	0.58	**74.24**	-7.10	-1.83	-69.33	**-78.26**	-5.41%
MW-3	12/13/2005	23.70	32.71	20.74	0.60	**77.75**	-6.60	-1.83	-68.70	**-77.14**	0.78%
MW-3	6/25/2006	20.71	29.49	19.26	0.68	**70.13**	-5.80	-1.78	-83.90	**-91.48**	**-30.44%**
MW-3	9/14/2006	22.66	31.80	18.76	0.60	**73.81**	-7.33	-1.78	-65.58	**-74.68**	-1.18%
MW-3	10/27/2006	22.31	30.71	19.75	0.61	**73.37**	-5.85	-1.78	-72.66	**-80.29**	-9.43%
MW-32	6/23/2005	25.15	9.26	18.76	0.32	**53.50**	-5.98	-0.90	-47.26	**-54.14**	-1.21%
MW-32	9/22/2005	26.65	9.44	20.00	0.34	**56.42**	-6.00	-0.93	-50.38	**-57.31**	-1.58%
MW-32	12/14/2005	27.80	9.48	19.91	0.35	**57.54**	-6.90	-0.93	-48.09	**-55.92**	2.81%
MW-32	3/22/2006	28.24	9.40	20.82	0.35	**58.81**	-6.49	-0.90	-49.76	**-57.15**	2.82%
MW-32	6/21/2006	25.40	8.57	19.42	0.36	**53.75**	-6.82	-0.85	-49.13	**-56.80**	-5.68%
MW-32	9/13/2006	27.25	9.53	19.42	0.36	**56.55**	-7.31	-0.90	-47.88	**-56.10**	0.81%
MW-32	10/25/2006	26.75	9.70	19.67	0.35	**56.47**	-7.26	-0.87	-50.59	**-58.73**	-4.00%
MW-32	3/16/2007	26.95	9.31	20.90	0.37	**57.52**	-6.60	-0.96	-50.18	**-57.74**	-0.38%
MW-32	6/21/2007	26.05	9.66	19.67	0.43	**55.80**	-7.36	-0.96	-51.22	**-59.53**	-6.69%
MW-5	5/19/1980	9.58	20.79	4.03	0.46	**34.87**	-6.60	-1.69	-26.86	**-35.15**	-0.83%
MW-5	6/16/1980	7.59	20.10	4.44	0.36	**32.48**	-6.39	-1.61	-24.98	**-32.98**	-1.54%
MW-5	7/16/1980	7.98	18.92	4.03	0.59	**31.53**	-6.60	-1.69	-22.90	**-31.20**	1.04%
MW-5	8/19/1980	7.59	20.23	3.79	0.51	**32.11**	-6.39	-1.69	-23.94	**-32.03**	0.25%
MW-5	9/1/1980	7.78	21.75	3.37	0.38	**33.29**	-11.60	-1.44	-19.99	**-33.03**	0.79%
MW-5	10/1/1980	7.59	19.27	3.46	0.51	**30.82**	-6.80	-1.55	-22.07	**-30.42**	1.30%
MW-5	11/11/1980	7.59	18.62	2.39	0.26	**28.84**	-6.00	-1.38	-21.86	**-29.24**	-1.38%
MW-5	12/9/1980	8.78	20.01	2.22	0.33	**31.35**	-6.39	-1.47	-23.94	**-31.80**	-1.45%
MW-5	1/22/1981	8.03	20.31	2.47	0.33	**31.15**	-6.19	-1.49	-23.73	**-31.42**	-0.88%
MW-5	2/11/1981	8.78	21.18	3.04	0.26	**33.27**	-5.90	-1.52	-26.23	**-33.66**	-1.17%
MW-5	3/17/1981	8.38	20.57	4.20	0.33	**33.49**	-6.19	-1.55	-25.19	**-32.94**	1.64%
MW-5	4/21/1981	8.78	20.31	3.79	0.33	**33.21**	-6.39	-1.49	-25.40	**-33.29**	-0.22%
MW-5	6/18/1981	8.38	19.01	3.37	0.31	**31.07**	-6.60	-1.49	-23.01	**-31.11**	-0.10%
MW-5	8/18/1981	8.38	18.53	3.95	0.31	**31.17**	-6.80	-1.47	-23.21	**-31.48**	-1.00%
MW-5	9/1/1981	1.40	1.65	0.99	0.10	**4.14**	-3.52	-0.11	-0.58	**-4.22**	-1.92%
MW-5	1/26/1982	9.98	21.31	6.83	0.56	**38.69**	-5.80	-1.44	-26.23	**-33.47**	**13.48%**
MW-5	12/13/1982	7.14	18.75	3.29	0.19	**29.36**	-6.18	-1.33	-24.61	**-32.12**	-9.37%
MW-5	5/24/1983	7.49	20.01	3.46	0.17	**31.12**	-6.10	-1.36	-25.57	**-33.02**	-6.12%
MW-5	10/27/1983	7.49	20.88	3.37	0.18	**31.92**	-6.49	-1.32	-24.63	**-32.44**	-1.64%
MW-5	5/12/1999	6.29	18.49	3.03	0.18	**27.98**	-6.10	-1.41	-20.44	**-27.95**	0.12%
MW-5	11/28/2000	7.09	19.14	3.34	0.19	**29.76**	-6.24	-1.59	-23.73	**-31.57**	-6.09%
MW-5	11/6/2001	6.74	16.88	3.10	0.18	**26.90**	-6.13	-1.92	-22.69	**-30.74**	**-14.28%**
MW-5	9/10/2002	6.09	21.23	3.57	0.20	**31.08**	-6.36	-1.57	-30.60	**-38.54**	**-23.98%**
MW-5	6/21/2005	6.09	19.23	2.95	0.18	**28.44**	-6.05	-1.35	-22.28	**-29.68**	-4.37%
MW-5	12/13/2005	6.69	20.10	3.28	0.19	**30.26**	-6.29	-1.44	-23.53	**-31.26**	-3.30%
MW-5	3/23/2006	7.09	19.83	3.58	0.20	**30.70**	-6.29	-1.44	-23.53	**-31.26**	-1.83%
MW-5	6/23/2006	7.39	22.79	3.42	0.24	**33.84**	-6.34	-1.41	-22.69	**-30.45**	**10.02%**
MW-5	10/27/2006	7.04	19.75	3.40	0.20	**30.38**	-6.15	-1.47	-24.98	**-32.60**	-7.28%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Chloride	10/26/1983	MW-3	56.6	MW-20	58.3	mg/L	-3.00%
pH	10/26/1983	MW-3	7.49	MW-20	7.78	s.u.	-3.87%
Sulfate	10/26/1983	MW-3	3226	MW-20	3250	mg/L	-0.74%
TDS @ 180 C	10/26/1983	MW-3	5127	MW-20	5156	mg/L	-0.57%
Arsenic	2/28/1986	MW-2	1	MW-2	1	ug/L	0.00%
Selenium	2/28/1986	MW-2	1	MW-2	1	ug/L	0.00%
Arsenic	12/10/1986	MW-5	2	MW-5A	2	ug/L	0.00%
Selenium	12/10/1986	MW-5	2	MW-5A	2	ug/L	0.00%
Arsenic	2/20/1987	MW-1	1	MW-A	1	ug/L	0.00%
Chloride	2/20/1987	MW-1	11	MW-A	12	mg/L	-9.09%
Selenium	2/20/1987	MW-1	1	MW-A	1	ug/L	0.00%
Sulfate	2/20/1987	MW-1	657	MW-A	665	mg/L	-1.22%
TDS @ 180 C	2/20/1987	MW-1	1270	MW-A	1270	mg/L	0.00%
Arsenic	2/20/1987	MW-11	1	MW-B	1	ug/L	0.00%
Chloride	2/20/1987	MW-11	32	MW-B	32	mg/L	0.00%
Selenium	2/20/1987	MW-11	3	MW-B	4	ug/L	-33.33%
Sulfate	2/20/1987	MW-11	895	MW-B	977	mg/L	-9.16%
TDS @ 180 C	2/20/1987	MW-11	1710	MW-B	1800	mg/L	-5.26%
Arsenic	11/2/1988	MW-1	1	MW-A	1	ug/L	0.00%
Chloride	11/2/1988	MW-1	11.8	MW-A	13.1	mg/L	-11.02%
pH	11/2/1988	MW-1	7.54	MW-A	8	s.u.	-6.10%
Selenium	11/2/1988	MW-1	5	MW-A	6	ug/L	-20.00%
Sulfate	11/2/1988	MW-1	688	MW-A	695	mg/L	-1.02%
TDS @ 180 C	11/2/1988	MW-1	1250	MW-A	1240	mg/L	0.80%
Arsenic	11/3/1988	MW-3	11	MW-B	11	ug/L	0.00%
Chloride	11/3/1988	MW-3	67.7	MW-B	69	mg/L	-1.92%
pH	11/3/1988	MW-3	7	MW-B	8	s.u.	-14.29%
Selenium	11/3/1988	MW-3	37	MW-B	41	ug/L	-10.81%
Sulfate	11/3/1988	MW-3	3410	MW-B	3430	mg/L	-0.59%
TDS @ 180 C	11/3/1988	MW-3	5430	MW-B	5280	mg/L	2.76%
Arsenic	3/9/1989	MW-2	32	MW-A	30	ug/L	6.25%
Chloride	3/9/1989	MW-2	7.6	MW-A	7.6	mg/L	0.00%
pH	3/9/1989	MW-2	7.1	MW-A	7.1	s.u.	0.00%
Selenium	3/9/1989	MW-2	17	MW-A	19	ug/L	-11.76%
Sulfate	3/9/1989	MW-2	1990	MW-A	2010	mg/L	-1.01%
TDS @ 180 C	3/9/1989	MW-2	3140	MW-A	3140	mg/L	0.00%
Chloride	6/22/1989	MW-11	32.4	MW-A	32.4	mg/L	0.00%
Sulfate	6/22/1989	MW-11	1020	MW-A	1020	mg/L	0.00%
TDS @ 180 C	6/22/1989	MW-11	1750	MW-A	1770	mg/L	-1.14%
Chloride	6/22/1989	MW-5	54.6	MW-B	54.6	mg/L	0.00%
Sulfate	6/22/1989	MW-5	1180	MW-B	1190	mg/L	-0.85%
TDS @ 180 C	6/22/1989	MW-5	2020	MW-B	2010	mg/L	0.50%
Ammonia	11/1/1989	MW-15	0.1	MW-15A	0.1	mg/L	0.00%
Arsenic	11/1/1989	MW-15	5	MW-15A	6	ug/L	-20.00%
Molybdenum	11/1/1989	MW-15	40	MW-15A	50	ug/L	-25.00%
Nickel	11/1/1989	MW-15	20	MW-15A	20	ug/L	0.00%
Vanadium	11/1/1989	MW-15	40	MW-15A	40	ug/L	0.00%
Ammonia	11/28/1989	MW-15	0.2	MW-15A	0.2	mg/L	0.00%
Arsenic	11/28/1989	MW-15	6	MW-15A	5	ug/L	16.67%
Beryllium	11/28/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Cadmium	11/28/1989	MW-15	5	MW-15A	5	ug/L	0.00%
Chloride	11/28/1989	MW-15	49	MW-15A	49	mg/L	0.00%
Chromium	11/28/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Mercury	11/28/1989	MW-15	0.2	MW-15A	0.2	ug/L	0.00%
Molybdenum	11/28/1989	MW-15	30	MW-15A	40	ug/L	-33.33%
Nickel	11/28/1989	MW-15	50	MW-15A	20	ug/L	60.00%
Selenium	11/28/1989	MW-15	19	MW-15A	19	ug/L	0.00%
Sulfate	11/28/1989	MW-15	2560	MW-15A	2530	mg/L	1.17%
TDS @ 180 C	11/28/1989	MW-15	3990	MW-15A	3950	mg/L	1.00%
Thallium	11/28/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Vanadium	11/28/1989	MW-15	30	MW-15A	40	ug/L	-33.33%
Ammonia	12/18/1989	MW-15	0.1	MW-15A	0.1	mg/L	0.00%
Arsenic	12/18/1989	MW-15	5	MW-15A	2	ug/L	60.00%
Beryllium	12/18/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Cadmium	12/18/1989	MW-15	5	MW-15A	5	ug/L	0.00%
Chloride	12/18/1989	MW-15	47	MW-15A	26	mg/L	44.68%
Chromium	12/18/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Mercury	12/18/1989	MW-15	0.2	MW-15A	0.2	ug/L	0.00%
Molybdenum	12/18/1989	MW-15	30	MW-15A	50	ug/L	-66.67%
Nickel	12/18/1989	MW-15	20	MW-15A	30	ug/L	-50.00%
Sulfate	12/18/1989	MW-15	1250	MW-15A	1160	mg/L	7.20%
TDS @ 180 C	12/18/1989	MW-15	3860	MW-15A	3520	mg/L	8.81%
Thallium	12/18/1989	MW-15	10	MW-15A	10	ug/L	0.00%
Vanadium	12/18/1989	MW-15	10	MW-15A	40	ug/L	-300.00%
Ammonia	1/25/1990	MW-15	0.1	MW-15A	0.1	mg/L	0.00%
Cadmium	1/25/1990	MW-15	5	MW-15A	5	ug/L	0.00%
Chromium	1/25/1990	MW-15	10	MW-15A	10	ug/L	0.00%
Mercury	1/25/1990	MW-15	0.2	MW-15A	0.2	ug/L	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Molybdenum	1/25/1990	MW-15	10	MW-15A	10	ug/L	0.00%
Nickel	1/25/1990	MW-15	10	MW-15A	20	ug/L	-100.00%
Vanadium	1/25/1990	MW-15	10	MW-15A	10	ug/L	0.00%
Arsenic	5/8/1990	MW-2	1	MW-15A	2	ug/L	-100.00%
Chloride	5/8/1990	MW-2	7	MW-15A	6	mg/L	14.29%
Selenium	5/8/1990	MW-2	1	MW-15A	1	ug/L	0.00%
Sulfate	5/8/1990	MW-2	2020	MW-15A	1020	mg/L	49.50%
TDS @ 180 C	5/8/1990	MW-2	3050	MW-15A	3070	mg/L	-0.66%
Chloride	8/7/1990	MW-11	33	MW-15A	33	mg/L	0.00%
pH	8/7/1990	MW-11	7.44	MW-15A	7.44	s.u.	0.00%
Sulfate	8/7/1990	MW-11	973	MW-15A	958	mg/L	1.54%
TDS @ 180 C	8/7/1990	MW-11	1700	MW-15A	1670	mg/L	1.76%
Arsenic	11/13/1990	MW-12	1	MW-13A	1	ug/L	0.00%
Chloride	11/13/1990	MW-12	63	MW-13A	63	mg/L	0.00%
pH	11/13/1990	MW-12	7.49	MW-13A	7.49	s.u.	0.00%
Selenium	11/13/1990	MW-12	1	MW-13A	1	ug/L	0.00%
Sulfate	11/13/1990	MW-12	2460	MW-13A	2420	mg/L	1.63%
TDS @ 180 C	11/13/1990	MW-12	3760	MW-13A	3810	mg/L	-1.33%
Arsenic	2/28/1991	MW-5	1	MW-15A	1	ug/L	0.00%
Beryllium	2/28/1991	MW-5	3	MW-15A	3	ug/L	0.00%
Chloride	2/28/1991	MW-5	50	MW-15A	50	mg/L	0.00%
Manganese	2/28/1991	MW-5	280	MW-15A	280	ug/L	0.00%
Nickel	2/28/1991	MW-5	40	MW-15A	40	ug/L	0.00%
Selenium	2/28/1991	MW-5	2	MW-15A	2	ug/L	0.00%
Sulfate	2/28/1991	MW-5	1028	MW-15A	950	mg/L	7.59%
TDS @ 180 C	2/28/1991	MW-5	1850	MW-15A	1808	mg/L	2.27%
Chloride	5/21/1991	MW-2	6	MW-14A	8	mg/L	-33.33%
Sulfate	5/21/1991	MW-2	1885	MW-14A	1877	mg/L	0.42%
TDS @ 180 C	5/21/1991	MW-2	3037	MW-14A	3157	mg/L	-3.95%
Chloride	5/22/1991	MW-11	30	MW-15A	31	mg/L	-3.33%
Sulfate	5/22/1991	MW-11	936	MW-15A	957	mg/L	-2.24%
TDS @ 180 C	5/22/1991	MW-11	1740	MW-15A	1761	mg/L	-1.21%
Arsenic	9/24/1991	MW-1	1	MW-14A	1	ug/L	0.00%
Beryllium	9/24/1991	MW-1	1	MW-14A	1	ug/L	0.00%
Cadmium	9/24/1991	MW-1	1	MW-14A	1	ug/L	0.00%
Chloride	9/24/1991	MW-1	11	MW-14A	14	mg/L	-27.27%
Molybdenum	9/24/1991	MW-1	1	MW-14A	1	ug/L	0.00%
Nickel	9/24/1991	MW-1	10	MW-14A	10	ug/L	0.00%
Selenium	9/24/1991	MW-1	2	MW-14A	2	ug/L	0.00%
Sulfate	9/24/1991	MW-1	692	MW-14A	665	mg/L	3.90%
TDS @ 180 C	9/24/1991	MW-1	1352	MW-14A	1299	mg/L	3.92%
Chloride	12/5/1991	MW-3	64	MW-15A	64	mg/L	0.00%
Sulfate	12/5/1991	MW-3	2214	MW-15A	2220	mg/L	-0.27%
TDS @ 180 C	12/5/1991	MW-3	5188	MW-15A	5251	mg/L	-1.21%
Arsenic	3/18/1992	MW-12	1	MW-14A	2	ug/L	-100.00%
Beryllium	3/18/1992	MW-12	1	MW-14A	1	ug/L	0.00%
Cadmium	3/18/1992	MW-12	1	MW-14A	1	ug/L	0.00%
Chloride	3/18/1992	MW-12	60	MW-14A	62	mg/L	-3.33%
Molybdenum	3/18/1992	MW-12	2	MW-14A	2	ug/L	0.00%
Nickel	3/18/1992	MW-12	10	MW-14A	10	ug/L	0.00%
Selenium	3/18/1992	MW-12	2	MW-14A	2	ug/L	0.00%
Sulfate	3/18/1992	MW-12	2330	MW-14A	2337	mg/L	-0.30%
TDS @ 180 C	3/18/1992	MW-12	4024	MW-14A	3919	mg/L	2.61%
Arsenic	3/18/1992	MW-14	1	MW-15A	2	ug/L	-100.00%
Beryllium	3/18/1992	MW-14	1	MW-15A	1	ug/L	0.00%
Cadmium	3/18/1992	MW-14	1	MW-15A	1	ug/L	0.00%
Chloride	3/18/1992	MW-14	22	MW-15A	21	mg/L	4.55%
Molybdenum	3/18/1992	MW-14	3	MW-15A	4	ug/L	-33.33%
Nickel	3/18/1992	MW-14	10	MW-15A	10	ug/L	0.00%
Selenium	3/18/1992	MW-14	2	MW-15A	2	ug/L	0.00%
Sulfate	3/18/1992	MW-14	2162	MW-15A	1711	mg/L	20.86%
TDS @ 180 C	3/18/1992	MW-14	3704	MW-15A	3022	mg/L	18.41%
Chloride	6/12/1992	MW-2	6	MW-14A	5	mg/L	16.67%
Sulfate	6/12/1992	MW-2	1862	MW-14A	1867	mg/L	-0.27%
TDS @ 180 C	6/12/1992	MW-2	2910	MW-14A	3040	mg/L	-4.47%
Chloride	6/12/1992	MW-11	29	MW-15A	29	mg/L	0.00%
Sulfate	6/12/1992	MW-11	976	MW-15A	980	mg/L	-0.41%
TDS @ 180 C	6/12/1992	MW-11	1740	MW-15A	1750	mg/L	-0.57%
Arsenic	9/15/1992	MW-5	6	MW-14A	4	ug/L	33.33%
Beryllium	9/15/1992	MW-5	1	MW-14A	1	ug/L	0.00%
Cadmium	9/15/1992	MW-5	1	MW-14A	1	ug/L	0.00%
Chloride	9/15/1992	MW-5	46	MW-14A	46	mg/L	0.00%
Molybdenum	9/15/1992	MW-5	1	MW-14A	1	ug/L	0.00%
Nickel	9/15/1992	MW-5	1	MW-14A	1	ug/L	0.00%
Selenium	9/15/1992	MW-5	2	MW-14A	2	ug/L	0.00%
Sulfate	9/15/1992	MW-5	1033	MW-14A	1055	mg/L	-2.13%
TDS @ 180 C	9/15/1992	MW-5	2130	MW-14A	2213	mg/L	-3.90%
Arsenic	9/15/1992	MW-15	1	MW-15A	1	ug/L	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Beryllium	9/15/1992	MW-15	1	MW-15A	1	ug/L	0.00%
Cadmium	9/15/1992	MW-15	1	MW-15A	1	ug/L	0.00%
Chloride	9/15/1992	MW-15	37	MW-15A	37	mg/L	0.00%
Nickel	9/15/1992	MW-15	1	MW-15A	1	ug/L	0.00%
Selenium	9/15/1992	MW-15	17	MW-15A	21	ug/L	-23.53%
Sulfate	9/15/1992	MW-15	2366	MW-15A	2367	mg/L	-0.04%
TDS @ 180 C	9/15/1992	MW-15	4040	MW-15A	2677	mg/L	33.74%
Chloride	12/9/1992	MW-12	62	MW-14A	71	mg/L	-14.52%
Sulfate	12/9/1992	MW-12	2343	MW-14A	2339	mg/L	0.17%
TDS @ 180 C	12/9/1992	MW-12	4323	MW-14A	4323	mg/L	0.00%
Chloride	12/9/1992	MW-1	13	MW-15A	13	mg/L	0.00%
Sulfate	12/9/1992	MW-1	654	MW-15A	674	mg/L	-3.06%
TDS @ 180 C	12/9/1992	MW-1	1567	MW-15A	1470	mg/L	6.19%
Arsenic	3/24/1993	MW-18	1	MW-14A	1	ug/L	0.00%
Beryllium	3/24/1993	MW-18	1	MW-14A	1	ug/L	0.00%
Cadmium	3/24/1993	MW-18	1	MW-14A	1	ug/L	0.00%
Chloride	3/24/1993	MW-18	34	MW-14A	34	mg/L	0.00%
Molybdenum	3/24/1993	MW-18	1	MW-14A	1	ug/L	0.00%
Nickel	3/24/1993	MW-18	5	MW-14A	5	ug/L	0.00%
pH	3/24/1993	MW-18	6.82	MW-14A	6.82	s.u.	0.00%
Selenium	3/24/1993	MW-18	2	MW-14A	2	ug/L	0.00%
Sulfate	3/24/1993	MW-18	1371	MW-14A	1371	mg/L	0.00%
TDS @ 180 C	3/24/1993	MW-18	2655	MW-14A	2620	mg/L	1.32%
Arsenic	3/31/1993	MW-17	9	MW-15A	7	ug/L	22.22%
Beryllium	3/31/1993	MW-17	1	MW-15A	1	ug/L	0.00%
Cadmium	3/31/1993	MW-17	1	MW-15A	1	ug/L	0.00%
Chloride	3/31/1993	MW-17	28	MW-15A	29	mg/L	-3.57%
Molybdenum	3/31/1993	MW-17	1	MW-15A	1	ug/L	0.00%
Nickel	3/31/1993	MW-17	1	MW-15A	1	ug/L	0.00%
pH	3/31/1993	MW-17	7	MW-15A	7	s.u.	0.00%
Selenium	3/31/1993	MW-17	2	MW-15A	2	ug/L	0.00%
Sulfate	3/31/1993	MW-17	2004	MW-15A	1902	mg/L	5.09%
TDS @ 180 C	3/31/1993	MW-17	4607	MW-15A	4615	mg/L	-0.17%
Chloride	6/9/1993	MW-2	6	MW-14A	6	mg/L	0.00%
pH	6/9/1993	MW-2	7.26	MW-14A	7.26	s.u.	0.00%
Sulfate	6/9/1993	MW-2	1499	MW-14A	1768	mg/L	-17.95%
TDS @ 180 C	6/9/1993	MW-2	3288	MW-14A	3300	mg/L	-0.36%
Arsenic	9/22/1993	MW-18	1	MW-15A	1	ug/L	0.00%
Beryllium	9/22/1993	MW-18	0.2	MW-15A	0.2	ug/L	0.00%
Cadmium	9/22/1993	MW-18	0.2	MW-15A	0.2	ug/L	0.00%
Chloride	9/22/1993	MW-18	34	MW-15A	33	mg/L	2.94%
Molybdenum	9/22/1993	MW-18	1	MW-15A	1	ug/L	0.00%
Nickel	9/22/1993	MW-18	1	MW-15A	1	ug/L	0.00%
pH	9/22/1993	MW-18	6.94	MW-15A	6.94	s.u.	0.00%
Selenium	9/22/1993	MW-18	2	MW-15A	2	ug/L	0.00%
Sulfate	9/22/1993	MW-18	1466	MW-15A	1450	mg/L	1.09%
TDS @ 180 C	9/22/1993	MW-18	2700	MW-15A	2656	mg/L	1.63%
Arsenic	9/23/1993	MW-19	1	MW-14A	1	ug/L	0.00%
Beryllium	9/23/1993	MW-19	0.2	MW-14A	0.2	ug/L	0.00%
Cadmium	9/23/1993	MW-19	0.4	MW-14A	0.1	ug/L	75.00%
Chloride	9/23/1993	MW-19	93	MW-14A	93	mg/L	0.00%
Molybdenum	9/23/1993	MW-19	4	MW-14A	4	ug/L	0.00%
Nickel	9/23/1993	MW-19	1	MW-14A	1	ug/L	0.00%
Selenium	9/23/1993	MW-19	2	MW-14A	2	ug/L	0.00%
Sulfate	9/23/1993	MW-19	1811	MW-14A	1816	mg/L	-0.28%
TDS @ 180 C	9/23/1993	MW-19	3172	MW-14A	3208	mg/L	-1.13%
Chloride	12/15/1993	MW-11	33	MW-15A	32	mg/L	3.03%
pH	12/15/1993	MW-11	7.87	MW-15A	7.87	s.u.	0.00%
Sulfate	12/15/1993	MW-11	1054	MW-15A	1042	mg/L	1.14%
TDS @ 180 C	12/15/1993	MW-11	2528	MW-15A	2566	mg/L	-1.50%
Arsenic	3/24/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Arsenic	3/24/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Beryllium	3/24/1994	MW-1	0.2	MW-14A	0.2	ug/L	0.00%
Beryllium	3/24/1994	MW-1	0.2	MW-14A	10	ug/L	-4900.00%
Cadmium	3/24/1994	MW-1	0.1	MW-14A	0.1	ug/L	0.00%
Cadmium	3/24/1994	MW-1	0.1	MW-14A	5	ug/L	-4900.00%
Chloride	3/24/1994	MW-1	15	MW-14A	1060	mg/L	-6966.67%
Chloride	3/24/1994	MW-1	15	MW-14A	1108	mg/L	-7286.67%
Molybdenum	3/24/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Molybdenum	3/24/1994	MW-1	1	MW-14A	10	ug/L	-900.00%
Nickel	3/24/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Nickel	3/24/1994	MW-1	1	MW-14A	10	ug/L	-900.00%
Selenium	3/24/1994	MW-1	2	MW-14A	2	ug/L	0.00%
Selenium	3/24/1994	MW-1	2	MW-14A	2	ug/L	0.00%
Sulfate	3/24/1994	MW-1	702	MW-14A	661	mg/L	5.84%
Sulfate	3/24/1994	MW-1	702	MW-14A	3570	mg/L	-408.55%
TDS @ 180 C	3/24/1994	MW-1	1210	MW-14A	1233	mg/L	-1.90%
TDS @ 180 C	3/24/1994	MW-1	1210	MW-14A	1250	mg/L	-3.31%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Arsenic	3/24/1994	MW-17	1	MW-15A	1	ug/L	0.00%
Arsenic	3/24/1994	MW-17	1	MW-15A	2	ug/L	-100.00%
Beryllium	3/24/1994	MW-17	0.2	MW-15A	0.2	ug/L	0.00%
Beryllium	3/24/1994	MW-17	0.2	MW-15A	10	ug/L	-4900.00%
Cadmium	3/24/1994	MW-17	0.2	MW-15A	0.1	ug/L	50.00%
Cadmium	3/24/1994	MW-17	0.2	MW-15A	5	ug/L	-2400.00%
Chloride	3/24/1994	MW-17	34	MW-15A	33	mg/L	2.94%
Chloride	3/24/1994	MW-17	34	MW-15A	36	mg/L	-5.88%
Molybdenum	3/24/1994	MW-17	1	MW-15A	1	ug/L	0.00%
Molybdenum	3/24/1994	MW-17	1	MW-15A	10	ug/L	-900.00%
Nickel	3/24/1994	MW-17	1	MW-15A	1	ug/L	0.00%
Nickel	3/24/1994	MW-17	1	MW-15A	20	ug/L	-1900.00%
Selenium	3/24/1994	MW-17	2	MW-15A	2	ug/L	0.00%
Selenium	3/24/1994	MW-17	2	MW-15A	2	ug/L	0.00%
Sulfate	3/24/1994	MW-17	1400	MW-15A	1420	mg/L	-1.43%
Sulfate	3/24/1994	MW-17	1400	MW-15A	1464	mg/L	-4.57%
TDS @ 180 C	3/24/1994	MW-17	2426	MW-15A	2400	mg/L	1.07%
TDS @ 180 C	3/24/1994	MW-17	2426	MW-15A	2464	mg/L	-1.57%
Chloride	6/21/1994	MW-14	20	MW-15A	24	mg/L	-20.00%
pH	6/21/1994	MW-14	6.88	MW-15A	6.88	s.u.	0.00%
Sulfate	6/21/1994	MW-14	2110	MW-15A	1392	mg/L	34.03%
TDS @ 180 C	6/21/1994	MW-14	3512	MW-15A	3573	mg/L	-1.74%
Arsenic	8/18/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Arsenic	8/18/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Beryllium	8/18/1994	MW-1	0.2	MW-14A	0.2	ug/L	0.00%
Beryllium	8/18/1994	MW-1	0.2	MW-14A	10	ug/L	-4900.00%
Cadmium	8/18/1994	MW-1	0.1	MW-14A	0.1	ug/L	0.00%
Cadmium	8/18/1994	MW-1	0.1	MW-14A	10	ug/L	-9900.00%
Chloride	8/18/1994	MW-1	15.1	MW-14A	14.4	mg/L	4.64%
Chloride	8/18/1994	MW-1	15.1	MW-14A	16	mg/L	-5.96%
Molybdenum	8/18/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Molybdenum	8/18/1994	MW-1	1	MW-14A	100	ug/L	-9900.00%
Nickel	8/18/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Nickel	8/18/1994	MW-1	1	MW-14A	50	ug/L	-4900.00%
pH	8/18/1994	MW-1	7.26	MW-14A	7.26	s.u.	0.00%
Selenium	8/18/1994	MW-1	1	MW-14A	1	ug/L	0.00%
Selenium	8/18/1994	MW-1	1	MW-14A	2	ug/L	-100.00%
Sulfate	8/18/1994	MW-1	691	MW-14A	678	mg/L	1.88%
Sulfate	8/18/1994	MW-1	691	MW-14A	700	mg/L	-1.30%
TDS @ 180 C	8/18/1994	MW-1	1357	MW-14A	1319	mg/L	2.80%
TDS @ 180 C	8/18/1994	MW-1	1357	MW-14A	1371	mg/L	-1.03%
Chloride	12/7/1994	MW-5	45	MW-14A	49	mg/L	-8.89%
Chloride	12/7/1994	MW-5	45	MW-14A	56.8	mg/L	-26.22%
pH	12/7/1994	MW-5	7.63	MW-14A	7.63	s.u.	0.00%
Sulfate	12/7/1994	MW-5	1032	MW-14A	1036	mg/L	-0.39%
Sulfate	12/7/1994	MW-5	1032	MW-14A	1085	mg/L	-5.14%
TDS @ 180 C	12/7/1994	MW-5	1952	MW-14A	1945	mg/L	0.36%
TDS @ 180 C	12/7/1994	MW-5	1952	MW-14A	1981	mg/L	-1.49%
Chloride	12/8/1994	MW-12	64.7	MW-15A	61	mg/L	5.72%
Chloride	12/8/1994	MW-12	64.7	MW-15A	72.7	mg/L	-12.36%
pH	12/8/1994	MW-12	6.82	MW-15A	6.82	s.u.	0.00%
Sulfate	12/8/1994	MW-12	2421	MW-15A	2307	mg/L	4.71%
Sulfate	12/8/1994	MW-12	2421	MW-15A	2452	mg/L	-1.28%
TDS @ 180 C	12/8/1994	MW-12	4077	MW-15A	4069	mg/L	0.20%
TDS @ 180 C	12/8/1994	MW-12	4077	MW-15A	4087	mg/L	-0.25%
Arsenic	3/16/1995	MW-15	1	MW-14A	1	ug/L	0.00%
Chloride	3/16/1995	MW-15	39	MW-14A	39	mg/L	0.00%
pH	3/16/1995	MW-15	7.1	MW-14A	7.1	s.u.	0.00%
Selenium	3/16/1995	MW-15	6	MW-14A	4	ug/L	33.33%
Sulfate	3/16/1995	MW-15	2295	MW-14A	2282	mg/L	0.57%
TDS @ 180 C	3/16/1995	MW-15	3851	MW-14A	3820	mg/L	0.80%
Arsenic	3/16/1995	MW-15	1	MW-15A	1	ug/L	0.00%
Chloride	3/16/1995	MW-15	39	MW-15A	20	mg/L	48.72%
pH	3/16/1995	MW-15	7.1	MW-15A	6.85	s.u.	3.52%
Selenium	3/16/1995	MW-15	6	MW-15A	2	ug/L	66.67%
Sulfate	3/16/1995	MW-15	2295	MW-15A	2115	mg/L	7.84%
TDS @ 180 C	3/16/1995	MW-15	3851	MW-15A	3601	mg/L	6.49%
Arsenic	6/27/1995	MW-11	1	MW-14A	1	ug/L	0.00%
Arsenic	6/27/1995	MW-11	1	MW-14A	1	ug/L	0.00%
Chloride	6/27/1995	MW-11	31.2	MW-14A	30	mg/L	3.85%
Chloride	6/27/1995	MW-11	31.2	MW-14A	35	mg/L	-12.18%
Nickel	6/27/1995	MW-11	1	MW-14A	20	ug/L	-1900.00%
Nickel	6/27/1995	MW-11	1	MW-14A	50	ug/L	-4900.00%
pH	6/27/1995	MW-11	7.91	MW-14A	7.91	s.u.	0.00%
Selenium	6/27/1995	MW-11	1	MW-14A	1	ug/L	0.00%
Selenium	6/27/1995	MW-11	1	MW-14A	10	ug/L	-900.00%
Sulfate	6/27/1995	MW-11	659	MW-14A	707	mg/L	-7.28%
Sulfate	6/27/1995	MW-11	659	MW-14A	1014	mg/L	-53.87%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
TDS @ 180 C	6/27/1995	MW-11	1837	MW-14A	1885	mg/L	-2.61%
TDS @ 180 C	6/27/1995	MW-11	1837	MW-14A	2059	mg/L	-12.08%
Arsenic	6/28/1995	MW-3	1	MW-15A	1	ug/L	0.00%
Arsenic	6/28/1995	MW-3	1	MW-15A	1	ug/L	0.00%
Chloride	6/28/1995	MW-3	59	MW-15A	30	mg/L	49.15%
Chloride	6/28/1995	MW-3	59	MW-15A	65	mg/L	-10.17%
Nickel	6/28/1995	MW-3	30	MW-15A	50	ug/L	-66.67%
Nickel	6/28/1995	MW-3	30	MW-15A	50	ug/L	-66.67%
pH	6/28/1995	MW-3	6.74	MW-15A	6.74	s.u.	0.00%
Selenium	6/28/1995	MW-3	10	MW-15A	10	ug/L	0.00%
Selenium	6/28/1995	MW-3	10	MW-15A	21	ug/L	-110.00%
Sulfate	6/28/1995	MW-3	1710	MW-15A	928	mg/L	45.73%
Sulfate	6/28/1995	MW-3	1710	MW-15A	3334	mg/L	-94.97%
TDS @ 180 C	6/28/1995	MW-3	5209	MW-15A	5136	mg/L	1.40%
TDS @ 180 C	6/28/1995	MW-3	5209	MW-15A	5421	mg/L	-4.07%
Chloride	9/14/1995	MW-2	7.6	MW-15A	7.5	mg/L	1.32%
Chloride	9/14/1995	MW-2	7.6	MW-15A	10	mg/L	-31.58%
Nickel	9/14/1995	MW-2	4	MW-15A	3	ug/L	25.00%
Nickel	9/14/1995	MW-2	4	MW-15A	50	ug/L	-1150.00%
pH	9/14/1995	MW-2	7.38	MW-15A	7.38	s.u.	0.00%
Sulfate	9/14/1995	MW-2	1864	MW-15A	1892	mg/L	-1.50%
Sulfate	9/14/1995	MW-2	1864	MW-15A	1983	mg/L	-6.38%
TDS @ 180 C	9/14/1995	MW-2	2808	MW-15A	2699	mg/L	3.88%
TDS @ 180 C	9/14/1995	MW-2	2808	MW-15A	3037	mg/L	-8.16%
Arsenic	12/8/1995	MW-5	1	MW-15A	1	ug/L	0.00%
Nickel	12/8/1995	MW-5	20	MW-15A	50	ug/L	-150.00%
pH	12/8/1995	MW-5	7.74	MW-15A	7.74	s.u.	0.00%
Selenium	12/8/1995	MW-5	1	MW-15A	1	ug/L	0.00%
Chloride	3/27/1996	MW-14	19.5	MW-14A	21.6	mg/L	-10.77%
Nickel	3/27/1996	MW-14	30	MW-14A	50	ug/L	-66.67%
pH	3/27/1996	MW-14	6.97	MW-14A	6.97	s.u.	0.00%
Sulfate	3/27/1996	MW-14	2067	MW-14A	2092	mg/L	-1.21%
TDS @ 180 C	3/27/1996	MW-14	3568	MW-14A	3698	mg/L	-3.64%
Chloride	3/27/1996	MW-15	33.7	MW-15A	39.1	mg/L	-16.02%
Nickel	3/27/1996	MW-15	40	MW-15A	50	ug/L	-25.00%
pH	3/27/1996	MW-15	7.09	MW-15A	7.09	s.u.	0.00%
Sulfate	3/27/1996	MW-15	2235	MW-15A	2228	mg/L	0.31%
TDS @ 180 C	3/27/1996	MW-15	3871	MW-15A	3929	mg/L	-1.50%
Arsenic	6/6/1996	MW-11	1	MW-15A	1	ug/L	0.00%
Chloride	6/6/1996	MW-11	35.3	MW-15A	38	mg/L	-7.65%
Nickel	6/6/1996	MW-11	50	MW-15A	50	ug/L	0.00%
pH	6/6/1996	MW-11	7.37	MW-15A	7.37	s.u.	0.00%
Selenium	6/6/1996	MW-11	3	MW-15A	5	ug/L	-66.67%
Sulfate	6/6/1996	MW-11	1051	MW-15A	1063	mg/L	-1.14%
TDS @ 180 C	6/6/1996	MW-11	1906	MW-15A	1908	mg/L	-0.10%
Chloride	9/12/1996	MW-15	38.3	MW-14A	37	mg/L	3.39%
Nickel	9/12/1996	MW-15	50	MW-14A	50	ug/L	0.00%
pH	9/12/1996	MW-15	6.87	MW-14A	6.87	s.u.	0.00%
Sulfate	9/12/1996	MW-15	2315	MW-14A	2299	mg/L	0.69%
TDS @ 180 C	9/12/1996	MW-15	3870	MW-14A	3870	mg/L	0.00%
Chloride	9/16/1996	MW-1	11.8	MW-15A	12	mg/L	-1.69%
Nickel	9/16/1996	MW-1	50	MW-15A	50	ug/L	0.00%
pH	9/16/1996	MW-1	7.37	MW-15A	7.37	s.u.	0.00%
Sulfate	9/16/1996	MW-1	658	MW-15A	673	mg/L	-2.28%
TDS @ 180 C	9/16/1996	MW-1	1270	MW-15A	1230	mg/L	3.15%
Arsenic	11/22/1996	MW-17	1	MW-14A	1	ug/L	0.00%
Chloride	11/22/1996	MW-17	29	MW-14A	27.2	mg/L	6.21%
Nickel	11/22/1996	MW-17	50	MW-14A	50	ug/L	0.00%
pH	11/22/1996	MW-17	7.24	MW-14A	7.24	s.u.	0.00%
Selenium	11/22/1996	MW-17	9	MW-14A	1	ug/L	88.89%
Sulfate	11/22/1996	MW-17	2450	MW-14A	2500	mg/L	-2.04%
TDS @ 180 C	11/22/1996	MW-17	4220	MW-14A	4220	mg/L	0.00%
Chloride	3/19/1997	MW-11	28.7	MW-14A	29.8	mg/L	-3.83%
Nickel	3/19/1997	MW-11	50	MW-14A	50	ug/L	0.00%
pH	3/19/1997	MW-11	7.72	MW-14A	7.72	s.u.	0.00%
Sulfate	3/19/1997	MW-11	922	MW-14A	986	mg/L	-6.94%
TDS @ 180 C	3/19/1997	MW-11	2030	MW-14A	1880	mg/L	7.39%
Chloride	3/20/1997	MW-15	38	MW-15A	38.9	mg/L	-2.37%
Nickel	3/20/1997	MW-15	50	MW-15A	50	ug/L	0.00%
pH	3/20/1997	MW-15	7	MW-15A	7	s.u.	0.00%
Sulfate	3/20/1997	MW-15	2210	MW-15A	2220	mg/L	-0.45%
TDS @ 180 C	3/20/1997	MW-15	3940	MW-15A	3960	mg/L	-0.51%
Chloride	6/11/1997	MW-11	29.2	MW-14A	29.4	mg/L	-0.68%
Nickel	6/11/1997	MW-11	50	MW-14A	50	ug/L	0.00%
pH	6/11/1997	MW-11	7.9	MW-14A	7.9	s.u.	0.00%
Chloride	9/30/1997	MW-5	54	MW-14A	51.8	mg/L	4.07%
Nickel	9/30/1997	MW-5	50	MW-14A	50	ug/L	0.00%
pH	9/30/1997	MW-5	7.7	MW-14A	7.7	s.u.	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Chloride	1/8/1998	MW-12	58.7	MW-13	59.8	mg/L	-1.87%
Nickel	1/8/1998	MW-12	50	MW-13	50	ug/L	0.00%
pH	1/8/1998	MW-12	7.75	MW-13	7.75	s.u.	0.00%
Chloride	3/16/1998	MW-5	46	MW-14A	48	mg/L	-4.35%
Nickel	3/16/1998	MW-5	50	MW-14A	50	ug/L	0.00%
pH	3/16/1998	MW-5	7.51	MW-14A	7.51	s.u.	0.00%
Chloride	5/12/1998	MW-5	56	MW-14A	58	mg/L	-3.57%
Nickel	5/12/1998	MW-5	50	MW-14A	50	ug/L	0.00%
pH	5/12/1998	MW-5	8	MW-14A	8.1	s.u.	-1.25%
Chloride	9/24/1998	MW-15	41.2	MW-13	39.5	mg/L	4.13%
Nickel	9/24/1998	MW-15	50	MW-13	50	ug/L	0.00%
pH	9/24/1998	MW-15	7.1	MW-13	7.1	s.u.	0.00%
Chloride	9/24/1998	MW-14	19.9	MW-14A	47	mg/L	-136.18%
Nickel	9/24/1998	MW-14	50	MW-14A	6	ug/L	88.00%
pH	9/24/1998	MW-14	6.8	MW-14A	6.8	s.u.	0.00%
Chloride	11/3/1998	MW-5	50.1	MW-14A	49.5	mg/L	1.20%
Nickel	11/3/1998	MW-5	50	MW-14A	50	ug/L	0.00%
pH	11/3/1998	MW-5	7.48	MW-14A	5.88	s.u.	21.39%
Chloride	2/18/1999	MW-5	50.8	MW-14A	49.5	mg/L	2.56%
Lead	2/18/1999	MW-5	50	MW-14A	50	ug/L	0.00%
Nickel	2/18/1999	MW-5	50	MW-14A	50	ug/L	0.00%
pH	2/18/1999	MW-5	7	MW-14A	7.43	s.u.	-6.14%
Chloride	5/12/1999	MW-17	35.5	MW-14A	46.8	mg/L	-31.83%
Nickel	5/12/1999	MW-17	15	MW-14A	50	ug/L	-233.33%
pH	5/12/1999	MW-17	7.1	MW-14A	7	s.u.	1.41%
Chloride	9/30/1999	MW-17	35	MW-14A	33	mg/L	5.71%
Nickel	9/30/1999	MW-17	50	MW-14A	50	ug/L	0.00%
pH	9/30/1999	MW-17	6.85	MW-14A	6.85	s.u.	0.00%
Chloride	12/9/1999	MW-17	27.9	MW-14A	27.1	mg/L	2.87%
Nickel	12/9/1999	MW-17	50	MW-14A	50	ug/L	0.00%
pH	12/9/1999	MW-17	6.7	MW-14A	6.7	s.u.	0.00%
Nickel	3/17/2000	MW-17	50	MW-14A	50	ug/L	0.00%
Chloride	6/6/2000	MW-5	58.9	MW-14A	54.1	mg/L	8.15%
Nickel	6/6/2000	MW-5	50	MW-14A	50	ug/L	0.00%
pH	6/6/2000	MW-5	8	MW-14A	7.54	s.u.	5.75%
Chloride	9/3/2000	MW-12	58.7	MW-13	66.2	mg/L	-12.78%
Nickel	9/3/2000	MW-12	50	MW-13	50	ug/L	0.00%
pH	9/3/2000	MW-12	6.89	MW-13	3.77	s.u.	45.28%
Chloride	3/23/2001	MW-11	31.1	MW-13A	35.3	mg/L	-13.50%
Nickel	3/23/2001	MW-11	50	MW-13A	50	ug/L	0.00%
pH	3/23/2001	MW-11	7.52	MW-13A	7.52	s.u.	0.00%
Chloride	6/12/2001	MW-11	36.5	MW-13A	36	mg/L	1.37%
Nickel	6/12/2001	MW-11	50	MW-13A	50	ug/L	0.00%
pH	6/12/2001	MW-11	7.98	MW-13A	7.98	s.u.	0.00%
Ammonia	11/6/2001	MW-15	0.05	MW-15A	0.05	mg/L	0.00%
Arsenic	11/6/2001	MW-15	1	MW-15A	1	ug/L	0.00%
Beryllium	11/6/2001	MW-15	10	MW-15A	10	ug/L	0.00%
Cadmium	11/6/2001	MW-15	5	MW-15A	5	ug/L	0.00%
Chloride	11/6/2001	MW-15	57.1	MW-15A	50.2	mg/L	12.08%
Chromium	11/6/2001	MW-15	50	MW-15A	50	ug/L	0.00%
Copper	11/6/2001	MW-15	10	MW-15A	10	ug/L	0.00%
Fluoride	11/6/2001	MW-15	0.3	MW-15A	0.3	mg/L	0.00%
Iron	11/6/2001	MW-15	50	MW-15A	50	ug/L	0.00%
Lead	11/6/2001	MW-15	50	MW-15A	50	ug/L	0.00%
Manganese	11/6/2001	MW-15	80	MW-15A	80	ug/L	0.00%
Mercury	11/6/2001	MW-15	1	MW-15A	1	ug/L	0.00%
Molybdenum	11/6/2001	MW-15	100	MW-15A	100	ug/L	0.00%
Nickel	11/6/2001	MW-15	50	MW-15A	50	ug/L	0.00%
Nitrate+Nitrite as N	11/6/2001	MW-15	0.2	MW-15A	0.2	mg/L	0.00%
Selenium	11/6/2001	MW-15	92	MW-15A	94	ug/L	-2.17%
Silver	11/6/2001	MW-15	10	MW-15A	10	ug/L	0.00%
Sulfate	11/6/2001	MW-15	2180	MW-15A	2260	mg/L	-3.67%
TDS @ 180 C	11/6/2001	MW-15	3920	MW-15A	3930	mg/L	-0.26%
Thallium	11/6/2001	MW-15	10	MW-15A	10	ug/L	0.00%
Vanadium	11/6/2001	MW-15	100	MW-15A	100	ug/L	0.00%
Zinc	11/6/2001	MW-15	10	MW-15A	10	ug/L	0.00%
Chloride	3/14/2002	MW-11	30.7	MW-13A	29.8	mg/L	2.93%
Nickel	3/14/2002	MW-11	50	MW-13A	50	ug/L	0.00%
pH	3/14/2002	MW-11	7.8	MW-13A	7.8	s.u.	0.00%
Chloride	5/20/2002	MW-11	35.9	MW-13A	36.3	mg/L	-1.11%
Nickel	5/20/2002	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	9/10/2002	MW-11	33.8	MW-13A	31.1	mg/L	7.99%
Nickel	9/10/2002	MW-11	10	MW-13A	50	ug/L	-400.00%
Ammonia	9/10/2002	MW-11	0.59	MW-13A	0.64	mg/L	-8.47%
Arsenic	9/10/2002	MW-11	1	MW-13A	1	ug/L	0.00%
Beryllium	9/10/2002	MW-11	10	MW-13A	10	ug/L	0.00%
Cadmium	9/10/2002	MW-11	5	MW-13A	5	ug/L	0.00%
Chloride	9/10/2002	MW-11	37.1	MW-13A	33	mg/L	11.05%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Chromium	9/10/2002	MW-11	50	MW-13A	50	ug/L	0.00%
Copper	9/10/2002	MW-11	10	MW-13A	10	ug/L	0.00%
Fluoride	9/10/2002	MW-11	0.5	MW-13A	0.5	mg/L	0.00%
Lead	9/10/2002	MW-11	50	MW-13A	50	ug/L	0.00%
Manganese	9/10/2002	MW-11	100	MW-13A	100	ug/L	0.00%
Mercury	9/10/2002	MW-11	1	MW-13A	1	ug/L	0.00%
Molybdenum	9/10/2002	MW-11	100	MW-13A	100	ug/L	0.00%
Nickel	9/10/2002	MW-11	50	MW-13A	50	ug/L	0.00%
pH	9/10/2002	MW-11	8.25	MW-13A	8.25	s.u.	0.00%
Selenium	9/10/2002	MW-11	3	MW-13A	2	ug/L	33.33%
Silver	9/10/2002	MW-11	10	MW-13A	10	ug/L	0.00%
Sulfate	9/10/2002	MW-11	1160	MW-13A	1160	mg/L	0.00%
TDS @ 180 C	9/10/2002	MW-11	1850	MW-13A	2130	mg/L	-15.14%
TDS @ 180 C	9/10/2002	MW-11	1850	MW-13A	2130	mg/L	-15.14%
Thallium	9/10/2002	MW-11	10	MW-13A	10	ug/L	0.00%
Vanadium	9/10/2002	MW-11	100	MW-13A	100	ug/L	0.00%
Zinc	9/10/2002	MW-11	10	MW-13A	10	ug/L	0.00%
Chloride	11/21/2002	MW-11	37.7	MW-13A	21	mg/L	44.30%
Nickel	11/21/2002	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	3/20/2003	MW-11	36.6	MW-13A	33	mg/L	9.84%
Nickel	3/20/2003	MW-11	50	MW-13A	50	ug/L	0.00%
pH	3/20/2003	MW-11	8.23	MW-13A	8.23	s.u.	0.00%
Chloride	6/27/2003	MW-11	29.3	MW-13A	30.4	mg/L	-3.75%
Nickel	6/27/2003	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	9/24/2003	MW-11	36.6	MW-13A	33	mg/L	9.84%
Nickel	9/24/2003	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	3/19/2004	MW-11	35.6	MW-13A	35.2	mg/L	1.12%
Nickel	3/19/2004	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	5/27/2004	MW-11	36	MW-13A	36	mg/L	0.00%
Nickel	5/27/2004	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	9/14/2004	MW-11	34.2	MW-13A	33.3	mg/L	2.63%
Nickel	9/14/2004	MW-11	50	MW-13A	50	ug/L	0.00%
Chloride	11/9/2004	MW-11	29.5	MW-13A	20.1	mg/L	31.86%
Nickel	11/9/2004	MW-11	1	MW-13A	1	ug/L	0.00%
Ammonia	3/30/2005	MW-11	0.61	MW-63	0.6	mg/L	1.64%
Arsenic	3/30/2005	MW-11	5	MW-63	5	ug/L	0.00%
Beryllium	3/30/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	3/30/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Chloride	3/30/2005	MW-11	33	MW-63	31	mg/L	6.06%
Chromium	3/30/2005	MW-11	50	MW-63	50	ug/L	0.00%
Cobalt	3/30/2005	MW-11	10	MW-63	10	ug/L	0.00%
Copper	3/30/2005	MW-11	17	MW-63	22	ug/L	-29.41%
Fluoride	3/30/2005	MW-11	0.5	MW-63	0.5	mg/L	0.00%
Gross Alpha minus Rn & U	3/30/2005	MW-11	1	MW-63	1	pCi/L	0.00%
Iron	3/30/2005	MW-11	3190	MW-63	3170	ug/L	0.63%
Lead	3/30/2005	MW-11	29	MW-63	33	ug/L	-13.79%
Manganese	3/30/2005	MW-11	83	MW-63	89	ug/L	-7.23%
Mercury	3/30/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Molybdenum	3/30/2005	MW-11	20	MW-63	20	ug/L	0.00%
Nickel	3/30/2005	MW-11	20	MW-63	20	ug/L	0.00%
Nitrate+Nitrite as N	3/30/2005	MW-11	0.1	MW-63	0.1	mg/L	0.00%
Selenium	3/30/2005	MW-11	5	MW-63	5	ug/L	0.00%
Silver	3/30/2005	MW-11	10	MW-63	10	ug/L	0.00%
Sulfate	3/30/2005	MW-11	1080	MW-63	1180	mg/L	-9.26%
TDS @ 180 C	3/30/2005	MW-11	1880	MW-63	1840	mg/L	2.13%
Thallium	3/30/2005	MW-11	1	MW-63	1	ug/L	0.00%
Vanadium	3/30/2005	MW-11	20	MW-63	20	ug/L	0.00%
Zinc	3/30/2005	MW-11	12	MW-63	10	ug/L	16.67%
Ammonia	6/21/2005	MW-11	0.64	MW-63	0.55	mg/L	14.06%
Arsenic	6/21/2005	MW-11	5	MW-63	5	ug/L	0.00%
Beryllium	6/21/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	6/21/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Chloride	6/21/2005	MW-11	31	MW-63	30	mg/L	3.23%
Chromium	6/21/2005	MW-11	25	MW-63	50	ug/L	-100.00%
Cobalt	6/21/2005	MW-11	10	MW-63	10	ug/L	0.00%
Copper	6/21/2005	MW-11	10	MW-63	10	ug/L	0.00%
Fluoride	6/21/2005	MW-11	0.7	MW-63	0.7	mg/L	0.00%
Iron	6/21/2005	MW-11	30	MW-63	30	ug/L	0.00%
Lead	6/21/2005	MW-11	1	MW-63	1	ug/L	0.00%
Manganese	6/21/2005	MW-11	95	MW-63	92	ug/L	3.16%
Mercury	6/21/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Molybdenum	6/21/2005	MW-11	10	MW-63	10	ug/L	0.00%
Nickel	6/21/2005	MW-11	20	MW-63	20	ug/L	0.00%
Nitrate+Nitrite as N	6/21/2005	MW-11	0.1	MW-63	0.1	mg/L	0.00%
pH	6/21/2005	MW-11	8	MW-63	7.96	s.u.	0.50%
Selenium	6/21/2005	MW-11	5	MW-63	5	ug/L	0.00%
Silver	6/21/2005	MW-11	10	MW-63	10	ug/L	0.00%
Sulfate	6/21/2005	MW-11	1090	MW-63	1070	mg/L	1.83%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
TDS @ 180 C	6/21/2005	MW-11	1950	MW-63	1940	mg/L	0.51%
Thallium	6/21/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Vanadium	6/21/2005	MW-11	15	MW-63	15	ug/L	0.00%
Zinc	6/21/2005	MW-11	10	MW-63	10	ug/L	0.00%
Ammonia	9/22/2005	MW-11	0.59	MW-63	0.61	mg/L	-3.39%
Arsenic	9/22/2005	MW-11	5	MW-63	5	ug/L	0.00%
Beryllium	9/22/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	9/22/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Chloride	9/22/2005	MW-11	33	MW-63	33	mg/L	0.00%
Chromium	9/22/2005	MW-11	25	MW-63	25	ug/L	0.00%
Cobalt	9/22/2005	MW-11	10	MW-63	10	ug/L	0.00%
Copper	9/22/2005	MW-11	10	MW-63	10	ug/L	0.00%
Fluoride	9/22/2005	MW-11	0.6	MW-63	0.6	mg/L	0.00%
Gross Alpha minus Rn & U	9/22/2005	MW-11	1	MW-63	1	pCi/L	0.00%
Iron	9/22/2005	MW-11	30	MW-63	30	ug/L	0.00%
Lead	9/22/2005	MW-11	1	MW-63	1	ug/L	0.00%
Manganese	9/22/2005	MW-11	81	MW-63	82	ug/L	-1.23%
Mercury	9/22/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Molybdenum	9/22/2005	MW-11	10	MW-63	10	ug/L	0.00%
Nickel	9/22/2005	MW-11	20	MW-63	20	ug/L	0.00%
Nitrate+Nitrite as N	9/22/2005	MW-11	0.1	MW-63	0.1	mg/L	0.00%
pH	9/22/2005	MW-11	8.22	MW-63	8.25	s.u.	-0.36%
Selenium	9/22/2005	MW-11	5	MW-63	5	ug/L	0.00%
Silver	9/22/2005	MW-11	10	MW-63	10	ug/L	0.00%
Sulfate	9/22/2005	MW-11	968	MW-63	973	mg/L	-0.52%
TDS @ 180 C	9/22/2005	MW-11	1930	MW-63	1920	mg/L	0.52%
Thallium	9/22/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Vanadium	9/22/2005	MW-11	15	MW-63	15	ug/L	0.00%
Zinc	9/22/2005	MW-11	10	MW-63	10	ug/L	0.00%
Iron	10/26/2005	MW-11	30	MW-63	30	ug/L	0.00%
Lead	10/26/2005	MW-11	1	MW-63	1	ug/L	0.00%
Iron	11/15/2005	MW-11	#N/A	MW-63	30	ug/L	#N/A
Lead	11/15/2005	MW-11	#N/A	MW-63	1	ug/L	#N/A
Ammonia	12/13/2005	MW-11	0.64	MW-63	0.61	mg/L	4.69%
Arsenic	12/13/2005	MW-11	5	MW-63	5	ug/L	0.00%
Beryllium	12/13/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	12/13/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	12/13/2005	MW-11	0.5	MW-63	31	ug/L	-6100.00%
Chromium	12/13/2005	MW-11	25	MW-63	25	ug/L	0.00%
Cobalt	12/13/2005	MW-11	10	MW-63	10	ug/L	0.00%
Copper	12/13/2005	MW-11	10	MW-63	10	ug/L	0.00%
Fluoride	12/13/2005	MW-11	0.5	MW-63	0.5	mg/L	0.00%
Gross Alpha minus Rn & U	12/13/2005	MW-11	1	MW-63	1	pCi/L	0.00%
Iron	12/13/2005	MW-11	30	MW-63	30	ug/L	0.00%
Lead	12/13/2005	MW-11	1	MW-63	1	ug/L	0.00%
Manganese	12/13/2005	MW-11	94	MW-63	97	ug/L	-3.19%
Mercury	12/13/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Molybdenum	12/13/2005	MW-11	10	MW-63	10	ug/L	0.00%
Nickel	12/13/2005	MW-11	20	MW-63	20	ug/L	0.00%
Nitrate+Nitrite as N	12/13/2005	MW-11	0.1	MW-63	0.1	mg/L	0.00%
PH	12/13/2005	MW-11	8.12	MW-63	8.19	s.u.	-0.86%
Selenium	12/13/2005	MW-11	5	MW-63	5	ug/L	0.00%
Silver	12/13/2005	MW-11	10	MW-63	10	ug/L	0.00%
Sulfate	12/13/2005	MW-11	1070	MW-63	1060	mg/L	0.93%
TDS @ 180 C	12/13/2005	MW-11	1930	MW-63	1930	mg/L	0.00%
Thallium	12/13/2005	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Vanadium	12/13/2005	MW-11	15	MW-63	15	ug/L	0.00%
Zinc	12/13/2005	MW-11	10	MW-63	10	ug/L	0.00%
Iron	1/25/2006	MW-11	30	MW-63	30	ug/L	0.00%
Lead	1/25/2006	MW-11	1	MW-63	1	ug/L	0.00%
Iron	2/21/2006	MW-11	30	MW-63	30	ug/L	0.00%
Lead	2/21/2006	MW-11	1	MW-63	1	ug/L	0.00%
Iron	4/25/2006	MW-11	30	MW-63	30	ug/L	0.00%
Lead	4/25/2006	MW-11	1	MW-63	1	ug/L	0.00%
Iron	5/26/2006	MW-11	30	MW-63	30	ug/L	0.00%
Lead	5/26/2006	MW-11	1	MW-63	1	ug/L	0.00%
Ammonia	6/20/2006	MW-11	0.64	MW-63	0.59	mg/L	7.81%
Arsenic	6/20/2006	MW-11	5	MW-63	5	ug/L	0.00%
Beryllium	6/20/2006	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	6/20/2006	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Cadmium	6/20/2006	MW-11	0.5	MW-63	31	ug/L	-6100.00%
Chromium	6/20/2006	MW-11	25	MW-63	25	ug/L	0.00%
Cobalt	6/20/2006	MW-11	10	MW-63	10	ug/L	0.00%
Copper	6/20/2006	MW-11	10	MW-63	10	ug/L	0.00%
Fluoride	6/20/2006	MW-11	0.5	MW-63	0.5	mg/L	0.00%
Gross Alpha minus Rn & U	6/20/2006	MW-11	1	MW-63	1	pCi/L	0.00%
Iron	6/20/2006	MW-11	127	MW-63	136	ug/L	-7.09%
Lead	6/20/2006	MW-11	1.5	MW-63	1.5	ug/L	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Manganese	6/20/2006	MW-11	102	MW-63	103	ug/L	-0.98%
Mercury	6/20/2006	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Molybdenum	6/20/2006	MW-11	10	MW-63	10	ug/L	0.00%
Nickel	6/20/2006	MW-11	20	MW-63	20	ug/L	0.00%
Nitrate+Nitrite as N	6/20/2006	MW-11	0.1	MW-63	0.1	mg/L	0.00%
PH	6/20/2006	MW-11	8.01	MW-63	7.93	s.u.	1.00%
Selenium	6/20/2006	MW-11	5	MW-63	5	ug/L	0.00%
Silver	6/20/2006	MW-11	10	MW-63	10	ug/L	0.00%
Sulfate	6/20/2006	MW-11	1150	MW-63	1150	mg/L	0.00%
TDS @ 180 C	6/20/2006	MW-11	2000	MW-63	1970	mg/L	1.50%
Thallium	6/20/2006	MW-11	0.5	MW-63	0.5	ug/L	0.00%
Tin	6/20/2006	MW-11	100	MW-63	100	ug/L	0.00%
Vanadium	6/20/2006	MW-11	15	MW-63	15	ug/L	0.00%
Zinc	6/20/2006	MW-11	10	MW-63	10	ug/L	0.00%
Ammonia	6/25/2006	MW-1	0.46	MW-75	0.48	mg/L	-4.35%
Arsenic	6/25/2006	MW-1	5	MW-75	5	ug/L	0.00%
Beryllium	6/25/2006	MW-1	0.5	MW-75	0.5	ug/L	0.00%
Cadmium	6/25/2006	MW-1	0.5	MW-75	0.5	ug/L	0.00%
Chloride	6/25/2006	MW-1	17	MW-75	17	mg/L	0.00%
Chromium	6/25/2006	MW-1	25	MW-75	25	ug/L	0.00%
Cobalt	6/25/2006	MW-1	10	MW-75	10	ug/L	0.00%
Copper	6/25/2006	MW-1	10	MW-75	10	ug/L	0.00%
Fluoride	6/25/2006	MW-1	0.3	MW-75	0.3	mg/L	0.00%
Gross Alpha minus Rn & U	6/25/2006	MW-1	1	MW-75	1	pCi/L	0.00%
Iron	6/25/2006	MW-1	1700	MW-75	1760	ug/L	-3.53%
Lead	6/25/2006	MW-1	1	MW-75	1	ug/L	0.00%
Manganese	6/25/2006	MW-1	230	MW-75	229	ug/L	0.43%
Mercury	6/25/2006	MW-1	0.5	MW-75	0.5	ug/L	0.00%
Molybdenum	6/25/2006	MW-1	10	MW-75	10	ug/L	0.00%
Nickel	6/25/2006	MW-1	20	MW-75	20	ug/L	0.00%
Nitrate+Nitrite as N	6/25/2006	MW-1	0.1	MW-75	0.1	mg/L	0.00%
PH	6/25/2006	MW-1	7.87	MW-75	7.91	s.u.	-0.51%
Selenium	6/25/2006	MW-1	5	MW-75	5	ug/L	0.00%
Silver	6/25/2006	MW-1	10	MW-75	10	ug/L	0.00%
Sulfate	6/25/2006	MW-1	724	MW-75	699	mg/L	3.45%
TDS @ 180 C	6/25/2006	MW-1	1320	MW-75	1320	mg/L	0.00%
Thallium	6/25/2006	MW-1	0.5	MW-75	0.5	ug/L	0.00%
Tin	6/25/2006	MW-1	100	MW-75	100	ug/L	0.00%
Vanadium	6/25/2006	MW-1	15	MW-75	15	ug/L	0.00%
Zinc	6/25/2006	MW-1	10	MW-75	10	ug/L	0.00%
Manganese	7/11/2006	MW-26	95	MW-63	108	ug/L	-13.68%
Cadmium	8/16/2006	MW-32	1.44	MW-63	1.47	ug/L	-2.08%
Iron	8/16/2006	MW-32	7790	MW-63	7550	ug/L	3.08%
Manganese	8/16/2006	MW-32	5160	MW-63	5160	ug/L	0.00%
Nickel	8/16/2006	MW-32	59	MW-63	59	ug/L	0.00%
Ammonia	9/12/2006	MW-26	0.4	MW-65	0.44	mg/L	-10.00%
Arsenic	9/12/2006	MW-26	5	MW-65	5	ug/L	0.00%
Beryllium	9/12/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Cadmium	9/12/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Chloride	9/12/2006	MW-26	49	MW-65	47	mg/L	4.08%
Chromium	9/12/2006	MW-26	25	MW-65	25	ug/L	0.00%
Cobalt	9/12/2006	MW-26	10	MW-65	10	ug/L	0.00%
Copper	9/12/2006	MW-26	10	MW-65	10	ug/L	0.00%
Fluoride	9/12/2006	MW-26	0.2	MW-65	0.2	mg/L	0.00%
Gross Alpha minus Rn & U	9/12/2006	MW-26	3	MW-65	2.4	pCi/L	20.00%
Iron	9/12/2006	MW-26	492	MW-65	707	ug/L	-43.70%
Lead	9/12/2006	MW-26	1	MW-65	1	ug/L	0.00%
Manganese	9/12/2006	MW-26	1330	MW-65	856	ug/L	35.64%
Manganese	9/12/2006	MW-26	1330	MW-65	859	ug/L	35.41%
Mercury	9/12/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Molybdenum	9/12/2006	MW-26	10	MW-65	10	ug/L	0.00%
Nickel	9/12/2006	MW-26	20	MW-65	20	ug/L	0.00%
Nitrate+Nitrite as N	9/12/2006	MW-26	0.4	MW-65	0.4	mg/L	0.00%
pH	9/12/2006	MW-26	6.96	MW-65	6.98	s.u.	-0.29%
Selenium	9/12/2006	MW-26	5	MW-65	5	ug/L	0.00%
Silver	9/12/2006	MW-26	10	MW-65	10	ug/L	0.00%
Sulfate	9/12/2006	MW-26	1770	MW-65	1830	mg/L	-3.39%
TDS @ 180 C	9/12/2006	MW-26	3090	MW-65	3090	mg/L	0.00%
Thallium	9/12/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Tin	9/12/2006	MW-26	100	MW-65	100	ug/L	0.00%
Vanadium	9/12/2006	MW-26	15	MW-65	20	ug/L	-33.33%
Zinc	9/12/2006	MW-26	10	MW-65	10	ug/L	0.00%
Ammonia	9/13/2006	MW-11	0.66	MW-70	0.54	mg/L	18.18%
Arsenic	9/13/2006	MW-11	5	MW-70	5	ug/L	0.00%
Beryllium	9/13/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Cadmium	9/13/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Cadmium	9/13/2006	MW-11	0.5	MW-70	31	ug/L	-6100.00%
Chromium	9/13/2006	MW-11	25	MW-70	25	ug/L	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Cobalt	9/13/2006	MW-11	10	MW-70	10	ug/L	0.00%
Copper	9/13/2006	MW-11	10	MW-70	10	ug/L	0.00%
Fluoride	9/13/2006	MW-11	0.6	MW-70	0.5	mg/L	16.67%
Gross Alpha minus Rn & U	9/13/2006	MW-11	1	MW-70	1	pCi/L	0.00%
Iron	9/13/2006	MW-11	30	MW-70	98	ug/L	-226.67%
Lead	9/13/2006	MW-11	1	MW-70	1.4	ug/L	-40.00%
Manganese	9/13/2006	MW-11	79	MW-70	72	ug/L	8.86%
Mercury	9/13/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Molybdenum	9/13/2006	MW-11	10	MW-70	10	ug/L	0.00%
Nickel	9/13/2006	MW-11	20	MW-70	20	ug/L	0.00%
Nitrate+Nitrite as N	9/13/2006	MW-11	0.1	MW-70	0.1	mg/L	0.00%
pH	9/13/2006	MW-11	7.94	MW-70	8.03	s.u.	-1.13%
Selenium	9/13/2006	MW-11	5	MW-70	5	ug/L	0.00%
Silver	9/13/2006	MW-11	10	MW-70	10	ug/L	0.00%
Sulfate	9/13/2006	MW-11	1060	MW-70	1070	mg/L	-0.94%
TDS @ 180 C	9/13/2006	MW-11	1910	MW-70	1870	mg/L	2.09%
Thallium	9/13/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Tin	9/13/2006	MW-11	100	MW-70	100	ug/L	0.00%
Vanadium	9/13/2006	MW-11	15	MW-70	15	ug/L	0.00%
Zinc	9/13/2006	MW-11	10	MW-70	10	ug/L	0.00%
Ammonia	10/24/2006	MW-26	0.48	MW-65	0.66	mg/L	-37.50%
Arsenic	10/24/2006	MW-26	5	MW-65	5	ug/L	0.00%
Beryllium	10/24/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Cadmium	10/24/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Chloride	10/24/2006	MW-26	57	MW-65	54	mg/L	5.26%
Chromium	10/24/2006	MW-26	25	MW-65	25	ug/L	0.00%
Cobalt	10/24/2006	MW-26	10	MW-65	10	ug/L	0.00%
Copper	10/24/2006	MW-26	10	MW-65	10	ug/L	0.00%
Fluoride	10/24/2006	MW-26	0.3	MW-65	0.2	mg/L	33.33%
Gross Alpha minus Rn & U	10/24/2006	MW-26	2.6	MW-65	1.9	pCi/L	26.92%
Iron	10/24/2006	MW-26	294	MW-65	509	ug/L	-73.13%
Lead	10/24/2006	MW-26	1	MW-65	1	ug/L	0.00%
Manganese	10/24/2006	MW-26	1610	MW-65	1260	ug/L	21.74%
Mercury	10/24/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Molybdenum	10/24/2006	MW-26	10	MW-65	10	ug/L	0.00%
Nickel	10/24/2006	MW-26	20	MW-65	20	ug/L	0.00%
Nitrate+Nitrite as N	10/24/2006	MW-26	0.2	MW-65	0.1	mg/L	50.00%
pH	10/24/2006	MW-26	7.09	MW-65	7.17	s.u.	-1.13%
Selenium	10/24/2006	MW-26	5	MW-65	5	ug/L	0.00%
Silver	10/24/2006	MW-26	10	MW-65	10	ug/L	0.00%
Sulfate	10/24/2006	MW-26	2100	MW-65	2040	mg/L	2.86%
TDS @ 180 C	10/24/2006	MW-26	3080	MW-65	3130	mg/L	-1.62%
Thallium	10/24/2006	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Tin	10/24/2006	MW-26	100	MW-65	100	ug/L	0.00%
Vanadium	10/24/2006	MW-26	15	MW-65	15	ug/L	0.00%
Zinc	10/24/2006	MW-26	10	MW-65	13	ug/L	-30.00%
Ammonia	10/25/2006	MW-11	0.61	MW-70	0.61	mg/L	0.00%
Arsenic	10/25/2006	MW-11	5	MW-70	5	ug/L	0.00%
Beryllium	10/25/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Cadmium	10/25/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Chloride	10/25/2006	MW-11	32	MW-70	33	mg/L	-3.13%
Chromium	10/25/2006	MW-11	25	MW-70	25	ug/L	0.00%
Cobalt	10/25/2006	MW-11	10	MW-70	10	ug/L	0.00%
Copper	10/25/2006	MW-11	10	MW-70	10	ug/L	0.00%
Fluoride	10/25/2006	MW-11	0.7	MW-70	0.6	mg/L	14.29%
Gross Alpha minus Rn & U	10/25/2006	MW-11	1	MW-70	1	pCi/L	0.00%
Iron	10/25/2006	MW-11	30	MW-70	30	ug/L	0.00%
Lead	10/25/2006	MW-11	1	MW-70	1	ug/L	0.00%
Manganese	10/25/2006	MW-11	107	MW-70	160	ug/L	-49.53%
Mercury	10/25/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Molybdenum	10/25/2006	MW-11	10	MW-70	10	ug/L	0.00%
Nickel	10/25/2006	MW-11	20	MW-70	20	ug/L	0.00%
Nitrate+Nitrite as N	10/25/2006	MW-11	0.1	MW-70	0.1	mg/L	0.00%
pH	10/25/2006	MW-11	7.87	MW-70	7.74	s.u.	1.65%
Selenium	10/25/2006	MW-11	5	MW-70	5	ug/L	0.00%
Silver	10/25/2006	MW-11	10	MW-70	10	ug/L	0.00%
Sulfate	10/25/2006	MW-11	1200	MW-70	1310	mg/L	-9.17%
TDS @ 180 C	10/25/2006	MW-11	1860	MW-70	2150	mg/L	-15.59%
Thallium	10/25/2006	MW-11	0.5	MW-70	0.5	ug/L	0.00%
Tin	10/25/2006	MW-11	100	MW-70	100	ug/L	0.00%
Vanadium	10/25/2006	MW-11	15	MW-70	15	ug/L	0.00%
Zinc	10/25/2006	MW-11	10	MW-70	10	ug/L	0.00%
Manganese	11/14/2006	MW-26	1500	MW-65	1270	ug/L	15.33%
Manganese	12/13/2006	MW-26	1080	MW-65	1190	ug/L	-10.19%
Manganese	1/23/2007	MW-26	769	MW-65	332	ug/L	56.83%
Manganese	2/8/2007	MW-26	979	MW-65	951	ug/L	2.86%
Ammonia	3/16/2007	MW-26	0.19	MW-65	0.21	mg/L	-10.53%
Arsenic	3/16/2007	MW-26	5	MW-65	5	ug/L	0.00%

Table 9
Relative Precent Difference Between Primary and Duplicate Samples

Constituent	Sample Date	Sample	Result	Duplicate	Result	Unit	RPD
Beryllium	3/16/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Cadmium	3/16/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Chloride	3/16/2007	MW-26	58	MW-65	57	mg/L	1.72%
Chromium	3/16/2007	MW-26	25	MW-65	25	ug/L	0.00%
Cobalt	3/16/2007	MW-26	10	MW-65	10	ug/L	0.00%
Copper	3/16/2007	MW-26	10	MW-65	10	ug/L	0.00%
Fluoride	3/16/2007	MW-26	0.3	MW-65	0.3	mg/L	0.00%
Gross Alpha minus Rn & U	3/16/2007	MW-26	2.3	MW-65	2.2	pCi/L	4.35%
Iron	3/16/2007	MW-26	68	MW-65	73	ug/L	-7.35%
Lead	3/16/2007	MW-26	1	MW-65	1	ug/L	0.00%
Manganese	3/16/2007	MW-26	1130	MW-65	1070	ug/L	5.31%
Mercury	3/16/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Molybdenum	3/16/2007	MW-26	10	MW-65	10	ug/L	0.00%
Nickel	3/16/2007	MW-26	20	MW-65	20	ug/L	0.00%
Nitrate+Nitrite as N	3/16/2007	MW-26	0.4	MW-65	0.4	mg/L	0.00%
pH	3/16/2007	MW-26	7.08	MW-65	6.59	s.u.	6.92%
Selenium	3/16/2007	MW-26	10.8	MW-65	13.3	ug/L	-23.15%
Silver	3/16/2007	MW-26	10	MW-65	10	ug/L	0.00%
Sulfate	3/16/2007	MW-26	1980	MW-65	1960	mg/L	1.01%
TDS @ 180 C	3/16/2007	MW-26	3250	MW-65	3280	mg/L	-0.92%
Thallium	3/16/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Tin	3/16/2007	MW-26	100	MW-65	100	ug/L	0.00%
Vanadium	3/16/2007	MW-26	15	MW-65	15	ug/L	0.00%
Zinc	3/16/2007	MW-26	10	MW-65	10	ug/L	0.00%
Manganese	4/24/2007	MW-26	1410	MW-65	1330	ug/L	5.67%
Manganese	5/22/2007	MW-26	910	MW-65	814	ug/L	10.55%
Ammonia	6/20/2007	MW-26	0.37	MW-65	0.36	mg/L	2.70%
Arsenic	6/20/2007	MW-26	5	MW-65	5	ug/L	0.00%
Beryllium	6/20/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Cadmium	6/20/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Chloride	6/20/2007	MW-26	54	MW-65	52	mg/L	3.70%
Chromium	6/20/2007	MW-26	25	MW-65	25	ug/L	0.00%
Cobalt	6/20/2007	MW-26	10	MW-65	10	ug/L	0.00%
Copper	6/20/2007	MW-26	10	MW-65	10	ug/L	0.00%
Fluoride	6/20/2007	MW-26	0.4	MW-65	0.3	mg/L	25.00%
Gross Alpha minus Rn & U	6/20/2007	MW-26	3.1	MW-65	3.2	pCi/L	-3.23%
Iron	6/20/2007	MW-26	564	MW-65	482	ug/L	14.54%
Lead	6/20/2007	MW-26	1	MW-65	1	ug/L	0.00%
Manganese	6/20/2007	MW-26	1230	MW-65	1200	ug/L	2.44%
Mercury	6/20/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Molybdenum	6/20/2007	MW-26	10	MW-65	10	ug/L	0.00%
Nickel	6/20/2007	MW-26	20	MW-65	20	ug/L	0.00%
Nitrate+Nitrite as N	6/20/2007	MW-26	0.5	MW-65	0.5	mg/L	0.00%
pH	6/20/2007	MW-26	7.08	MW-65	7.11	s.u.	-0.42%
Selenium	6/20/2007	MW-26	5	MW-65	5	ug/L	0.00%
Silver	6/20/2007	MW-26	10	MW-65	10	ug/L	0.00%
Sulfate	6/20/2007	MW-26	1940	MW-65	1960	mg/L	-1.03%
TDS @ 180 C	6/20/2007	MW-26	3250	MW-65	3260	mg/L	-0.31%
Thallium	6/20/2007	MW-26	0.5	MW-65	0.5	ug/L	0.00%
Tin	6/20/2007	MW-26	100	MW-65	100	ug/L	0.00%
Vanadium	6/20/2007	MW-26	15	MW-65	15	ug/L	0.00%
Zinc	6/20/2007	MW-26	10	MW-65	10	ug/L	0.00%

Table 10a

Descriptive Summary Statistics for Constituents in Compliance Wells with Greater Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	%Det	**Means	Geometric Mean	Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
With Extremes	MW-1	Ammonia	mg/L	27	31	87.1%	0.485	0.290	0.40	0.240	0.450	0.53	0.005	1.9	1.9	1.68657
Without Extremes	MW-1	Ammonia	mg/L	26	30	86.7%	0.437	0.273	0.307	0.240	0.435	0.50	0.005	1.24	1.24	0.75330
With Extremes	MW-11	Ammonia	mg/L	19	21	90.5%	0.565	0.495	0.18	0.500	0.600	0.64	0.025	1.0	1.0	-0.95431
Without Extremes	MW-11	Ammonia	mg/L	19	20	95.0%	0.592	0.574	0.140	0.545	0.605	0.64	0.250	1.00	0.75	0.42066
With Extremes	MW-12	Ammonia	mg/L	13	15	86.7%	0.246	0.150	0.29	0.090	0.140	0.29	0.025	1.0	1.0	1.99967
Without Extremes	MW-12	Ammonia	mg/L	12	14	85.7%	0.192	0.131	0.204	0.090	0.135	0.21	0.025	0.81	0.79	2.45556
All	MW-14	Ammonia	mg/L	14	17	82.4%	0.151	0.120	0.09	0.060	0.170	0.21	0.025	0.4	0.3	0.45726
All	MW-15	Ammonia	mg/L	10	13	76.9%	0.080	0.068	0.05	0.050	0.070	0.10	0.025	0.2	0.2	1.34129
All	MW-17	Ammonia	mg/L	9	10	90.0%	0.123	0.100	0.07	0.050	0.110	0.19	0.025	0.2	0.2	0.06444
All	MW-18	Ammonia	mg/L	7	8	87.5%	0.133	0.110	0.07	0.070	0.170	0.17	0.025	0.2	0.2	-0.56224
All	MW-19	Ammonia	mg/L	6	10	60.0%	0.087	0.063	0.07	0.025	0.080	0.11	0.025	0.3	0.2	1.35256
With Extremes	MW-2	Ammonia	mg/L	13	25	52.0%	0.178	0.078	0.31	0.025	0.080	0.15	0.005	1.4	1.4	3.24817
All	MW-26	Ammonia	mg/L	11	11	100.0%	0.545	0.509	0.19	0.400	0.490	0.70	0.190	0.8	0.6	-0.39916
With Extremes	MW-3	Ammonia	mg/L	27	30	90.0%	0.475	0.281	0.55	0.170	0.270	0.57	0.025	2.6	2.6	2.48629
Without Extremes	MW-3	Ammonia	mg/L	26	29	89.7%	0.401	0.260	0.379	0.170	0.270	0.54	0.025	1.51	1.49	1.64205
All	MW-32	Ammonia	mg/L	11	11	100.0%	0.963	0.957	0.10	0.900	0.980	1.06	0.730	1.1	0.4	-0.98969
All	MW-5	Ammonia	mg/L	22	24	91.7%	0.508	0.388	0.26	0.395	0.505	0.69	0.025	1.0	1.0	-0.29099
With Extremes	MW-3	Cadmium	ug/L	27	40	67.5%	5.696	2.458	7.87	0.790	2.350	8.50	0.300	40.0	39.7	2.50875
Without Extremes	MW-3	Cadmium	ug/L	26	39	66.7%	4.775	2.230	5.668	0.780	2.000	8.00	0.300	20.00	19.70	1.26910
With Extremes	MW-32	Cadmium	ug/L	23	27	85.2%	2.777	1.709	4.37	1.000	2.100	2.75	0.250	23.8	23.6	4.59260
Without Extremes	MW-32	Cadmium	ug/L	22	26	84.6%	1.968	1.545	1.236	1.000	2.085	2.58	0.250	6.18	5.93	1.35602
With Extremes	MW-1	Chloride	mg/L	92	92	100.0%	14.007	12.890	5.93	11.800	13.000	15.00	1.000	53.2	52.2	3.48336
Without Extremes	MW-1	Chloride	mg/L	86	86	100.0%	13.352	12.998	2.832	11.800	13.000	15.00	2.500	22.10	19.60	0.16194
With Extremes	MW-11	Chloride	mg/L	107	107	100.0%	33.294	31.139	6.77	31.000	32.400	35.00	0.031	71.0	71.0	2.06824
Without Extremes	MW-11	Chloride	mg/L	104	104	100.0%	32.896	32.751	3.133	31.000	32.350	35.00	24.400	43.20	18.80	0.54526
With Extremes	MW-12	Chloride	mg/L	96	96	100.0%	60.058	59.231	11.50	56.250	60.000	63.00	28.100	150.0	121.9	4.79692
Without Extremes	MW-12	Chloride	mg/L	94	94	100.0%	59.288	58.925	6.348	56.100	60.150	63.00	37.600	80.50	42.90	-0.65568
With Extremes	MW-14	Chloride	mg/L	82	82	100.0%	20.226	19.963	3.23	18.600	20.000	21.60	8.900	33.6	24.7	0.54673
Without Extremes	MW-14	Chloride	mg/L	80	80	100.0%	20.201	20.038	2.597	18.700	20.000	21.00	12.700	27.00	14.30	0.41284
With Extremes	MW-15	Chloride	mg/L	80	80	100.0%	40.996	40.629	5.52	38.000	40.000	44.00	24.100	57.1	33.0	0.43805
Without Extremes	MW-15	Chloride	mg/L	80	80	100.0%	40.536	40.186	5.345	38.000	39.750	43.85	24.100	57.10	33.00	0.33952
With Extremes	MW-17	Chloride	mg/L	56	56	100.0%	30.534	30.000	5.94	27.700	29.000	32.55	14.100	51.0	36.9	1.20455
Without Extremes	MW-17	Chloride	mg/L	55	55	100.0%	30.058	29.628	5.158	27.600	29.000	32.70	14.100	46.80	32.70	0.87184
All	MW-18	Chloride	mg/L	19	19	100.0%	41.184	39.108	14.02	34.000	35.100	47.60	19.900	75.0	55.1	1.06966
With Extremes	MW-19	Chloride	mg/L	22	22	100.0%	57.827	53.226	23.22	36.000	60.000	80.40	27.000	94.0	67.0	0.22914
Without Extremes	MW-19	Chloride	mg/L	22	22	100.0%	57.736	53.065	23.337	36.000	60.000	80.40	27.000	94.00	67.00	0.21950
With Extremes	MW-2	Chloride	mg/L	90	91	98.9%	9.241	7.995	7.72	6.000	7.000	10.00	2.700	70.9	68.2	5.97727
Without Extremes	MW-2	Chloride	mg/L	87	88	98.9%	8.432	7.785	3.733	6.000	7.000	10.00	2.700	20.00	17.30	1.50548
All	MW-26	Chloride	mg/L	11	11	100.0%	53.182	53.126	2.56	52.000	53.000	54.00	49.000	58.0	9.0	0.58243
With Extremes	MW-3	Chloride	mg/L	92	92	100.0%	63.064	60.206	13.88	62.300	65.000	66.05	3.000	140.0	137.0	0.03201
Without Extremes	MW-3	Chloride	mg/L	82	82	100.0%	64.559	64.461	3.541	63.000	65.000	66.00	53.000	76.00	23.00	-0.19793
All	MW-32	Chloride	mg/L	11	11	100.0%	32.645	32.619	1.37	32.000	33.000	34.00	30.000	34.1	4.1	-0.62231
With Extremes	MW-5	Chloride	mg/L	122	122	100.0%	52.602	51.287	10.12	49.000	52.250	55.00	4.000	130.0	126.0	2.64734
Without Extremes	MW-5	Chloride	mg/L	118	118	100.0%	52.328	52.132	4.582	49.000	52.000	54.70	37.500	71.00	33.50	0.52538
All	MW-1	Chloromethane	ug/L	6	12	50.0%	1.52500	1.09544	1.22632	0.50000	0.85000	2.55000	0.500000	3.5000	3.0000	0.661810
All	MW-32	Cobalt	ug/L	10	10	100.0%	49.200	47.882	13.00	40.000	44.500	55.00	37.000	80.0	43.0	1.60395
With Extremes	MW-2	Copper	ug/L	15	30	50.0%	14.600	10.079	14.64	5.000	5.500	20.00	5.000	70.0	65.0	2.18536
With Extremes	MW-3	Copper	ug/L	16	32	50.0%	14.709	10.232	13.52	5.000	5.500	20.00	5.000	60.0	55.0	1.55589
All	MW-1	Fluoride	mg/L	28	28	100.0%	0.334	0.313	0.11	0.300	0.300	0.40	0.100	0.6	0.5	0.25456
All	MW-11	Fluoride	mg/L	14	14	100.0%	0.559	0.554	0.07	0.500	0.510	0.60	0.500	0.7	0.2	0.97789
All	MW-12	Fluoride	mg/L	8	8	100.0%	0.321	0.320	0.04	0.300	0.300	0.34	0.300	0.4	0.1	1.88479
With Extremes	MW-14	Fluoride	mg/L	14	14	100.0%	0.199	0.194	0.04	0.200	0.200	0.20	0.100	0.3	0.2	0.11479
Without Extremes	MW-14	Fluoride	mg/L	11	11	100.0%	0.200	0.200	0.000	0.200	0.200	0.20	0.200	0.20	0.00	0.00000
All	MW-15	Fluoride	mg/L	8	8	100.0%	0.248	0.234	0.07	0.200	0.290	0.30	0.100	0.3	0.2	-1.32003
All	MW-17	Fluoride	mg/L	9	9	100.0%	0.324	0.322	0.05	0.300	0.300	0.35	0.270	0.4	0.1	0.96935
All	MW-19	Fluoride	mg/L	12	12	100.0%	1.045	1.033	0.17	0.915	1.000	1.10	0.810	1.4	0.6	0.91445
With Extremes	MW-2	Fluoride	mg/L	28	28	100.0%	0.350	0.336	0.12	0.300	0.330	0.37	0.200	0.8	0.6	2.46301
Without Extremes	MW-2	Fluoride	mg/L	26	26	100.0%	0.322	0.317	0.055	0.300	0.330	0.36	0.200	0.42	0.22	-0.34610
With Extremes	MW-26	Fluoride	mg/L	11	11	100.0%	0.373	0.346	0.18	0.300	0.300	0.40	0.200	0.9	0.7	2.69194
Without Extremes	MW-26	Fluoride	mg/L	10	10	100.0%	0.320	0.314	0.063	0.300	0.300	0.40	0.200	0.40	0.20	-0.13176

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10a

Descriptive Summary Statistics for Constituents in Compliance Wells with Greater Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	%Det	**Means	Geometric Mean	Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
With Extremes	MW-3	Fluoride	mg/L	30	30	100.0%	0.458	0.427	0.16	0.360	0.470	0.51	0.074	1.0	0.9	0.92083
Without Extremes	MW-3	Fluoride	mg/L	29	29	100.0%	0.439	0.414	0.121	0.360	0.460	0.50	0.074	0.65	0.58	-0.86089
All	MW-32	Fluoride	mg/L	11	11	100.0%	0.218	0.210	0.06	0.200	0.200	0.30	0.100	0.3	0.2	-0.02764
All	MW-5	Fluoride	mg/L	30	30	100.0%	0.881	0.840	0.27	0.740	0.900	1.00	0.330	1.7	1.4	0.63638
All	MW-26	Gross Alpha minus Rn & U	pCi/L	10	10	100.0%	3.100	3.015	0.80	2.600	2.900	3.60	2.200	4.5	2.3	0.84818
With Extremes	MW-32	Gross Alpha minus Rn & U	pCi/L	9	9	100.0%	3.644	2.418	4.97	1.700	2.000	2.50	1.000	16.8	15.8	2.91069
Without Extremes	MW-32	Gross Alpha minus Rn & U	pCi/L	8	8	100.0%	2.000	1.898	0.663	1.550	1.950	2.45	1.000	3.10	2.10	0.18012
All	MW-1	Iron	ug/L	38	40	95.0%	715.350	248.912	832.25	70.000	432.000	1175.00	5.000	3570.0	3565.0	1.47279
With Extremes	MW-12	Iron	ug/L	5	9	55.6%	70.444	38.547	90.51	15.000	25.000	50.00	15.000	266.0	251.0	1.75796
All	MW-15	Iron	ug/L	4	8	50.0%	24.250	20.720	16.50	15.000	17.500	29.00	10.000	61.0	51.0	1.90673
All	MW-18	Iron	ug/L	8	8	100.0%	121.888	65.692	146.40	32.550	57.500	172.50	10.000	440.0	430.0	1.82180
With Extremes	MW-2	Iron	ug/L	27	37	73.0%	153.784	46.080	308.78	15.000	30.000	90.00	5.000	1460.0	1455.0	2.97563
Without Extremes	MW-2	Iron	ug/L	21	32	65.6%	42.969	28.156	47.056	15.000	27.500	55.00	5.000	220.00	215.00	2.48809
All	MW-26	Iron	ug/L	10	10	100.0%	864.700	564.181	905.56	358.000	550.500	1100.00	68.000	3180.0	3112.0	2.18291
With Extremes	MW-3	Iron	ug/L	32	39	82.1%	489.936	96.419	1063.00	30.000	70.000	190.00	5.000	4600.0	4595.0	2.84083
Without Extremes	MW-3	Iron	ug/L	26	33	78.8%	104.470	54.279	159.136	30.000	60.000	99.00	5.000	770.00	765.00	3.28288
All	MW-32	Iron	ug/L	26	26	100.0%	8393.077	7749.501	2833.94	5970.000	9435.000	10300.00	1660.000	12700.0	11040.0	-0.64882
With Extremes	MW-5	Iron	ug/L	31	36	86.1%	88.123	39.889	110.90	20.000	40.000	140.00	0.910	417.0	416.1	1.83198
Without Extremes	MW-5	Iron	ug/L	30	36	83.3%	77.428	36.907	96.612	20.000	35.000	90.00	0.910	417.00	416.09	1.99649
All	MW-1	Manganese	ug/L	37	37	100.0%	199.416	174.818	65.61	180.000	220.000	240.00	14.000	289.0	275.0	-1.55915
All	MW-11	Manganese	ug/L	16	16	100.0%	87.750	84.826	21.77	74.500	92.000	101.00	40.000	130.0	90.0	-0.37156
All	MW-12	Manganese	ug/L	16	16	100.0%	631.563	273.011	728.62	132.000	320.000	905.50	17.000	2030.0	2013.0	1.25934
All	MW-14	Manganese	ug/L	31	31	100.0%	1919.032	1912.759	155.64	1860.000	1940.000	2000.00	1590.000	2290.0	700.0	-0.35529
With Extremes	MW-15	Manganese	ug/L	5	10	50.0%	121.000	17.120	294.73	5.000	5.500	80.00	5.000	950.0	945.0	3.03241
All	MW-17	Manganese	ug/L	11	11	100.0%	287.727	140.934	313.83	44.000	108.000	680.00	22.000	776.0	754.0	0.77361
With Extremes	MW-18	Manganese	ug/L	9	9	100.0%	211.444	166.159	188.37	110.000	119.000	214.00	94.000	664.0	570.0	2.14506
Without Extremes	MW-18	Manganese	ug/L	8	8	100.0%	154.875	139.739	87.387	105.000	117.500	175.00	94.000	350.00	256.00	2.01031
With Extremes	MW-2	Manganese	ug/L	27	33	81.8%	246.697	70.592	618.57	20.000	160.000	230.00	1.000	3640.0	3639.0	5.47039
Without Extremes	MW-2	Manganese	ug/L	26	32	81.3%	140.656	62.409	109.221	12.500	160.000	225.00	1.000	395.00	394.00	0.12048
All	MW-26	Manganese	ug/L	27	27	100.0%	1105.370	1024.209	301.49	949.000	1100.000	1330.00	95.000	1610.0	1515.0	-1.23815
All	MW-3	Manganese	ug/L	38	38	100.0%	1908.632	1217.758	1162.20	1010.000	2000.000	3000.00	10.000	4000.0	3990.0	0.08640
All	MW-32	Manganese	ug/L	27	27	100.0%	4727.778	4707.531	433.58	4540.000	4790.000	5040.00	3660.000	5470.0	1810.0	-0.76875
With Extremes	MW-5	Manganese	ug/L	31	32	96.9%	246.750	184.718	93.19	228.000	265.000	290.00	3.000	420.0	417.0	-1.44034
Without Extremes	MW-5	Manganese	ug/L	29	29	100.0%	271.655	266.649	52.544	240.000	270.000	290.00	140.000	420.00	280.00	0.47141
With Extremes	MW-32	Molybdenum	ug/L	8	10	80.0%	11.600	11.230	2.55	12.000	12.000	13.00	5.000	14.0	9.0	-2.26264
Without Extremes	MW-32	Molybdenum	ug/L	8	9	88.9%	11.778	11.375	2.635	12.000	12.000	13.00	5.000	14.00	9.00	-2.58953
With Extremes	MW-32	Nickel	ug/L	27	28	96.4%	63.750	61.733	16.99	54.000	63.000	68.50	25.000	127.0	102.0	1.74310
Without Extremes	MW-32	Nickel	ug/L	26	27	96.3%	61.407	60.106	11.843	54.000	63.000	68.00	25.000	94.00	69.00	-0.31695
With Extremes	MW-15	Nitrate+Nitrite as N	mg/L	6	8	75.0%	0.236	0.145	0.32	0.075	0.130	0.22	0.050	1.0	1.0	2.60093
All	MW-19	Nitrate+Nitrite as N	mg/L	9	9	100.0%	2.134	2.105	0.35	2.000	2.200	2.40	1.360	2.5	1.1	-1.38690
All	MW-26	Nitrate+Nitrite as N	mg/L	7	10	70.0%	0.215	0.155	0.17	0.050	0.200	0.40	0.050	0.5	0.5	0.64237
All	MW-3	Nitrate+Nitrite as N	mg/L	16	17	94.1%	0.289	0.207	0.22	0.101	0.200	0.40	0.025	0.8	0.8	0.99174
With Extremes	MW-5	Nitrate+Nitrite as N	mg/L	7	12	58.3%	0.258	0.136	0.33	0.050	0.130	0.25	0.050	1.0	0.9	1.78295
Without Extremes	MW-5	Nitrate+Nitrite as N	mg/L	5	10	50.0%	0.121	0.092	0.094	0.050	0.055	0.20	0.050	0.30	0.25	0.86647
With Extremes	MW-1	pH	s.u.	87	87	100.0%	7.512	7.503	0.37	7.280	7.470	7.79	6.700	8.6	1.9	0.25312
Without Extremes	MW-1	pH	s.u.	87	87	100.0%	7.511	7.502	0.371	7.280	7.470	7.79	6.700	8.60	1.90	0.24716
All	MW-11	pH	s.u.	96	96	100.0%	7.746	7.732	0.46	7.470	7.870	8.00	6.220	9.0	2.8	-0.71579
All	MW-12	pH	s.u.	87	87	100.0%	7.062	7.054	0.35	6.820	7.000	7.20	6.370	8.2	1.9	1.13419
With Extremes	MW-14	pH	s.u.	69	69	100.0%	6.938	6.928	0.38	6.780	6.890	7.03	6.000	8.2	2.2	0.79349
Without Extremes	MW-14	pH	s.u.	65	65	100.0%	6.904	6.897	0.298	6.780	6.880	7.02	6.170	7.75	1.58	0.35860
With Extremes	MW-15	pH	s.u.	64	64	100.0%	7.104	7.096	0.34	6.975	7.075	7.27	5.880	8.3	2.5	0.17293
Without Extremes	MW-15	pH	s.u.	61	61	100.0%	7.088	7.084	0.236	6.980	7.070	7.26	6.300	7.54	1.24	-0.52079
With Extremes	MW-17	pH	s.u.	46	46	100.0%	7.324	7.271	1.08	7.000	7.090	7.39	6.340	14.0	7.7	5.52175
Without Extremes	MW-17	pH	s.u.	45	45	100.0%	7.176	7.166	0.387	7.000	7.080	7.34	6.340	8.31	1.97	0.82305
All	MW-18	pH	s.u.	15	15	100.0%	7.119	7.107	0.43	6.890	6.990	7.38	6.350	7.9	1.6	0.50374
With Extremes	MW-19	pH	s.u.	16	16	100.0%	7.428	7.412	0.49	7.360	7.500	7.67	6.170	8.1	1.9	-1.31462
Without Extremes	MW-19	pH	s.u.	15	15	100.0%	7.512	7.504	0.365	7.390	7.520	7.72	6.580	8.11	1.53	-0.80373
All	MW-2	pH	s.u.	85	85	100.0%	7.268	7.262	0.30	7.000	7.190	7.42	6.720	8.1	1.4	0.87006
All	MW-26	pH	s.u.	10	10	100.0%	7.281	7.277	0.27	7.080	7.215	7.42	6.960	7.8	0.9	0.99325
All	MW-3	pH	s.u.	88	88	100.0%	6.955	6.947	0.34	6.740	6.950	7.11	5.800	7.8	2.0	0.15235
All	MW-32	pH	s.u.	8	8	100.0%	6.890	6.886	0.25	6.780	6.835	6.97	6.550	7.4	0.9	1.17049

Notes:

Type = All valid records or records without extremes from the calculations

Well = Monitoring well location

Detects = Number of detections

N = Number of samples

%Det = Detection rate as a percentage

**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.

**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.

Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)

Q25 = 25th percentile of the sample population

Median = 50th percentile of the sample population

Q75 = 75th percentile of the sample population

MinConc = Minimum detected concentration

MaxConc = Maximum detected concentration

Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)

95UCL = One-sided 95 percent confidence limit on the arithmetic mean

W-norm = Shapiro-Wilk score for normality

p-norm = p-value from Shapiro-Wilk test for normality, where p < 0.05 indicates a non-normal distribution

W-log = Shapiro-Wilk score for lognormality

p-log = p-value from Shapiro-Wilk test for lognormality, where p < 0.05 indicates a non-lognormal distribution

Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric

ug/L = Micrograms per liter

mg/L = Milligrams per liter

pCi/L = Picocuries per liter

TDS = Total dissolved solids

N/A = Not Applicable, due to lack of detections

NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10a

Descriptive Summary Statistics for Constituents in Compliance Wells with Greater Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	%Det	**Means	Geometric Mean	Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
All	MW-5	pH	s.u.	114	114	100.0%	7.630	7.623	0.33	7.420	7.660	7.91	6.980	8.7	1.7	-0.16576
With Extremes	MW-15	Selenium	ug/L	28	35	80.0%	52.054	22.272	41.25	5.000	54.000	92.00	0.500	117.0	116.5	0.06048
Without Extremes	MW-15	Selenium	ug/L	28	35	80.0%	48.340	20.874	39.882	5.000	47.000	91.00	0.500	117.00	116.50	0.24538
All	MW-19	Selenium	ug/L	14	18	77.8%	10.961	7.378	7.24	3.000	12.000	17.00	1.000	22.0	21.0	-0.05386
With Extremes	MW-2	Selenium	ug/L	42	63	66.7%	8.068	4.023	8.26	1.000	4.000	12.00	0.500	39.0	38.5	1.35792
Without Extremes	MW-2	Selenium	ug/L	42	63	66.7%	8.021	3.936	8.295	1.000	4.000	12.00	0.500	39.00	38.50	1.35152
With Extremes	MW-3	Selenium	ug/L	41	67	61.2%	13.618	4.129	43.91	1.000	4.000	14.60	0.500	360.0	359.5	7.66141
Without Extremes	MW-3	Selenium	ug/L	40	66	60.6%	8.233	3.824	9.033	1.000	3.500	13.00	0.500	37.00	36.50	1.24532
With Extremes	MW-1	Sulfate	mg/L	87	87	100.0%	703.621	652.249	418.90	637.000	670.000	692.00	38.000	4410.0	4372.0	8.18138
Without Extremes	MW-1	Sulfate	mg/L	82	82	100.0%	663.524	660.425	59.979	638.000	670.000	692.00	352.000	838.00	486.00	-1.53466
With Extremes	MW-11	Sulfate	mg/L	74	74	100.0%	1025.459	991.753	213.40	951.000	1002.500	1061.00	79.000	2250.0	2171.0	1.59856
Without Extremes	MW-11	Sulfate	mg/L	71	71	100.0%	1014.338	1009.559	99.120	951.000	1000.000	1060.00	659.000	1309.00	650.00	0.39748
With Extremes	MW-12	Sulfate	mg/L	66	66	100.0%	2385.106	2338.663	697.72	2221.000	2323.500	2421.00	1708.000	7820.0	6112.0	7.46432
Without Extremes	MW-12	Sulfate	mg/L	65	65	100.0%	2301.046	2295.181	160.691	2221.000	2321.000	2420.00	1708.000	2560.00	852.00	-1.08262
With Extremes	MW-14	Sulfate	mg/L	52	52	100.0%	2071.096	2055.742	222.59	2067.000	2109.000	2185.00	1160.000	2330.0	1170.0	-3.01829
Without Extremes	MW-14	Sulfate	mg/L	50	50	100.0%	2106.400	2102.199	127.812	2067.000	2107.000	2190.00	1512.000	2330.00	818.00	-2.10860
With Extremes	MW-15	Sulfate	mg/L	48	48	100.0%	2242.583	2225.305	246.84	2212.500	2292.000	2361.50	1250.000	2560.0	1310.0	-2.82471
Without Extremes	MW-15	Sulfate	mg/L	46	46	100.0%	2273.130	2268.890	137.944	2215.000	2291.000	2361.00	1876.000	2560.00	684.00	-0.73564
With Extremes	MW-17	Sulfate	mg/L	25	25	100.0%	2352.080	2270.198	501.66	2360.000	2510.000	2670.00	662.000	2860.0	2198.0	-2.15356
Without Extremes	MW-17	Sulfate	mg/L	23	23	100.0%	2463.565	2440.643	309.554	2371.000	2520.000	2678.00	1400.000	2860.00	1460.00	-2.03943
All	MW-18	Sulfate	mg/L	19	19	100.0%	1478.158	1460.783	230.36	1371.000	1446.000	1600.00	1023.000	1940.0	917.0	0.10537
With Extremes	MW-19	Sulfate	mg/L	22	22	100.0%	1345.409	1166.037	648.29	858.000	1175.500	1793.00	167.000	2770.0	2603.0	0.41971
Without Extremes	MW-19	Sulfate	mg/L	21	21	100.0%	1386.190	1271.589	573.954	860.000	1204.000	1793.00	570.000	2448.00	1878.00	0.42712
With Extremes	MW-2	Sulfate	mg/L	86	86	100.0%	1742.837	1630.652	361.78	1733.000	1845.000	1920.00	25.000	2147.0	2122.0	-2.89786
Without Extremes	MW-2	Sulfate	mg/L	81	81	100.0%	1818.037	1808.384	179.526	1788.000	1849.000	1930.00	1270.000	2147.00	877.00	-1.24888
All	MW-26	Sulfate	mg/L	11	11	100.0%	1892.727	1890.617	94.67	1830.000	1890.000	1940.00	1770.000	2100.0	330.0	0.81707
With Extremes	MW-3	Sulfate	mg/L	87	87	100.0%	2960.207	2800.166	591.81	2712.000	3150.000	3330.00	42.000	4030.0	3988.0	-2.14565
Without Extremes	MW-3	Sulfate	mg/L	84	84	100.0%	2992.821	2955.054	448.007	2731.000	3125.000	3330.00	1710.000	3663.00	1953.00	-1.02763
All	MW-32	Sulfate	mg/L	11	11	100.0%	2340.000	2337.617	108.35	2300.000	2360.000	2420.00	2070.000	2460.0	390.0	-1.60267
With Extremes	MW-5	Sulfate	mg/L	88	88	100.0%	1190.477	1096.610	738.14	1038.500	1117.500	1185.50	28.000	7820.0	7792.0	8.47741
Without Extremes	MW-5	Sulfate	mg/L	84	84	100.0%	1113.702	1107.935	111.859	1037.000	1110.000	1181.00	669.000	1518.00	849.00	-0.07795
With Extremes	MW-1	TDS @ 180 C	mg/L	82	82	100.0%	1287.561	1251.439	349.20	1210.000	1270.000	1317.00	246.000	4000.0	3754.0	5.51184
Without Extremes	MW-1	TDS @ 180 C	mg/L	77	77	100.0%	1273.104	1269.801	93.178	1217.000	1270.000	1314.00	990.000	1567.00	577.00	0.63602
With Extremes	MW-11	TDS @ 180 C	mg/L	72	72	100.0%	1906.500	1877.179	436.51	1712.500	1815.500	1919.50	1520.000	5100.0	3580.0	5.85192
Without Extremes	MW-11	TDS @ 180 C	mg/L	71	71	100.0%	1843.648	1835.811	178.313	1710.000	1810.000	1916.00	1520.000	2528.00	1008.00	1.58542
With Extremes	MW-12	TDS @ 180 C	mg/L	62	62	100.0%	3918.661	3909.034	277.39	3750.000	3921.000	4040.00	3010.000	5100.0	2090.0	0.47735
Without Extremes	MW-12	TDS @ 180 C	mg/L	61	61	100.0%	3893.803	3886.076	240.853	3750.000	3920.000	4039.00	3010.000	4323.00	1313.00	-1.11364
With Extremes	MW-14	TDS @ 180 C	mg/L	52	52	100.0%	3581.308	3574.520	213.86	3511.000	3630.000	3685.00	2684.000	4062.0	1378.0	-1.74868
Without Extremes	MW-14	TDS @ 180 C	mg/L	51	51	100.0%	3592.000	3587.643	176.063	3512.000	3630.000	3680.00	3000.000	4062.00	1062.00	-0.74788
With Extremes	MW-15	TDS @ 180 C	mg/L	49	49	100.0%	3856.592	3847.364	264.04	3780.000	3890.000	3970.00	3120.000	4530.0	1410.0	-0.72211
Without Extremes	MW-15	TDS @ 180 C	mg/L	47	47	100.0%	3856.936	3849.080	242.686	3800.000	3890.000	3970.00	3120.000	4530.00	1410.00	-0.99993
With Extremes	MW-17	TDS @ 180 C	mg/L	25	25	100.0%	4162.440	4000.644	908.84	4200.000	4519.000	4607.00	1031.000	5296.0	4265.0	-2.31260
Without Extremes	MW-17	TDS @ 180 C	mg/L	22	22	100.0%	4444.364	4433.331	320.529	4220.000	4545.000	4607.00	3750.000	5296.00	1546.00	0.19713
With Extremes	MW-18	TDS @ 180 C	mg/L	19	19	100.0%	2544.526	2508.785	399.24	2350.000	2557.000	2846.00	1393.000	3030.0	1637.0	-1.37511
Without Extremes	MW-18	TDS @ 180 C	mg/L	18	18	100.0%	2604.611	2587.917	297.080	2350.000	2606.000	2846.00	1920.000	3030.00	1110.00	-0.40921
With Extremes	MW-19	TDS @ 180 C	mg/L	22	22	100.0%	2488.000	2315.871	966.94	1730.000	2346.000	3144.00	1120.000	4829.0	3709.0	0.74247
Without Extremes	MW-19	TDS @ 180 C	mg/L	22	22	100.0%	2457.136	2299.411	900.144	1730.000	2346.000	3144.00	1120.000	4190.00	3070.00	0.46594
With Extremes	MW-2	TDS @ 180 C	mg/L	82	82	100.0%	2949.183	2838.843	537.73	2901.000	3110.000	3180.00	207.000	3800.0	3593.0	-3.07424
Without Extremes	MW-2	TDS @ 180 C	mg/L	77	77	100.0%	3060.623	3049.919	252.011	2972.000	3130.000	3190.00	2278.000	3800.00	1522.00	-0.54314
With Extremes	MW-26	TDS @ 180 C	mg/L	12	12	100.0%	3156.667	3156.088	63.29	3105.000	3140.000	3220.00	3080.000	3250.0	170.0	0.51074
Without Extremes	MW-26	TDS @ 180 C	mg/L	12	12	100.0%	3155.000	3154.397	64.597	3100.000	3140.000	3220.00	3080.000	3250.00	170.00	0.51967
With Extremes	MW-3	TDS @ 180 C	mg/L	83	83	100.0%	5049.807	4884.251	779.45	5050.000	5240.000	5360.00	256.000	6186.0	5930.0	-4.11517
Without Extremes	MW-3	TDS @ 180 C	mg/L	78	78	100.0%	5217.269	5210.615	263.254	5090.000	5269.000	5366.00	4362.000	6186.00	1824.00	-0.25205
All	MW-32	TDS @ 180 C	mg/L	12	12	100.0%	3669.167	3661.140	247.07	3625.000	3735.000	3780.00	3190.000	3960.0	770.0	-1.24540
With Extremes	MW-5	TDS @ 180 C	mg/L	85	85	100.0%	2103.400	2037.421	571.77	1943.000	2030.000	2172.00	229.000	6600.0	6371.0	5.59048
Without Extremes	MW-5	TDS @ 180 C	mg/L	82	82	100.0%	2057.707	2051.019	170.151	1943.000	2030.000	2160.00	1742.000	2575.00	833.00	0.88946
All	MW-1	Tetrahydrofuran	ug/L	9	11	81.8%	34.12273	18.04572	27.28499	14.00000	26.00000	58.00000	0.500000	85.0000	84.5000	0.466507
All	MW-12	Tetrahydrofuran	ug/L	6	8	75.0%	16.81250	10.64979	11.64332	8.50000	17.00000	22.50000	0.500000	38.0000	37.5000	0.465402
With Extremes	MW-5	Tetrahydrofuran	ug/L	5	8	62.5%	7.52500	6.97108	3.18916	5.00000	6.40000	10.00000	4.400000	13.0000	8.6000	0.679118
All	MW-18	Thallium	ug/L	6	9	66.7%	0.984	0.887	0.47	0.500	0.950	1.26	0.500	1.9	1.4	0.66118
All	MW-19	Thallium	ug/L	5	10	50.0%	0.499	0.474	0.15	0.500	0.500	0.57	0.250	0.7	0.4	-0.72835
With Extremes	MW-3	Thallium	ug/L	8	10	80.0%	1.117	1.036	0.44	0.990	1.120	1.16	0.500	2.0	1.5	0.61549

Notes:

Type = All valid records or records without extremes from the calculations
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**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
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MinConc = Minimum detected concentration

MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where p < 0.05 indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where p < 0.05 indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10a

Descriptive Summary Statistics for Constituents in Compliance Wells with Greater Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Analyte	Units	Detects	N	%Det	**Means	Geometric Mean	Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
Without Extremes	MW-3	Thallium	ug/L	7	9	77.8%	1.019	0.963	0.332	0.990	1.110	1.14	0.500	1.60	1.10	-0.17465
With Extremes	MW-1	Uranium	ug/L	61	80	76.3%	4.471	1.157	13.67	0.485	1.284	3.61	0.00015	107.5	107.5	6.25128
Without Extremes	MW-1	Uranium	ug/L	58	77	75.3%	2.085	0.992	2.256	0.470	1.200	3.03	0.000	11.00	11.00	1.79188
With Extremes	MW-11	Uranium	ug/L	75	95	78.9%	1.582	0.566	2.78	0.400	0.810	1.30	0.00015	19.4	19.4	4.13039
Without Extremes	MW-11	Uranium	ug/L	66	86	76.7%	0.851	0.431	0.732	0.343	0.746	1.04	0.000	4.00	4.00	1.72305
With Extremes	MW-12	Uranium	ug/L	90	91	98.9%	18.695	13.890	22.32	13.537	15.800	17.91	0.150	177.0	176.9	5.84526
Without Extremes	MW-12	Uranium	ug/L	85	85	100.0%	14.763	13.293	4.579	13.537	15.224	17.70	0.500	23.50	23.00	-1.26197
With Extremes	MW-14	Uranium	ug/L	93	93	100.0%	59.985	54.960	18.74	49.254	64.000	69.20	0.707	150.7	150.0	0.47782
Without Extremes	MW-14	Uranium	ug/L	92	92	100.0%	58.510	51.942	17.322	49.254	63.866	69.10	0.707	98.00	97.29	-1.18917
With Extremes	MW-15	Uranium	ug/L	75	75	100.0%	45.227	43.316	13.58	38.507	44.776	50.40	7.313	116.4	109.1	2.29962
Without Extremes	MW-15	Uranium	ug/L	73	73	100.0%	43.420	42.140	8.963	38.507	44.500	49.25	7.313	65.67	58.36	-0.87484
With Extremes	MW-17	Uranium	ug/L	51	51	100.0%	29.978	28.396	8.50	24.925	30.299	35.60	4.627	46.8	42.2	-0.37240
Without Extremes	MW-17	Uranium	ug/L	51	51	100.0%	29.899	28.343	8.384	24.925	30.299	35.60	4.627	46.80	42.17	-0.42046
All	MW-18	Uranium	ug/L	18	18	100.0%	24.991	19.231	15.05	13.134	22.154	39.60	2.687	46.9	44.2	0.02727
All	MW-19	Uranium	ug/L	19	19	100.0%	12.470	11.825	4.48	9.370	11.300	14.00	7.000	24.0	17.0	1.32407
With Extremes	MW-2	Uranium	ug/L	75	75	100.0%	10.590	8.204	8.58	6.250	10.149	13.00	0.703	67.0	66.3	4.22034
Without Extremes	MW-2	Uranium	ug/L	73	73	100.0%	9.451	7.807	4.498	6.250	10.104	12.30	0.703	18.00	17.30	-0.23945
With Extremes	MW-26	Uranium	ug/L	26	26	100.0%	25.565	21.158	21.43	12.600	22.500	26.00	9.480	119.0	109.5	3.54142
Without Extremes	MW-26	Uranium	ug/L	25	25	100.0%	21.827	19.745	10.013	12.600	22.400	24.60	9.480	44.20	34.72	0.78240
With Extremes	MW-3	Uranium	ug/L	77	78	98.7%	28.455	21.169	29.00	16.418	22.313	32.00	0.500	219.0	218.5	4.56135
Without Extremes	MW-3	Uranium	ug/L	74	75	98.7%	23.544	19.605	11.894	15.000	22.000	31.34	0.500	67.16	66.66	0.68630
All	MW-32	Uranium	ug/L	12	12	100.0%	2.957	2.792	1.15	2.260	2.490	3.53	1.830	5.7	3.9	1.56329
With Extremes	MW-5	Uranium	ug/L	88	113	77.9%	3.138	1.070	6.80	0.500	0.900	2.00	0.040	48.5	48.5	4.19970
Without Extremes	MW-5	Uranium	ug/L	71	96	74.0%	0.950	0.690	0.788	0.500	0.709	1.04	0.040	4.70	4.66	2.01003
With Extremes	MW-1	Zinc	ug/L	20	31	64.5%	901.339	27.512	4659.24	5.000	16.000	80.00	2.500	26000.0	25997.5	5.56347
Without Extremes	MW-1	Zinc	ug/L	18	29	62.1%	51.431	19.727	75.921	5.000	15.000	60.00	2.500	270.00	267.50	1.93393
All	MW-14	Zinc	ug/L	10	14	71.4%	11.571	10.586	4.64	9.000	12.000	15.00	5.000	20.0	15.0	0.01654
All	MW-2	Zinc	ug/L	24	30	80.0%	134.550	56.095	143.14	14.000	83.500	240.00	2.500	530.0	527.5	1.18557
With Extremes	MW-3	Zinc	ug/L	29	33	87.9%	9106.636	66.559	51682.18	23.000	60.000	106.00	2.500	297000.0	296997.5	5.74447
Without Extremes	MW-3	Zinc	ug/L	25	29	86.2%	62.690	40.101	55.252	22.000	50.000	100.00	2.500	259.00	256.50	1.70389
With Extremes	MW-32	Zinc	ug/L	11	11	100.0%	180.455	152.080	143.78	100.000	141.000	191.00	85.000	594.0	509.0	2.80122
Without Extremes	MW-32	Zinc	ug/L	10	10	100.0%	139.100	132.709	45.449	100.000	131.000	167.00	85.000	222.00	137.00	0.59906
With Extremes	MW-5	Zinc	ug/L	18	29	62.1%	1906.121	21.634	10019.49	5.000	15.000	40.00	2.500	54000.0	53997.5	5.38444
Without Extremes	MW-5	Zinc	ug/L	15	26	57.7%	22.250	12.970	25.028	5.000	12.000	30.00	2.500	100.00	97.50	1.74578

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10a

Descriptive Summary Statistics for Constituents in Compliance Wells with Greater Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Less Than 8																
Type	Well	Analyte	Units	Detects	N	%Det	**Means	Geometric Mean	Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
All	MW-18	Fluoride	mg/L	7	7	100.0%	0.296	0.287	0.08	0.200	0.300	0.37	0.200	0.4	0.2	-0.11074
All	MW-19	Gross Alpha minus Rn & U	pCi/L	2	4	50.0%	0.925	0.814	0.53	0.500	0.800	1.35	0.500	1.6	1.1	0.70762
All	MW-2	Gross Alpha minus Rn & U	pCi/L	2	4	50.0%	1.000	0.862	0.60	0.500	0.900	1.50	0.500	1.7	1.2	0.37037
Without Extremes	MW-15	Nitrate+Nitrite as N	mg/L	4	4	100.0%	0.173	0.167	0.051	0.130	0.170	0.22	0.120	0.23	0.11	0.15800
All	MW-3	Tetrahydrofuran	ug/L	6	7	85.7%	33.92857	14.30010	44.80553	11.00000	13.00000	46.00000	0.500000	130.0000	129.5000	2.120245
Without Extremes	MW-5	Tetrahydrofuran	ug/L	4	7	57.1%	7.97143	7.44474	3.16318	5.00000	7.80000	10.00000	5.000000	13.0000	8.0000	0.480218

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Constituent	Units	Detects	N	%Det	**Means	Geometric Mean	**Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
Without Extremes	MW-2	Ammonia	mg/L	11	23	47.8%	0.098	0.062	0.097	0.025	0.050	0.15	0.005	0.42	0.42	1.90389
With Extremes	MW-1	Arsenic	ug/L	20	67	29.9%	1.978	1.184	2.75	0.500	1.000	2.50	0.500	16.0	15.5	3.79970
Without Extremes	MW-1	Arsenic	ug/L	18	65	27.7%	1.562	1.094	1.379	0.500	1.000	2.50	0.500	7.00	6.50	1.54982
All	MW-11	Arsenic	ug/L	16	49	32.7%	2.224	1.324	2.82	0.500	1.000	2.50	0.500	15.0	14.5	3.00376
With Extremes	MW-12	Arsenic	ug/L	18	45	40.0%	2.856	1.318	6.02	0.500	1.000	2.50	0.500	36.0	35.5	4.60506
Without Extremes	MW-12	Arsenic	ug/L	17	43	39.5%	1.674	1.163	1.596	0.500	1.000	2.50	0.500	9.00	8.50	2.46875
With Extremes	MW-14	Arsenic	ug/L	6	37	16.2%	1.338	0.958	1.15	0.500	0.500	2.50	0.500	5.0	4.5	1.19112
Without Extremes	MW-14	Arsenic	ug/L	5	37	13.5%	1.216	0.900	0.976	0.500	0.500	2.50	0.500	3.00	2.50	0.77133
With Extremes	MW-15	Arsenic	ug/L	10	33	30.3%	1.833	1.146	2.08	0.500	0.500	2.50	0.500	10.0	9.5	2.38701
Without Extremes	MW-15	Arsenic	ug/L	8	33	24.2%	1.500	1.003	1.490	0.500	0.500	2.50	0.500	6.00	5.50	1.65327
With Extremes	MW-17	Arsenic	ug/L	3	19	15.8%	1.895	1.219	2.05	0.500	1.000	2.50	0.500	9.0	8.5	2.47549
Without Extremes	MW-17	Arsenic	ug/L	2	19	10.5%	1.711	1.092	2.009	0.500	0.500	2.50	0.500	9.00	8.50	2.85336
All	MW-18	Arsenic	ug/L	0	15	0.0%	1.167	0.855	0.98	0.500	0.500	2.50	0.500	2.5	2.0	0.78823
All	MW-19	Arsenic	ug/L	0	17	0.0%	1.324	0.970	1.01	0.500	0.500	2.50	0.500	2.5	2.0	0.39424
With Extremes	MW-2	Arsenic	ug/L	26	63	41.3%	3.373	1.635	5.42	0.500	2.000	3.00	0.500	32.0	31.5	3.48063
Without Extremes	MW-2	Arsenic	ug/L	24	61	39.3%	2.615	1.494	3.301	0.500	2.000	3.00	0.500	16.00	15.50	2.77013
With Extremes	MW-26	Arsenic	ug/L	1	11	9.1%	2.364	2.300	0.45	2.500	2.500	2.50	1.000	2.5	1.5	-3.31662
Without Extremes	MW-26	Arsenic	ug/L	0	10	0.0%	2.500	2.500	0.000	2.500	2.500	2.50	2.500	2.50	0.00	0.00000
With Extremes	MW-3	Arsenic	ug/L	26	68	38.2%	3.912	1.734	7.17	0.500	2.250	4.50	0.500	46.0	45.5	4.27966
Without Extremes	MW-3	Arsenic	ug/L	23	65	35.4%	2.585	1.519	2.761	0.500	2.000	3.00	0.500	12.00	11.50	1.69438
With Extremes	MW-32	Arsenic	ug/L	1	11	9.1%	2.455	2.450	0.15	2.500	2.500	2.50	2.000	2.5	0.5	-3.31662
Without Extremes	MW-32	Arsenic	ug/L	0	10	0.0%	2.500	2.500	0.000	2.500	2.500	2.50	2.500	2.50	0.00	0.00000
With Extremes	MW-5	Arsenic	ug/L	29	64	45.3%	3.148	1.907	3.59	0.500	2.500	3.00	0.500	19.0	18.5	2.58594
Without Extremes	MW-5	Arsenic	ug/L	28	63	44.4%	2.881	1.818	3.006	0.500	2.500	3.00	0.500	17.00	16.50	2.31348
With Extremes	MW-1	Beryllium	ug/L	1	18	5.6%	1.156	0.500	1.78	0.250	0.500	0.50	0.100	5.0	4.9	1.89378
Without Extremes	MW-1	Beryllium	ug/L	1	15	6.7%	0.387	0.315	0.237	0.250	0.500	0.50	0.100	1.00	0.90	0.98895
With Extremes	MW-11	Beryllium	ug/L	1	22	4.5%	1.025	0.441	1.66	0.250	0.250	0.50	0.100	5.0	4.9	2.07718
Without Extremes	MW-11	Beryllium	ug/L	1	19	5.3%	0.397	0.300	0.414	0.250	0.250	0.50	0.100	2.00	1.90	3.50101
With Extremes	MW-12	Beryllium	ug/L	1	18	5.6%	1.308	0.520	1.91	0.250	0.500	0.50	0.100	5.0	4.9	1.48155
Without Extremes	MW-12	Beryllium	ug/L	0	14	0.0%	0.325	0.276	0.167	0.250	0.250	0.50	0.100	0.50	0.40	-0.07909
With Extremes	MW-14	Beryllium	ug/L	1	22	4.5%	1.070	0.449	1.70	0.250	0.250	0.50	0.100	5.0	4.9	1.91411
Without Extremes	MW-14	Beryllium	ug/L	0	18	0.0%	0.308	0.270	0.150	0.250	0.250	0.50	0.100	0.50	0.40	0.26272
With Extremes	MW-15	Beryllium	ug/L	1	17	5.9%	1.091	0.455	1.72	0.250	0.500	0.50	0.100	5.0	4.9	1.88999
Without Extremes	MW-15	Beryllium	ug/L	0	14	0.0%	0.325	0.276	0.167	0.250	0.250	0.50	0.100	0.50	0.40	-0.07909
With Extremes	MW-17	Beryllium	ug/L	0	15	0.0%	0.920	0.373	1.66	0.250	0.250	0.50	0.100	5.0	4.9	2.36772
Without Extremes	MW-17	Beryllium	ug/L	0	13	0.0%	0.292	0.250	0.157	0.250	0.250	0.50	0.100	0.50	0.40	0.36029
With Extremes	MW-18	Beryllium	ug/L	0	13	0.0%	1.023	0.397	1.77	0.250	0.250	0.50	0.100	5.0	4.9	2.14260
Without Extremes	MW-18	Beryllium	ug/L	0	11	0.0%	0.300	0.251	0.170	0.100	0.250	0.50	0.100	0.50	0.40	0.18562
With Extremes	MW-19	Beryllium	ug/L	0	15	0.0%	0.920	0.373	1.66	0.250	0.250	0.50	0.100	5.0	4.9	2.36772
Without Extremes	MW-19	Beryllium	ug/L	0	13	0.0%	0.292	0.250	0.157	0.250	0.250	0.50	0.100	0.50	0.40	0.36029
With Extremes	MW-2	Beryllium	ug/L	1	18	5.6%	1.322	0.540	1.90	0.250	0.500	0.50	0.100	5.0	4.9	1.48023
Without Extremes	MW-2	Beryllium	ug/L	0	14	0.0%	0.343	0.291	0.172	0.250	0.375	0.50	0.100	0.50	0.40	-0.33568
With Extremes	MW-26	Beryllium	ug/L	0	11	0.0%	0.682	0.328	1.43	0.250	0.250	0.25	0.250	5.0	4.8	3.31662
Without Extremes	MW-26	Beryllium	ug/L	0	10	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-3	Beryllium	ug/L	1	19	5.3%	1.121	0.452	1.89	0.250	0.500	0.50	0.100	6.0	5.9	2.06143
Without Extremes	MW-3	Beryllium	ug/L	0	16	0.0%	0.331	0.285	0.163	0.250	0.250	0.50	0.100	0.50	0.40	-0.11714
With Extremes	MW-32	Beryllium	ug/L	1	19	5.3%	0.624	0.331	1.19	0.250	0.250	0.25	0.250	5.0	4.8	3.35144
Without Extremes	MW-32	Beryllium	ug/L	0	17	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-5	Beryllium	ug/L	2	18	11.1%	1.258	0.531	1.84	0.250	0.500	0.50	0.100	5.0	4.9	1.60537
Without Extremes	MW-5	Beryllium	ug/L	1	14	7.1%	0.332	0.291	0.159	0.250	0.250	0.50	0.100	0.50	0.40	-0.03855
With Extremes	MW-1	Cadmium	ug/L	12	38	31.6%	2.193	0.994	3.03	0.500	1.000	2.50	0.050	13.0	13.0	2.41911
Without Extremes	MW-1	Cadmium	ug/L	12	38	31.6%	2.129	0.897	3.051	0.500	1.000	2.50	0.050	13.00	12.95	2.43051
With Extremes	MW-11	Cadmium	ug/L	5	25	20.0%	1.218	0.509	1.92	0.250	0.400	1.00	0.050	7.0	7.0	2.41424
Without Extremes	MW-11	Cadmium	ug/L	3	19	15.8%	0.339	0.276	0.214	0.250	0.250	0.50	0.050	1.00	0.95	1.58260
With Extremes	MW-12	Cadmium	ug/L	5	23	21.7%	1.490	0.673	1.85	0.250	0.500	2.50	0.050	7.0	7.0	1.90881
Without Extremes	MW-12	Cadmium	ug/L	5	23	21.7%	1.384	0.568	1.860	0.250	0.500	2.50	0.050	7.00	6.95	2.03630
With Extremes	MW-14	Cadmium	ug/L	11	24	45.8%	1.450	1.014	0.86	0.650	1.360	2.50	0.050	2.5	2.5	-0.12339
Without Extremes	MW-14	Cadmium	ug/L	11	24	45.8%	1.348	0.862	0.879	0.500	1.295	2.25	0.050	2.50	2.45	-0.00778
With Extremes	MW-15	Cadmium	ug/L	0	20	0.0%	0.970	0.482	1.04	0.250	0.500	2.50	0.050	2.5	2.5	0.86941

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	**Well**	**Constituent**	**Units**	**Detects**	**N**	**%Det**	****Means**	**Geometric Mean**	****Std.Dev.**	**Q25**	**Median**	**Q75**	**MinConc**	**MaxConc**	**Range**	**Skewness**
Without Extremes	MW-15	Cadmium	ug/L	0	20	0.0%	0.848	0.397	0.992	0.250	0.500	1.50	0.050	2.50	2.45	1.15019
With Extremes	MW-17	Cadmium	ug/L	2	16	12.5%	0.754	0.419	0.89	0.250	0.375	0.73	0.050	2.5	2.5	1.55237
Without Extremes	MW-17	Cadmium	ug/L	2	13	15.4%	0.351	0.278	0.239	0.250	0.250	0.50	0.050	0.96	0.91	1.35063
With Extremes	MW-18	Cadmium	ug/L	1	14	7.1%	0.775	0.410	0.95	0.250	0.375	0.50	0.050	2.5	2.5	1.46718
Without Extremes	MW-18	Cadmium	ug/L	1	11	9.1%	0.305	0.251	0.168	0.200	0.250	0.50	0.050	0.50	0.45	0.07795
With Extremes	MW-19	Cadmium	ug/L	1	16	6.3%	0.719	0.386	0.90	0.250	0.325	0.50	0.050	2.5	2.5	1.66288
Without Extremes	MW-19	Cadmium	ug/L	1	13	7.7%	0.308	0.250	0.161	0.250	0.250	0.50	0.050	0.50	0.45	-0.14623
With Extremes	MW-2	Cadmium	ug/L	15	37	40.5%	3.012	1.207	4.01	0.500	1.000	3.00	0.050	17.0	17.0	1.92242
Without Extremes	MW-2	Cadmium	ug/L	15	37	40.5%	2.946	1.086	4.035	0.500	1.000	3.00	0.050	17.00	16.95	1.92199
With Extremes	MW-26	Cadmium	ug/L	0	11	0.0%	0.455	0.308	0.68	0.250	0.250	0.25	0.250	2.5	2.3	3.31662
Without Extremes	MW-26	Cadmium	ug/L	0	10	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-5	Cadmium	ug/L	16	40	40.0%	3.305	1.414	3.90	0.500	2.500	5.00	0.050	17.0	17.0	2.00248
Without Extremes	MW-5	Cadmium	ug/L	16	40	40.0%	3.244	1.282	3.929	0.400	2.500	5.00	0.050	17.00	16.95	1.98792
All	MW-11	Chloromethane	ug/L	6	14	42.9%	1.92143	1.14825	2.01616	0.50000	0.50000	2.40000	0.500000	5.8000	5.3000	1.168997
With Extremes	MW-12	Chloromethane	ug/L	3	10	30.0%	1.34000	0.83496	1.79889	0.50000	0.50000	1.70000	0.500000	6.2000	5.7000	2.647803
Without Extremes	MW-12	Chloromethane	ug/L	2	9	22.2%	0.80000	0.66822	0.60000	0.50000	0.50000	0.50000	0.500000	2.0000	1.5000	1.687500
All	MW-14	Chloromethane	ug/L	4	13	30.8%	1.40000	0.88928	1.56312	0.50000	0.50000	2.50000	0.500000	5.4000	4.9000	1.726676
With Extremes	MW-15	Chloromethane	ug/L	3	8	37.5%	1.11250	0.80423	1.21354	0.50000	0.50000	1.20000	0.500000	4.0000	3.5000	2.445858
All	MW-17	Chloromethane	ug/L	4	9	44.4%	1.27778	0.93563	1.14322	0.50000	0.50000	1.80000	0.500000	3.7000	3.2000	1.442346
All	MW-18	Chloromethane	ug/L	2	8	25.0%	1.00000	0.74767	0.92582	0.50000	0.50000	1.50000	0.500000	2.5000	2.0000	1.440165
With Extremes	MW-19	Chloromethane	ug/L	2	9	22.2%	1.06667	0.74060	1.20208	0.50000	0.50000	0.50000	0.500000	3.9000	3.4000	2.121320
With Extremes	MW-2	Chloromethane	ug/L	2	9	22.2%	1.03333	0.75571	1.06301	0.50000	0.50000	0.70000	0.500000	3.5000	3.0000	2.043660
Without Extremes	MW-2	Chloromethane	ug/L	1	8	12.5%	0.72500	0.62394	0.55997	0.50000	0.50000	0.60000	0.500000	2.1000	1.6000	2.745813
All	MW-26	Chloromethane	ug/L	8	26	30.8%	2.07500	1.38013	1.85942	0.50000	1.25000	2.60000	0.500000	6.6000	6.1000	1.076371
All	MW-3	Chloromethane	ug/L	5	11	45.5%	1.41818	0.98527	1.44140	0.50000	0.50000	2.20000	0.500000	5.2000	4.7000	2.058786
All	MW-32	Chloromethane	ug/L	4	10	40.0%	1.36000	0.94783	1.27819	0.50000	0.50000	1.70000	0.500000	3.6000	3.1000	1.246446
All	MW-5	Chloromethane	ug/L	5	11	45.5%	1.36364	0.99985	1.10116	0.50000	0.50000	2.70000	0.500000	3.2000	2.7000	0.767211
With Extremes	MW-1	Chromium	ug/L	7	36	19.4%	10.792	6.810	12.88	5.000	5.000	12.50	0.500	60.0	59.5	2.57995
Without Extremes	MW-1	Chromium	ug/L	6	35	17.1%	9.386	6.399	9.881	5.000	5.000	12.50	0.500	50.00	49.50	2.50108
All	MW-11	Chromium	ug/L	0	19	0.0%	11.868	8.499	8.12	5.000	12.500	12.50	0.500	25.0	24.5	0.53952
All	MW-12	Chromium	ug/L	0	14	0.0%	12.893	8.869	8.93	5.000	12.500	25.00	0.500	25.0	24.5	0.32786
All	MW-14	Chromium	ug/L	0	17	0.0%	12.971	9.921	7.77	7.500	12.500	12.50	0.500	25.0	24.5	0.50095
All	MW-15	Chromium	ug/L	1	12	8.3%	11.617	8.468	7.49	5.000	12.500	12.50	0.500	25.0	24.5	0.66331
All	MW-17	Chromium	ug/L	0	11	0.0%	11.864	7.897	8.07	2.500	12.500	12.50	0.500	25.0	24.5	0.33100
All	MW-18	Chromium	ug/L	1	9	11.1%	12.656	8.399	8.36	10.900	12.500	12.50	0.500	25.0	24.5	0.25141
All	MW-19	Chromium	ug/L	1	11	9.1%	12.273	8.672	7.66	7.000	12.500	12.50	0.500	25.0	24.5	0.38445
All	MW-2	Chromium	ug/L	6	34	17.6%	9.559	6.811	8.25	5.000	5.000	12.50	0.500	30.0	29.5	1.29519
All	MW-26	Chromium	ug/L	0	11	0.0%	15.909	15.101	5.84	12.500	12.500	25.00	12.500	25.0	12.5	1.18937
All	MW-3	Chromium	ug/L	8	37	21.6%	11.419	7.634	11.53	5.000	5.000	12.50	0.500	47.0	46.5	1.91434
With Extremes	MW-32	Chromium	ug/L	0	11	0.0%	14.545	13.894	5.22	12.500	12.500	12.50	10.000	25.0	15.0	1.82177
Without Extremes	MW-32	Chromium	ug/L	0	8	0.0%	12.500	12.500	0.000	12.500	12.500	12.50	12.500	12.50	0.00	0.00000
All	MW-5	Chromium	ug/L	1	34	2.9%	9.868	6.774	10.26	5.000	5.000	12.50	0.500	50.0	49.5	2.32167
All	MW-11	Cobalt	ug/L	0	9	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-14	Cobalt	ug/L	0	9	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-26	Cobalt	ug/L	0	10	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
With Extremes	MW-1	Copper	ug/L	11	32	34.4%	8.172	6.804	6.11	5.000	5.000	10.00	2.500	30.0	27.5	2.19288
Without Extremes	MW-1	Copper	ug/L	5	22	22.7%	6.136	5.853	2.145	5.000	5.000	5.00	5.000	10.00	5.00	1.39882
With Extremes	MW-11	Copper	ug/L	2	16	12.5%	5.844	5.288	3.36	5.000	5.000	5.00	2.500	17.0	14.5	2.81065
Without Extremes	MW-11	Copper	ug/L	0	11	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
With Extremes	MW-12	Copper	ug/L	1	11	9.1%	5.364	5.169	1.69	5.000	5.000	5.00	3.000	10.0	7.0	2.18781
Without Extremes	MW-12	Copper	ug/L	0	8	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-14	Copper	ug/L	1	14	7.1%	5.000	4.985	0.39	5.000	5.000	5.00	4.000	6.0	2.0	0.00000
With Extremes	MW-15	Copper	ug/L	1	9	11.1%	5.111	5.102	0.33	5.000	5.000	5.00	5.000	6.0	1.0	3.00000
With Extremes	MW-17	Copper	ug/L	1	11	9.1%	5.182	5.169	0.40	5.000	5.000	5.00	5.000	6.0	1.0	1.92272
Without Extremes	MW-17	Copper	ug/L	0	8	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-18	Copper	ug/L	1	9	11.1%	5.000	4.977	0.50	5.000	5.000	5.00	4.000	6.0	2.0	0.00000
With Extremes	MW-19	Copper	ug/L	1	11	9.1%	5.182	5.169	0.40	5.000	5.000	5.00	5.000	6.0	1.0	1.92272
Without Extremes	MW-19	Copper	ug/L	0	8	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
Without Extremes	MW-2	Copper	ug/L	14	29	48.3%	12.690	9.428	10.417	5.000	5.000	20.00	5.000	40.00	35.00	1.12262
All	MW-26	Copper	ug/L	0	11	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
Without Extremes	MW-3	Copper	ug/L	15	31	48.4%	13.248	9.665	10.875	5.000	5.000	20.00	5.000	40.00	35.00	0.95483
With Extremes	MW-32	Copper	ug/L	1	11	9.1%	9.182	6.175	13.87	5.000	5.000	5.00	5.000	51.0	46.0	3.31662

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Constituent	Units	Detects	N	%Det	**Means	Geometric Mean	**Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
Without Extremes	MW-32	Copper	ug/L	0	10	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-5	Copper	ug/L	13	29	44.8%	9.862	7.987	7.13	5.000	5.000	10.00	3.000	30.0	27.0	1.31281
All	MW-11	Gross Alpha minus Rn & U	pCi/L	0	9	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
With Extremes	MW-14	Gross Alpha minus Rn & U	pCi/L	1	8	12.5%	0.600	0.563	0.28	0.500	0.500	0.50	0.500	1.3	0.8	2.82843
With Extremes	MW-11	Iron	ug/L	8	23	34.8%	165.737	20.434	660.37	15.000	15.000	30.00	0.850	3190.0	3189.2	4.77002
Without Extremes	MW-11	Iron	ug/L	3	18	16.7%	18.278	17.442	6.497	15.000	15.000	15.00	15.000	34.00	19.00	1.66941
With Extremes	MW-14	Iron	ug/L	2	13	15.4%	104.846	24.019	302.60	15.000	15.000	15.00	10.000	1110.0	1100.0	3.58137
Without Extremes	MW-14	Iron	ug/L	0	9	0.0%	15.000	15.000	0.000	15.000	15.000	15.00	15.000	15.00	0.00	0.00000
With Extremes	MW-17	Iron	ug/L	3	10	30.0%	29.000	20.075	39.21	15.000	15.000	20.00	10.000	140.0	130.0	3.09899
Without Extremes	MW-17	Iron	ug/L	2	9	22.2%	16.667	16.179	4.330	15.000	15.000	20.00	10.000	25.00	15.00	0.65983
With Extremes	MW-19	Iron	ug/L	4	10	40.0%	196.100	34.147	512.24	15.000	15.000	86.00	10.000	1650.0	1640.0	3.13098
Without Extremes	MW-19	Iron	ug/L	3	9	33.3%	34.556	22.193	39.960	15.000	15.000	25.00	10.000	120.00	110.00	1.76203
With Extremes	MW-1	Lead	ug/L	2	25	8.0%	8.740	3.051	23.50	1.500	5.000	5.00	0.500	120.0	119.5	4.79434
Without Extremes	MW-1	Lead	ug/L	1	24	4.2%	4.104	2.618	3.945	1.000	5.000	5.00	0.500	20.00	19.50	2.86272
With Extremes	MW-11	Lead	ug/L	3	23	13.0%	2.761	0.826	7.01	0.500	0.500	0.50	0.500	29.0	28.5	3.32129
Without Extremes	MW-11	Lead	ug/L	0	18	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
With Extremes	MW-12	Lead	ug/L	0	9	0.0%	0.833	0.676	0.71	0.500	0.500	0.50	0.500	2.5	2.0	2.12132
With Extremes	MW-14	Lead	ug/L	1	11	9.1%	0.636	0.588	0.32	0.500	0.500	0.50	0.500	1.5	1.0	2.42043
Without Extremes	MW-14	Lead	ug/L	1	10	10.0%	0.550	0.536	0.158	0.500	0.500	0.50	0.500	1.00	0.50	3.16228
With Extremes	MW-17	Lead	ug/L	0	9	0.0%	0.722	0.638	0.44	0.500	0.500	0.50	0.500	1.5	1.0	1.61985
With Extremes	MW-19	Lead	ug/L	0	8	0.0%	0.625	0.574	0.35	0.500	0.500	0.50	0.500	1.5	1.0	2.82843
With Extremes	MW-2	Lead	ug/L	4	23	17.4%	20.913	3.712	56.09	0.500	5.000	5.00	0.500	230.0	229.5	3.30588
Without Extremes	MW-2	Lead	ug/L	2	21	9.5%	4.333	2.550	4.397	0.500	5.000	5.00	0.500	20.00	19.50	2.37093
All	MW-26	Lead	ug/L	0	10	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
With Extremes	MW-3	Lead	ug/L	5	26	19.2%	13.346	2.553	30.81	0.500	5.000	5.00	0.005	140.0	140.0	3.43657
Without Extremes	MW-3	Lead	ug/L	2	23	8.7%	3.783	1.639	4.408	0.500	5.000	5.00	0.005	20.00	20.00	2.42035
With Extremes	MW-32	Lead	ug/L	3	18	16.7%	1.472	0.683	3.64	0.500	0.500	0.50	0.500	16.0	15.5	4.18353
Without Extremes	MW-32	Lead	ug/L	0	15	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
With Extremes	MW-5	Lead	ug/L	4	22	18.2%	20.114	3.501	46.62	0.500	5.000	5.00	0.500	180.0	179.5	2.81366
Without Extremes	MW-5	Lead	ug/L	1	19	5.3%	3.289	2.009	2.684	0.500	5.000	5.00	0.500	10.00	9.50	0.60724
Without Extremes	MW-15	Manganese	ug/L	4	9	44.4%	28.889	10.957	47.716	5.000	5.000	11.00	5.000	138.00	133.00	1.99204
With Extremes	MW-19	Manganese	ug/L	5	11	45.5%	34.409	10.058	70.30	5.000	5.000	36.00	2.000	239.0	237.0	2.94785
Without Extremes	MW-19	Manganese	ug/L	4	10	40.0%	13.950	7.327	19.366	5.000	5.000	13.00	2.000	61.00	59.00	2.06696
All	MW-1	Mercury	ug/L	0	32	0.0%	0.225	0.166	0.12	0.100	0.250	0.25	0.00015	0.5	0.5	0.76967
All	MW-11	Mercury	ug/L	0	18	0.0%	0.244	0.211	0.13	0.100	0.250	0.25	0.100	0.5	0.4	0.92051
All	MW-12	Mercury	ug/L	1	14	7.1%	0.446	0.250	0.75	0.100	0.250	0.50	0.100	3.0	2.9	3.48292
With Extremes	MW-14	Mercury	ug/L	0	17	0.0%	0.274	0.237	0.14	0.250	0.250	0.25	0.100	0.5	0.4	0.60681
Without Extremes	MW-14	Mercury	ug/L	0	9	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
All	MW-15	Mercury	ug/L	0	12	0.0%	0.263	0.219	0.16	0.100	0.250	0.38	0.100	0.5	0.4	0.63303
All	MW-17	Mercury	ug/L	0	11	0.0%	0.291	0.256	0.15	0.250	0.250	0.50	0.100	0.5	0.4	0.51101
All	MW-18	Mercury	ug/L	0	9	0.0%	0.300	0.257	0.16	0.250	0.250	0.50	0.100	0.5	0.4	0.28341
All	MW-19	Mercury	ug/L	0	11	0.0%	0.291	0.256	0.15	0.250	0.250	0.50	0.100	0.5	0.4	0.51101
All	MW-2	Mercury	ug/L	0	30	0.0%	0.220	0.132	0.12	0.100	0.250	0.25	0.00015	0.5	0.5	0.61766
With Extremes	MW-26	Mercury	ug/L	0	11	0.0%	0.273	0.266	0.08	0.250	0.250	0.25	0.250	0.5	0.3	3.31662
Without Extremes	MW-26	Mercury	ug/L	0	10	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-3	Mercury	ug/L	0	34	0.0%	0.285	0.148	0.41	0.100	0.250	0.25	0.00015	2.5	2.5	5.07563
Without Extremes	MW-3	Mercury	ug/L	0	33	0.0%	0.218	0.136	0.121	0.100	0.250	0.25	0.00015	0.50	0.50	0.62834
With Extremes	MW-32	Mercury	ug/L	0	11	0.0%	0.273	0.266	0.08	0.250	0.250	0.25	0.250	0.5	0.3	3.31662
Without Extremes	MW-32	Mercury	ug/L	0	10	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-5	Mercury	ug/L	2	33	6.1%	0.273	0.173	0.33	0.100	0.250	0.25	0.00015	2.0	2.0	4.68721
Without Extremes	MW-5	Mercury	ug/L	1	32	3.1%	0.219	0.160	0.118	0.100	0.250	0.25	0.00015	0.50	0.50	0.86102
With Extremes	MW-1	Molybdenum	ug/L	9	21	42.9%	16.871	3.277	45.00	1.000	2.500	5.00	0.500	190.0	189.5	3.46399
Without Extremes	MW-1	Molybdenum	ug/L	7	19	36.8%	3.147	1.958	2.996	0.500	2.000	5.00	0.500	10.00	9.50	1.28320
With Extremes	MW-11	Molybdenum	ug/L	6	24	25.0%	7.663	3.084	19.80	1.500	5.000	5.00	0.500	100.0	99.5	4.79168
Without Extremes	MW-11	Molybdenum	ug/L	5	23	21.7%	3.452	2.399	2.423	1.000	5.000	5.00	0.500	10.00	9.50	0.55368
With Extremes	MW-12	Molybdenum	ug/L	8	20	40.0%	9.610	3.273	21.98	1.350	5.000	5.00	0.500	100.0	99.5	4.04314
Without Extremes	MW-12	Molybdenum	ug/L	7	19	36.8%	4.616	2.422	5.776	0.500	2.500	5.00	0.500	20.00	19.50	2.19689
With Extremes	MW-14	Molybdenum	ug/L	8	22	36.4%	6.705	4.188	6.67	3.000	5.000	5.00	0.500	25.0	24.5	1.74232
Without Extremes	MW-14	Molybdenum	ug/L	8	22	36.4%	6.500	3.772	6.791	2.000	5.000	5.00	0.500	25.00	24.50	1.70991
With Extremes	MW-15	Molybdenum	ug/L	9	19	47.4%	8.974	3.454	11.95	0.500	5.000	10.00	0.500	40.0	39.5	1.64446
Without Extremes	MW-15	Molybdenum	ug/L	7	18	38.9%	6.167	2.456	9.130	0.500	4.000	5.00	0.500	30.00	29.50	2.23760
With Extremes	MW-17	Molybdenum	ug/L	3	14	21.4%	3.007	2.039	2.12	0.500	3.500	5.00	0.500	5.0	4.5	-0.15576

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where p < 0.05 indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where p < 0.05 indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Constituent	Units	Detects	N	%Det	**Means	Geometric Mean	**Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
Without Extremes	MW-17	Molybdenum	ug/L	3	14	21.4%	2.686	1.730	2.139	0.500	2.000	5.00	0.500	5.00	4.50	0.16075
All	MW-18	Molybdenum	ug/L	2	12	16.7%	2.667	1.742	2.12	0.500	2.000	5.00	0.500	5.0	4.5	0.20025
With Extremes	MW-19	Molybdenum	ug/L	6	14	42.9%	4.400	3.757	1.69	4.000	5.000	5.00	0.500	7.0	6.5	-1.46539
Without Extremes	MW-19	Molybdenum	ug/L	6	14	42.9%	4.079	3.187	1.973	4.000	5.000	5.00	0.500	7.00	6.50	-1.04358
With Extremes	MW-2	Molybdenum	ug/L	9	21	42.9%	12.986	3.075	29.27	1.000	3.000	5.00	0.500	100.0	99.5	2.85815
Without Extremes	MW-2	Molybdenum	ug/L	7	18	38.9%	3.650	1.859	4.856	0.500	1.100	5.00	0.500	20.00	19.50	2.53890
With Extremes	MW-26	Molybdenum	ug/L	0	10	0.0%	6.000	5.743	2.11	5.000	5.000	5.00	5.000	10.0	5.0	1.77878
Without Extremes	MW-26	Molybdenum	ug/L	0	8	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
With Extremes	MW-3	Molybdenum	ug/L	5	23	21.7%	24.196	3.464	65.71	0.500	5.000	5.00	0.500	300.0	299.5	3.77419
Without Extremes	MW-3	Molybdenum	ug/L	2	19	10.5%	3.132	1.742	2.798	0.500	5.000	5.00	0.500	10.00	9.50	0.61992
With Extremes	MW-5	Molybdenum	ug/L	4	21	19.0%	7.567	2.333	21.28	0.500	5.000	5.00	0.500	100.0	99.5	4.50865
Without Extremes	MW-5	Molybdenum	ug/L	3	20	15.0%	2.720	1.723	2.164	0.500	1.950	5.00	0.500	5.00	4.50	0.10151
With Extremes	MW-1	Nickel	ug/L	7	40	17.5%	11.850	7.965	8.52	5.000	10.000	22.50	0.500	25.0	24.5	0.60579
Without Extremes	MW-1	Nickel	ug/L	7	40	17.5%	11.738	7.520	8.646	5.000	10.000	22.50	0.500	25.00	24.50	0.57406
With Extremes	MW-11	Nickel	ug/L	4	68	5.9%	17.912	11.425	10.55	10.000	25.000	25.00	0.500	50.0	49.5	-0.24233
Without Extremes	MW-11	Nickel	ug/L	3	68	4.4%	18.184	11.462	10.497	10.000	25.000	25.00	0.500	50.00	49.50	-0.30925
With Extremes	MW-12	Nickel	ug/L	10	62	16.1%	19.281	13.499	10.62	10.000	25.000	25.00	0.500	60.0	59.5	0.17747
Without Extremes	MW-12	Nickel	ug/L	11	62	17.7%	18.821	12.349	10.951	10.000	25.000	25.00	0.500	60.00	59.50	0.16292
With Extremes	MW-14	Nickel	ug/L	13	69	18.8%	20.616	15.746	9.89	10.000	25.000	25.00	0.500	50.0	49.5	-0.27295
Without Extremes	MW-14	Nickel	ug/L	16	69	23.2%	20.710	15.274	10.315	10.000	25.000	25.00	0.500	50.00	49.50	-0.22131
With Extremes	MW-15	Nickel	ug/L	16	70	22.9%	23.523	16.000	17.57	15.000	25.000	25.00	0.500	104.0	103.5	2.55983
Without Extremes	MW-15	Nickel	ug/L	17	70	24.3%	22.259	14.878	15.139	14.100	25.000	25.00	0.500	97.00	96.50	2.00187
With Extremes	MW-17	Nickel	ug/L	5	52	9.6%	20.482	13.857	14.90	10.000	25.000	25.00	0.500	104.0	103.5	3.24015
Without Extremes	MW-17	Nickel	ug/L	5	52	9.6%	18.299	12.383	9.395	10.000	25.000	25.00	0.500	25.00	24.50	-0.87588
All	MW-18	Nickel	ug/L	2	15	13.3%	9.573	5.328	8.69	4.000	8.100	10.00	0.500	25.0	24.5	1.04306
With Extremes	MW-19	Nickel	ug/L	2	17	11.8%	10.118	5.483	8.33	5.000	10.000	10.00	0.500	25.0	24.5	0.75659
Without Extremes	MW-19	Nickel	ug/L	2	17	11.8%	9.853	4.789	8.573	0.500	10.000	10.00	0.500	25.00	24.50	0.71469
With Extremes	MW-2	Nickel	ug/L	10	39	25.6%	14.613	9.135	11.54	10.000	10.000	25.00	0.500	60.0	59.5	1.62507
Without Extremes	MW-2	Nickel	ug/L	10	39	25.6%	14.497	8.611	11.664	10.000	10.000	25.00	0.500	60.00	59.50	1.57291
With Extremes	MW-26	Nickel	ug/L	1	11	9.1%	12.727	11.813	6.07	10.000	10.000	10.00	10.000	25.0	15.0	1.92272
Without Extremes	MW-26	Nickel	ug/L	0	9	0.0%	10.000	10.000	0.000	10.000	10.000	10.00	10.000	10.00	0.00	0.00000
With Extremes	MW-3	Nickel	ug/L	18	42	42.9%	21.940	17.858	17.38	10.000	17.250	25.00	10.000	100.0	90.0	2.68011
Without Extremes	MW-3	Nickel	ug/L	18	42	42.9%	21.869	17.747	17.425	10.000	17.250	25.00	10.000	100.00	90.00	2.66811
With Extremes	MW-5	Nickel	ug/L	6	74	8.1%	17.277	11.570	9.95	10.000	25.000	25.00	0.500	40.0	39.5	-0.41638
Without Extremes	MW-5	Nickel	ug/L	7	74	9.5%	17.568	12.048	9.849	10.000	25.000	25.00	0.500	40.00	39.50	-0.46915
With Extremes	MW-1	Nitrate+Nitrite as N	mg/L	2	11	18.2%	0.058	0.056	0.02	0.050	0.050	0.05	0.050	0.1	0.1	3.05090
Without Extremes	MW-1	Nitrate+Nitrite as N	mg/L	0	9	0.0%	0.050	0.050	0.000	0.050	0.050	0.05	0.050	0.05	0.00	0.00000
With Extremes	MW-11	Nitrate+Nitrite as N	mg/L	1	13	7.7%	0.055	0.053	0.02	0.050	0.050	0.05	0.050	0.1	0.1	3.60555
Without Extremes	MW-11	Nitrate+Nitrite as N	mg/L	0	12	0.0%	0.050	0.050	0.000	0.050	0.050	0.05	0.050	0.05	0.00	0.00000
With Extremes	MW-12	Nitrate+Nitrite as N	mg/L	2	8	25.0%	0.071	0.064	0.04	0.050	0.050	0.09	0.050	0.2	0.1	1.60807
With Extremes	MW-14	Nitrate+Nitrite as N	mg/L	1	13	7.7%	0.065	0.057	0.06	0.050	0.050	0.05	0.050	0.3	0.2	3.60555
Without Extremes	MW-14	Nitrate+Nitrite as N	mg/L	0	12	0.0%	0.050	0.050	0.000	0.050	0.050	0.05	0.050	0.05	0.00	0.00000
With Extremes	MW-17	Nitrate+Nitrite as N	mg/L	3	9	33.3%	0.100	0.077	0.09	0.050	0.050	0.10	0.050	0.3	0.3	1.81040
With Extremes	MW-2	Nitrate+Nitrite as N	mg/L	4	11	36.4%	0.133	0.087	0.16	0.050	0.050	0.12	0.050	0.5	0.5	2.05883
Without Extremes	MW-2	Nitrate+Nitrite as N	mg/L	2	9	22.2%	0.066	0.061	0.031	0.050	0.050	0.05	0.050	0.12	0.07	1.61985
All	MW-32	Nitrate+Nitrite as N	mg/L	1	10	10.0%	0.055	0.054	0.02	0.050	0.050	0.05	0.050	0.1	0.1	3.16228
With Extremes	MW-1	Selenium	ug/L	19	66	28.8%	3.530	1.479	8.35	0.500	1.000	2.50	0.500	52.0	51.5	4.61470
Without Extremes	MW-1	Selenium	ug/L	16	63	25.4%	1.810	1.266	1.671	0.500	1.000	2.50	0.500	9.00	8.50	1.88765
With Extremes	MW-11	Selenium	ug/L	13	46	28.3%	3.224	1.725	5.53	1.000	2.000	2.80	0.500	29.0	28.5	3.61246
Without Extremes	MW-11	Selenium	ug/L	10	43	23.3%	1.844	1.442	1.247	1.000	1.000	2.50	0.500	5.00	4.50	0.81185
With Extremes	MW-12	Selenium	ug/L	21	43	48.8%	5.414	2.654	6.52	1.000	2.500	7.00	0.500	23.8	23.3	1.51005
Without Extremes	MW-12	Selenium	ug/L	20	43	46.5%	5.344	2.570	6.553	1.000	2.500	7.00	0.500	23.80	23.30	1.51453
With Extremes	MW-14	Selenium	ug/L	10	35	28.6%	2.286	1.668	2.39	1.000	2.000	2.50	0.500	14.0	13.5	3.71443
Without Extremes	MW-14	Selenium	ug/L	10	34	29.4%	2.250	1.682	2.356	1.000	2.000	2.50	0.500	14.00	13.50	3.99930
With Extremes	MW-17	Selenium	ug/L	7	19	36.8%	6.079	2.578	12.64	1.000	2.500	3.00	0.500	55.0	54.5	3.64142
Without Extremes	MW-17	Selenium	ug/L	5	17	29.4%	2.382	1.909	1.908	1.000	2.500	2.50	0.500	9.00	8.50	2.75819
All	MW-18	Selenium	ug/L	6	15	40.0%	3.053	2.055	3.35	1.000	2.000	2.50	0.500	11.0	10.5	2.07162
With Extremes	MW-26	Selenium	ug/L	4	11	36.4%	3.845	3.348	2.60	2.500	2.500	5.00	2.500	10.8	8.3	2.29005
Without Extremes	MW-26	Selenium	ug/L	1	8	12.5%	2.813	2.726	0.884	2.500	2.500	2.50	2.500	5.00	2.50	2.82843
With Extremes	MW-32	Selenium	ug/L	1	11	9.1%	2.636	2.609	0.45	2.500	2.500	2.50	2.500	4.0	1.5	3.31662
Without Extremes	MW-32	Selenium	ug/L	0	10	0.0%	2.500	2.500	0.000	2.500	2.500	2.50	2.500	2.50	0.00	0.00000
With Extremes	MW-5	Selenium	ug/L	18	60	30.0%	3.313	1.658	6.87	1.000	2.000	2.50	0.500	46.0	45.5	4.99291

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Greater Than 8																
Type	Well	Constituent	Units	Detects	N	%Det	**Means	Geometric Mean	**Std.Dev.	Q25	Median	Q75	MinConc	MaxConc	Range	Skewness
Without Extremes	MW-5	Selenium	ug/L	15	57	26.3%	1.909	1.429	1.439	1.000	1.000	2.50	0.500	6.00	5.50	1.05794
All	MW-1	Silver	ug/L	3	15	20.0%	3.700	3.041	1.77	2.000	5.000	5.00	0.500	5.0	4.5	-0.86029
With Extremes	MW-11	Silver	ug/L	0	14	0.0%	4.036	2.308	1.93	5.000	5.000	5.00	0.005	5.0	5.0	-1.60754
Without Extremes	MW-11	Silver	ug/L	0	11	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-12	Silver	ug/L	0	11	0.0%	3.773	1.870	2.11	1.000	5.000	5.00	0.005	5.0	5.0	-1.23258
With Extremes	MW-14	Silver	ug/L	0	14	0.0%	4.393	3.781	1.55	5.000	5.000	5.00	0.500	5.0	4.5	-2.31414
Without Extremes	MW-14	Silver	ug/L	0	12	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
With Extremes	MW-15	Silver	ug/L	0	9	0.0%	4.056	3.237	1.88	5.000	5.000	5.00	0.500	5.0	4.5	-1.63916
All	MW-17	Silver	ug/L	0	11	0.0%	3.864	3.027	1.95	1.000	5.000	5.00	0.500	5.0	4.5	-1.20698
All	MW-18	Silver	ug/L	0	9	0.0%	3.611	2.707	2.09	1.000	5.000	5.00	0.500	5.0	4.5	-0.87601
All	MW-19	Silver	ug/L	0	11	0.0%	3.864	3.027	1.95	1.000	5.000	5.00	0.500	5.0	4.5	-1.20698
All	MW-2	Silver	ug/L	3	15	20.0%	3.700	2.110	2.00	1.000	5.000	5.00	0.005	5.0	5.0	-1.04446
All	MW-26	Silver	ug/L	0	11	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-3	Silver	ug/L	2	16	12.5%	3.875	3.024	1.88	2.500	5.000	5.00	0.500	5.0	4.5	-1.23876
All	MW-32	Silver	ug/L	0	11	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
With Extremes	MW-5	Silver	ug/L	0	13	0.0%	3.962	2.175	1.98	5.000	5.000	5.00	0.005	5.0	5.0	-1.49324
Without Extremes	MW-5	Silver	ug/L	0	10	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-11	Tetrahydrofuran	ug/L	0	9	0.0%	2.00000	1.07722	2.25000	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	0.857143
All	MW-14	Tetrahydrofuran	ug/L	0	9	0.0%	2.00000	1.07722	2.25000	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	0.857143
With Extremes	MW-26	Tetrahydrofuran	ug/L	2	24	8.3%	6.16667	3.15921	11.02139	1.25000	2.50000	5.00000	0.500000	55.0000	54.5000	4.105218
Without Extremes	MW-26	Tetrahydrofuran	ug/L	1	23	4.3%	4.04348	2.79018	3.72618	1.25000	2.50000	5.00000	0.500000	12.5000	12.0000	1.526908
All	MW-32	Tetrahydrofuran	ug/L	0	10	0.0%	2.30000	1.25594	2.32379	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	0.484123
With Extremes	MW-11	Thallium	ug/L	0	12	0.0%	0.708	0.382	1.36	0.250	0.250	0.50	0.250	5.0	4.8	3.42283
Without Extremes	MW-11	Thallium	ug/L	0	11	0.0%	0.318	0.302	0.117	0.250	0.250	0.50	0.250	0.50	0.25	1.18937
With Extremes	MW-12	Thallium	ug/L	0	9	0.0%	0.861	0.439	1.56	0.250	0.250	0.50	0.250	5.0	4.8	2.96541
Without Extremes	MW-12	Thallium	ug/L	0	8	0.0%	0.344	0.324	0.129	0.250	0.250	0.50	0.250	0.50	0.25	0.64406
With Extremes	MW-14	Thallium	ug/L	0	13	0.0%	0.692	0.390	1.30	0.250	0.250	0.50	0.250	5.0	4.8	3.55374
Without Extremes	MW-14	Thallium	ug/L	0	12	0.0%	0.333	0.315	0.123	0.250	0.250	0.50	0.250	0.50	0.25	0.81240
All	MW-17	Thallium	ug/L	1	9	11.1%	0.362	0.341	0.13	0.250	0.250	0.50	0.250	0.5	0.3	0.27301
With Extremes	MW-26	Thallium	ug/L	0	10	0.0%	0.300	0.287	0.11	0.250	0.250	0.25	0.250	0.5	0.3	1.77878
Without Extremes	MW-26	Thallium	ug/L	0	8	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-32	Thallium	ug/L	0	10	0.0%	0.275	0.268	0.08	0.250	0.250	0.25	0.250	0.5	0.3	3.16228
Without Extremes	MW-32	Thallium	ug/L	0	9	0.0%	0.250	0.250	0.000	0.250	0.250	0.25	0.250	0.25	0.00	0.00000
With Extremes	MW-5	Thallium	ug/L	0	9	0.0%	0.861	0.439	1.56	0.250	0.250	0.50	0.250	5.0	4.8	2.96541
Without Extremes	MW-5	Thallium	ug/L	0	8	0.0%	0.344	0.324	0.129	0.250	0.250	0.50	0.250	0.50	0.25	0.64406
All	MW-1	Vanadium	ug/L	0	23	0.0%	20.565	15.299	12.69	7.500	25.000	25.00	0.500	50.0	49.5	0.68772
All	MW-11	Vanadium	ug/L	0	14	0.0%	7.179	6.078	3.15	5.000	7.500	7.50	0.500	15.0	14.5	0.49579
All	MW-12	Vanadium	ug/L	0	10	0.0%	6.800	5.429	3.64	5.000	7.500	7.50	0.500	15.0	14.5	0.82382
All	MW-14	Vanadium	ug/L	0	14	0.0%	7.357	6.204	3.24	5.000	7.500	7.50	0.500	15.0	14.5	0.32193
All	MW-15	Vanadium	ug/L	3	11	27.3%	12.545	8.160	11.83	7.500	7.500	15.00	0.500	40.0	39.5	1.71065
With Extremes	MW-17	Vanadium	ug/L	0	9	0.0%	8.389	6.476	4.39	7.500	7.500	7.50	0.500	15.0	14.5	0.15682
With Extremes	MW-19	Vanadium	ug/L	0	9	0.0%	8.389	6.476	4.39	7.500	7.500	7.50	0.500	15.0	14.5	0.15682
All	MW-2	Vanadium	ug/L	0	22	0.0%	22.409	16.612	13.92	10.000	25.000	25.00	0.500	50.0	49.5	0.67418
With Extremes	MW-26	Vanadium	ug/L	0	10	0.0%	8.000	7.944	1.05	7.500	7.500	7.50	7.500	10.0	2.5	1.77878
Without Extremes	MW-26	Vanadium	ug/L	0	8	0.0%	7.500	7.500	0.000	7.500	7.500	7.50	7.500	7.50	0.00	0.00000
With Extremes	MW-3	Vanadium	ug/L	1	25	4.0%	28.620	17.056	40.21	7.500	25.000	25.00	0.500	210.0	209.5	4.10844
Without Extremes	MW-3	Vanadium	ug/L	0	24	0.0%	21.063	15.362	14.051	7.500	25.000	25.00	0.500	50.00	49.50	0.77142
With Extremes	MW-32	Vanadium	ug/L	0	10	0.0%	8.000	7.944	1.05	7.500	7.500	7.50	7.500	10.0	2.5	1.77878
Without Extremes	MW-32	Vanadium	ug/L	0	8	0.0%	7.500	7.500	0.000	7.500	7.500	7.50	7.500	7.50	0.00	0.00000
All	MW-5	Vanadium	ug/L	0	24	0.0%	15.646	11.241	9.86	6.250	20.000	25.00	0.500	25.0	24.5	-0.17067
With Extremes	MW-11	Zinc	ug/L	3	15	20.0%	7.133	6.256	4.67	5.000	5.000	5.00	5.000	20.0	15.0	2.11242
Without Extremes	MW-11	Zinc	ug/L	0	11	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
With Extremes	MW-12	Zinc	ug/L	4	12	33.3%	17.083	9.708	24.79	5.000	5.000	14.50	5.000	89.0	84.0	2.66063
Without Extremes	MW-12	Zinc	ug/L	3	11	27.3%	10.545	7.937	10.568	5.000	5.000	14.00	5.000	40.00	35.00	2.53670
With Extremes	MW-15	Zinc	ug/L	1	9	11.1%	5.889	5.337	3.48	5.000	5.000	5.00	3.000	15.0	12.0	2.77330
With Extremes	MW-17	Zinc	ug/L	2	11	18.2%	7.727	6.926	4.10	5.000	5.000	10.00	5.000	15.0	10.0	1.15331
Without Extremes	MW-17	Zinc	ug/L	2	9	22.2%	6.111	5.833	2.205	5.000	5.000	5.00	5.000	10.00	5.00	1.61985
All	MW-18	Zinc	ug/L	1	9	11.1%	8.556	7.312	5.36	5.000	5.000	15.00	5.000	17.0	12.0	0.90337
With Extremes	MW-19	Zinc	ug/L	1	11	9.1%	7.273	6.503	4.10	5.000	5.000	10.00	5.000	15.0	10.0	1.50480
Without Extremes	MW-19	Zinc	ug/L	1	9	11.1%	5.556	5.400	1.667	5.000	5.000	5.00	5.000	10.00	5.00	3.00000
With Extremes	MW-26	Zinc	ug/L	1	11	9.1%	7.818	5.983	9.35	5.000	5.000	5.00	5.000	36.0	31.0	3.31662
Without Extremes	MW-26	Zinc	ug/L	0	10	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000

Notes:

Type = All valid records or records without extremes from the calculations
Well = Monitoring well location
Detects = Number of detections
N = Number of samples
%Det = Detection rate as a percentage
**Mean = Arithmetic mean; For constituents with greater than 15% and less than 50% non-detects, means are determined in a separate manner in the GWCL Table.
**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
Median = 50th percentile of the sample population
Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where p < 0.05 indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where p < 0.05 indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 10b

Descriptive Summary Statistics for Constituents in Compliance Wells with Less Than 50% Detects; Groundwater Data from 1979 to 2007. Background Groundwater Quality Report for White Mesa Hill, Utah

N Less Than 8																
Type	**Well**	**Constituent**	**Units**	**Detects**	**N**	**%Det**	****Means**	**Geometric Mean**	****Std.Dev.**	**Q25**	**Median**	**Q75**	**MinConc**	**MaxConc**	**Range**	**Skewness**
Without Extremes	MW-15	Chloromethane	ug/L	2	7	28.6%	0.70000	0.63952	0.36056	0.50000	0.50000	1.00000	0.500000	1.4000	0.9000	1.642766
Without Extremes	MW-19	Chloromethane	ug/L	0	7	0.0%	0.50000	0.50000	0.00000	0.50000	0.50000	0.50000	0.500000	0.5000	0.0000	0.000000
All	MW-1	Cobalt	ug/L	0	4	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-12	Cobalt	ug/L	0	5	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-15	Cobalt	ug/L	0	5	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-17	Cobalt	ug/L	0	6	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-18	Cobalt	ug/L	0	4	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-19	Cobalt	ug/L	0	6	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-2	Cobalt	ug/L	0	4	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-3	Cobalt	ug/L	0	6	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
All	MW-5	Cobalt	ug/L	0	5	0.0%	5.000	5.000	0.00	5.000	5.000	5.00	5.000	5.0	0.0	0.00000
Without Extremes	MW-15	Copper	ug/L	0	7	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-1	Gross Alpha minus Rn & U	pCi/L	0	3	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
All	MW-12	Gross Alpha minus Rn & U	pCi/L	0	3	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
Without Extremes	MW-14	Gross Alpha minus Rn & U	pCi/L	0	7	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
All	MW-15	Gross Alpha minus Rn & U	pCi/L	0	4	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
All	MW-17	Gross Alpha minus Rn & U	pCi/L	1	4	25.0%	1.075	0.769	1.15	0.500	0.500	1.65	0.500	2.8	2.3	2.00000
All	MW-18	Gross Alpha minus Rn & U	pCi/L	0	3	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
All	MW-3	Gross Alpha minus Rn & U	pCi/L	1	6	16.7%	0.583	0.561	0.20	0.500	0.500	0.50	0.500	1.0	0.5	2.44949
All	MW-5	Gross Alpha minus Rn & U	pCi/L	0	4	0.0%	0.500	0.500	0.00	0.500	0.500	0.50	0.500	0.5	0.0	0.00000
Without Extremes	MW-12	Iron	ug/L	3	7	42.9%	26.571	23.434	15.131	15.000	20.000	46.00	15.000	50.00	35.00	1.02766
Without Extremes	MW-12	Lead	ug/L	0	7	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
With Extremes	MW-15	Lead	ug/L	0	7	0.0%	0.643	0.585	0.38	0.500	0.500	0.50	0.500	1.5	1.0	2.64575
Without Extremes	MW-15	Lead	ug/L	0	6	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
Without Extremes	MW-17	Lead	ug/L	0	7	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
With Extremes	MW-18	Lead	ug/L	0	7	0.0%	0.786	0.684	0.49	0.500	0.500	1.50	0.500	1.5	1.0	1.22963
Without Extremes	MW-18	Lead	ug/L	0	5	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
Without Extremes	MW-19	Lead	ug/L	0	7	0.0%	0.500	0.500	0.000	0.500	0.500	0.50	0.500	0.50	0.00	0.00000
Without Extremes	MW-12	Nitrate+Nitrite as N	mg/L	1	7	14.3%	0.060	0.057	0.026	0.050	0.050	0.05	0.050	0.12	0.07	2.64575
Without Extremes	MW-17	Nitrate+Nitrite as N	mg/L	1	7	14.3%	0.057	0.055	0.019	0.050	0.050	0.05	0.050	0.10	0.05	2.64575
All	MW-18	Nitrate+Nitrite as N	mg/L	0	7	0.0%	0.050	0.050	0.00	0.050	0.050	0.05	0.050	0.1	0.0	0.00000
Without Extremes	MW-15	Silver	ug/L	0	7	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000
All	MW-15	Tetrahydrofuran	ug/L	0	4	0.0%	1.62500	0.88914	2.25000	0.50000	0.50000	2.75000	0.500000	5.0000	4.5000	2.000000
All	MW-17	Tetrahydrofuran	ug/L	0	6	0.0%	2.00000	1.07722	2.32379	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	0.968246
All	MW-18	Tetrahydrofuran	ug/L	0	3	0.0%	2.00000	1.07722	2.59808	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	1.732051
All	MW-19	Tetrahydrofuran	ug/L	0	5	0.0%	2.30000	1.25594	2.46475	0.50000	0.50000	5.00000	0.500000	5.0000	4.5000	0.608581
All	MW-2	Tetrahydrofuran	ug/L	1	5	20.0%	5.10000	1.64031	8.01093	0.50000	0.50000	5.00000	0.500000	19.0000	18.5000	1.939962
All	MW-1	Thallium	ug/L	0	7	0.0%	0.393	0.371	0.13	0.250	0.500	0.50	0.250	0.5	0.3	-0.37417
All	MW-15	Thallium	ug/L	0	7	0.0%	0.321	0.305	0.12	0.250	0.250	0.50	0.250	0.5	0.3	1.22963
All	MW-2	Thallium	ug/L	0	7	0.0%	0.393	0.371	0.13	0.250	0.500	0.50	0.250	0.5	0.3	-0.37417
All	MW-1	Tin	ug/L	0	2	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	
All	MW-11	Tin	ug/L	0	4	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-12	Tin	ug/L	0	3	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-14	Tin	ug/L	0	4	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-15	Tin	ug/L	0	2	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	
All	MW-17	Tin	ug/L	0	3	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-18	Tin	ug/L	0	2	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	
All	MW-19	Tin	ug/L	0	3	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-2	Tin	ug/L	0	2	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	
All	MW-26	Tin	ug/L	0	5	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-3	Tin	ug/L	0	3	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-32	Tin	ug/L	0	5	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	0.00000
All	MW-5	Tin	ug/L	0	2	0.0%	50.000	50.000	0.00	50.000	50.000	50.00	50.000	50.0	0.0	
Without Extremes	MW-17	Vanadium	ug/L	0	6	0.0%	7.500	7.500	0.000	7.500	7.500	7.50	7.500	7.50	0.00	0.00000
All	MW-18	Vanadium	ug/L	0	7	0.0%	8.643	6.210	5.04	7.500	7.500	15.00	0.500	15.0	14.5	-0.05847
Without Extremes	MW-19	Vanadium	ug/L	0	6	0.0%	7.500	7.500	0.000	7.500	7.500	7.50	7.500	7.50	0.00	0.00000
Without Extremes	MW-15	Zinc	ug/L	0	7	0.0%	5.000	5.000	0.000	5.000	5.000	5.00	5.000	5.00	0.00	0.00000

Notes:

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Well = Monitoring well location
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N = Number of samples
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**Std.Dev. = Standard deviation; For constituents with greater than 15% and less than 50% non-detects, the standard deviation is determined in a separate manner in the GWCL Table.
Mean + 2SD = Arithmetic mean plus two standard deviations. (Note: For pH,the values range from plus or minus two standard deviations)
Q25 = 25th percentile of the sample population
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Q75 = 75th percentile of the sample population
MinConc = Minimum detected concentration
MaxConc = Maximum detected concentration
Skew = Measure of skewness of the data distribution; indicates degree of assymetry and direction of the skewness (values greater than 2 indicate significant skew, with negative values indicating left skew, positive values indicating right skew)
95UCL = One-sided 95 percent confidence limit on the arithmetic mean
W-norm = Shapiro-Wilk score for normality
p-norm = p-value from Shapiro-Wilk test for normality, where $p < 0.05$ indicates a non-normal distribution
W-log = Shapiro-Wilk score for lognormality
p-log = p-value from Shapiro-Wilk test for lognormality, where $p < 0.05$ indicates a non-lognormal distribution
Distribution = Type of distribution, based on Shapiro-Wilk test; Normal, Lognormal, and Nonparametric
ug/L = Micrograms per liter
mg/L = Milligrams per liter
pCi/L = Picocuries per liter
TDS = Total dissolved solids
N/A = Not Applicable, due to lack of detections
NR = Not Run: data set contains extremes or was determined to be normally distributed

Table 11
Shapiro-Wilk Distribution Test Results for Wells and Constituents with more than 50% Detected Values

Monitoring Well	Constituent	N	Percent Detected	W-norm	P-norm	Wlog	Plog	Distribution
MW-1	Ammonia	30	86.7%	0.922192	0.030584	0.789349	0.000042	Non-Parametric
MW-1	Chloride	86	100.0%	0.937539	0.000429	0.770652	0.000000	Non-Parametric
MW-1	**Chloromethane**	**12**	**50.0%**	**0.925856**	**0.548498**	**NR**	**NR**	**Normal**
MW-1	Fluoride	28	100.0%	0.957308	0.300489	NR	NR	Normal
MW-1	Iron	40	95.0%	0.814108	0.000014	0.931173	0.017593	Non-Parametric
MW-1	Manganese	37	100.0%	0.842273	0.000104	0.570138	0.000000	Non-Parametric
MW-1	pH	87	100.0%	0.982396	0.284789	NR	NR	Normal
MW-1	Sulfate	82	100.0%	0.836439	0.000000	0.741341	0.000000	Non-Parametric
MW-1	TDS @ 180 C	77	100.0%	0.941468	0.001479	0.951724	0.005372	Non-Parametric
MW-1	**Tetrahydrofuran**	**11**	**81.8%**	**0.911627**	**0.327431**	**NR**	**NR**	**Normal**
MW-1	**Uranium**	**77**	**75.3%**	**0.837746**	**0.000002**	**0.974834**	**0.269039**	**Log Normal**
MW-1	**Zinc**	**29**	**62.1%**	**0.795962**	**0.001333**	**0.949288**	**0.413962**	**Log Normal**
MW-11	Ammonia	20	95.0%	0.821502	0.001841	0.787228	0.000561	Non-Parametric
MW-11	Chloride	104	100.0%	0.964665	0.007080	0.975533	0.050917	Log Normal
MW-11	Fluoride	14	100.0%	0.756768	0.001530	0.763219	0.001814	Non-Parametric
MW-11	Manganese	16	100.0%	0.974815	0.909266	NR	NR	Normal
MW-11	pH	96	100.0%	0.915568	0.000012	0.899400	0.000002	Non-Parametric
MW-11	Sulfate	71	100.0%	0.912459	0.000112	0.900835	0.000037	Non-Parametric
MW-11	TDS @ 180 C	71	100.0%	0.866903	0.000002	0.905233	0.000056	Non-Parametric
MW-11	**Uranium**	**86**	**76.7%**	**0.854616**	**0.000002**	**0.563401**	**0.000000**	**Non Parametric**
MW-12	Ammonia	14	85.7%	0.705705	0.000424	0.977240	0.955641	Log Normal
MW-12	Chloride	94	100.0%	0.923391	0.000037	0.880239	0.000000	Non-Parametric
MW-12	Fluoride	8	100.0%	0.691799	0.001819	0.705255	0.002582	Non-Parametric
MW-12	Manganese	16	100.0%	0.748913	0.000616	0.903667	0.092023	Log Normal
MW-12	pH	87	100.0%	0.910901	0.000017	0.926804	0.000105	Non-Parametric
MW-12	Sulfate	65	100.0%	0.937678	0.002706	0.906617	0.000128	Non-Parametric
MW-12	TDS @ 180 C	61	100.0%	0.933643	0.002584	0.904788	0.000155	Non-Parametric
MW-12	**Tetrahydrofuran**	**8**	**75.0%**	**0.898432**	**0.364745**	**NR**	**NR**	**Normal**
MW-12	Uranium	85	100.0%	0.889594	0.000003	0.593685	0.000000	Non-Parametric
MW-14	**Ammonia**	**17**	**82.4%**	**0.929652**	**0.301733**	**0.896847**	**0.101514**	**Normal**
MW-14	Chloride	80	100.0%	0.955105	0.006832	0.958206	0.010468	Non-Parametric
MW-14	Fluoride	11	100.0%	blank	blank	blank	blank	N/A
MW-14	Manganese	31	100.0%	0.950898	0.165269	NR	NR	Normal
MW-14	pH	65	100.0%	0.961942	0.043315	0.966015	0.071003	Log Normal
MW-14	Sulfate	50	100.0%	0.838006	0.000007	0.779697	0.000000	Non-Parametric
MW-14	TDS @ 180 C	51	100.0%	0.911689	0.001058	0.896101	0.000312	Non-Parametric
MW-14	Uranium	92	100.0%	0.907938	0.000008	0.470220	0.000000	Non-Parametric
MW-14	**Zinc**	**14**	**71.4%**	**0.922291**	**0.376459**	**0.948757**	**0.653819**	**Normal**
MW-15	**Ammonia**	**13**	**76.9%**	**0.844361**	**0.049757**	**0.931578**	**0.463588**	**Log Normal**
MW-15	Chloride	80	100.0%	0.950783	0.003823	0.942170	0.001261	Non-Parametric
MW-15	Fluoride	8	100.0%	0.765004	0.011950	0.716529	0.003459	Non-Parametric
MW-15	**Iron**	**8**	**50.0%**	**0.940368**	**0.112942**	**0.998051**	**0.993835**	**Normal**
MW-15	Nitrate+Nitrite as N	4*	100.0%	--	--	--	--	--
MW-15	pH	61	100.0%	0.964596	0.074787	NR	NR	Normal
MW-15	**Selenium**	**35**	**80.0%**	**0.944609**	**0.682617**	**0.818169**	**0.000227**	**Normal**
MW-15	Sulfate	46	100.0%	0.952209	0.057070	NR	NR	Normal
MW-15	TDS @ 180 C	47	100.0%	0.855482	0.000036	0.831559	0.000009	Non-Parametric
MW-15	Uranium	73	100.0%	0.957423	0.014833	0.728520	0.000000	Non-Parametric
MW-17	Ammonia	10	90.0%	0.914095	0.310316	NR	NR	Normal
MW-17	Chloride	55	100.0%	0.870778	0.000028	0.860612	0.000014	Non-Parametric
MW-17	Fluoride	9	100.0%	0.783942	0.013369	0.803135	0.022174	Non-Parametric
MW-17	Manganese	11	100.0%	0.755934	0.002485	0.881061	0.107322	Log Normal
MW-17	pH	45	100.0%	0.941265	0.023939	0.954145	0.073003	Log Normal
MW-17	Sulfate	23	100.0%	0.820358	0.000827	0.730956	0.000036	Non-Parametric
MW-17	TDS @ 180 C	22	100.0%	0.916284	0.063701	NR	NR	Normal
MW-17	Uranium	51	100.0%	0.983029	0.672942	NR	NR	Normal
MW-18	Ammonia	8	87.5%	0.864793	0.133972	NR	NR	Normal
MW-18	Chloride	19	100.0%	0.882662	0.023896	0.932313	0.191019	Log Normal
MW-18	Fluoride	7*	100.0%	--	--	--	--	--
MW-18	Iron	8	100.0%	0.766062	0.012273	0.980249	0.964125	Log Normal
MW-18	Manganese	8	100.0%	0.716291	0.003438	0.817772	0.044211	Non-Parametric
MW-18	pH	15	100.0%	0.940193	0.384800	NR	NR	Normal
MW-18	Sulfate	19	100.0%	0.941557	0.281232	NR	NR	Normal
MW-18	TDS @ 180 C	18	100.0%	0.955305	0.514129	NR	NR	Normal
MW-18	**Thallium**	**9**	**66.7%**	**0.929927**	**0.579536**	**0.961596**	**0.831954**	**Normal**
MW-18	Uranium	18	100.0%	0.901033	0.059891	NR	NR	Normal
MW-19	**Ammonia**	**10**	**60.0%**	**0.799578**	**0.058263**	**0.880913**	**0.273276**	**Normal**
MW-19	Chloride	22	100.0%	0.911047	0.049731	0.914690	0.059065	Log Normal
MW-19	Fluoride	12	100.0%	0.917926	0.269200	NR	NR	Normal
MW-19	Gross Alpha minus Rn & U	4*	50.0%	--	--	--	--	--
MW-19	Nitrate+Nitrite as N	9	100.0%	0.864268	0.106669	NR	NR	Normal
MW-19	pH	15	100.0%	0.910095	0.135867	NR	NR	Normal
MW-19	**Selenium**	**18**	**77.8%**	**0.935290**	**0.361305**	**0.830429**	**0.012176**	**Normal**
MW-19	Sulfate	21	100.0%	0.938497	0.203464	NR	NR	Normal

Table 11
Shapiro-Wilk Distribution Test Results for Wells and Constituents with more than 50% Detected Values

Monitoring Well	Constituent	N	Percent Detected	W-norm	P-norm	Wlog	Plog	Distribution
MW-19	TDS @ 180 C	22	100.0%	0.948199	0.290779	NR	NR	Normal
MW-19	**Thallium**	**10**	**50.0%**	**0.891540**	**0.364905**	**0.901970**	**0.420871**	**Normal**
MW-19	Uranium	19	100.0%	0.876201	0.018449	0.959257	0.557831	Log Normal
MW-2	Chloride	88	98.9%	0.828143	0.000000	0.938813	0.000428	Non-Parametric
MW-2	Fluoride	26	100.0%	0.963391	0.462634	NR	NR	Normal
MW-2	Gross Alpha minus Rn & U	4*	50.0%	--	--	--	--	--
MW-2	**Iron**	**32**	**65.6%**	**0.765489**	**0.000204**	**0.973372**	**0.805955**	**Log Normal**
MW-2	**Manganese**	**32**	**81.3%**	**0.950778**	**0.241809**	**0.690637**	**0.000004**	**Normal**
MW-2	pH	85	100.0%	0.917277	0.000043	0.925708	0.000112	Non-Parametric
MW-2	**Selenium**	**63**	**66.7%**	**0.912525**	**0.003489**	**0.952968**	**0.082534**	**Log Normal**
MW-2	Sulfate	81	100.0%	0.887123	0.000003	0.846884	0.000000	Non-Parametric
MW-2	TDS @ 180 C	77	100.0%	0.912607	0.000059	0.891561	0.000007	Non-Parametric
MW-2	Uranium	73	100.0%	0.970547	0.085156	NR	NR	Normal
MW-2	**Zinc**	**30**	**80.0%**	**0.895790**	**0.017544**	**0.893924**	**0.016035**	**Non Parametric**
MW-26	Ammonia	11	100.0%	0.953188	0.684868	NR	NR	Normal
MW-26	Chloride	11	100.0%	0.935880	0.473341	NR	NR	Normal
MW-26	Fluoride	10	100.0%	0.794064	0.012279	0.783375	0.009101	Non-Parametric
MW-26	Gross Alpha minus Rn & U	10	100.0%	0.897058	0.203331	NR	NR	Normal
MW-26	Iron	10	100.0%	0.741638	0.002823	0.950400	0.673233	Log Normal
MW-26	Manganese	27	100.0%	0.913688	0.027890	0.556429	0.000000	Non-Parametric
MW-26	**Nitrate+Nitrite as N**	**10**	**70.0%**	**0.888944**	**0.269198**	**0.899030**	**0.325149**	**Normal**
MW-26	pH	10	100.0%	0.901355	0.226718	NR	NR	Normal
MW-26	Sulfate	11	100.0%	0.938505	0.503088	NR	NR	Normal
MW-26	TDS @ 180 C	12	100.0%	0.873429	0.072247	NR	NR	Normal
MW-26	Uranium	25	100.0%	0.914265	0.037986	0.950234	0.253787	Log Normal
MW-3	Ammonia	29	89.7%	0.801005	0.000087	0.946849	0.151522	Log Normal
MW-3	**Cadmium**	**39**	**66.7%**	**0.862632**	**0.002526**	**0.916738**	**0.037728**	**Non Parametric**
MW-3	Chloride	82	100.0%	0.946984	0.001997	0.939461	0.000763	Non-Parametric
MW-3	Fluoride	29	100.0%	0.946830	0.151351	NR	NR	Normal
MW-3	**Iron**	**33**	**78.8%**	**0.573994**	**0.000000**	**0.937947**	**0.119957**	**Log Normal**
MW-3	Manganese	38	100.0%	0.960121	0.191573	NR	NR	Normal
MW-3	Nitrate+Nitrite as N	17	94.1%	0.904220	0.079944	NR	NR	Normal
MW-3	pH	88	100.0%	0.957812	0.005951	0.956594	0.004972	Non-Parametric
MW-3	**Selenium**	**66**	**60.6%**	**0.923765**	**0.010134**	**0.934354**	**0.022395**	**Non Parametric**
MW-3	Sulfate	84	100.0%	0.896154	0.000005	0.853976	0.000000	Non-Parametric
MW-3	TDS @ 180 C	78	100.0%	0.935658	0.000677	0.931892	0.000398	Non-Parametric
MW-3	Tetrahydrofuran	7	85.7%	0.724465	0.006814	0.936260	0.605298	Log Normal
MW-3	**Thallium**	**9**	**77.8%**	**0.744351**	**0.011071**	**0.791428**	**0.033663**	**Non Parametric**
MW-3	Uranium	75	98.7%	0.968316	0.056959	NR	NR	Normal
MW-3	Zinc	29	86.2%	0.851358	0.000811	0.943320	0.122505	Log Normal
MW-32	Ammonia	11	100.0%	0.897123	0.170434	NR	NR	Normal
MW-32	**Cadmium**	**26**	**84.6%**	**0.823681**	**0.001203**	**0.946711**	**0.271421**	**Log Normal**
MW-32	Chloride	11	100.0%	0.892404	0.149000	NR	NR	Normal
MW-32	Cobalt	10	100.0%	0.813875	0.021365	0.871350	0.103651	Log Normal
MW-32	Fluoride	11	100.0%	0.773908	0.004271	0.746007	0.001844	Non-Parametric
MW-32	Gross Alpha minus Rn & U	8	100.0%	0.990669	0.996041	NR	NR	Normal
MW-32	Iron	26	100.0%	0.944919	0.175936	NR	NR	Normal
MW-32	Manganese	27	100.0%	0.944331	0.155793	NR	NR	Normal
MW-32	Molybdenum	9	88.9%	0.629884	0.000214	0.548322	0.000024	Non-Parametric
MW-32	Nickel	27	96.3%	0.903884	0.016432	0.796515	0.000119	Non-Parametric
MW-32	pH	8	100.0%	0.901535	0.298270	NR	NR	Normal
MW-32	Sulfate	11	100.0%	0.860191	0.057911	NR	NR	Normal
MW-32	TDS @ 180 C	12	100.0%	0.820434	0.016148	0.800847	0.009579	Non-Parametric
MW-32	Uranium	12	100.0%	0.810809	0.012466	0.894382	0.134224	Log Normal
MW-32	Zinc	10	100.0%	0.932755	0.475534	NR	NR	Normal
MW-5	Ammonia	24	91.7%	0.957648	0.393019	NR	NR	Normal
MW-5	Chloride	118	100.0%	0.966222	0.004570	0.974306	0.023054	Non-Parametric
MW-5	Fluoride	30	100.0%	0.955553	0.237468	NR	NR	Normal
MW-5	**Iron**	**36**	**83.3%**	**0.763365**	**0.000015**	**0.898718**	**0.007815**	**Non Parametric**
MW-5	Manganese	29	100.0%	0.950075	0.183866	NR	NR	Normal
MW-5	**Nitrate+Nitrite as N**	**10**	**50.0%**	**0.869007**	**0.262427**	**0.769797**	**0.044931**	**Normal**
MW-5	pH	114	100.0%	0.964490	0.004040	0.961146	0.002188	Non-Parametric
MW-5	Sulfate	84	100.0%	0.938945	0.000605	0.905954	0.000014	Non-Parametric
MW-5	TDS @ 180 C	82	100.0%	0.949819	0.002907	0.968182	0.037414	Non-Parametric
MW-5	**Tetrahydrofuran**	**7**	**57.1%**	**0.933616**	**0.615809**	**NR**	**NR**	**Normal**
MW-5	**Uranium**	**96**	**74.0%**	**0.824647**	**0.000000**	**0.919542**	**0.000227**	**Non Parametric**
MW-5	**Zinc**	**26**	**57.7%**	**0.880434**	**0.048158**	**0.974701**	**0.920535**	**Log Normal**

Notes:

BOLD items are those where the percent detection is between 85 and 50%; only the detected values were used to determine the "w" and "p" Shapiro-Wilk values. Other values used the convention of substituting one-half the detection limit where results were non-detect.

NR - Not Run; the data set was determined to be normally distributed, therefore the log results were not necessary.

*Columns with no "w" or "p" values are for those wells and analytes with less than 8 samples obtained.

Red values indicate statistically significant "p" values, or those less than 0.05.

"blank" indicates that the statistics software did not return a value for "w" or "p" due to a lack of variation in the sample data.

Table 12
Geometric Mean and Geometric Standard Deviation of Analytes with Log Normal Distributions

Well	Constituent	Geometric Mean	Geometric Mean Standard Deviation
MW-1	Uranium	0.99	5.01
MW-1	Zinc	19.73	4.06
MW-11	Chloride	32.75	1.10
MW-12	Ammonia	0.13	2.44
MW-12	Manganese	273.01	4.83
MW-14	pH	6.90	1.04
MW-15	Ammonia	0.07	1.84
MW-15	Iron	20.72	1.77
MW-17	Manganese	140.93	3.75
MW-17	pH	7.17	1.05
MW-18	Chloride	39.11	1.39
MW-18	Iron	65.69	3.43
MW-19	Chloride	53.07	1.54
MW-19	Uranium	11.82	1.38
MW-2	Iron	28.16	2.51
MW-2	Selenium	3.94	3.90
MW-26	Iron	564.18	2.79
MW-26	Uranium	19.75	1.58
MW-3	Ammonia	0.26	2.82
MW-3	Iron	54.28	3.13
MW-3	Tetrahydrofuran	14.30	5.65
MW-3	Zinc	40.10	3.00
MW-32	Cadmium	1.54	2.25
MW-32	Cobalt	47.88	1.27
MW-32	Uranium	2.79	1.40
MW-5	Zinc	12.97	2.85

Table 13
Classification of inorganic constituents in ground water by observed frequency of detection.

Chloride	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32			
Fluoride	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32			
pH	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32		**Ubiquitous**	
Sulfate	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32			
TDS	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32			
Uranium	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32			
Ammonia	MW-1	MW-3	MW-5	MW-11	MW-12	MW-14	MW-15	MW-17	MW-18	MW-19	MW-26	MW-32				
Manganese	MW-1	MW-2	MW-3	MW-5	MW-11	MW-12	MW-14	MW-17	MW-18	MW-26	MW-32					
Iron	MW-1	MW-2	MW-3	MW-5	MW-15	MW-18	MW-26	MW-32								
Zinc	MW-1	MW-2	MW-3	MW-5	MW-14	MW-32									**Less Common**	
Nitrate	MW-3	MW-5	MW-15	MW-19	MW-26											
Gross Alpha	MW-2	MW-19	MW-16	MW-32												
Selenium	MW-2	MW-3	MW-15	MW-19												
Thallium	MW-3	MW-18	MW-19													
Cadmium	MW-3	MW-32														
Cobalt	MW-32															
Molybdenum	MW-32															
Nickel	MW-32															
Arsenic															**Rare, Generally**	
Beryllium															**Immobile in**	
Chromium															**Groundwater**	
Copper																
Lead																
Mercury																
Silver																
Tin																
Vanadium																

Constituents with corresponding wells listed in this table were detected at least 50% of the time

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-1	Ammonia	1/31/1980	1.9	mg/L	
MW-1	Arsenic	9/1/1981	16	ug/L	
MW-1	Arsenic	3/9/1989	15	ug/L	
MW-1	Beryllium	11/15/1989	10	ug/L	U
MW-1	Beryllium	3/24/1994	10	ug/L	U
MW-1	Beryllium	9/9/2002	10	ug/L	U
MW-1	Chloride	10/1/1980	30	mg/L	
MW-1	Chloride	9/1/1981	1	mg/L	
MW-1	Chloride	12/15/1985	53.2	mg/L	
MW-1	Chloride	6/26/1986	25	mg/L	
MW-1	Chloride	9/4/1986	2	mg/L	
MW-1	Chloride	6/28/1995	30	mg/L	
MW-1	Chromium	6/28/1985	60	ug/L	
MW-1	Copper	4/30/1980	20	ug/L	
MW-1	Copper	5/19/1980	20	ug/L	
MW-1	Copper	8/19/1980	30	ug/L	
MW-1	Copper	11/13/1980	9	ug/L	
MW-1	Copper	1/22/1981	20	ug/L	
MW-1	Copper	6/13/1984	5	ug/L	U
MW-1	Copper	6/28/1985	20	ug/L	U
MW-1	Copper	5/11/1999	3	ug/L	
MW-1	Copper	11/30/2000	12	ug/L	U
MW-1	Copper	9/9/2002	12	ug/L	U
MW-1	Gross Alpha	4/30/1980	27	pCi/L	
MW-1	Gross Alpha	12/10/1982	37.3	pCi/L	+/-11.1
MW-1	Lead	6/16/1980	120	ug/L	
MW-1	Molybdenum	4/30/1980	190	ug/L	
MW-1	Molybdenum	6/28/1985	100	ug/L	
MW-1	Nitrate+Nitrite as N	6/16/1980	0.067	mg/L	
MW-1	Nitrate+Nitrite as N	7/16/1980	0.125	mg/L	
MW-1	Selenium	7/23/1985	37	ug/L	
MW-1	Selenium	12/11/1995	30	ug/L	
MW-1	Selenium	11/30/2000	52	ug/L	
MW-1	Sulfate	12/15/1985	1080	mg/L	
MW-1	Sulfate	6/28/1995	1038	mg/L	
MW-1	Sulfate	9/9/2002	4410	mg/L	
MW-1	TDS @ 180 C	10/31/1979	627	mg/L	
MW-1	TDS @ 180 C	1/31/1980	882	mg/L	
MW-1	TDS @ 180 C	9/1/1981	246	mg/L	
MW-1	TDS @ 180 C	12/15/1985	4000	mg/L	
MW-1	TDS @ 180 C	12/14/1993	1692	mg/L	
MW-1	Uranium	1/31/1980	39.6	ug/L	
MW-1	Uranium	8/23/1988	107.46	ug/L	
MW-1	Uranium	8/18/1994	50.15	ug/L	
MW-1	Zinc	3/19/1981	26000	ug/L	
MW-1	Zinc	8/14/1981	450	ug/L	
MW-11	Ammonia	11/27/2000	0.05	mg/L	U
MW-11	Beryllium	11/17/1989	10	ug/L	U
MW-11	Beryllium	3/30/1994	10	ug/L	U
MW-11	Beryllium	9/10/2002	10	ug/L	U
MW-11	Cadmium	11/17/1989	5	ug/L	U

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-11	Cadmium	12/15/1989	7	ug/L	
MW-11	Cadmium	1/24/1990	7	ug/L	
MW-11	Cadmium	3/30/1994	5	ug/L	U
MW-11	Cadmium	11/6/2001	5	ug/L	U
MW-11	Cadmium	9/10/2002	5	ug/L	U
MW-11	Chloride	12/15/1985	71	mg/L	
MW-11	Chloride	6/26/1986	70	mg/L	
MW-11	Chloride	3/15/2007	0.031	mg/L	
MW-11	Copper	6/12/1984	5	ug/L	U
MW-11	Copper	6/28/1985	20	ug/L	U
MW-11	Copper	5/11/1999	3	ug/L	
MW-11	Copper	9/10/2002	12	ug/L	U
MW-11	Copper	3/30/2005	17	ug/L	
MW-11	Iron	5/24/1983	0.85	ug/L	
MW-11	Iron	5/24/1983	1.09	ug/L	
MW-11	Iron	9/10/2002	164	ug/L	
MW-11	Iron	3/30/2005	3190	ug/L	
MW-11	Iron	6/20/2006	127	ug/L	
MW-11	Lead	5/24/1983	20	ug/L	
MW-11	Lead	6/12/1984	5	ug/L	U
MW-11	Lead	9/10/2002	3	ug/L	U
MW-11	Lead	3/30/2005	29	ug/L	
MW-11	Lead	6/20/2006	1.5	ug/L	
MW-11	Molybdenum	6/28/1985	100	ug/L	
MW-11	Nitrate+Nitrite as N	5/11/1999	0.12	mg/L	
MW-11	Selenium	11/20/1987	20	ug/L	
MW-11	Selenium	11/2/1988	29	ug/L	
MW-11	Selenium	11/17/1989	20	ug/L	
MW-11	Silver	5/24/1983	0.01	ug/L	U
MW-11	Silver	5/11/1999	1	ug/L	U
MW-11	Silver	9/10/2002	2	ug/L	U
MW-11	Sulfate	2/15/1984	2250	mg/L	
MW-11	Sulfate	12/15/1985	79	mg/L	
MW-11	Sulfate	11/12/1992	1507	mg/L	
MW-11	TDS @ 180 C	12/15/1985	5100	mg/L	
MW-11	TDS @ 180 C	11/12/1992	2850	mg/L	
MW-11	Thallium	11/17/1989	10	ug/L	U
MW-11	Uranium	2/15/1984	11.12	ug/L	
MW-11	Uranium	2/15/1984	11	ug/L	
MW-11	Uranium	12/4/1984	6.33	ug/L	
MW-11	Uranium	9/27/1985	19.40	ug/L	
MW-11	Uranium	4/8/1986	10.30	ug/L	
MW-11	Uranium	9/15/1992	5.06	ug/L	
MW-11	Uranium	11/12/1992	4.75	ug/L	
MW-11	Uranium	3/14/2002	5.1	ug/L	
MW-11	Uranium	3/17/1992	4.03	ug/L	
MW-11	Zinc	6/28/1985	20	ug/L	
MW-11	Zinc	5/11/1999	5	ug/L	
MW-11	Zinc	9/10/2002	30	ug/L	U
MW-11	Zinc	3/30/2005	12	ug/L	

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-12	Ammonia	6/12/1984	1	mg/L	
MW-12	Arsenic	3/9/1989	36	ug/L	
MW-12	Arsenic	6/22/1989	21	ug/L	
MW-12	Beryllium	11/16/1989	10	ug/L	U
MW-12	Beryllium	2/28/1991	4	ug/L	
MW-12	Beryllium	3/30/1994	10	ug/L	U
MW-12	Beryllium	9/10/2002	10	ug/L	U
MW-12	Chloride	6/26/1986	150	mg/L	
MW-12	Chloride	2/18/1999	28.1	mg/L	
MW-12	Chloromethane	3/7/2006	6.2	ug/L	
MW-12	Copper	6/28/1985	20	ug/L	U
MW-12	Copper	5/12/1999	3	ug/L	
MW-12	Copper	9/10/2002	12	ug/L	U
MW-12	Gross Alpha	12/18/1989	62	pCi/L	
MW-12	Iron	9/10/2002	182	ug/L	
MW-12	Iron	6/22/2005	266	ug/L	
MW-12	Lead	6/12/1984	5	ug/L	U
MW-12	Lead	9/10/2002	3	ug/L	U
MW-12	Molybdenum	6/28/1985	100	ug/L	
MW-12	Nitrate+Nitrite as N	5/12/1999	0.15	mg/L	
MW-12	Sulfate	12/15/1985	7820	mg/L	
MW-12	TDS @ 180 C	12/15/1985	5100	mg/L	
MW-12	Thallium	11/16/1989	10	ug/L	U
MW-12	Uranium	2/15/1984	43	ug/L	
MW-12	Uranium	3/27/2006	0.3	ug/L	U
MW-12	Uranium	11/3/1988	177	ug/L	
MW-12	Uranium	12/8/1994	139.25	ug/L	
MW-12	Uranium	6/27/1995	45.52	ug/L	
MW-12	Uranium	9/19/1995	41.49	ug/L	
MW-12	Zinc	6/28/1985	89	ug/L	
MW-14	Beryllium	11/17/1989	10	ug/L	U
MW-14	Beryllium	3/4/1991	3	ug/L	
MW-14	Beryllium	3/30/1994	10	ug/L	U
MW-14	Beryllium	9/10/2002	10	ug/L	U
MW-14	Chloride	5/11/1999	8.9	mg/L	
MW-14	Chloride	5/11/1999	33.6	mg/L	
MW-14	Copper	5/11/1999	4	ug/L	U
MW-14	Copper	9/10/2002	12	ug/L	U
MW-14	Fluoride	5/11/1999	0.18	mg/L	
MW-14	Fluoride	9/10/2002	0.1	mg/L	
MW-14	Fluoride	10/25/2006	0.3	mg/L	
MW-14	Gross Alpha minus Rn & U	12/13/2005	1.3	pCi/L	
MW-14	Iron	5/11/1999	1110	ug/L	
MW-14	Iron	11/6/2001	50	ug/L	U
MW-14	Iron	9/10/2002	20	ug/L	U
MW-14	Iron	3/30/2005	83	ug/L	
MW-14	Lead	9/10/2002	3	ug/L	U
MW-14	Mercury	11/17/1989	0.2	ug/L	U
MW-14	Mercury	12/18/1989	0.2	ug/L	U
MW-14	Mercury	1/25/1990	0.2	ug/L	U

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-14	Mercury	5/11/1999	1	ug/L	U
MW-14	Mercury	11/28/2000	1	ug/L	U
MW-14	Mercury	11/6/2001	1	ug/L	U
MW-14	Mercury	9/10/2002	0.2	ug/L	U
MW-14	Mercury	9/10/2002	1	ug/L	U
MW-14	Nitrate+Nitrite as N	5/11/1999	0.25	mg/L	
MW-14	pH	11/28/2000	7.96	s.u.	
MW-14	pH	11/9/2001	6	s.u.	
MW-14	pH	9/10/2002	7.82	s.u.	
MW-14	pH	6/27/2003	8.21	s.u.	
MW-14	Silver	5/11/1999	1	ug/L	U
MW-14	Silver	9/10/2002	2	ug/L	U
MW-14	Sulfate	12/18/1989	1160	mg/L	
MW-14	Sulfate	5/8/1990	1160	mg/L	
MW-14	TDS @ 180 C	3/4/1991	2684	mg/L	
MW-14	Thallium	11/17/1989	10	ug/L	U
MW-14	Uranium	9/19/1995	150.75	ug/L	
MW-15	Beryllium	3/4/1991	4	ug/L	
MW-15	Beryllium	3/30/1994	10	ug/L	U
MW-15	Beryllium	9/10/2002	10	ug/L	U
MW-15	Chloromethane	10/25/2006	4	ug/L	
MW-15	Copper	5/11/1999	5	ug/L	
MW-15	Copper	9/10/2002	12	ug/L	U
MW-15	Lead	9/10/2002	3	ug/L	U
MW-15	Manganese	3/4/1991	950	ug/L	
MW-15	Molybdenum	11/1/1989	40	ug/L	
MW-15	Nitrate+Nitrite as N	6/23/2005	0.1	mg/L	U
MW-15	Nitrate+Nitrite as N	12/13/2005	1	mg/L	
MW-15	Nitrate+Nitrite as N	6/21/2006	0.1	mg/L	U
MW-15	Nitrate+Nitrite as N	10/25/2006	0.1	mg/L	
MW-15	pH	11/3/1998	5.88	s.u.	
MW-15	pH	9/10/2002	8.08	s.u.	
MW-15	pH	6/27/2003	8.34	s.u.	
MW-15	Silver	5/11/1999	1	ug/L	U
MW-15	Silver	9/10/2002	2	ug/L	U
MW-15	Sulfate	12/18/1989	1250	mg/L	
MW-15	Sulfate	5/9/1990	1260	mg/L	
MW-15	TDS @ 180 C	3/30/1994	3120	mg/L	
MW-15	TDS @ 180 C	9/10/2002	3170	mg/L	
MW-15	Uranium	6/27/1995	95.82	ug/L	
MW-15	Uranium	9/19/1995	116.42	ug/L	
MW-15	Zinc	5/11/1999	3	ug/L	
MW-15	Zinc	9/10/2002	30	ug/L	U
MW-17	Beryllium	3/24/1994	10	ug/L	U
MW-17	Beryllium	9/10/2002	10	ug/L	U
MW-17	Cadmium	3/24/1994	5	ug/L	U
MW-17	Cadmium	11/6/2001	5	ug/L	U
MW-17	Cadmium	9/10/2002	5	ug/L	U
MW-17	Chloride	9/17/1996	51	mg/L	
MW-17	Copper	5/12/1999	5	ug/L	

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-17	Copper	11/30/2000	12	ug/L	U
MW-17	Copper	9/10/2002	12	ug/L	U
MW-17	Iron	6/23/2006	140	ug/L	
MW-17	Lead	11/30/2000	3	ug/L	U
MW-17	Lead	9/10/2002	3	ug/L	U
MW-17	Nitrate+Nitrite as N	10/26/2006	0.2	mg/L	
MW-17	Nitrate+Nitrite as N	6/20/2007	0.3	mg/L	
MW-17	pH	3/24/1994	14	s.u.	
MW-17	Selenium	11/22/1996	20	ug/L	
MW-17	Selenium	11/30/2000	55	ug/L	
MW-17	Sulfate	3/24/1994	1400	mg/L	
MW-17	Sulfate	9/17/1996	662	mg/L	
MW-17	TDS @ 180 C	3/24/1994	2426	mg/L	
MW-17	TDS @ 180 C	3/24/1994	2460	mg/L	
MW-17	TDS @ 180 C	9/17/1996	1031	mg/L	
MW-17	Vanadium	5/12/1999	1	ug/L	U
MW-17	Vanadium	11/30/2000	30	ug/L	U
MW-17	Vanadium	9/10/2002	30	ug/L	U
MW-17	Zinc	11/30/2000	30	ug/L	U
MW-17	Zinc	9/10/2002	30	ug/L	U
MW-18	Beryllium	3/29/1994	10	ug/L	U
MW-18	Beryllium	9/9/2002	10	ug/L	U
MW-18	Cadmium	3/29/1994	5	ug/L	U
MW-18	Cadmium	11/6/2001	5	ug/L	U
MW-18	Cadmium	9/9/2002	5	ug/L	U
MW-18	Copper	5/12/1999	4	ug/L	
MW-18	Copper	12/1/2000	12	ug/L	U
MW-18	Lead	12/1/2000	3	ug/L	U
MW-18	Lead	9/9/2002	3	ug/L	U
MW-18	Manganese	12/1/2000	664	ug/L	
MW-19	Beryllium	3/31/1994	10	ug/L	U
MW-19	Beryllium	9/10/2002	10	ug/L	U
MW-19	Cadmium	3/31/1994	5	ug/L	U
MW-19	Cadmium	11/5/2001	5	ug/L	U
MW-19	Cadmium	9/10/2002	5	ug/L	U
MW-19	Chloromethane	11/5/2001	2.2	ug/L	
MW-19	Chloromethane	10/26/2006	3.9	ug/L	
MW-19	Copper	5/12/1999	5	ug/L	
MW-19	Copper	12/1/2000	12	ug/L	U
MW-19	Copper	9/10/2002	12	ug/L	U
MW-19	Gross Alpha	3/31/1994	52	pCi/L	
MW-19	Iron	12/1/2000	1650	ug/L	
MW-19	Lead	9/10/2002	3	ug/L	U
MW-19	Manganese	12/1/2000	239	ug/L	
MW-19	pH	3/31/1994	6.17	s.u.	
MW-19	Vanadium	5/12/1999	1	ug/L	U
MW-19	Vanadium	12/1/2000	30	ug/L	U
MW-19	Vanadium	9/10/2002	30	ug/L	U
MW-19	Zinc	12/1/2000	30	ug/L	U
MW-19	Zinc	9/10/2002	30	ug/L	U

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-2	Ammonia	1/31/1980	1.4	mg/L	
MW-2	Ammonia	12/28/1981	0.8	mg/L	
MW-2	Arsenic	7/23/1985	21	ug/L	
MW-2	Arsenic	3/9/1989	32	ug/L	
MW-2	Beryllium	11/16/1989	10	ug/L	U
MW-2	Beryllium	2/27/1991	4	ug/L	
MW-2	Beryllium	3/29/1994	10	ug/L	U
MW-2	Beryllium	9/10/2002	10	ug/L	U
MW-2	Chloride	5/4/1983	25	mg/L	
MW-2	Chloride	12/15/1985	70.9	mg/L	
MW-2	Chloromethane	6/21/2005	3.5	ug/L	
MW-2	Copper	6/28/1985	70	ug/L	
MW-2	Fluoride	9/1/1980	0.79	mg/L	
MW-2	Fluoride	8/11/1981	0.65	mg/L	
MW-2	Gross Alpha	11/16/1989	39	pCi/L	
MW-2	Gross Alpha	3/17/1992	67	pCi/L	
MW-2	Iron	1/31/1980	1460	ug/L	
MW-2	Iron	4/30/1980	750	ug/L	
MW-2	Iron	6/24/1981	430	ug/L	
MW-2	Iron	9/1/1981	680	ug/L	
MW-2	Iron	9/1/1981	910	ug/L	
MW-2	Lead	6/16/1980	230	ug/L	
MW-2	Lead	7/16/1980	160	ug/L	
MW-2	Manganese	6/24/1981	3640	ug/L	
MW-2	Molybdenum	4/30/1980	100	ug/L	
MW-2	Molybdenum	5/19/1980	50	ug/L	U
MW-2	Molybdenum	6/28/1985	100	ug/L	
MW-2	Nitrate+Nitrite as N	5/19/1980	0.35	mg/L	
MW-2	Nitrate+Nitrite as N	7/16/1980	0.525	mg/L	
MW-2	Sulfate	10/31/1979	240	mg/L	
MW-2	Sulfate	1/31/1980	630	mg/L	
MW-2	Sulfate	4/30/1980	650	mg/L	
MW-2	Sulfate	5/19/1980	1075	mg/L	
MW-2	Sulfate	9/1/1981	25	mg/L	
MW-2	TDS @ 180 C	10/31/1979	855	mg/L	
MW-2	TDS @ 180 C	1/31/1980	1060	mg/L	
MW-2	TDS @ 180 C	4/30/1980	1828	mg/L	
MW-2	TDS @ 180 C	5/19/1980	1983	mg/L	
MW-2	TDS @ 180 C	9/1/1981	207	mg/L	
MW-2	Uranium	9/1/1980	67	ug/L	
MW-2	Uranium	9/27/1985	37.31	ug/L	
MW-26	Arsenic	9/13/2002	1	ug/L	
MW-26	Beryllium	9/13/2002	10	ug/L	U
MW-26	Cadmium	9/13/2002	5	ug/L	U
MW-26	Fluoride	3/30/2005	0.9	mg/L	
MW-26	Mercury	9/13/2002	1	ug/L	U
MW-26	Molybdenum	3/30/2005	20	ug/L	U
MW-26	Molybdenum	6/21/2005	20	ug/L	U
MW-26	Nickel	9/13/2002	50	ug/L	U
MW-26	Nickel	3/30/2005	25	ug/L	

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-26	Selenium	3/30/2005	6	ug/L	
MW-26	Selenium	3/16/2007	10.8	ug/L	
MW-26	Selenium	9/13/2002	3	ug/L	
MW-26	Tetrahydrofuran	12/14/2005	55	ug/L	
MW-26	Thallium	3/30/2005	1	ug/L	U
MW-26	Thallium	6/21/2005	1	ug/L	U
MW-26	Uranium	5/22/2007	119	ug/L	
MW-26	Vanadium	3/30/2005	20	ug/L	U
MW-26	Vanadium	6/21/2005	20	ug/L	U
MW-26	Zinc	9/13/2002	36	ug/L	
MW-3	Ammonia	1/31/1980	2.6	mg/L	
MW-3	Arsenic	9/1/1981	19	ug/L	
MW-3	Arsenic	3/9/1989	46	ug/L	
MW-3	Arsenic	6/22/1989	33	ug/L	
MW-3	Beryllium	3/5/1991	6	ug/L	
MW-3	Beryllium	3/30/1994	10	ug/L	U
MW-3	Beryllium	9/12/2002	10	ug/L	U
MW-3	Cadmium	10/1/1980	40	ug/L	
MW-3	Chloride	10/31/1979	12.6	mg/L	
MW-3	Chloride	1/31/1980	25	mg/L	
MW-3	Chloride	4/30/1980	30	mg/L	
MW-3	Chloride	5/19/1980	50	mg/L	
MW-3	Chloride	6/16/1980	51	mg/L	
MW-3	Chloride	9/1/1981	3	mg/L	
MW-3	Chloride	9/30/1985	78	mg/L	
MW-3	Chloride	12/15/1985	35	mg/L	
MW-3	Chloride	6/26/1986	140	mg/L	
MW-3	Chloride	11/6/2001	82.5	mg/L	
MW-3	Copper	6/28/1985	60	ug/L	
MW-3	Fluoride	9/12/2002	1	mg/L	
MW-3	Gross Alpha	9/30/1993	180	pCi/L	
MW-3	Iron	1/31/1980	1280	ug/L	
MW-3	Iron	1/31/1980	3470	ug/L	
MW-3	Iron	4/30/1980	3500	ug/L	
MW-3	Iron	4/30/1980	4600	ug/L	
MW-3	Iron	5/19/1980	1190	ug/L	
MW-3	Iron	12/28/1981	1620	ug/L	
MW-3	Lead	7/16/1980	80	ug/L	
MW-3	Lead	10/1/1980	140	ug/L	
MW-3	Lead	3/18/1981	40	ug/L	
MW-3	Mercury	1/31/1980	5	ug/L	U
MW-3	Molybdenum	4/30/1980	90	ug/L	
MW-3	Molybdenum	5/19/1980	50	ug/L	U
MW-3	Molybdenum	6/28/1985	100	ug/L	
MW-3	Molybdenum	11/28/1989	300	ug/L	
MW-3	Selenium	11/20/1987	360	ug/L	
MW-3	Sulfate	9/1/1981	42	mg/L	
MW-3	TDS @ 180 C	10/31/1979	2102	mg/L	
MW-3	TDS @ 180 C	1/31/1980	2530	mg/L	
MW-3	TDS @ 180 C	4/30/1980	3254	mg/L	

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-3	TDS @ 180 C	7/16/1980	4024	mg/L	
MW-3	TDS @ 180 C	9/1/1981	256	mg/L	
MW-3	Thallium	5/11/1999	2	ug/L	U
MW-3	Uranium	9/30/1985	67.16	ug/L	
MW-3	Uranium	11/3/1988	219	ug/L	
MW-3	Uranium	12/16/1993	131.34	ug/L	
MW-3	Uranium	9/20/1995	103.13	ug/L	
MW-3	Vanadium	6/16/1980	210	ug/L	
MW-3	Zinc	10/31/1979	820	ug/L	
MW-3	Zinc	6/16/1980	440	ug/L	
MW-3	Zinc	3/18/1981	297000	ug/L	
MW-3	Zinc	8/18/1981	441	ug/L	
MW-32	Arsenic	9/13/2002	2	ug/L	
MW-32	Beryllium	9/13/2002	10	ug/L	U
MW-32	Beryllium	3/30/2005	2.6	ug/L	
MW-32	Cadmium	3/30/2005	23.8	ug/L	
MW-32	Chromium	9/13/2002	50	ug/L	U
MW-32	Chromium	3/30/2005	50	ug/L	U
MW-32	Chromium	9/22/2005	20	ug/L	U
MW-32	Copper	3/30/2005	51	ug/L	
MW-32	Gross Alpha minus Rn & U	3/16/2007	16.8	pCi/L	
MW-32	Lead	3/30/2005	16	ug/L	
MW-32	Lead	1/25/2006	1.8	ug/L	
MW-32	Lead	4/25/2006	1.2	ug/L	
MW-32	Mercury	9/13/2002	1	ug/L	U
MW-32	Molybdenum	3/30/2005	20	ug/L	U
MW-32	Nickel	5/22/2007	127	ug/L	
MW-32	Selenium	9/13/2002	4	ug/L	
MW-32	Thallium	3/30/2005	1	ug/L	U
MW-32	Vanadium	3/30/2005	20	ug/L	U
MW-32	Vanadium	9/22/2005	20	ug/L	U
MW-32	Zinc	3/30/2005	594	ug/L	
MW-5	Arsenic	3/9/1989	19	ug/L	
MW-5	Beryllium	11/16/1989	10	ug/L	U
MW-5	Beryllium	2/28/1991	3	ug/L	
MW-5	Beryllium	3/30/1994	10	ug/L	U
MW-5	Beryllium	9/10/2002	10	ug/L	U
MW-5	Chloride	9/1/1981	4	mg/L	
MW-5	Chloride	12/28/1981	20	mg/L	
MW-5	Chloride	6/26/1986	130	mg/L	
MW-5	Lead	5/19/1980	130	ug/L	
MW-5	Lead	6/16/1980	180	ug/L	
MW-5	Lead	7/16/1980	70	ug/L	
MW-5	Manganese	6/18/1981	10	ug/L	U
MW-5	Manganese	9/1/1981	10	ug/L	
MW-5	Manganese	5/12/1999	3	ug/L	
MW-5	Mercury	5/12/1999	2	ug/L	
MW-5	Molybdenum	6/28/1985	100	ug/L	
MW-5	Nitrate+Nitrite as N	7/16/1980	0.91	mg/L	
MW-5	Nitrate+Nitrite as N	1/26/1982	0.98	mg/L	

Table 14
Extremes Excluded from Analysis

Well	Constituent	Date	Results	Units	Qualifier
MW-5	Selenium	11/20/1987	18	ug/L	
MW-5	Selenium	11/4/1988	26	ug/L	
MW-5	Selenium	6/6/1996	46	ug/L	
MW-5	Silver	5/24/1983	0.01	ug/L	U
MW-5	Silver	5/12/1999	1	ug/L	U
MW-5	Silver	9/10/2002	2	ug/L	U
MW-5	Sulfate	9/1/1981	28	mg/L	
MW-5	Sulfate	12/15/1985	7820	mg/L	
MW-5	Sulfate	6/26/1986	1890	mg/L	
MW-5	TDS @ 180 C	9/1/1981	229	mg/L	
MW-5	TDS @ 180 C	12/15/1985	6600	mg/L	
MW-5	TDS @ 180 C	6/26/1986	3210	mg/L	
MW-5	Tetrahydrofuran	6/21/2005	4.4	ug/L	
MW-5	Thallium	11/16/1989	10	ug/L	U
MW-5	Uranium	9/1/1980	8	ug/L	
MW-5	Uranium	10/1/1980	8	ug/L	
MW-5	Uranium	1/22/1981	13	ug/L	
MW-5	Uranium	3/17/1981	30	ug/L	
MW-5	Uranium	4/21/1981	26	ug/L	
MW-5	Uranium	6/18/1981	14	ug/L	
MW-5	Uranium	5/19/1980	8	ug/L	
MW-5	Uranium	6/16/1980	8	ug/L	
MW-5	Uranium	7/16/1980	8	ug/L	
MW-5	Uranium	8/19/1980	10	ug/L	
MW-5	Uranium	6/18/1981	12	ug/L	
MW-5	Uranium	9/27/1985	7.46	ug/L	
MW-5	Uranium	4/8/1986	10.30	ug/L	
MW-5	Uranium	3/15/1995	48.51	ug/L	
MW-5	Uranium	12/8/1995	27	ug/L	
MW-5	Uranium	2/18/1999	19	ug/L	
MW-5	Uranium	9/15/1992	6.06	ug/L	
MW-5	Zinc	6/16/1980	250	ug/L	
MW-5	Zinc	3/17/1981	54000	ug/L	
MW-5	Zinc	8/18/1981	449	ug/L	

Table 15. Summary of the measured concentrations of several constituents in tailings impoundment solutions from Table 5 of the Statement of Basis for the White Mesa Mill (UDEQ, 2004)

Contaminant	State GWQS mg/L	1979 IUC Bench-top Estimate[1] (mg/L)	1980 NRC Generic EIS Estimate[2] (mg/L)	September, 1980-March, 2003 IUC/NRC Tailings Wastewater Samples[3]					
				Reported Concentrations					Avg/ GWQS Ratio
				Min. (mg/L)	Max. (mg/L)	Average (mg/L)	Std. Dev. (mg/L)	Sample Count	
Nitrate (N)	10			24	24	24		1	2.4
Chloride	N/A	3,050	300	2,110	8,000	4,608.44	2,372.39	16	
Fluoride	4	1.4	5	0.02	4,440	1,694.70	1,449.21	13	423.7
Sulfate	N/A	82,200	30,000	29,800	190,000	64,913.90	48,361.60	17	
Arsenic	0.05	52	0.2	0.3	440	149	148.18	22	2,981
Beryllium	0.004			0.347	1	0.50	0.13	15	125.6
Chromium	0.1	6		1	13	6.20	3.38	17	61.7
Iron	11	N/A	1,000	1080	3,400	2,211.9	887.56	16	201.1
Lead	0.015	1	0.7	0.21	6.0	3.0	1.26	14	198.1
Manganese	0.8	4,580	500	74	222	145.8	34.76	18	182.3
Molybdenum	0.04	7	100	0.44	240	52.8	71.17	18	1,320.30
Nickel	0.1	N/A	N/A	7.2	370	82.6	115.40	17	826.1
Selenium	0.05	0.56	20	0.18	2	1.4	0.67	18	27.0
Urnaium	0.03	2.5		5.0	154	93.6	41.20	17	3,120.60
Gross Alpha	15	250,000		14,000	189,000	120,493	50,345.10	15	8,032.9

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-1	**Nutrients (mg/L)**																	
	Ammonia	25	30	86.7%	Non Parametric			0.48	None			1.24		6.25	6.25	6.25	No	Permit GWCL
	Nitrate+Nitrite as N	10	9	0.0%	Not Tested							0.05		2.5	2.5	2.5	No	Permit GWCL
	Heavy Metals (ug/L)																	
	Arsenic	50	65	27.7%	Not Tested			-2.13	Downward			7		12.5	12.5	12.5	No	Permit GWCL
	Beryllium	4	15	6.7%	Not Tested			-1.37	None			1	0.9	1	1	1	No	Permit GWCL
	Cadmium	5	38	31.6%	Not Tested			-3.22	Downward			13		1.25	13	13	Yes	Highest Historical Value
	Chromium	100	35	17.1%	Not Tested			0.779	None			50		25	50	50	No	Highest Historical Value
	Cobalt	730	4	0.0%	Not Tested							5		182.5	182.5	182.5	No	Permit GWCL
	Copper	1300	22	22.7%	Not Tested			0	None			10		325	325	325	No	Permit GWCL
	Iron	11000	40	93.1%	Non Parametric			2.07	Upward			2110		2750	TBD	2750	No	Permit GWCL
	Lead	15	24	4.2%	Not Tested			-4.17	Downward			20	5.59	3.75	20	20	Yes	Highest Historical Value
	Manganese	800	37	100.0%	Non Parametric			1.17	None			289		200	289	289	No	Highest Historical Value
	Mercury	2	32	0.0%	Not Tested							0.5		0.5	0.5	0.5	No	Permit GWCL
	Molybdenum	40	19	36.8%	Not Tested			0.699	None			10		10	10	10	No	Permit GWCL
	Nickel	100	40	17.5%	Not Tested			0.801	None			25		25	25	25	No	Permit GWCL
	Selenium	50	63	25.4%	Not Tested			-0.539	None			9		12.5	12.5	12.5	No	Permit GWCL
	Silver	100	15	20.0%	Not Tested			1.64	None			5		25	25	25	No	Permit GWCL
	Thallium	2	7	0.0%	Not Tested							0.5		0.5	0.5	0.5	No	Permit GWCL
	Tin	17000	2	0.0%	Not Tested							50		4250	4250	4250	No	Permit GWCL
	Uranium	30	77	75.3%	Log Normal	0.215	Downward	-4.45	Downward	2.70	2.29			7.5	7.28	7.28	No	Cohen's Mean + 2σ
	Vanadium	60	23	0.0%	Not Tested							50		15	15	15	No	Permit GWCL
	Zinc	5000	29	62.1%	Log Normal	0.155	Downward	-2.77	Downward	78.80	85.90			1250	250.60	250.60	No	Cohen's Mean + 2σ
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	3	0.0%	Not Tested							0.5		3.75	3.75	3.75	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	7	0.0%	Not Tested							20		175	175	175	No	Permit GWCL
	Benzene	5	12	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	2-Butanone (MEK)	4000	12	0.0%	Not Tested							20		1000	1000	1000	No	Permit GWCL
	Carbon Tetrachloride	5	12	0.0%	Not Tested							1		1.25	1	1.25	No	Permit GWCL
	Chloroform	70	11	0.0%	Not Tested							1		17.5	1	17.5	No	Permit GWCL
	Chloromethane	30	12	50.0%	Normal	0.153	None					3.5		7.5	3.5	7.5	No	Permit GWCL
	Dichloromethane	5	12	0.0%	Not Tested							1		1.25	1	1.25	No	Permit GWCL
	Naphthalene	100	12	0.0%	Not Tested							1		25	1	25	No	Permit GWCL
	Tetrahydrofuran	46	11	81.8%	Normal	0.281	None	0	None	31.19	31.61			11.5	94.41	94.41	Yes	Cohen's Mean + 2σ
	Toluene	1000	12	0.0%	Not Tested							1		250	1	250	No	Permit GWCL
	Xylenes (total)	10000	7	0.0%	Not Tested							1		2.5	1	2.5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		86	100.0%	Non Parametric			-0.1	None			22.1			22.1	22.1		Highest Historical Value
	Fluoride (mg/L)	4	28	100.0%	Normal	0.002	None			0.33	0.11			1	0.56	0.56	No	Mean + 2σ
	pH (s.u.)		87	100.0%	Normal	0.009	None			7.51	0.37			6.5-8.5	6.77	<6.77		Mean - 2σ
	Sulfate (mg/L)		82	100.0%	Non Parametric			4.47	Upward			838			TBD	838		Highest Historical Value
	TDS @ 180 C (mg/L)		77	100.0%	Non Parametric			2.34	Upward			1567			TBD	1567		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-2	**Nutrients (mg/L)**																	
	Ammonia	25	23	47.8%	Not Tested			-2.03	Downward			0.42		12.5	12.5	12.5	No	Permit GWCL
	Nitrate+Nitrite as N	10	9	22.2%	Not Tested				None			0.12		5	0.12	0.12	No	Highest Historical Value
	Heavy Metals (ug/L)																	
	Arsenic	50	61	39.3%	Not Tested			-2.12	Downward			16		25	25	25	No	Permit GWCL
	Beryllium	4	14	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	37	40.5%	Not Tested			-3.9	Downward			17		2.5	17	17	Yes	Highest Historical Value
	Chromium	100	34	17.6%	Not Tested			1	None			30		50	50	50	No	Permit GWCL
	Cobalt	730	4	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	29	48.3%	Not Tested			-1.43	None			40		650	650	650	No	Permit GWCL
	Iron	11000	32	65.6%	Log Normal	0.109	None	-0.75	None	14.80	68.40			5500	151.60	151.60	No	Cohen's Mean + 2σ
	Lead	15	21	9.5%	Not Tested			-3.32	Downward			20	5	7.5	20	20	Yes	Highest Historical Value
	Manganese	800	32	81.3%	Normal	0.376	Downward	-3.9	Downward	29.22	174.77			400	378.76	378.76	No	Cohen's Mean + 2σ
	Mercury	2	30	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Molybdenum	40	18	38.9%	Not Tested			0.289	None			20		20	20	20	No	Permit GWCL
	Nickel	100	39	25.6%	Not Tested			0.88	None			60		50	60	60	No	Highest Historical Value
	Selenium	50	63	66.7%	Log Normal	0.014	None	-0.26	None	3.20	11.70			25	26.60	25.00	No	Permit GWCL
	Silver	100	15	20.0%	Not Tested			1.68	Upward			5		50	TBD	50	No	Permit GWCL
	Thallium	2	7	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Tin	17000	2	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	73	100.0%	Normal	0.012	None			9.45	4.50			15	18.45	18.45	No	Mean + 2σ
	Vanadium	60	22	0.0%	Not Tested							50		30	30	30	No	Permit GWCL
	Zinc	5000	30	80.0%	Non Parametric			-3.79	Downward			530		2500	2500	2500	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	4	50.0%	Normal					0.60	1.30			7.5	3.2	3.2	No	Cohen's Mean + 2σ
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	4	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	9	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	9	0.0%	Not Tested							1		35	35	35	No	Permit GWCL
	Chloromethane	30	8	12.5%	Not Tested			0.662	None			2.1		15	15	15	No	Permit GWCL
	Dichloromethane	5	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Naphthalene	100	9	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	5	20.0%	Not Tested							19		23	23	23	No	Permit GWCL
	Toluene	1000	9	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	4	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		88	98.9%	Non Parametric			-3.07	Downward			20			20	20		Highest Historical Value
	Fluoride (mg/L)	4	26	100.0%	Normal	0.059	None			0.32	0.06			2	0.43	0.43	No	Mean + 2σ
	pH (s.u.)		85	100.0%	Non Parametric			-0.26	None			8.11		6.5-8.5	6.5-8.5	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		81	100.0%	Non Parametric			2.19	Upward			2147			TBD	2147		Highest Historical Value
	TDS @ 180 C (mg/L)		78	100.0%	Non Parametric			3.79	Upward			3800			TBD	3800		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-3	**Nutrients (mg/L)**																	
	Ammonia	25	29	89.7%	Log Normal	0.130	None			0.40	0.38			12.5	1.16	1.16	No	Mean + 2σ
	Nitrate+Nitrite as N	10	17	94.1%	Normal	0.151	None			0.29	0.22			5	0.73	0.73	No	Mean + 2σ
	Heavy Metals (ug/L)																	
	Arsenic	50	65	35.4%	Not Tested			-1.9	None			12		25	25	25	No	Permit GWCL
	Beryllium	4	16	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	39	66.7%	Non Parametric			-4.03	Downward			20		2.5	20	20	Yes	Highest Historical Value
	Chromium	100	37	21.6%	Not Tested			1	None			47		50	50	50	No	Permit GWCL
	Cobalt	730	6	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	31	48.4%	Not Tested			-2.22	Downward			40		650	650	650	No	Permit GWCL
	Iron	11000	33	78.8%	Log Normal	0.059	None	-0.89	None	22.93	202.10			5500	427.13	427.13	No	Cohen's Mean + 2σ
	Lead	15	23	8.7%	Not Tested			-3.75	Downward			20	4.8	7.5	20	20	Yes	Highest Historical Value
	Manganese	800	38	100.0%	Normal	0.232	Downward			1908.63	1162.20			400	4233.03	4233.03	Yes	Mean + 2σ
	Mercury	2	33	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Molybdenum	40	19	10.5%	Not Tested			1.43	None			10		20	20	20	No	Permit GWCL
	Nickel	100	42	42.9%	Not Tested			0.225	None			100		50	100	100	No	Highest Historical Value
	Selenium	50	66	60.6%	Non Parametric			4.8	Upward			37		25	TBD	37	No	Highest Historical Value
	Silver	100	16	12.5%	Not Tested			2.25	Upward			5		50	TBD	50	No	Permit GWCL
	Thallium	2	9	77.8%	Non Parametric				None			1.6		1	1.6	1.6	No	Highest Historical Value
	Tin	17000	3	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	75	98.7%	Normal	0.236	Upward			23.54	11.89	67.16		15	TBD	67.16	Yes	Highest Historical Value
	Vanadium	60	24	0.0%	Not Tested							50		30	30	30	No	Permit GWCL
	Zinc	5000	29	86.2%	Log Normal	0.308	Downward			62.69	55.25			2500	173.19	173.19	No	Mean + 2σ
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	6	16.7%	Not Tested							1		7.5	1	1	No	Highest Historical Value
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	6	0.0%	Not Tested							20		350	20	350	No	Permit GWCL
	Benzene	5	11	0.0%	Not Tested							1		2.5	1	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested							1		2.5	1	2.5	No	Permit GWCL
	Chloroform	70	11	0.0%	Not Tested							1		35	1	35	No	Permit GWCL
	Chloromethane	30	11	45.5%	Not Tested			0.689	None			5.2		15	5.2	15	No	Permit GWCL
	Dichloromethane	5	11	0.0%	Not Tested							1		2.5	1	2.5	No	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested							1		50	1	50	No	Permit GWCL
	Tetrahydrofuran	46	7	85.7%	Log Normal	0.772	Downward			33.93	44.81			23	123.55	123.55	Yes	Mean + 2σ
	Toluene	1000	11	0.0%	Not Tested							1		500	1	500	No	Permit GWCL
	Xylenes (total)	10000	6	0.0%	Not Tested							1		5	1	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		82	100.0%	Non Parametric			-2.48	Downward			76			76	76		Highest Historical Value
	Fluoride (mg/L)	4	29	100.0%	Normal	0.070	None			0.44	0.12			2	0.68	0.68	No	Mean + 2σ
	pH (s.u.)		88	100.0%	Non Parametric			-2.94	Downward			7.84		6.5-8.5	6.5-8.5	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		84	100.0%	Non Parametric			2.06	Upward			3663			TBD	3663		Highest Historical Value
	TDS @ 180 C (mg/L)		79	100.0%	Non Parametric			3.57	Upward			6186			TBD	6186		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-5	**Nutrients (mg/L)**																	
	Ammonia	25	24	91.7%	Normal	0.019	None			0.51	0.26			6.25	1.02	1.02	No	Mean + 2σ
	Nitrate+Nitrite as N	10	10	50.0%	Non Parametric							0.3		2.5	0.3	0.3	No	Highest Historical Value
	Heavy Metals (ug/L)																	
	Arsenic	50	63	44.4%	Not Tested			-1.75	Downward			17		12.5	17	17	No	Highest Historical Value
	Beryllium	4	14	7.1%	Not Tested			-1.18	None			0.5	0.8	1	1	1	No	Permit GWCL
	Cadmium	5	40	40.0%	Not Tested			-4.49	Downward			17		1.25	17	17	Yes	Highest Historical Value
	Chromium	100	34	2.9%	Not Tested			1.66	Upward			50	15	25	TBD	25	No	Permit GWCL
	Cobalt	730	5	0.0%	Not Tested							5		182.5	182.5	182.5	No	Permit GWCL
	Copper	1300	29	44.8%	Not Tested			-1	None			30		325	325	325	No	Permit GWCL
	Iron	11000	36	84.6%	Non Parametric			1.76	Upward			417		2750	TBD	2750	No	Permit GWCL
	Lead	15	19	5.3%	Not Tested			-3.93	Downward			10	4.1	3.75	10	10	No	Highest Historical Value
	Manganese	800	29	100.0%	Normal	0.009	None			271.66	52.54			200	376.74	376.74	No	Mean + 2σ
	Mercury	2	32	3.1%	Not Tested			-0.504	None			0.5	1	0.5	0.5	0.5	No	Permit GWCL
	Molybdenum	40	20	15.0%	Not Tested			0.614	None			5		10	10	10	No	Permit GWCL
	Nickel	100	74	9.5%	Not Tested			3.46	Upward			40	44.1	25	TBD	44.1	No	Poisson Limit
	Selenium	50	57	26.3%	Not Tested			0.2	None			6		12.5	12.5	12.5	No	Permit GWCL
	Silver	100	10	0.0%	Not Tested							5		25	25	25	No	Permit GWCL
	Thallium	2	8	0.0%	Not Tested							0.5		0.5	0.5	0.5	No	Permit GWCL
	Tin	17000	2	0.0%	Not Tested							50		4250	4250	4250	No	Permit GWCL
	Uranium	30	96	74.0%	Non Parametric			-2.33	Downward			4.7		7.5	7.5	7.5	No	Permit GWCL
	Vanadium	60	24	0.0%	Not Tested							25		15	15	15	No	Permit GWCL
	Zinc	5000	26	57.7%	Log Normal	0.297	Downward	-3.21	Downward	3.56	41.91			1250	87.38	87.38	No	Cohen's Mean + 2σ
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	4	0.0%	Not Tested							0.5		3.75	3.75	3.75	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	6	0.0%	Not Tested							20		175	175	175	No	Permit GWCL
	Benzene	5	11	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		1000	1000	1000	No	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	Chloroform	70	15	0.0%	Not Tested							5		17.5	17.5	17.5	No	Permit GWCL
	Chloromethane	30	11	45.5%	Not Tested			1.29	None			3.2		7.5	7.5	7.5	No	Permit GWCL
	Dichloromethane	5	15	0.0%	Not Tested							5		1.25	5	1.25	No	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested							1		25	25	25	No	Permit GWCL
	Tetrahydrofuran	46	7	57.1%	Normal	0.224	None			1.51	10.26			11.5	22.03	22.03	No	Cohen's Mean + 2σ
	Toluene	1000	11	0.0%	Not Tested							1		250	250	250	No	Permit GWCL
	Xylenes (total)	10000	6	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		118	100.0%	Non Parametric			-3.1	Downward			71			71	71		Highest Historical Value
	Fluoride (mg/L)	4	30	100.0%	Normal	0.136	Upward			0.88	0.27	1.68		1	TBD	1.68	No	Highest Historical Value
	pH (s.u.)		114	100.0%	Non Parametric			0.41	None			8.65		6.5-8.5	6.5-8.5	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		84	100.0%	Non Parametric			-4.19	Downward			1518			1518	1518		Highest Historical Value
	TDS @ 180 C (mg/L)		83	100.0%	Non Parametric			-4.72	Downward			2575			2575	2575		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-11	**Nutrients (mg/L)**																	
	Ammonia	25	20	95.0%	Non Parametric			2.66	Upward			1		6.25	TBD	6.25	No	Permit GWCL
	Nitrate+Nitrite as N	10	12	0.0%	Not Tested							0.05		2.5	2.5	2.5	No	Permit GWCL
	Heavy Metals (ug/L)																	
	Arsenic	50	49	32.7%	Not Tested			0.843	None			15		12.5	15	15	No	Highest Historical Value
	Beryllium	4	19	5.3%	Not Tested			-1.9	Downward			2	1	1	2	2	No	Highest Historical Value
	Cadmium	5	19	15.8%	Not Tested			-0.834	None			1		1.25	1.25	1.25	No	Permit GWCL
	Chromium	100	19	0.0%	Not Tested							25		25	25	25	No	Permit GWCL
	Cobalt	730	9	0.0%	Not Tested							5		182.5	182.5	182.5	No	Permit GWCL
	Copper	1300	11	0.0%	Not Tested							5		325	325	325	No	Permit GWCL
	Iron	11000	18	16.7%	Not Tested			-1.82	Downward			34		2750	2750	2750	No	Permit GWCL
	Lead	15	18	0.0%	Not Tested							0.5		3.75	3.75	3.75	No	Permit GWCL
	Manganese	800	16	100.0%	Normal	0.512	Upward			87.75	21.77	130		200	TBD	200	No	Permit GWCL
	Mercury	2	18	0.0%	Not Tested							0.5		0.5	0.5	0.5	No	Permit GWCL
	Molybdenum	40	23	21.7%	Not Tested			2.23	Upward			10		10	TBD	10	No	Permit GWCL
	Nickel	100	68	4.4%	Not Tested			1.57	None			50	46.2	25	50	50	No	Highest Historical Value
	Selenium	50	43	23.3%	Not Tested			3.28	Upward			5		12.5	TBD	12.5	No	Permit GWCL
	Silver	100	11	0.0%	Not Tested							5		25	25	25	No	Permit GWCL
	Thallium	2	11	0.0%	Not Tested							0.5		0.5	0.5	0.5	No	Permit GWCL
	Tin	17000	4	0.0%	Not Tested							50		4250	4250	4250	No	Permit GWCL
	Uranium	30	86	76.7%	Non Parametric			0.56	None			4		7.5	7.5	7.5	No	Permit GWCL
	Vanadium	60	14	0.0%	Not Tested							15		15	15	15	No	Permit GWCL
	Zinc	5000	11	0.0%	Not Tested							5		1250	1250	1250	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	9	0.0%	Not Tested							0.5		3.75	3.75	3.75	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	9	0.0%	Not Tested							20		175	175	175	No	Permit GWCL
	Benzene	5	14	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		1000	1000	1000	No	Permit GWCL
	Carbon Tetrachloride	5	13	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	Chloroform	70	15	0.0%	Not Tested							5		17.5	17.5	17.5	No	Permit GWCL
	Chloromethane	30	14	42.9%	Not Tested			0.306	None			5.8		7.5	7.5	7.5	No	Permit GWCL
	Dichloromethane	5	14	0.0%	Not Tested							1		1.25	1.25	1.25	No	Permit GWCL
	Naphthalene	100	14	0.0%	Not Tested							1		25	25	25	No	Permit GWCL
	Tetrahydrofuran	46	9	0.0%	Not Tested							10		11.5	11.5	11.5	No	Permit GWCL
	Toluene	1000	12	0.0%	Not Tested							1		250	250	250	No	Permit GWCL
	Xylenes (total)	10000	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		104	100.0%	Log Normal	0.034	None			32.90	3.13				39.16	39.16		Mean + 2σ
	Fluoride (mg/L)	4	14	100.0%	Non Parametric			1.57	None			0.7		1	1	1	No	Permit GWCL
	pH (s.u.)		96	100.0%	Non Parametric			0.7	None			9		6.5-8.5	6.5-8.5	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		71	100.0%	Non Parametric			5.95	Upward			1309			TBD	1309		Highest Historical Value
	TDS @ 180 C (mg/L)		71	100.0%	Non Parametric			5.92	Upward			2528			TBD	2528		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-12	**Nutrients (mg/L)**																	
	Ammonia	25	14	85.7%	Log Normal	0.273	None			0.19	0.20			12.5	0.60	0.60	No	Mean + 2σ
	Nitrate+Nitrite as N	10	7	14.3%	Not Tested							0.12		5	0.12	0.12	No	Highest Historical Value
	Heavy Metals (ug/L)																	
	Arsenic	50	43	39.5%	Not Tested			0.128	None			9		25	25	25	No	Permit GWCL
	Beryllium	4	14	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	23	21.7%	Not Tested			-0.998	None			7		2.5	7	7	Yes	Highest Historical Value
	Chromium	100	14	0.0%	Not Tested							25		50	50	50	No	Permit GWCL
	Cobalt	730	5	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	8	0.0%	Not Tested							5		650	650	650	No	Permit GWCL
	Iron	11000	7	42.9%	Not Tested							50		5500	5500	5500	No	Permit GWCL
	Lead	15	7	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Manganese	800	16	100.0%	Log Normal	0.991	Downward			631.56	728.62			400	2088.80	2088.80	Yes	Mean + 2σ
	Mercury	2	14	7.1%	Not Tested			0.814	None			3	0.82	1	3	3	Yes	Highest Historical Value
	Molybdenum	40	19	36.8%	Not Tested			-0.218	None			20		20	20	20	No	Permit GWCL
	Nickel	100	62	17.7%	Not Tested			1.84	Upward			60		50	TBD	60	No	Highest Historical Value
	Selenium	50	43	46.5%	Not Tested			3.46	Upward			23.8		25	TBD	25	No	Permit GWCL
	Silver	100	11	0.0%	Not Tested							5		50	50	50	No	Permit GWCL
	Thallium	2	8	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Tin	17000	3	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	85	100.0%	Non Parametric			5.08	Upward			23.5		15	TBD	23.5	No	Highest Historical Value
	Vanadium	60	10	0.0%	Not Tested							15		30	30	30	No	Permit GWCL
	Zinc	5000	11	27.3%	Not Tested			-1.83	Downward			40		2500	2500	2500	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	3	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	6	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	11	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	15	0.0%	Not Tested							5		35	35	35	No	Permit GWCL
	Chloromethane	30	9	22.2%	Not Tested			0	None			2		15	15	15	No	Permit GWCL
	Dichloromethane	5	15	0.0%	Not Tested							5		2.5	5	2.5	No	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	8	75.0%	Normal	0.004	None			8.60	16.79			23	42.18	42.18	No	Cohen's Mean + 2σ
	Toluene	1000	11	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	6	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		94	100.0%	Non Parametric			-5.02	Downward			80.5			80.5	80.5		Highest Historical Value
	Fluoride (mg/L)	4	8	100.0%	Non Parametric				None			0.4		2	2	2	No	Permit GWCL
	pH (s.u.)		87	100.0%	Non Parametric			0.32	None			8.22		6.5-8.5	6.5-8.5	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		65	100.0%	Non Parametric			-4.31	Downward			2560			2560	2560		Highest Historical Value
	TDS @ 180 C (mg/L)		62	100.0%	Non Parametric			-3.56	Downward			4323			4323	4323		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-14	**Nutrients (mg/L)**																	
	Ammonia	25	17	82.4%	Normal	0.017	Upward	1.16	None	0.04	0.17	0.36		12.5	TBD	12.5	No	Permit GWCL
	Nitrate+Nitrite as N	10	12	0.0%	Not Tested							0.05		5	5	5	No	Permit GWCL
	Heavy Metals (ug/L)																	
	Arsenic	50	37	13.5%	Not Tested			3.56	Upward			3		25	TBD	25	No	Permit GWCL
	Beryllium	4	18	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	24	45.8%	Not Tested			-0.653	None			2.5		2.5	2.5	2.5	No	Permit GWCL
	Chromium	100	17	0.0%	Not Tested							25		50	50	50	No	Permit GWCL
	Cobalt	730	9	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	12	0.0%	Not Tested							6		650	650	650	No	Permit GWCL
	Iron	11000	9	0.0%	Not Tested							15		5500	5500	5500	No	Permit GWCL
	Lead	15	10	10.0%	Not Tested				None			1		7.5	7.5	7.5	No	Permit GWCL
	Manganese	800	31	100.0%	Normal	0.091	None			1919.03	155.64			400	2230.30	2230.30	Yes	Mean + 2σ
	Mercury	2	9	0.0%	Not Tested							0.25		1	1	1	No	Permit GWCL
	Molybdenum	40	22	36.4%	Not Tested			0.524	None			25		20	25	25	No	Highest Historical Value
	Nickel	100	69	23.2%	Not Tested			1.7	Upward			50		50	TBD	50	No	Permit GWCL
	Selenium	50	34	29.4%	Not Tested			3.29	Upward			14		25	TBD	25	No	Permit GWCL
	Silver	100	12	0.0%	Not Tested							5		50	50	50	No	Permit GWCL
	Thallium	2	12	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Tin	17000	4	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	92	100.0%	Non Parametric			4.65	Upward			98		15	TBD	98	Yes	Highest Historical Value
	Vanadium	60	14	0.0%	Not Tested							15		30	30	30	No	Permit GWCL
	Zinc	5000	14	71.4%	Normal	0.017	None	-0.34		9.74	12.65			2500	35.04	2500	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	7	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	9	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	14	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	14	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	14	0.0%	Not Tested							1		35	35	35	No	Permit GWCL
	Chloromethane	30	13	30.8%	Not Tested			0.453	None			5.4		15	15	15	No	Permit GWCL
	Dichloromethane	5	14	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Naphthalene	100	14	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	9	0.0%	Not Tested							10		23	23	23	No	Permit GWCL
	Toluene	1000	14	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	9	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		80	100.0%	Non Parametric			-1.2	None			27			27	27		Highest Historical Value
	Fluoride (mg/L)	4	11	100.0%	N/A	NA	None			0.20	0.00			2	0.2	0.2	No	Mean + 2σ
	pH (s.u.)		65	100.0%	Log Normal	0.076	Upward			6.90	0.30	7.75		6.5-8.5	TBD	6.5-8.5		Permit GWCL
	Sulfate (mg/L)		50	100.0%	Non Parametric			-0.64	None			2330			2330	2330		Highest Historical Value
	TDS @ 180 C (mg/L)		51	100.0%	Non Parametric			0.2	None			4062			4062	4062		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-15	**Nutrients (mg/L)**																	
	Ammonia	25	13	76.9%	Log Normal	0.115	None	-1.13	None	0.01	0.10			12.5	0.21	12.5	No	Permit GWCL
	Nitrate+Nitrite as N	10	4	100.0%	Normal					0.17	0.05			5	0.27	0.27	No	Mean + 2σ
	Heavy Metals (ug/L)																	
	Arsenic	50	33	24.2%	Not Tested			0.607	None			6		25	25	25	No	Permit GWCL
	Beryllium	4	14	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	20	0.0%	Not Tested							2.5		2.5	2.5	2.5	No	Permit GWCL
	Chromium	100	12	8.3%	Not Tested			1.59	None			25	7.6	50	50	50	No	Permit GWCL
	Cobalt	730	5	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	7	0.0%	Not Tested							5		650	650	650	No	Permit GWCL
	Iron	11000	8	50.0%	Log Normal	0.121	None			2.58	39.56			5500	81.7	5500	No	Permit GWCL
	Lead	15	6	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Manganese	800	9	44.4%	Not Tested			-0.695	None			138		400	400	400	No	Permit GWCL
	Mercury	2	12	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Molybdenum	40	18	38.9%	Not Tested			-0.326	None			30		20	30	30	No	Highest Historical Value
	Nickel	100	70	24.3%	Not Tested			2.23	Upward			97		50	TBD	97	No	Highest Historical Value
	Selenium	50	35	80.0%	Normal	0.667	Upward	5.31	Upward	20.02	54.35	117		25	TBD	128.72	Yes	Cohen's Mean + 2σ
	Silver	100	7	0.0%	Not Tested							5		50	50	50	No	Permit GWCL
	Thallium	2	7	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Tin	17000	2	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	73	100.0%	Non Parametric			4.03	Upward			65.67		15	TBD	65.67	Yes	Highest Historical Value
	Vanadium	60	11	27.3%	Not Tested			-0.496	None			40		30	40	40	No	Highest Historical Value
	Zinc	5000	7	0.0%	Not Tested							5		2500	2500	2500	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	4	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	4	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	9	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	9	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	13	0.0%	Not Tested							5		35	35	35	No	Permit GWCL
	Chloromethane	30	7	28.6%	Not Tested			0	None			1.4		15	15	15	No	Permit GWCL
	Dichloromethane	5	14	0.0%	Not Tested							5		2.5	5	2.5	No	Permit GWCL
	Naphthalene	100	9	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	4	0.0%	Not Tested							10		23	23	23	No	Permit GWCL
	Toluene	1000	9	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	4	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		80	100.0%	Non Parametric			0.14	None			57.1			57.1	57.1		Highest Historical Value
	Fluoride (mg/L)	4	8	100.0%	Non Parametric			0.13	None			0.3		2	2	2	No	Permit GWCL
	pH (s.u.)		61	100.0%	Normal	0.000	None			7.09	0.24			6.5-8.5	6.62	<6.62		Mean - 2σ
	Sulfate (mg/L)		46	100.0%	Normal	0.002	None			2273.13	137.94				2549.02	2549.02		Mean + 2σ
	TDS @ 180 C (mg/L)		47	100.0%	Non Parametric			-0.27	None			4530			4530	4530		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-17	**Nutrients (mg/L)**																	
	Ammonia	25	10	90.0%	Normal	0.032	None			0.12	0.07			12.5	0.26	0.26	No	Mean + 2σ
	Nitrate+Nitrite as N	10	7	14.3%	Not Tested							0.1		5	0.1	0.1	No	Highest Historical Value
	Heavy Metals (ug/L)																	
	Arsenic	50	19	10.5%	Not Tested			2.32	Upward			9		25	TBD	25	No	Permit GWCL
	Beryllium	4	13	0.0%	Not Tested							0.5		2	2	2	No	Permit GWCL
	Cadmium	5	13	15.4%	Not Tested			-0.128	None			0.96		2.5	2.5	2.5	No	Permit GWCL
	Chromium	100	11	0.0%	Not Tested							25		50	50	50	No	Permit GWCL
	Cobalt	730	6	0.0%	Not Tested							5		362	362	362	No	Permit GWCL
	Copper	1300	8	0.0%	Not Tested							5		650	650	650	No	Permit GWCL
	Iron	11000	9	22.2%	Not Tested				None			25		5500	5500	5500	No	Permit GWCL
	Lead	15	7	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Manganese	800	11	100.0%	Log Normal	0.464	Downward			287.73	313.83			400	915.39	915.39	Yes	Mean + 2σ
	Mercury	2	11	0.0%	Not Tested							0.5		1	1	1	No	Permit GWCL
	Molybdenum	40	14	21.4%	Not Tested			3.54	Upward			5		20	TBD	20	No	Permit GWCL
	Nickel	100	52	9.6%	Not Tested			0.91	None			25	38.1	50	50	50	No	Permit GWCL
	Selenium	50	17	29.4%	Not Tested			3.18	Upward			9		25	TBD	25	No	Permit GWCL
	Silver	100	11	0.0%	Not Tested							5		50	50	50	No	Permit GWCL
	Thallium	2	9	11.1%	Not Tested				None			0.51		1	1	1	No	Permit GWCL
	Tin	17000	3	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	51	100.0%	Normal	0.110	Upward			29.90	8.38	46.8		15	TBD	46.8	Yes	Highest Historical Value
	Vanadium	60	6	0.0%	Not Tested							7.5		30	30	30	No	Permit GWCL
	Zinc	5000	9	22.2%	Not Tested				None			10		2500	2500	2500	No	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	4	25.0%	Not Tested							2.8		7.5	2.8	2.8	No	Highest Historical Value
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	5	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	10	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	10	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	10	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	11	0.0%	Not Tested							1		35	35	35	No	Permit GWCL
	Chloromethane	30	9	44.4%	Not Tested			1.27	None			3.7		15	15	15	No	Permit GWCL
	Dichloromethane	5	10	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Naphthalene	100	10	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	6	0.0%	Not Tested							10		23	23	23	No	Permit GWCL
	Toluene	1000	10	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	5	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		55	100.0%	Non Parametric			-1.8	Downward			46.8			46.8	46.8		Highest Historical Value
	Fluoride (mg/L)	4	9	100.0%	Non Parametric				None			0.4		2	2	2	No	Permit GWCL
	pH (s.u.)		45	100.0%	Log Normal	0.058	None			7.18	0.39			6.5-8.5	6.40	<6.40		Mean - 2σ
	Sulfate (mg/L)		23	100.0%	Non Parametric			2.17	Upward			2860			TBD	2860		Highest Historical Value
	TDS @ 180 C (mg/L)		22	100.0%	Normal	0.374	Downward			4444.36	320.53				5085.42	5085.42		Mean + 2σ

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-18	**Nutrients (mg/L)**																	
	Ammonia	25	8	87.5%	Normal	0.261	None			0.13	0.07			6.25	0.27	0.27	No	Mean + 2σ
	Nitrate+Nitrite as N	10	7	0.0%	Not Tested							0.05		2.5	2.5	2.5	No	GWCL for Class III Water
	Heavy Metals (ug/L)																	
	Arsenic	50	15	0.0%	Not Tested							2.5		12.5	12.5	25	No	GWCL for Class III Water
	Beryllium	4	11	0.0%	Not Tested							0.5		1	1	2	No	GWCL for Class III Water
	Cadmium	5	11	9.1%	Not Tested			0	None			0.5	0.66	1.25	1.25	2.5	No	GWCL for Class III Water
	Chromium	100	9	11.1%	Not Tested			0.997	None			25		25	25	50	No	GWCL for Class III Water
	Cobalt	730	4	0.0%	Not Tested							5		182.5	182.5	365	No	GWCL for Class III Water
	Copper	1300	7	0.0%	Not Tested							6		325	325	650	No	GWCL for Class III Water
	Iron	11000	8	100.0%	Log Normal	0.004	None			121.89	146.40			2750	414.68	414.68	No	Mean + 2σ
	Lead	15	5	0.0%	Not Tested							0.5		3.75	3.75	7.5	No	GWCL for Class III Water
	Manganese	800	8	100.0%	Non Parametric			-1.99	Downward			350		200	350	350	No	Highest Historical Value
	Mercury	2	9	0.0%	Not Tested							0.5		0.5	0.5	1	No	GWCL for Class III Water
	Molybdenum	40	12	16.7%	Not Tested			1.92	Upward			5		10	TBD	20	No	GWCL for Class III Water
	Nickel	100	15	13.3%	Not Tested			2.18	Upward			25		25	TBD	50	No	GWCL for Class III Water
	Selenium	50	15	40.0%	Not Tested			1.35	None			11		12.5	12.5	25	No	GWCL for Class III Water
	Silver	100	9	0.0%	Not Tested							5		25	25	50	No	GWCL for Class III Water
	Thallium	2	9	66.7%	Normal	0.587	Upward	NA	None	1.05	0.45	1.85		0.5	TBD	1.95	No	Cohen's Mean + 2σ
	Tin	17000	2	0.0%	Not Tested							50		4250	4250	8500	No	GWCL for Class III Water
	Uranium	30	18	100.0%	Normal	0.894	Upward			24.99	15.05	46.9		7.5	TBD	55.1	Yes	Mean + 2σ
	Vanadium	60	7	0.0%	Not Tested							15		15	15	30	No	GWCL for Class III Water
	Zinc	5000	9	11.1%	Not Tested			-1.52	None			17		1250	1250	2500	No	GWCL for Class III Water
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	3	0.0%	Not Tested							0.5		3.75	3.75	7.5	No	GWCL for Class III Water
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	3	0.0%	Not Tested							20		175	175	350	No	GWCL for Class III Water
	Benzene	5	8	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	2-Butanone (MEK)	4000	8	0.0%	Not Tested							20		1000	1000	2000	No	GWCL for Class III Water
	Carbon Tetrachloride	5	8	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	Chloroform	70	8	0.0%	Not Tested							1		17.5	17.5	35	No	GWCL for Class III Water
	Chloromethane	30	8	25.0%	Not Tested			0.503	None			2.5		7.5	7.5	15	No	GWCL for Class III Water
	Dichloromethane	5	8	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	Naphthalene	100	8	0.0%	Not Tested							1		25	25	50	No	GWCL for Class III Water
	Tetrahydrofuran	46	3	0.0%	Not Tested							10		11.5	11.5	23	No	GWCL for Class III Water
	Toluene	1000	7	0.0%	Not Tested							1		250	250	500	No	GWCL for Class III Water
	Xylenes (total)	10000	3	0.0%	Not Tested							1		2.5	2.5	5	No	GWCL for Class III Water
	Other																	
	Chloride (mg/L)		19	100.0%	Log Normal	0.063	None			41.18	14.02				69.23	69.23		Mean + 2σ
	Fluoride (mg/L)	4	7	100.0%	Normal					0.30	0.08			1	0.45	0.45	No	Mean + 2σ
	pH (s.u.)		15	100.0%	Normal	0.057	None			7.12	0.43			6.5-8.5	6.25	<6.25		Mean - 2σ
	Sulfate (mg/L)		19	100.0%	Normal	0.492	Upward			1478.16	230.36	1940			TBD	1940		Highest Historical Value
	TDS @ 180 C (mg/L)		18	100.0%	Normal	0.184	None			2604.61	297.08				3198.77	3198.77		Mean + 2σ

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-19	**Nutrients (mg/L)**																	
	Ammonia	25	10	60.0%	Normal	0.515	Upward	2.06	Upward	0.01	0.15	0.25		6.25	TBD	12.5	No	GWCL for Class III Water
	Nitrate+Nitrite as N	10	9	100.0%	Normal	0.159	None			2.13	0.35			2.5	2.83	2.83	No	Mean + 2σ
	Heavy Metals (ug/L)																	
	Arsenic	50	17	0.0%	Not Tested							2.5		12.5	12.5	25	No	GWCL for Class III Water
	Beryllium	4	13	0.0%	Not Tested							0.5		1	1	2	No	GWCL for Class III Water
	Cadmium	5	13	7.7%	Not Tested			-0.066	None			0.5	0.72	1.25	1.25	2.5	No	GWCL for Class III Water
	Chromium	100	11	9.1%	Not Tested			0.947	None			25	7.5	25	25	50	No	GWCL for Class III Water
	Cobalt	730	6	0.0%	Not Tested							5		182.5	182.5	365	No	GWCL for Class III Water
	Copper	1300	8	0.0%	Not Tested							5		325	325	650	No	GWCL for Class III Water
	Iron	11000	9	33.3%	Not Tested				None			120		2750	2750	5500	No	GWCL for Class III Water
	Lead	15	7	0.0%	Not Tested							0.5		3.75	3.75	7.5	No	GWCL for Class III Water
	Manganese	800	10	40.0%	Not Tested			1.65	None			61		200	200	400	No	GWCL for Class III Water
	Mercury	2	11	0.0%	Not Tested							0.5		0.5	0.5	1	No	GWCL for Class III Water
	Molybdenum	40	14	42.9%	Not Tested			2.71	Upward			7		10	TBD	20	No	GWCL for Class III Water
	Nickel	100	17	11.8%	Not Tested			2.42	Upward			25		25	TBD	50	No	GWCL for Class III Water
	Selenium	50	18	77.8%	Normal	0.367	Upward	1.14	None	1.76	13.60	22		12.5	TBD	28.96	No	Cohen's Mean + 2σ
	Silver	100	11	0.0%	Not Tested							5		25	25	50	No	GWCL for Class III Water
	Thallium	2	10	50.0%	Normal	0.001	None	NA	None	0.79	0.68			0.5	2.15	2.15	Yes	Cohen's Mean + 2σ
	Tin	17000	3	0.0%	Not Tested							50		4250	4250	8500	No	GWCL for Class III Water
	Uranium	30	19	100.0%	Log Normal	0.000	None			12.47	4.48			7.5	21.43	21.43	No	Mean + 2σ
	Vanadium	60	6	0.0%	Not Tested							7.5		15	15	30	No	GWCL for Class III Water
	Zinc	5000	9	11.1%	Not Tested				None			10		1250	1250	2500	No	GWCL for Class III Water
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	4	50.0%	Normal					0.90	0.73			3.75	2.36	2.36	No	Cohen's Mean + 2σ
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	5	0.0%	Not Tested							20		175	175	350	No	GWCL for Class III Water
	Benzene	5	10	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	2-Butanone (MEK)	4000	10	0.0%	Not Tested							20		1000	1000	2000	No	GWCL for Class III Water
	Carbon Tetrachloride	5	10	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	Chloroform	70	10	0.0%	Not Tested							1		17.5	17.5	35	No	GWCL for Class III Water
	Chloromethane	30	7	0.0%	Not Tested							1		7.5	7.5	15	No	GWCL for Class III Water
	Dichloromethane	5	10	0.0%	Not Tested							1		1.25	1.25	2.5	No	GWCL for Class III Water
	Naphthalene	100	10	0.0%	Not Tested							1		25	25	50	No	GWCL for Class III Water
	Tetrahydrofuran	46	5	0.0%	Not Tested							10		11.5	11.5	23	No	GWCL for Class III Water
	Toluene	1000	10	0.0%	Not Tested							1		250	250	500	No	GWCL for Class III Water
	Xylenes (total)	10000	5	0.0%	Not Tested							1		2.5	2.5	5	No	GWCL for Class III Water
	Other																	
	Chloride (mg/L)		22	100.0%	Log Normal	0.208	Downward			57.74	23.34				104.41	104.41		Mean + 2σ
	Fluoride (mg/L)	4	12	100.0%	Normal	0.573	Upward			1.05	0.17	1.4		1	TBD	1.4	No	Highest Historical Value
	pH (s.u.)		15	100.0%	Normal	0.007	None			7.51	0.36			6.5-8.5	6.78	<6.78		Mean - 2σ
	Sulfate (mg/L)		21	100.0%	Normal	0.255	Downward			1386.19	573.95				2534.10	2534.10		Mean + 2σ
	TDS @ 180 C (mg/L)		22	100.0%	Normal	0.259	Downward			2457.14	900.14				4257.42	4257.42		Mean + 2σ

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-26	**Nutrients (mg/L)**																	
	Ammonia	25	11	100.0%	Normal	0.496	Downward			0.54	0.19			12.5	0.92	NA	NA	Mean + 2σ
	Nitrate+Nitrite as N	10	10	70.0%	Normal	0.551	Upward	NA	Upward	0.06	0.28	0.5		5	0.623	NA	NA	Permit GWCL
	Heavy Metals (ug/L)																	
	Arsenic	50	10	0.0%	Not Tested							2.5		25	25	NA	NA	Permit GWCL
	Beryllium	4	10	0.0%	Not Tested							0.25		2	2	NA	NA	Permit GWCL
	Cadmium	5	10	0.0%	Not Tested							0.25		2.5	2.5	NA	NA	Permit GWCL
	Chromium	100	11	0.0%	Not Tested							25		50	50	NA	NA	Permit GWCL
	Cobalt	730	10	0.0%	Not Tested							5		362	362	NA	NA	Permit GWCL
	Copper	1300	11	0.0%	Not Tested							5		650	650	NA	NA	Permit GWCL
	Iron	11000	10	100.0%	Log Normal	0.353	None			864.70	905.56			5500	2675.83	NA	NA	Mean + 2σ
	Lead	15	10	0.0%	Not Tested							0.5		7.5	7.5	NA	NA	Permit GWCL
	Manganese	800	27	100.0%	Non Parametric			0.33	None			1610		400	1610	NA	NA	Highest Historical Value
	Mercury	2	10	0.0%	Not Tested							0.25		1	1	NA	NA	Permit GWCL
	Molybdenum	40	8	0.0%	Not Tested							5		20	20	NA	NA	Permit GWCL
	Nickel	100	9	0.0%	Not Tested							10		50	50	NA	NA	Permit GWCL
	Selenium	50	8	12.5%	Not Tested				None			5		25	25	NA	NA	Permit GWCL
	Silver	100	11	0.0%	Not Tested							5		50	50	NA	NA	Permit GWCL
	Thallium	2	8	0.0%	Not Tested							0.25		1	1	NA	NA	Permit GWCL
	Tin	17000	5	0.0%	Not Tested							50		8500	8500	NA	NA	Permit GWCL
	Uranium	30	25	100.0%	Log Normal	0.377	Upward			21.83	10.01	44.2		15	TBD	NA	NA	Mean + 2σ
	Vanadium	60	8	0.0%	Not Tested							7.5		30	30	NA	NA	Permit GWCL
	Zinc	5000	10	0.0%	Not Tested							5		2500	2500	NA	NA	Permit GWCL
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	10	100.0%	Normal					3.10	0.80			7.5	4.69	NA	NA	Mean + 2σ
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	25	4.0%	Not Tested			-2.6	Downward				51.08	350	350	NA	NA	Permit GWCL
	Benzene	5	26	3.8%	Not Tested			-1.07	None				4.75	2.5	4.75	NA	NA	Poisson Limit
	2-Butanone (MEK)	4000	26	3.8%	Not Tested			-2.35	Downward				51.08	2000	2000	NA	NA	Permit GWCL
	Carbon Tetrachloride	5	26	3.8%	Not Tested			-1.07	None				4.75	2.5	4.75	NA	NA	Poisson Limit
	Chloroform	70	24	100.0%	Normal	0.453	Upward			1003.44	559.57	2400		35	TBD	NA	NA	
	Chloromethane	30	26	30.8%	Not Tested			-1.49	None			6.6		15	6.6	NA	NA	Highest Historical Value
	Dichloromethane	5	26	88.5%	Log Normal	0.385	Upward			13.46	10.75	37		2.5	TBD	NA	NA	
	Naphthalene	100	26	3.8%	Not Tested			-1.07	None				4.75	50	50	NA	NA	Permit GWCL
	Tetrahydrofuran	46	23	4.3%	Not Tested			-1.07	None				5.79	23	23	NA	NA	Permit GWCL
	Toluene	1000	26	3.8%	Not Tested			-1.07	None				4.75	500	500	NA	NA	Permit GWCL
	Xylenes (total)	10000	24	4.2%	Not Tested			-2.06	Downward				5.93	5	5.93	NA	NA	Poisson Limit
	Other																	
	Chloride (mg/L)		11	100.0%	Normal	0.023	None			53.18	2.56				58.31	NA	NA	Mean + 2σ
	Fluoride (mg/L)	4	10	100.0%	Non Parametric				None			0.4		2	2	NA	NA	Permit GWCL
	pH (s.u.)		10	100.0%	Normal	0.665	Downward			7.28	0.27			6.5-8.5	6.74	NA	NA	Mean - 2σ
	Sulfate (mg/L)		11	100.0%	Normal	0.288	None			1892.73	94.67				2082.06	NA	NA	Mean + 2σ
	TDS @ 180 C (mg/L)		12	100.0%	Normal	0.205	None			3155.00	64.60				3284.19	NA	NA	Mean + 2σ

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

Well	Constituent	GWQS	N	% Detect	Distribution[1]	(r^2)	Regression Trend[2]	Z-Score	Mann-Kendall Trend[3]	Mean	Standard Deviation (σ)	Highest Observed Value	Poisson Limit	Original Permit GWCL	Flow Sheet GWCL	Proposed GWCL[4,5]	Proposed GWCL Exceeds GWQS	Comment
MW-32	**Nutrients (mg/L)**																	
	Ammonia	25	11	100.0%	Normal	0.442	Downward			0.96	0.10			12.5	1.17	1.17	No	Mean + 2σ
	Nitrate+Nitrite as N	10	10	10.0%	Not Tested				None			0.1		5	0.1	0.1	No	Highest Historical Value
	Heavy Metals (ug/L)																	
	Arsenic	50	10	0.0%	Not Tested							2.5		25	25	25	No	Permit GWCL
	Beryllium	4	17	0.0%	Not Tested							0.25		2	2	2	No	Permit GWCL
	Cadmium	5	26	84.6%	Log Normal	0.006	None	-1.21	None	0.40	2.16			2.5	4.72	4.72	No	Cohen's Mean + 2σ
	Chromium	100	8	0.0%	Not Tested							12.5		50	50	50	No	Permit GWCL
	Cobalt	730	10	100.0%	Log Normal	0.286	None			49.20	13.00			362	75.21	75.21	No	Mean + 2σ
	Copper	1300	10	0.0%	Not Tested							5		650	650	650	No	Permit GWCL
	Iron	11000	26	100.0%	Normal	0.426	Downward			8393.08	2833.94			5500	14060.96	14060.96	Yes	Mean + 2σ
	Lead	15	15	0.0%	Not Tested							0.5		7.5	7.5	7.5	No	Permit GWCL
	Manganese	800	27	100.0%	Normal	0.609	Upward			4727.78	433.58	5470		400	TBD	5594.95	Yes	Mean + 2σ
	Mercury	2	10	0.0%	Not Tested							0.25		1	1	1	No	Permit GWCL
	Molybdenum	40	9	88.9%	Non Parametric				None			14		20	20	20	No	Permit GWCL
	Nickel	100	27	96.3%	Non Parametric			0.38	None			94		50	94	94	No	Highest Historical Value
	Selenium	50	10	0.0%	Not Tested							2.5		25	25	25	No	Permit GWCL
	Silver	100	11	0.0%	Not Tested							5		50	50	50	No	Permit GWCL
	Thallium	2	9	0.0%	Not Tested							0.25		1	1	1	No	Permit GWCL
	Tin	17000	5	0.0%	Not Tested							50		8500	8500	8500	No	Permit GWCL
	Uranium	30	12	100.0%	Log Normal	0.146	None			2.96	1.15			15	5.26	5.26	No	Mean + 2σ
	Vanadium	60	8	0.0%	Not Tested							7.5		30	30	30	No	Permit GWCL
	Zinc	5000	10	100.0%	Normal	0.459	Downward			139.10	45.45			2500	230.00	230.00	No	Mean + 2σ
	Radiologics (pCi/L)																	
	Gross Alpha minus Rn & U	15	8	100.0%	Normal					2.00	0.66			7.5	3.33	3.33	No	Mean + 2σ
	Volatile Organic Compounds (ug/L)																	
	Acetone	700	10	0.0%	Not Tested							20		350	350	350	No	Permit GWCL
	Benzene	5	11	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	2-Butanone (MEK)	4000	11	0.0%	Not Tested							20		2000	2000	2000	No	Permit GWCL
	Carbon Tetrachloride	5	11	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Chloroform	70	10	0.0%	Not Tested							1		35	35	35	No	Permit GWCL
	Chloromethane	30	10	40.0%	Not Tested			0	None			3.6		15	15	15	No	Permit GWCL
	Dichloromethane	5	11	0.0%	Not Tested							1		2.5	2.5	2.5	No	Permit GWCL
	Naphthalene	100	11	0.0%	Not Tested							1		50	50	50	No	Permit GWCL
	Tetrahydrofuran	46	10	0.0%	Not Tested							10		23	23	23	No	Permit GWCL
	Toluene	1000	11	0.0%	Not Tested							1		500	500	500	No	Permit GWCL
	Xylenes (total)	10000	10	0.0%	Not Tested							1		5	5	5	No	Permit GWCL
	Other																	
	Chloride (mg/L)		11	100.0%	Normal	0.084	None			32.65	1.37				35.39	35.39		Mean + 2σ
	Fluoride (mg/L)	4	11	100.0%	Non Parametric			0	None			0.3		2	2	2	No	Permit GWCL
	pH (s.u.)		8	100.0%	Normal	0.456	None			6.89	0.25			6.5-8.5	6.40	<6.40		Mean - 2σ
	Sulfate (mg/L)		11	100.0%	Normal	0.788	Upward			2340.00	108.35	2460			TBD	2556.7		Mean + 2σ
	TDS @ 180 C (mg/L)		12	100.0%	Non Parametric			3.26	Upward			3960			TBD	3960		Highest Historical Value

Table 16
Proposed GWCL Calculations Based on UDEQ Approved Flow Sheet

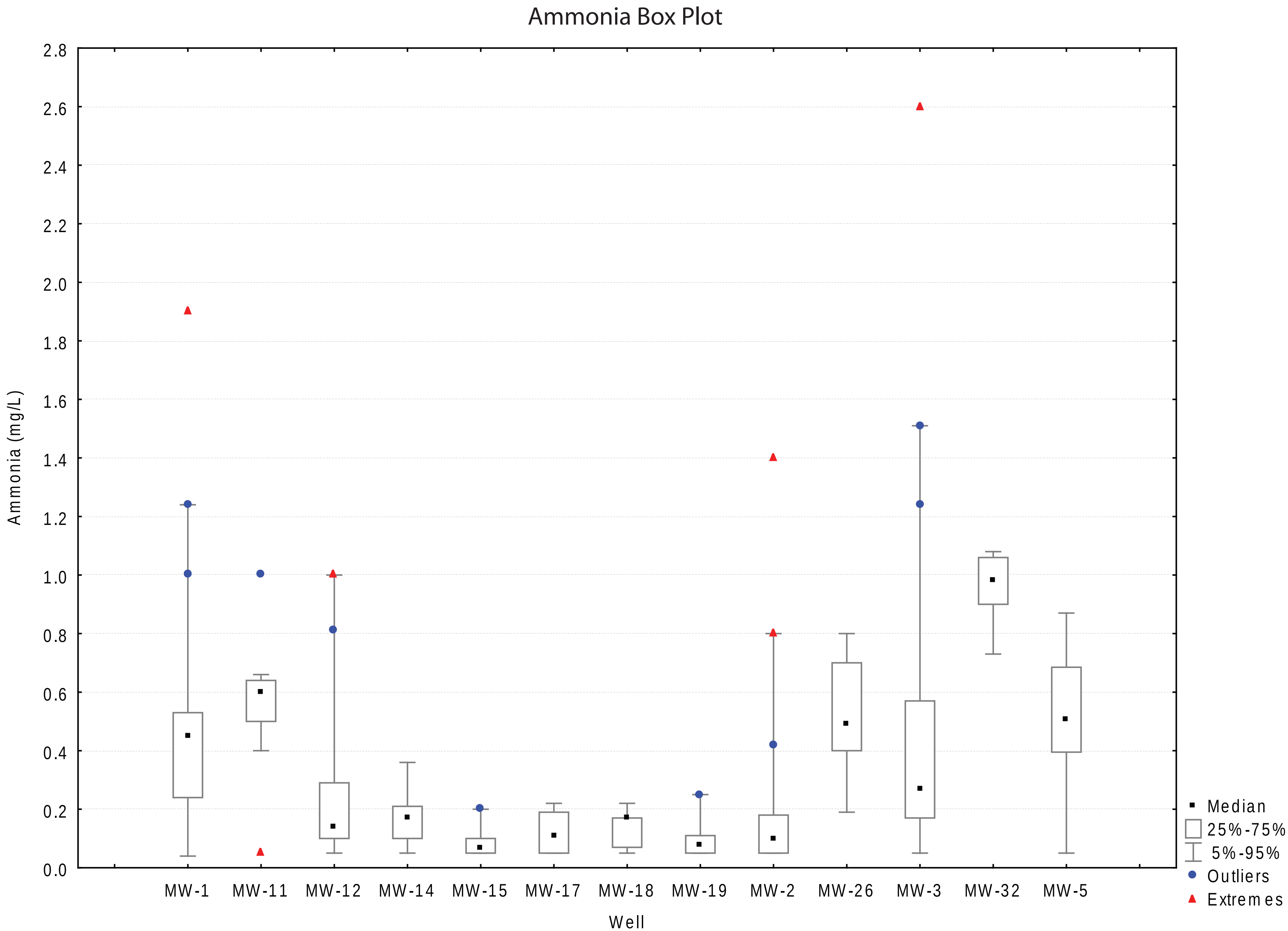
NOTES FOR TABLE 16:

1 = The Shapiro-Wilk Distribution test was performed on data with % Detect > 50%, for % Detect > 85% 1/2 the detection limit was substituted for non-detected values, for % Detect > 50% and < 85% the test was done on detected values only
2 = A regression test was performed on data that was determined to have either a normal or log-normal distribution and % Detect > 50%. 1/2 of the detection limit was used for non-detected values
3 = The Mann-Kendall test was performed on data with either a non-parametric distribution or with % Detect < 50%, it was not performed on constituents where N < 8
4 = MW-18 and MW-19 were determined to contain Class III water due to high TDS values and the GWCLs were updated to reflect this change
5 = No GWCLs have been proposed for MW-26 because it is a pumping well under the chloroform investigation (see Section 7.3.1)

GWQS = Ground Water Quality Standard
N = Number of occurrences in the database
% Detect = The percent at which a constituent was detected in a given well
Distribution = Distribution as determined by the Shapiro-Wilk distribution test for constituents with % Detect > 50%
r^2 = The measure of how well the trendline fits the data for regression analysis, where r^2 = 1 represents a perfect fit
Regression Trend = The result of the linear regression test analysis using 1/2 of the detection limit for values reported as "not detected"
Z-Score = The value for the Mann-Kendall test that indicates the direction and significance of the trend where z > 1.65 indicates a significant upward trend and z < -1.65 indicates a significant downward trend at the 95% confidence interval
Mann-Kendall Trend = The result of the Mann-Kendall test for non-parametric distributions and for % Detect < 50%
Mean = The arithmetic mean as determined for normally or log-normally distributed constituents with % Detect > 85%
Standard Deviation = The standard deviation as determined for normally or log-normally distributed constituents with % Detect > 85%
Explanation of Mean = The method used to calculate the mean and standard deviation
Highest Observed Value = The highest observed value for constituents with % Detect < 50%
Poisson Limit = The calculated highest value for constituents with % Detect < 10% and assuming a Poisson distribution
Permit GWCL = The Groundwater Compliance Limit as defined in Permit No. UGW370004
Flow Sheet GWCL = The Groundwater Compliance Limit as determined by the Flow Sheet for calculating the GWCL based on the % Detect
Proposed GWCL = The proposed Groundwater Compliance Limit
Cohen's Mean = The mean as determined by Cohen's adjustment for non-detected values for constituents with 50 to 85% Detects

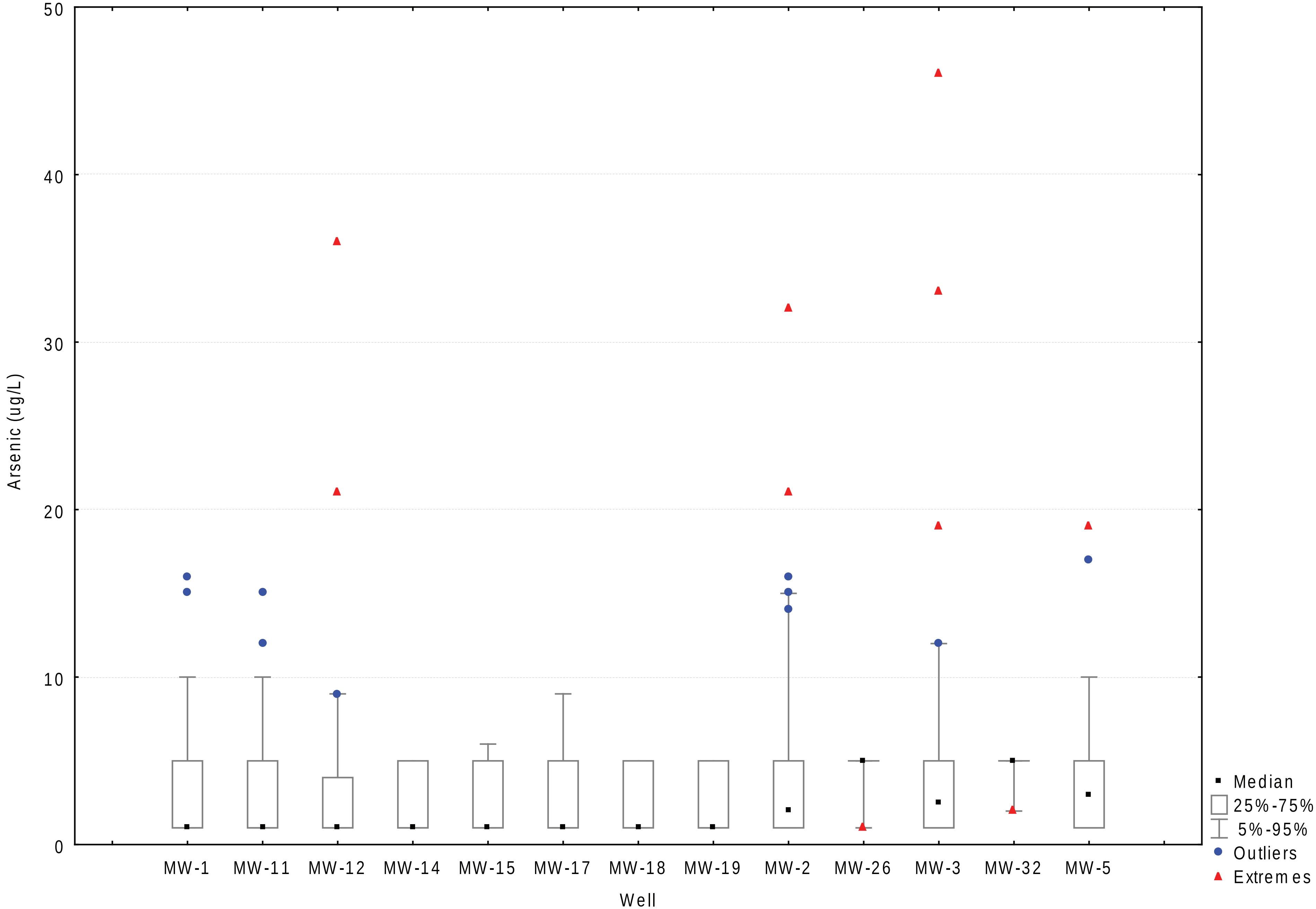
APPENDIX A

BOX PLOTS

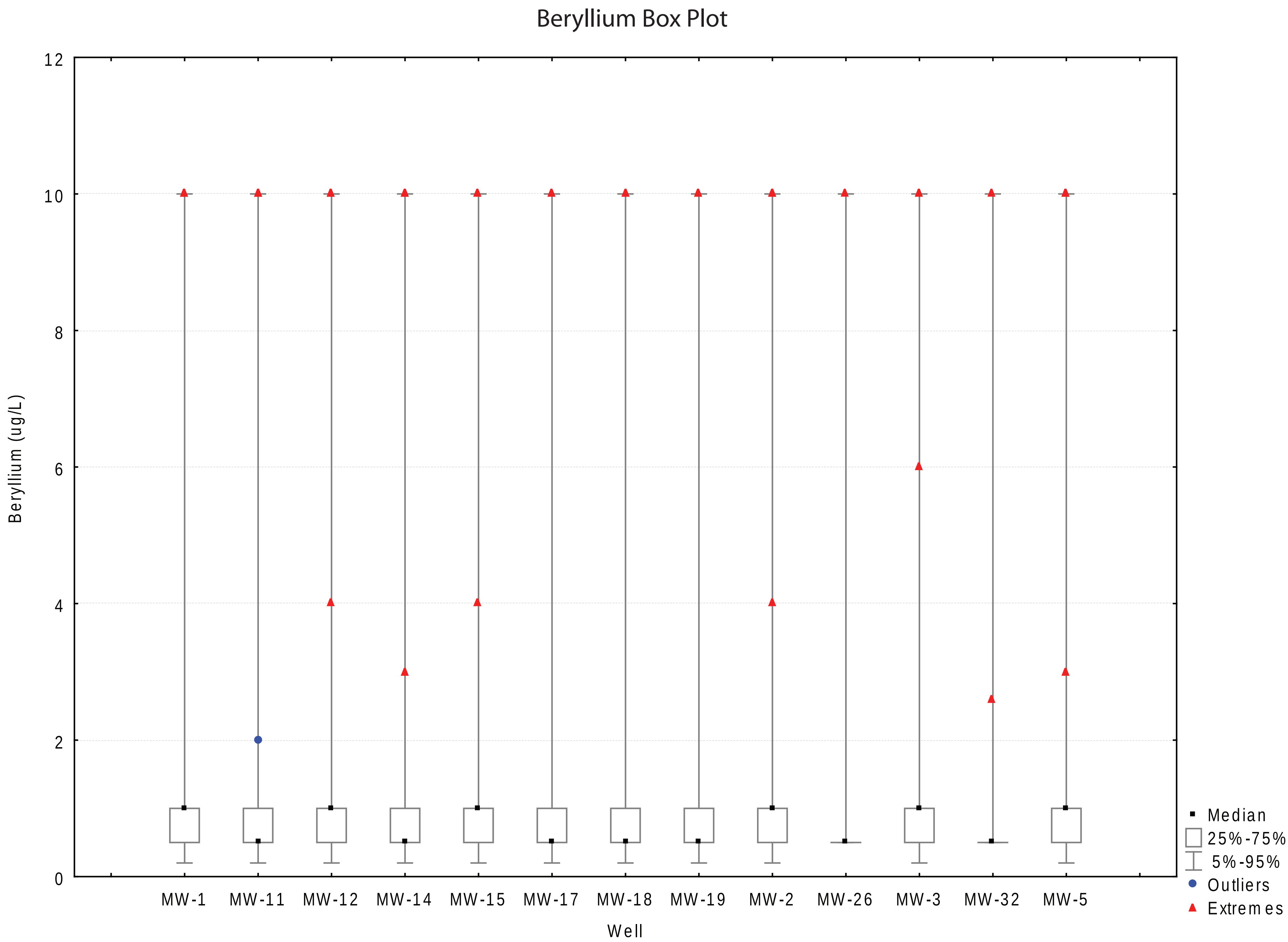


Appendix A
Box Plots

Arsenic Box Plot



Appendix A
Box Plots



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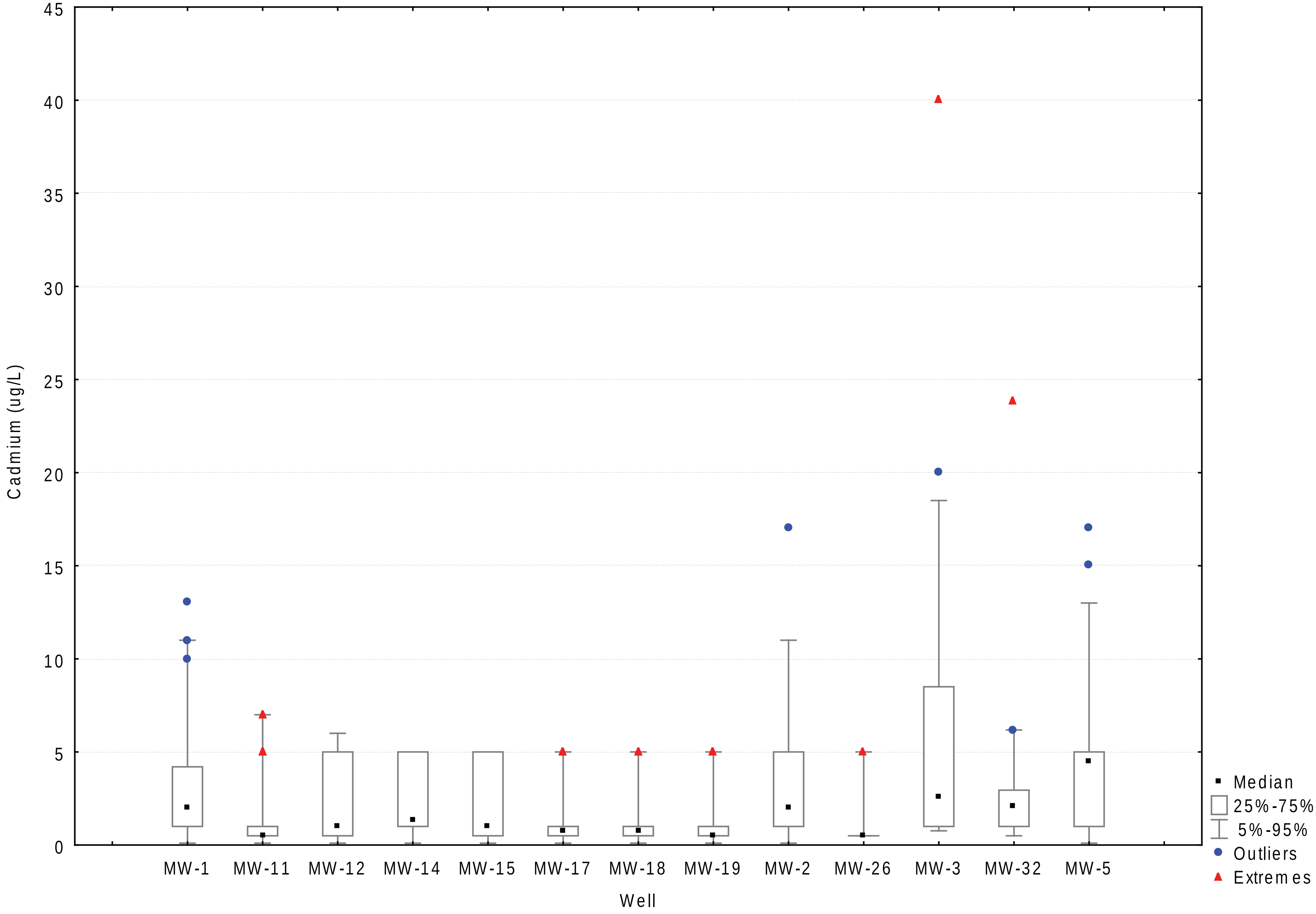
Box Plots

Cadmium Box Plot



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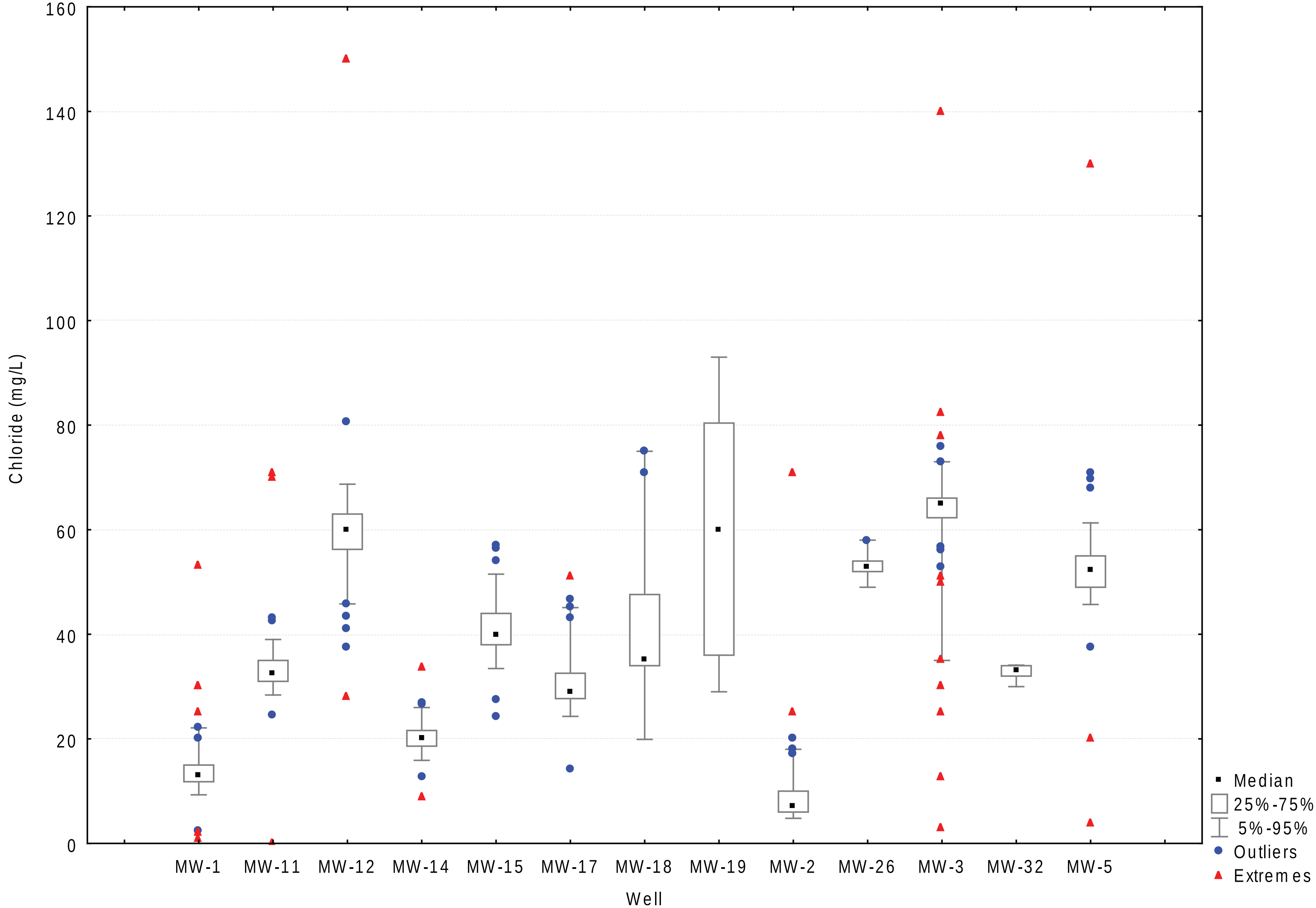
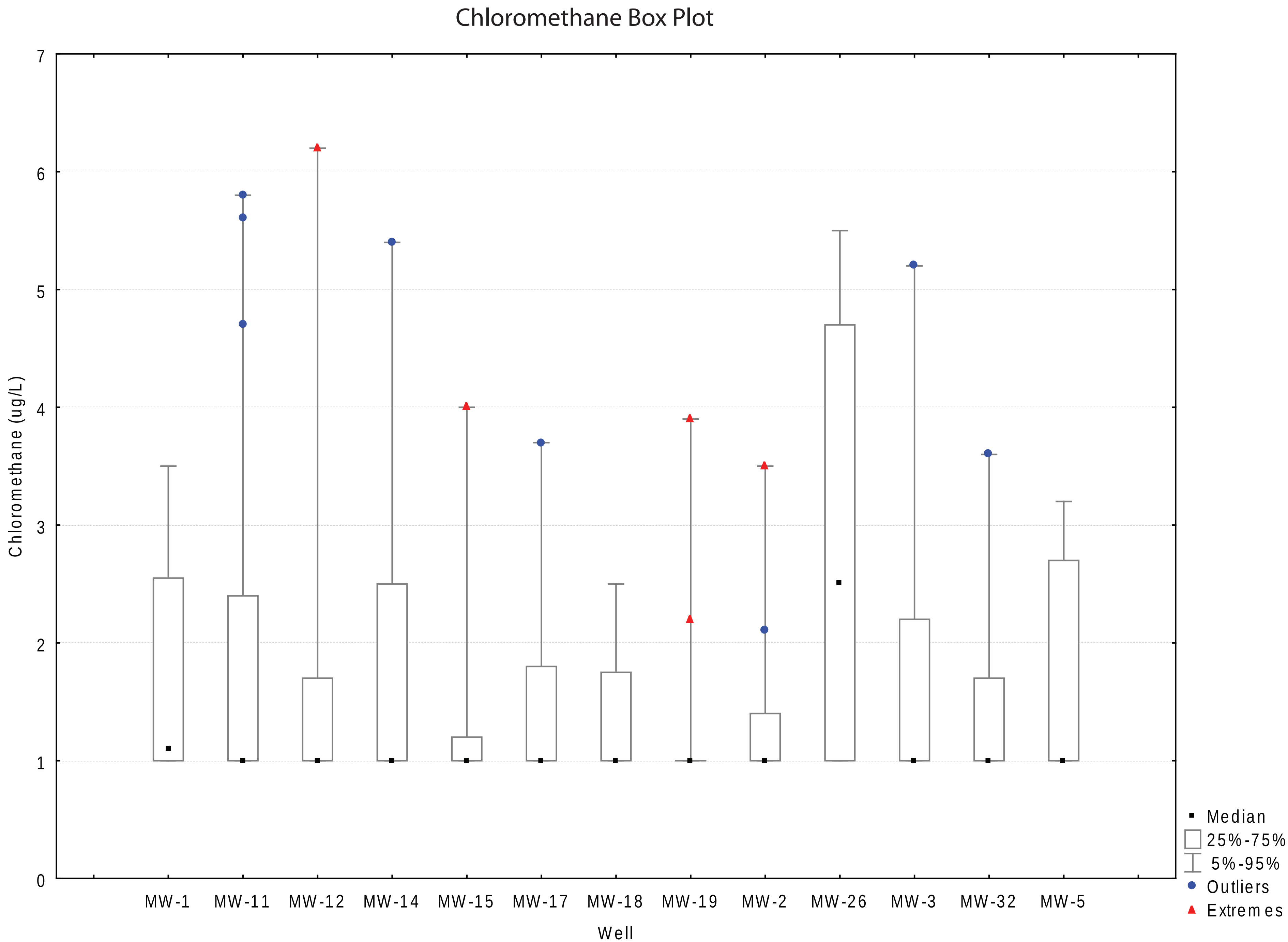
Box Plots

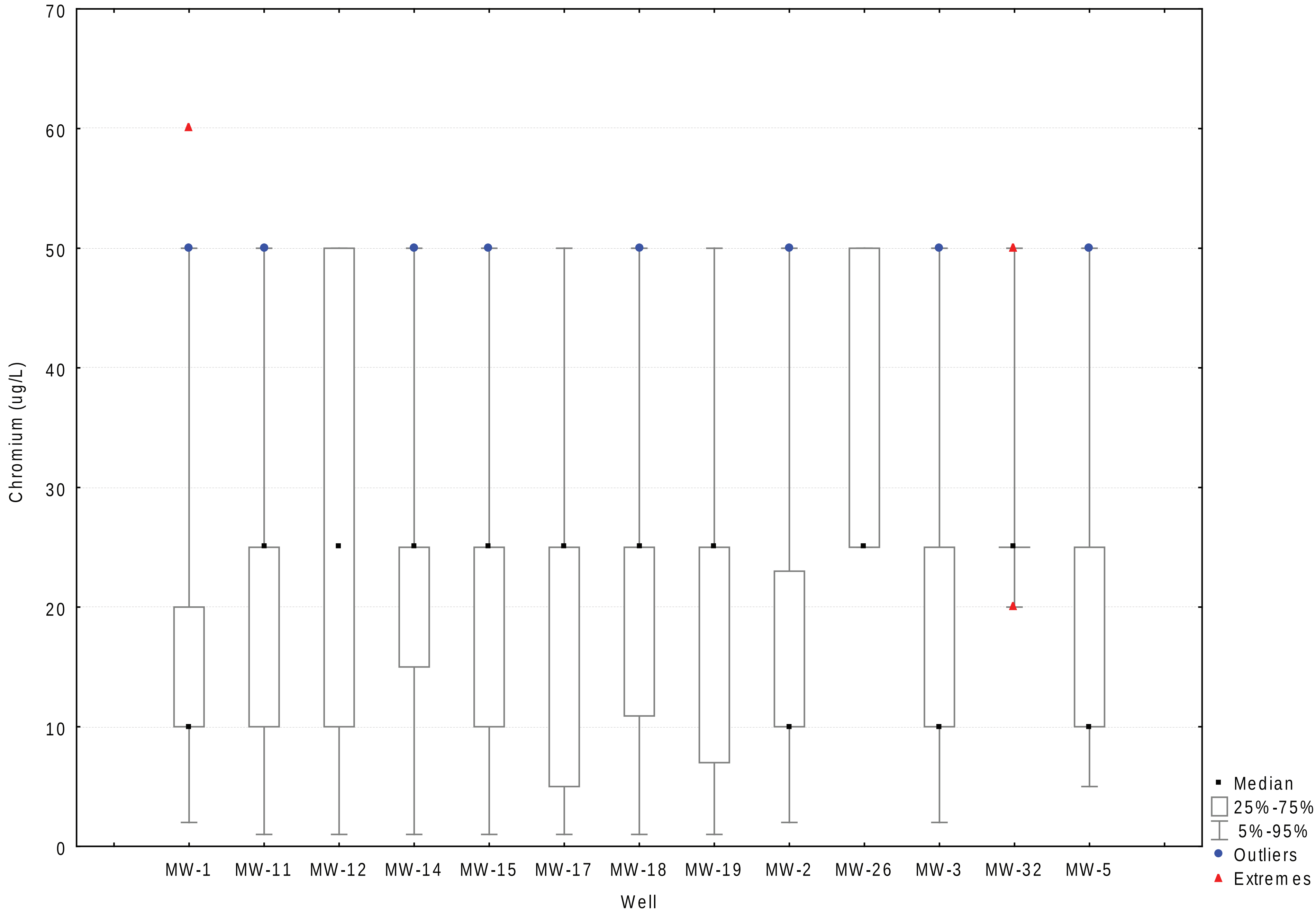
Chloride Box Plot

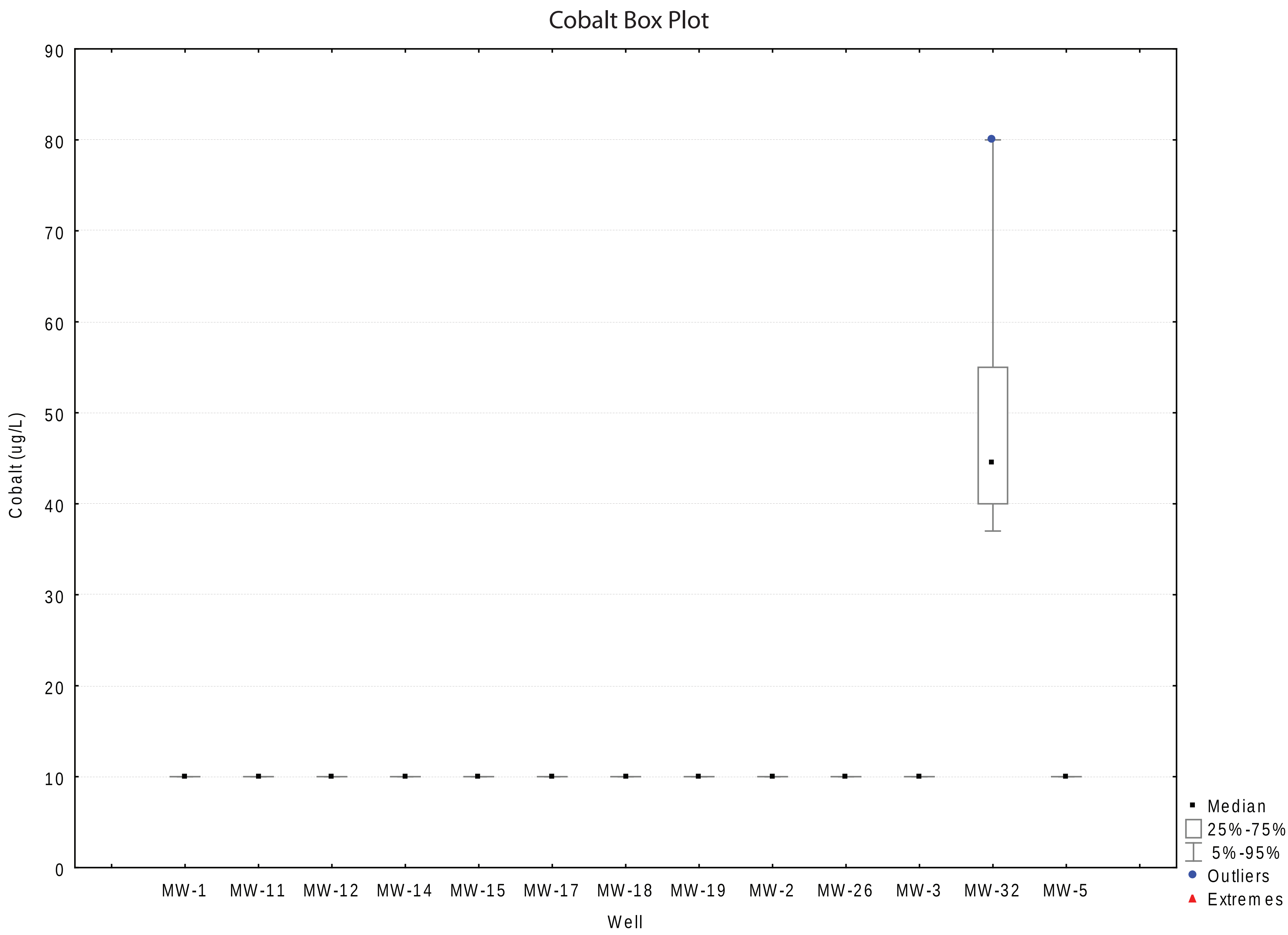


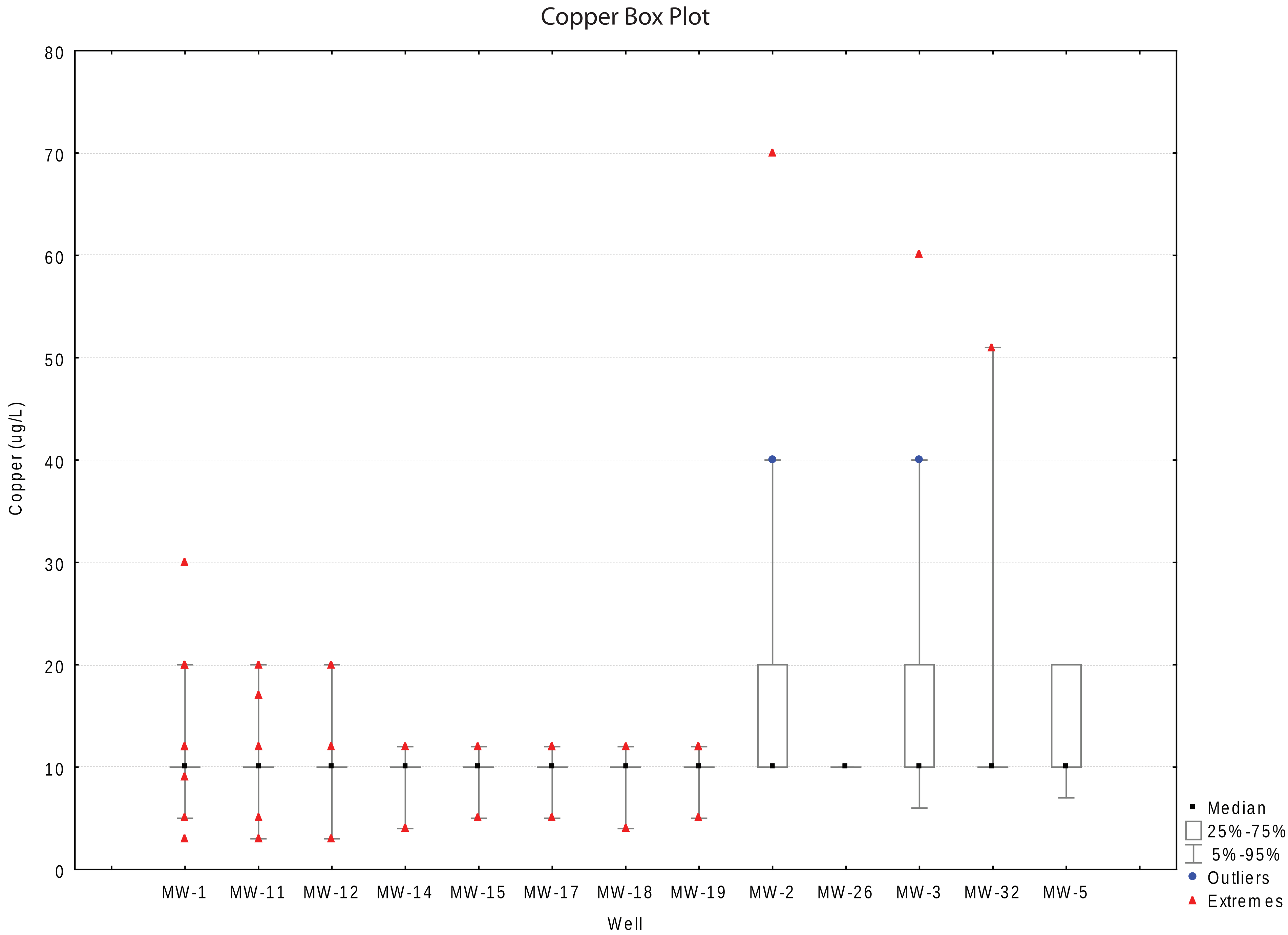
Appendix A
Box Plots


Chloromethane Box Plot
Chloromethane (ug/L)
0
1
2
3
4
5
6
7
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

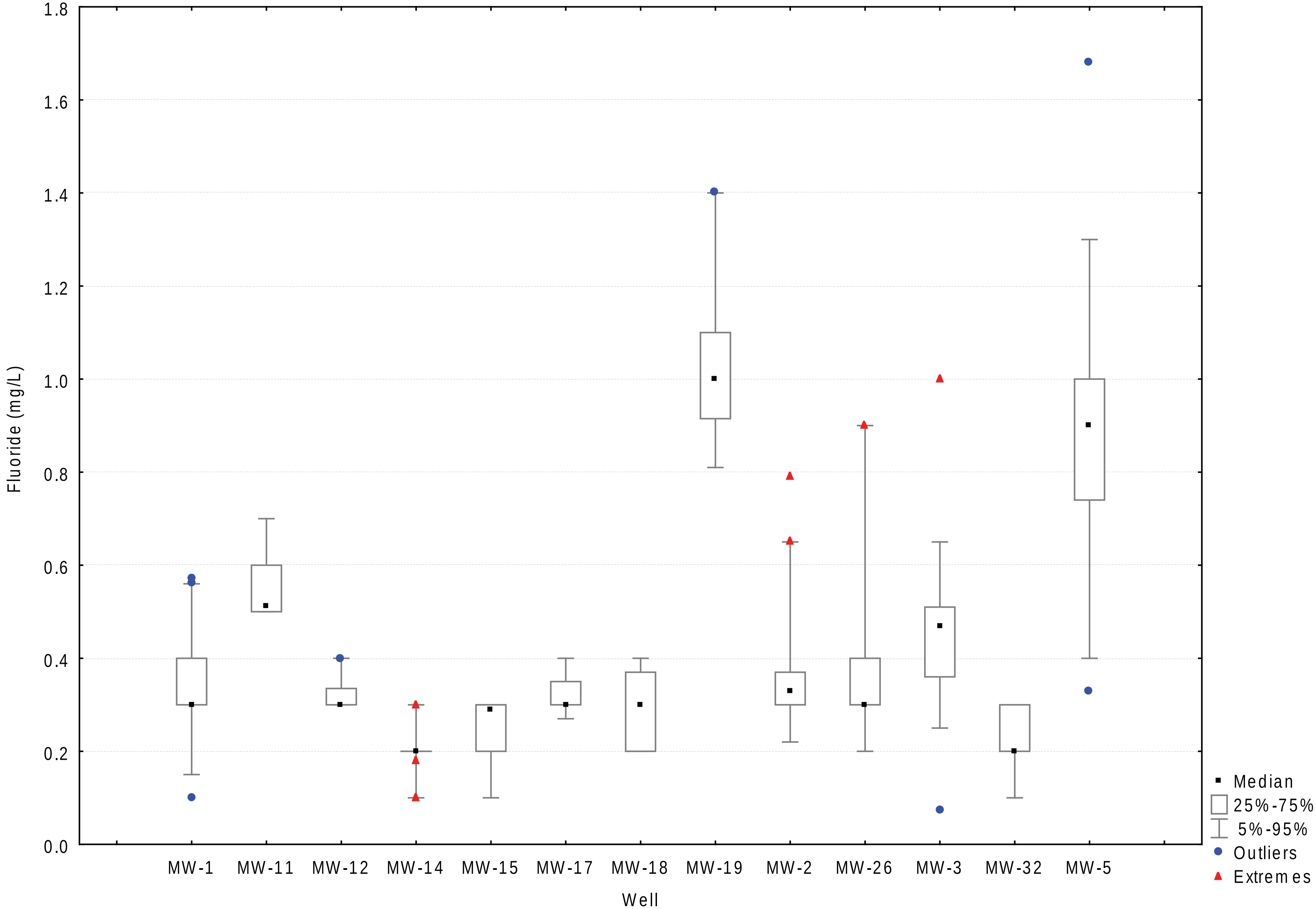
Chromium Box Plot




Cobalt Box Plot
Cobalt (ug/L)
90
80
70
60
50
40
30
20
10
0
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

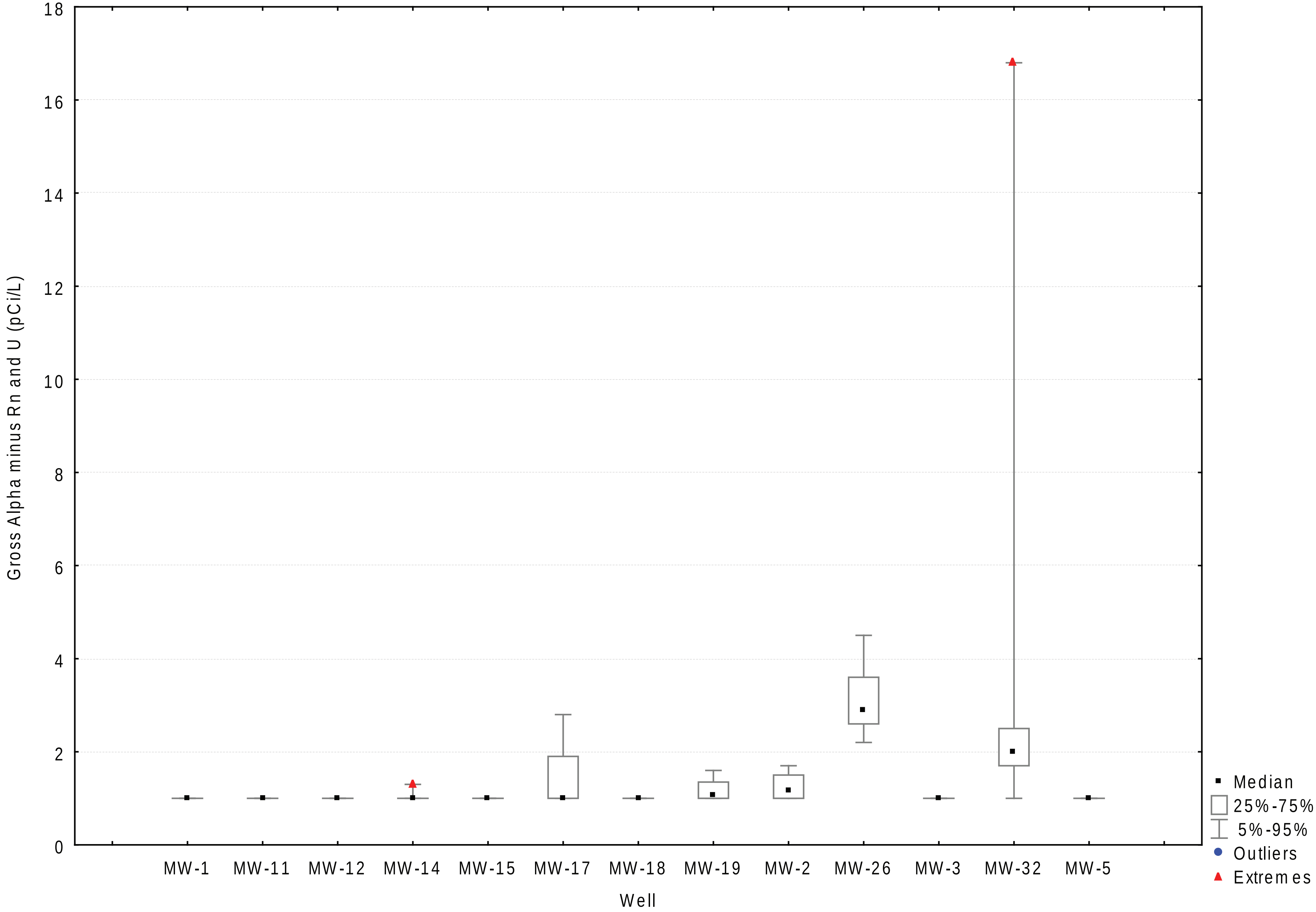

Copper Box Plot
80
70
60
50
40
30
20
10
0
Copper (ug/L)
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

Fluoride Box Plot

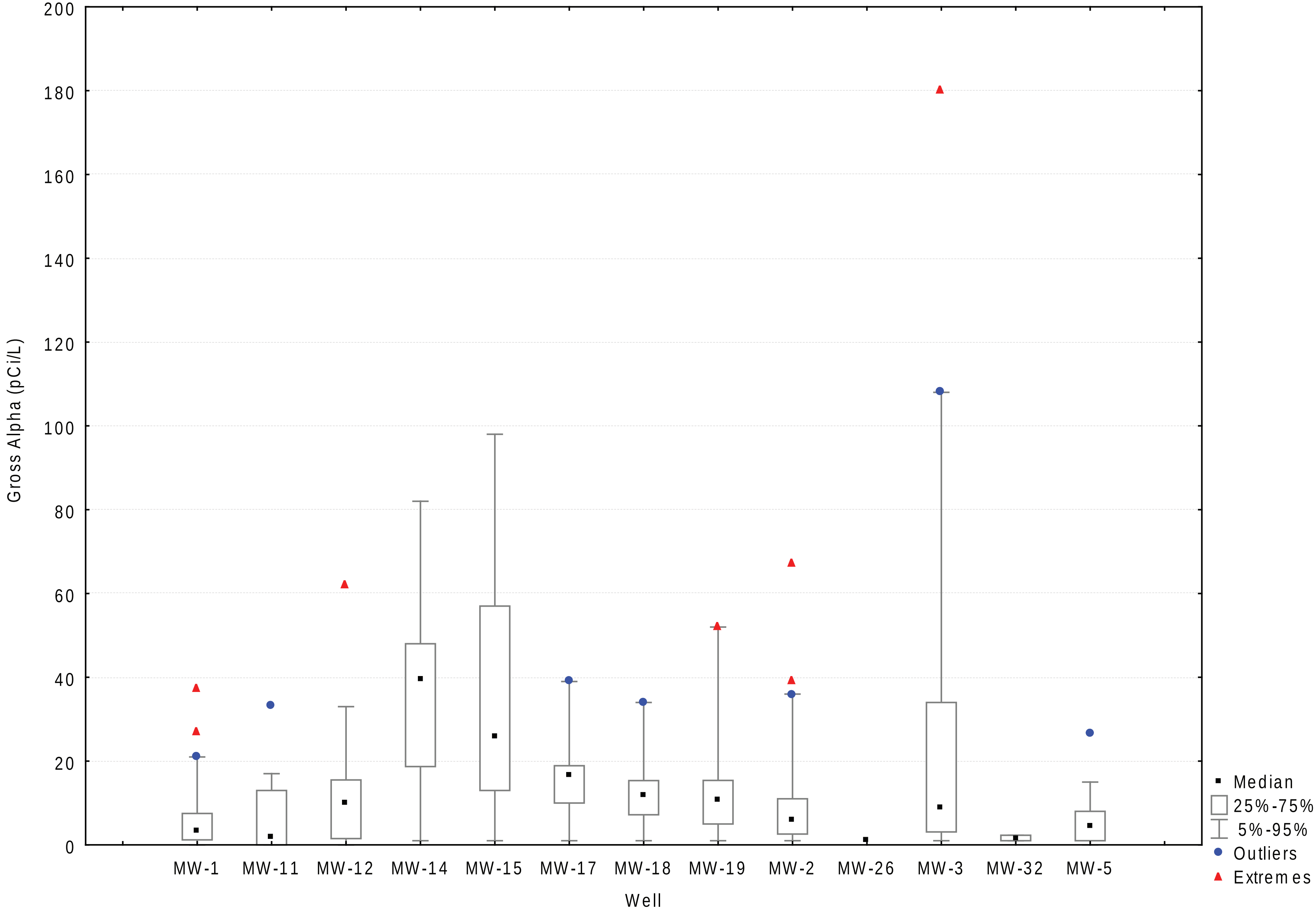


Appendix A
Box Plots

Gross Alpha minu Rn and U Box Plot



Gross Alpha Box Plot



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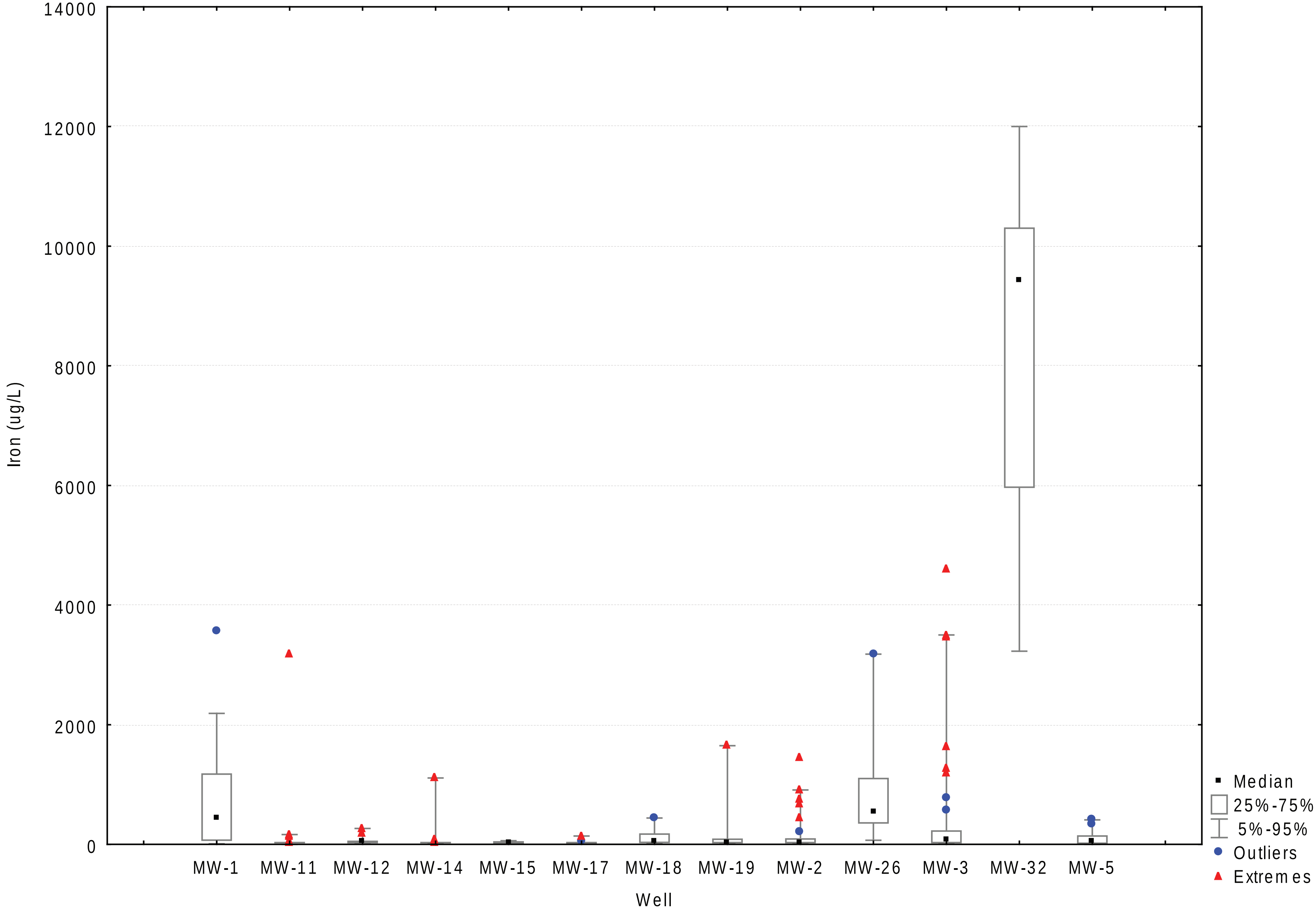
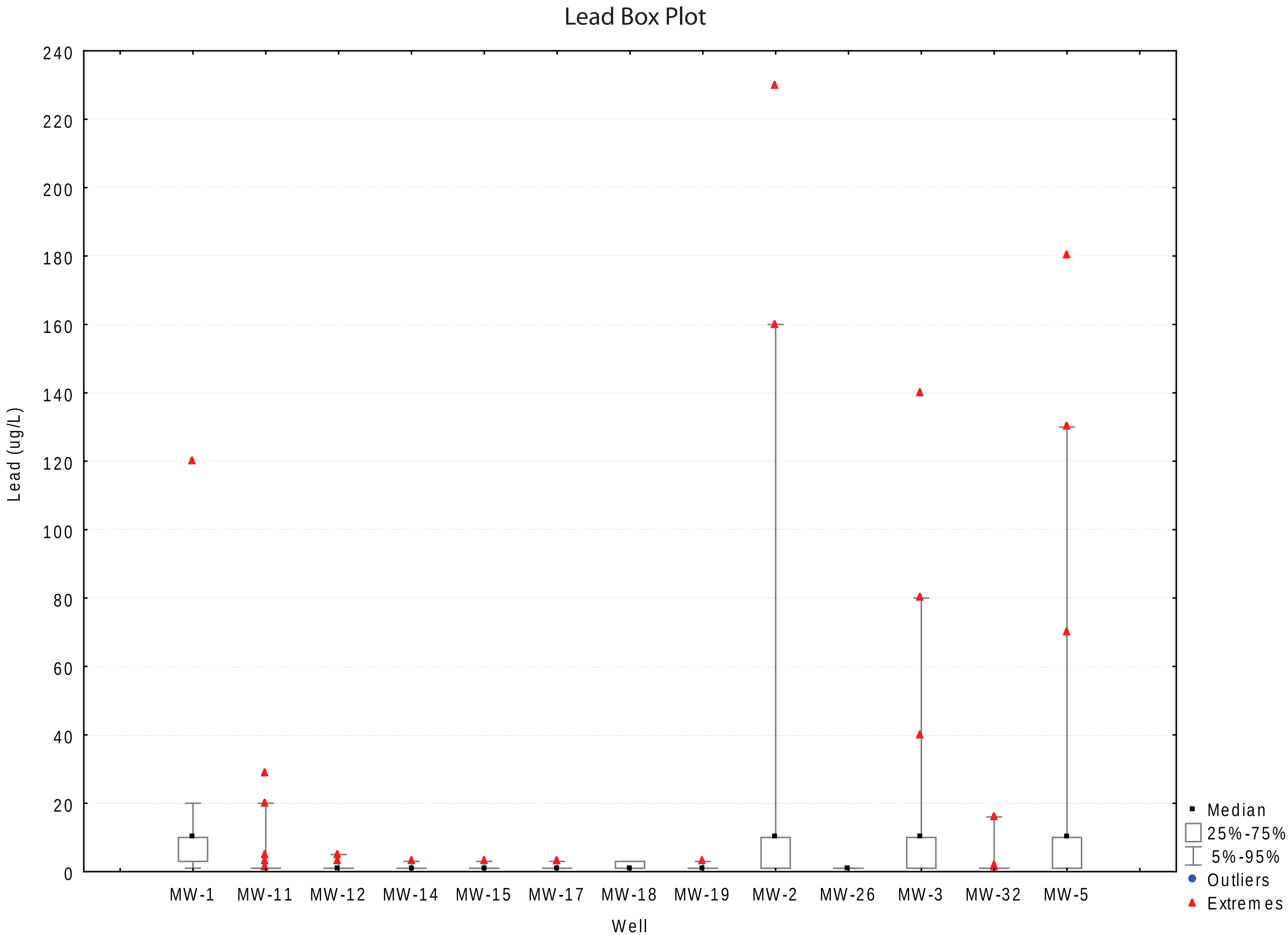
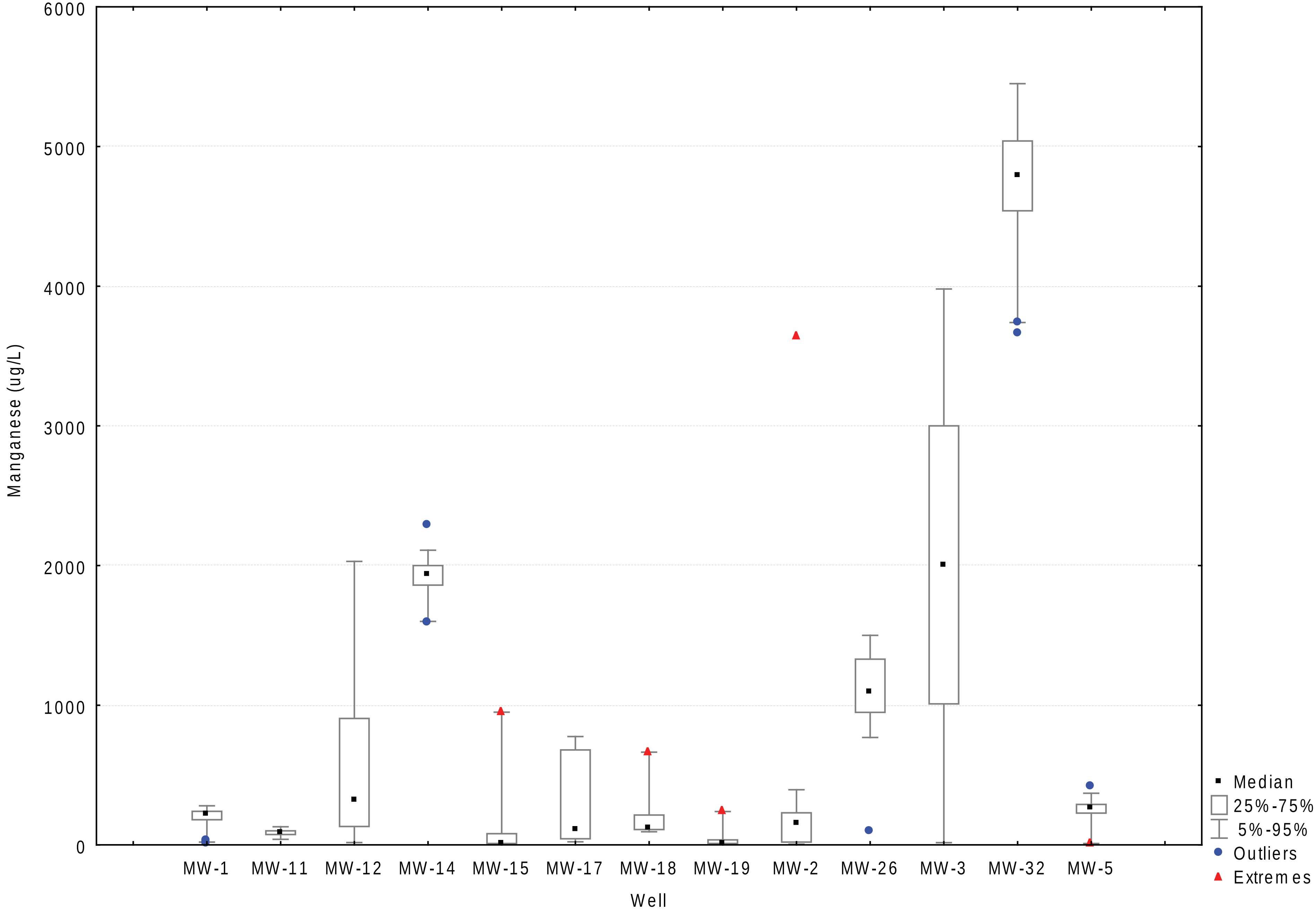
Box Plots

Iron Box Plot




Lead Box Plot
240
220
200
180
160
140
120
100
80
60
40
20
0
Lead (ug/L)
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

Manganese Box Plot



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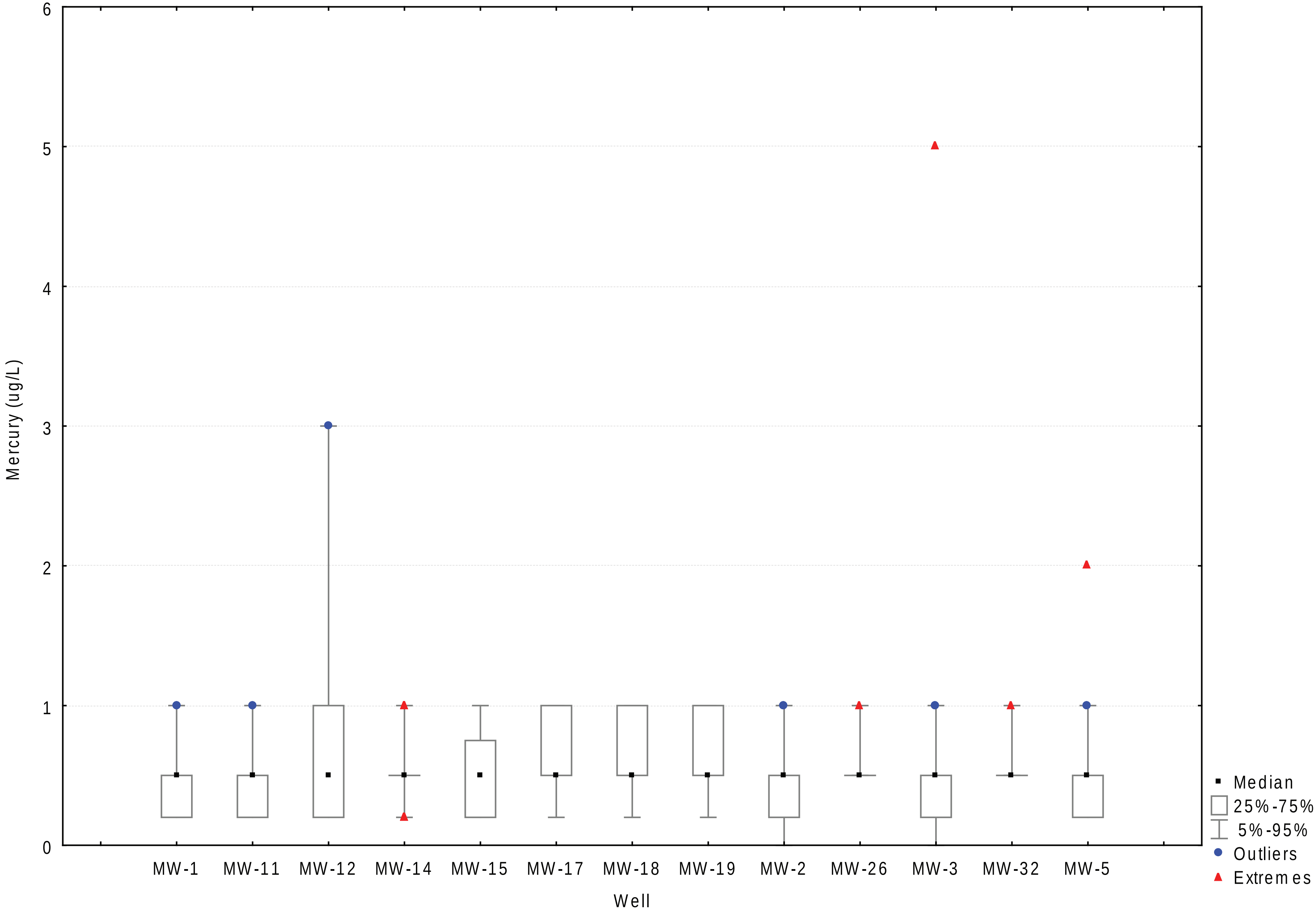
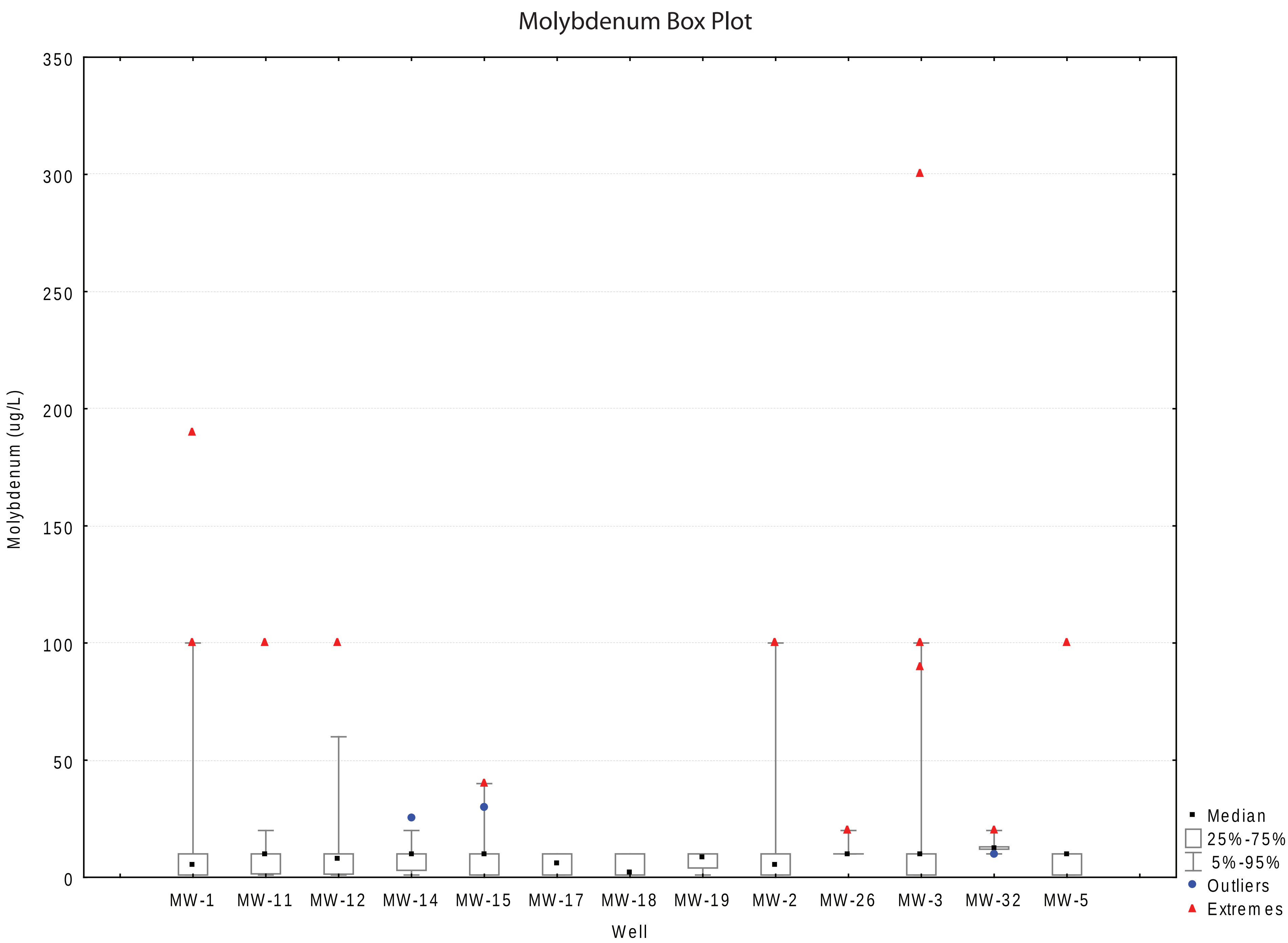
Box Plots

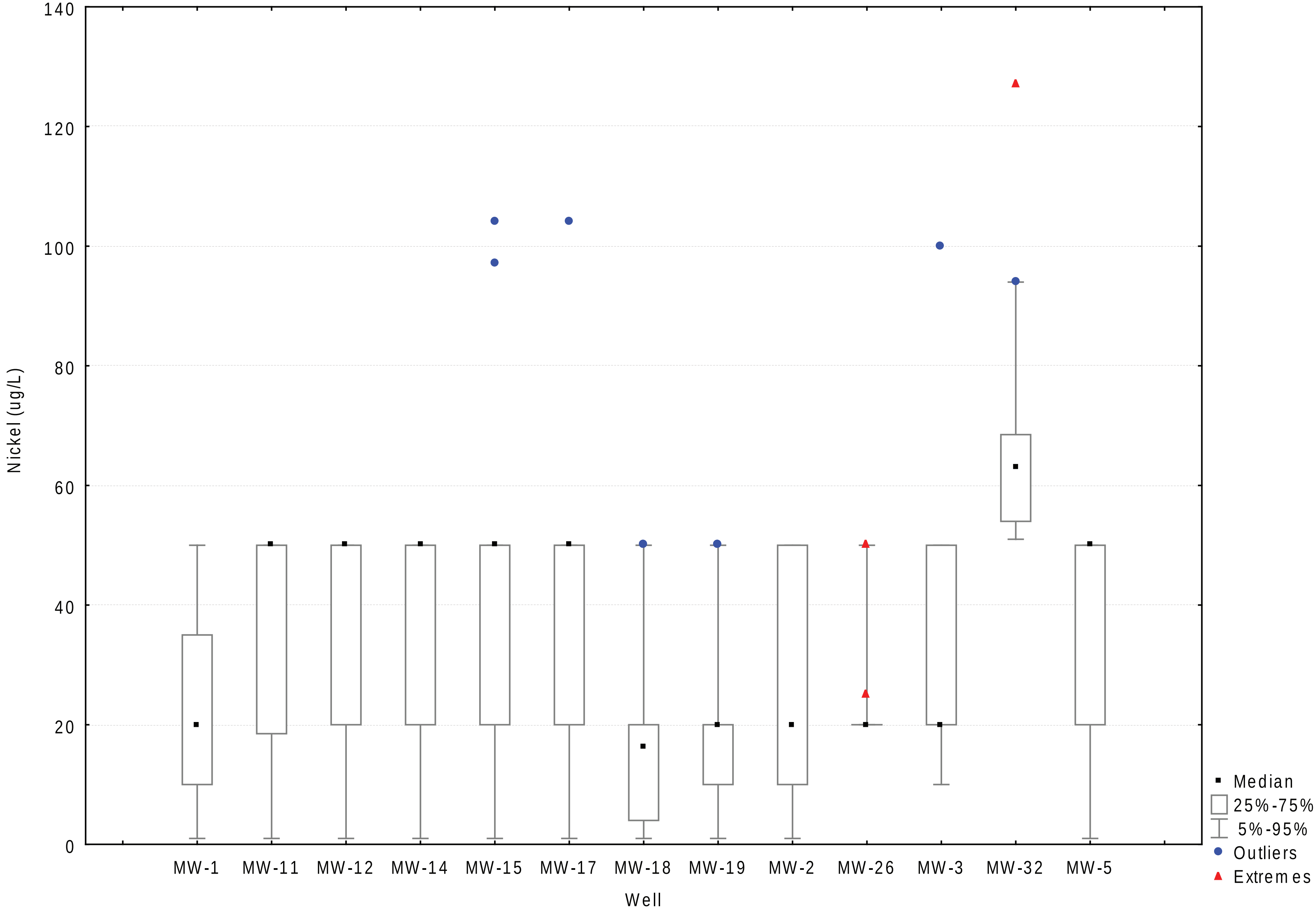
Mercury Box Plot

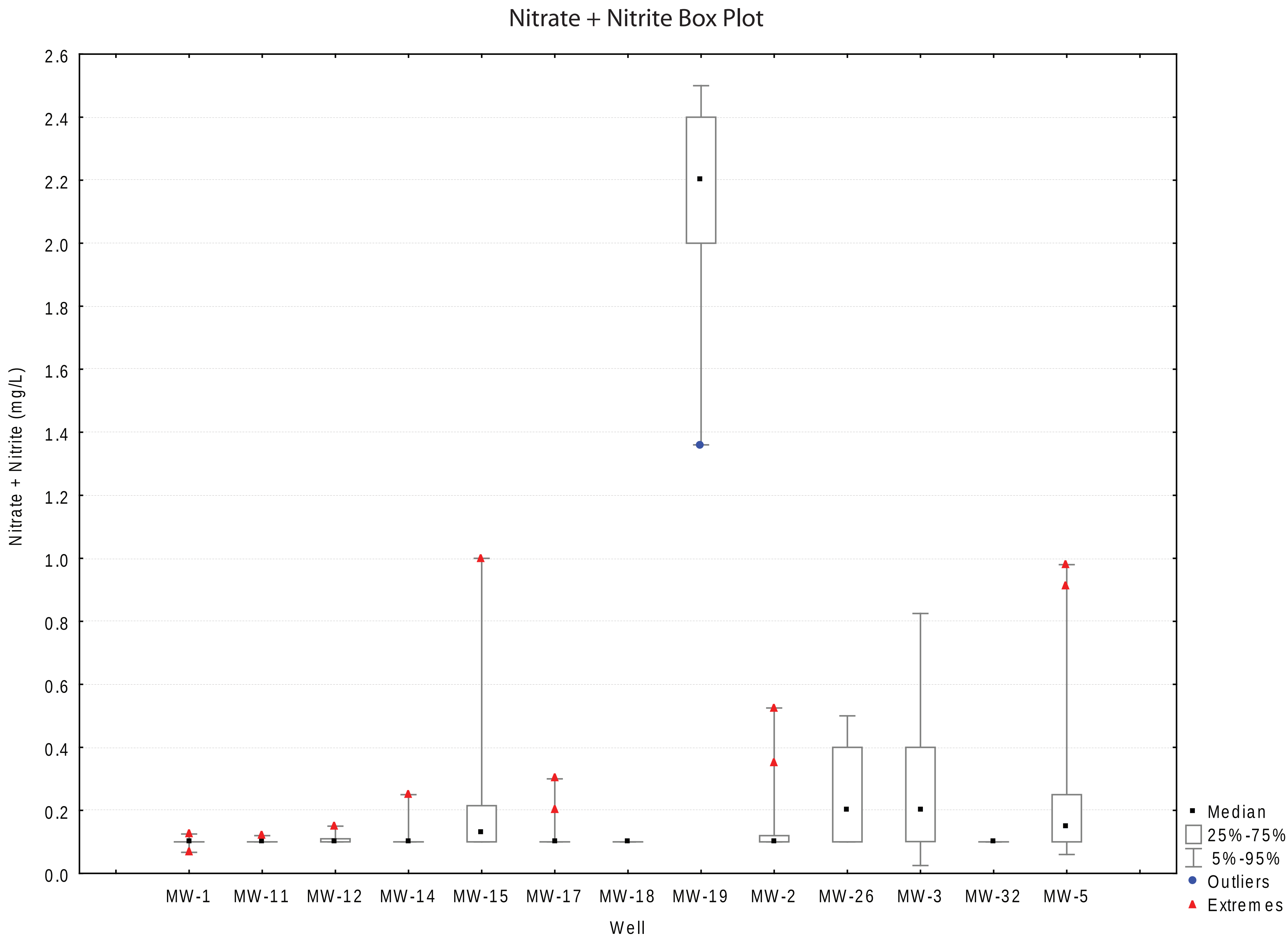




Appendix A
Box Plots

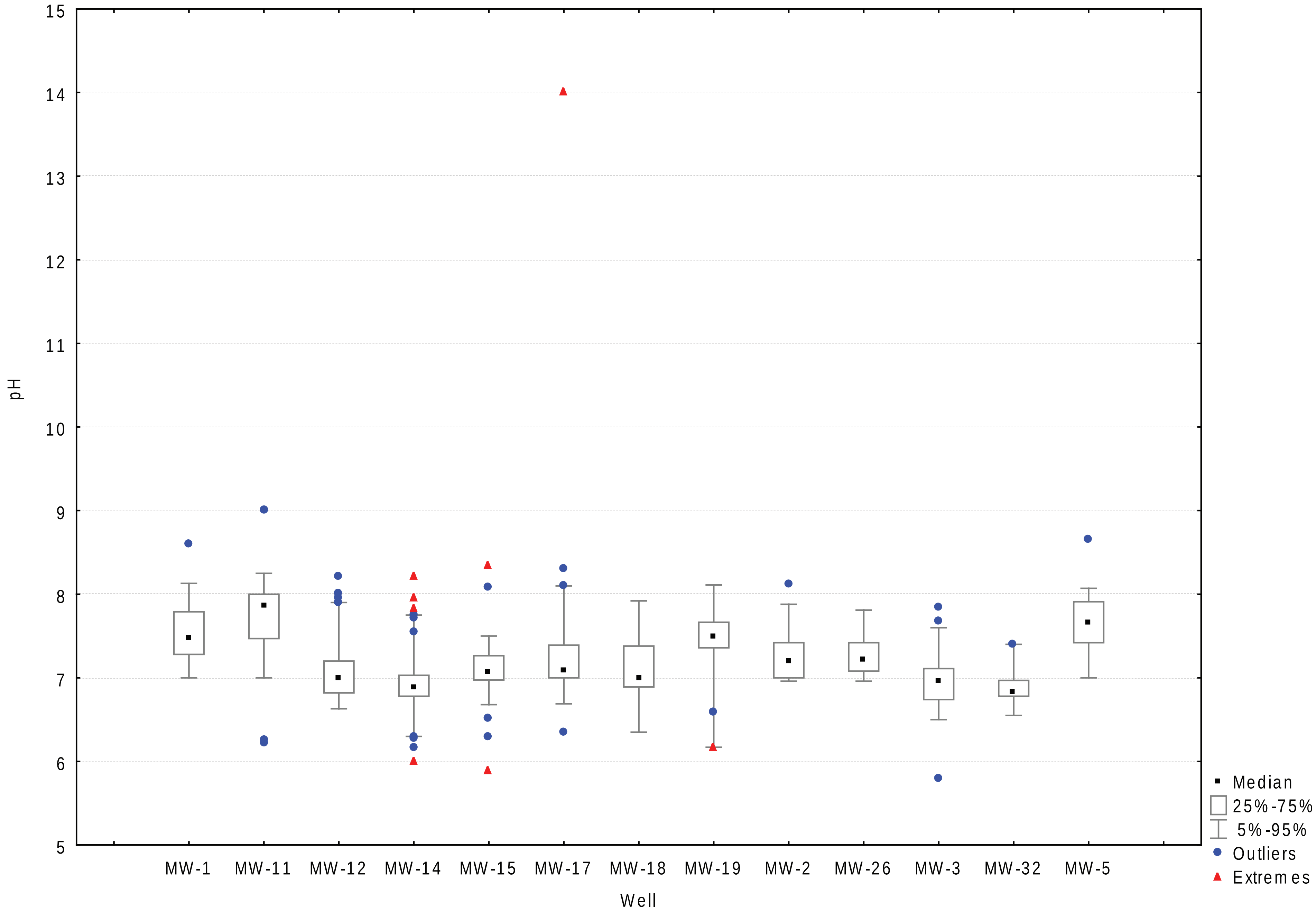
Nickel Box Plot





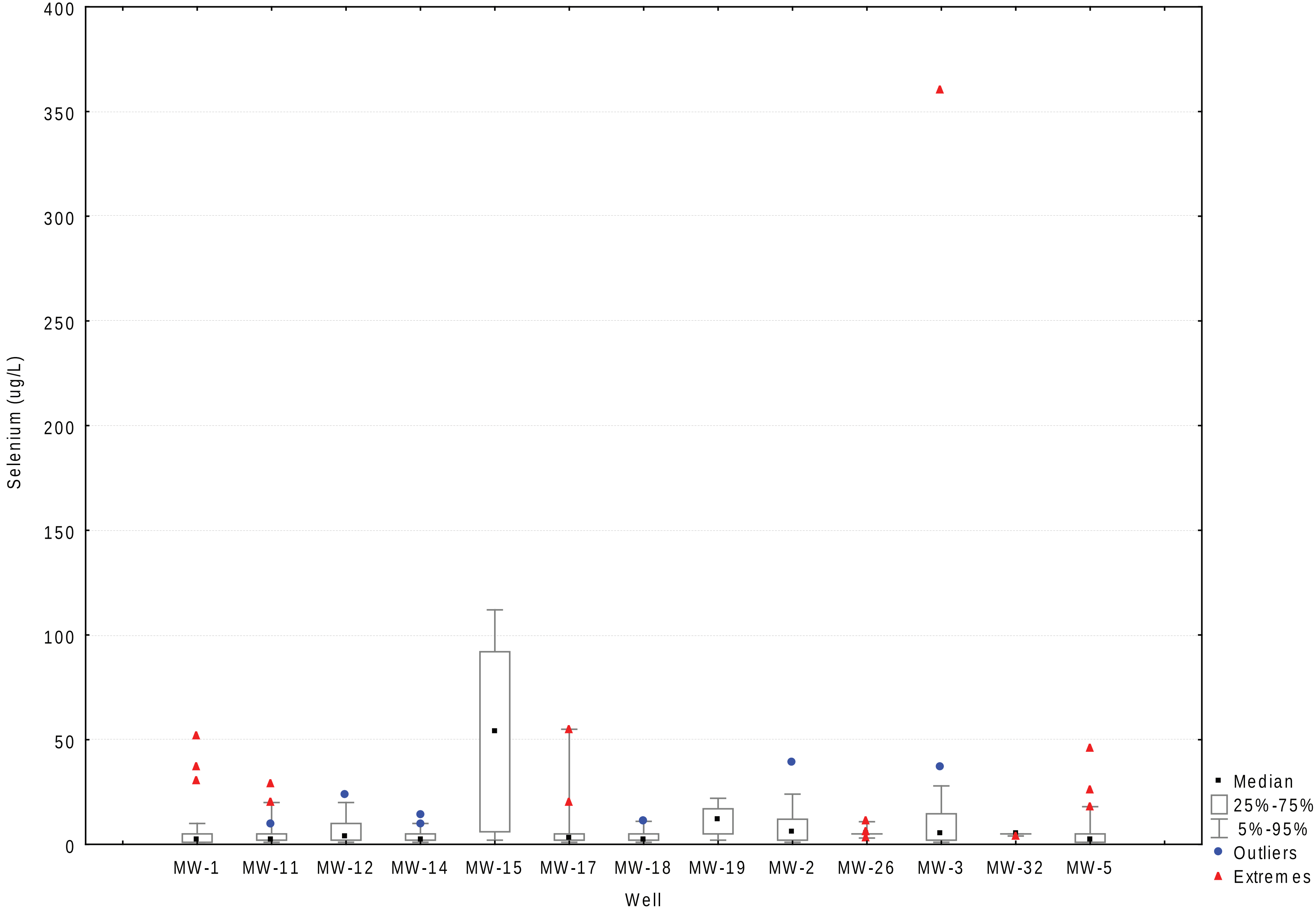
Appendix A
Box Plots

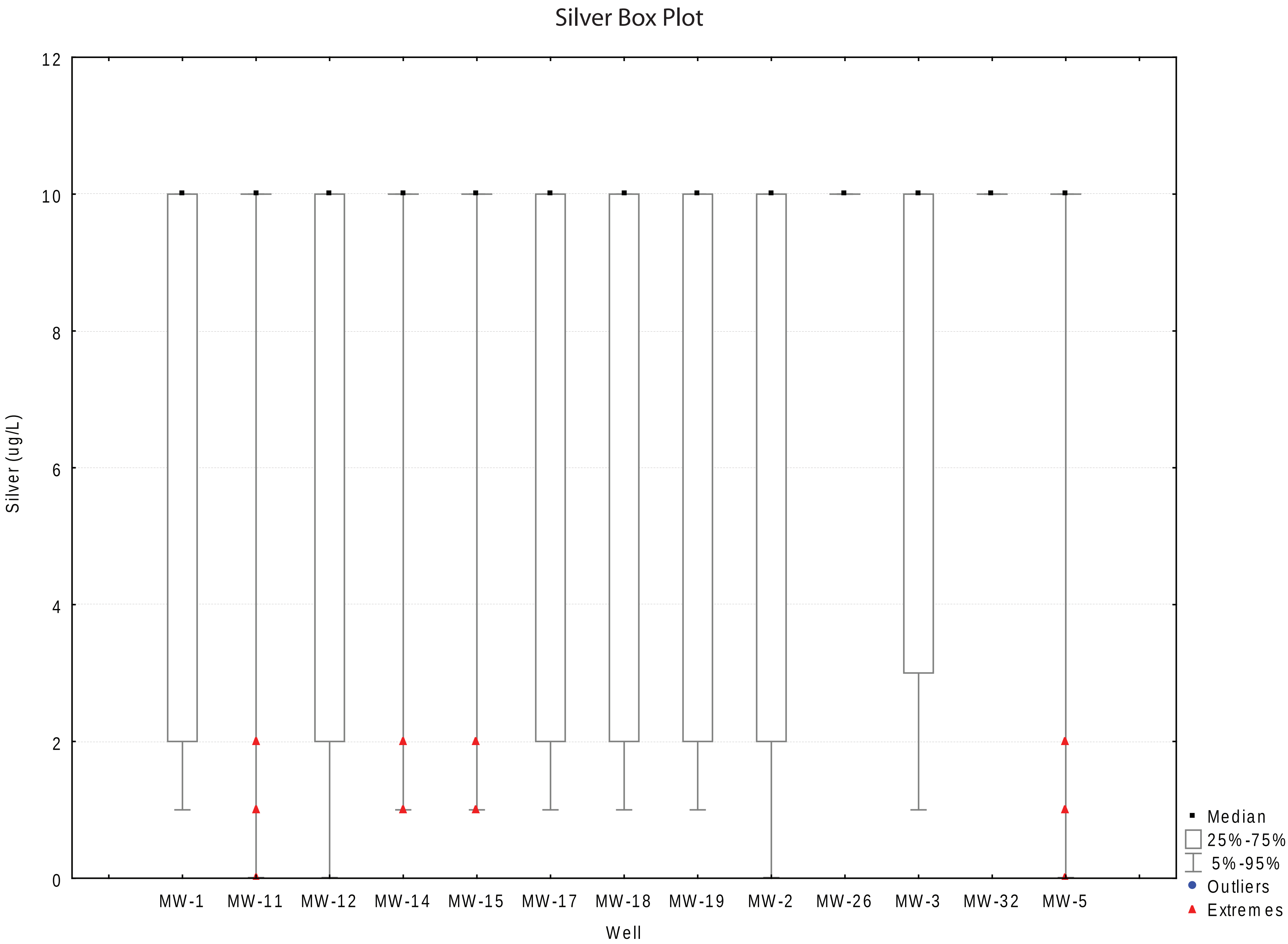
pH Box Plot



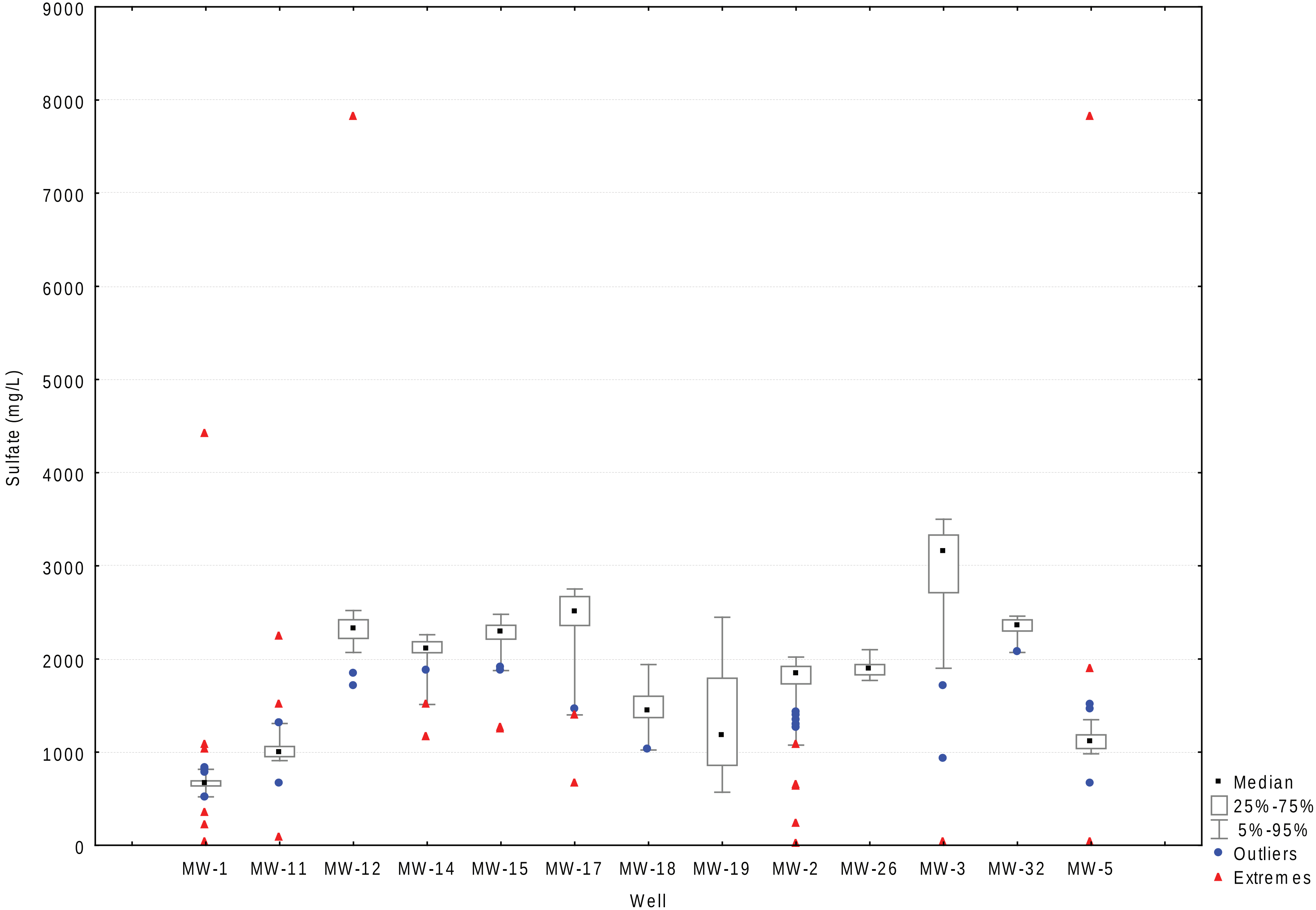
15
14
13
12
11
10
9
8
7
6
5
pH
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

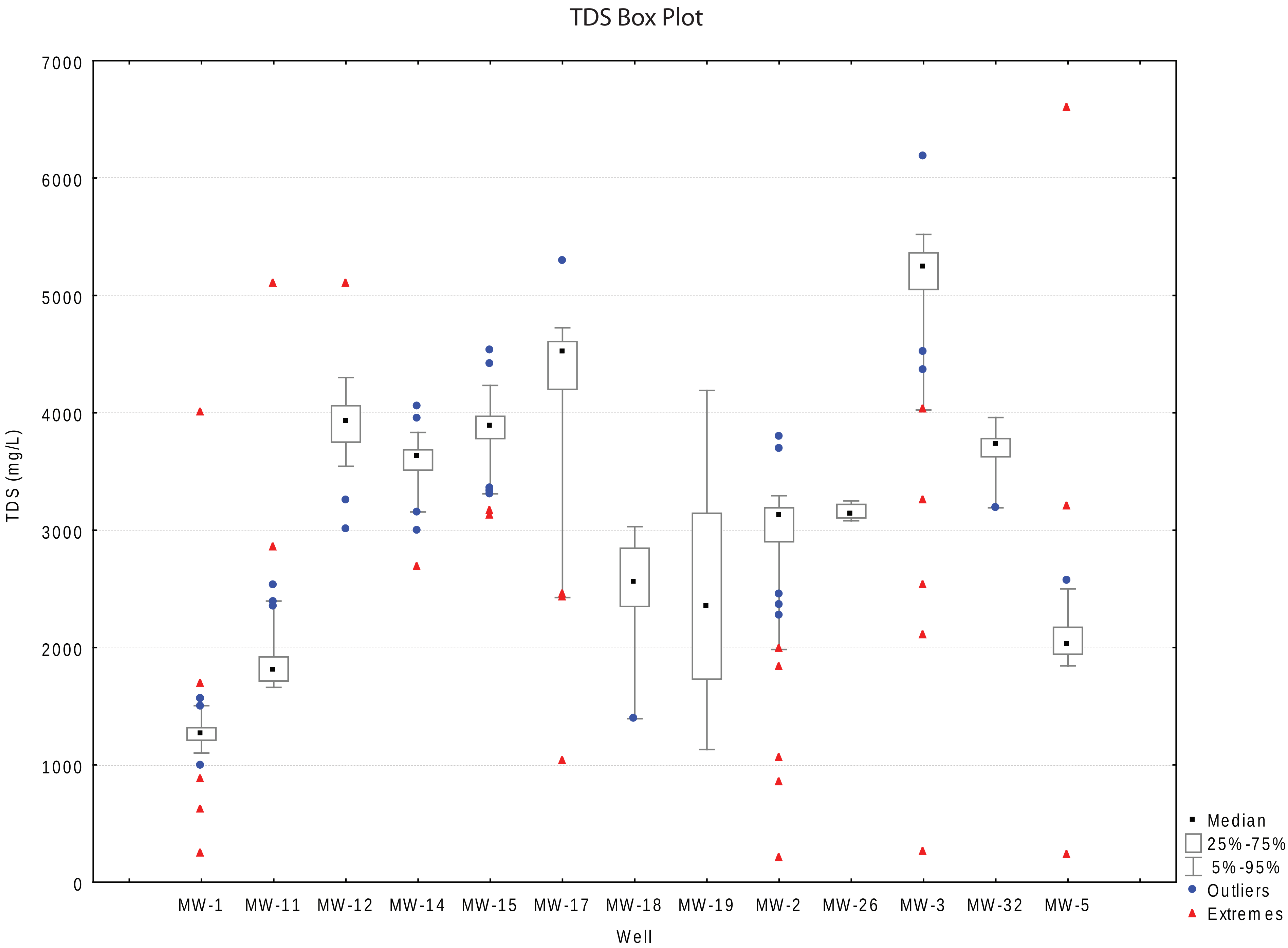
Selenium Box Plot



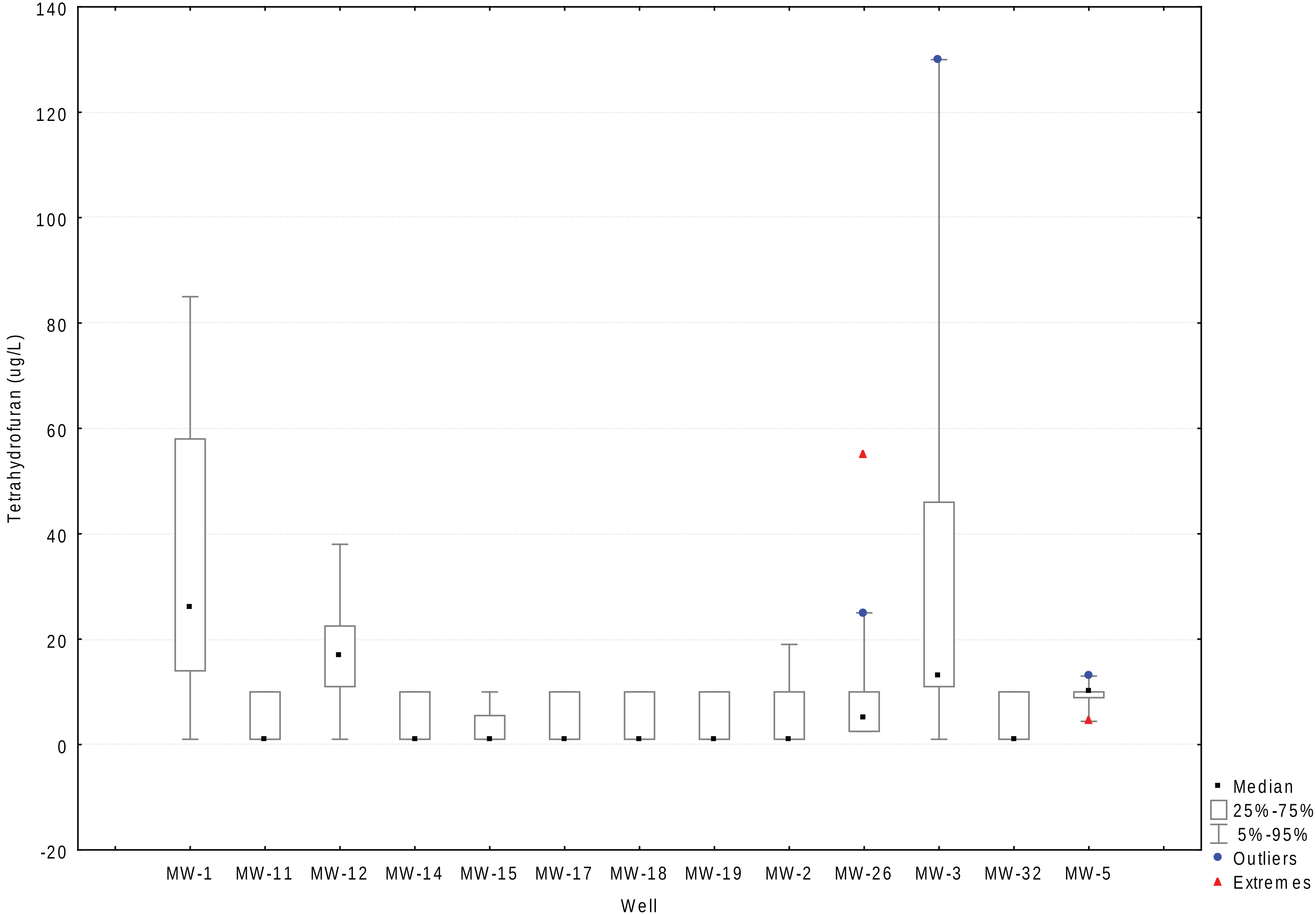

Silver Box Plot
Silver (ug/L)
0
2
4
6
8
10
12
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

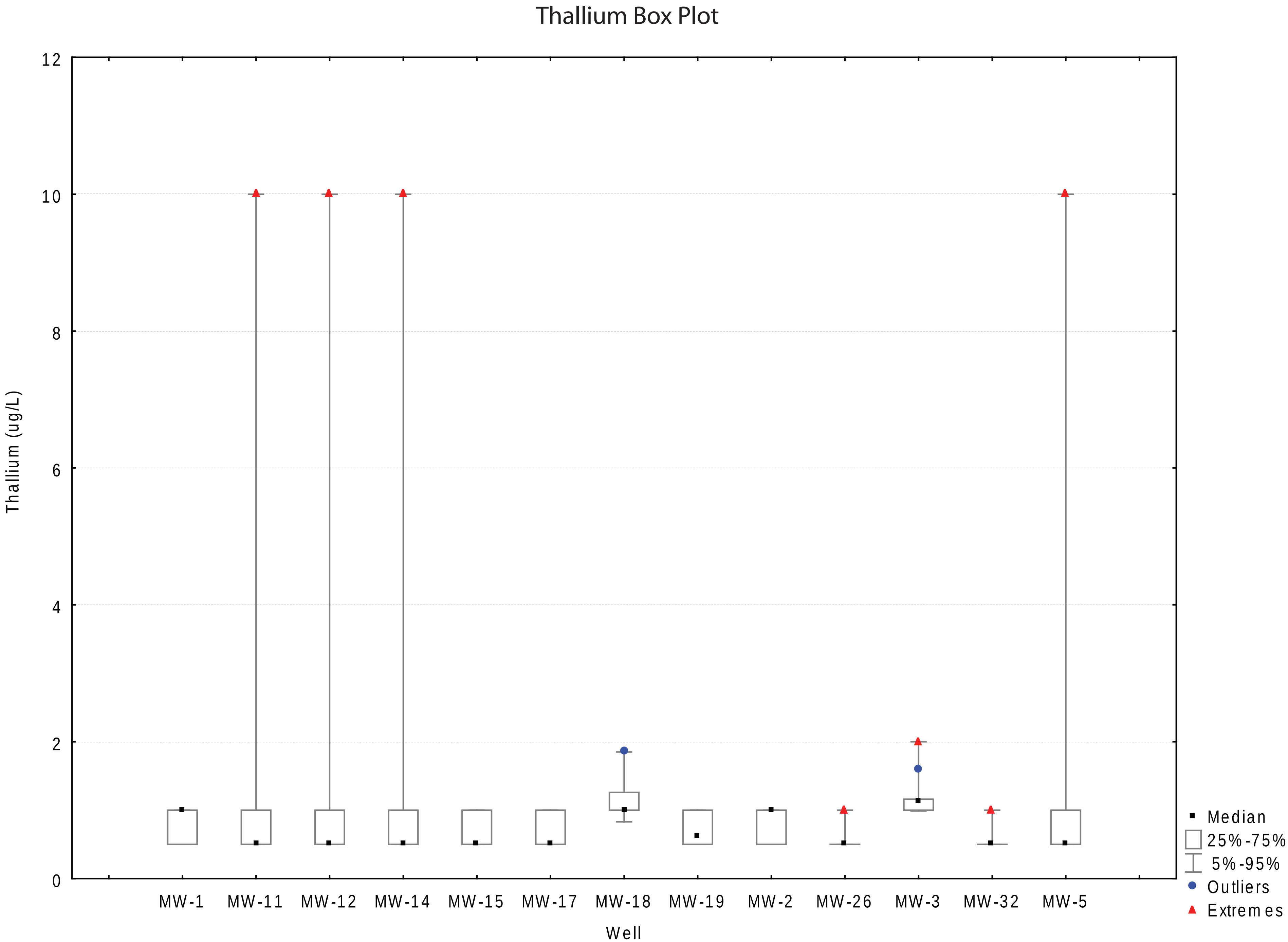
Sulfate Box Plot




TDS Box Plot
7000
6000
5000
4000
3000
2000
1000
0
TDS (mg/L)
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

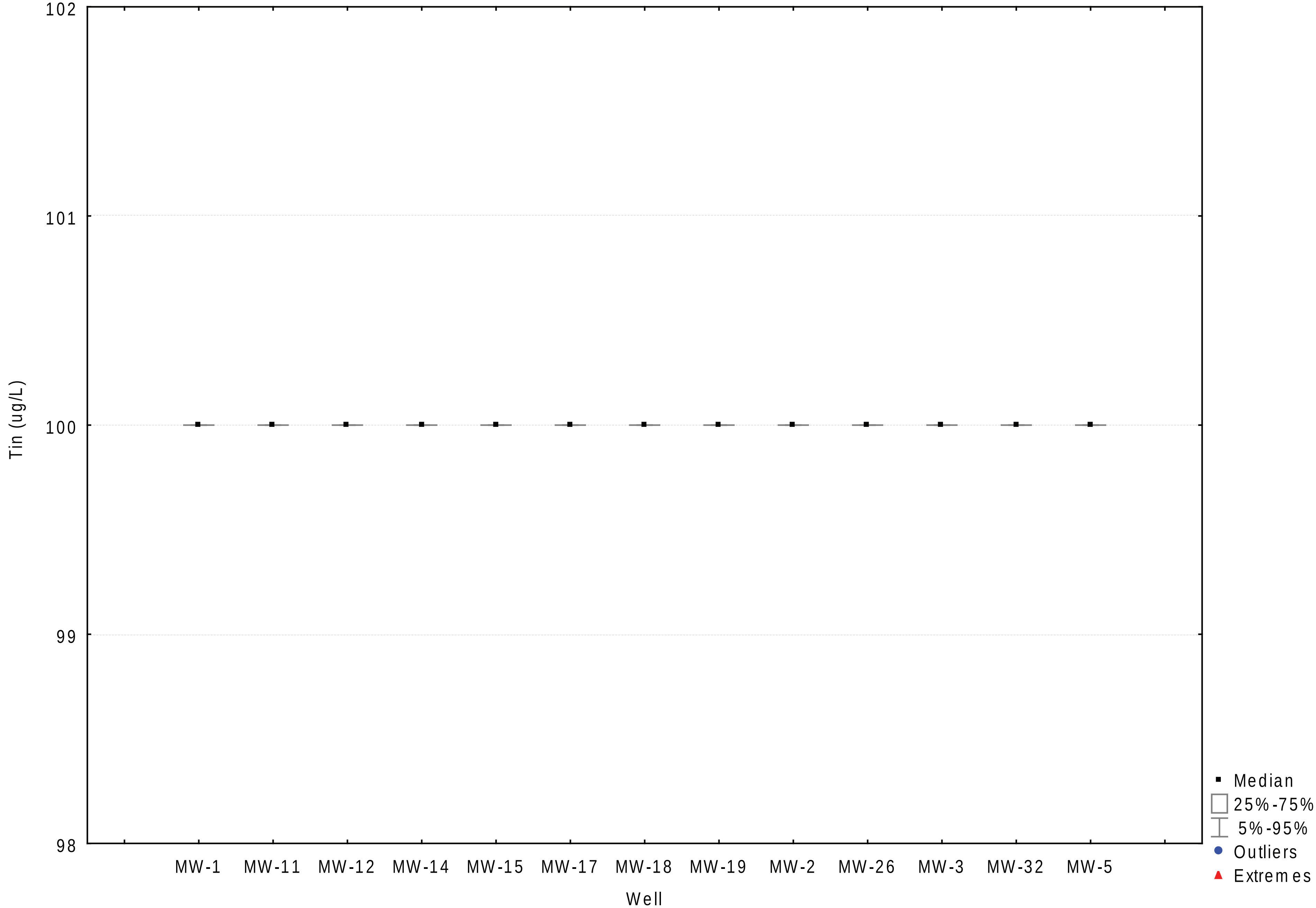
Tetrahydrofuran Box Plot





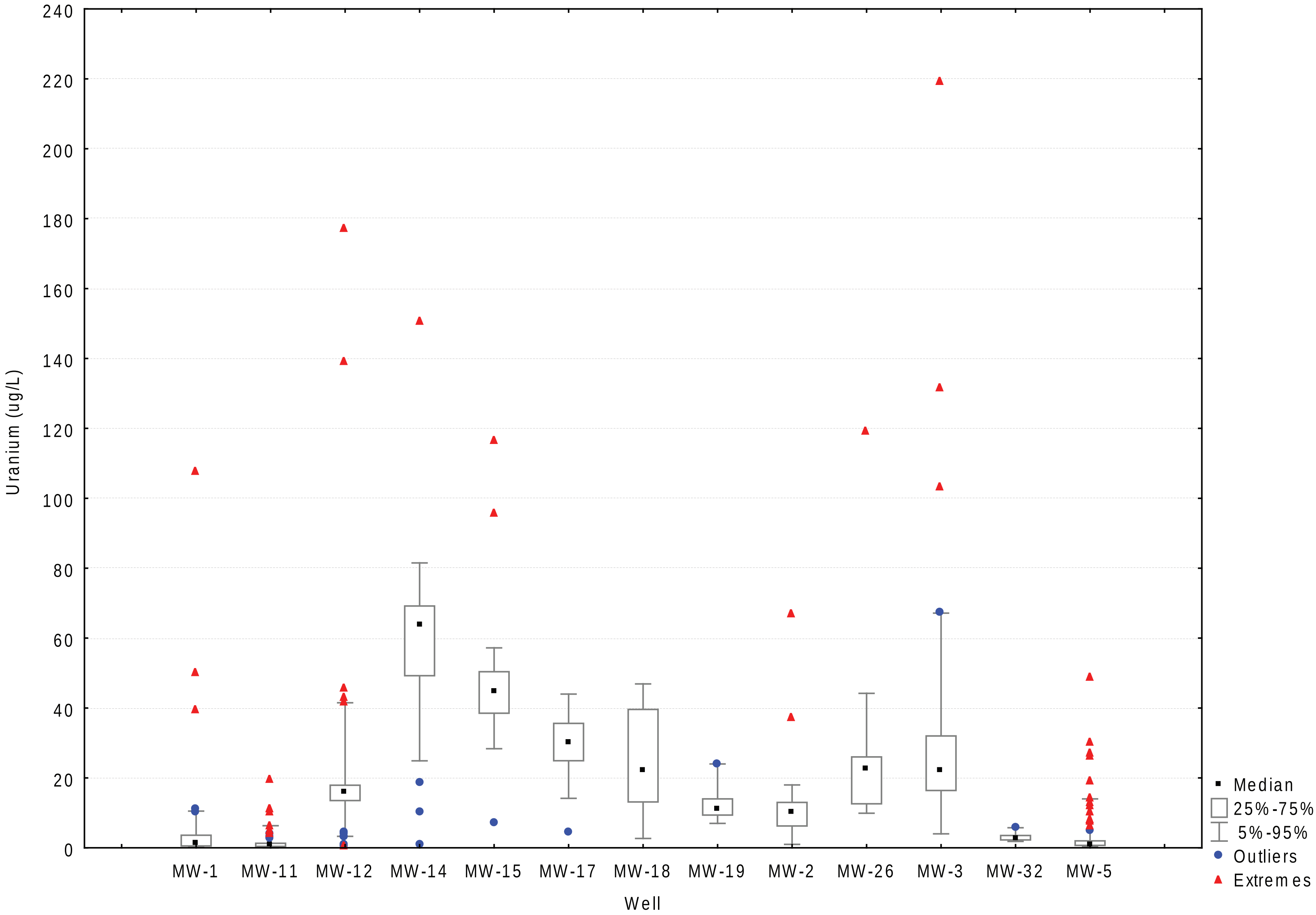
Thallium Box Plot
Thallium (ug/L)
0
2
4
6
8
10
12
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

Tin Box Plot

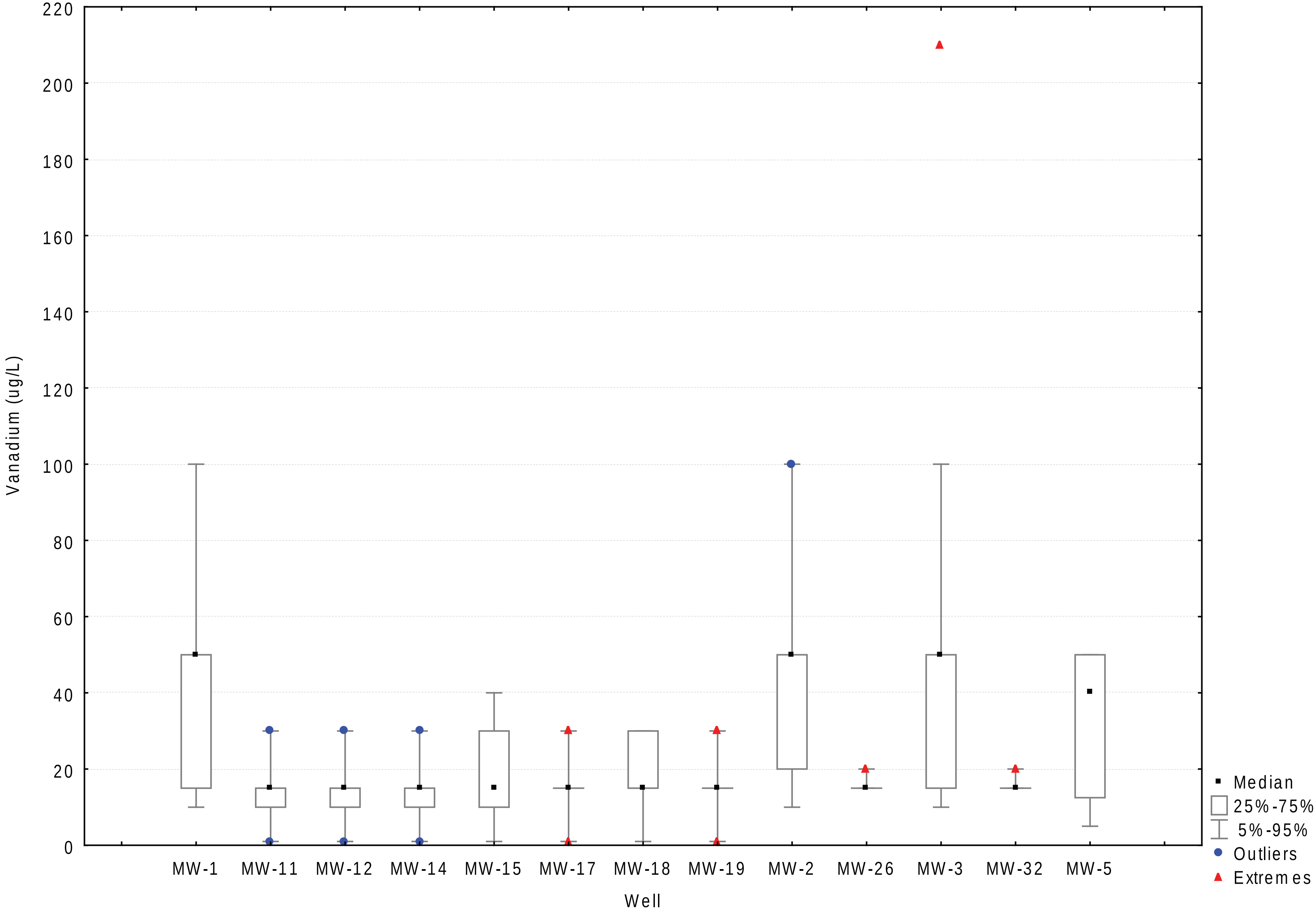


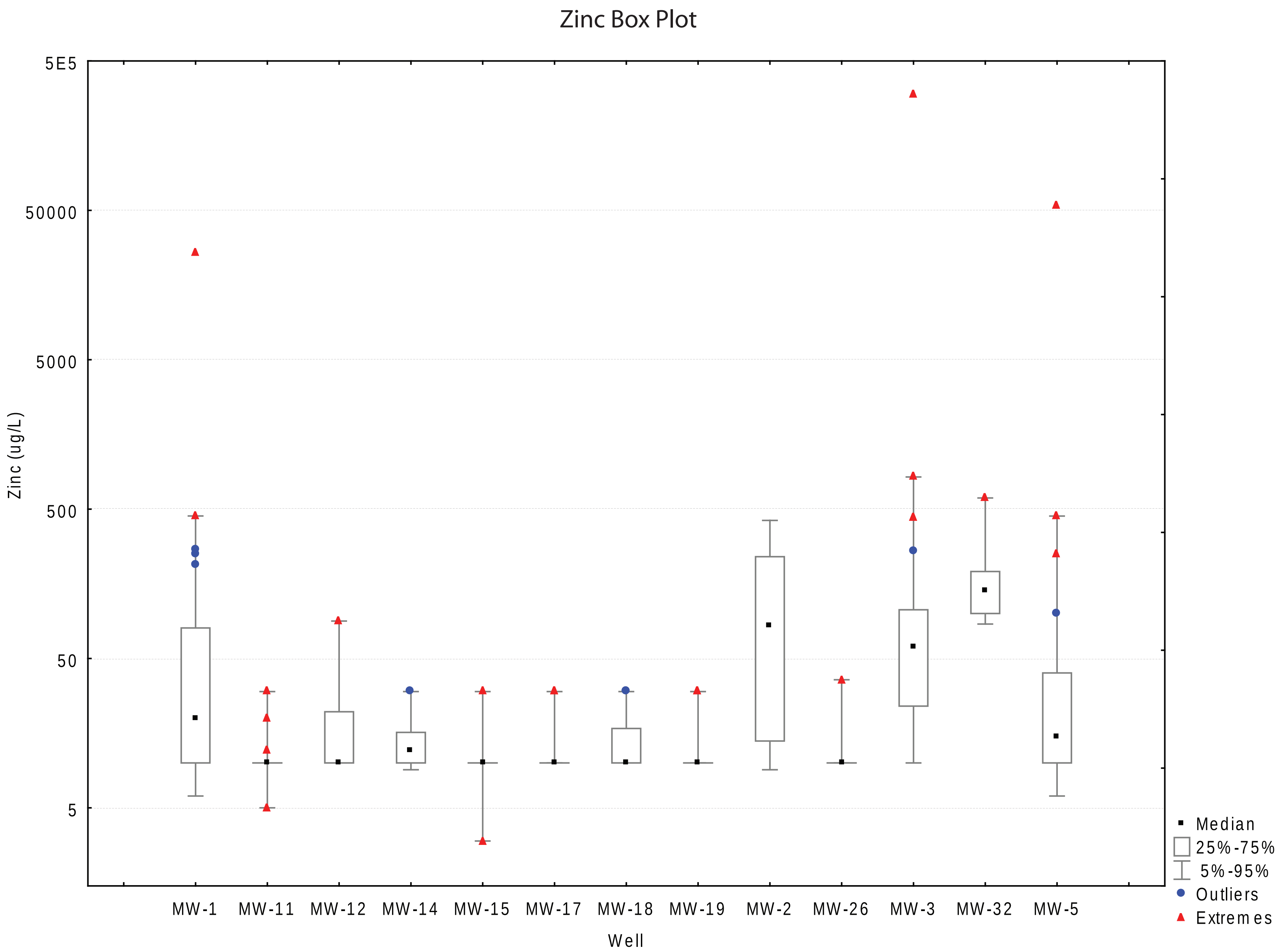
Tin (ug/L)
102
101
100
99
98
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

Uranium Box Plot



Vanadium Box Plot

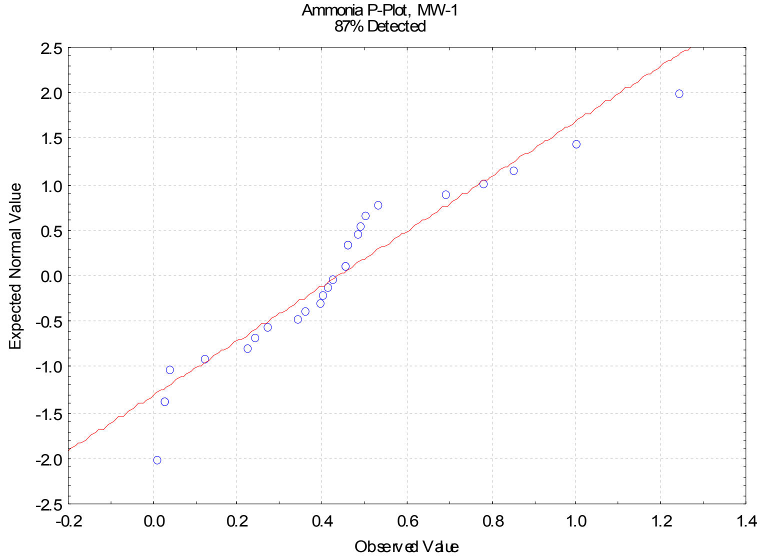


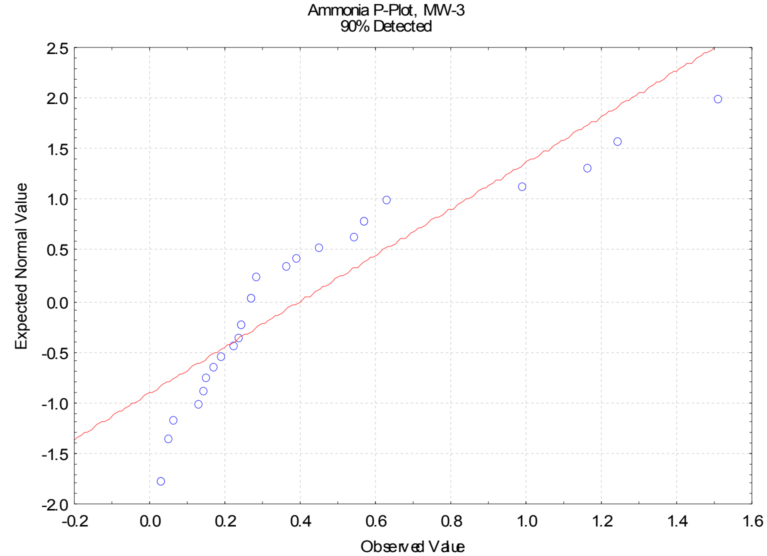

Zinc Box Plot
Zinc (ug/L)
5E5
50000
5000
500
50
5
MW-1
MW-11
MW-12
MW-14
MW-15
MW-17
MW-18
MW-19
MW-2
MW-26
MW-3
MW-32
MW-5
Well
Median
25%-75%
5%-95%
Outliers
Extremes

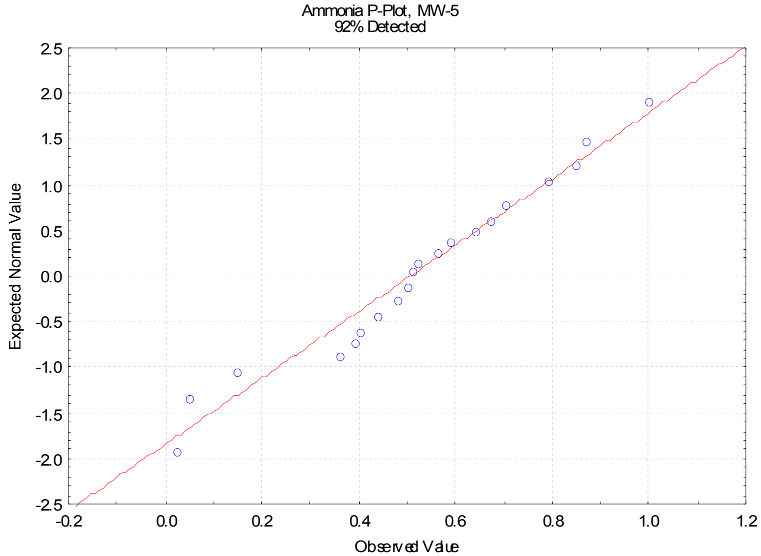
APPENDIX B

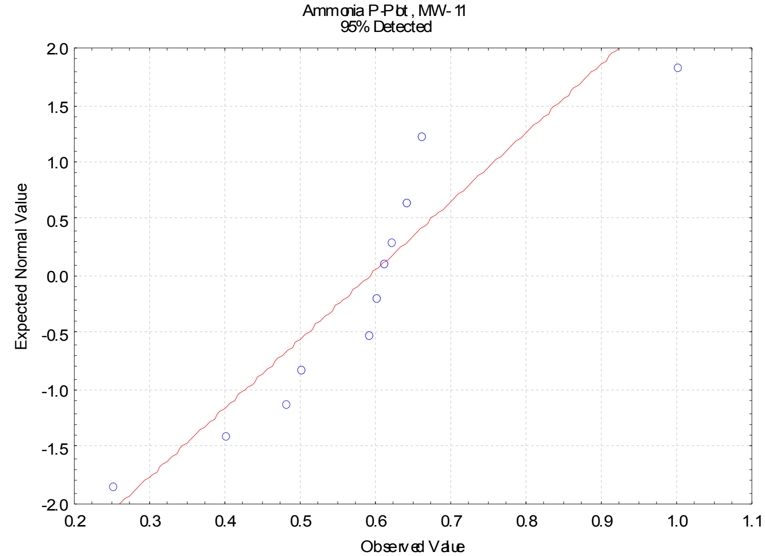
PROBABILITY PLOTS

Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

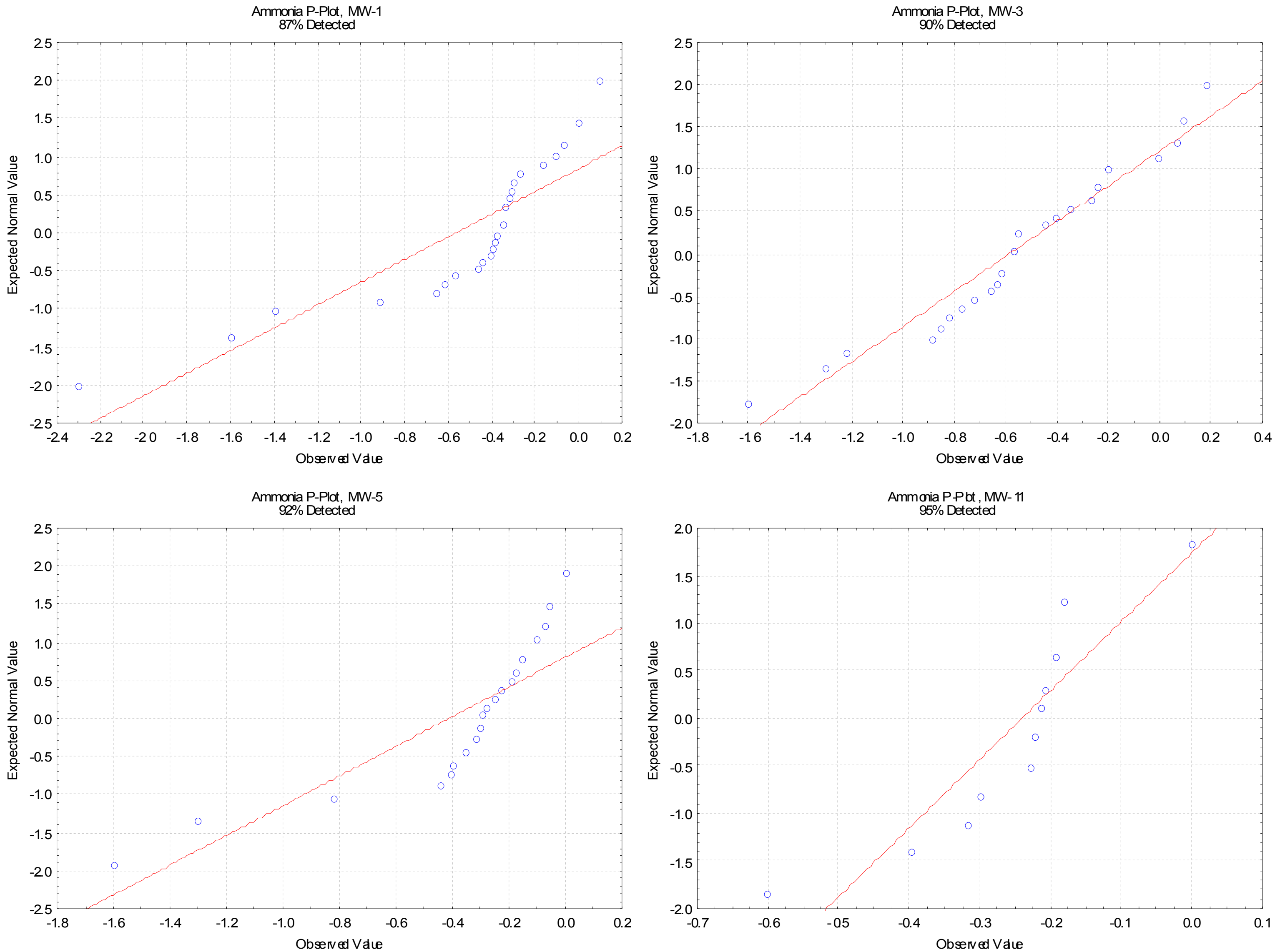




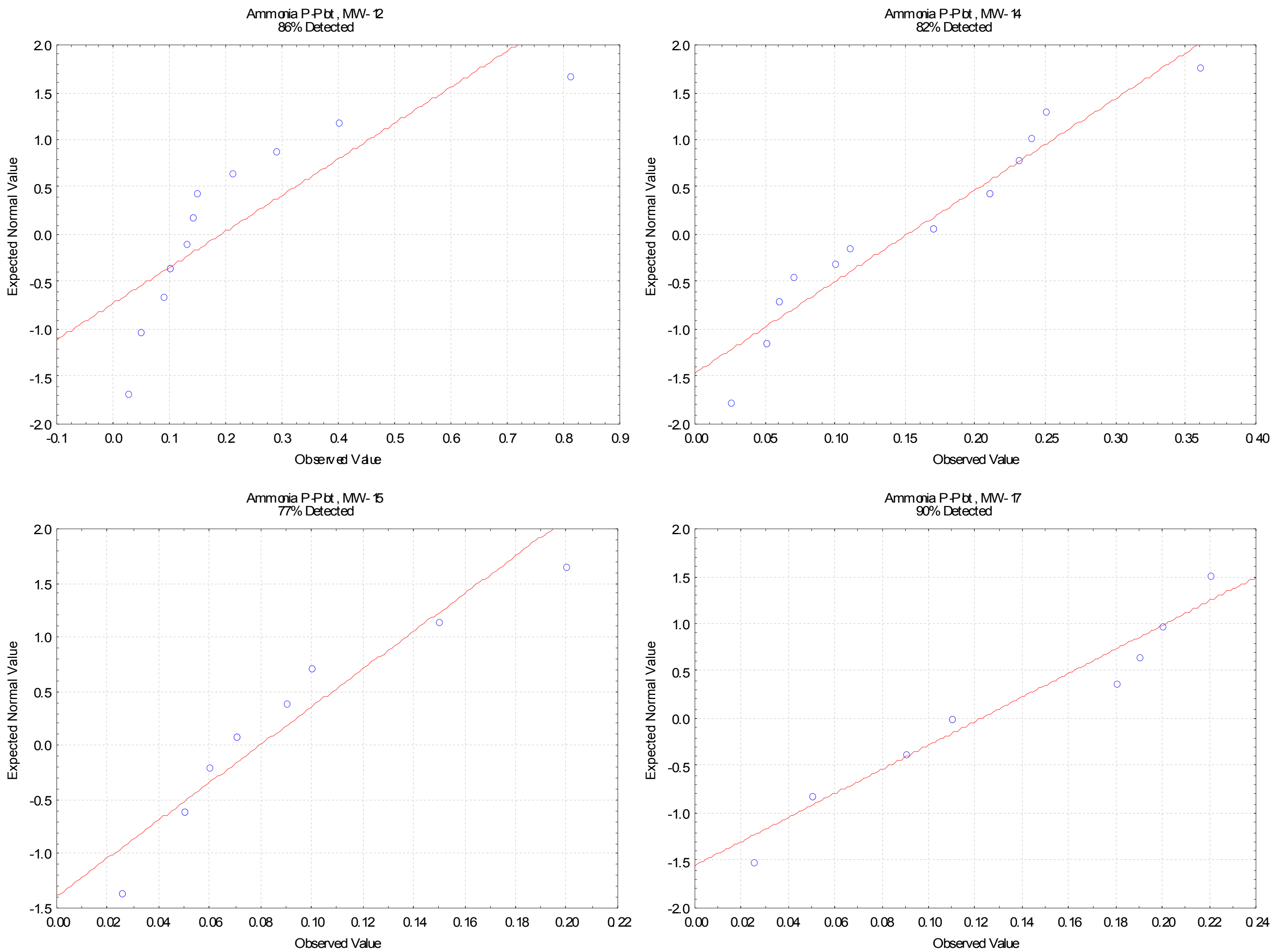




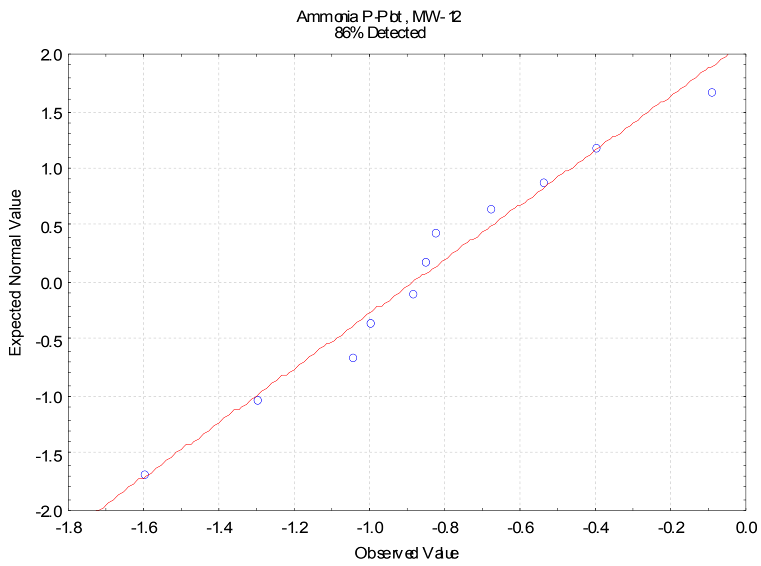
Log-Transformed Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

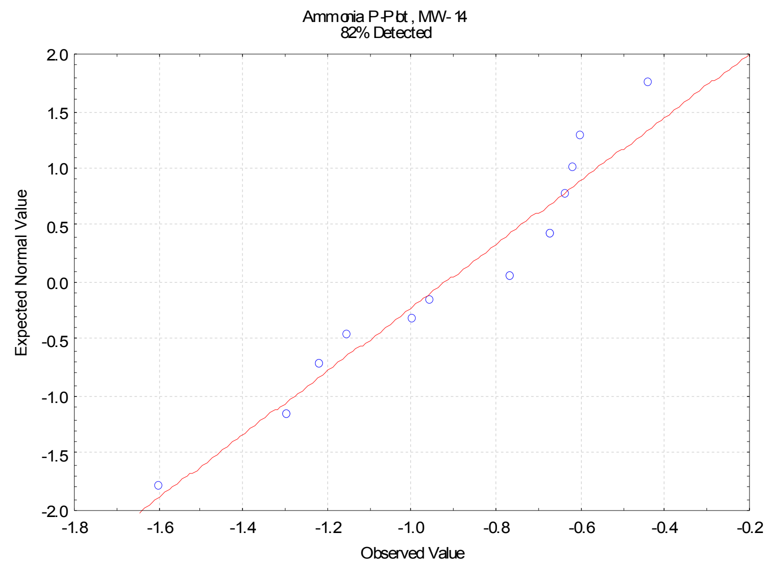


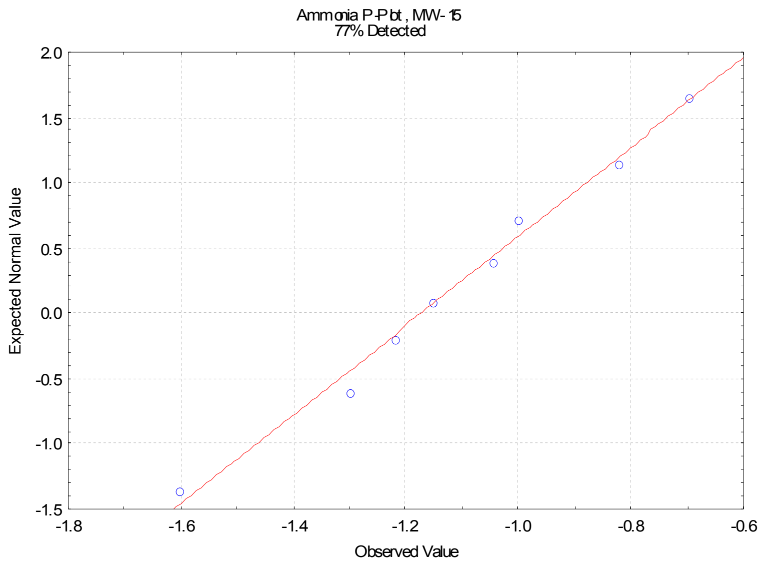
Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

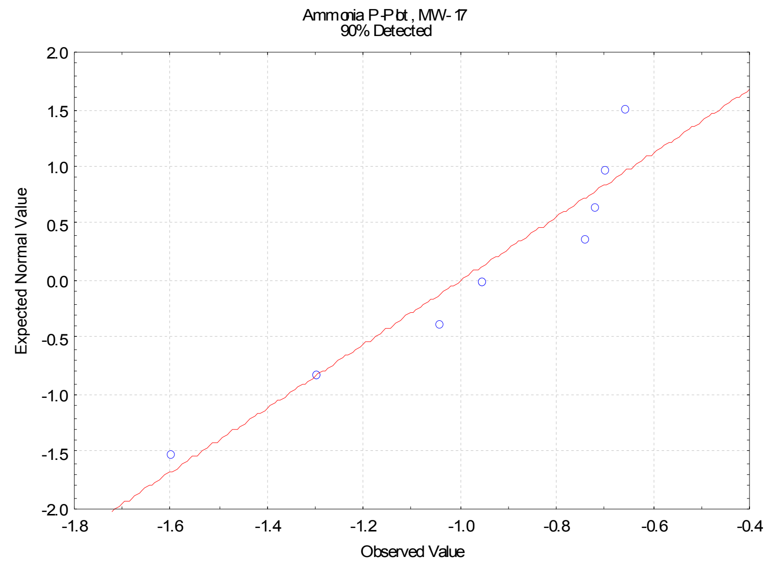


Log-Transformed Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

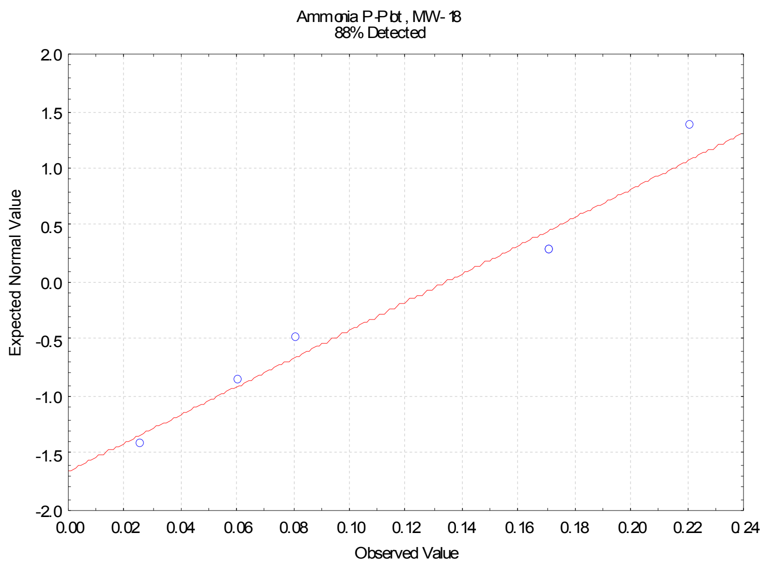


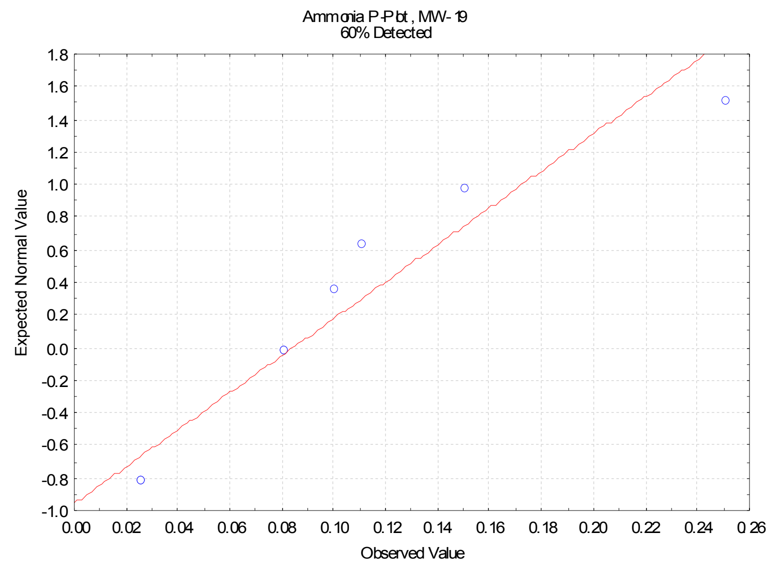


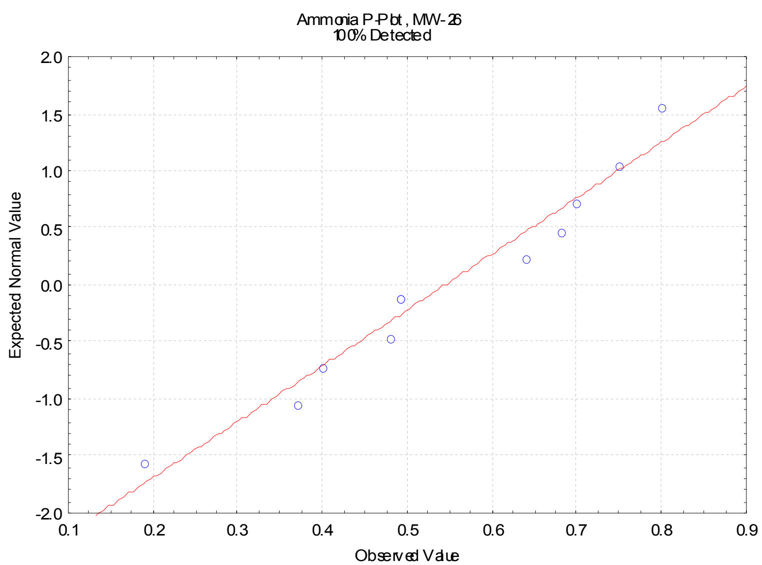


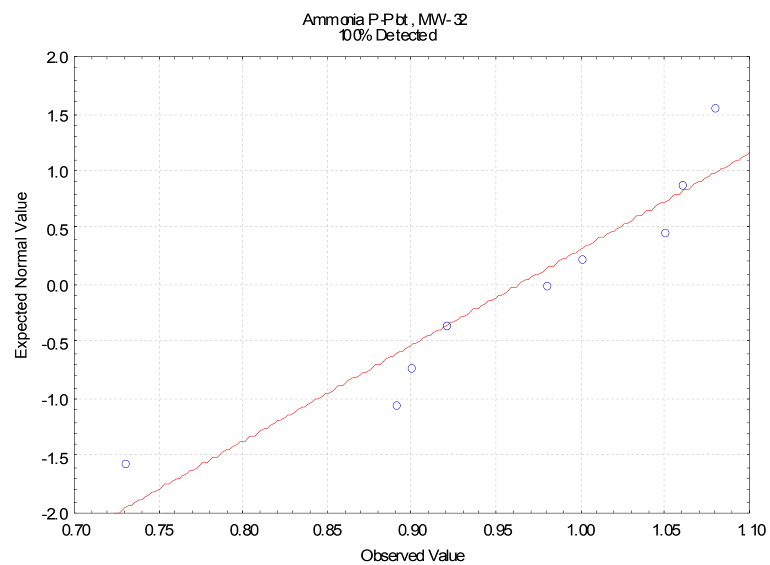


Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

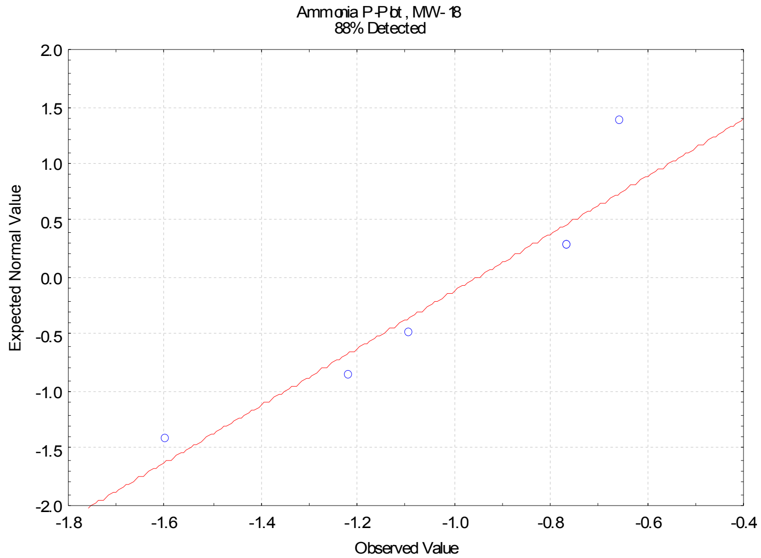


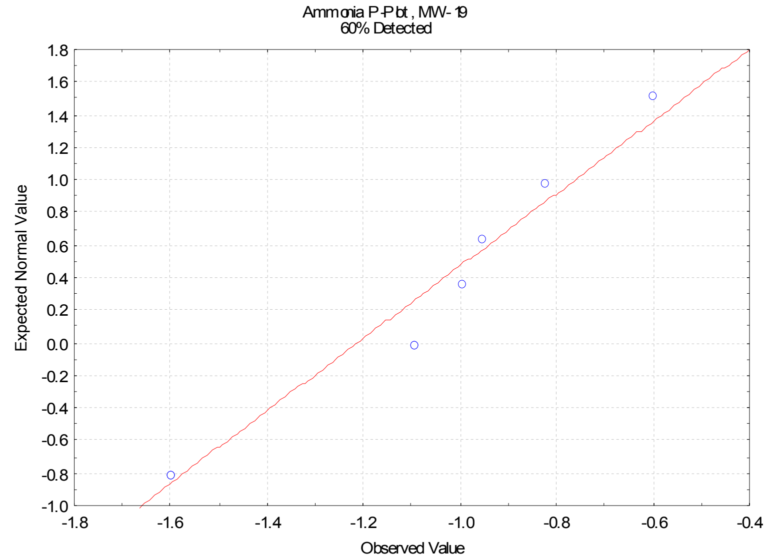


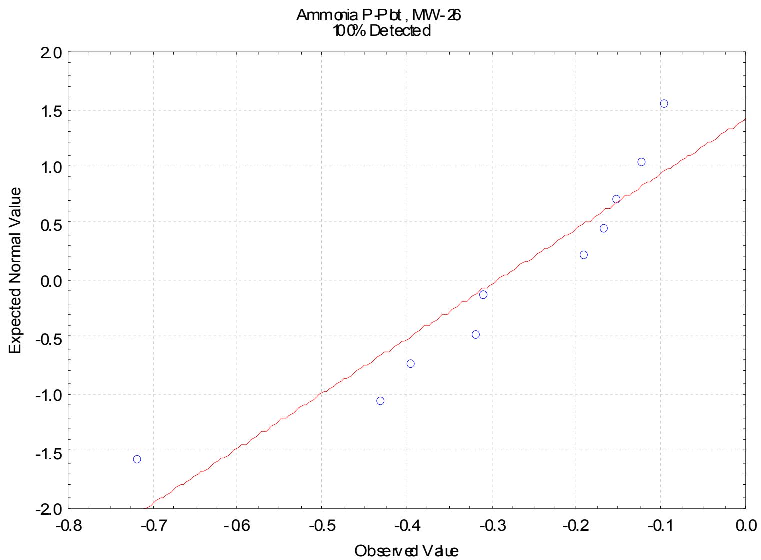


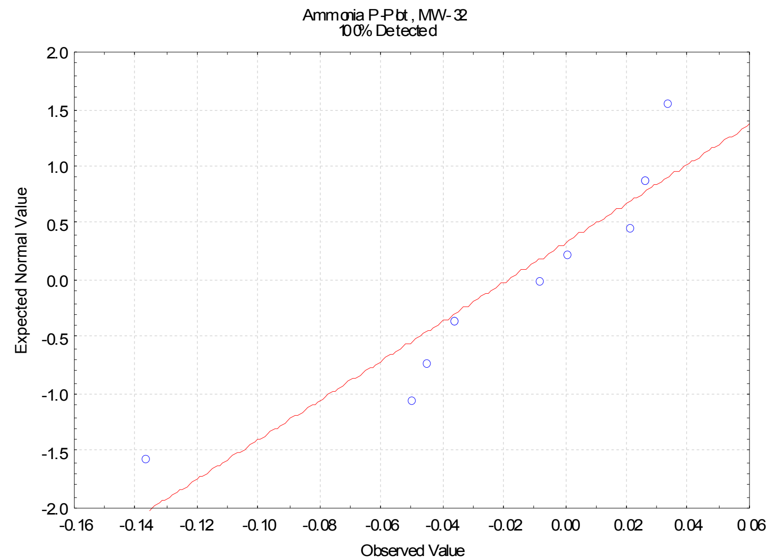


Log-Transformed Ammonia (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

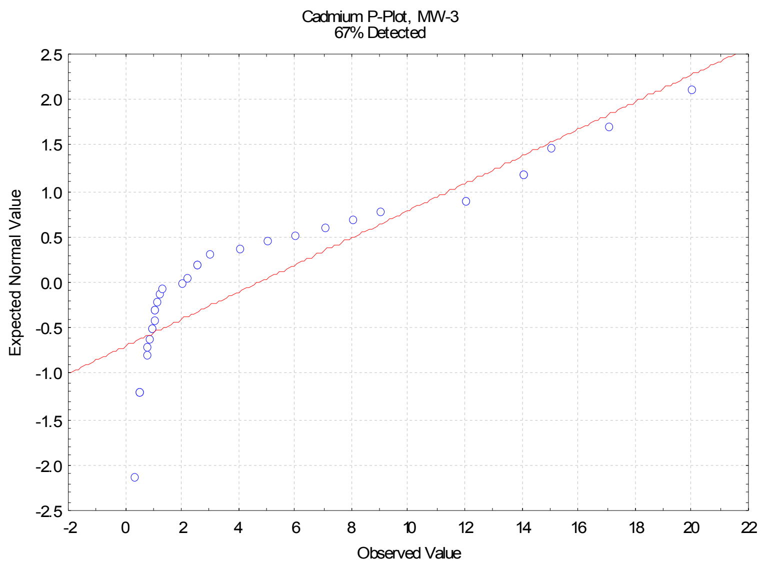


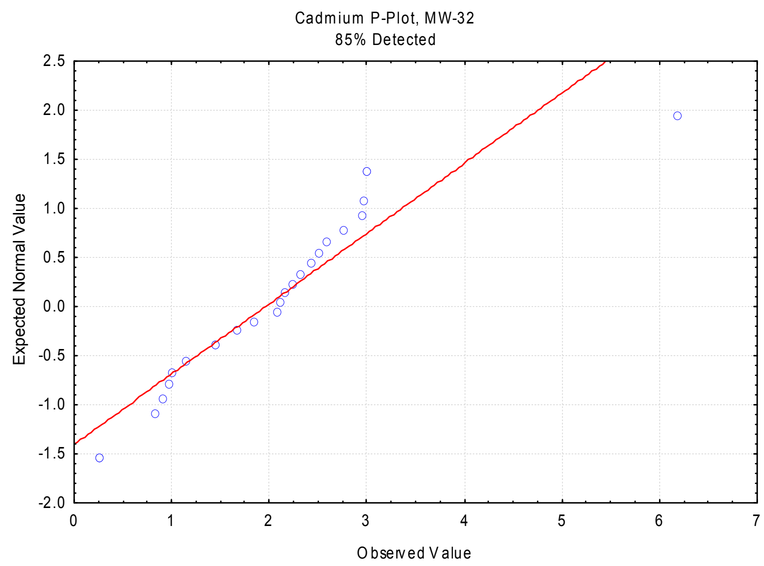




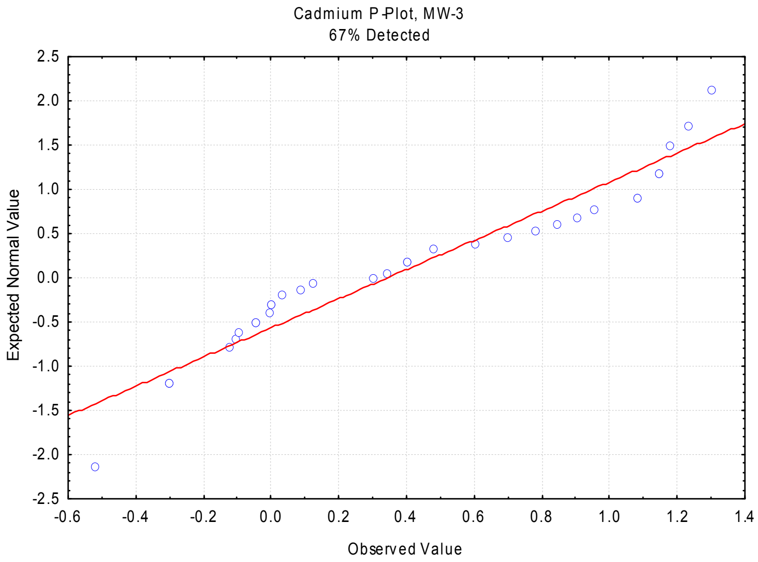


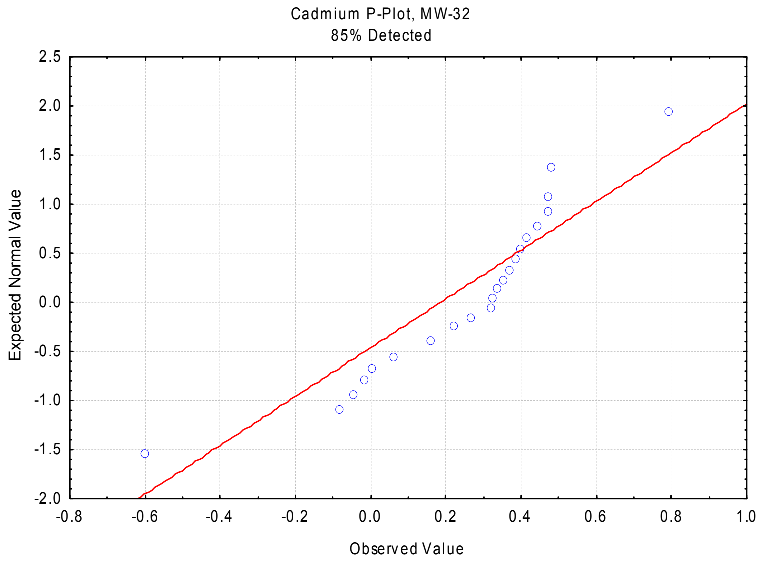
Cadmium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects



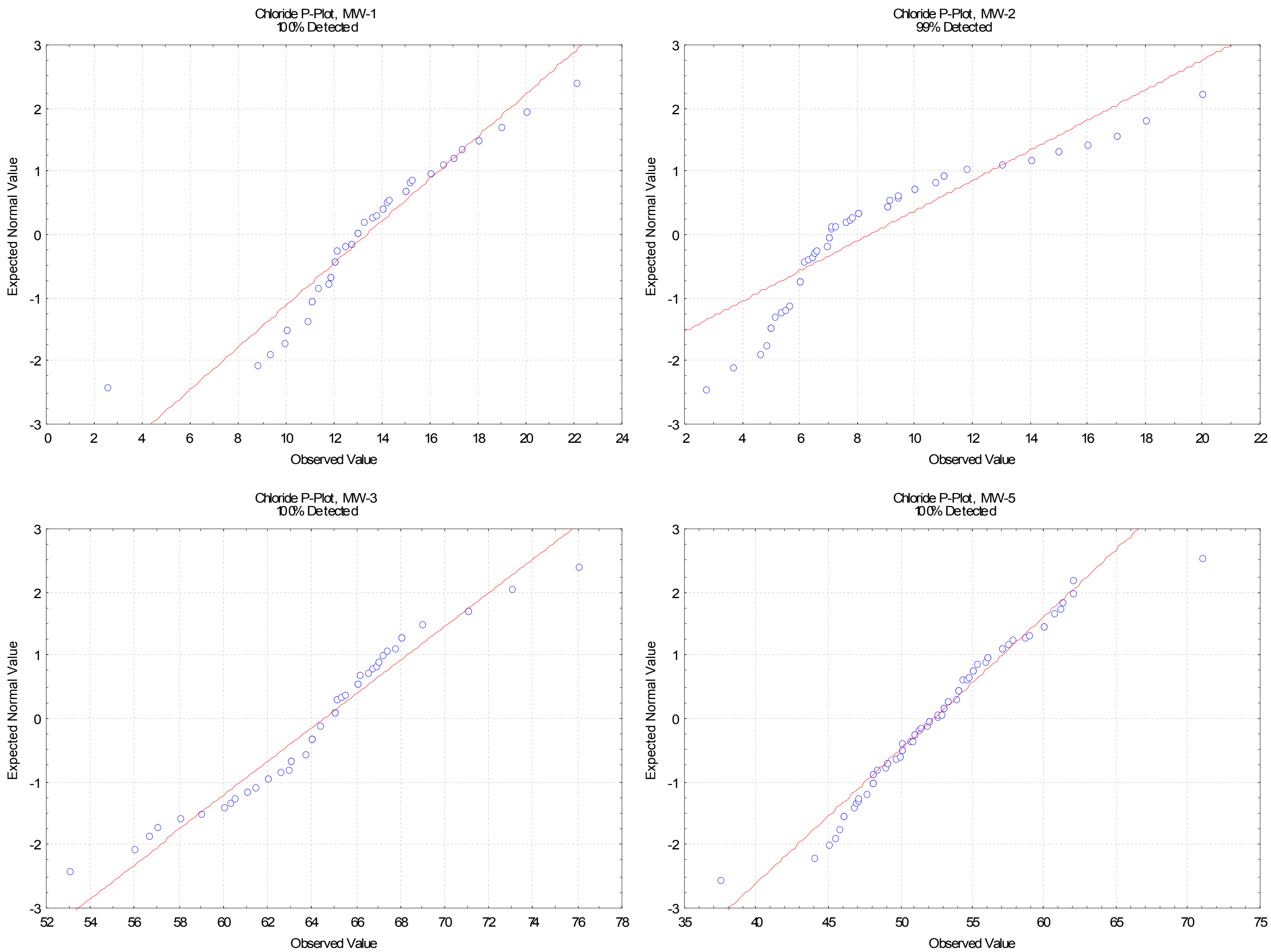


Log-Transformed Cadmium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

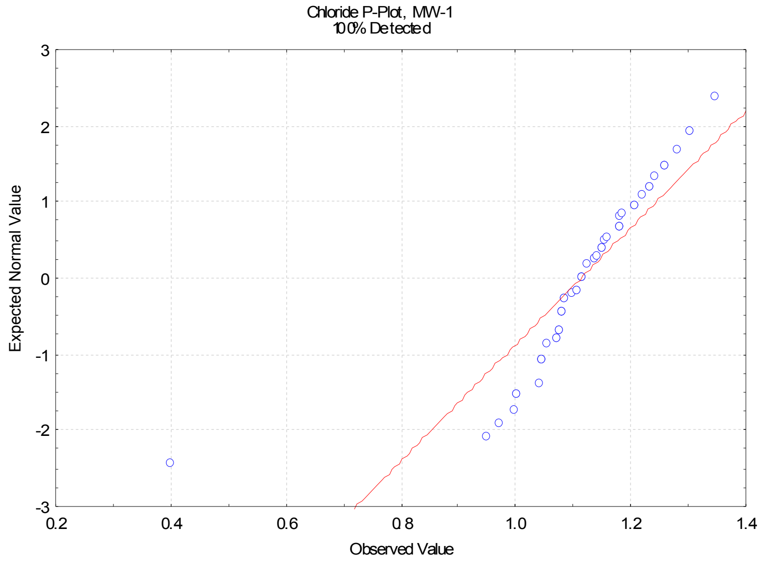


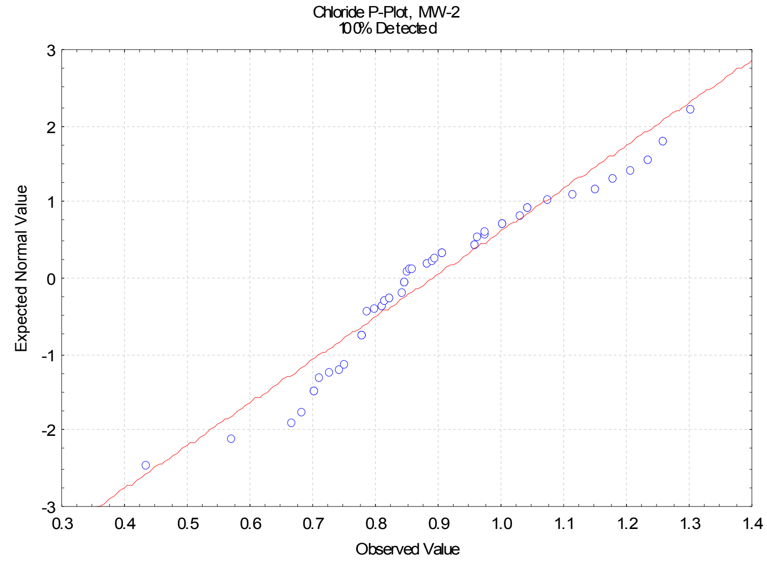


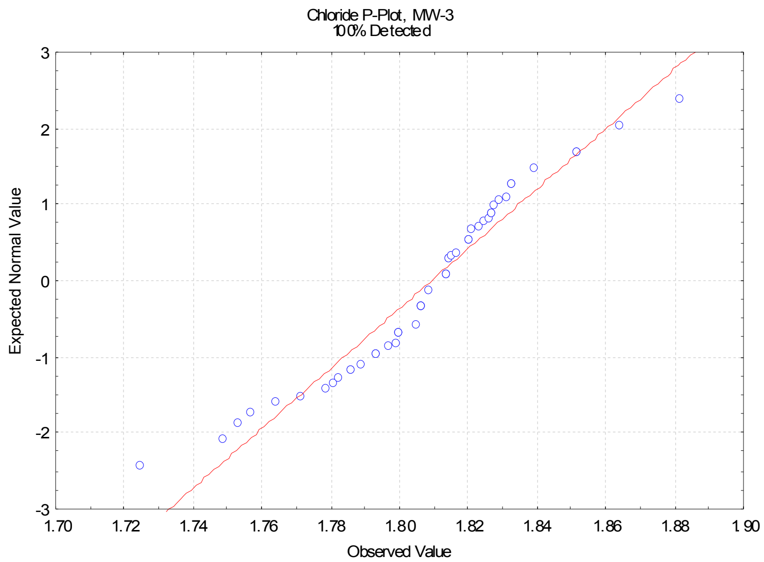
Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

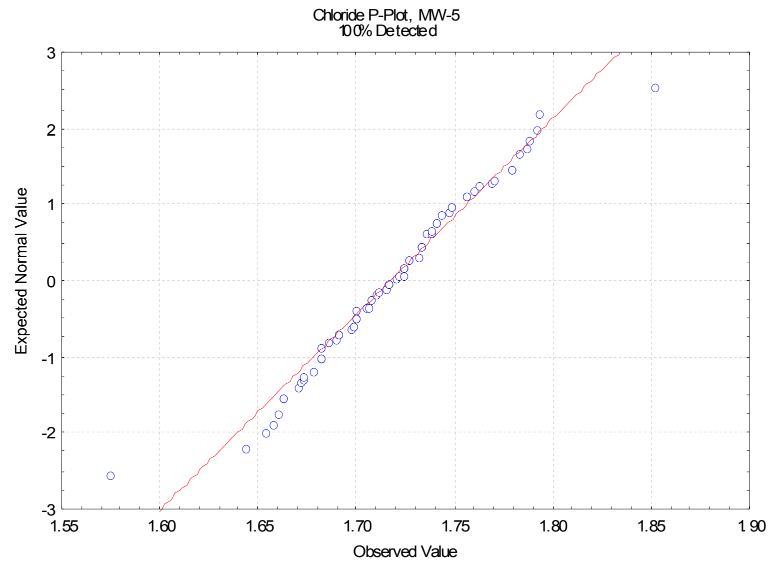


Log-Transformed Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

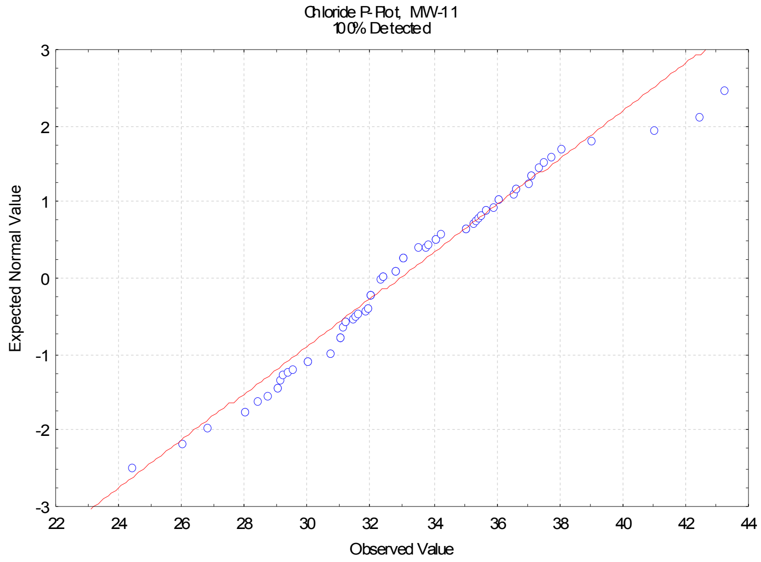


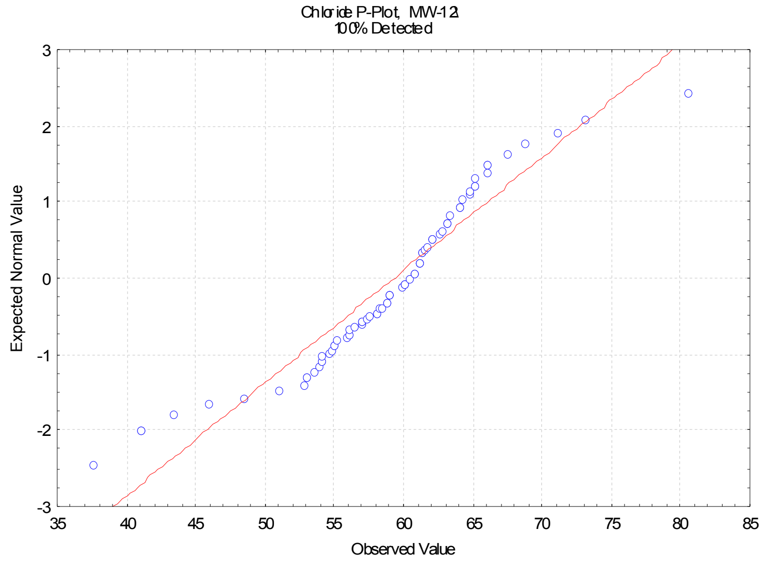


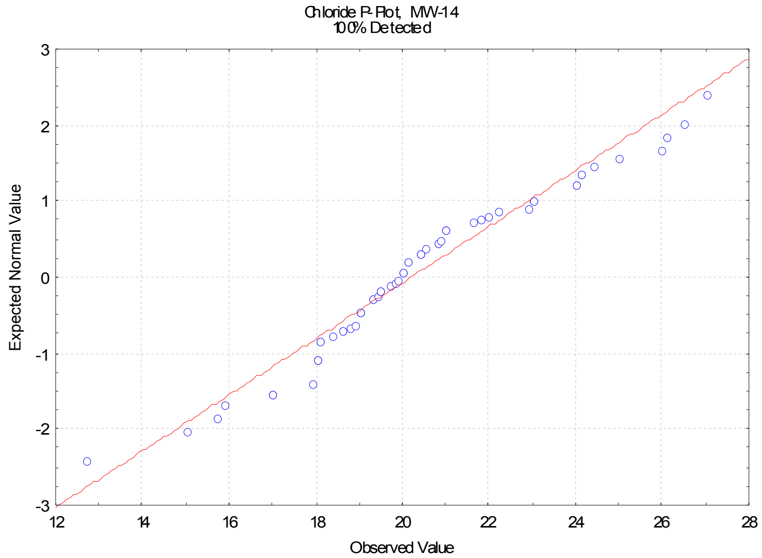


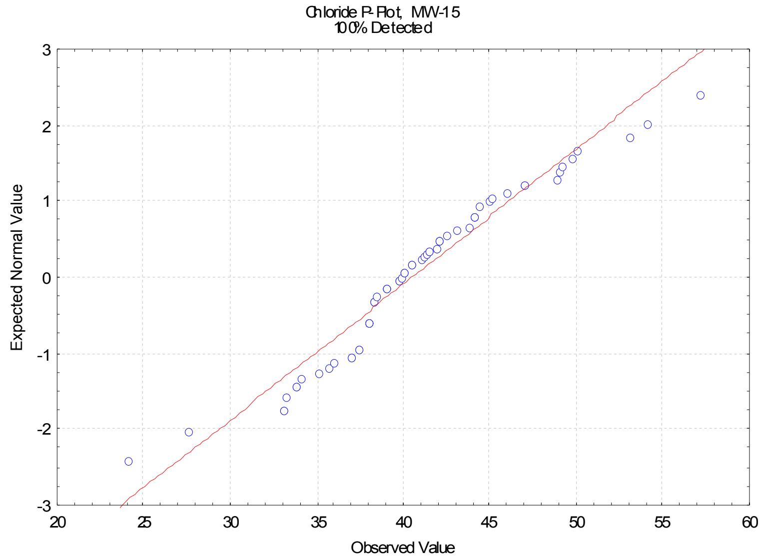


Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

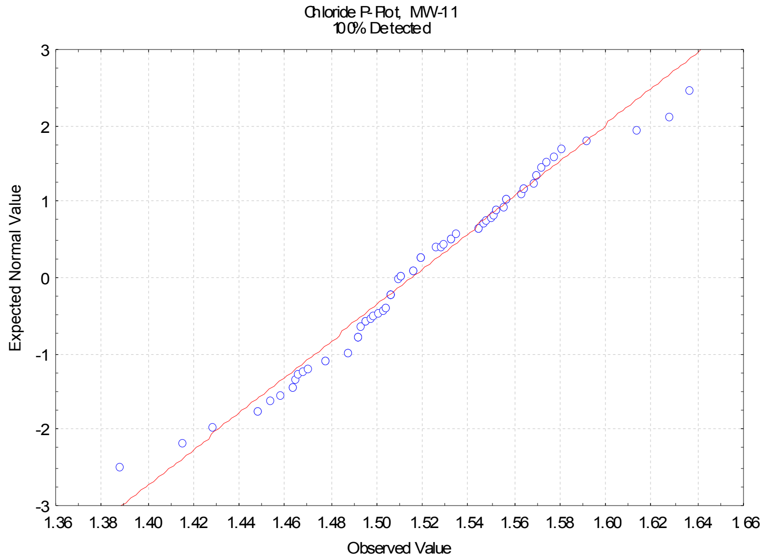


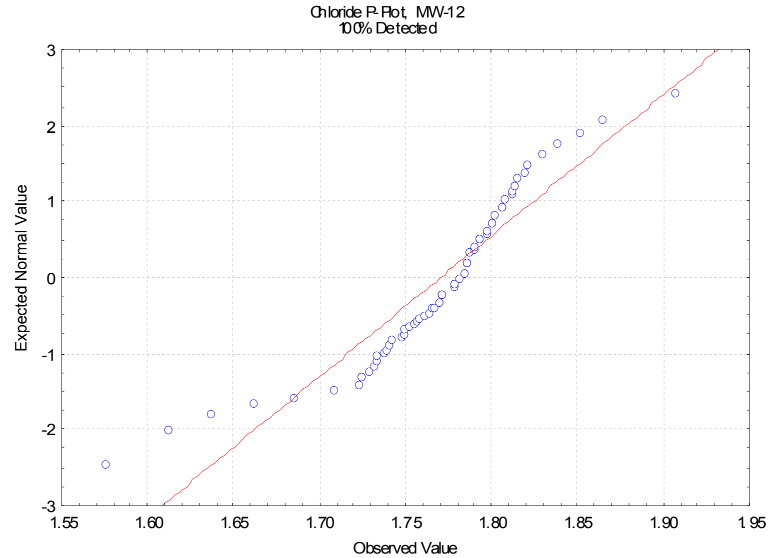


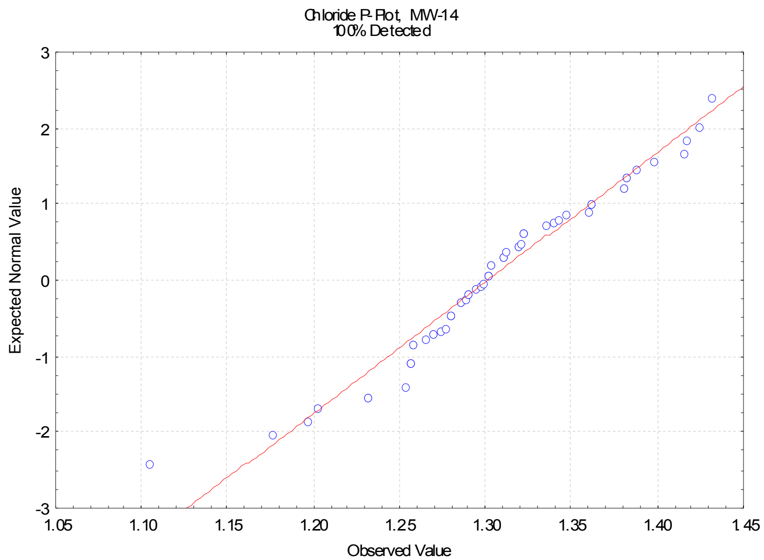


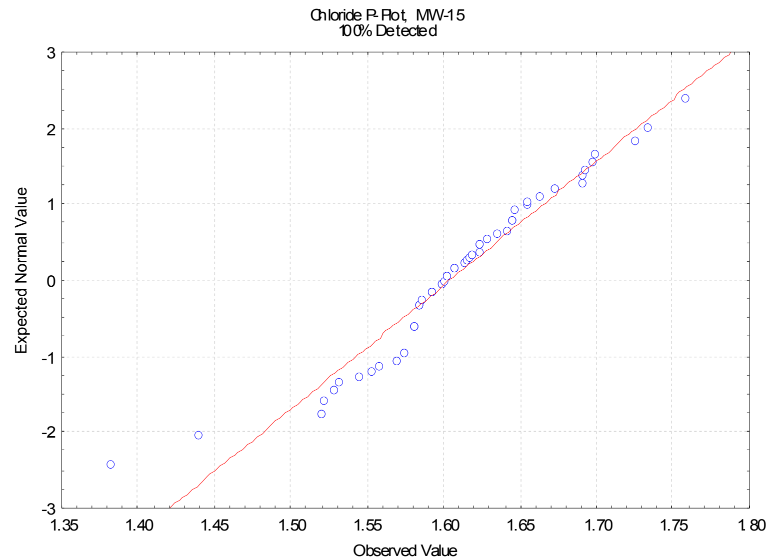


Log-Transformed Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

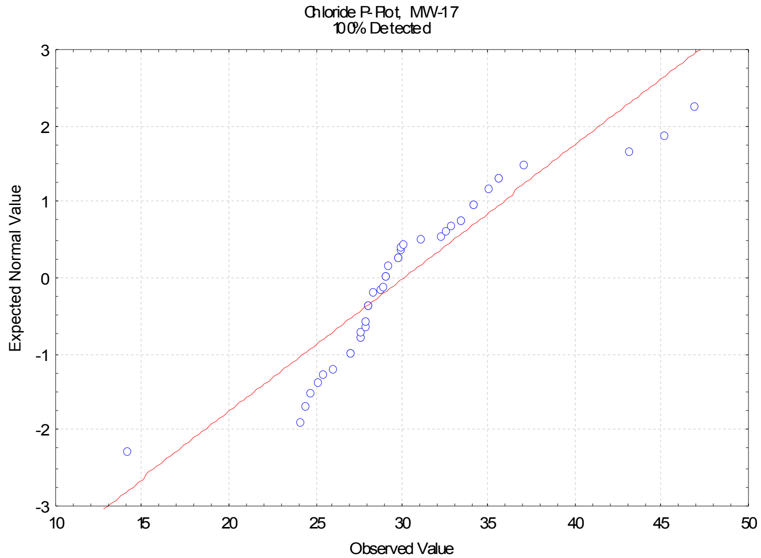


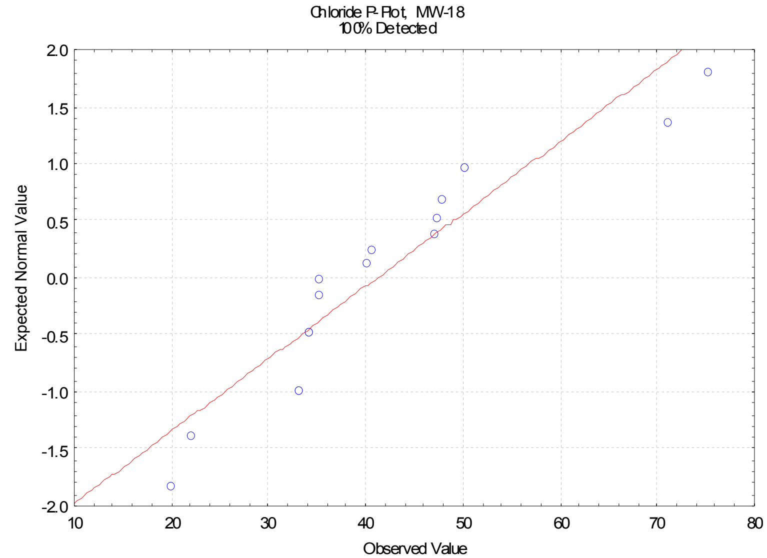


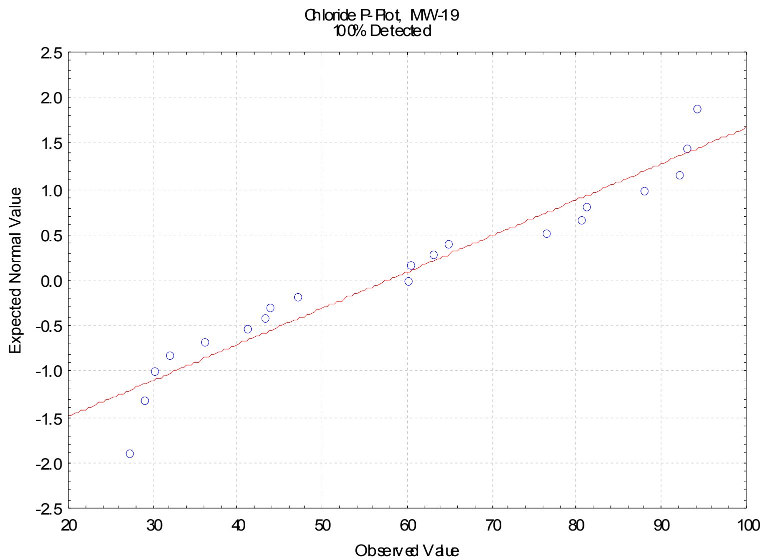


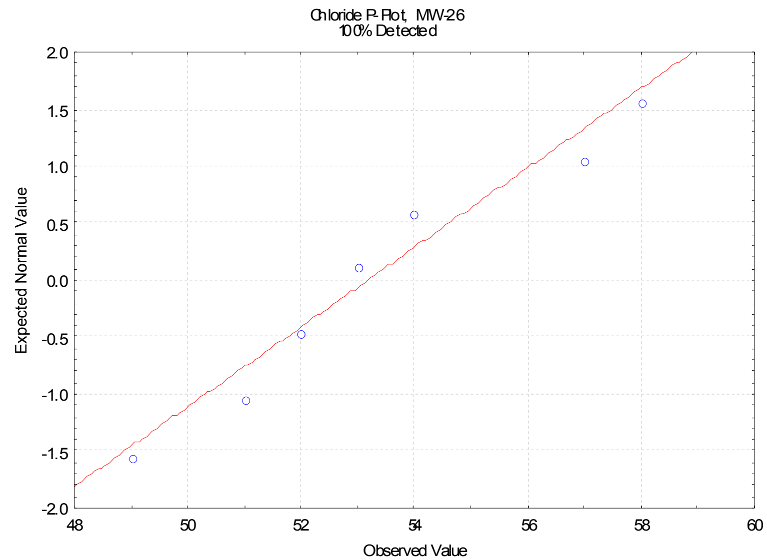


Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

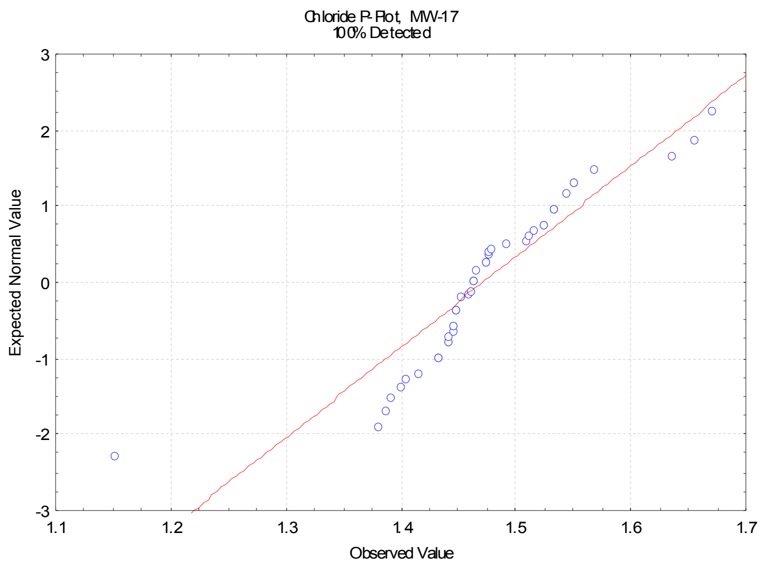


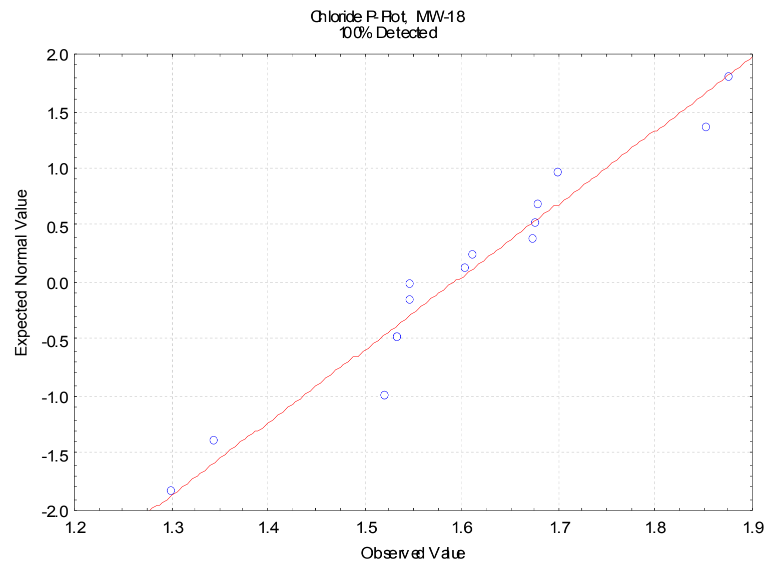


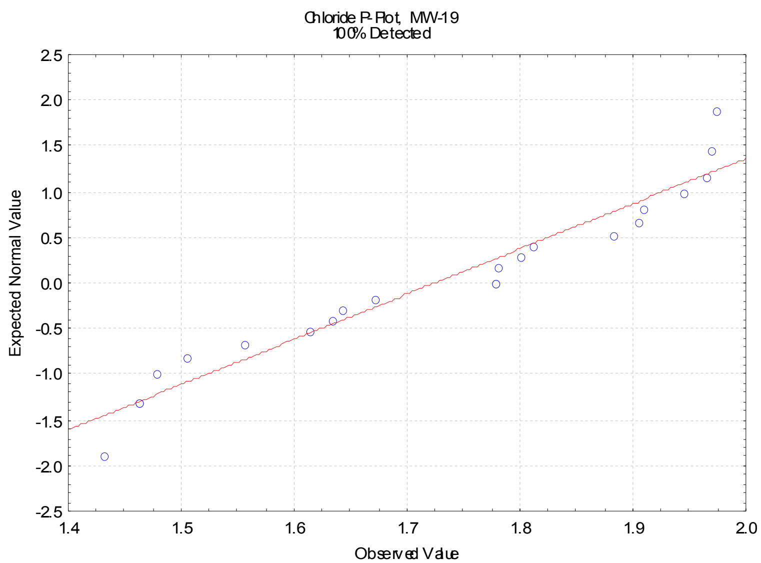


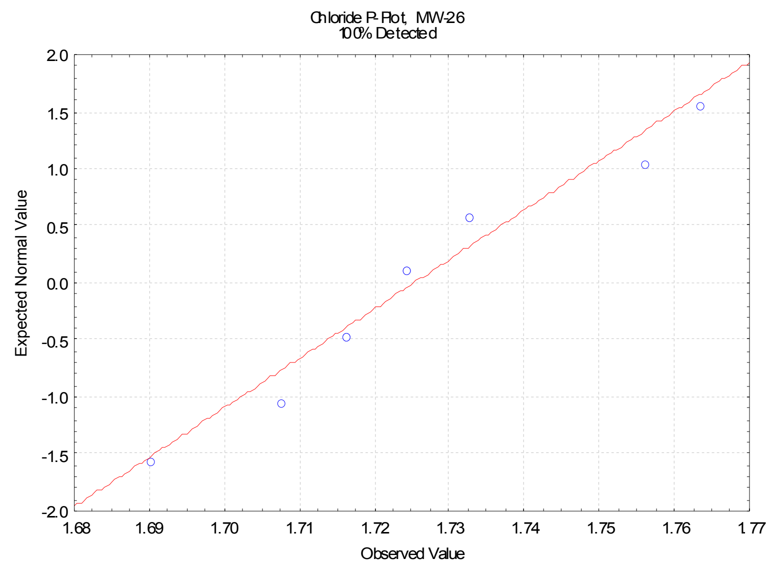


Log-Transformed Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

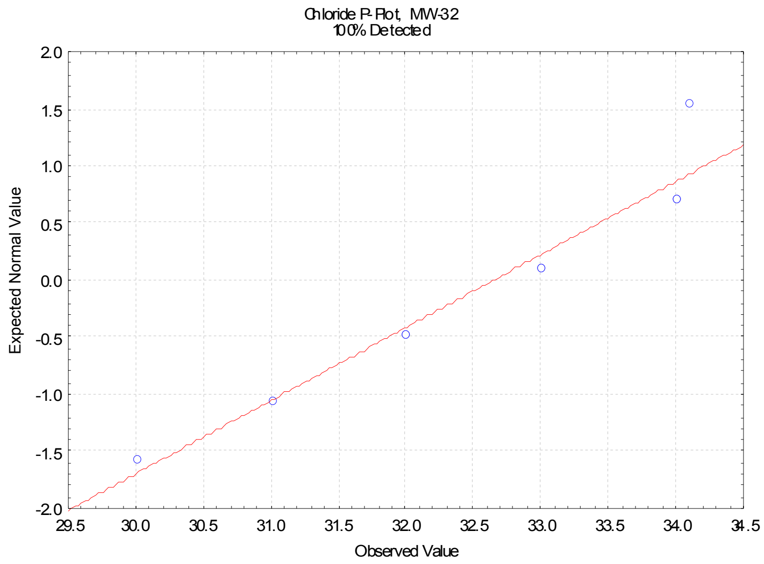




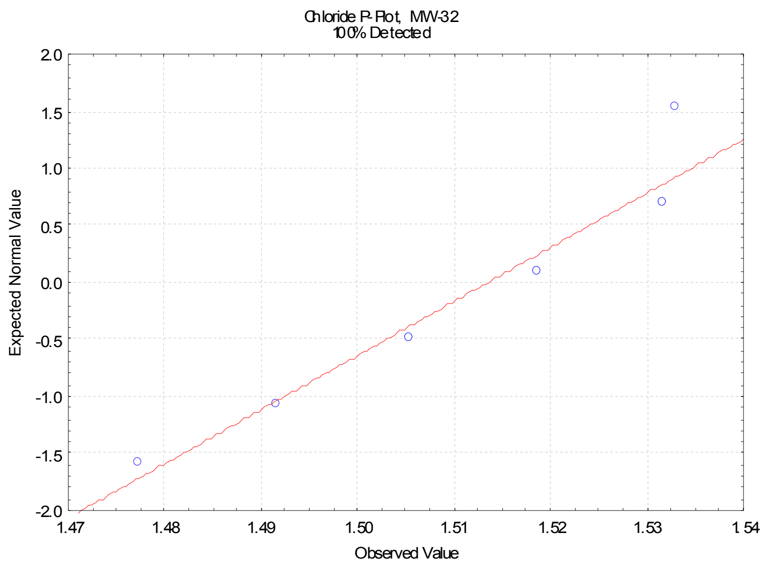




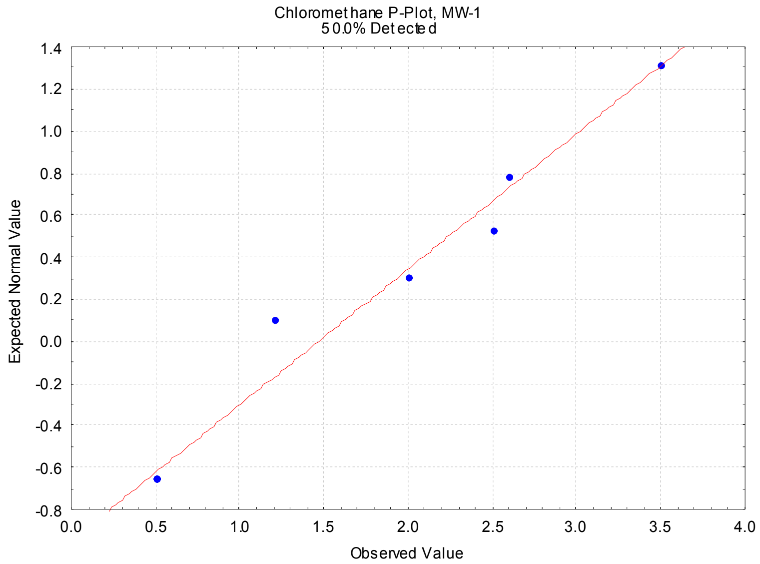
Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

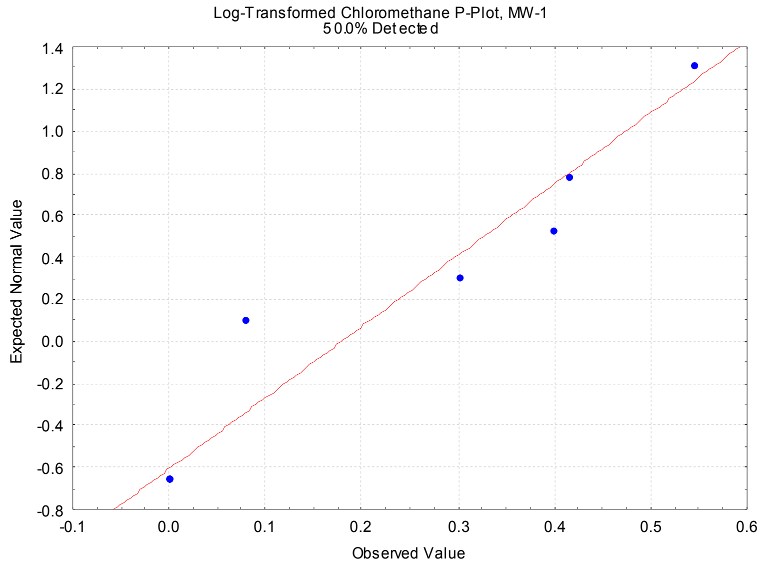


Log-Transformed Chloride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

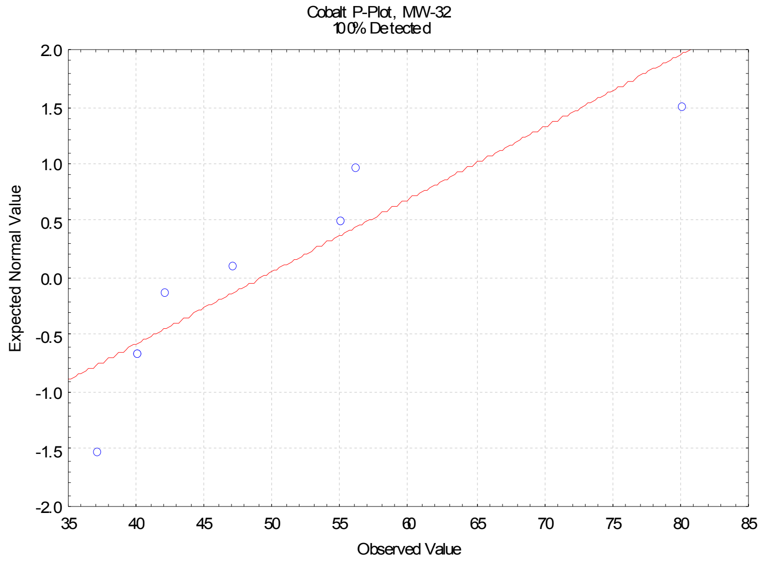


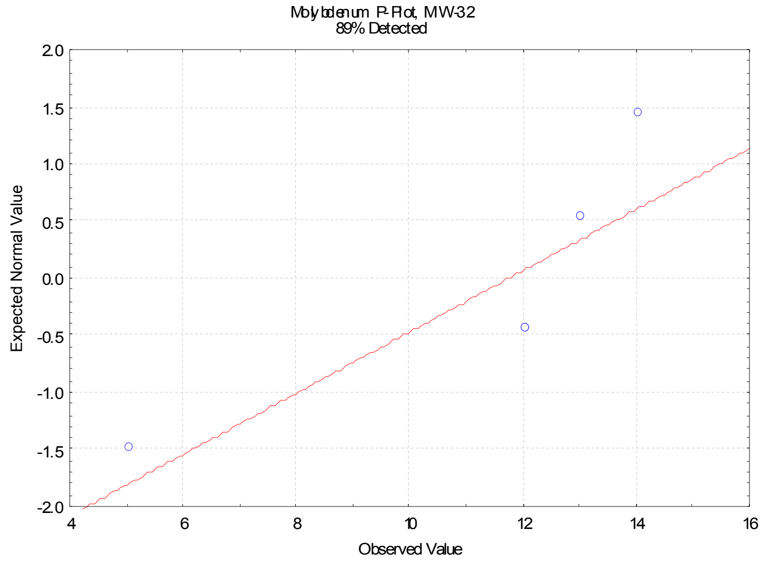
Chloromethane (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

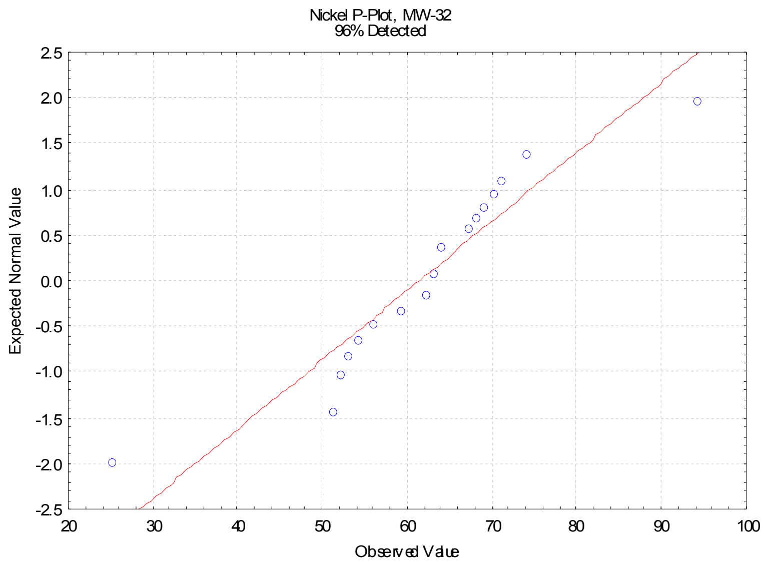




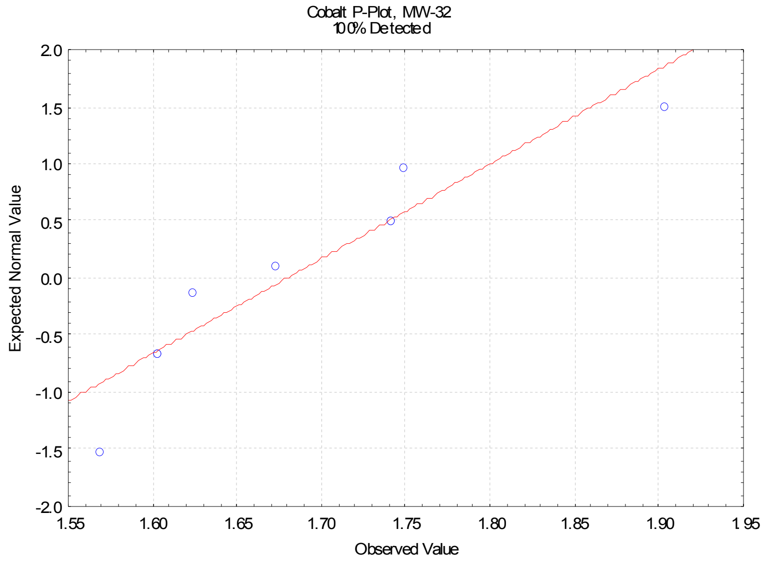
Cobalt, Molybdenum, Nickel (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

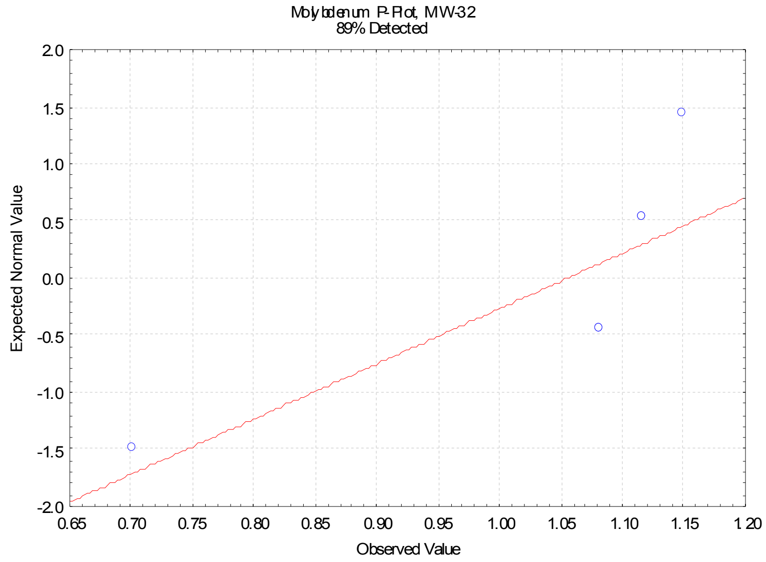


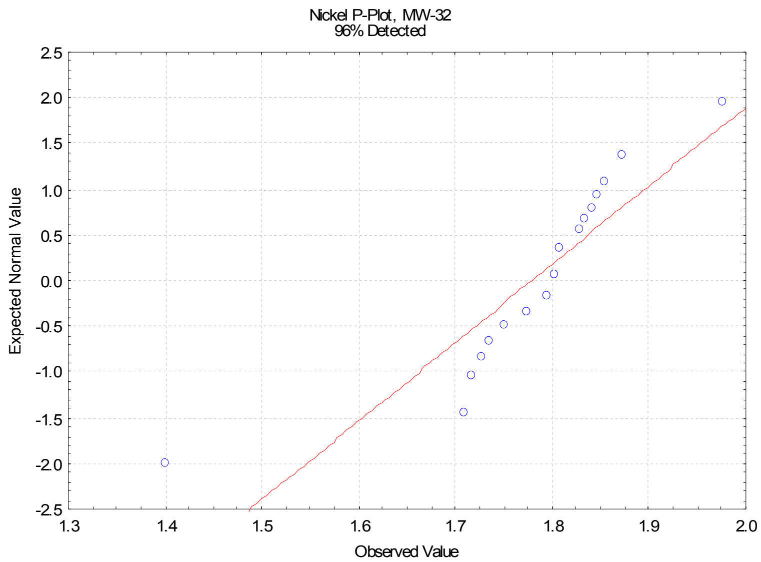




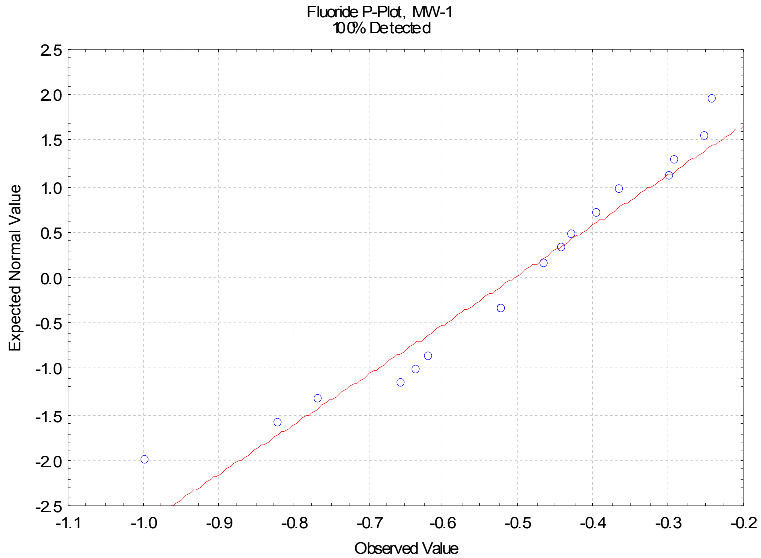
Log-Transformed Cobalt, Molybdenum and Nickel (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

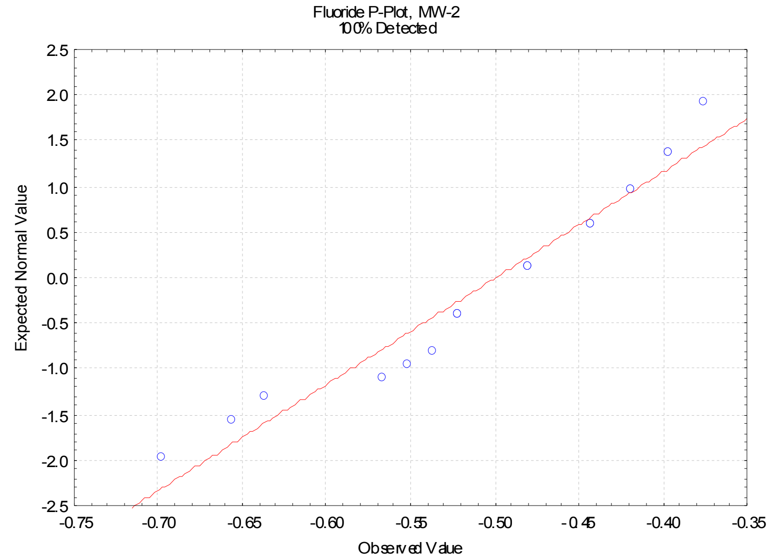


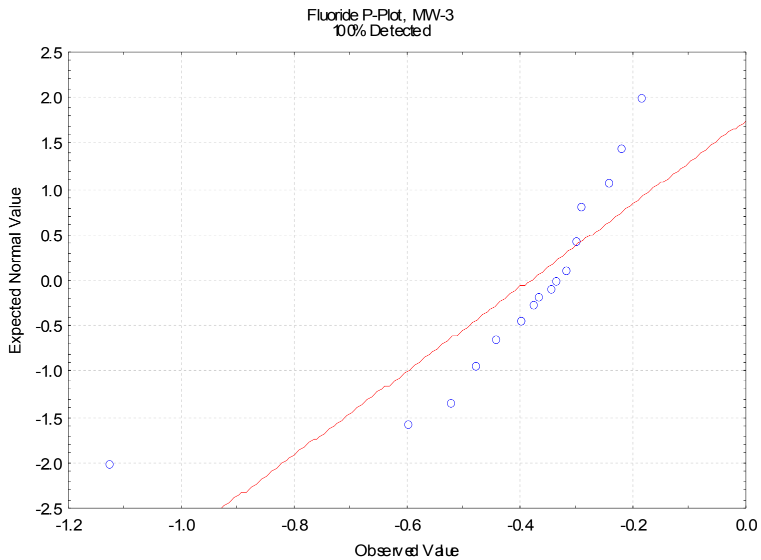


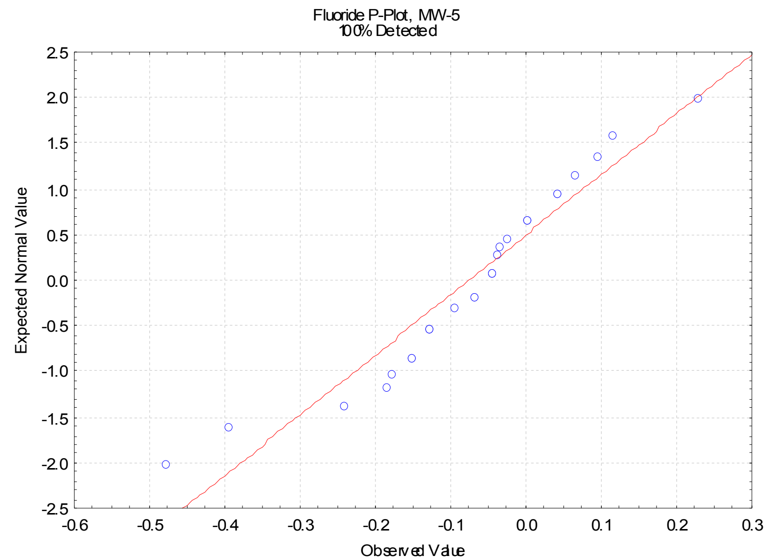


Log-Transformed Fluoride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

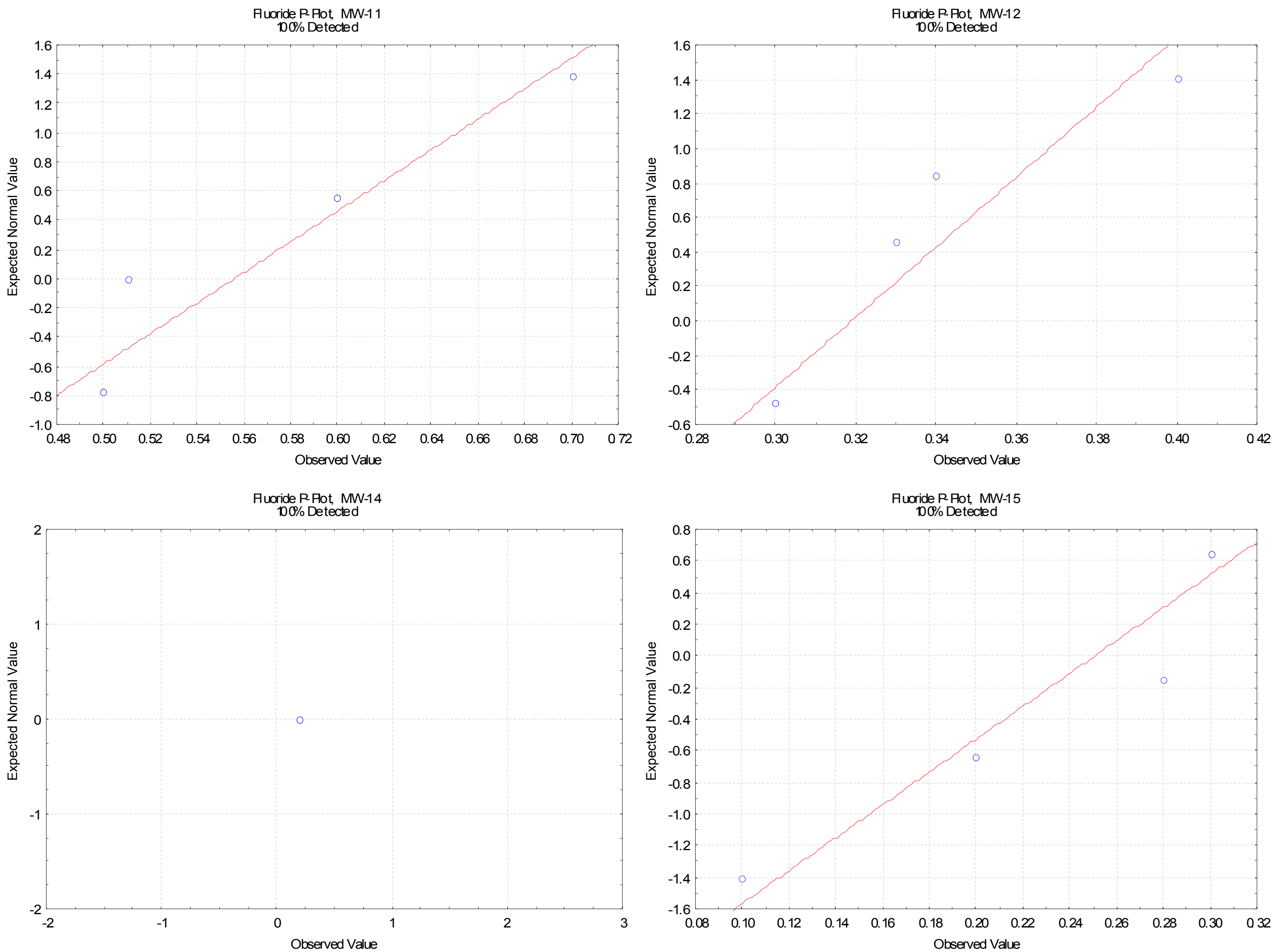




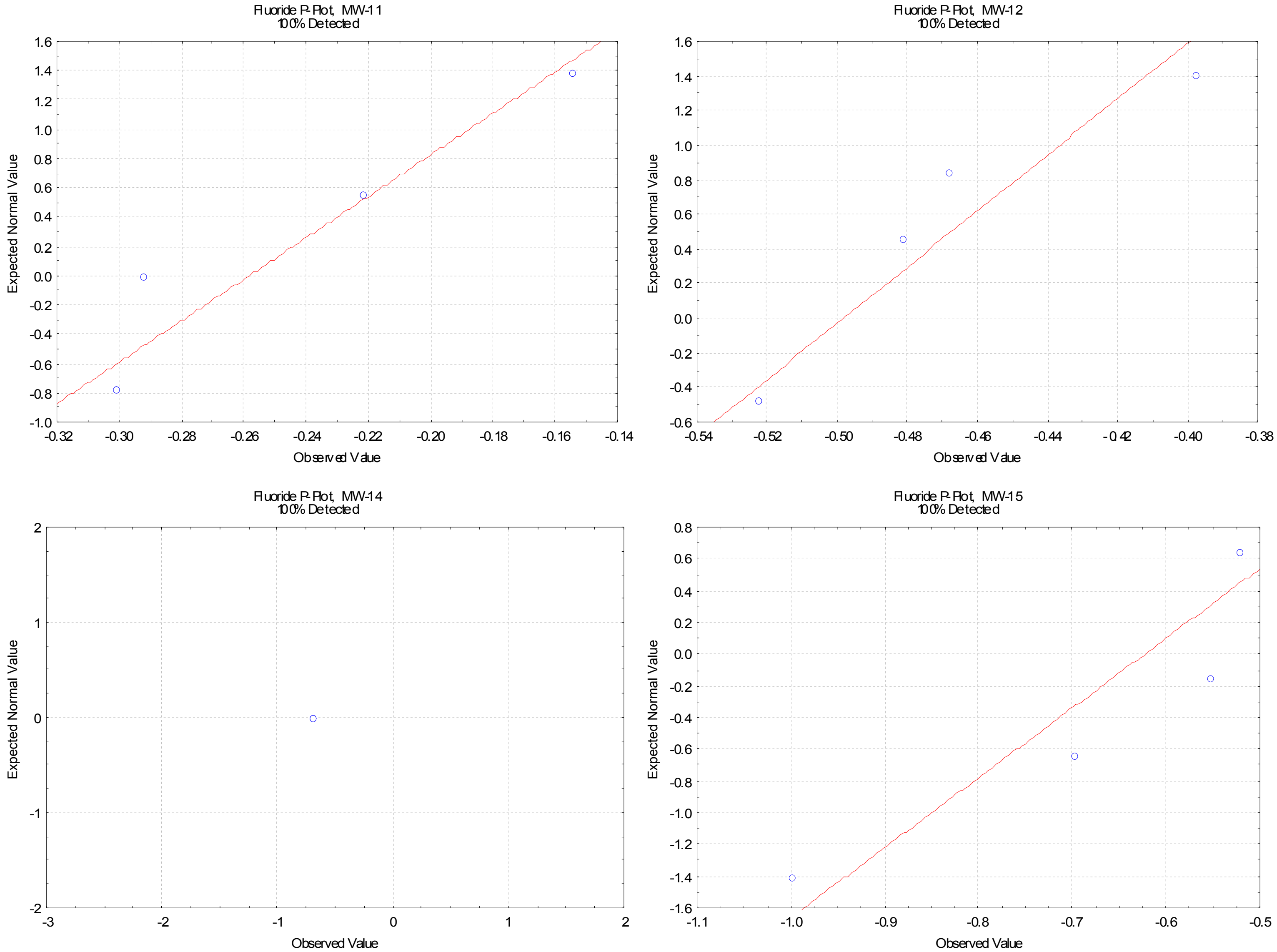




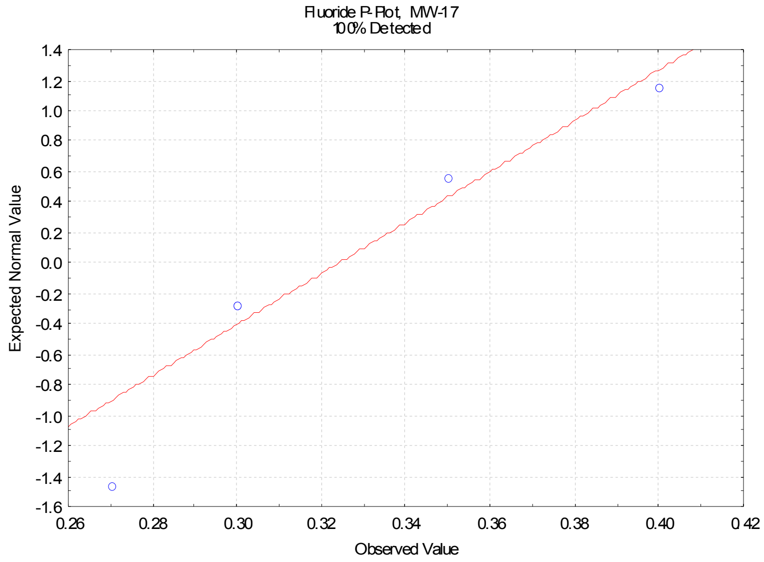
Fluoride (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

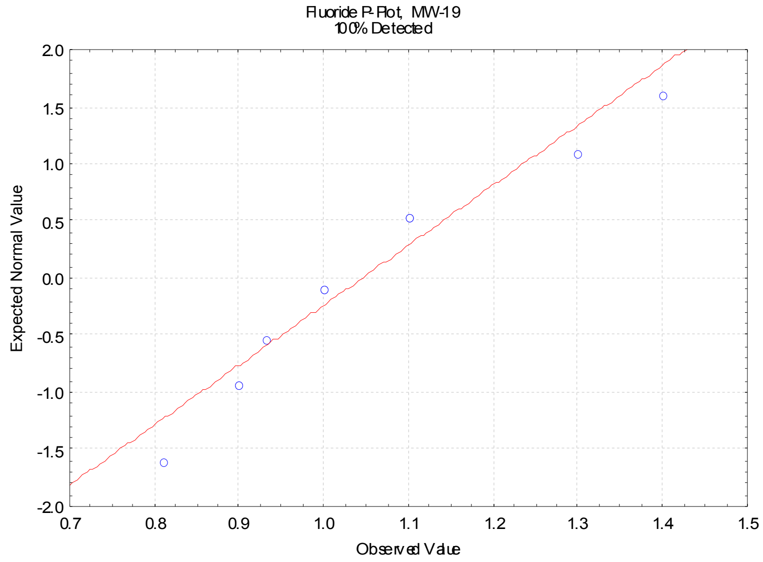


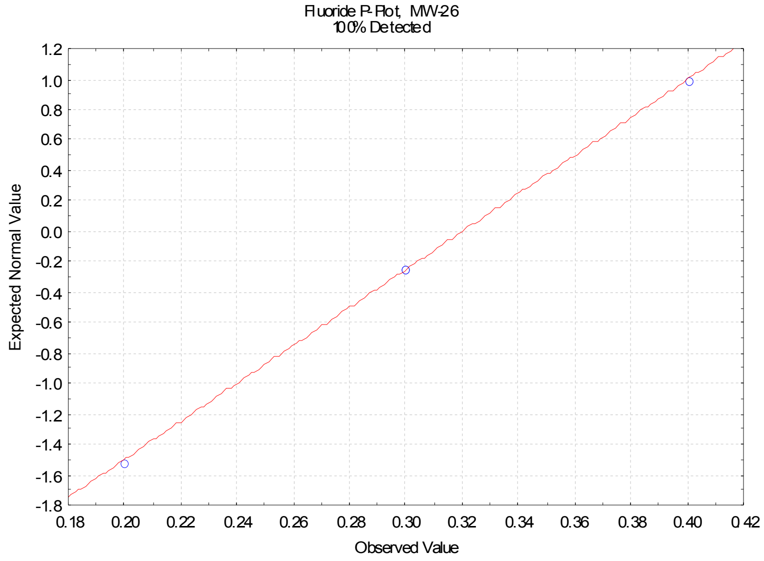
Log-Transformed Fluoride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

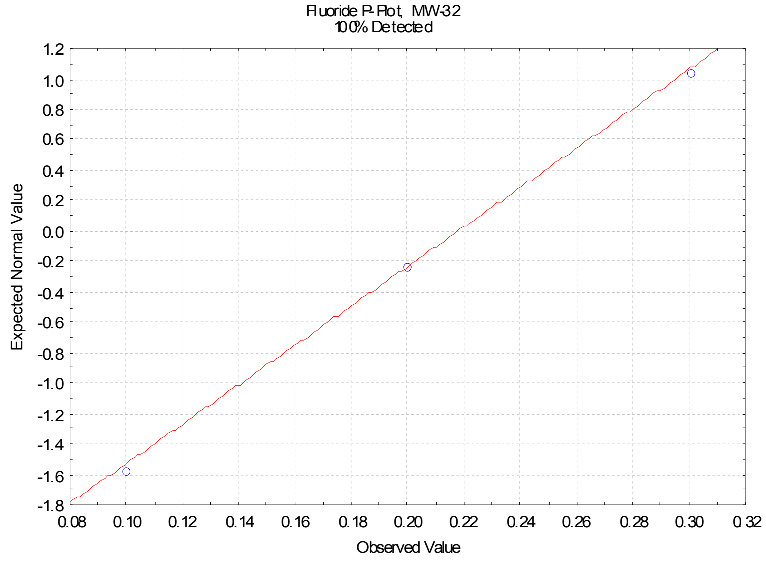


Fluoride (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

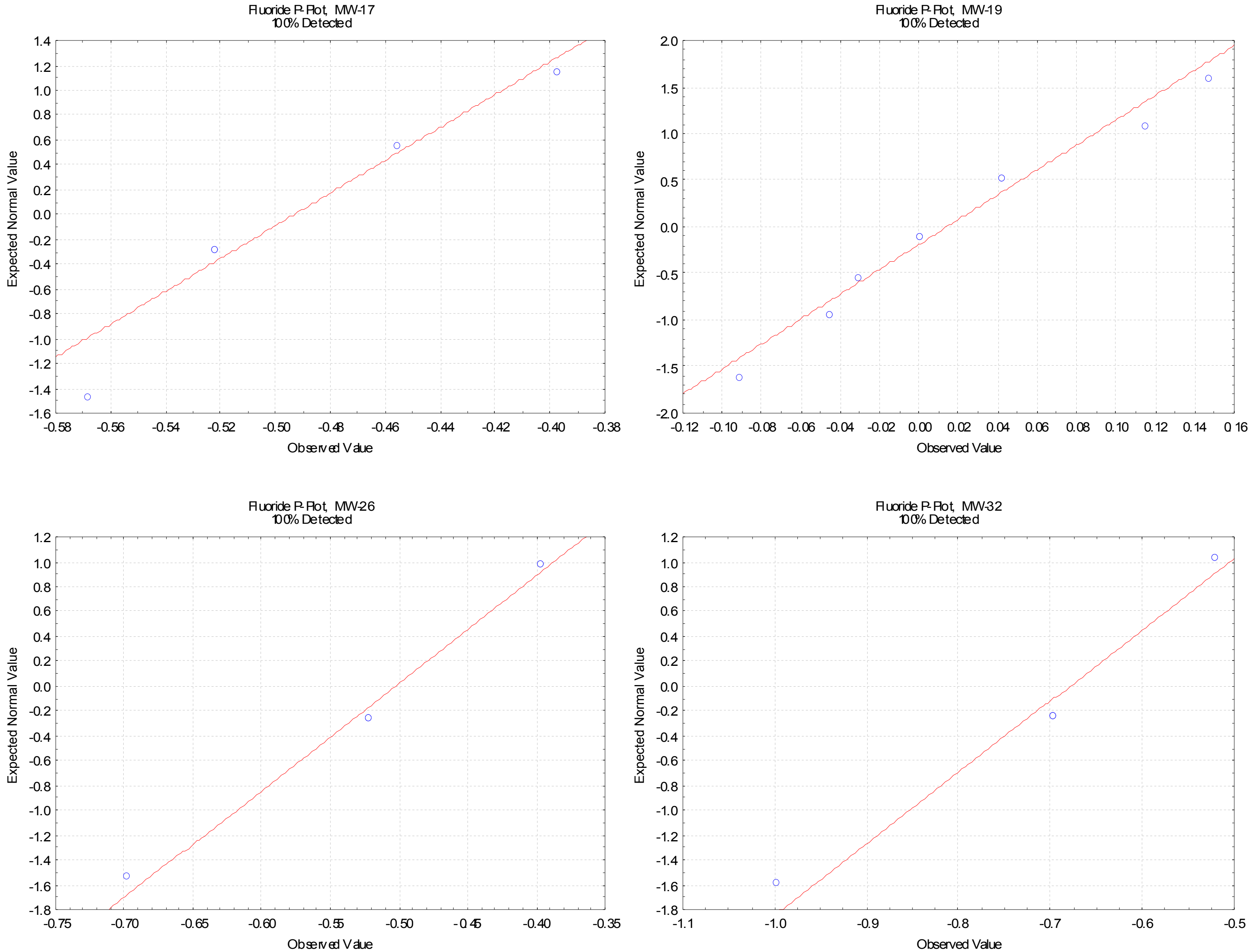




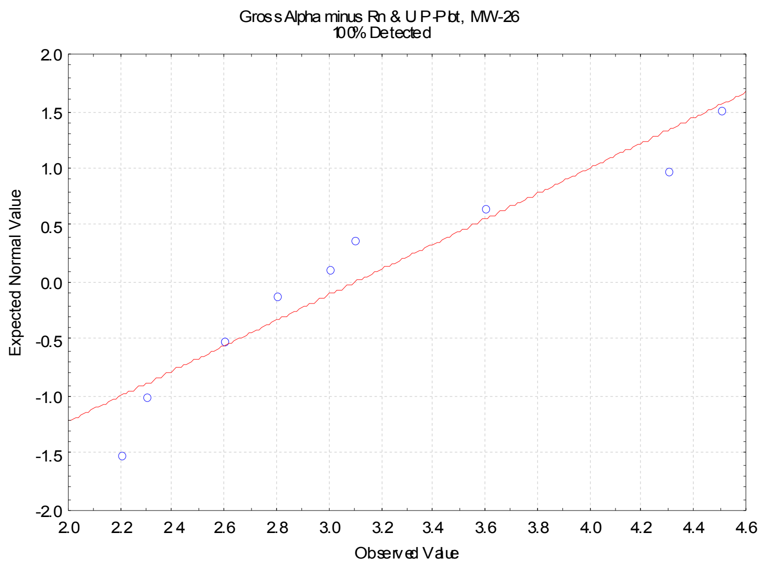


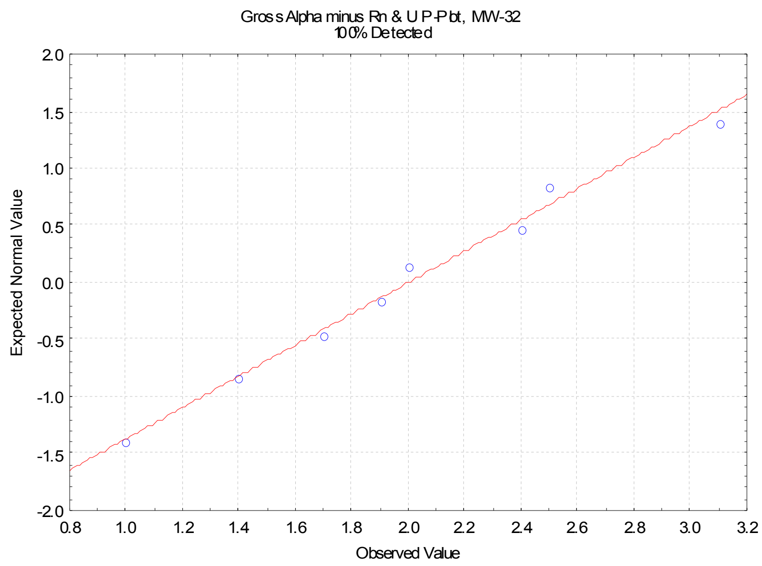


Log-Transformed Fluoride (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

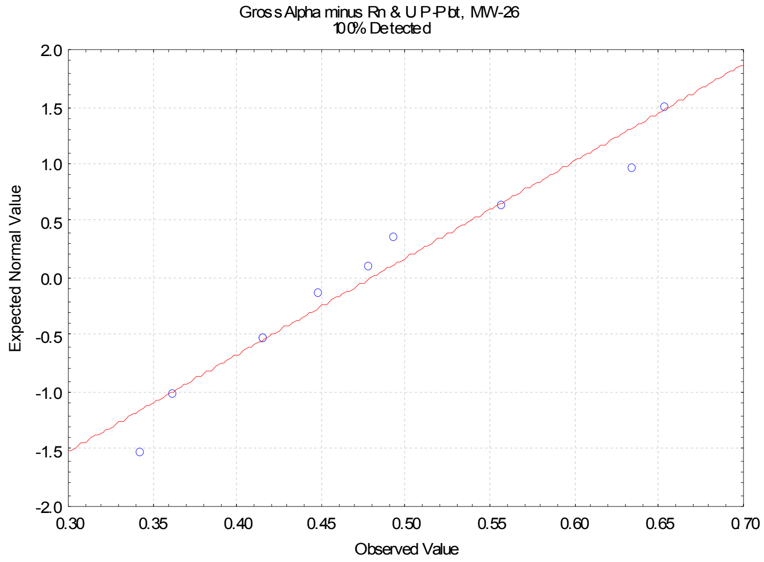


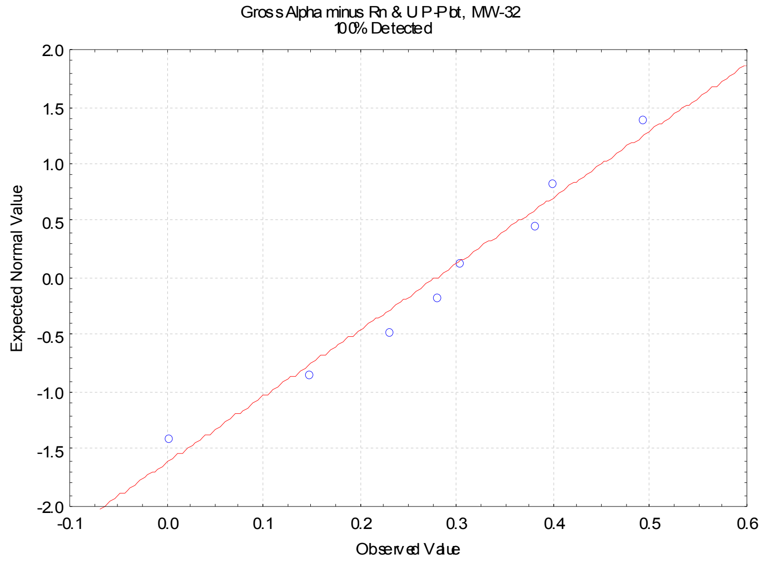
Gross Alpha minus Rn & U (pCi/L) Normal Probability Plots for 0 to 50% Non-Detects



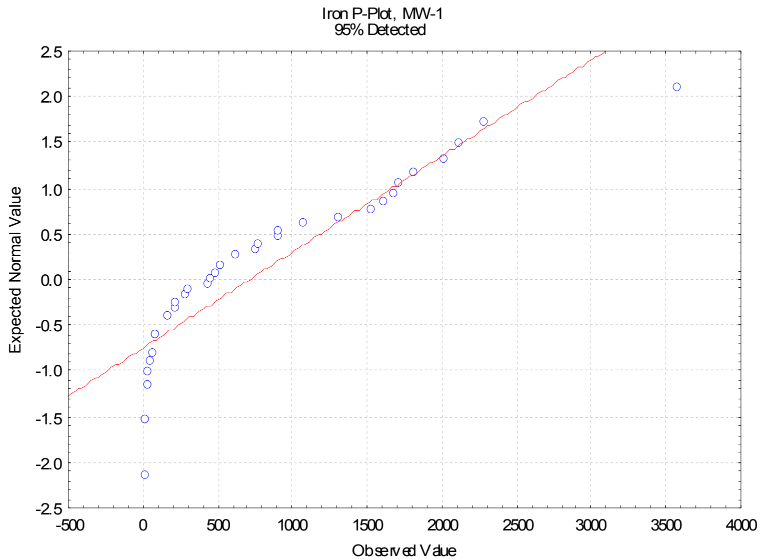


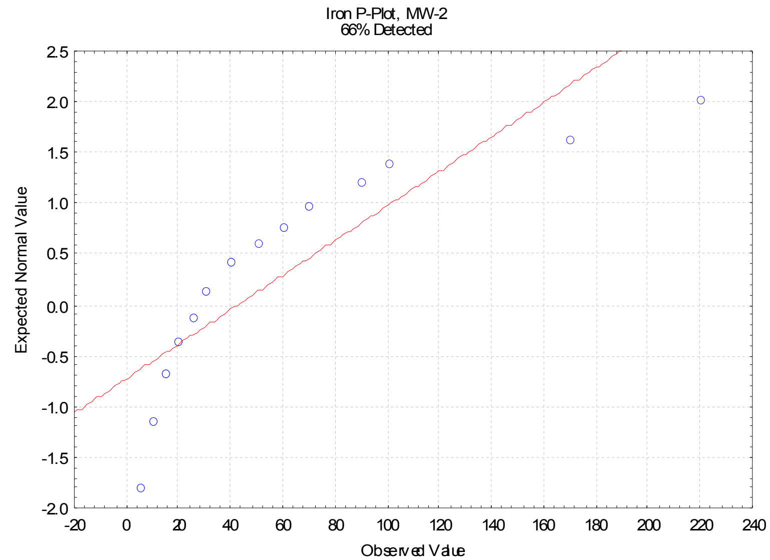
Log-Transformed Gross Alpha minus Rn & U (pCi/L) Normal Probability Plots for 0 to 50% Non-Detects

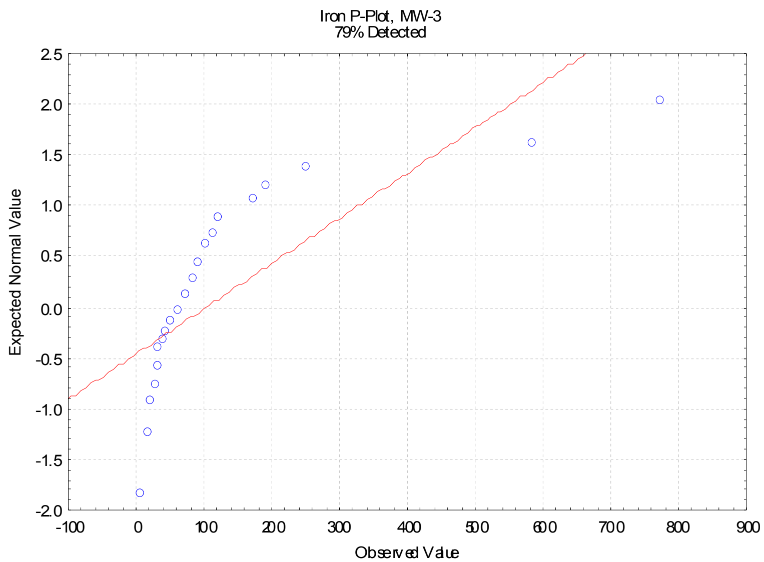


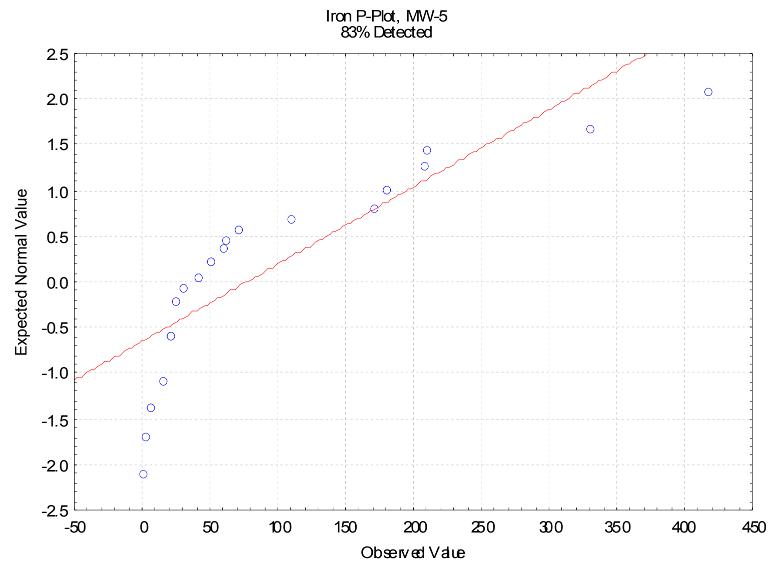


Iron (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

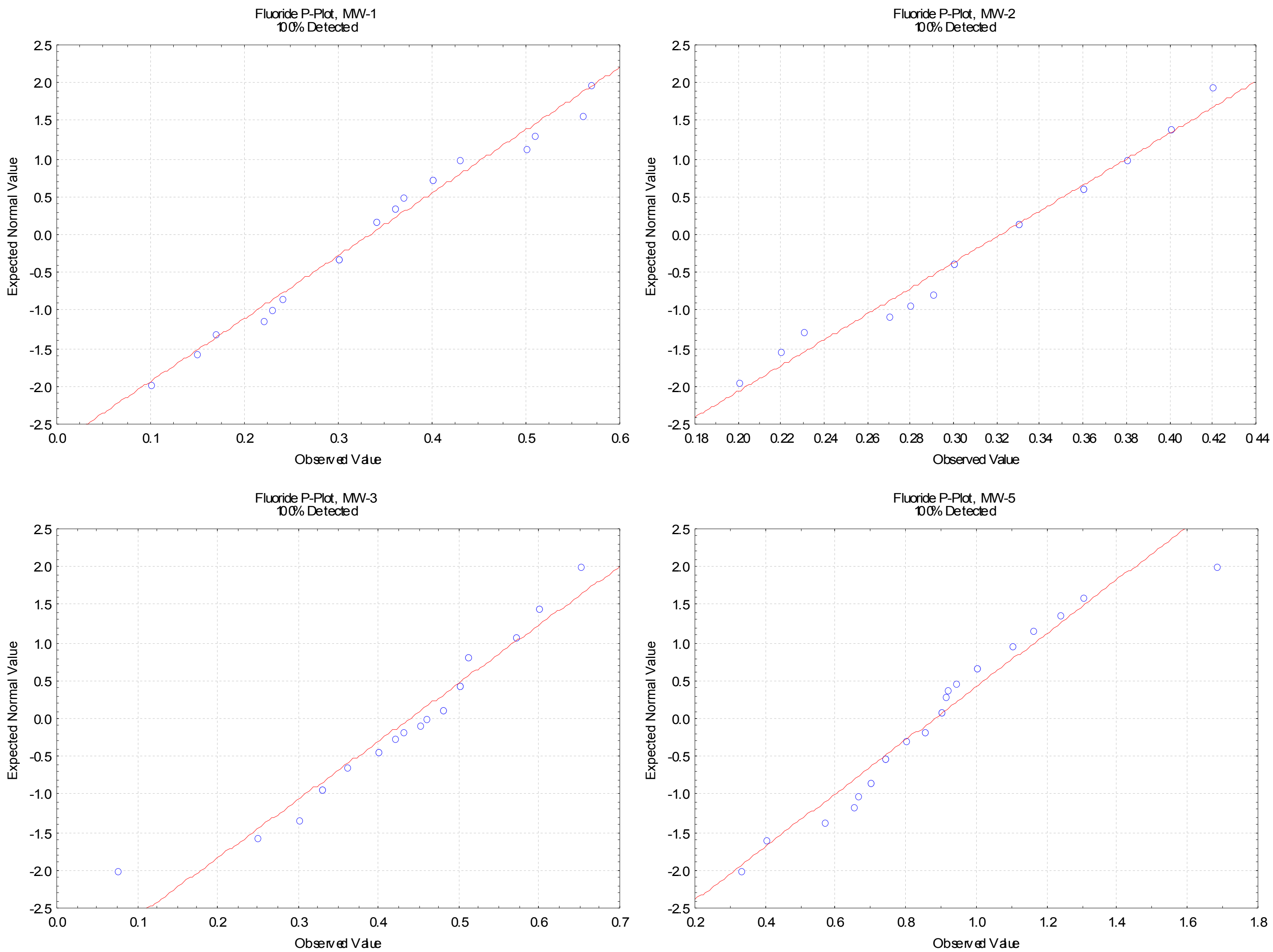




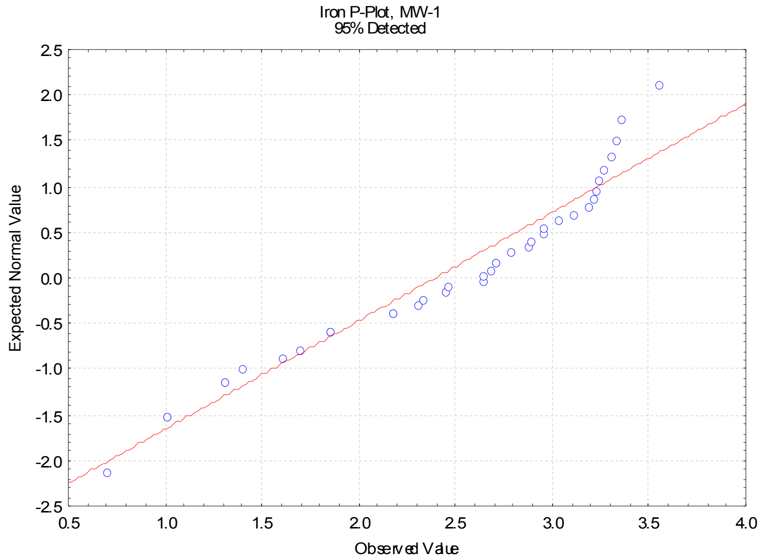


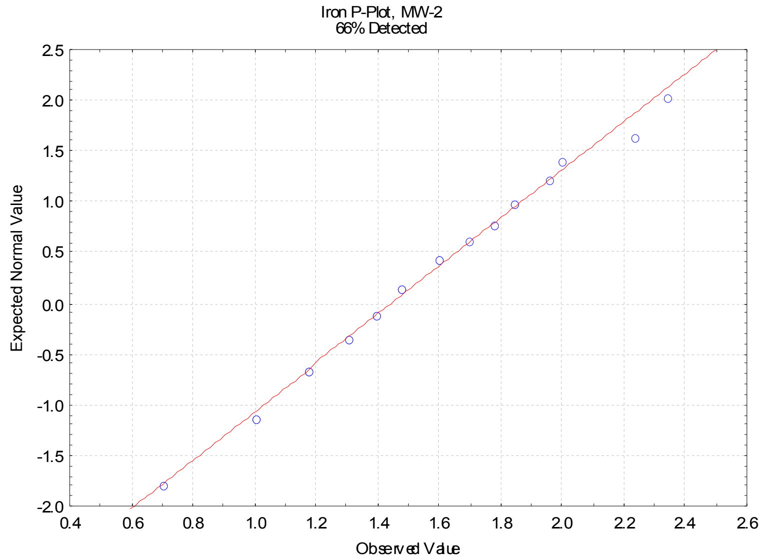


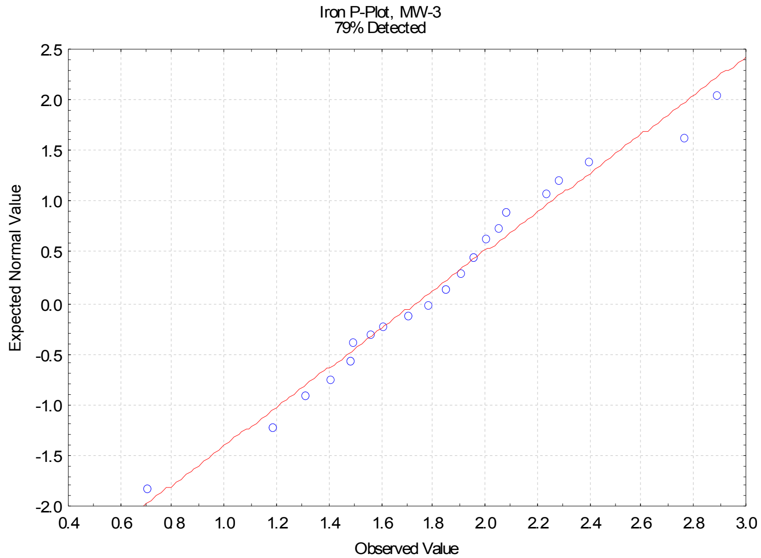
Fluoride (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

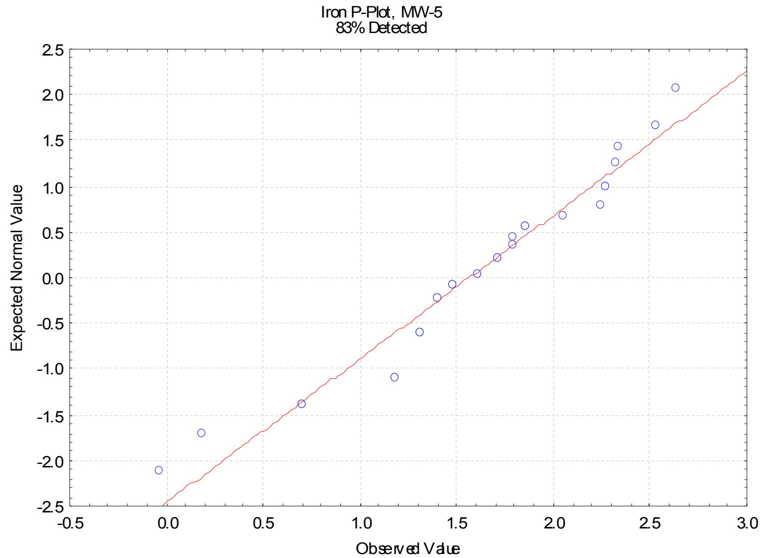


Log-Transformed Iron (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

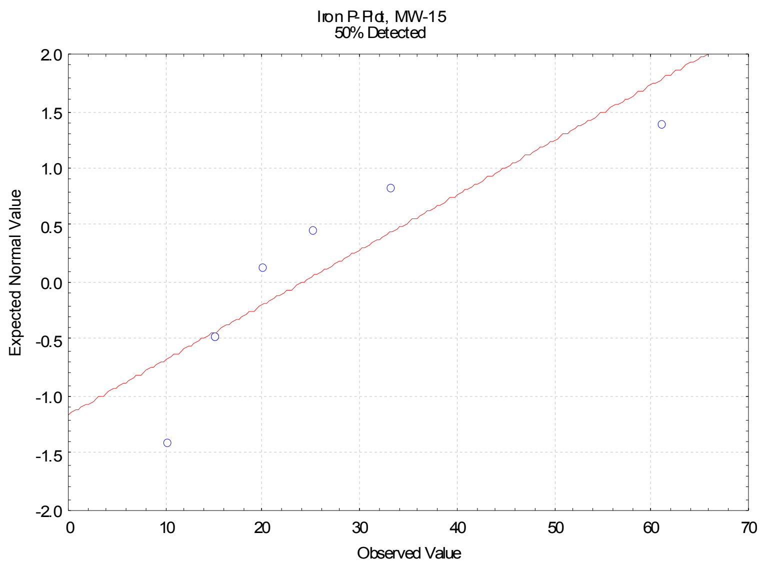


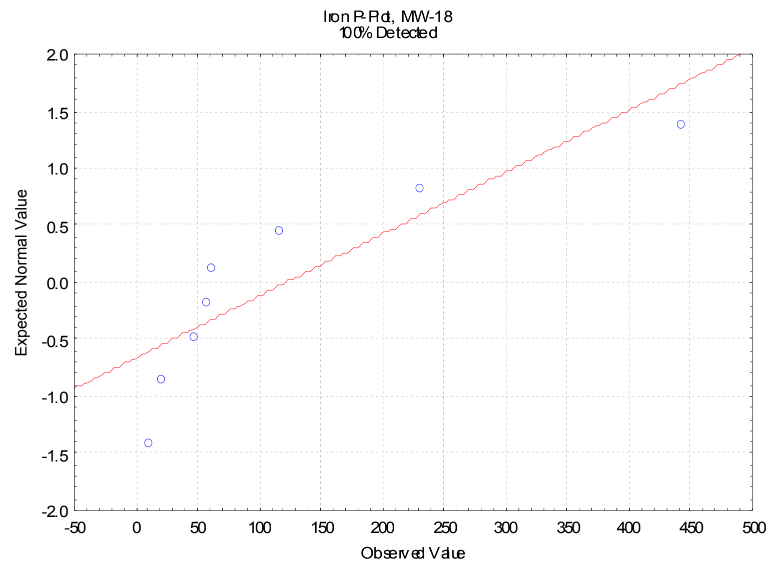


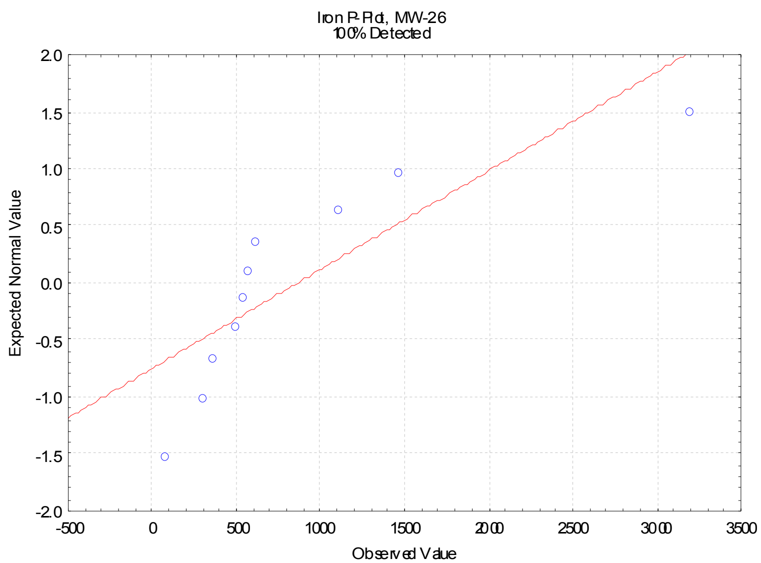


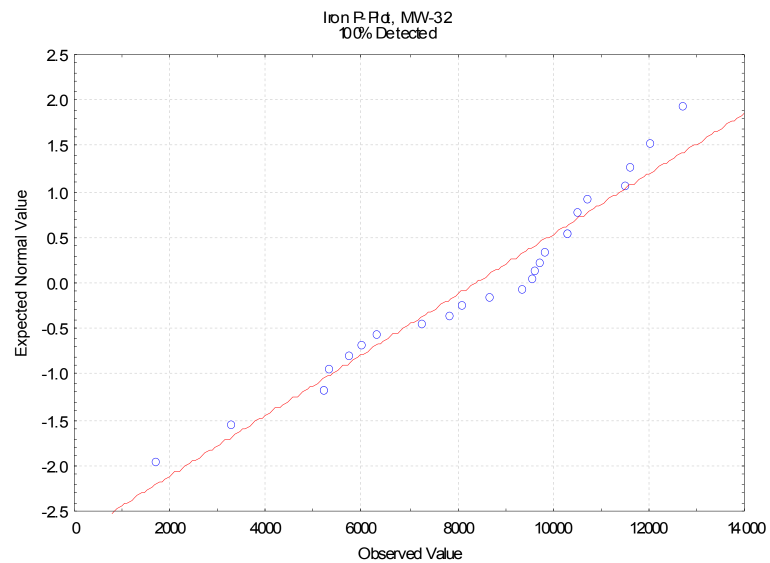


Iron (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

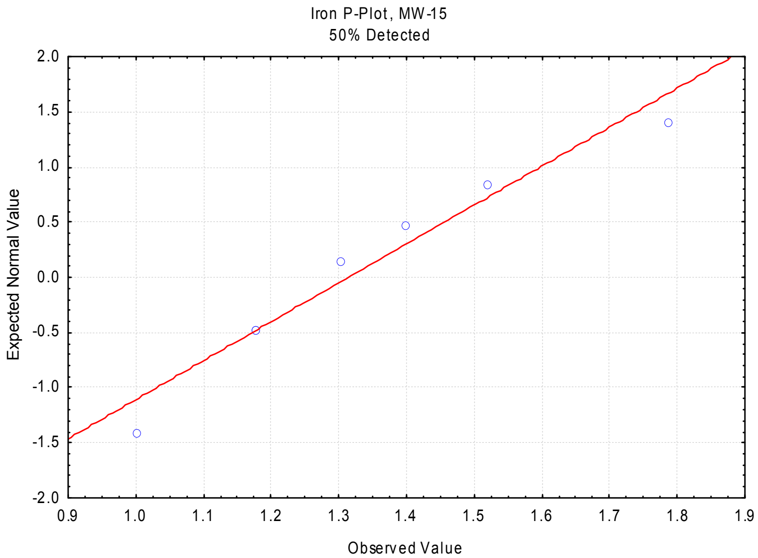


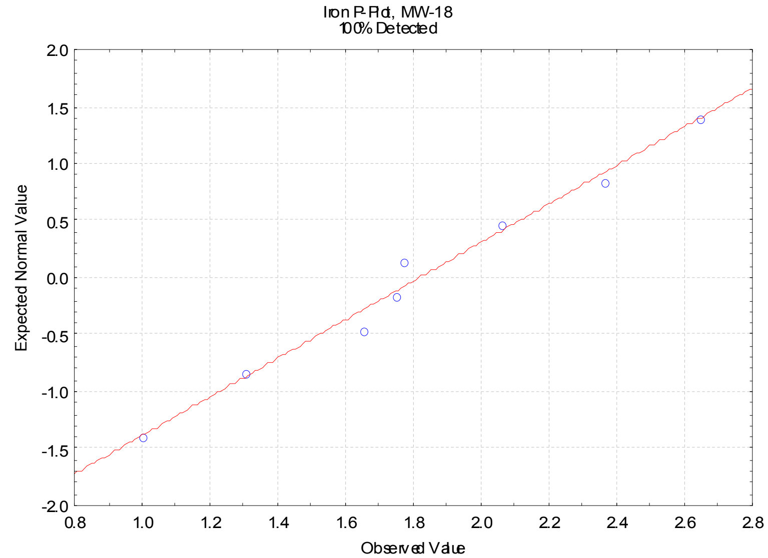


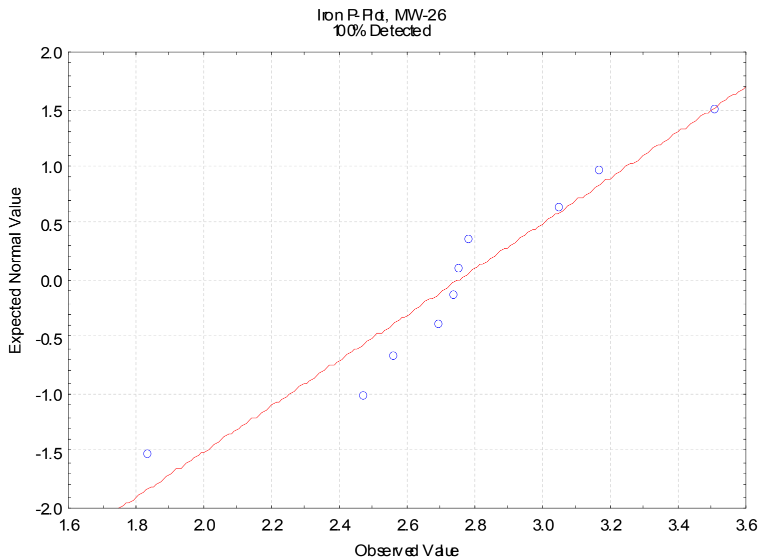


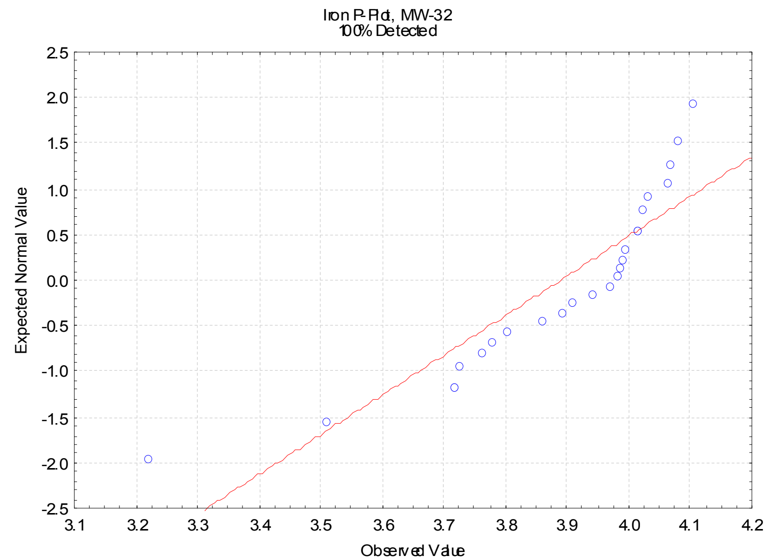


Log-Transformed Iron (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

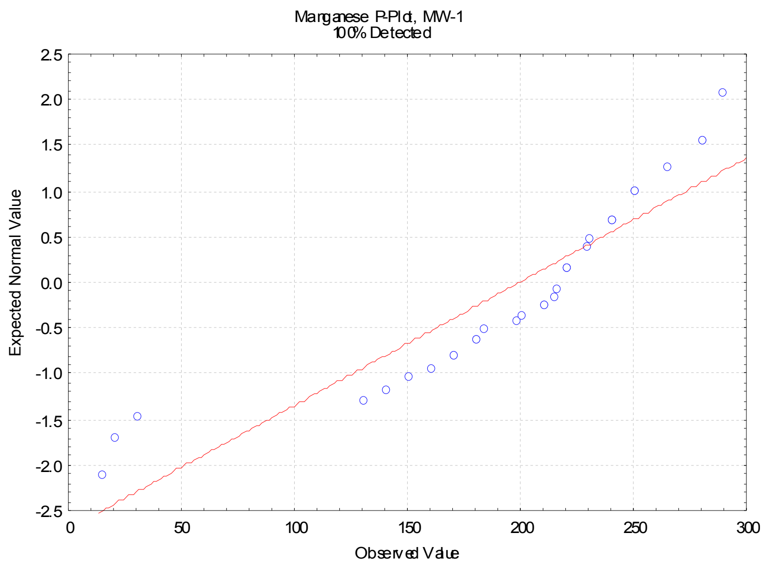


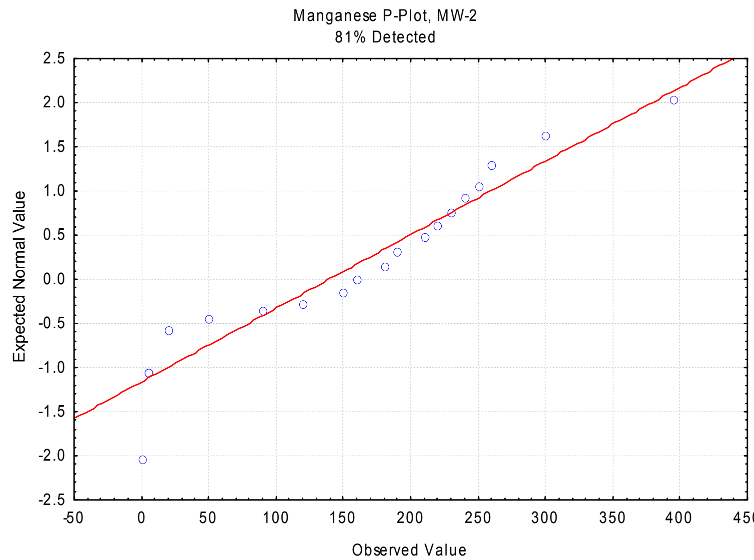


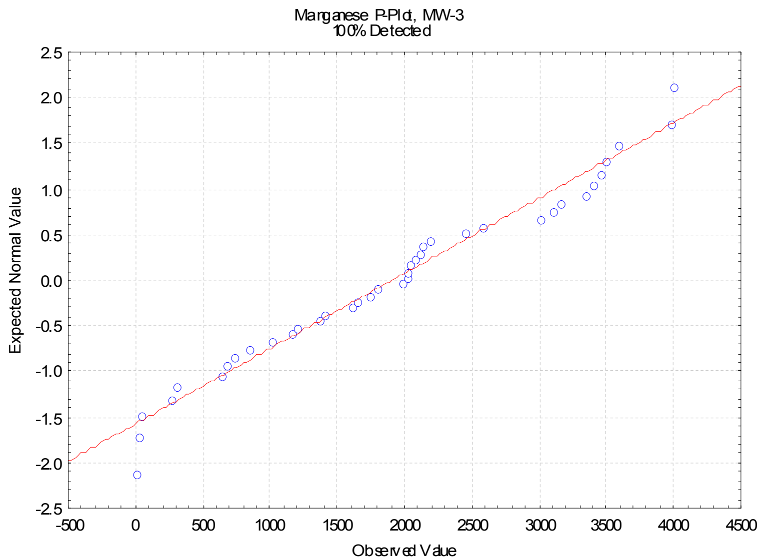


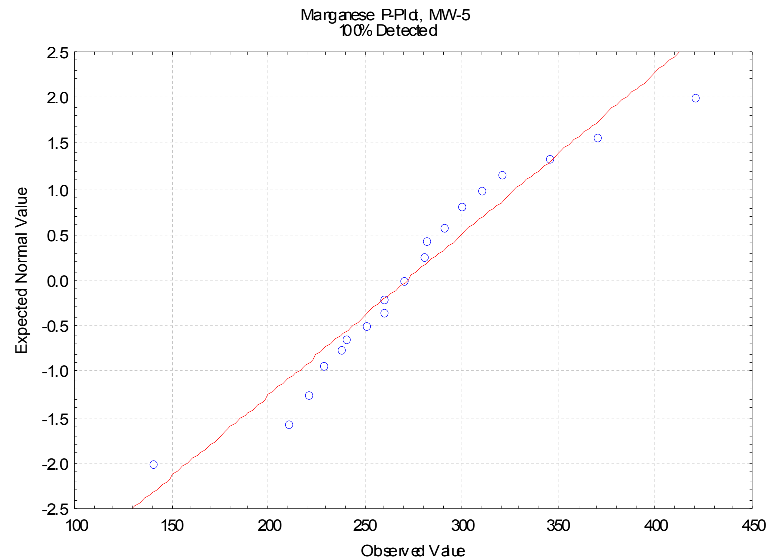


Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

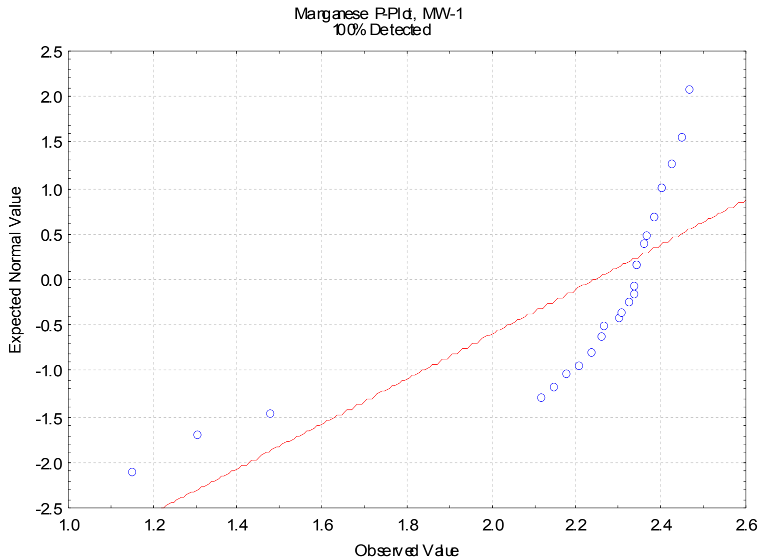


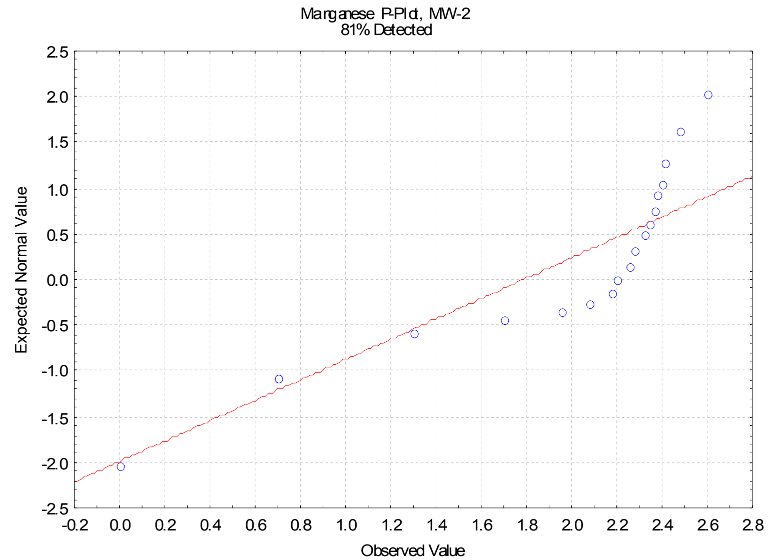


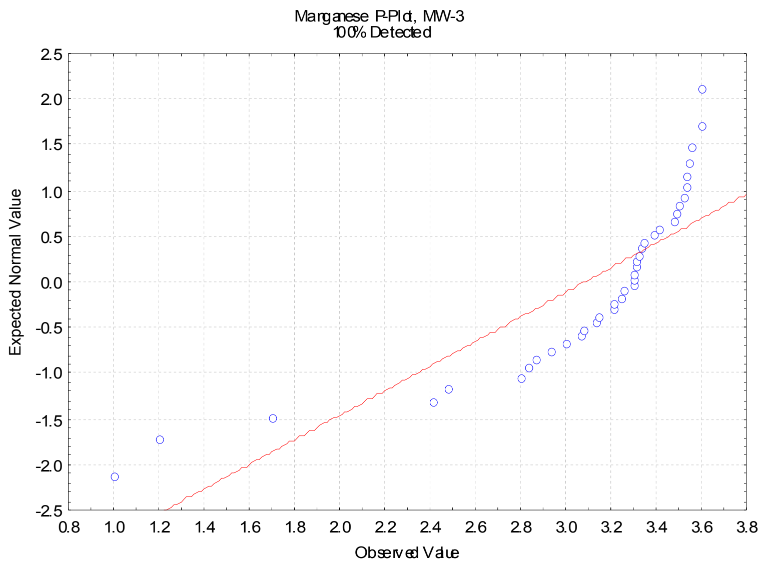


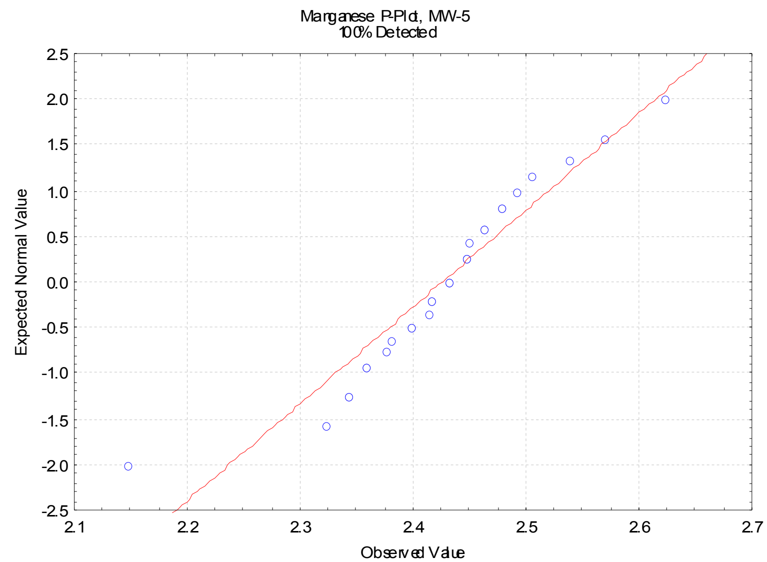


Log-Transformed Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

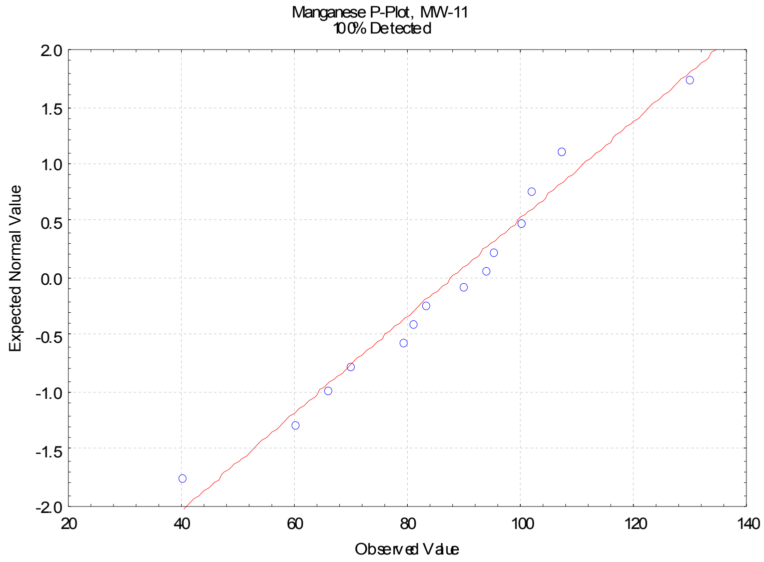


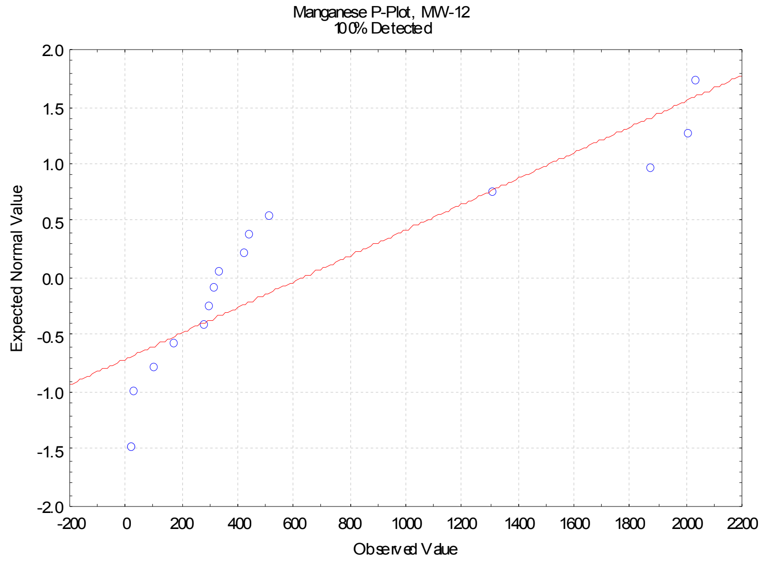


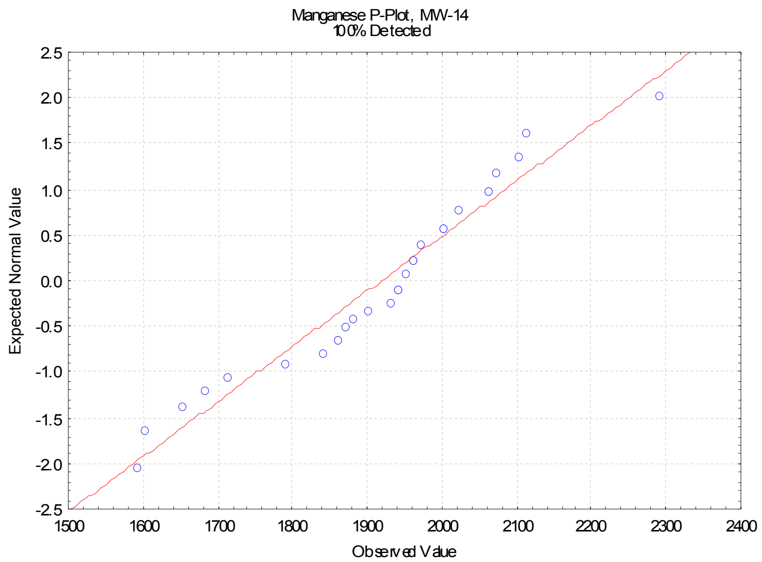


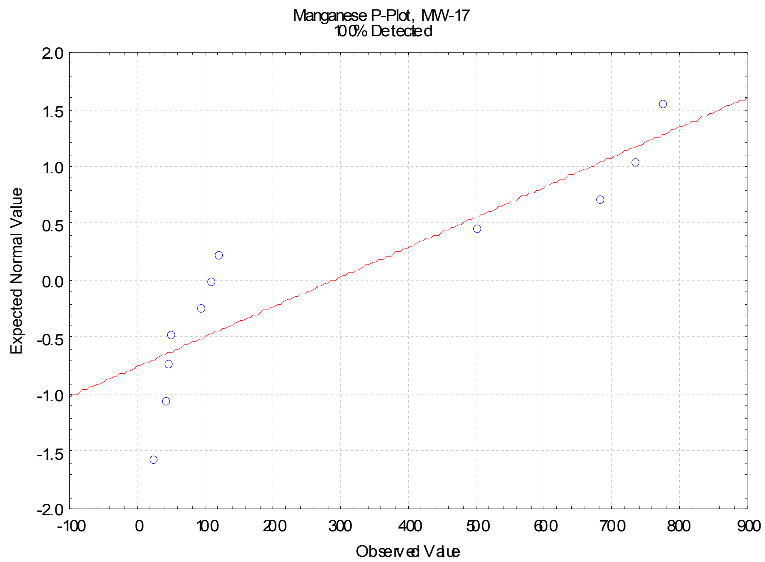


Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

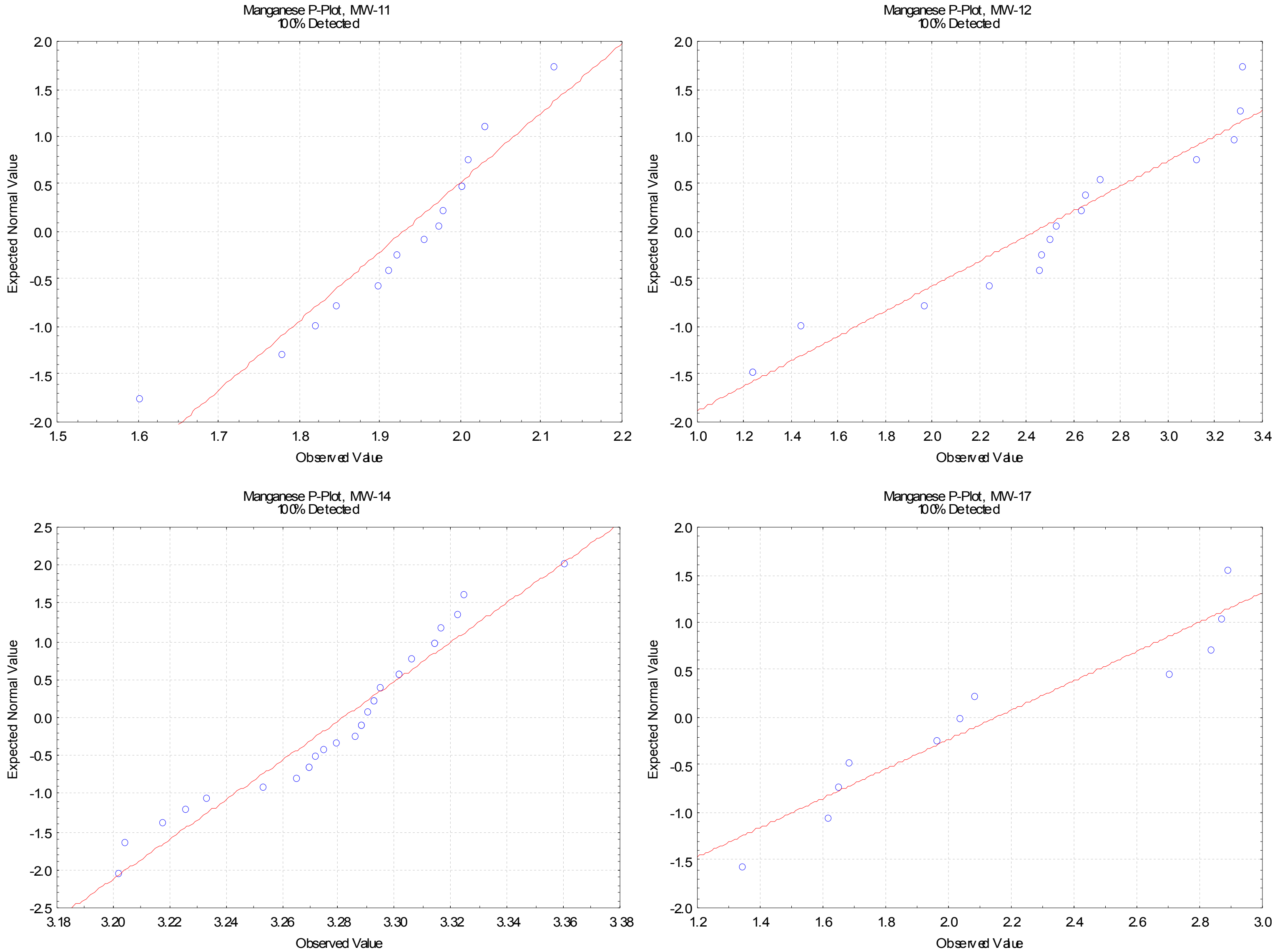




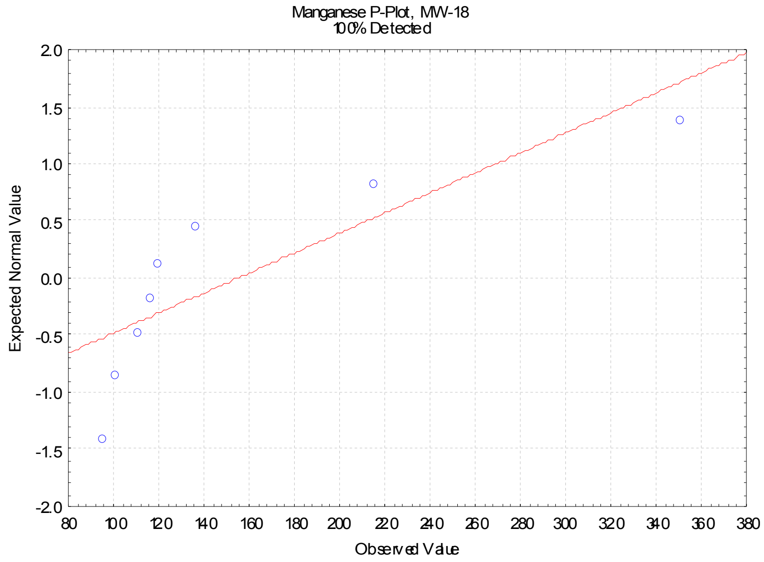


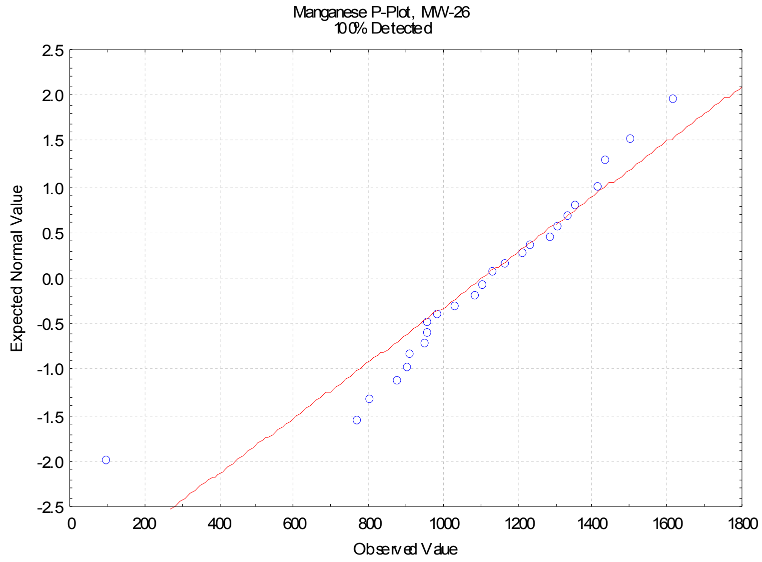


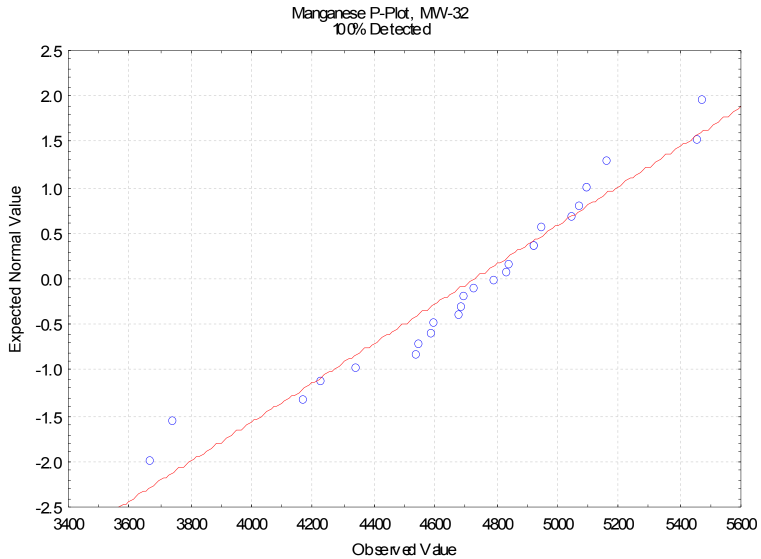
Log-Transformed Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects



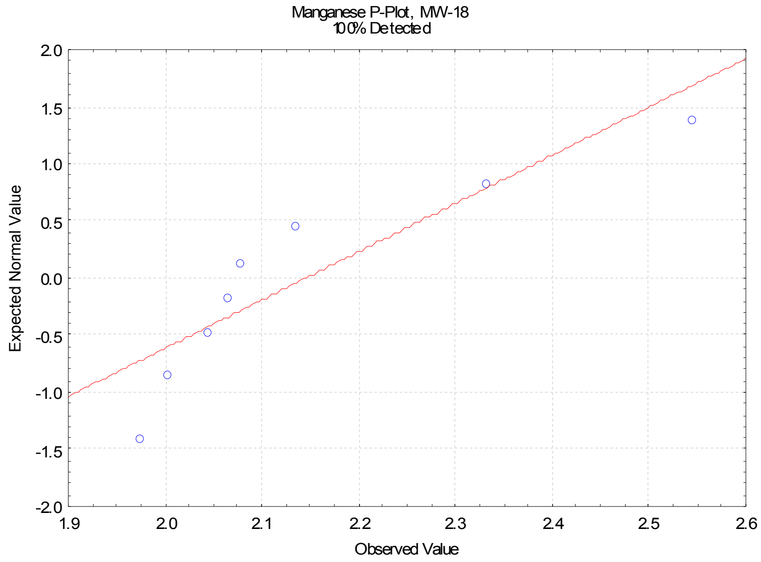
Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

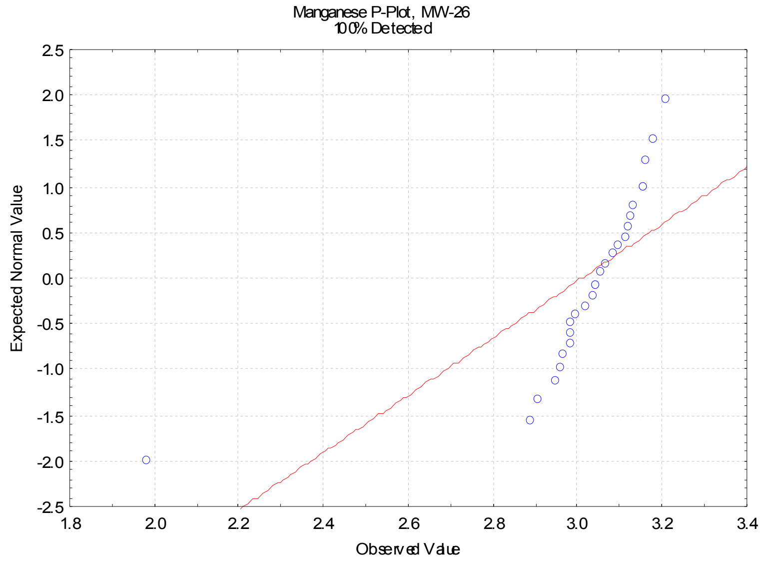


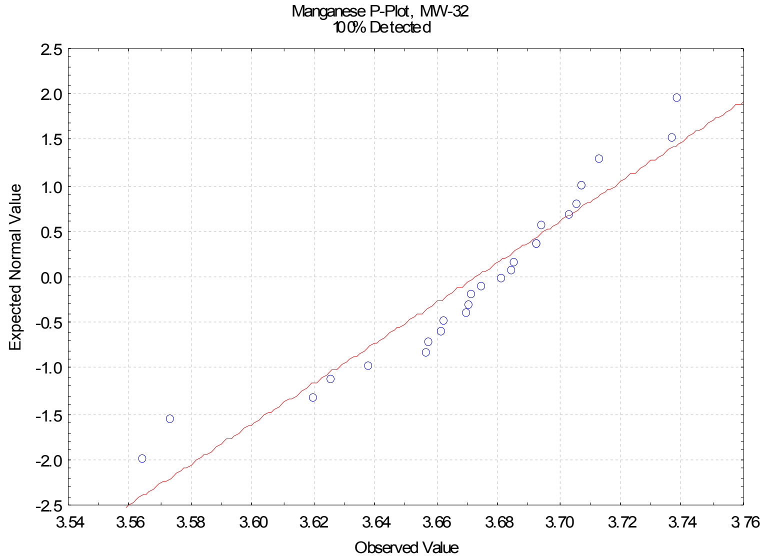




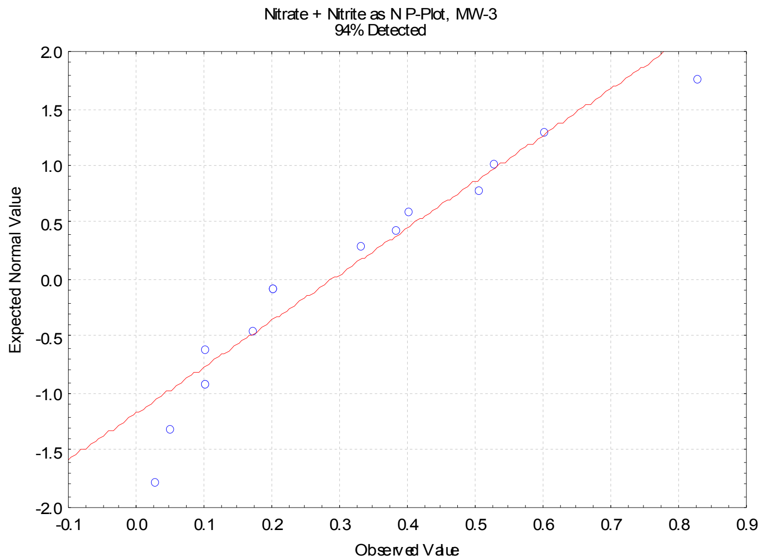
Log-Transformed Manganese (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

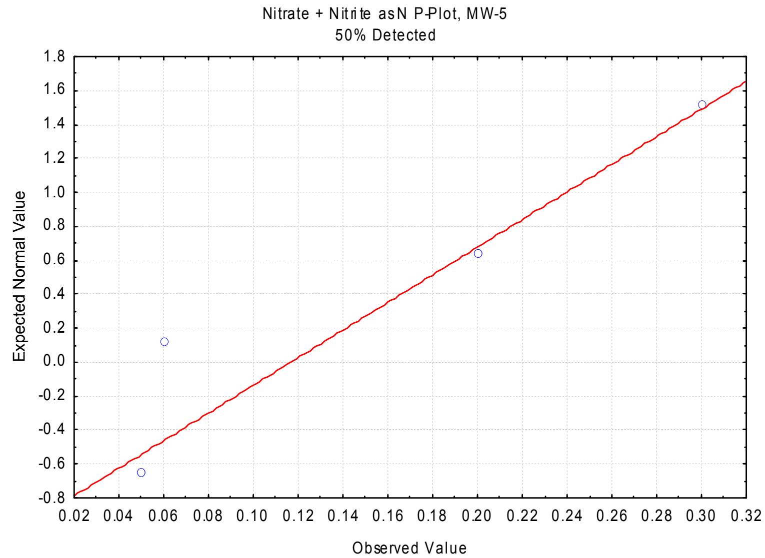


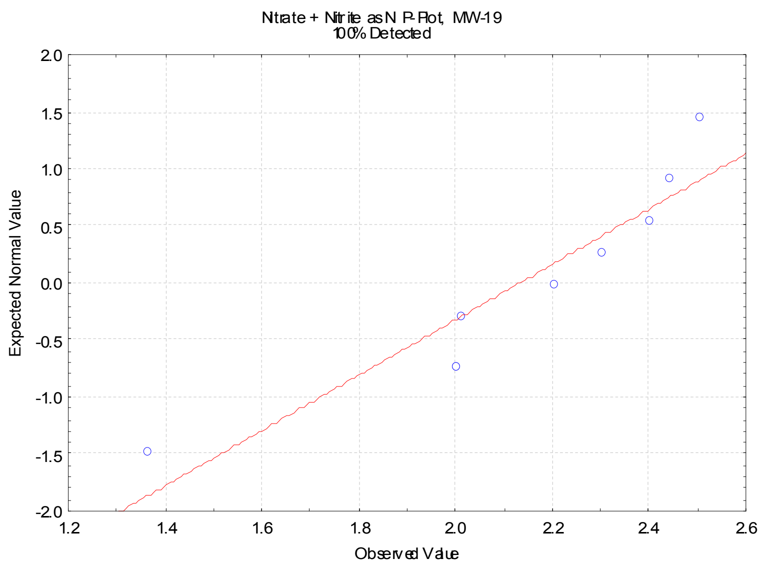


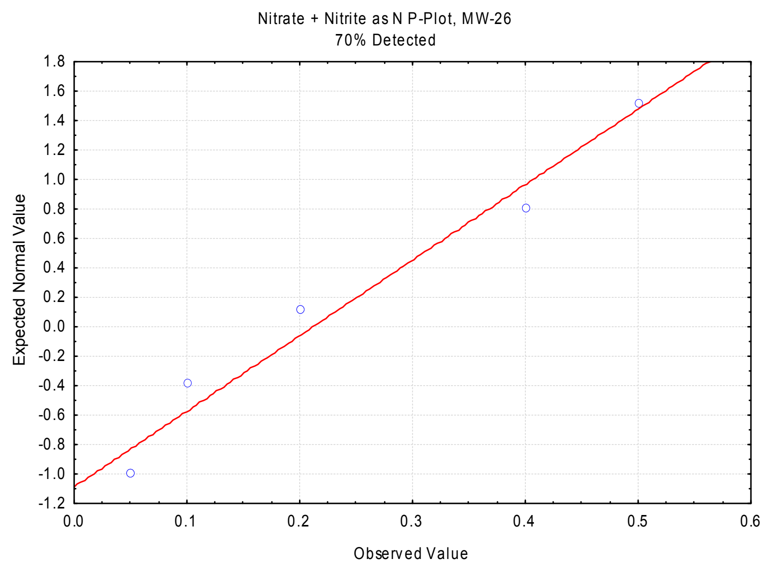


Nitrate + Nitrite as N (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

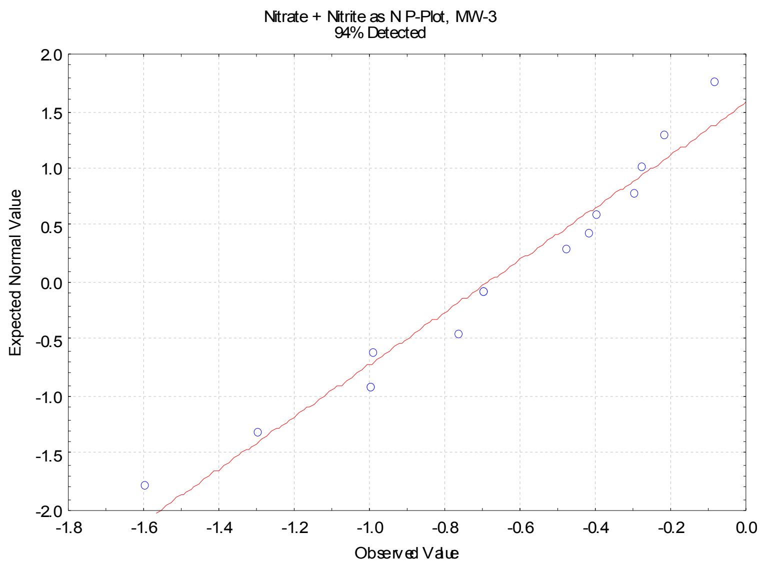


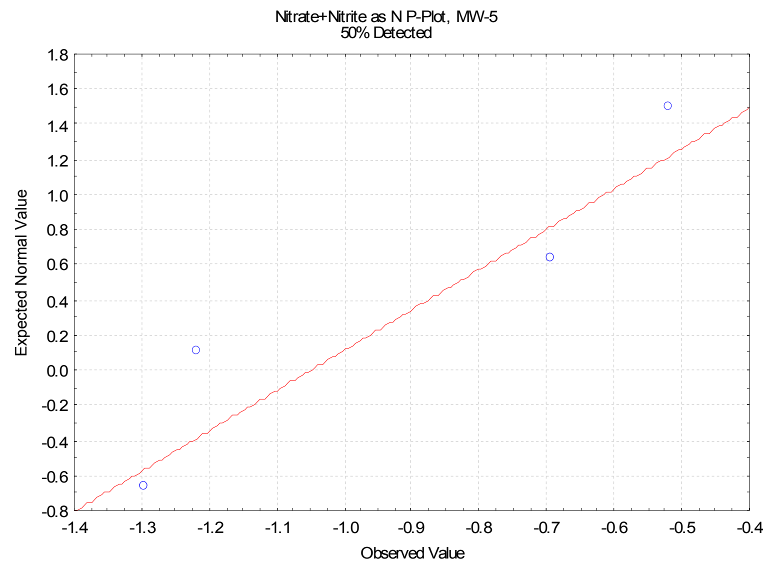


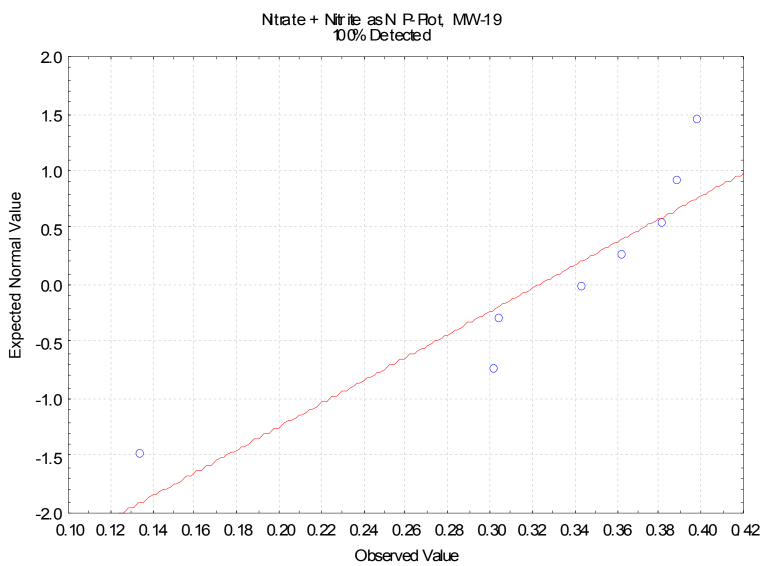


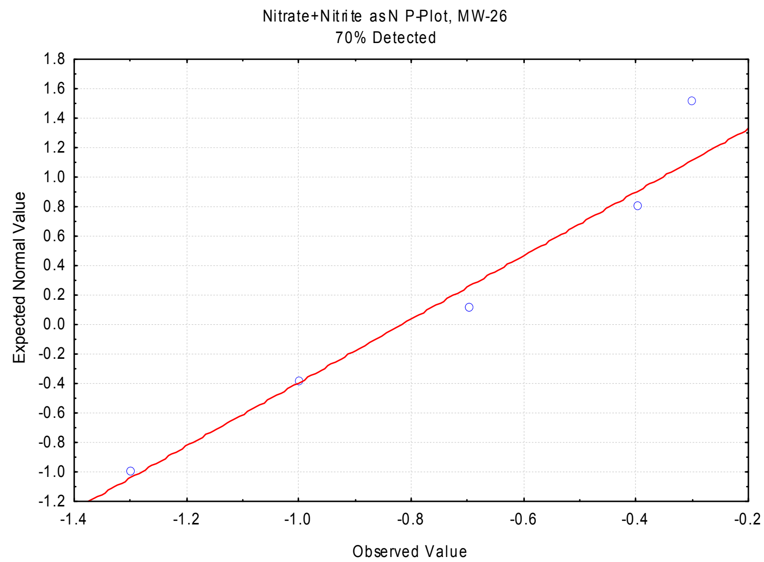


Log-Transformed Nitrate + Nitrite as N (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

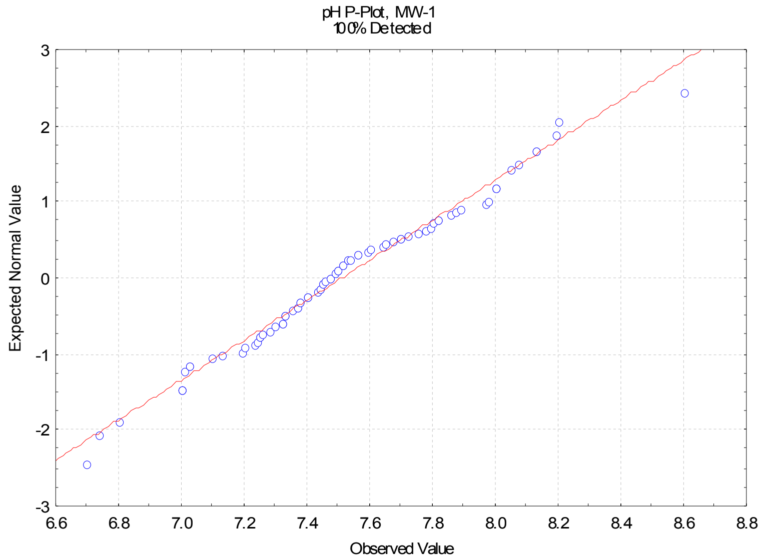


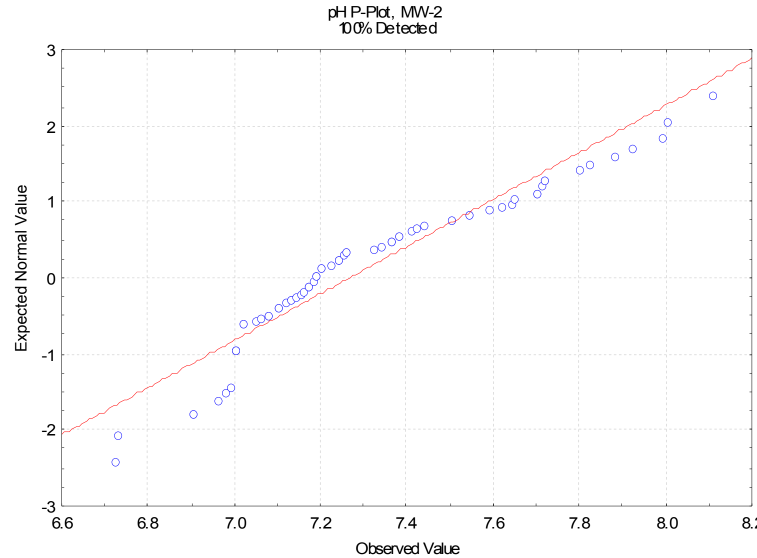


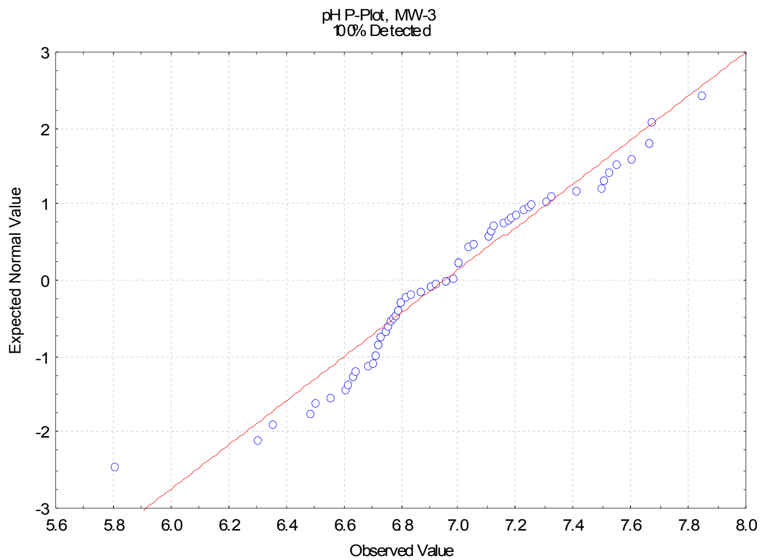


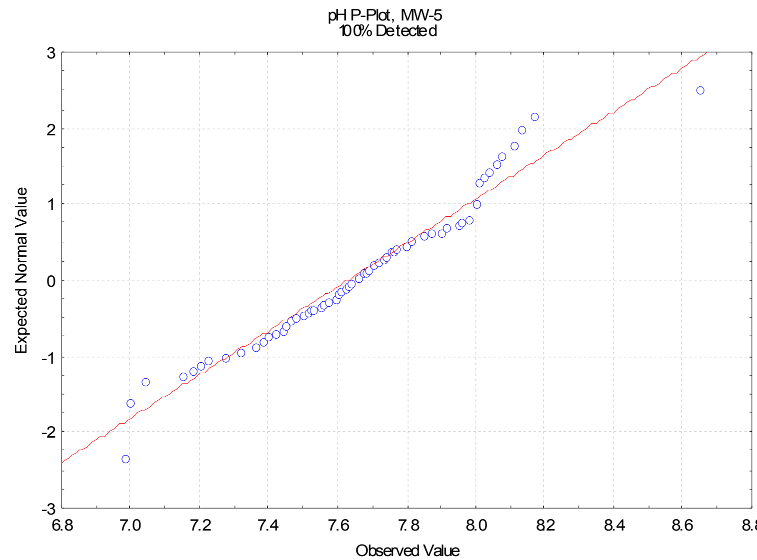


pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

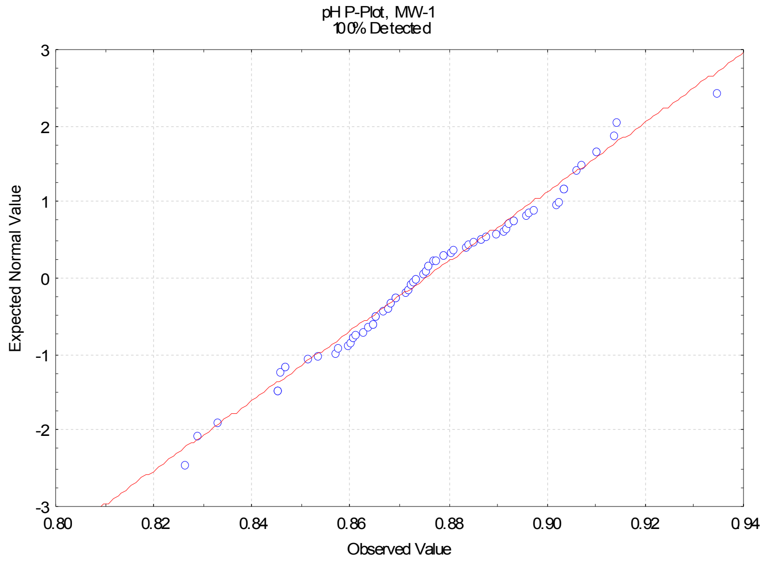


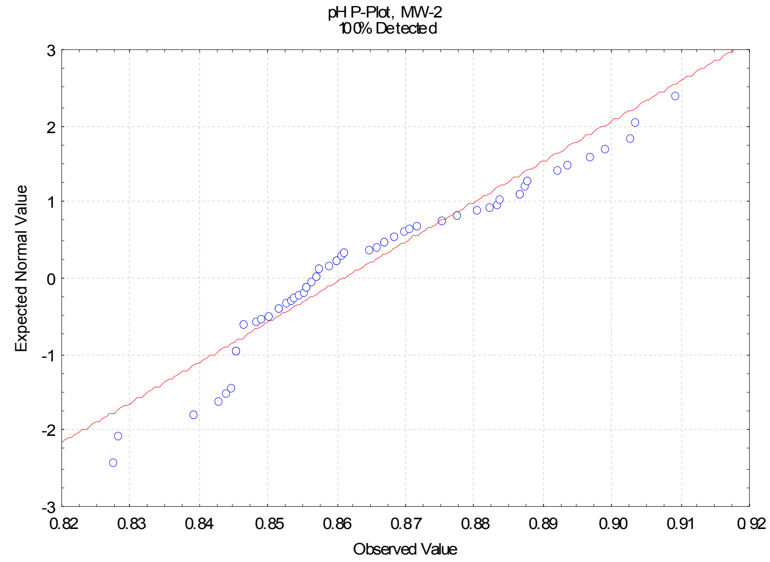


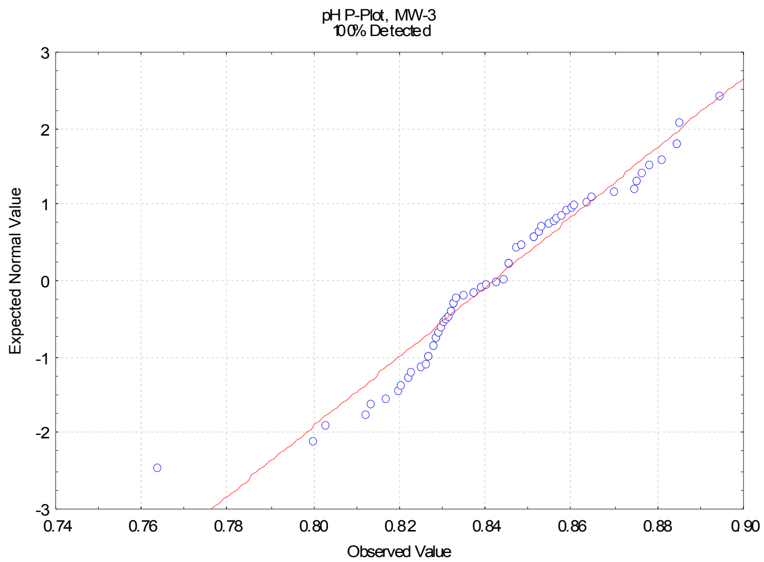


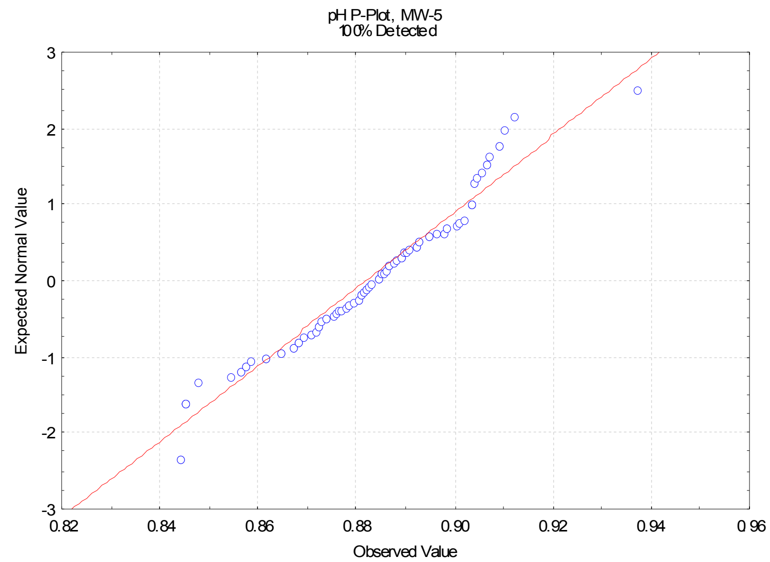


Log-Transformed pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

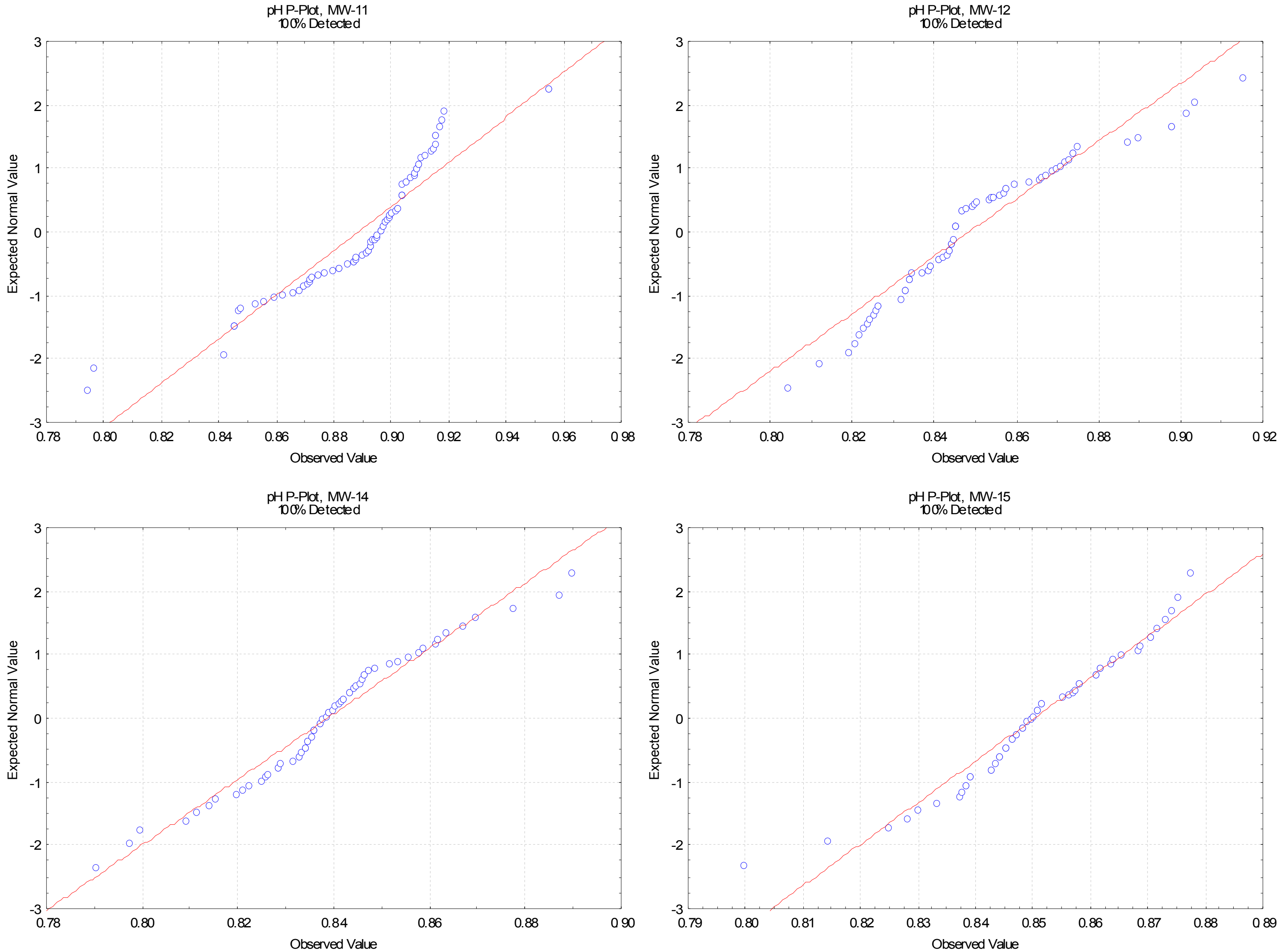




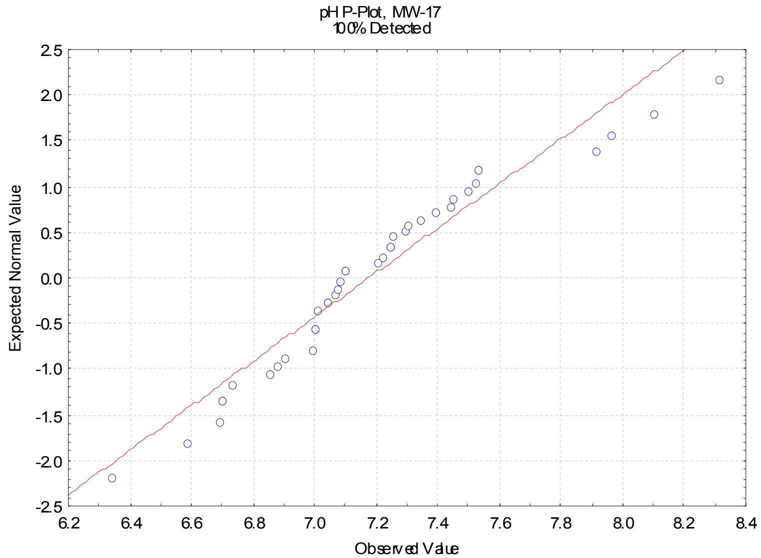


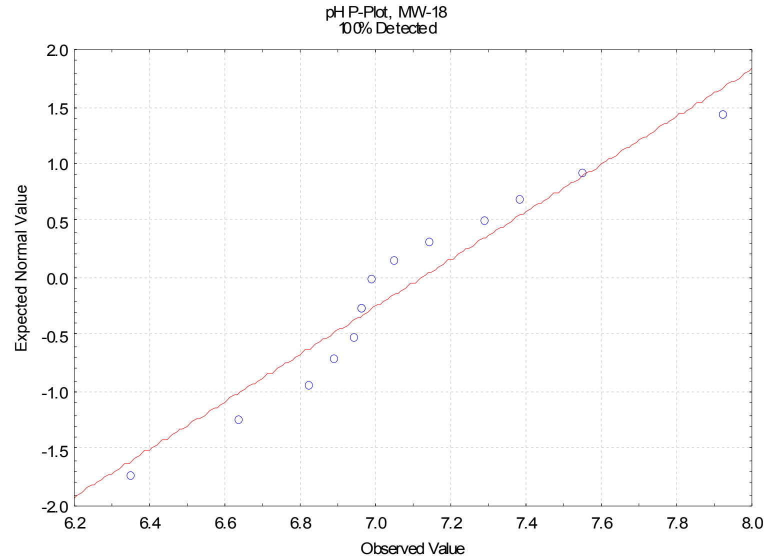


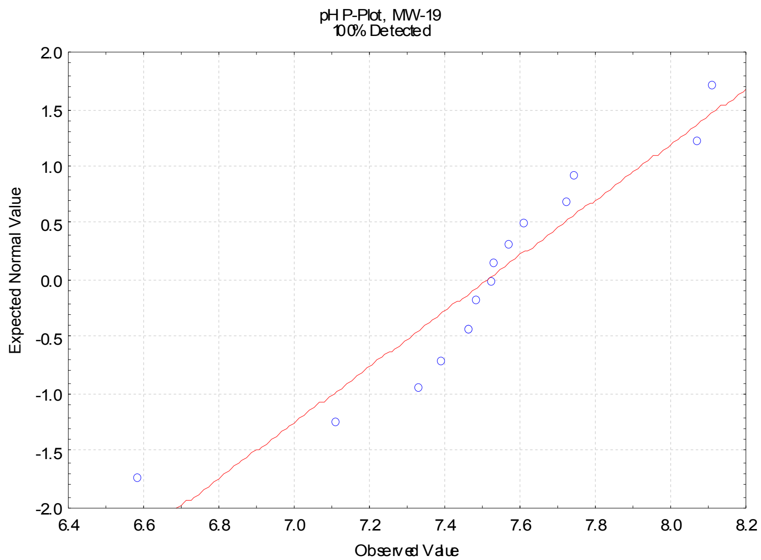
Log-Transformed pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

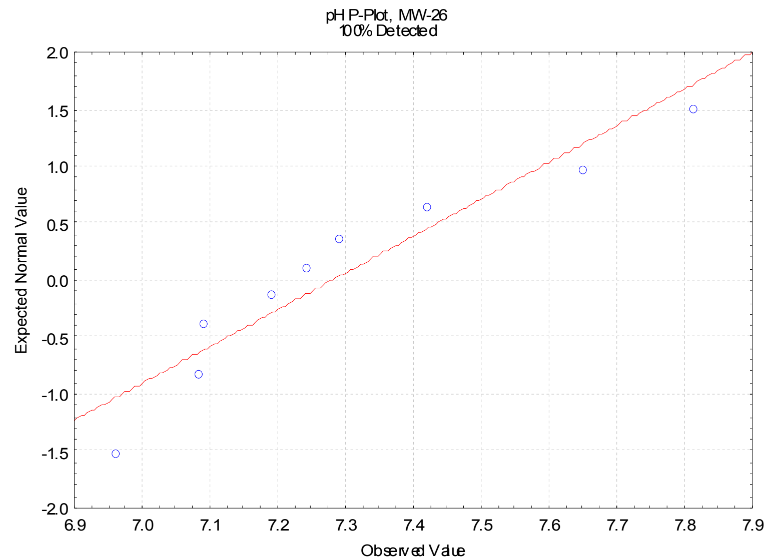


pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

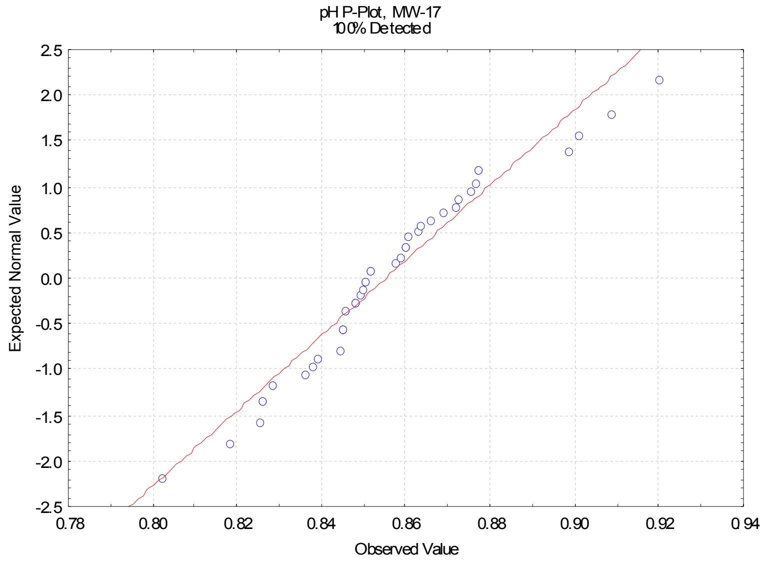


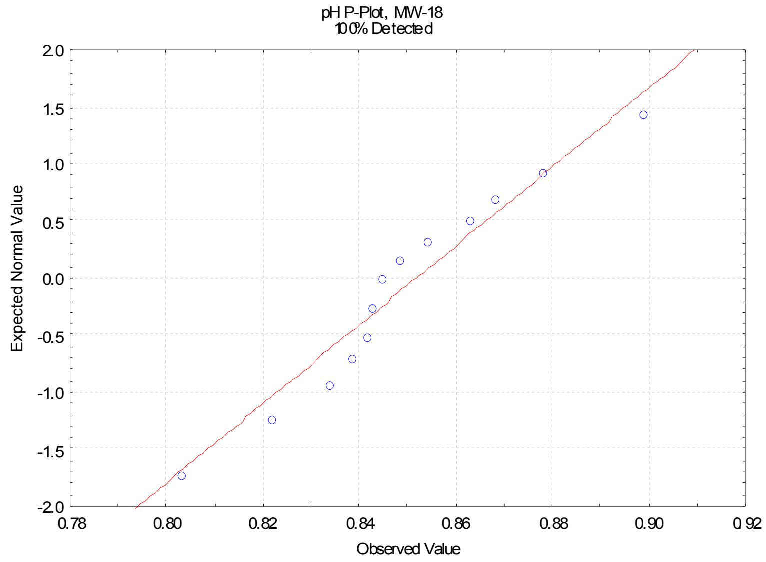


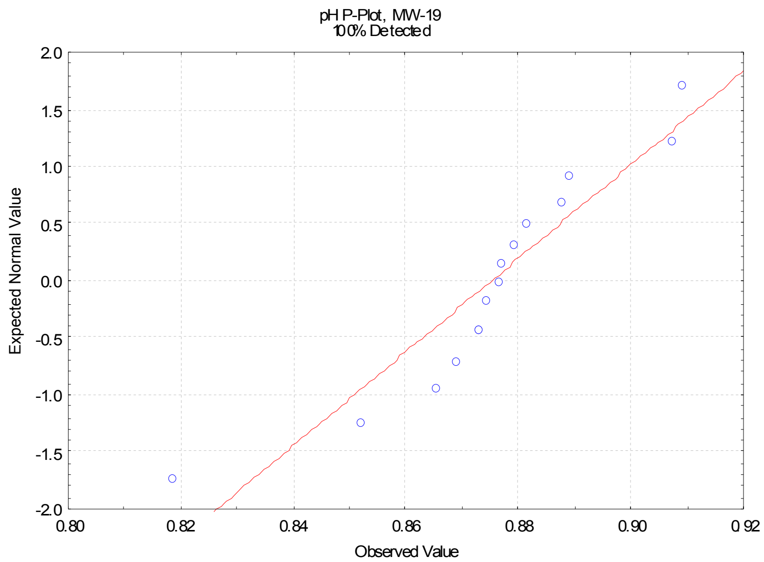


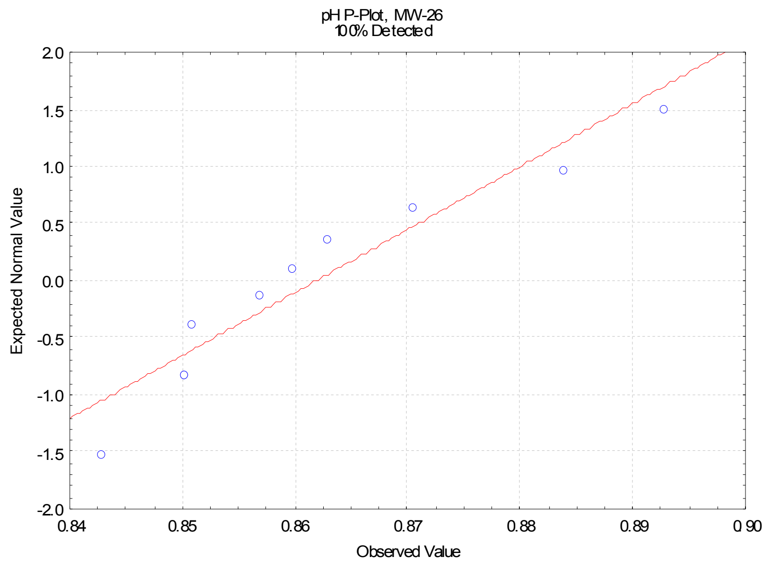


Log-Transformed pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

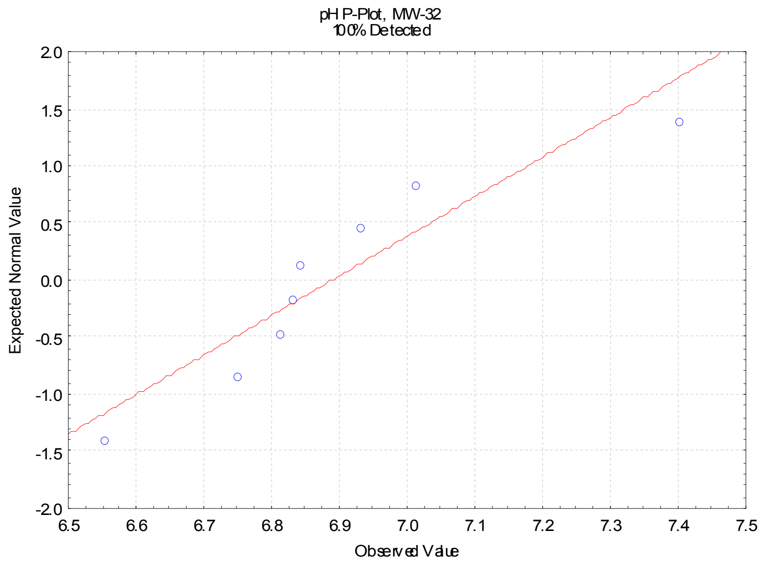




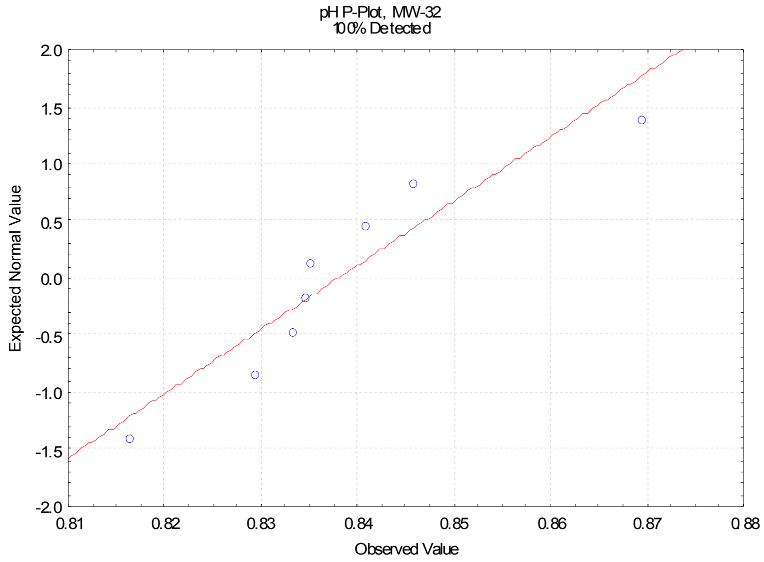




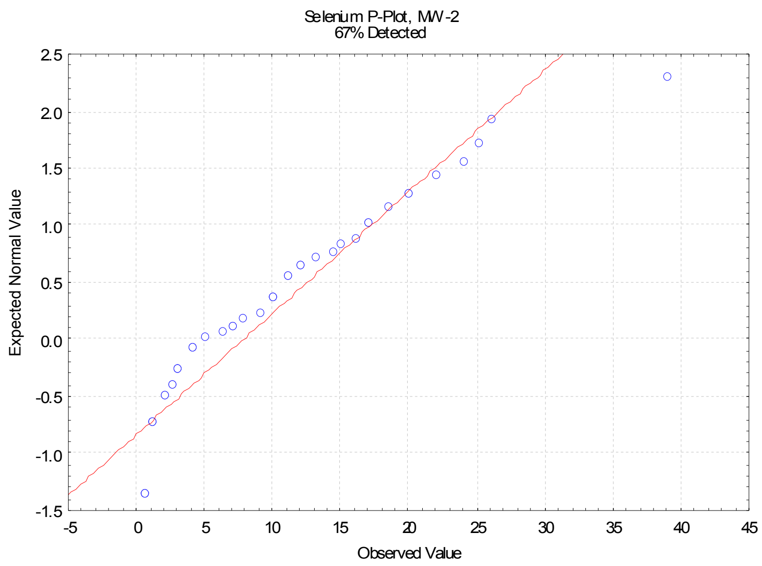
pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

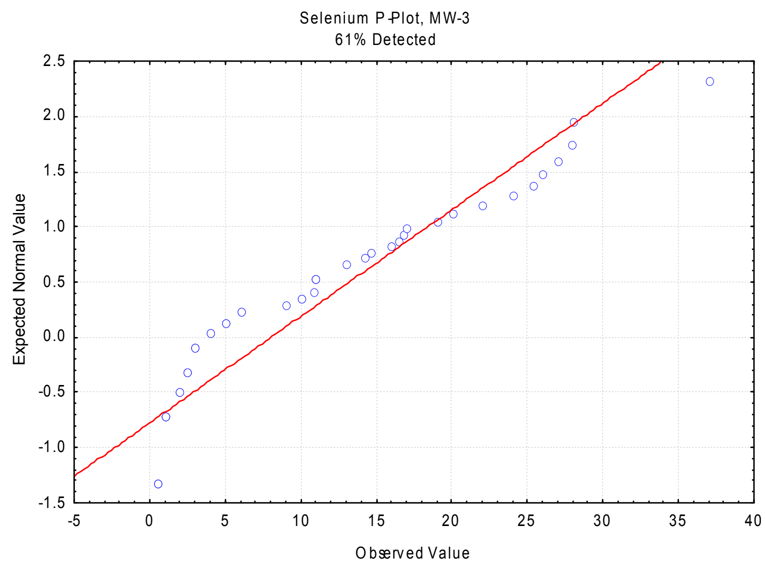


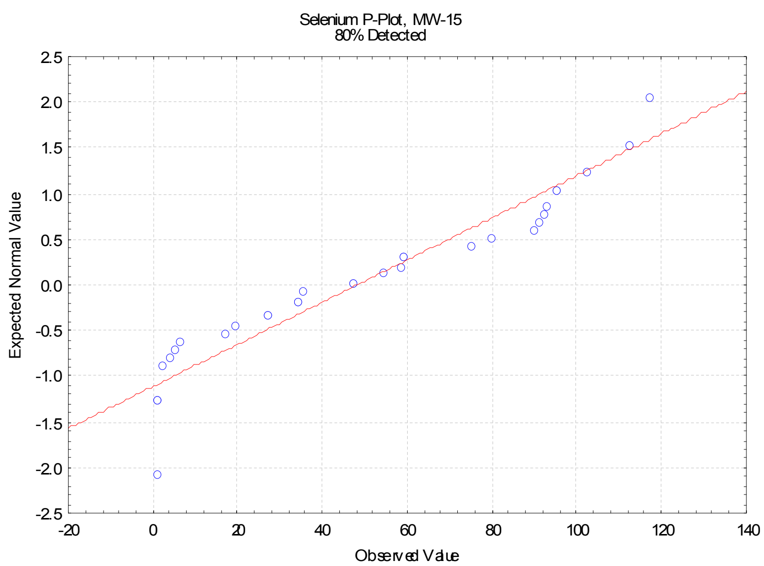
Log-Transformed pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

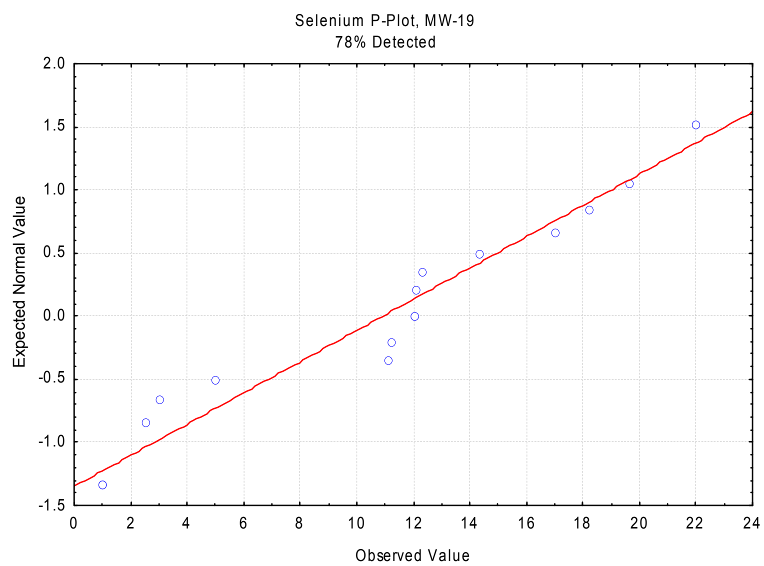


Selenium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

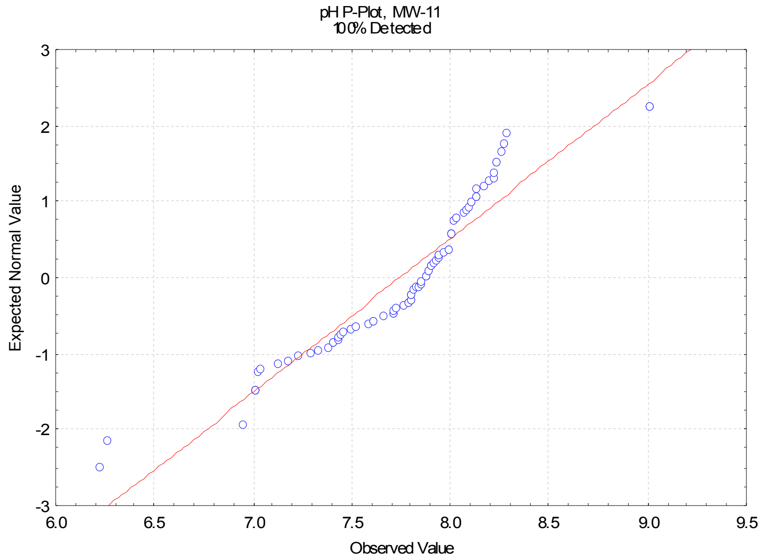


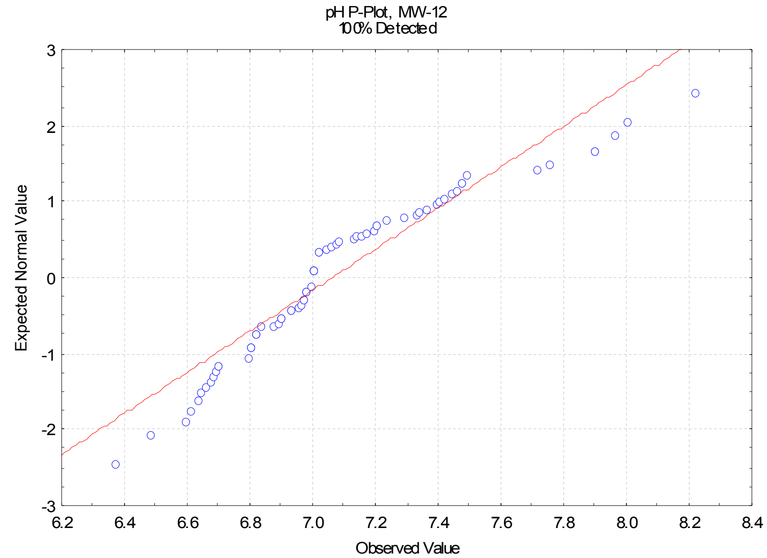


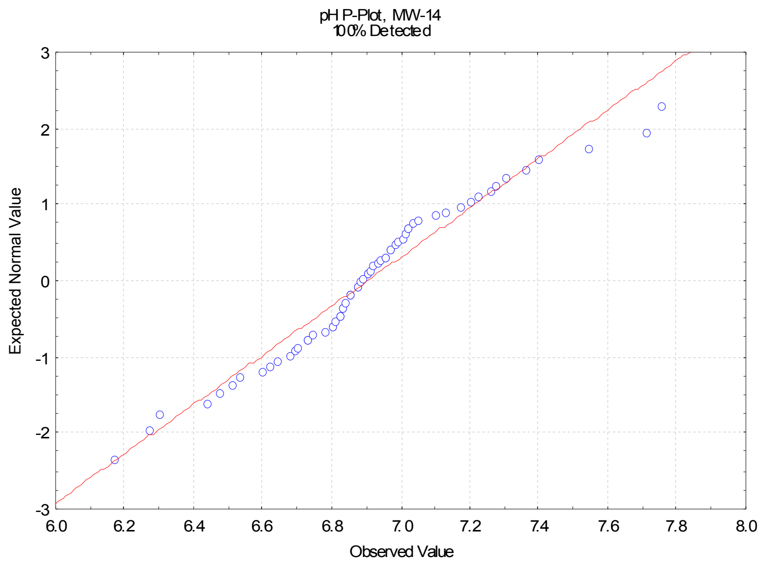


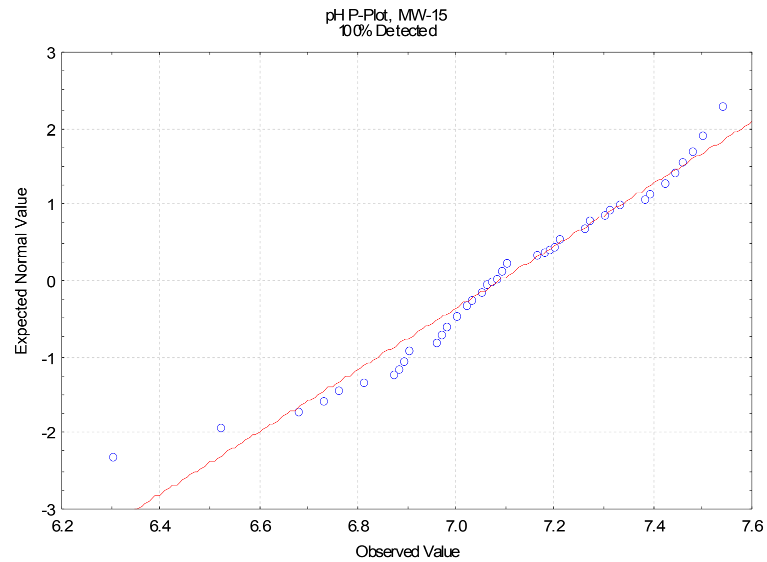


pH (s.u.) Normal Probability Plots for 0 to 50% Non-Detects

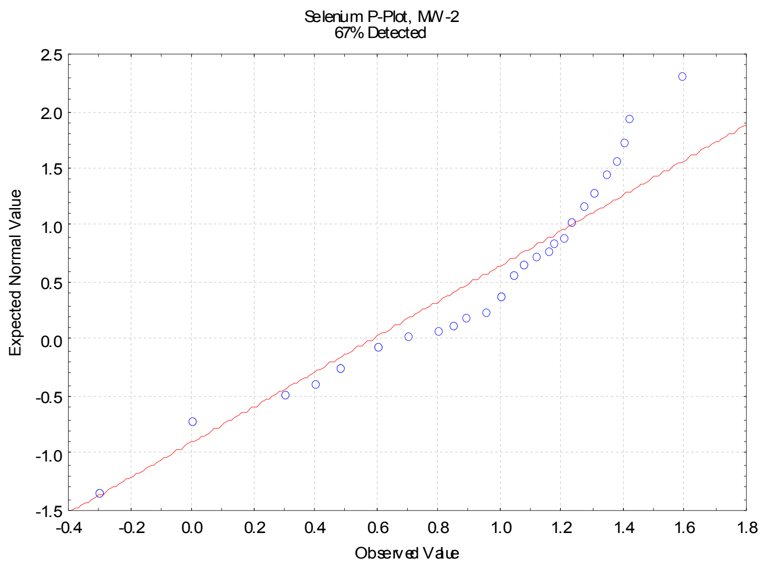


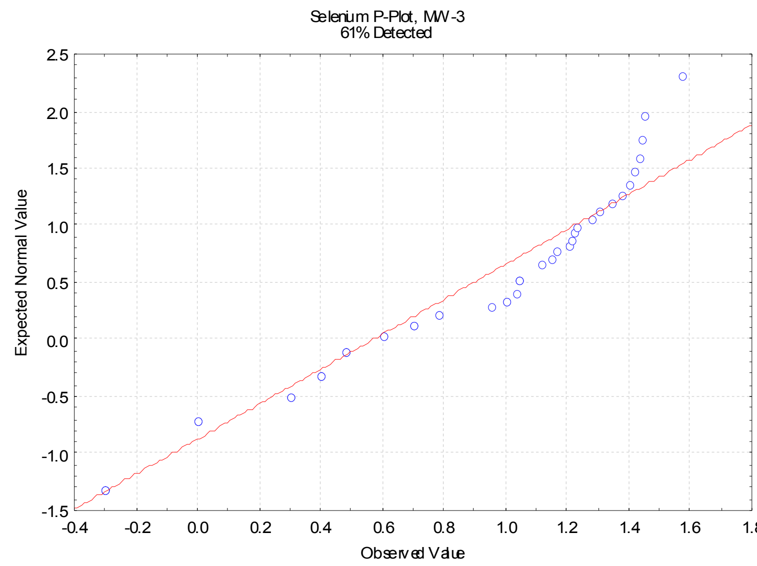


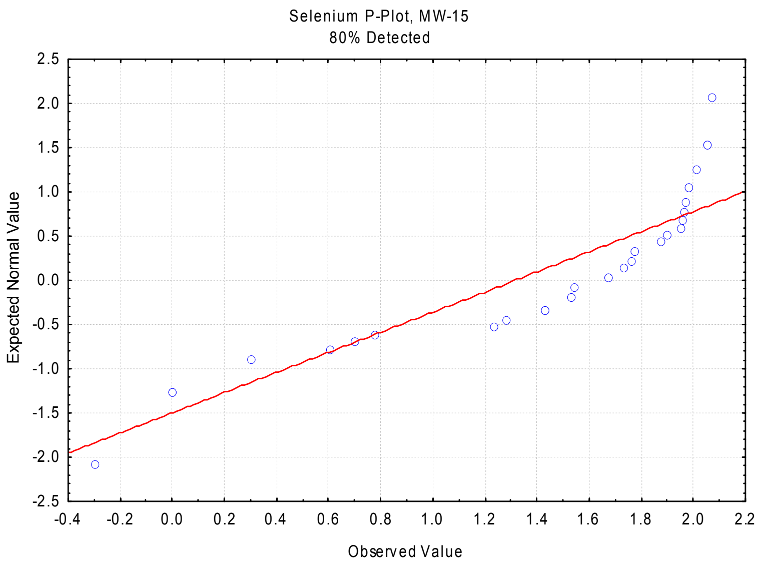


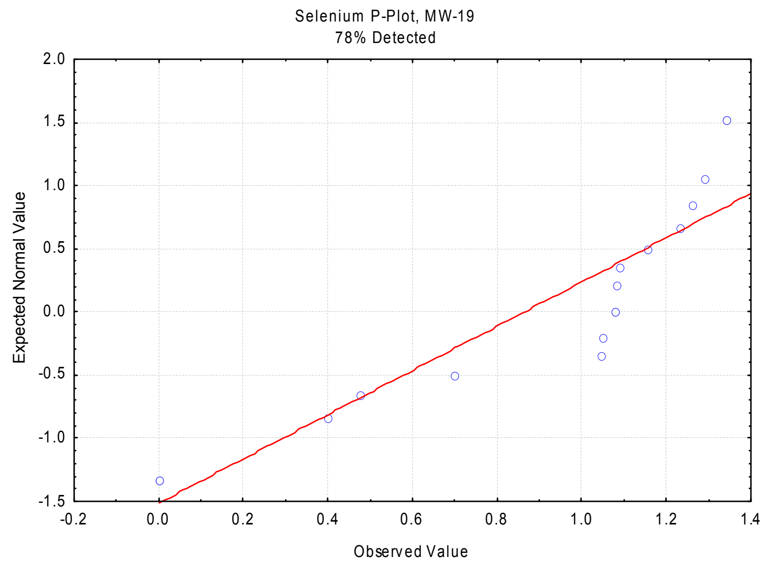


Log-Transformed Selenium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

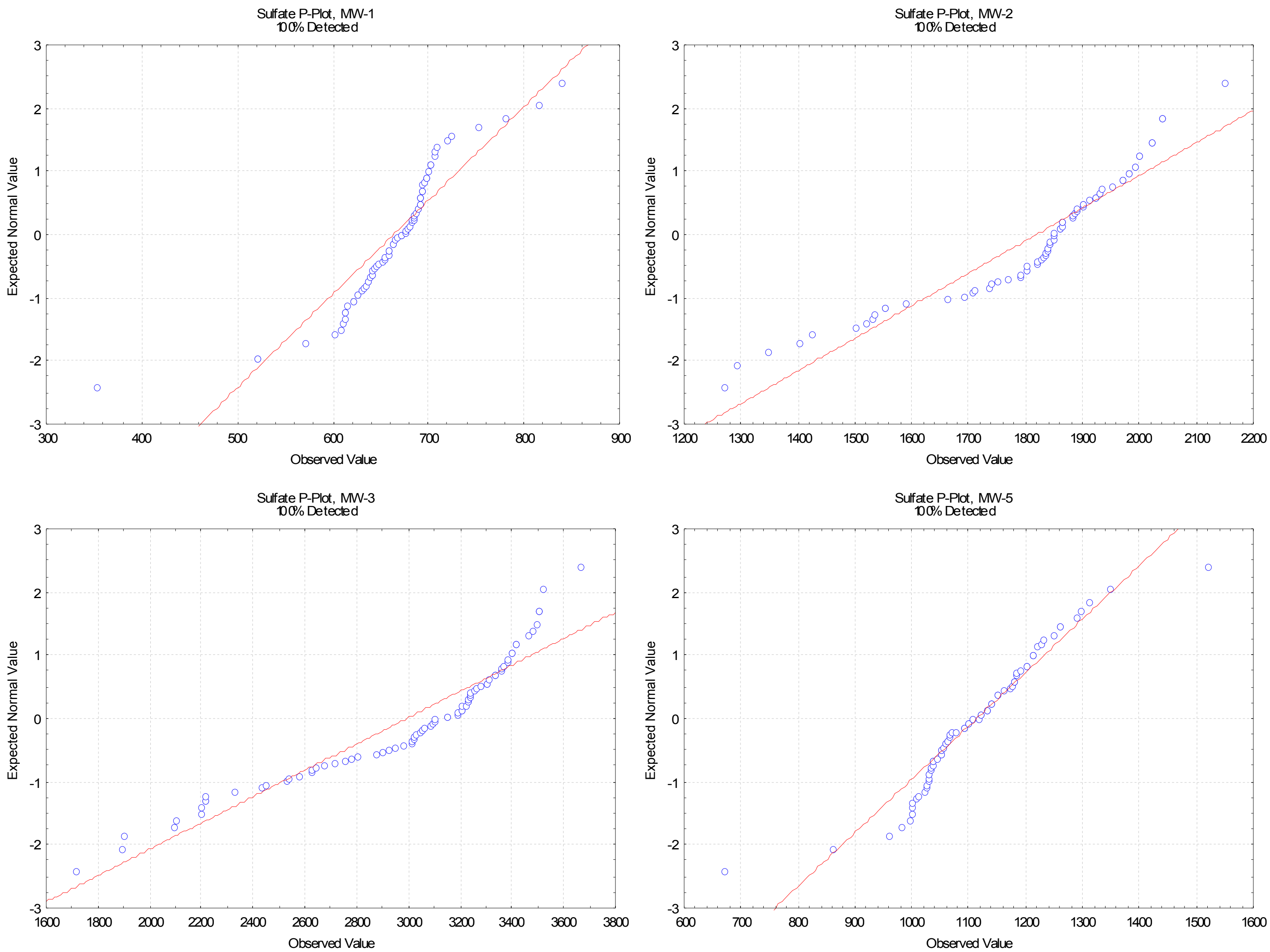




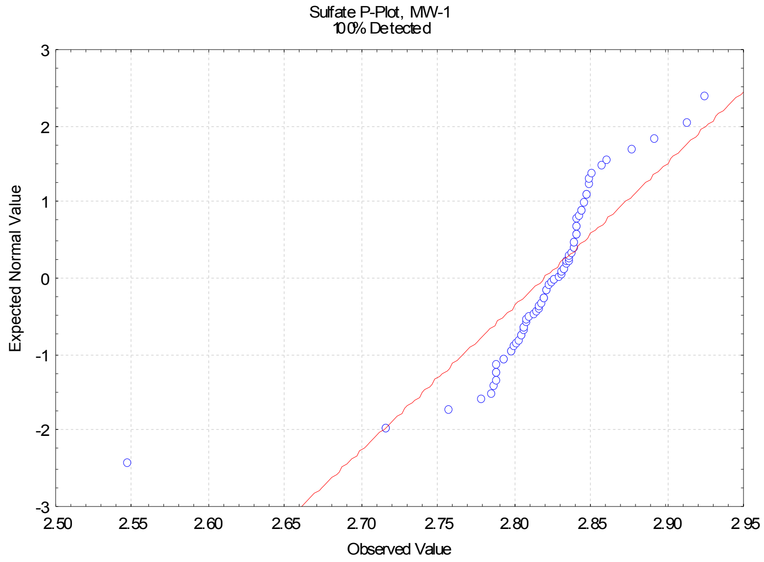


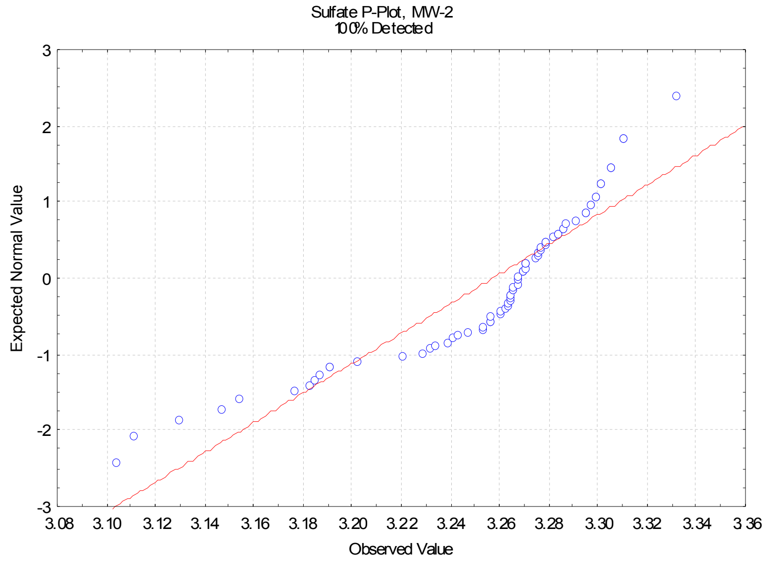


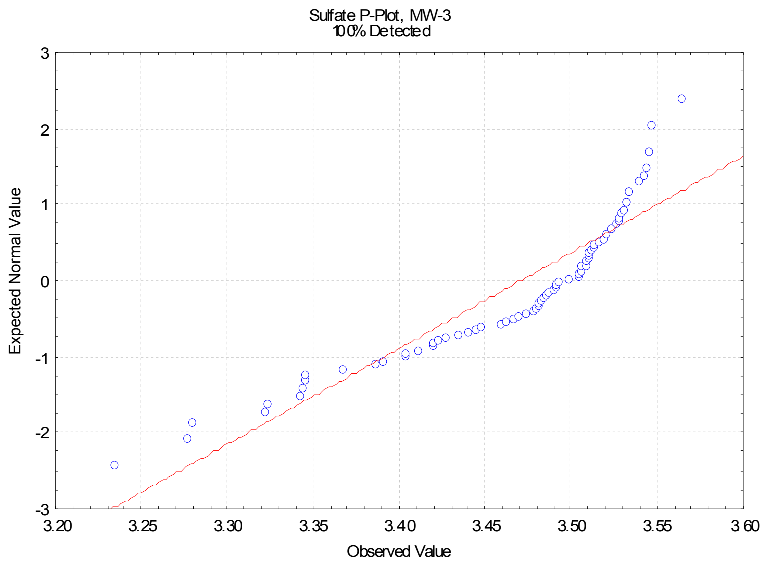
Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

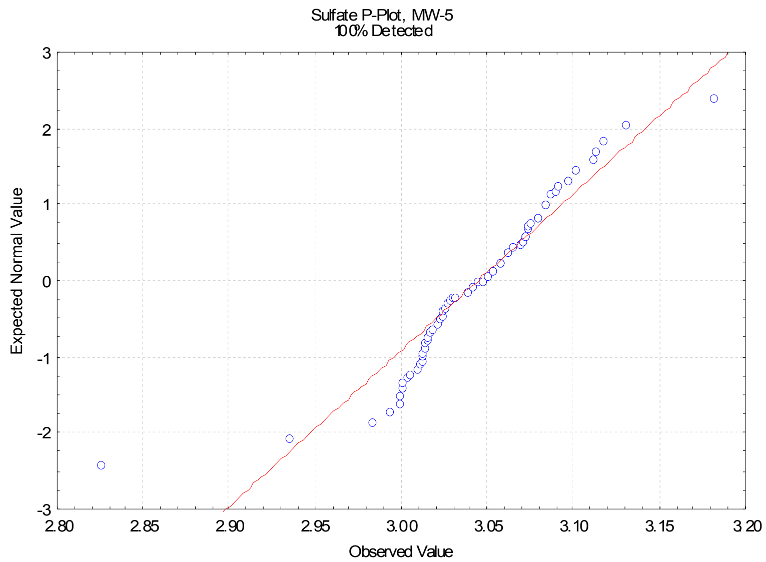


Log-Transformed Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

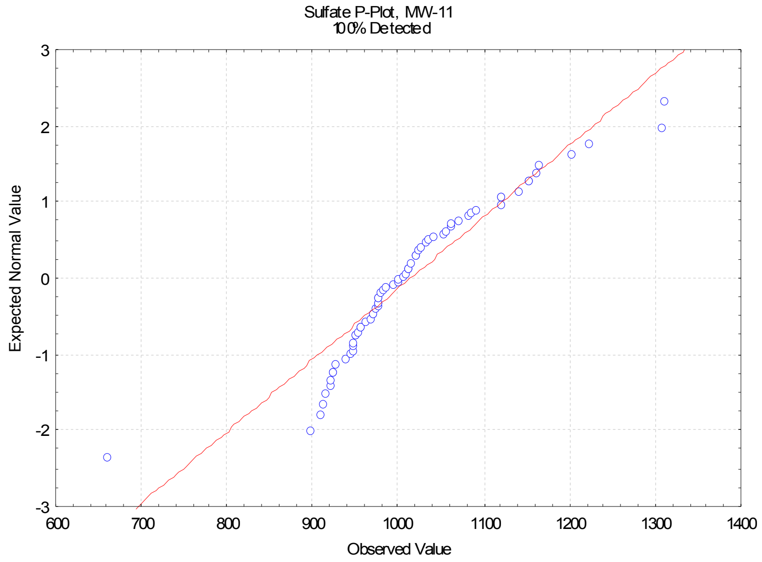


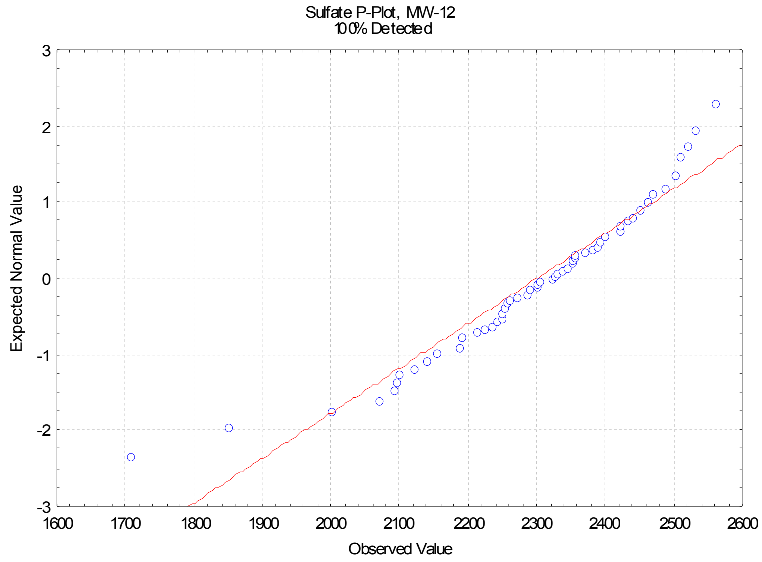


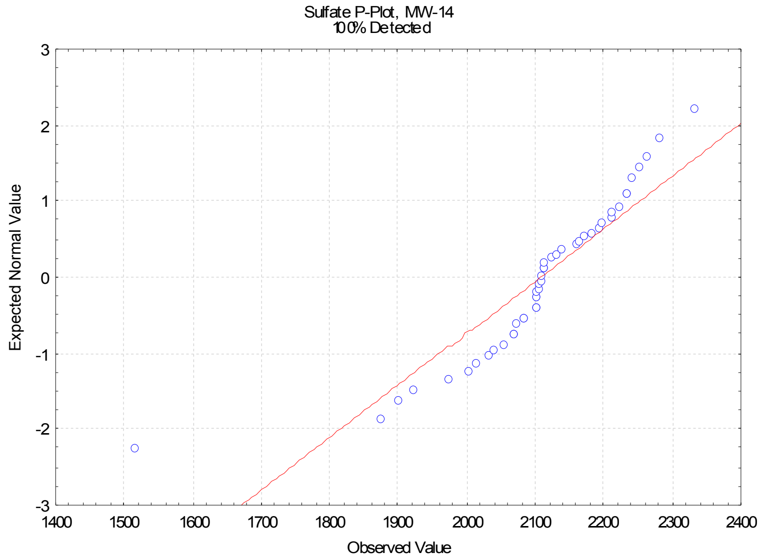


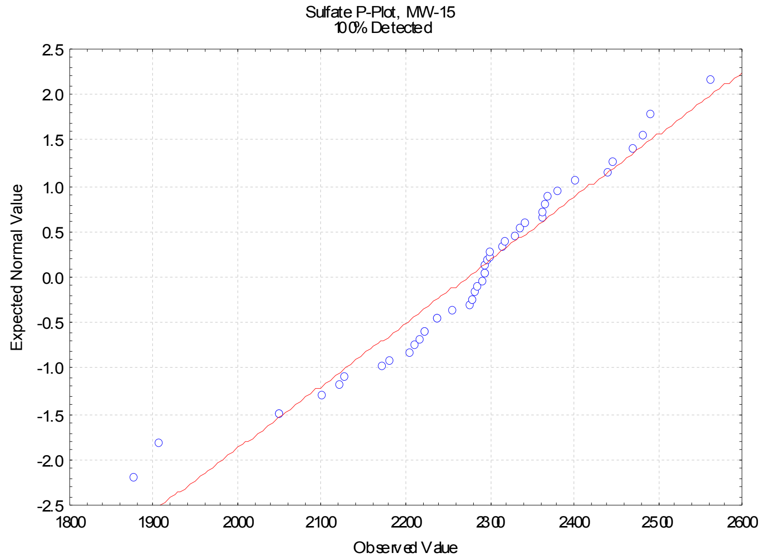


Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

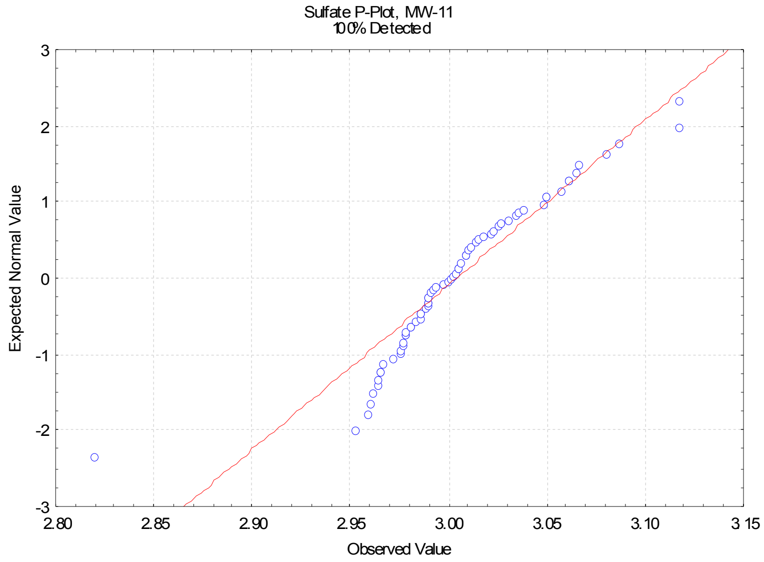


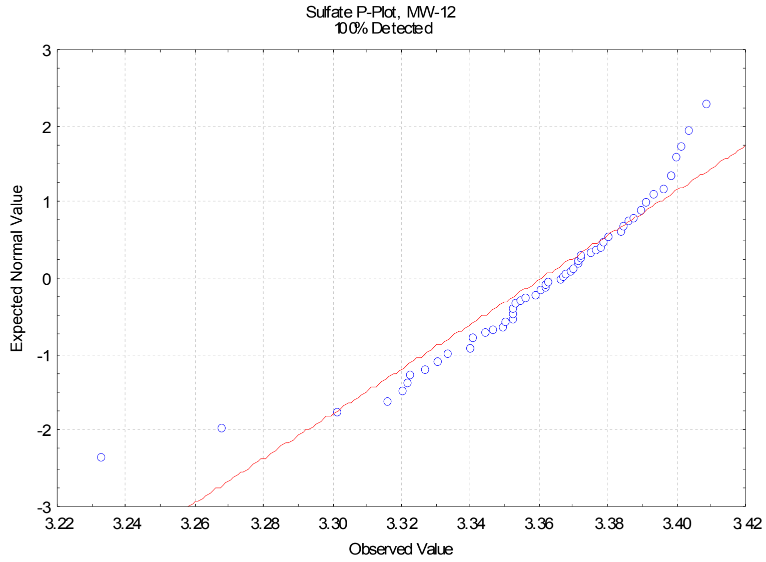


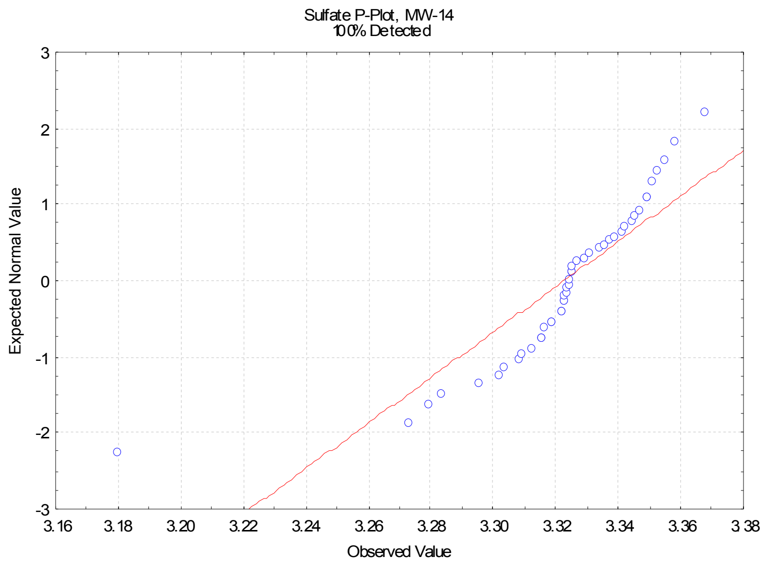


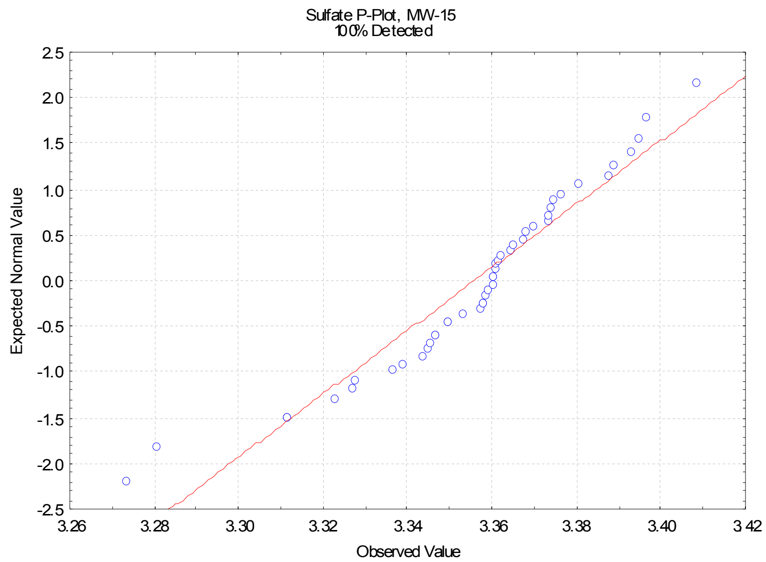


Log-Transformed Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

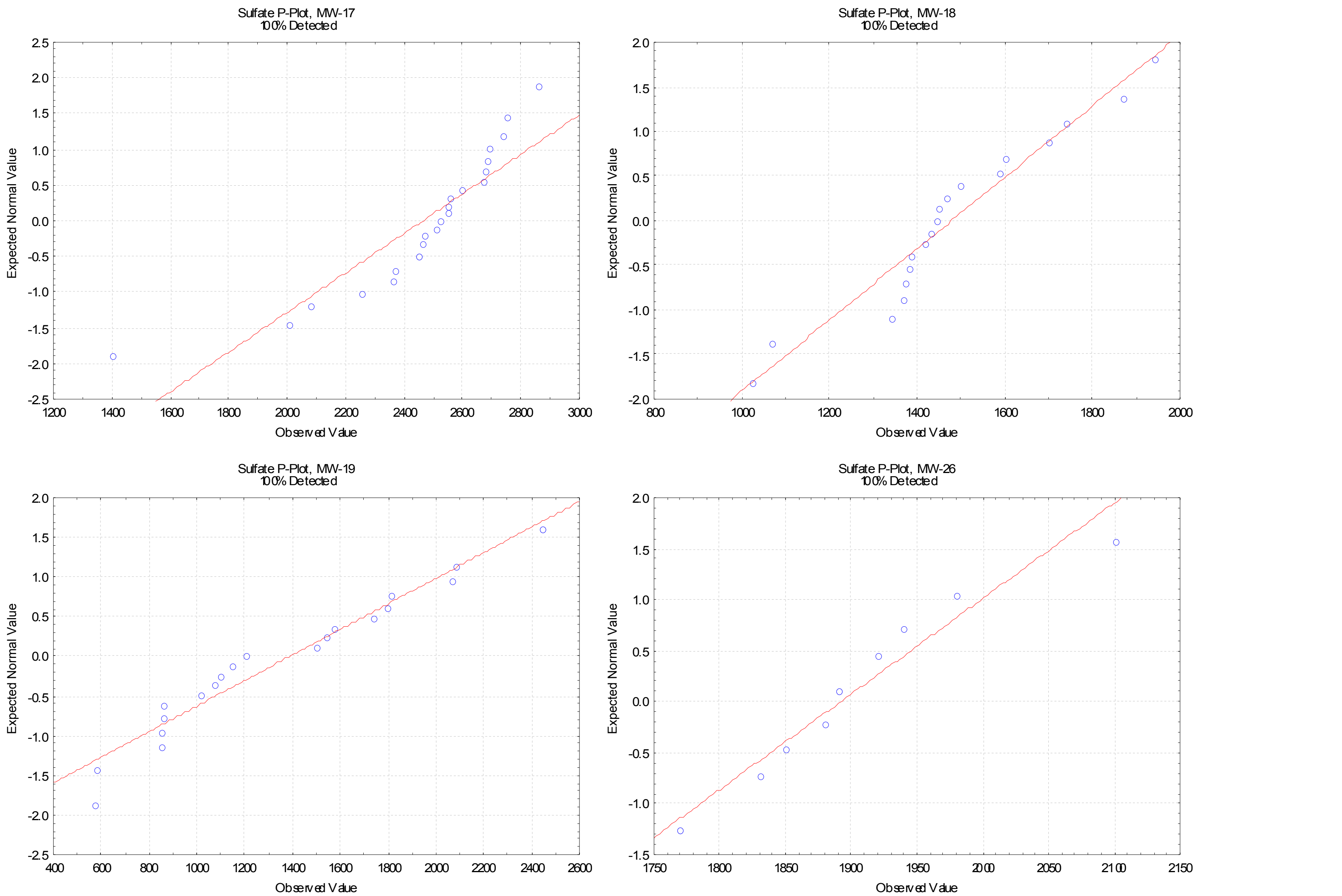




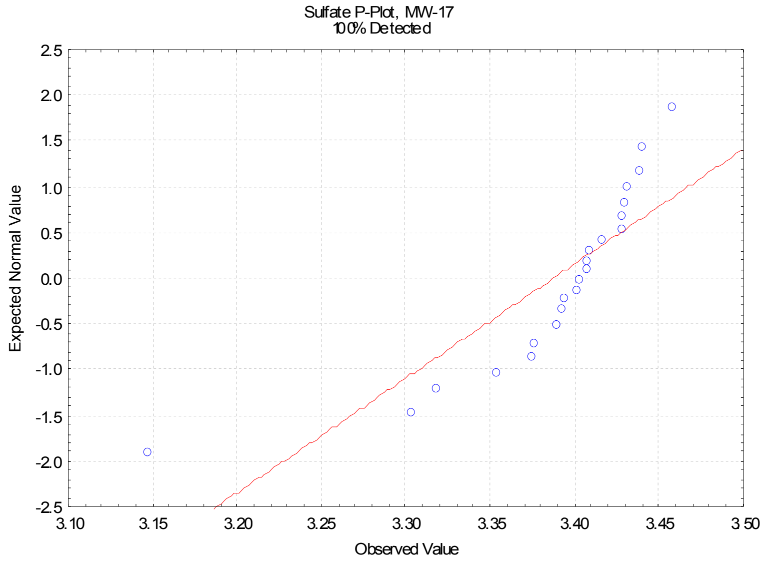


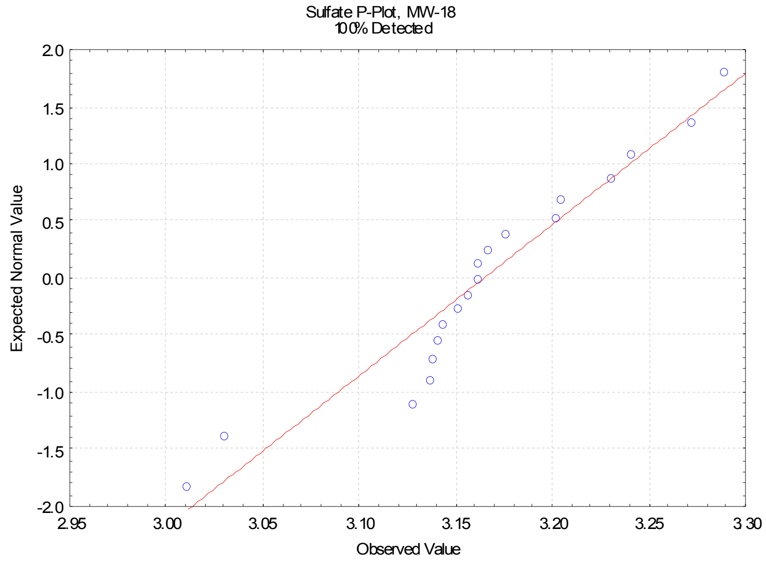


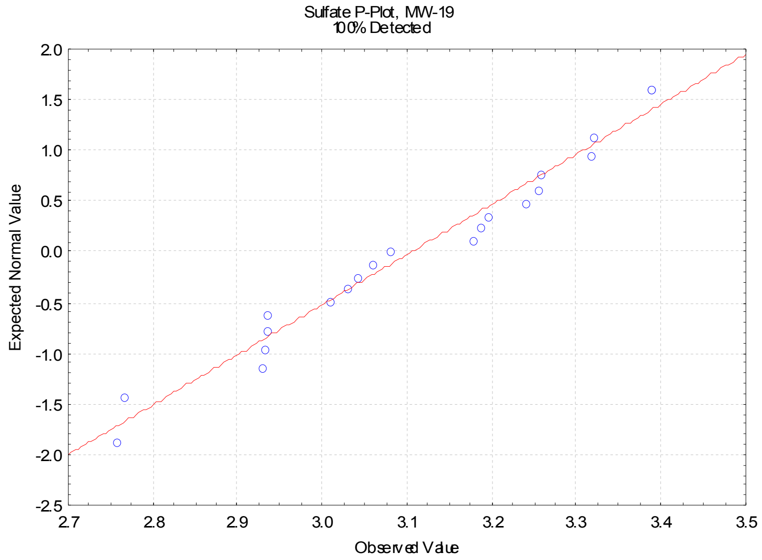
Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

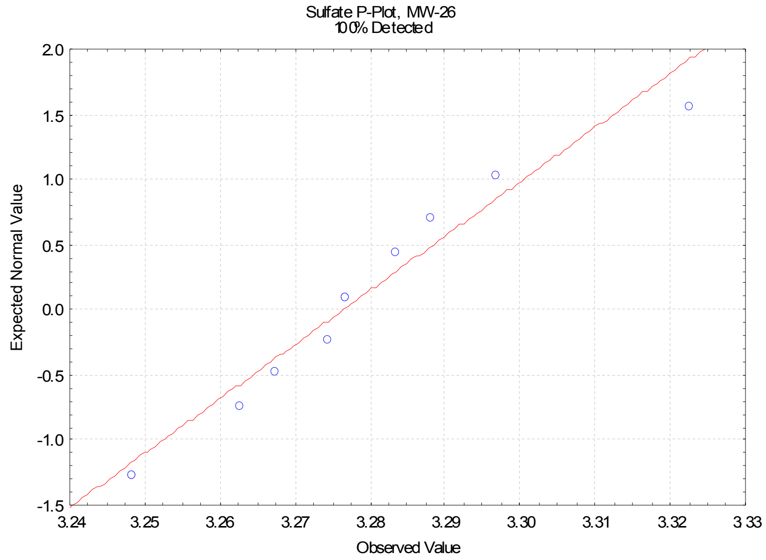


Log-Transformed Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

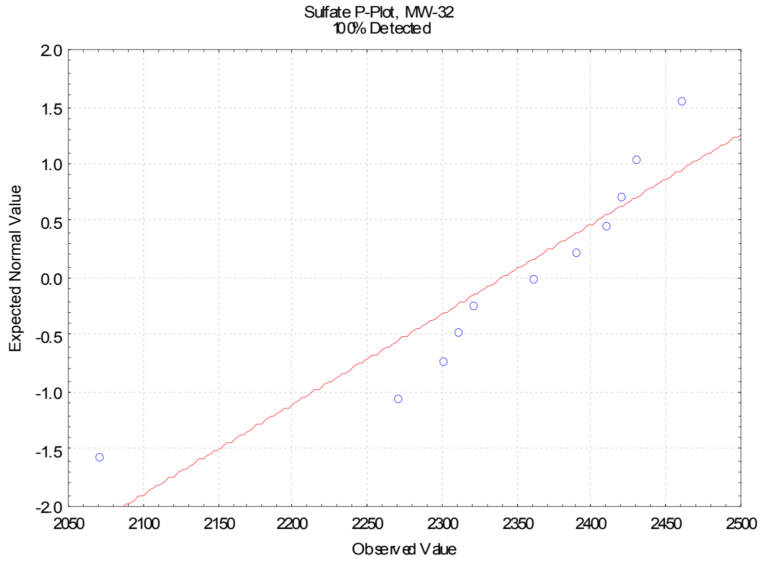




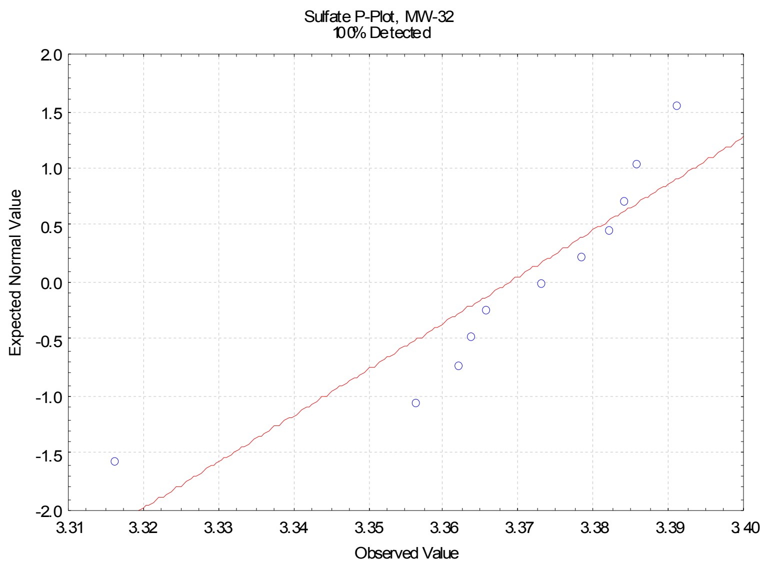




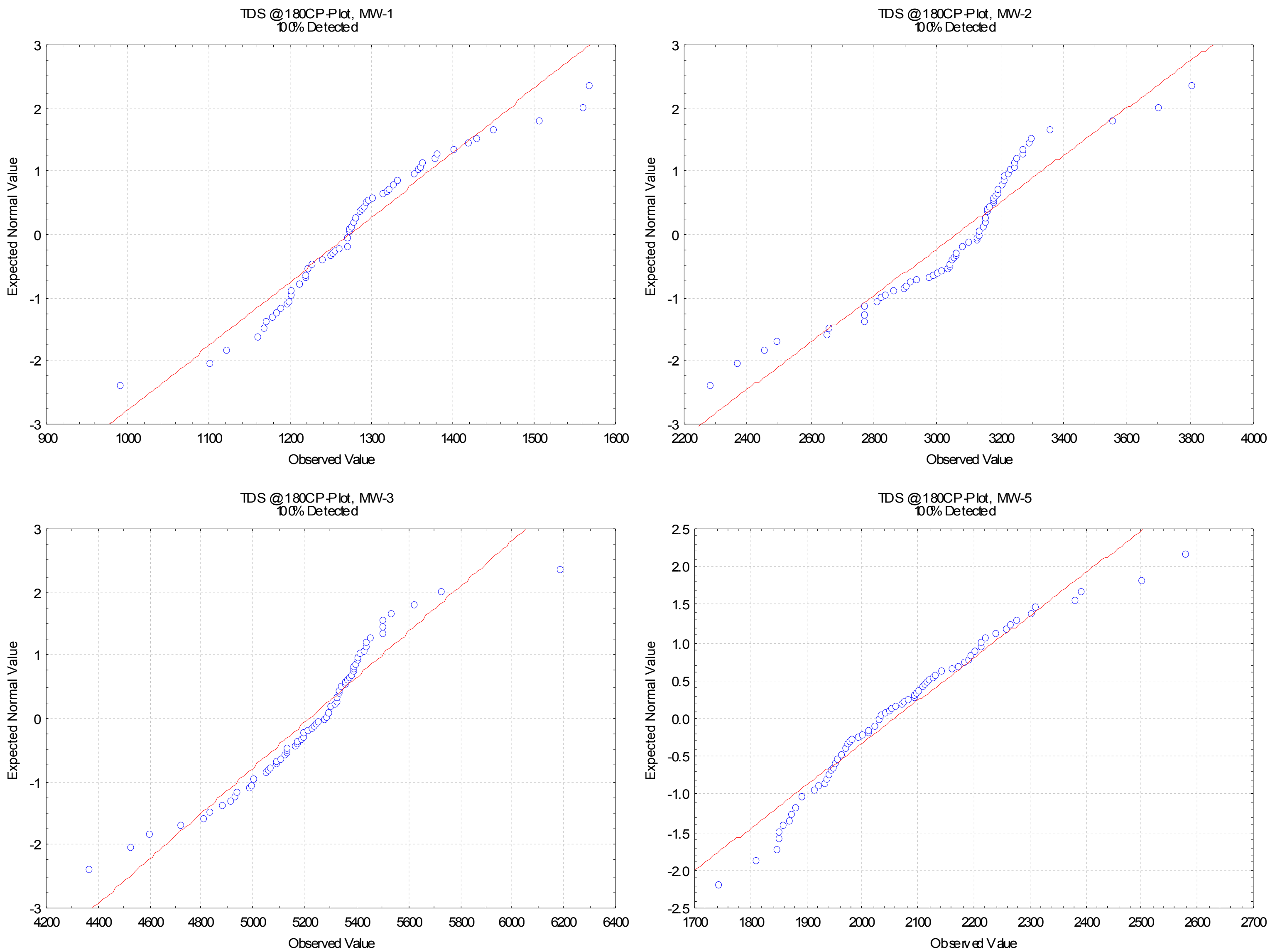
Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects



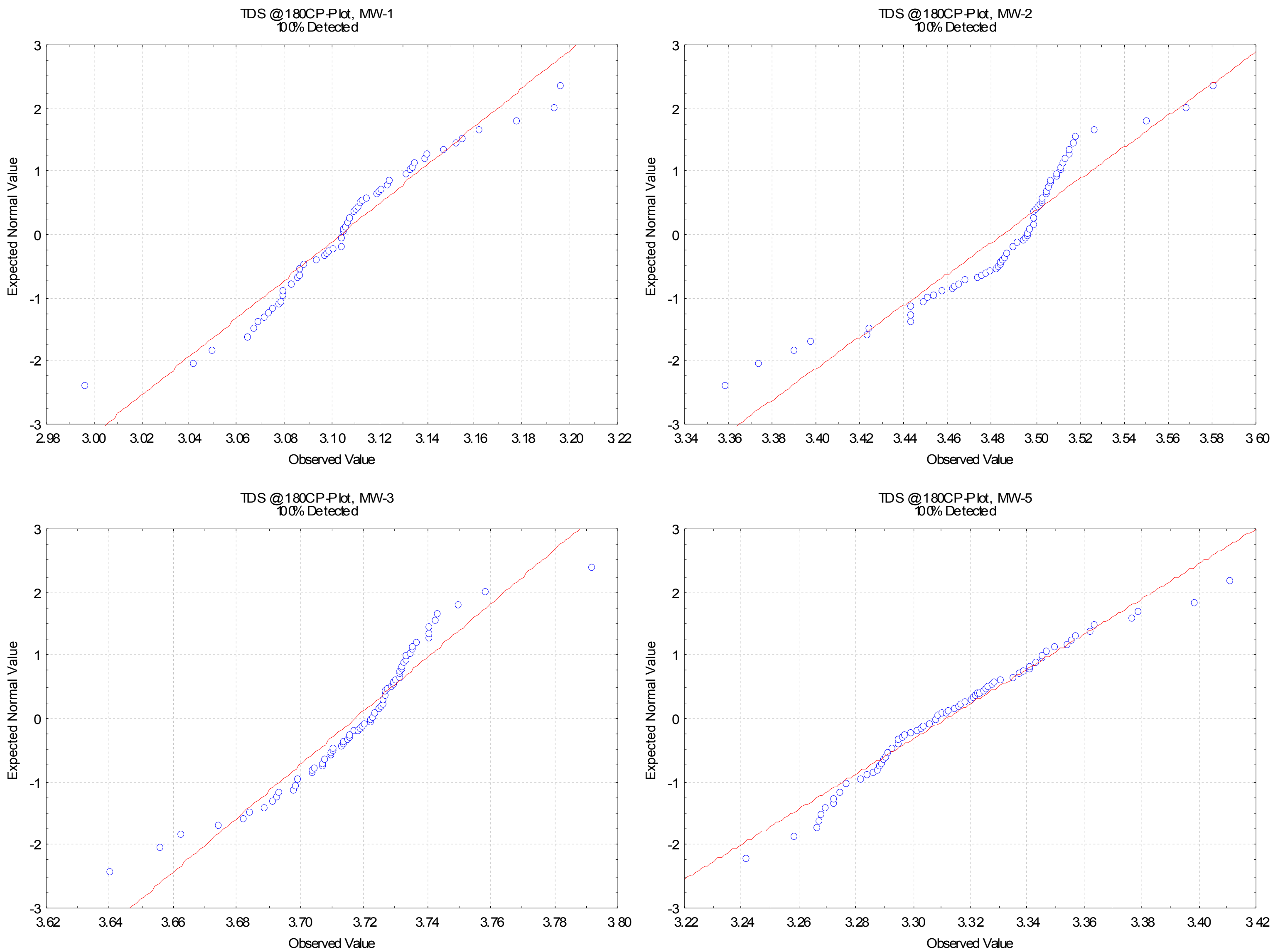
Log-Transformed Sulfate (mg/L) Normal Probability Plots for 0 to 50% Non-Detects



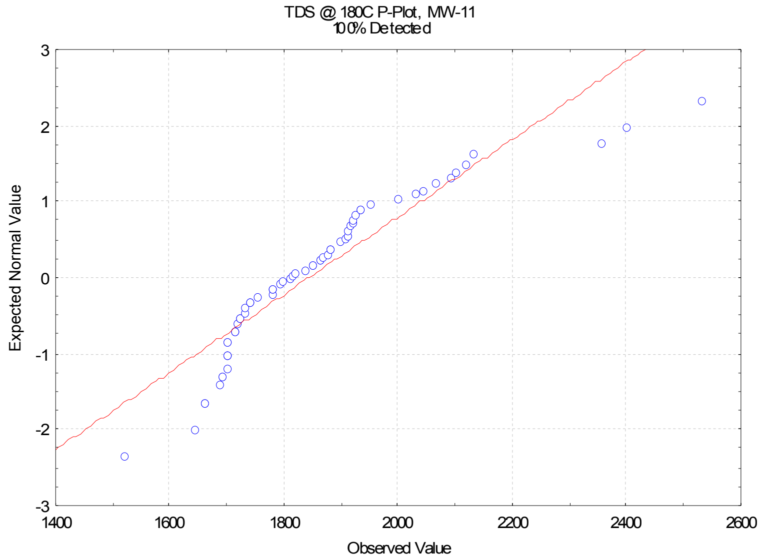
TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

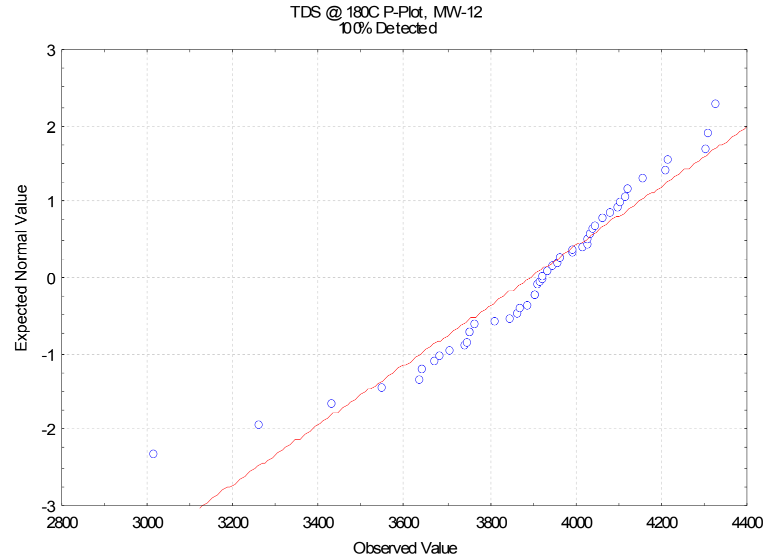


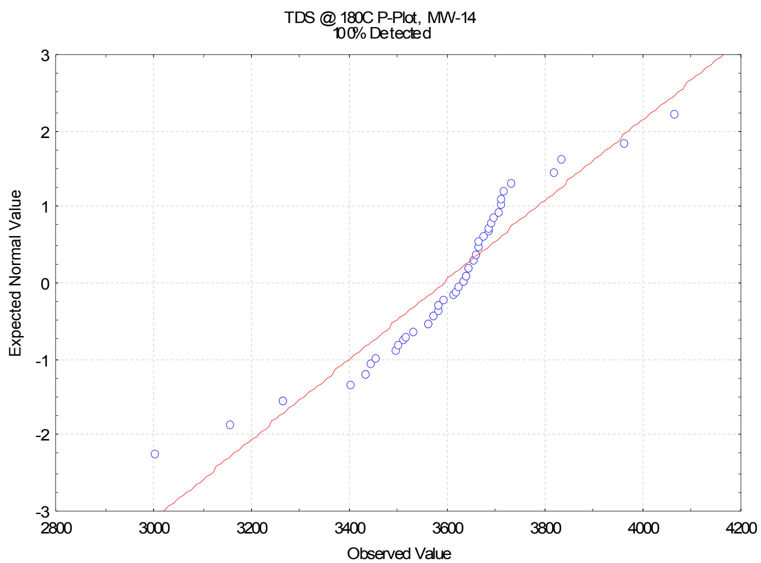
Log-Transformed TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

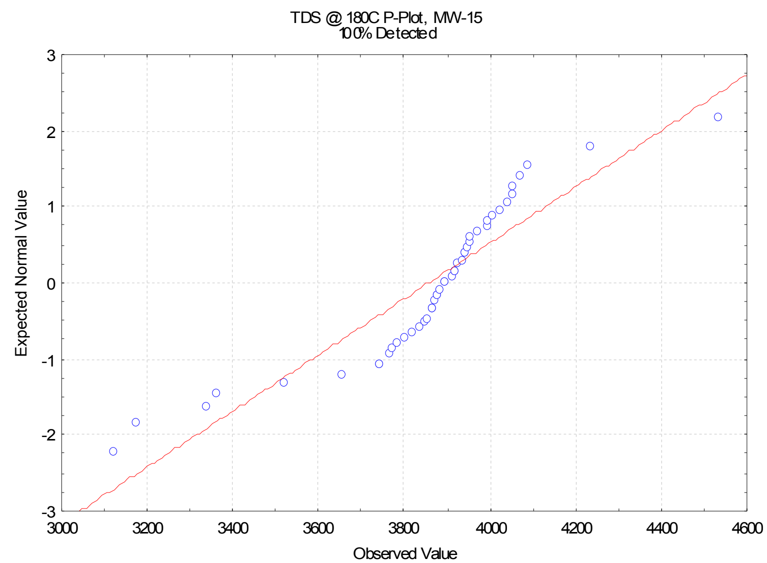


TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

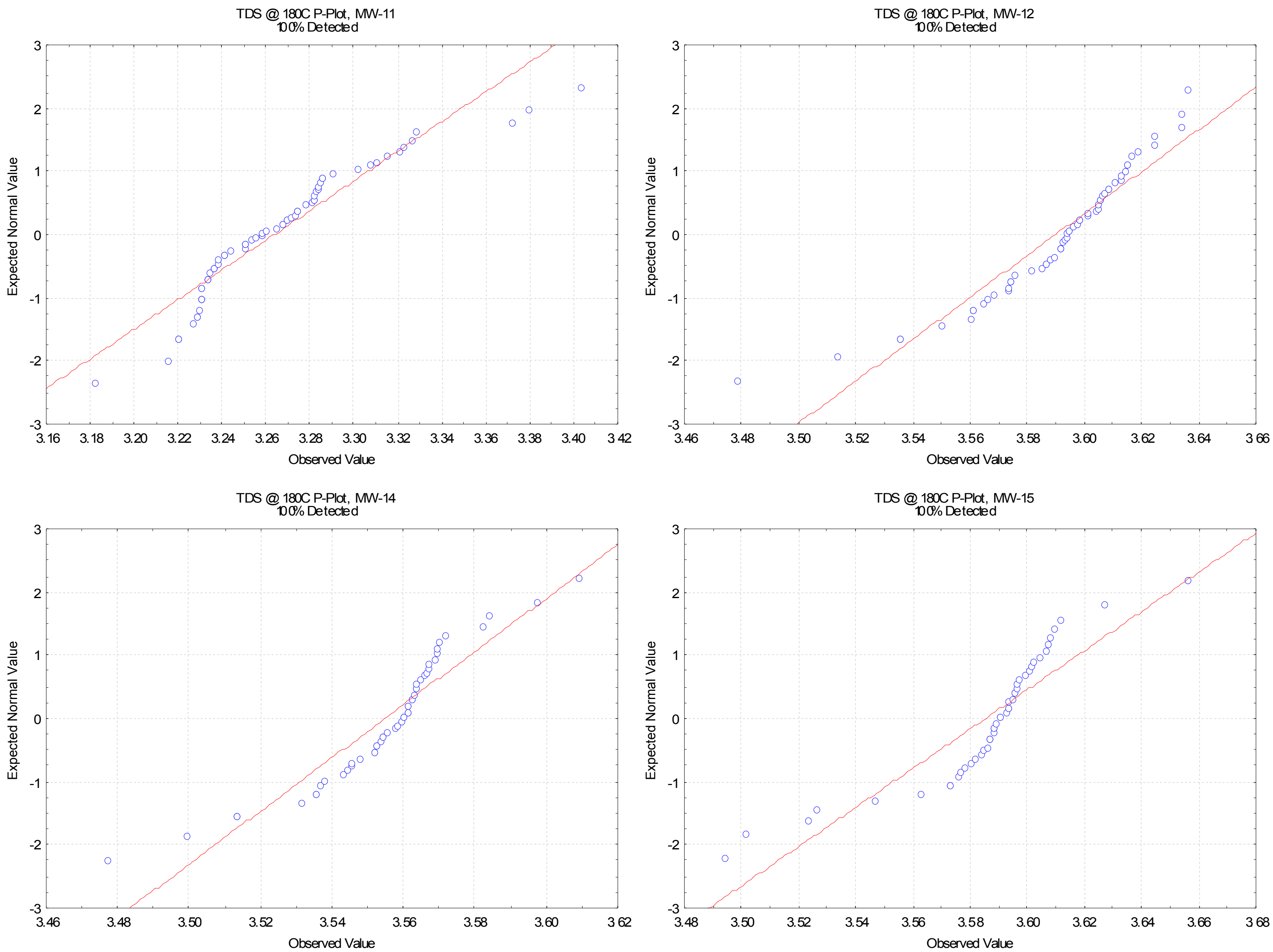




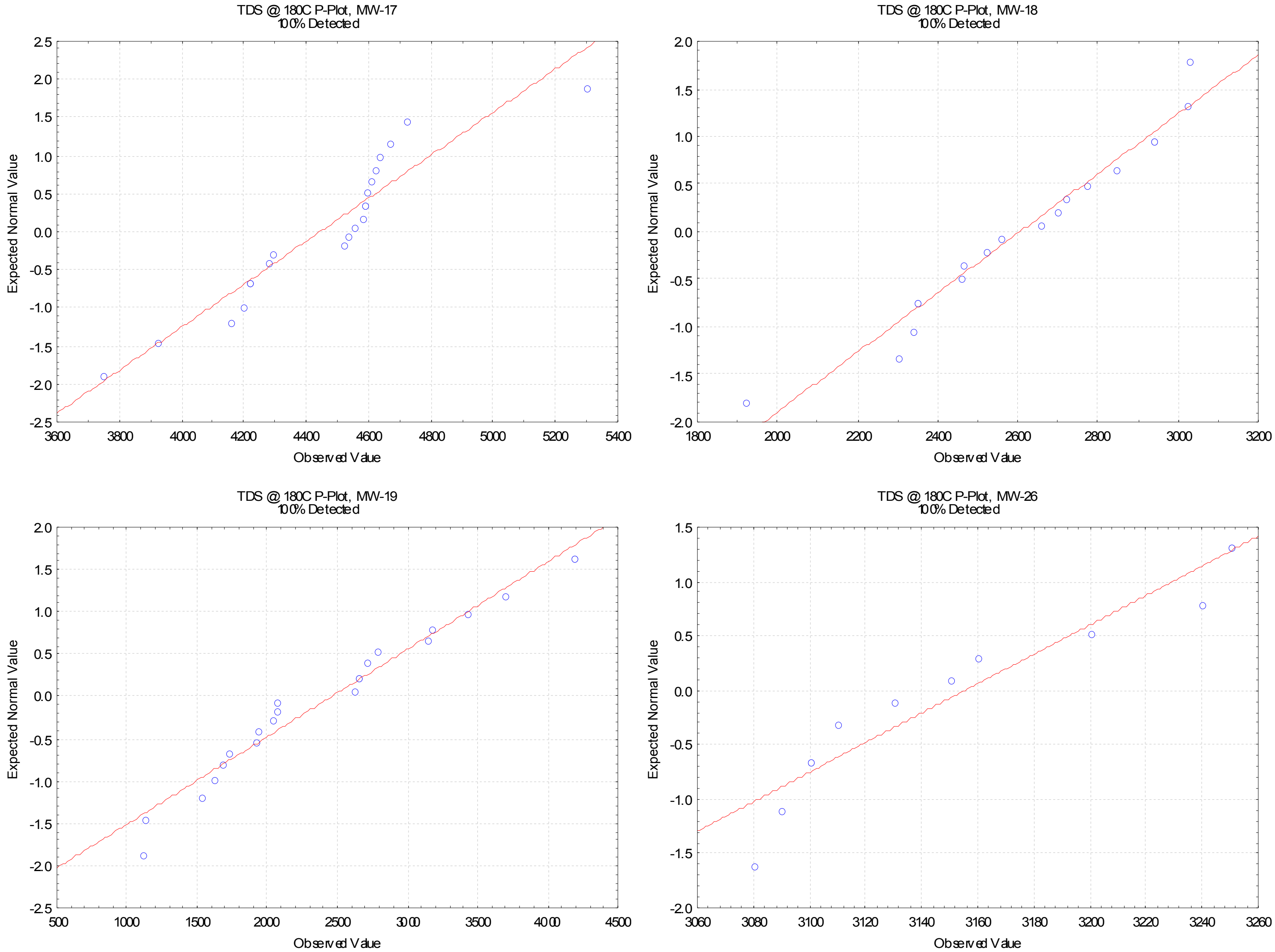




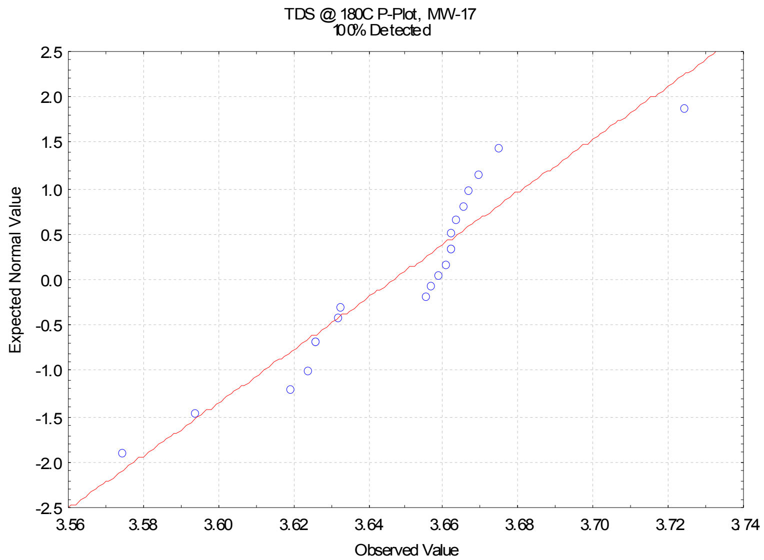
Log-Transformed TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

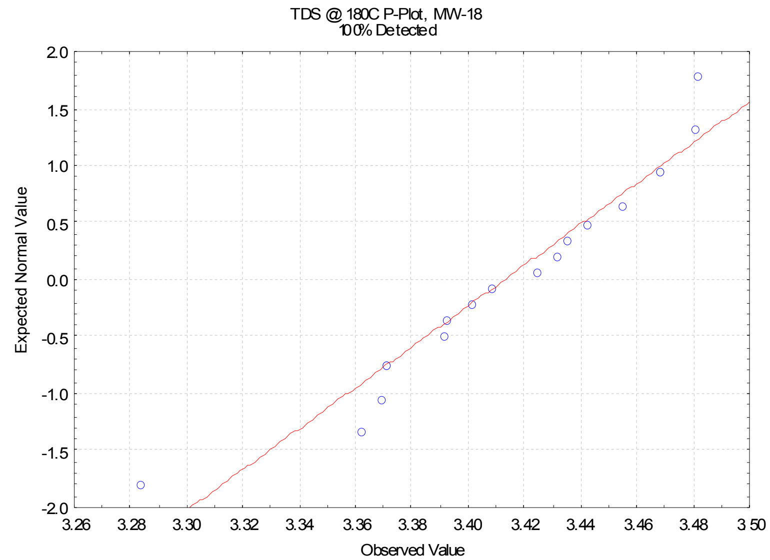


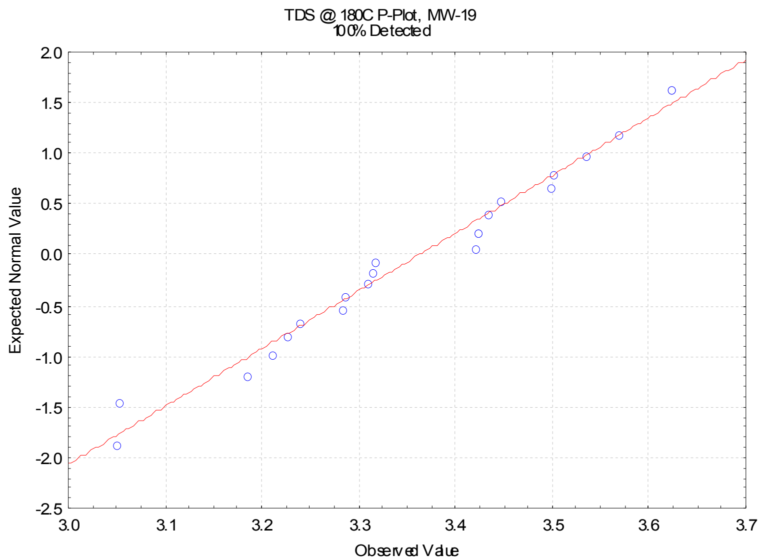
TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

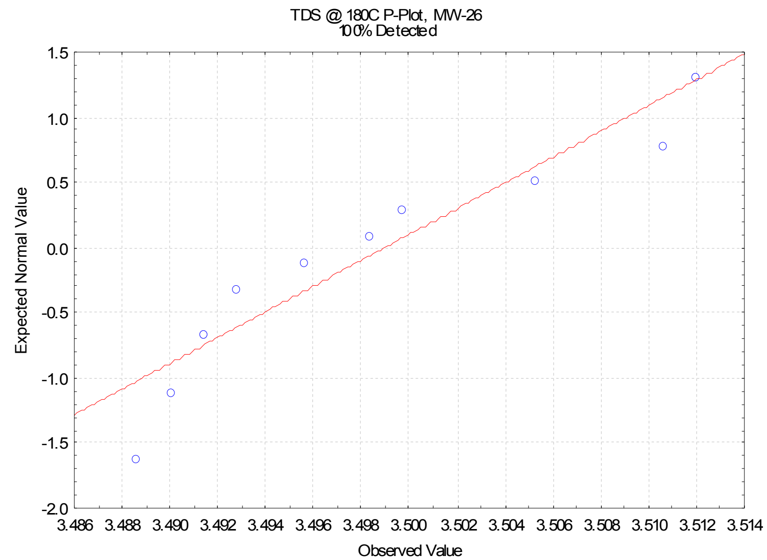


Log-Transformed TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

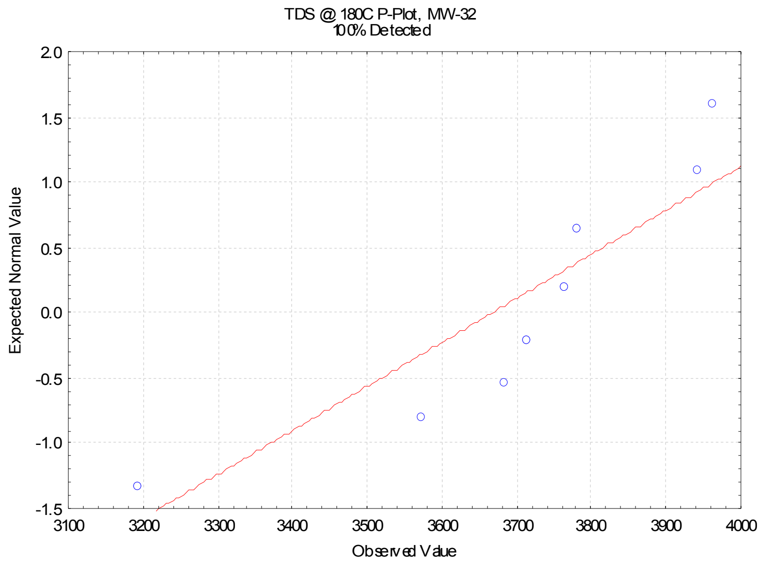




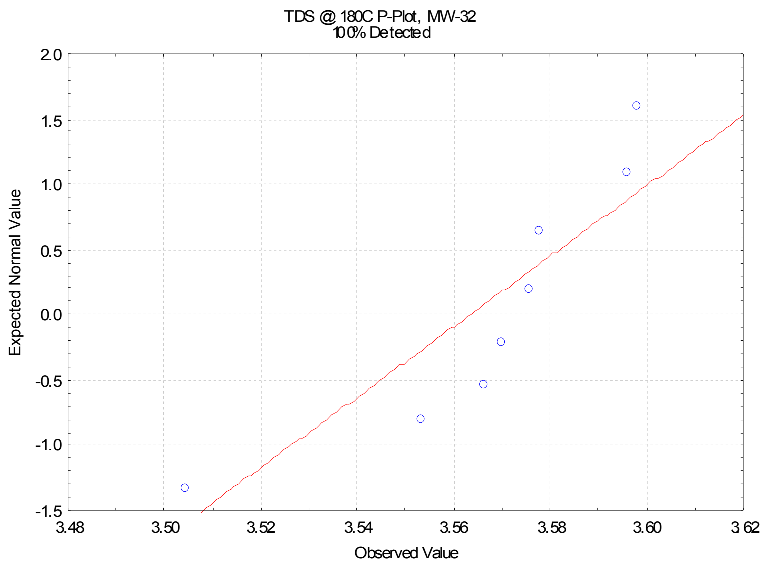




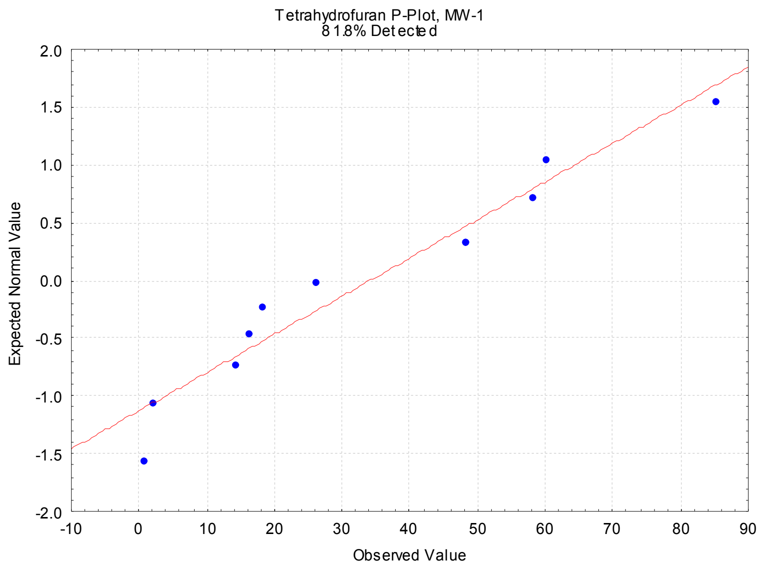
TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

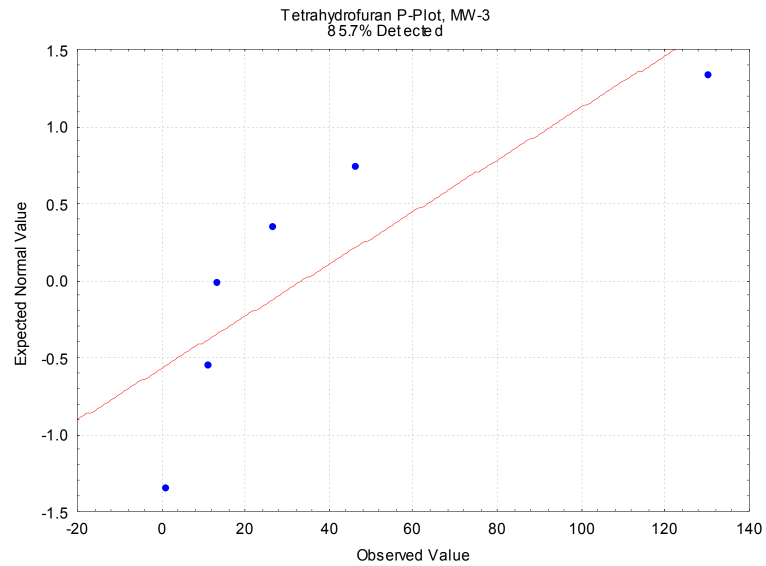


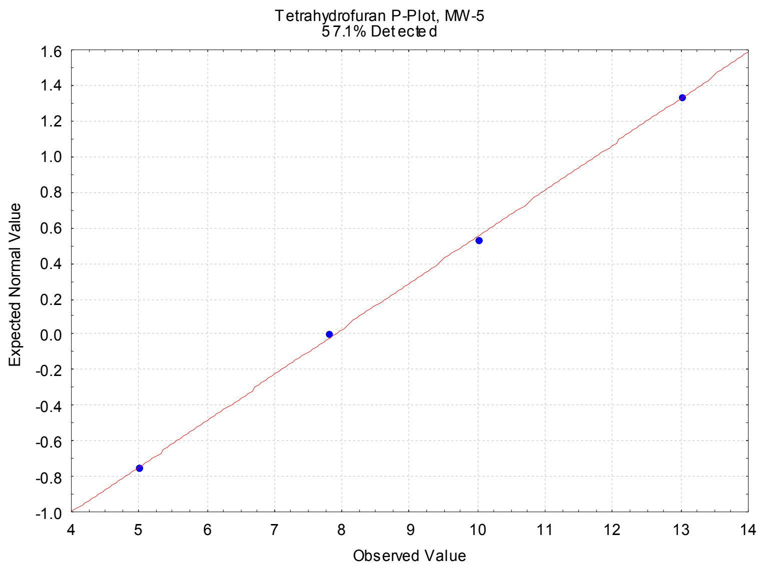
Log-Transformed TDS @ 180C (mg/L) Normal Probability Plots for 0 to 50% Non-Detects

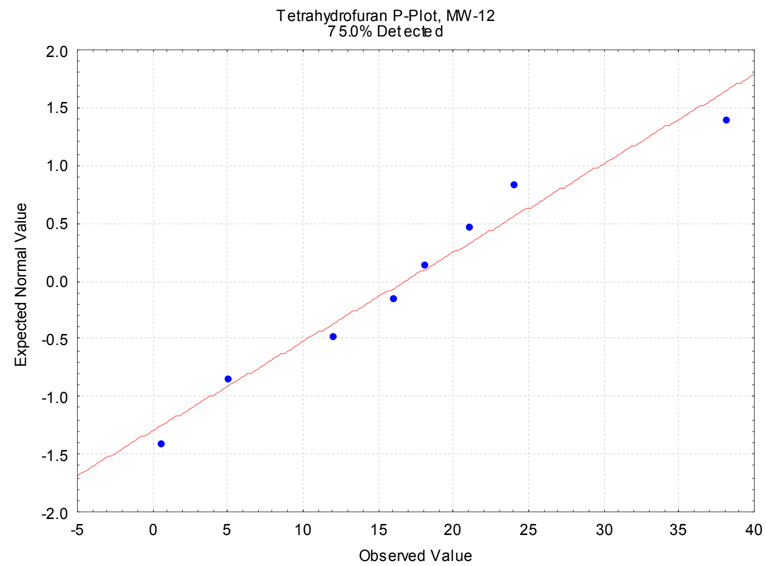


Tetrahydrofuran (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

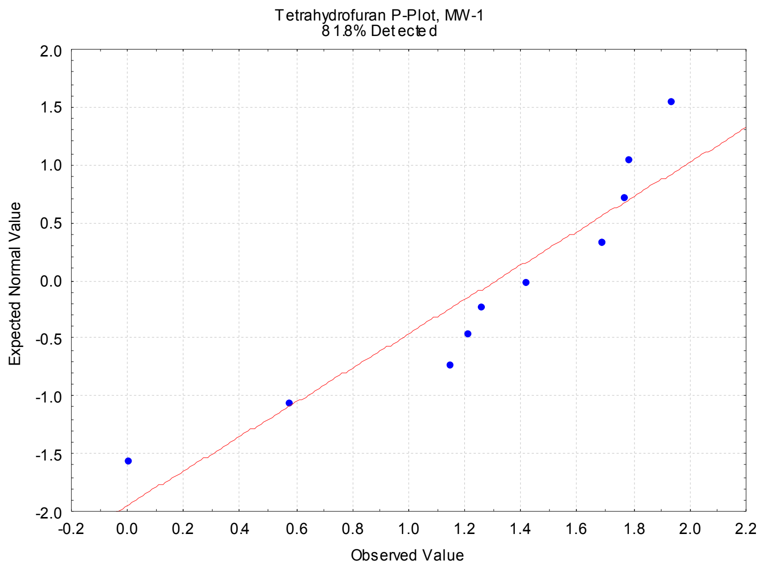


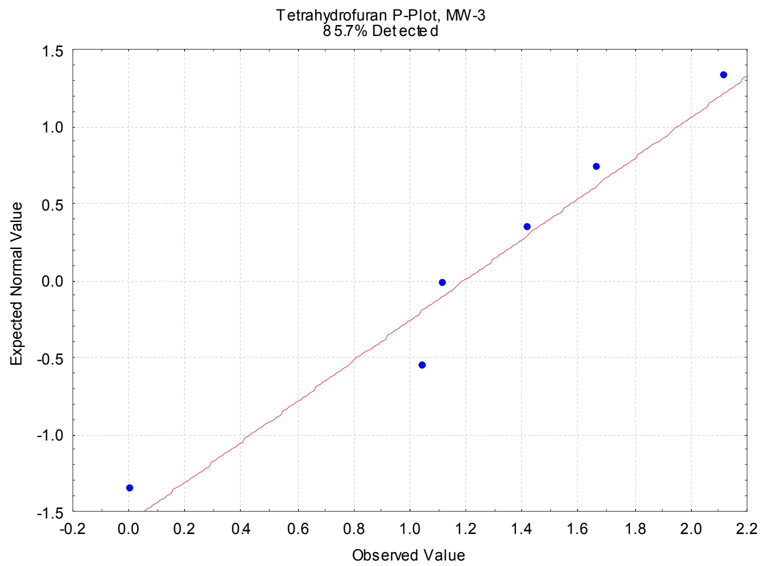


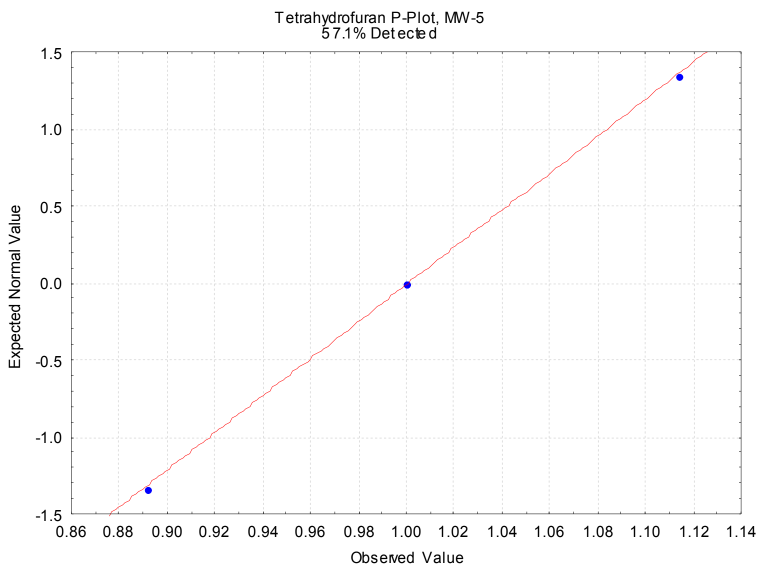


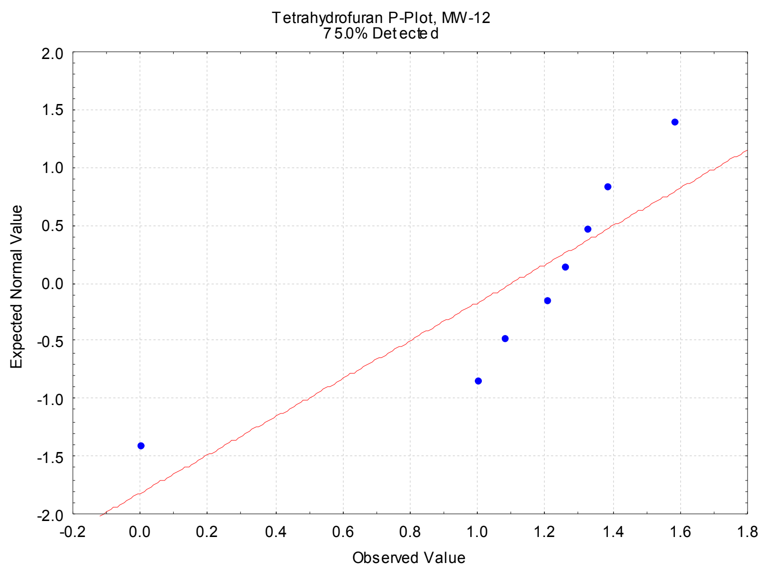


Log-Transformed Tetrahydrofuran (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

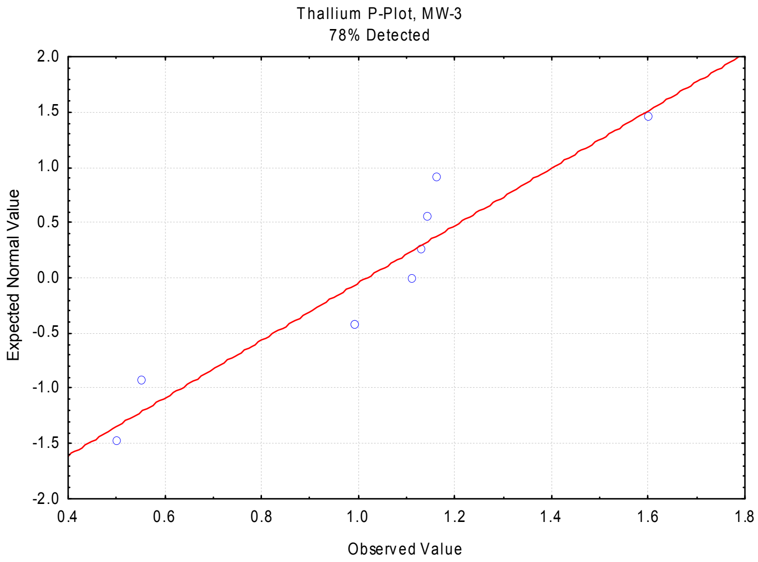


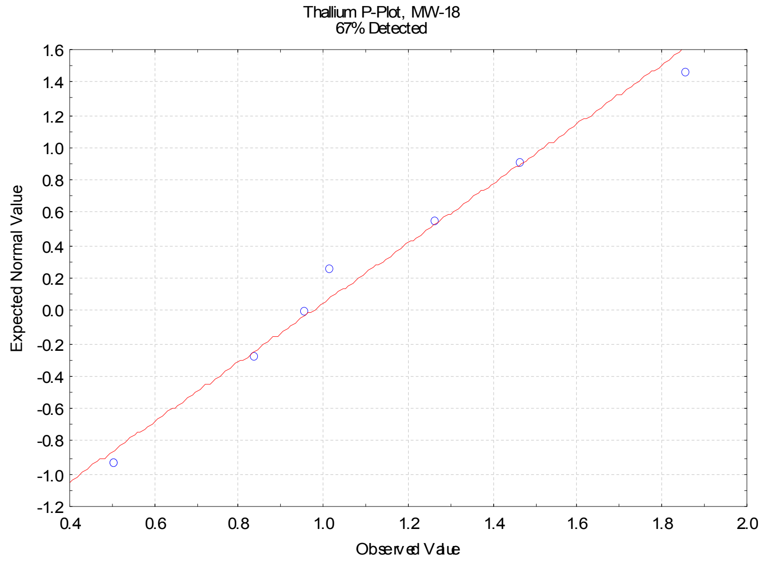


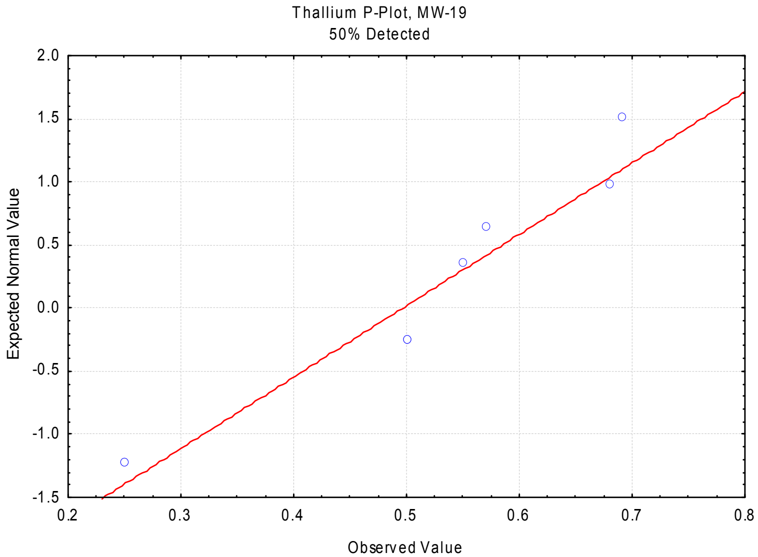




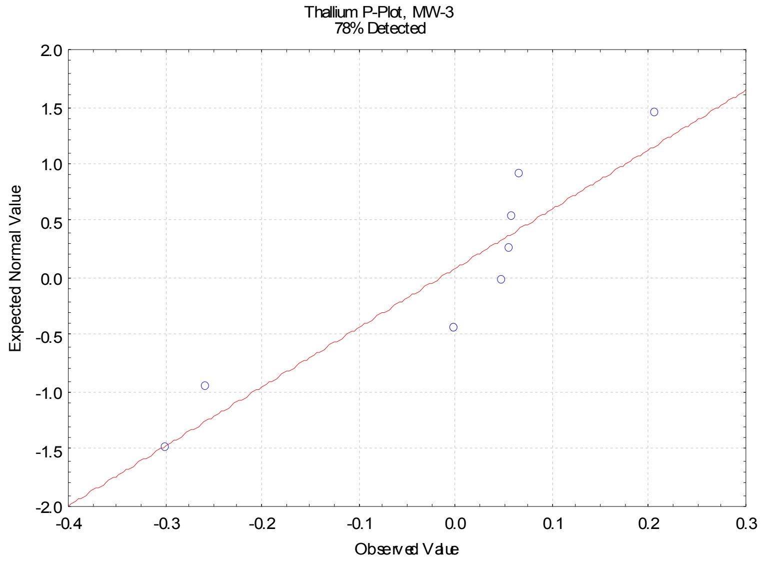
Thallium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

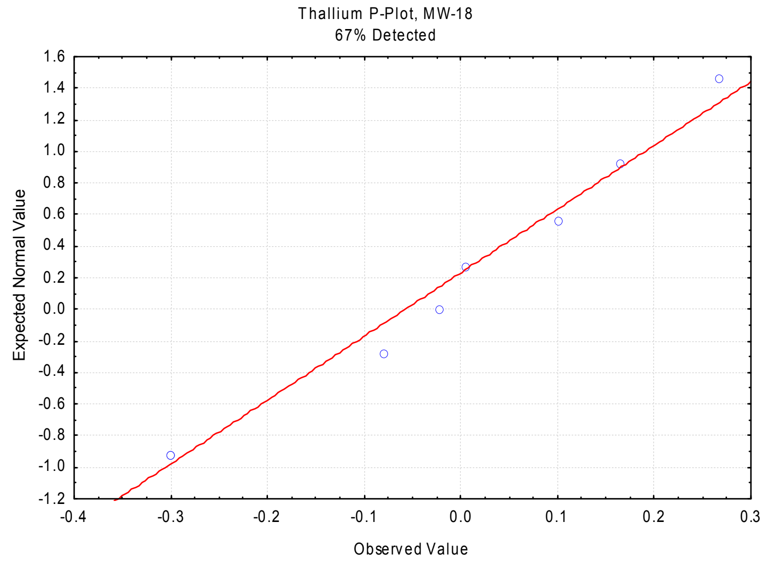


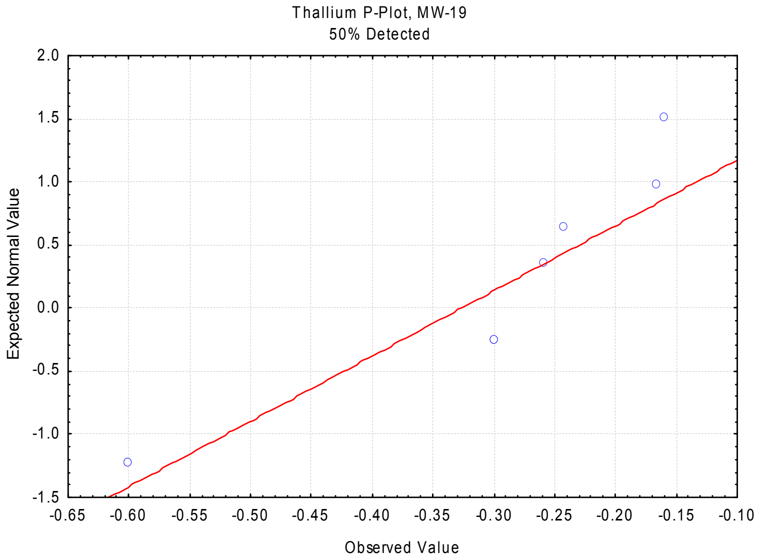




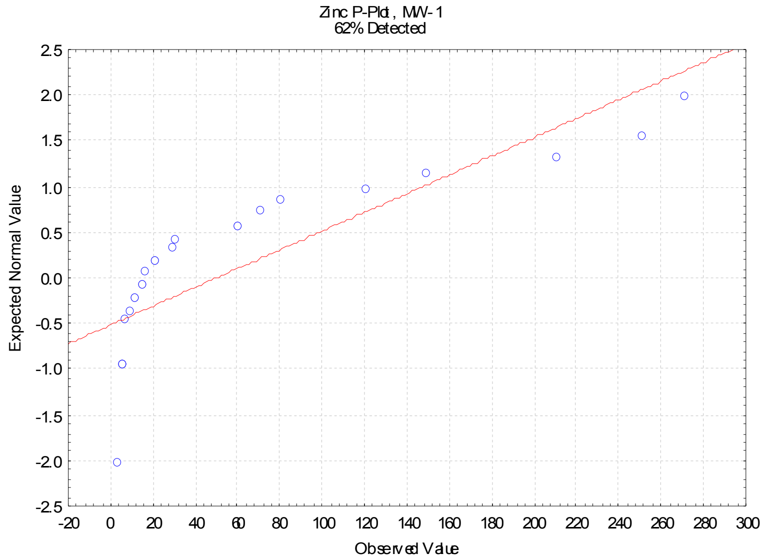
Log-Transformed Thallium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

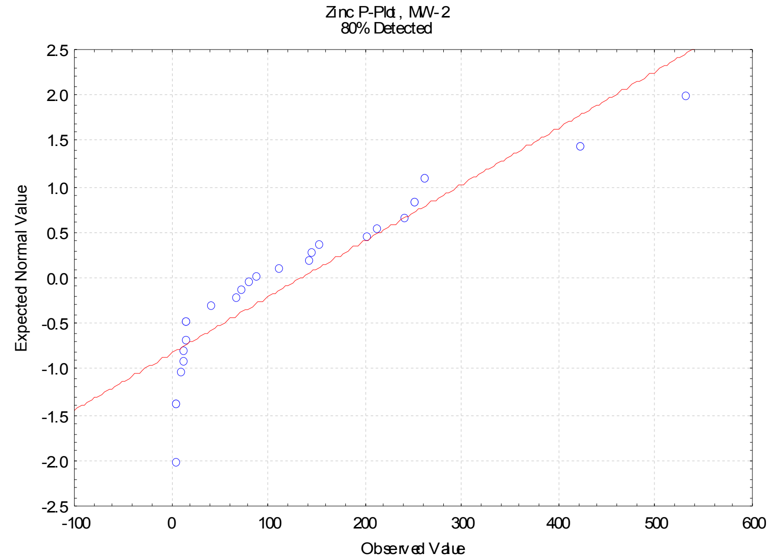


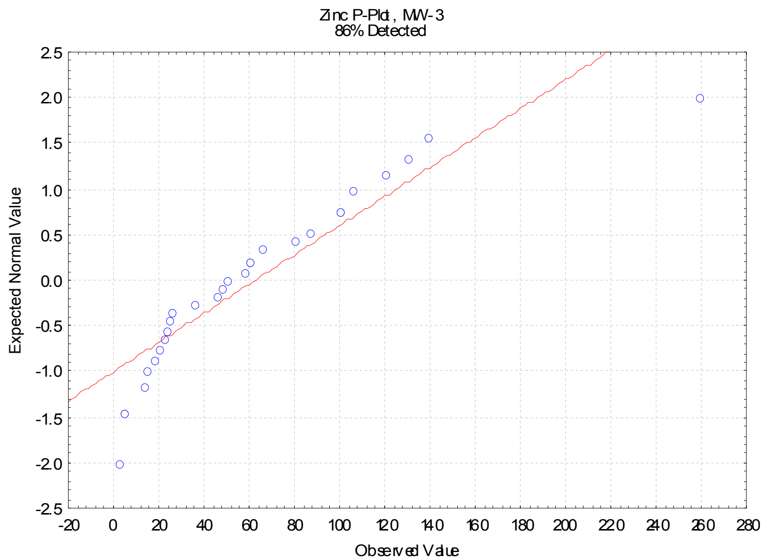


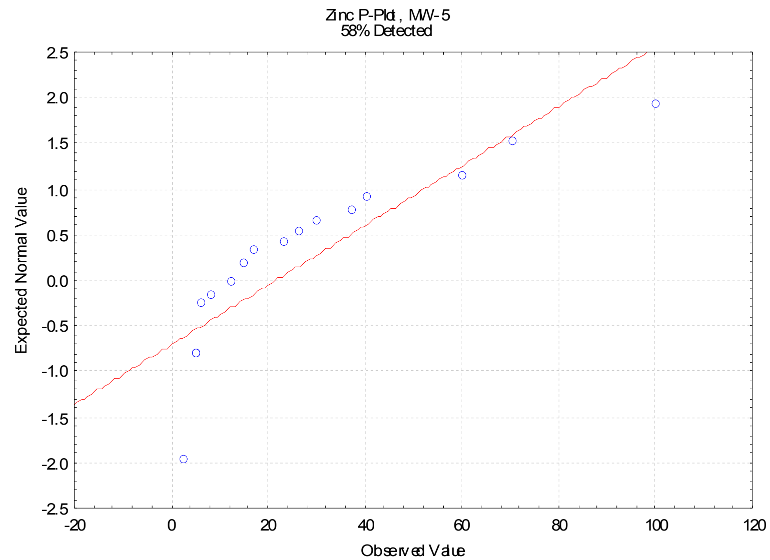


Zinc (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

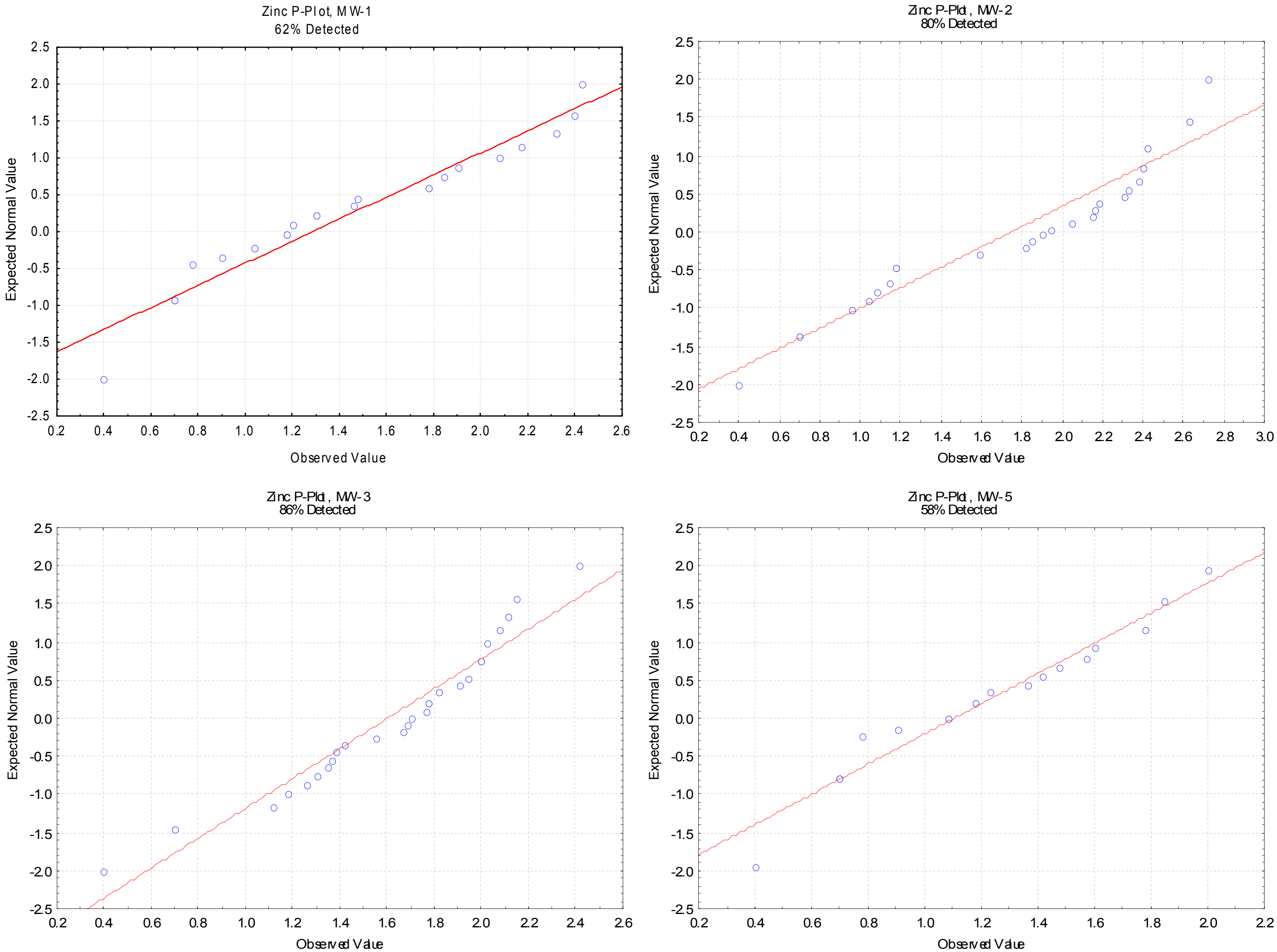




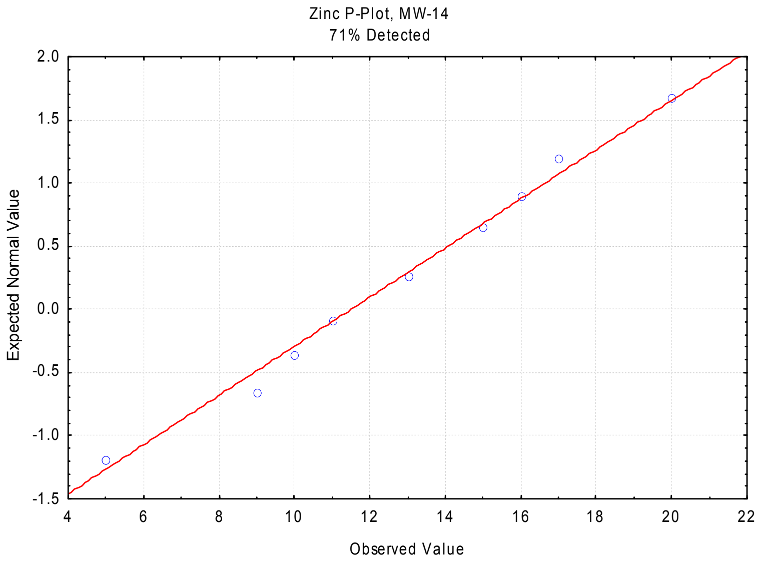


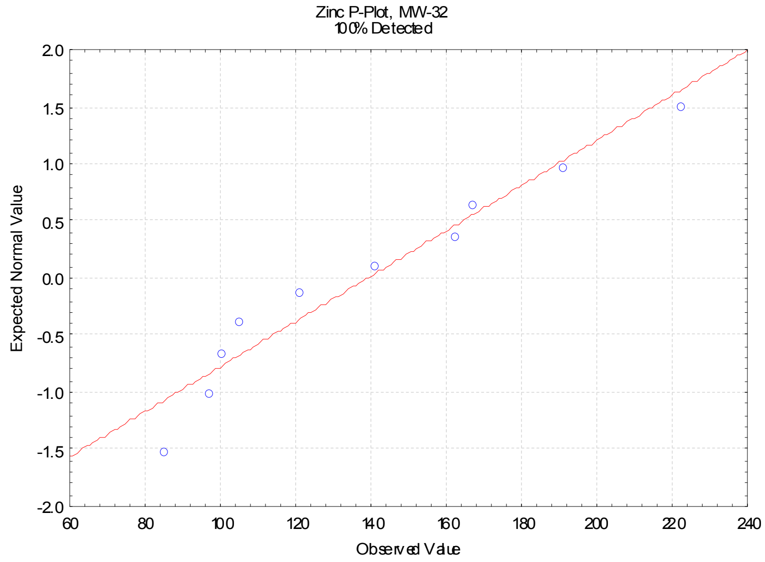


Log-Transformed Zinc (ug/L) Normal Probabililty Plots for 0 to 50% Non-Detects

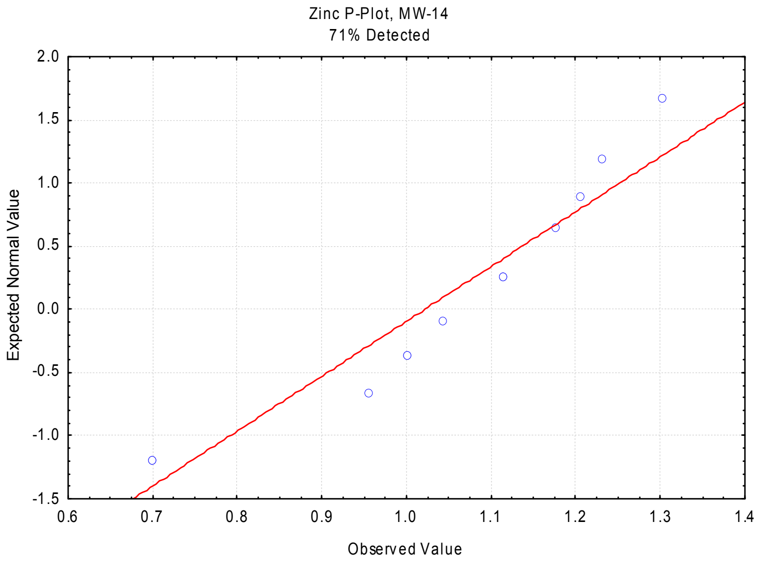


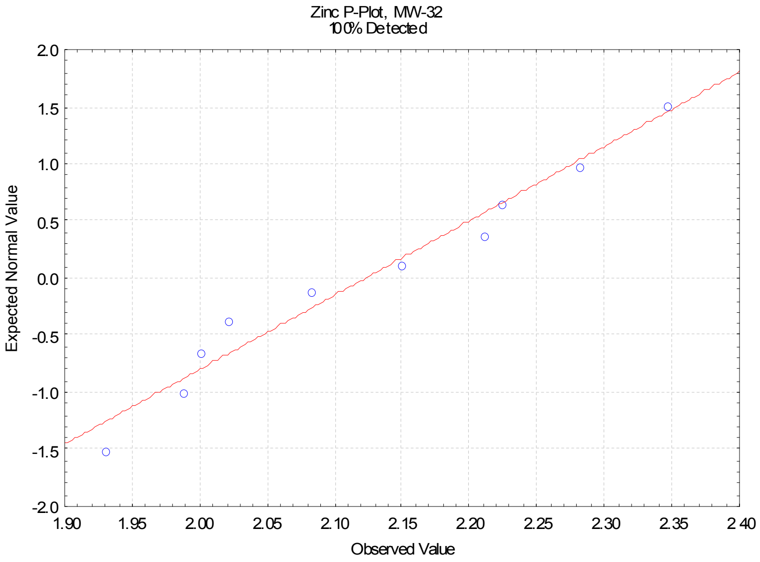
Zinc (ug/L) Normal Probability Plots for 0 to 50% Non-Detects



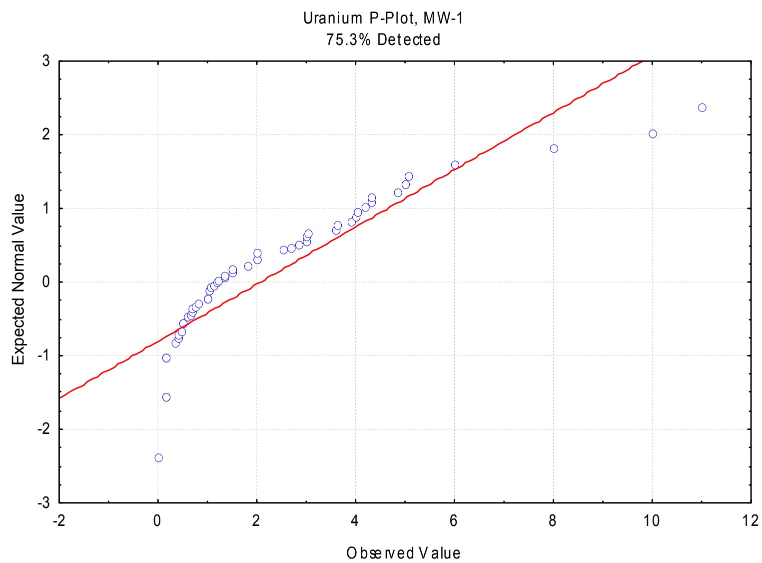


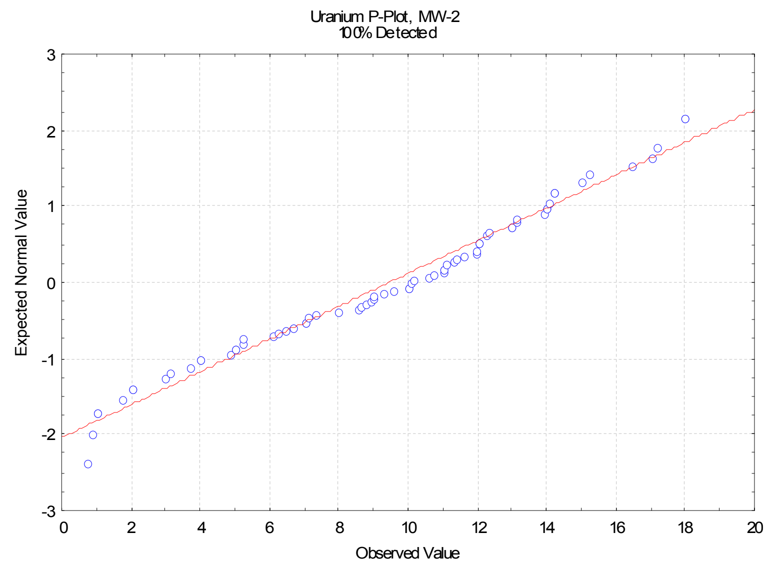
Log-Transformed Zinc (ug/L) Normal Probabililty Plots for 0 to 50% Non-Detects

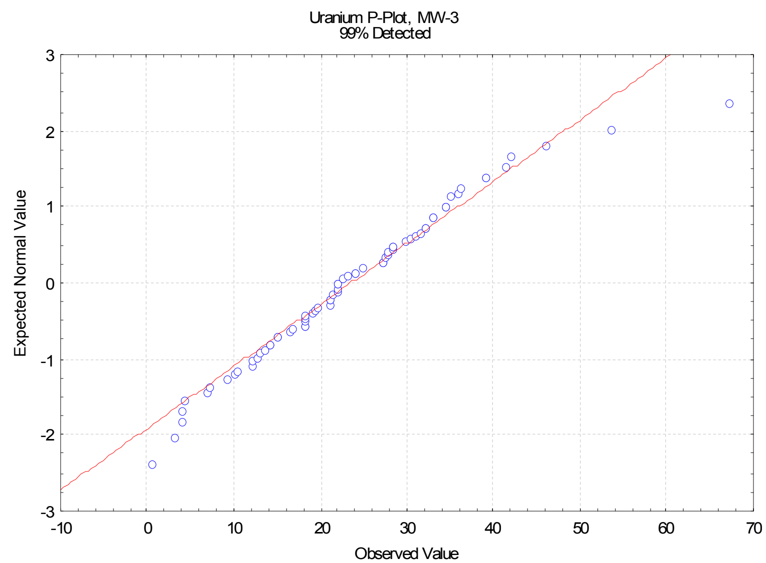


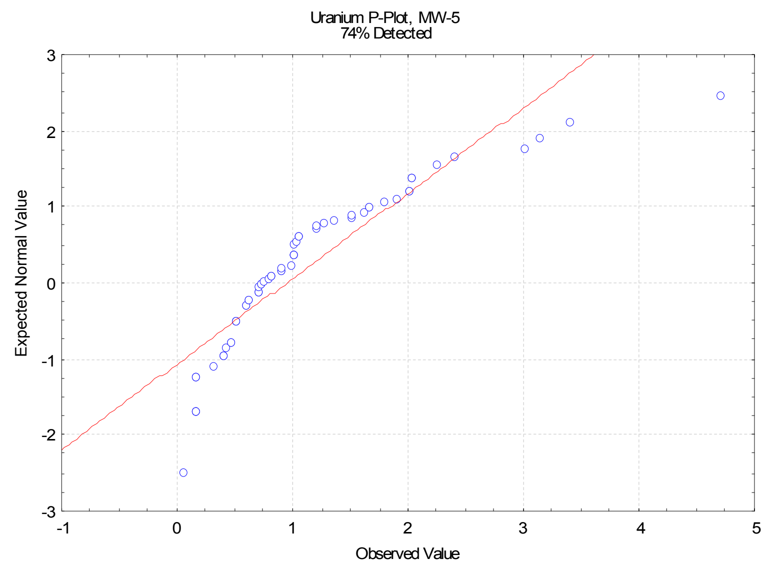


Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

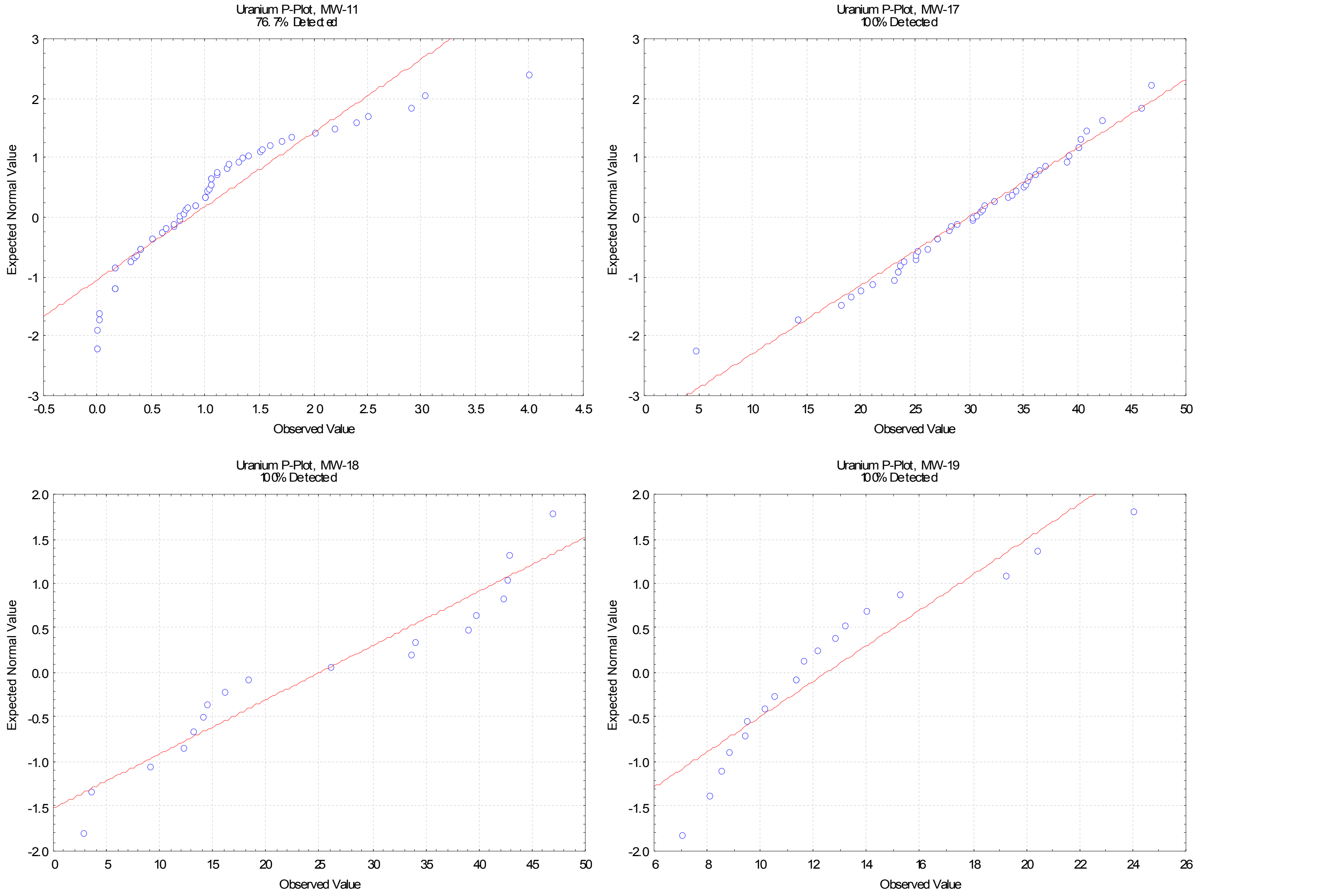




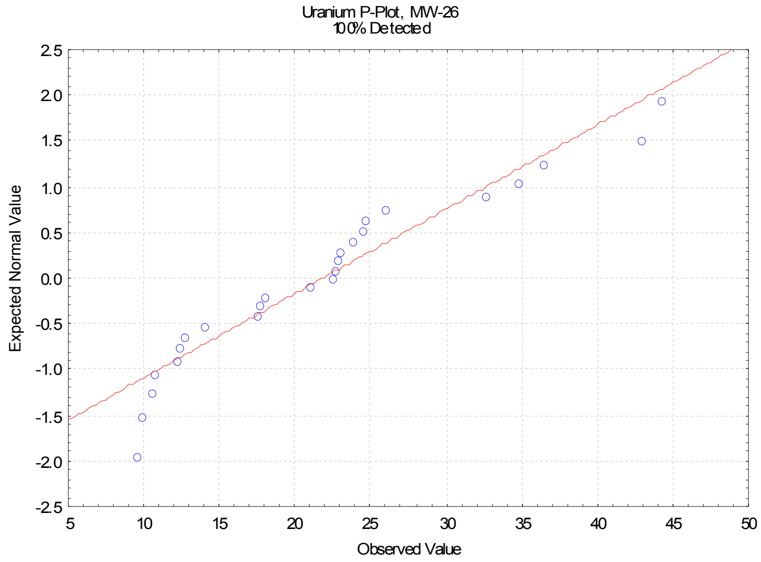


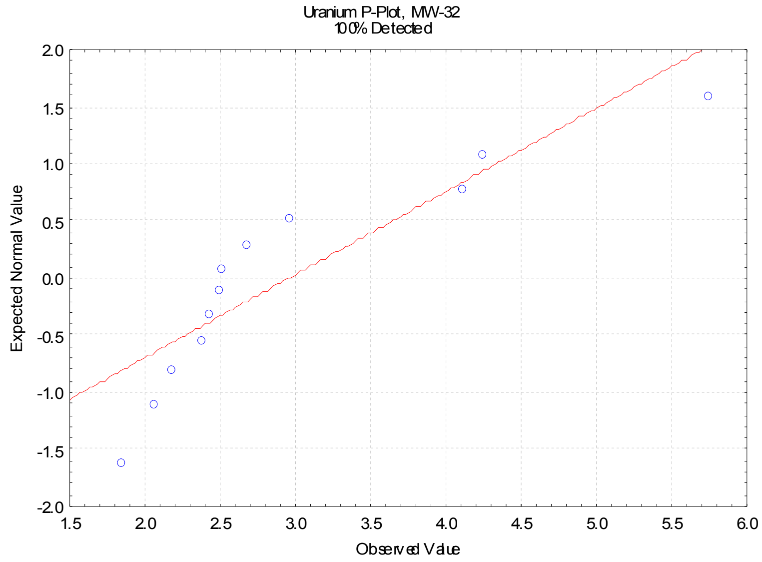


Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

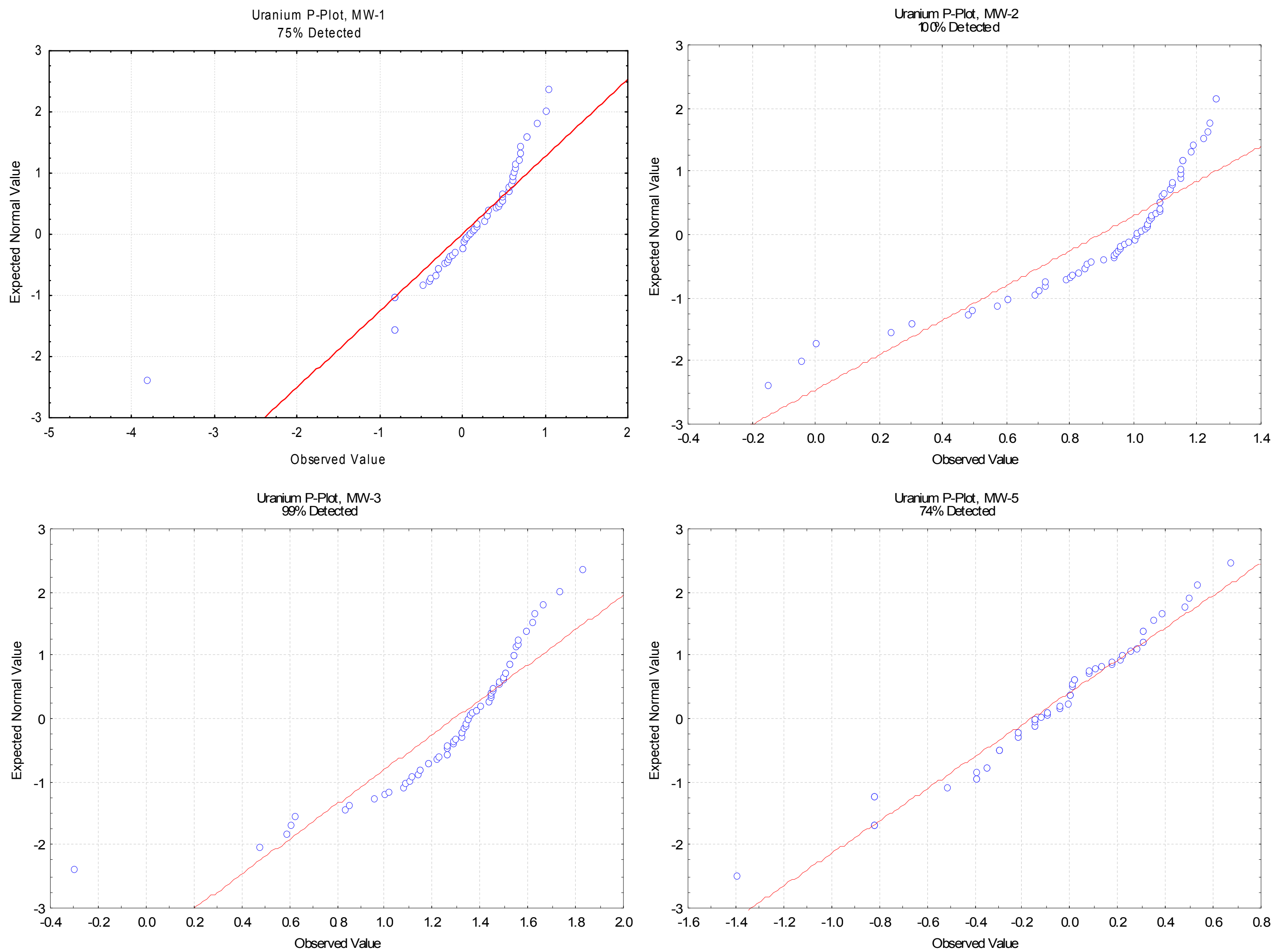


Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

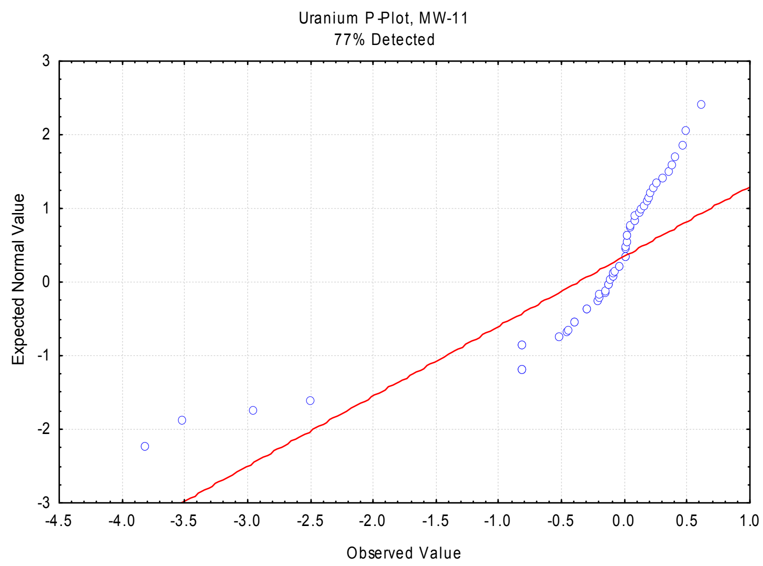


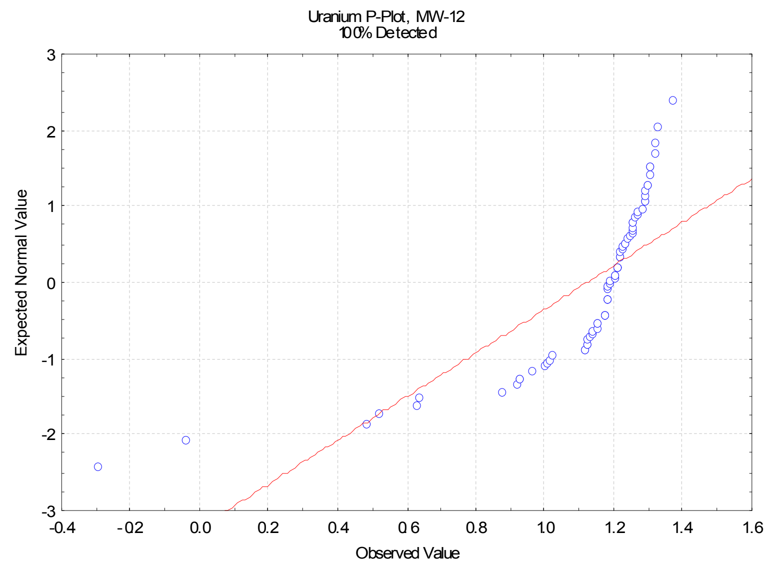


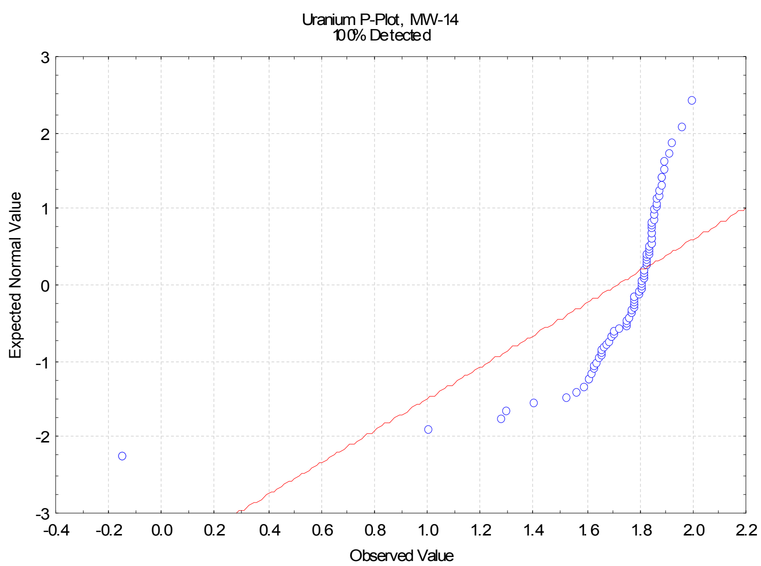
Log-Transformed Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

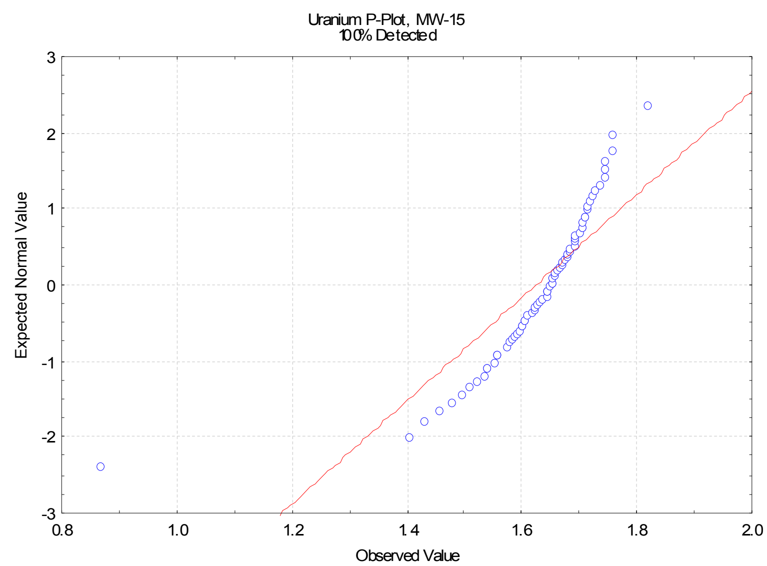


Log-Transformed Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

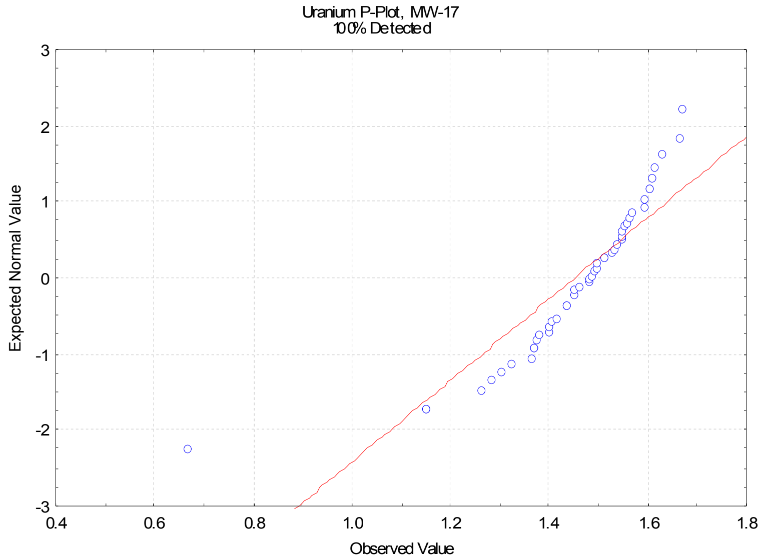


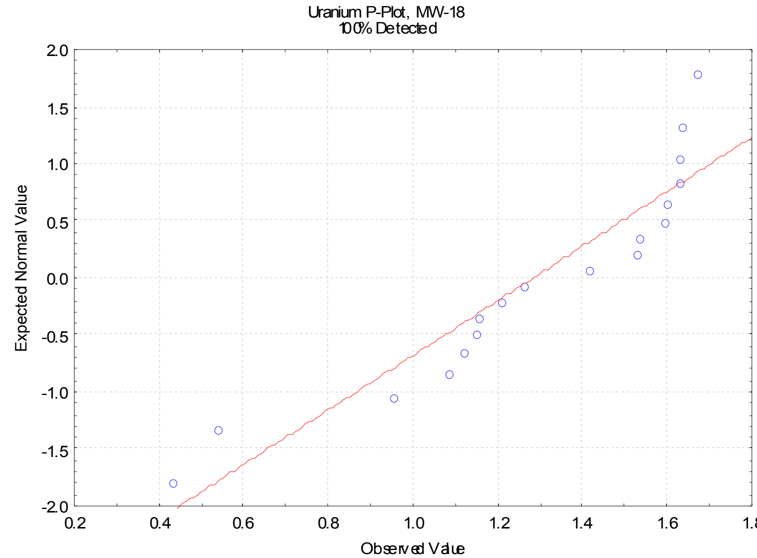


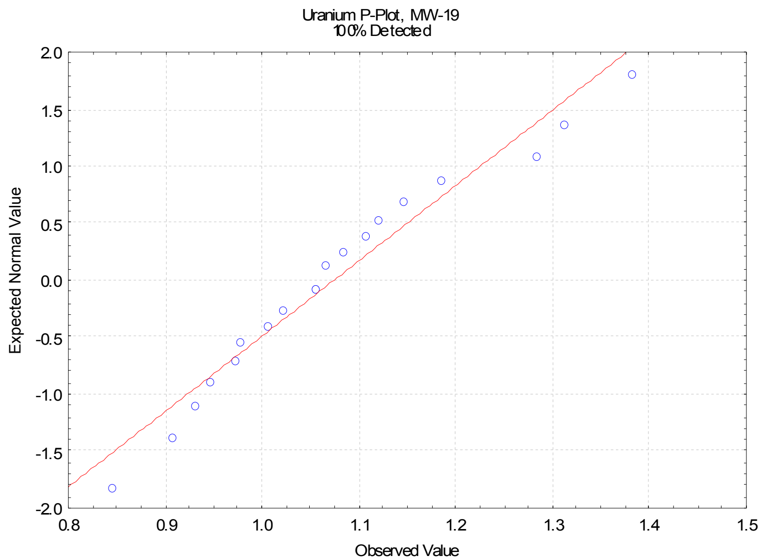


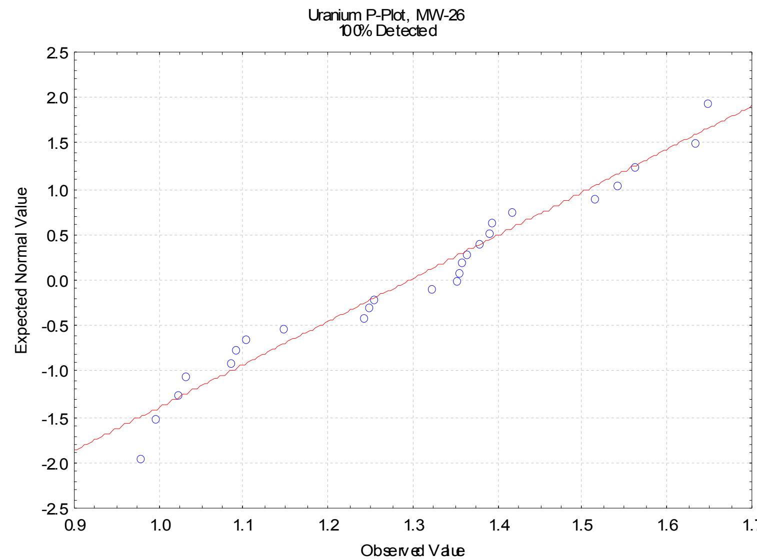


Log-Transformed Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

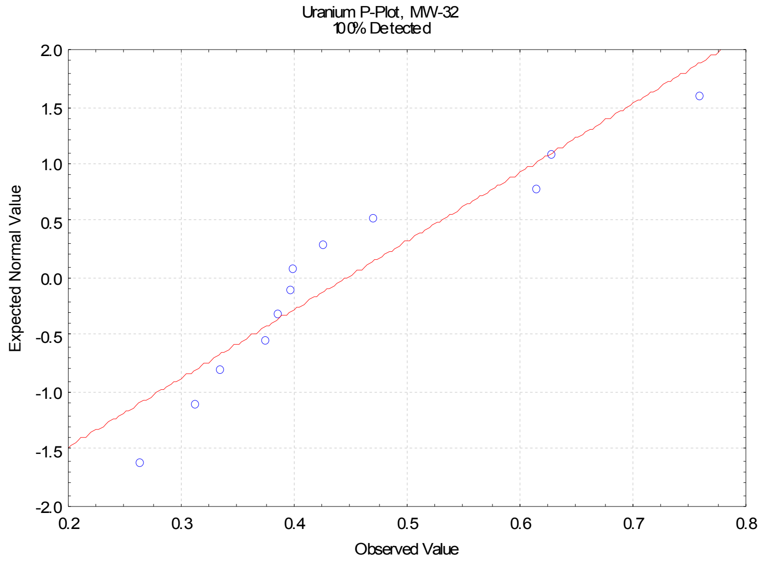








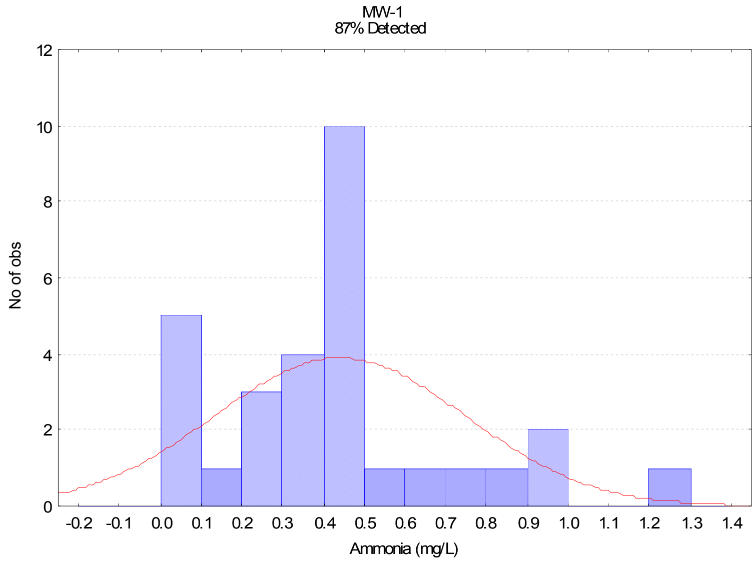
Log-Transformed Uranium (ug/L) Normal Probability Plots for 0 to 50% Non-Detects

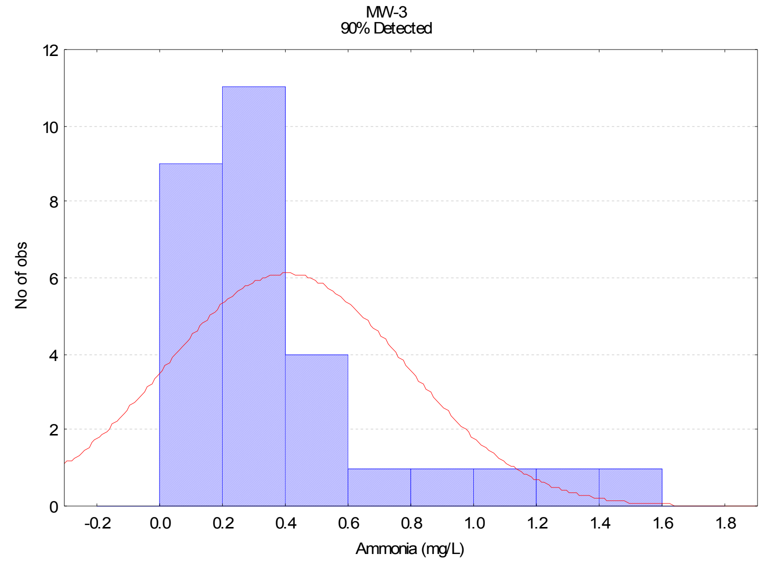


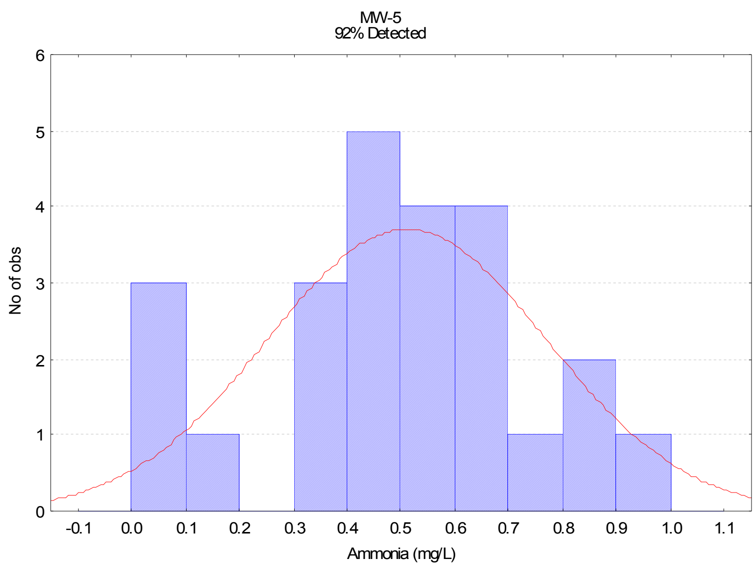
APPENDIX C

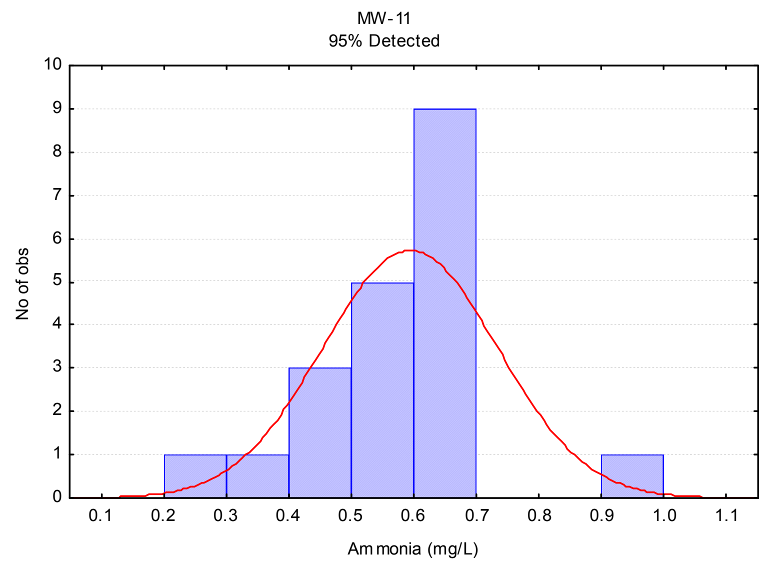
HISTOGRAMS

Ammonia Histograms for 0 to 50% Non-Detects

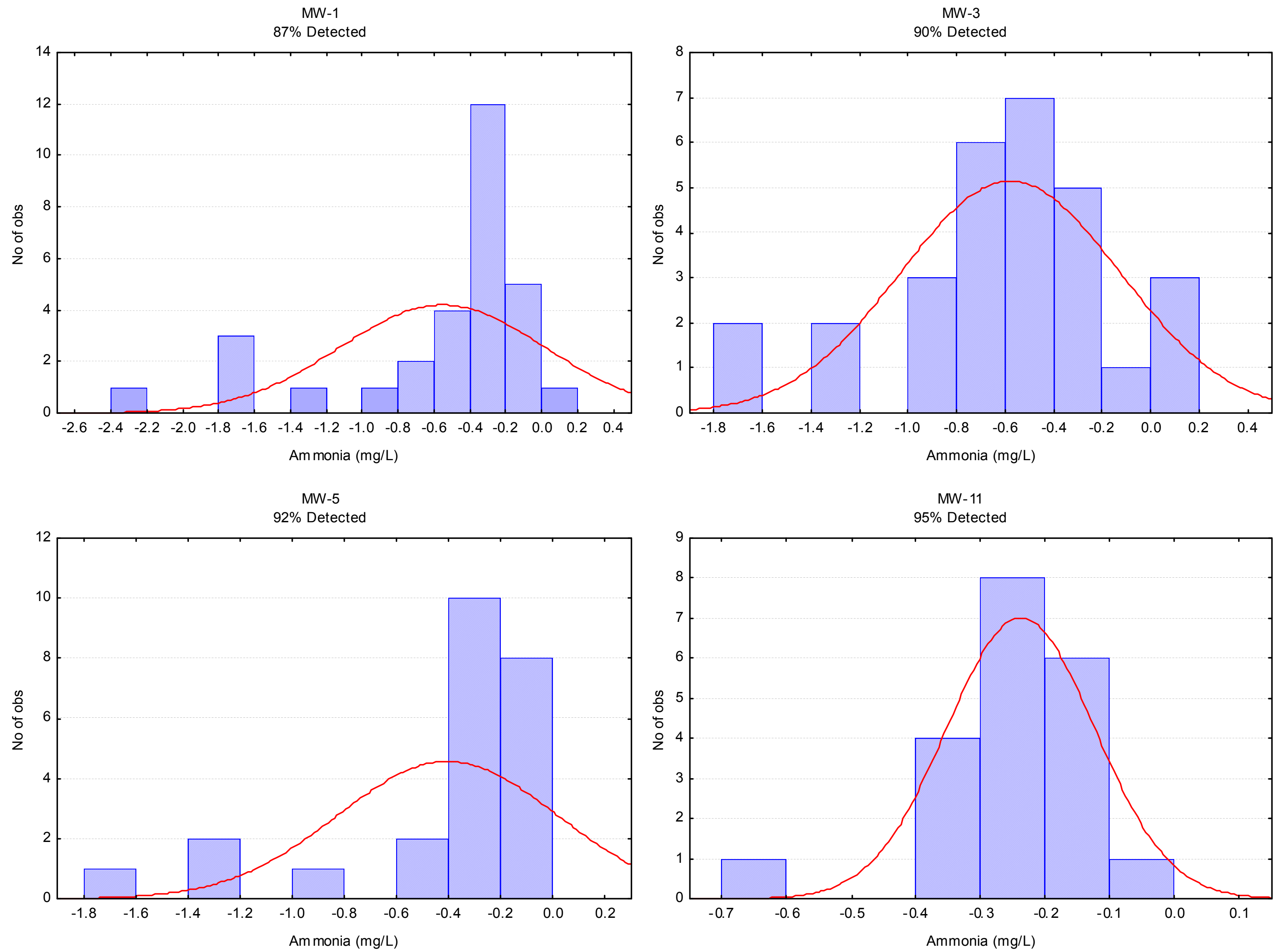




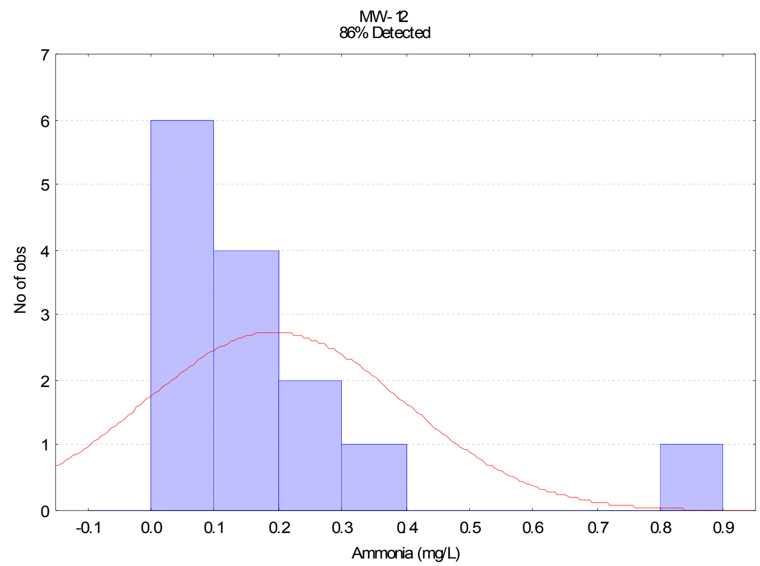


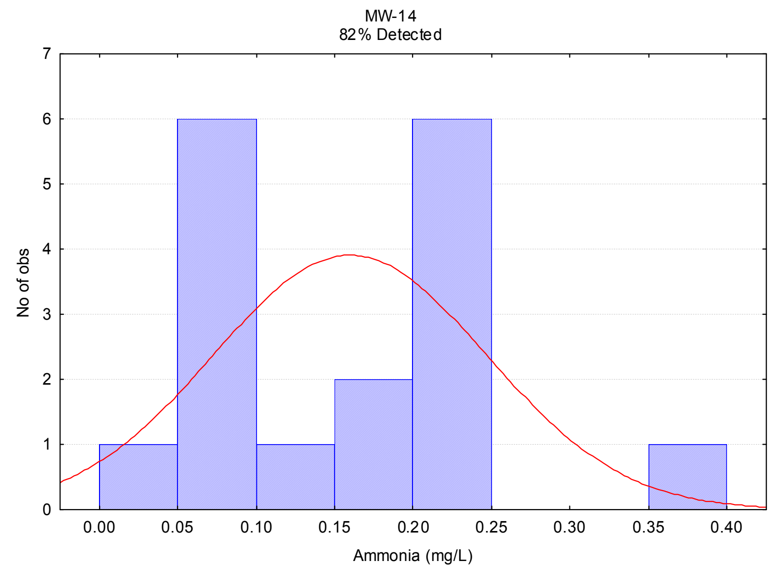


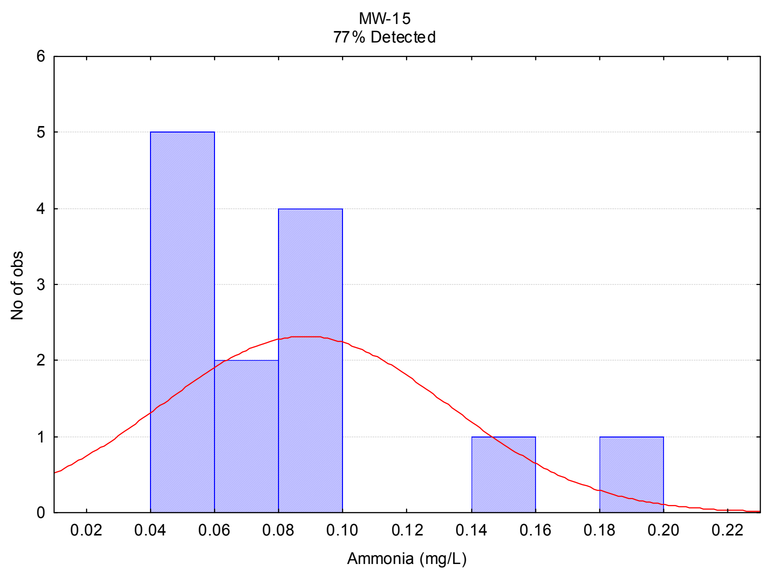
Log-Transformed Ammonia Histograms for 0 to 50% Non-Detects

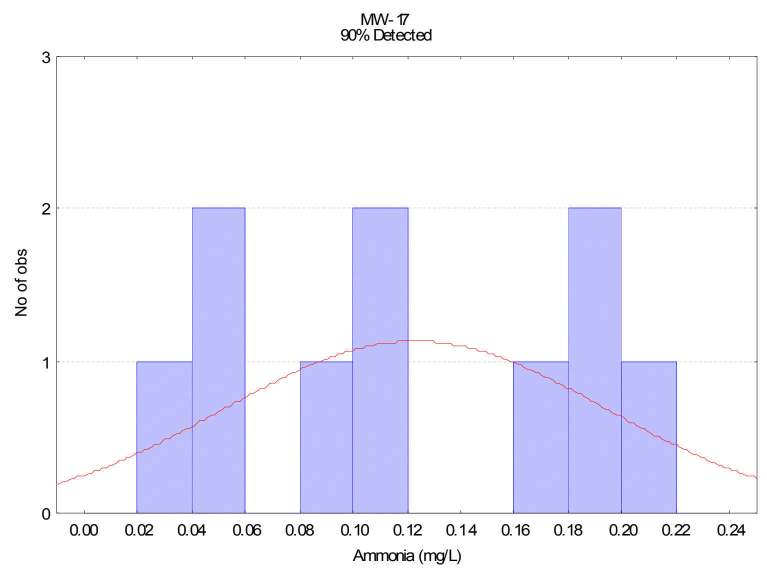


Ammonia Histograms for 0 to 50% Non-Detects

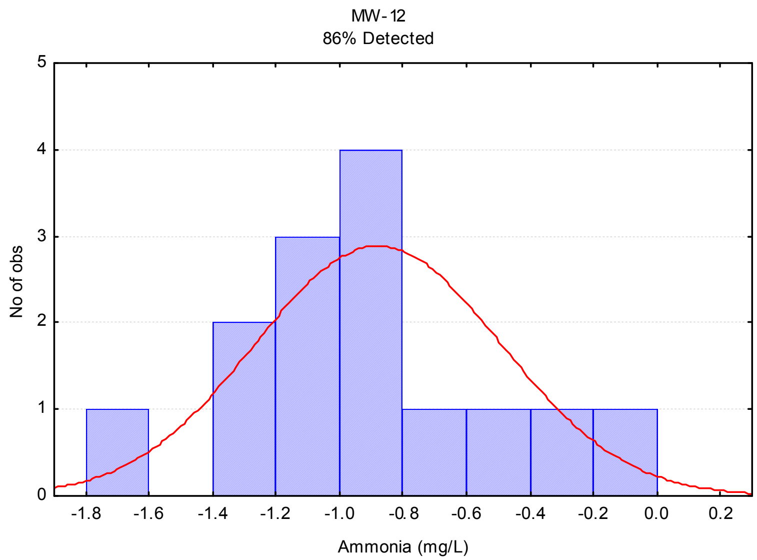


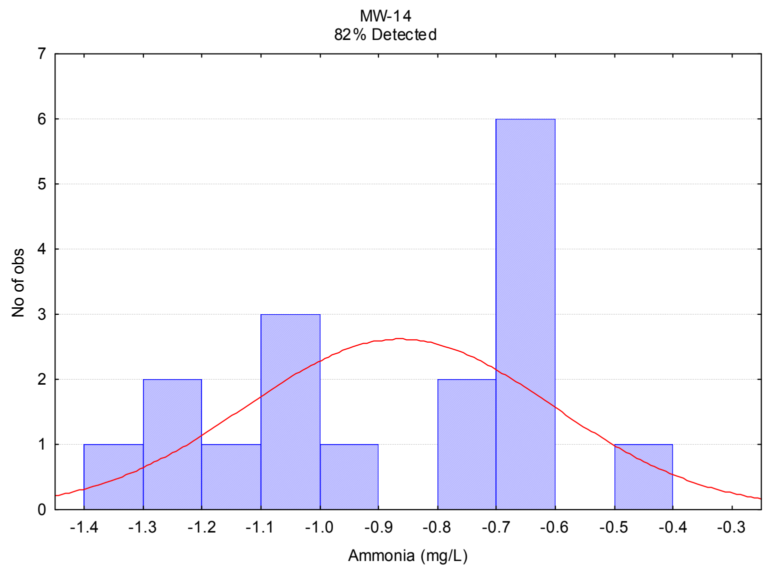


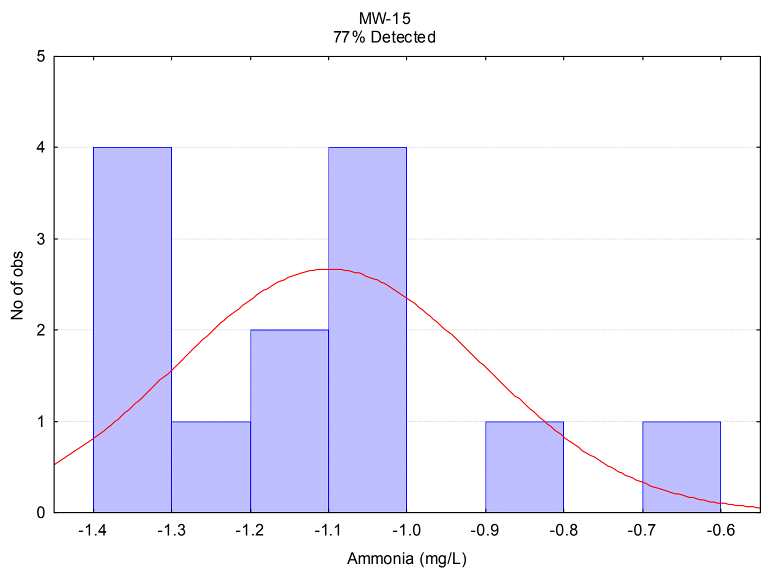


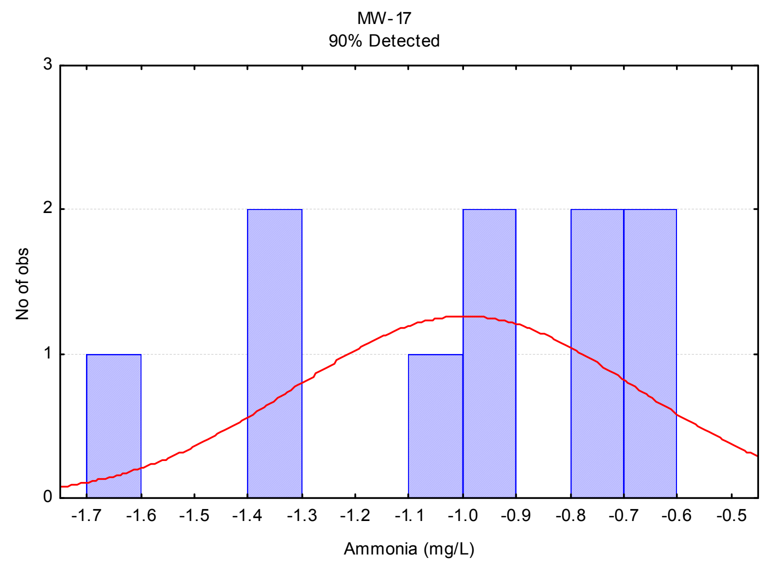


Log-Transformed Ammonia Histograms for 0 to 50% Non-Detects

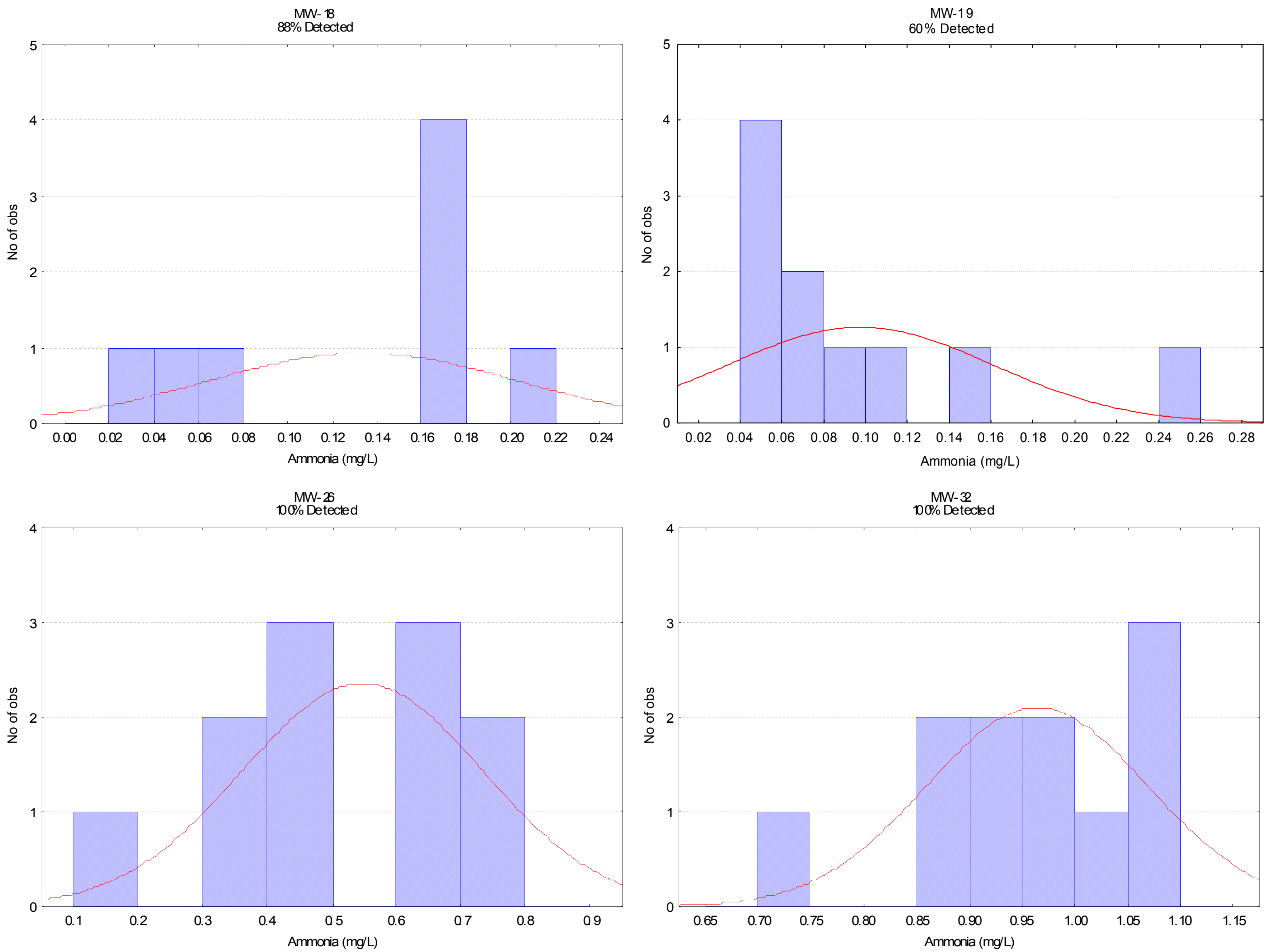




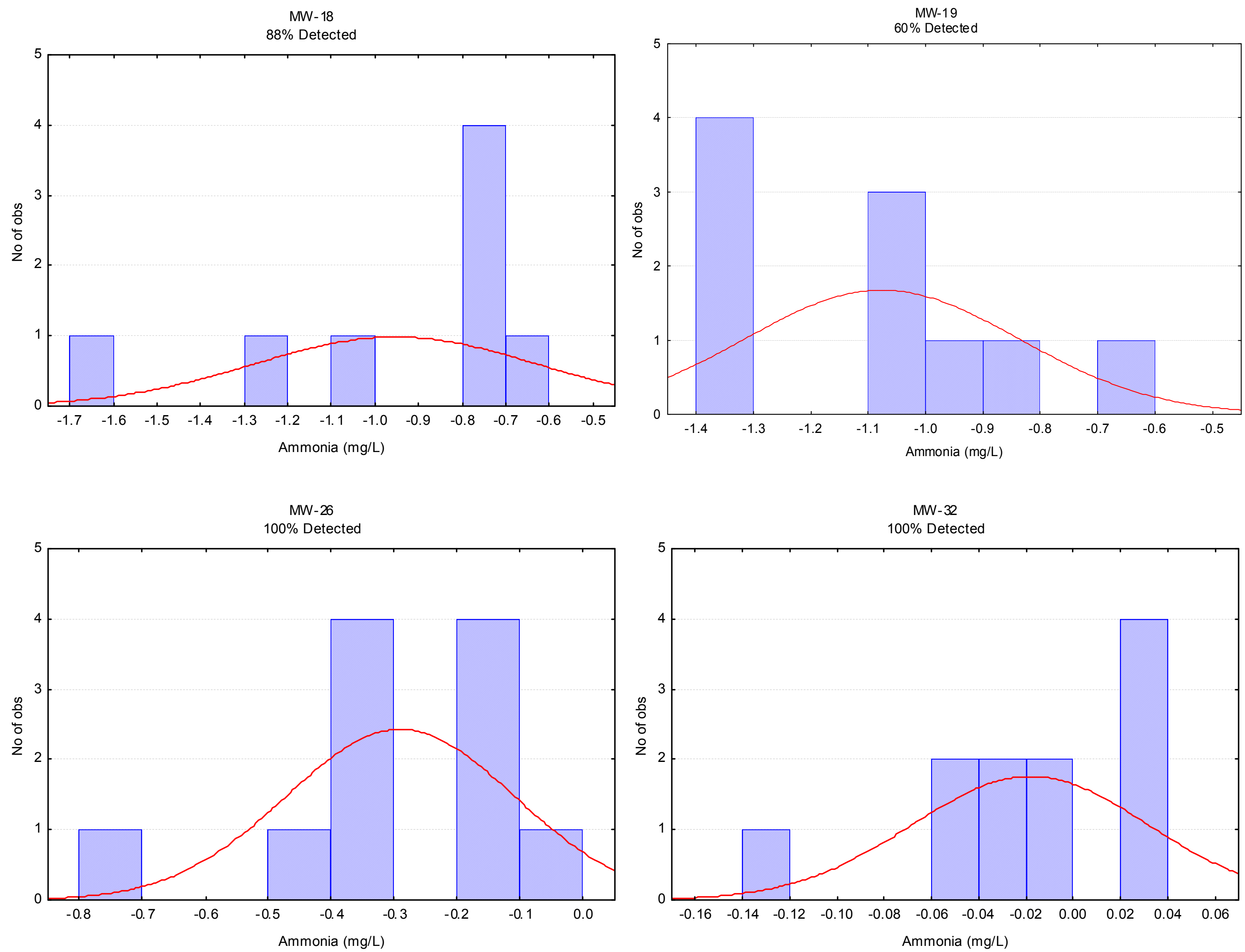




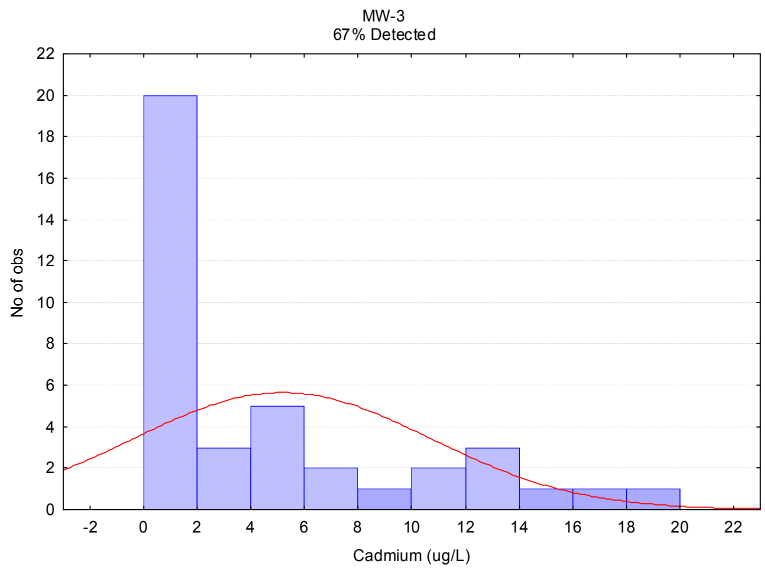
Ammonia Histograms for 0 to 50% Non-Detects

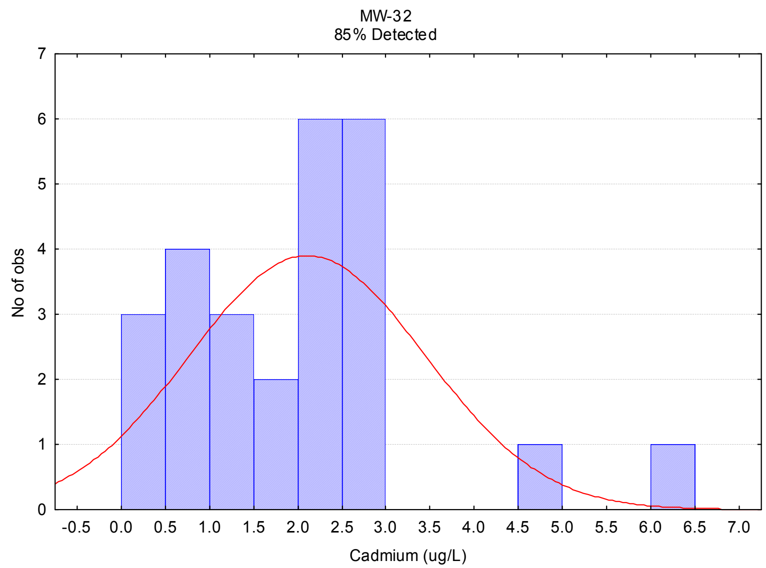


Log-Transformed Ammonia Histograms for 0 to 50% Non-Detects

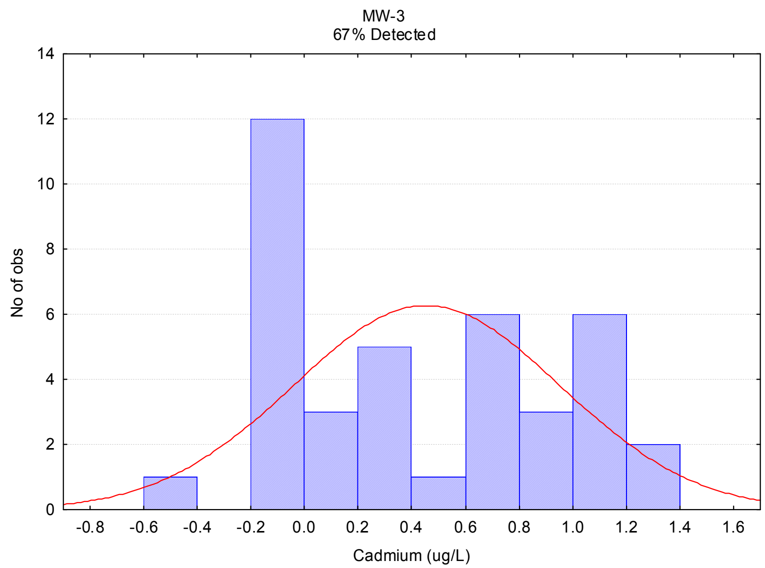


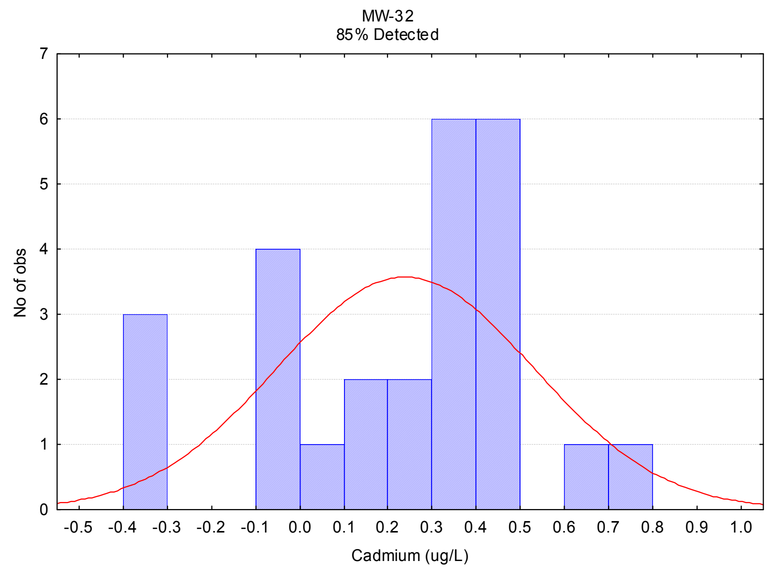
Cadmium Histograms for 0 to 50% Non-Detects



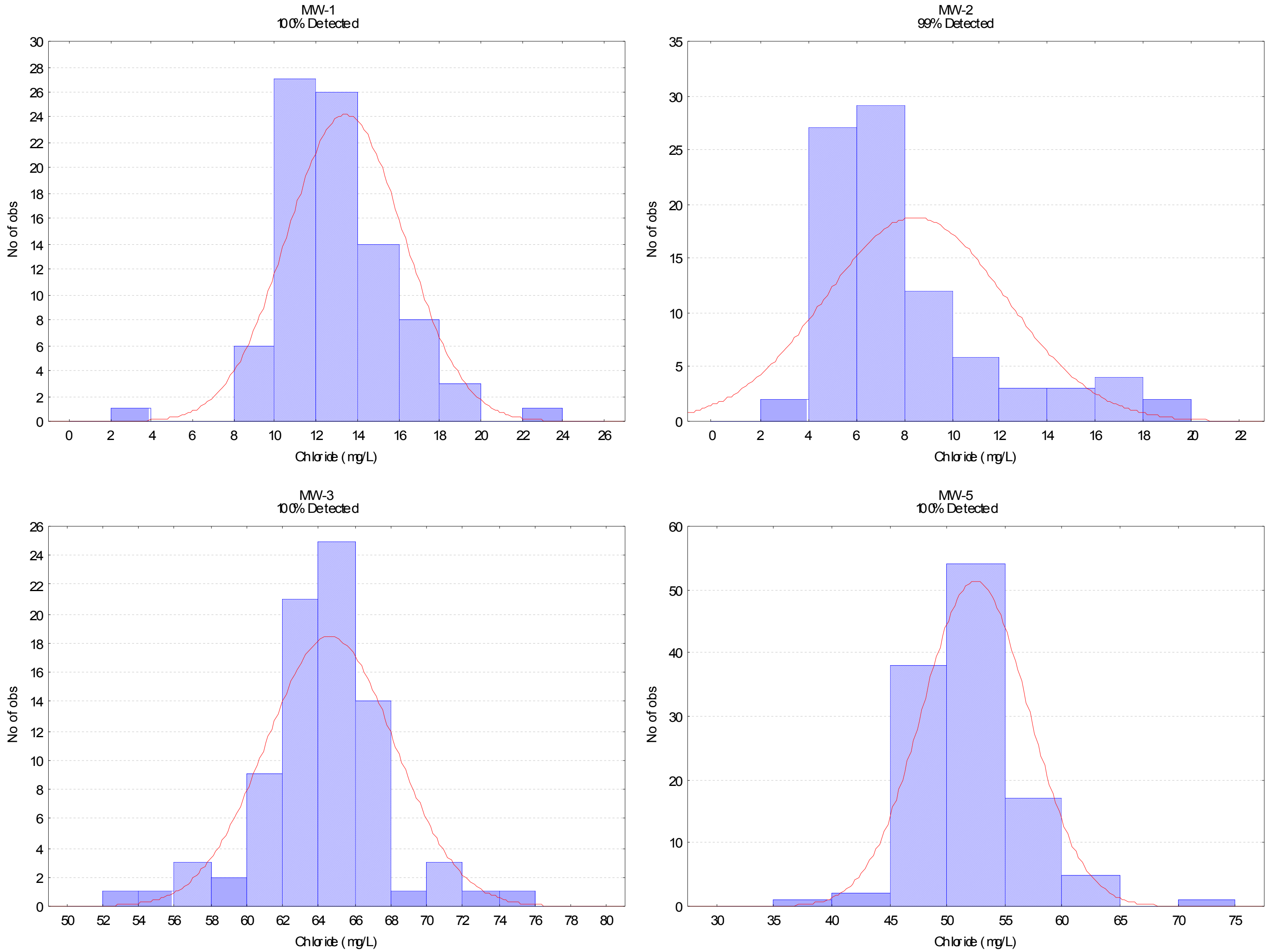


Log-Transformed Cadmium Histograms for 0 to 50% Non-Detects

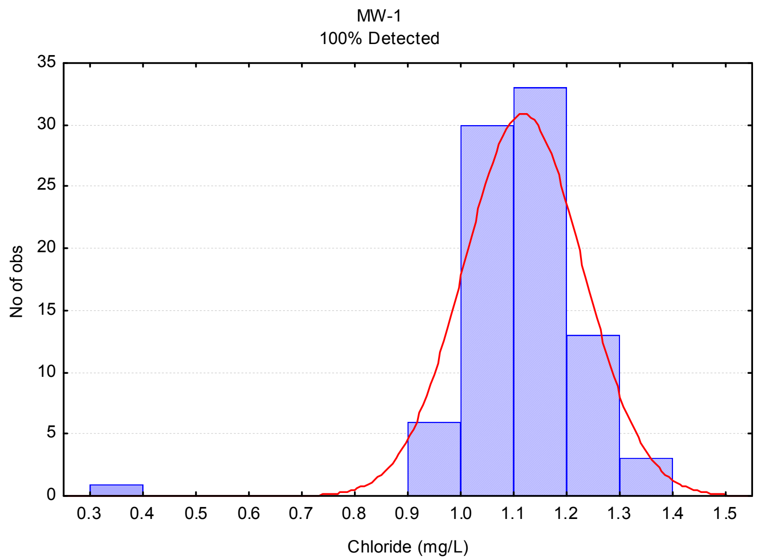


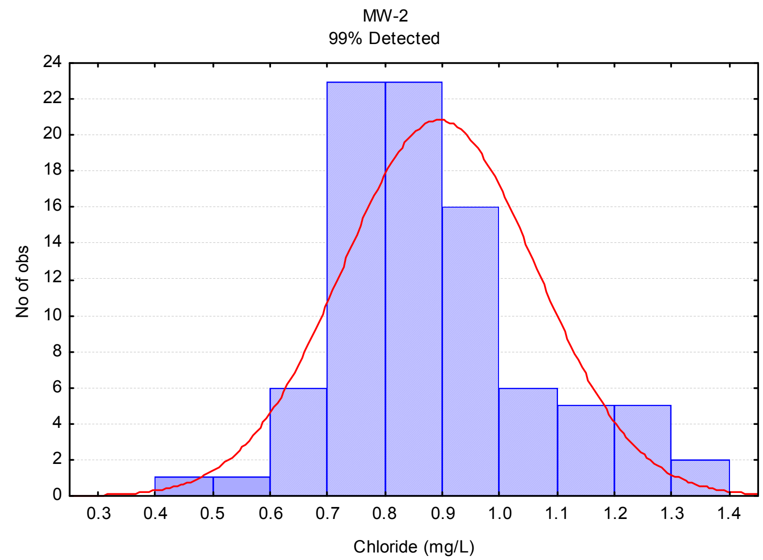


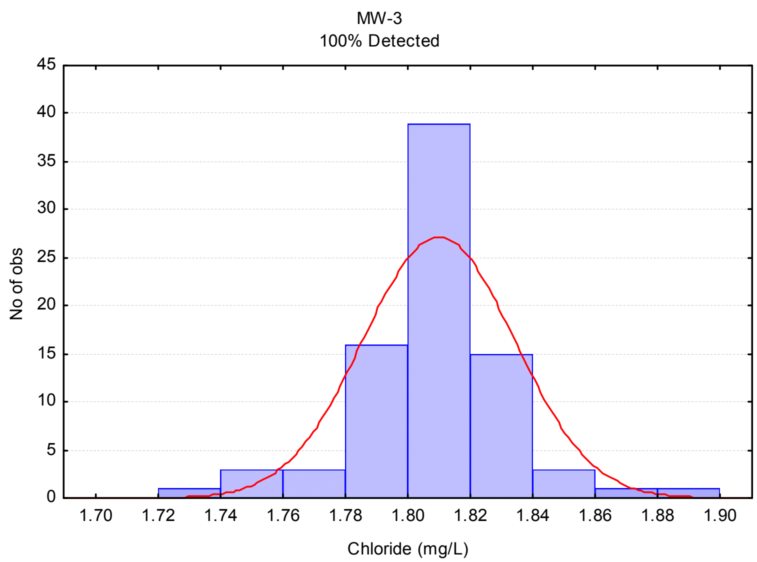
Chloride Histograms for 0 to 50% Non-Detects

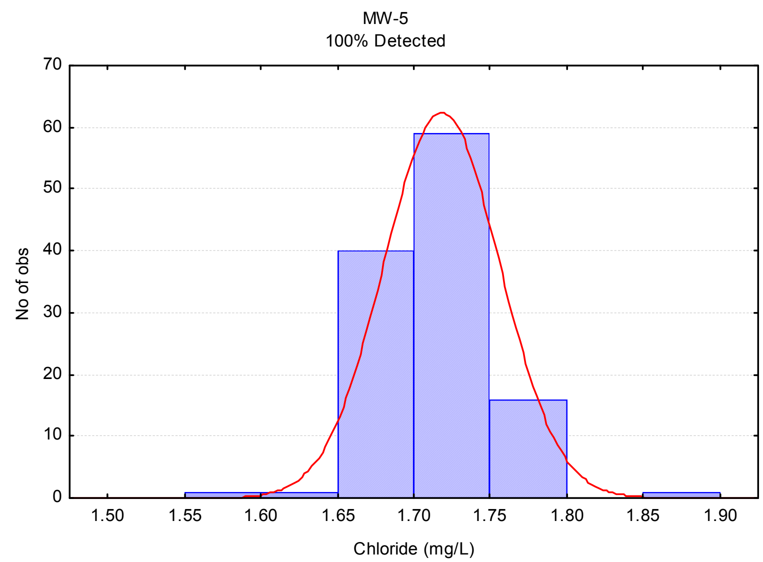


Log-Transformed Chloride Histograms for 0 to 50% Non-Detects

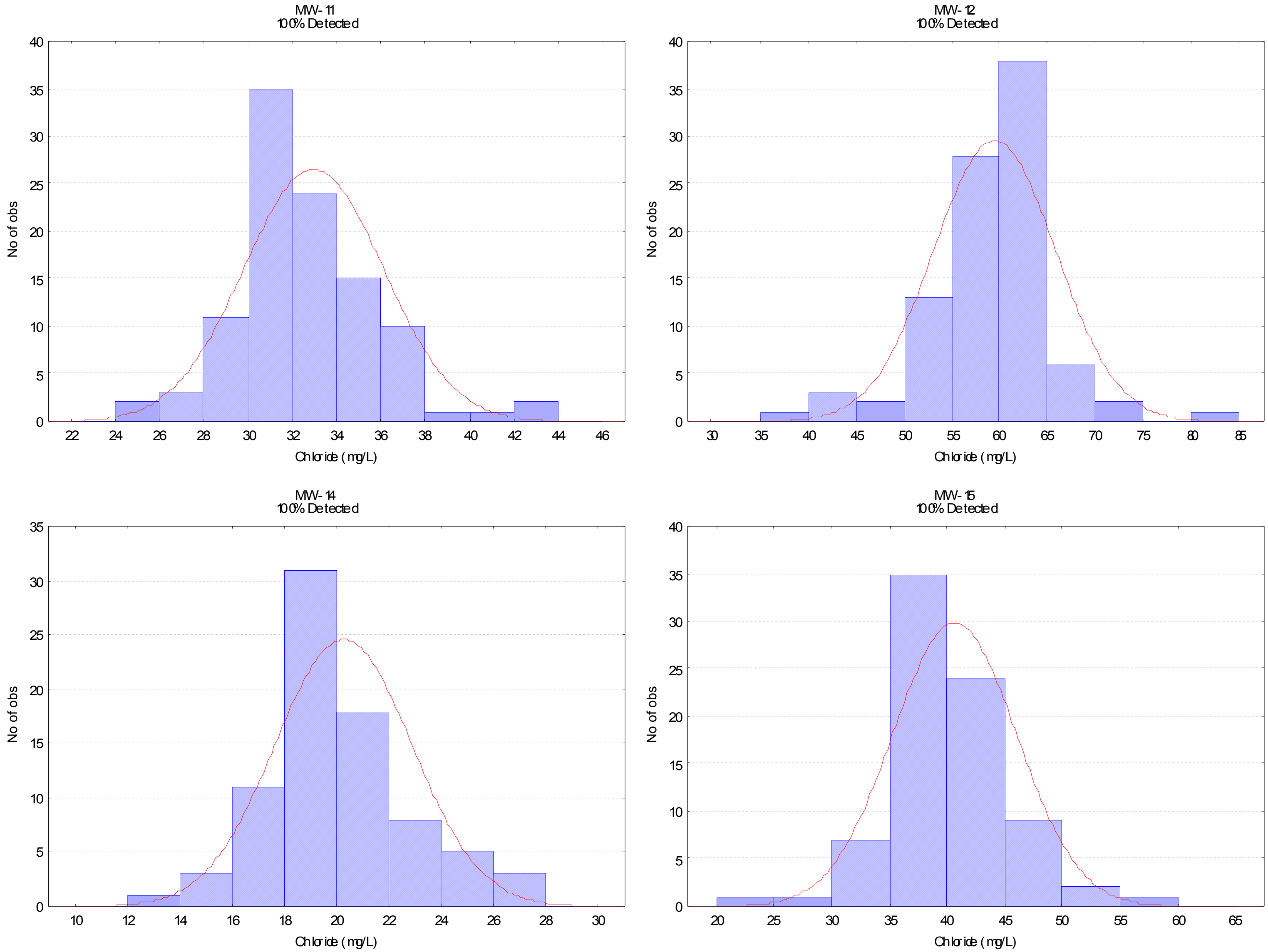






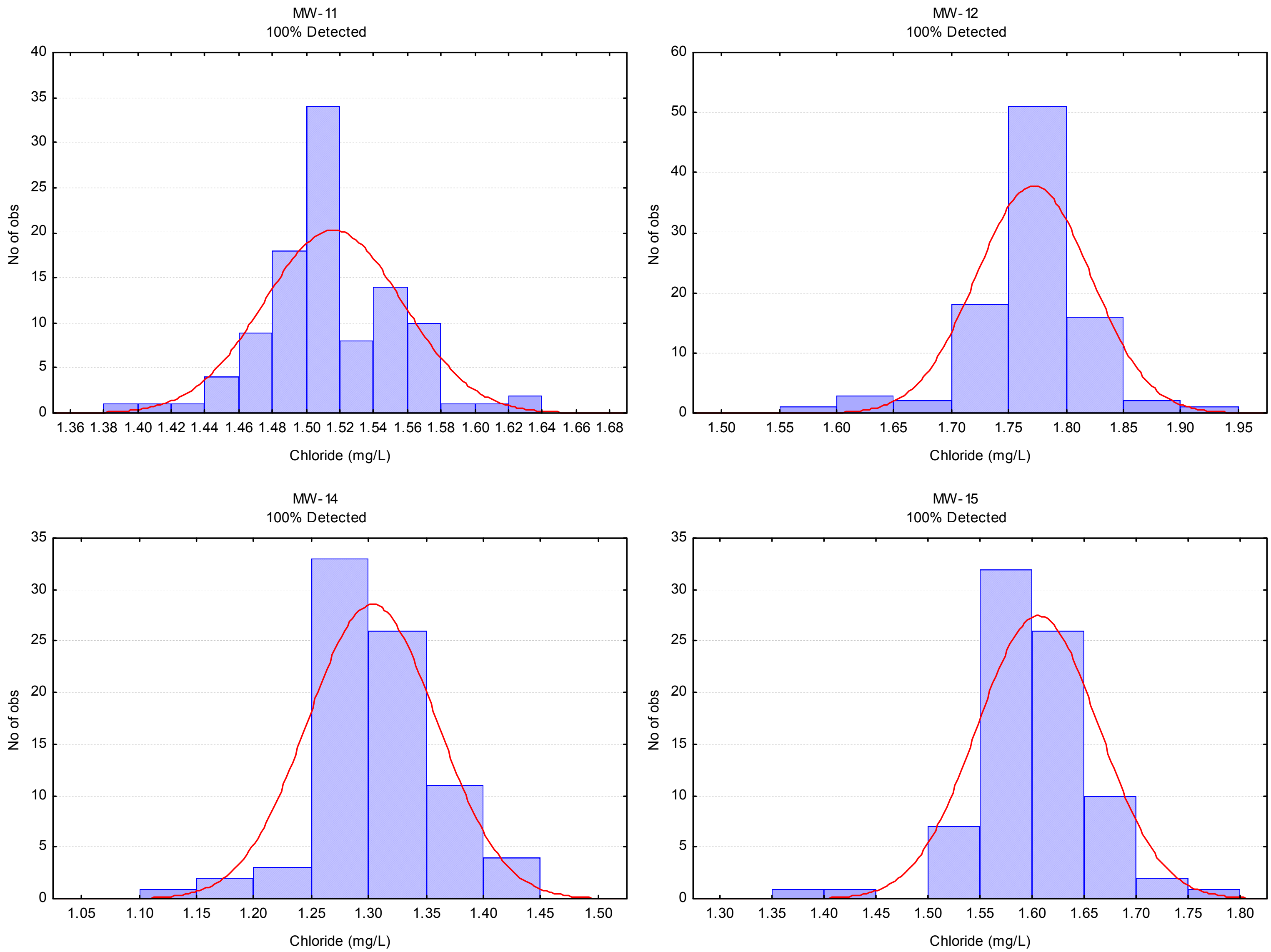


Chloride Histograms for 0 to 50% Non-Detects

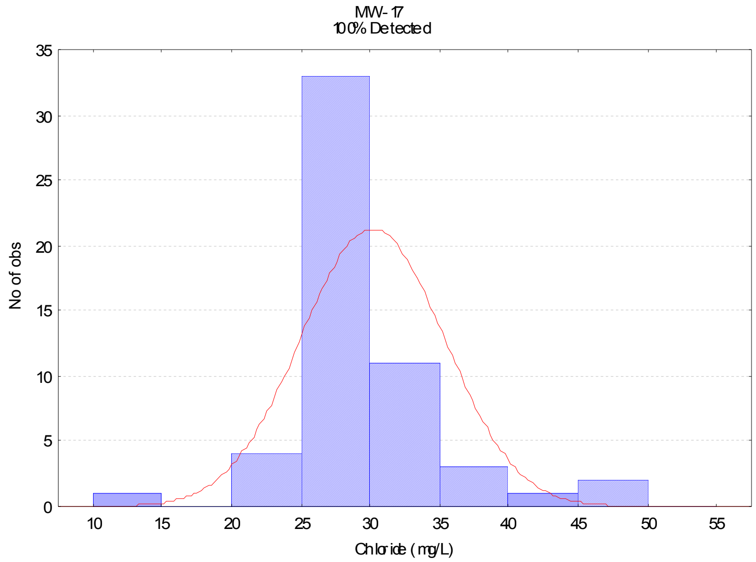


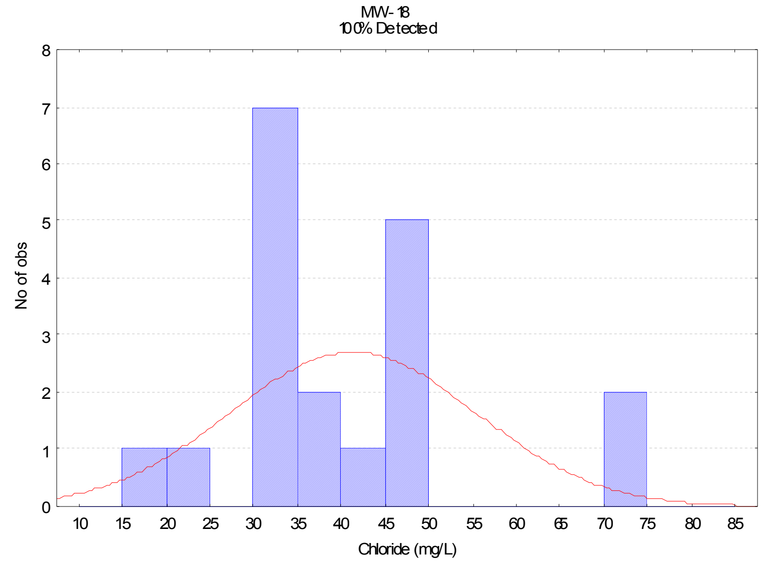
Appendix C
Histograms
Exploratory Statistics Substituting Half the MDL for Non-Detected Values

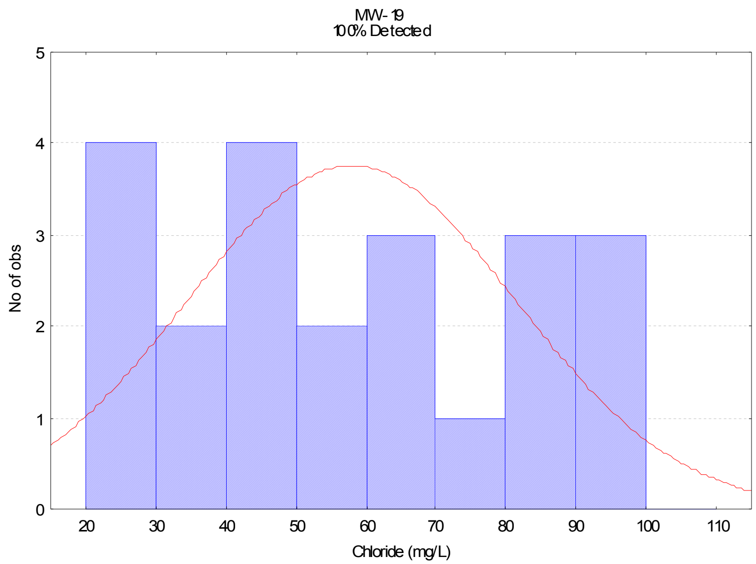
Log-Transformed Chloride Histograms for 0 to 50% Non-Detects

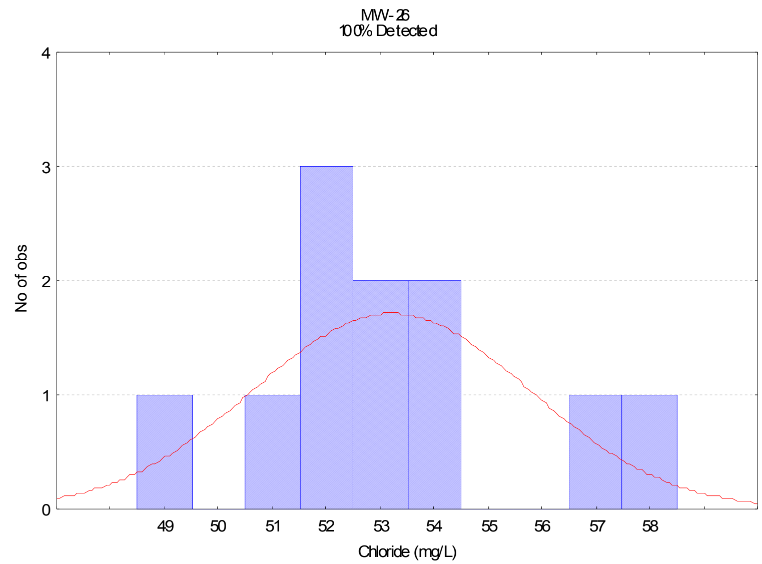


Chloride Histograms for 0 to 50% Non-Detects

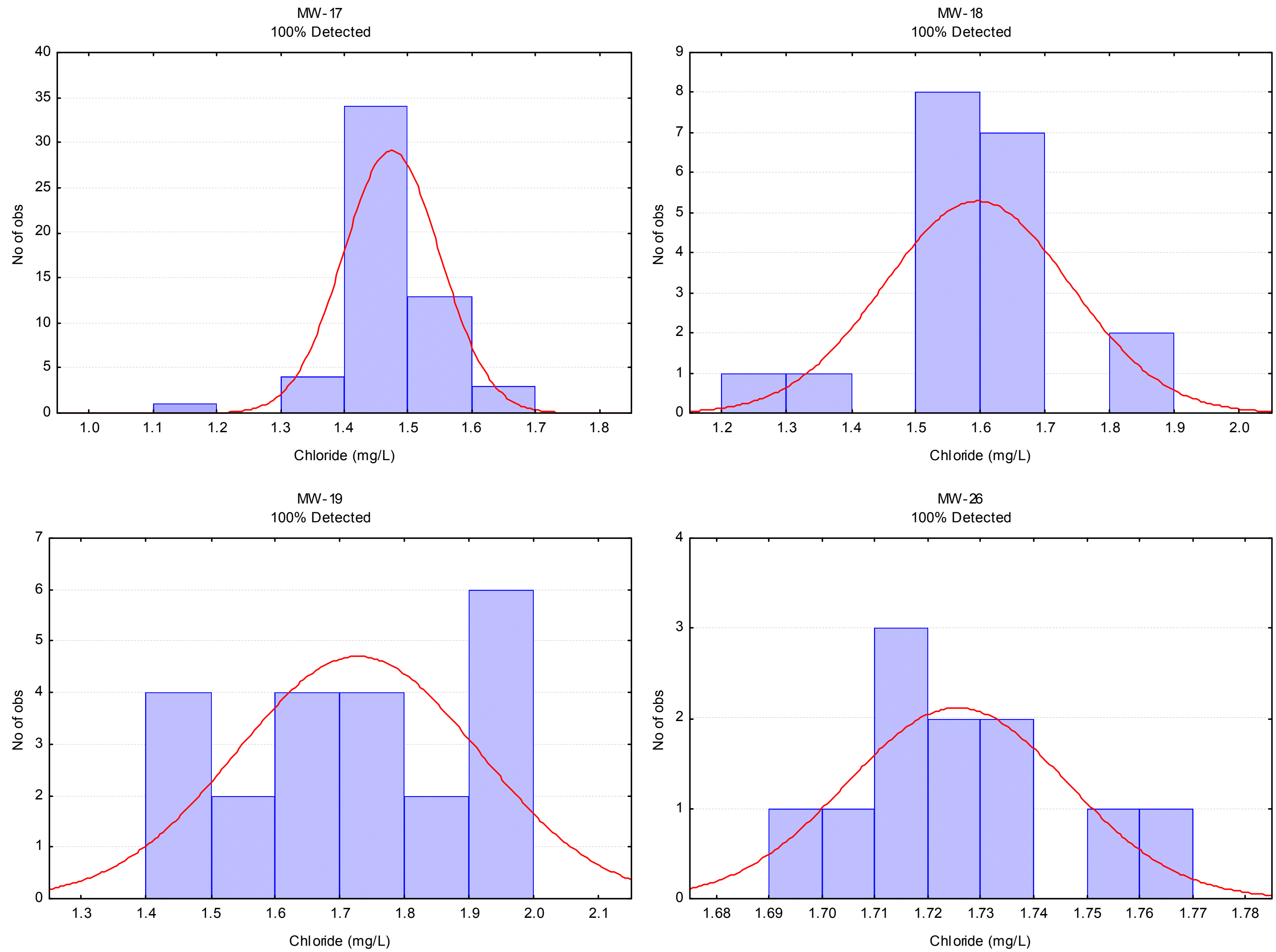




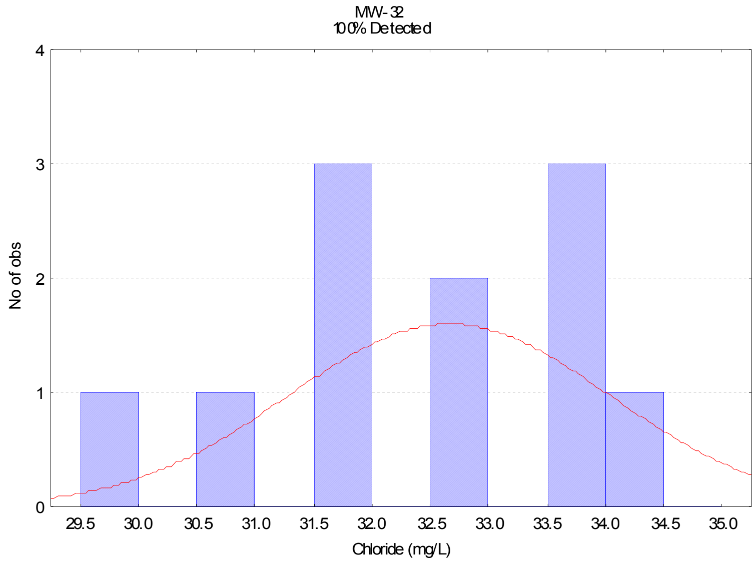




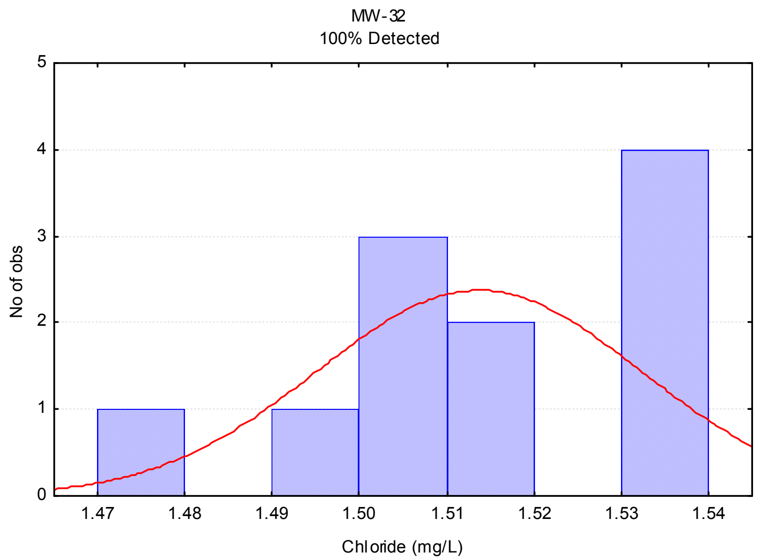
Log-Transformed Chloride Histograms for 0 to 50% Non-Detects



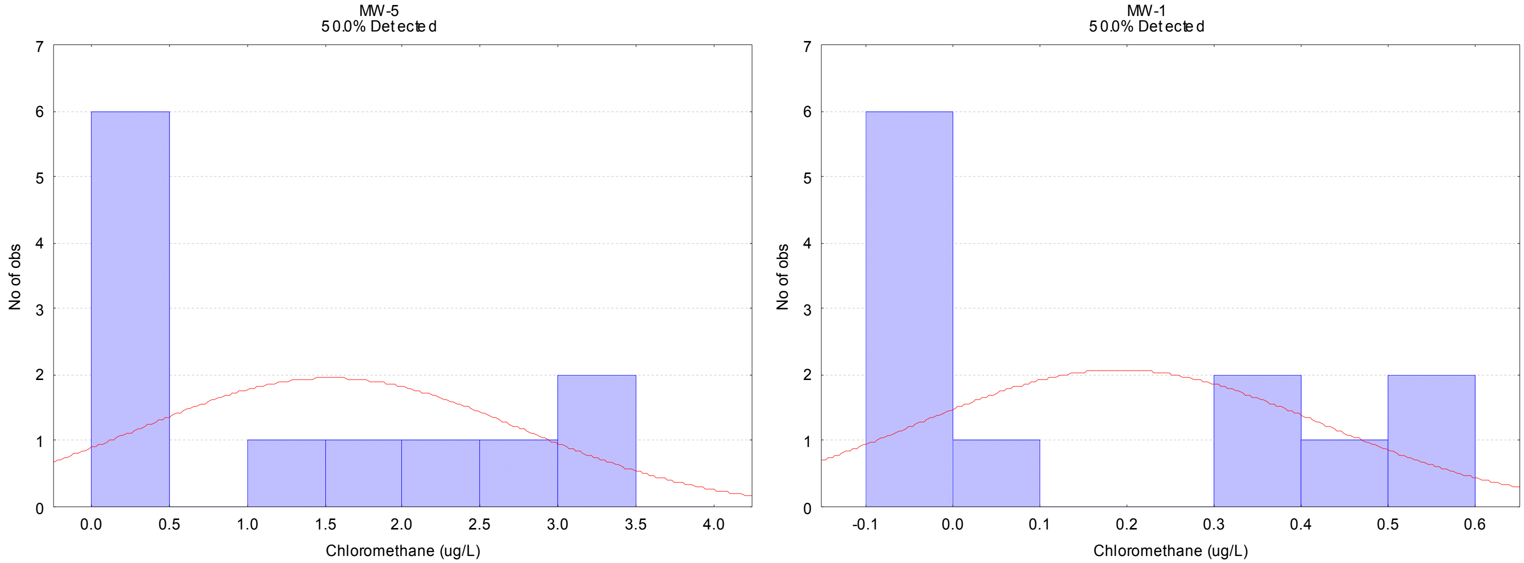
Chloride Histograms for 0 to 50% Non-Detects



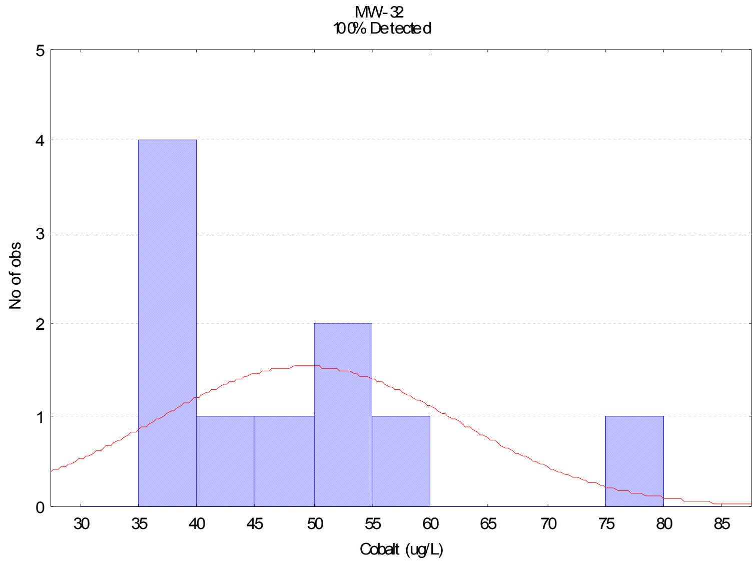
Log-Transformed Chloride Histograms for 0 to 50% Non-Detects

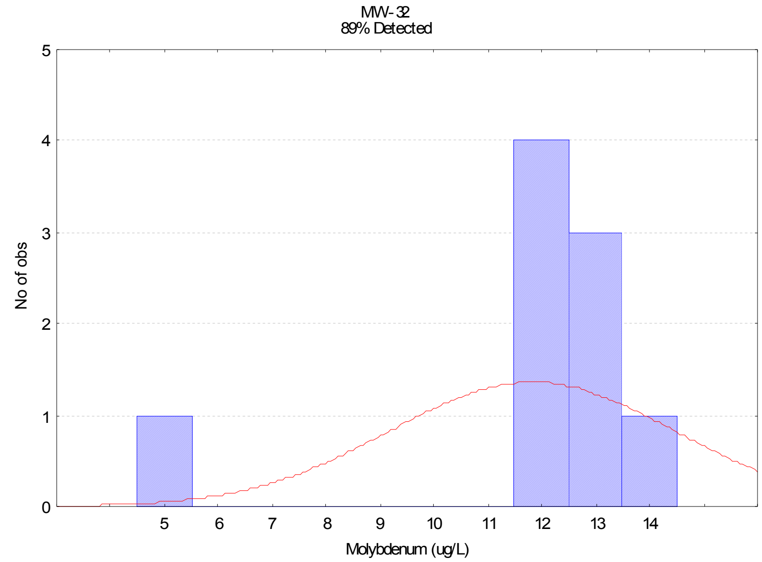


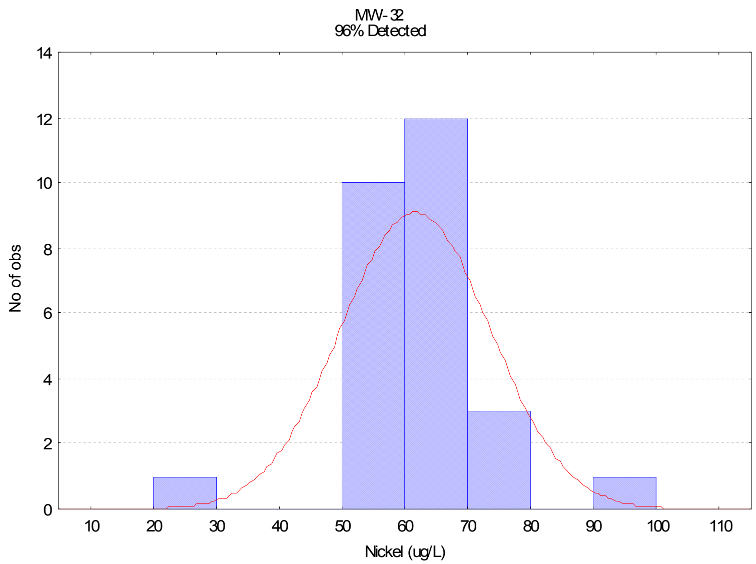
Chloromethane Histograms for 0 to 50% Non-Detects



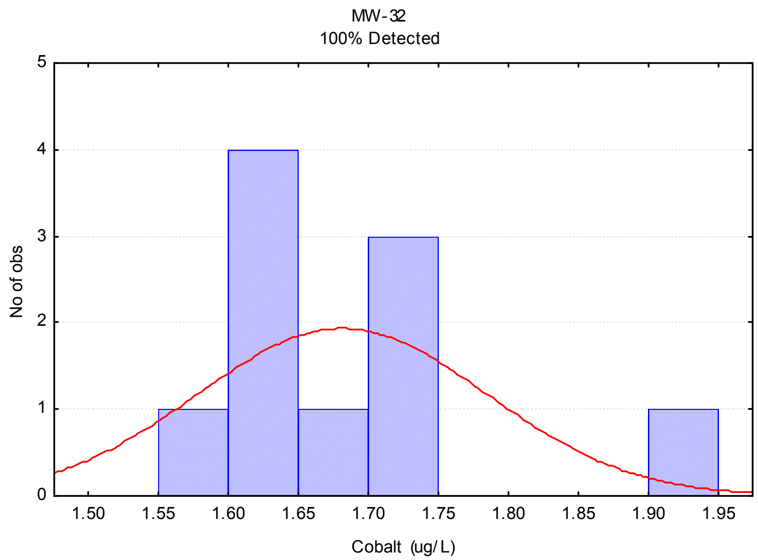
Cobalt, Molydenum and Nickel Histograms for 0 to 50% Non-Detects

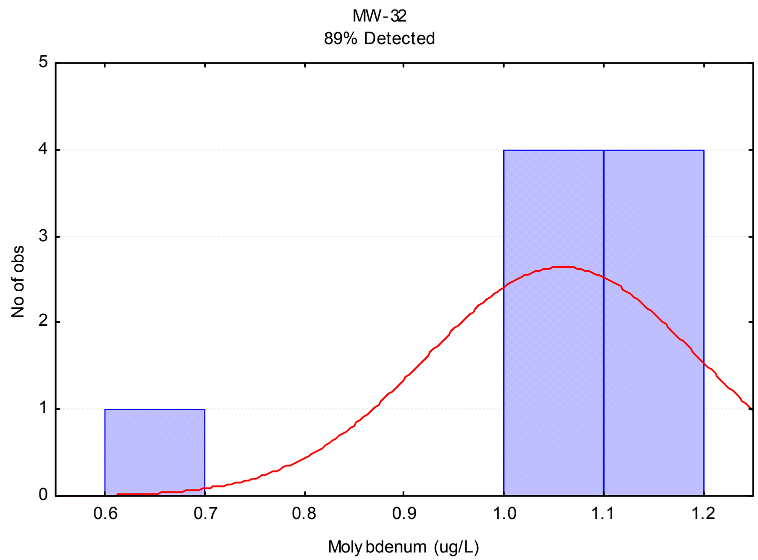


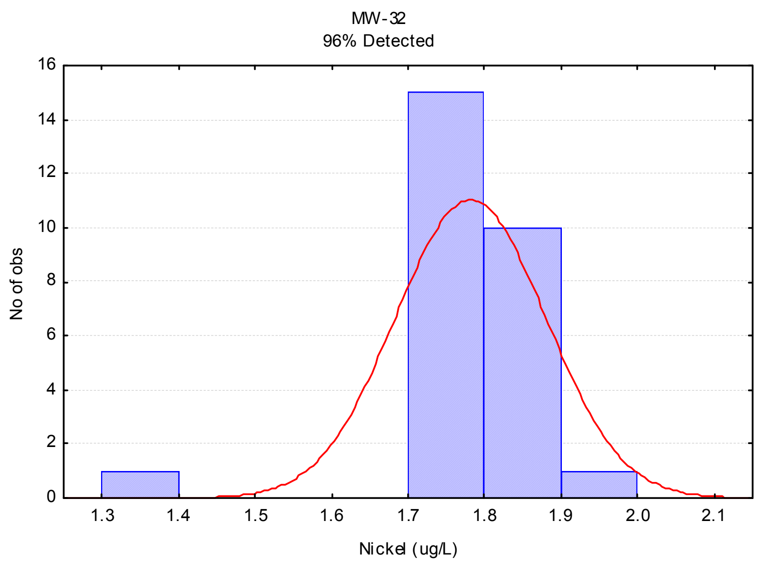




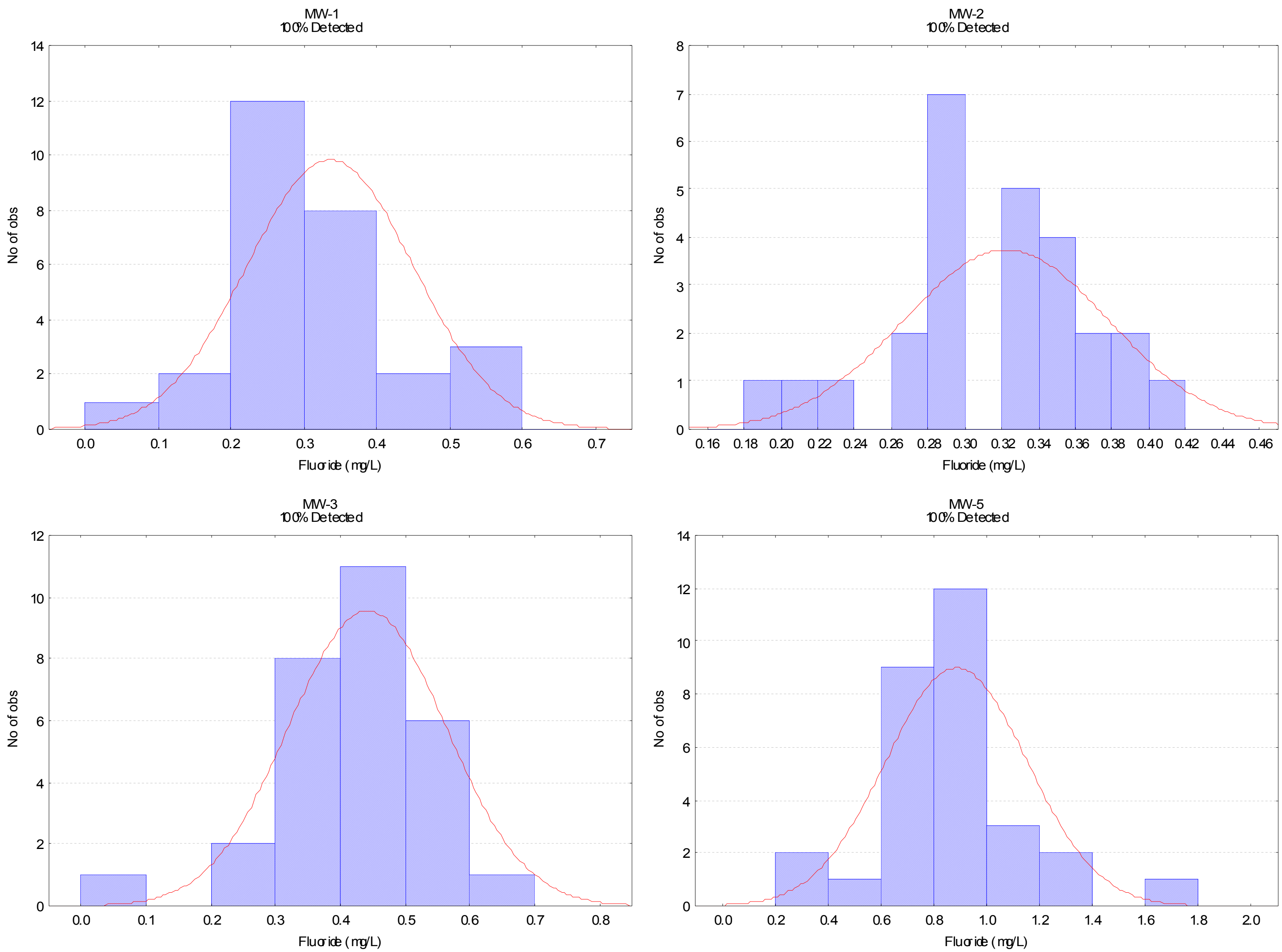
Log-Transformed Cobalt, Molybdenum, and Nickel Histograms for 0 to 50% Non-Detects



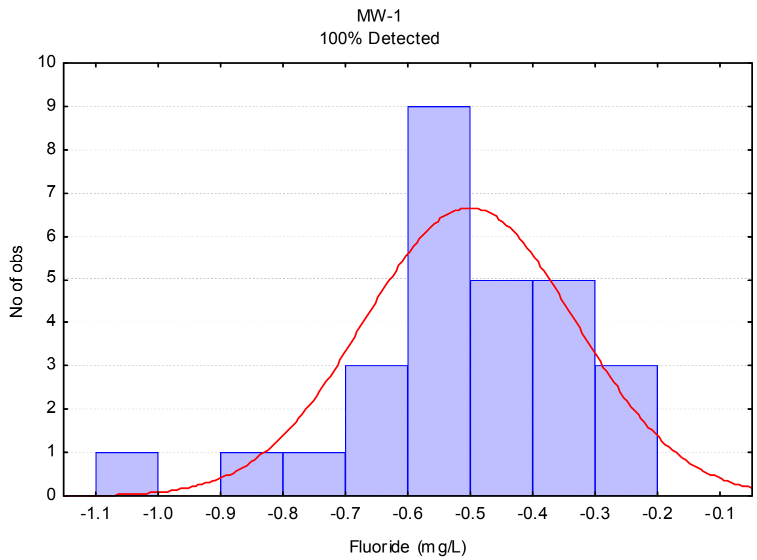


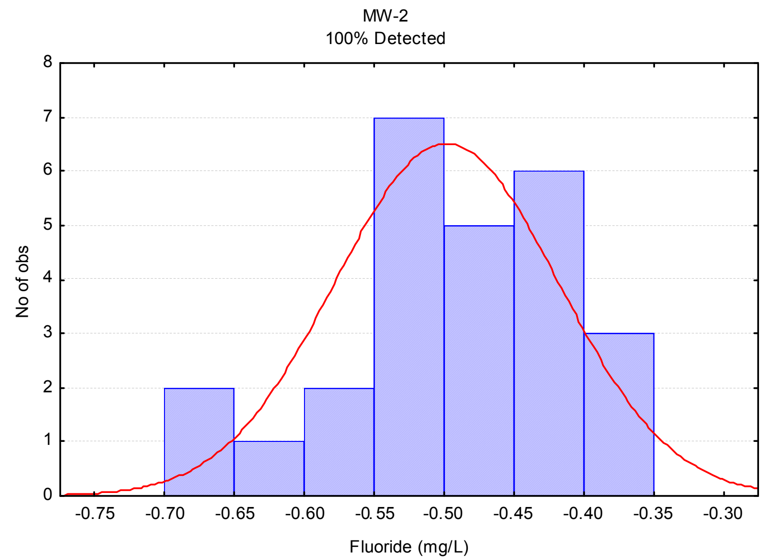


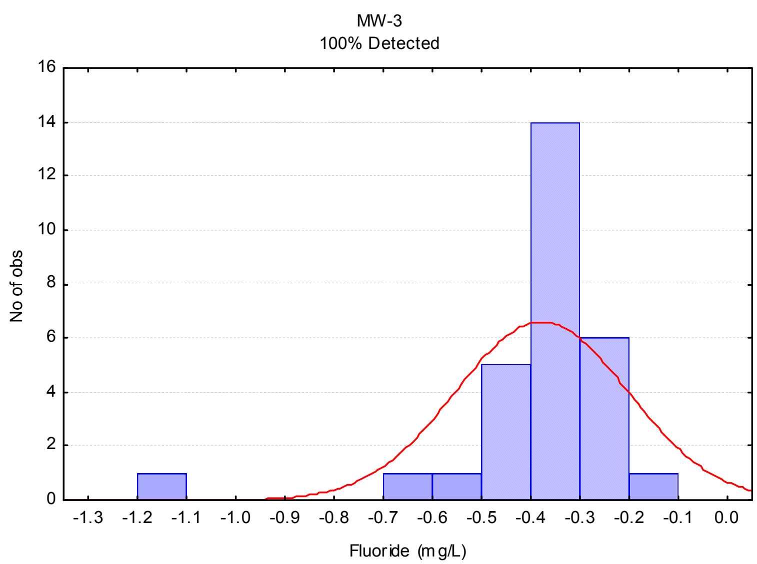
Fluoride Histograms for 0 to 50% Non-Detects

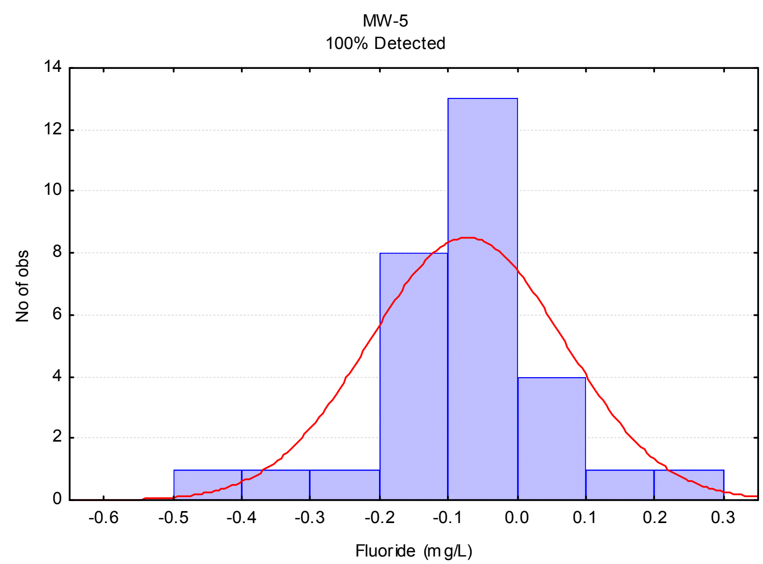


Log-Transformed Fluoride Histograms for 0 to 50% Non-Detects

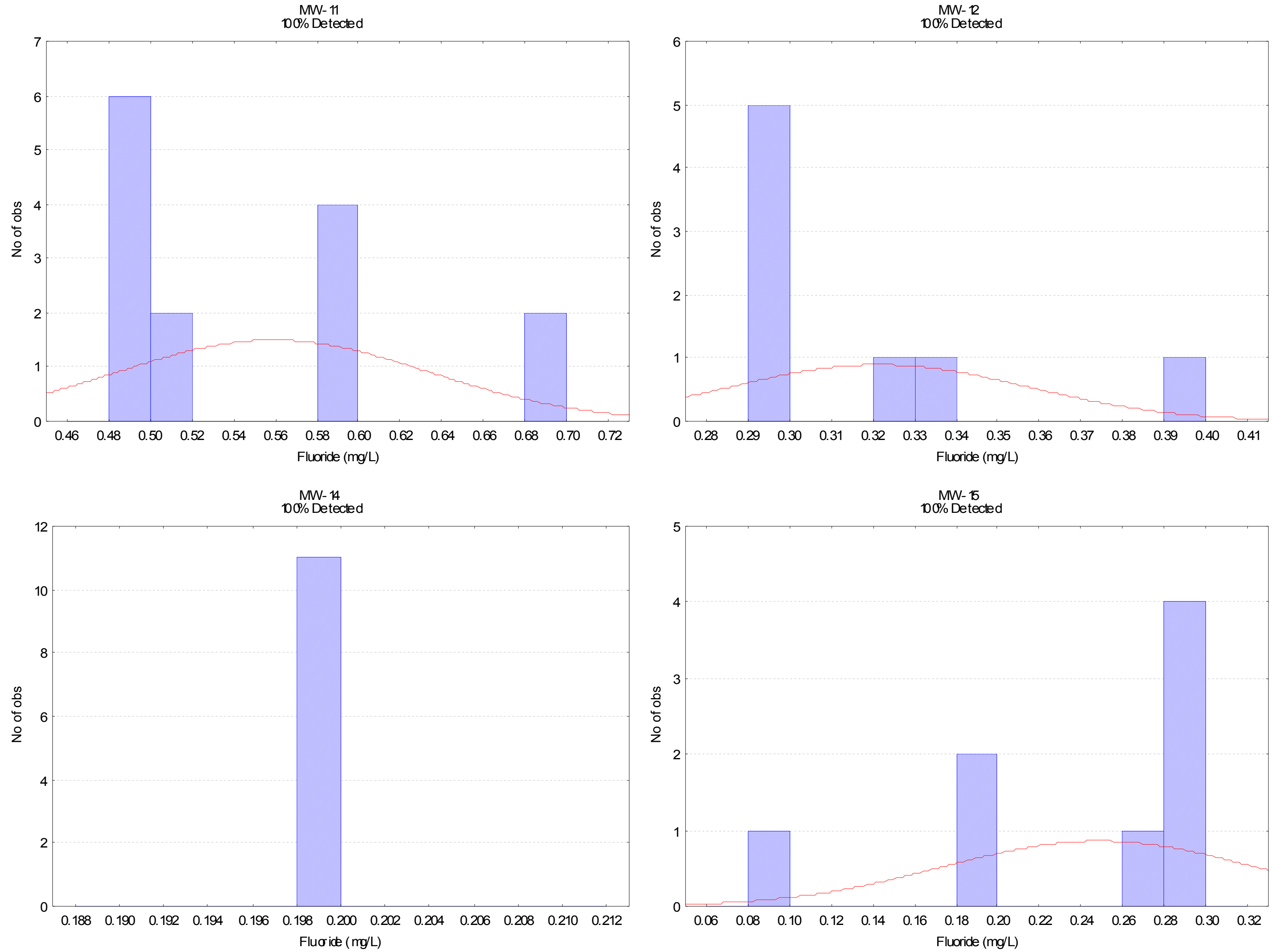




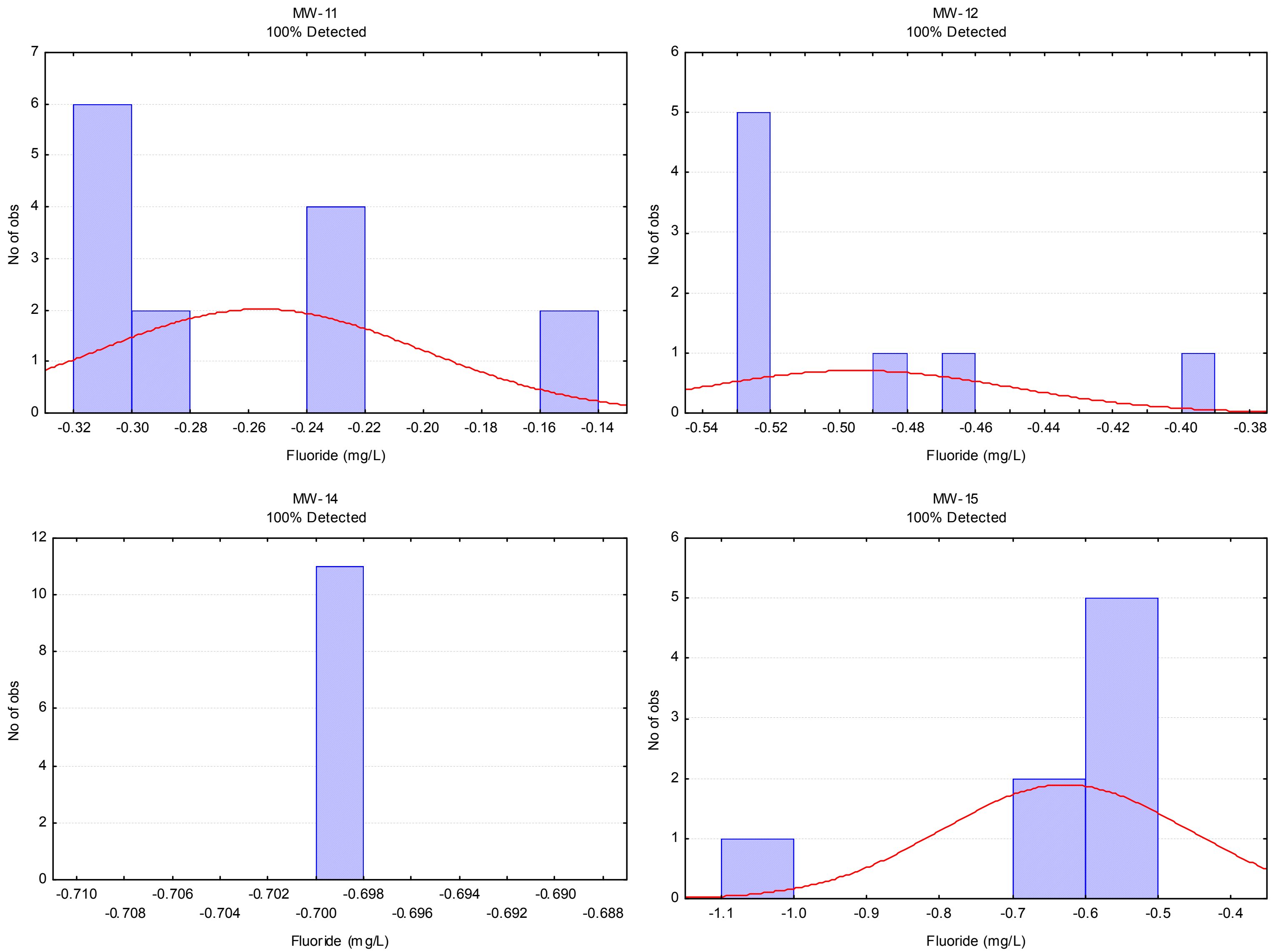




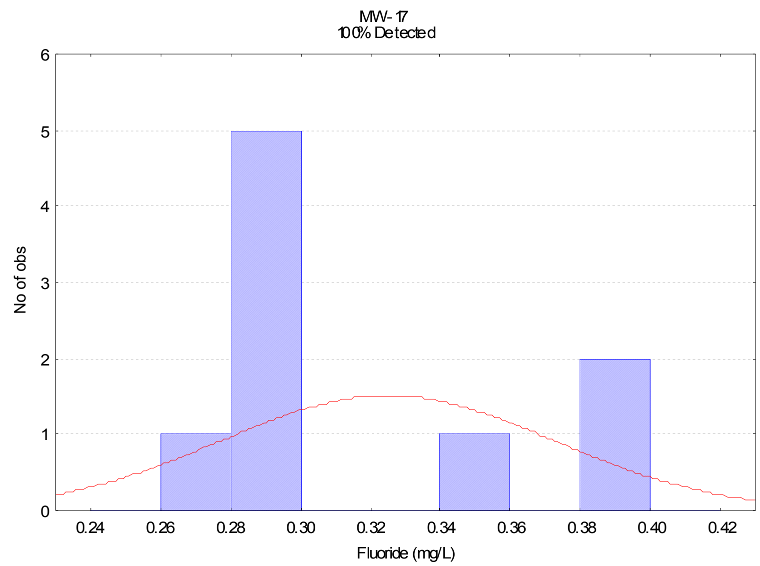
Fluoride Histograms for 0 to 50% Non-Detects

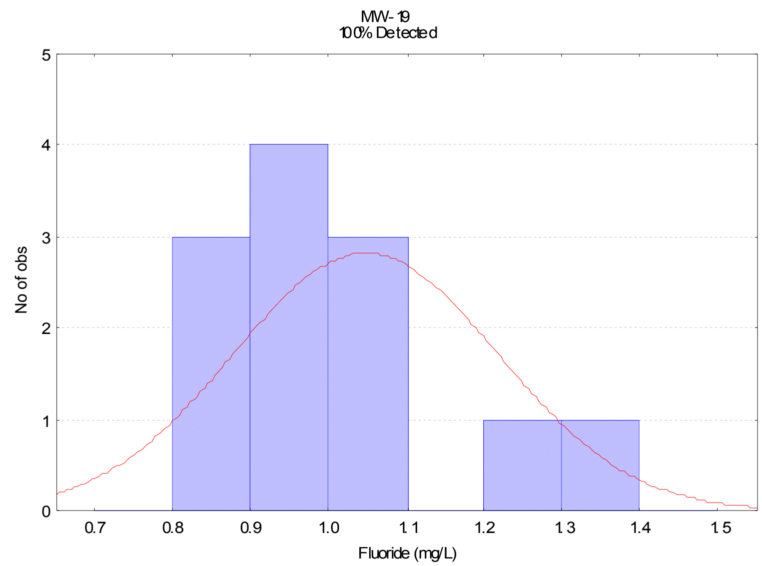


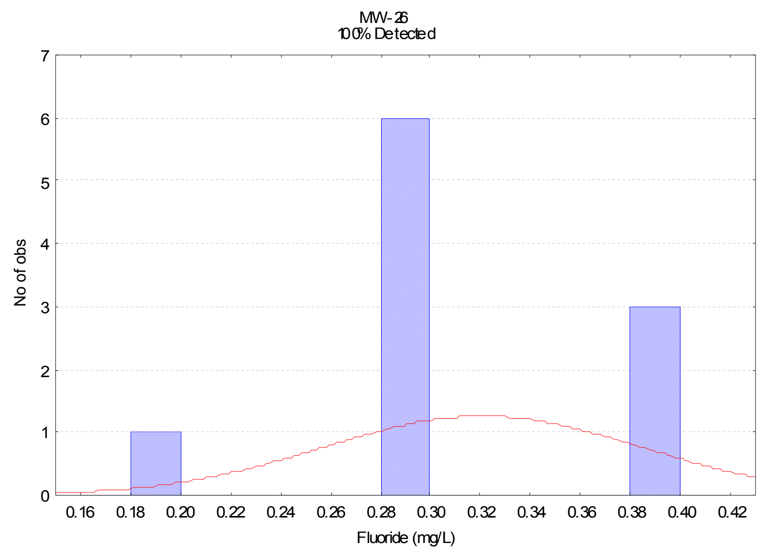
Log-Transformed Fluoride Histograms for 0 to 50% Non-Detects

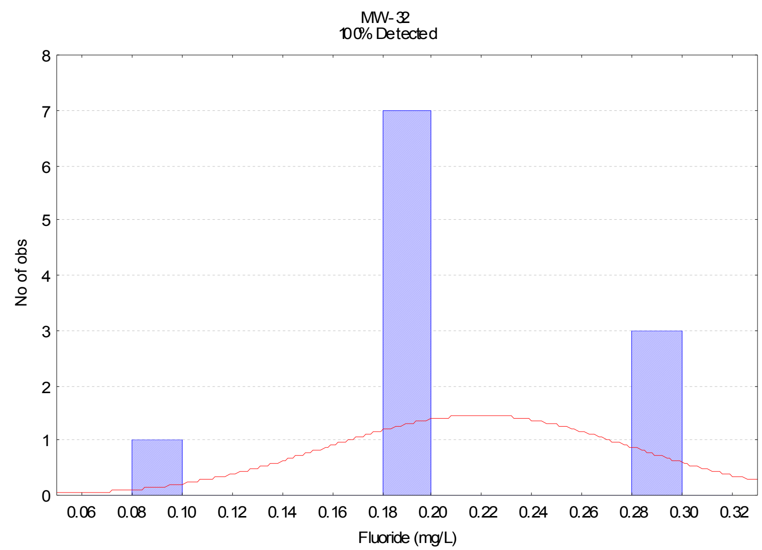


Fluoride Histograms for 0 to 50% Non-Detects

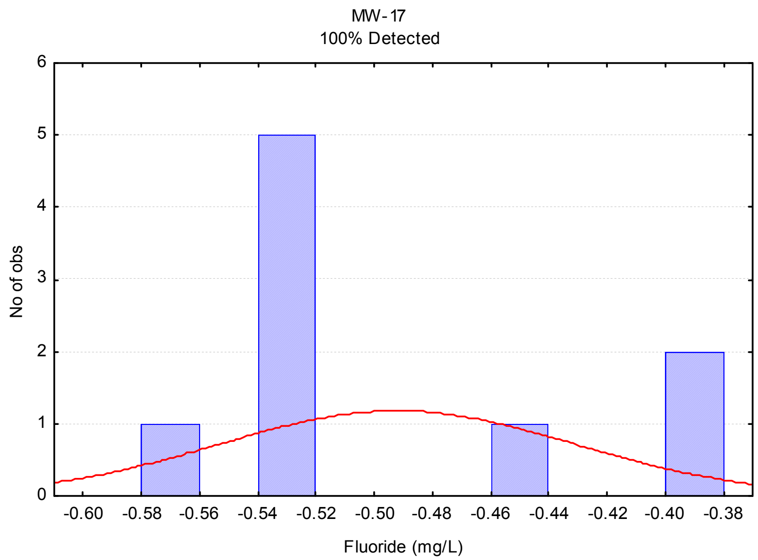


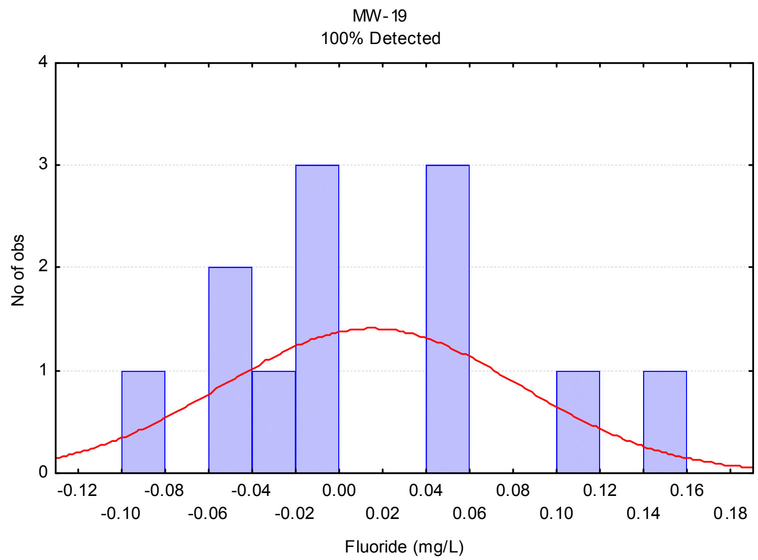


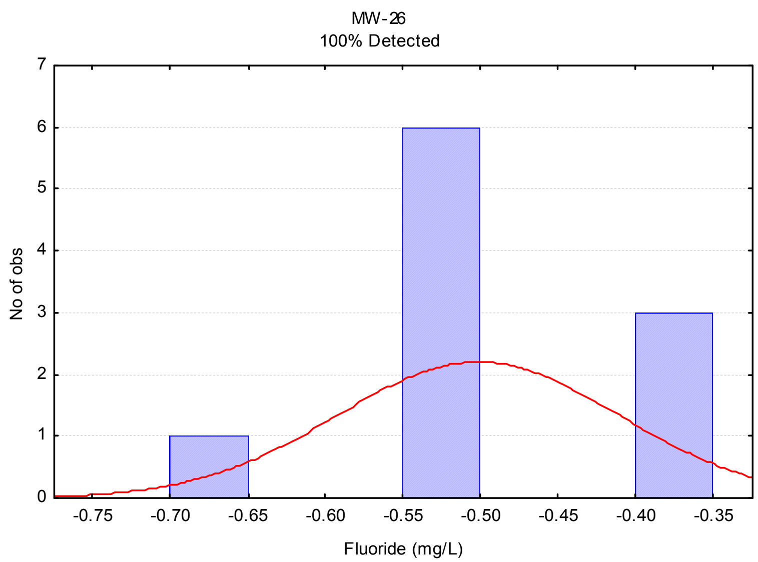


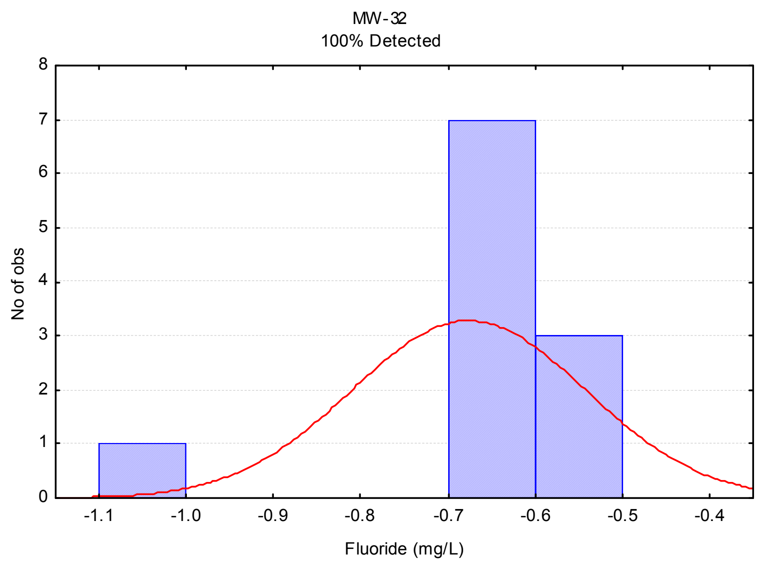


Log-Transformed Fluoride Histograms for 0 to 50% Non-Detects

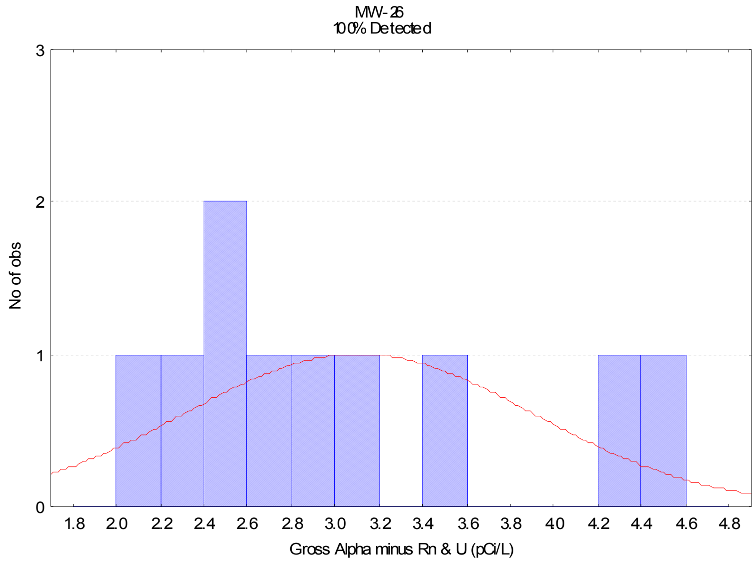


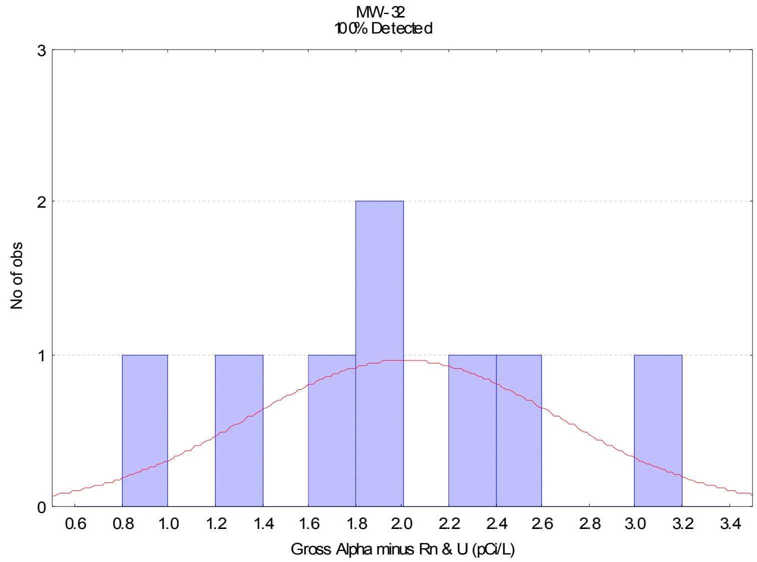




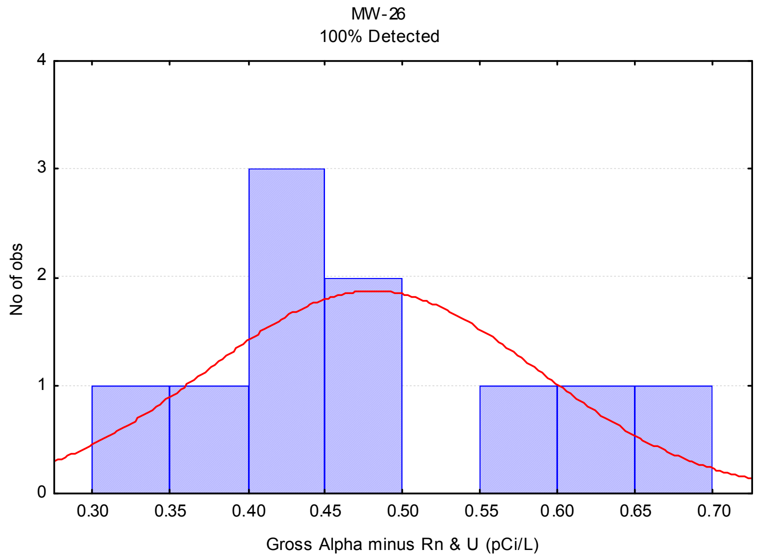


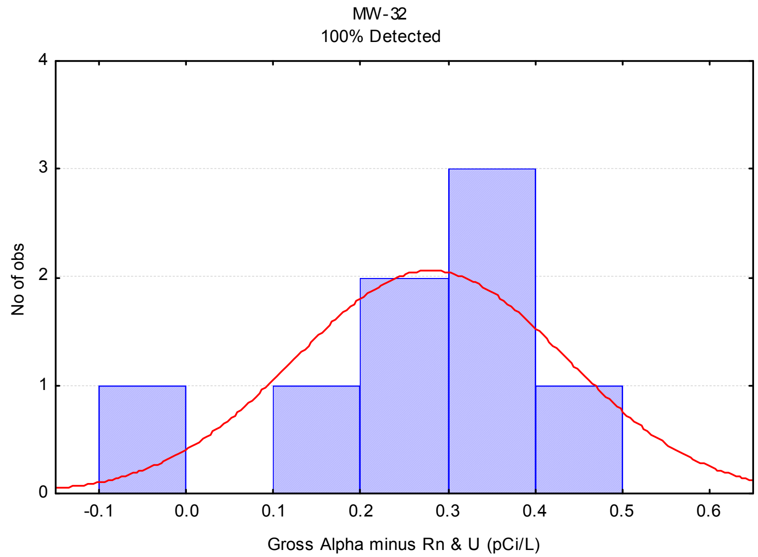
Gross Alpha minus Rn & U Histograms for 0 to 50% Non-Detects



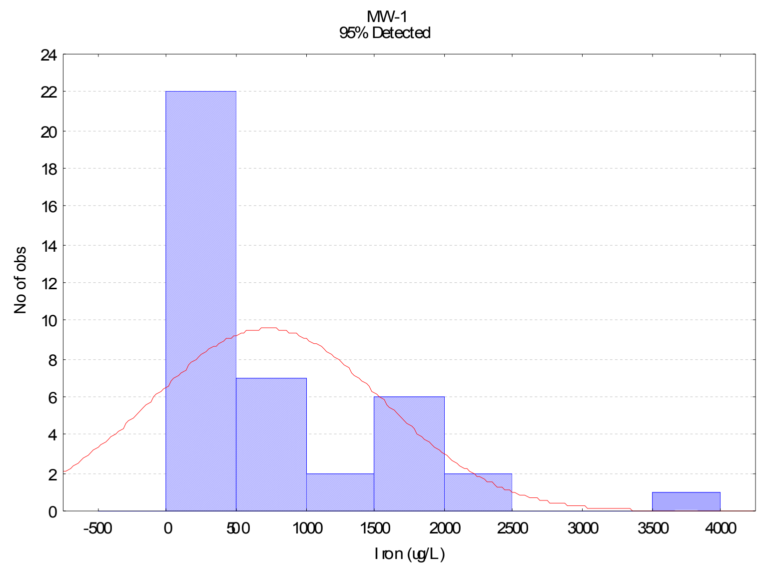


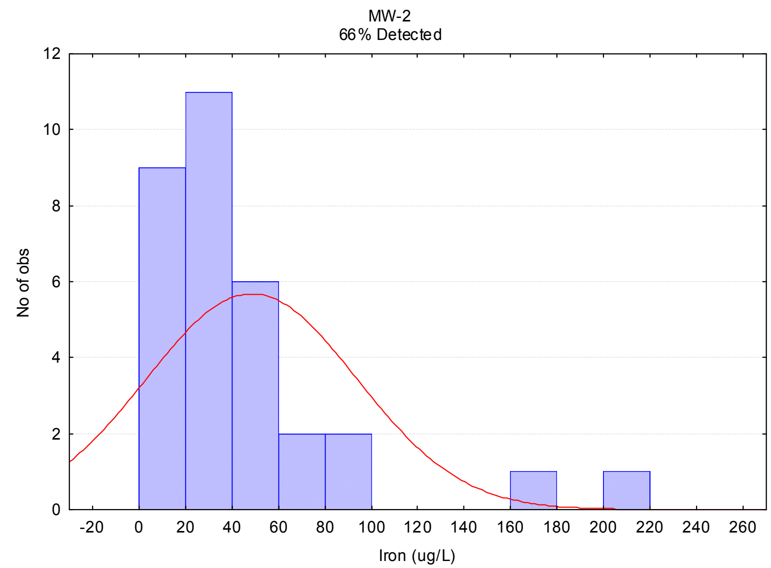
Log-Transformed Gross Alpha minus Rn & U Histograms for 0 to 50% Non-Detects

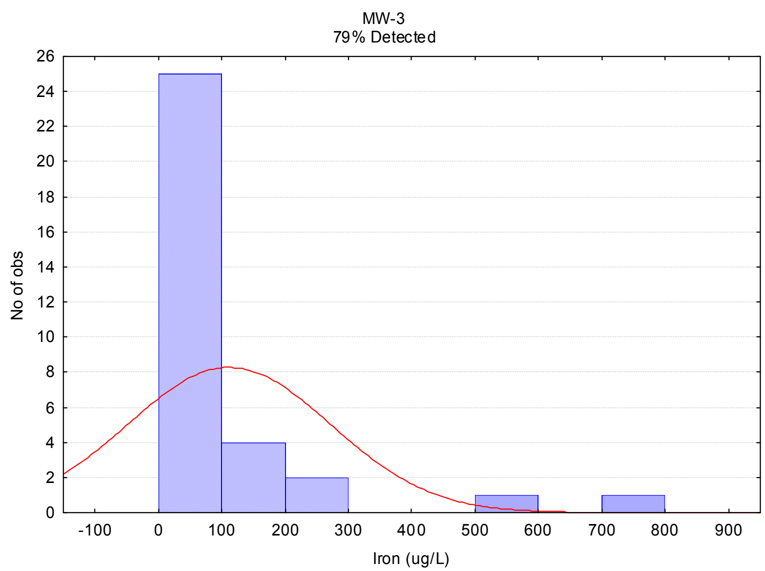


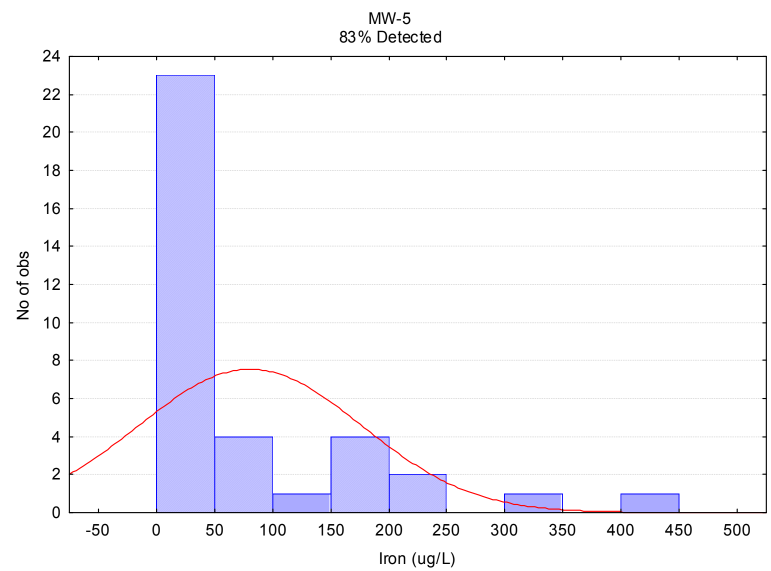


Iron Histograms for 0 to 50% Non-Detects

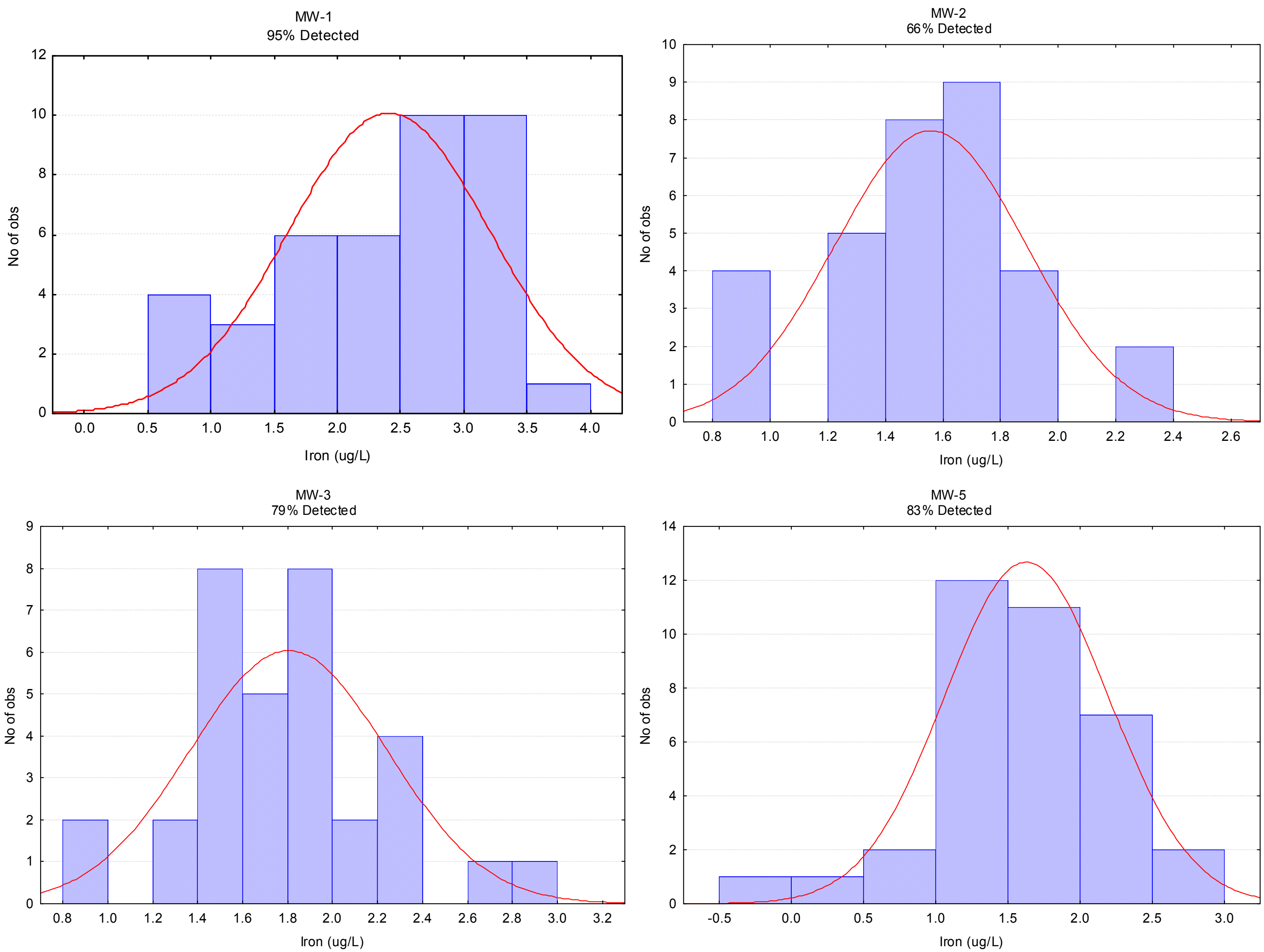




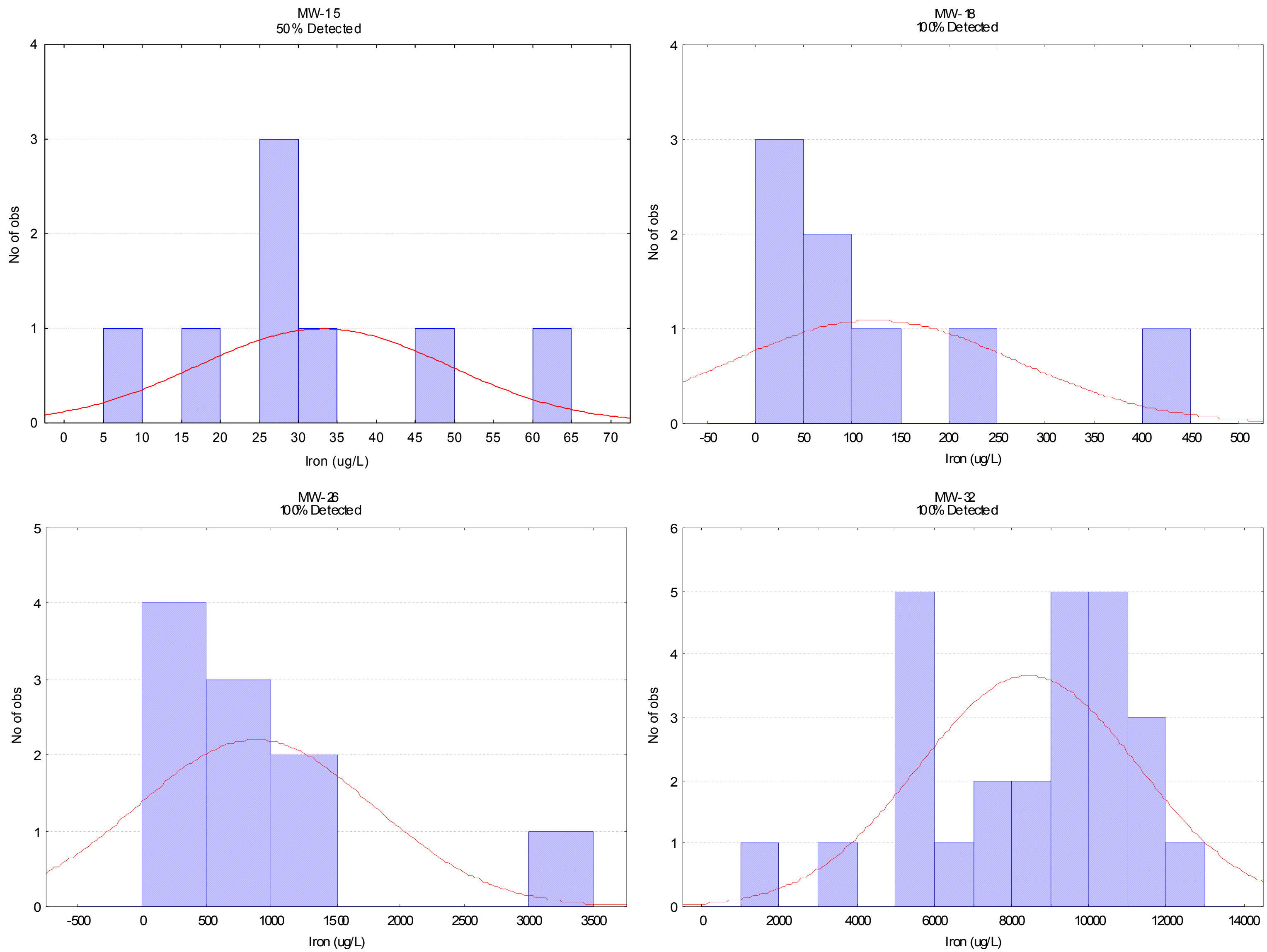




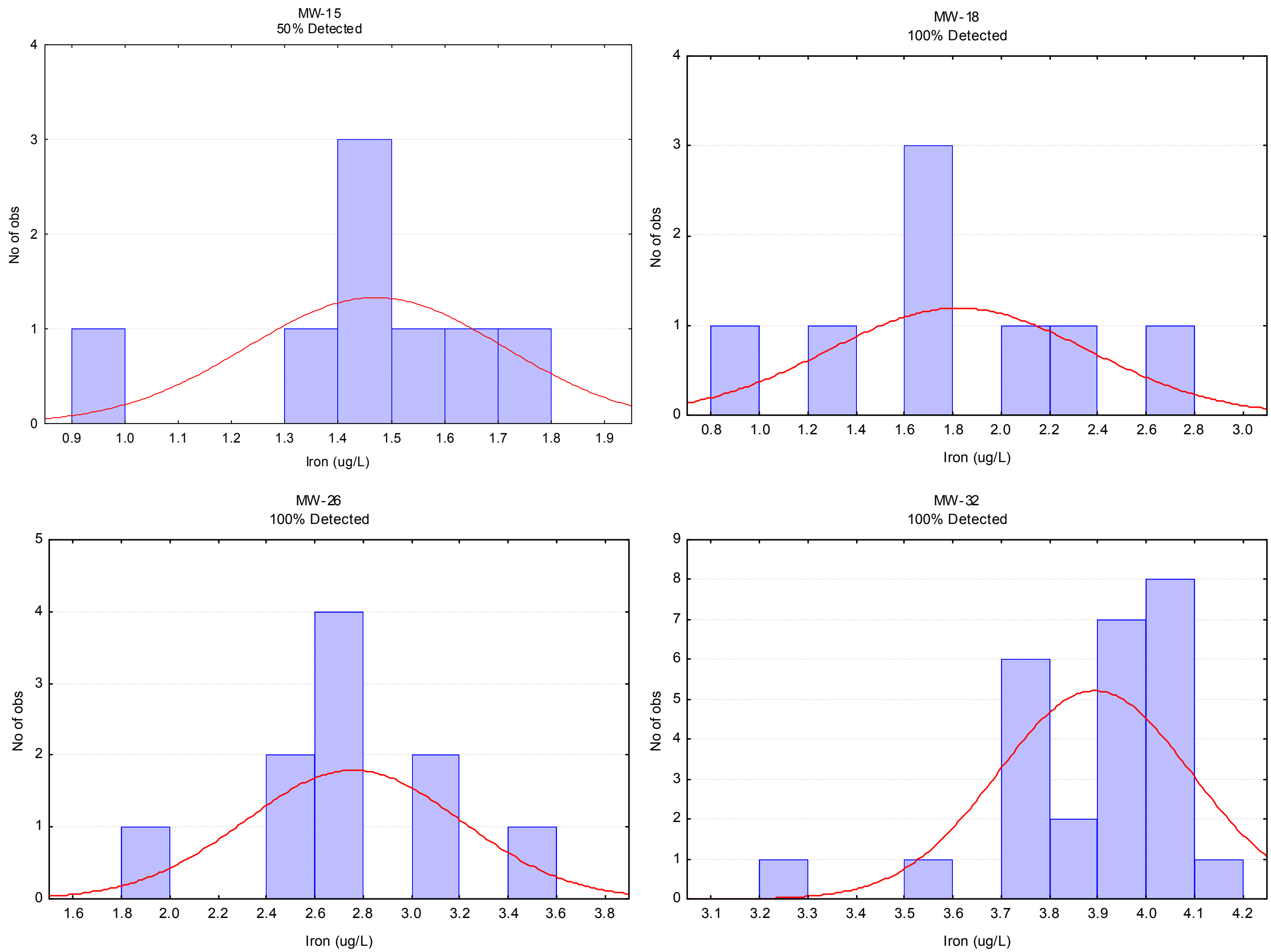
Log-Transformed Iron Histograms for 0 to 50% Non-Detects



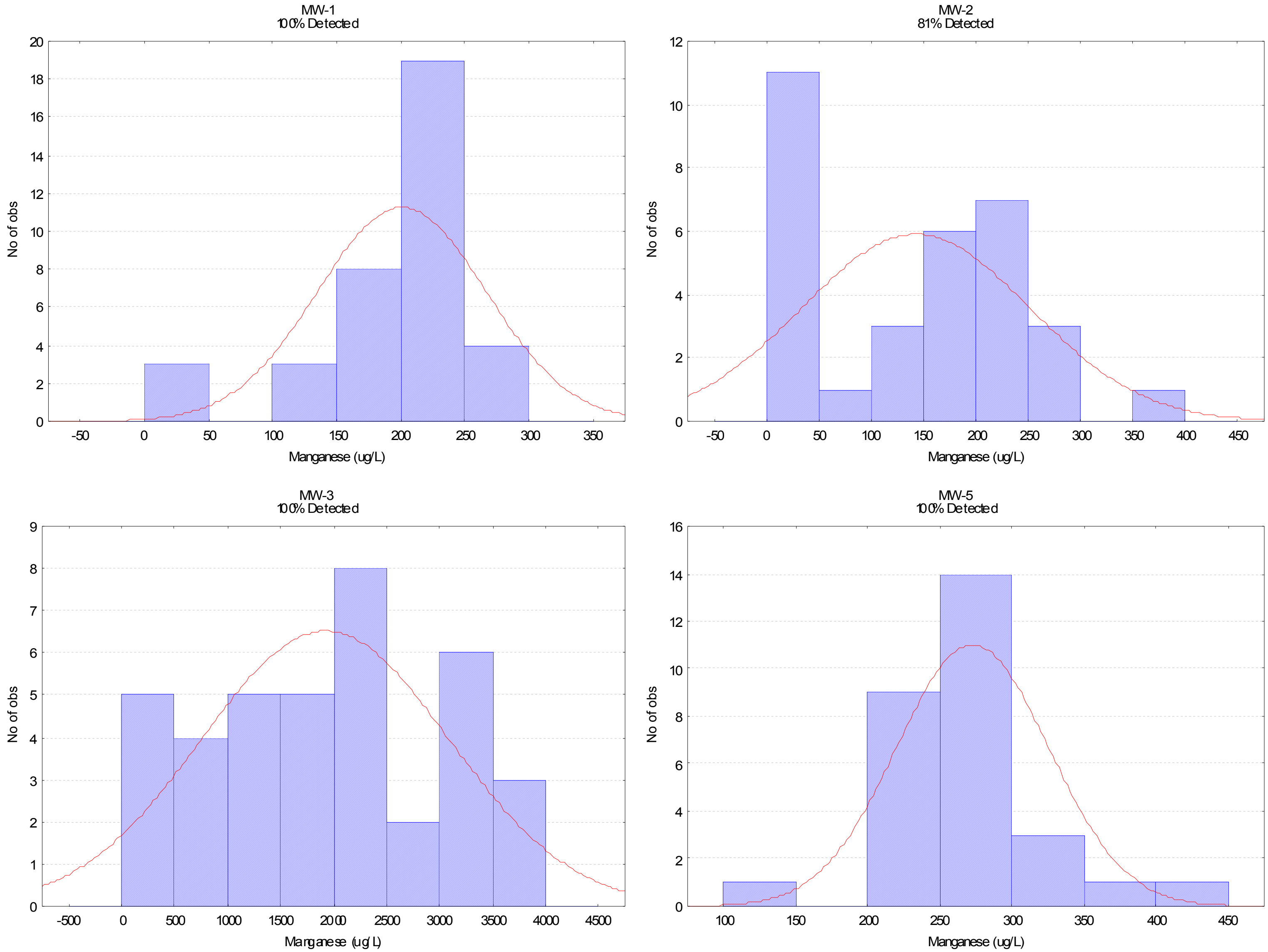
Iron Histograms for 0 to 50% Non-Detects



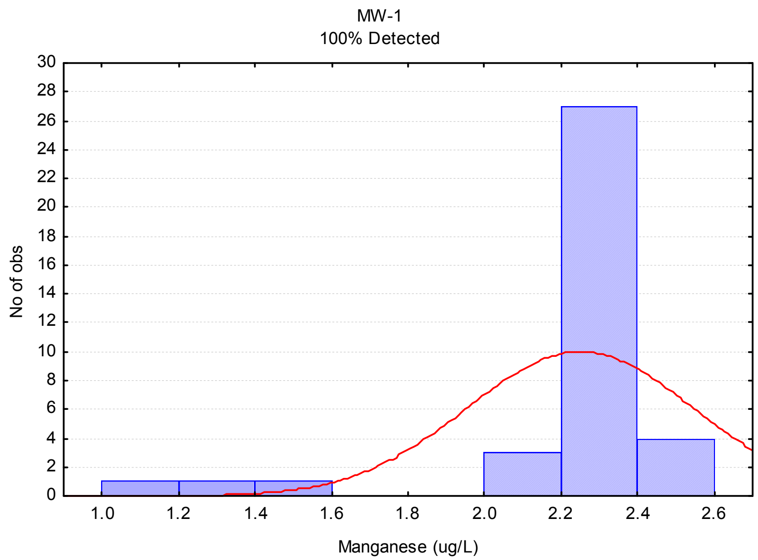
Log-Transformed Iron Histograms for 0 to 50% Non-Detects

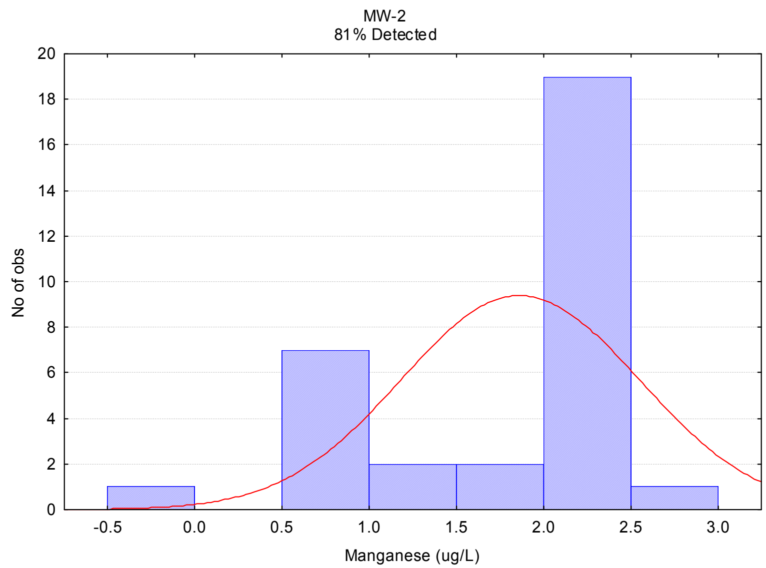


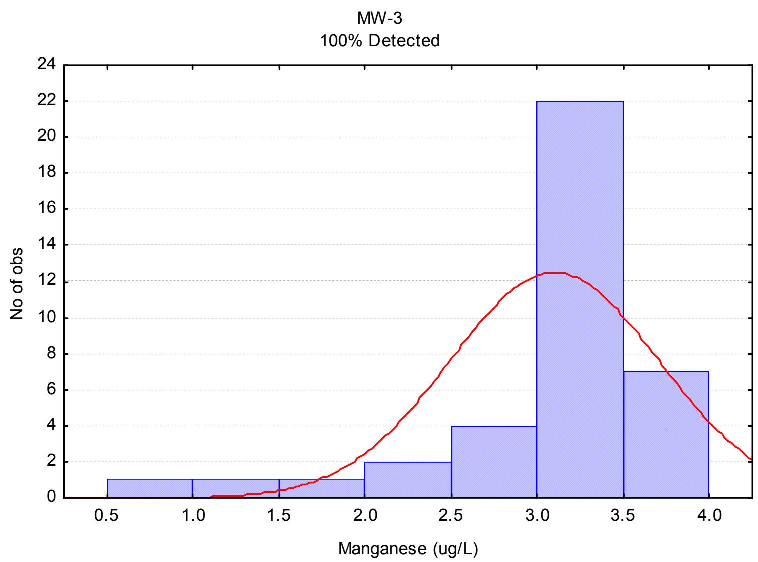
Manganese Histograms for 0 to 50% Non-Detects

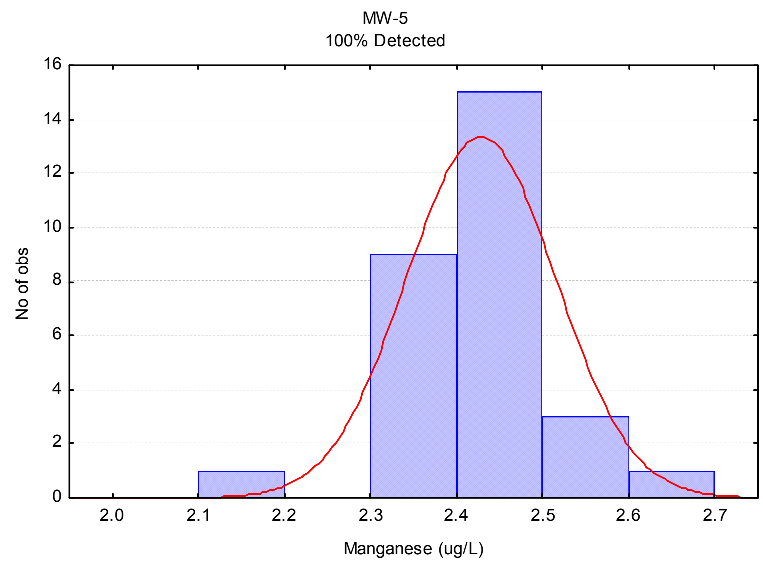


Log-Transformed Manganese Histograms for 0 to 50% Non-Detects

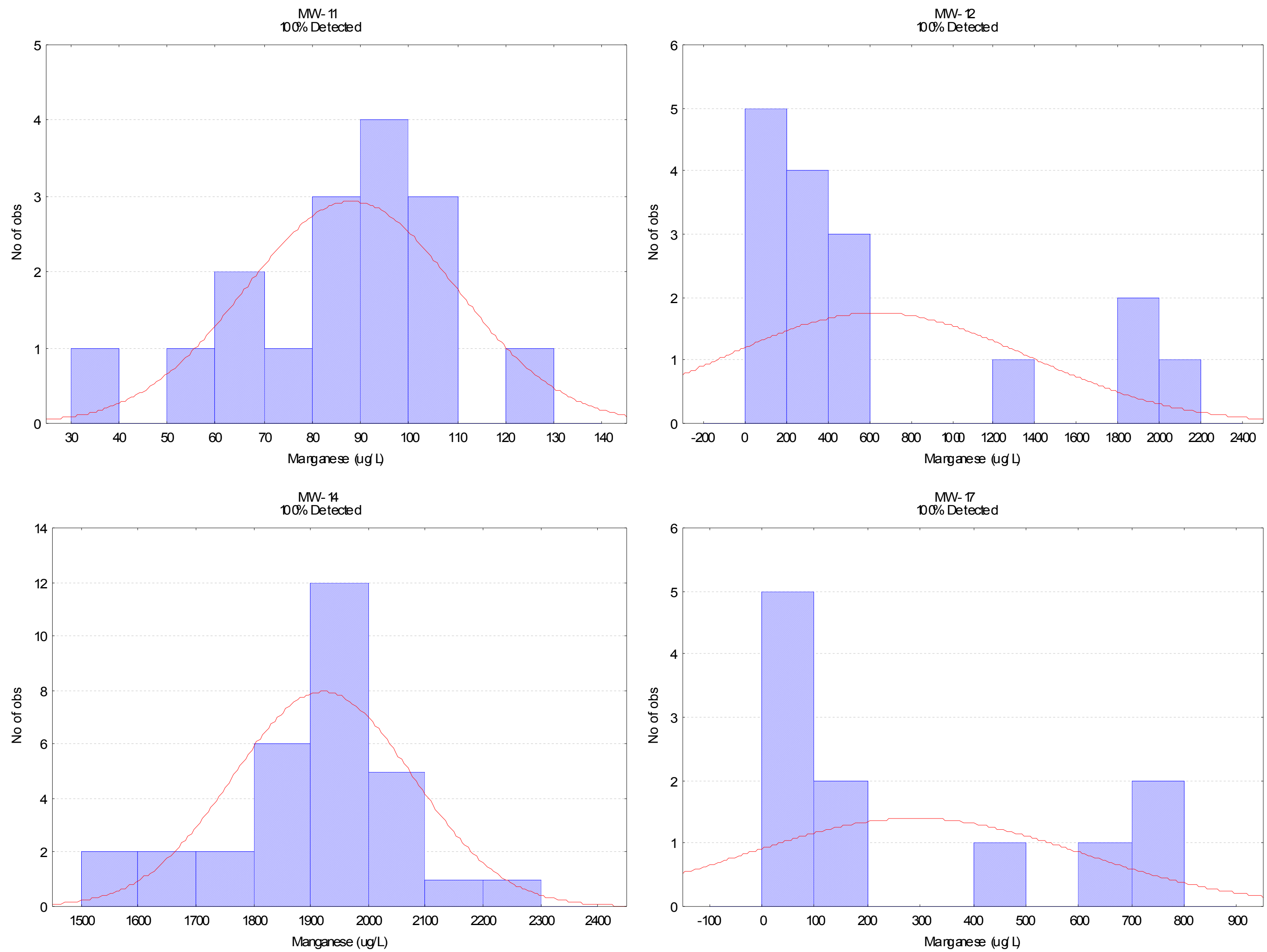




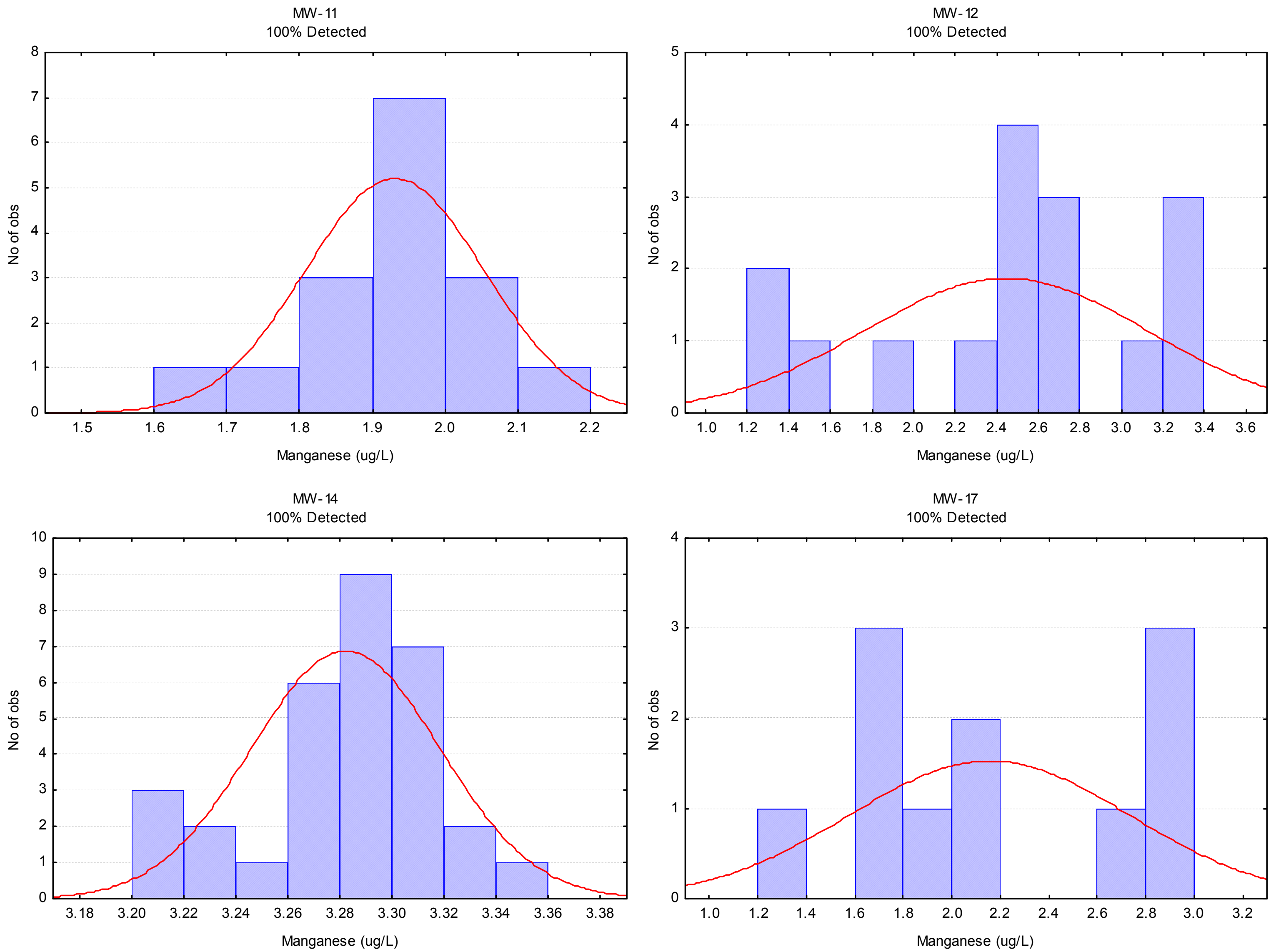




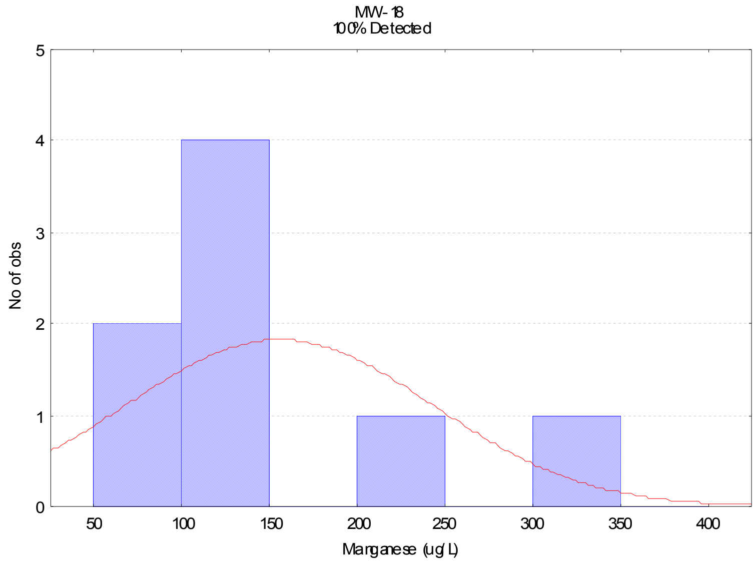
Manganese Histograms for 0 to 50% Non-Detects

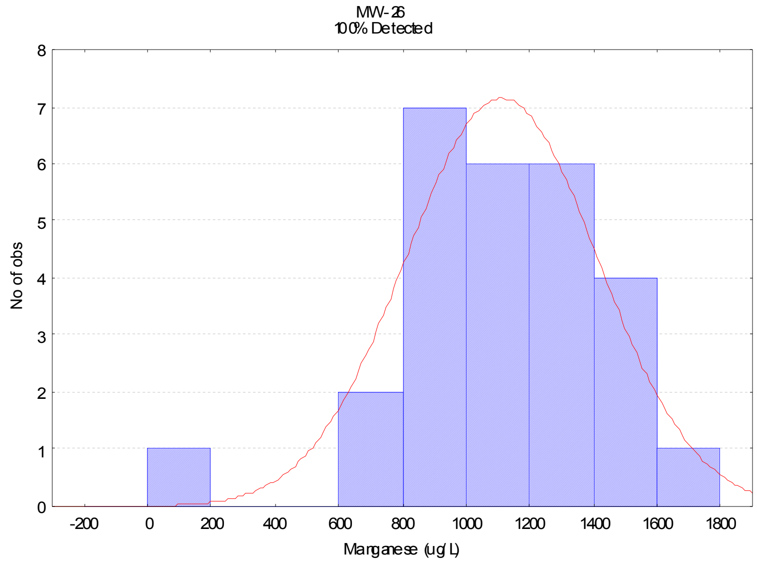


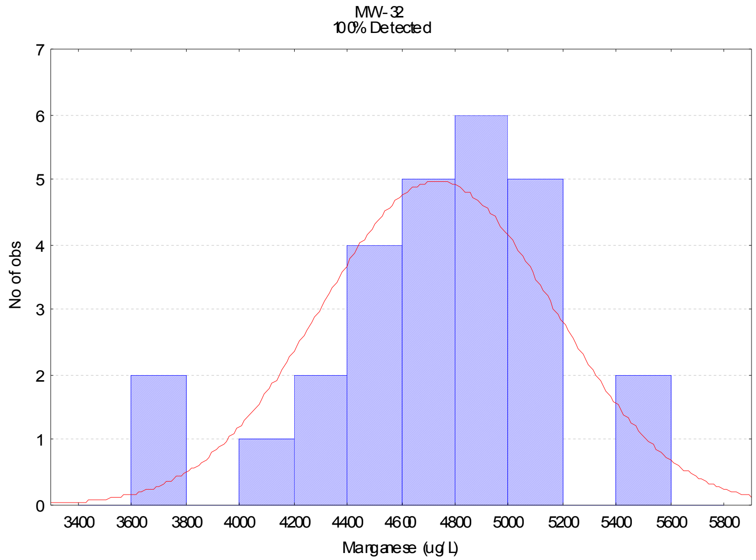
Log-Transformed Manganese Histograms for 0 to 50% Non-Detects



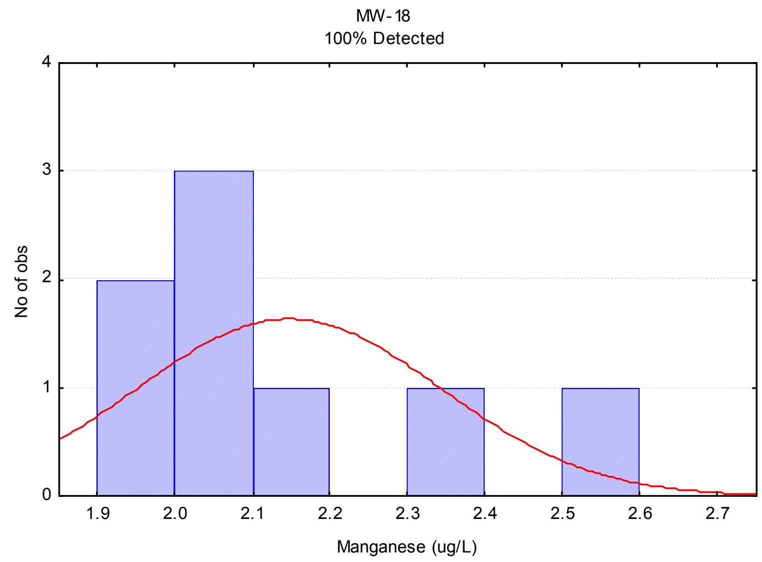
Manganese Histograms for 0 to 50% Non-Detects

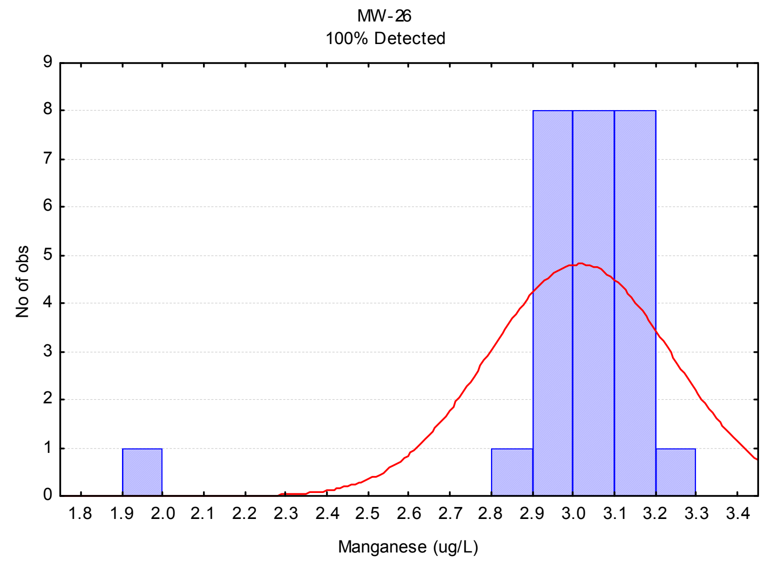


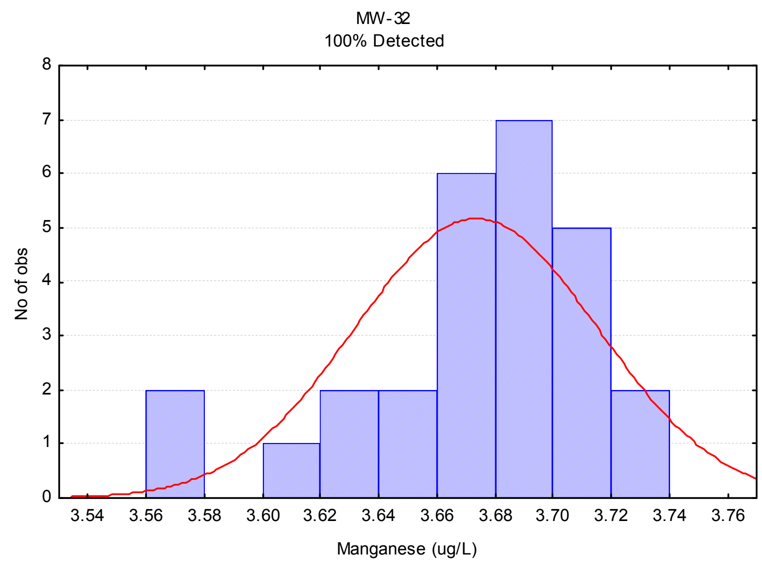




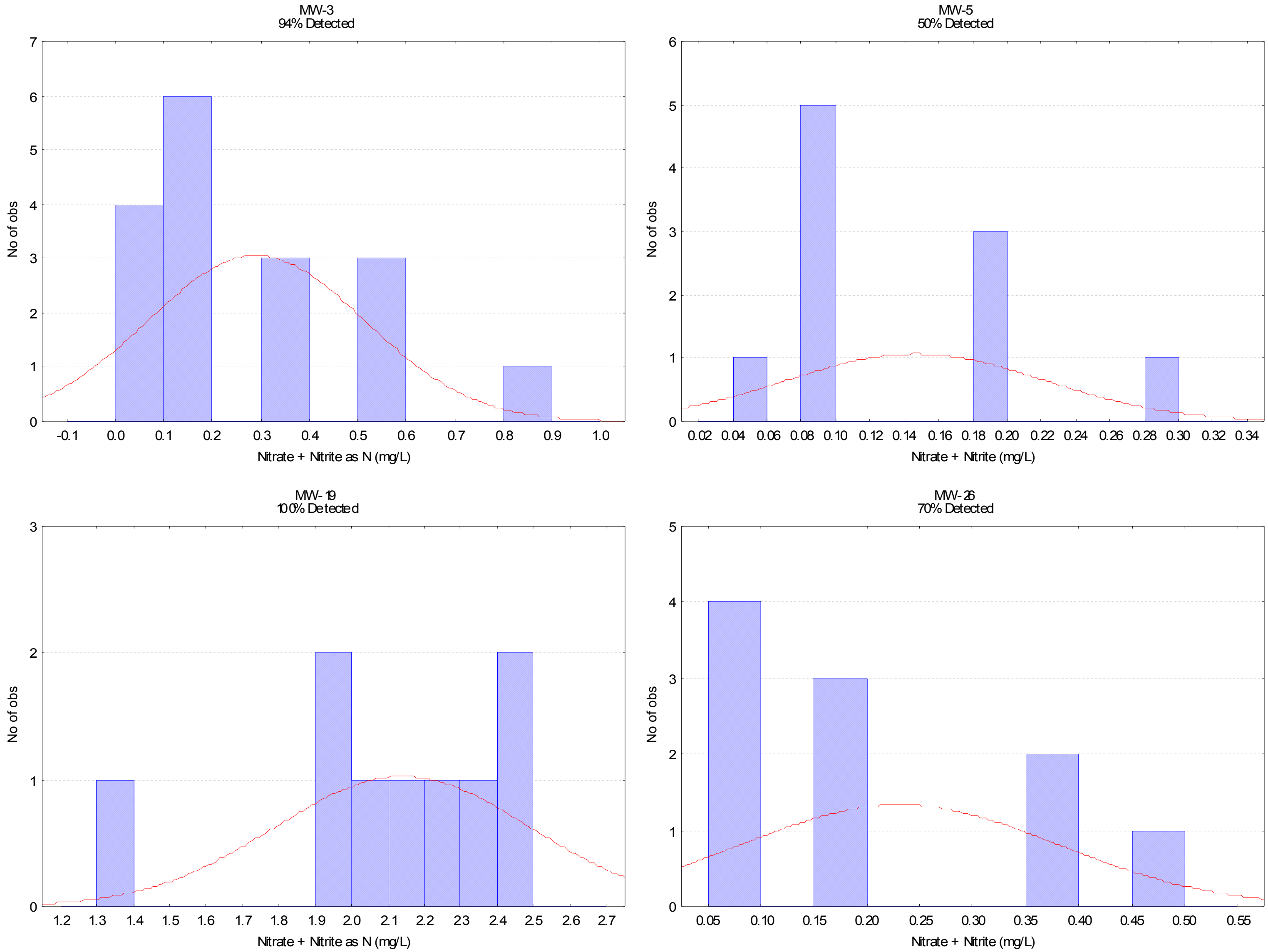
Log-Transformed Manganese Histograms for 0 to 50% Non-Detects



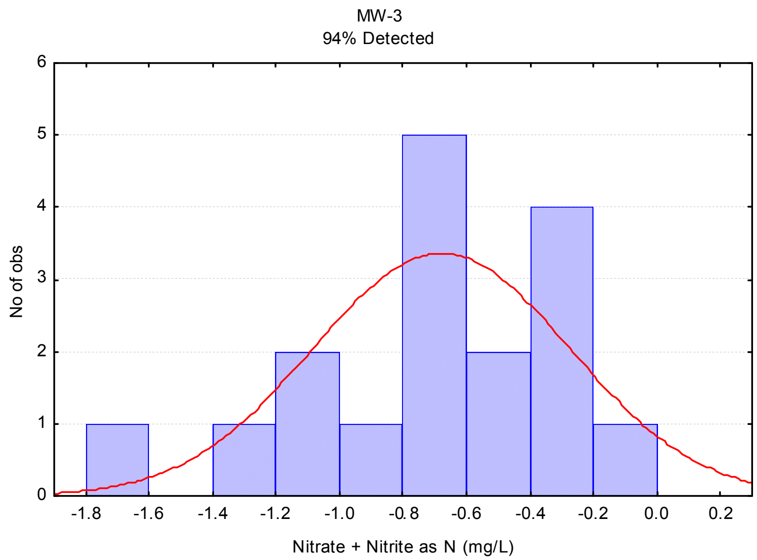


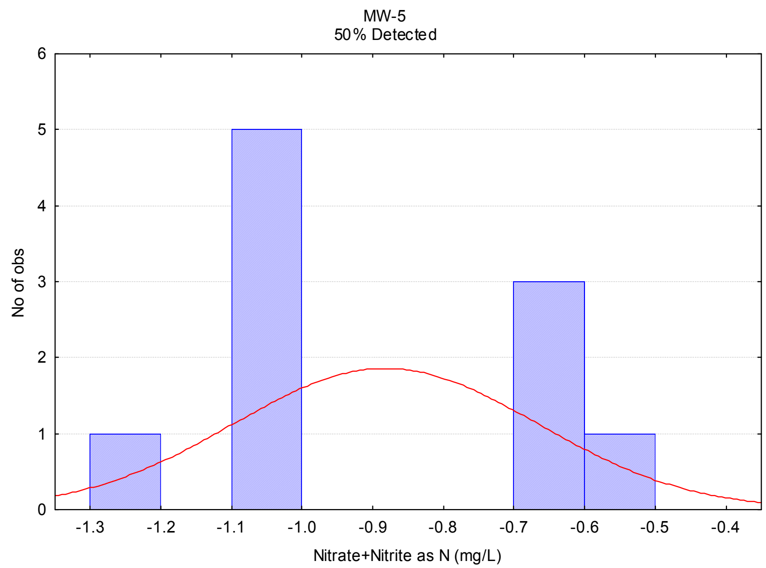


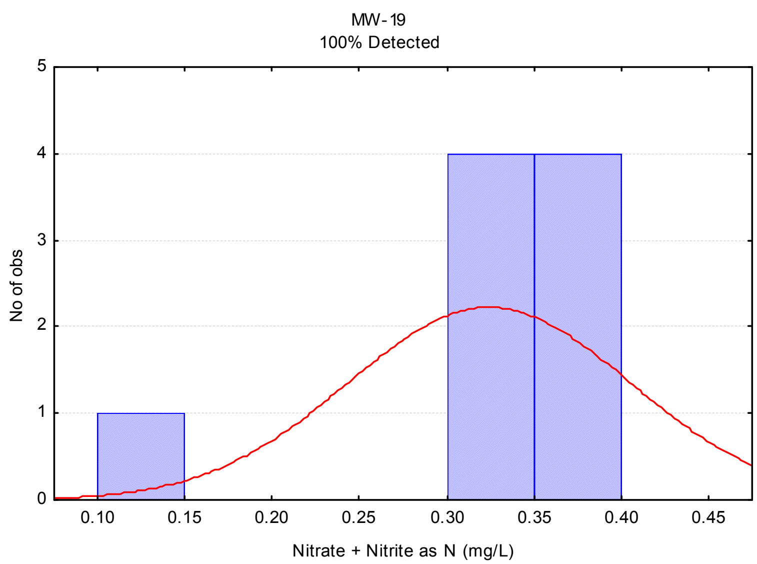
Nitrate + Nitrite as N Histograms for 0 to 50% Non-Detects

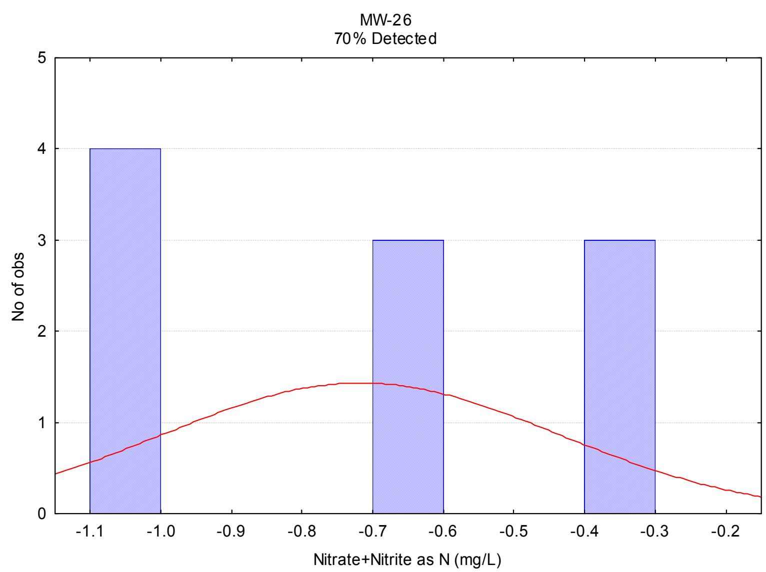


Log-Transformed Nitrate+Nitrite as N Histograms for 0 to 50% Non-Detects

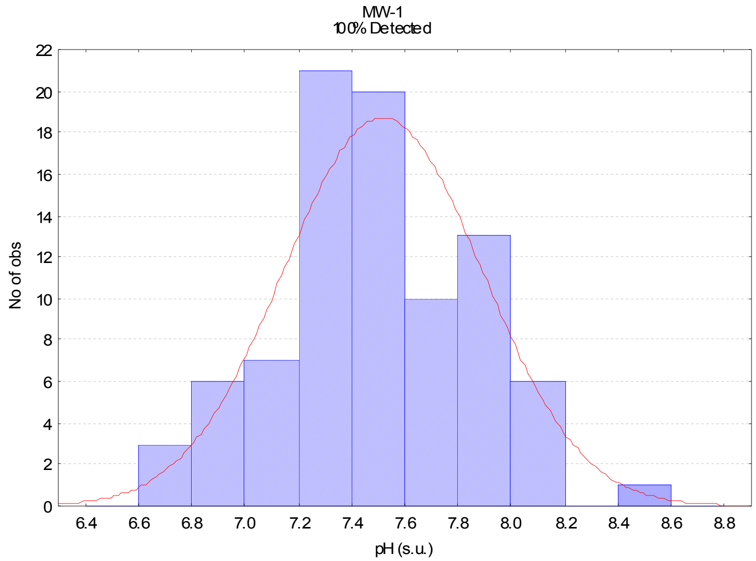


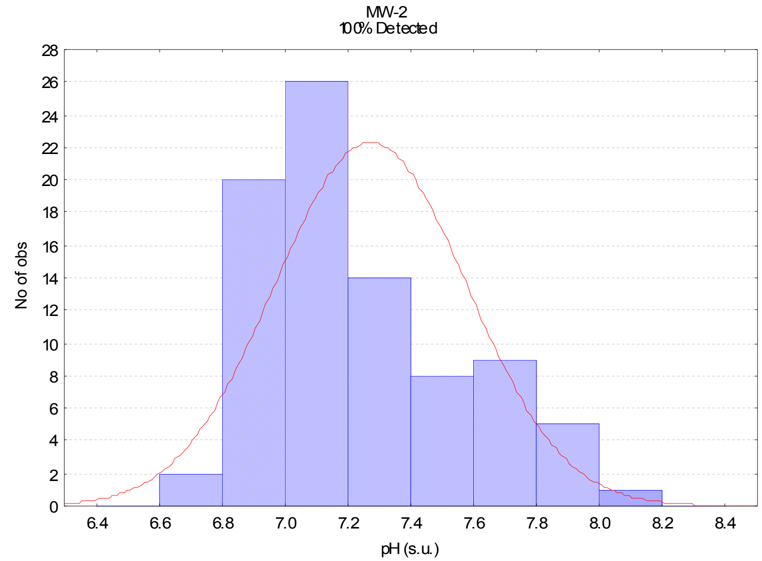


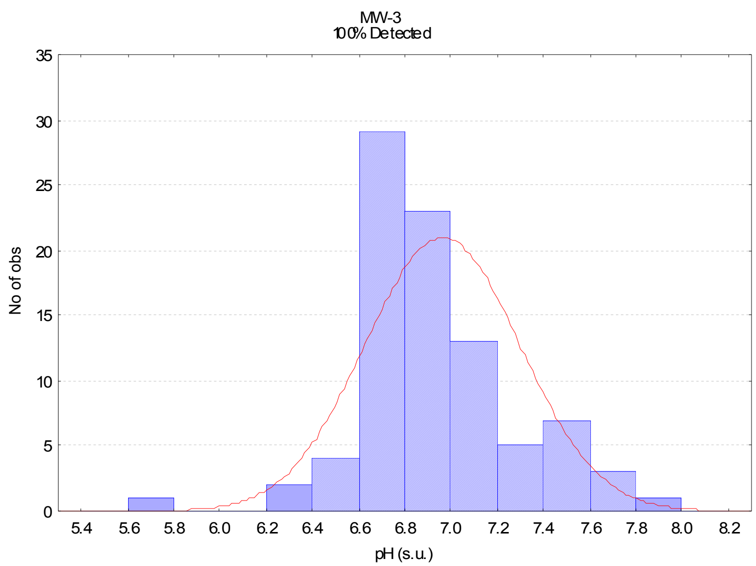


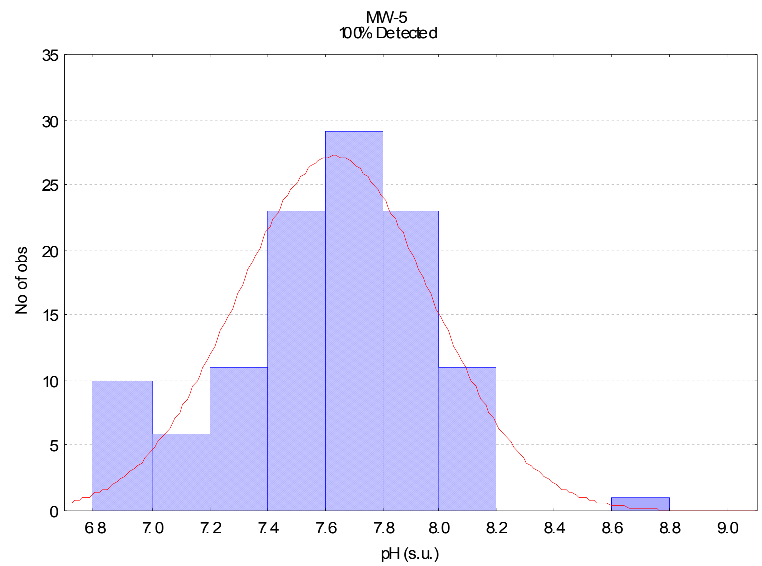


pH Histograms for 0 to 50% Non-Detects

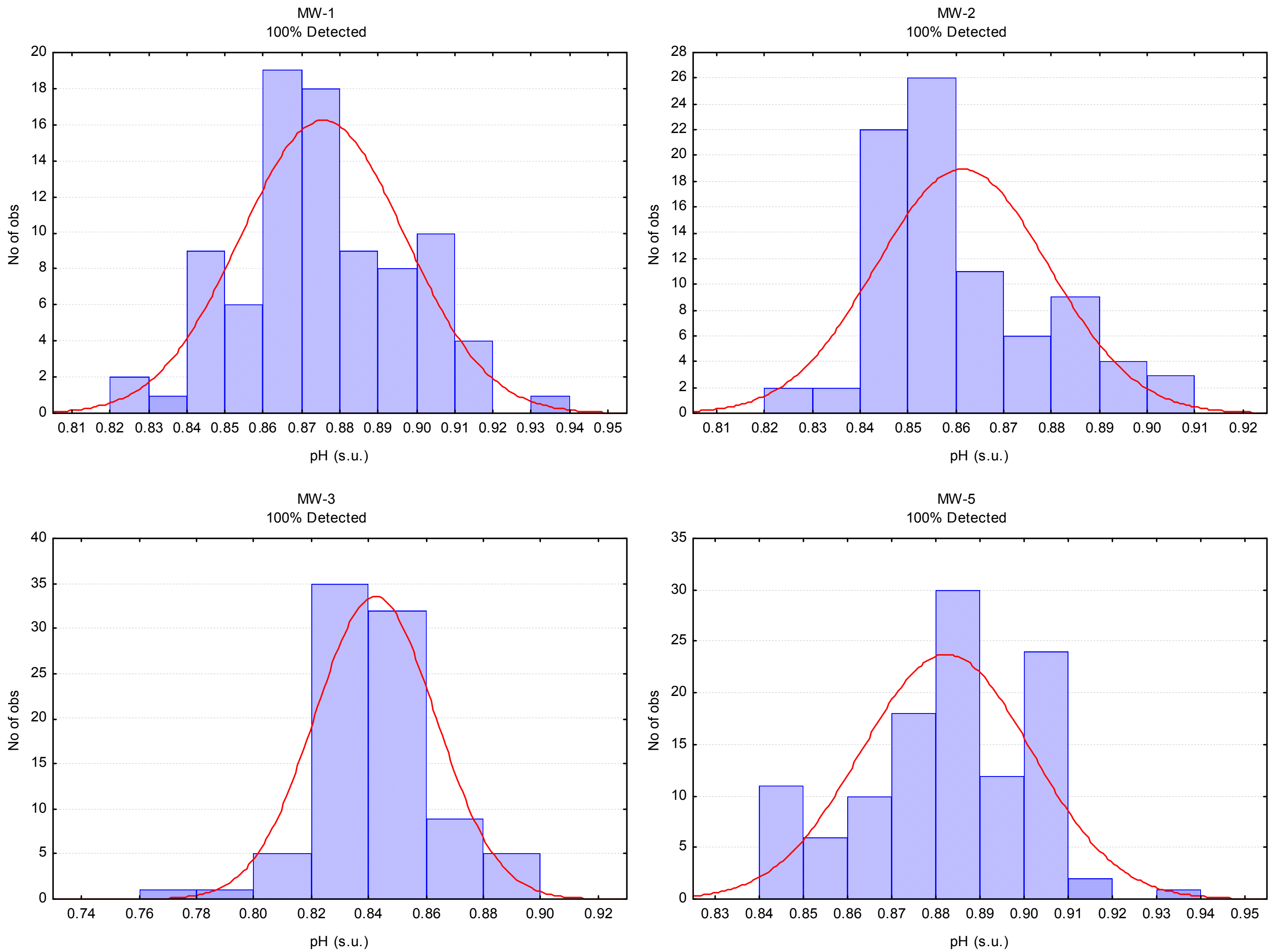




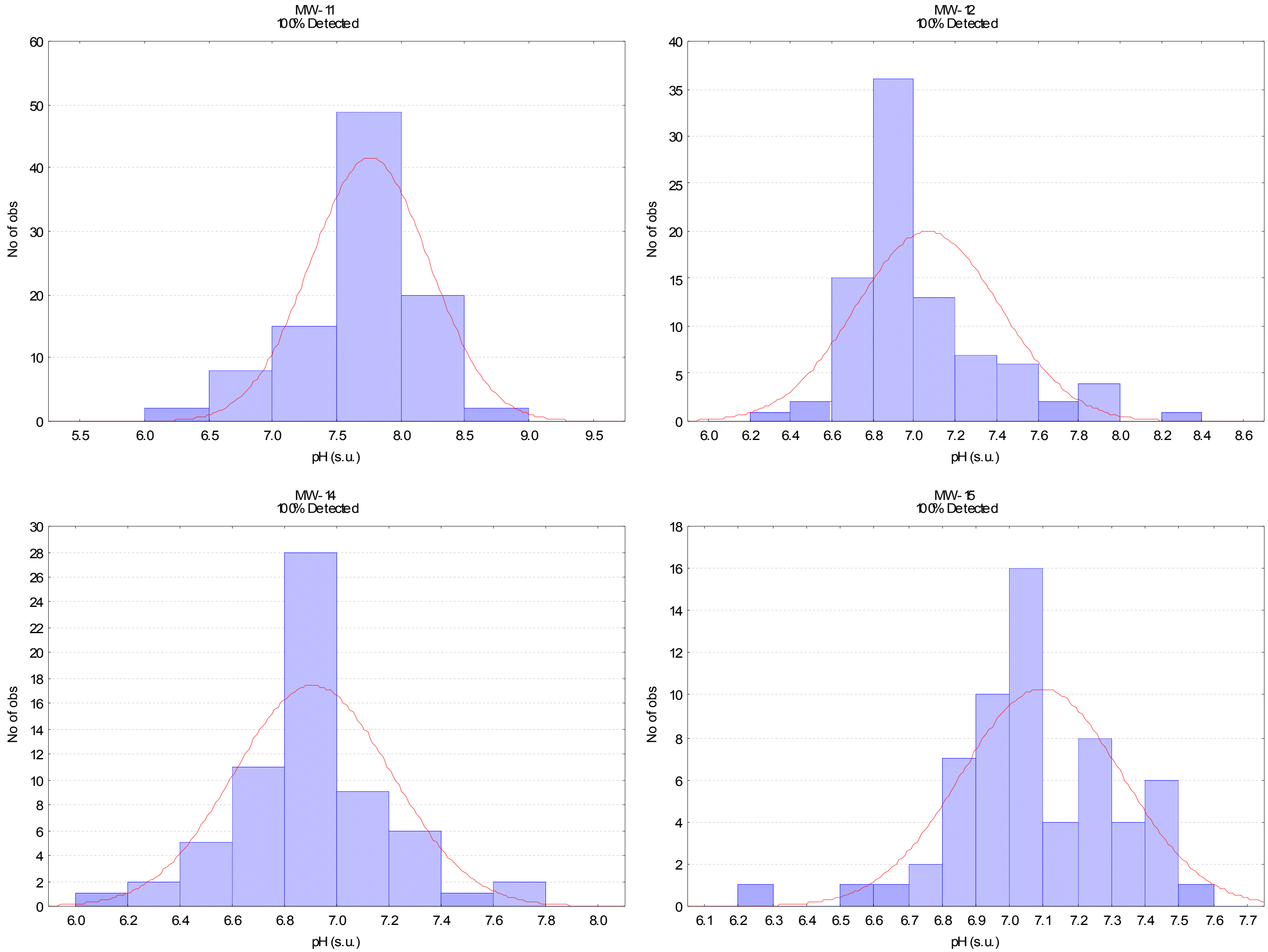




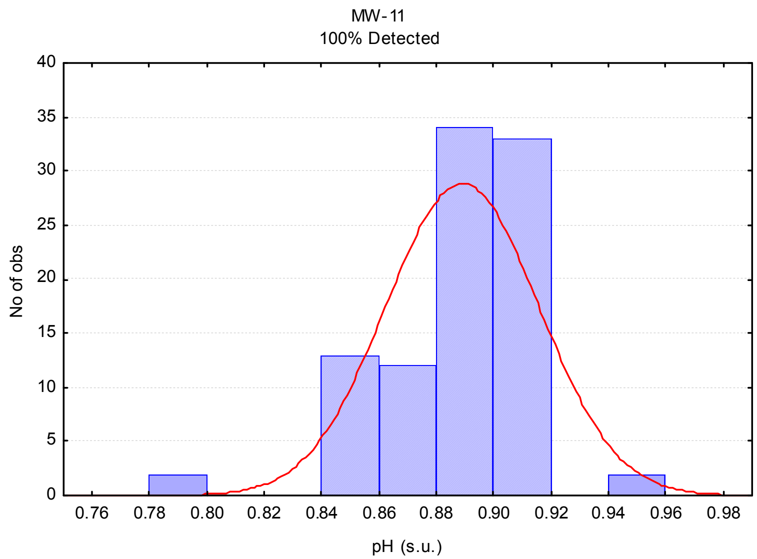
Log-Transformed pH Histograms for 0 to 50% Non-Detects

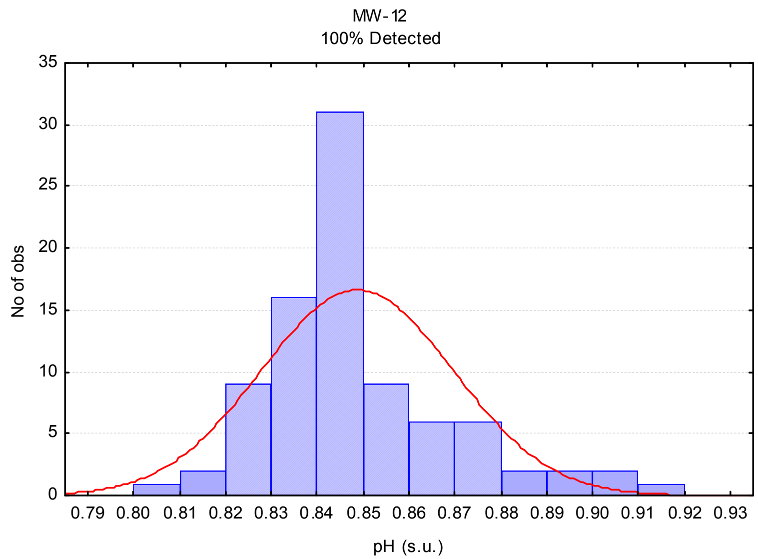


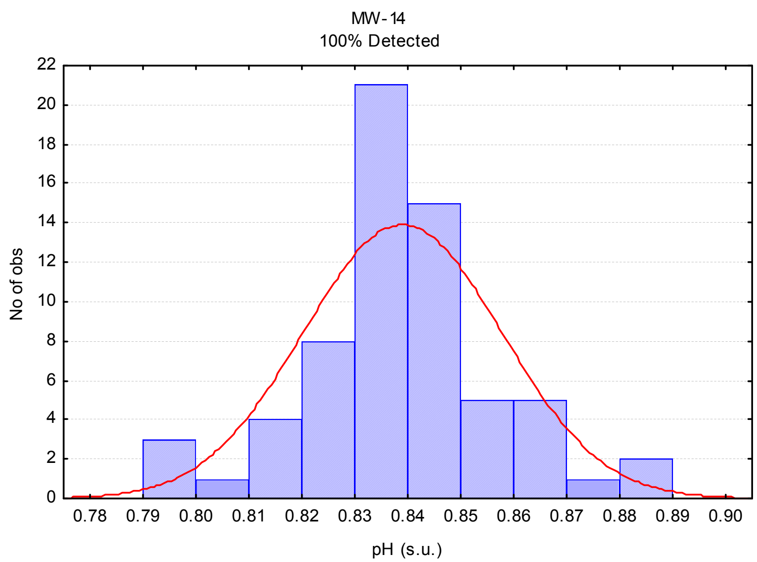
pH Histograms for 0 to 50% Non-Detects

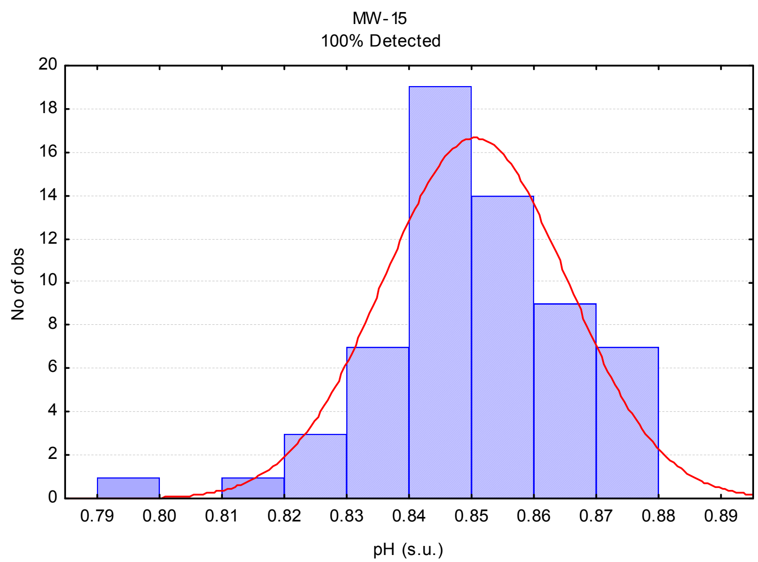


Log-Transformed pH Histograms for 0 to 50% Non-Detects

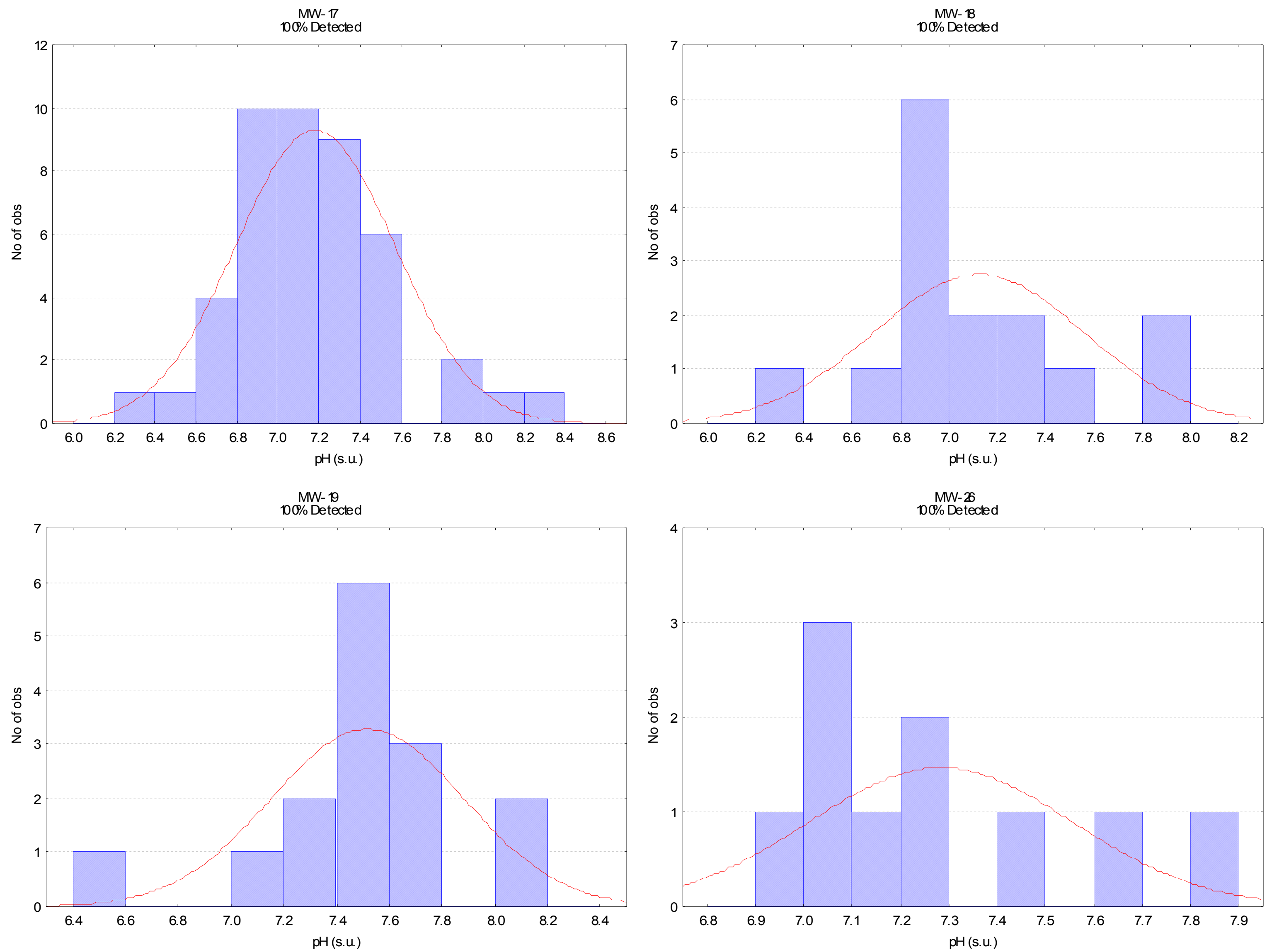




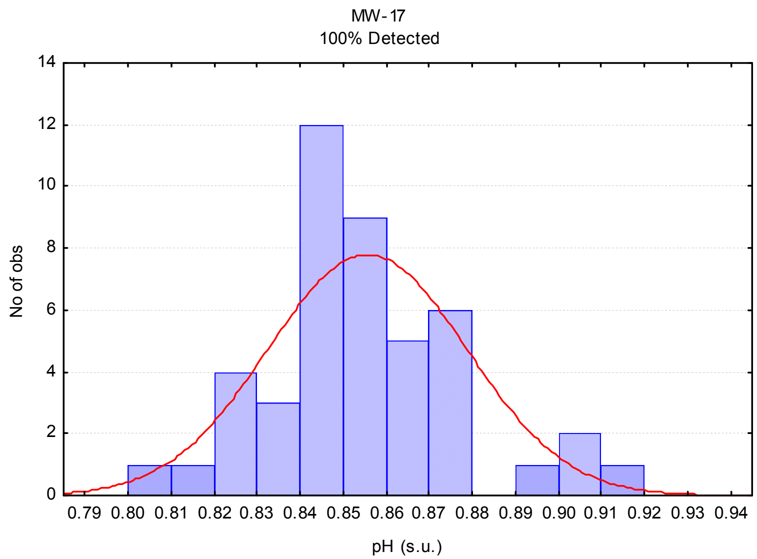


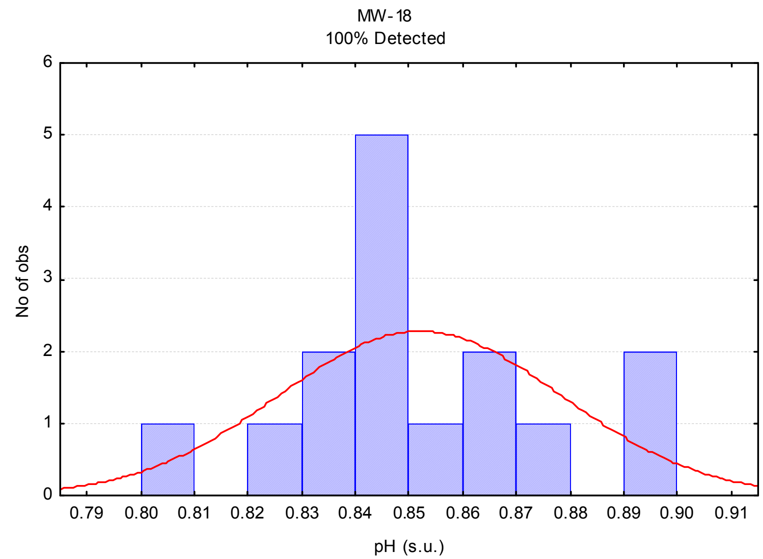


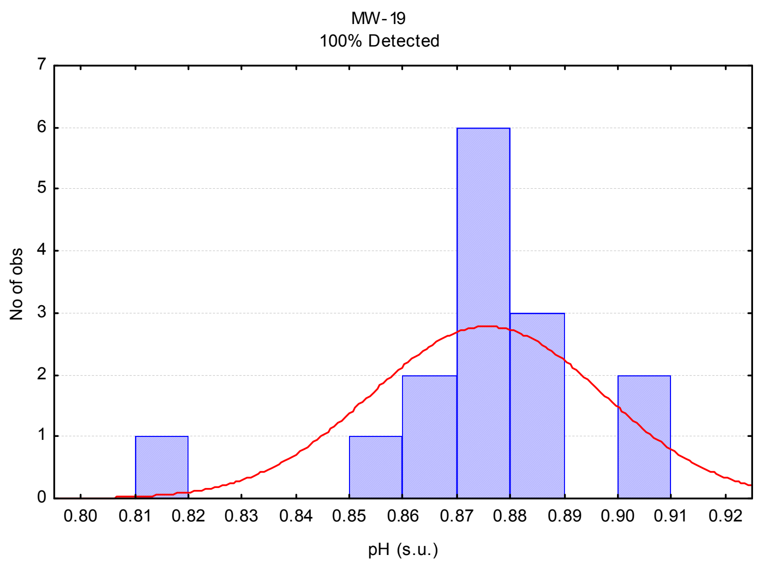
pH Histograms for 0 to 50% Non-Detects

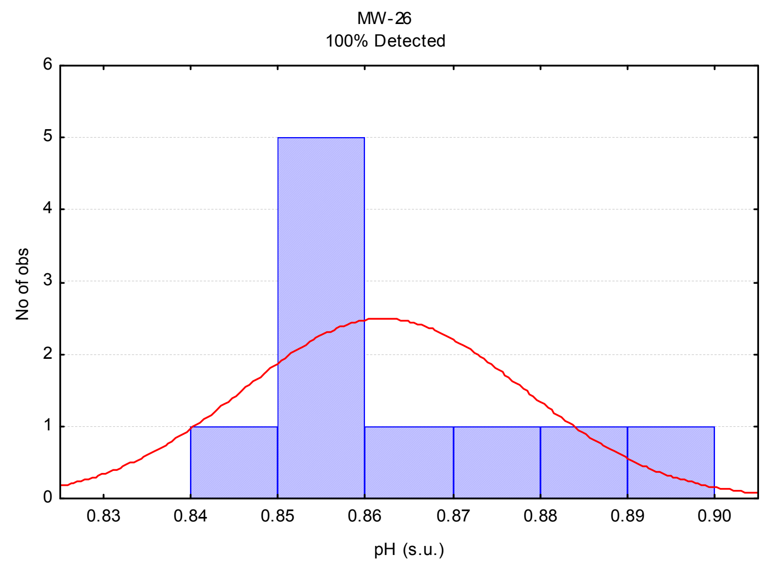


Log-Transformed pH Histograms for 0 to 50% Non-Detects

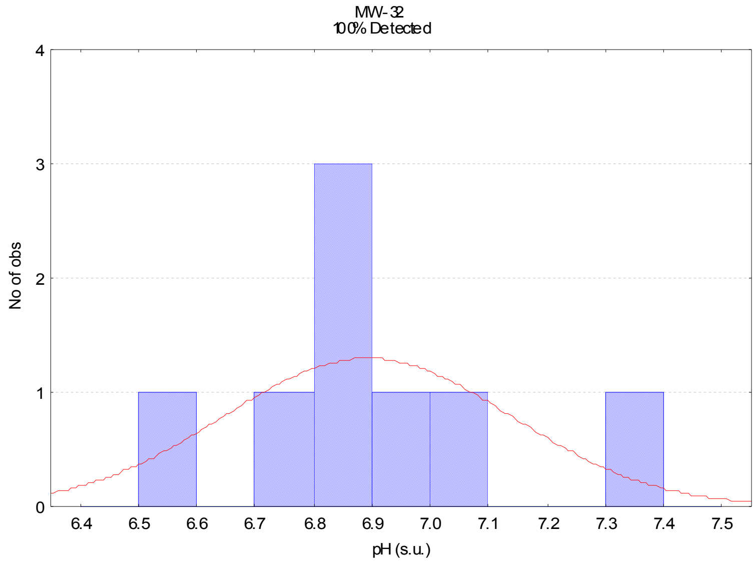




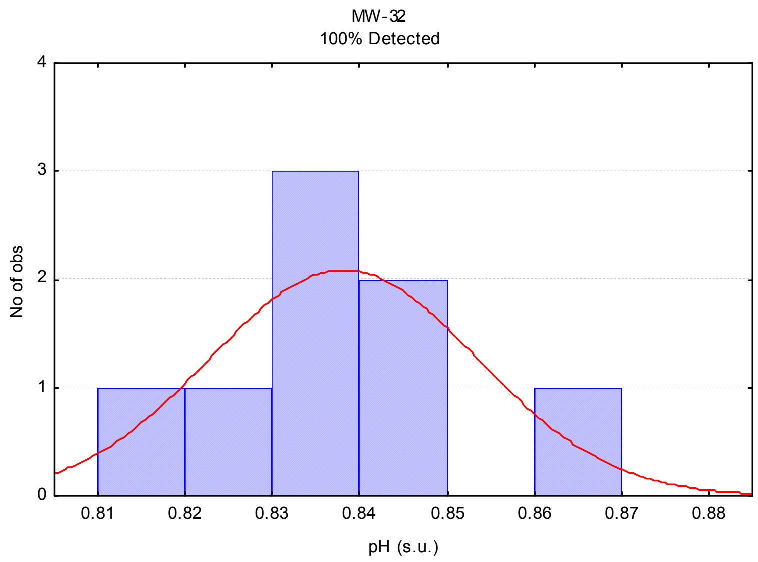




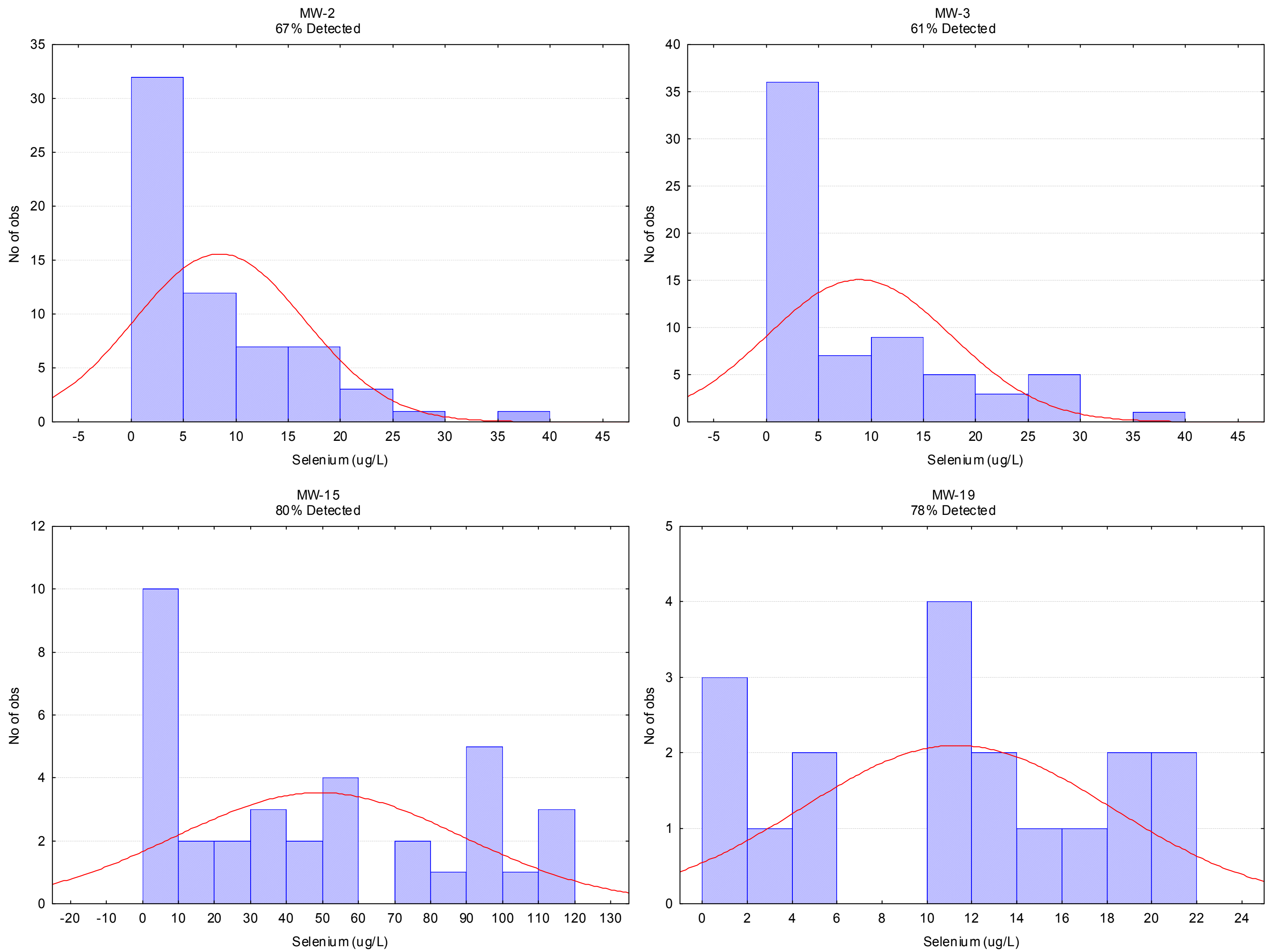
pH Histograms for 0 to 50% Non-Detects



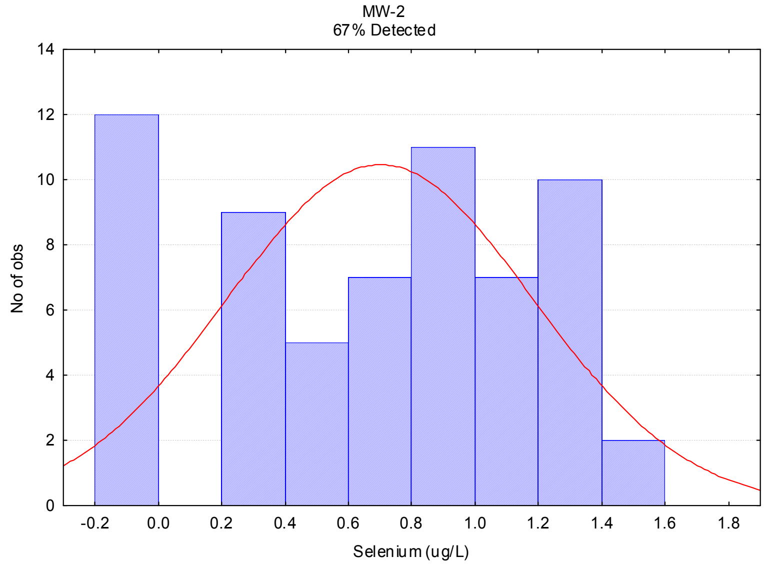
Log-Transformed pH Histograms for 0 to 50% Non-Detects

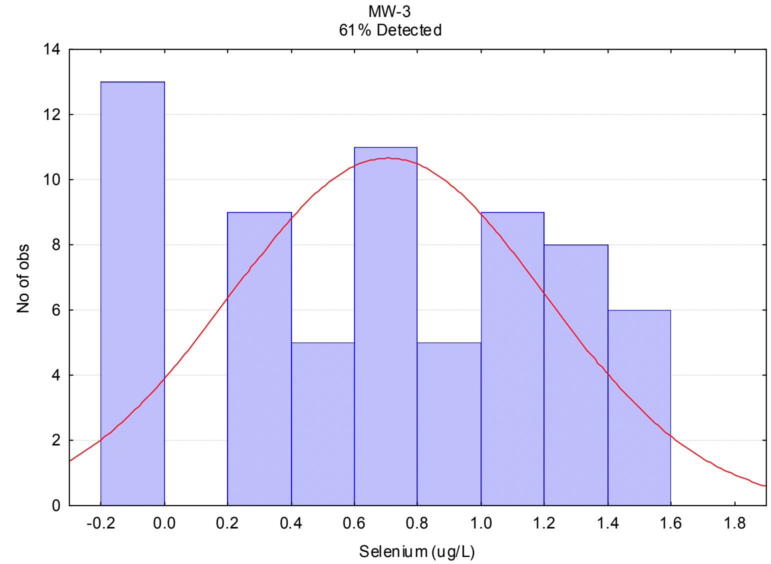


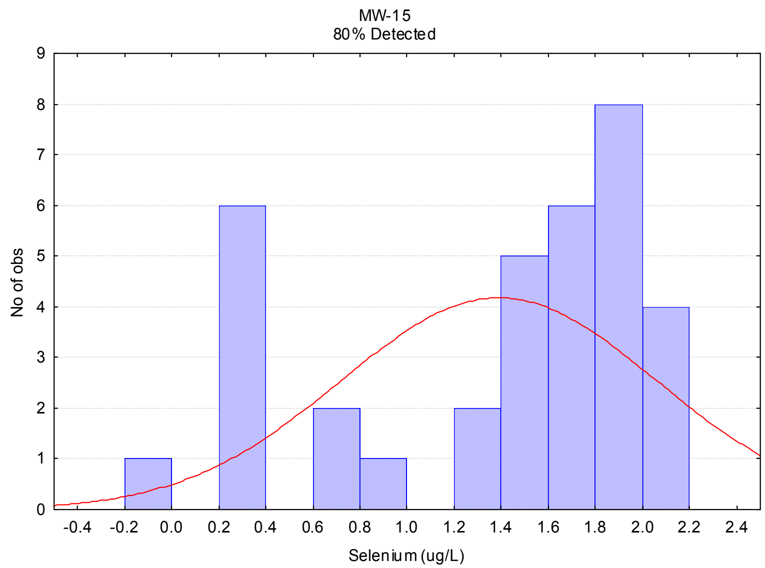
Selenium Histograms for 0 to 50% Non-Detects

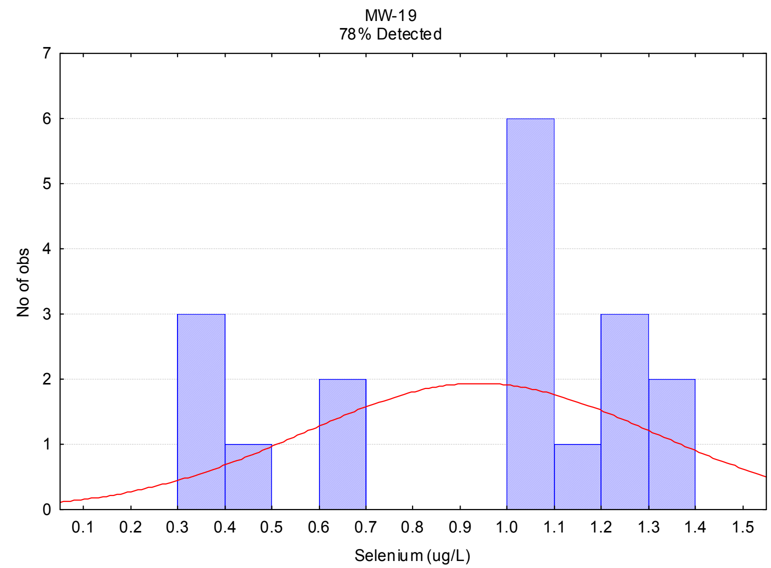


Log-Transformed Selenium Histograms for 0 to 50% Non-Detects

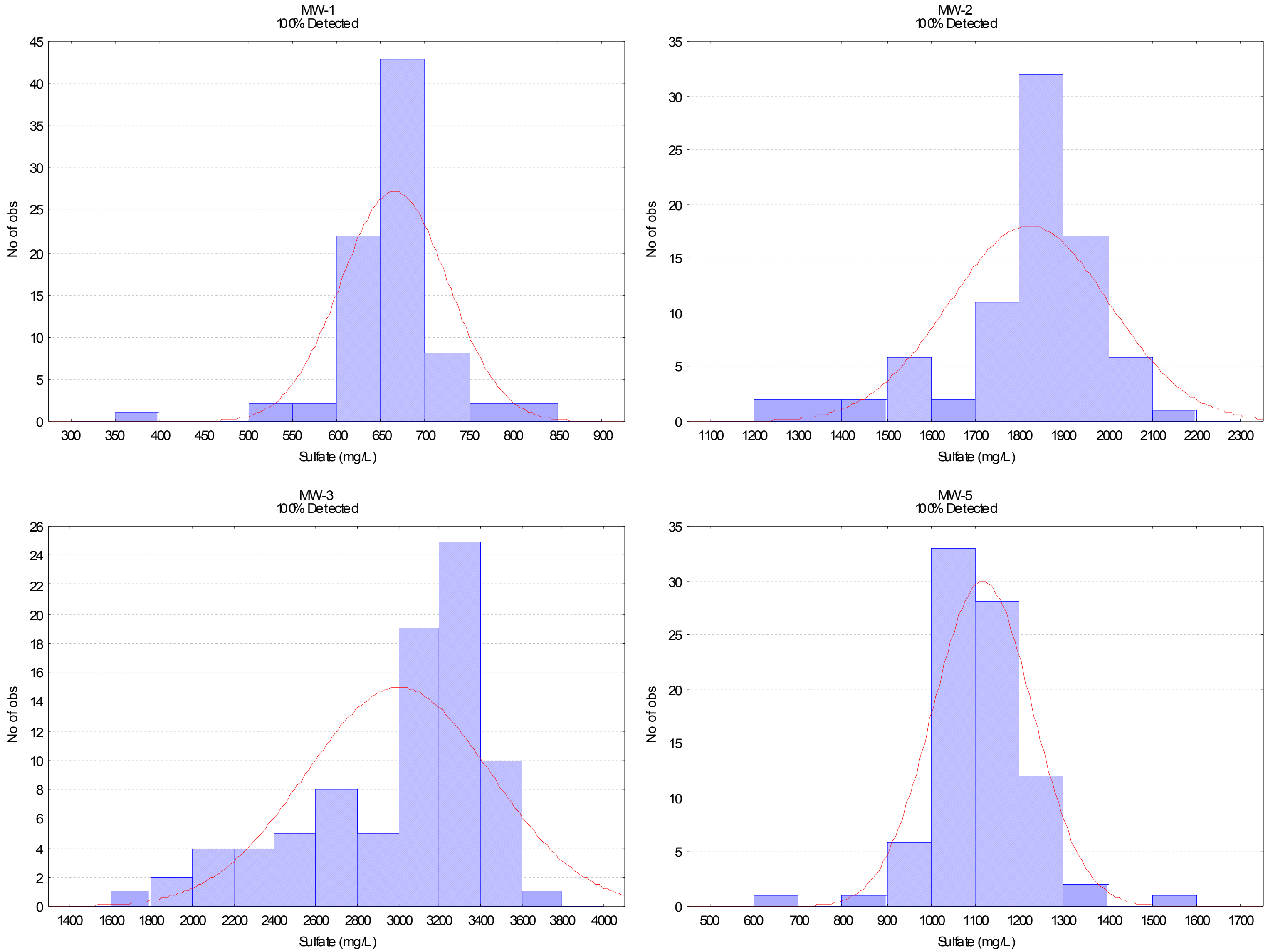




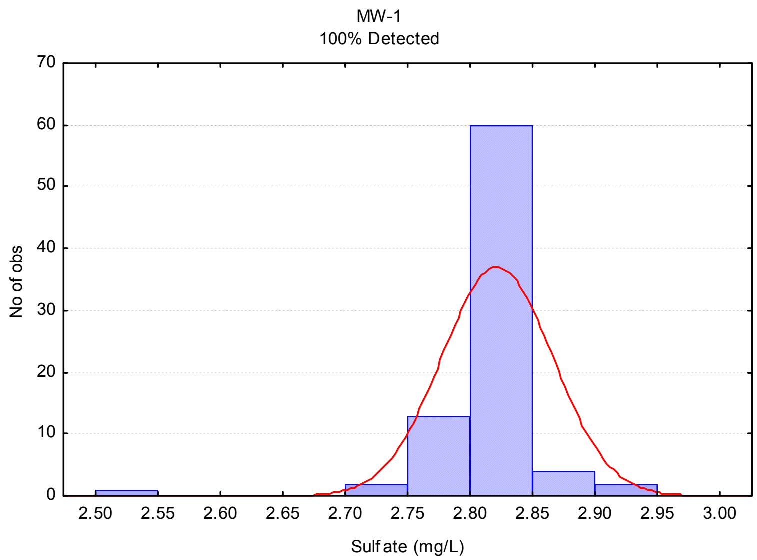


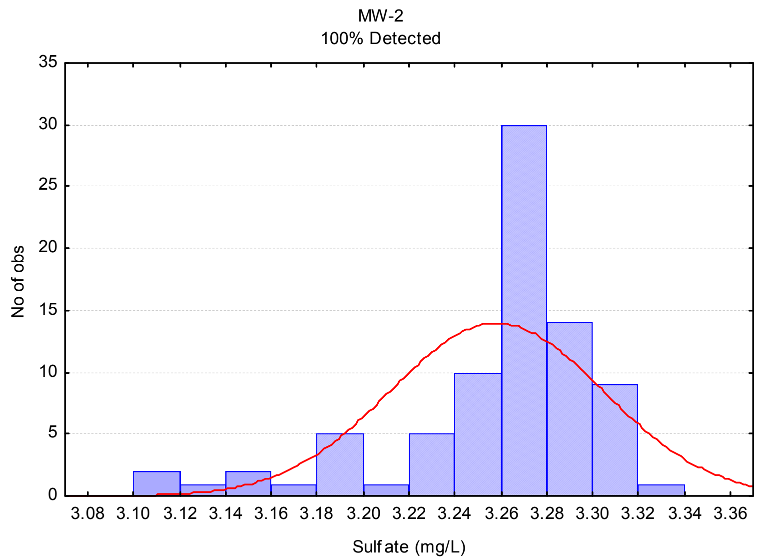


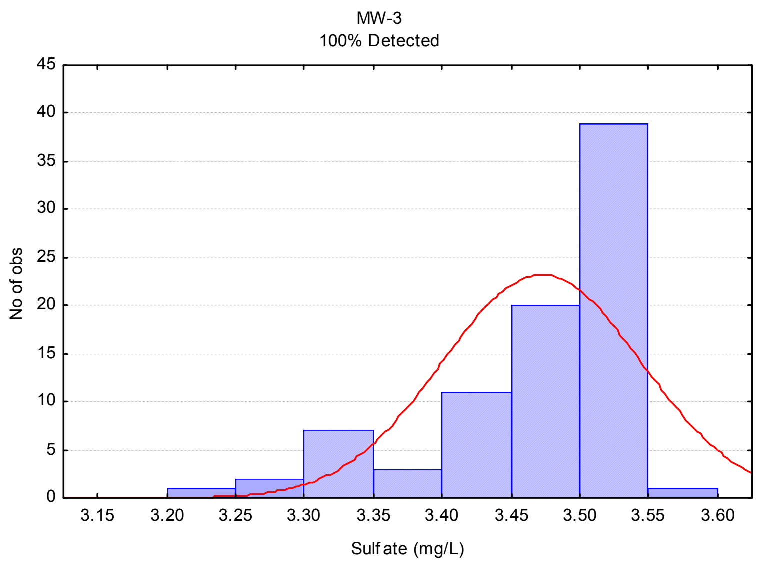
Sulfate Histograms for 0 to 50% Non-Detects

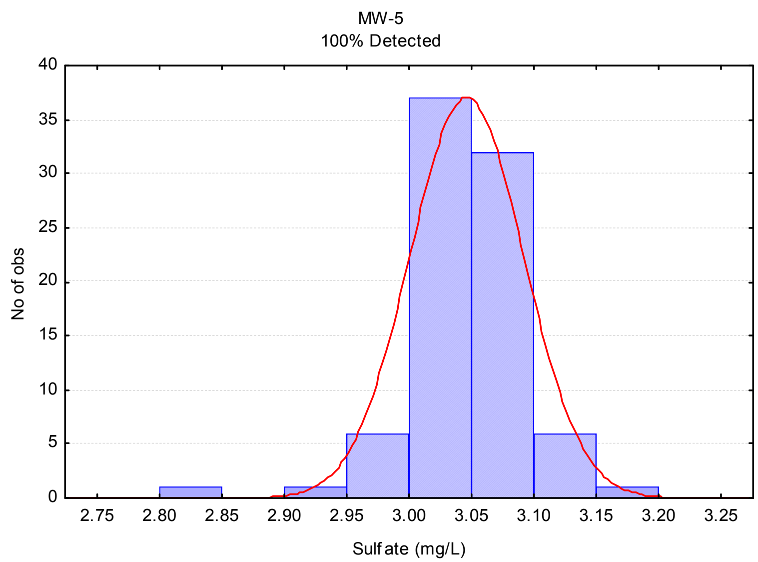


Log-Transformed Sulfate Histograms for 0 to 50% Non-Detects

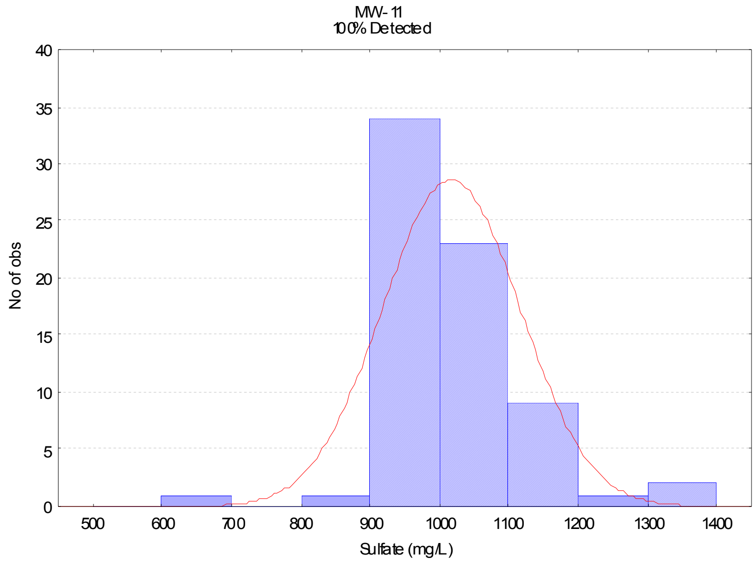


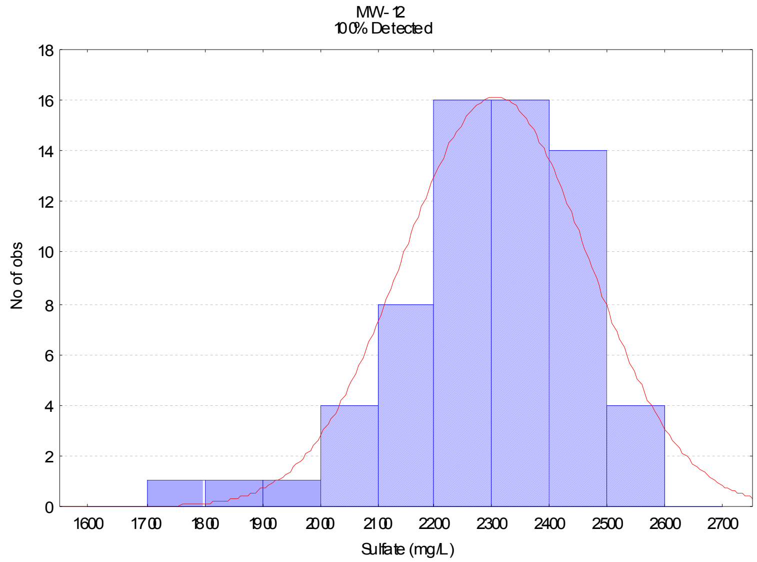


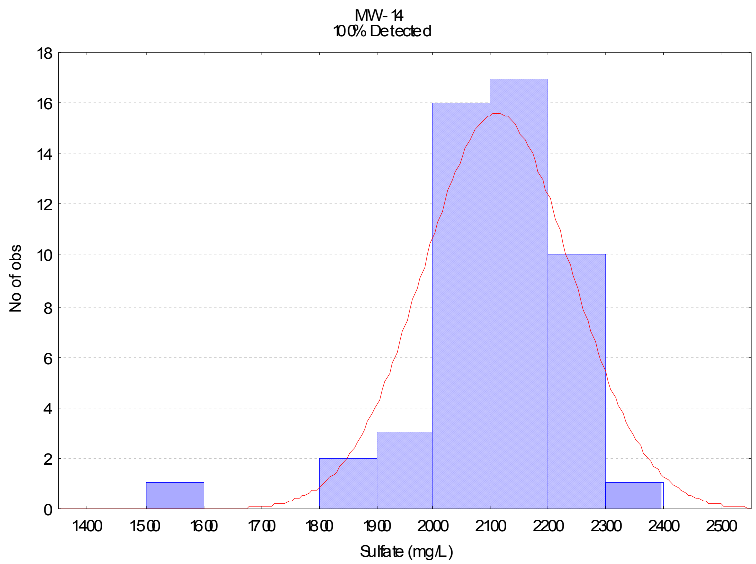


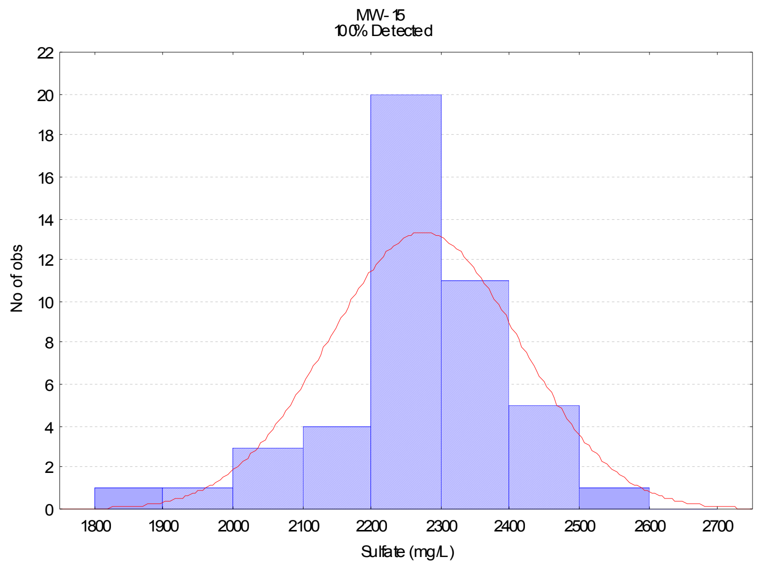


Sulfate Histograms for 0 to 50% Non-Detects

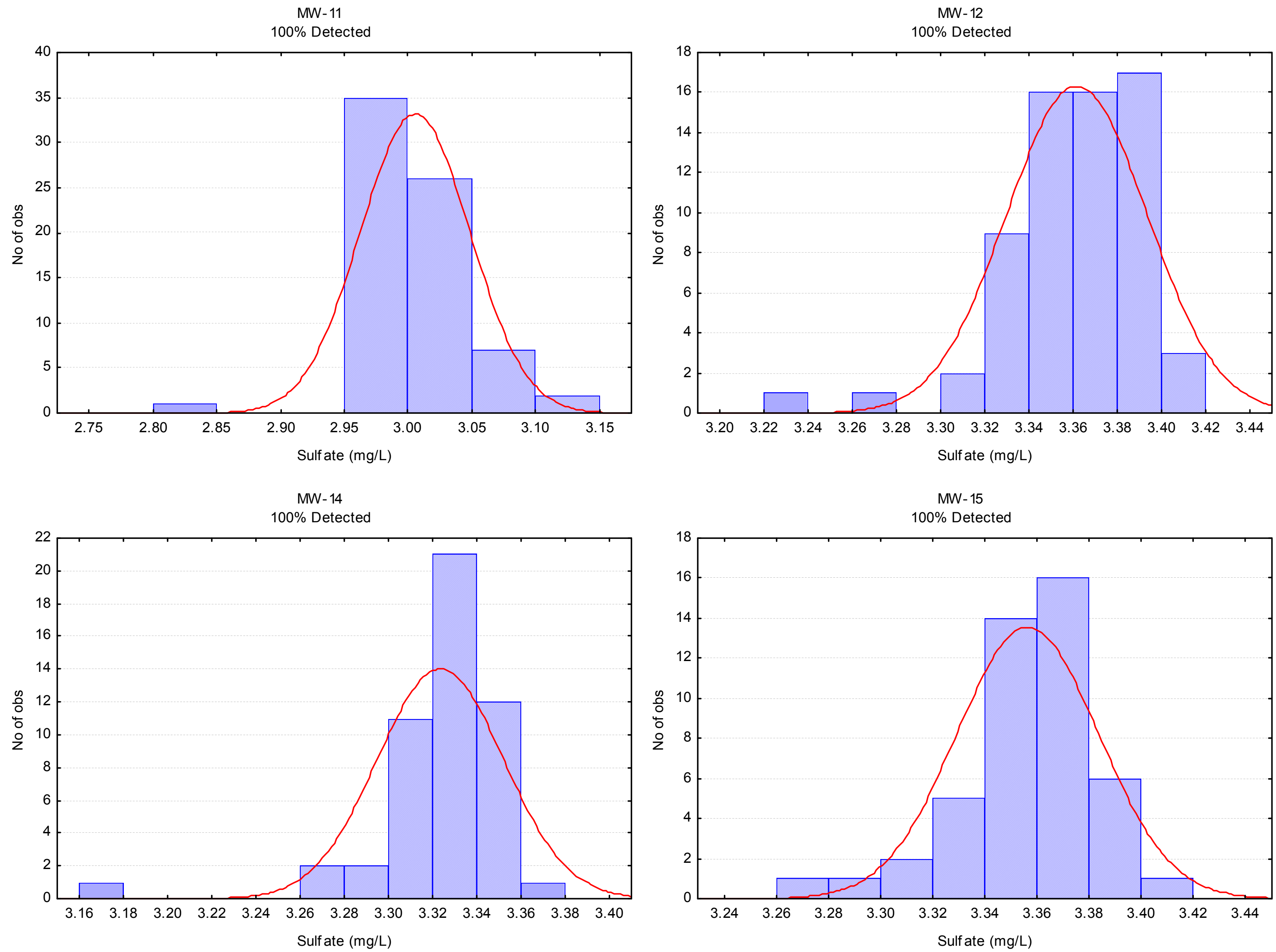




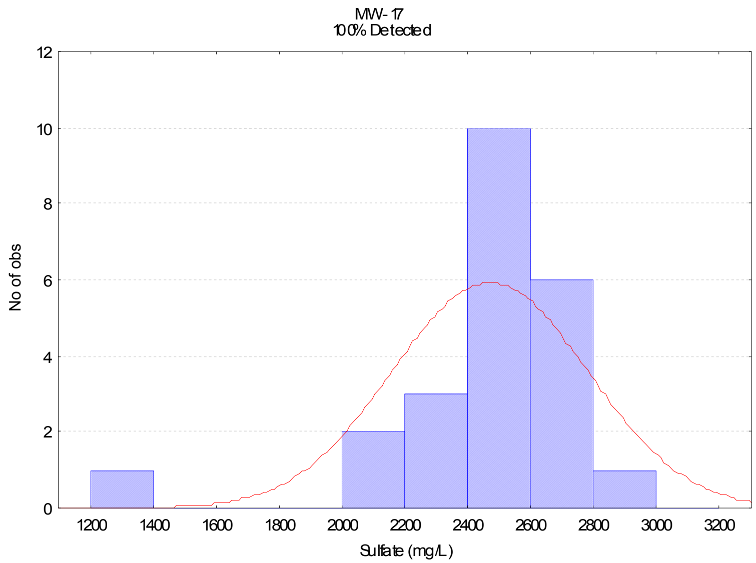


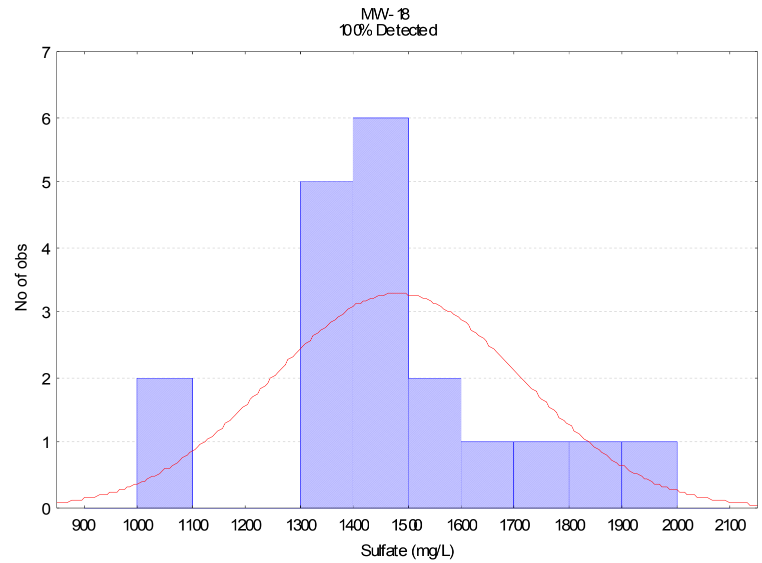


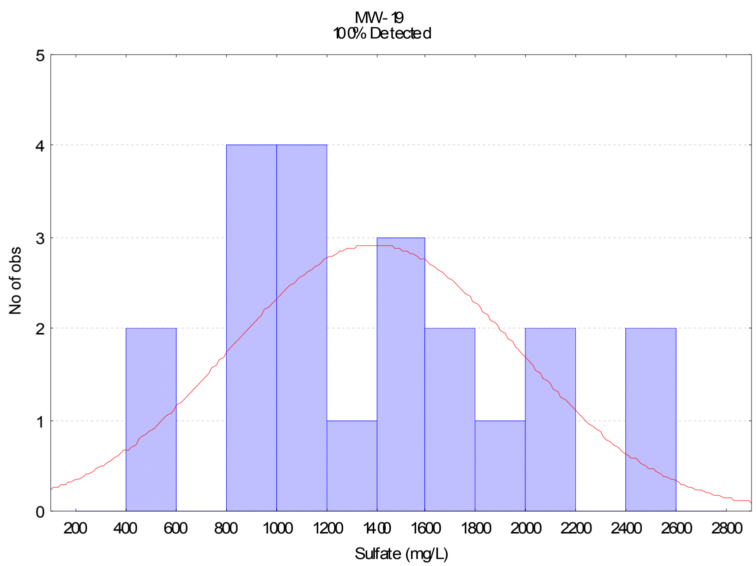
Log-Transformed Sulfate Histograms for 0 to 50% Non-Detects

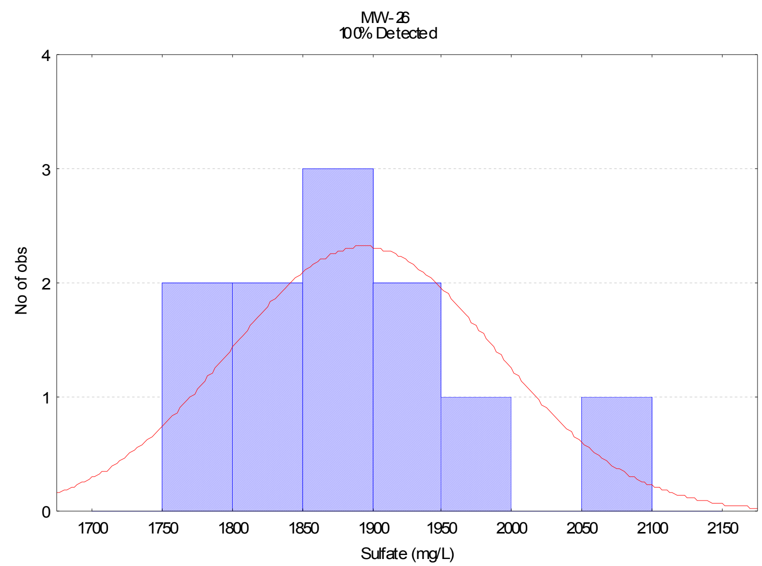


Sulfate Histograms for 0 to 50% Non-Detects

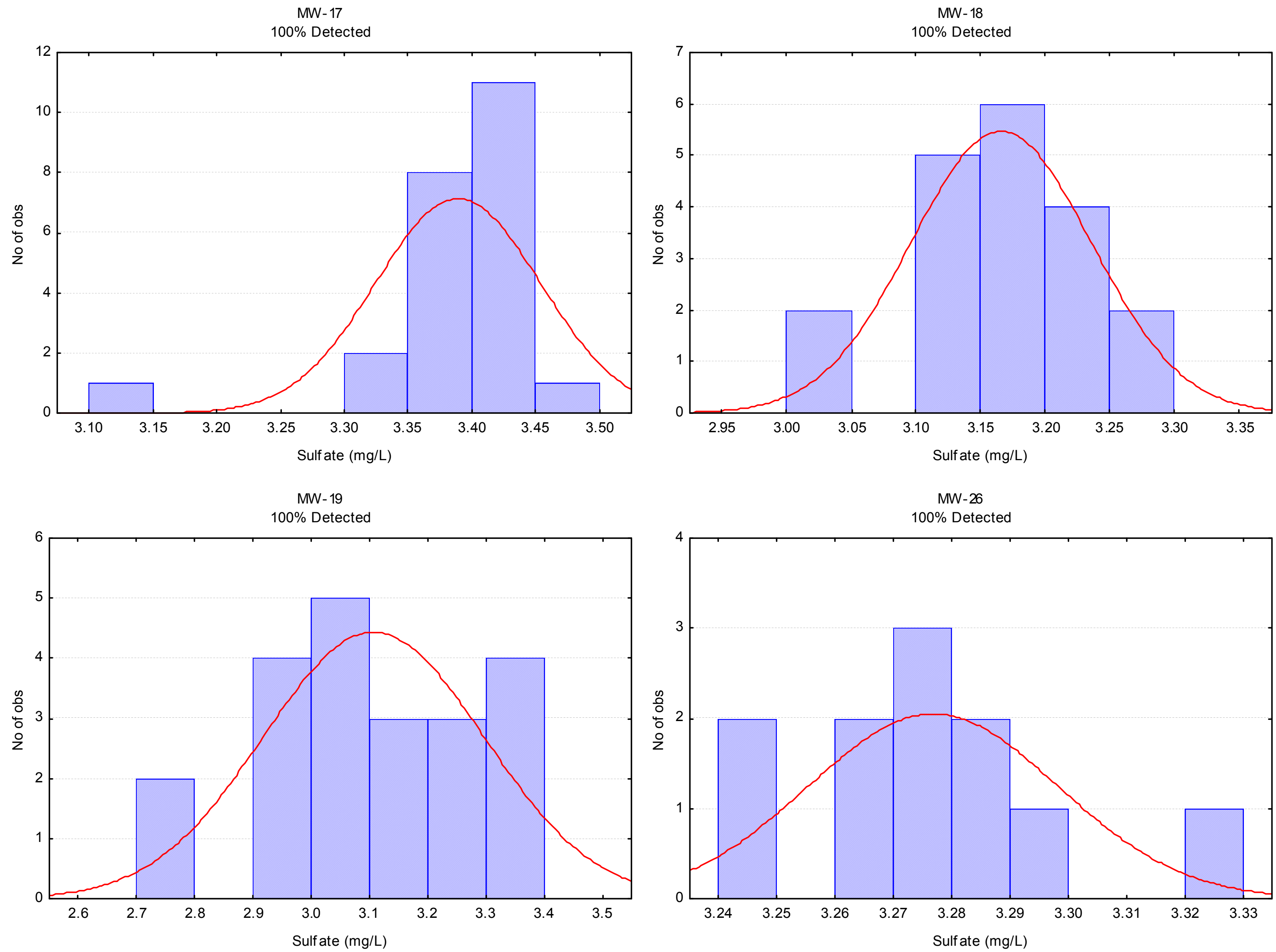




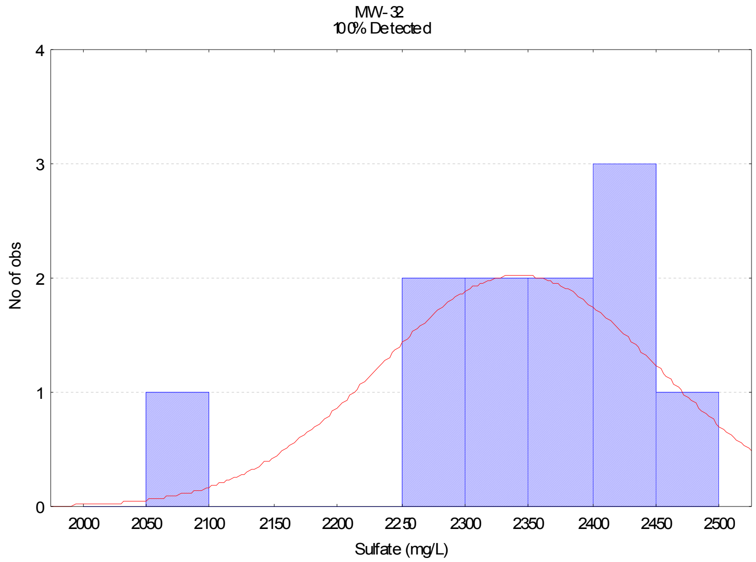




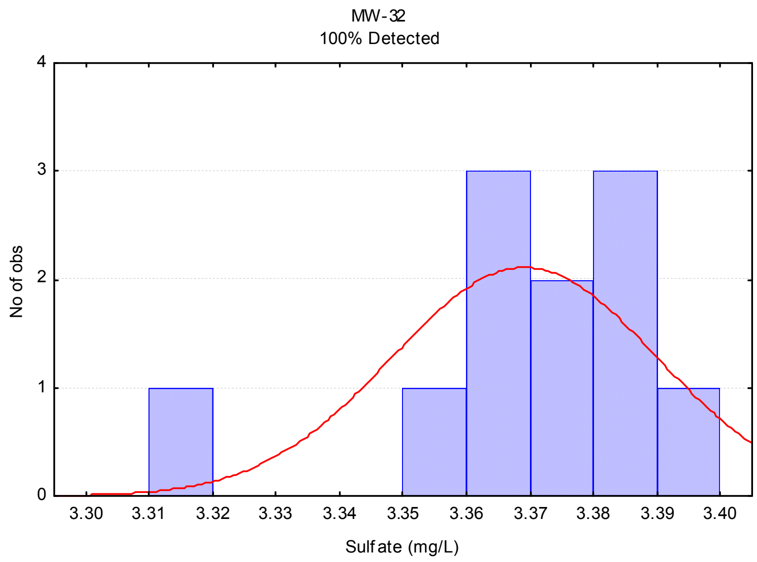
Log-Transformed Sulfate Histograms for 0 to 50% Non-Detects



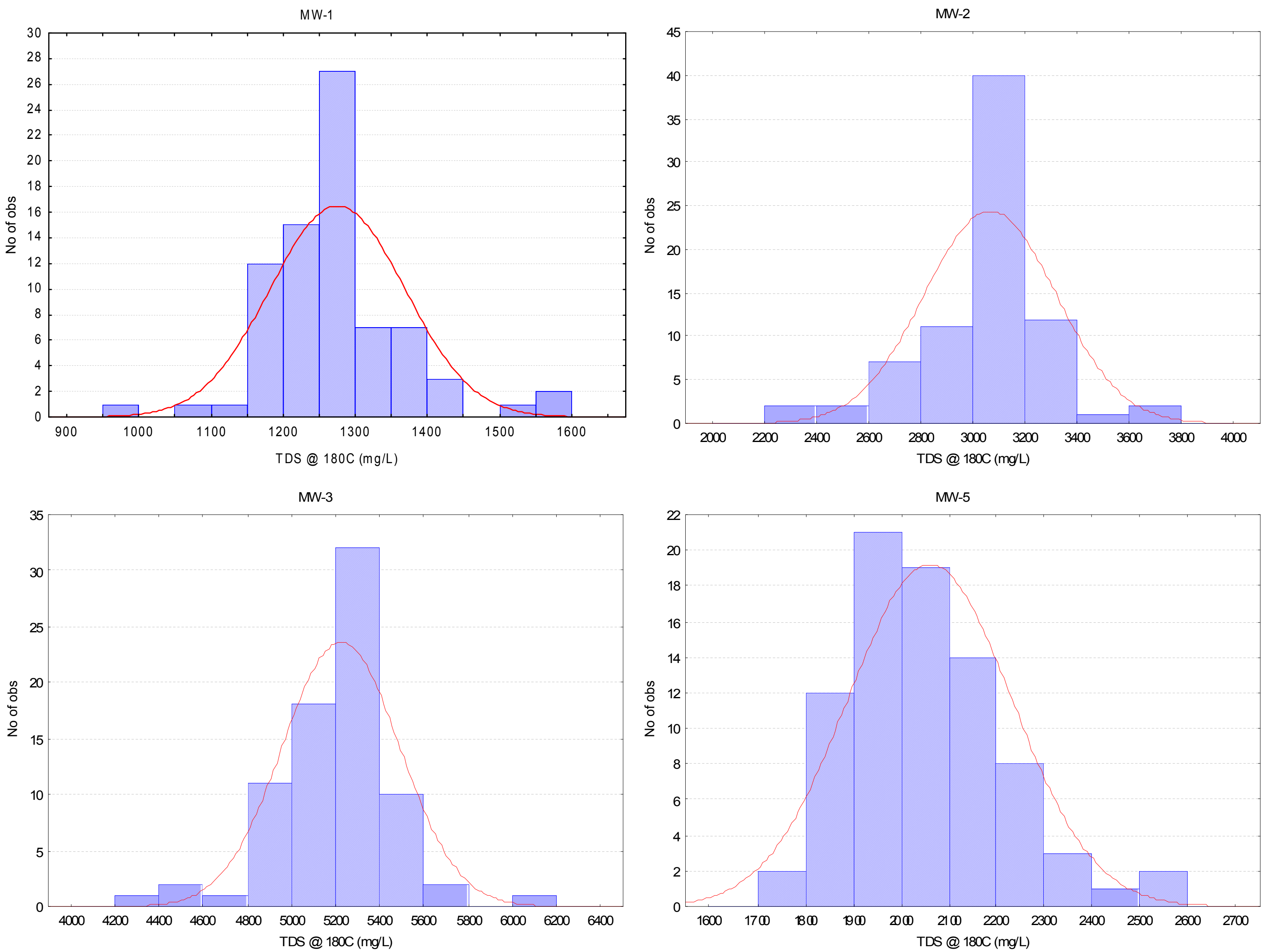
Sulfate Histograms for 0 to 50% Non-Detects



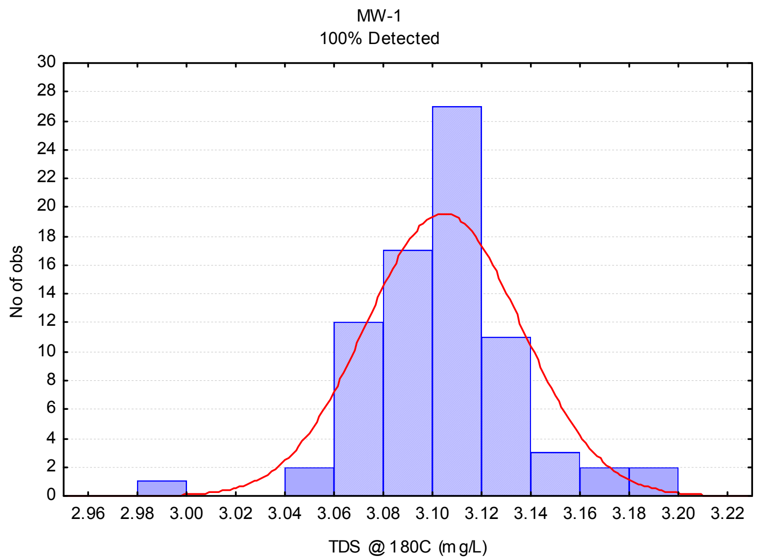
Log-Transformed Sulfate Histograms for 0 to 50% Non-Detects

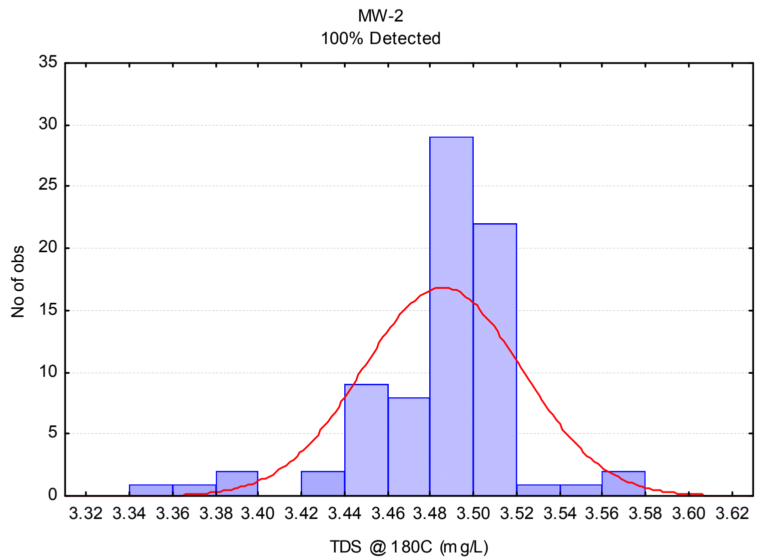


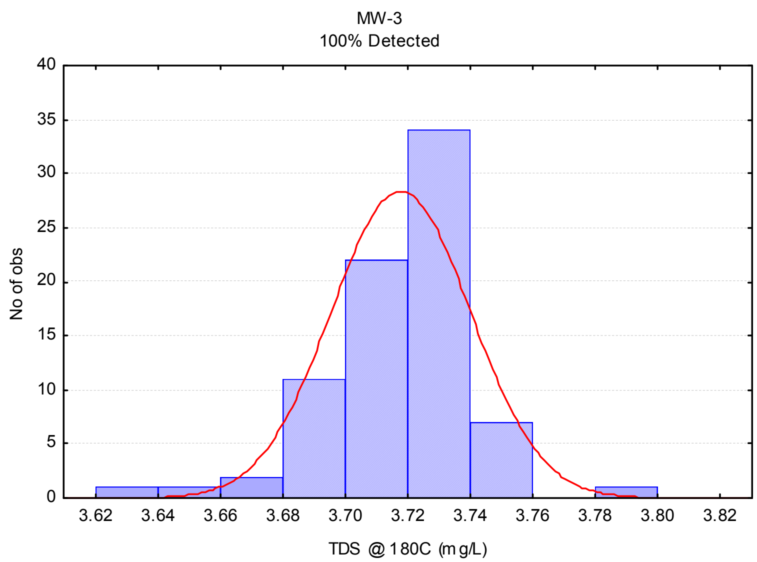
TDS @ 180C Histograms for 0 to 50% Non-Detects

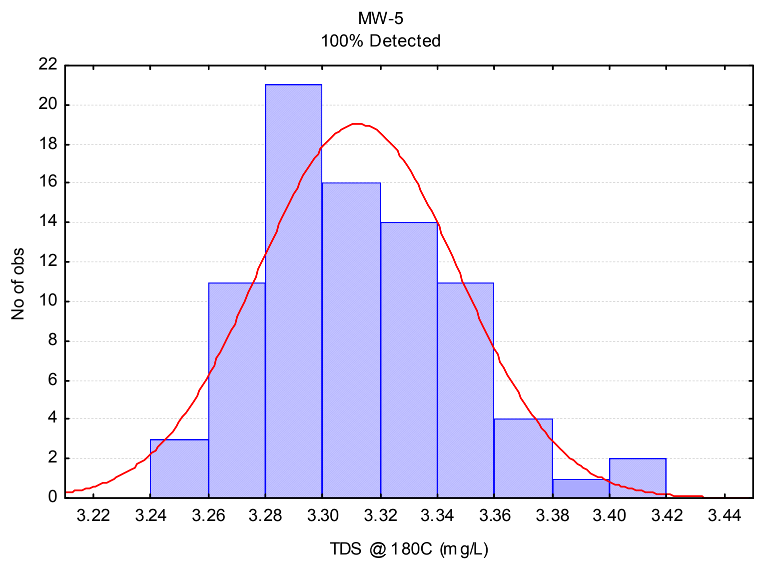


Log-Transformed TDS @180 C Histograms for 0 to 50% Non-Detects

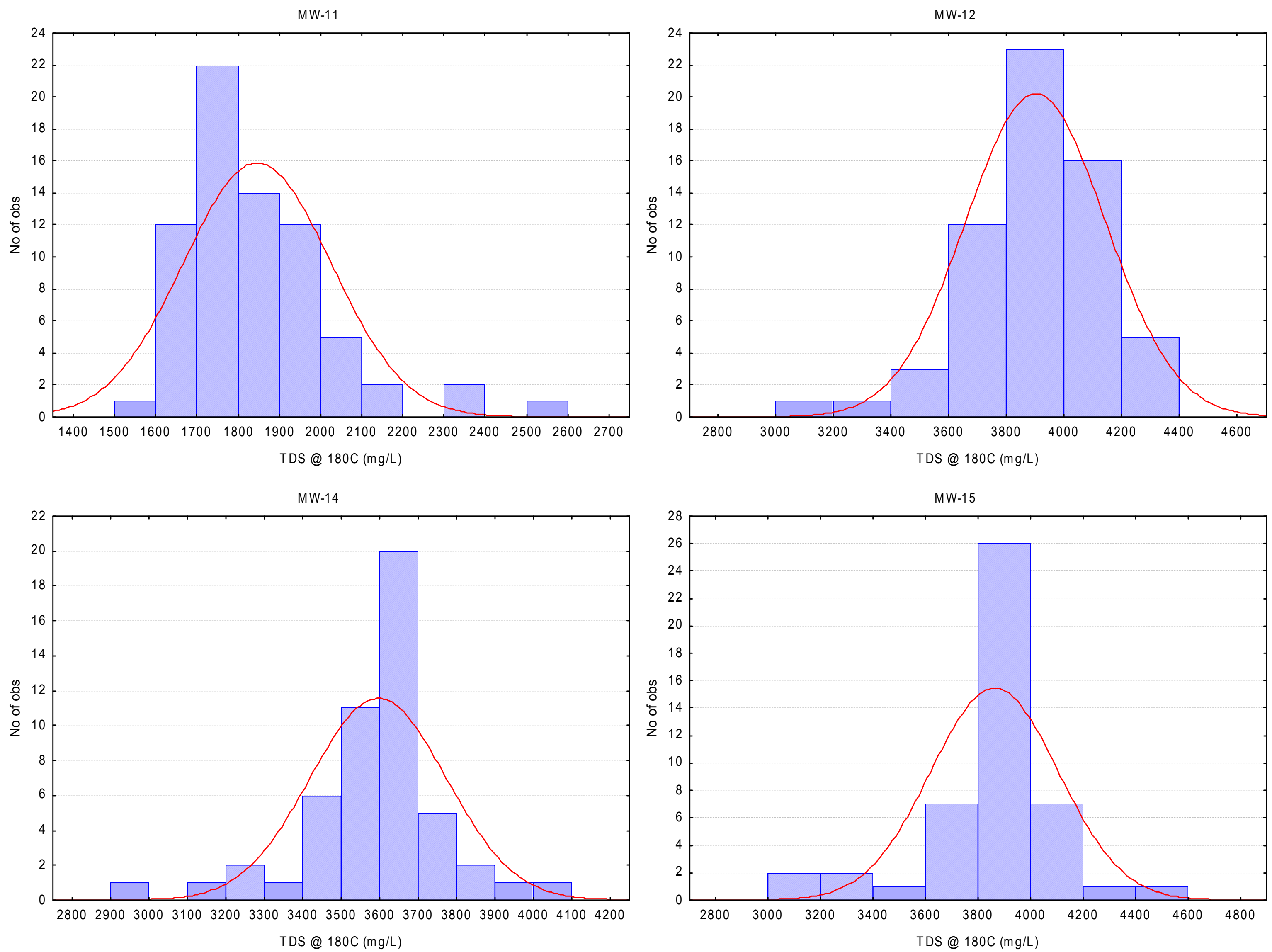




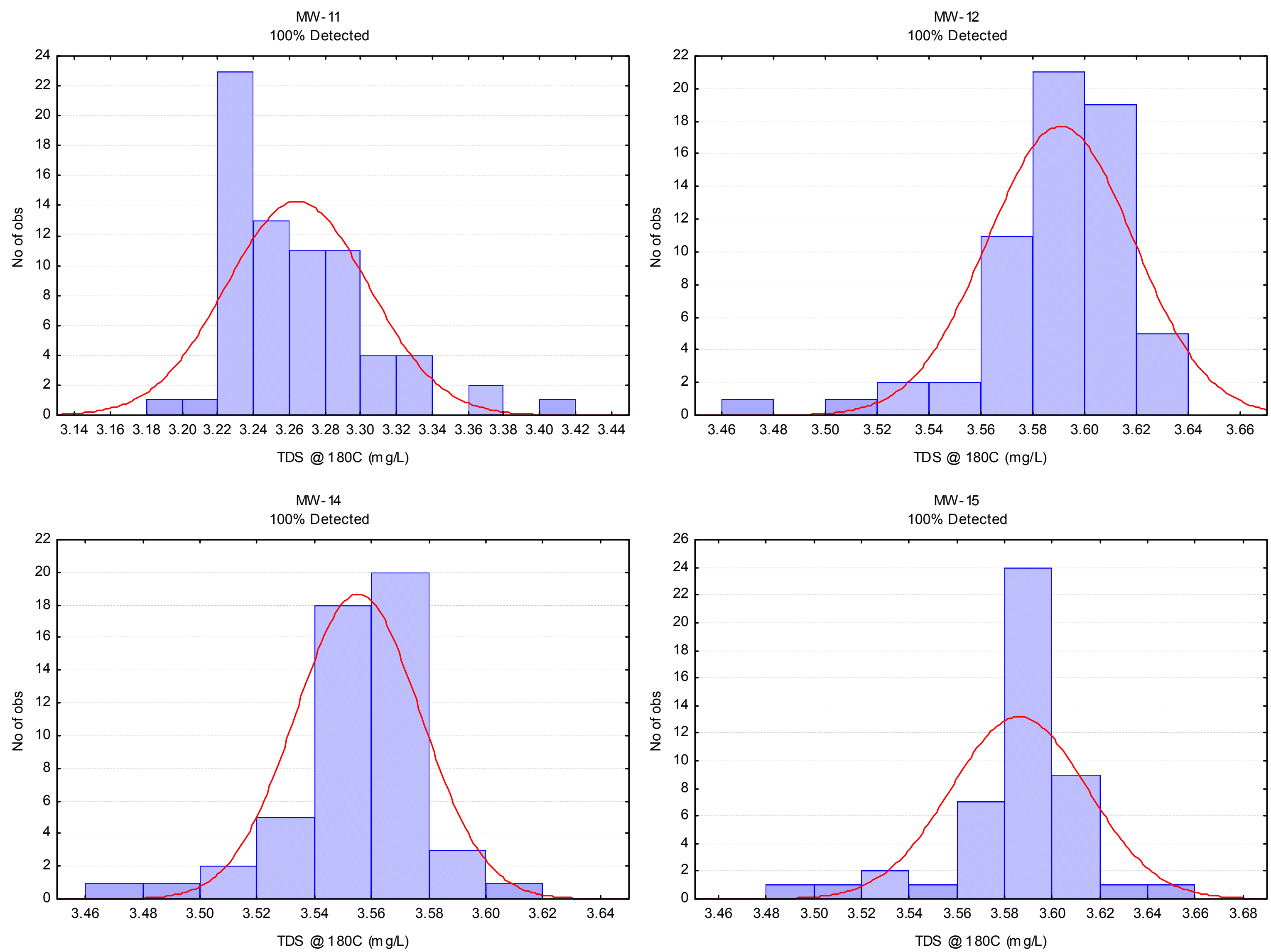




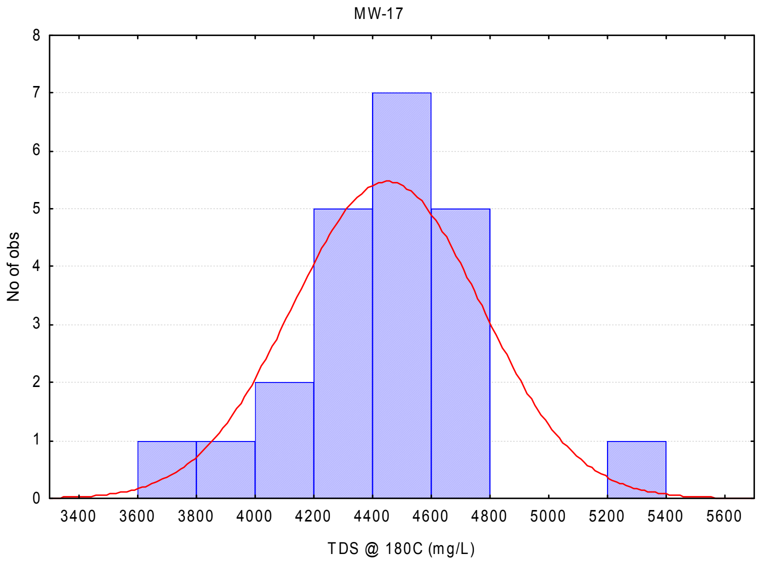
TDS @ 180C Histograms for 0 to 50% Non-Detects

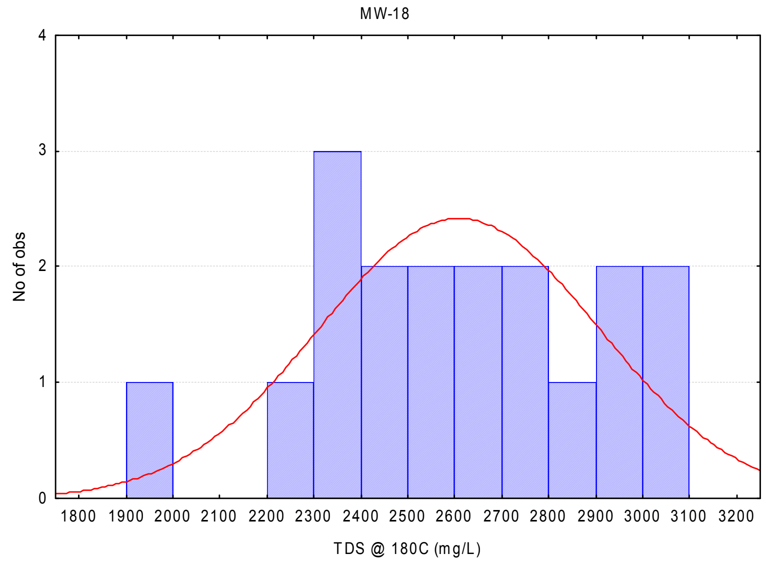


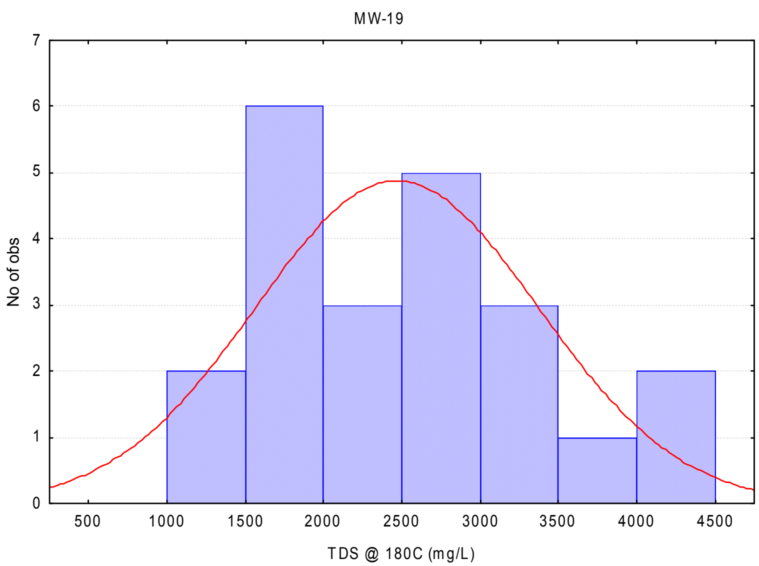
Log-Transformed TDS @180 C Histograms for 0 to 50% Non-Detects

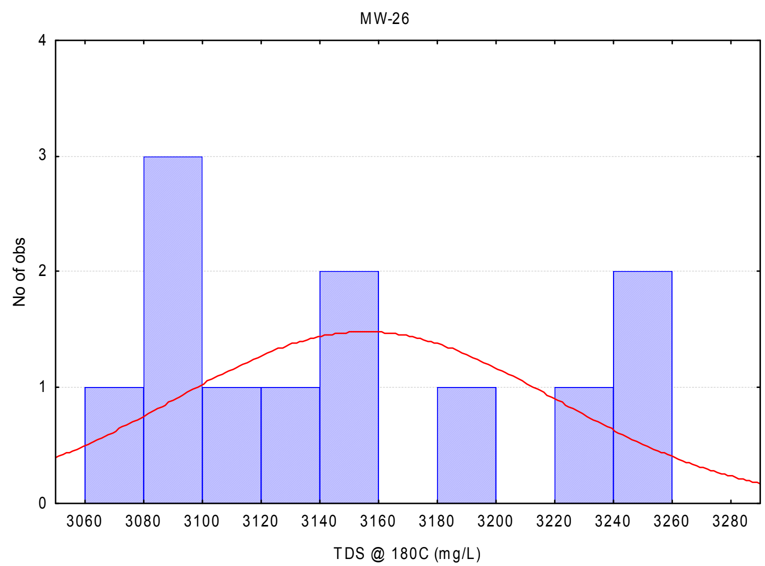


TDS @ 180C Histograms for 0 to 50% Non-Detects

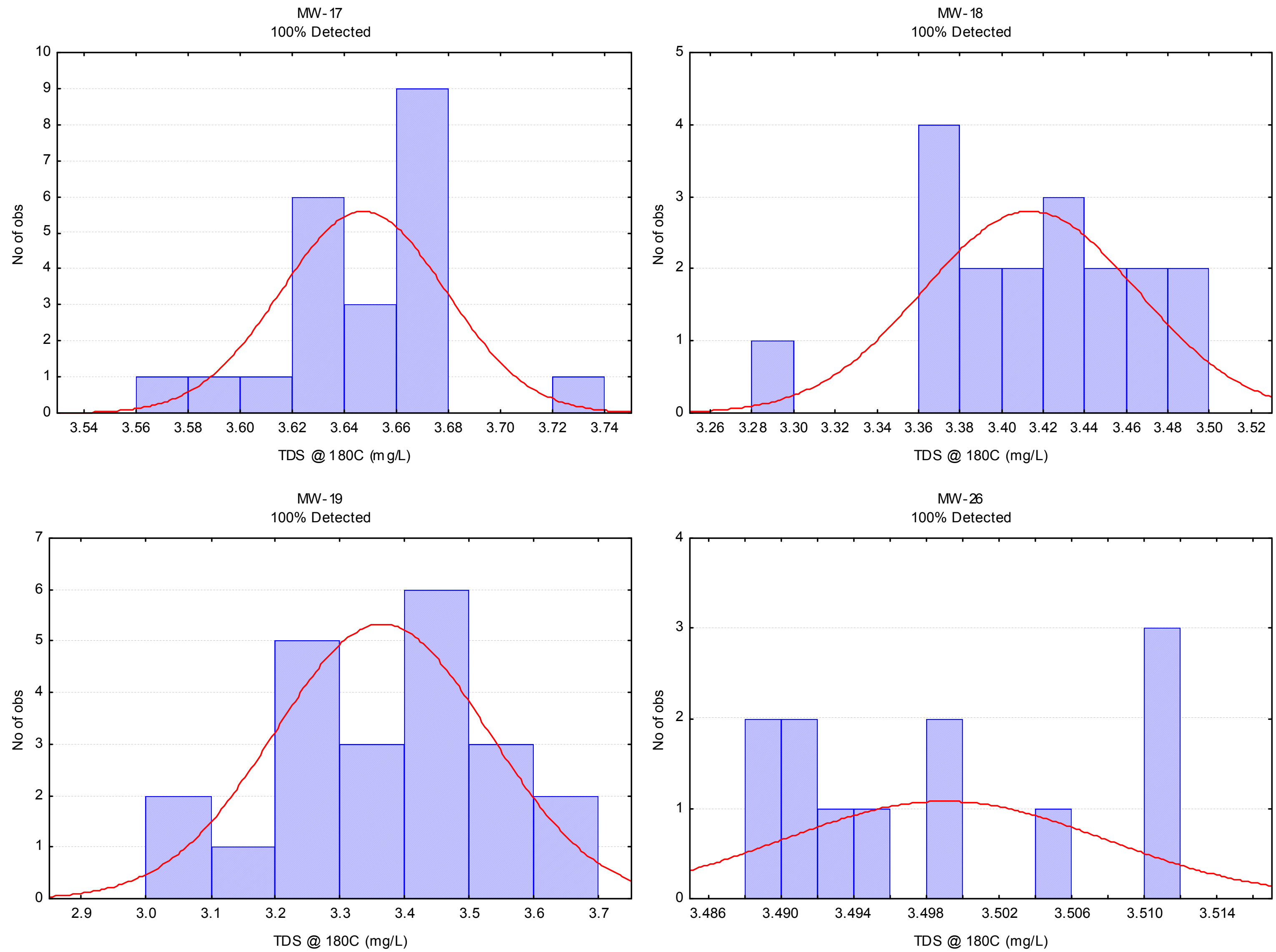




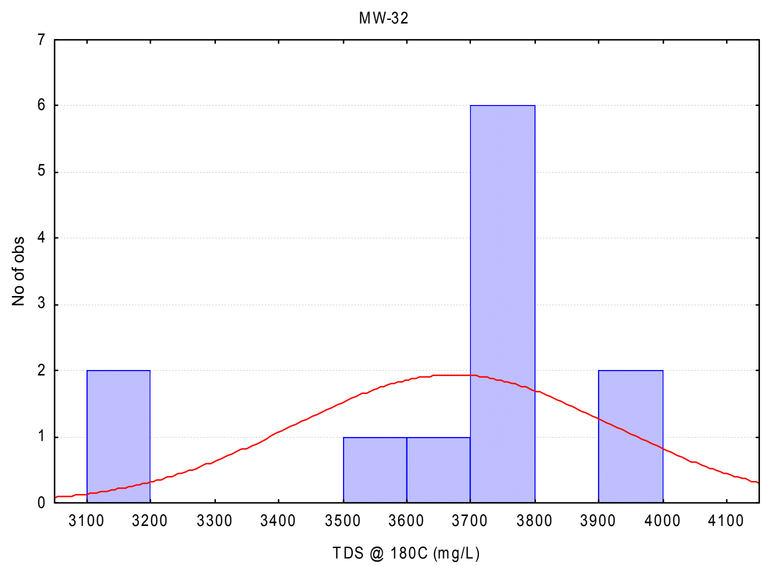




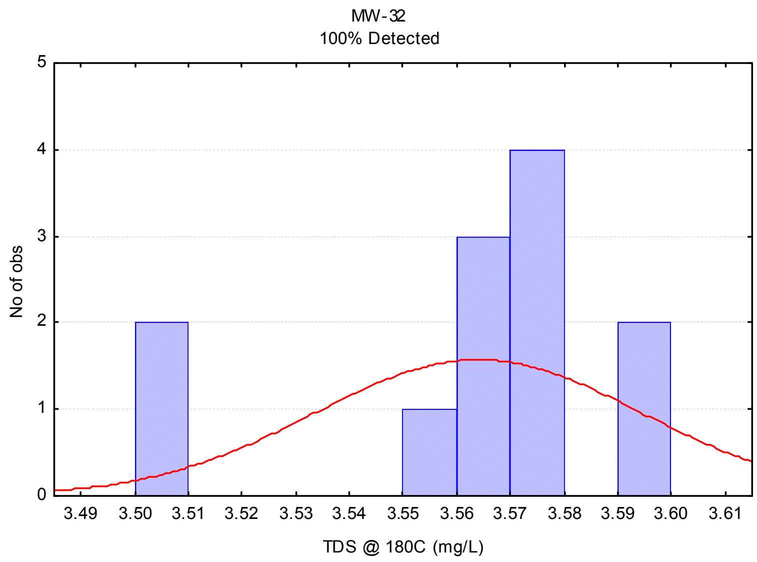
Log-Transformed TDS @180 C Histograms for 0 to 50% Non-Detects



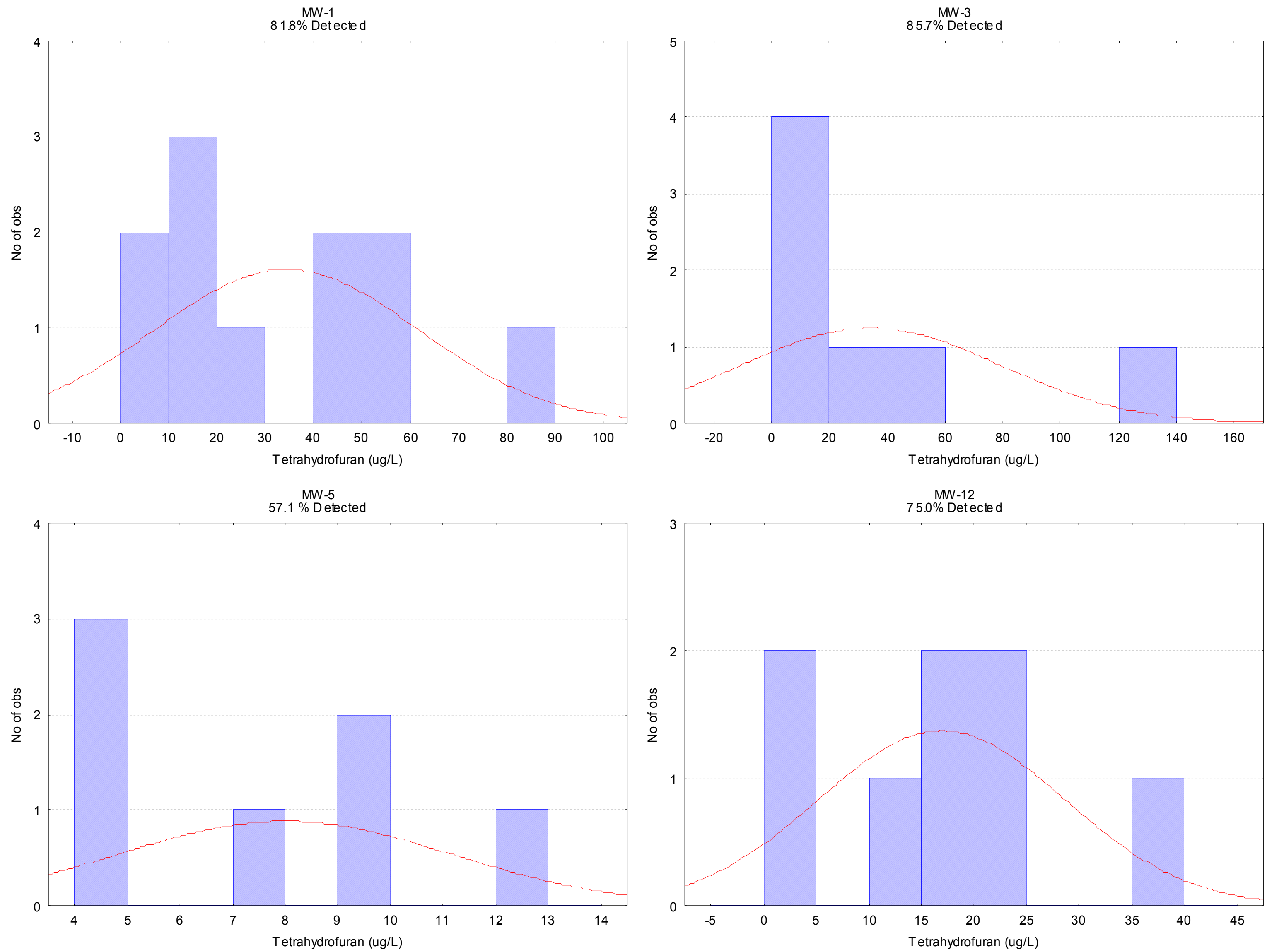
TDS @ 180C Histograms for 0 to 50% Non-Detects



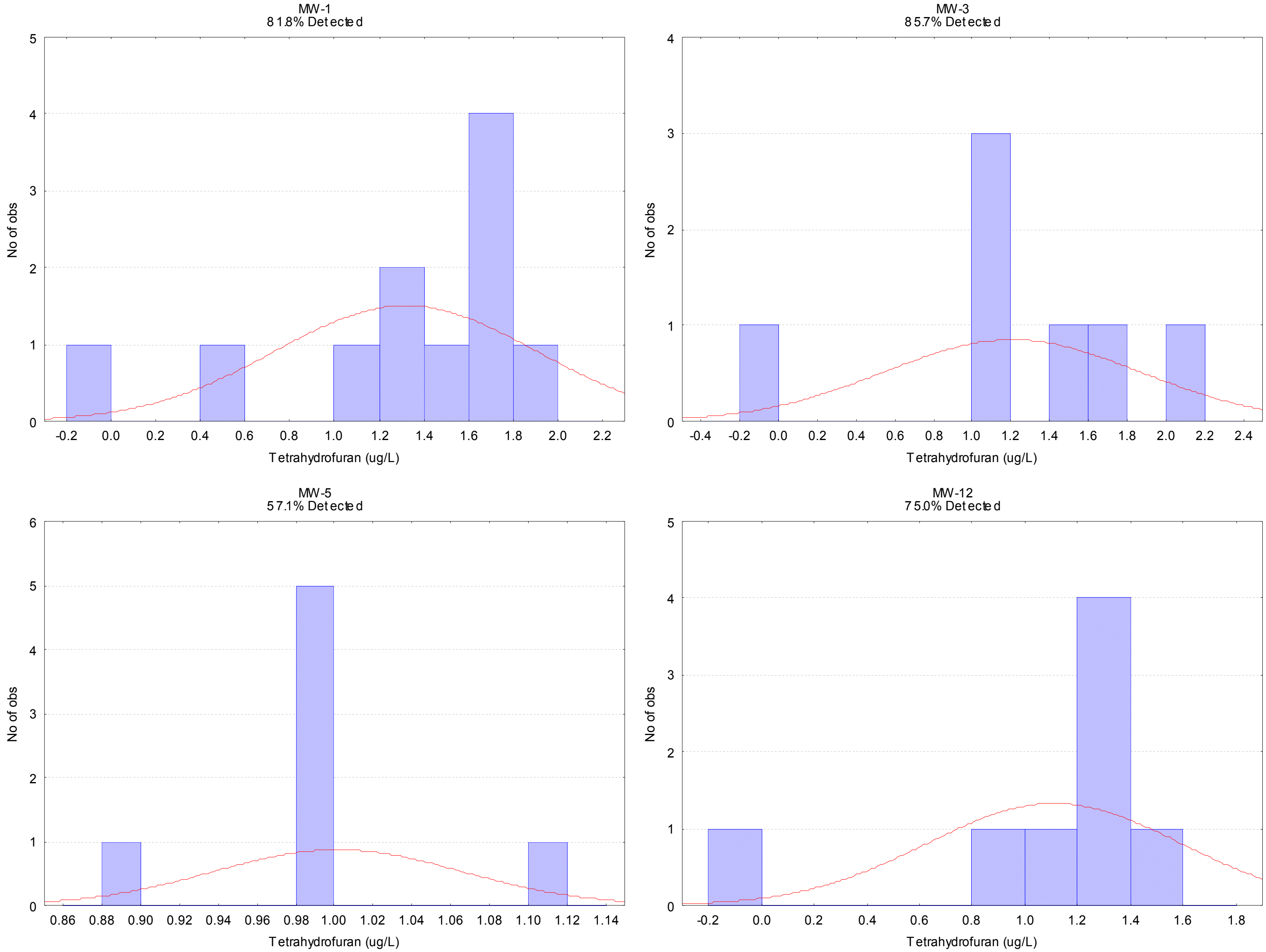
Log-Transformed TDS @180 C Histograms for 0 to 50% Non-Detects



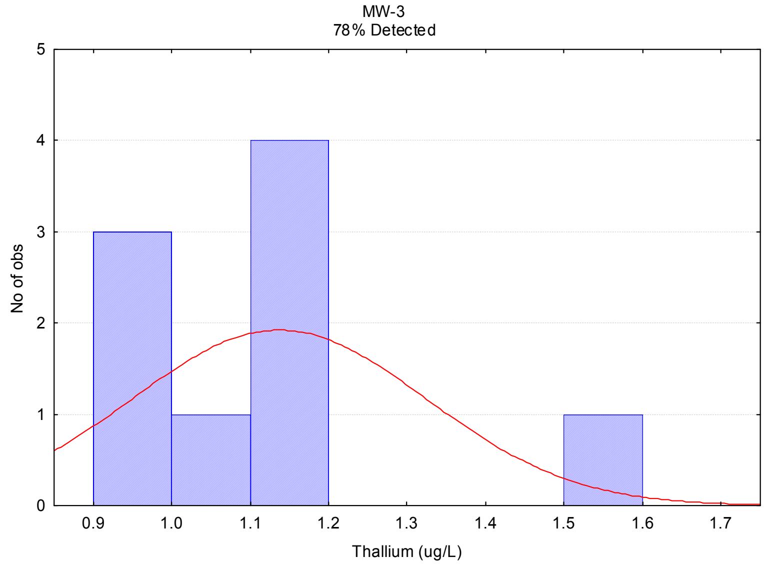
Tetrahydrofuran Histograms for 0 to 50% Non-Detects

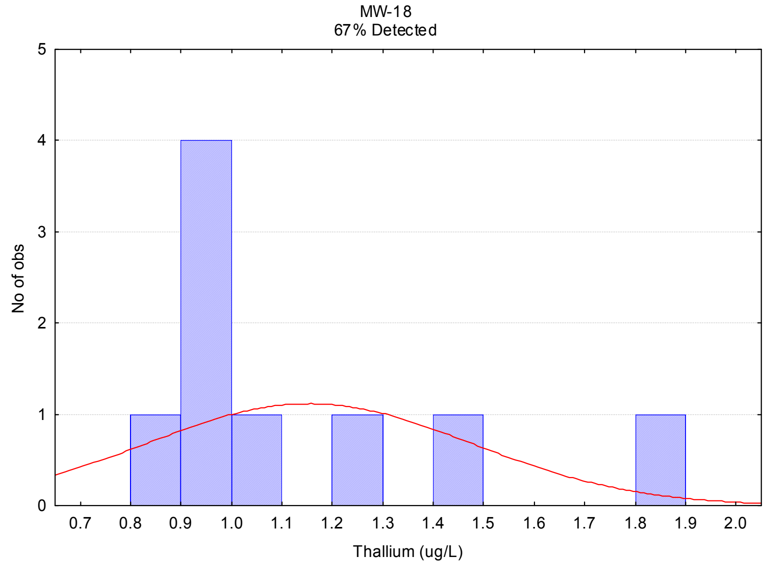


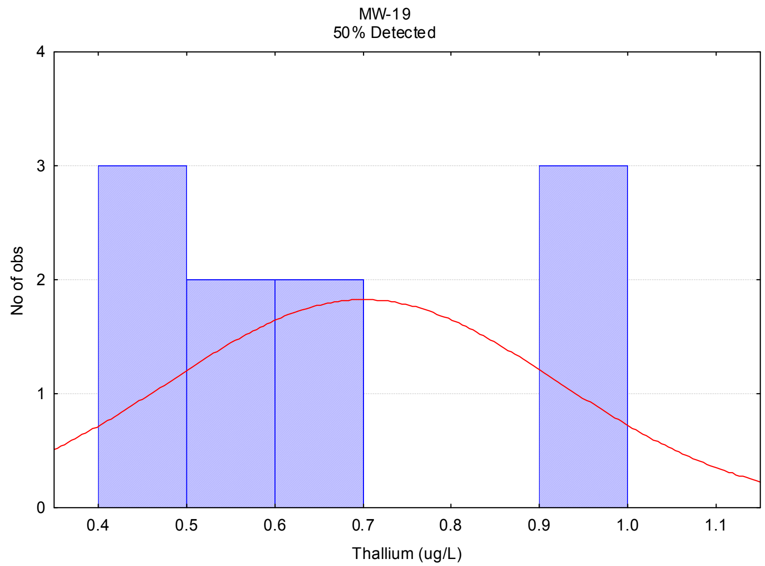
Log-Transformed Tetrahydrofuran Histograms for 0 to 50% Non-Detects



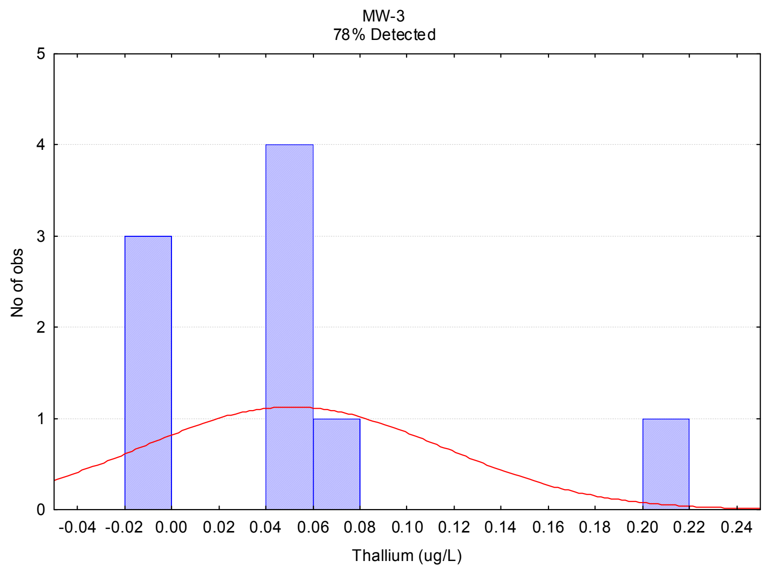
Thallium Histograms for 0 to 50% Non-Detects

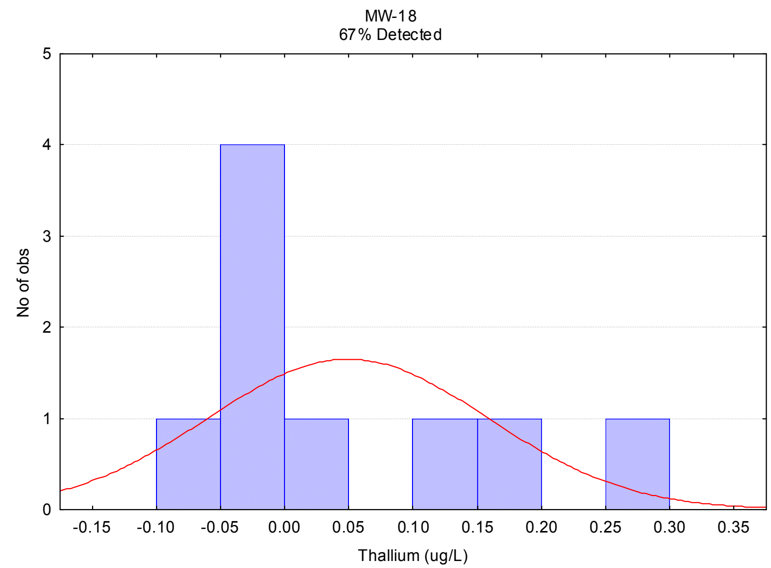


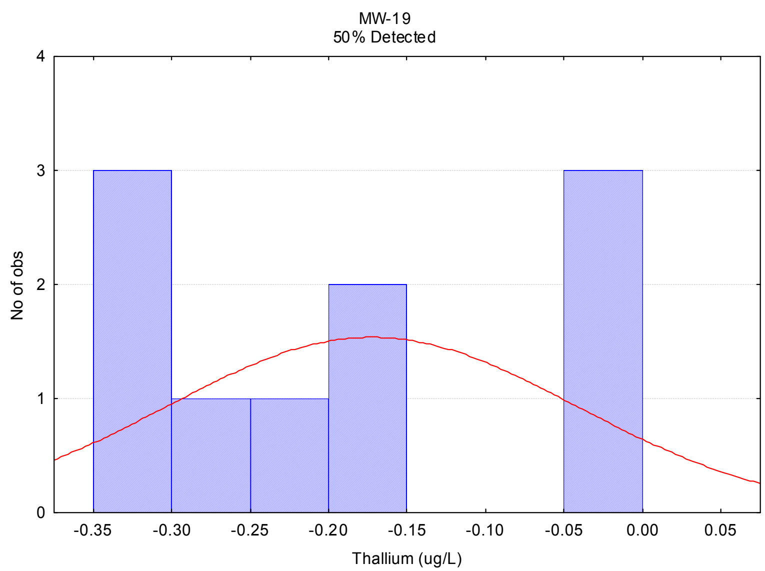




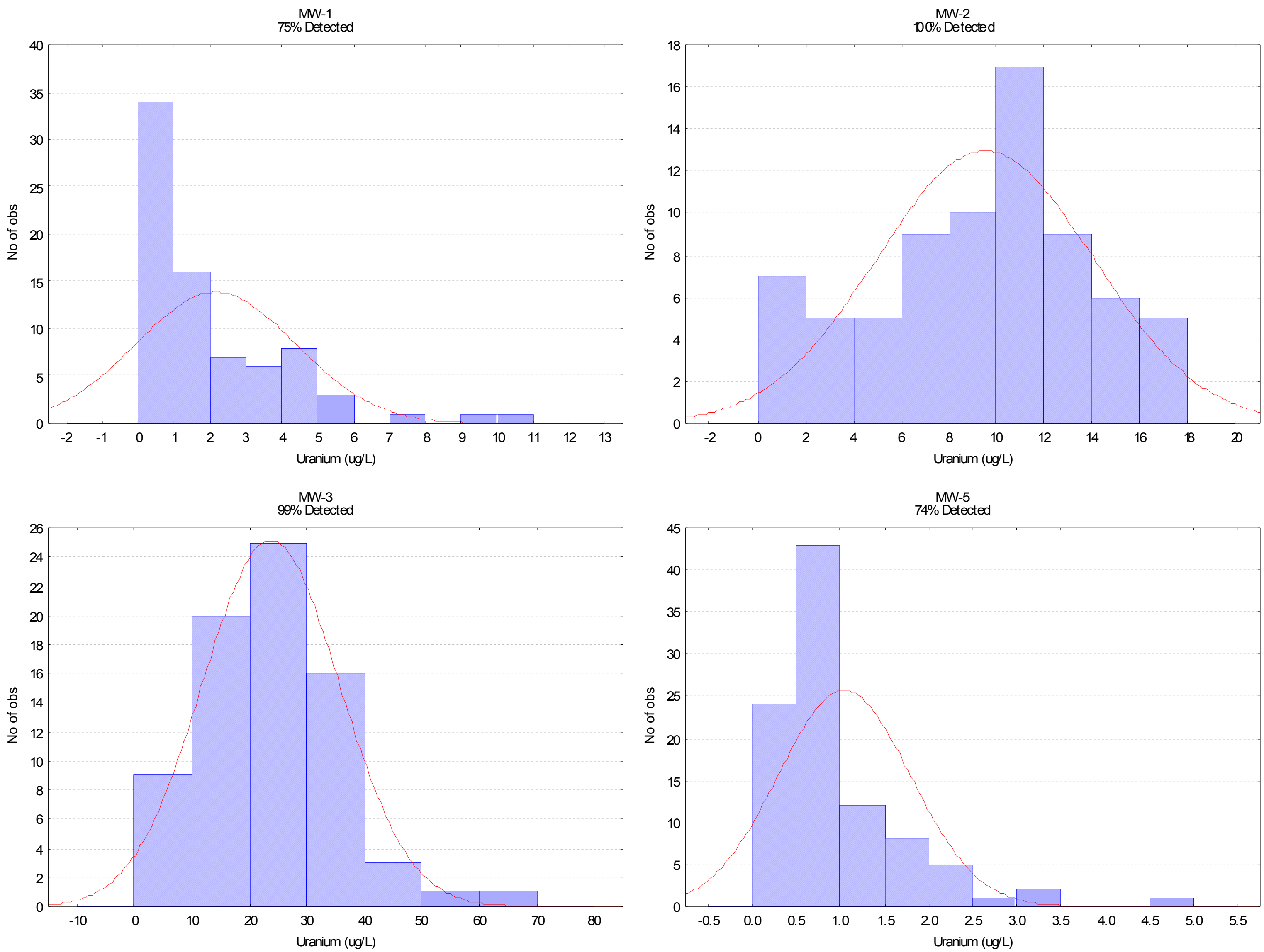
Log-Transformed Thallium Histograms for 0 to 50% Non-Detects



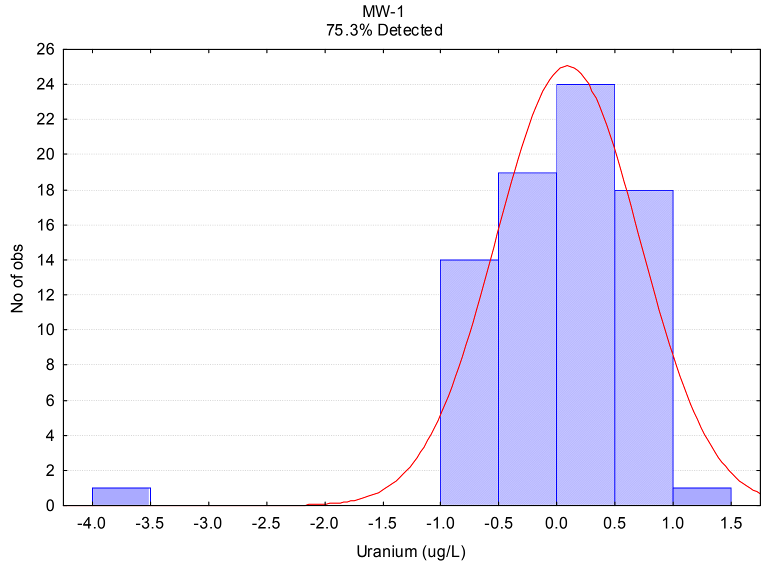


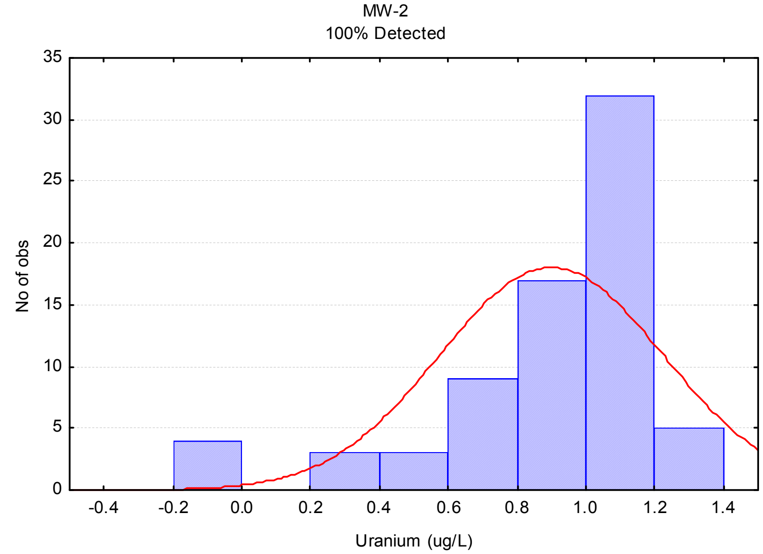


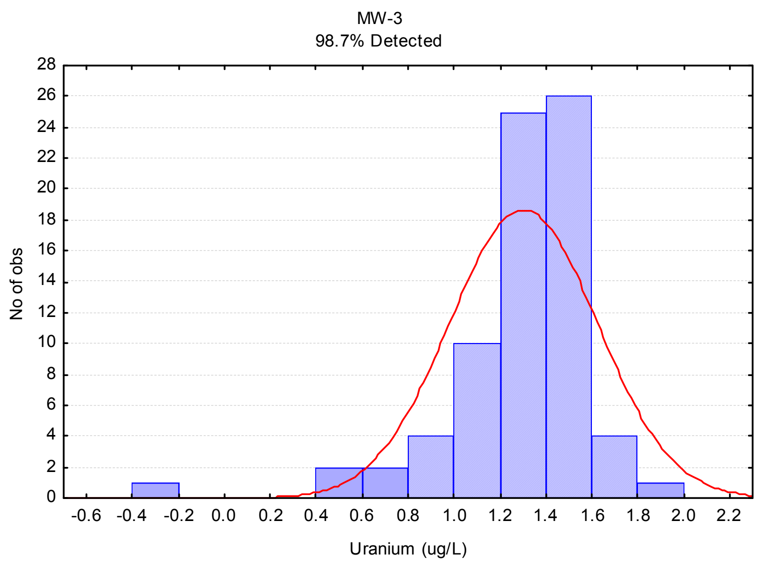
Uranium Histograms for 0 to 50% Non-Detects

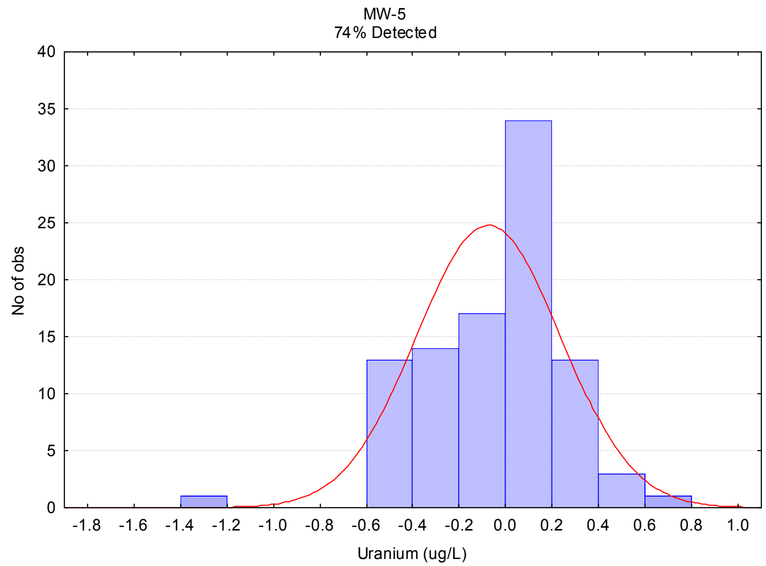


Log-Transformed Uranium Histograms for 0 to 50% Non-Detects

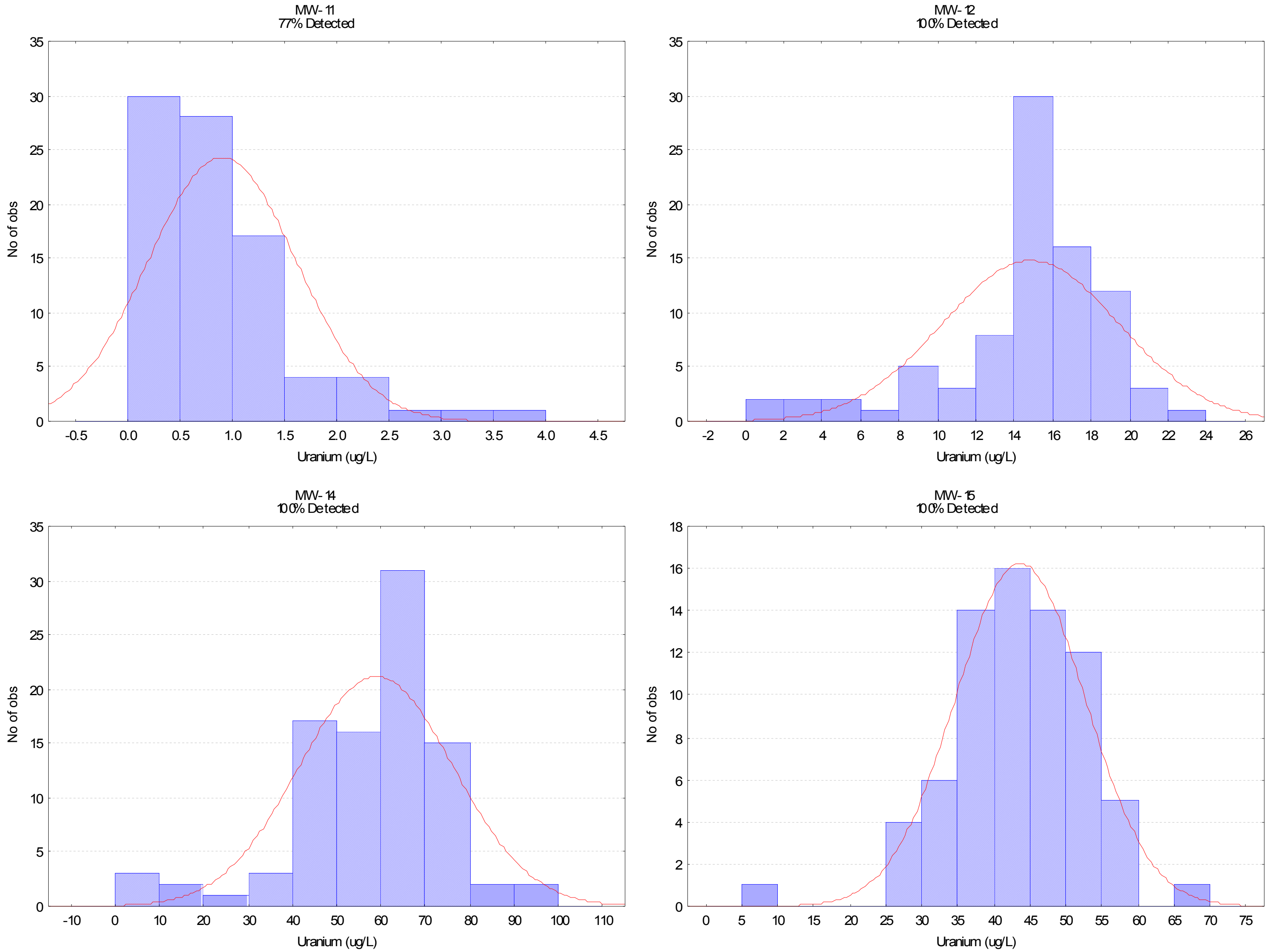








Uranium Histograms for 0 to 50% Non-Detects



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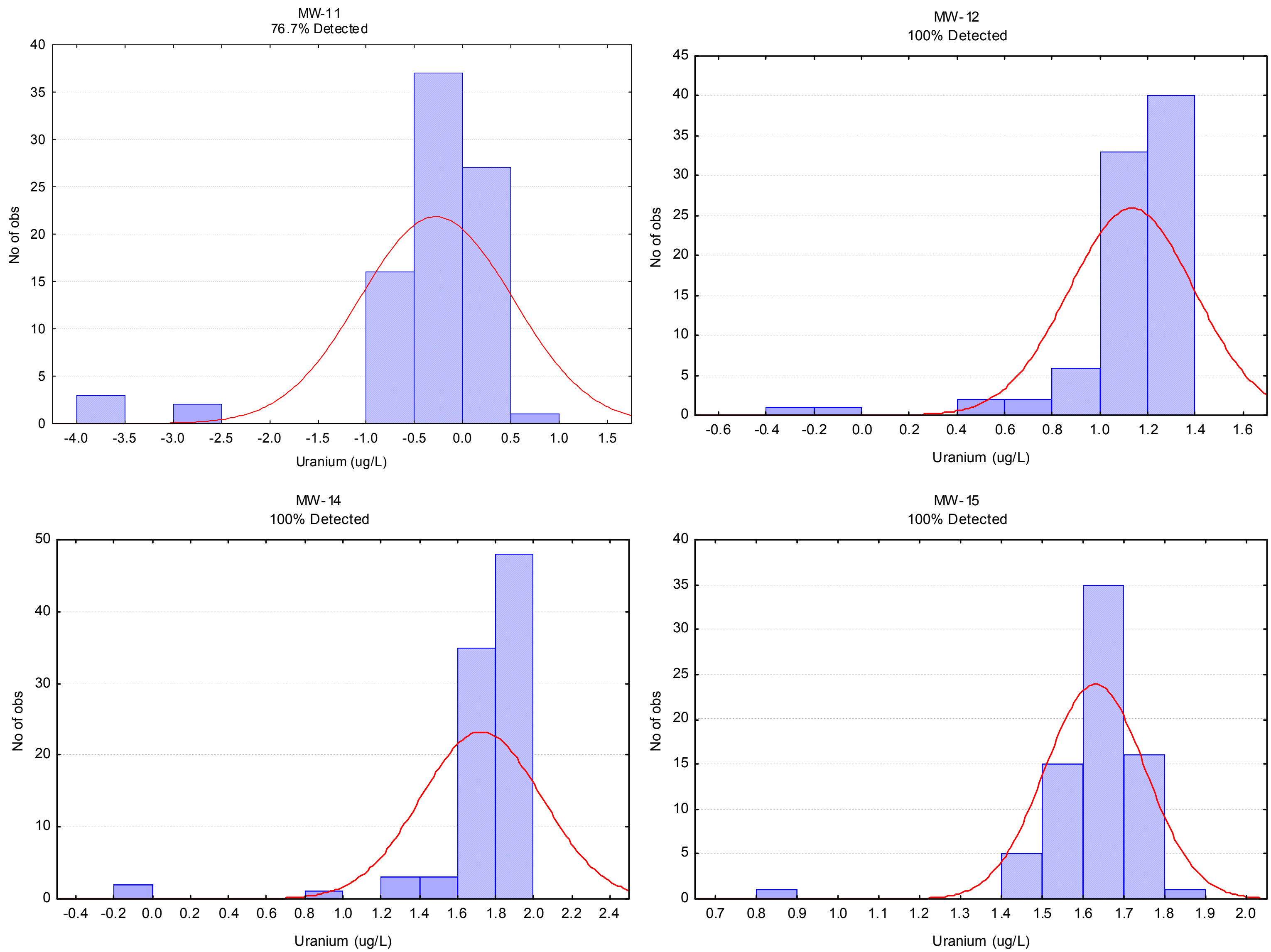

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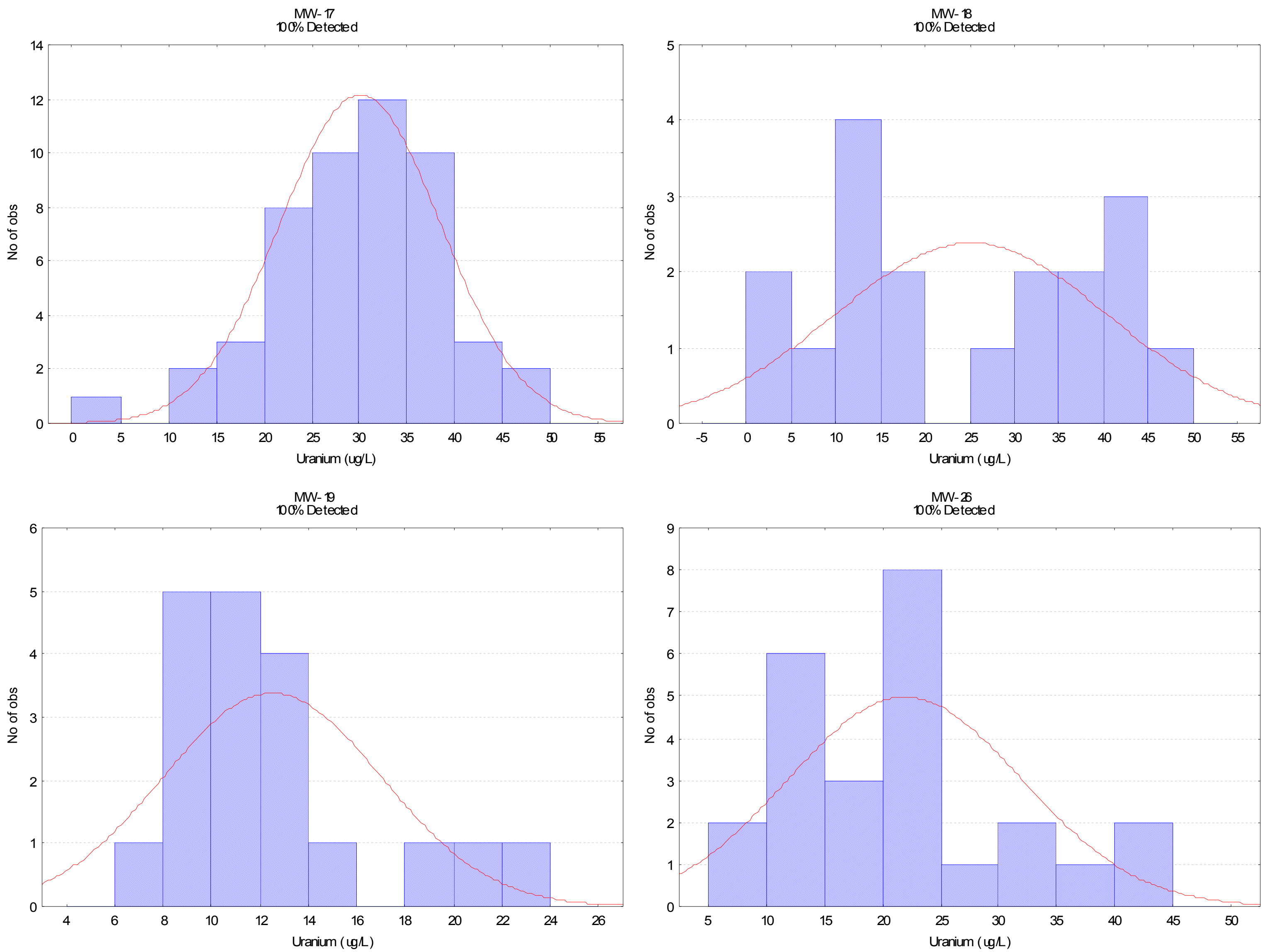
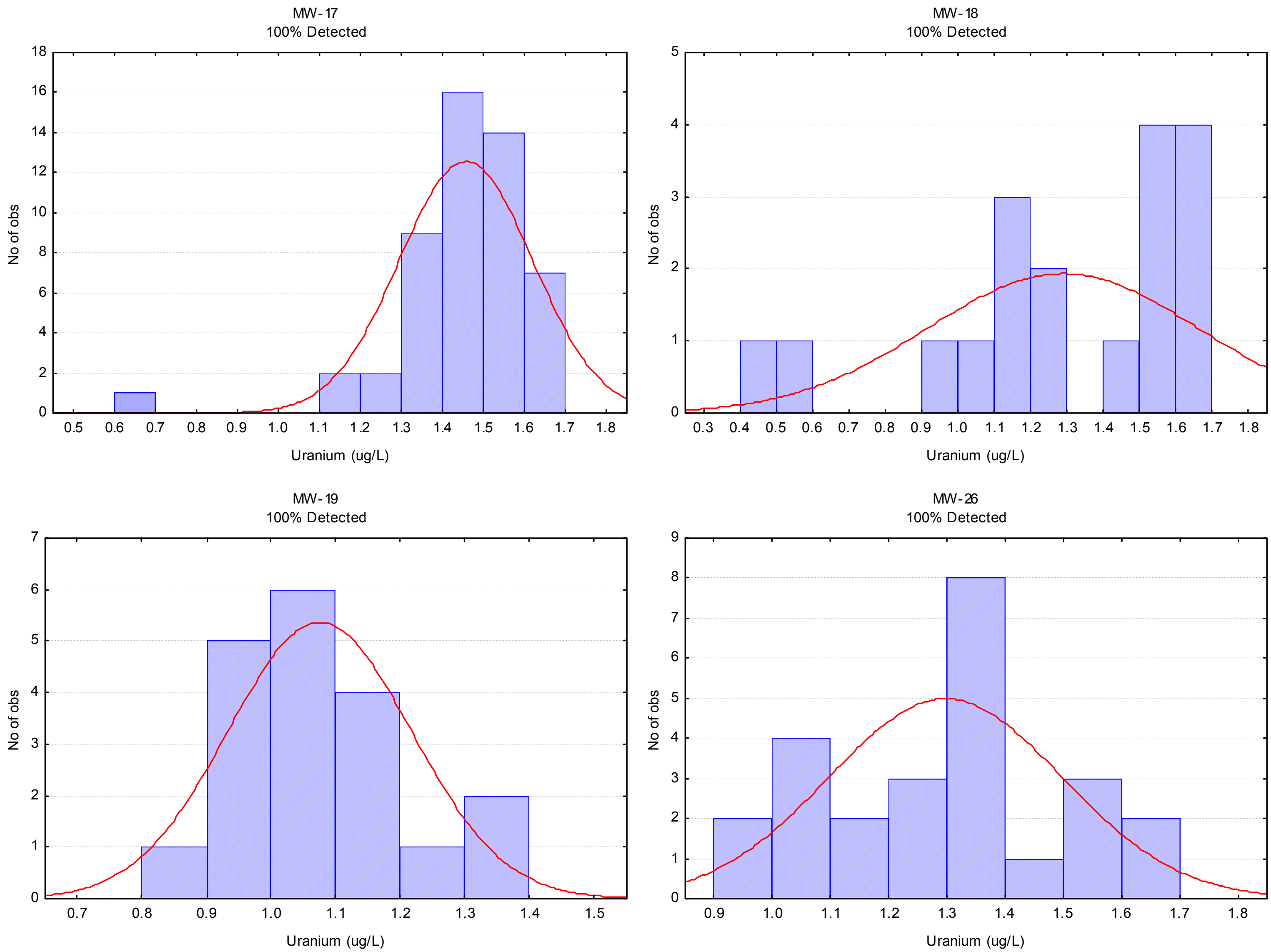
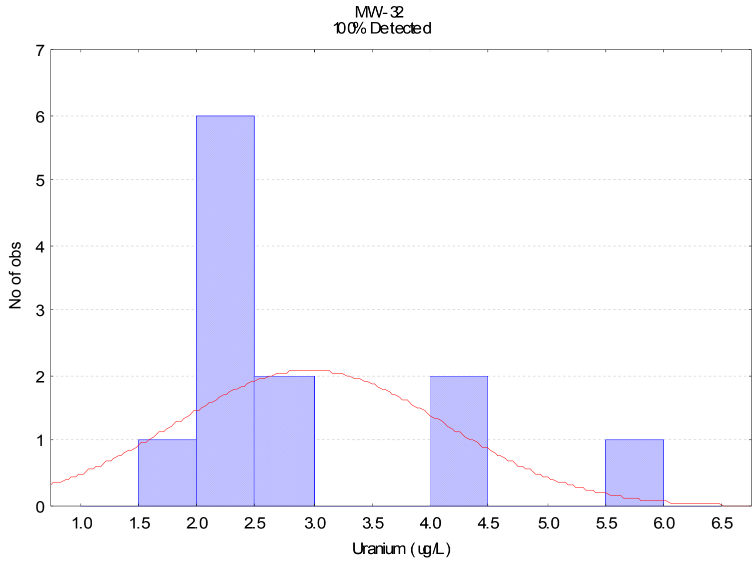


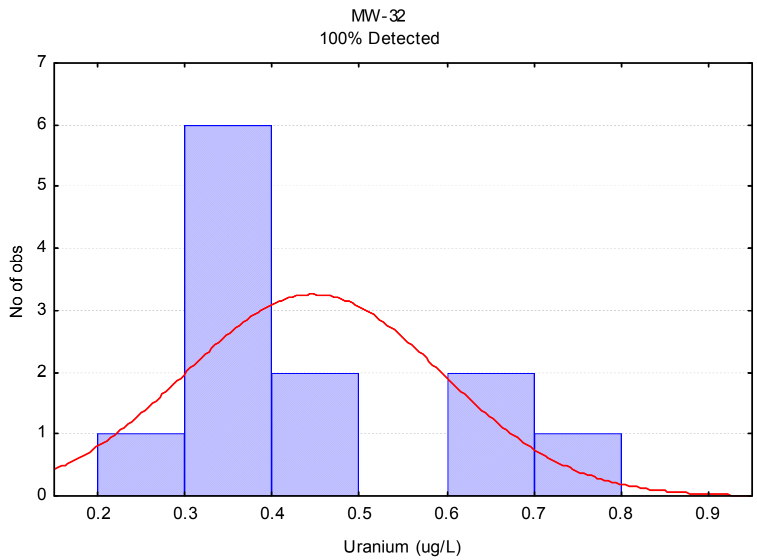
Log-Transformed Uranium Histograms for 0 to 50% Non-Detects



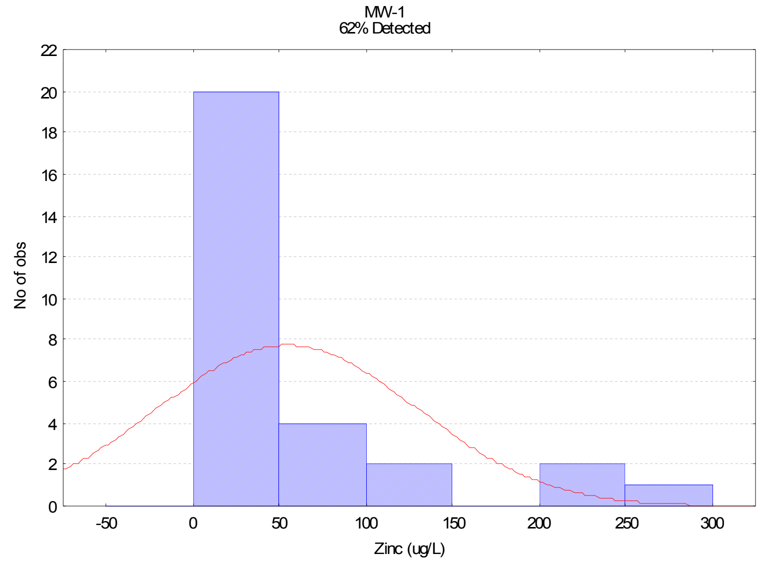
Uranium Histograms for 0 to 50% Non-Detects

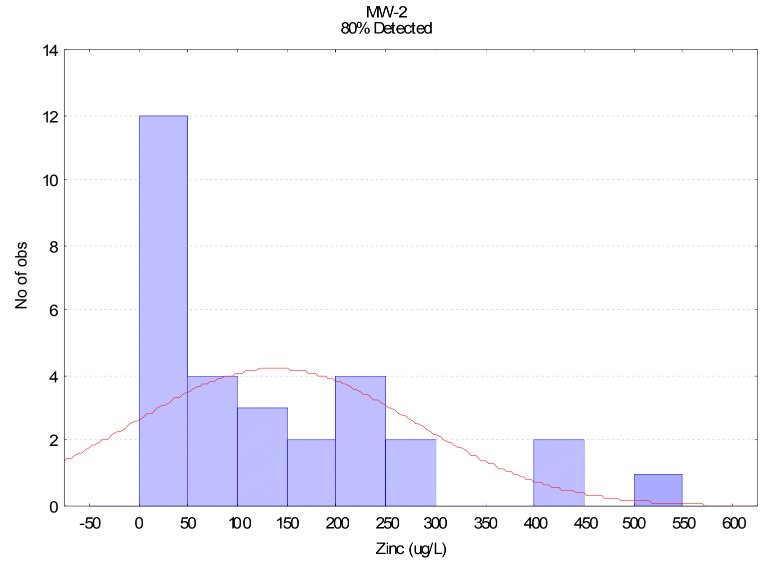


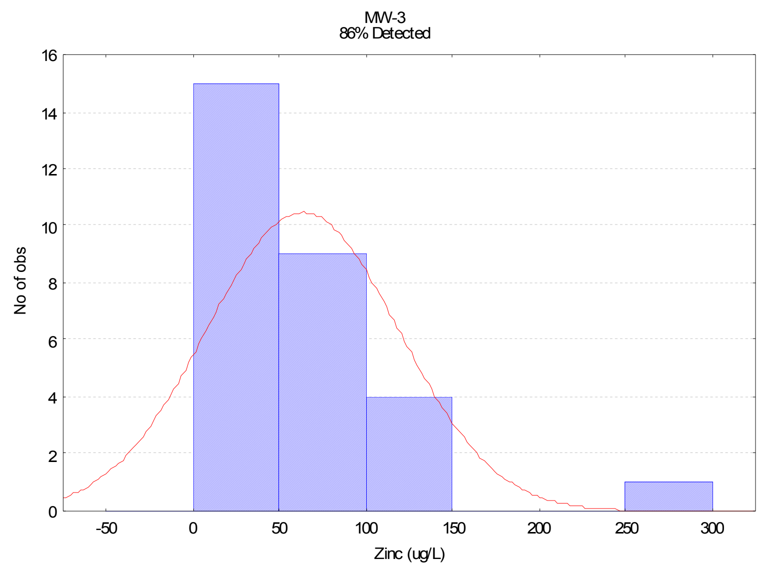
Log-Transformed Uranium Histograms for 0 to 50% Non-Detects

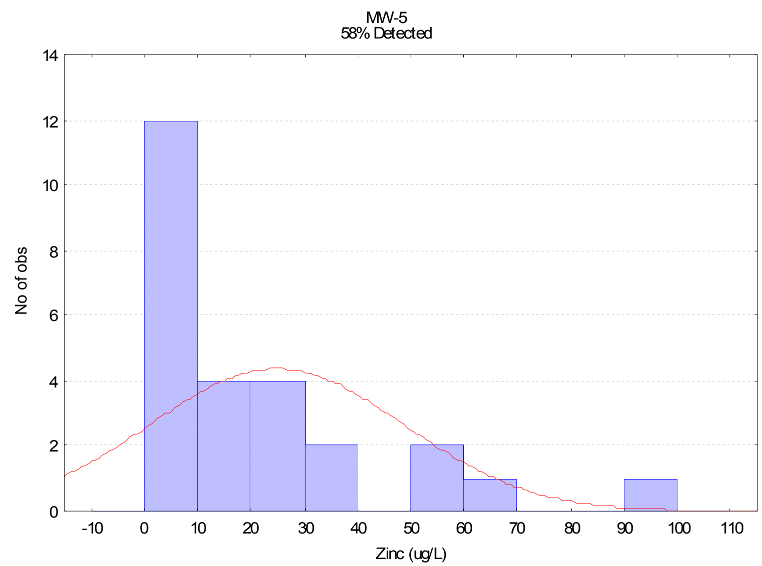


Zinc Histograms for 0 to 50% Non-Detects

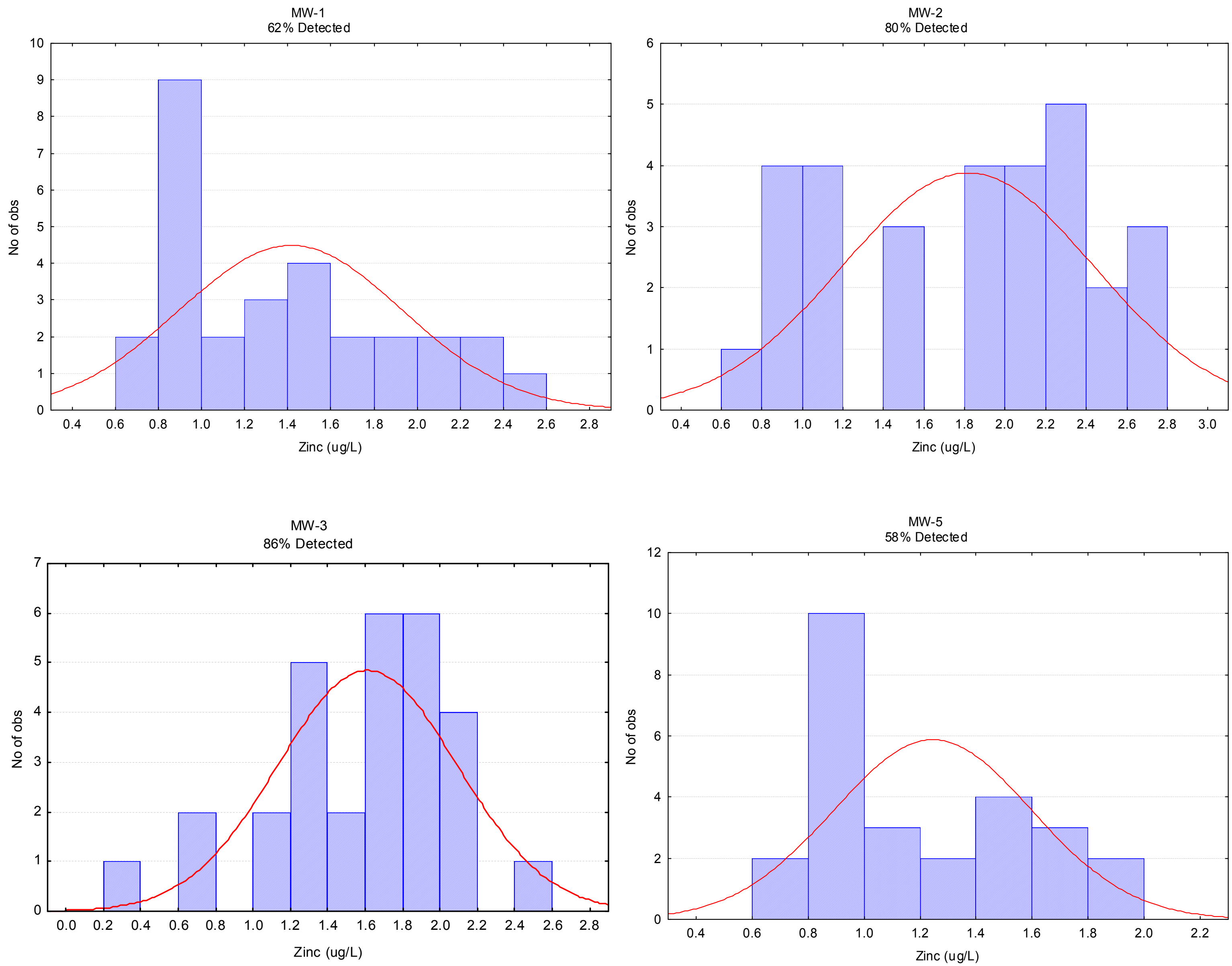




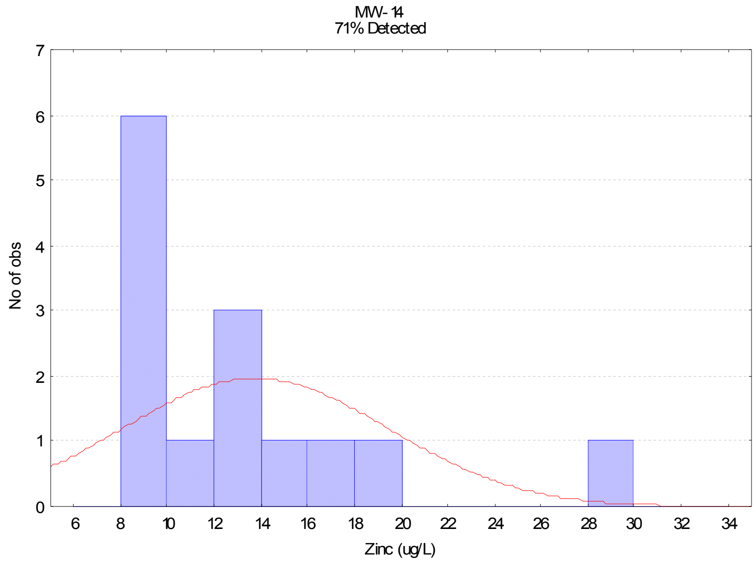


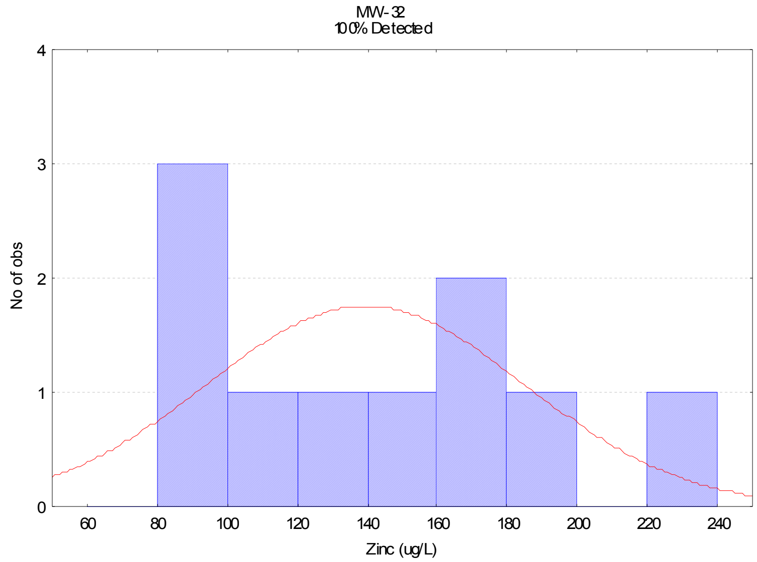


Log-Transformed Zinc Histograms for 0 to 50% Non-Detects



Zinc Histograms for 0 to 50% Non-Detects





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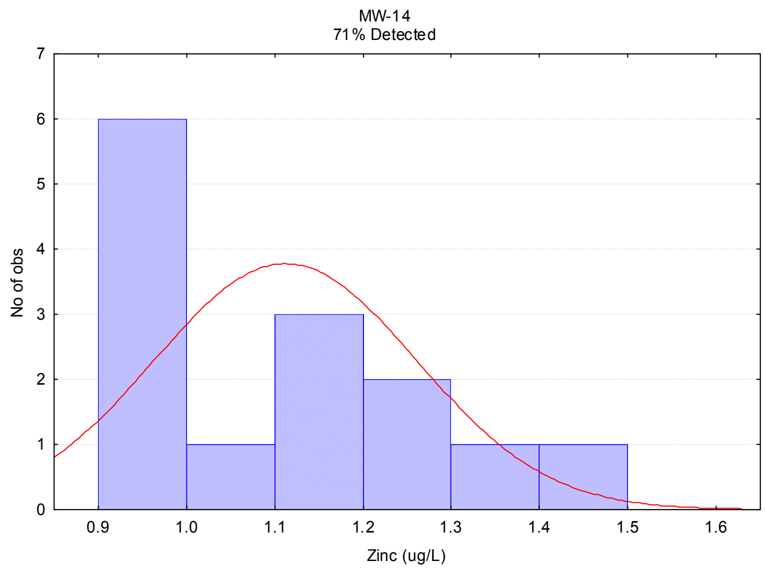
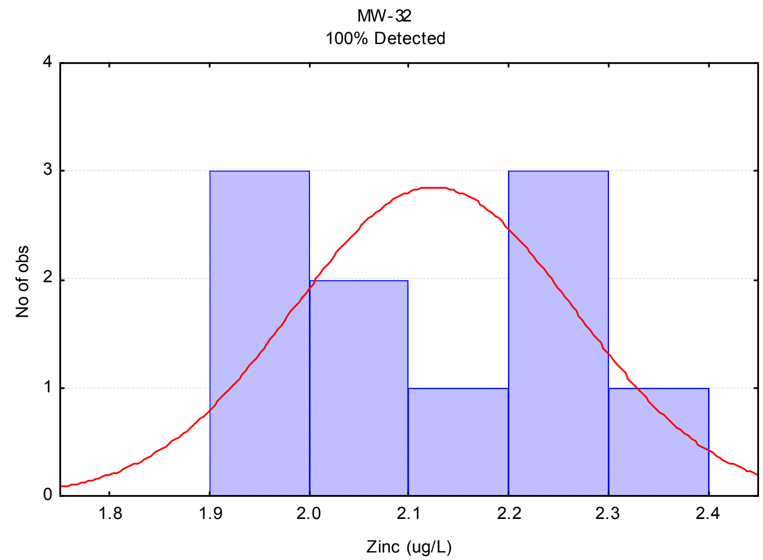


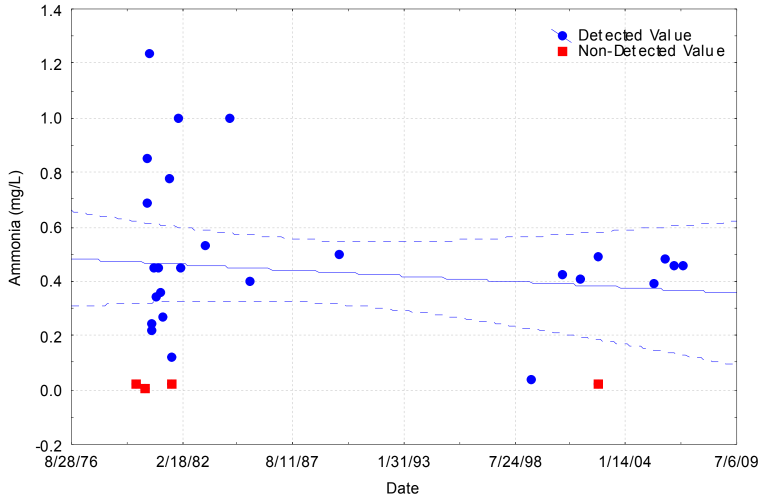


APPENDIX D

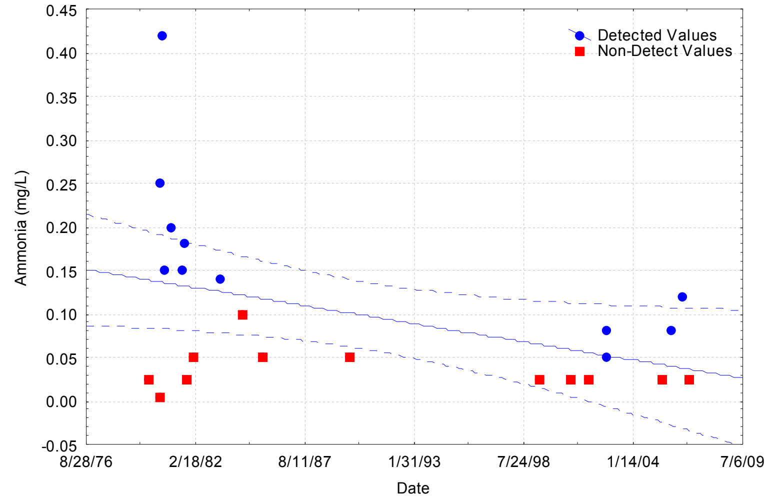
LINEAR REGRESSION PLOTS

Linear Regressions for Ammonia

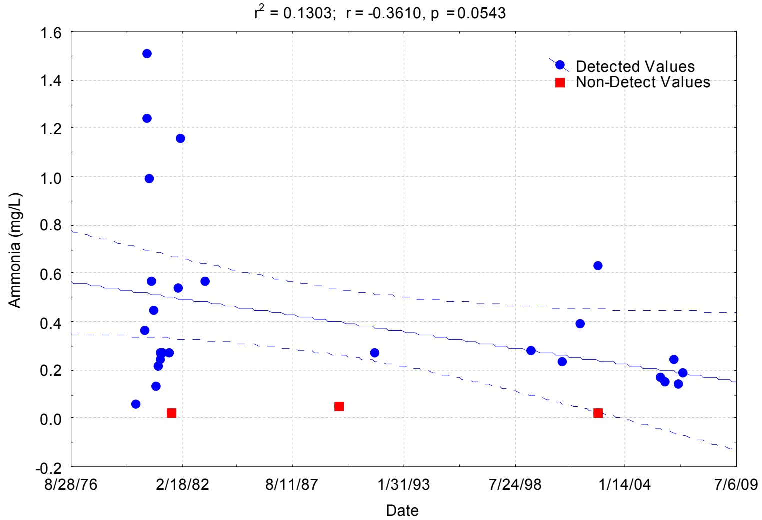
Linear Regression for Ammonia in MW-1
86.7% Detected
r^2 = 0.0169; r = -0.1298, p = 0.4941



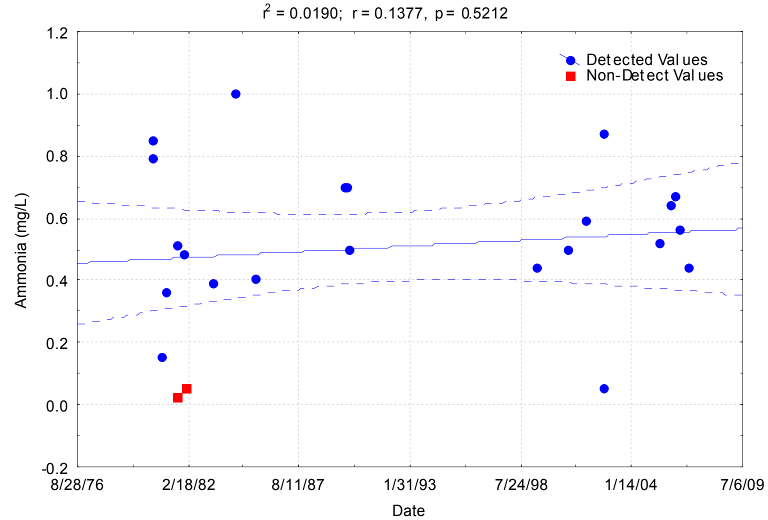
Linear Regression for Ammonia in MW-2
47.8% Detected
r^2 = 0.1826; r = -0.4273, p = 0.0420



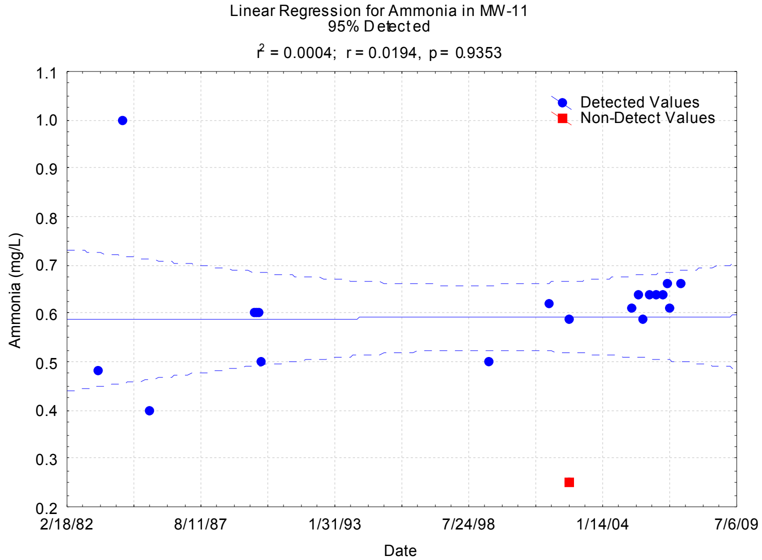
Linear Regression for Ammonia in MW-3
89.7% Detected
r^2 = 0.1303; r = -0.3610, p = 0.0543

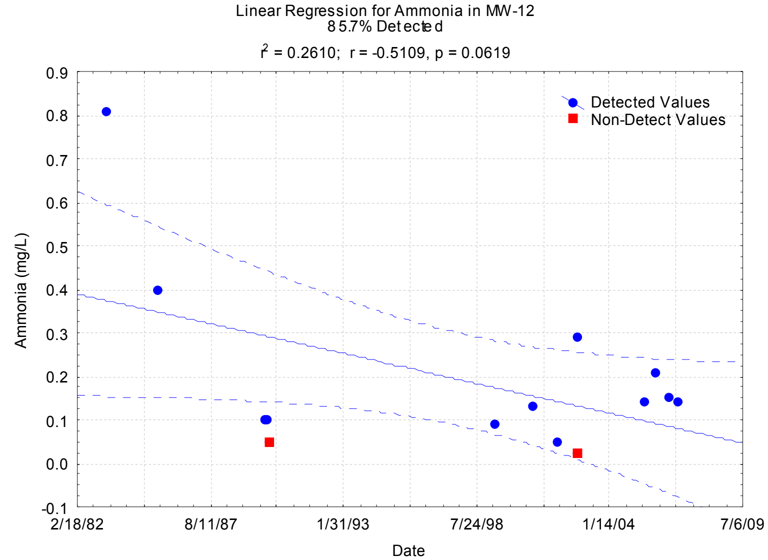


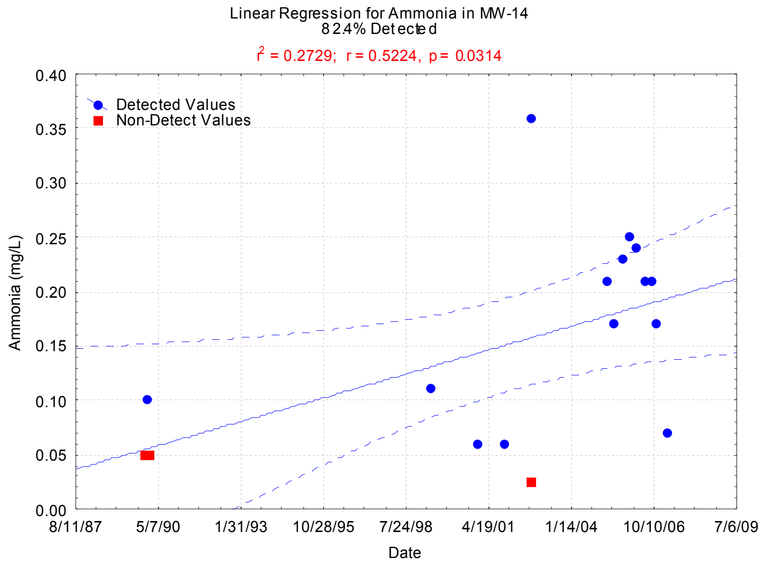
Linear Regression for Ammonia in MW-5
91.7% Detected
r^2 = 0.0190; r = 0.1377, p = 0.5212

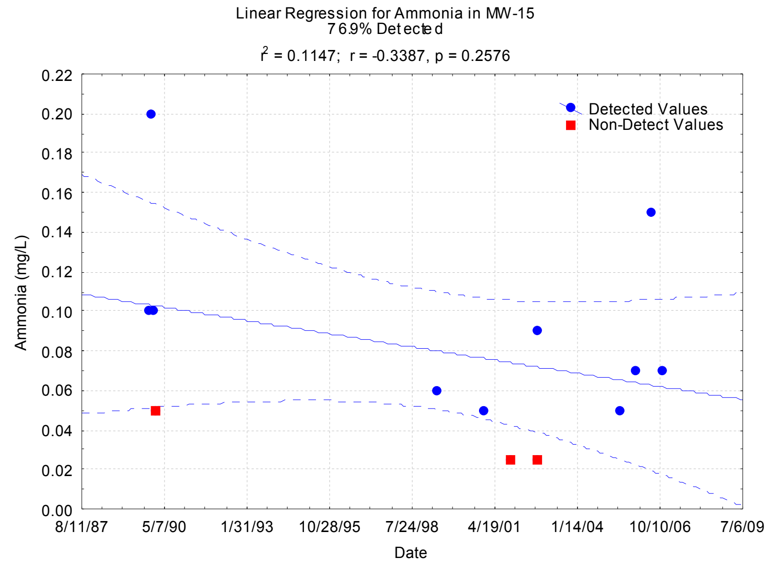


Linear Regressions for Ammonia

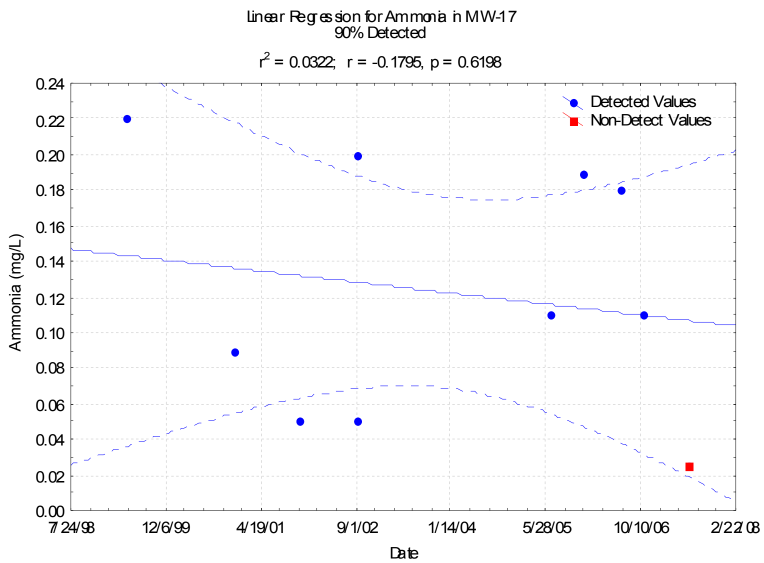


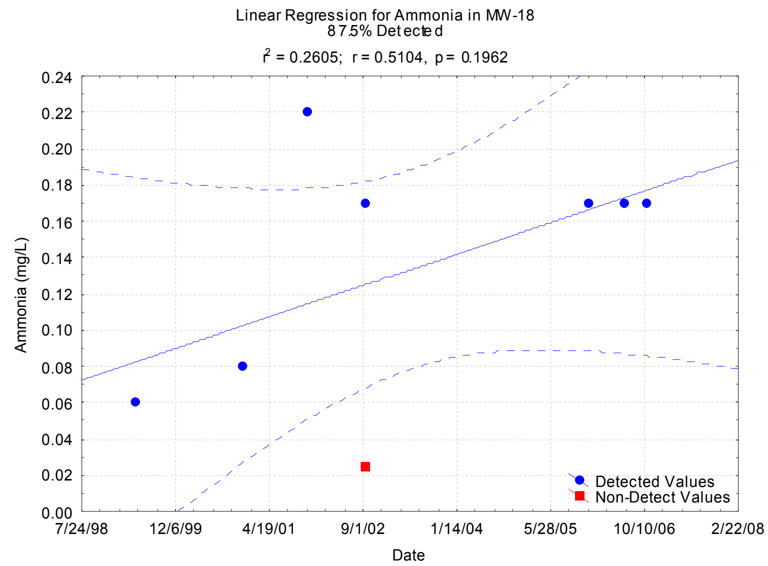


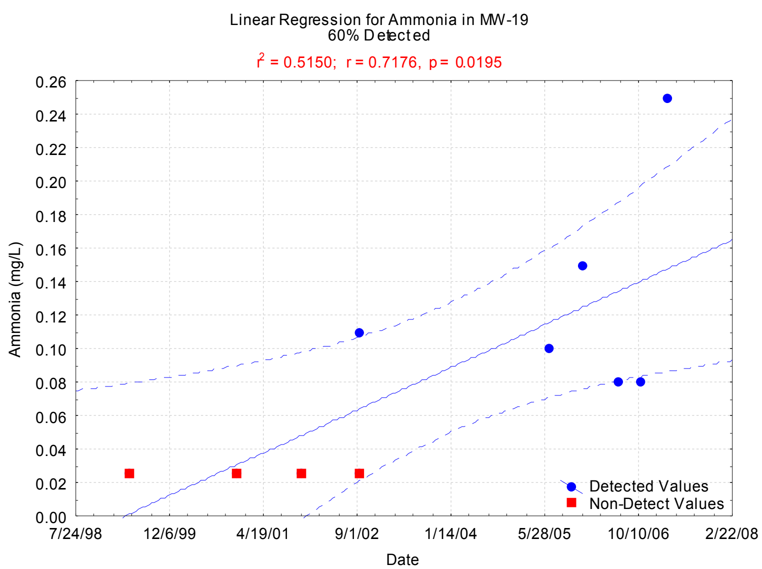


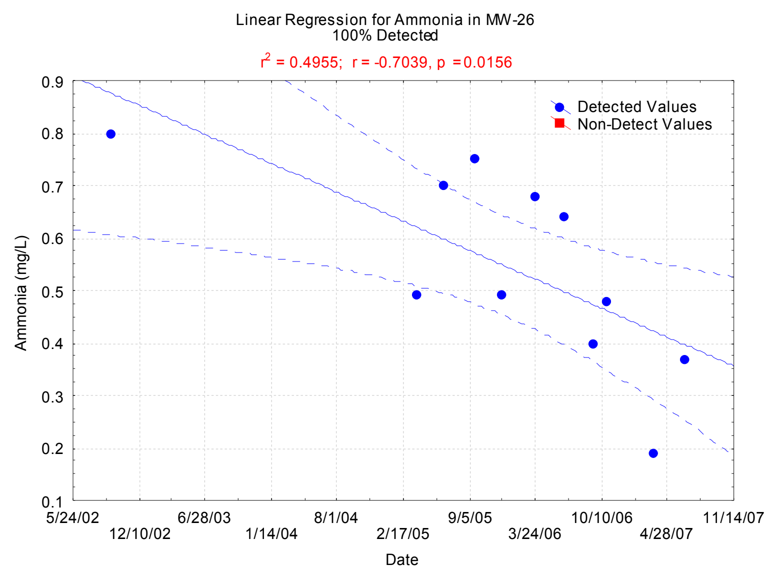


Linear Regressions for Ammonia

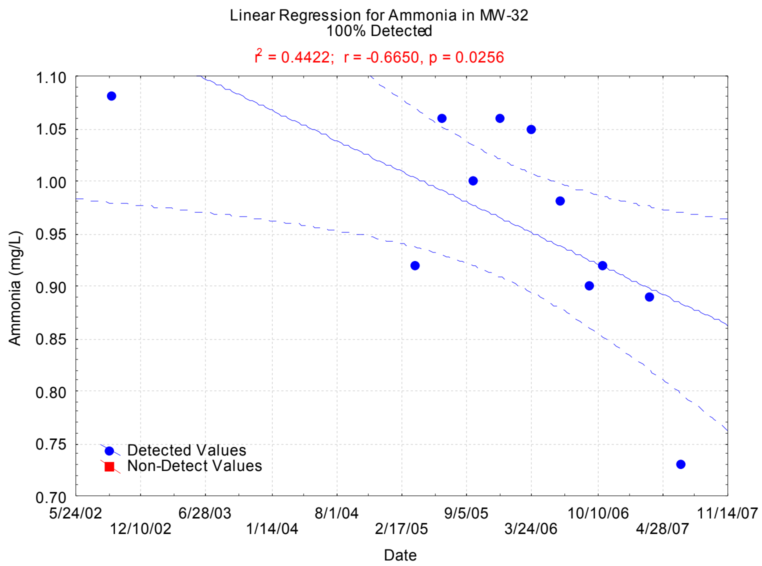




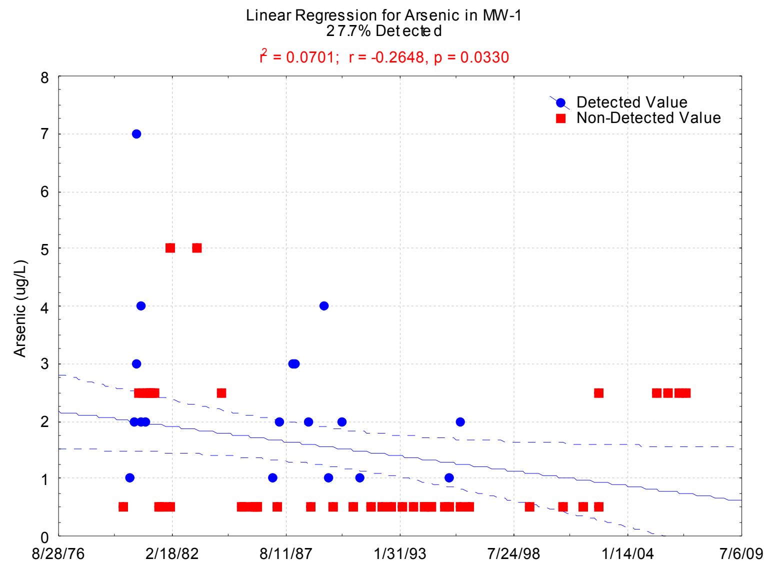


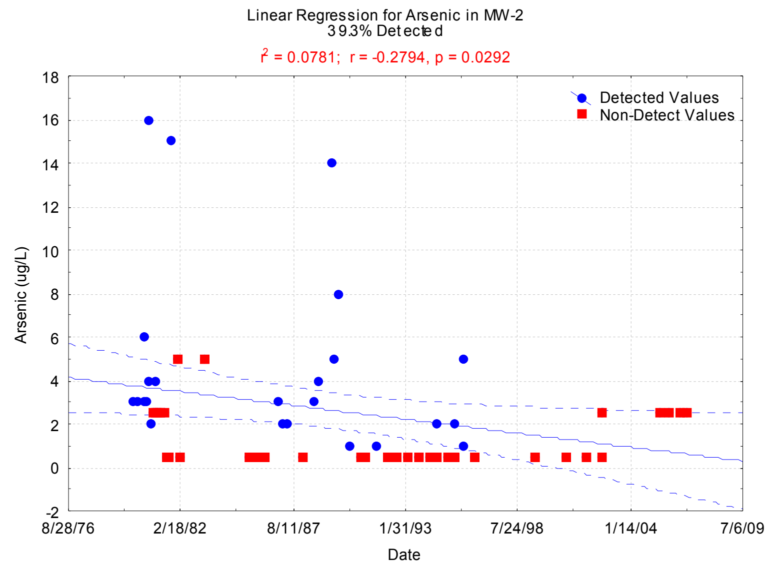


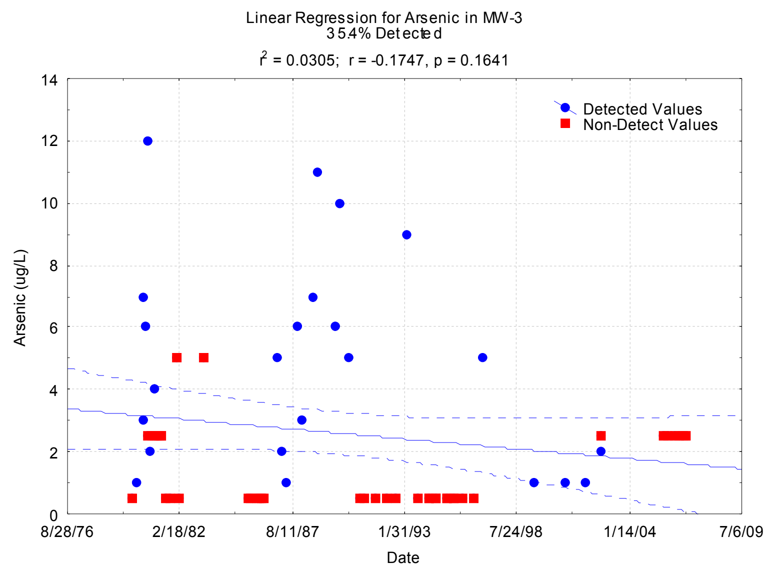
Linear Regressions for Ammonia

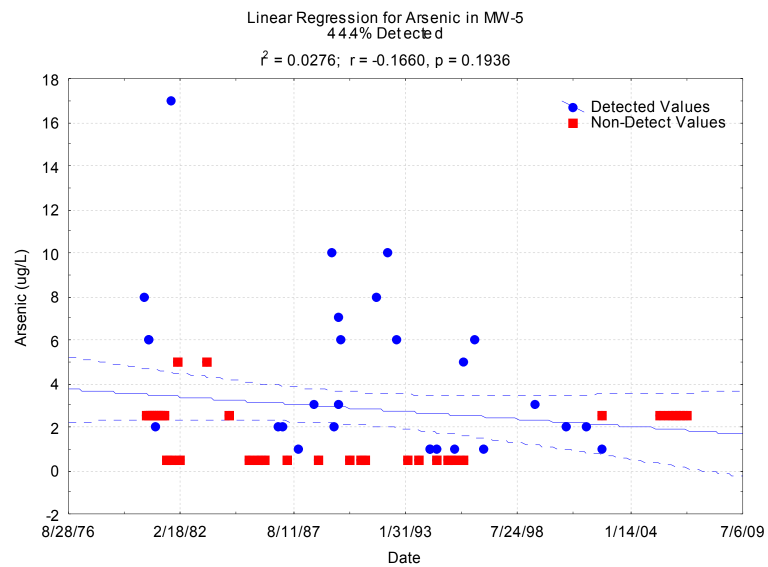


Linear Regression for Arsenic

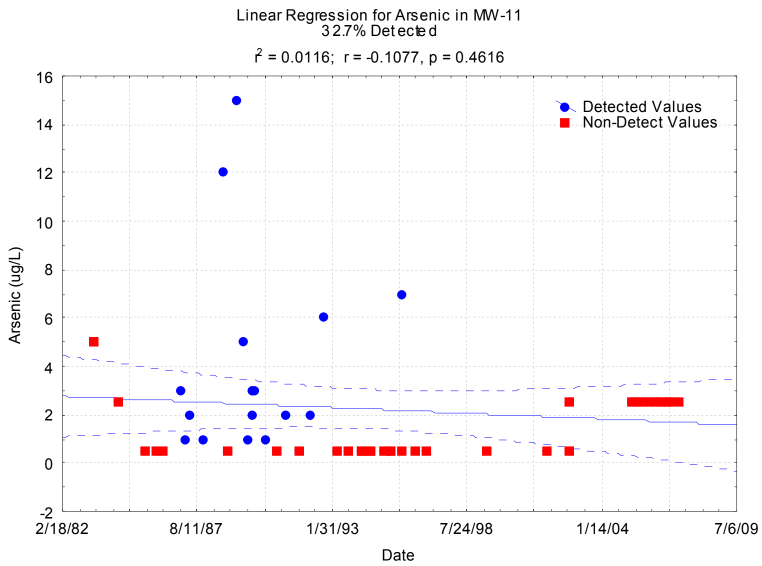


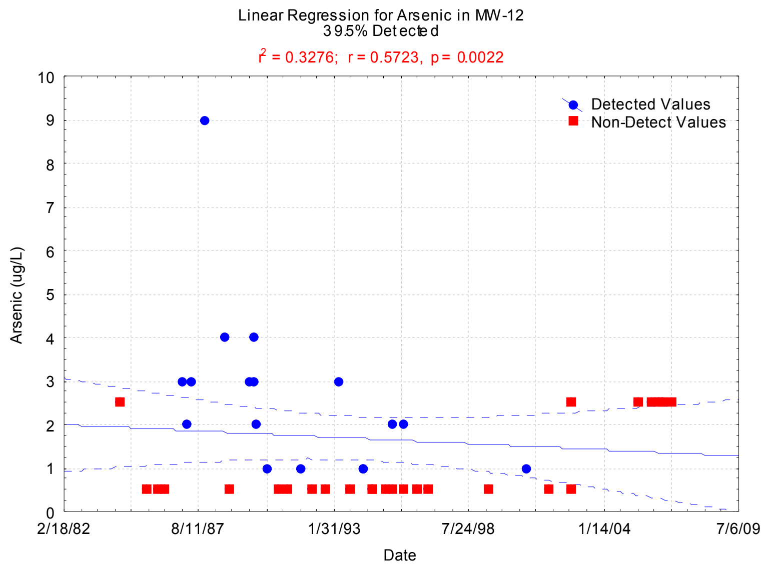


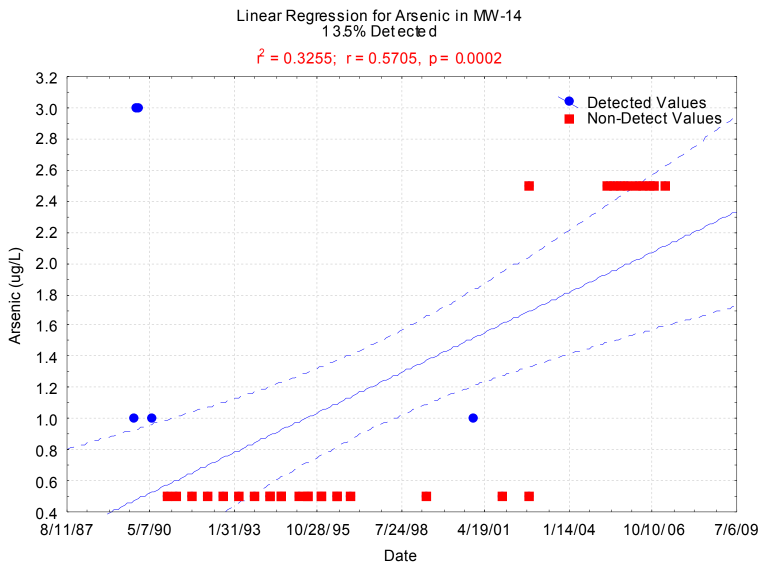


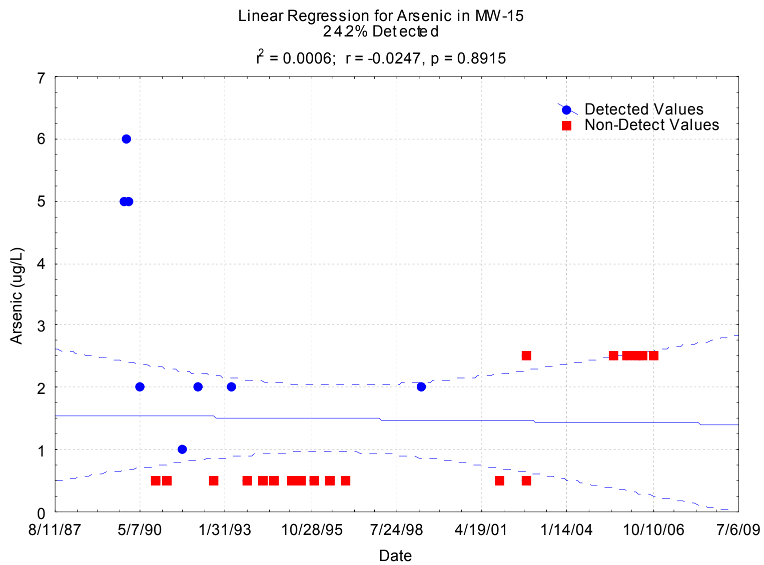


Linear Regression for Arsenic

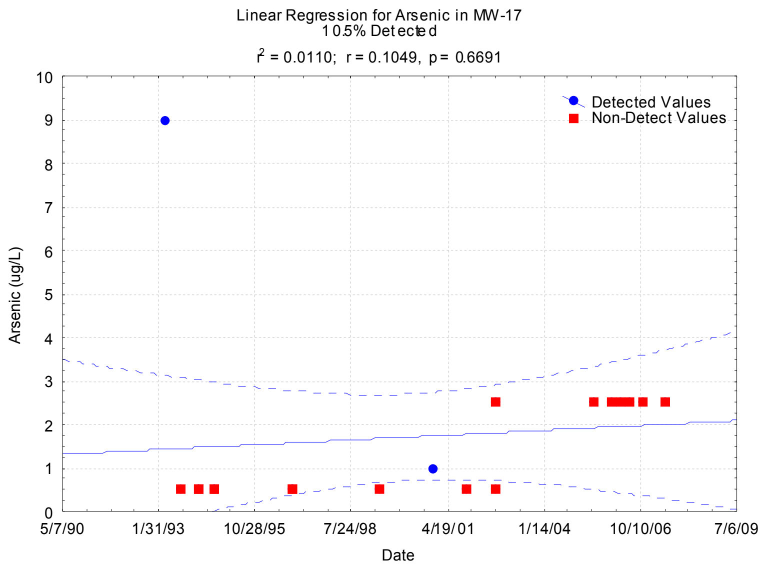


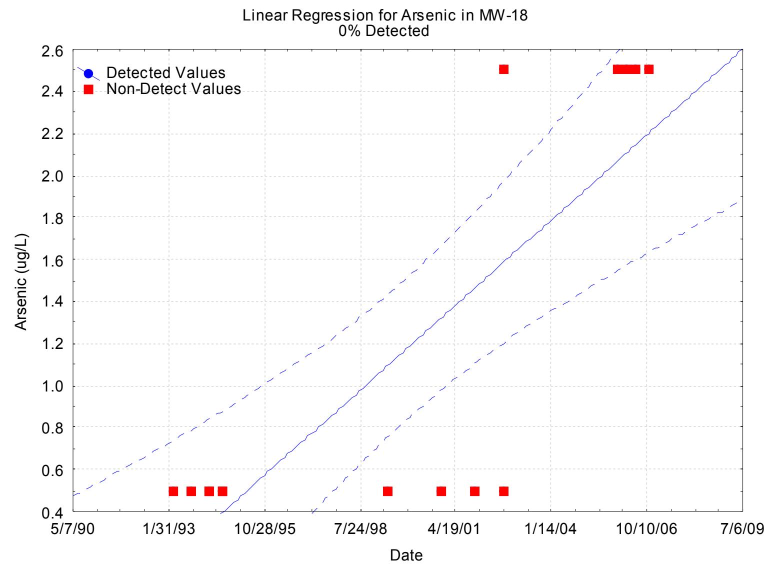


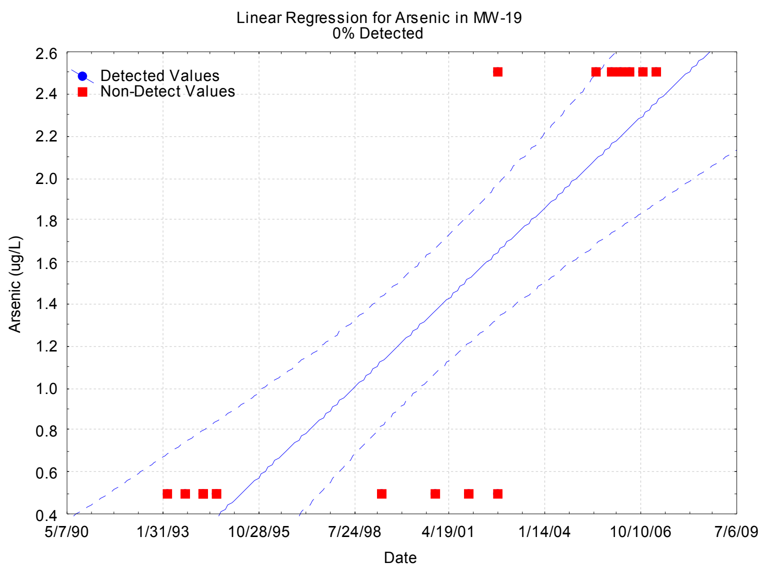


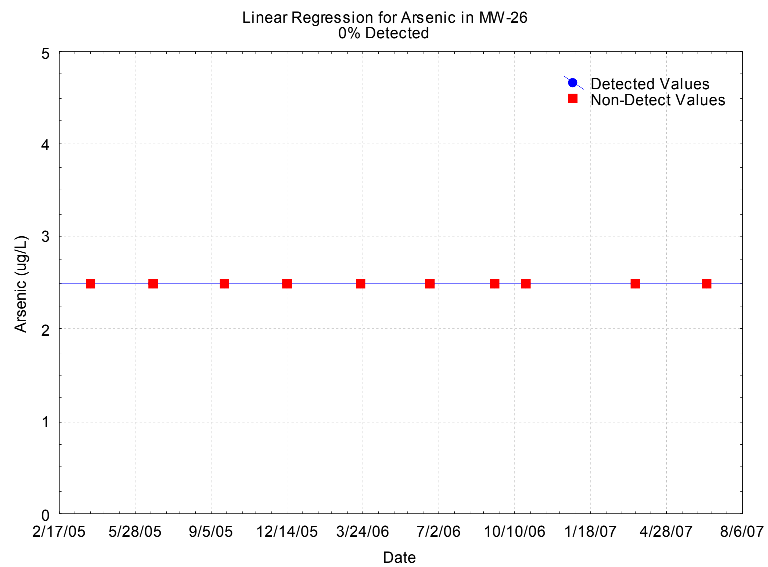


Linear Regression for Arsenic

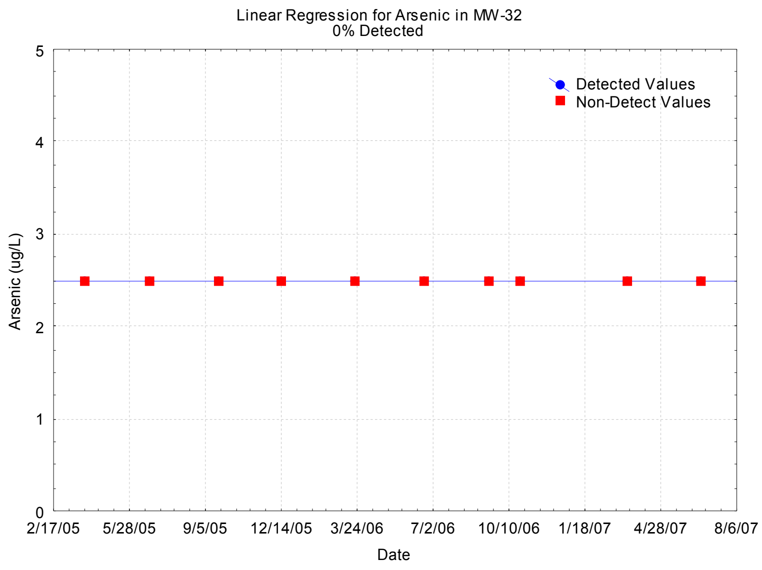




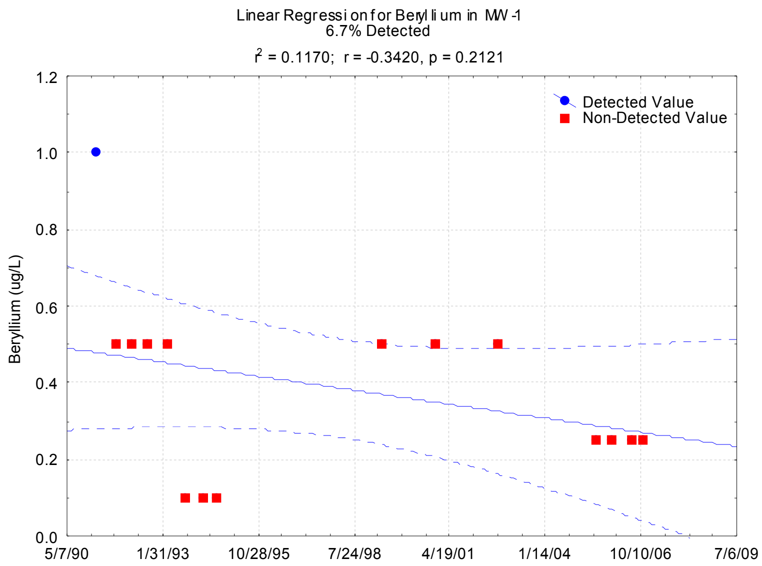


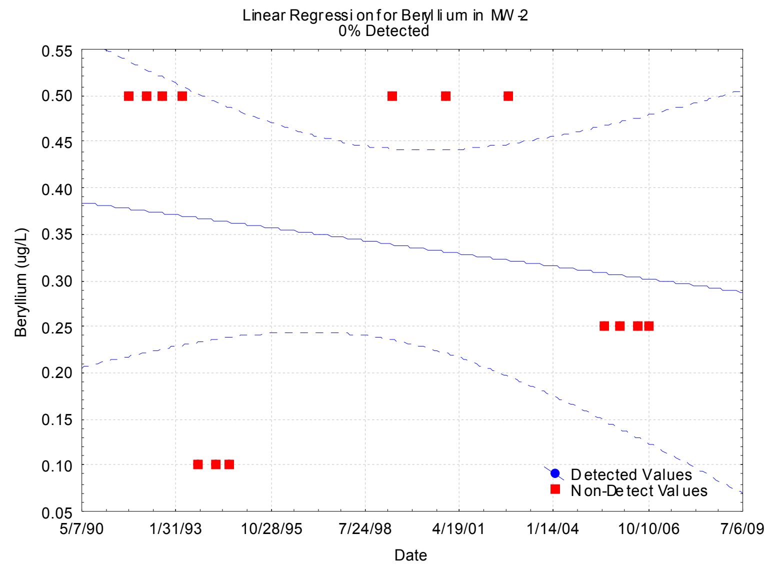


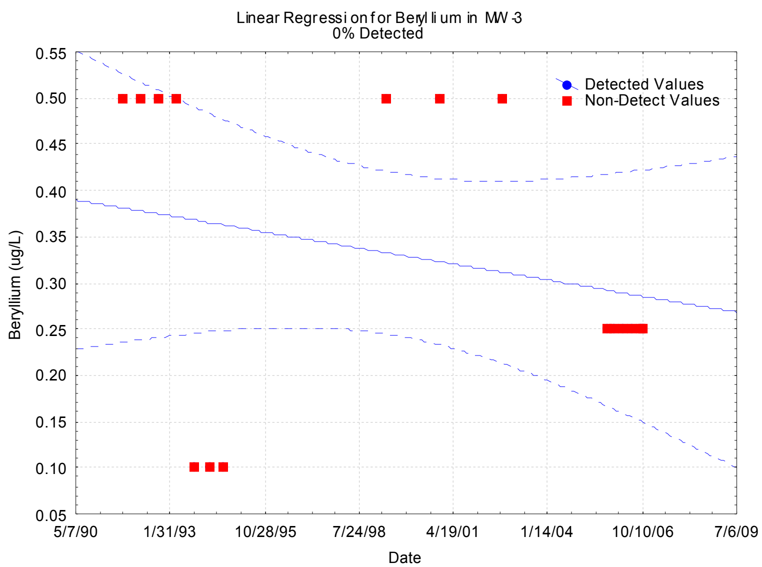
Linear Regression for Arsenic

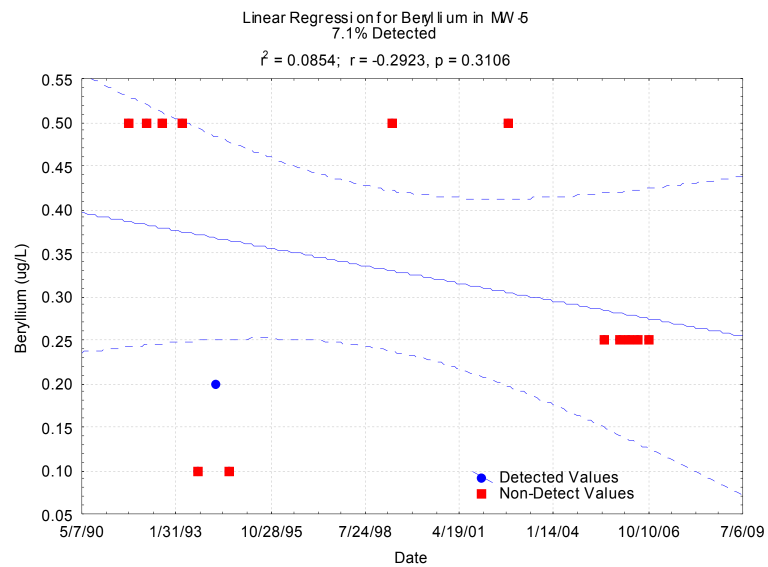


Linear Regressions for Beryllium

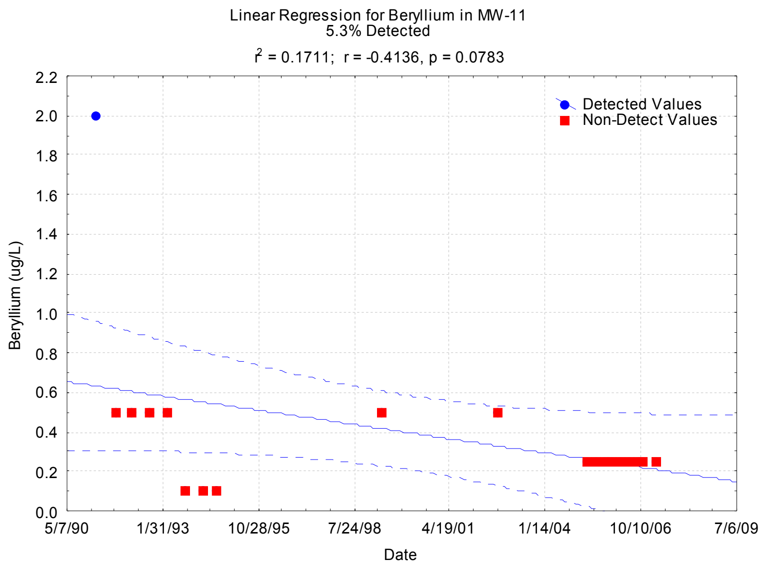


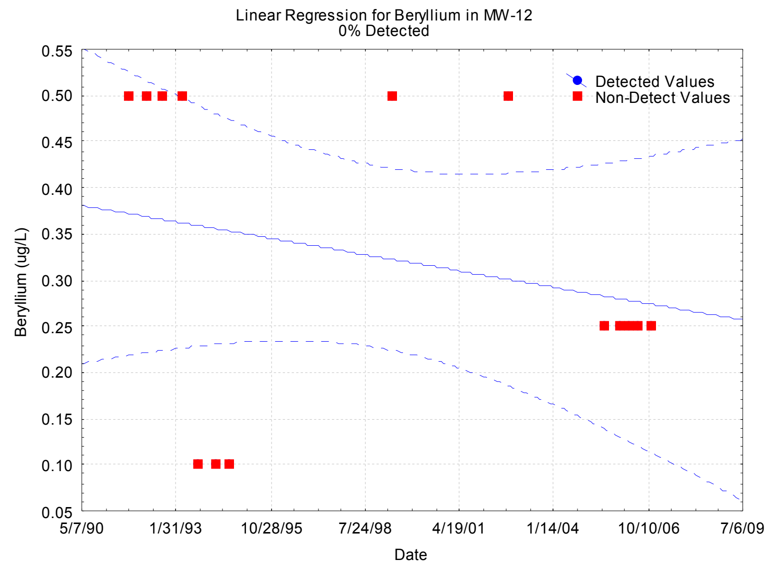


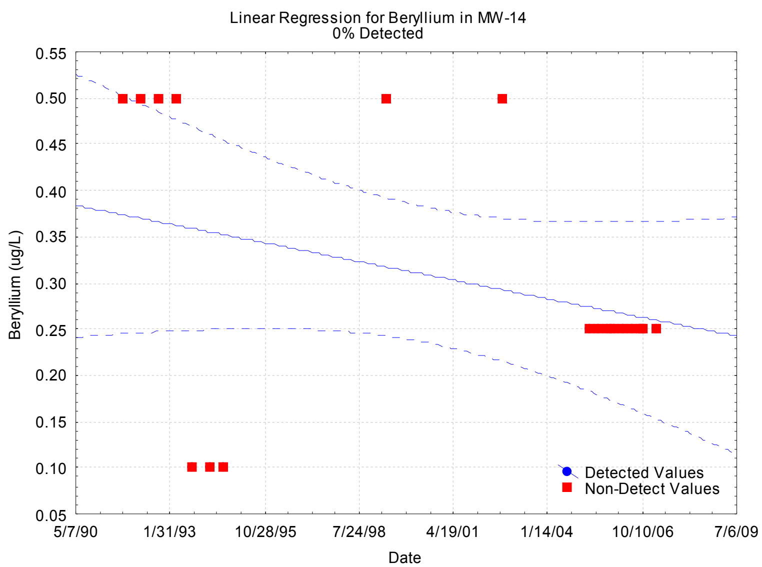


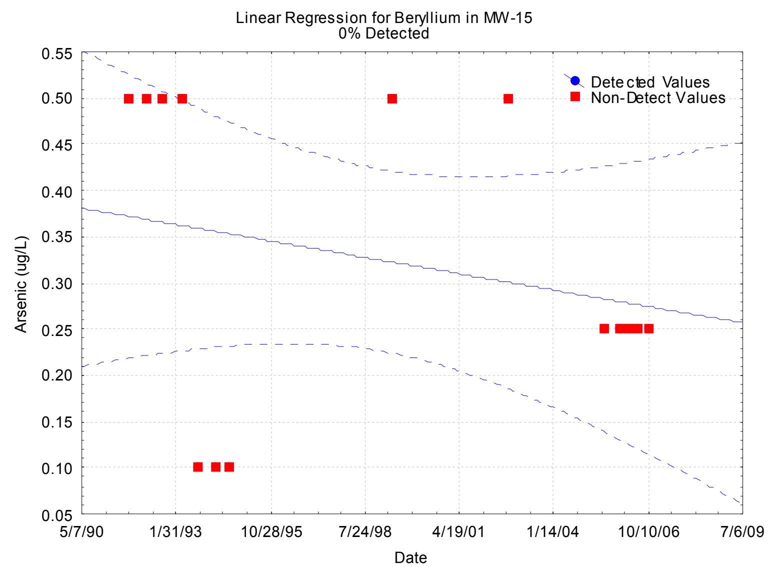


Linear Regressions for Beryllium

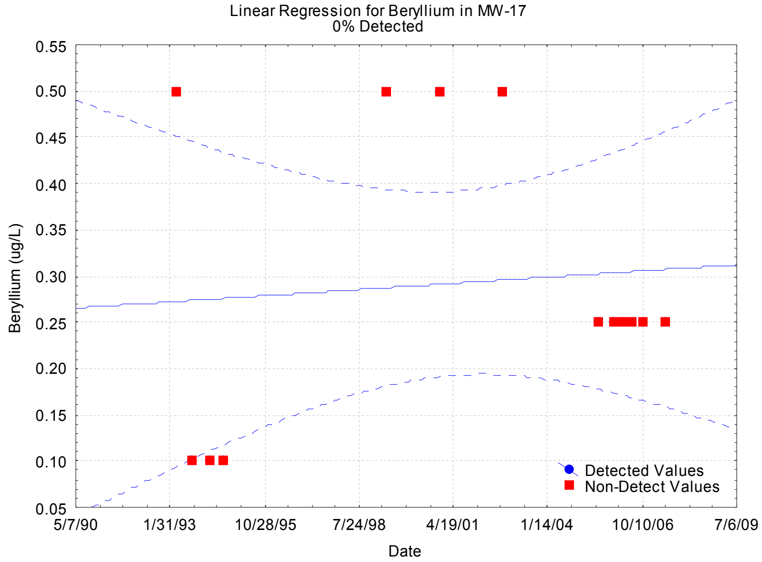


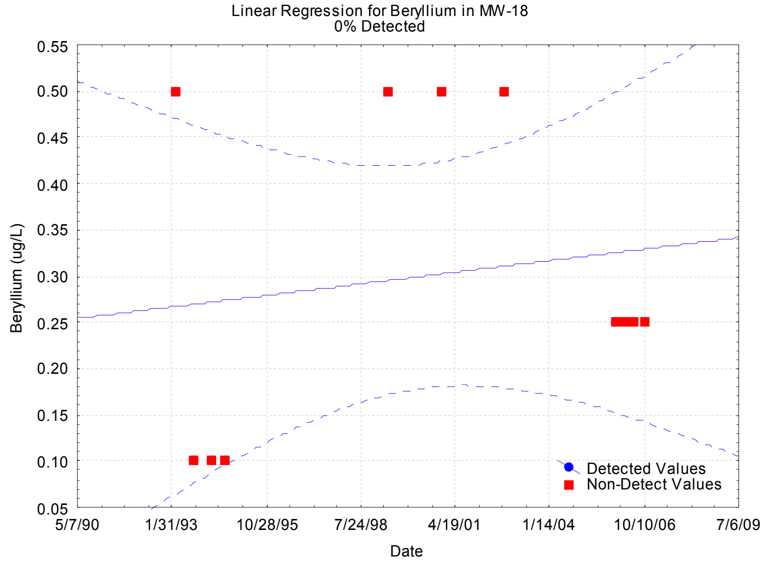


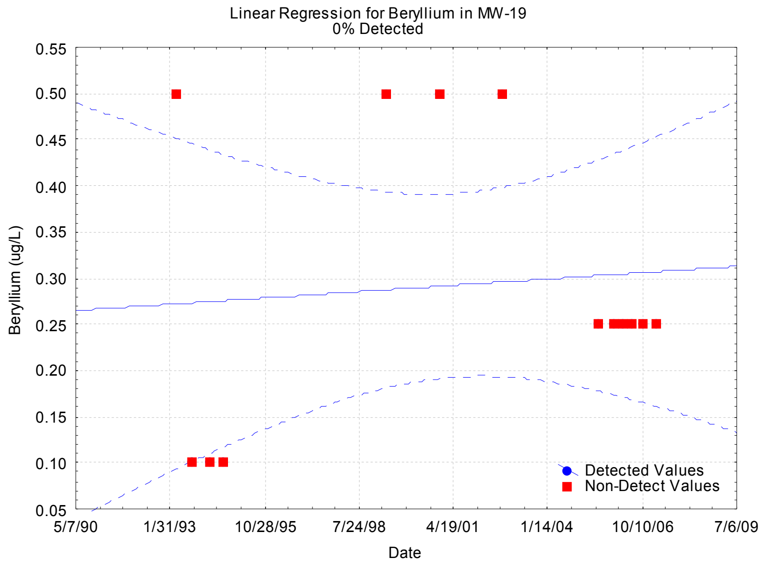


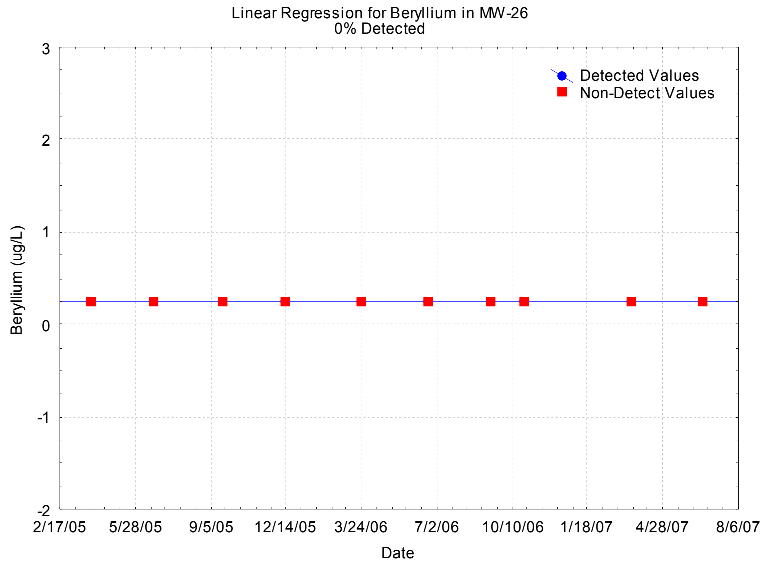


Linear Regressions for Beryllium









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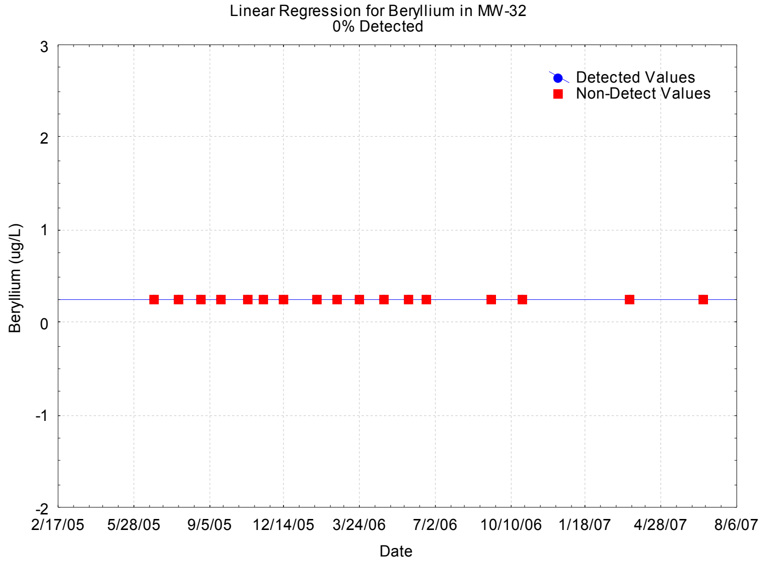
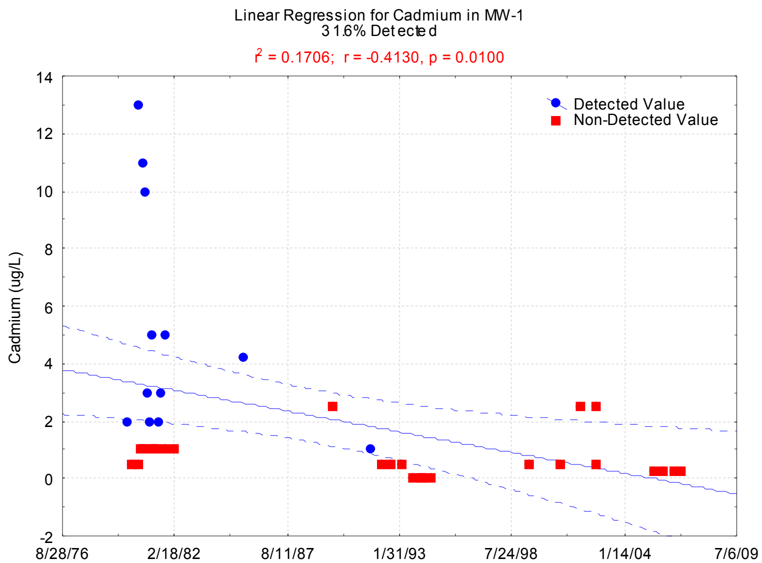
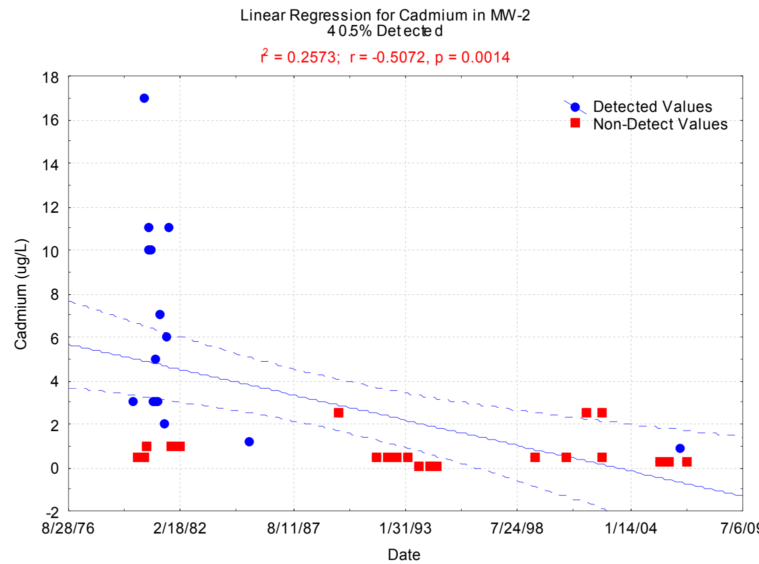
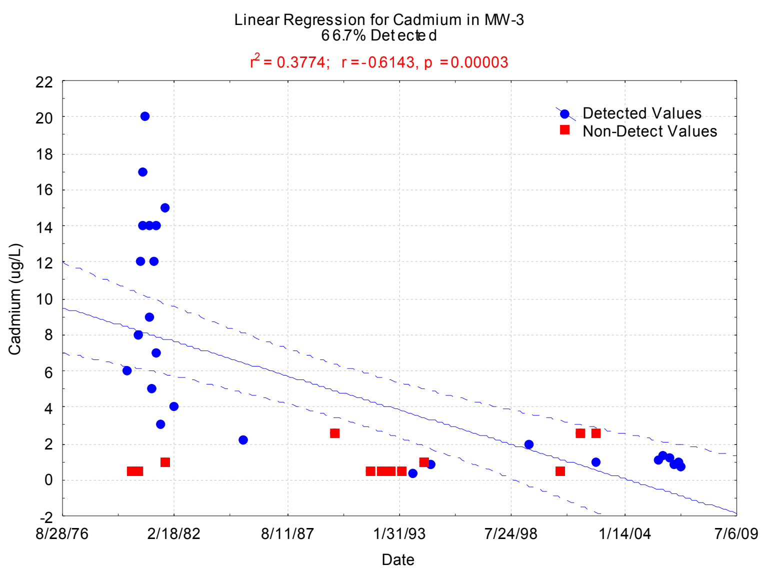
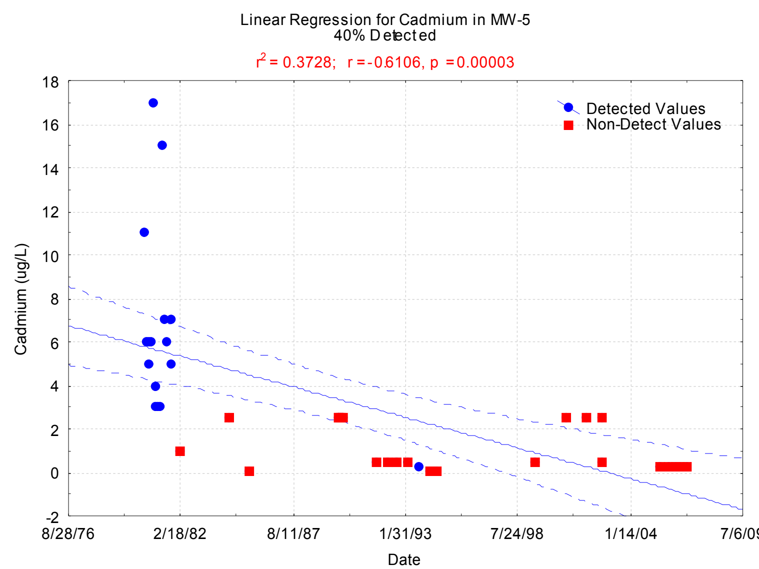


Linear Regressions for Cadmium

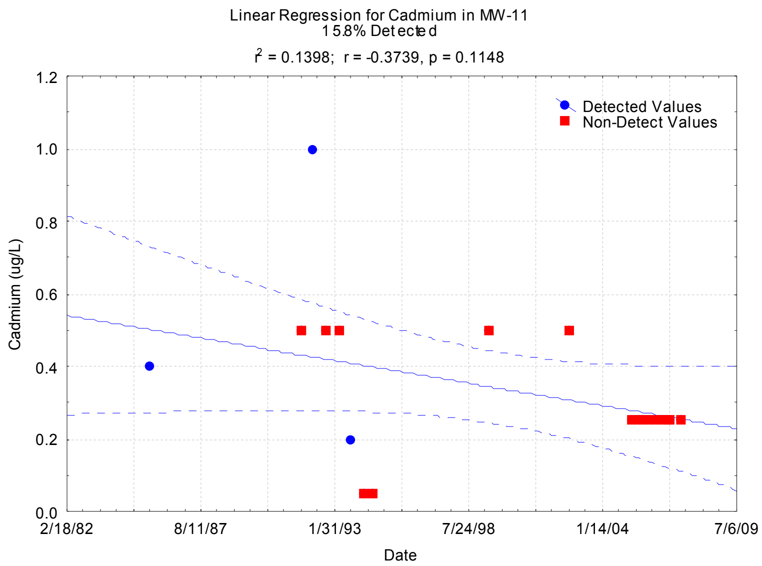


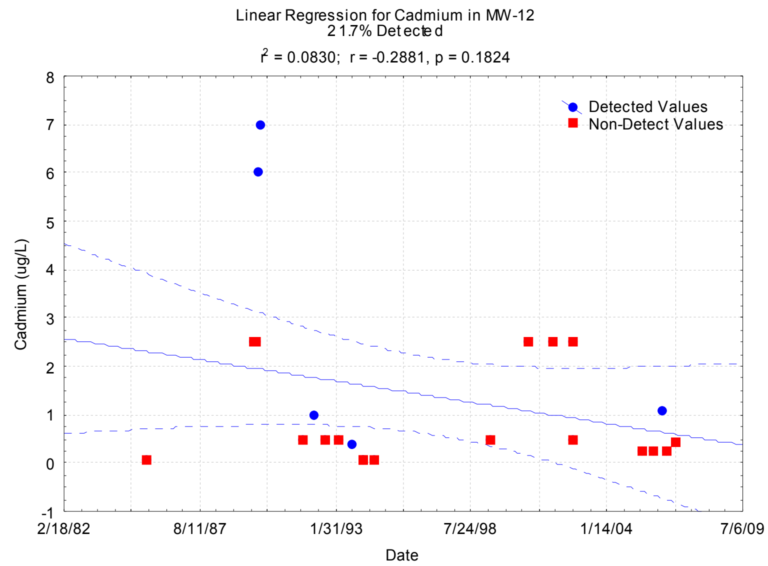


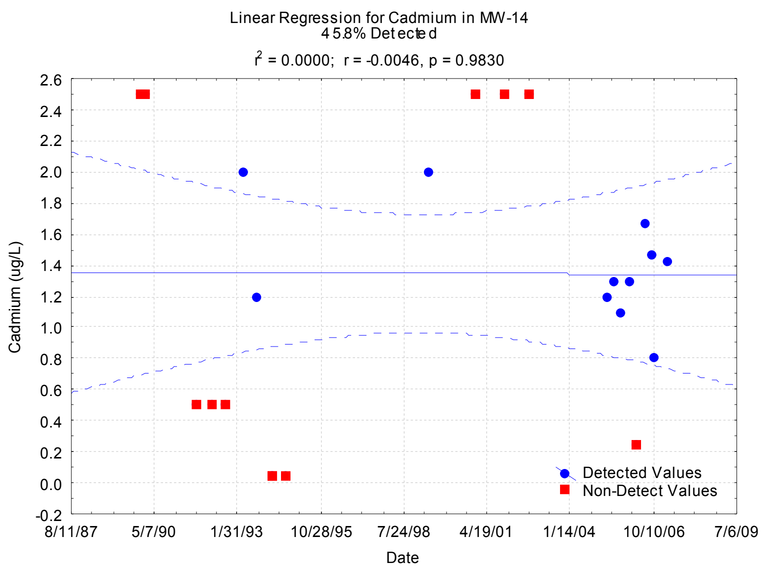


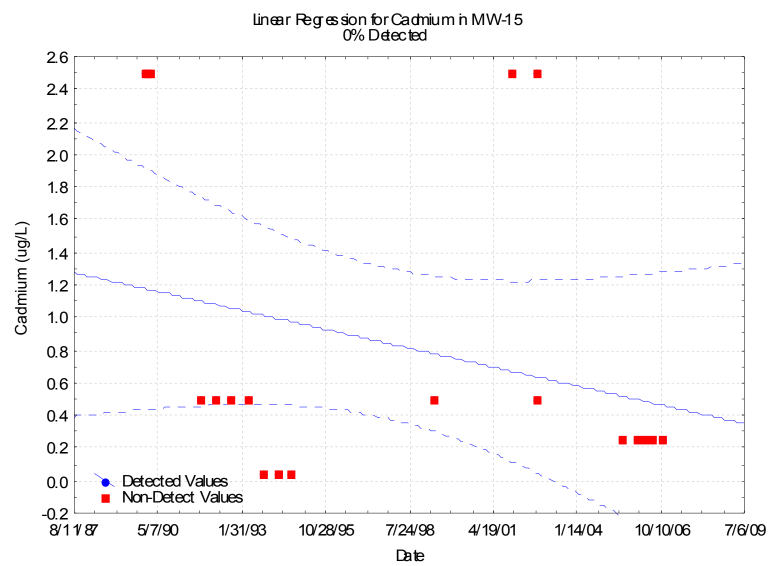


Linear Regressions for Cadmium

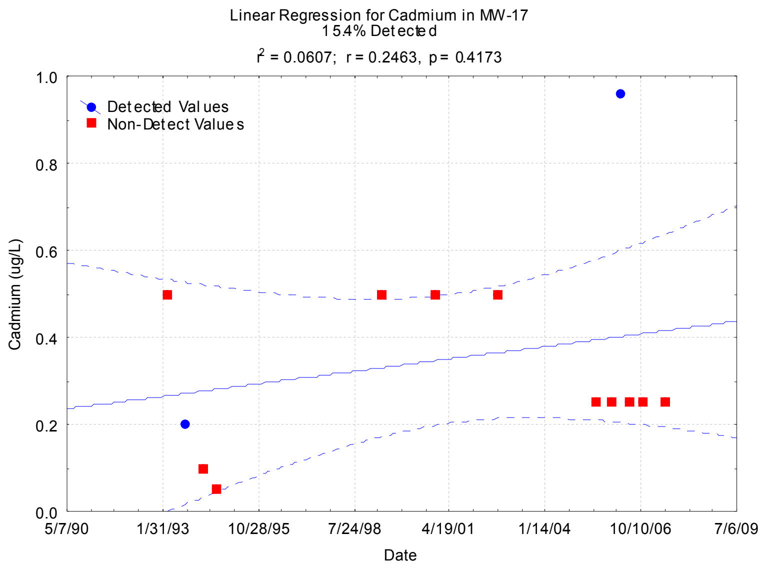


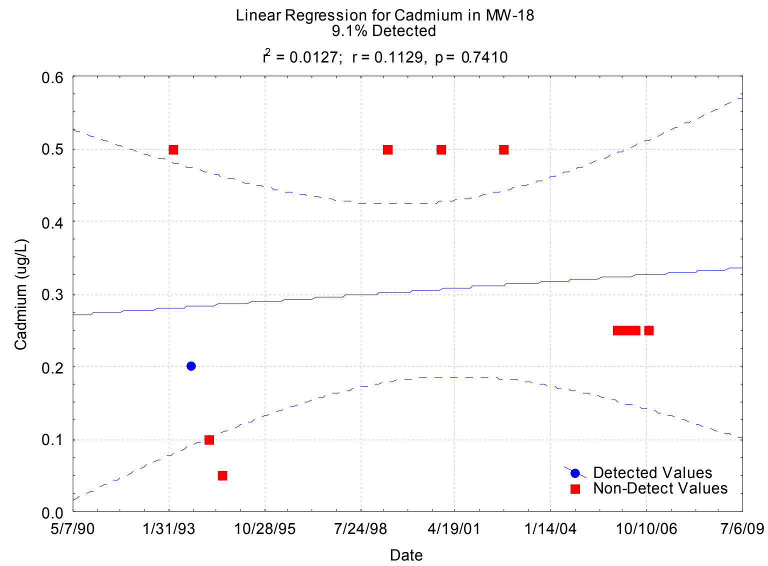


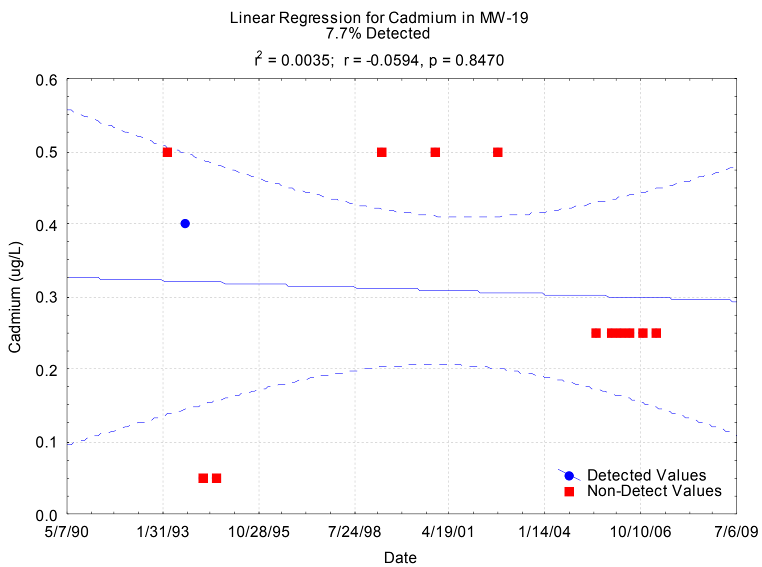


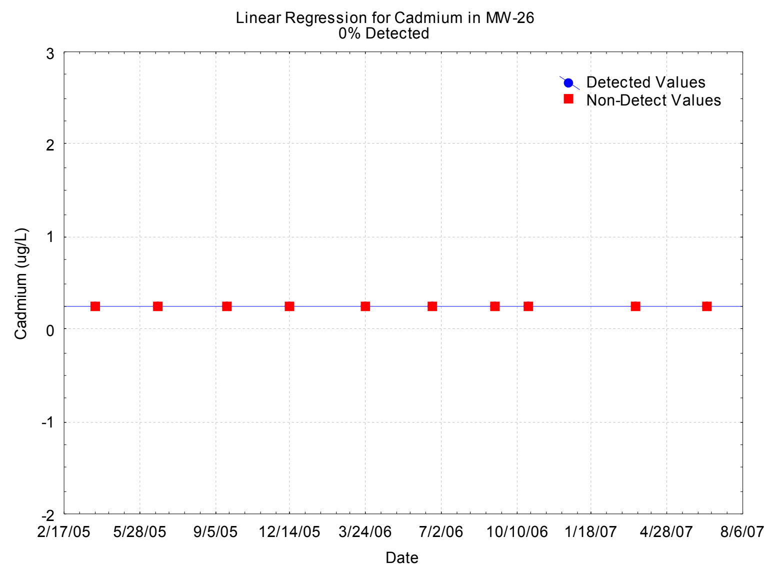


Linear Regressions for Cadmium

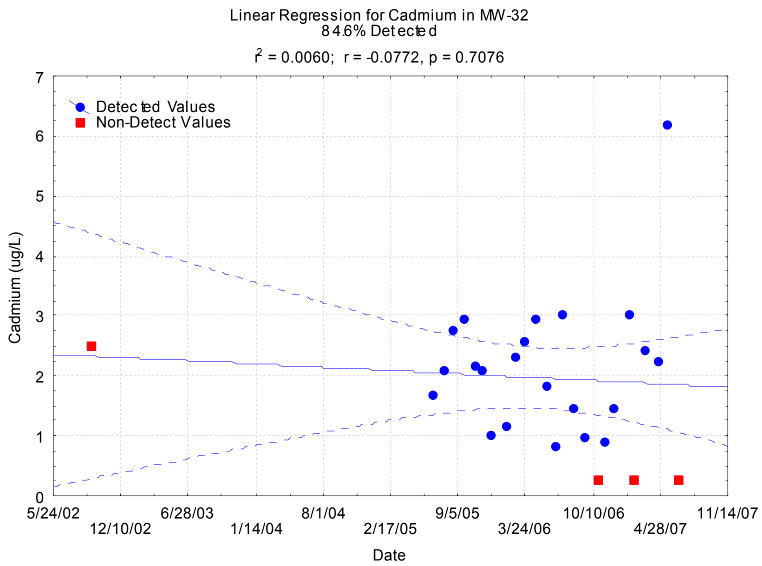






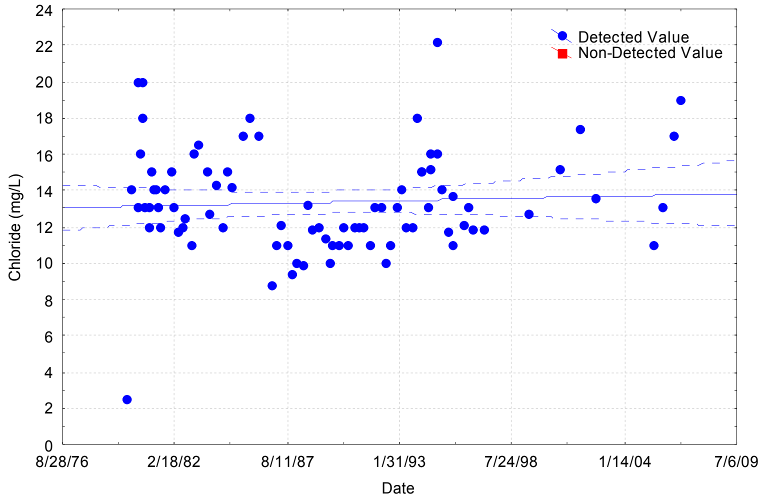


Linear Regressions for Cadmium

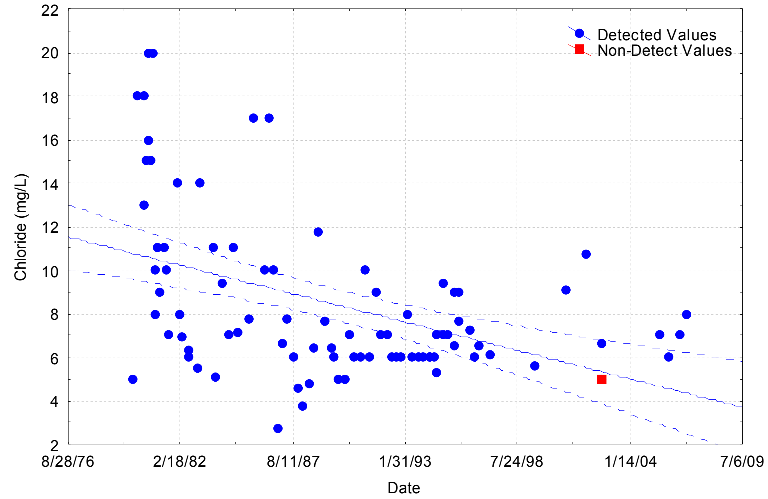


Linear Regressions for Chloride

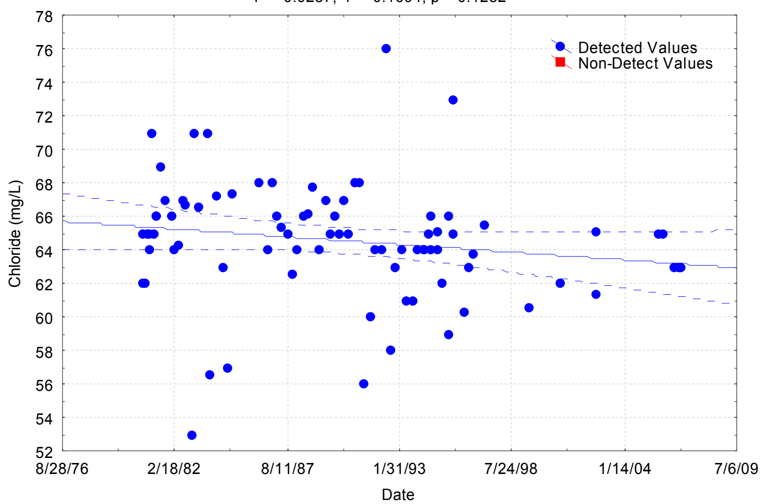
Linear Regression for Chloride in MW-1
100% Detected
r^2 = 0.0036; r = 0.0598, p = 0.5846



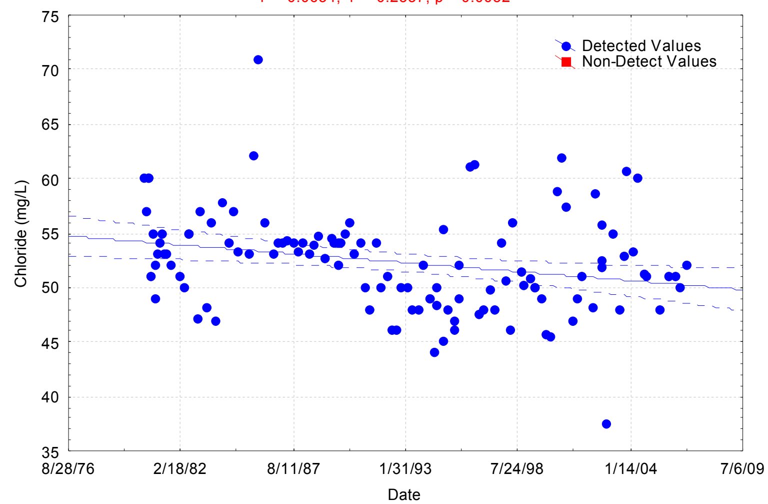
Linear Regression for Chloride in MW-2
98.9% Detected
r^2 = 0.2033; r = -0.4509, p = 0.00001



Linear Regression for Chloride in MW-3
100% Detected
r^2 = 0.0287; r = -0.1694, p = 0.1282

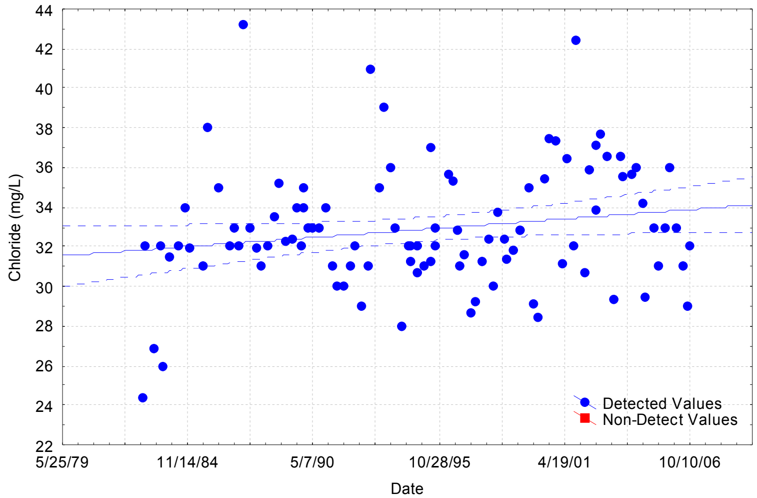


Linear Regression for Chloride in MW-5
100% Detected
r^2 = 0.0654; r = -0.2557, p = 0.0052

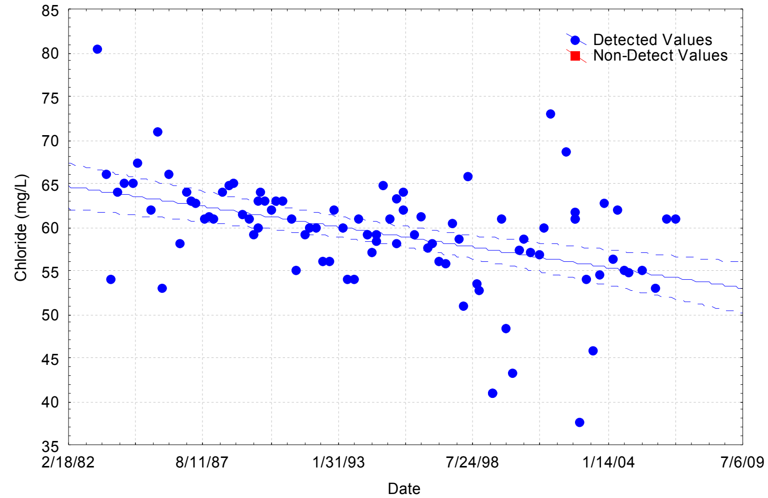


Linear Regressions for Chloride

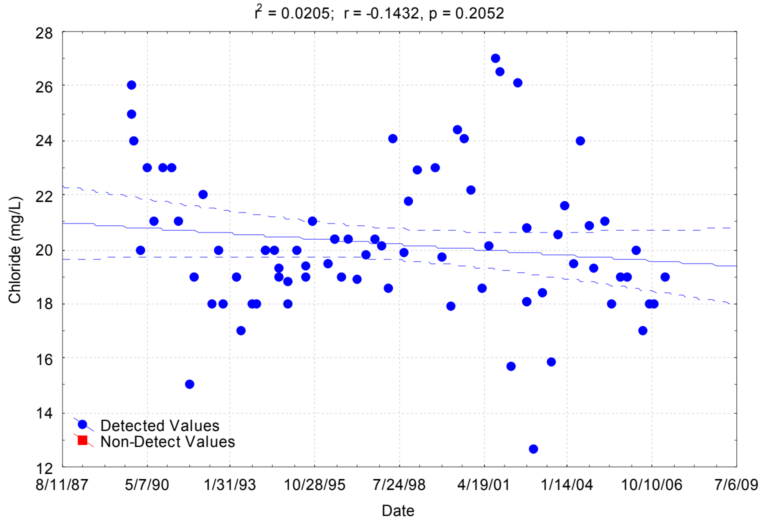
Linear Regression for Chloride in MW-11
100% Detected
$r^2 = 0.0340$; $r = 0.1844$, $p = 0.0609$



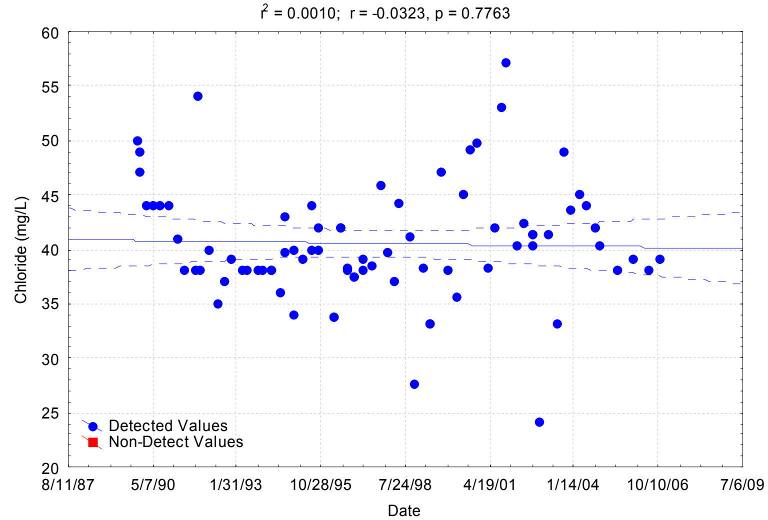
Linear Regression for Chloride in MW-12
100% Detected
$r^2 = 0.1890$; $r = -0.4347$, $p = 0.00001$



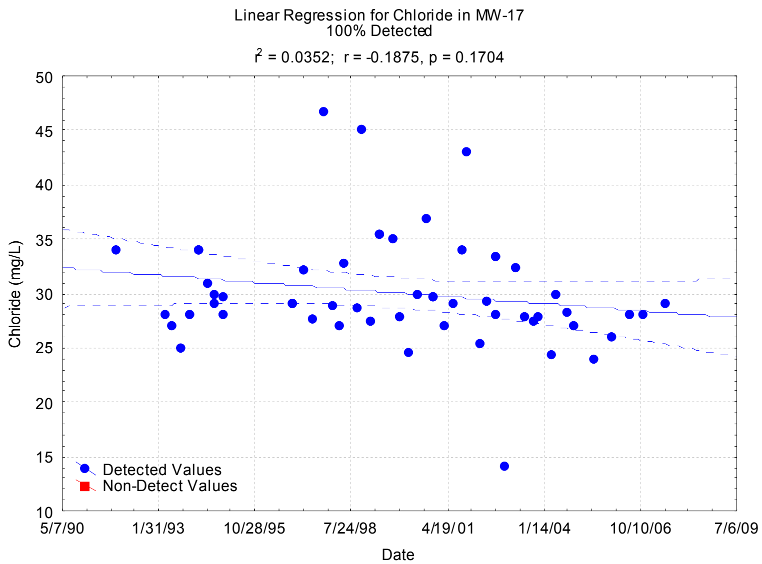
Linear Regression for Chloride in MW-14
100% Detected
$r^2 = 0.0205$; $r = -0.1432$, $p = 0.2052$

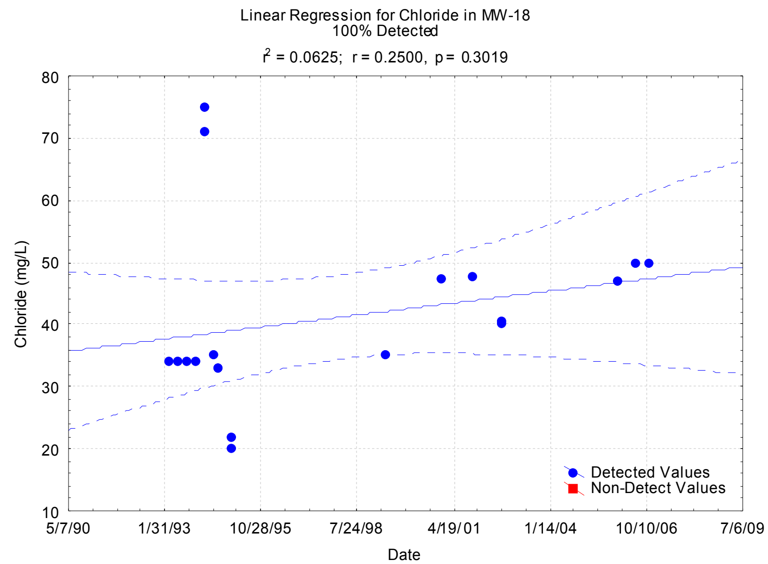


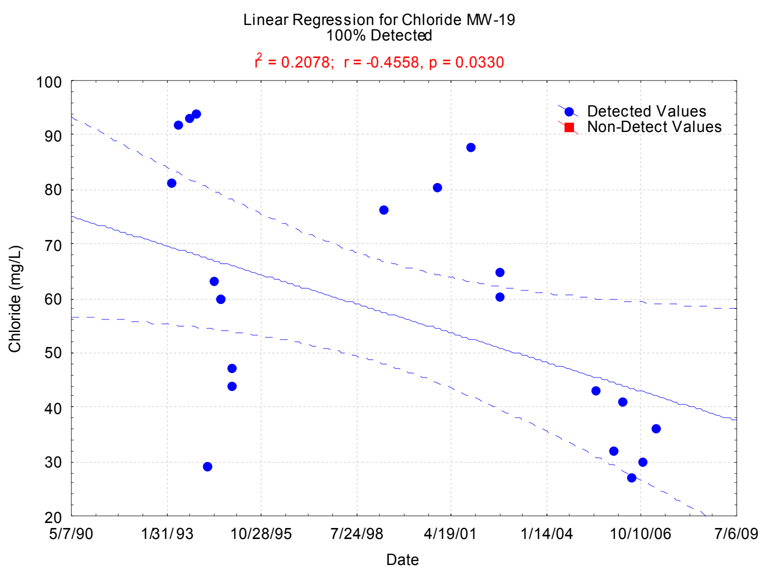
Linear Regression for Chloride in MW-15
100% Detected
$r^2 = 0.0010$; $r = -0.0323$, $p = 0.7763$

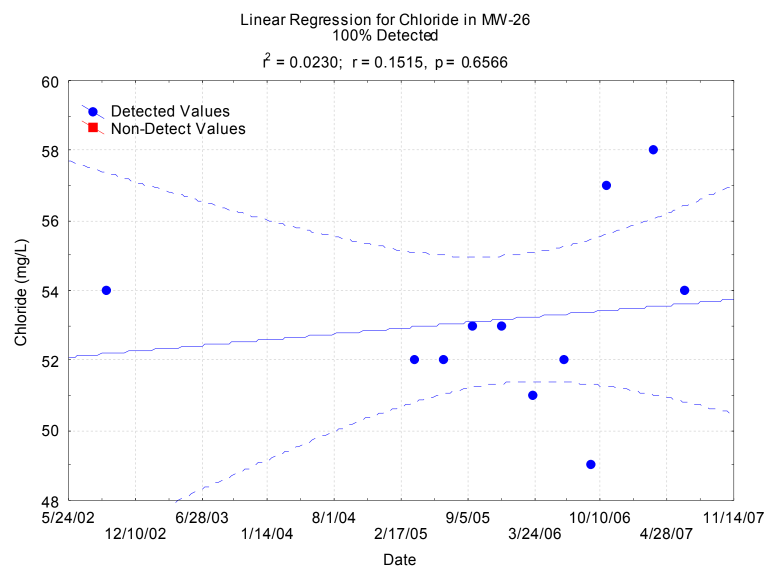


Linear Regressions for Chloride

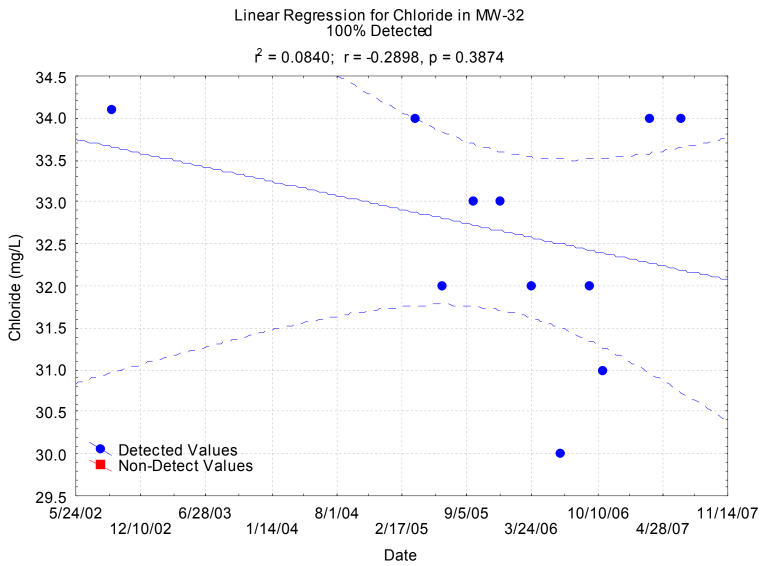




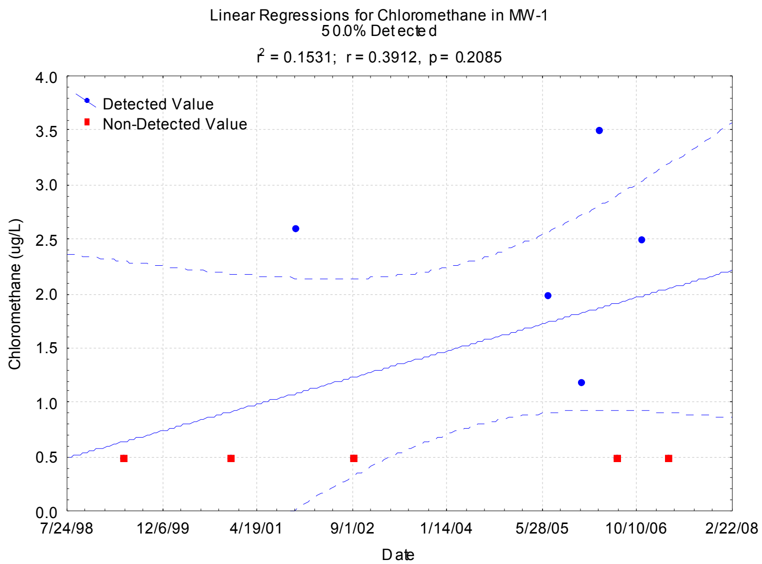


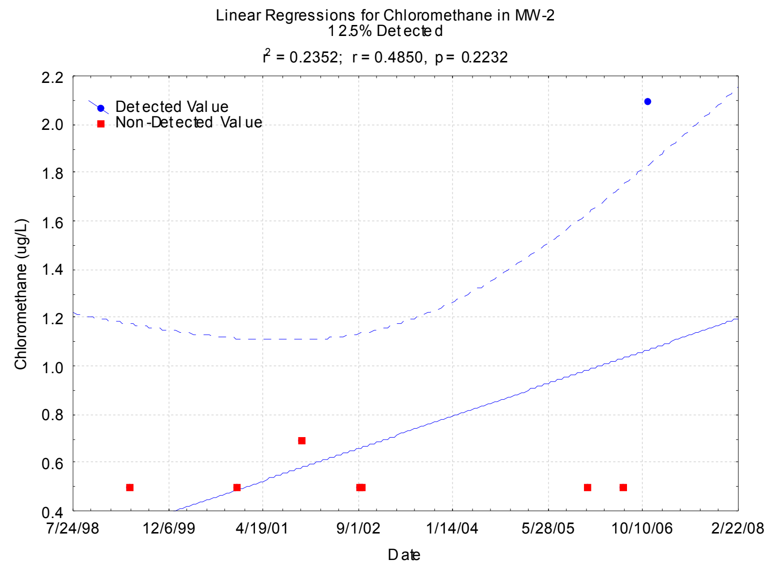


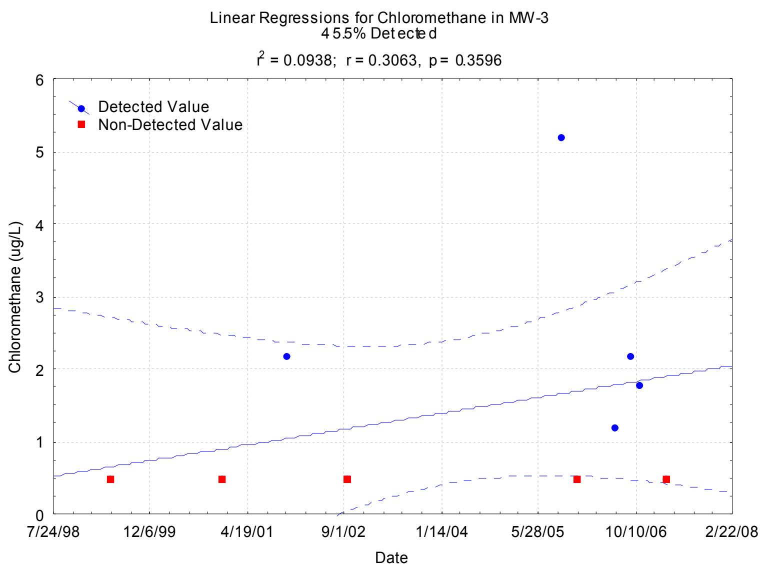
Linear Regressions for Chloride

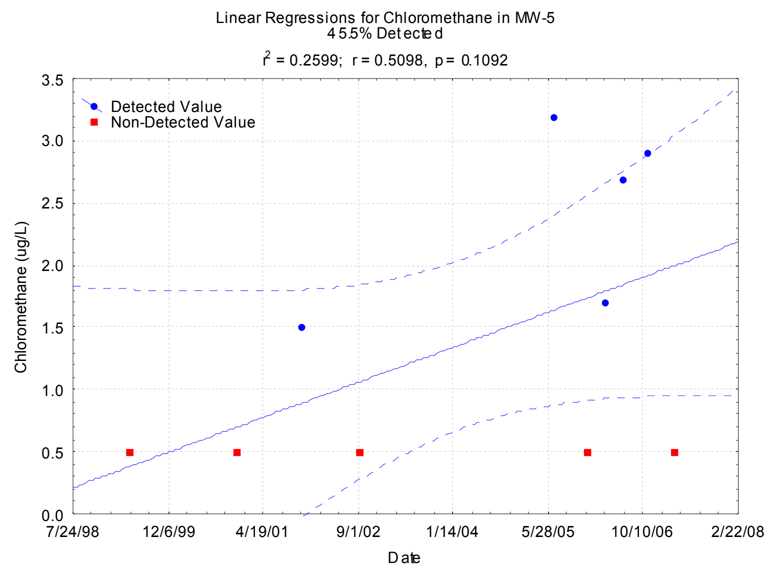


Linear Regressions for Chloromethane

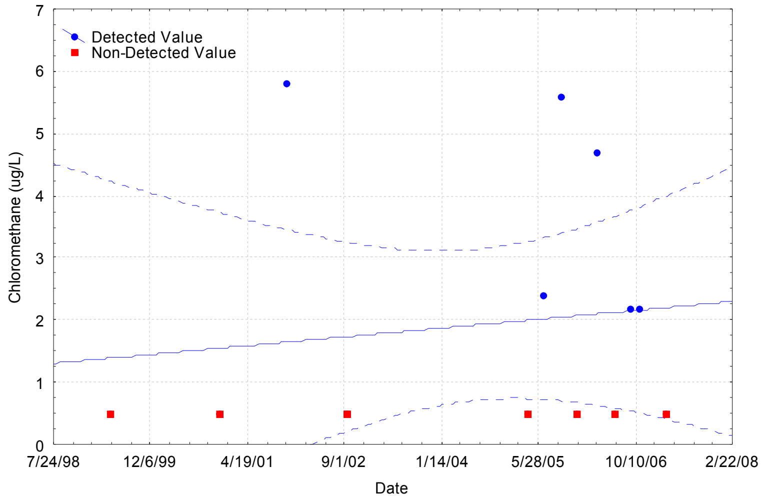


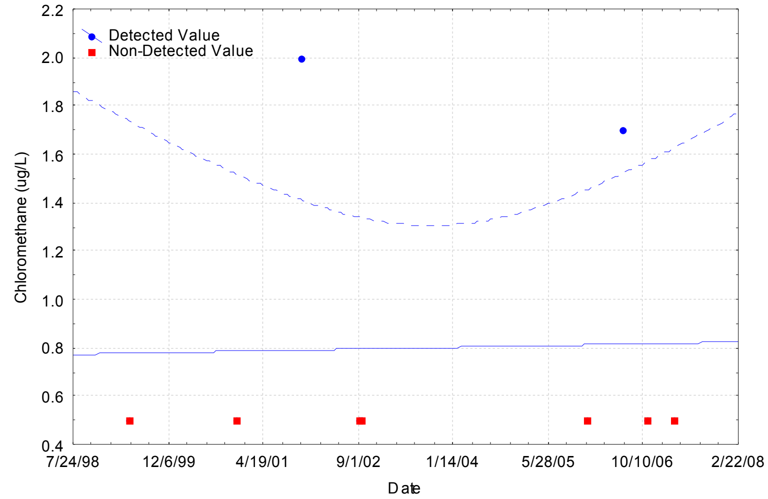


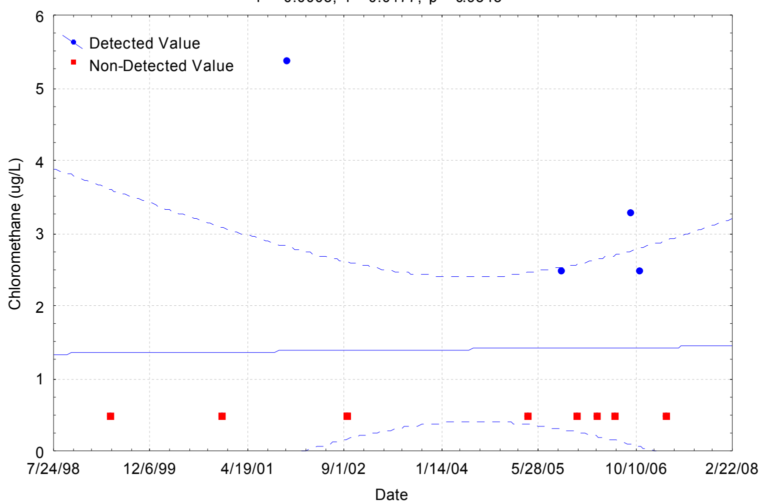


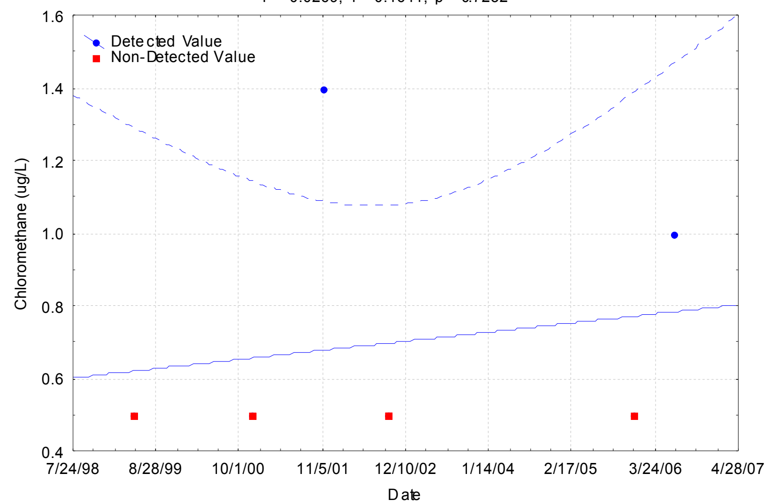


Linear Regressions for Chloromethane

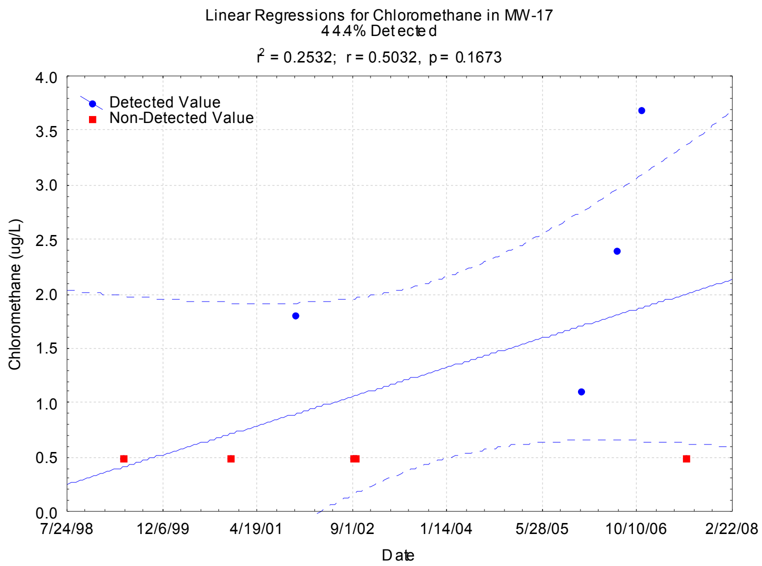


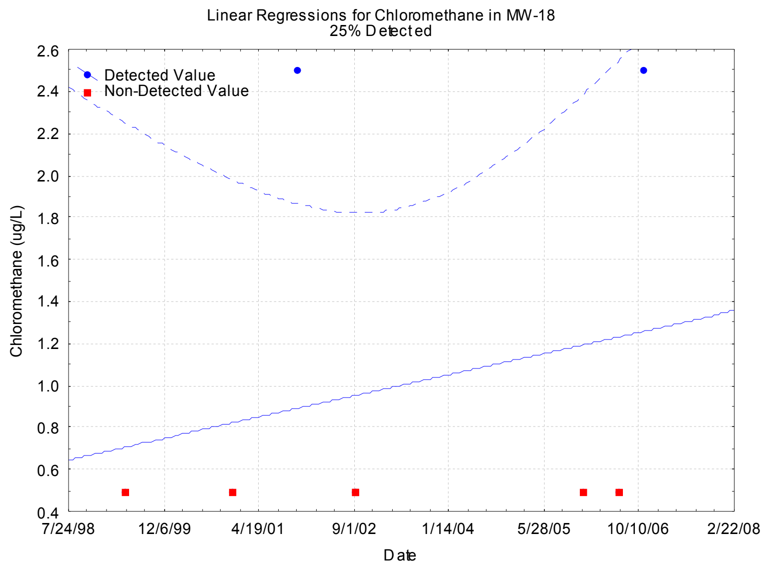


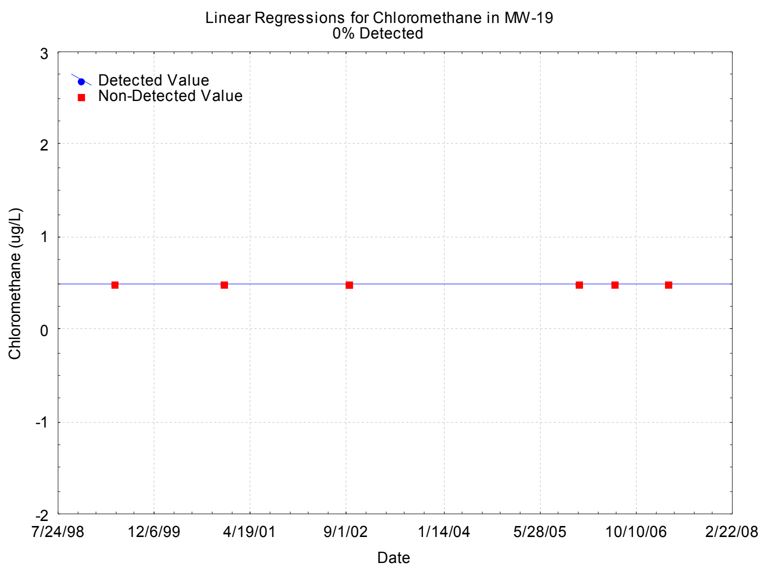


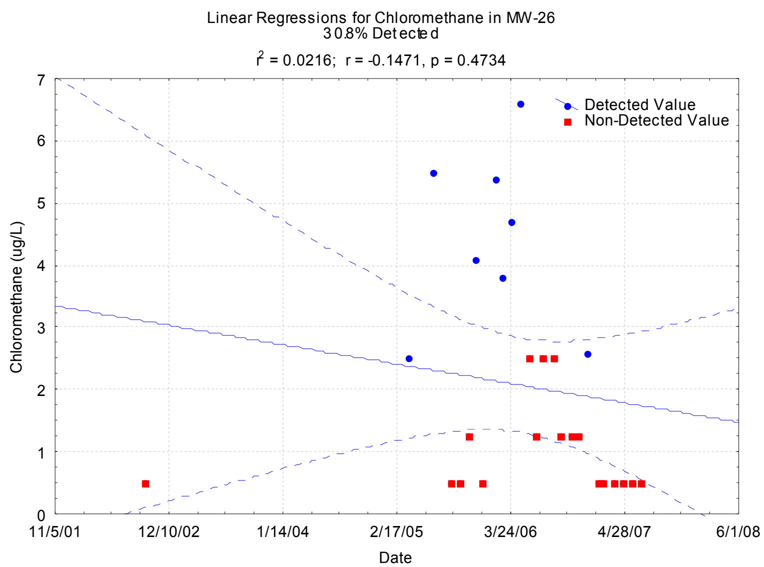


Linear Regressions for Chloromethane

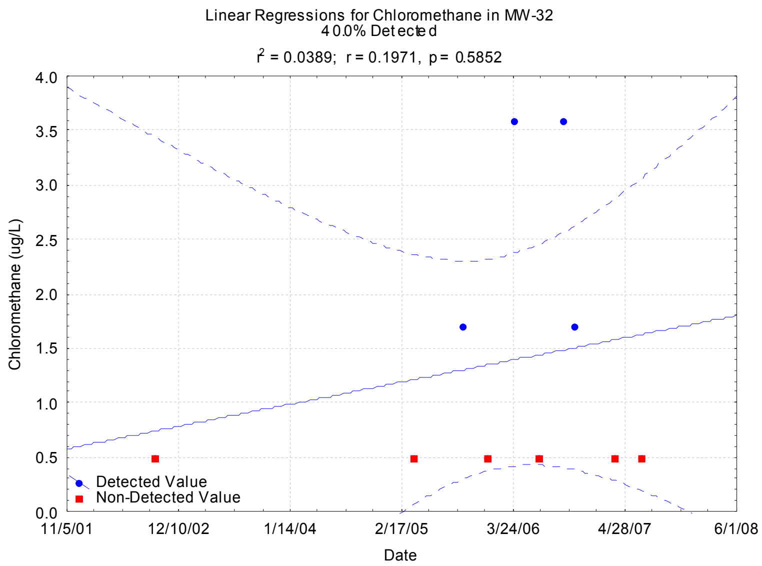






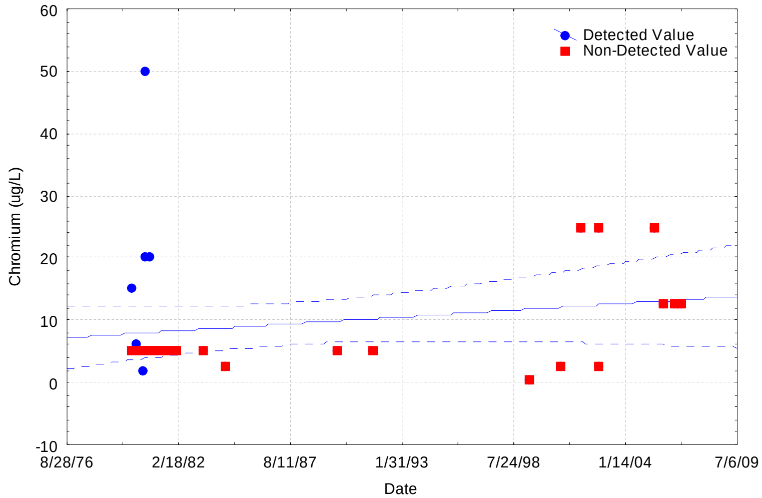


Linear Regressions for Chloromethane

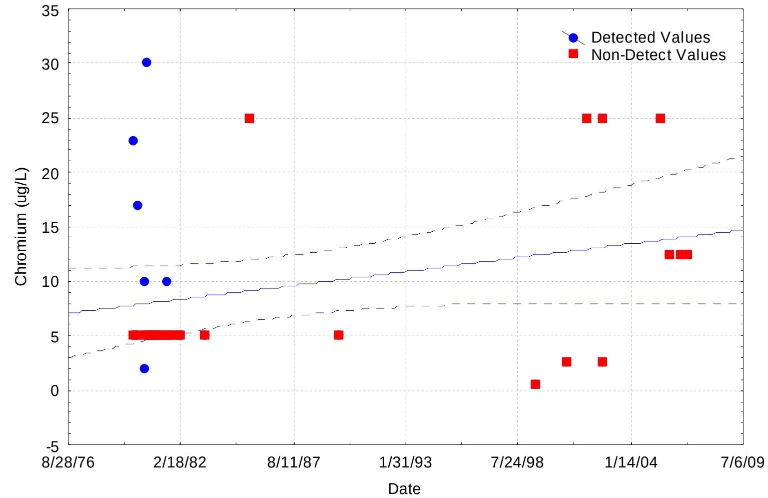


Linear Regressions for Chromium

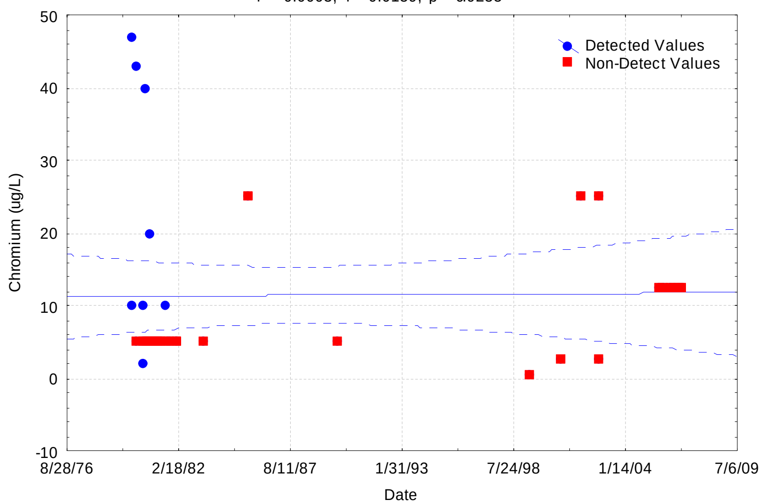
Linear Regression for Chromium in MW-1
17.1% Detected
r^2 = 0.0418; r = 0.2044, p = 0.2389



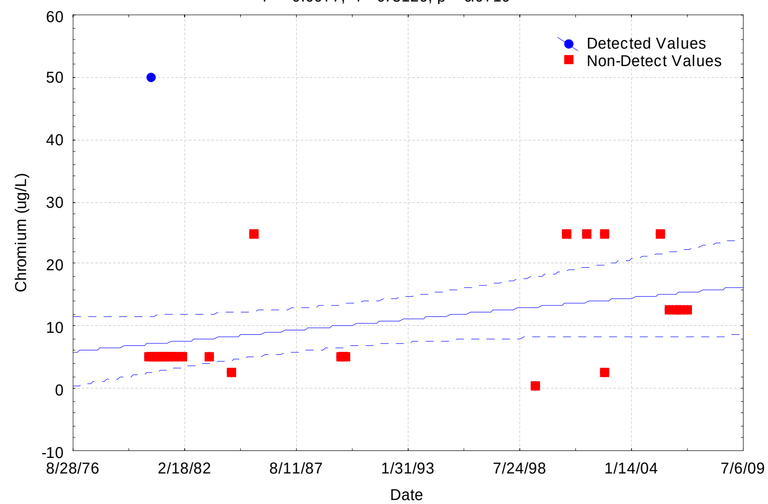
Linear Regression for Chromium in MW-2
17.6% Detected
r^2 = 0.0818; r = 0.2860, p = 0.1010



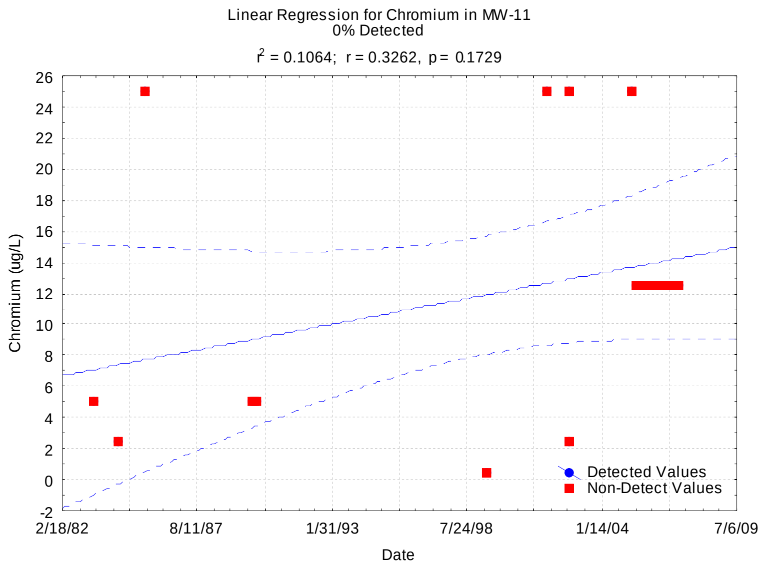
Linear Regression for Chromium in MW-3
21.6% Detected
r^2 = 0.0003; r = 0.0159, p = 0.9255

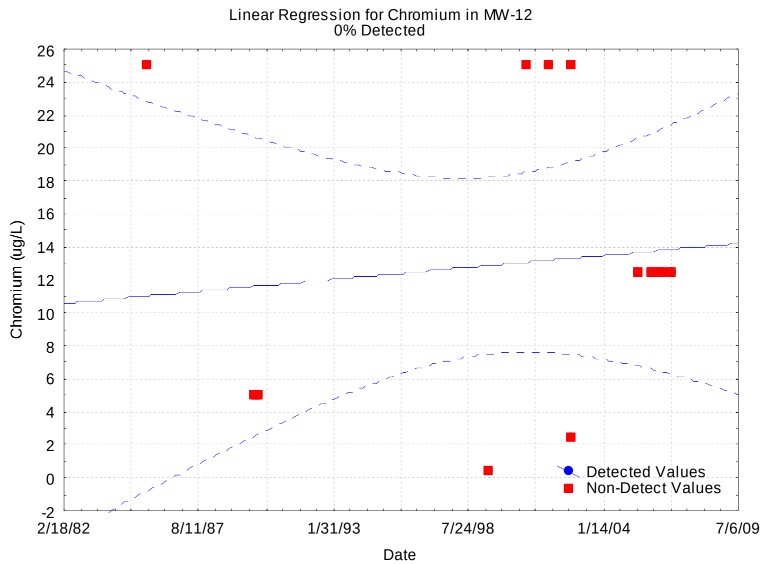


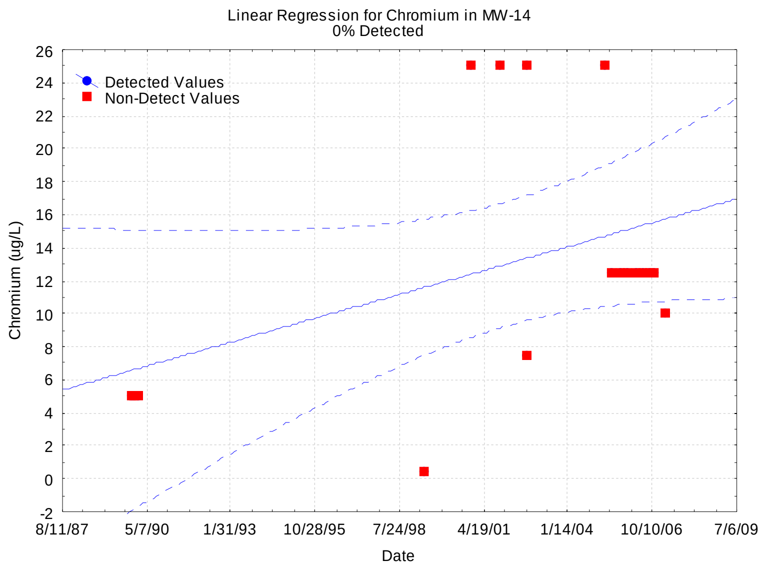
Linear Regression for Chromium in MW-5
2.9% Detected
r^2 = 0.0977; r = 0.3126, p = 0.0719

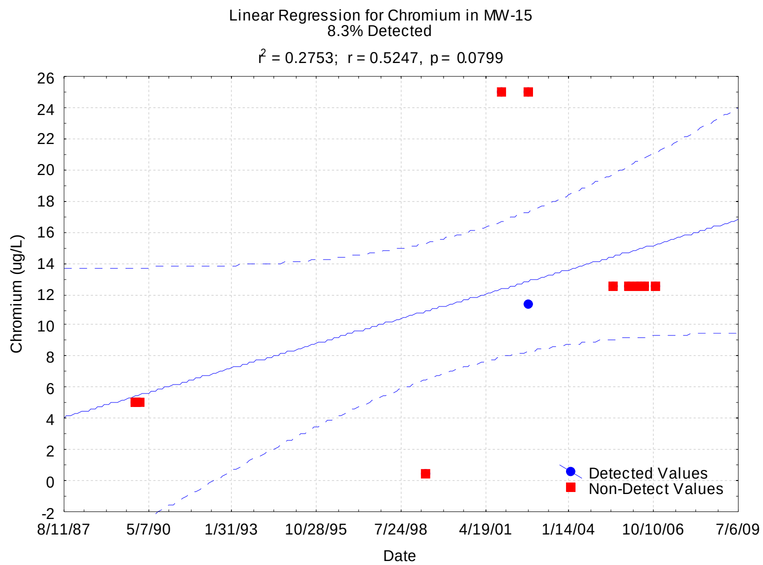


Linear Regressions for Chromium

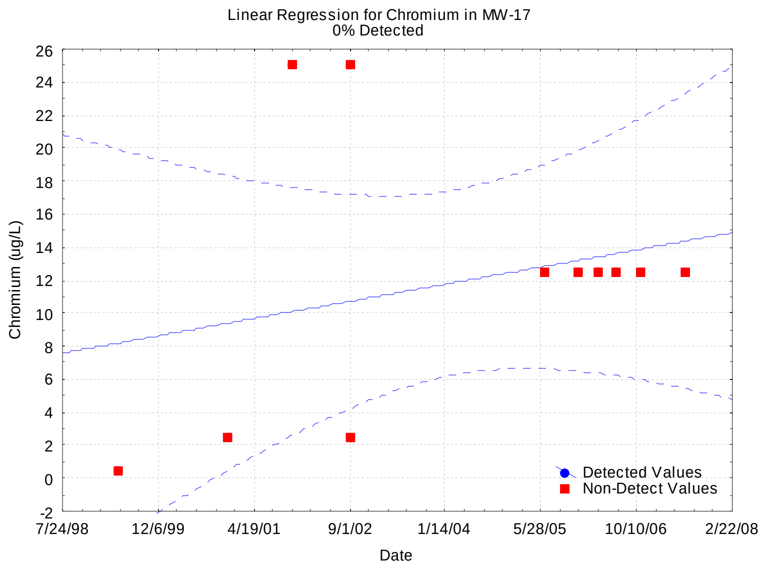


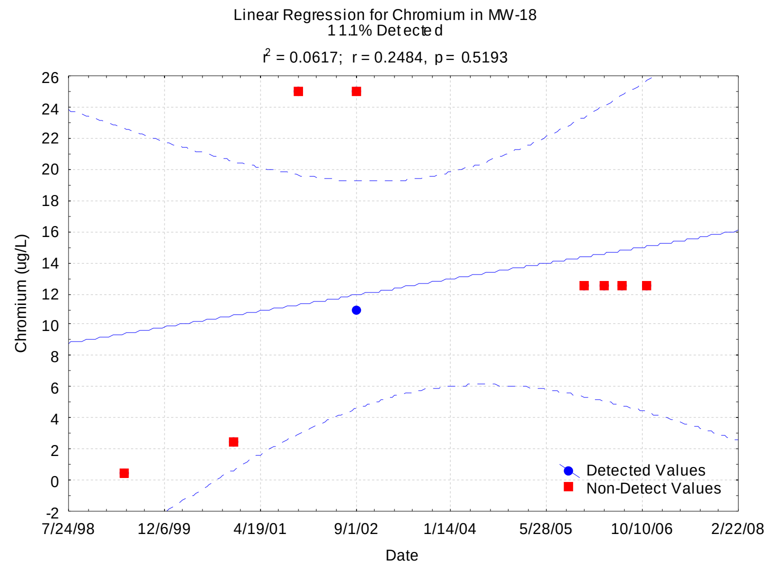


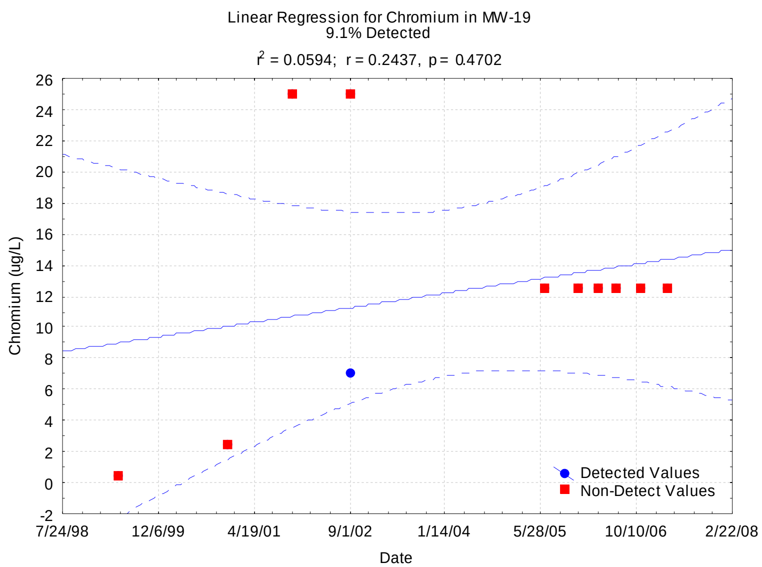


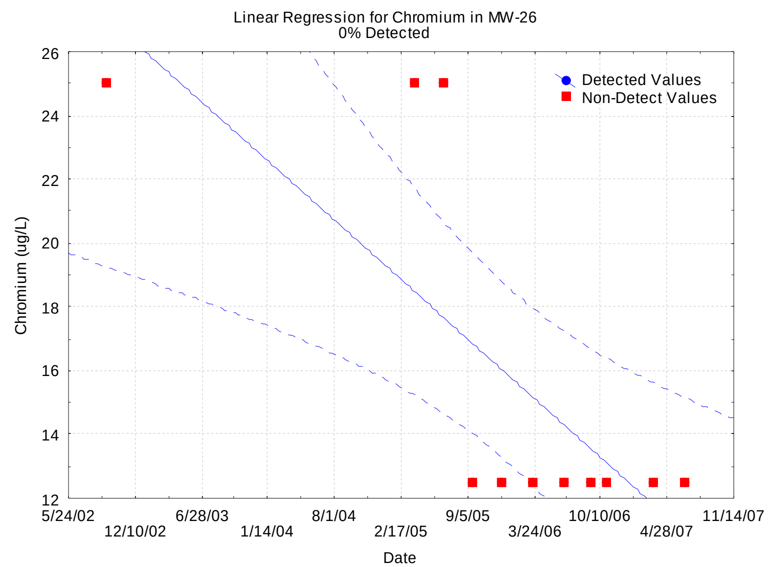


Linear Regressions for Chromium

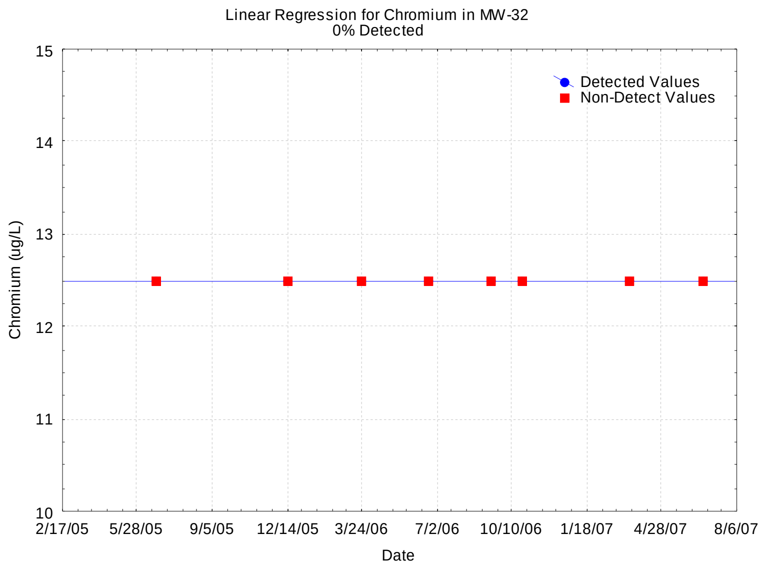




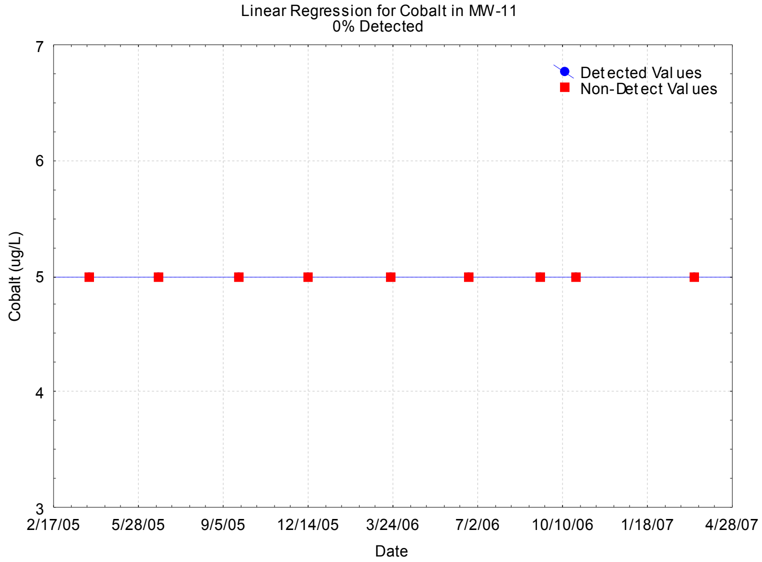


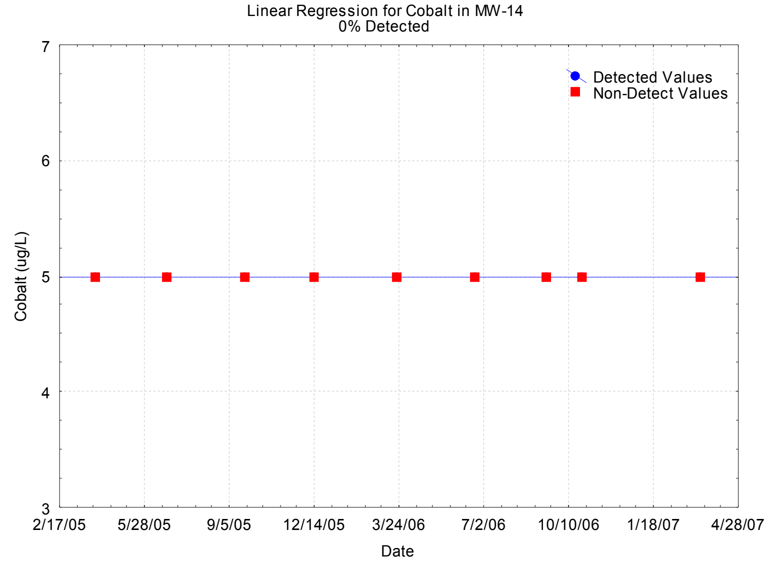


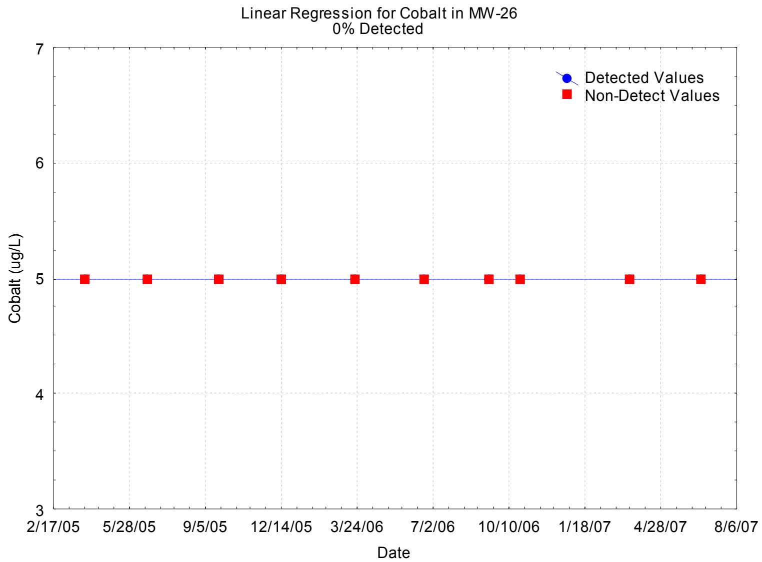
Linear Regressions for Chromium

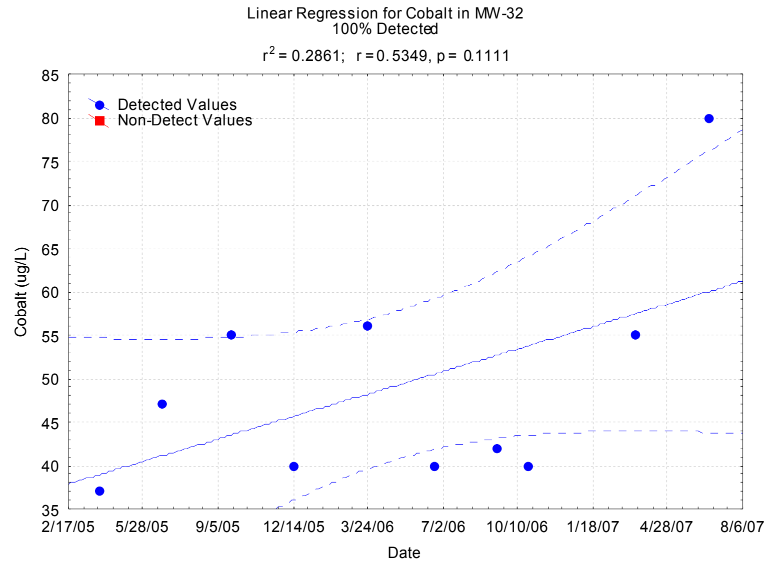


Linear Regressions for Cobalt

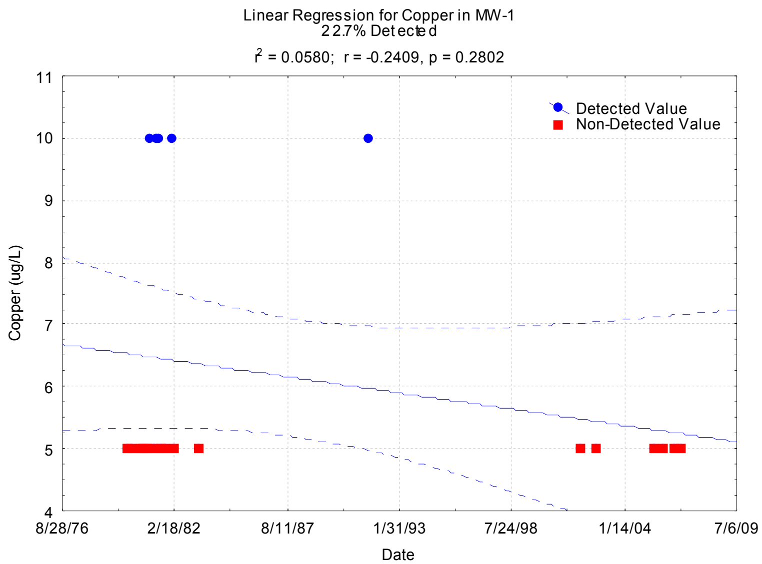


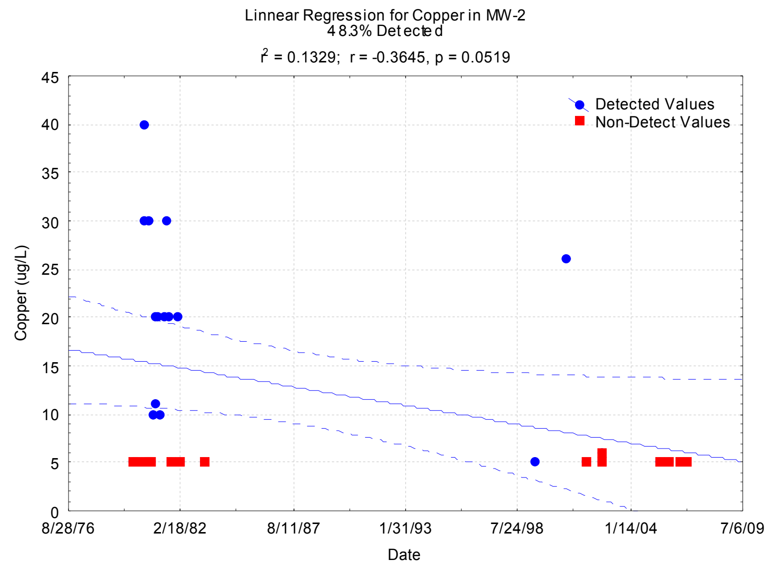


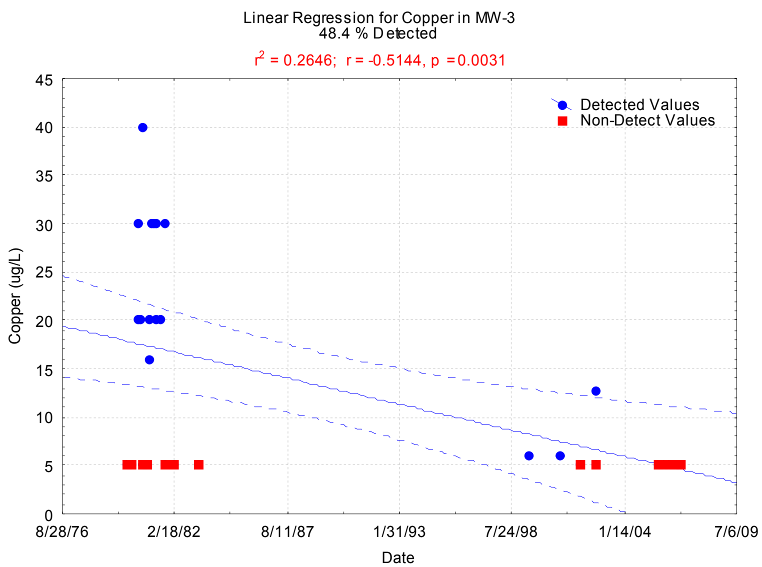


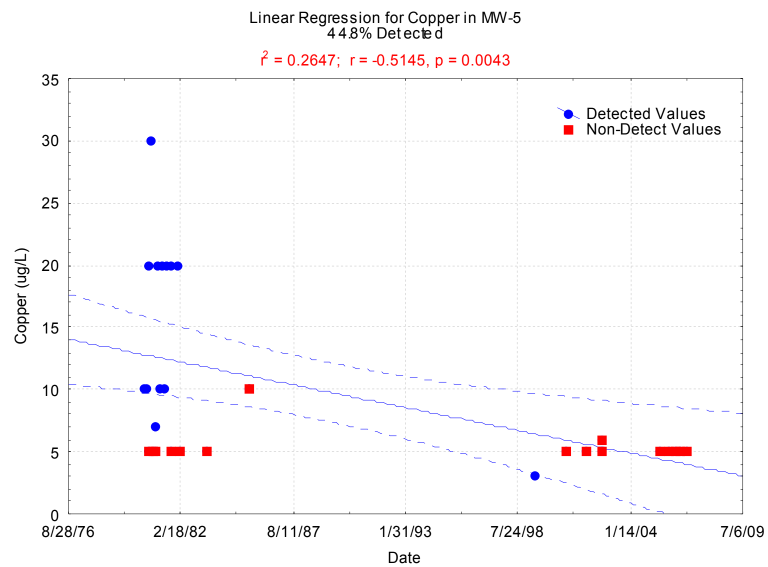


Linear Regressions for Copper

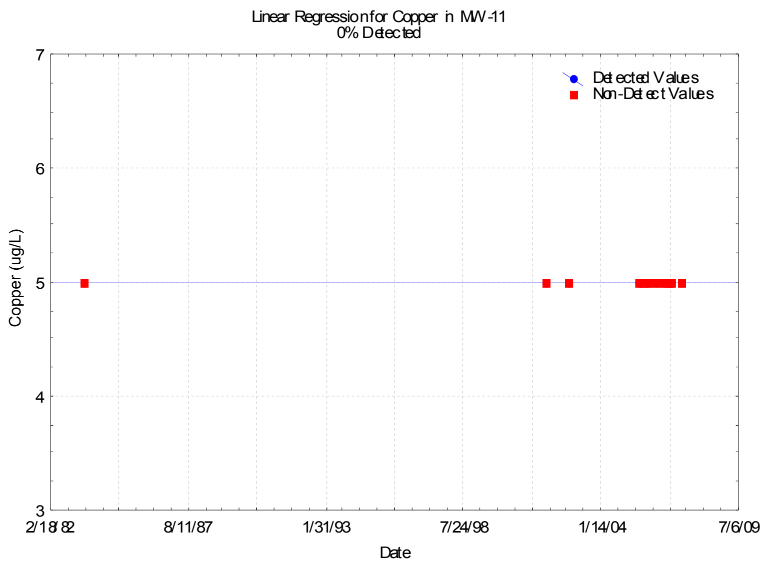


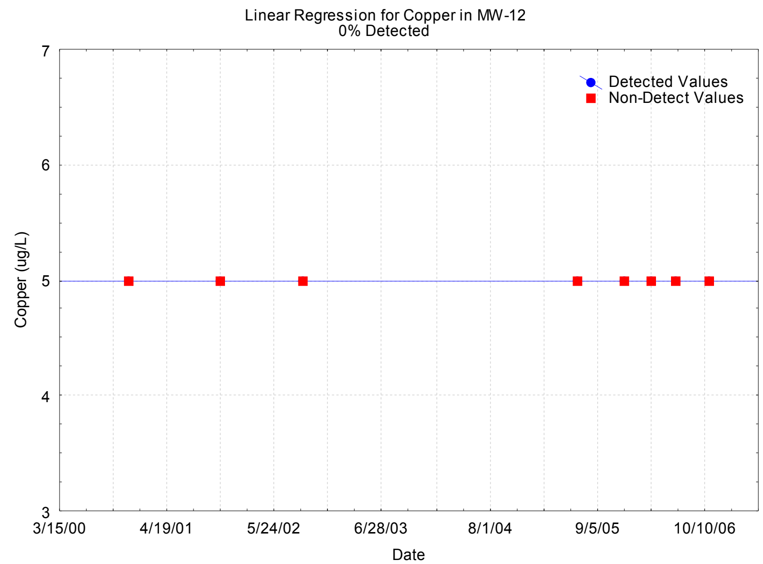


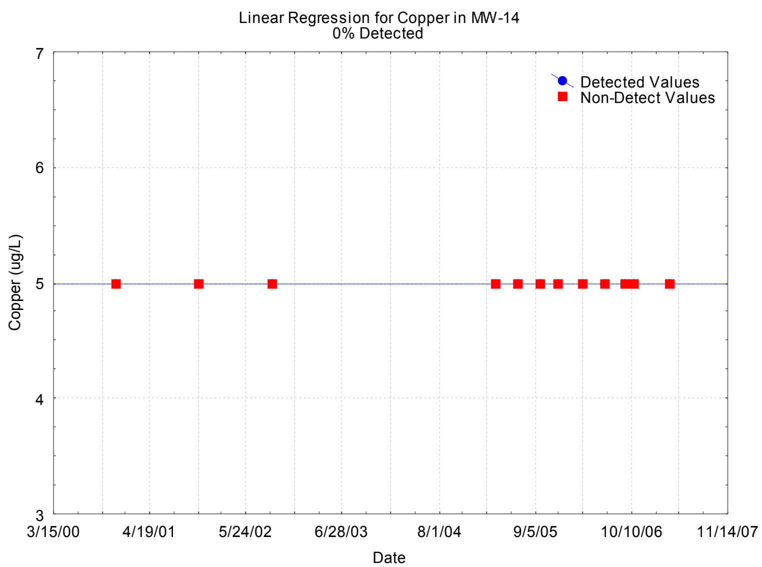


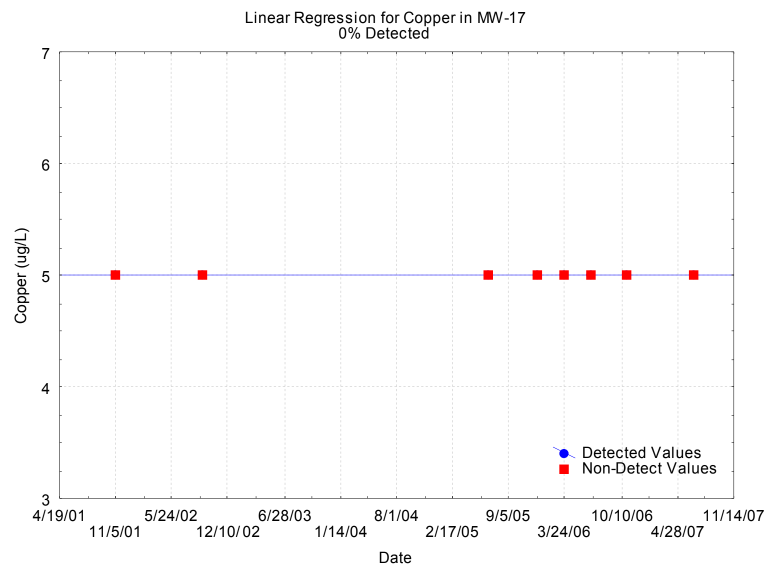


Linear Regressions for Copper

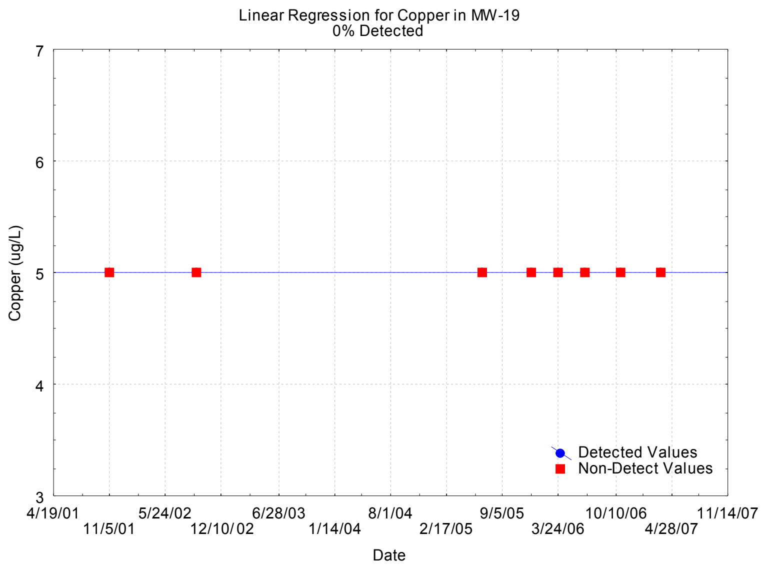


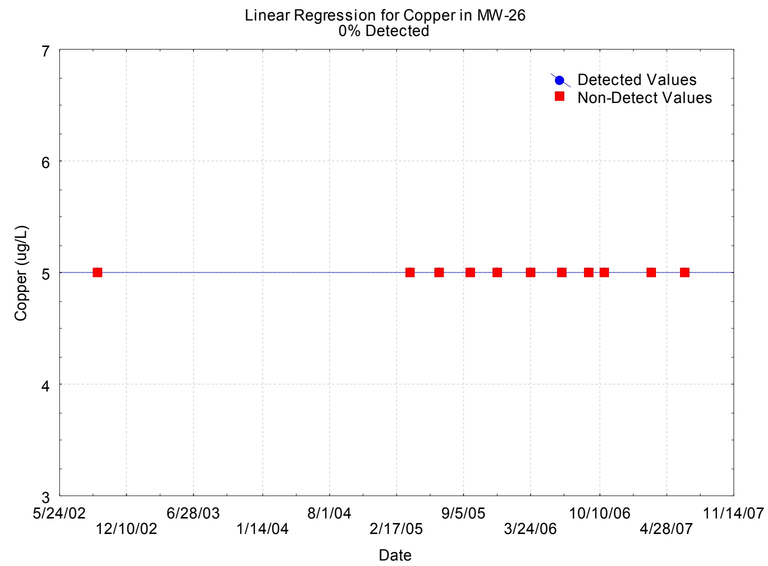


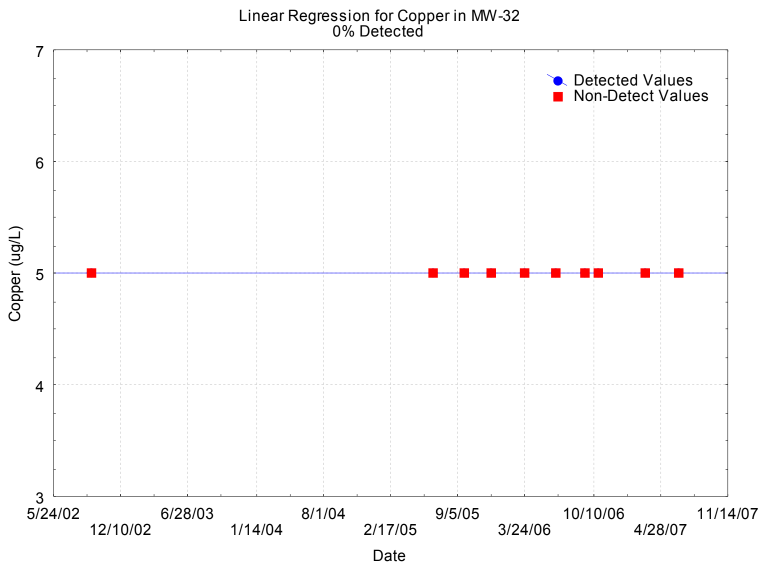




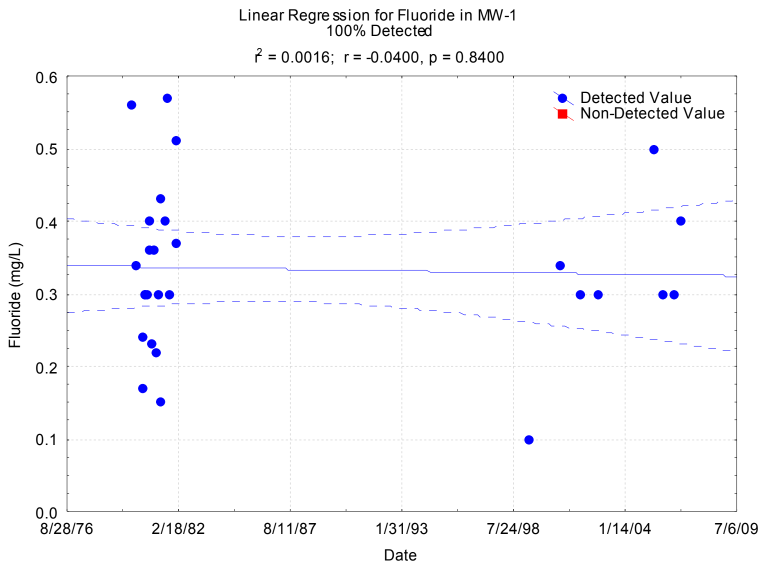
Linear Regressions for Copper

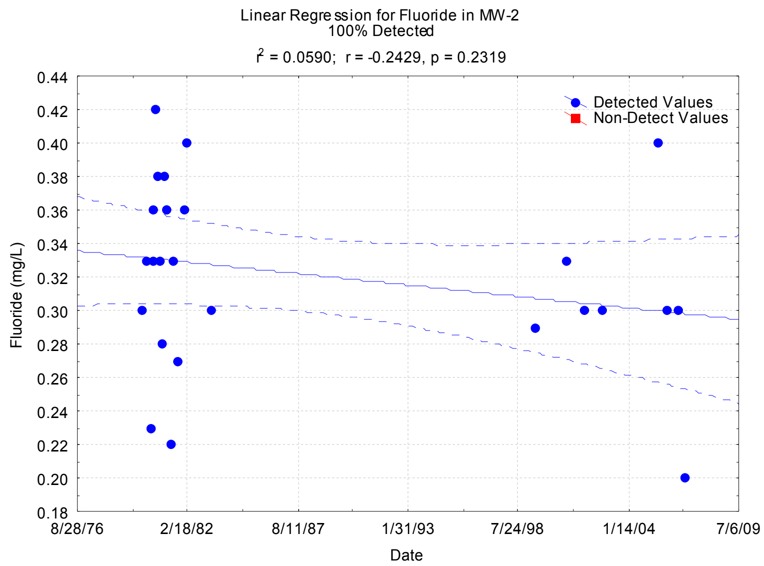


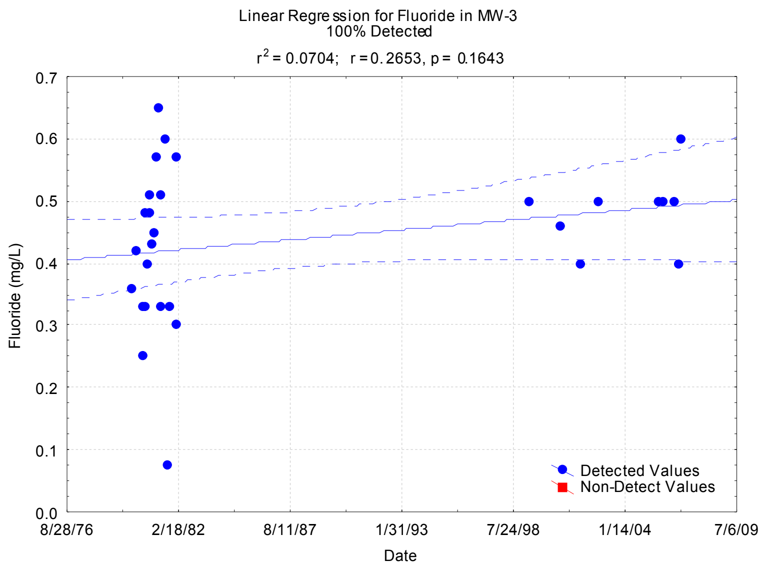


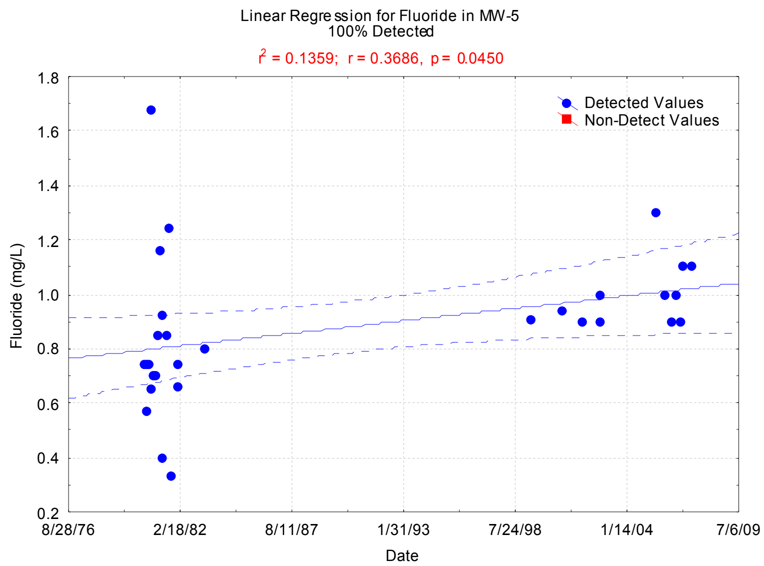


Linear Regressions for Fluoride

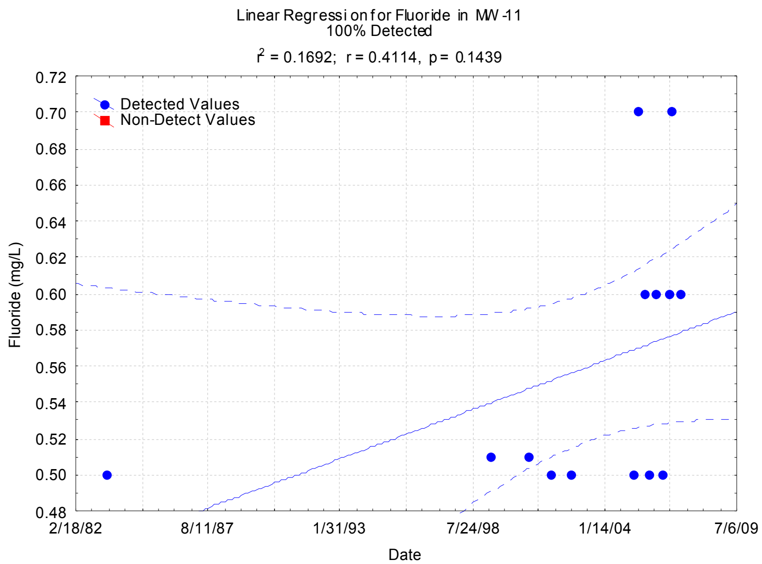


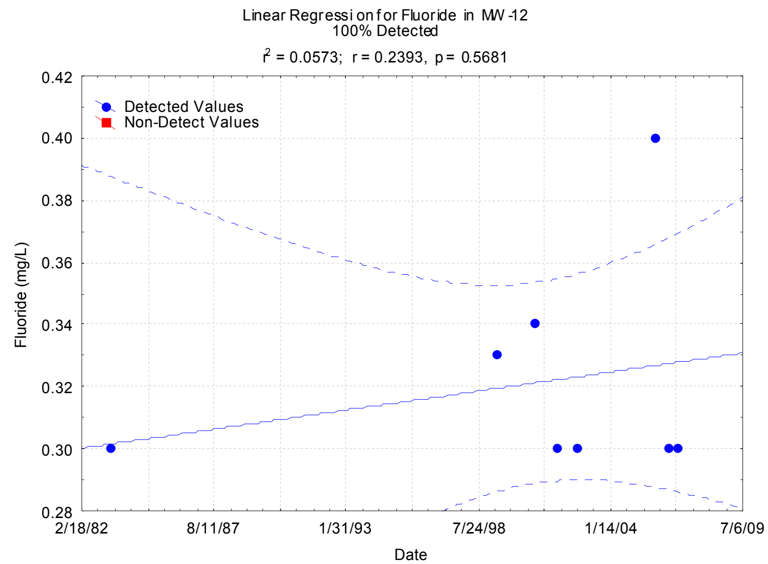


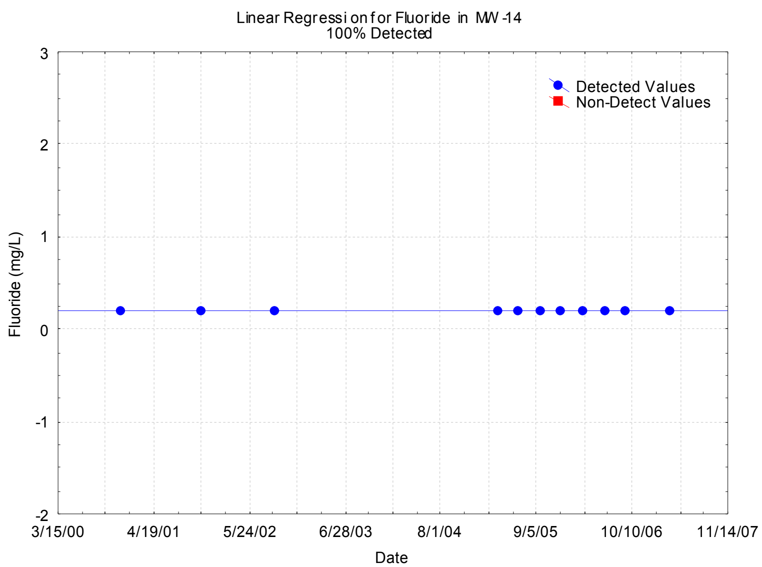


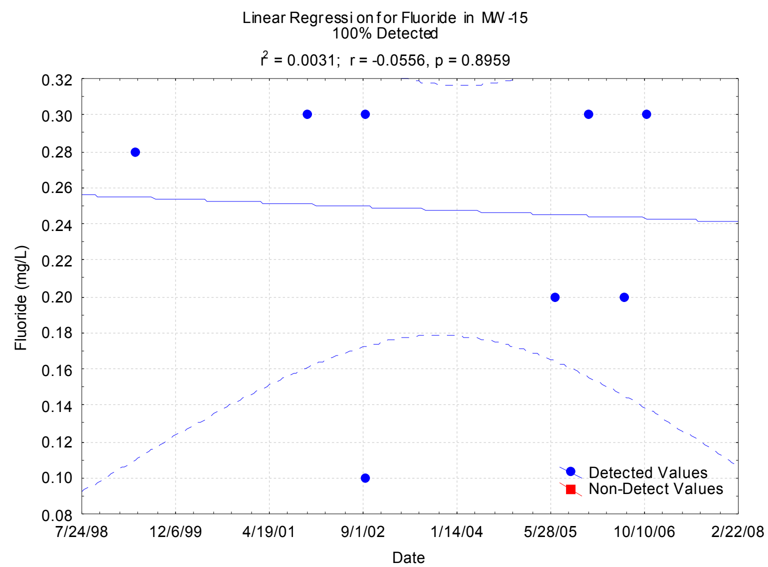


Linear Regressions for Fluoride

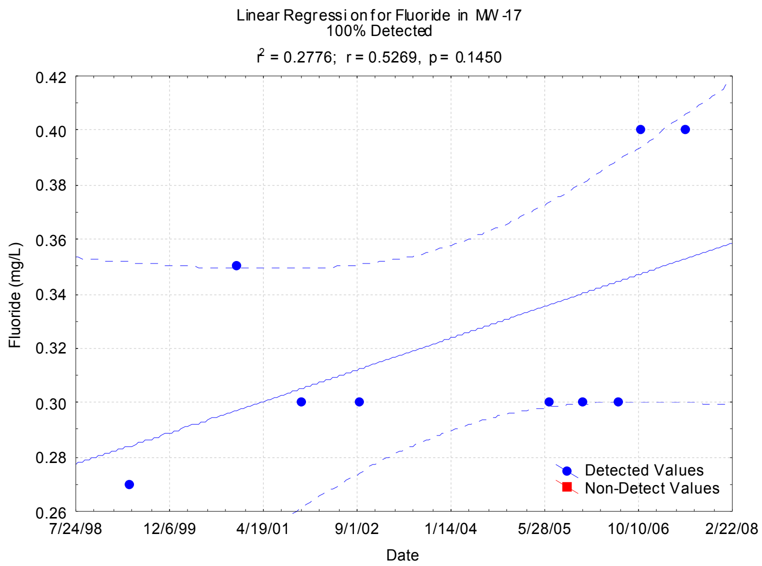


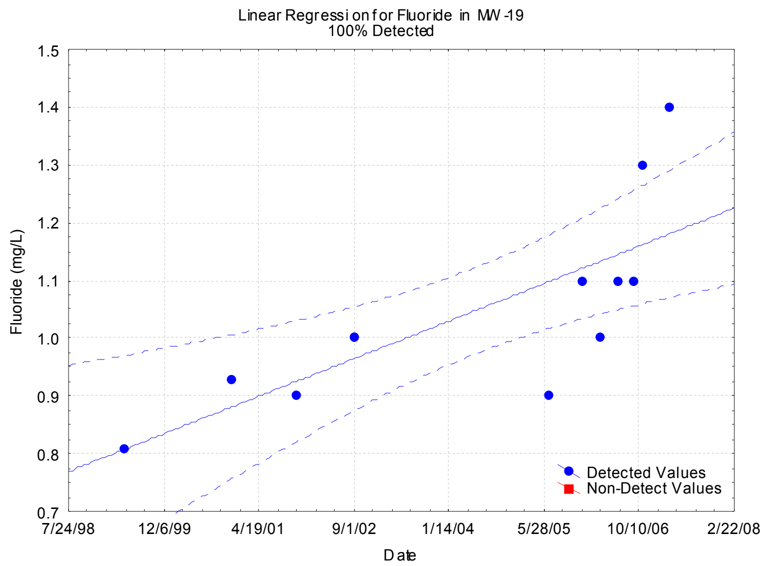


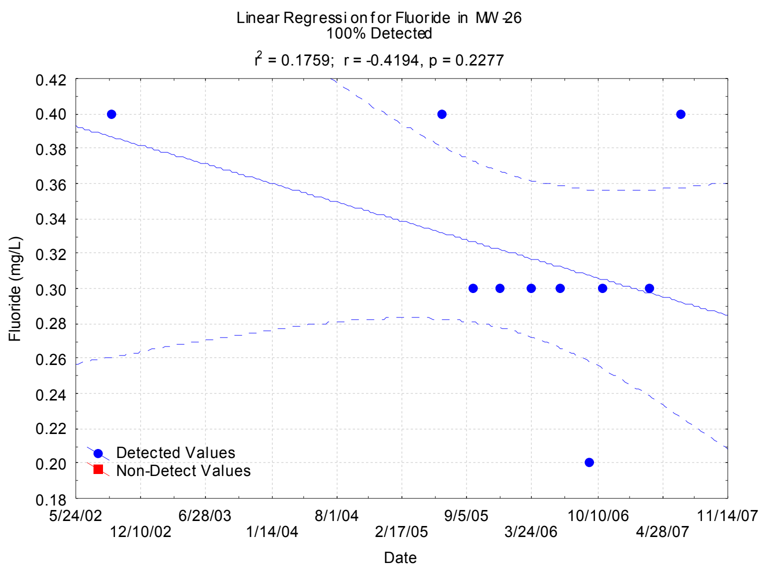


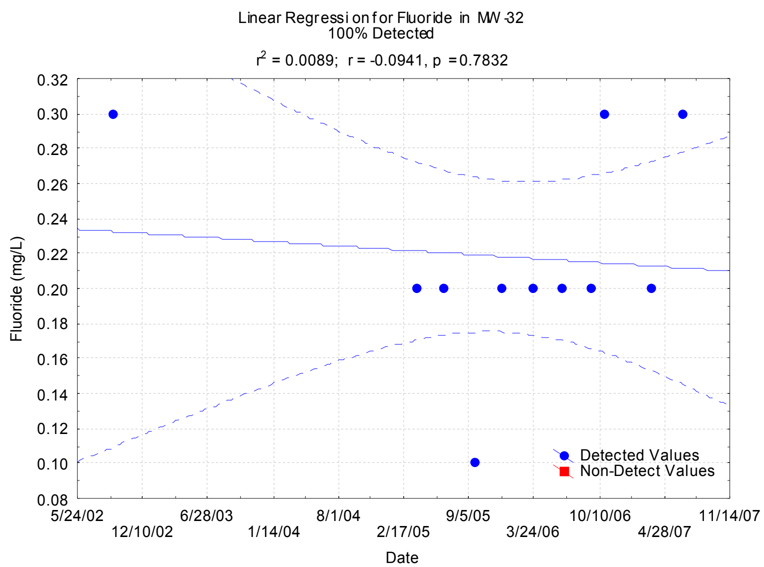


Linear Regressions for Fluoride

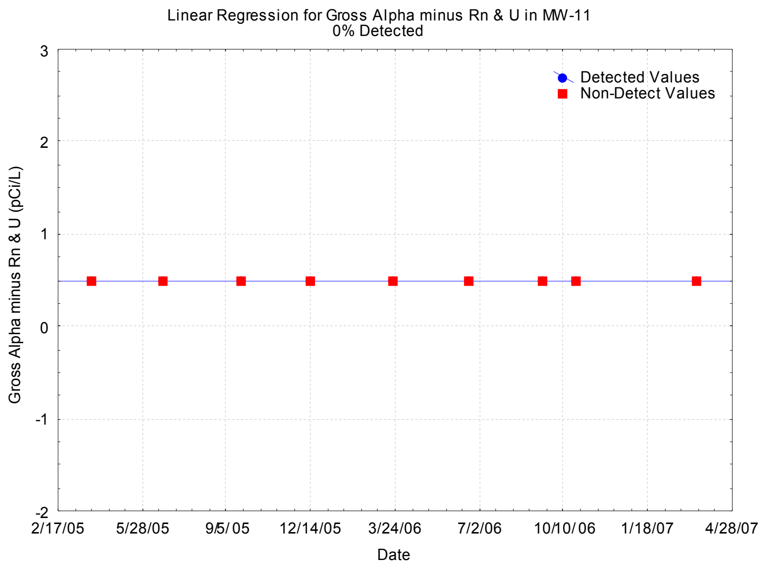


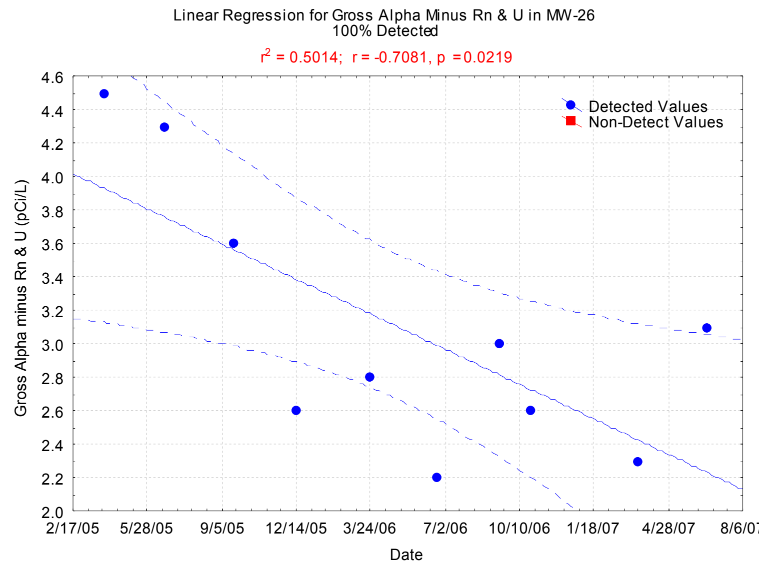


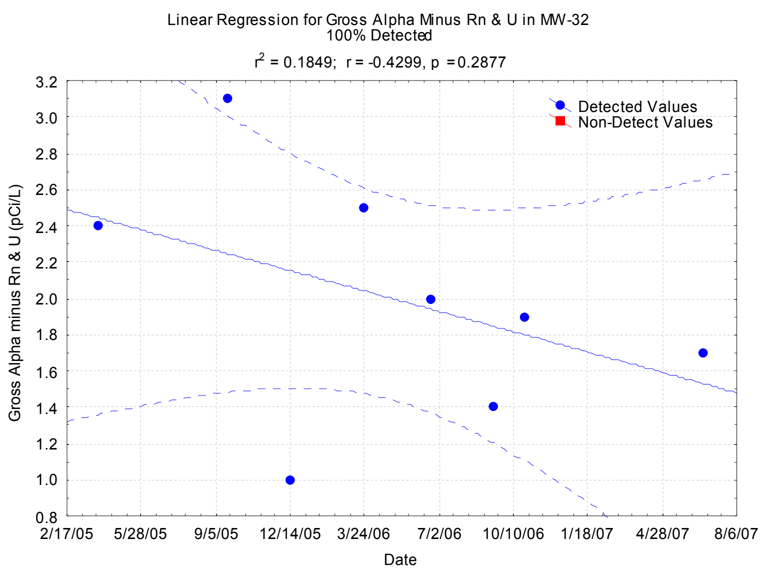




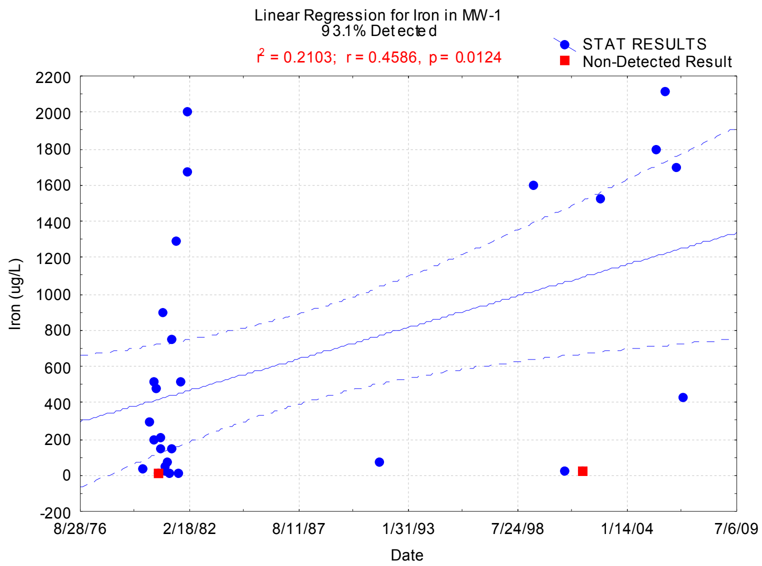
Linear Regression for Gross Alpha minus Rn and U

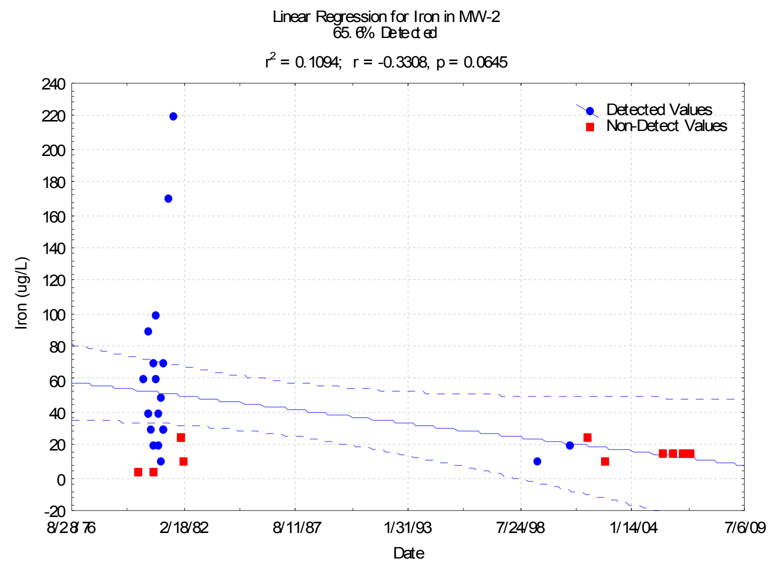


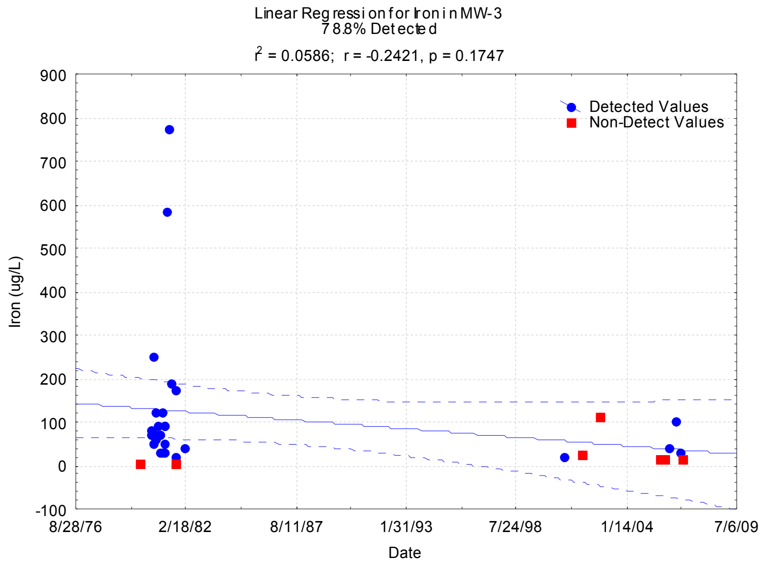


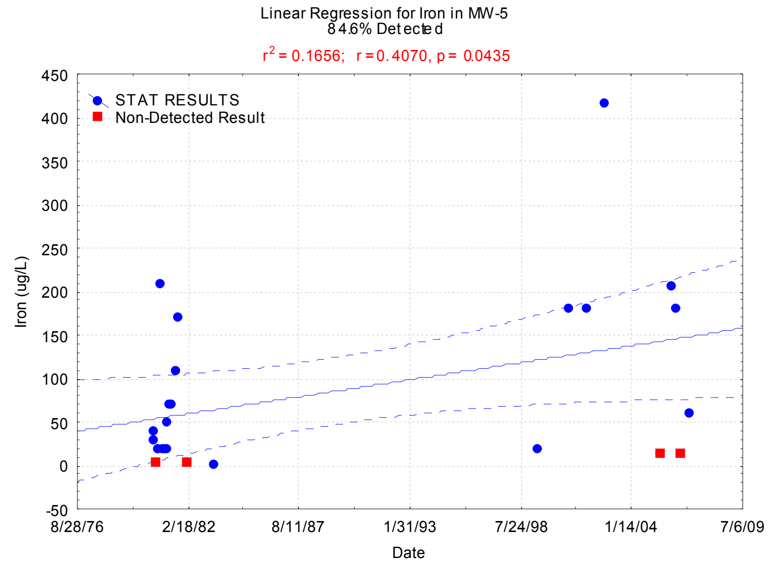


Linear Regressions for Iron

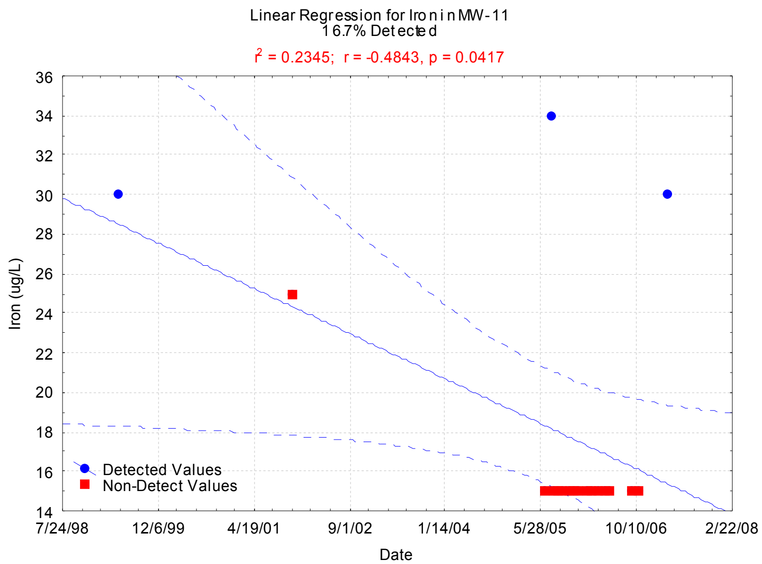


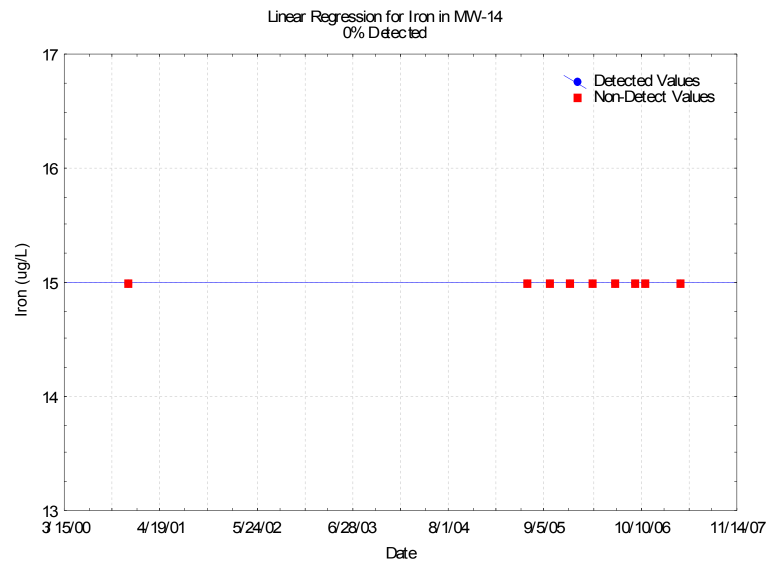


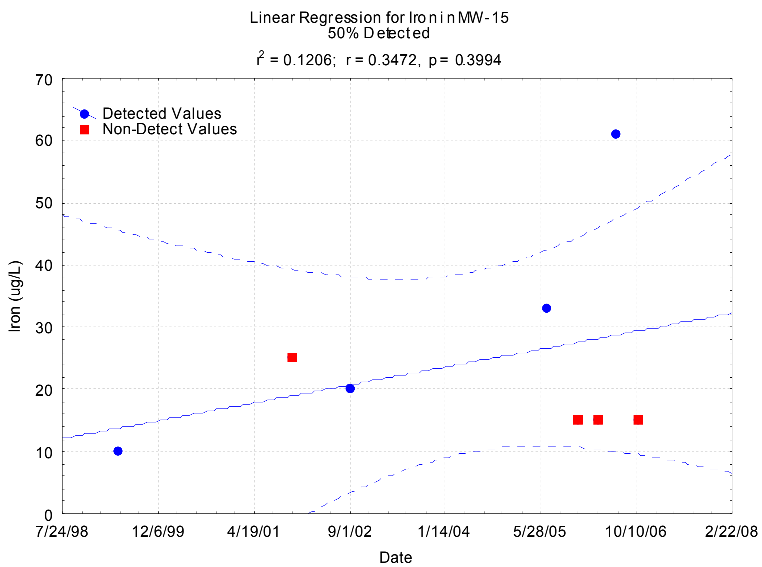


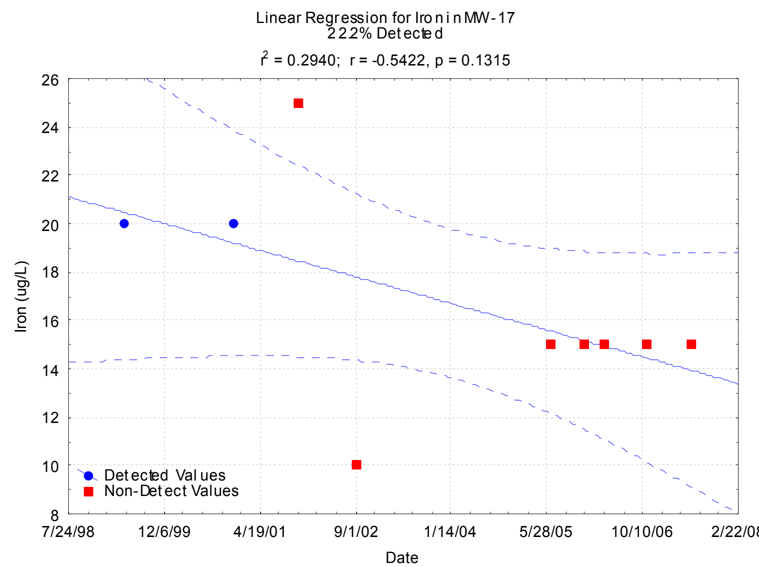


Linear Regressions for Iron



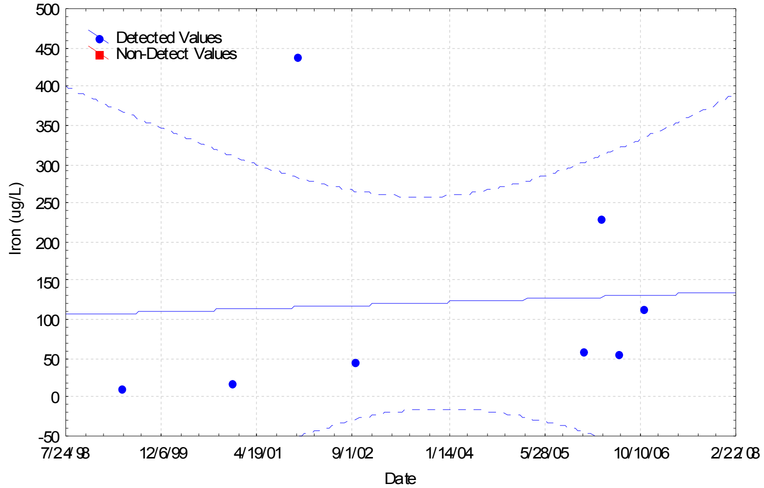




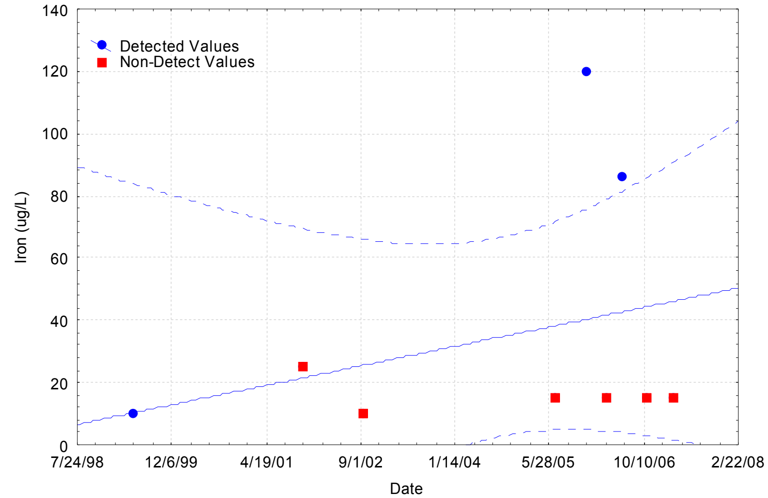


Linear Regressions for Iron

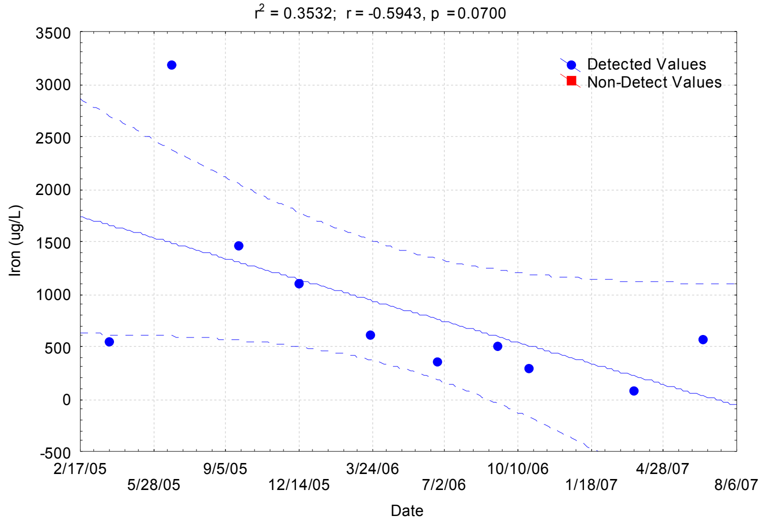
Linear Regression for Iron in MW-18
100% Detected
$r^2 = 0.0038$; $r = 0.0615$, $p = 0.8849$



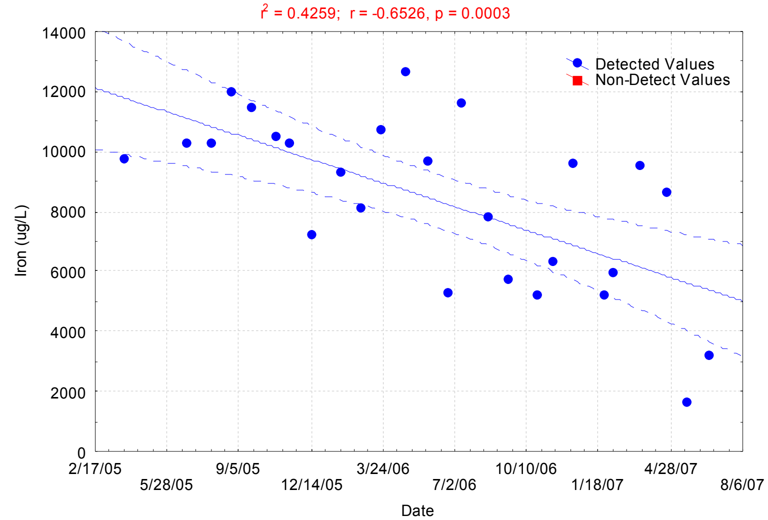
Linear Regression for Iron in MW-19
33.3% Detected
$r^2 = 0.0968$; $r = 0.3111$, $p = 0.4152$



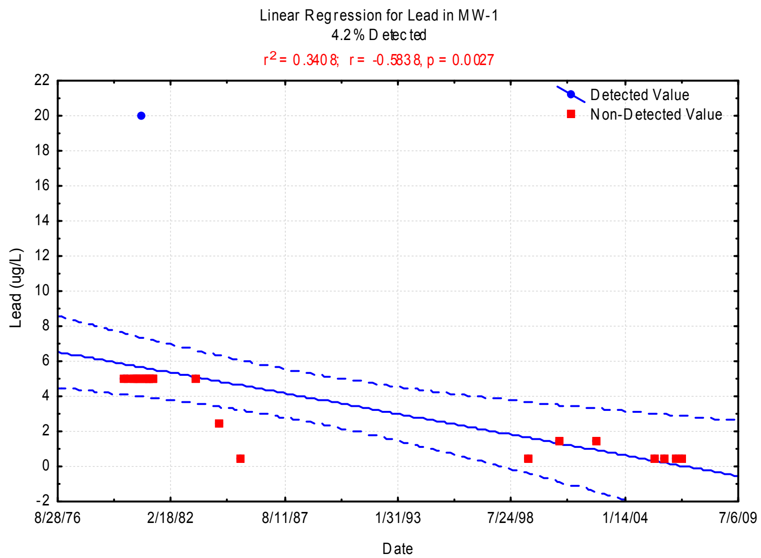
Linear Regression for Iron in MW-26
100% Detected
$r^2 = 0.3532$; $r = -0.5943$, $p = 0.0700$

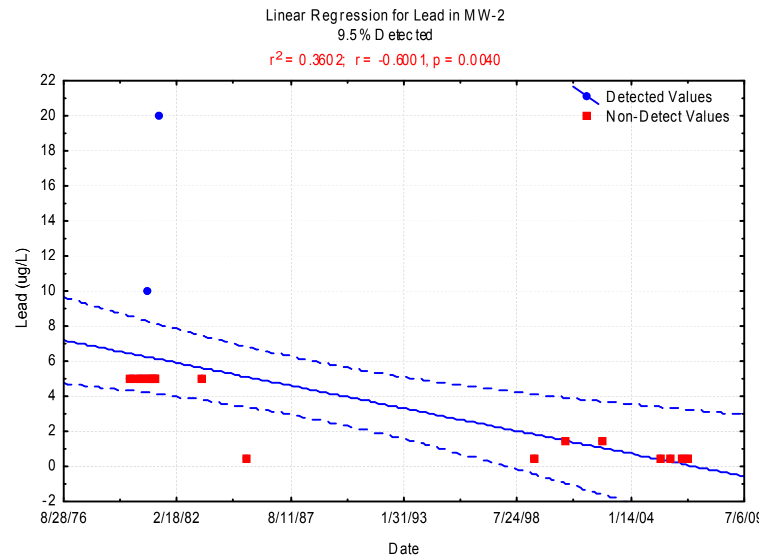


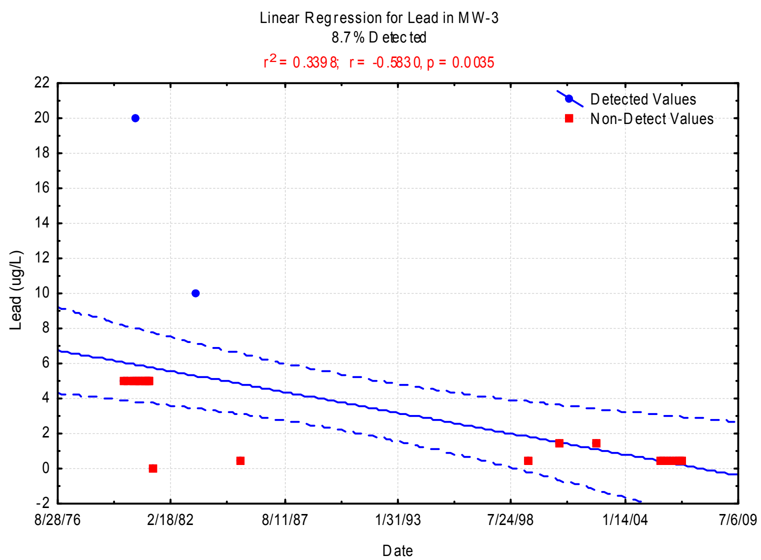
Linear Regression for Iron in MW-32
100% Detected
$r^2 = 0.4259$; $r = -0.6526$, $p = 0.0003$

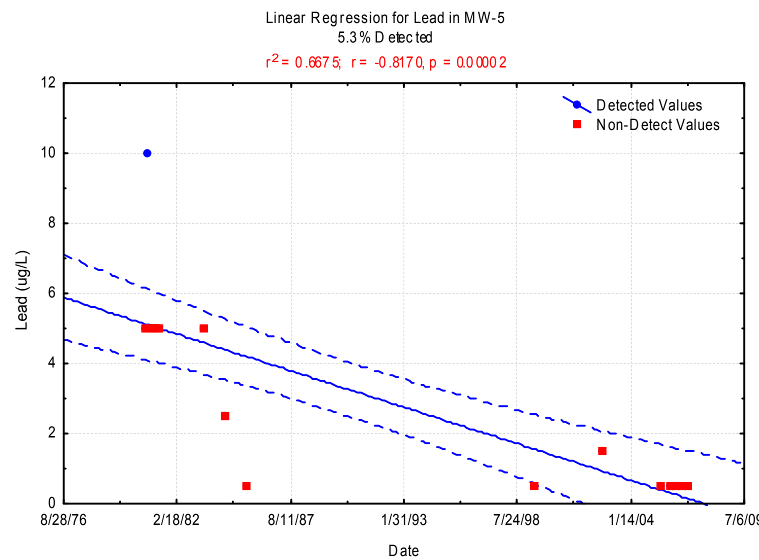


Linear Regressions for Lead

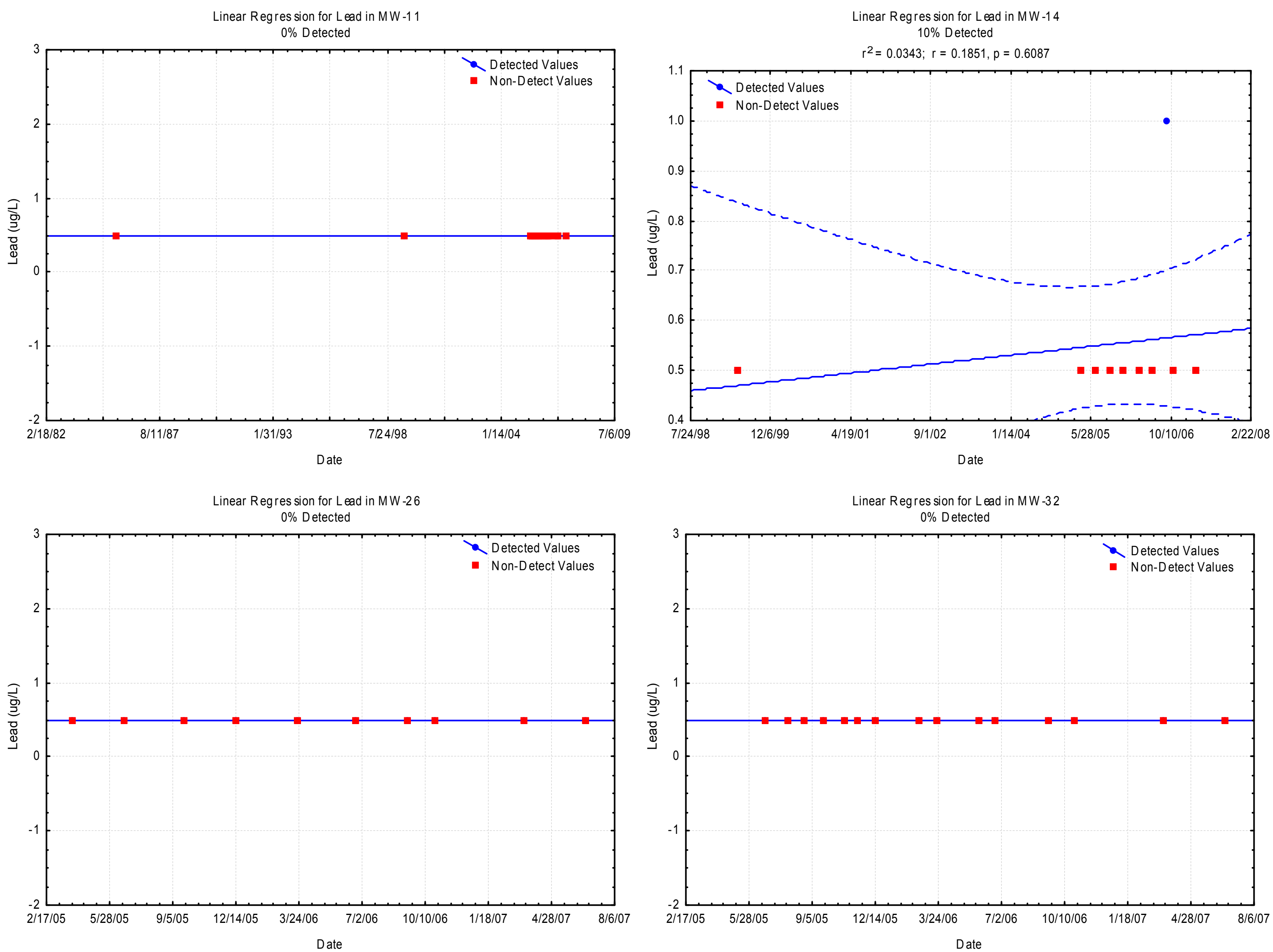




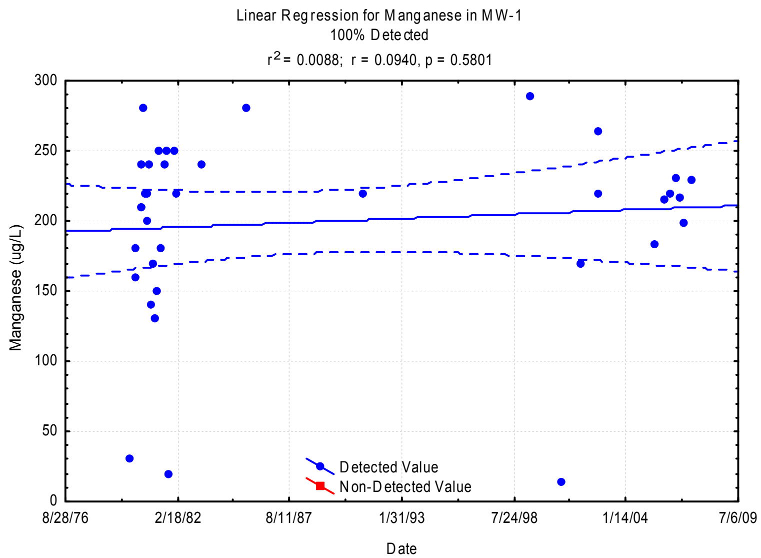


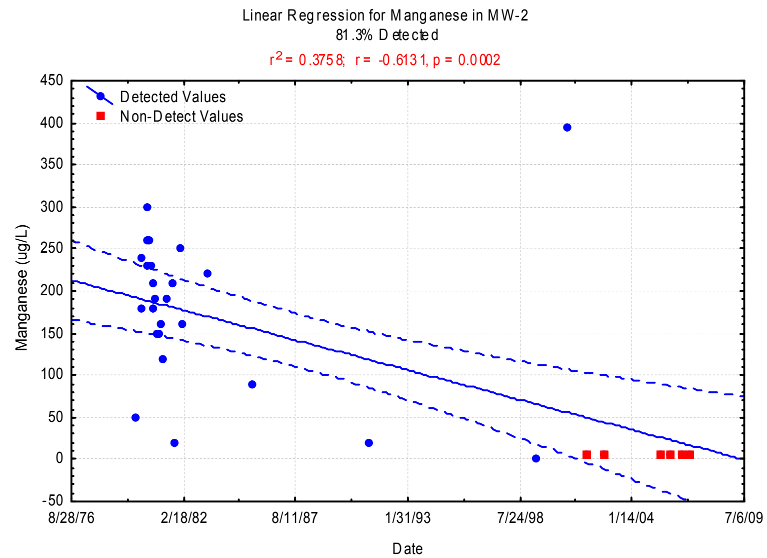


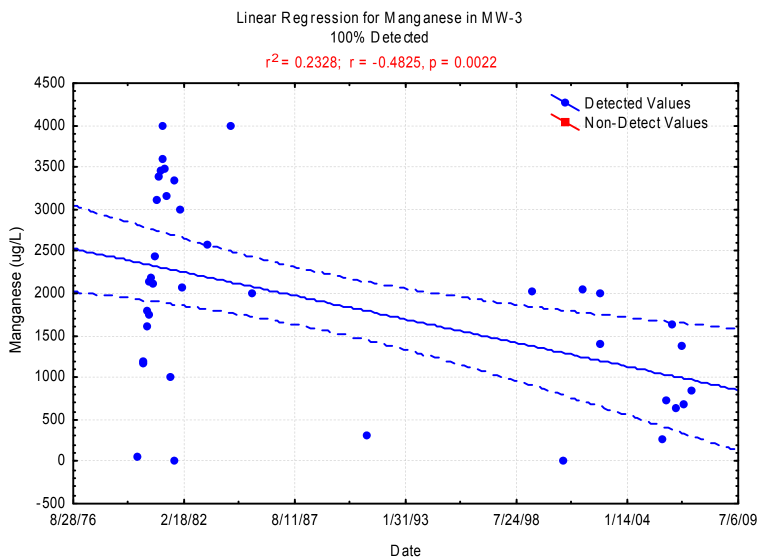
Linear Regressions for Lead

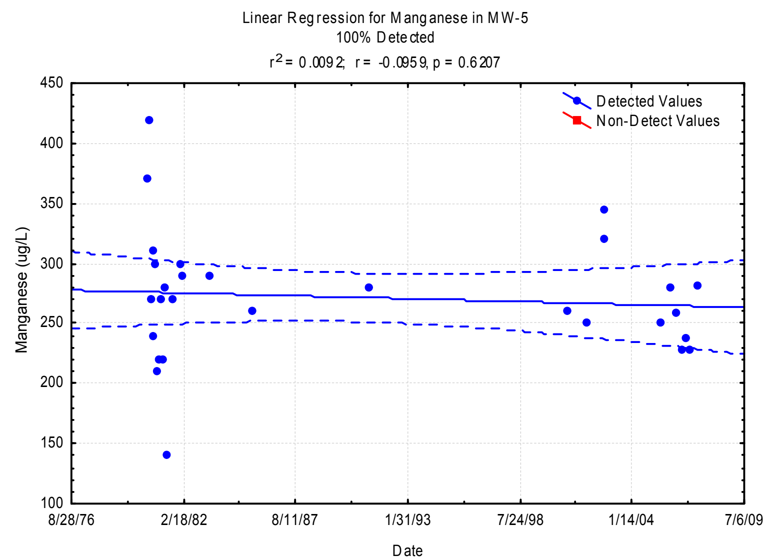


Linear Regressions for Manganese

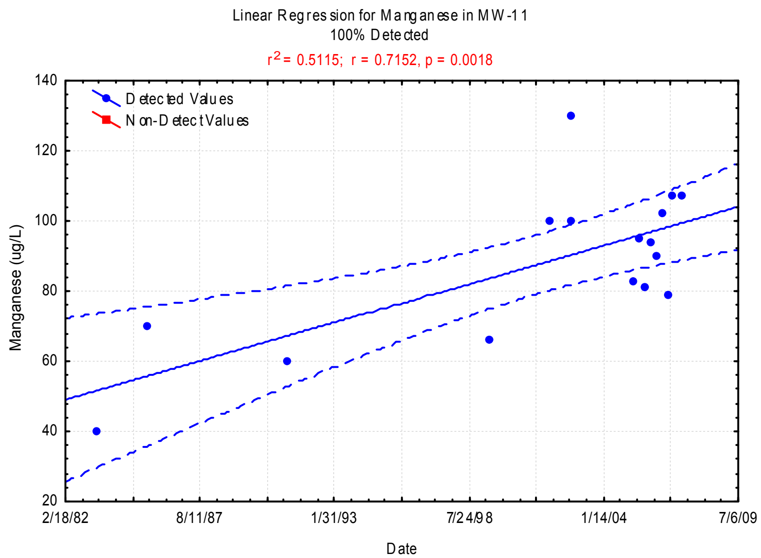


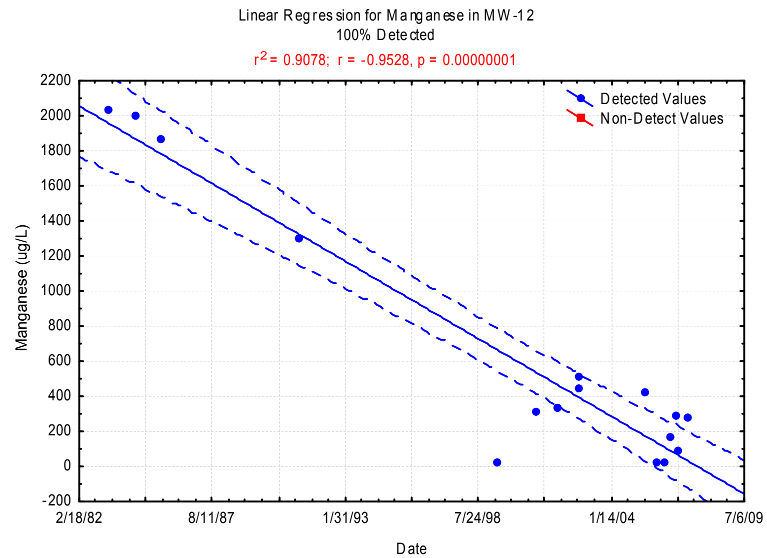


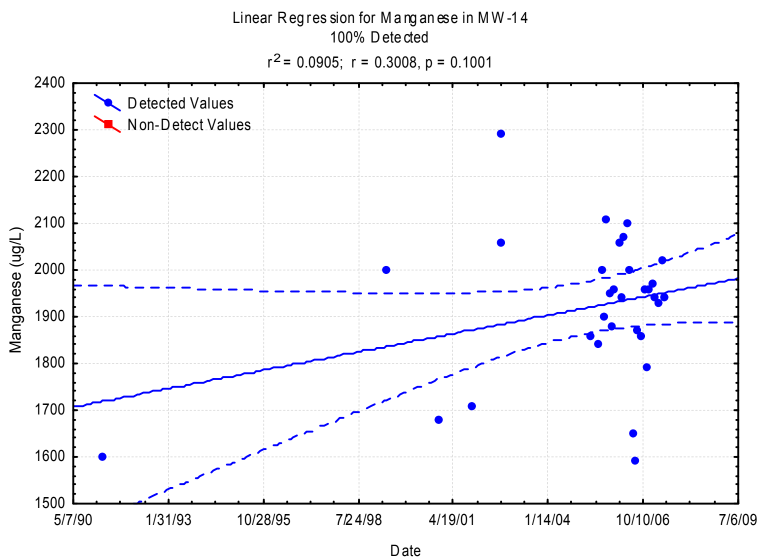


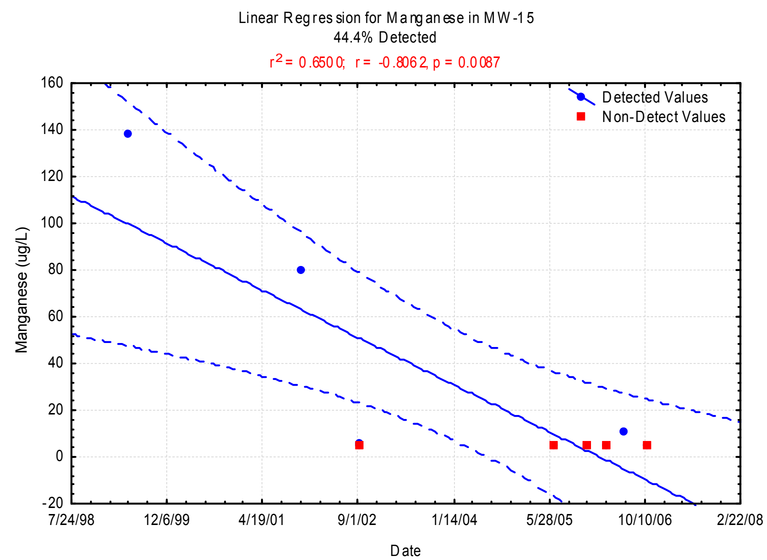


Linear Regressions for Manganese









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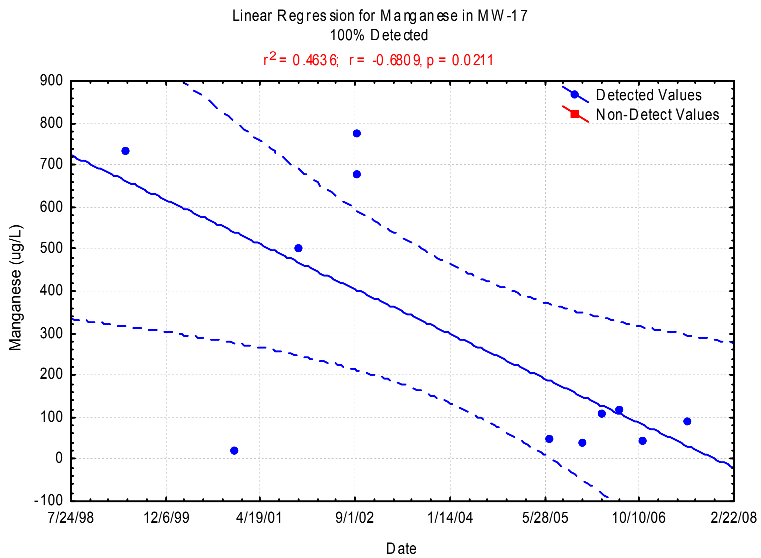

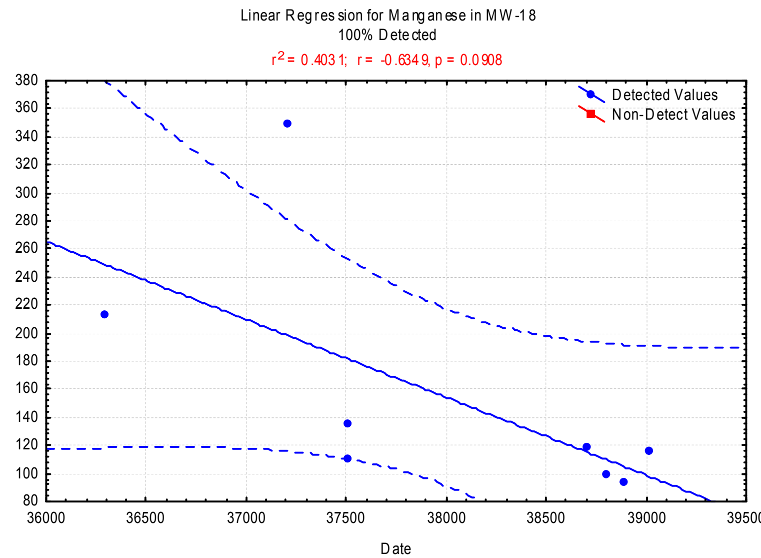

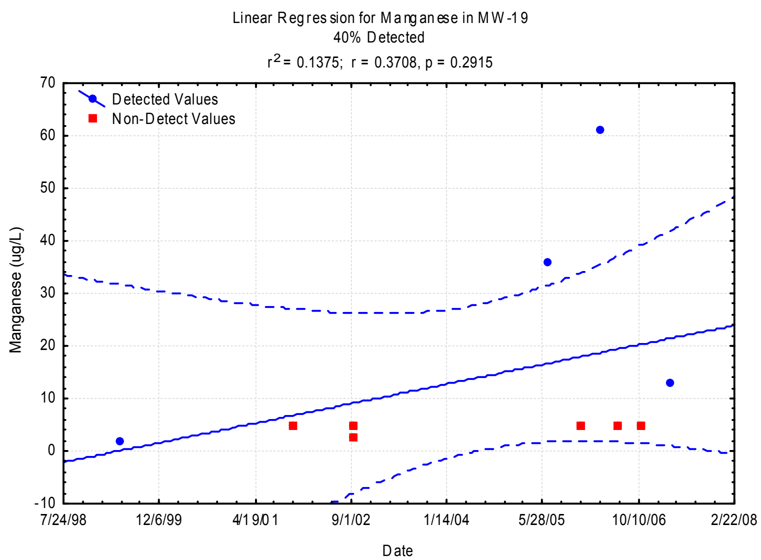

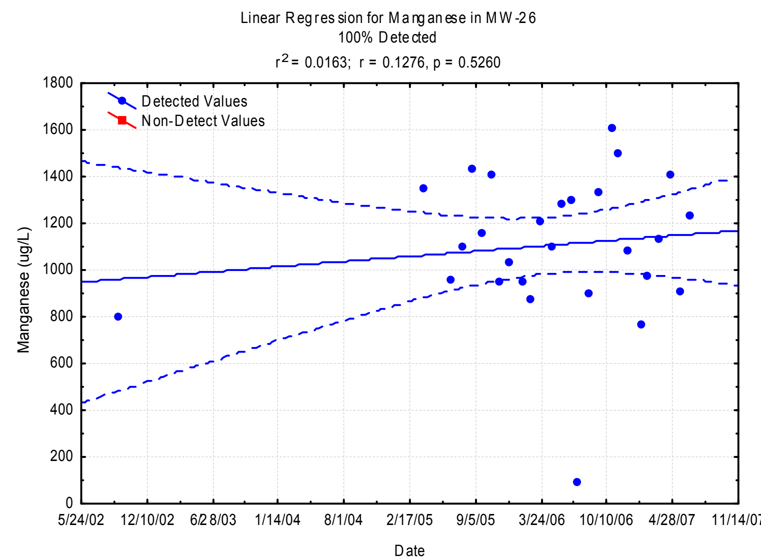

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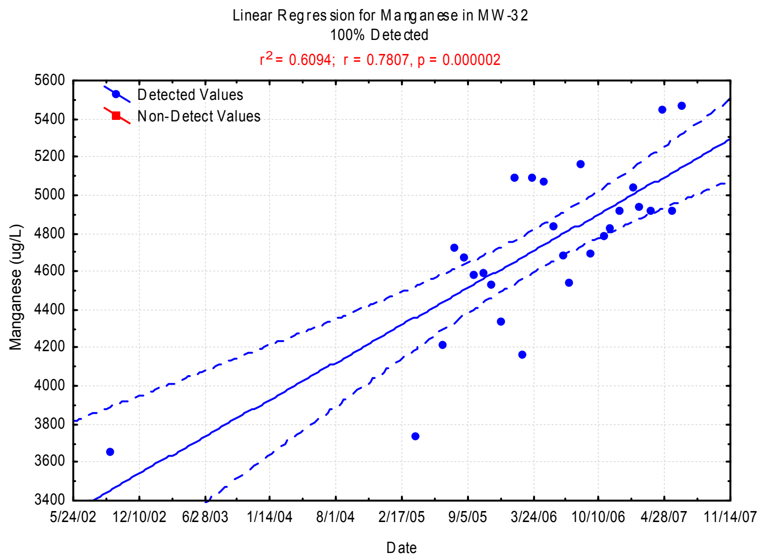
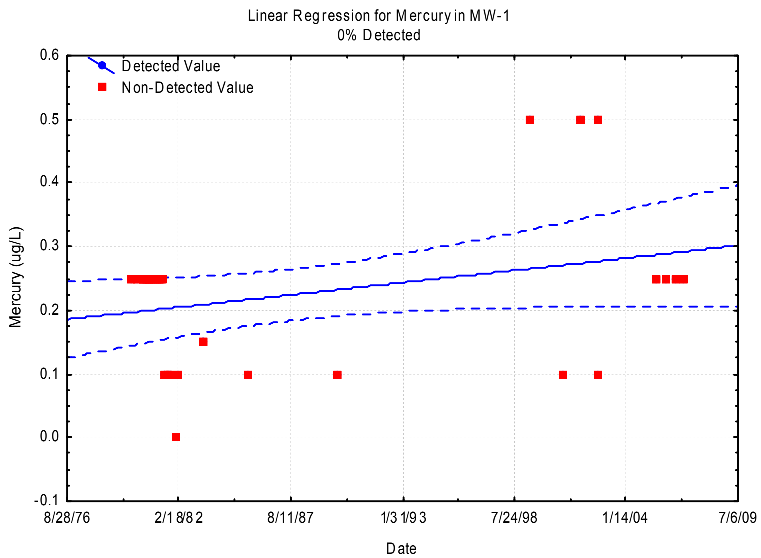
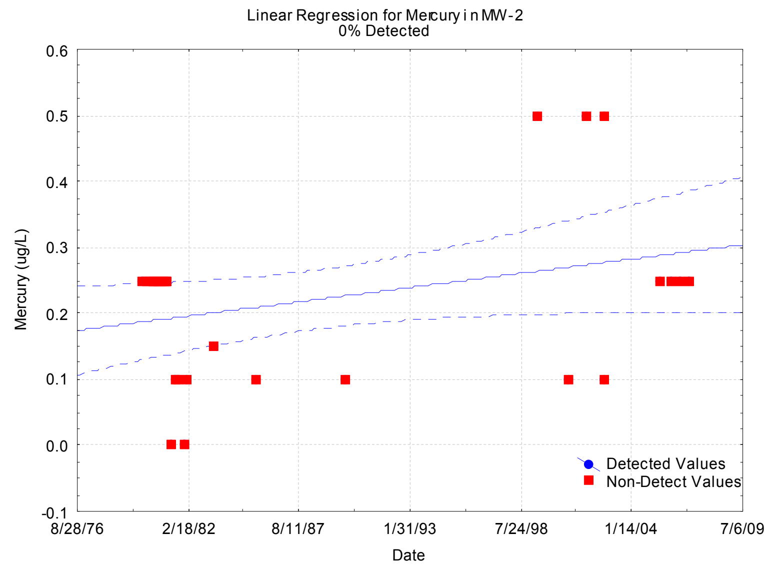
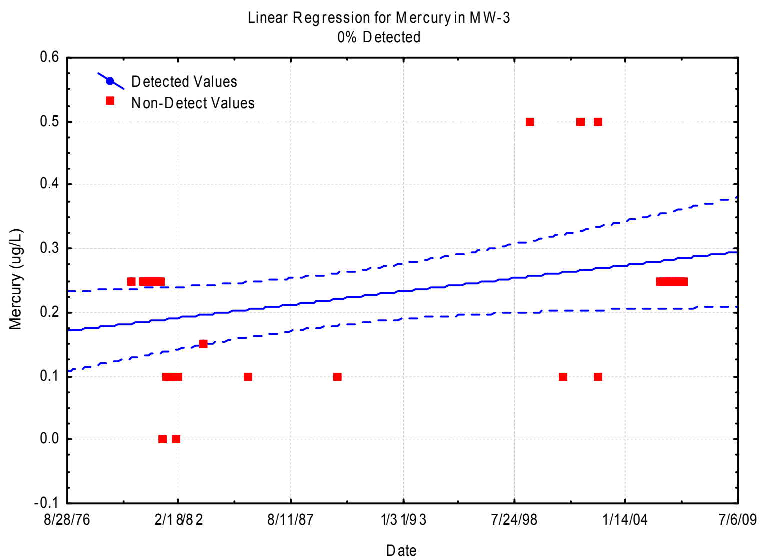
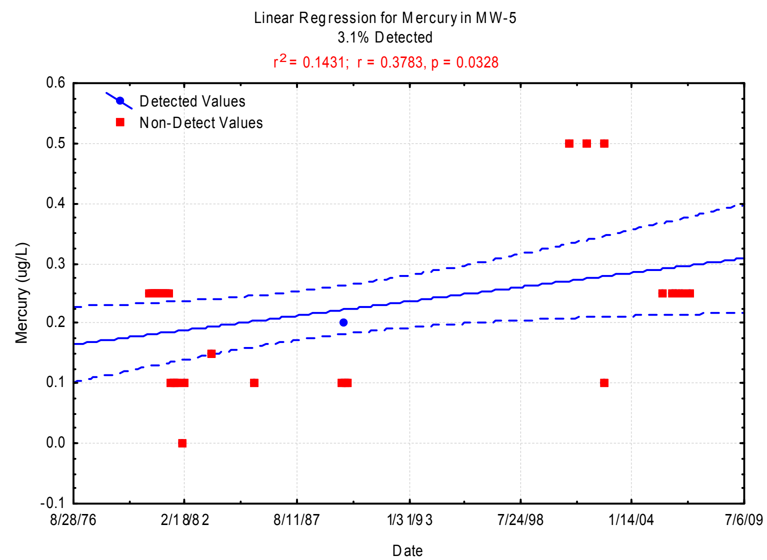


Linear Regressions for Mercury

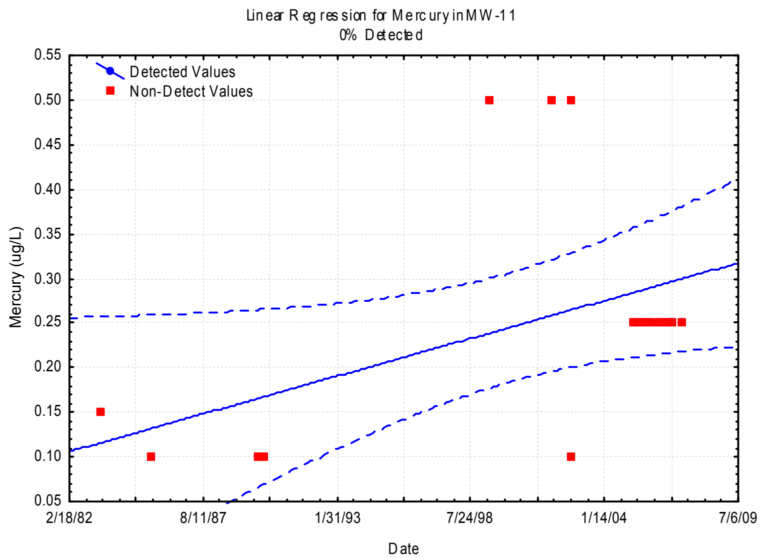


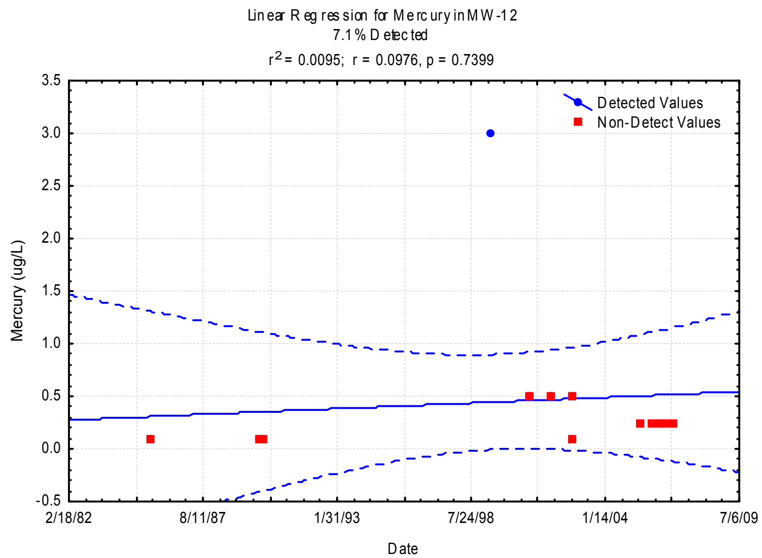


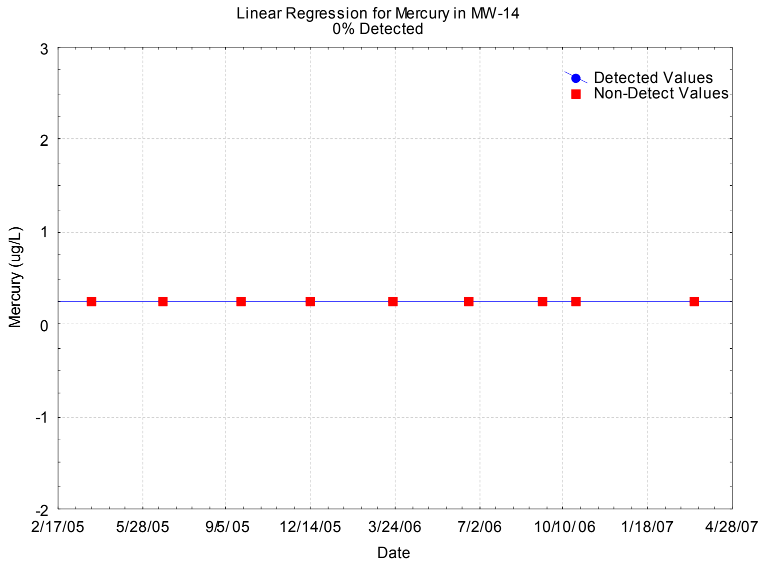


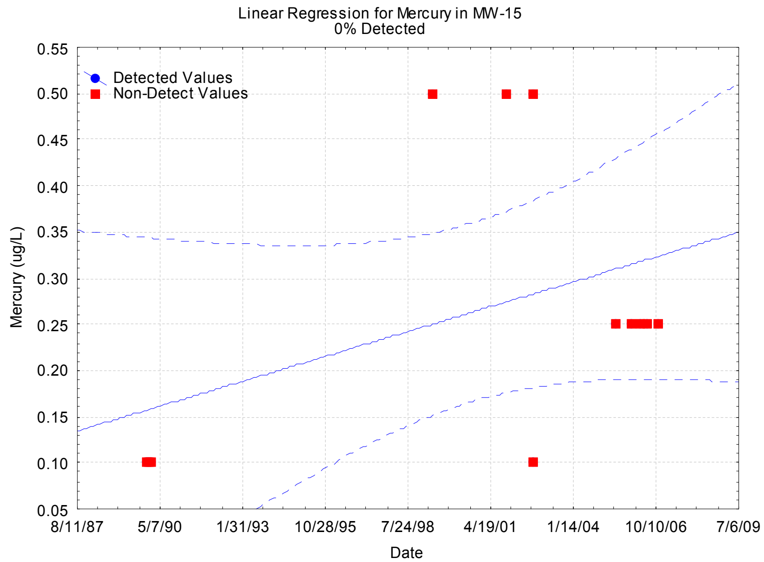


Linear Regressions for Mercury









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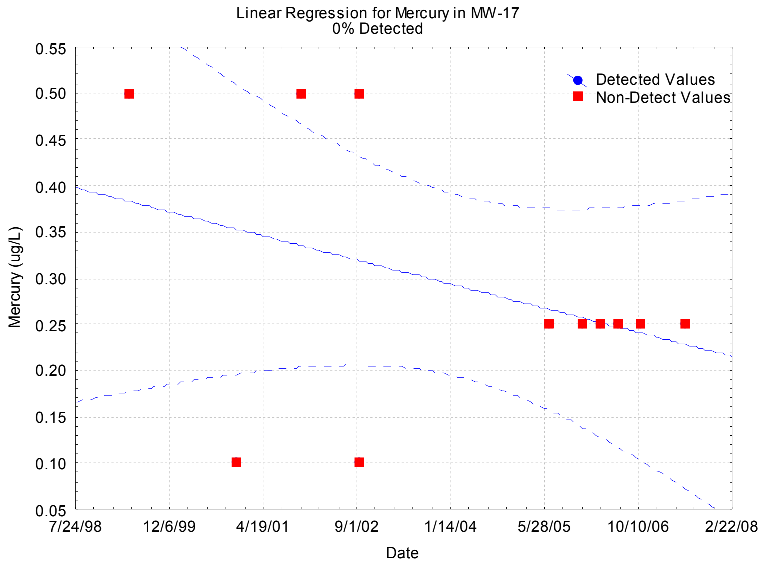
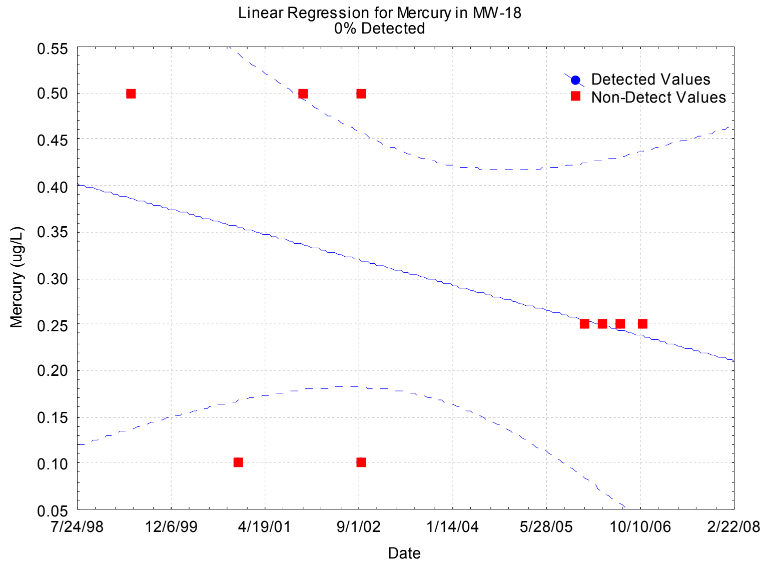
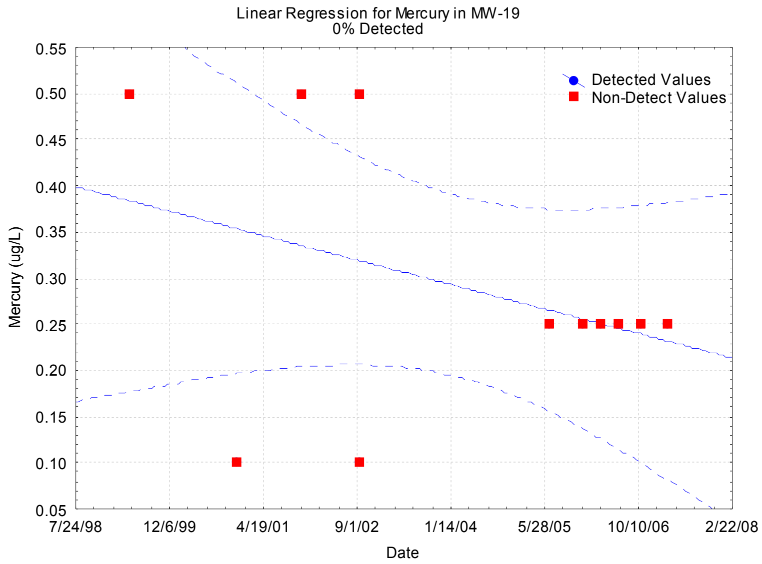
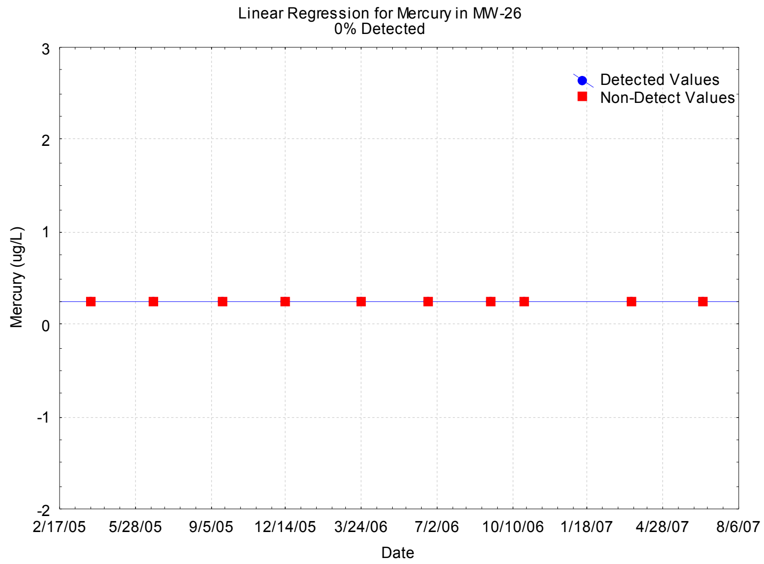
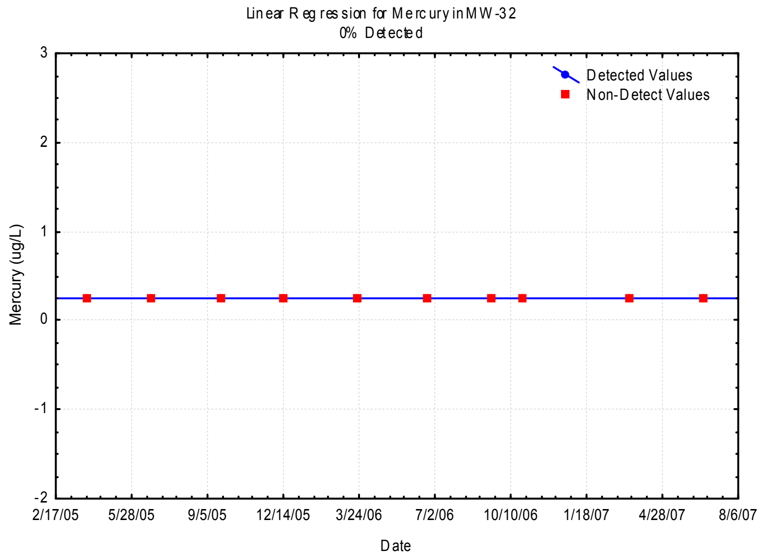




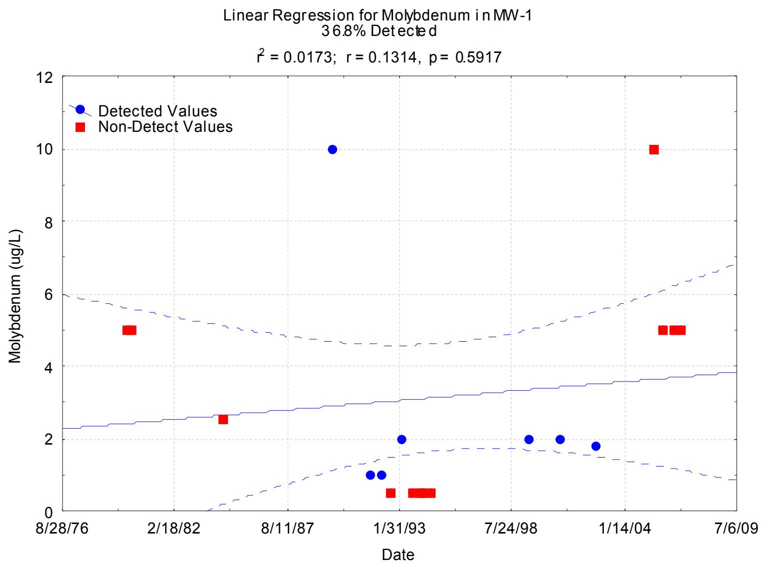


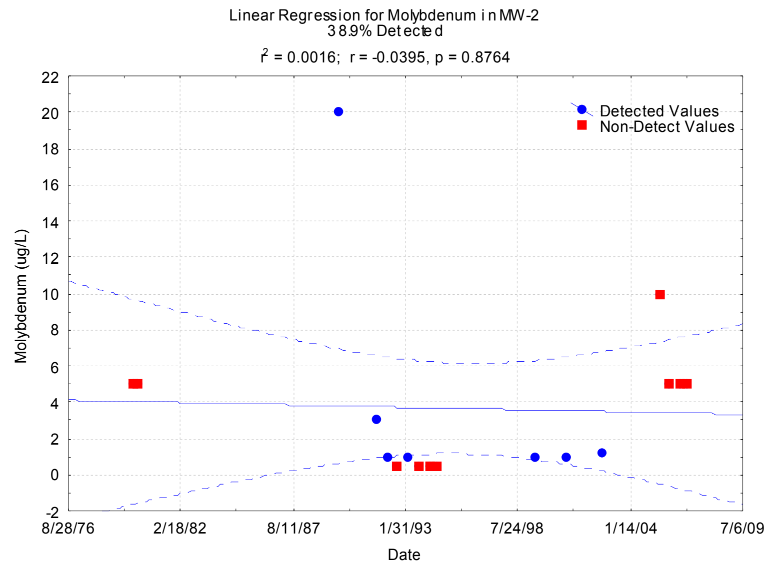


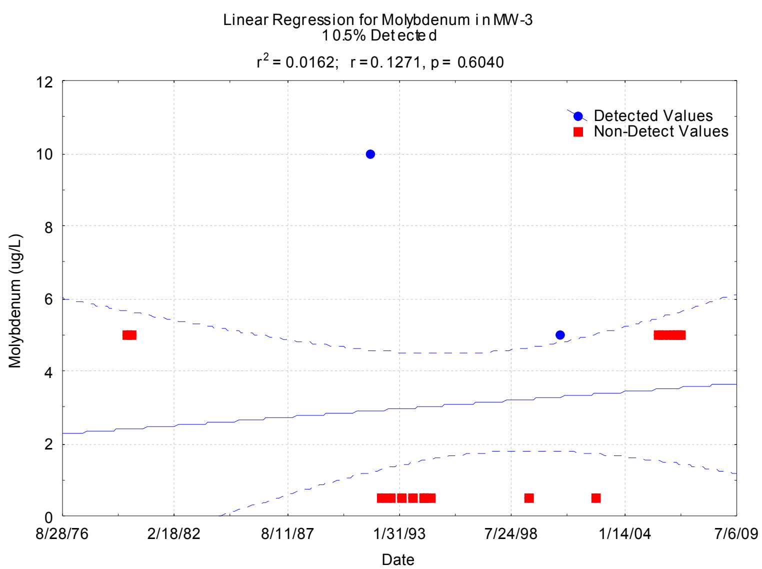
Linear Regressions for Mercury

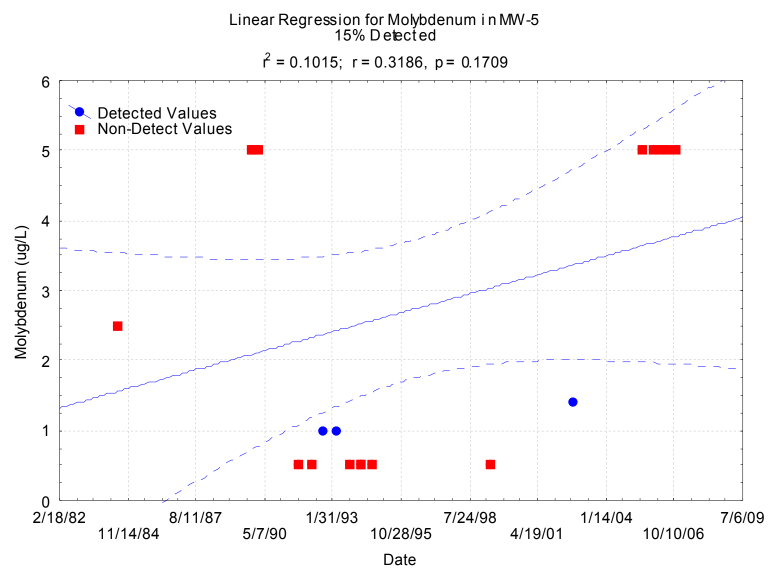


Linear Regressions for Molybdenum

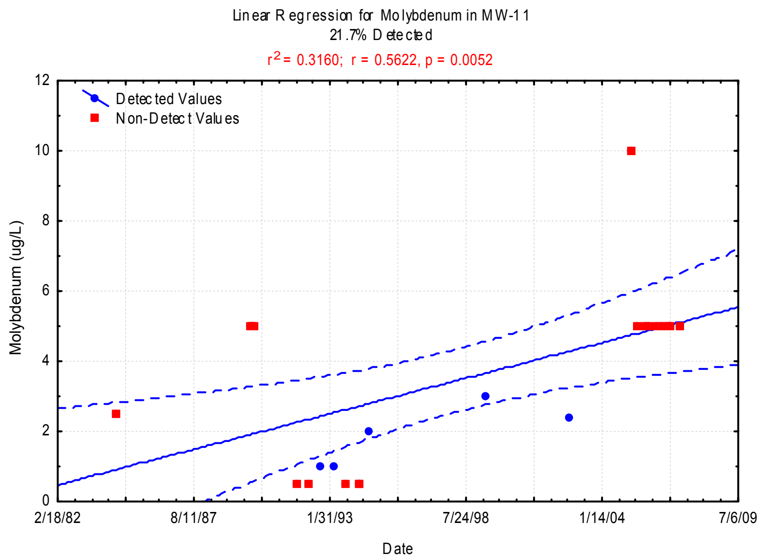


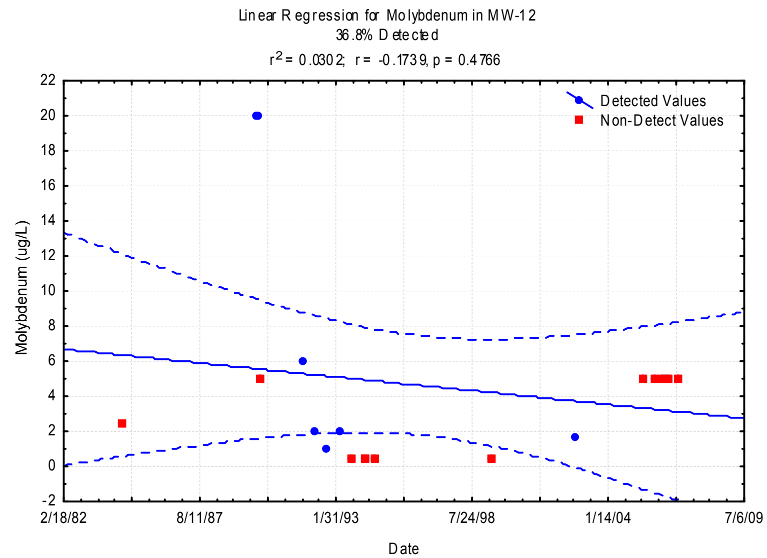


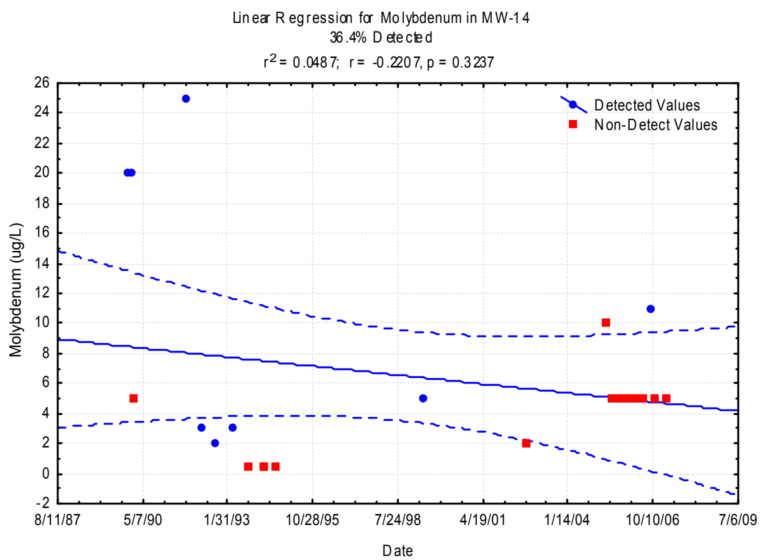


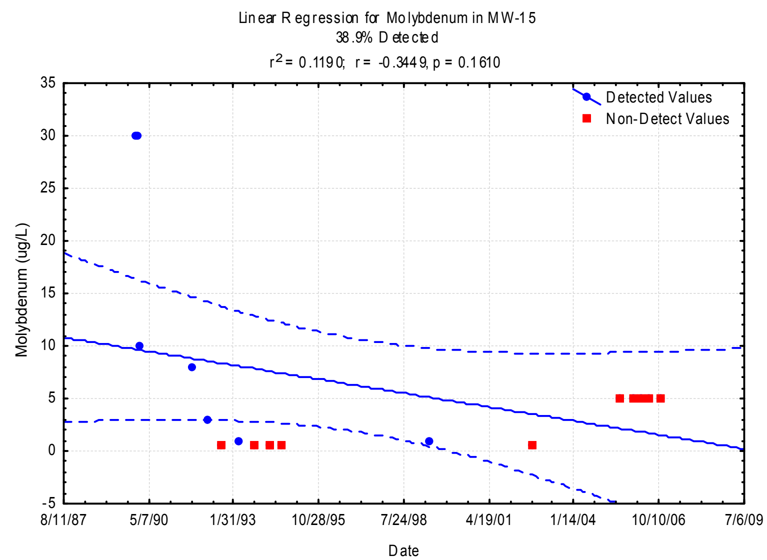


Linear Regressions for Molybdenum

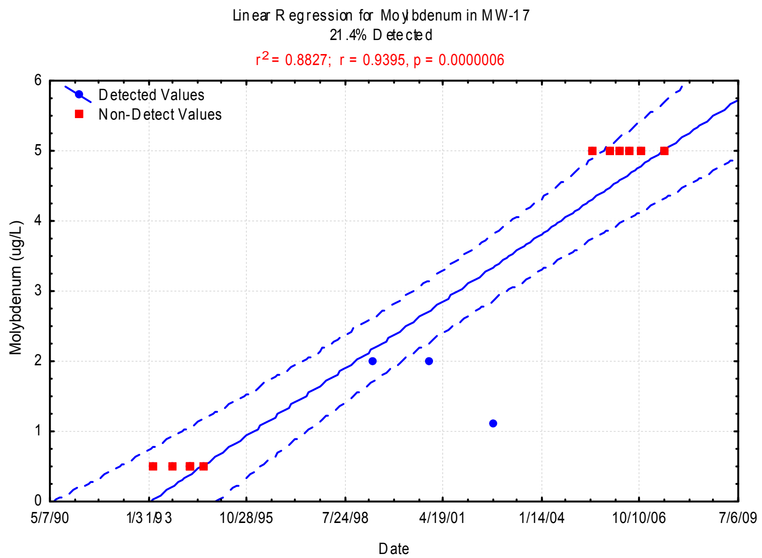


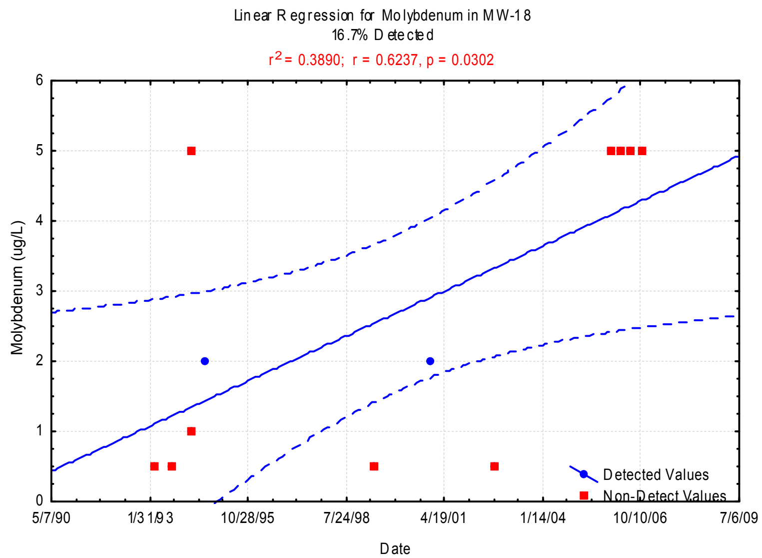


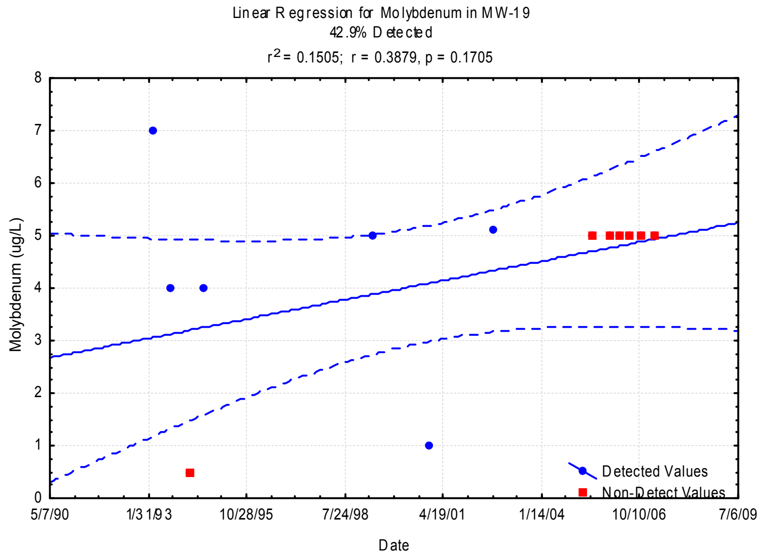


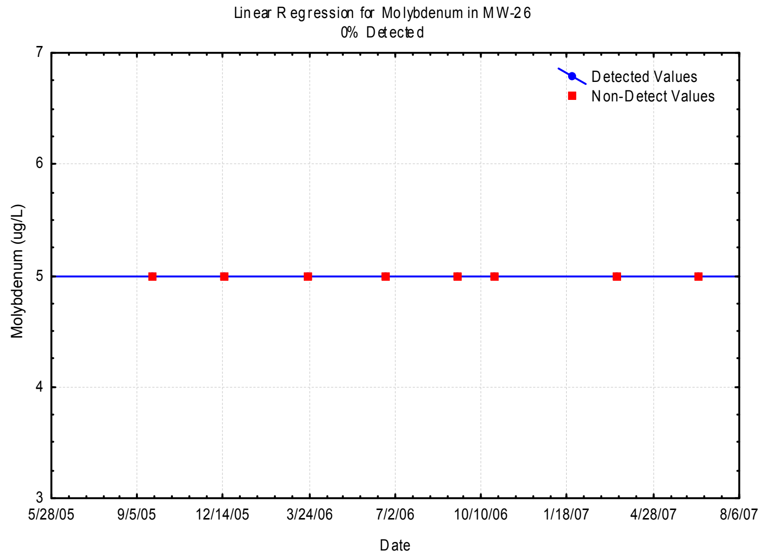


Linear Regressions for Molybdenum

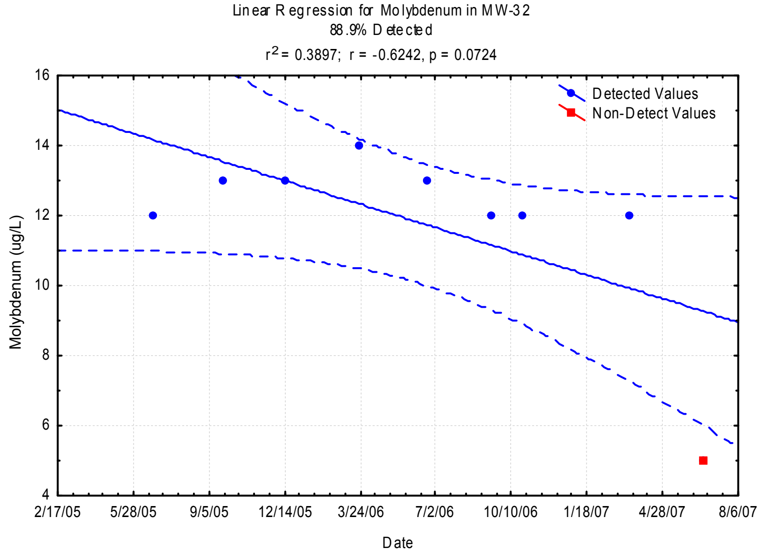




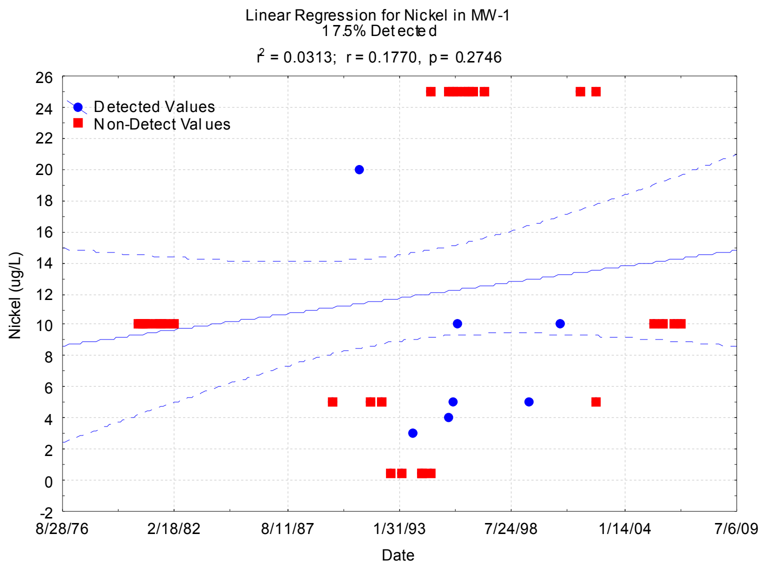


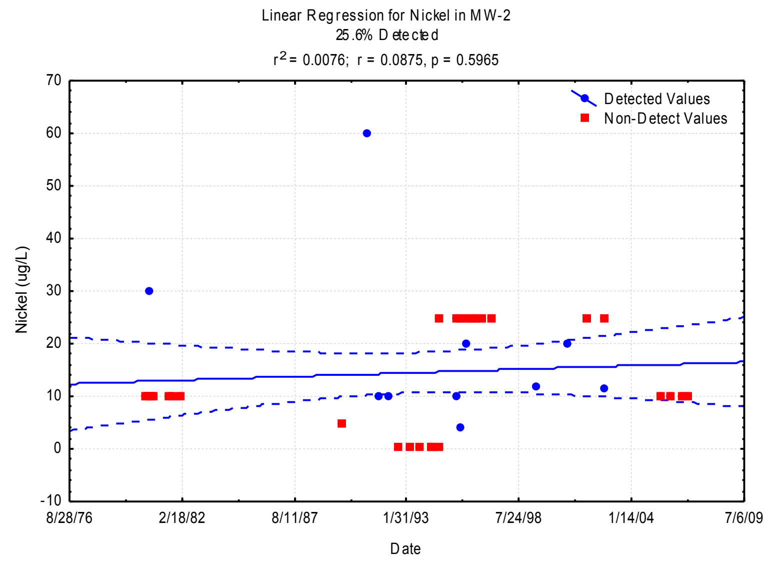


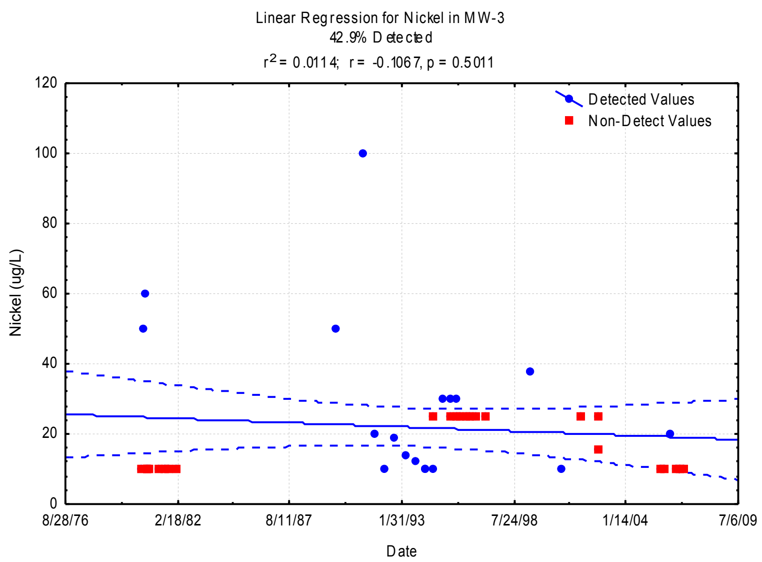
Linear Regressions for Molybdenum

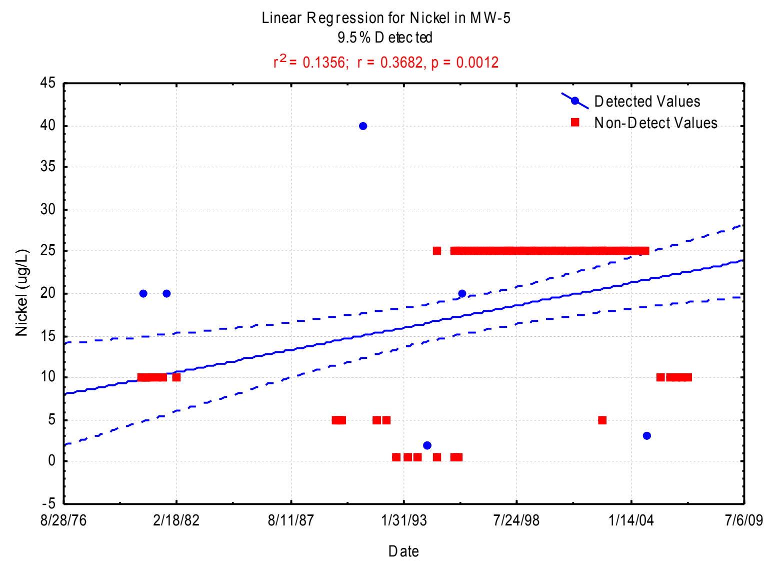


Linear Regressions for Nickel

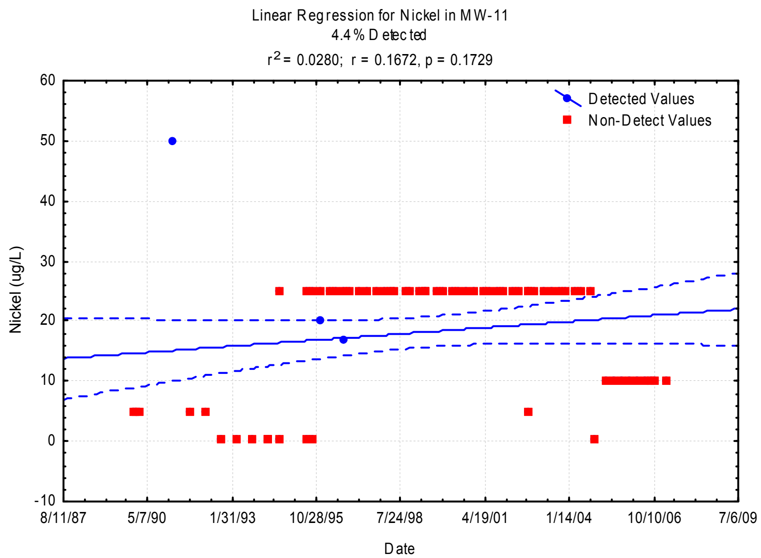


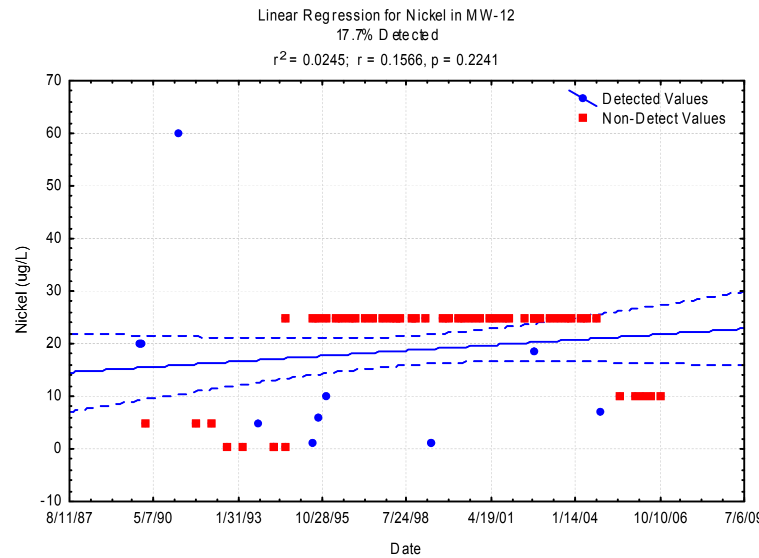


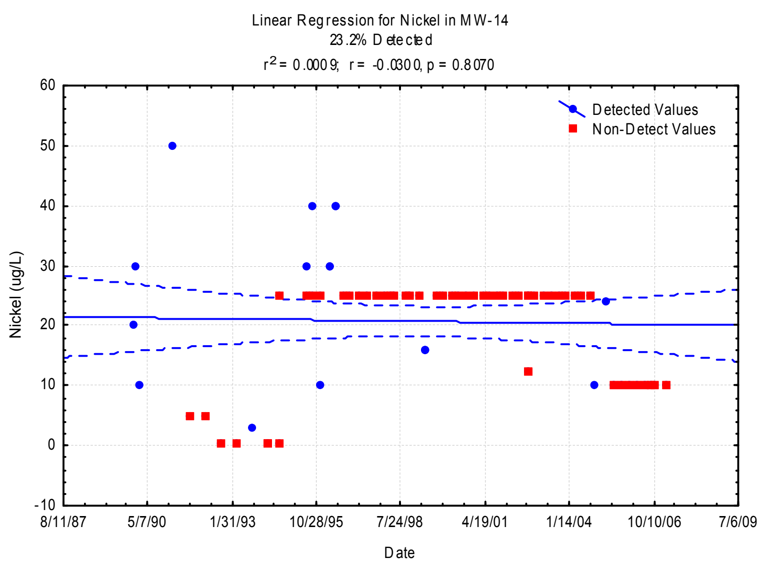


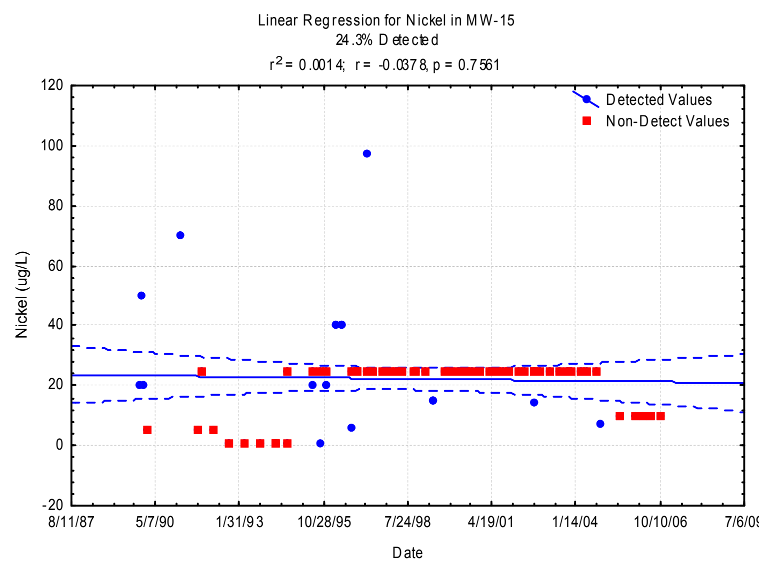


Linear Regressions for Nickel



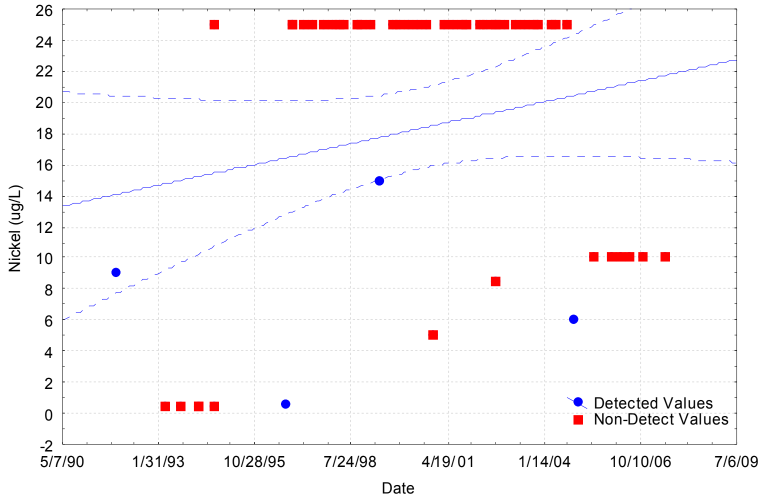




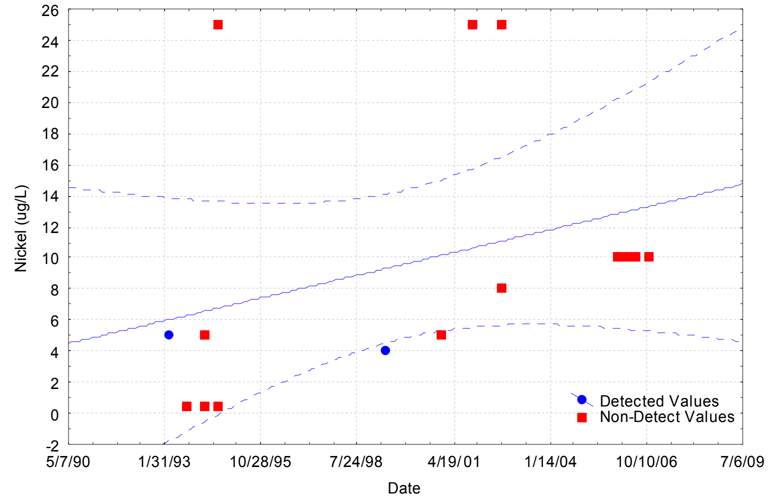


Linear Regressions for Nickel

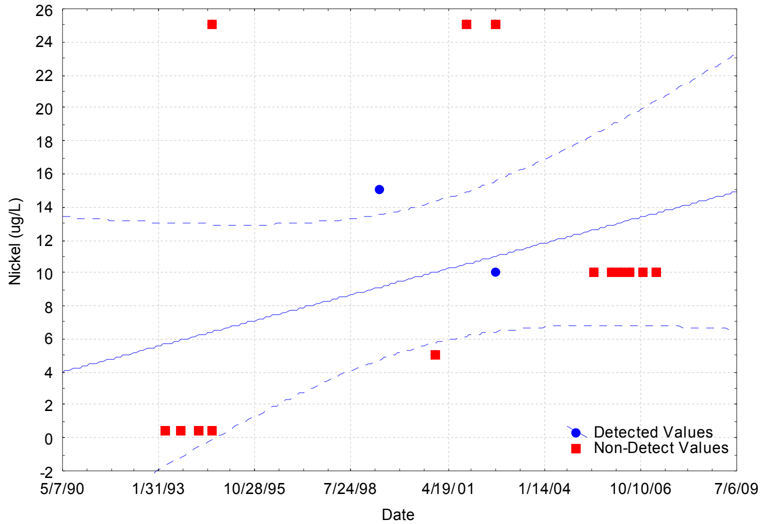
Linear Regression for Nickel in MW-17
9.6% Detected
r^2 = 0.0408; r = 0.2019, p = 0.1512



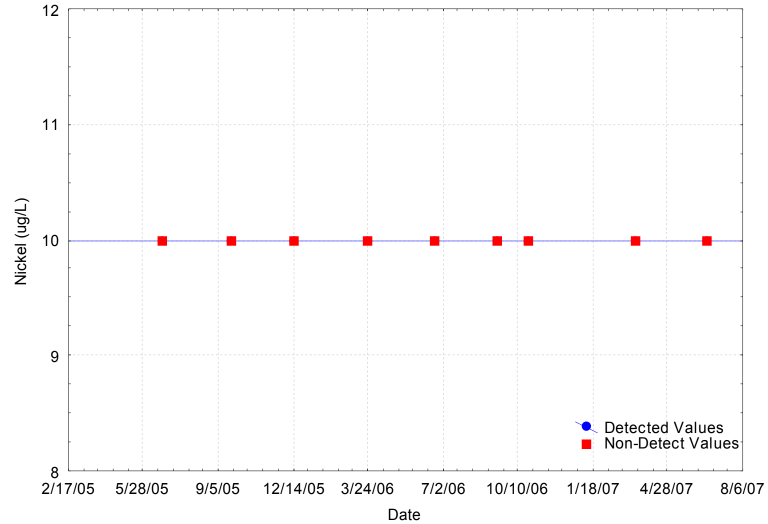
Linear Regression for Nickel in MW-18
13.3% Detected
r^2 = 0.1054; r = 0.3247, p = 0.2377



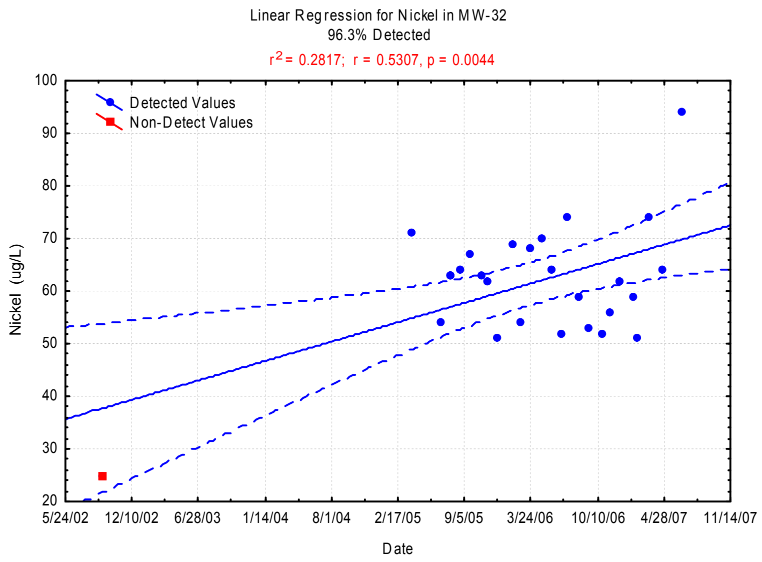
Linear Regression for Nickel in MW-19
11.8% Detected



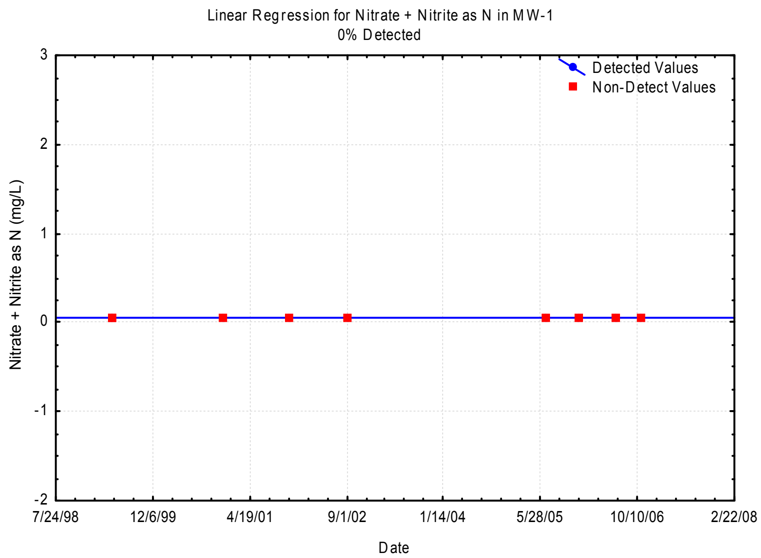
Linear Regression for Nickel in MW-26
0% Detected

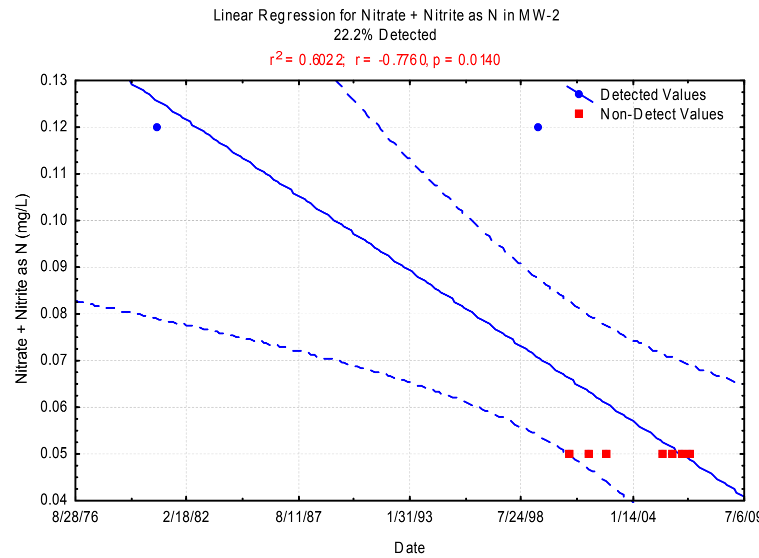


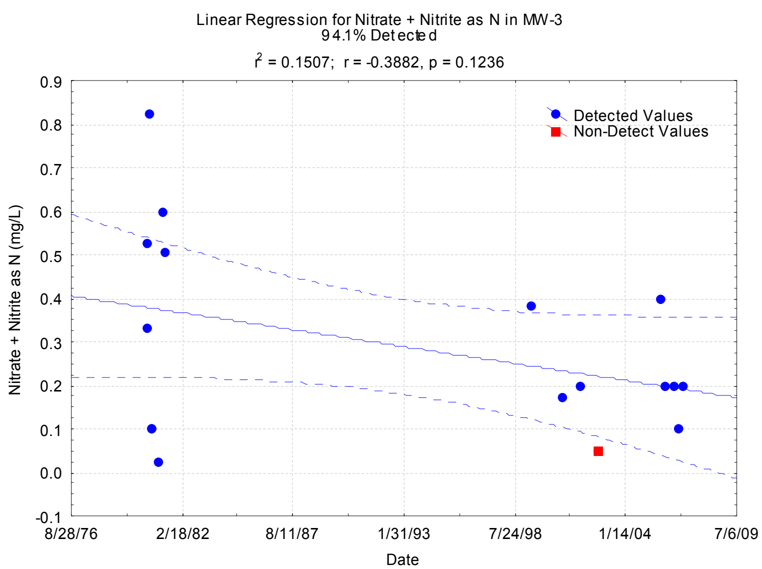
Linear Regressions for Nickel

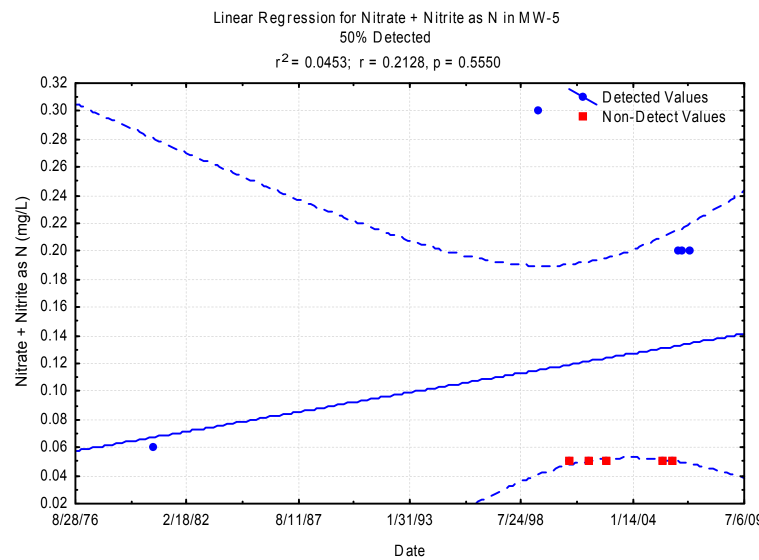


Linear Regressions for Nitrate + Nitrite as N

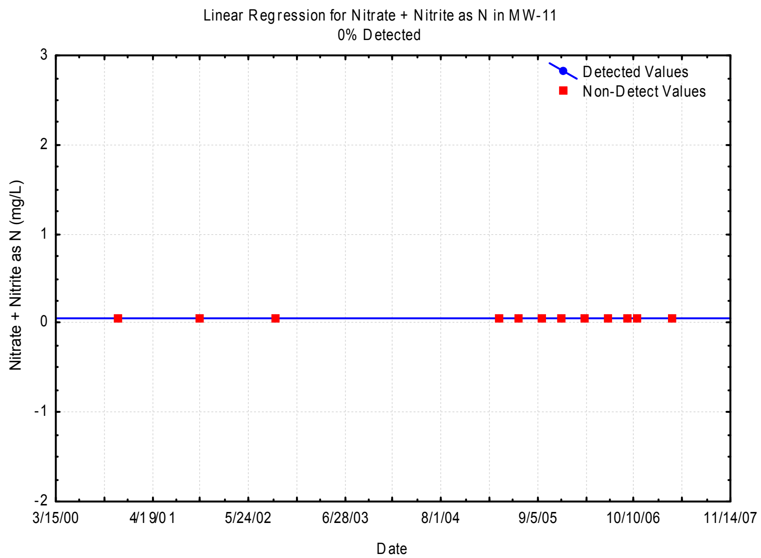


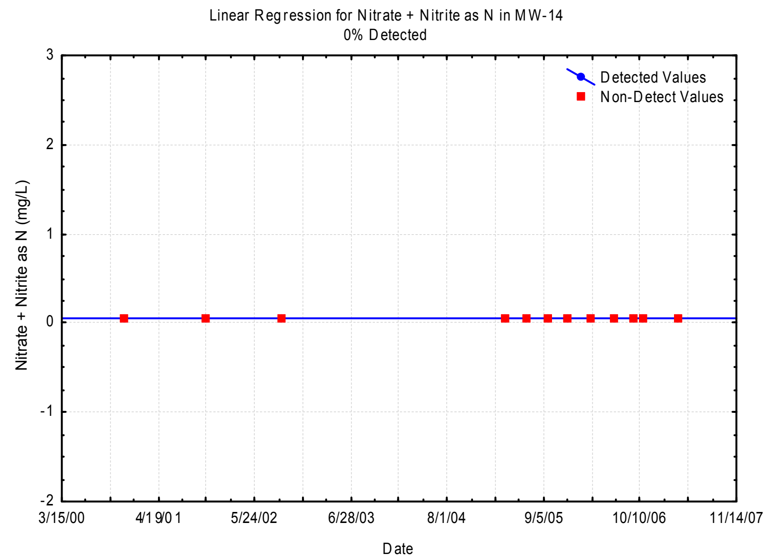


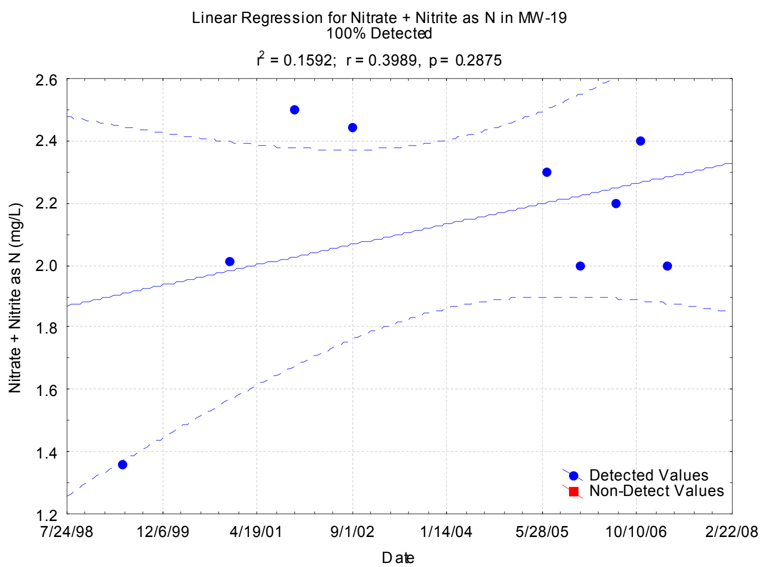


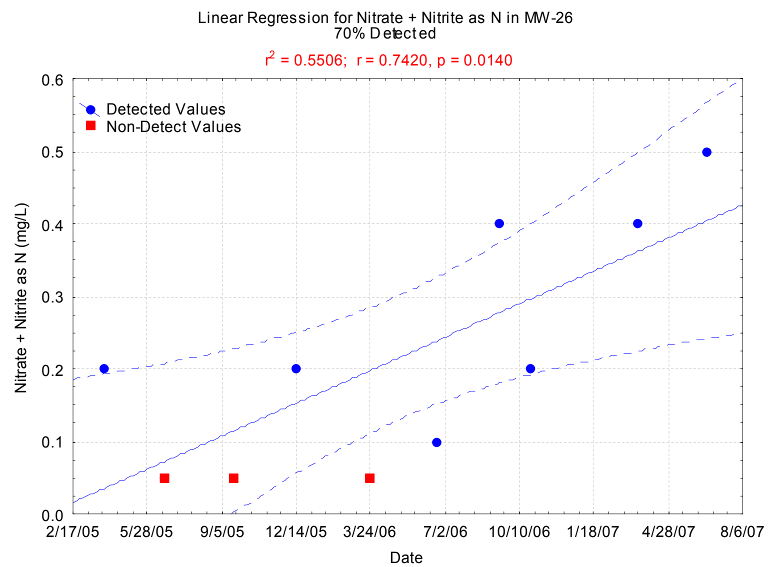


Linear Regressions for Nitrate + Nitrite as N

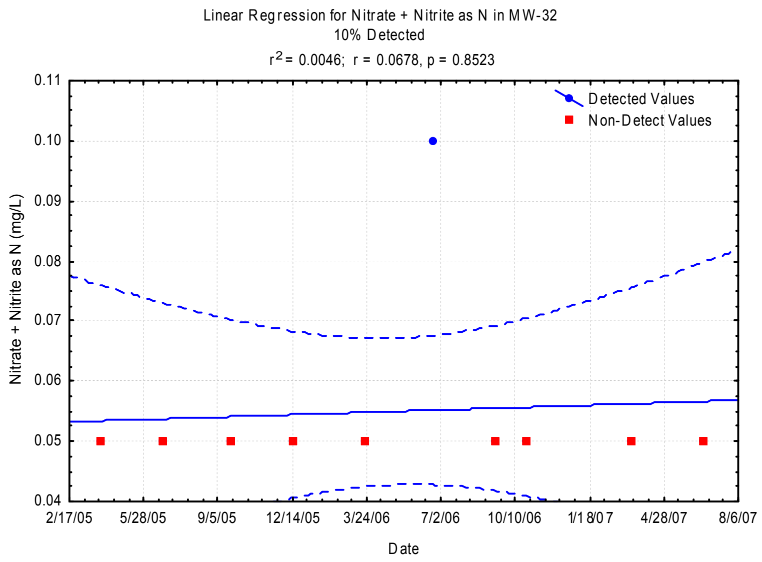




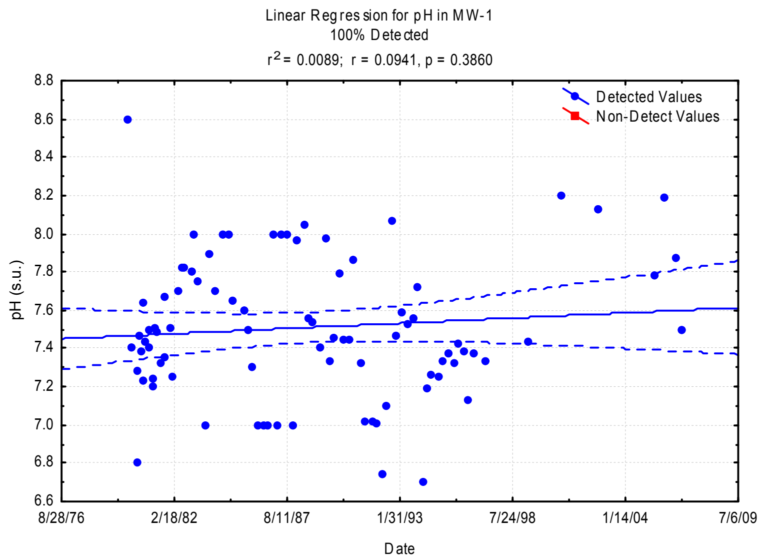


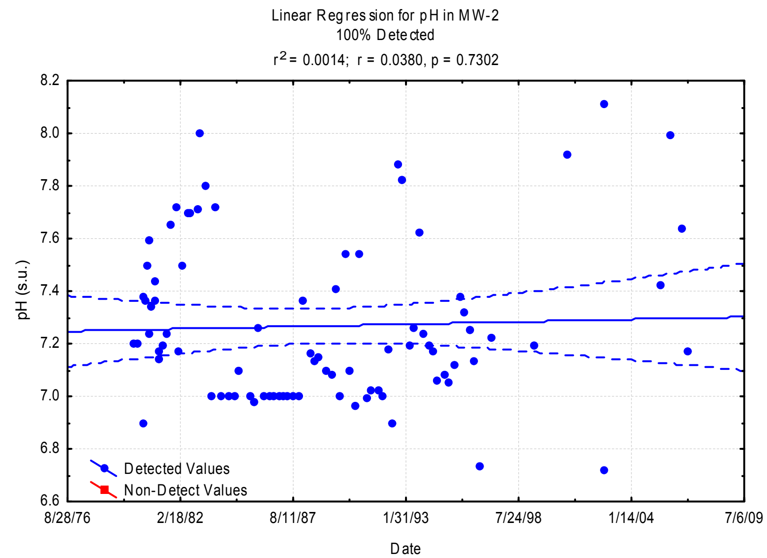


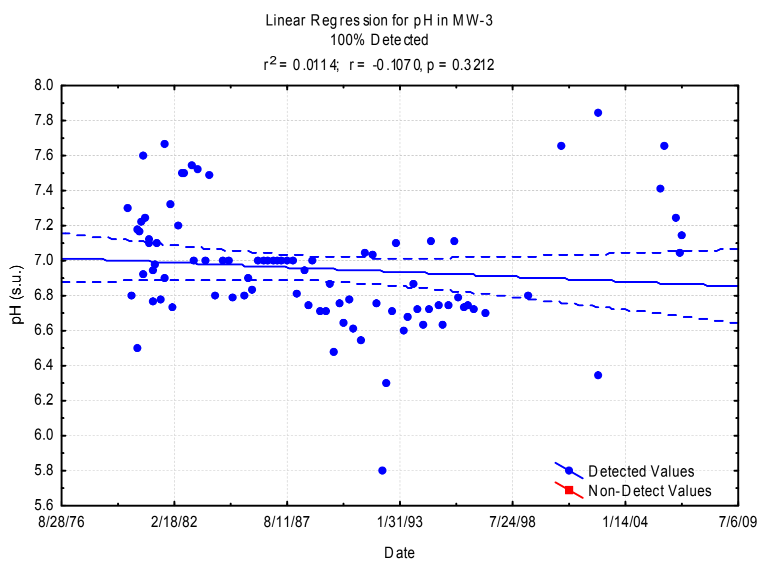
Linear Regressions for Nitrate + Nitrite as N

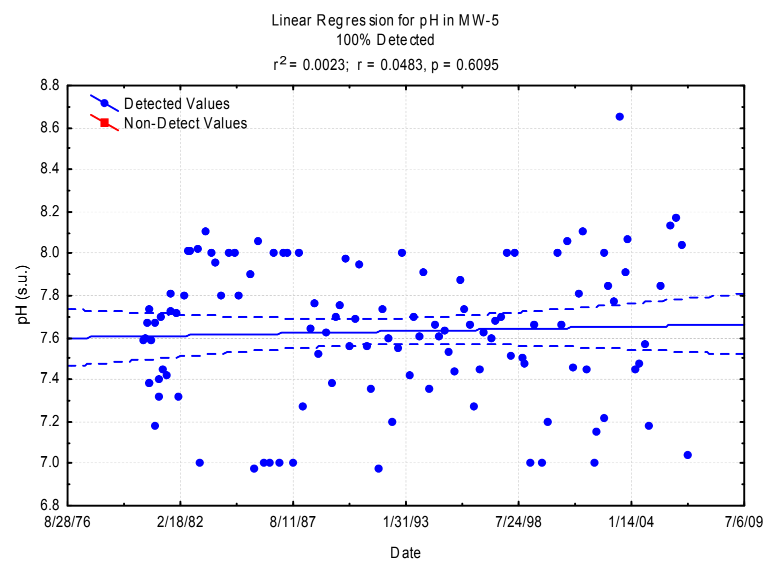


Linear Regressions for pH

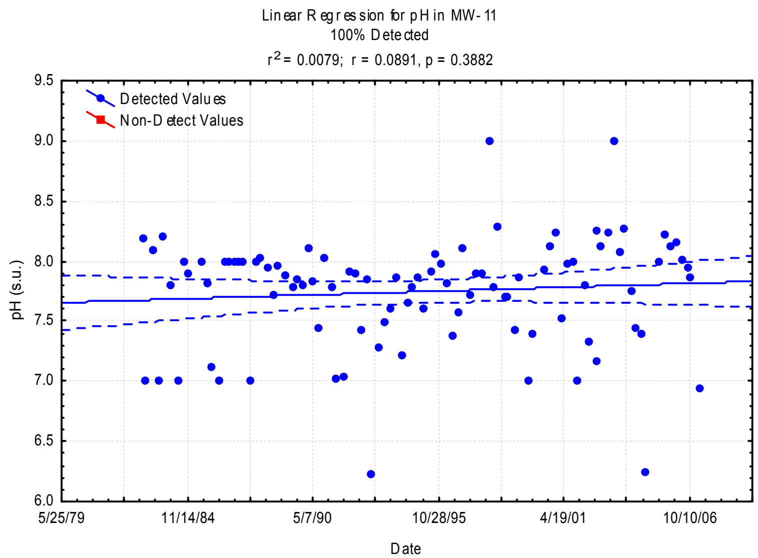


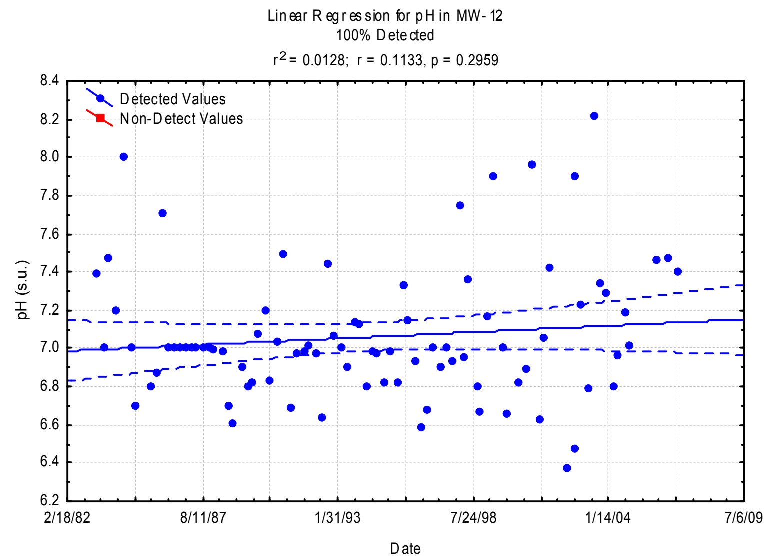


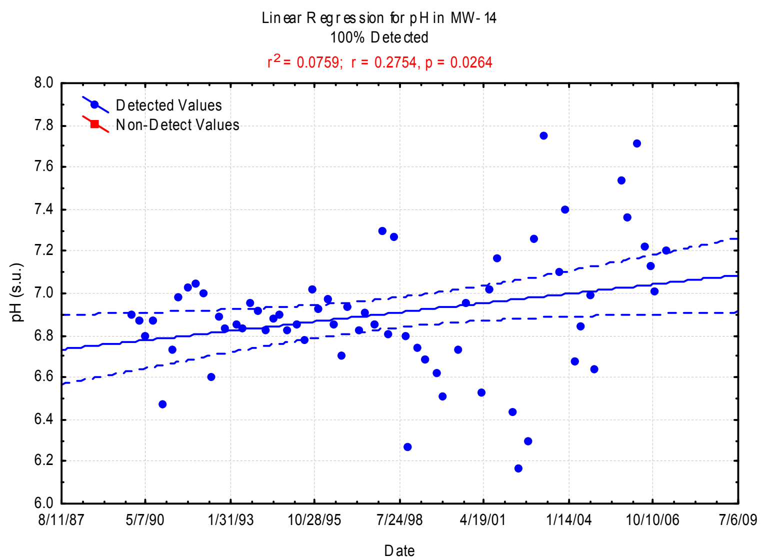


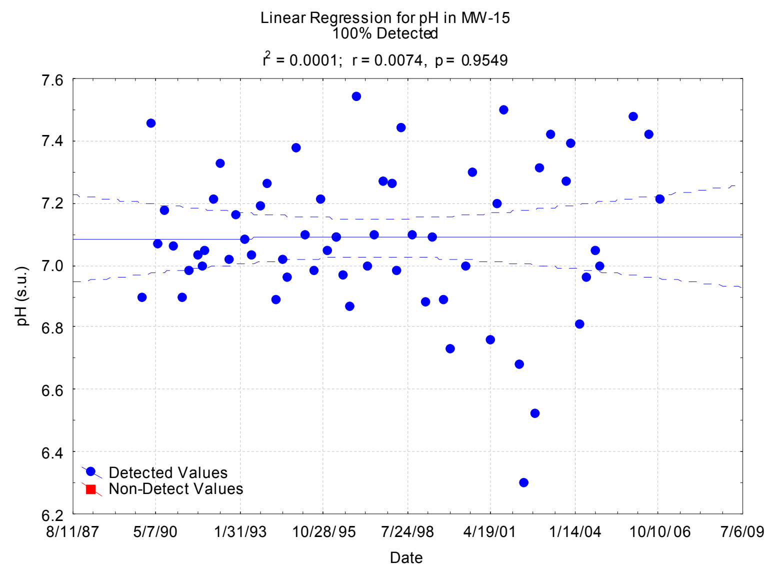


Linear Regressions for pH

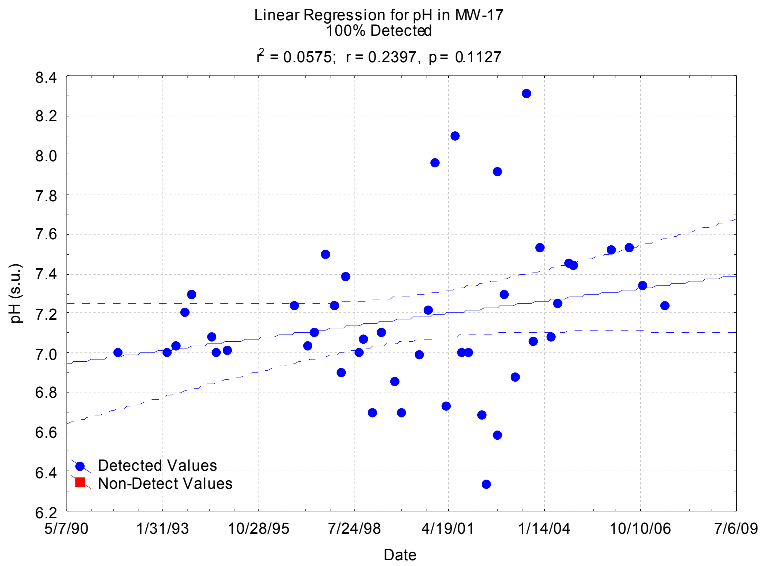


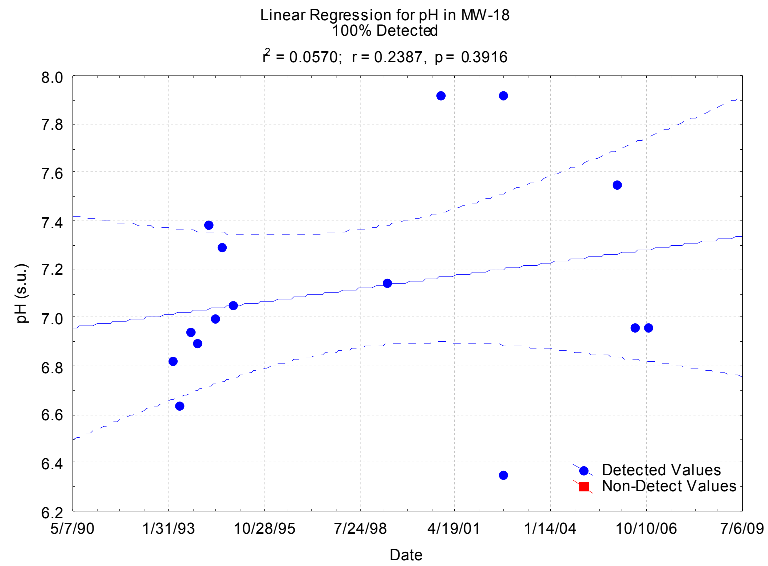


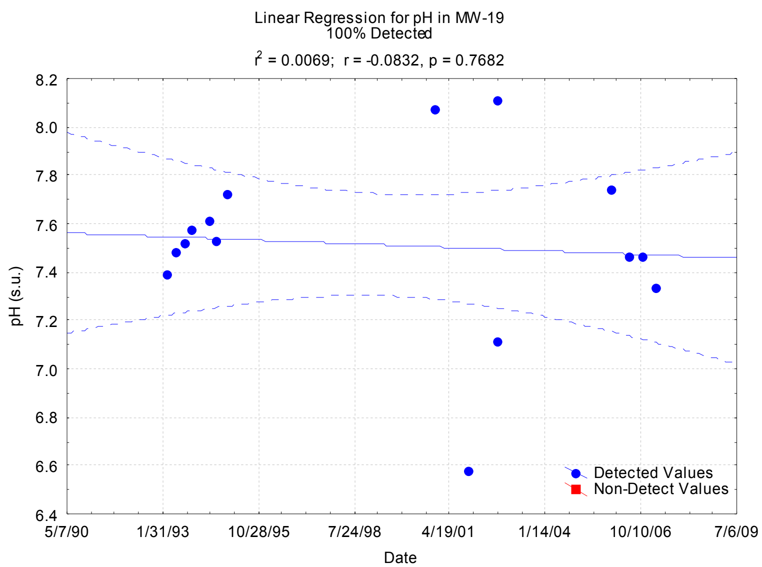


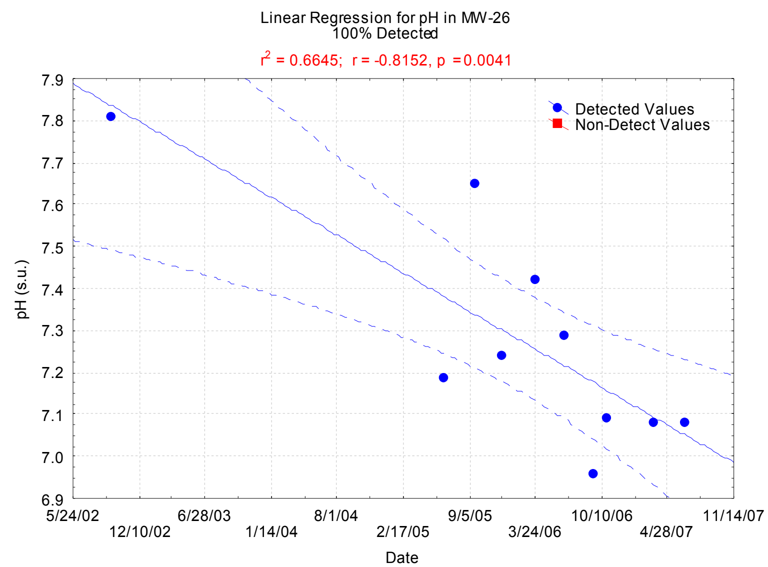


Linear Regressions for pH

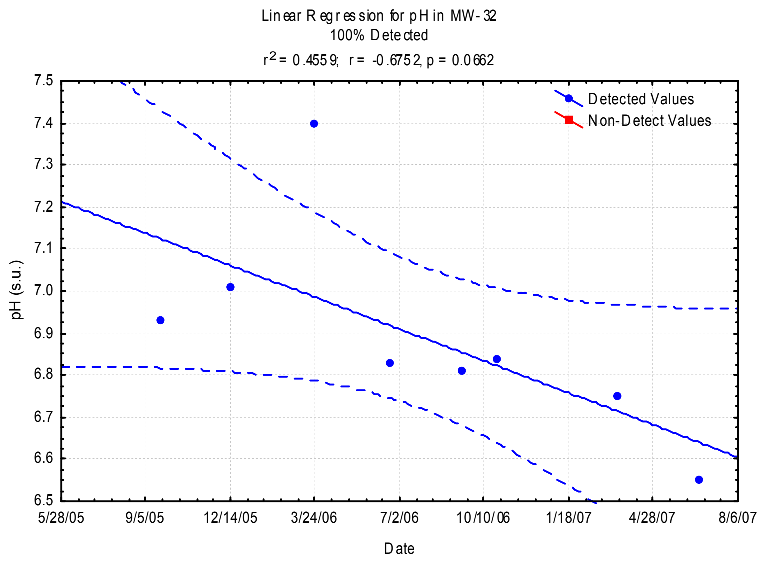




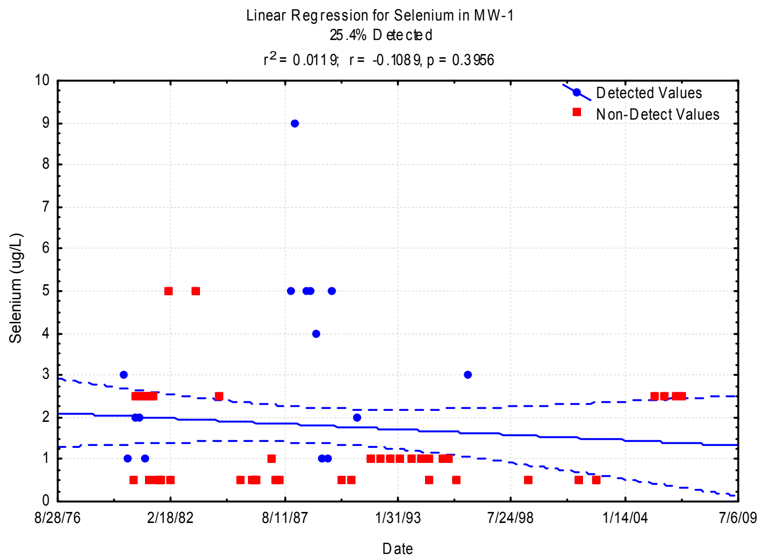


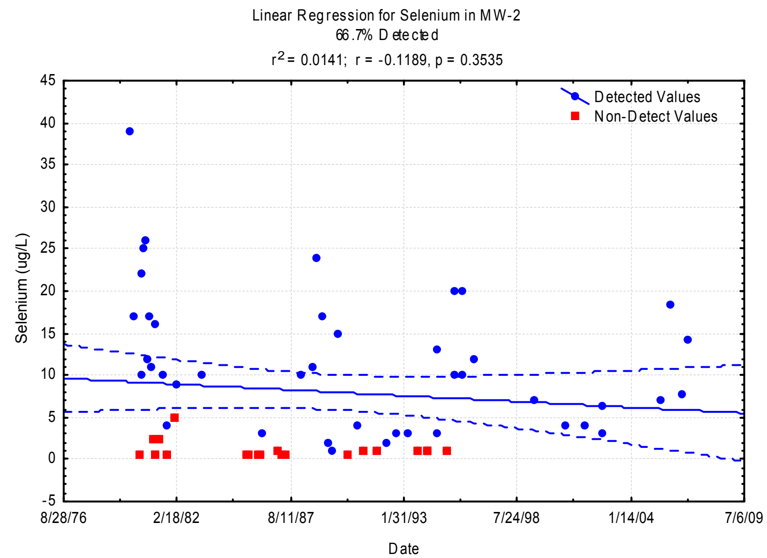


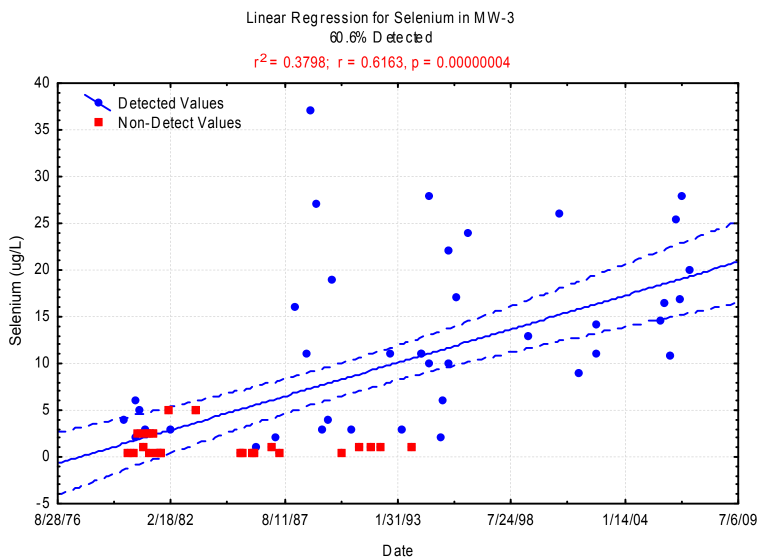
Linear Regressions for pH

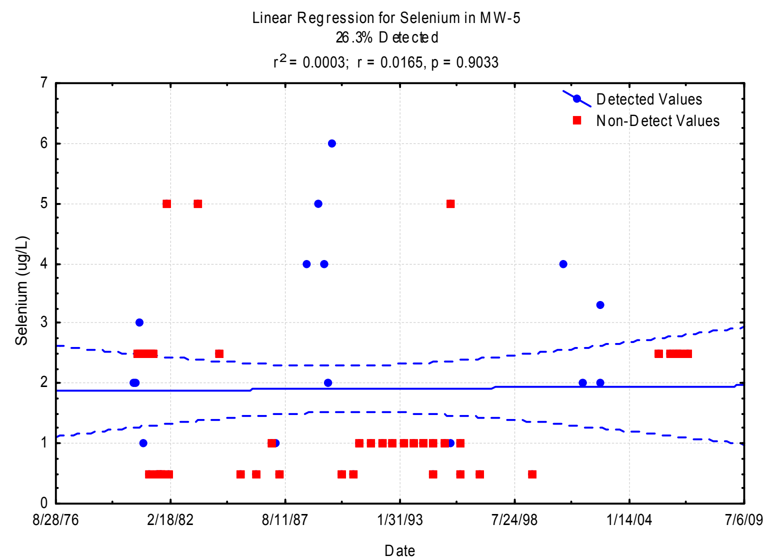


Linear Regressions for Selenium

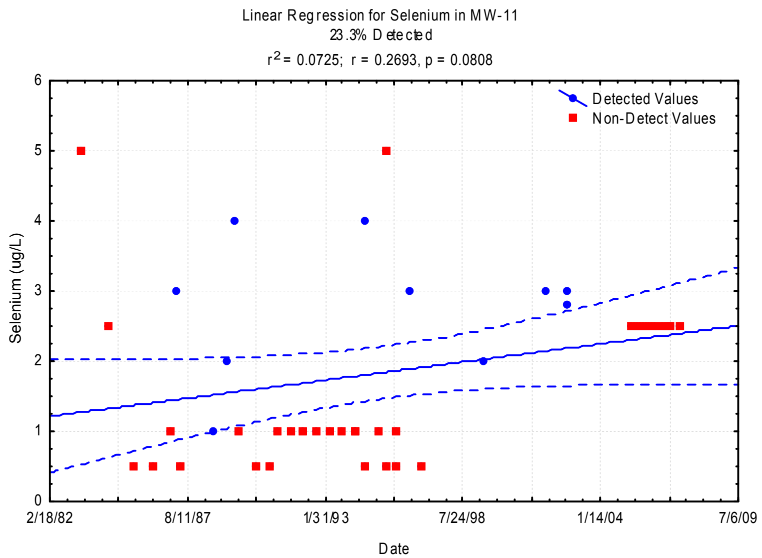


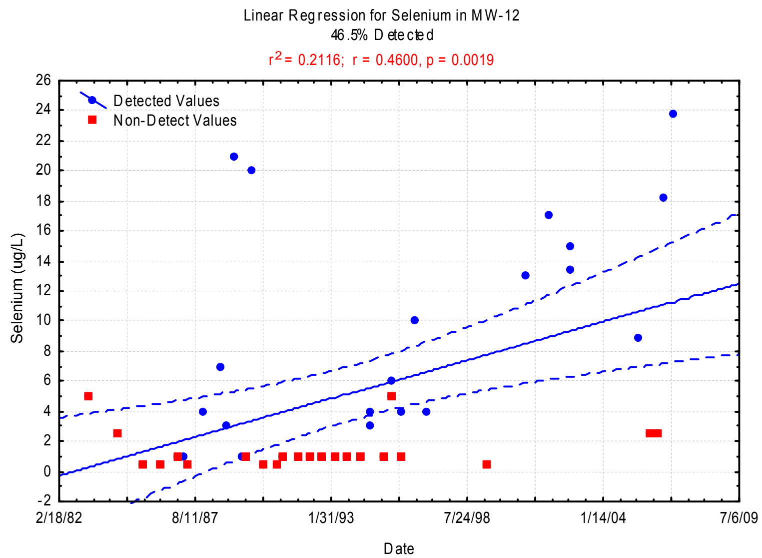


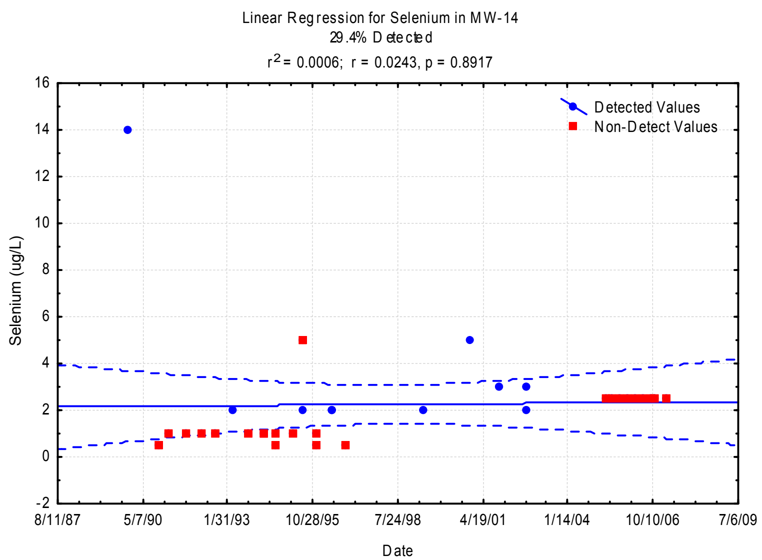


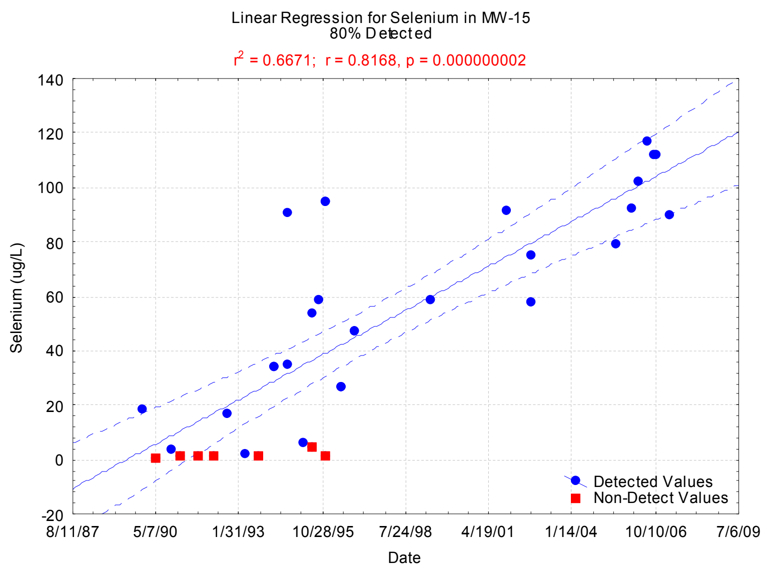


Linear Regressions for Selenium

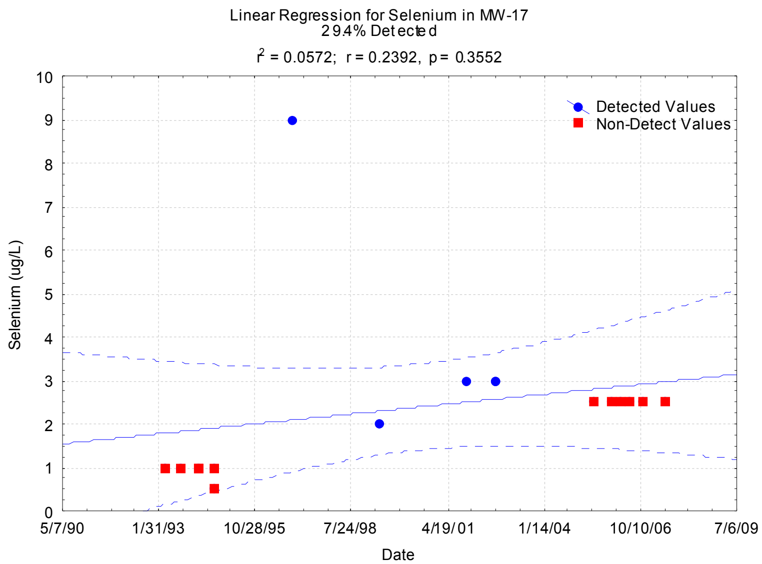


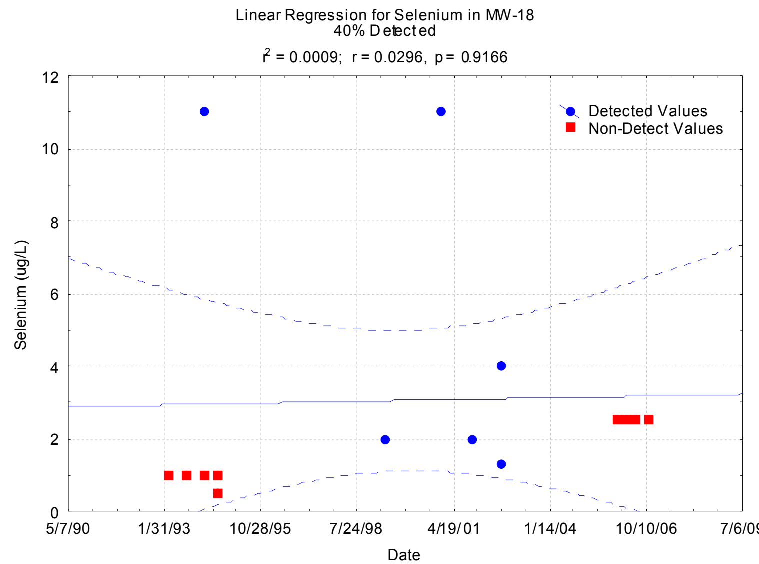


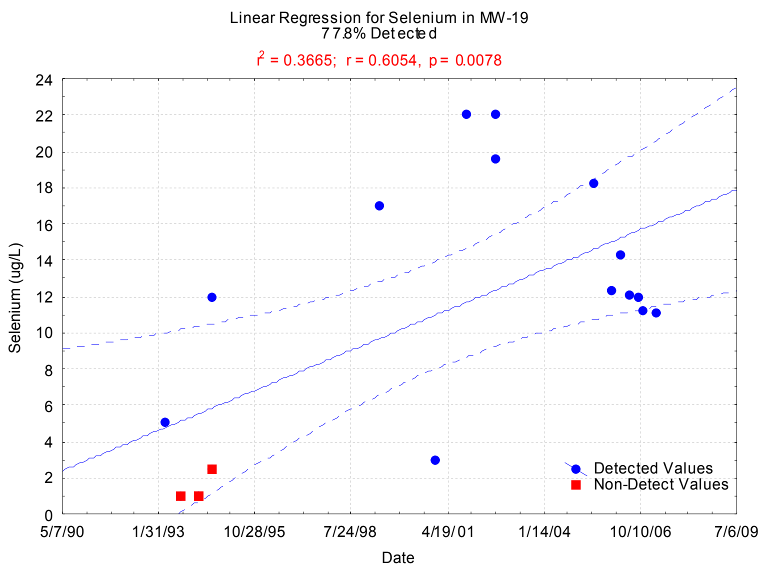


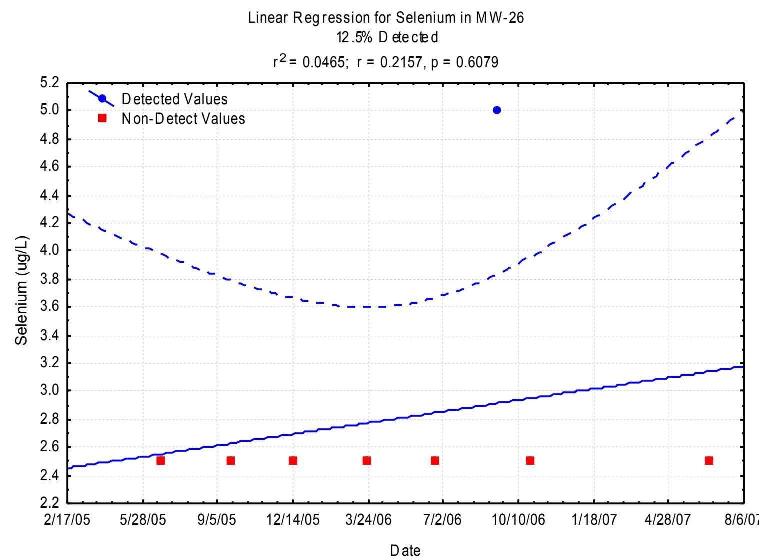


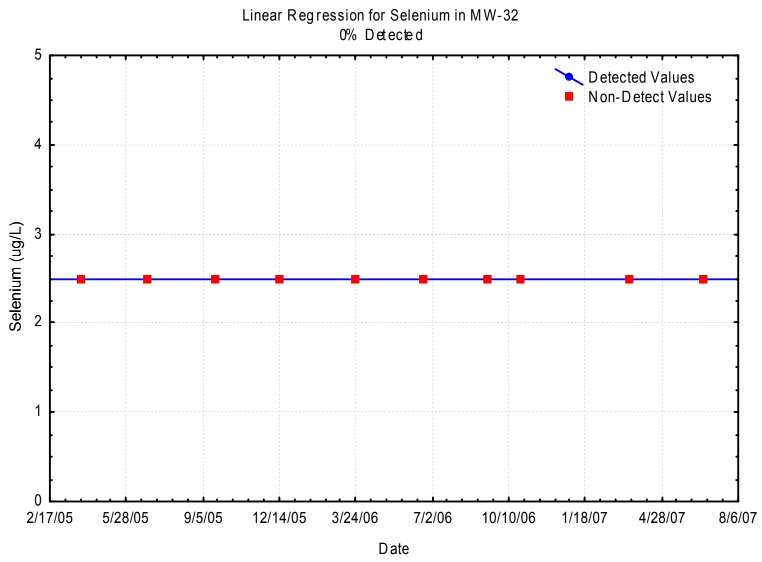
Linear Regressions for Selenium



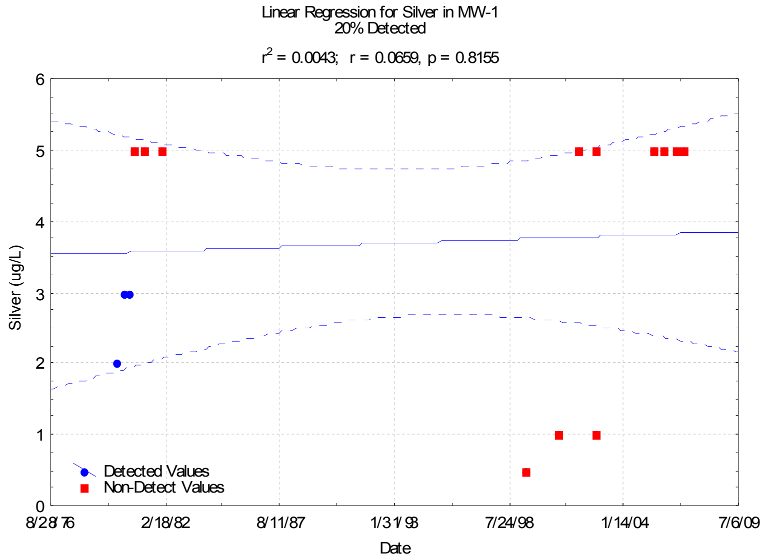


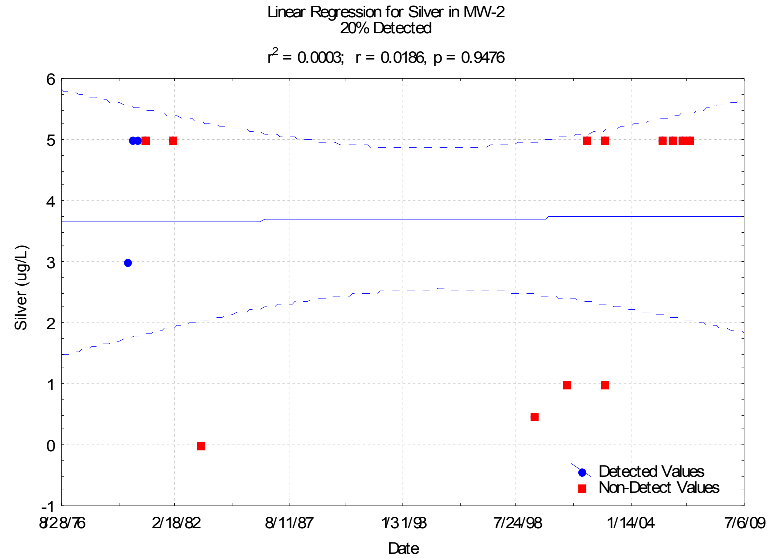


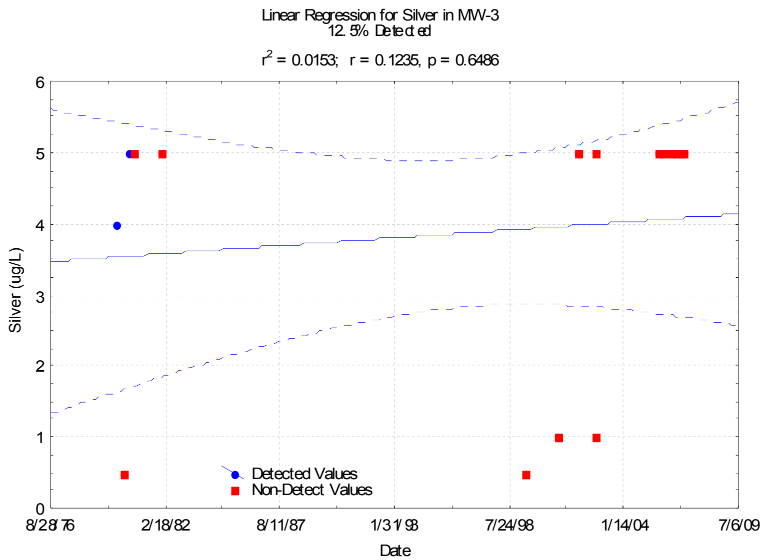


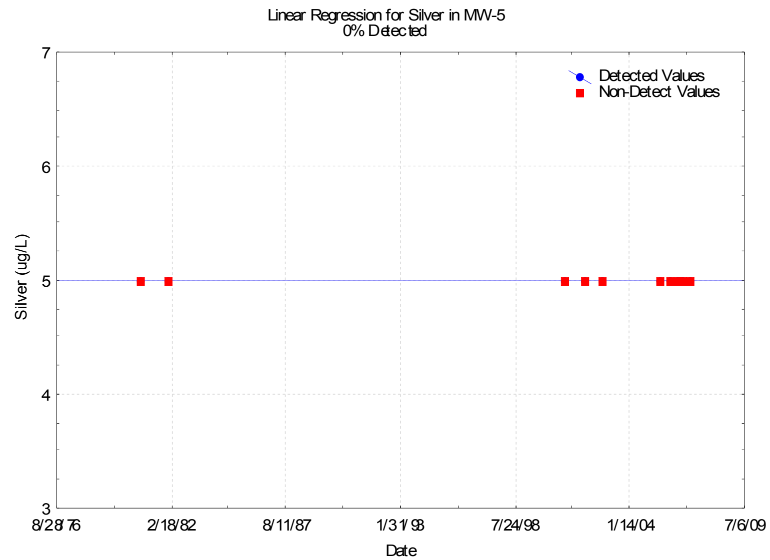

Linear Regression for Selenium in MW-32
0% Detected
Detected Values
Non-Detect Values
Selenium (ug/L)
0
1
2
3
4
5
2/17/05
5/28/05
9/5/05
12/14/05
3/24/06
7/2/06
10/10/06
1/18/07
4/28/07
8/6/07
Date

Linear Regressions for Silver

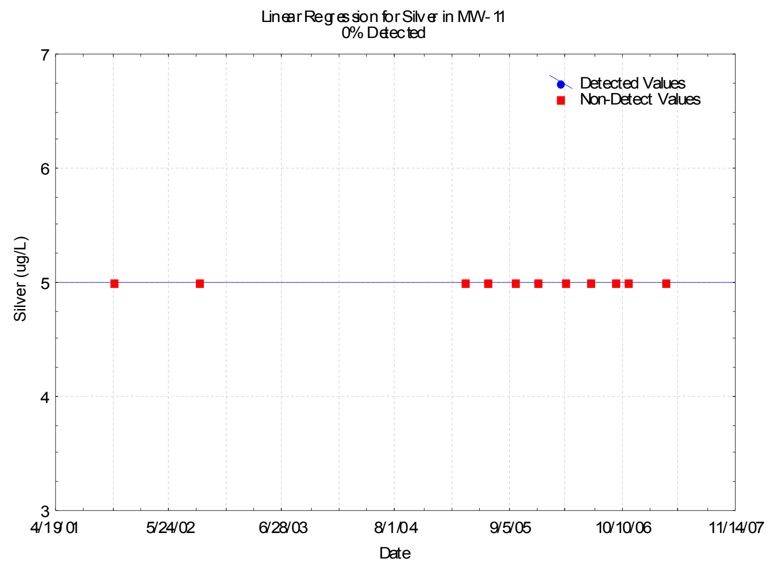


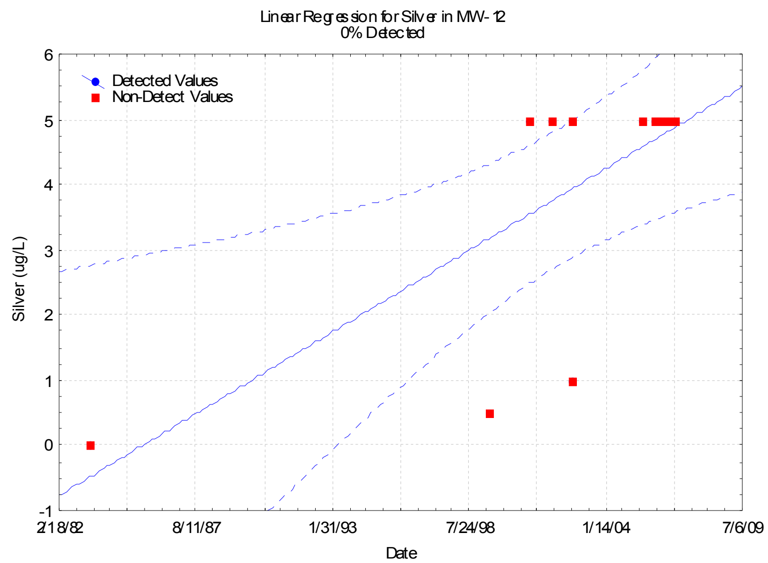


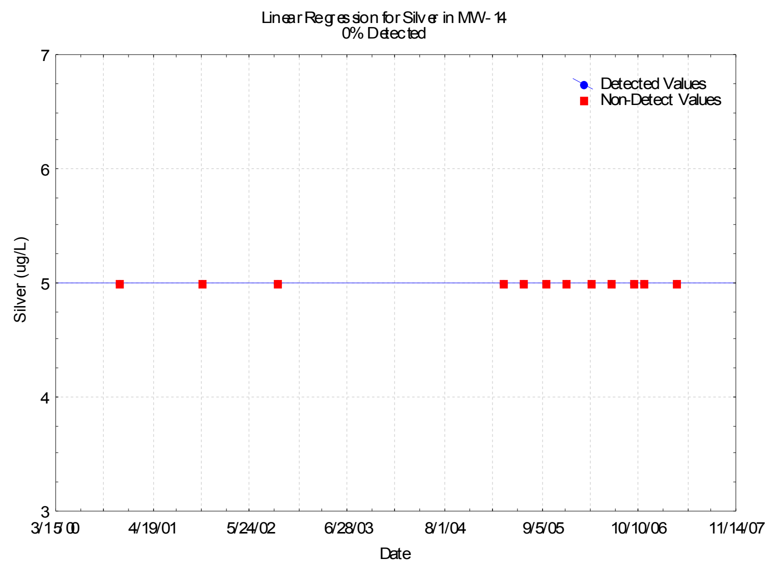


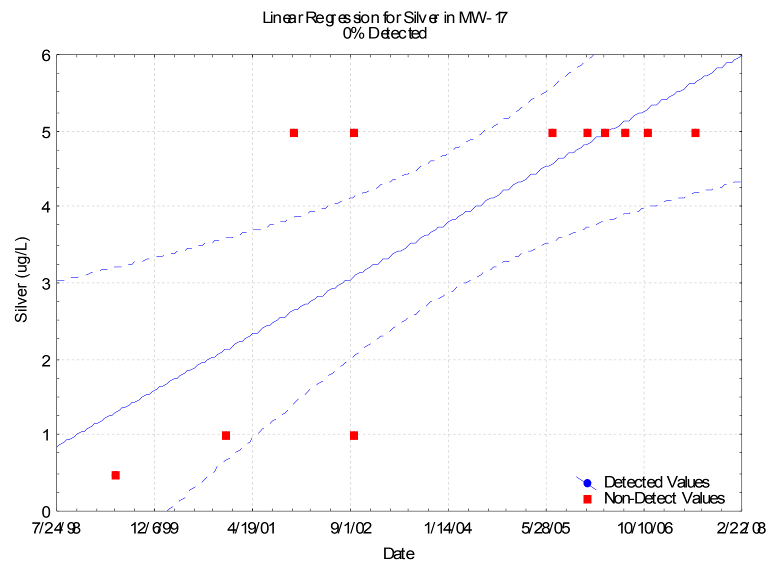


Linear Regressions for Silver

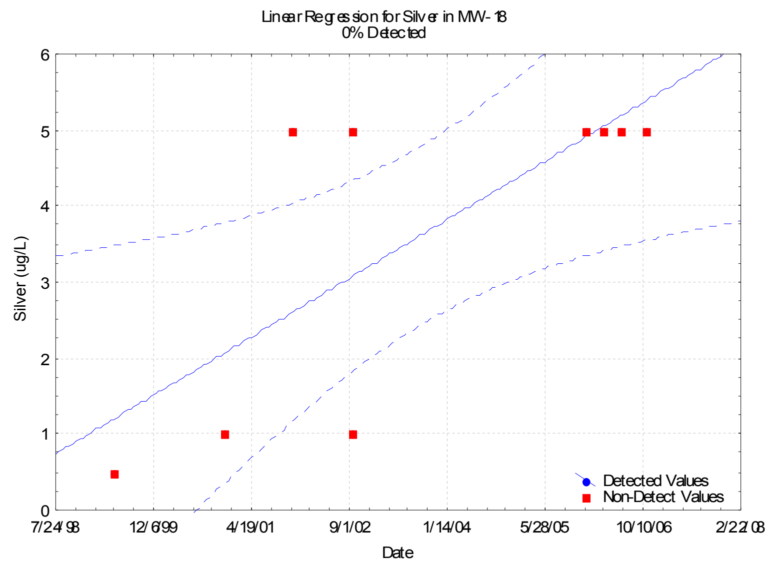


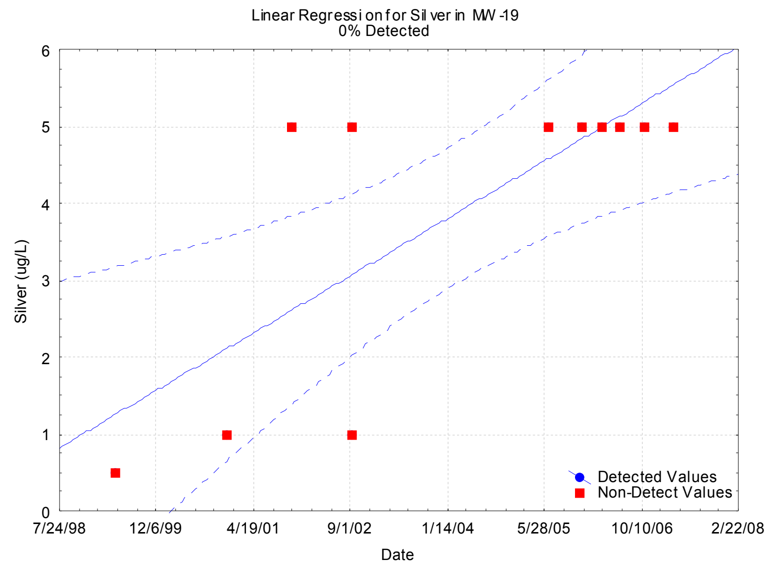


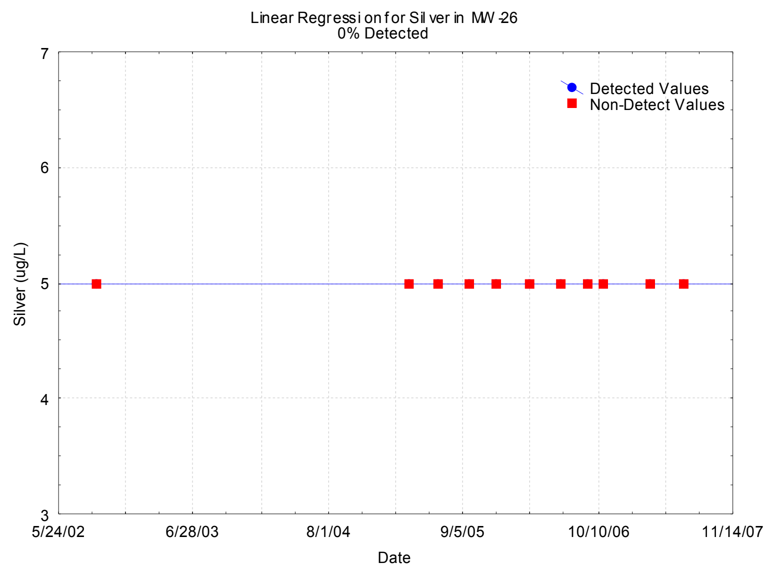


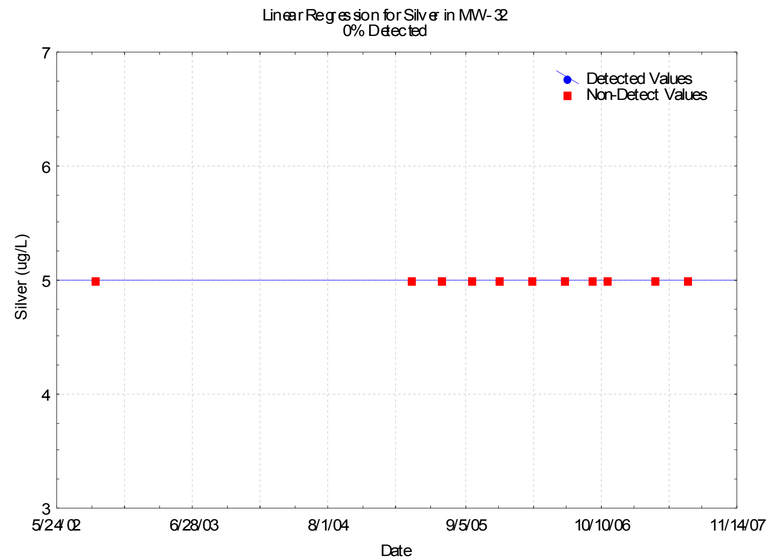


Linear Regressions for Silver



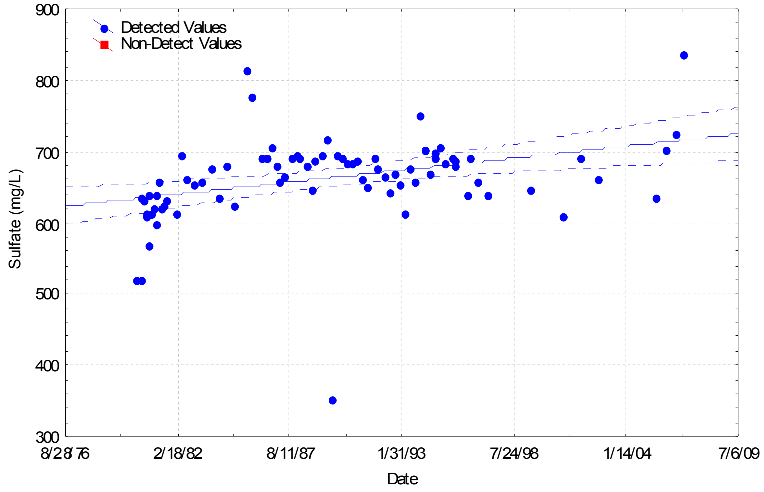




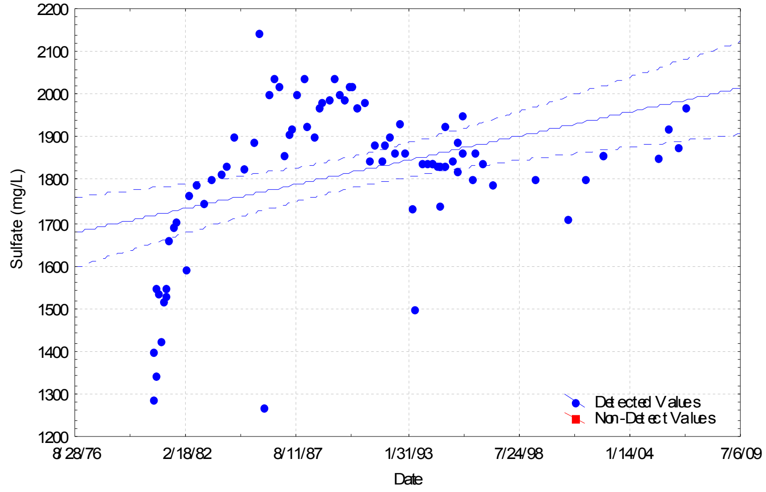


Linear Regressions for Sulfate

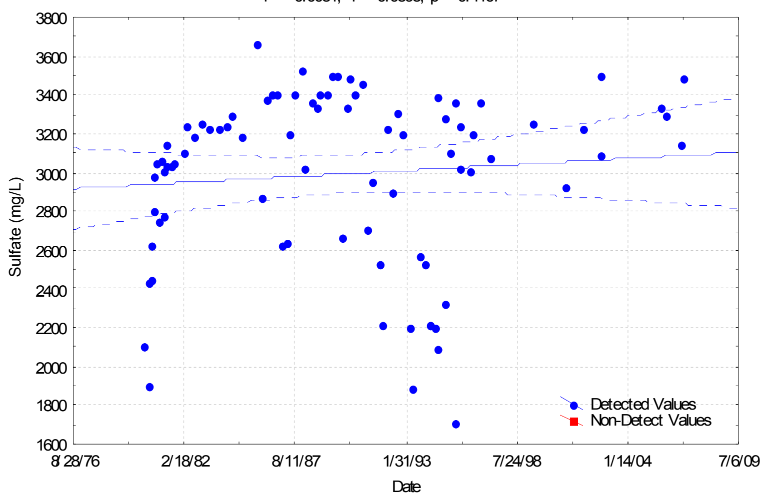
Linear Regression for Sulfate in MW-1
100% Detected
r^2 = 0.1284; r = 0.3584, p = 0.0009



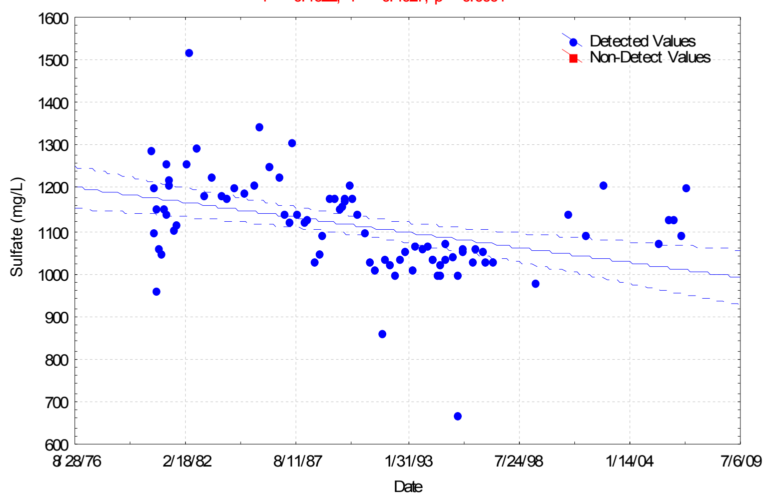
Linear Regression for Sulfate in MW-2
100% Detected
r^2 = 0.1553; r = 0.3941, p = 0.0003



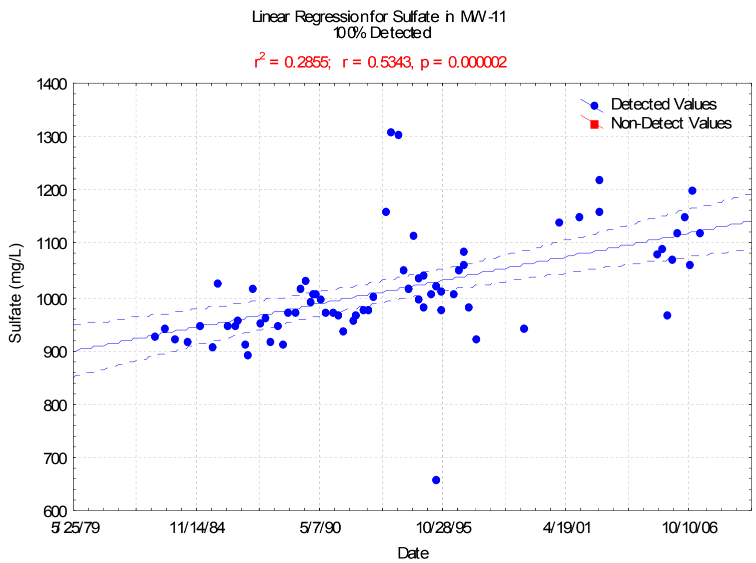
Linear Regression for Sulfate in MW-3
100% Detected
r^2 = 0.0081; r = 0.0898, p = 0.4167

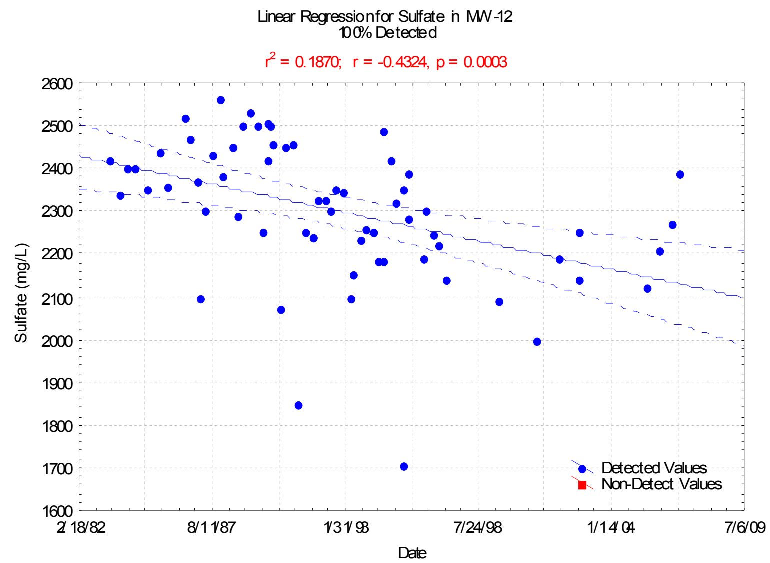


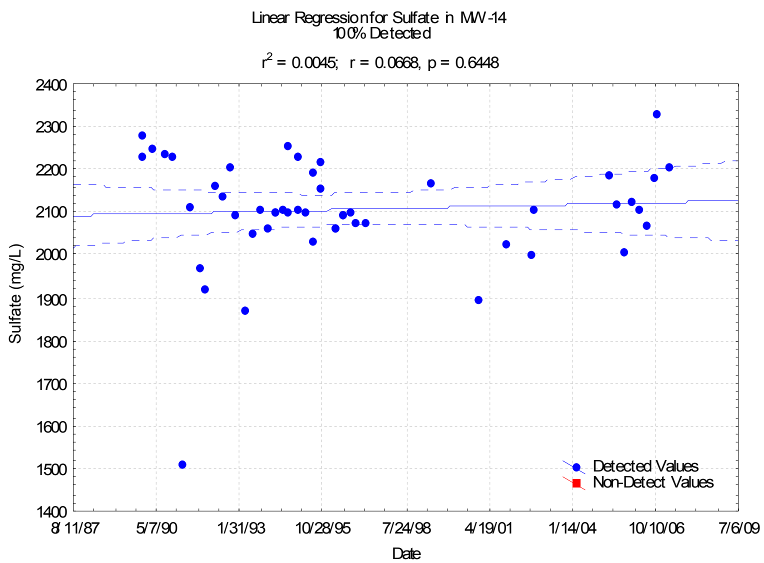
Linear Regression for Sulfate in MW-5
100% Detected
r^2 = 0.1622; r = -0.4027, p = 0.0001

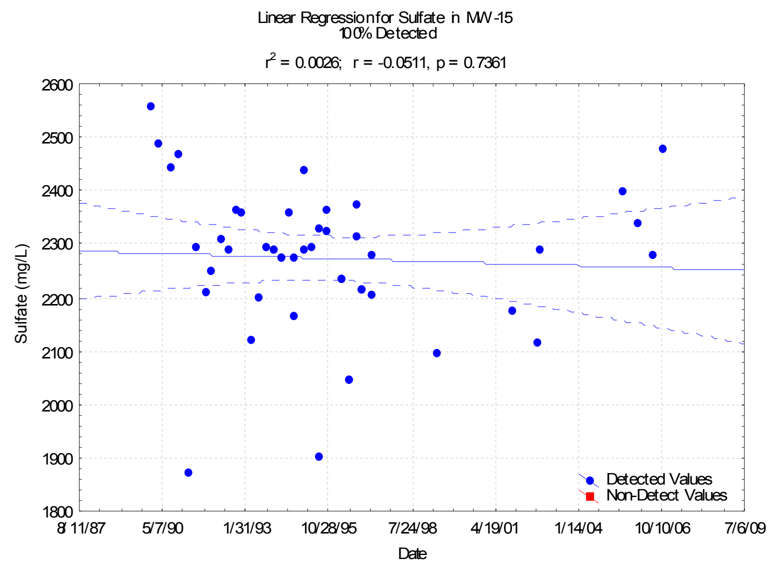


Linear Regressions for Sulfate

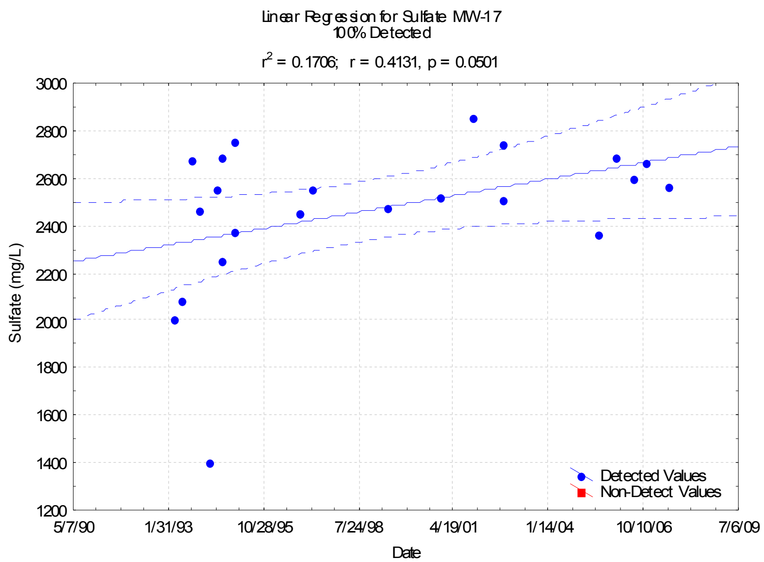


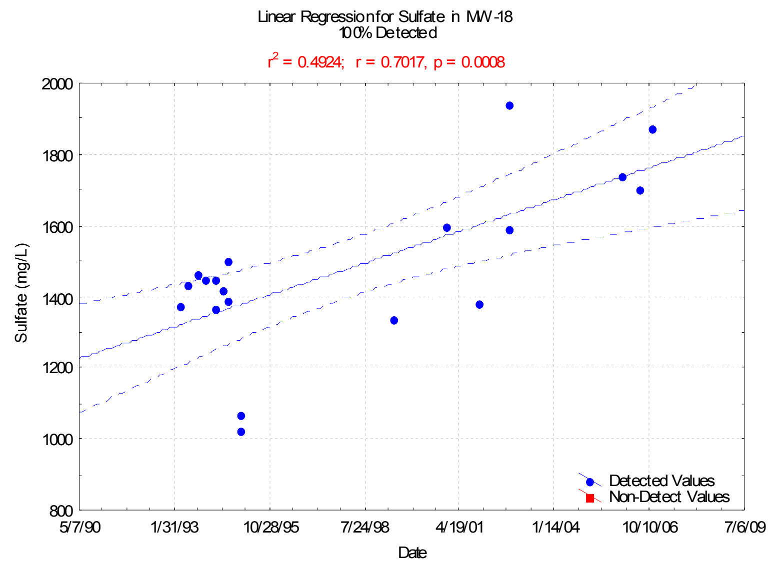


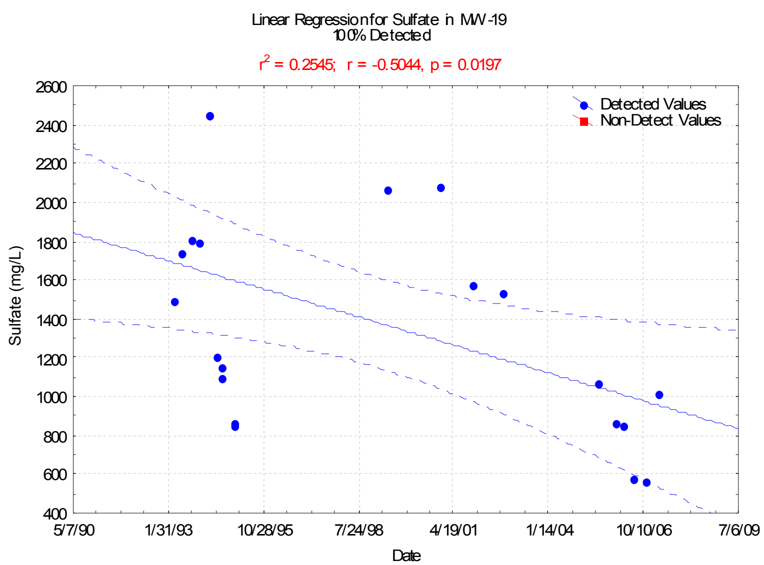


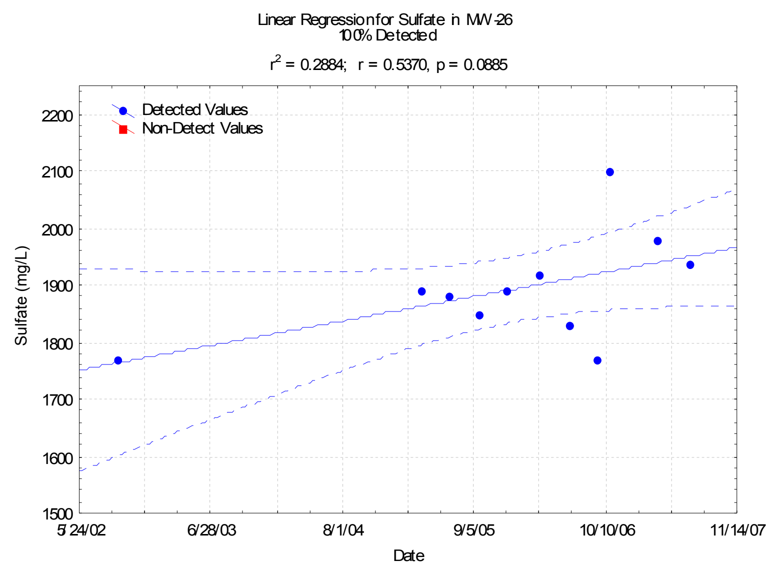


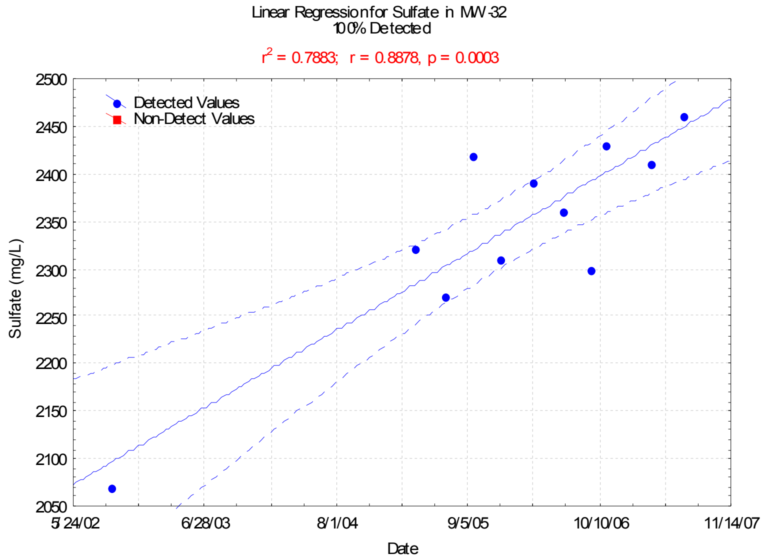
Linear Regressions for Sulfate



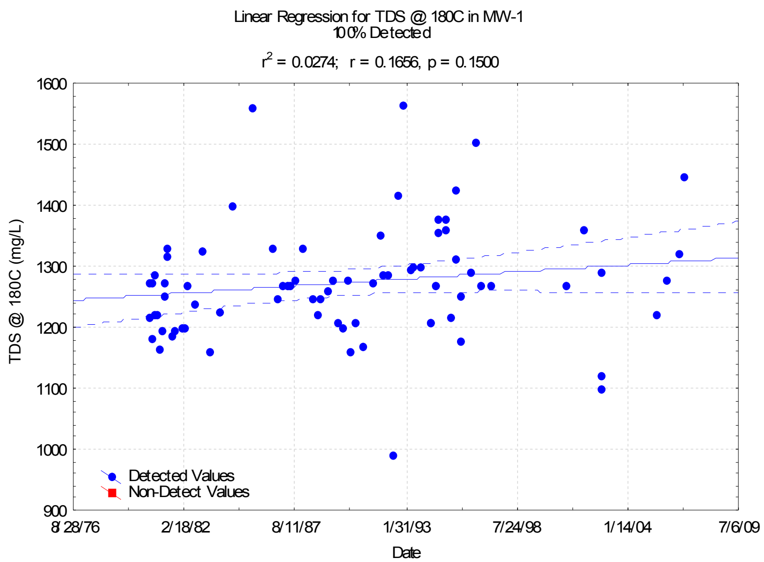


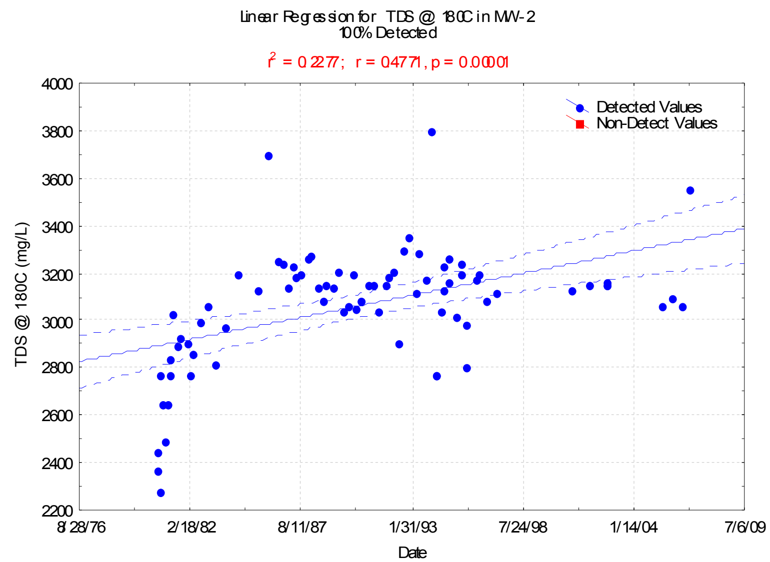


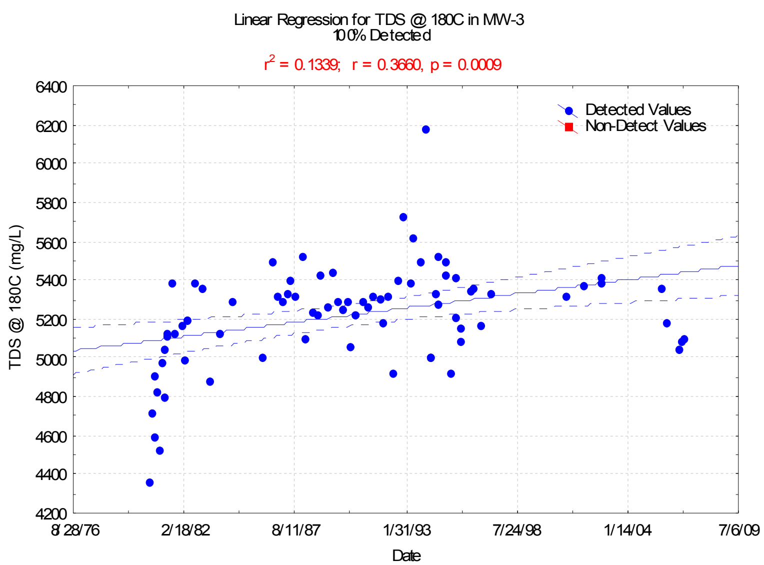


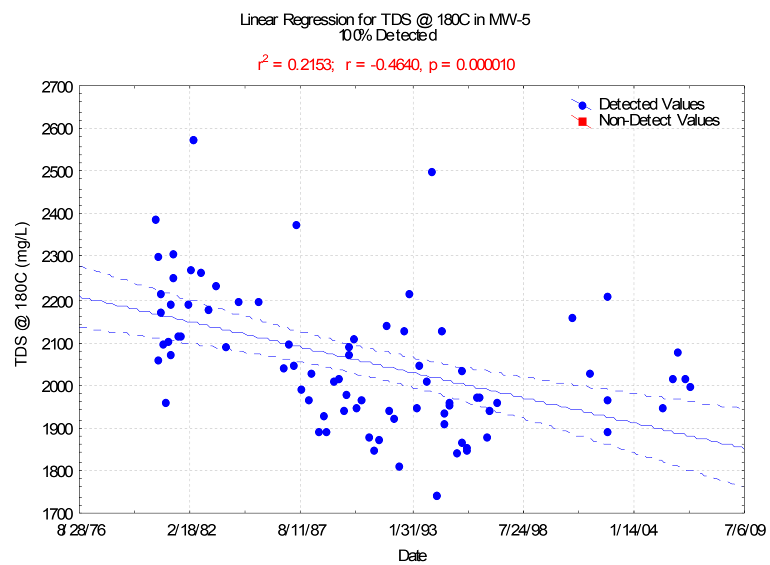

Linear Regression for Sulfate in MW-32
100% Detected
r^2 = 0.7883; r = 0.8878, p = 0.0003
Detected Values
Non-Detect Values
Sulfate (mg/L)
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
5/24/02
6/28/03
8/1/04
9/5/05
10/10/06
11/14/07
Date

Linear Regressions for TDS @ 180C

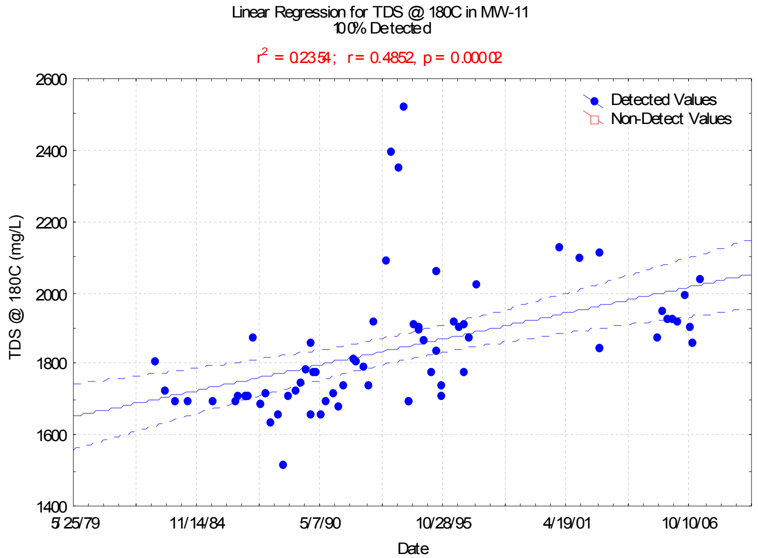


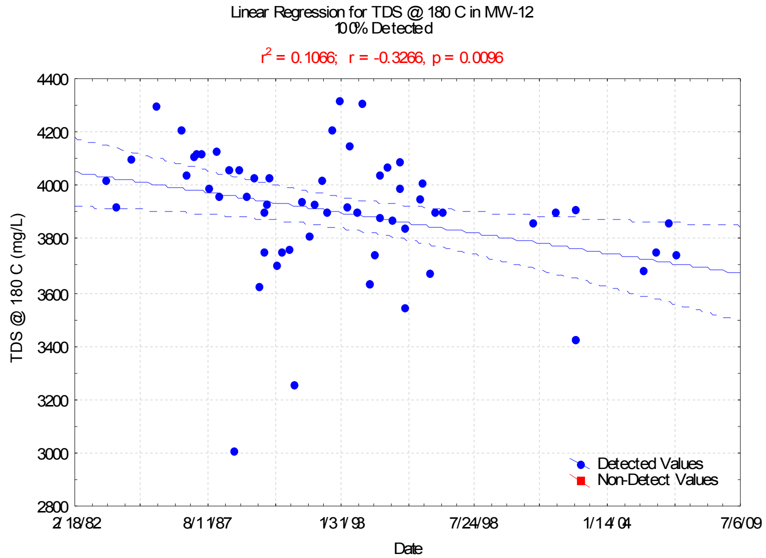


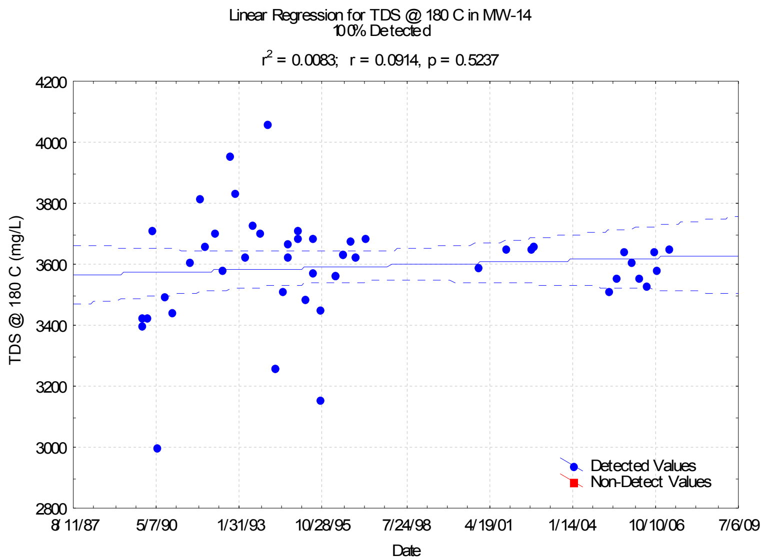


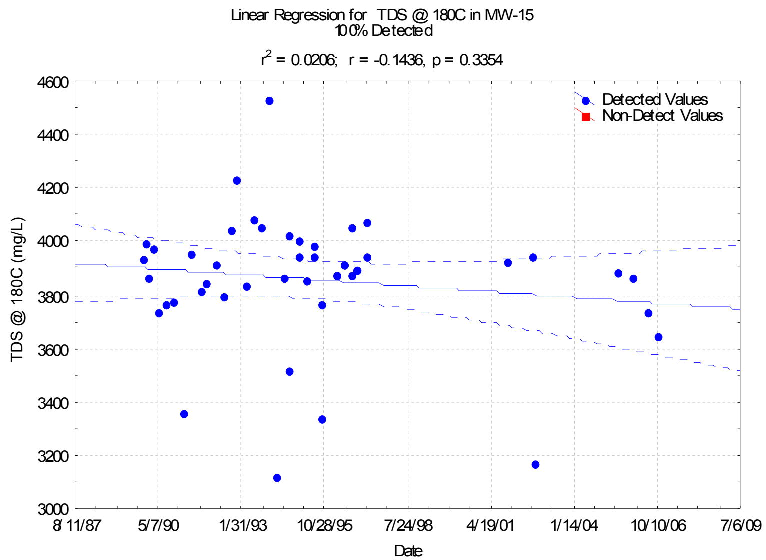


Linear Regressions for TDS @ 180C

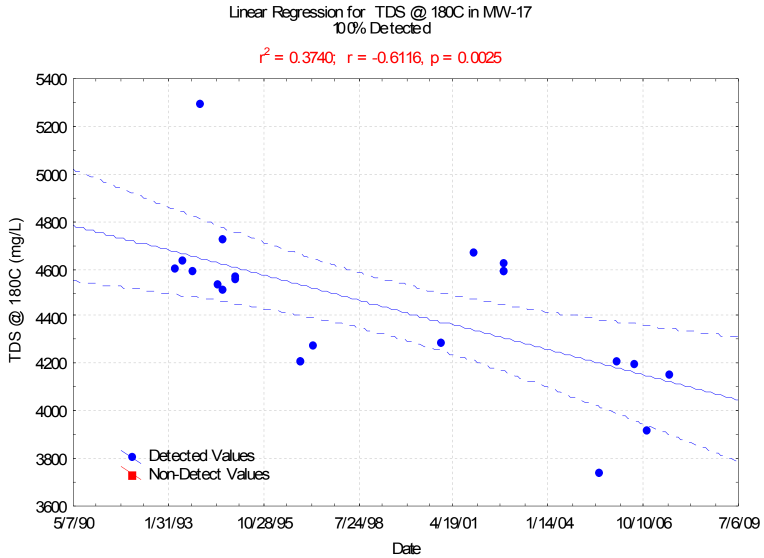


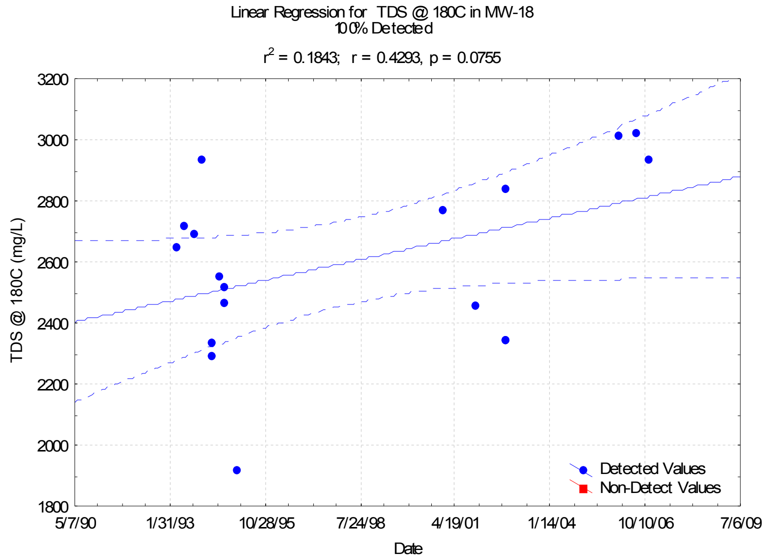


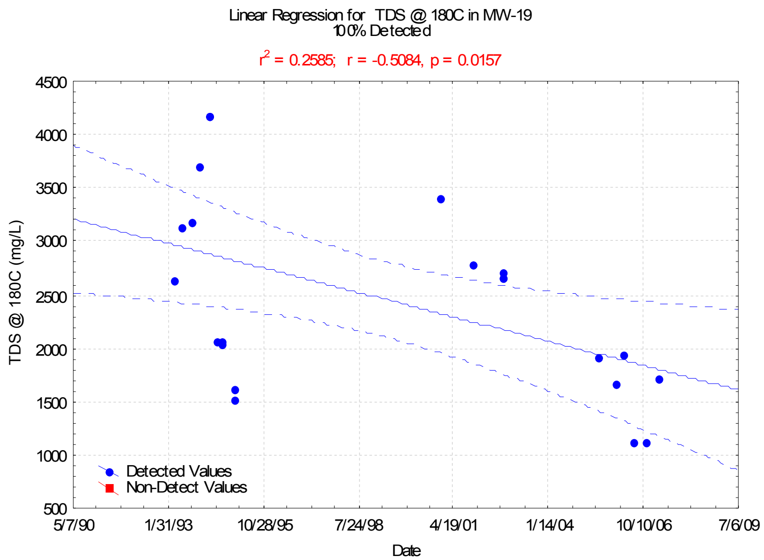


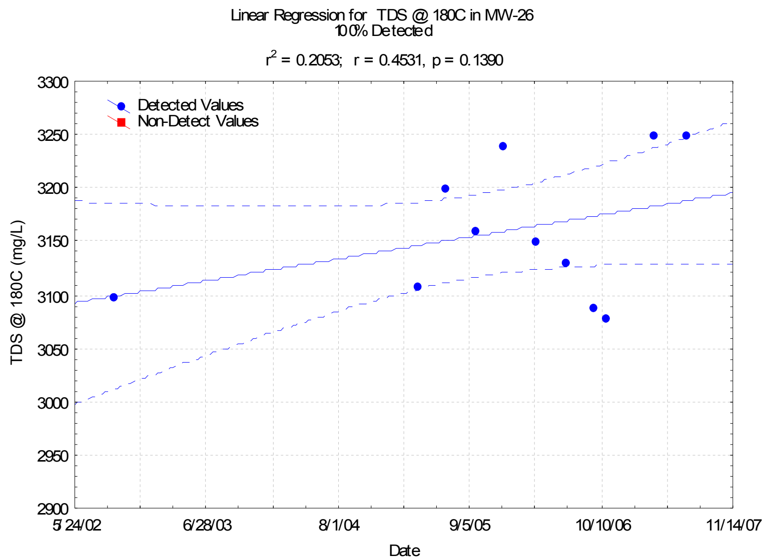


Linear Regressions for TDS @ 180C

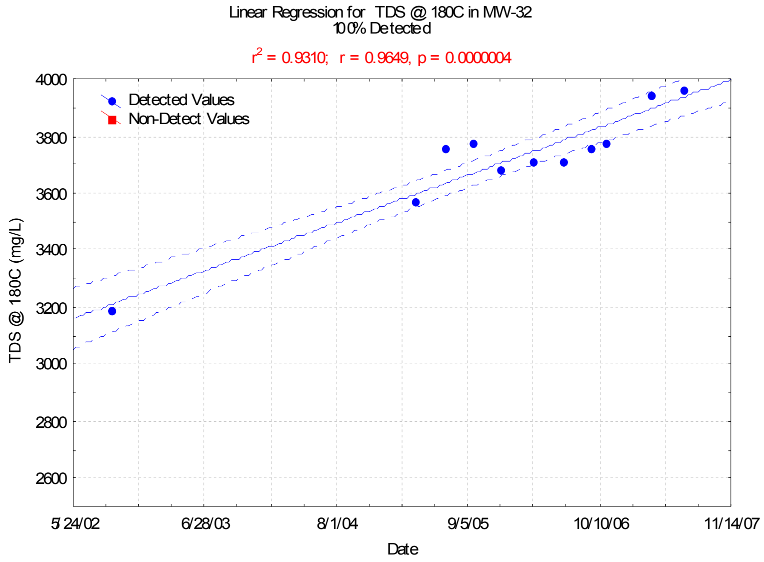




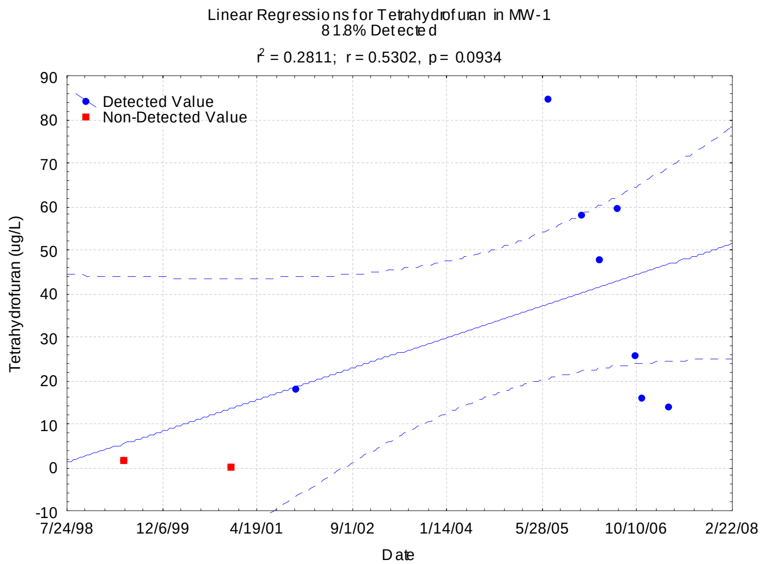


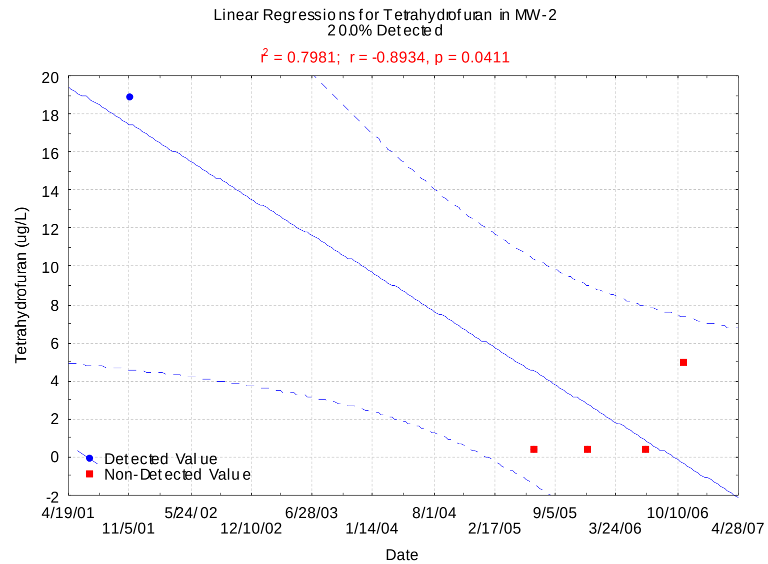


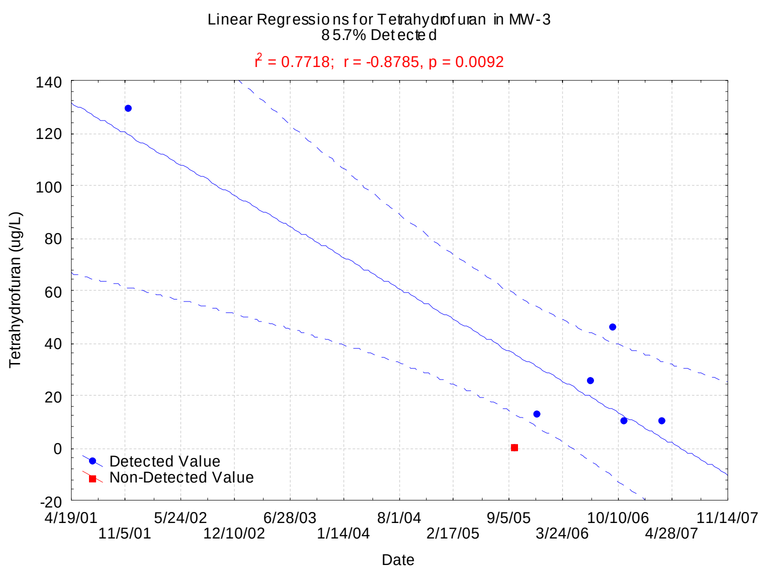
Linear Regressions for TDS @ 180C

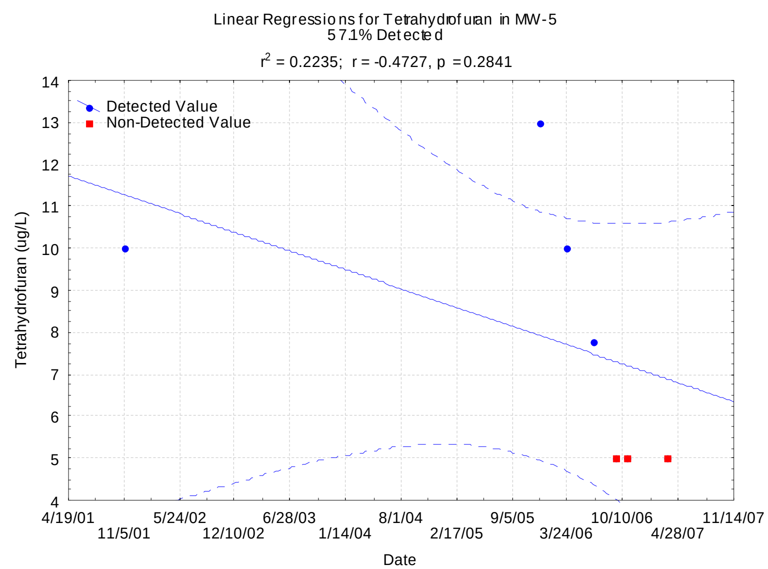


Linear Regression for Tetrahydrofuran

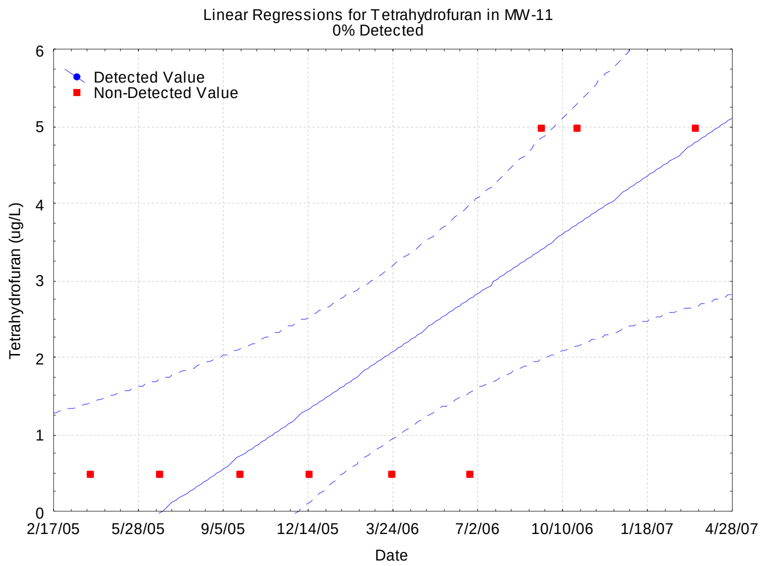


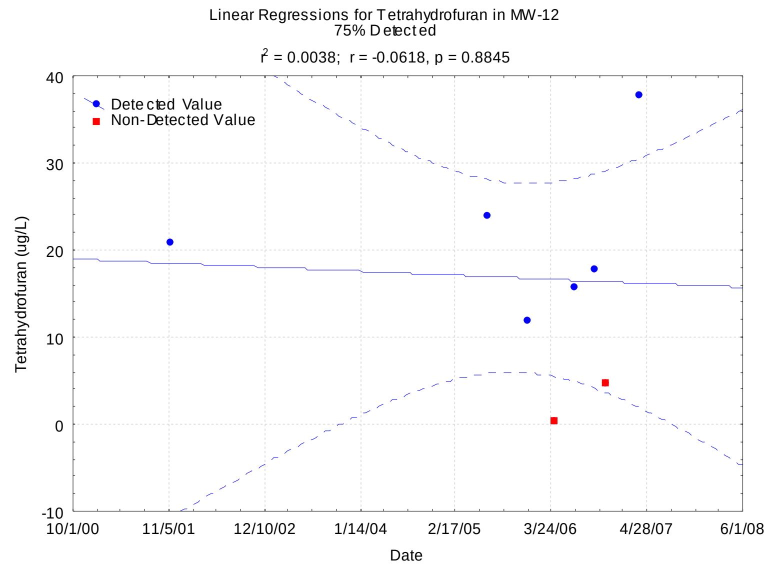


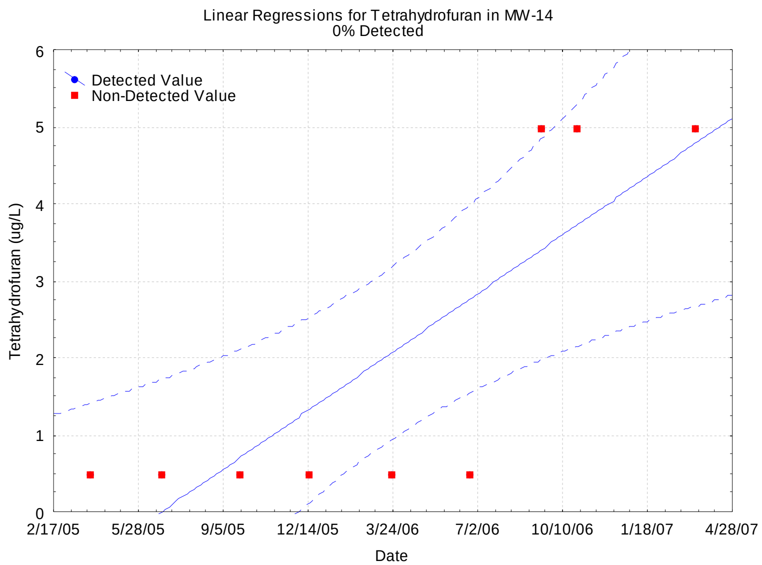


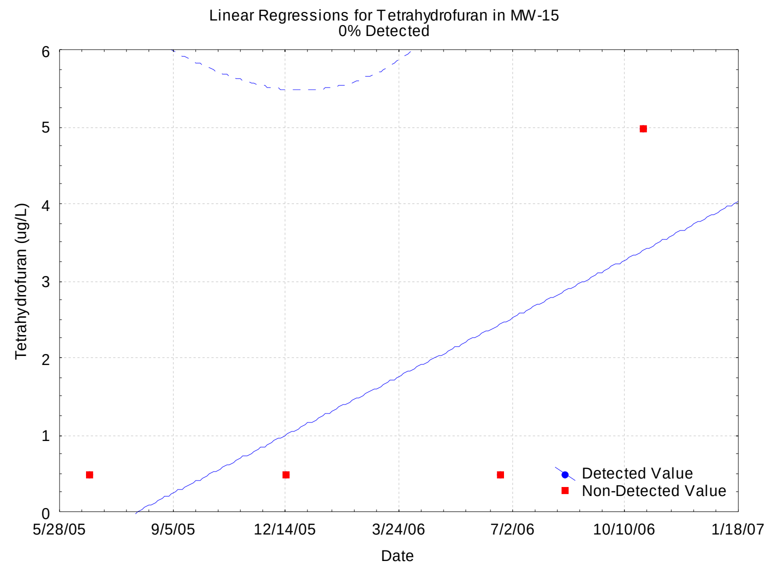


Linear Regression for Tetrahydrofuran

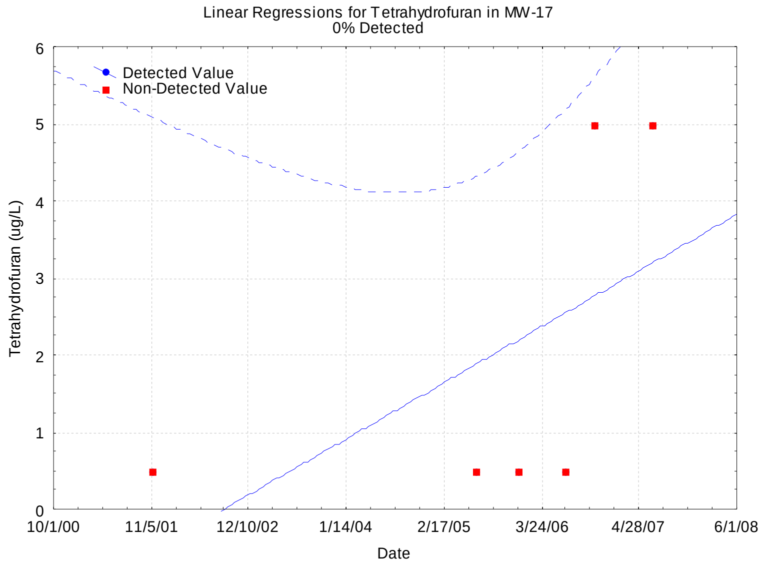


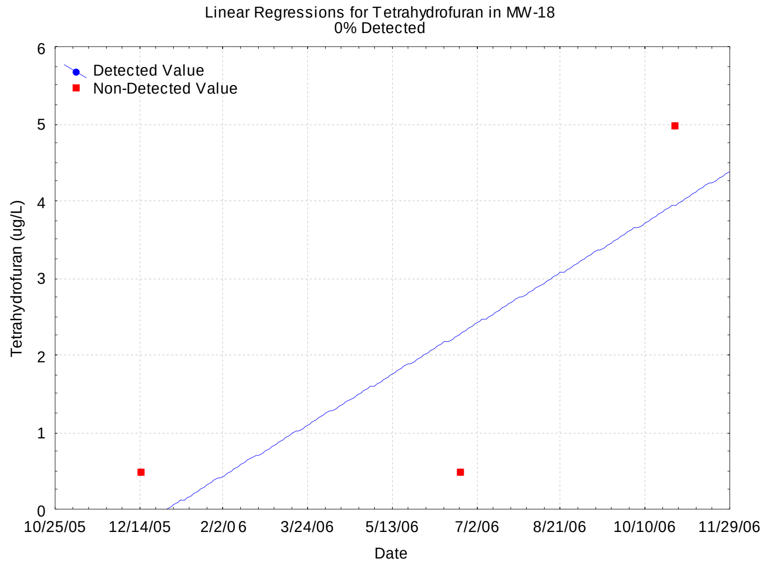


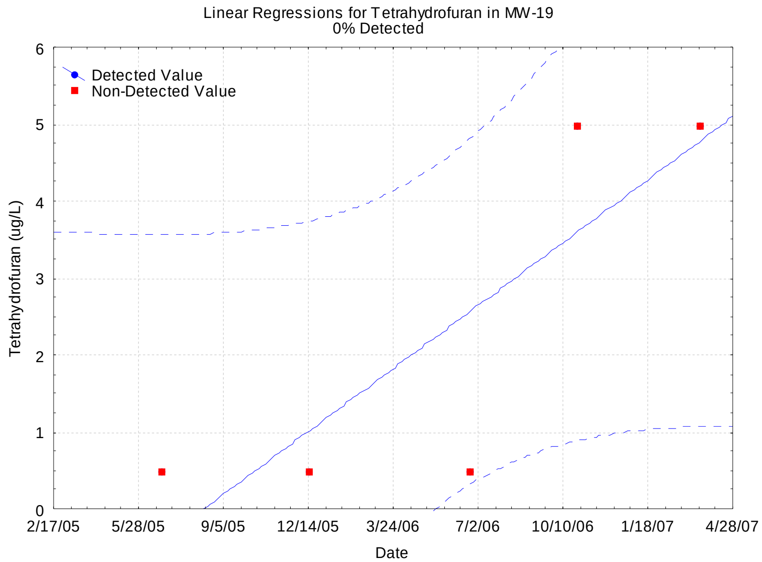


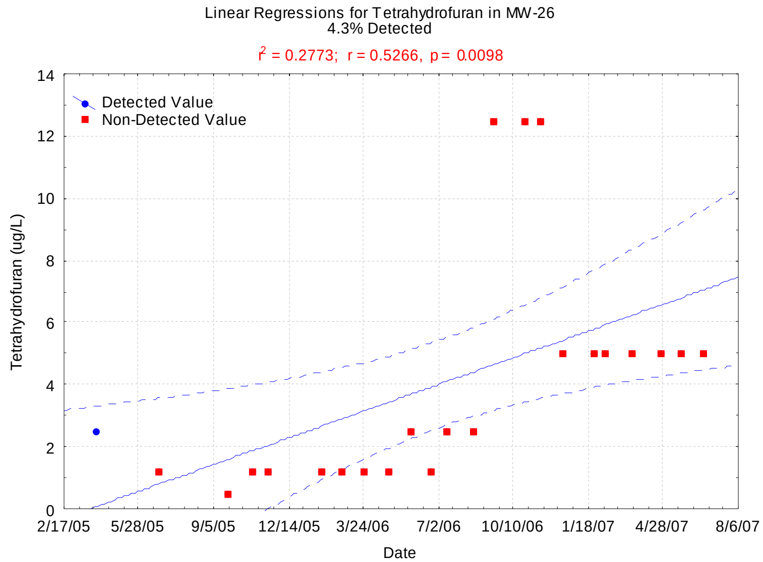


Linear Regression for Tetrahydrofuran

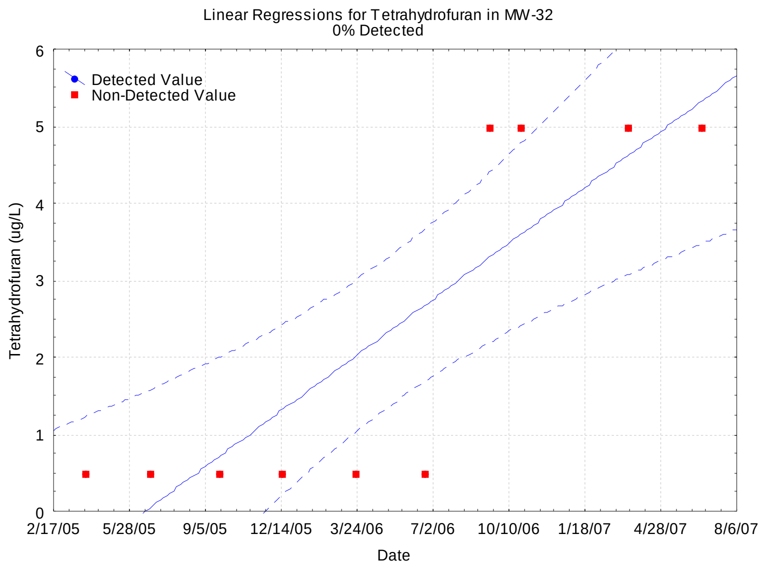




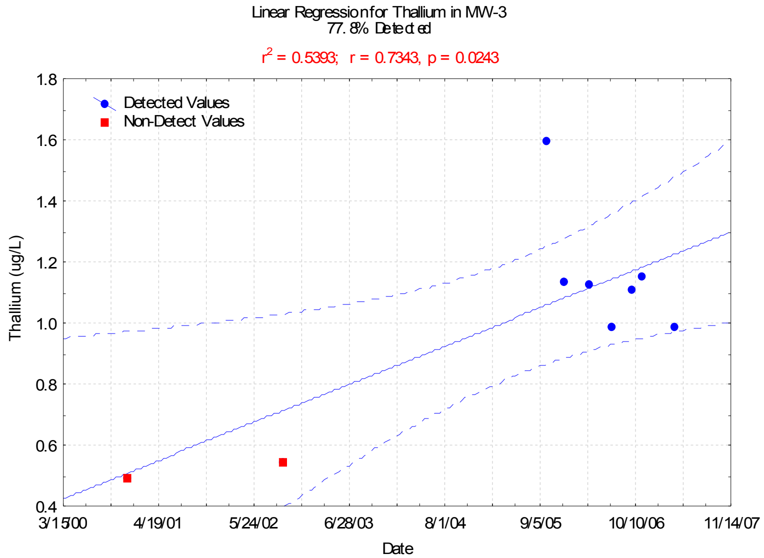


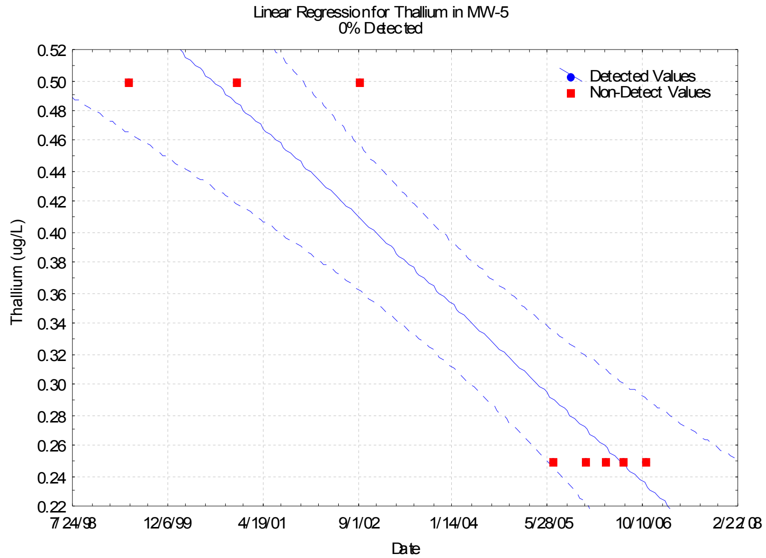


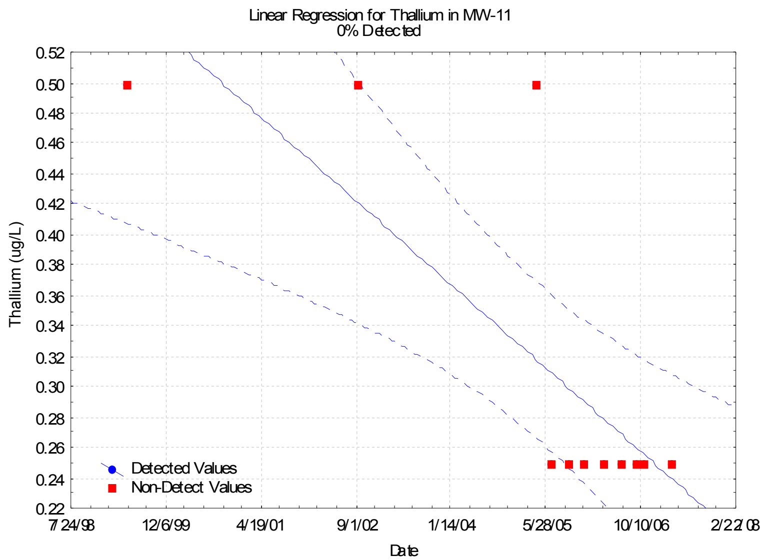
Linear Regression for Tetrahydrofuran

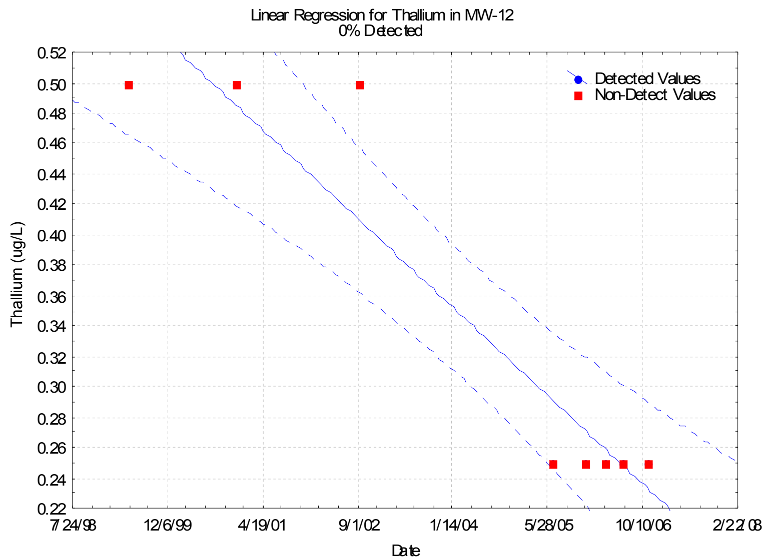


Linear Regressions for Thallium

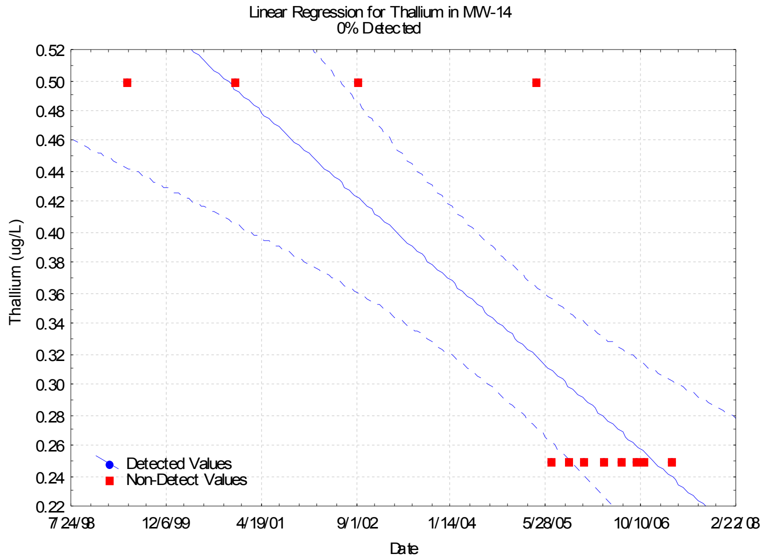


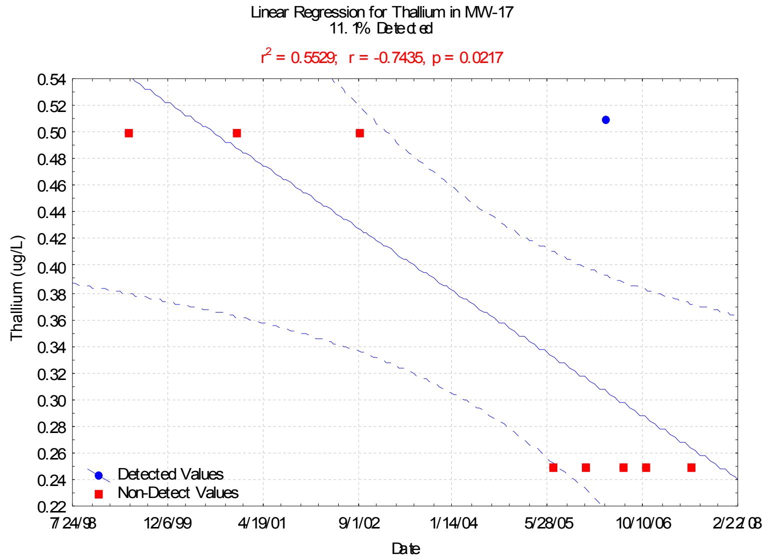


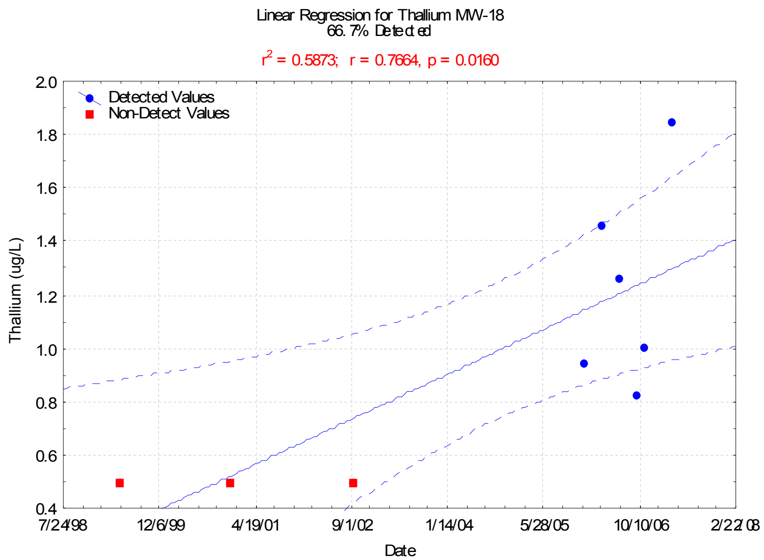


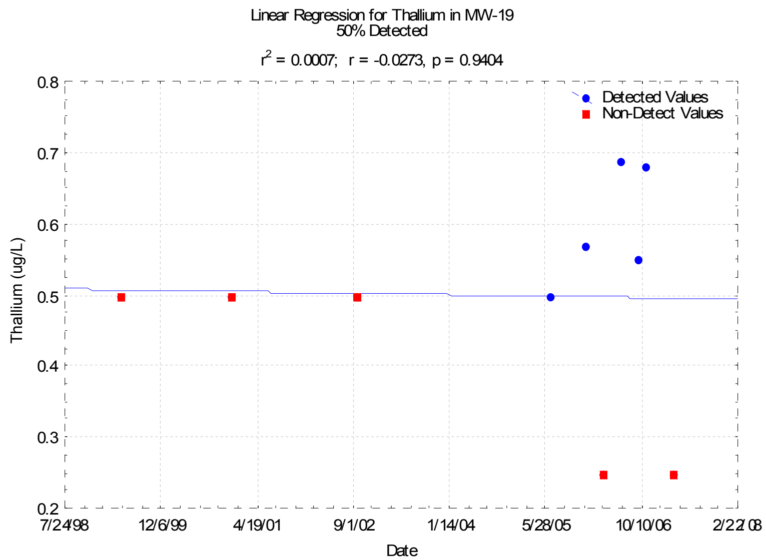


Linear Regressions for Thallium









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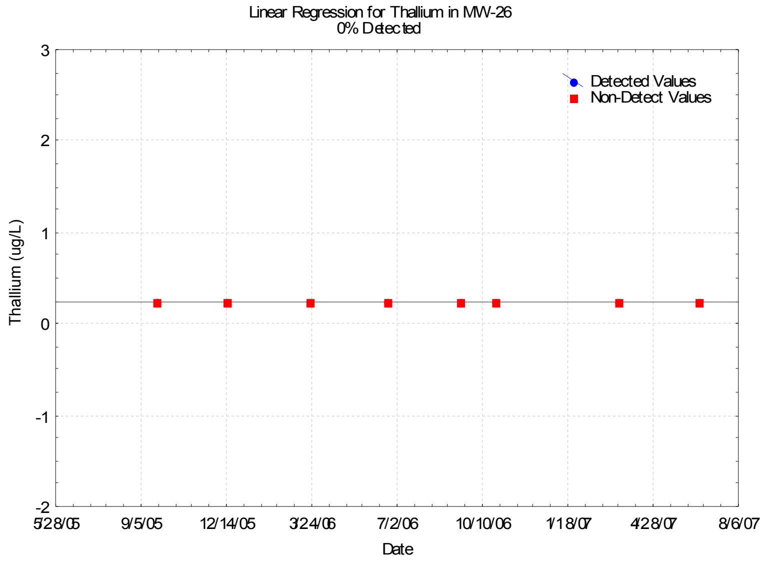
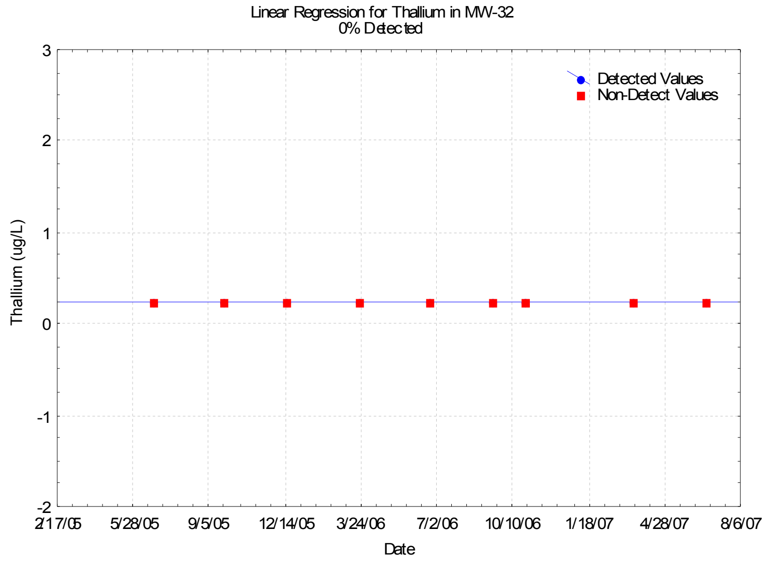
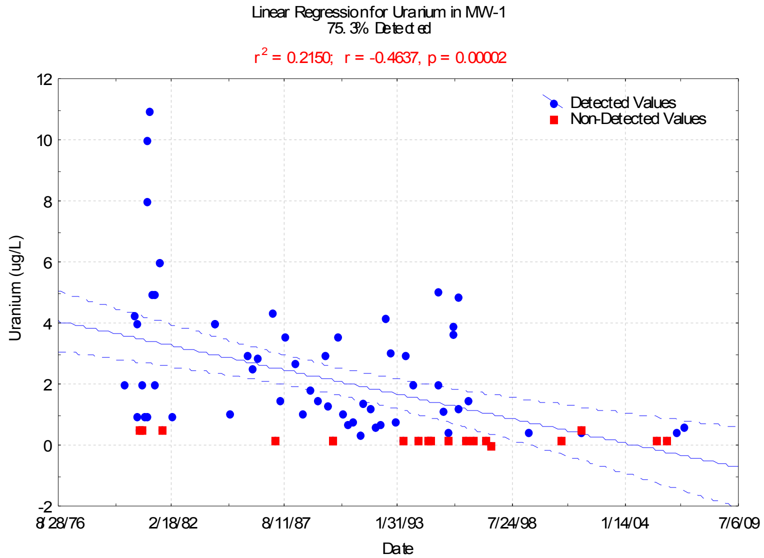
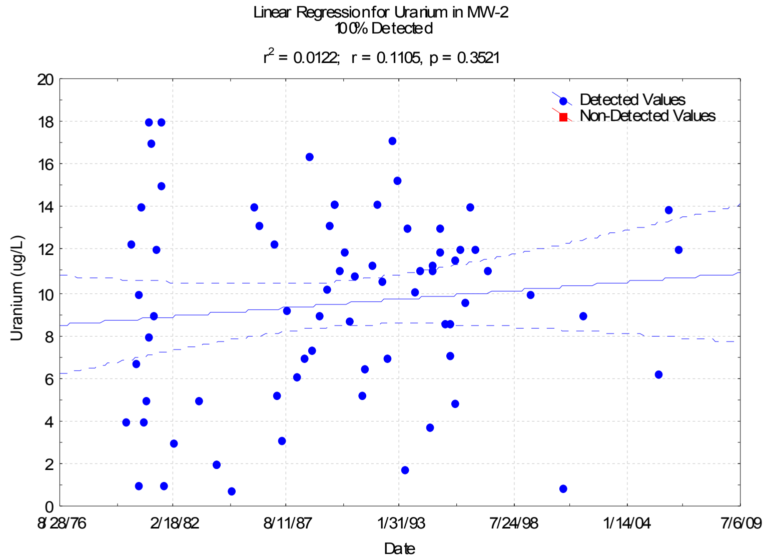
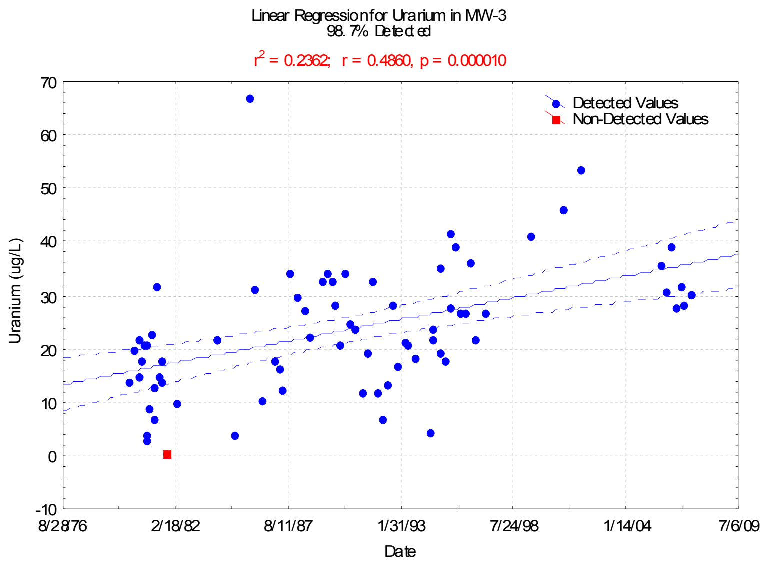


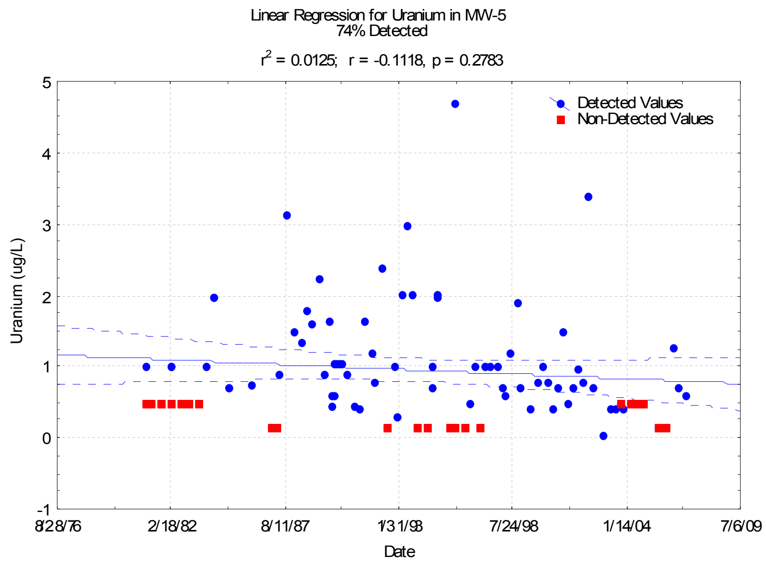


Linear Regressions for Uranium

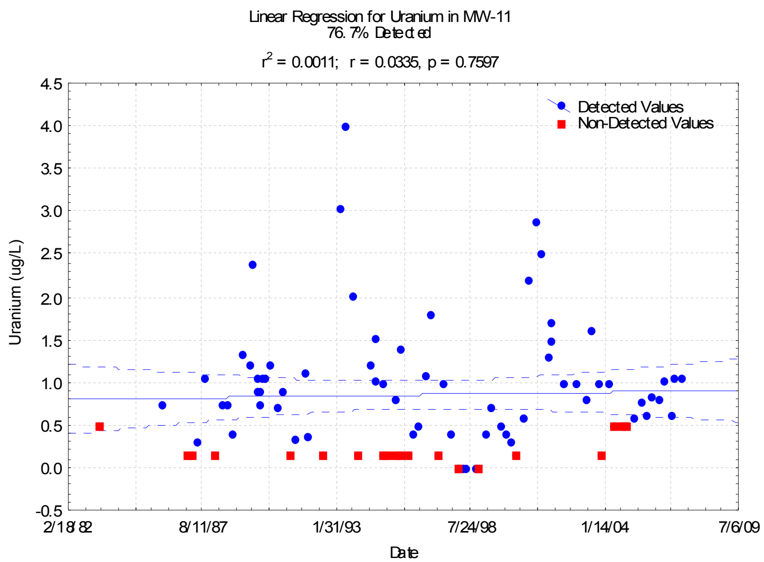


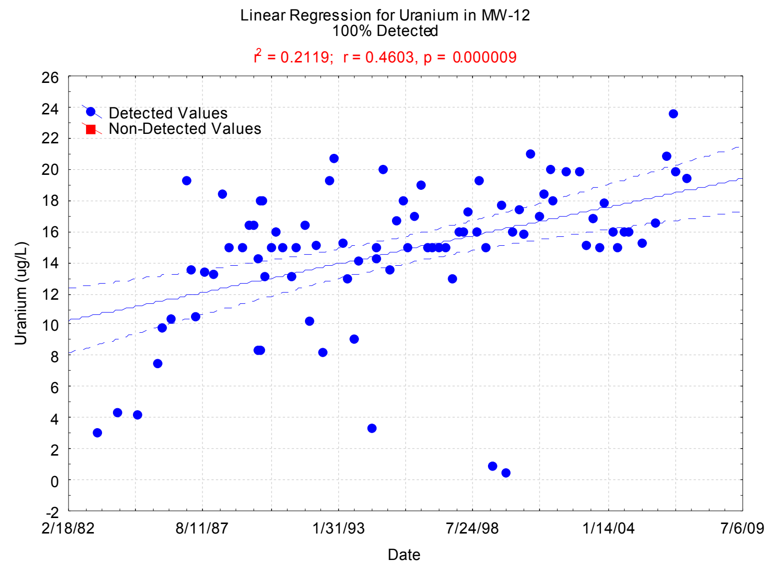


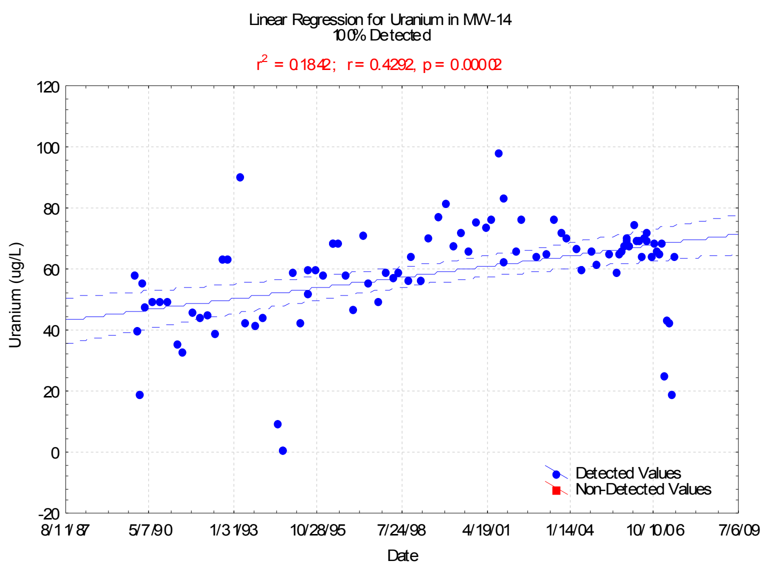


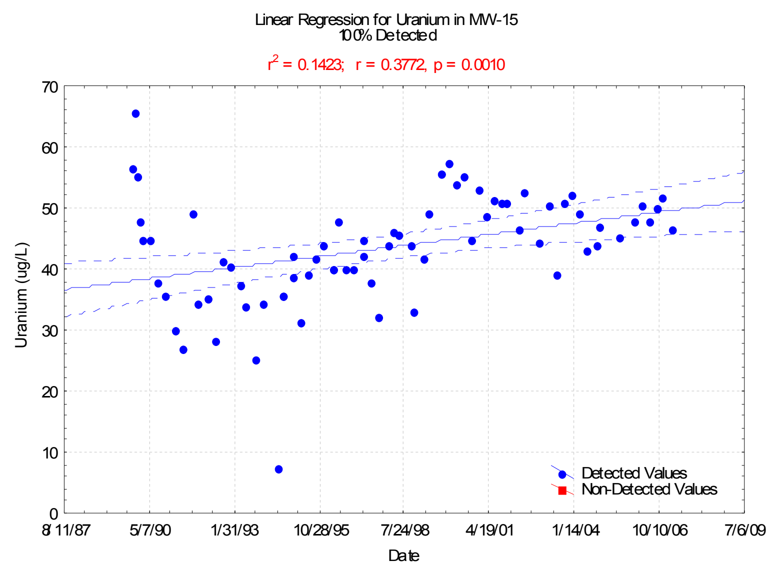


Linear Regressions for Uranium

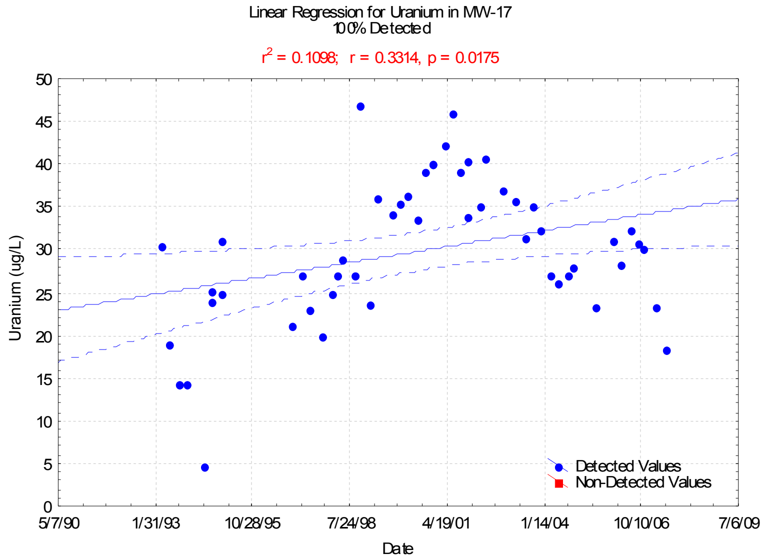


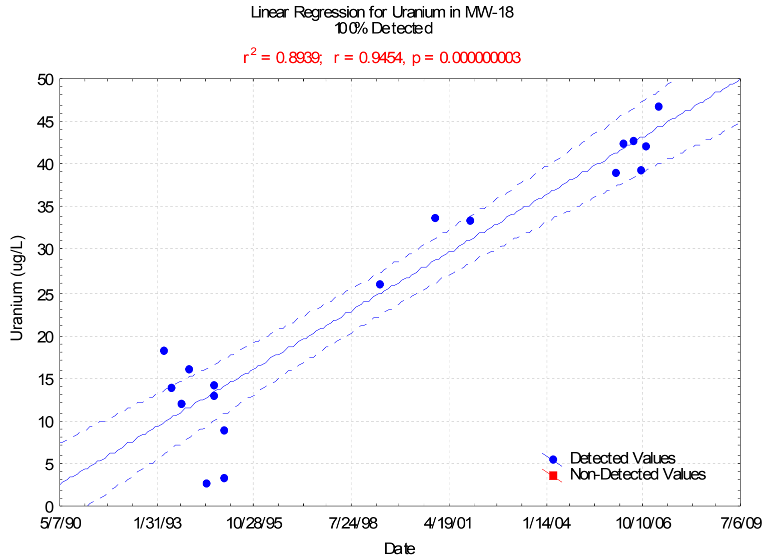


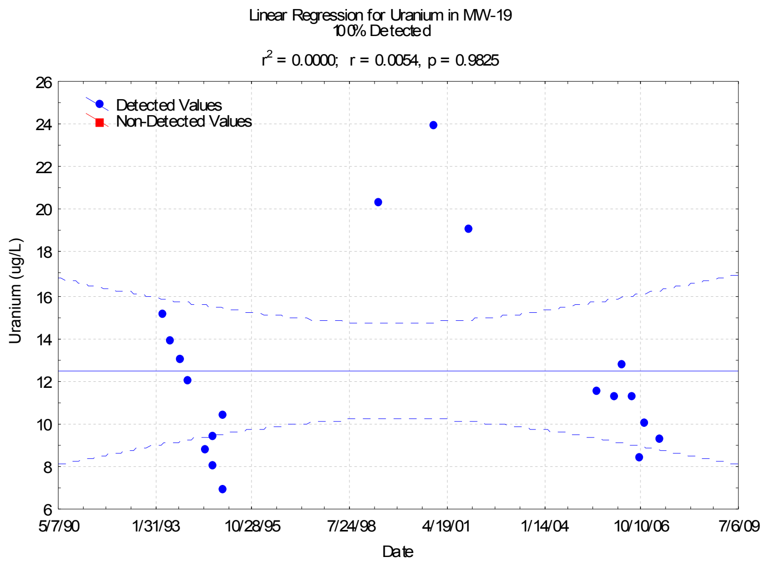


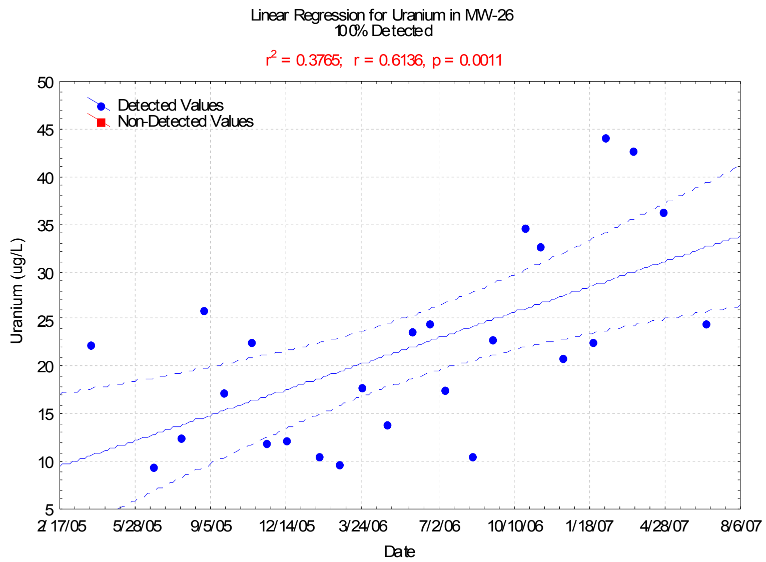


Linear Regressions for Uranium

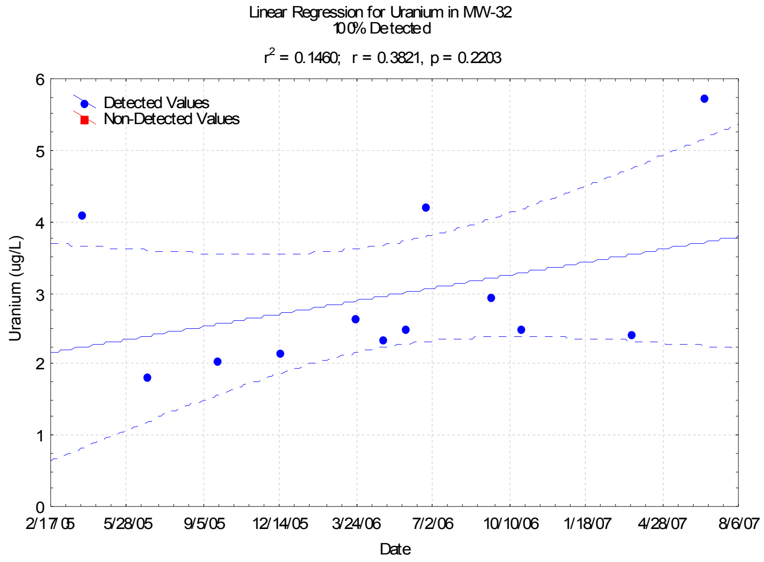




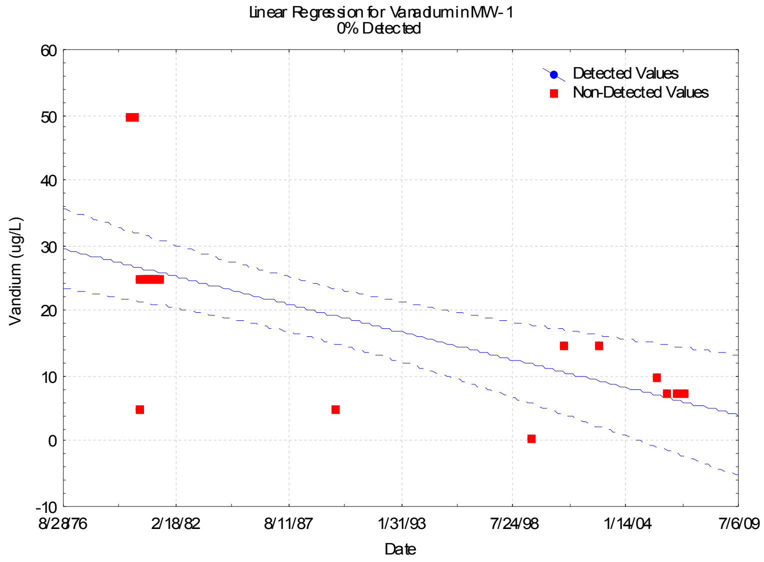


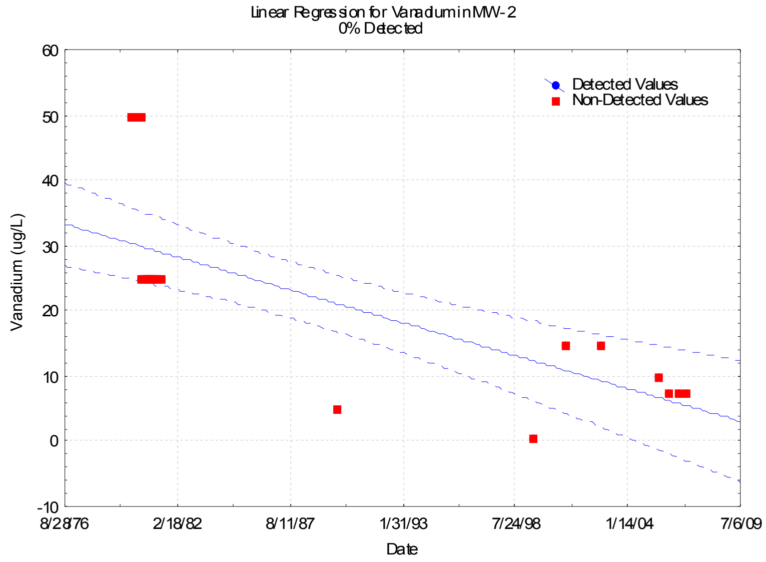


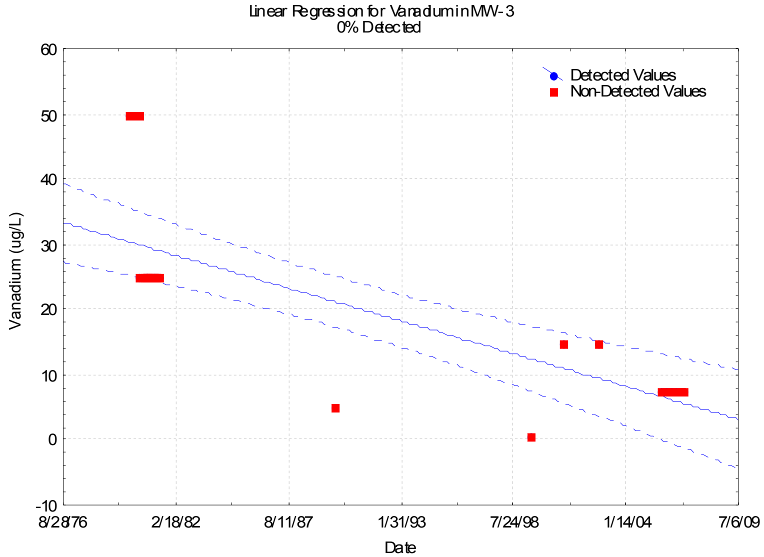
Linear Regressions for Uranium

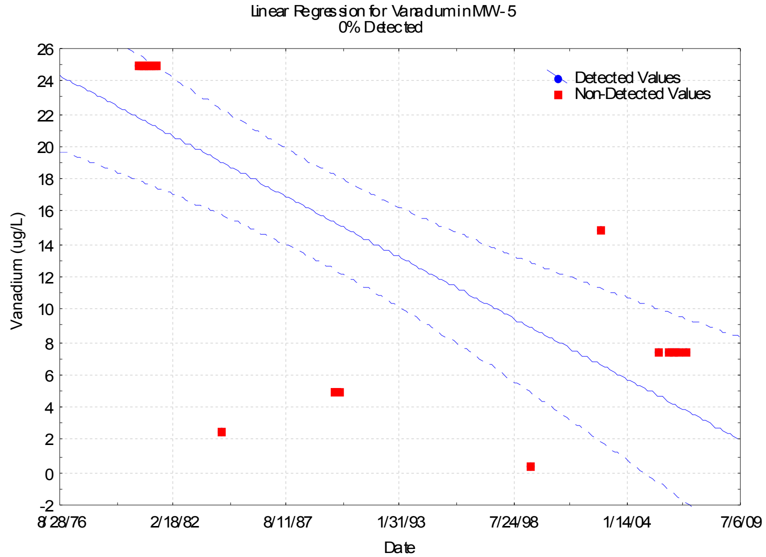


Linear Regressions for Vanadium



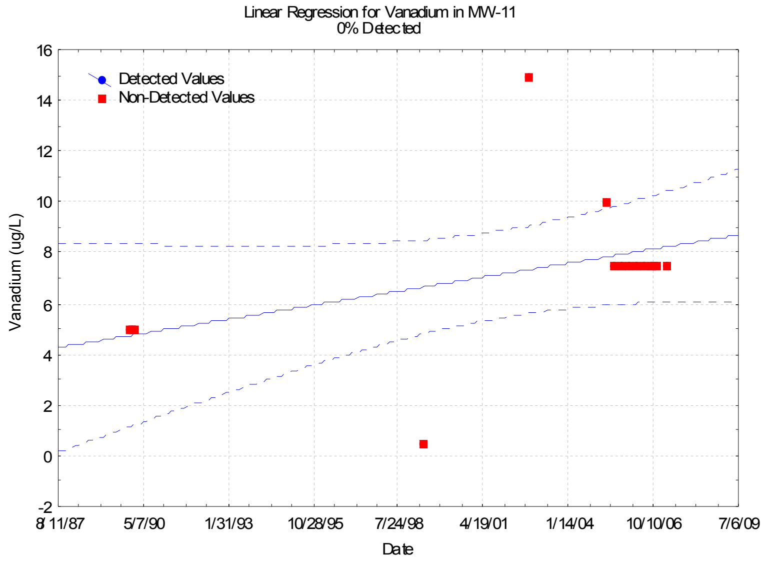


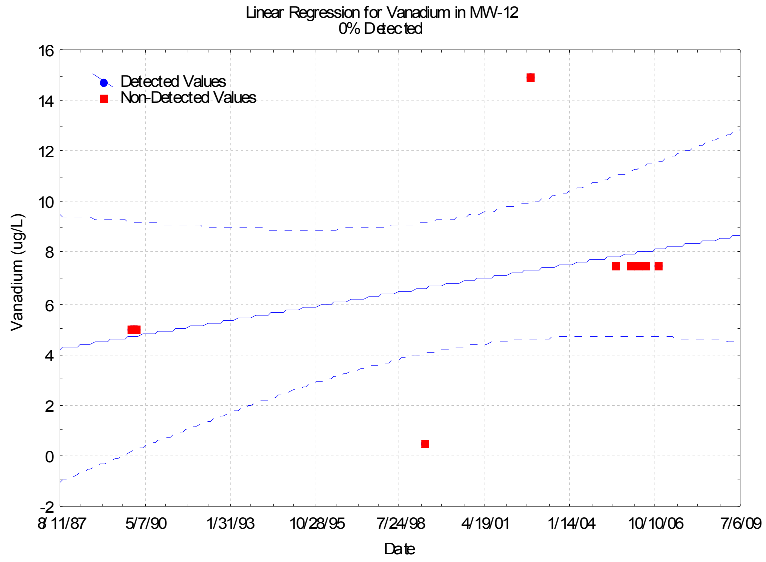


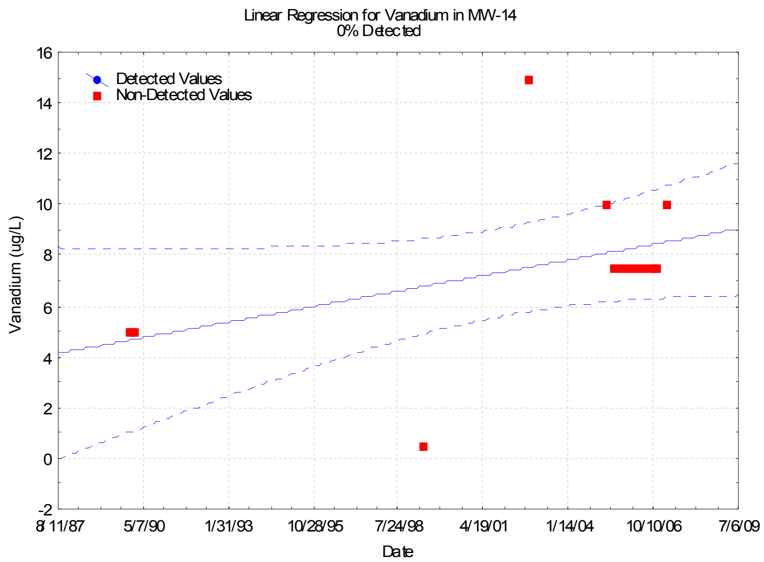


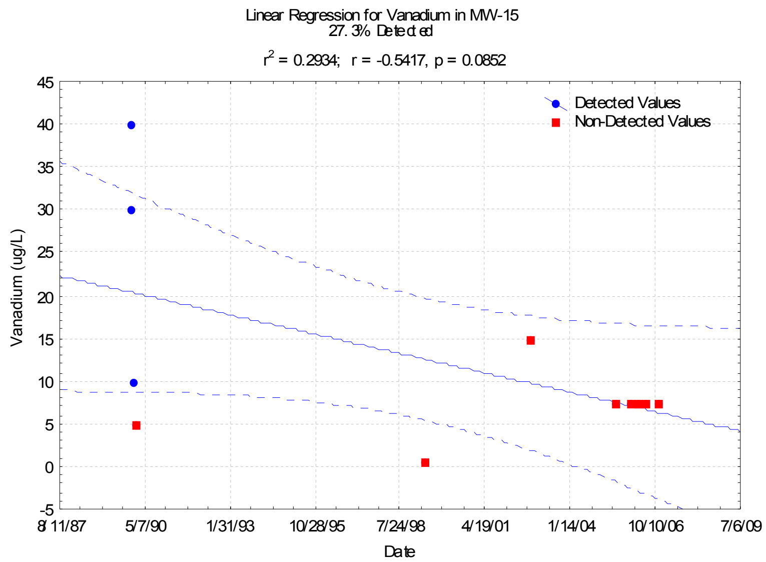
Appendix D
Linear Regression Plots
Exploratory Statistics Substituting Half of the MDL for Non-Detected Values

Linear Regressions for Vanadium

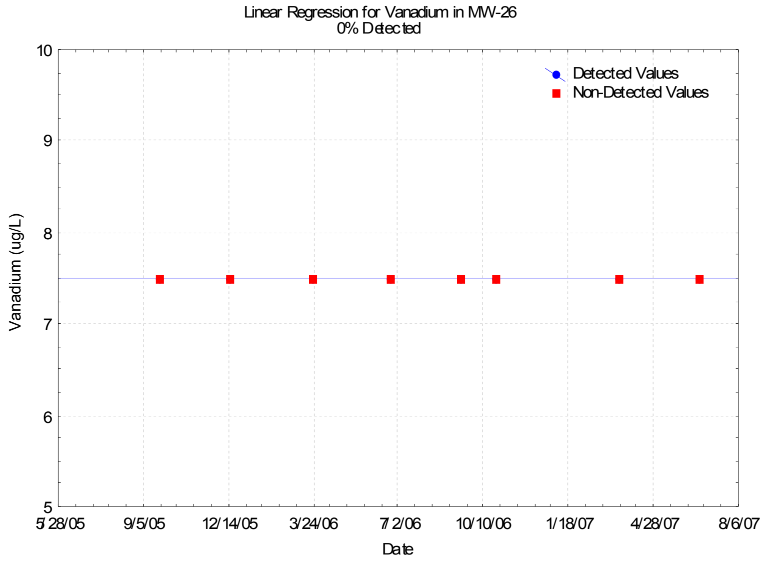


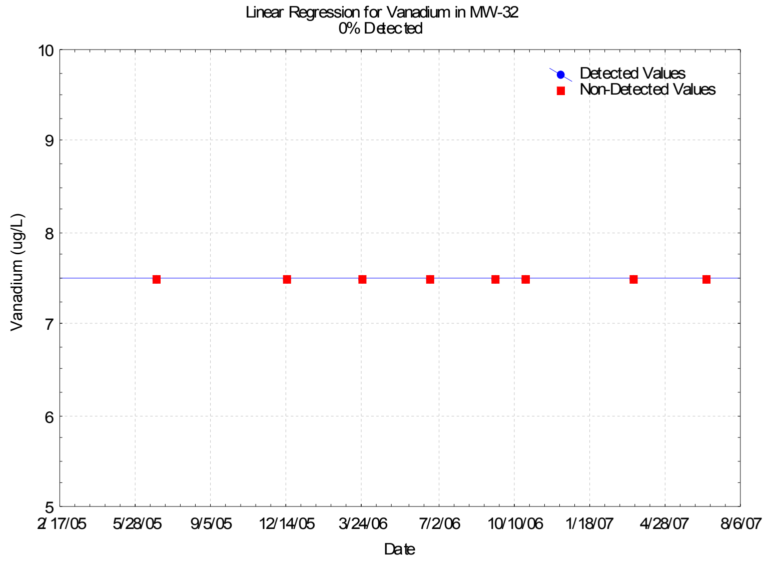




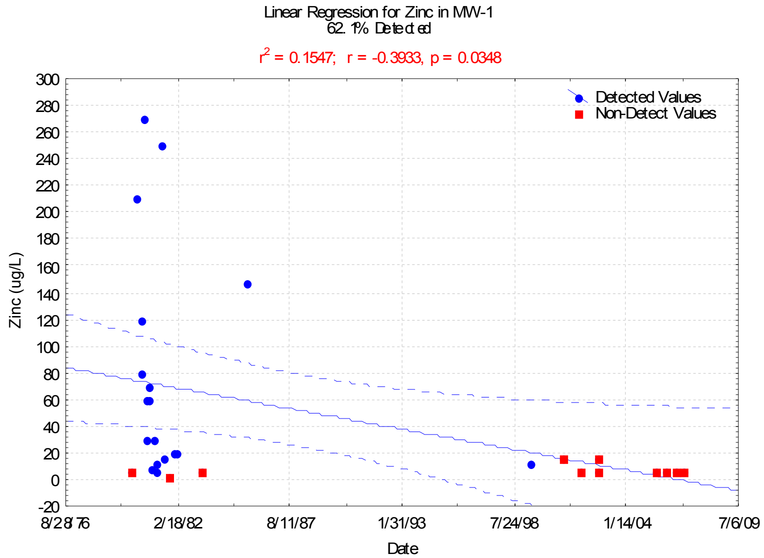


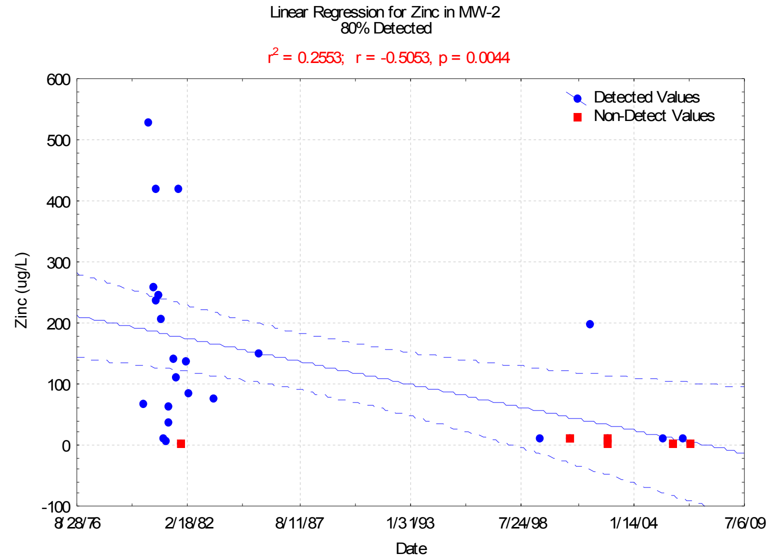
Linear Regressions for Vanadium

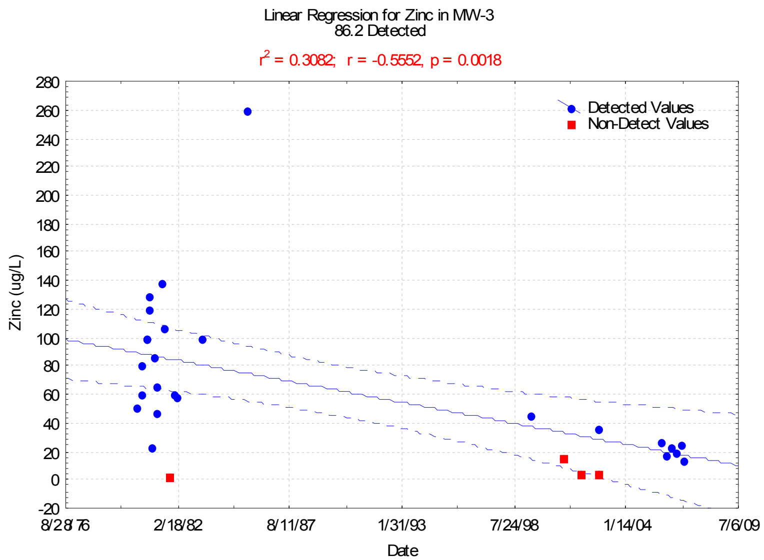


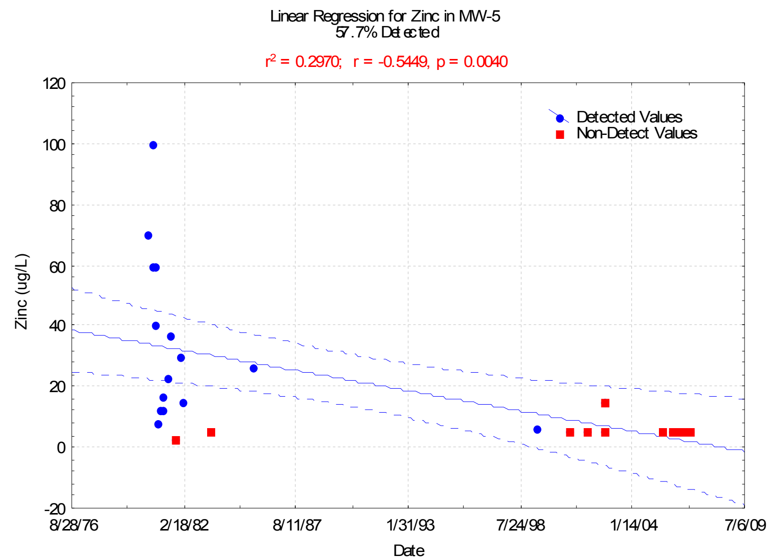


Linear Regressions for Zinc

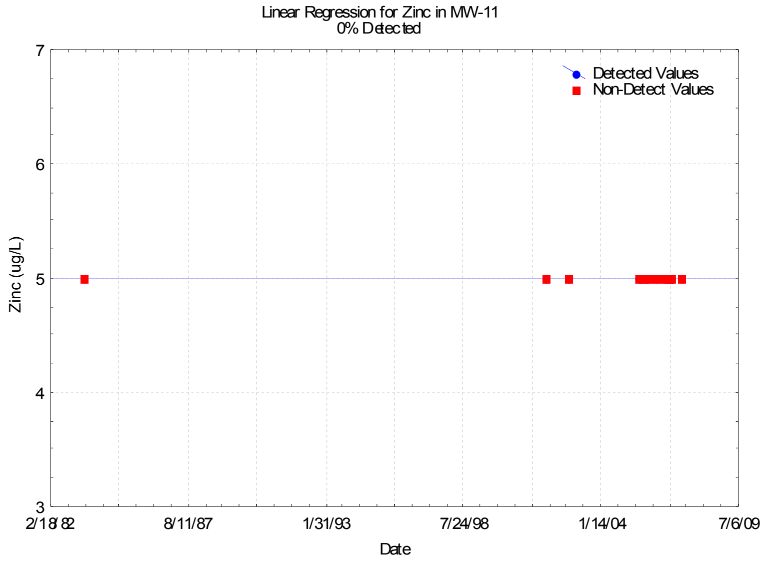


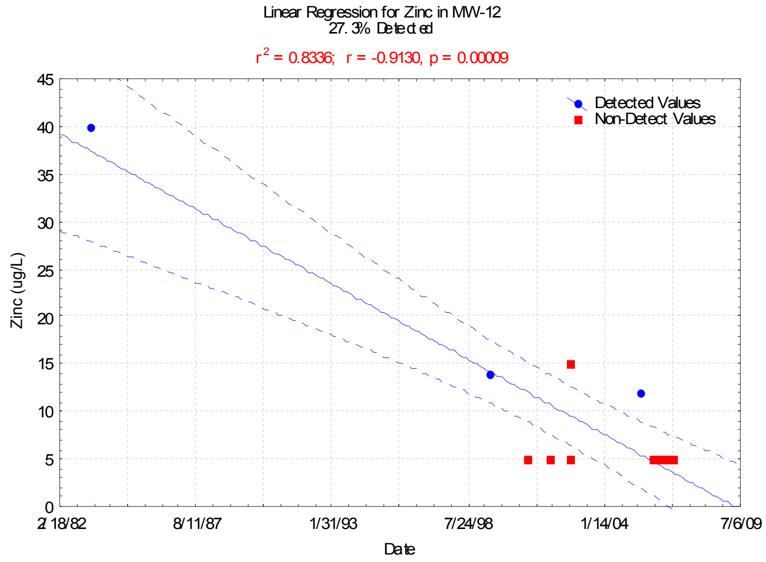


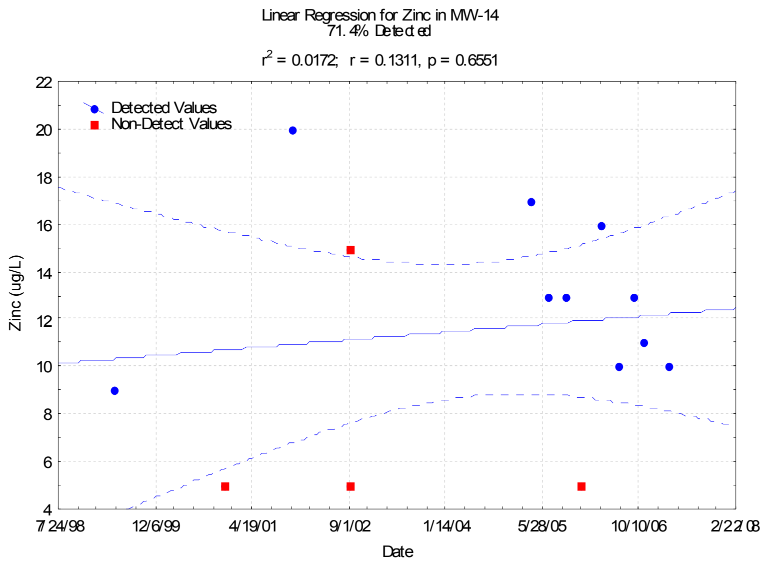


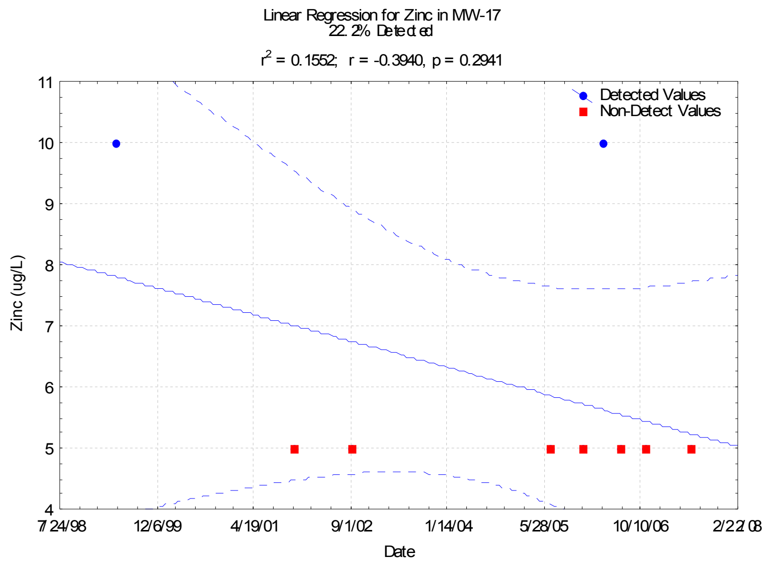


Linear Regressions for Zinc

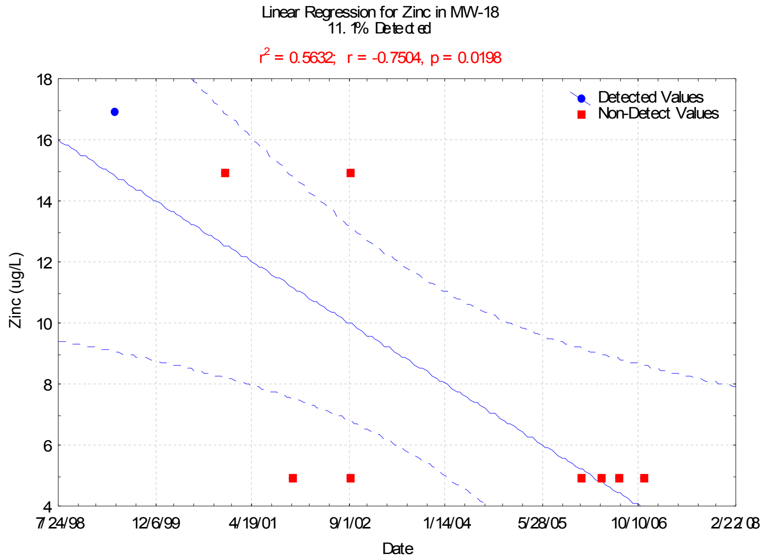


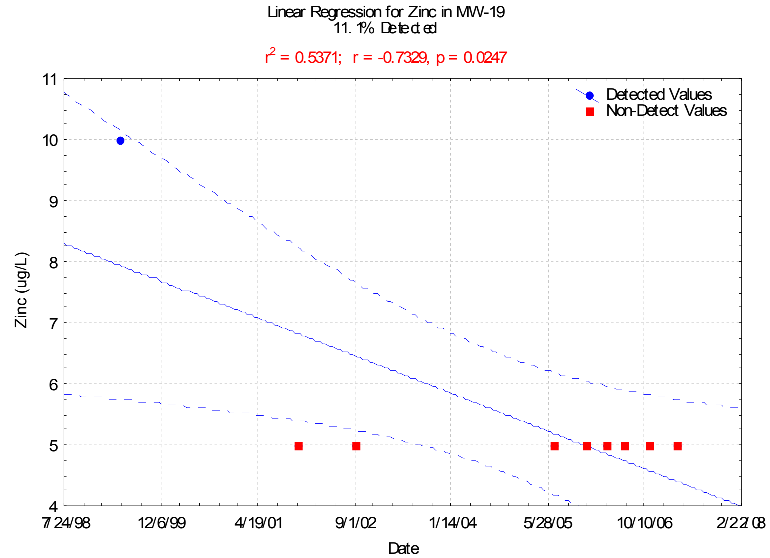


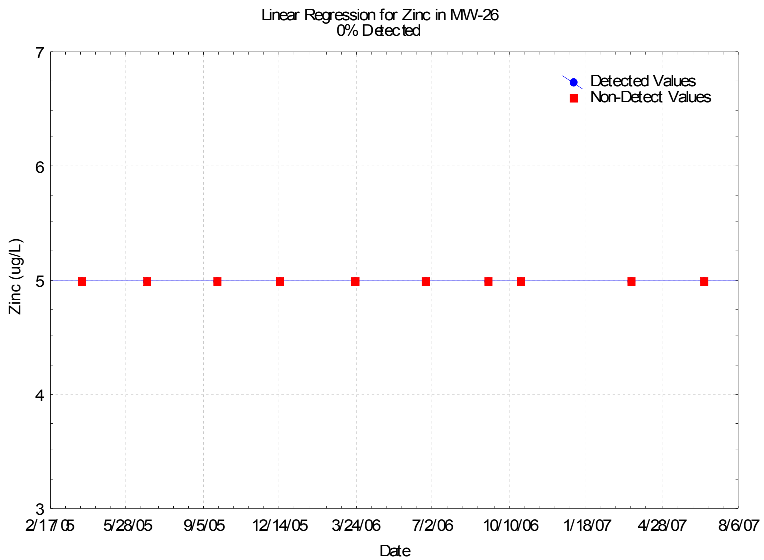


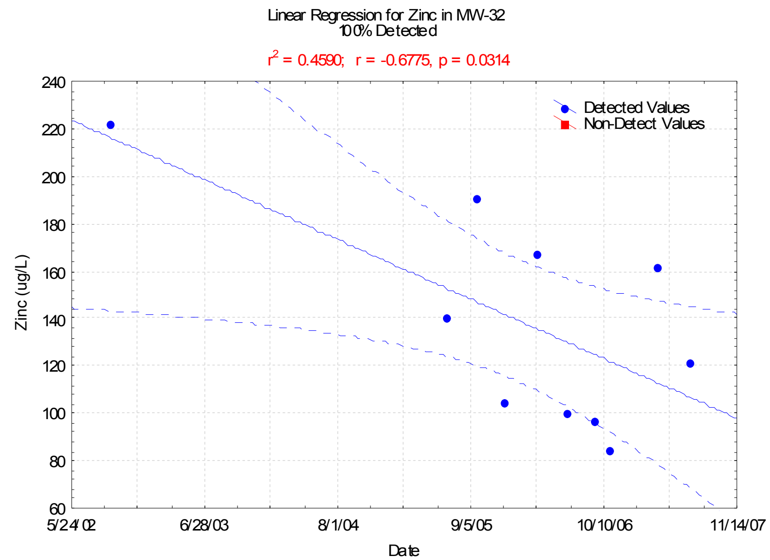


Linear Regressions for Zinc





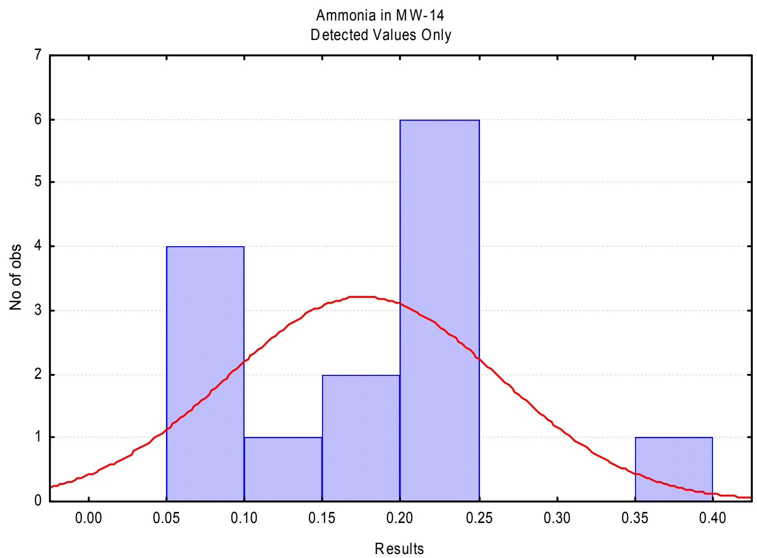


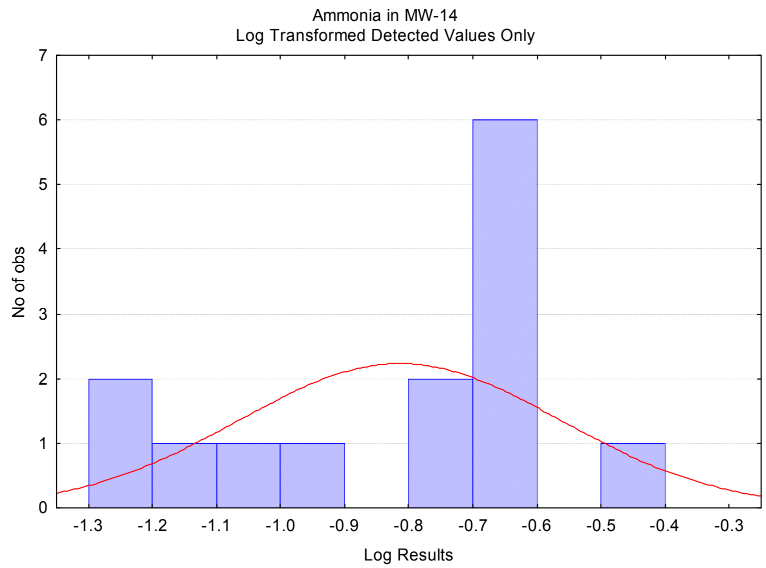


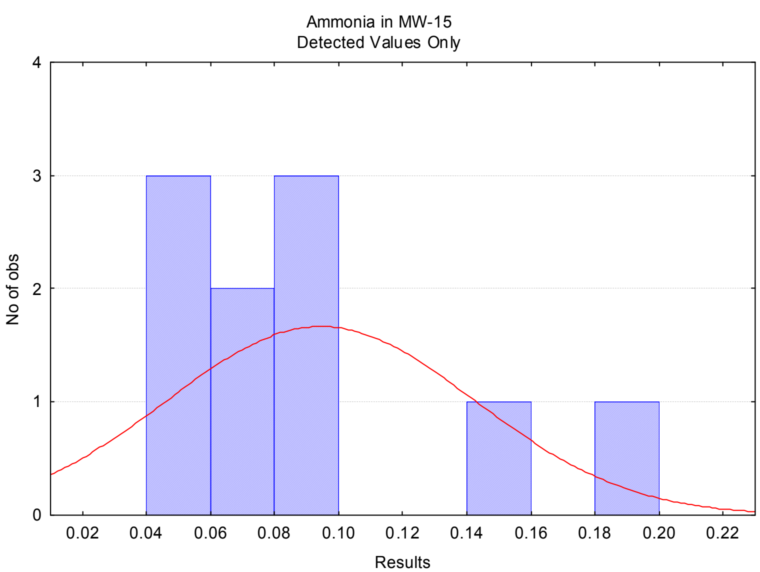
APPENDIX E

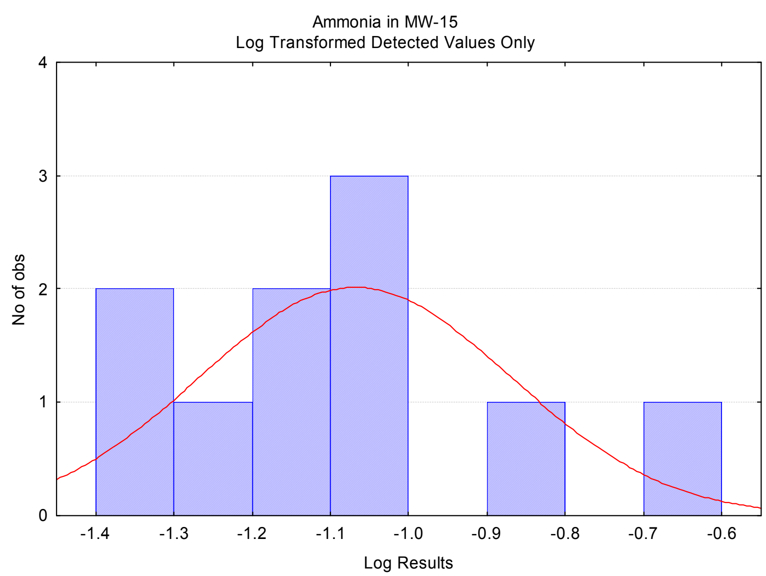
HISTOGRAMS AND PROBABILITY PLOTS FOR 15 TO 50% NON-DETECTS USING DETECTED VALUES ONLY

Histograms for Ammonia (mg/L) in Wells With 15 to 50% Non-Detected Values

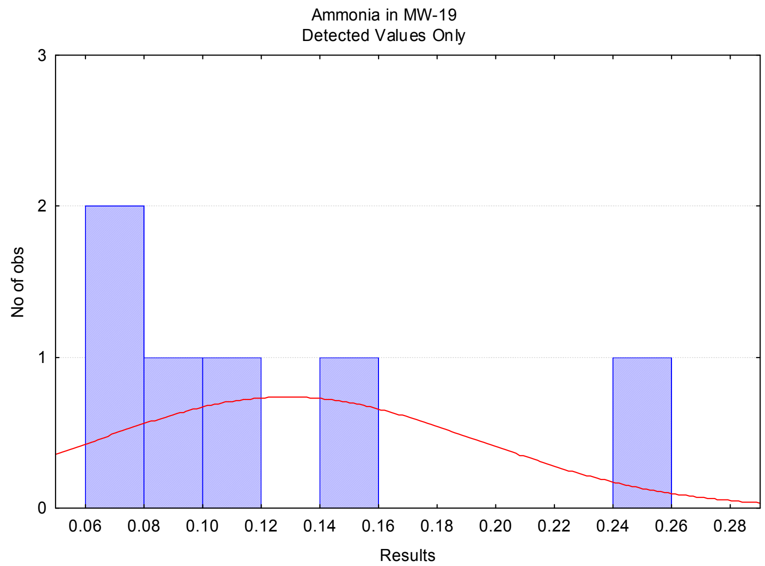


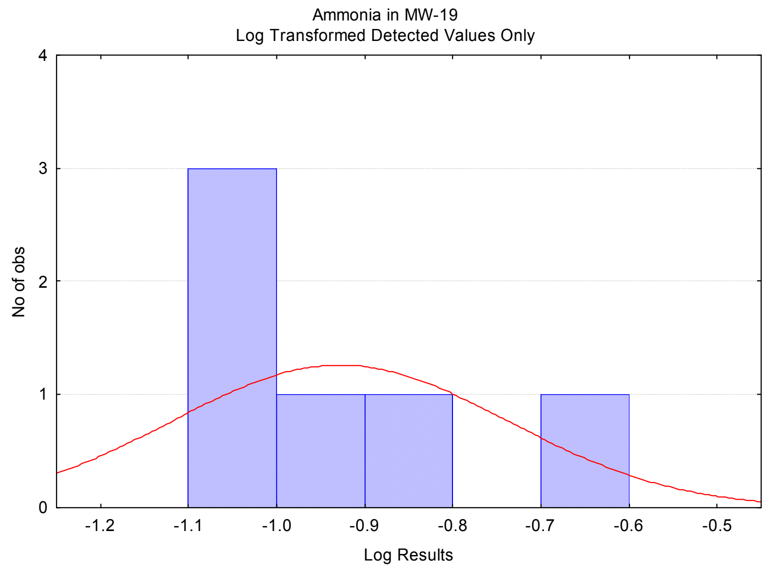




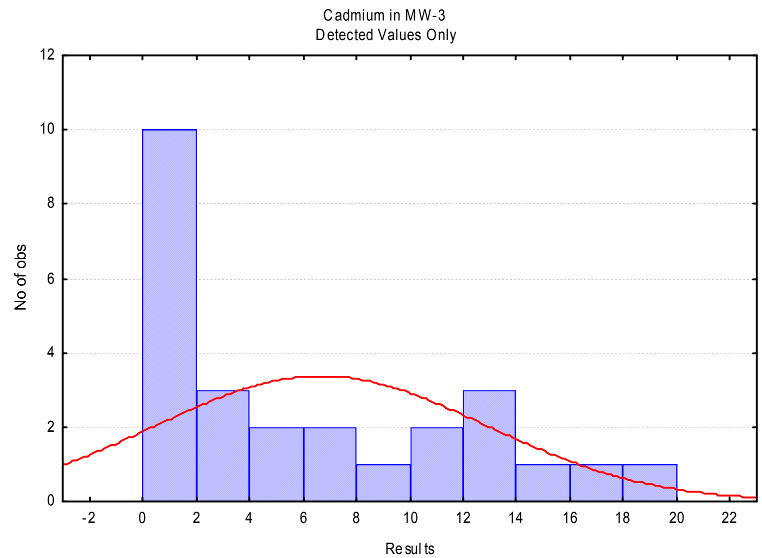


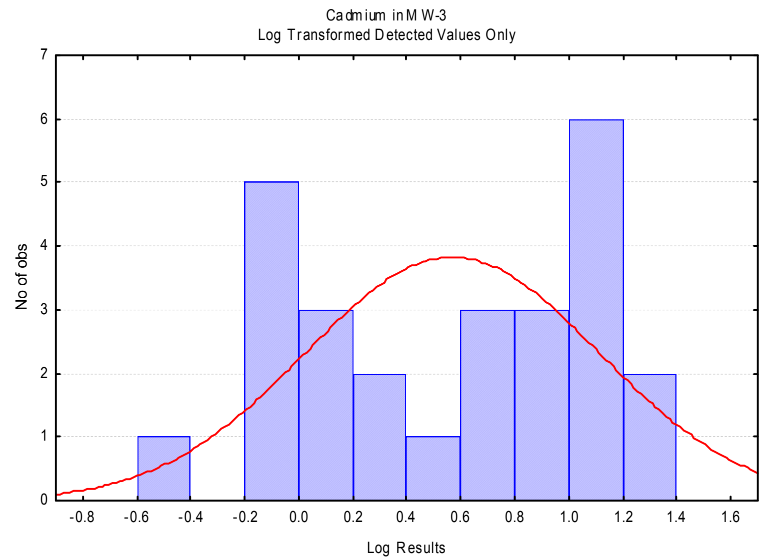
Histograms for Ammonia (mg/L) in Wells With 15 to 50% Non-Detected Values

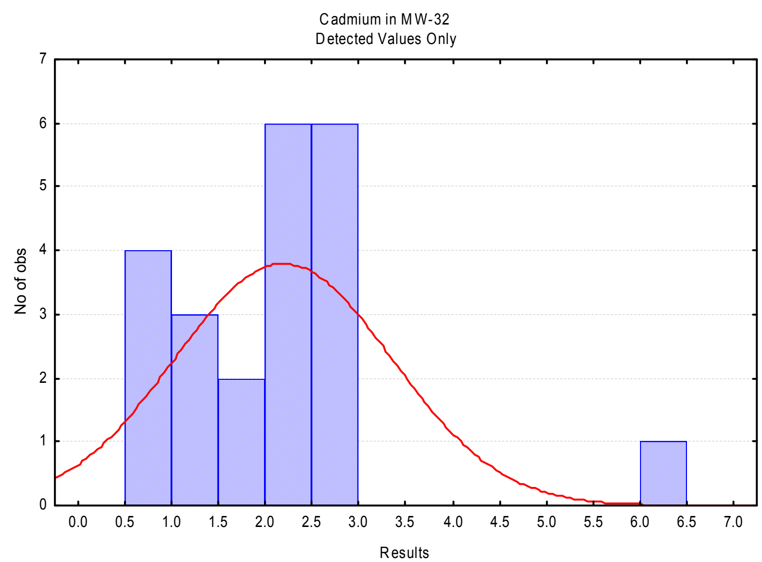


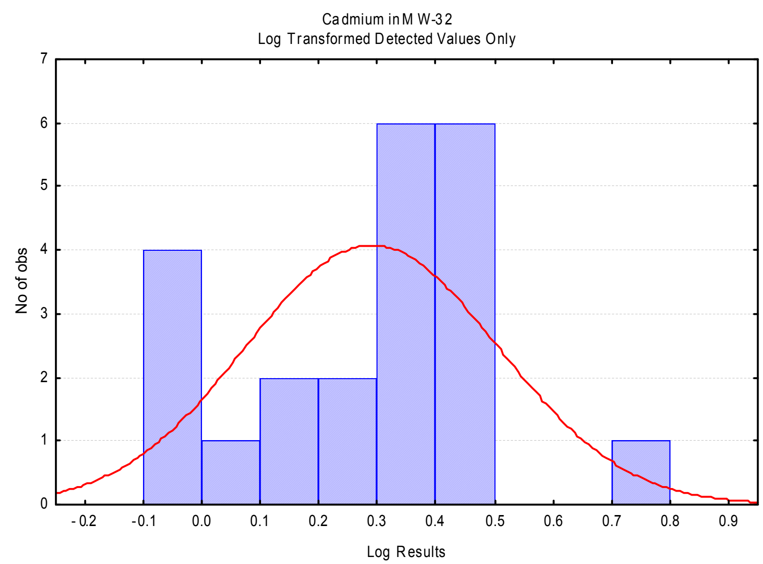


Histograms for Cadmium (ug/L) in Wells With 15 to 50% Non-Detected Values

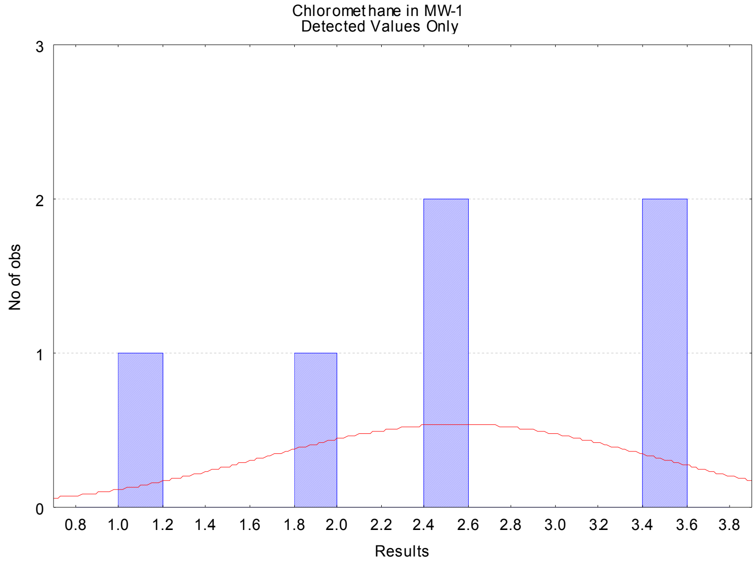


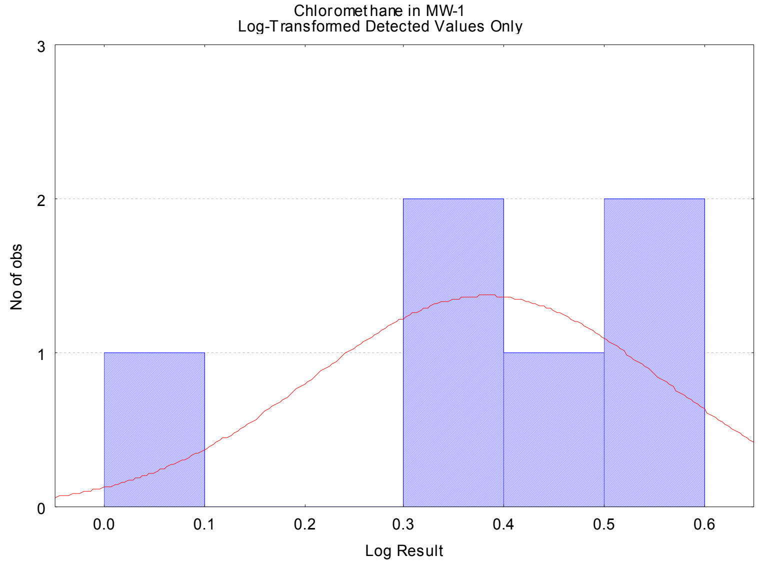




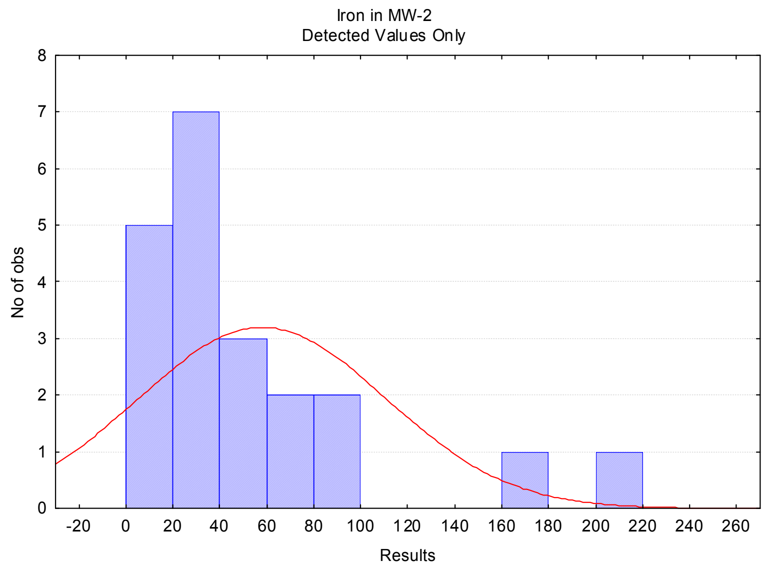


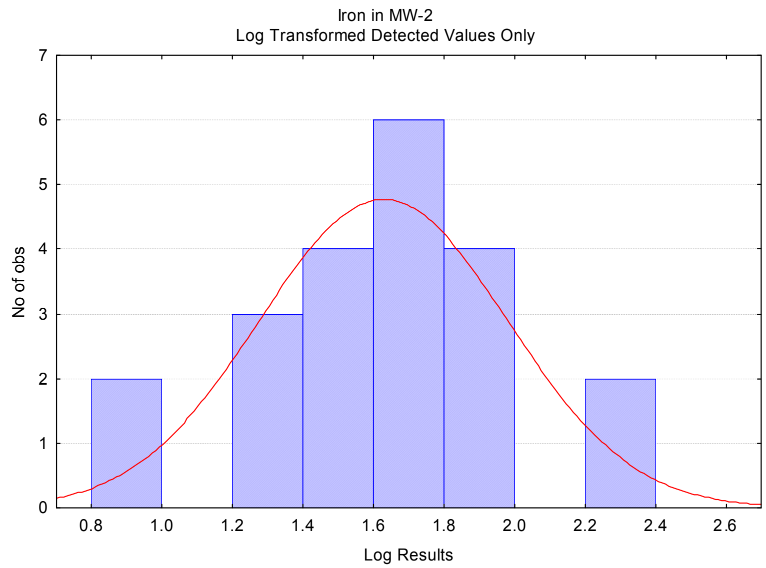
Histograms for Chloromethane (ug/L) in Wells with 15 to 50% Non-Detected Values

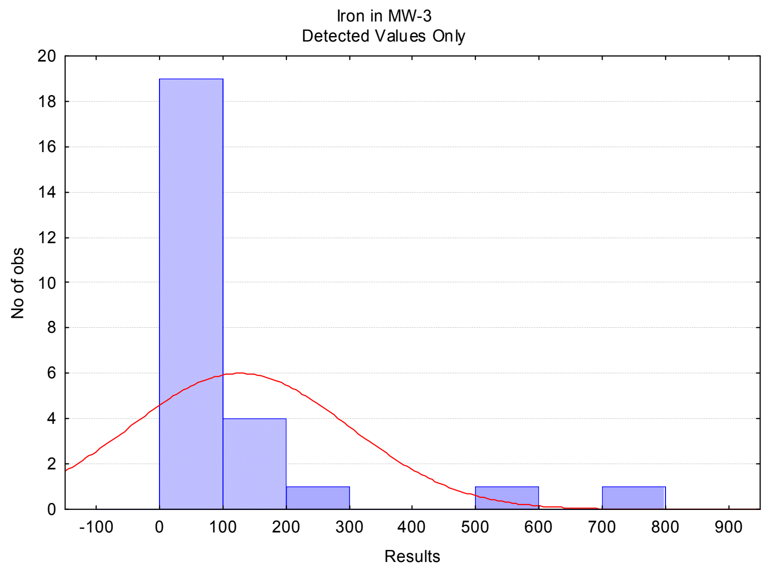


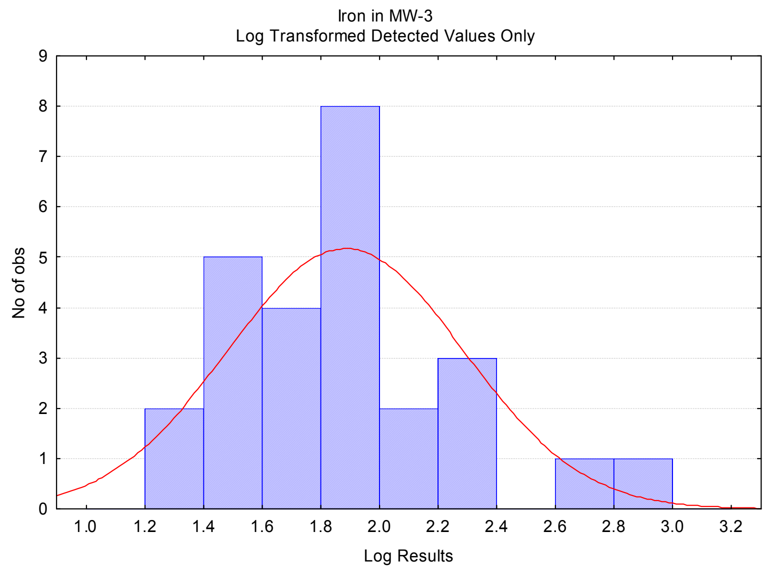


Histograms for Iron (ug/L) in Wells With 15 to 50% Non-Detected Values

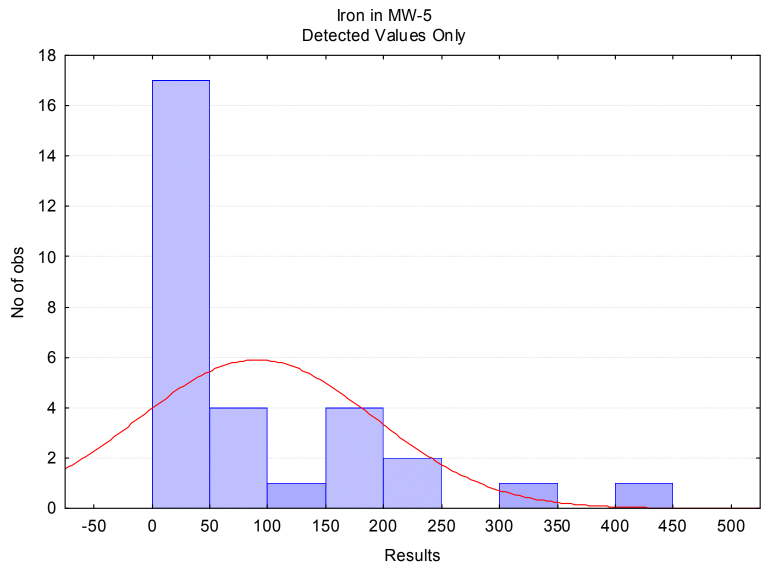


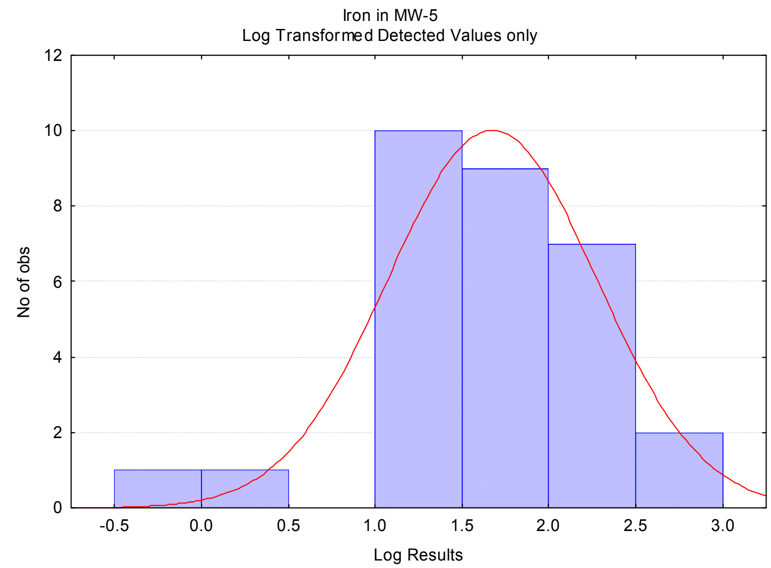


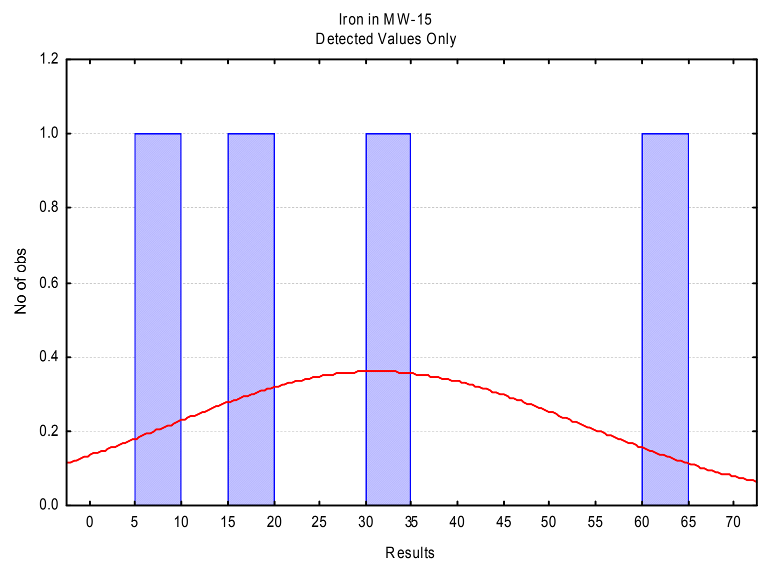


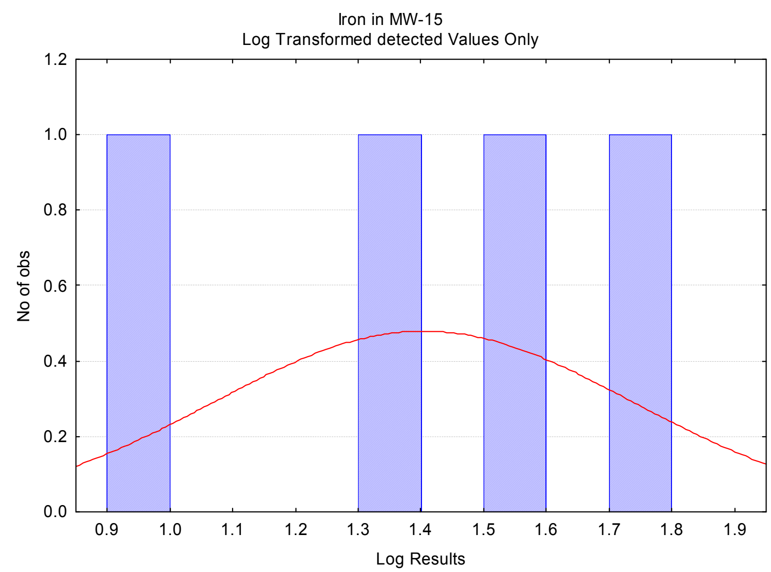


Histograms for Iron (ug/L) in Wells With 15 to 50% Non-Detected Values

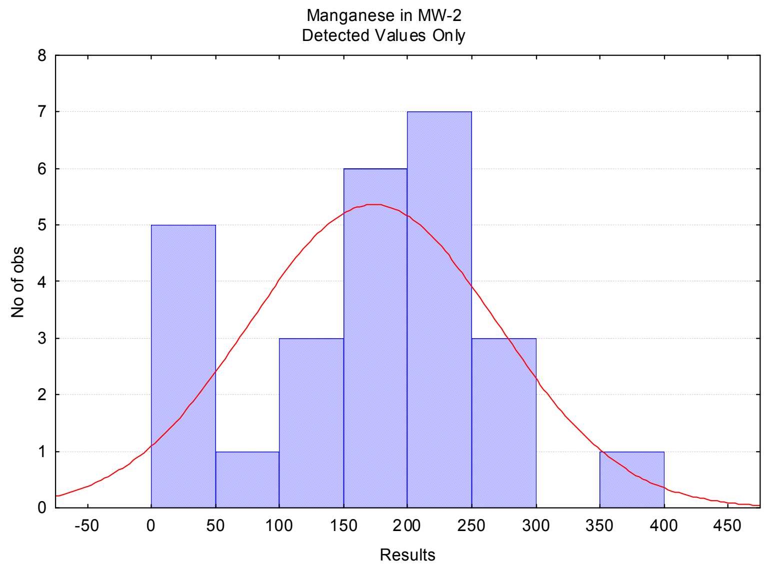


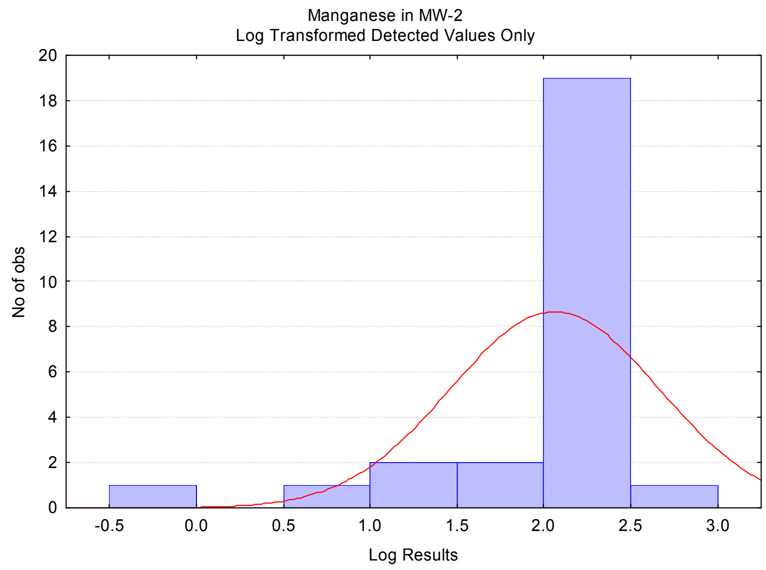




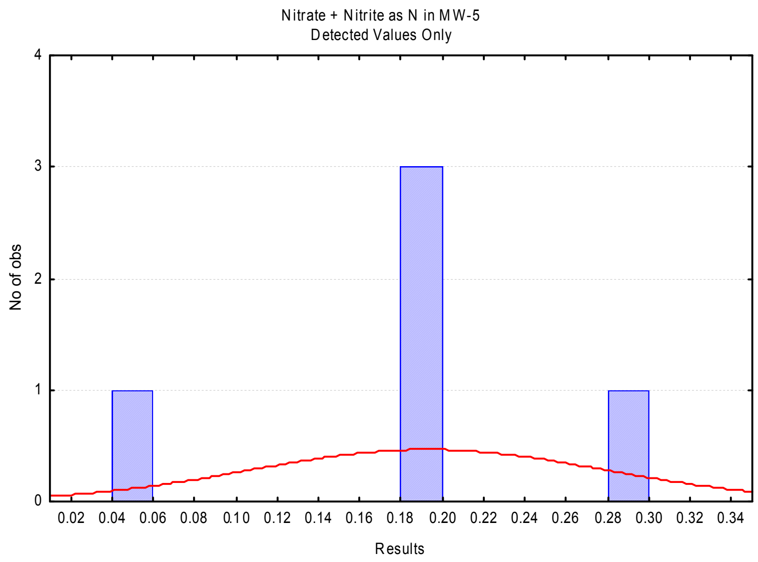


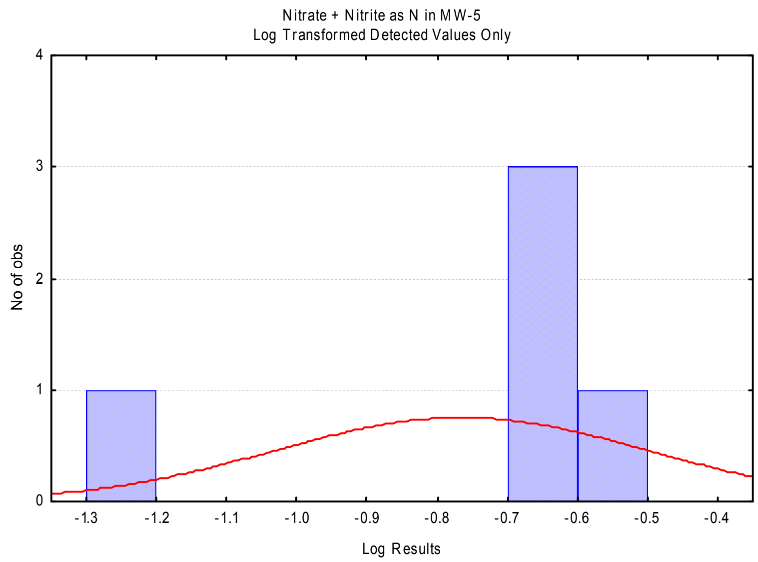
Histograms for Manganese (ug/L) in Wells With 15 to 50% Non-Detected Values

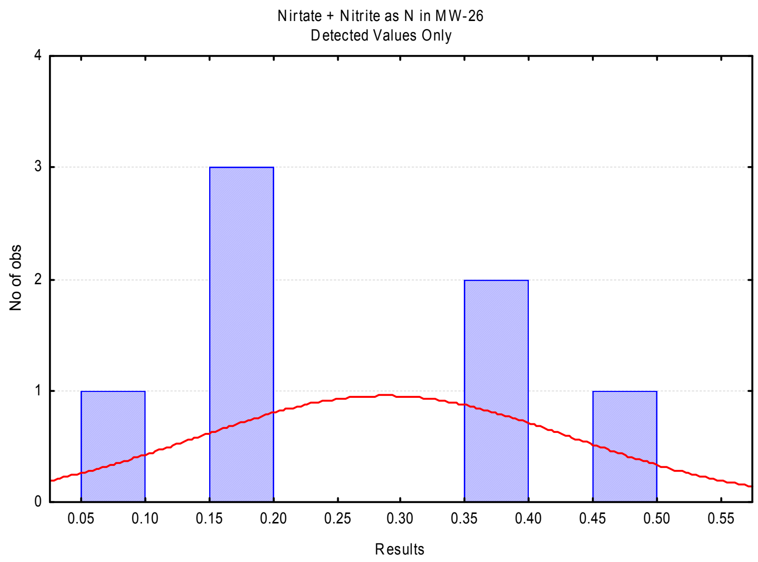


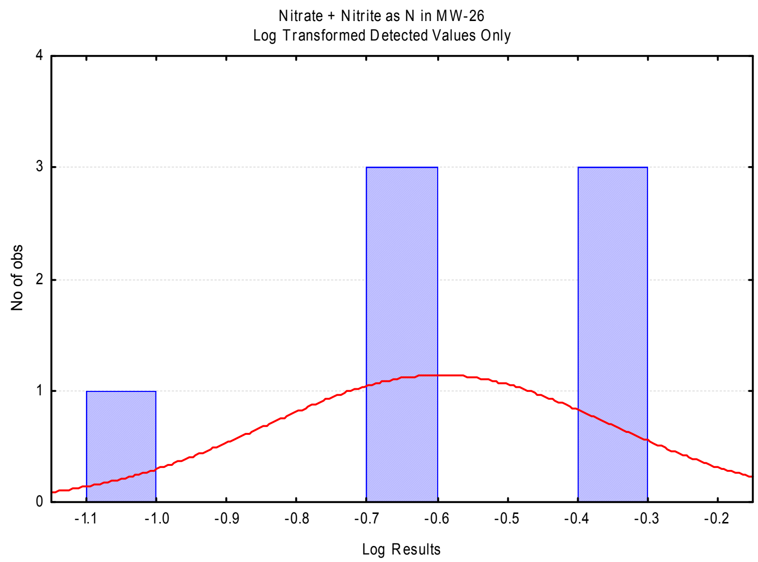


Nitrate + Nitrite as N (mg/L) in Wells With 15 to 50% Non-Detected Values

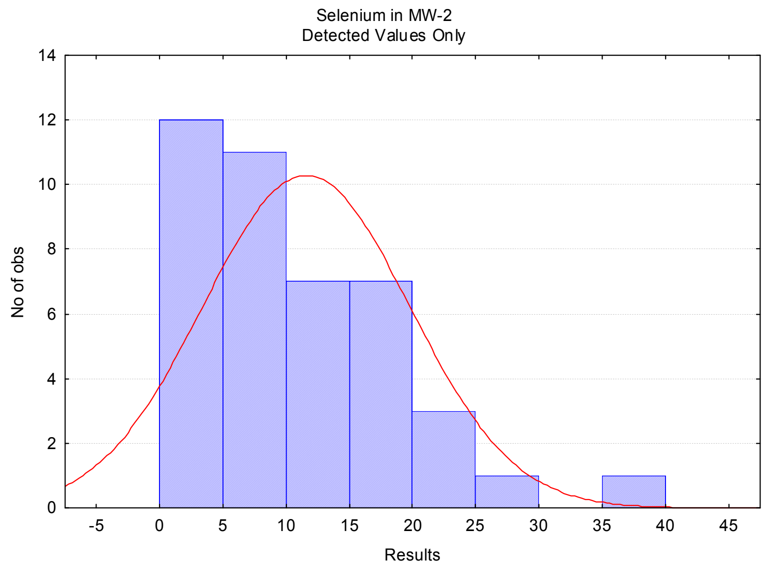


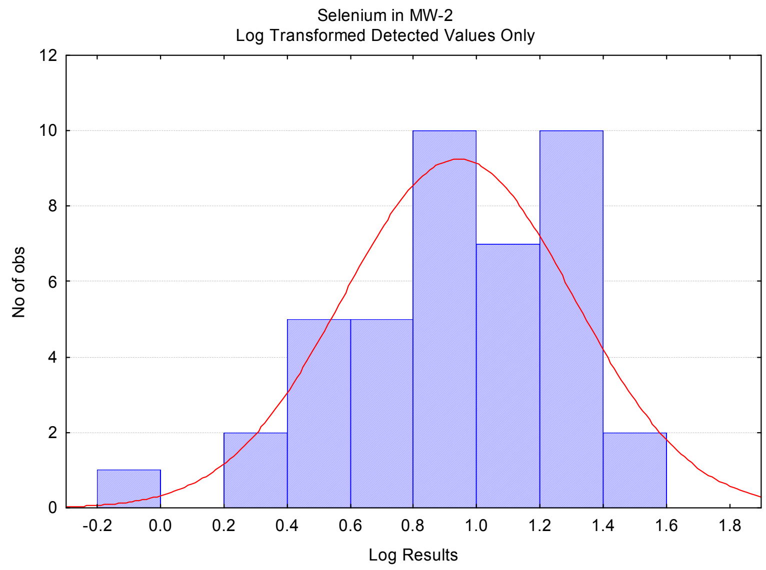


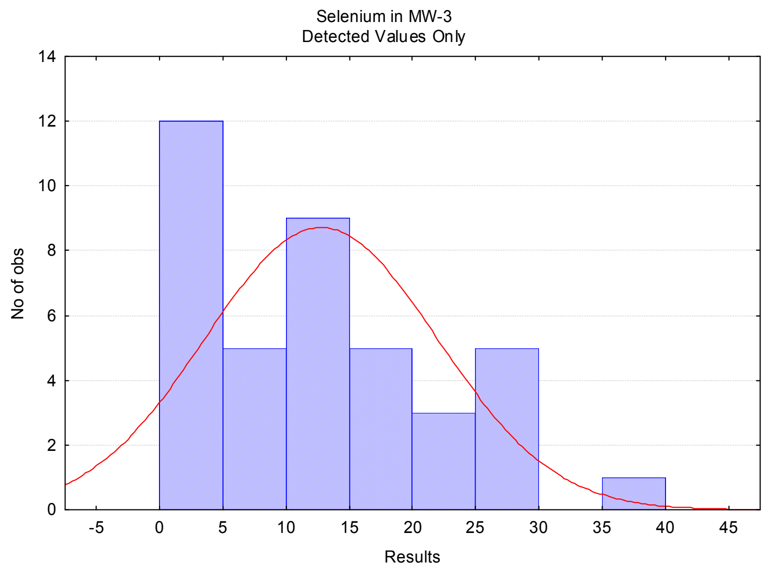


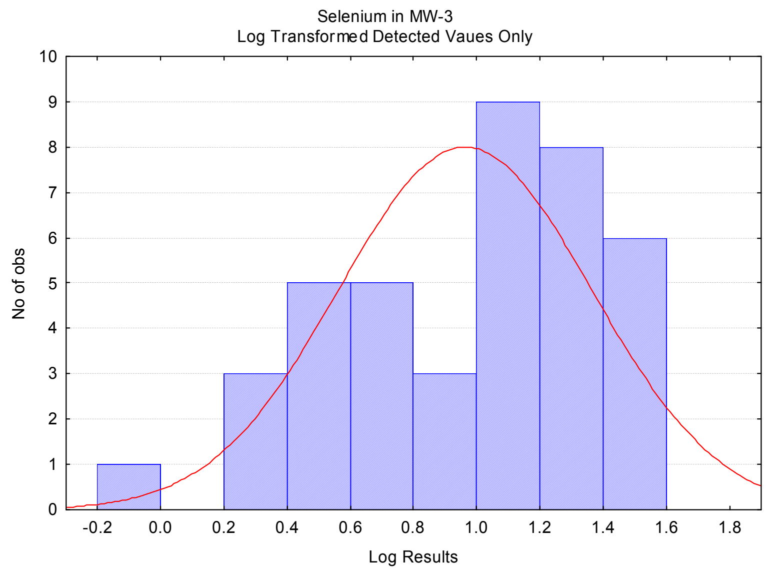


Histograms for Selenium (ug/L) in Wells With 15 to 50% Non-Detected Values

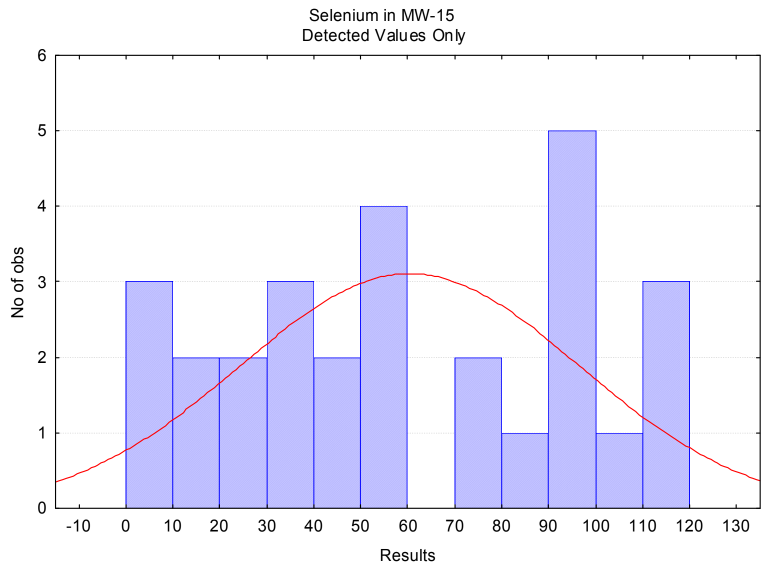


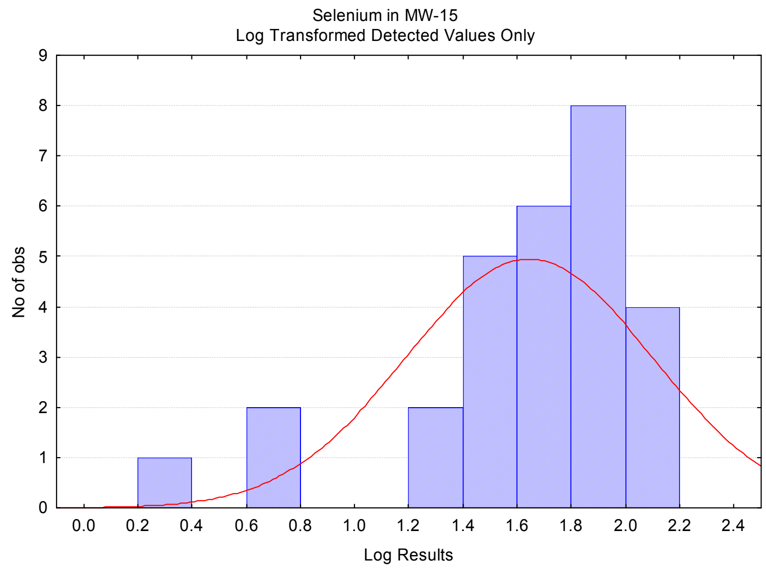


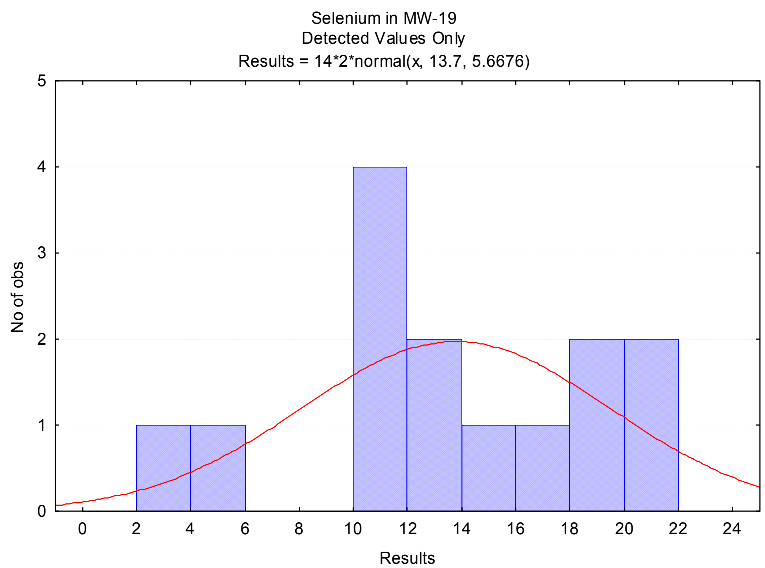


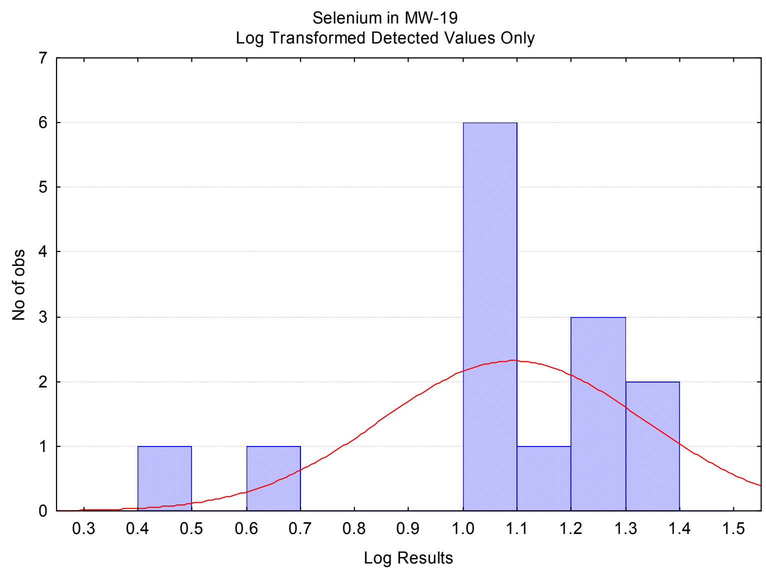


Histograms for Selenium (ug/L) in Wells With 15 to 50% Non-Detected Values

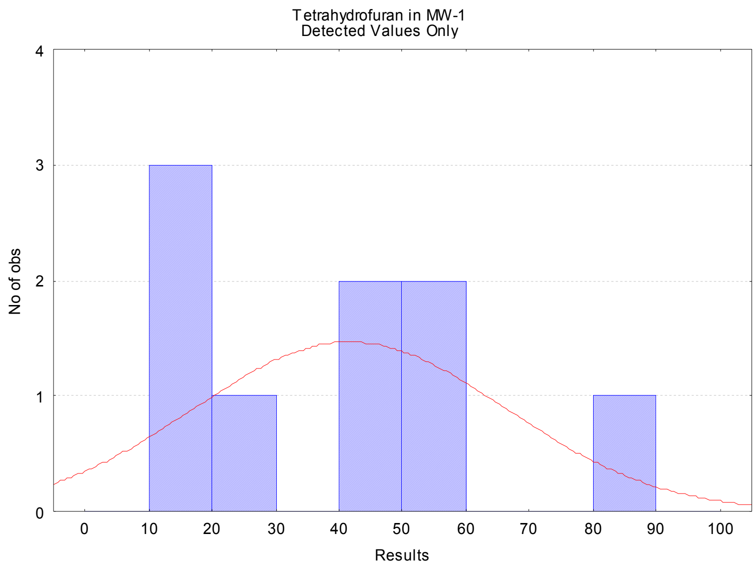


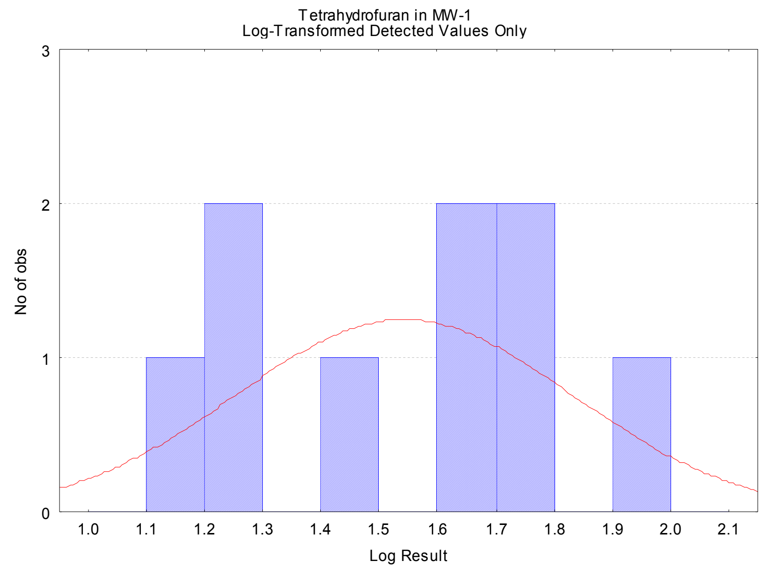


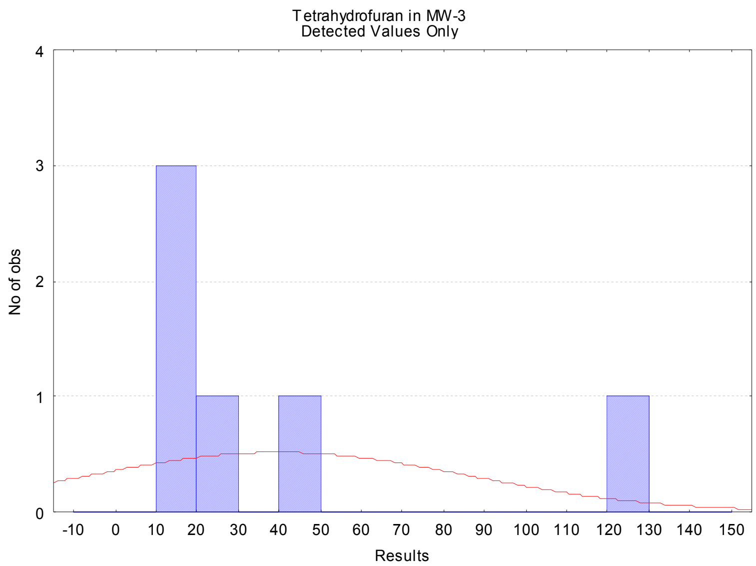


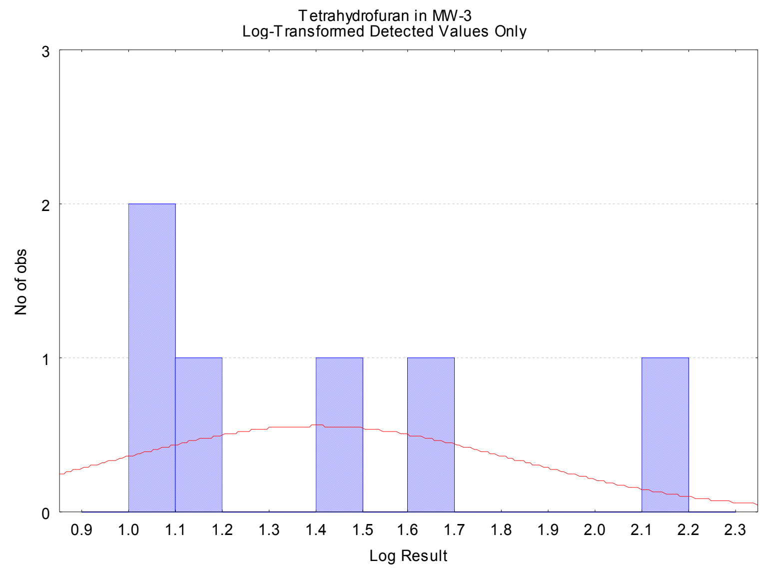


Histograms for Tetrahydrofuran (ug/L) in Wells with 15 to 50% Non-Detected Values

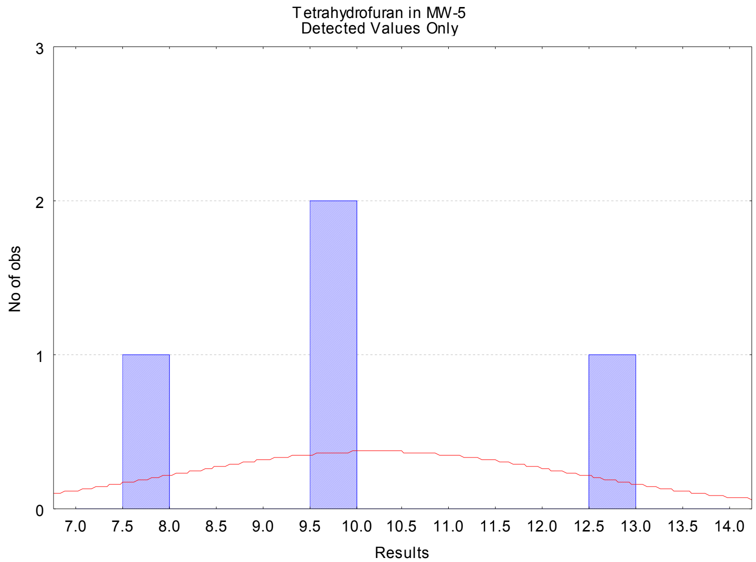


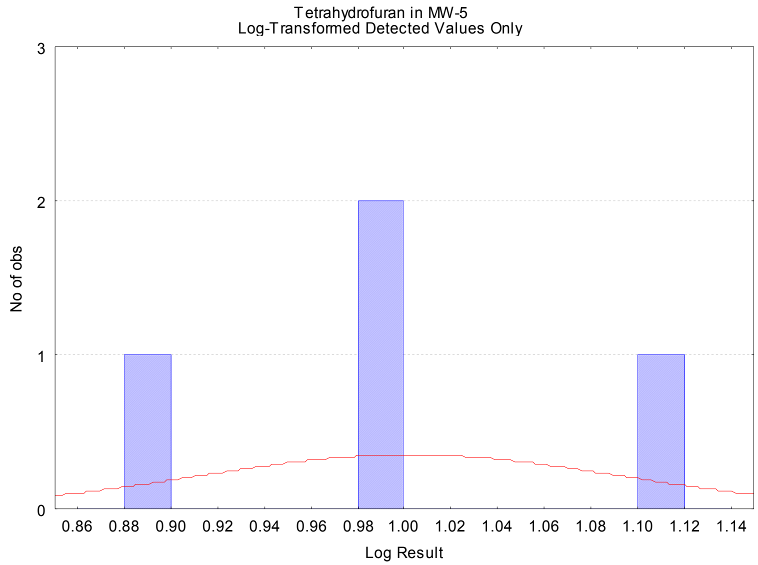


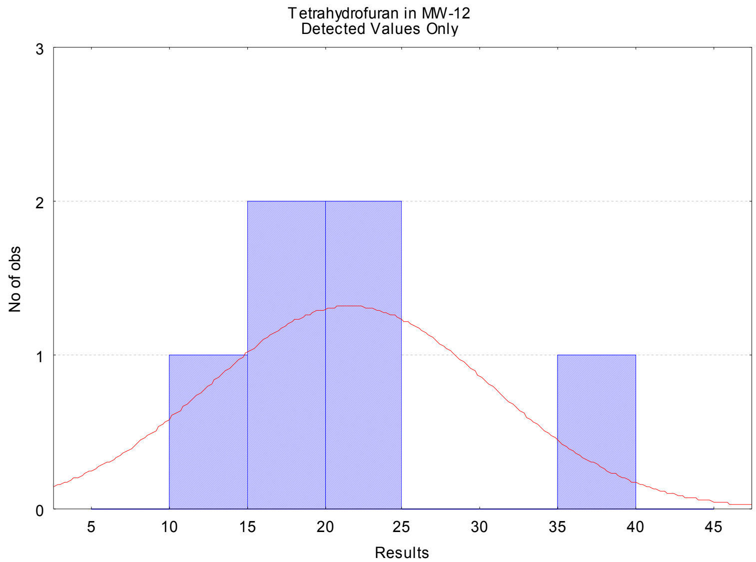


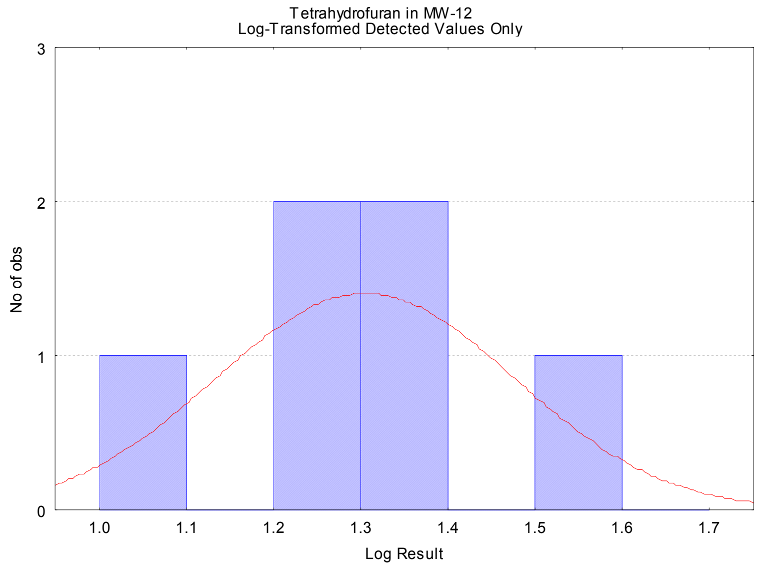


Histograms for Tetrahydrofuran (ug/L) in Wells with 15 to 50% Non-Detected Values

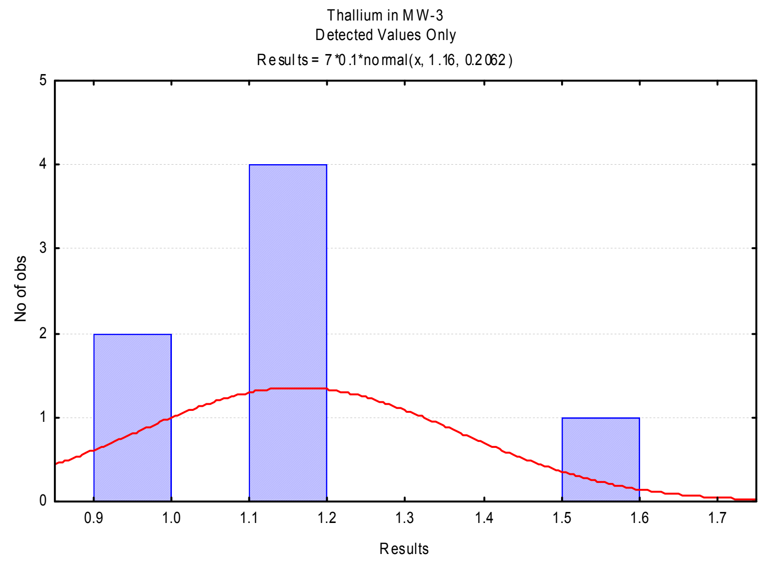


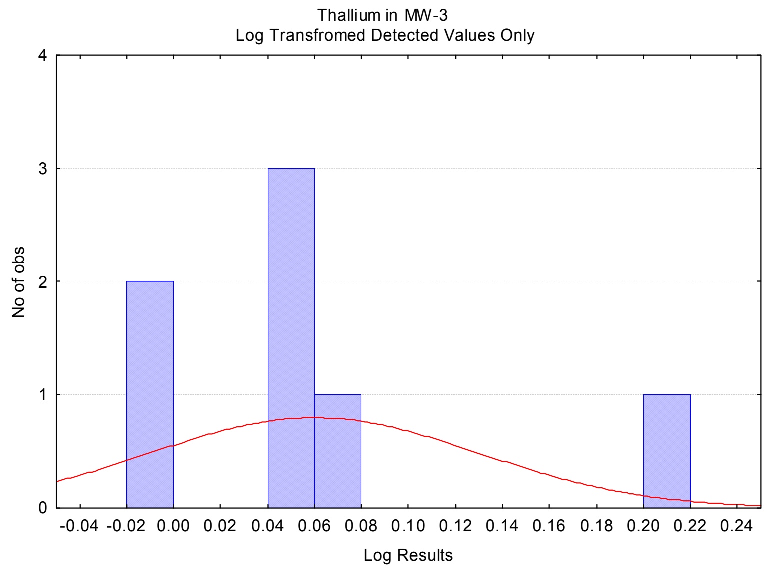


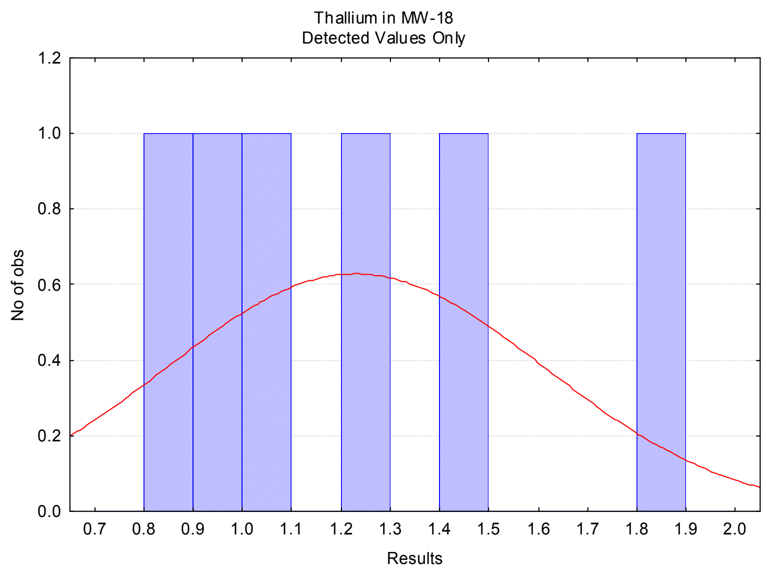


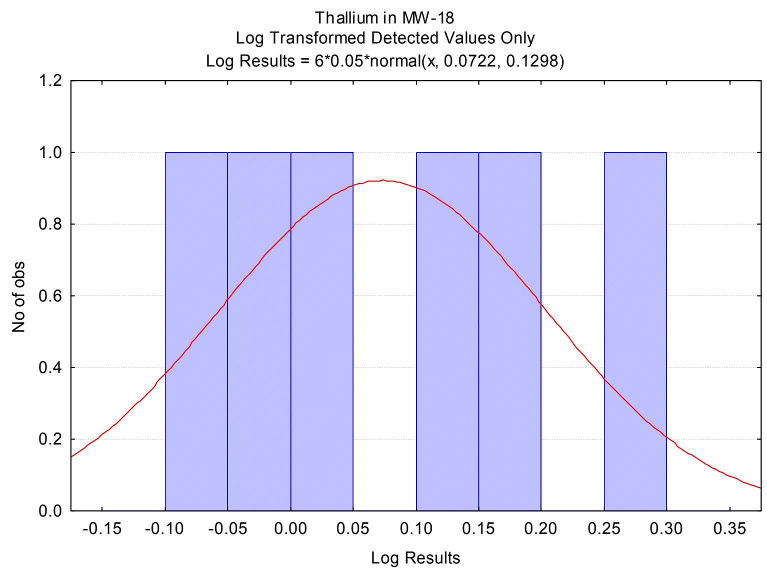


Histograms for Thallium (ug/L) in Wells With 15 to 50% Non-Detected Values

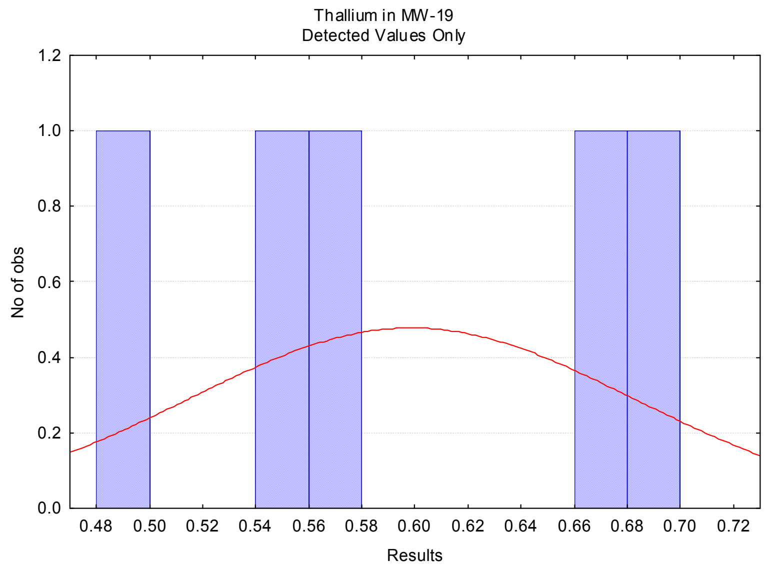


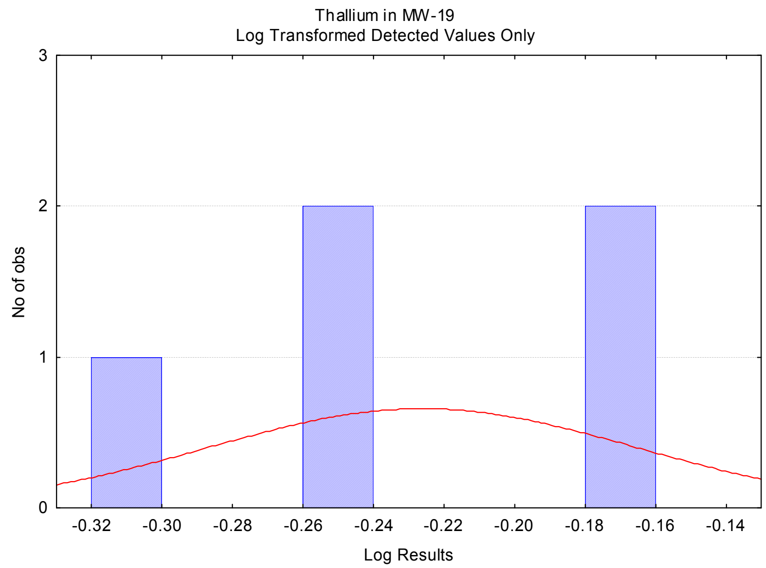




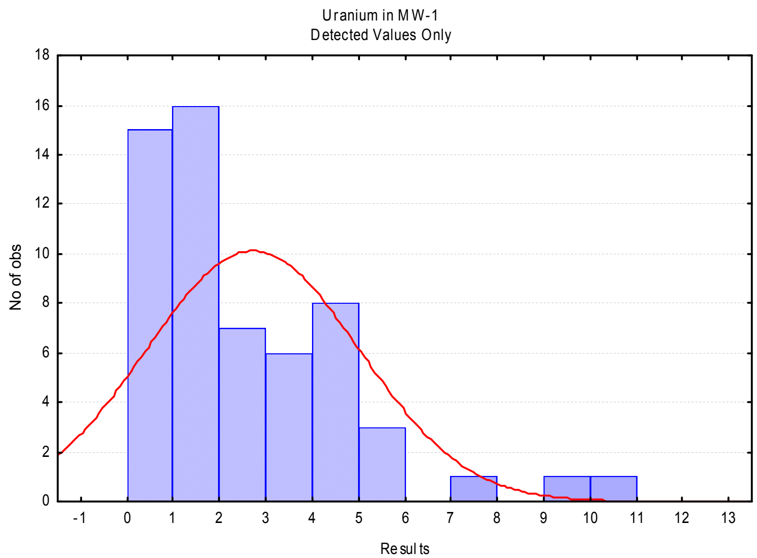


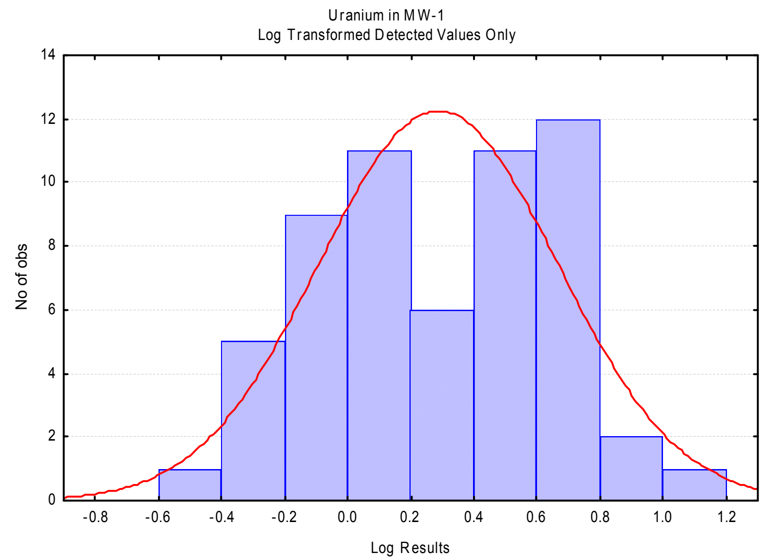
Histograms for Thallium (ug/L) in Wells With 15 to 50% Non-Detected Values

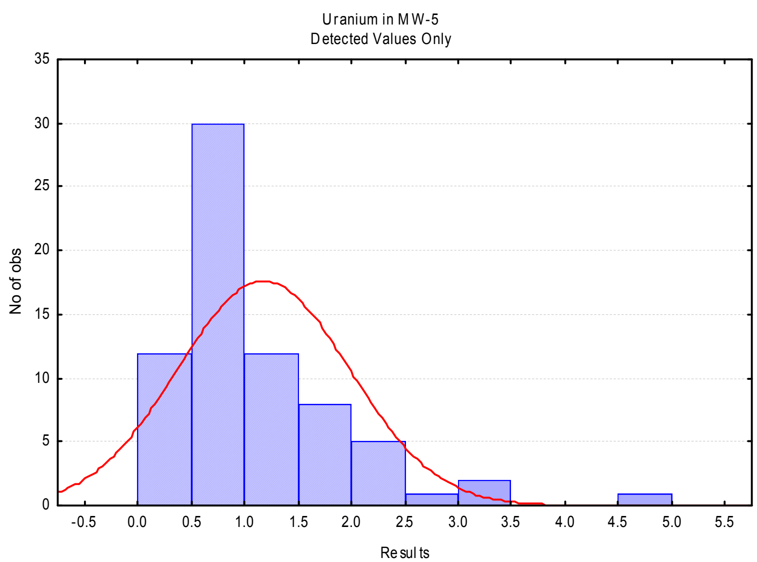


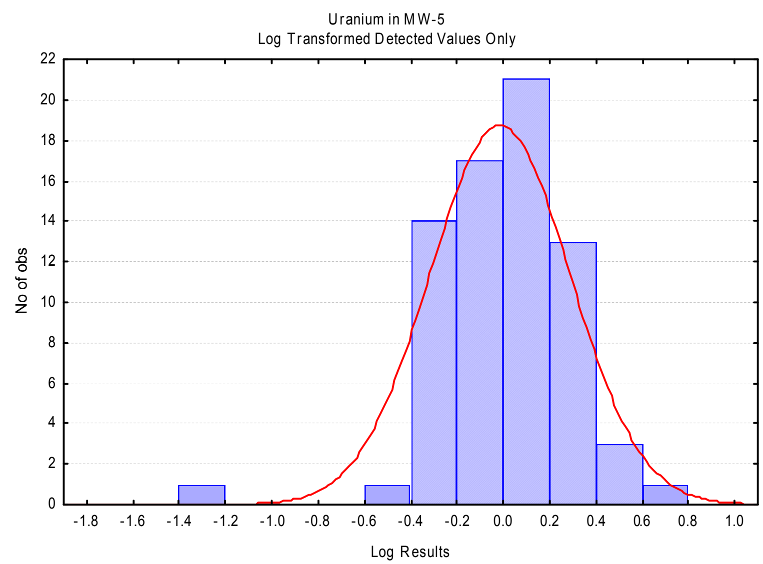


Histograms for Uranium (ug/L) in Wells with 15 to 50% Non-Detected Values

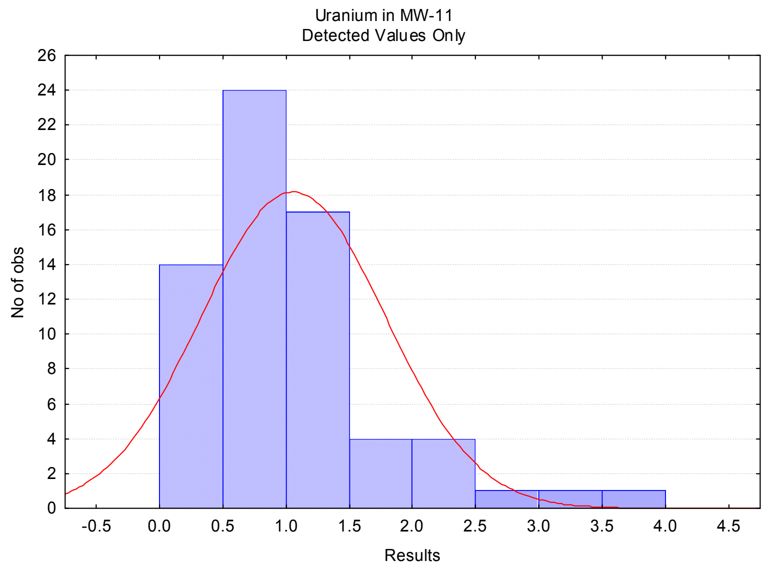


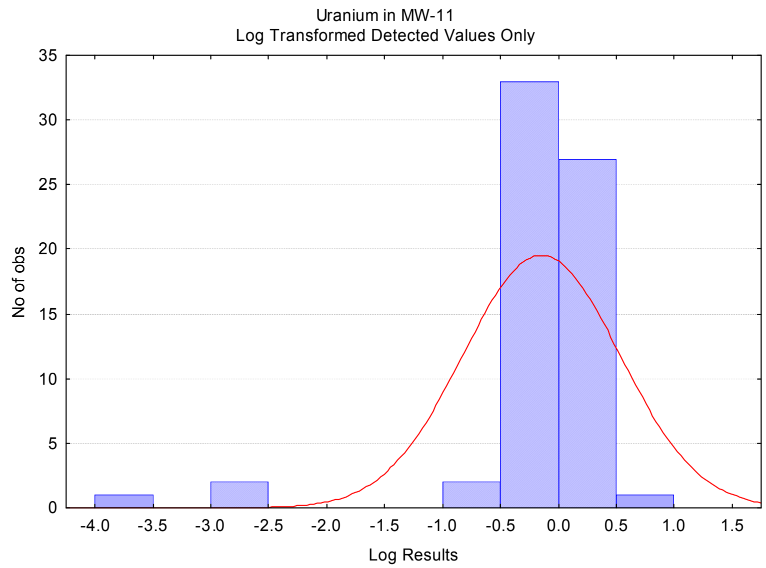




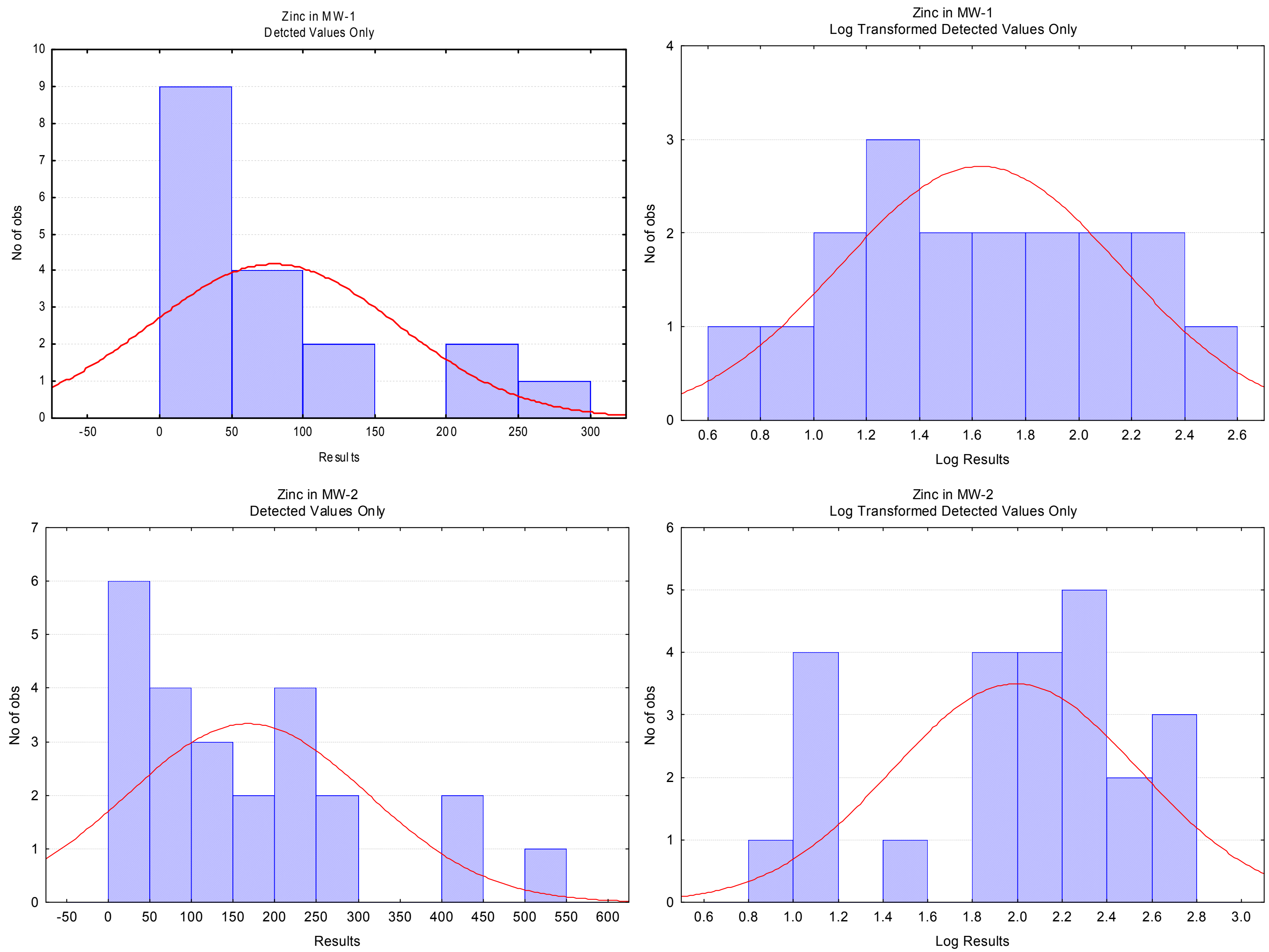


Histograms for Uranium (ug/L) in Wells with 15 to 50% Non-Detected Values

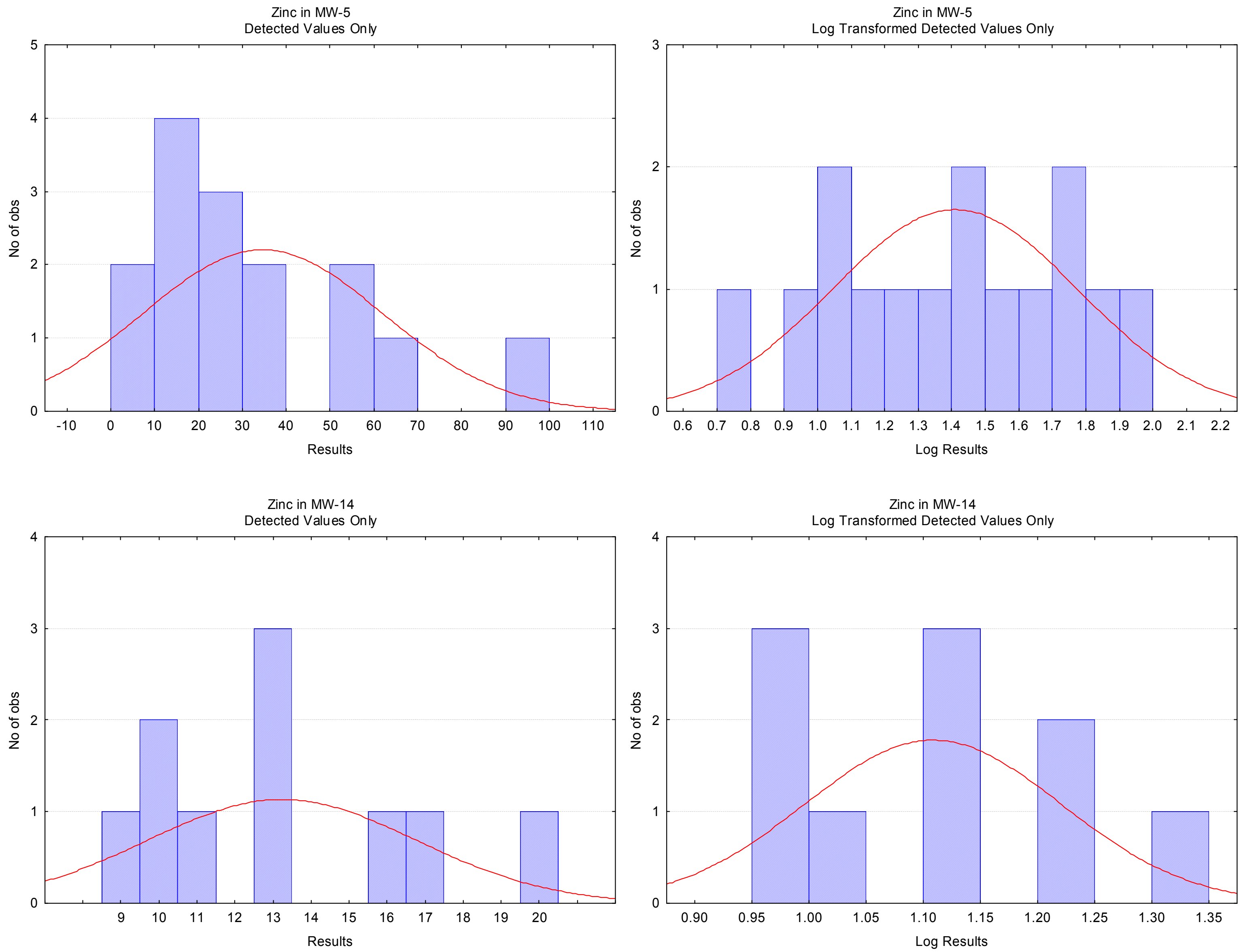




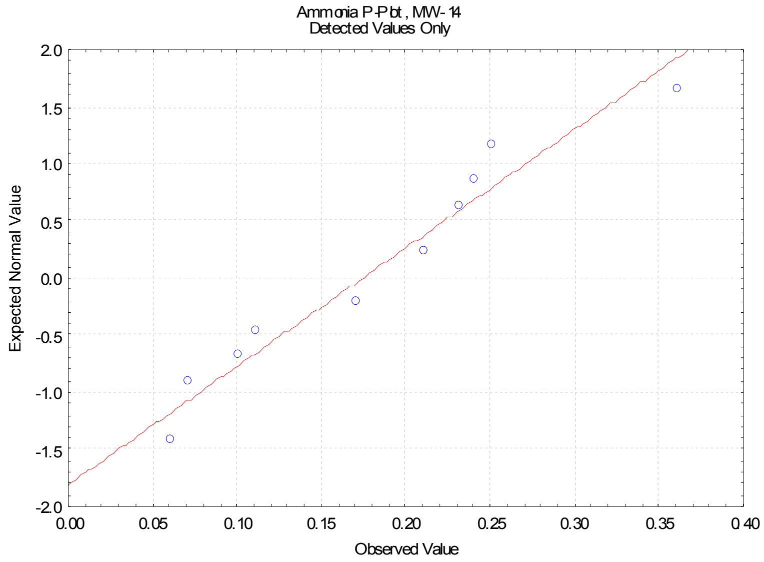
Histograms for Zinc (ug/L) in Wells with 15 to 50% Non-Detected Values

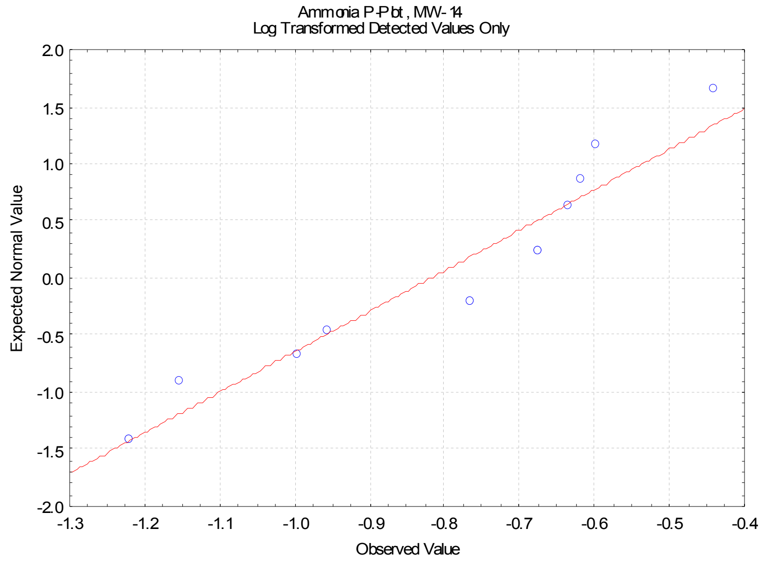


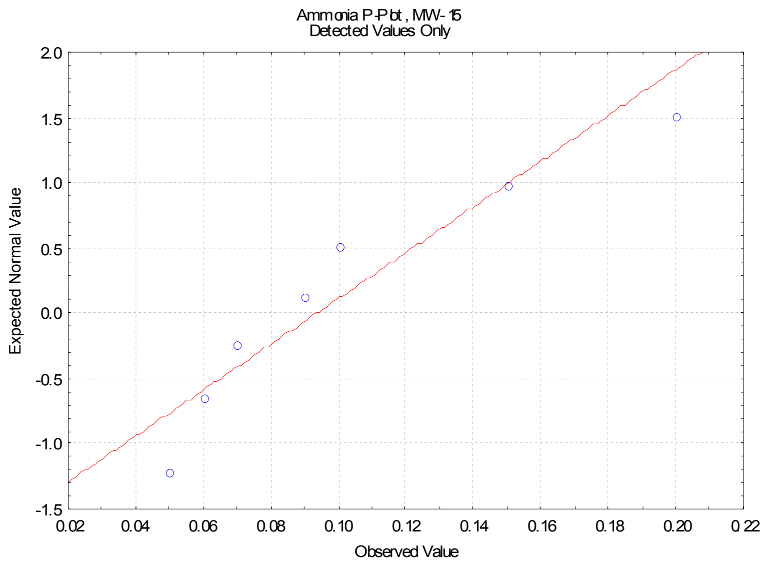
Histograms for Zinc (ug/L) in Wells with 15 to 50% Non-Detected Values

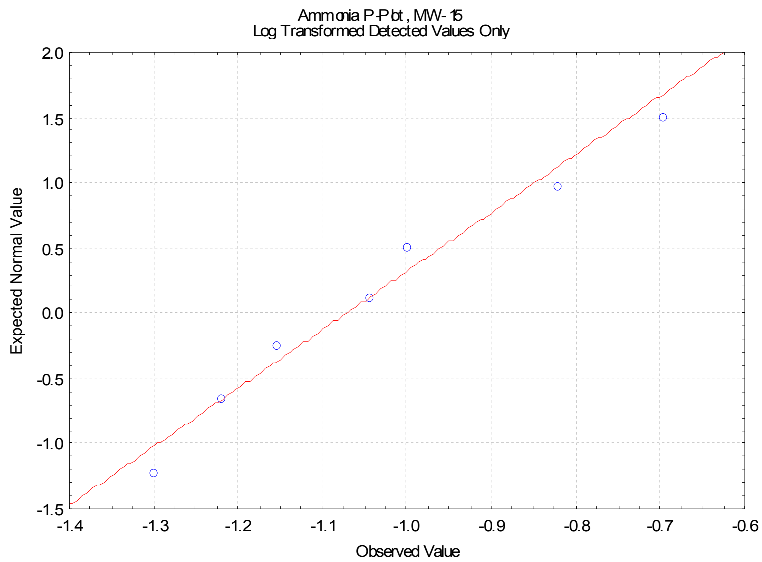


Normal Probability Plots for Ammonia (mg/L) in Wells with 15 to 50% Non-Detected Values

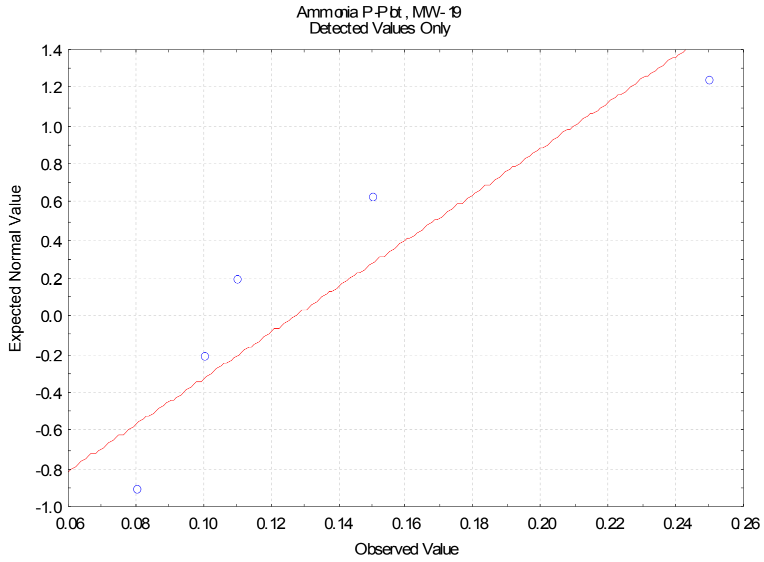


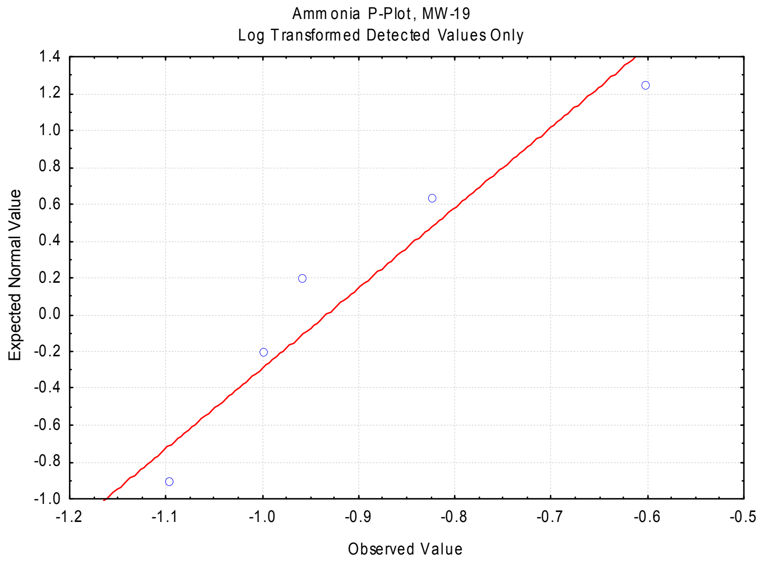




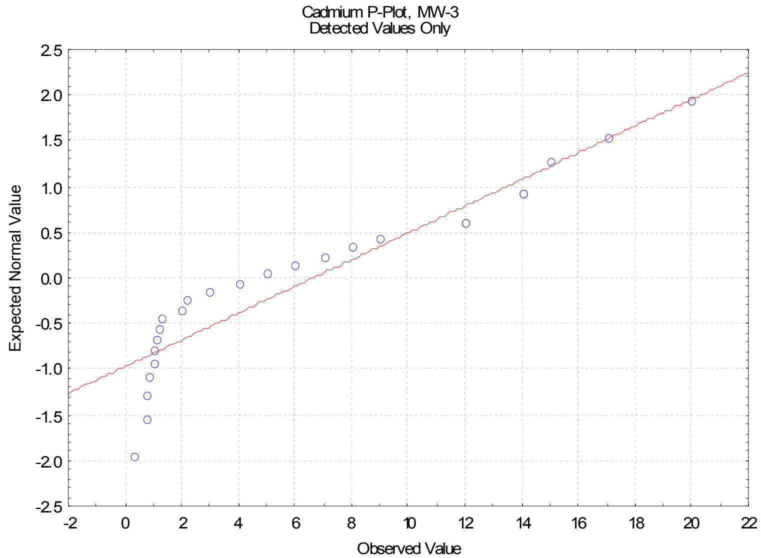


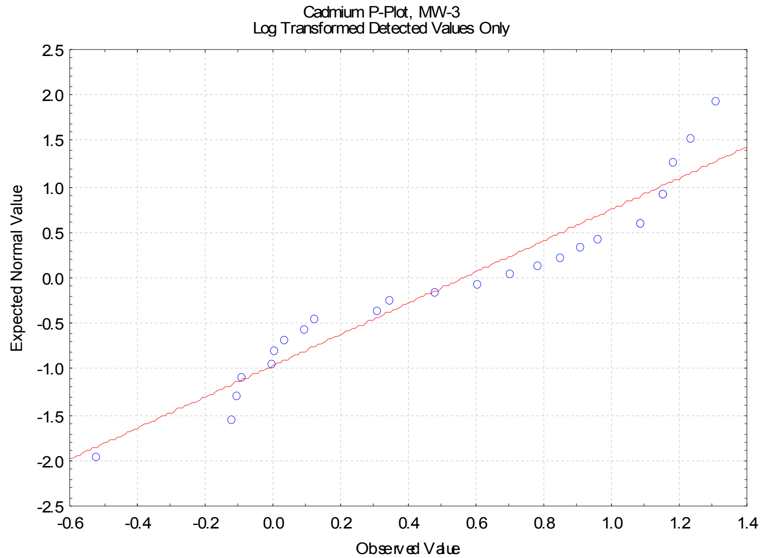
Normal Probability Plots for Ammonia (mg/L) in Wells with 15 to 50% Non-Detected Values

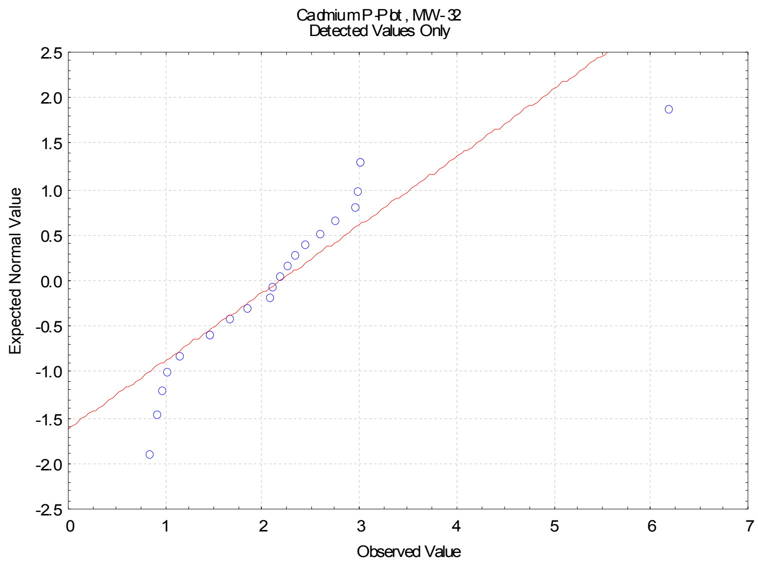


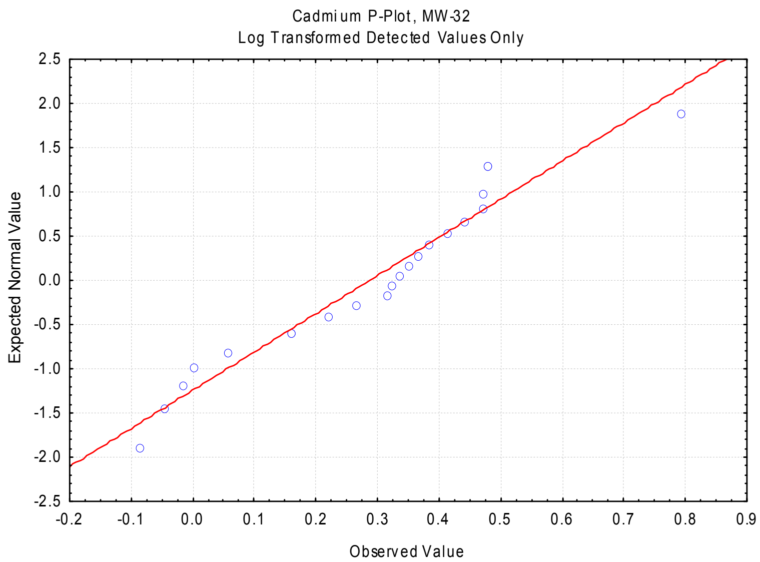


Normal Probability Plots for Cadmium (ug/L) in Wells with 15 to 50% Non- Detected Values

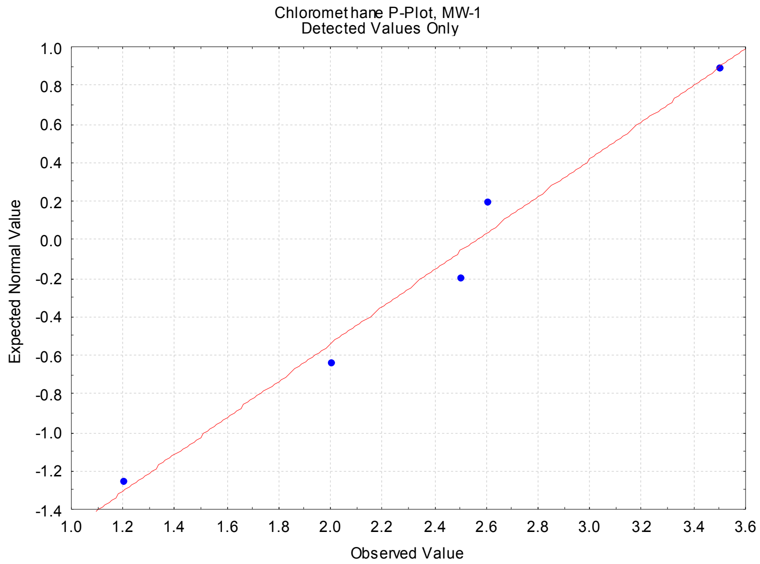


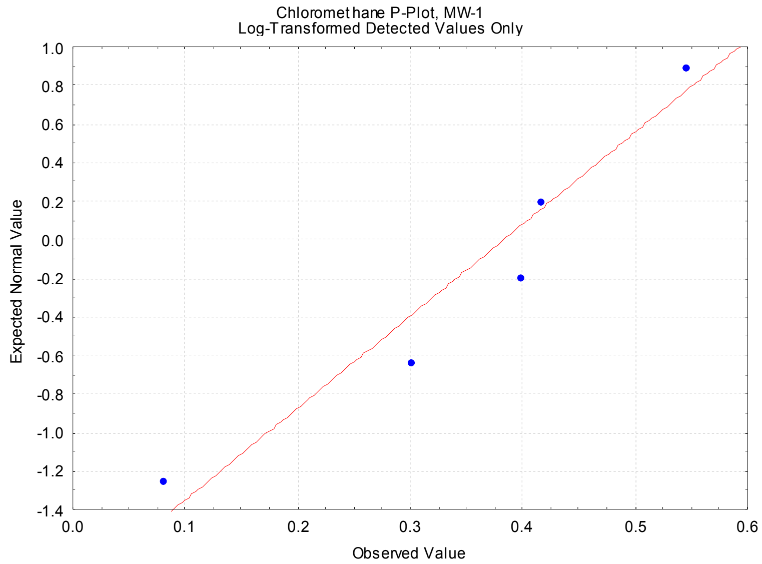




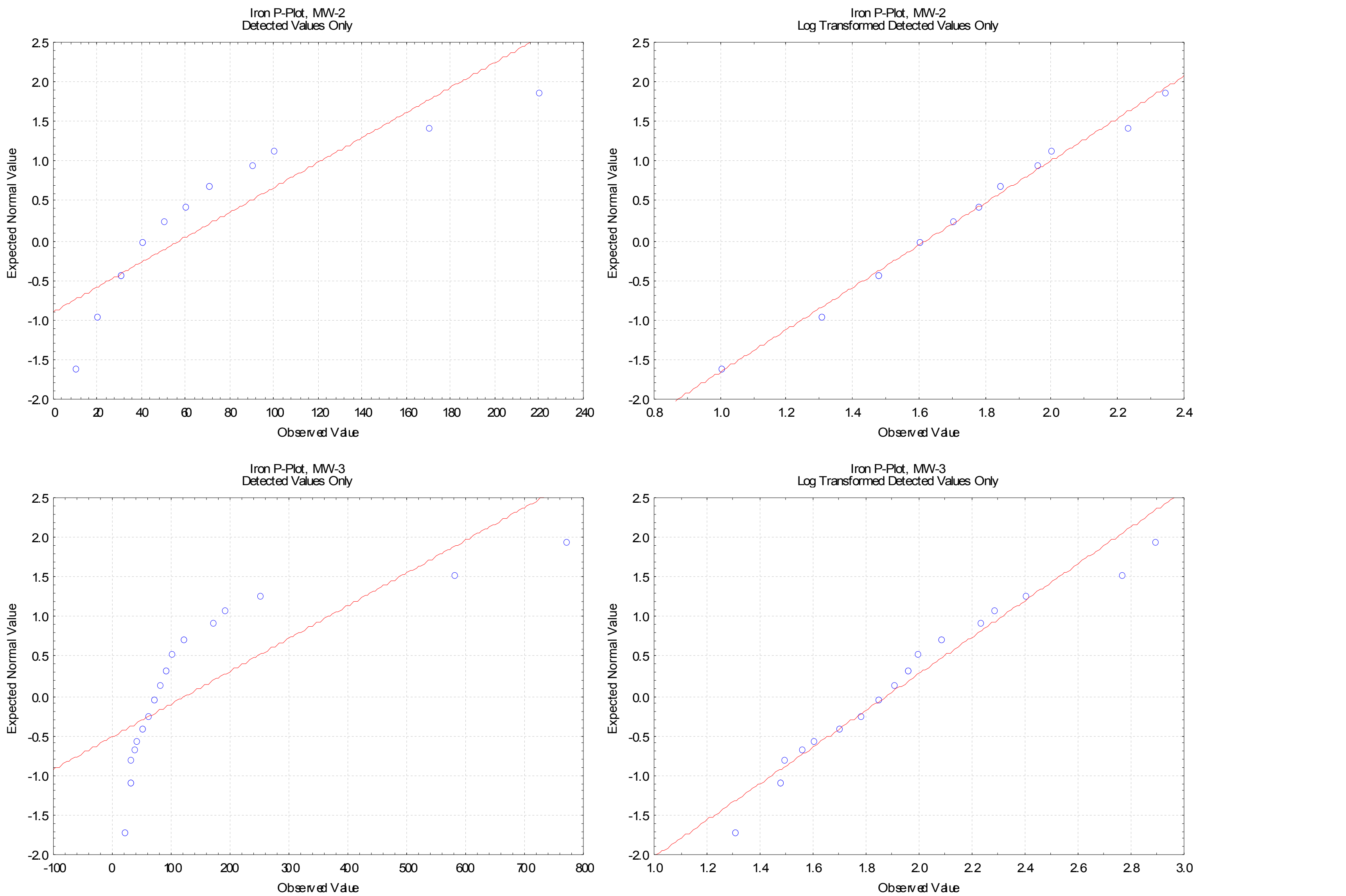


Normal Probability Plots for Chloromethane (ug/L) in Wells with 15 to 50% Non-Detected Values

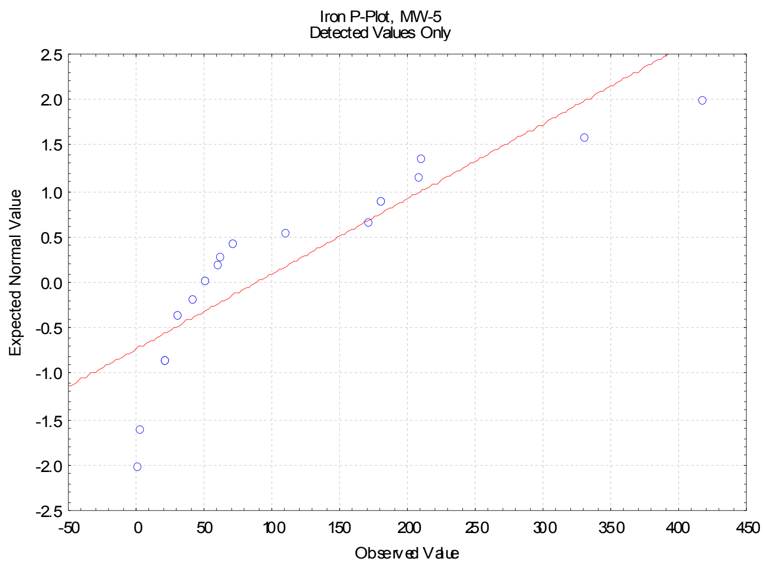


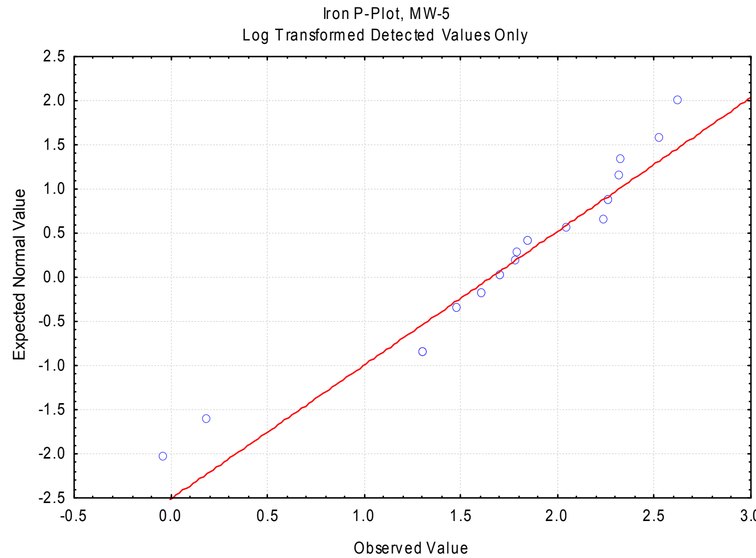


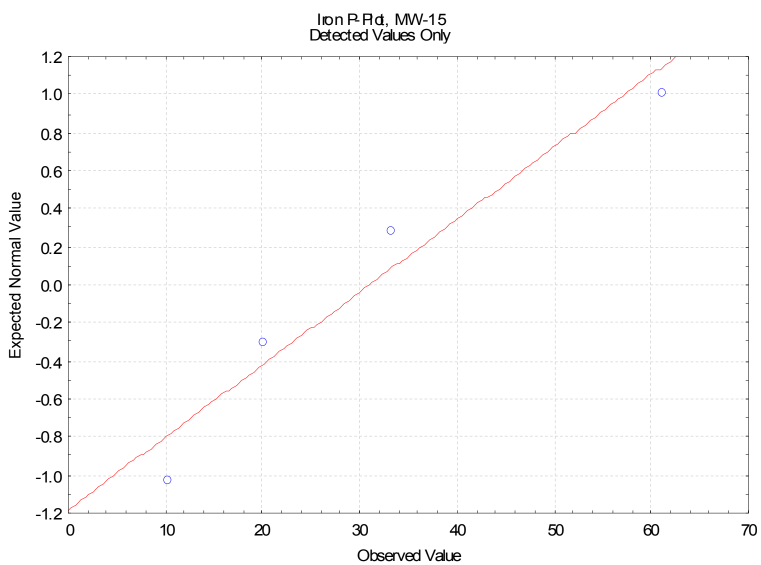
Normal Probability Plots for Iron (ug/L) in Wells with 15 to 50% Non-Detected Values

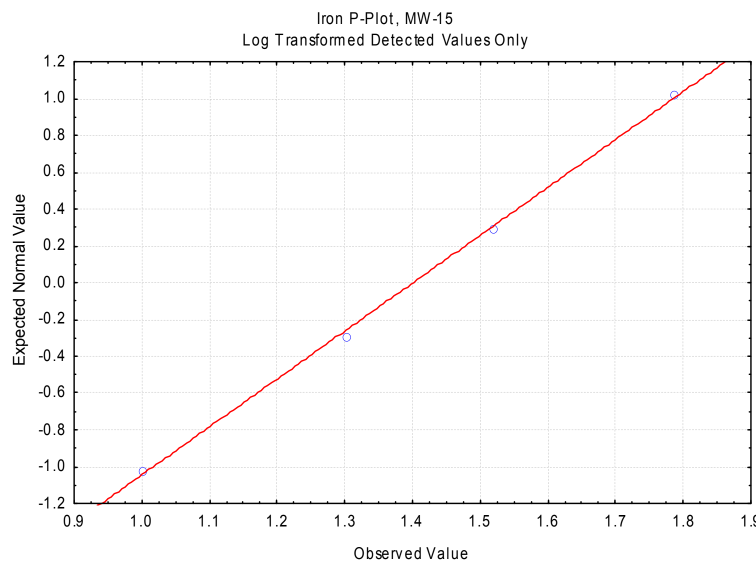


Normal Probability Plots for Iron (ug/L) in Wells with 15 to 50% Non-Detected Values

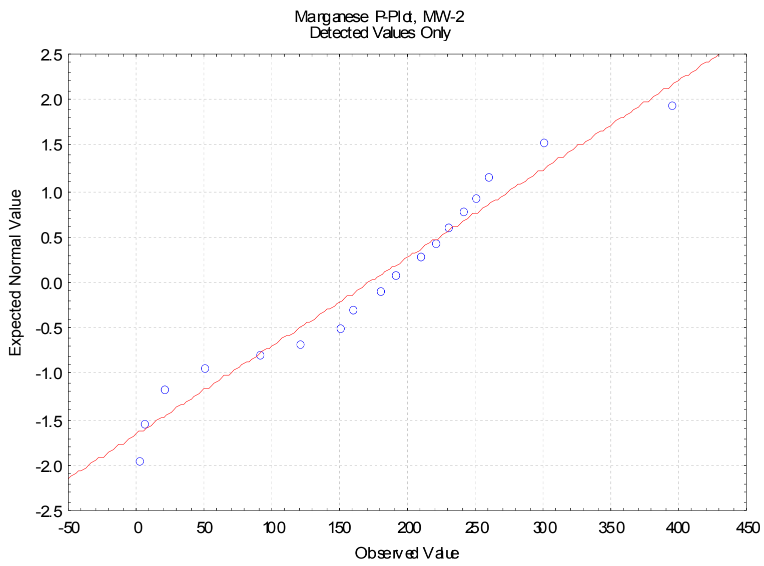


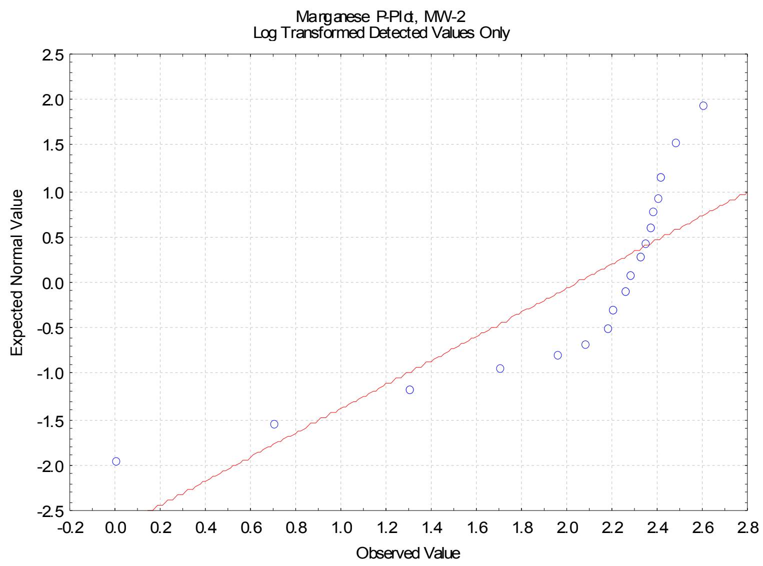




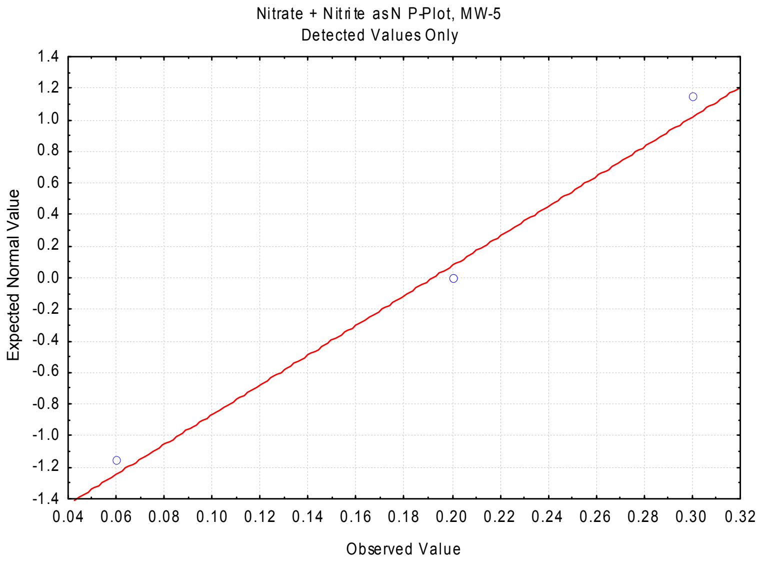


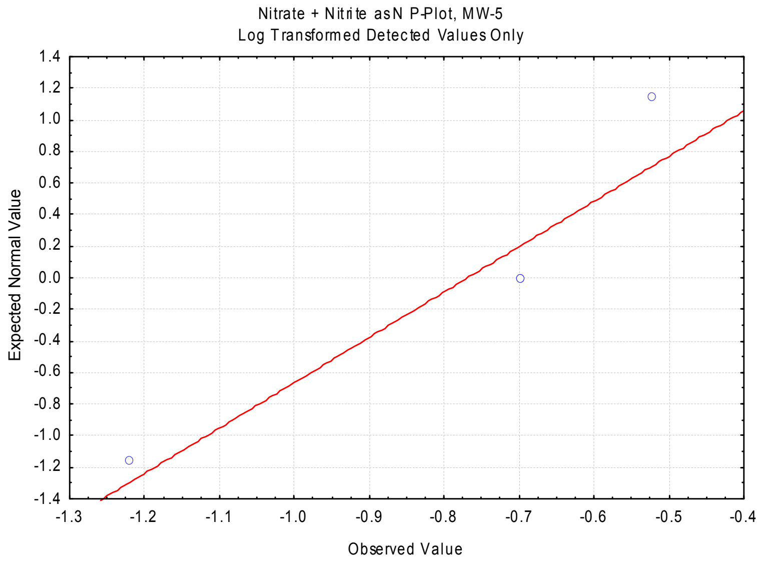
Normal Probability Plots for Manganese (ug/L) in Wells with 15 to 50% Non-Detected Values

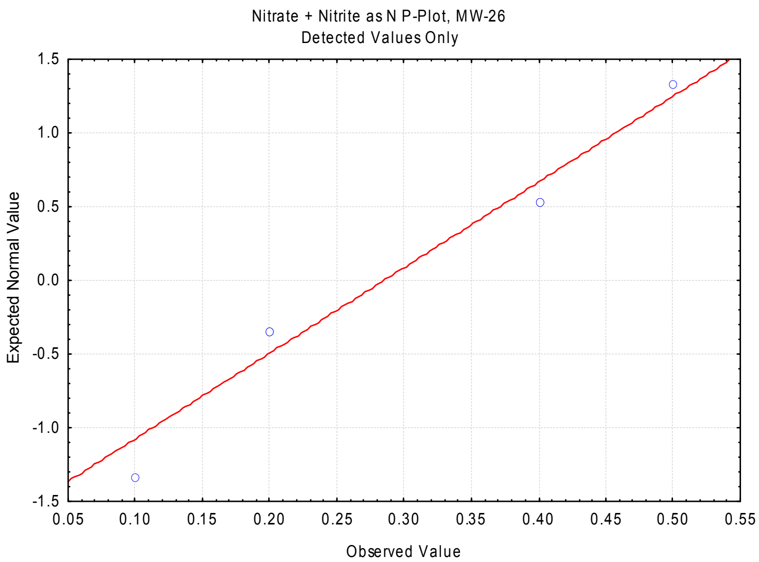


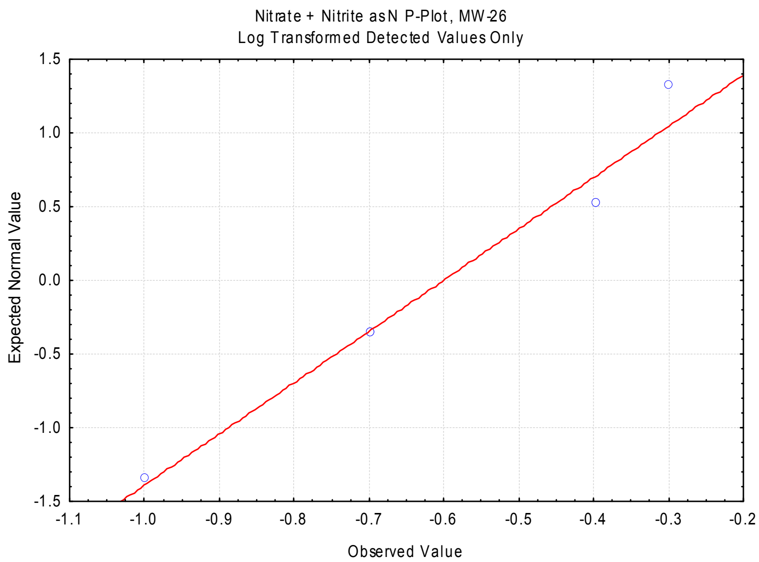


Normal Probability Plots for Nitrate+Nitrite as N (mg/L) in Wells with 15 to 50% Non-Detected Values

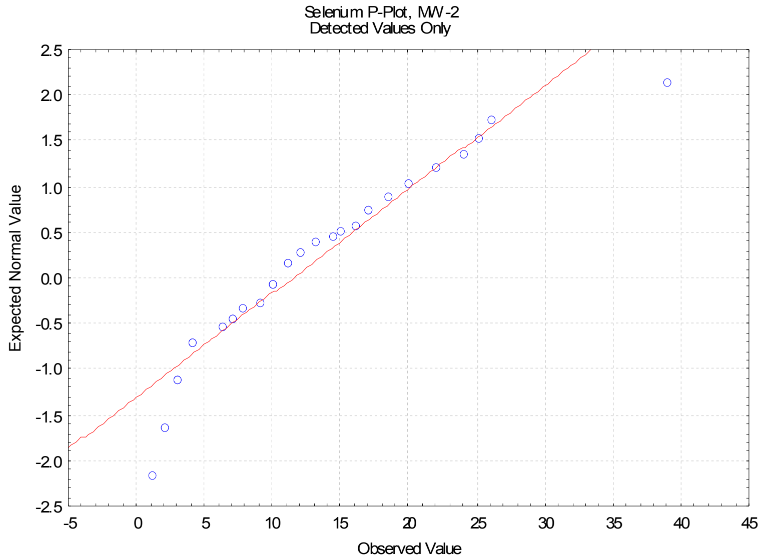


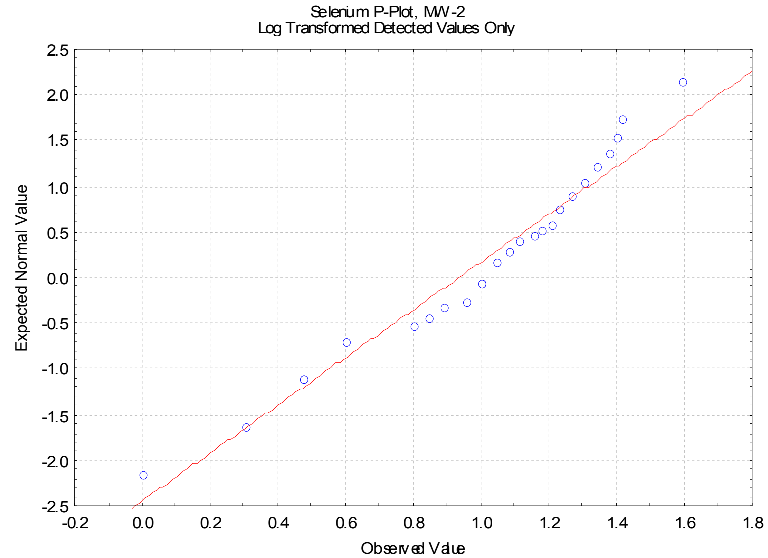


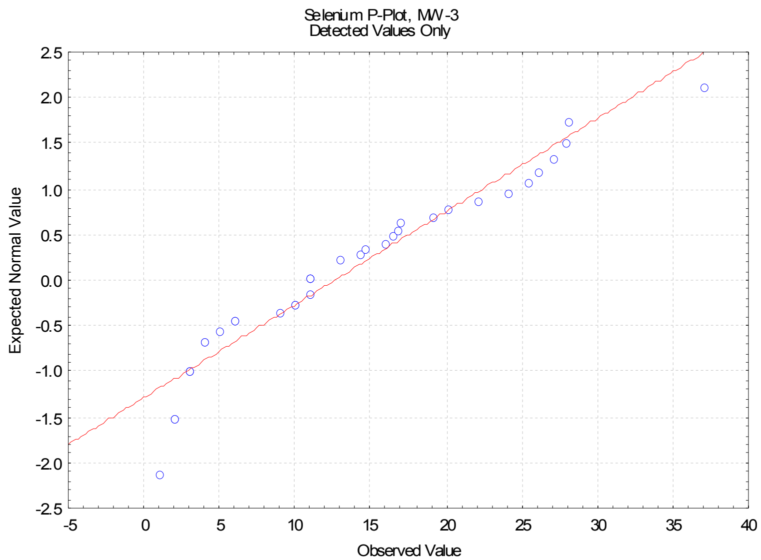


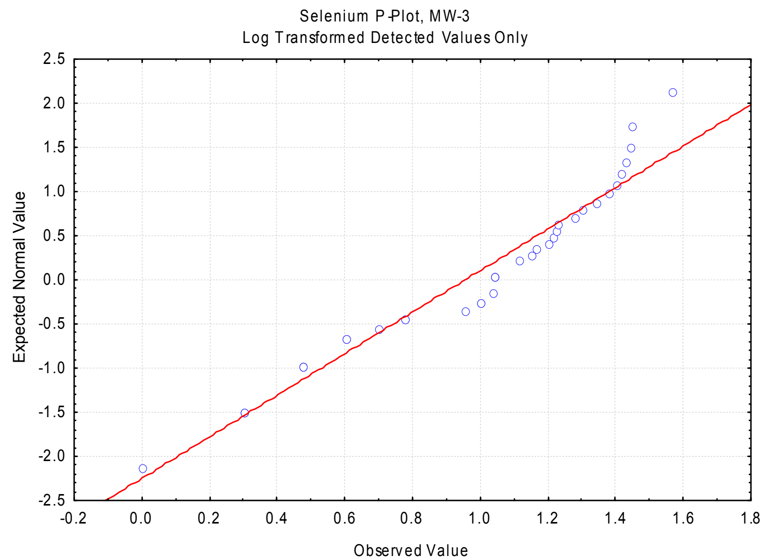


Normal Probability Plots for Selenium (ug/L) in Wells with 15 to 50% Non-Detected Values

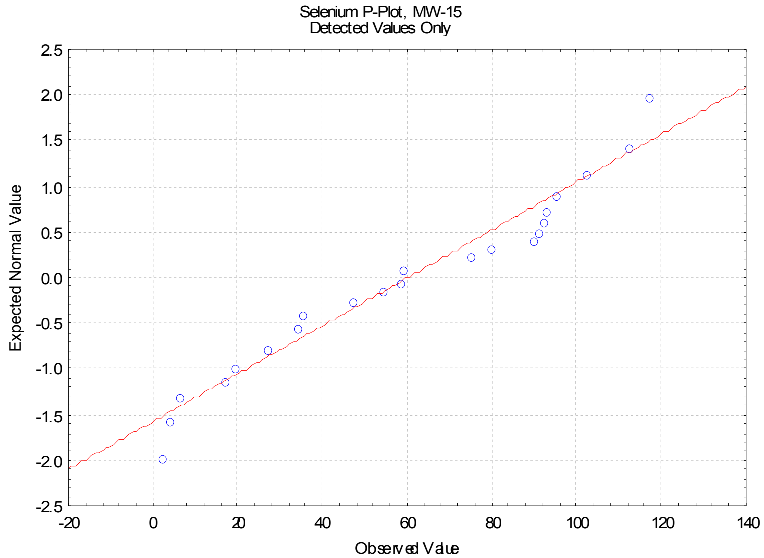


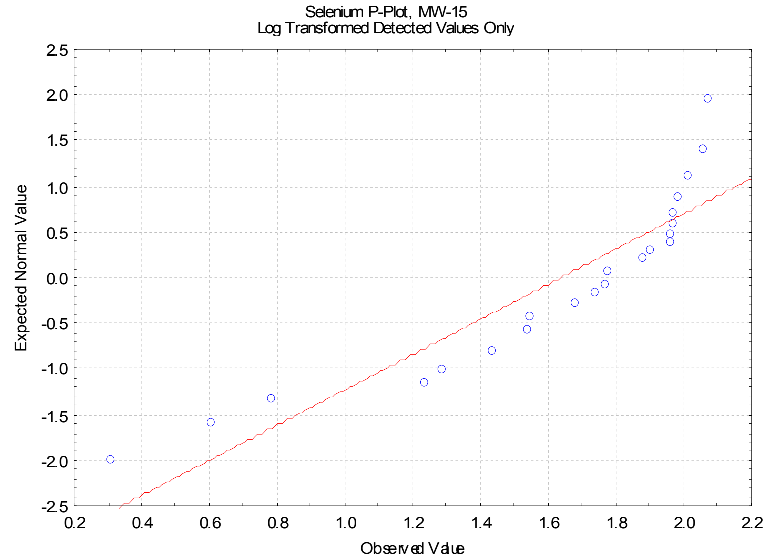


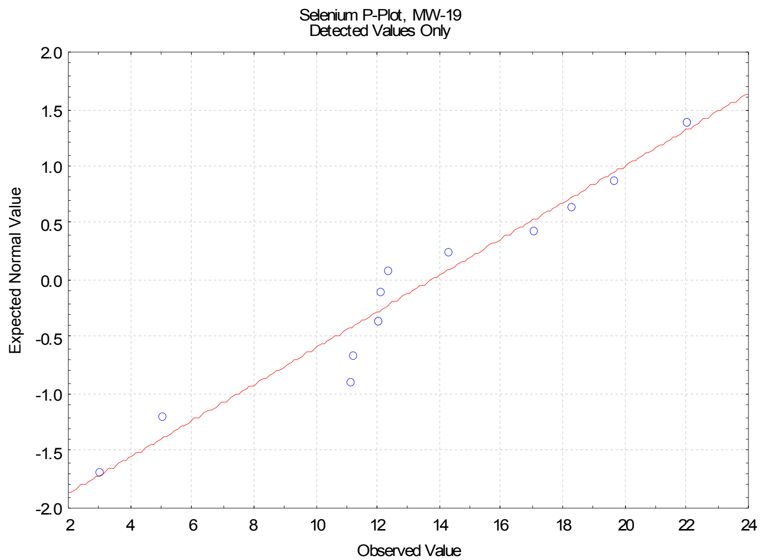


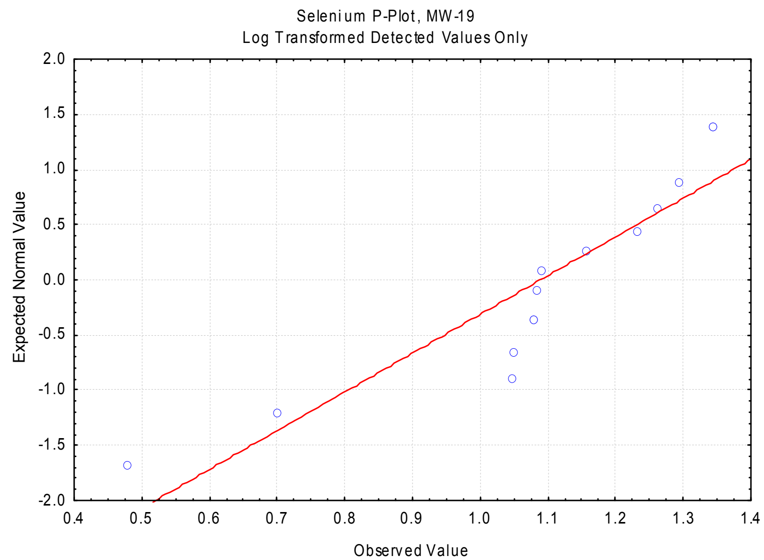


Normal Probability Plots for Selenium (ug/L) in Wells with 15 to 50% Non-Detected Values

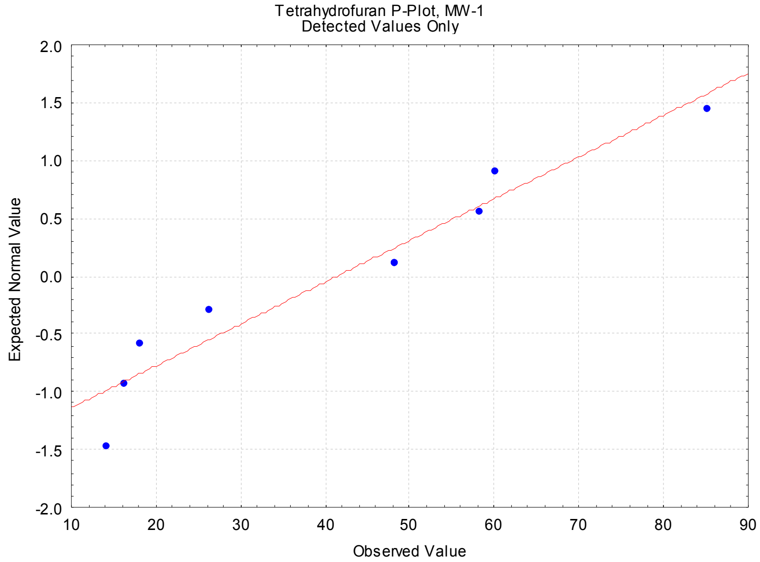


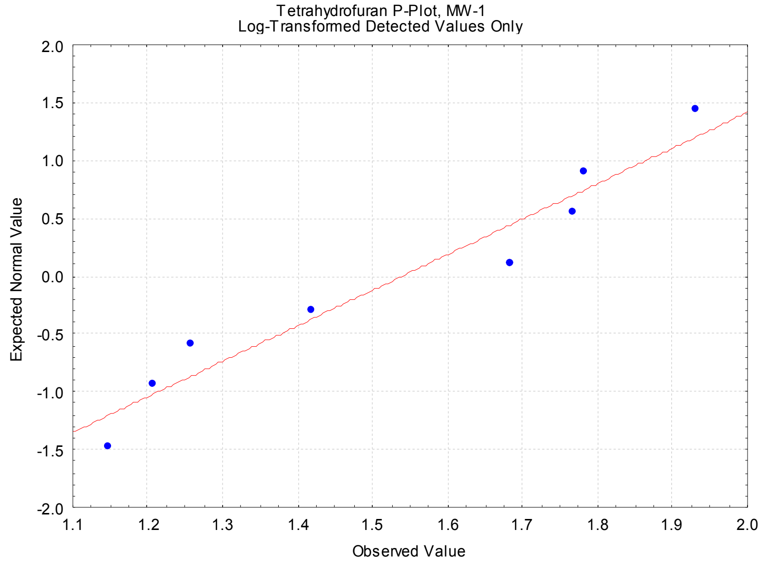


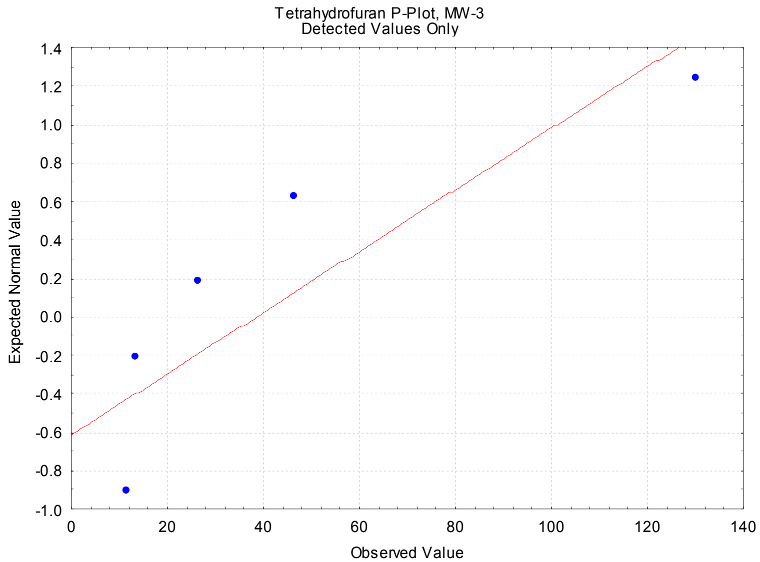


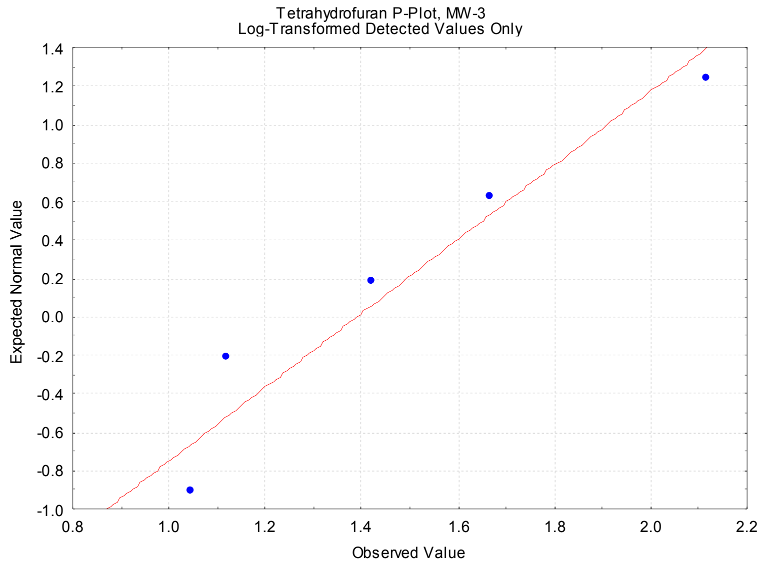


Normal Probability Plots for Tetrahydrofuran (ug/L) in Wells with 15 to 50% Non-Detected Values

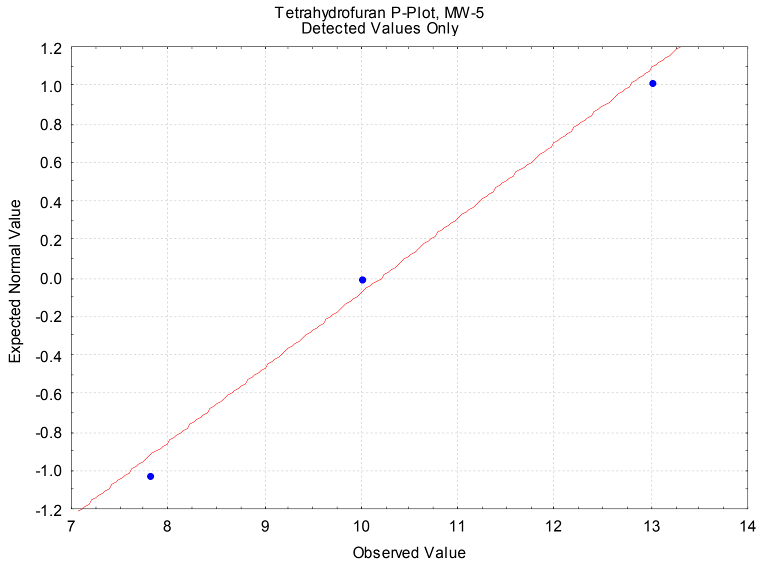


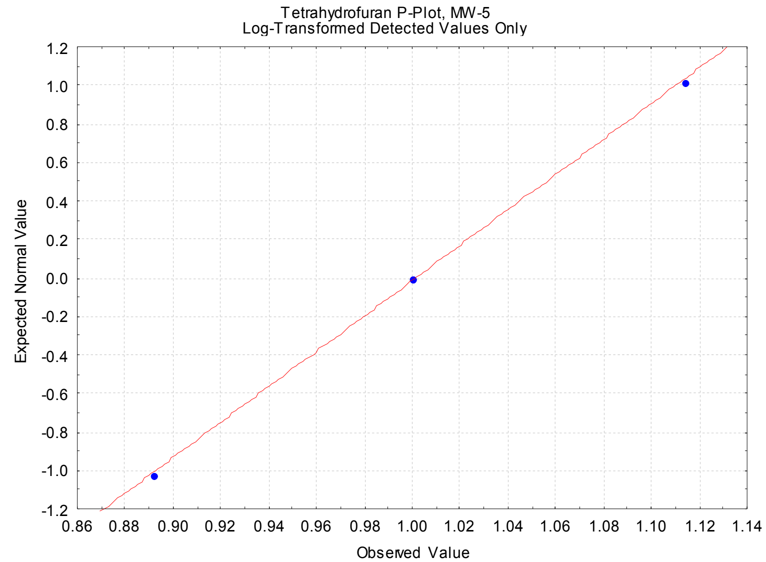


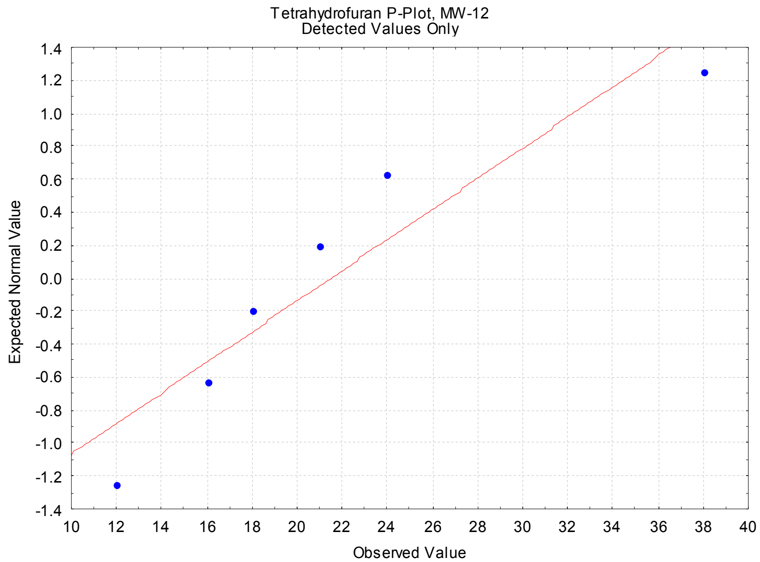


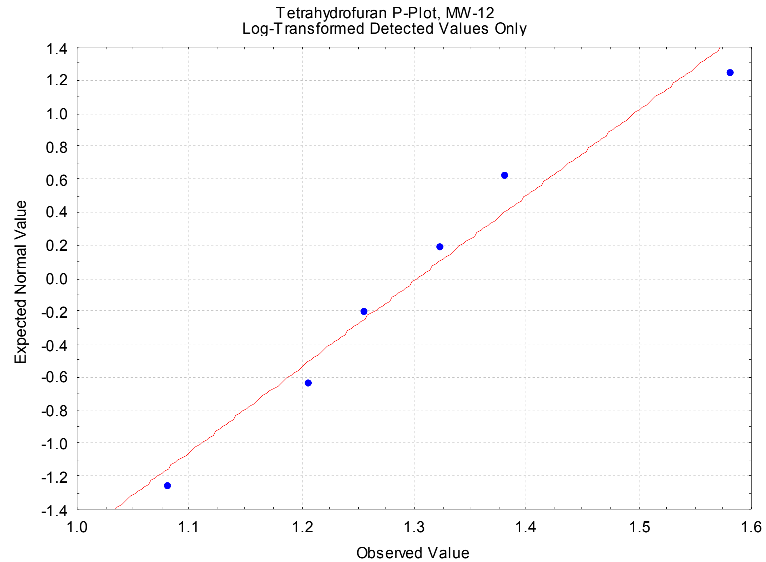


Normal Probability Plots for Tetrahydrofuran (ug/L) in Wells with 15 to 50% Non-Detected Values

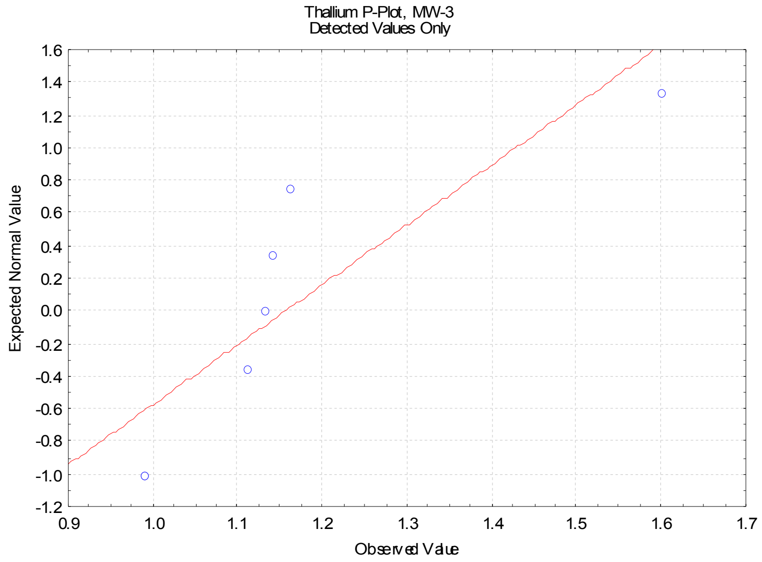


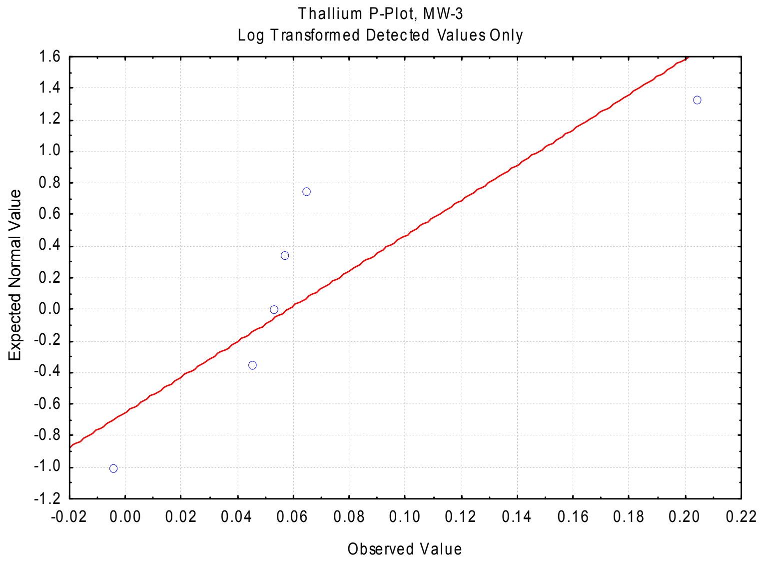


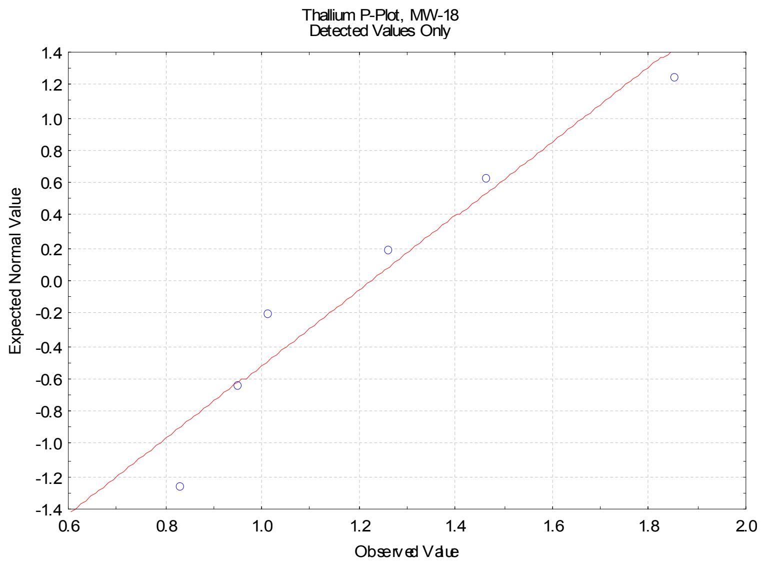


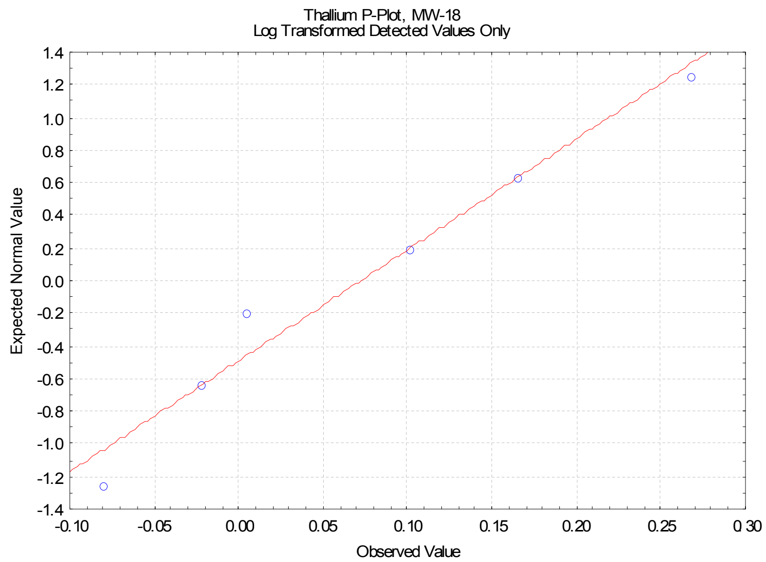


Normal Probability Plots for Thallium (ug/L) in Wells with 15 to 50% Non-Detected Values

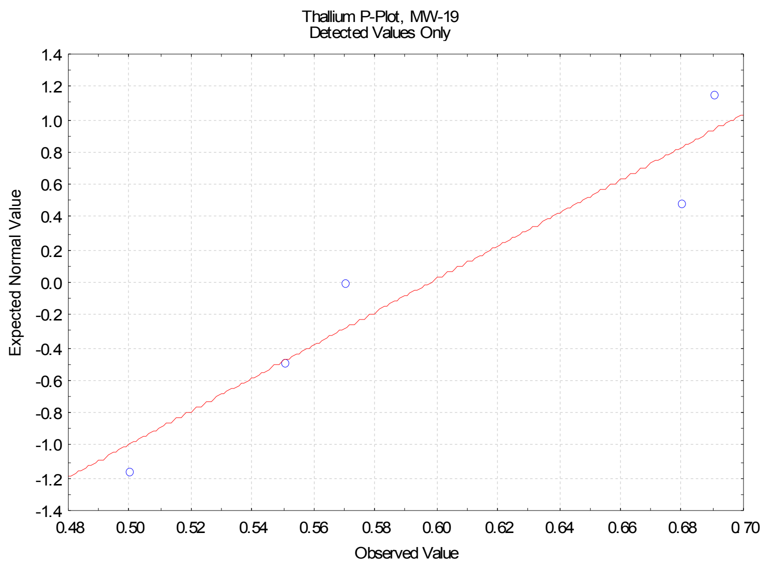


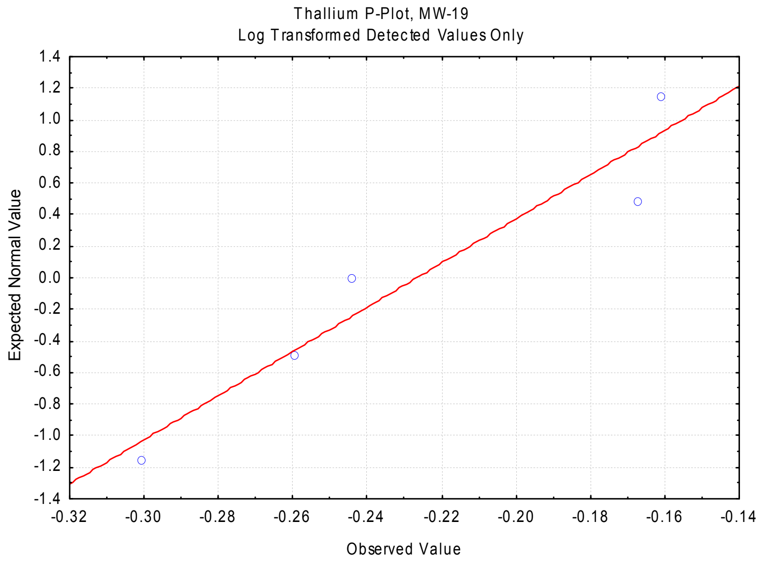




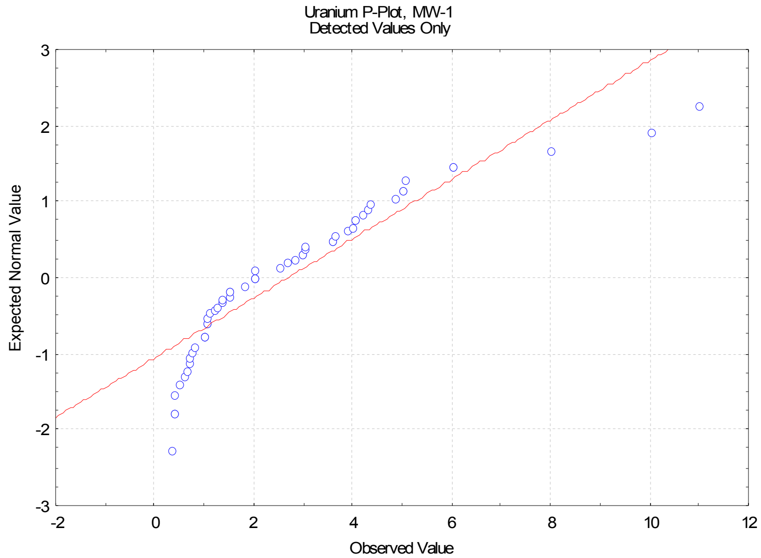


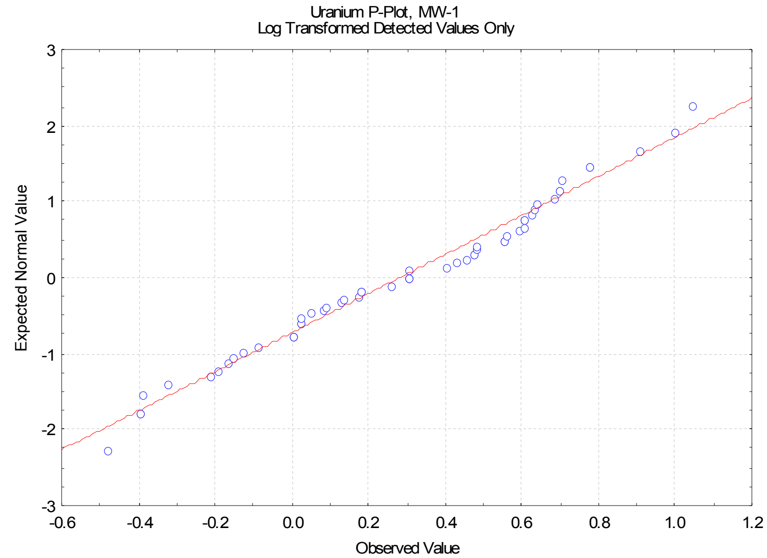
Normal Probability Plots for Thallium (ug/L) in Wells with 15 to 50% Non-Detected Values

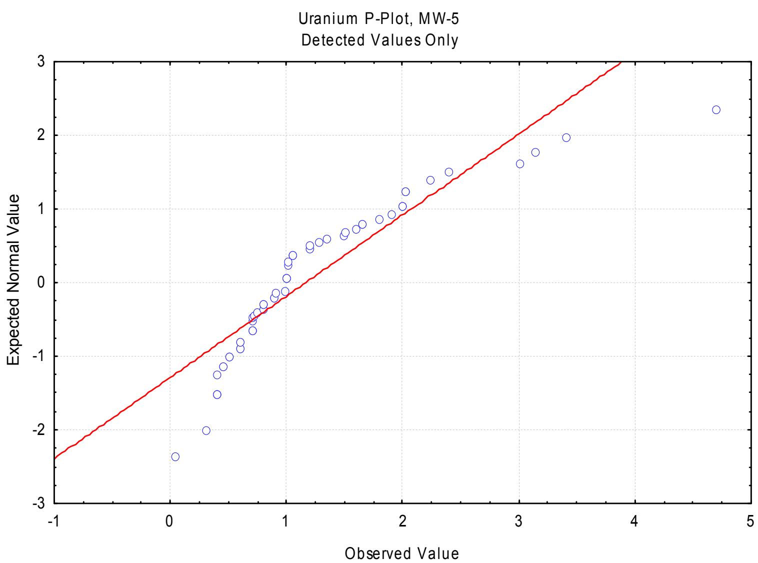


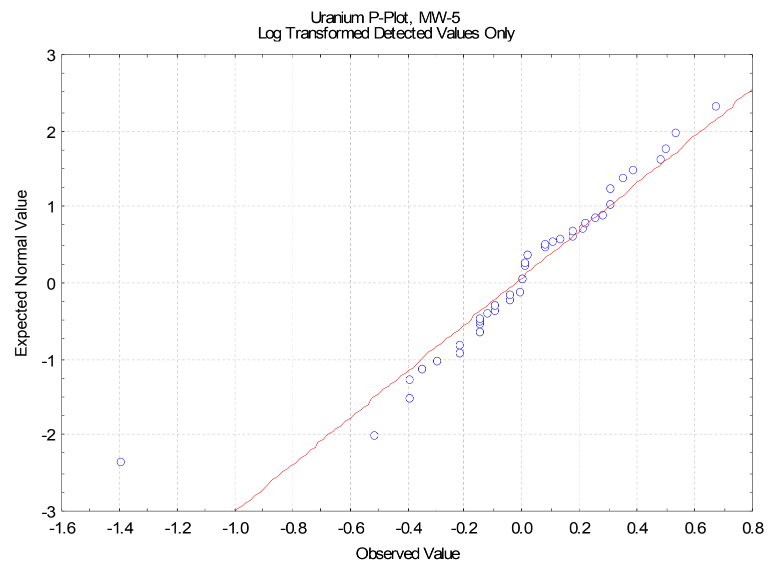


Normal Probability Plots for Uranium (ug/L) in Wells with 15 to 50% Non-Detected Values

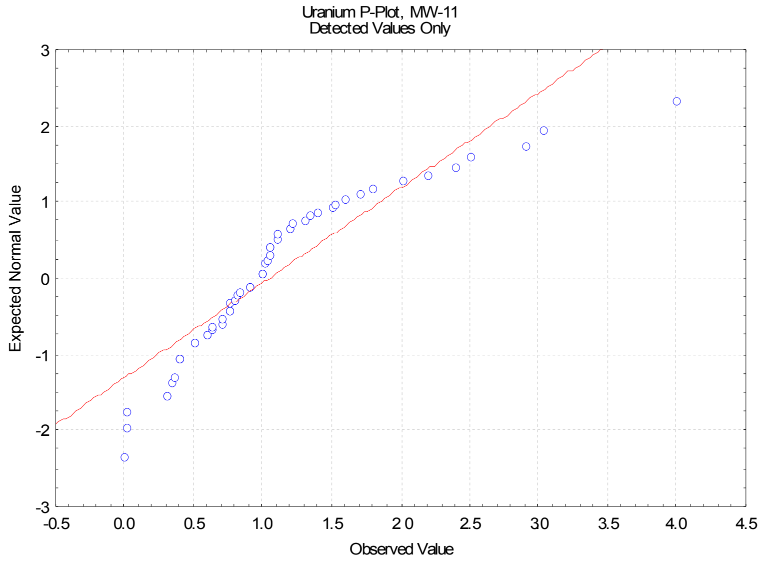


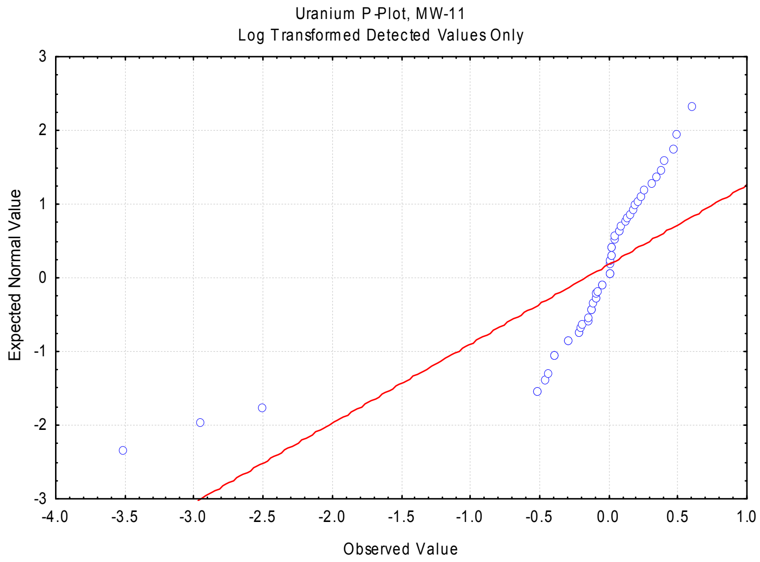




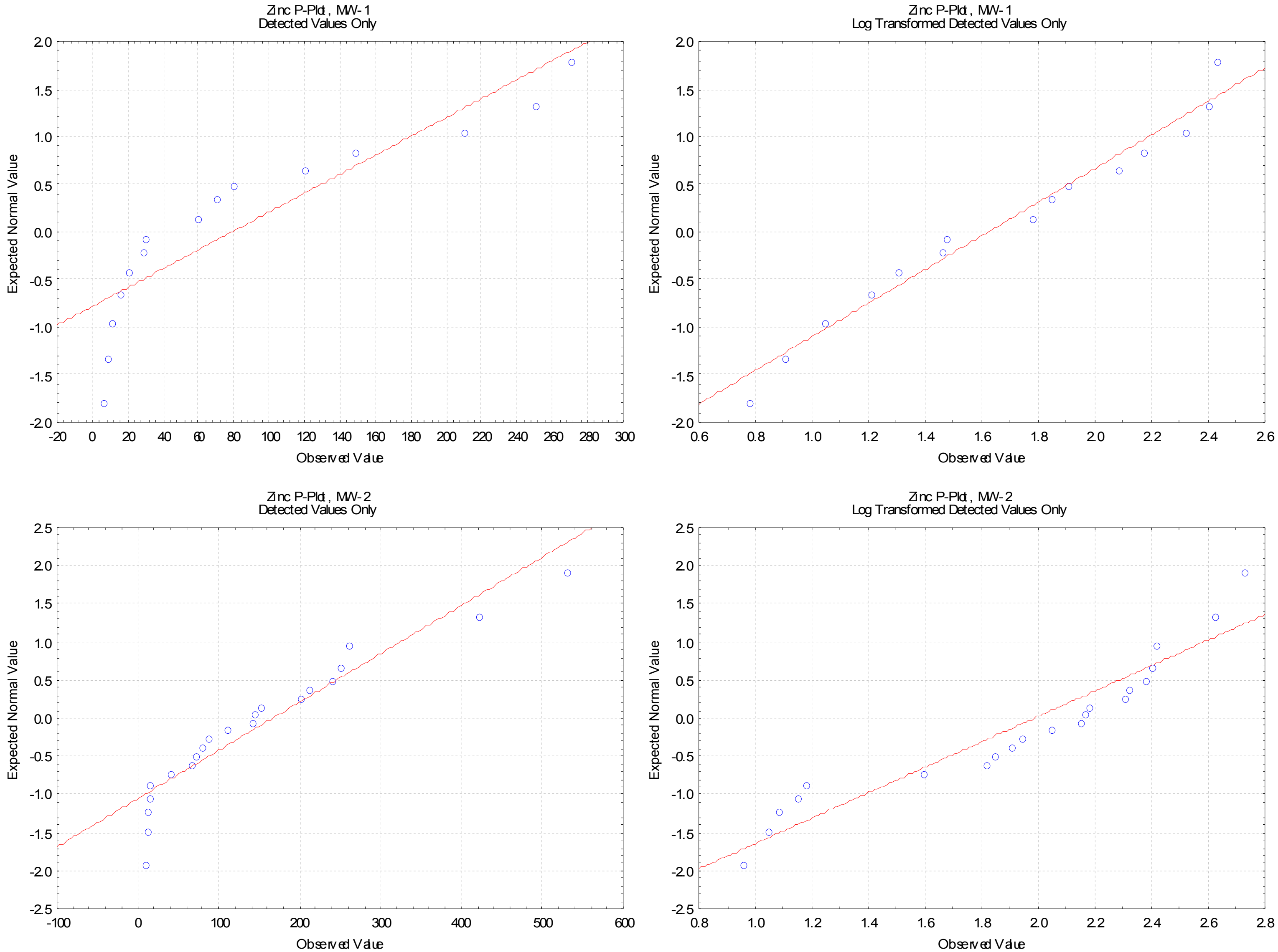


Normal Probability Plots for Uranium (ug/L) in Wells with 15 to 50% Non-Detected Values

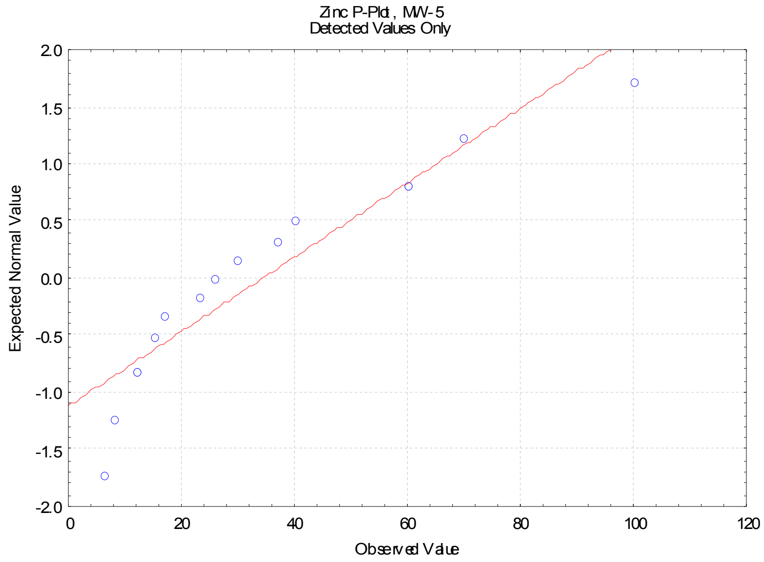


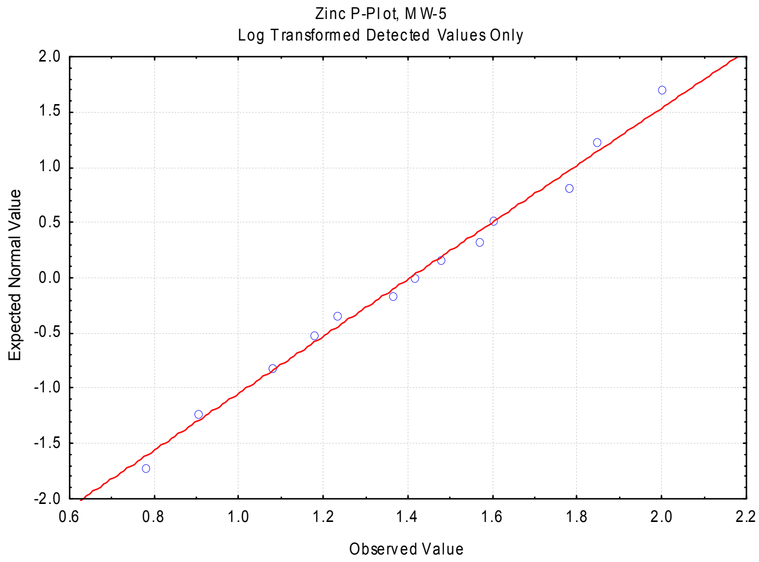


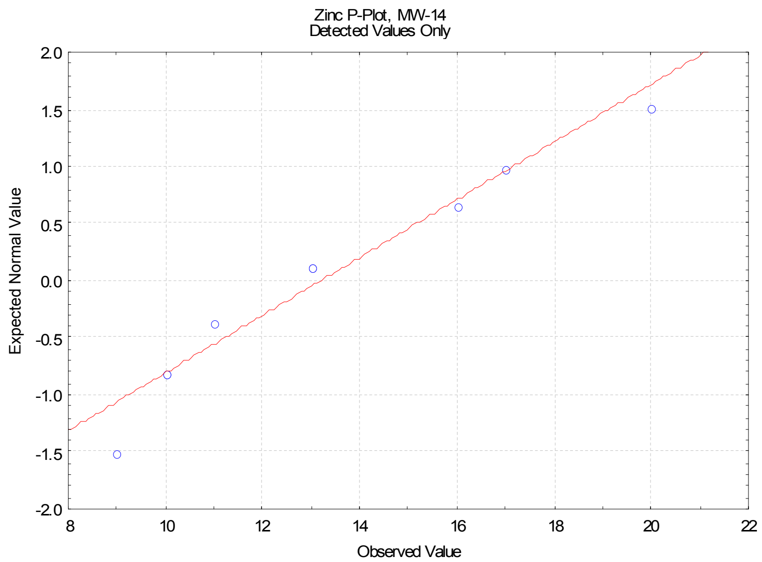
Normal Probability Plots for Zinc (ug/L) in Wells with 15 to 50% Non-Detected Values

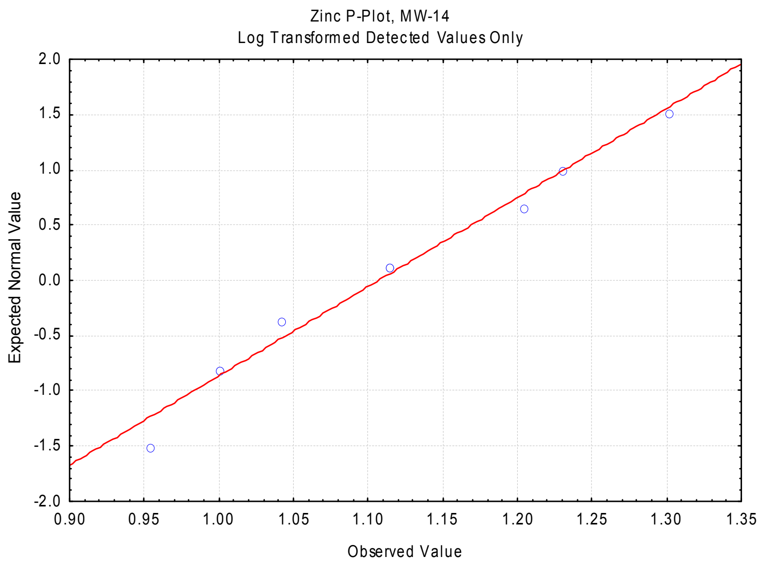


Normal Probability Plots for Zinc (ug/L) in Wells with 15 to 50% Non-Detected Values









APPENDIX F

DATA MODIFIED PRIOR TO STATISTICAL ANALYSIS

Appendix F - Data That Have Been Modified Prior to Statistical Analysis

Well	Date	Analyte	Result	Qualifier*	Units	Final Result	Final Units	Reason Changed
MW-1	3/9/1989	Arsenic	0.15		mg/L	15	ug/L	Off by a factor of 10 from correct data point
MW-5	6/23/2006	Cadmium	50	U	ug/L	0.25	ug/L	Off by a factor of 100 from correct data point
MW-1	2/12/1981	Cadmium	3		ug/L	3	ug/L	Detection limit entered as result when result was not non-detect
MW-5	3/17/1981	Cadmium	15		mg/L	15	ug/L	Units changed from mg/L to ug/L
MW-3	3/18/1981	Cadmium	7		mg/L	7	ug/L	Units changed from mg/L to ug/L
MW-11	6/11/1997	Chloride	29.2		mg/L	29.2	mg/L	U qualifier was removed since it was erroneously added initially
MW-2	9/10/2002	Chloride	10	U	ug/L	5	mg/L	Units changed from ug/L to mg/L
MW-11	3/15/2007	Chloride	31		mg/L	0.031	mg/L	Units changed from mg/L to ug/L
MW-31	3/15/2007	Chloride	132		mg/L	0.132	mg/L	Units changed from mg/L to ug/L
MW-25	6/20/2007	Chloride	31		mg/L	0.031	mg/L	Units changed from mg/L to ug/L
MW-3	9/14/2006	Fluoride	0.4		mg/L	0.4	mg/L	U qualifier was removed since it was erroneously added initially
MW-18	9/9/2002	Vanadium	30	U	mg/L	15	ug/L	Units changed from mg/L to ug/L
MW-17	11/6/1991	Nickel	9		mg/L	9	ug/L	Units changed from mg/L to ug/L
MW-17	9/17/1996	Nickel	0.618		mg/L	0.618	ug/L	Units changed from mg/L to ug/L
MW-23	9/4/2001	Nickel	9		mg/L	9	ug/L	Units changed from mg/L to ug/L
MW-12	10/30/2006	Selenium	23.8		ug/L	23.8	ug/L	U qualifier was removed since it was erroneously added initially
MW-27	3/21/2006	TDS @ 180 C	1010		mg/L	1010	mg/L	U qualifier was removed since it was erroneously added initially
MW-1	5/19/1980	Uranium	4		mg/L	4	ug/L**	Units changed from mg/L to ug/L
MW-1	6/16/1980	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-1	7/16/1980	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-1	8/19/1980	Uranium	2		mg/L	2	ug/L**	Units changed from mg/L to ug/L
MW-1	9/1/1980	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-1	10/1/1980	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-1	11/13/1980	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-1	12/10/1980	Uranium	10		mg/L	10	ug/L**	Units changed from mg/L to ug/L
MW-1	1/22/1981	Uranium	11		mg/L	11	ug/L**	Units changed from mg/L to ug/L
MW-1	2/12/1981	Uranium	5		mg/L	5	ug/L**	Units changed from mg/L to ug/L
MW-1	3/19/1981	Uranium	5		mg/L	5	ug/L**	Units changed from mg/L to ug/L
MW-1	6/18/1981	Uranium	6		mg/L	6	ug/L**	Units changed from mg/L to ug/L
MW-1	9/1/1981	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-1	4/29/1987	Uranium	1.5		mg/L	1.5	ug/L**	Units changed from mg/L to ug/L
MW-1	1/27/1988	Uranium	1.8E-09		pCi/L	2.69	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-1	6/1/1988	Uranium	7E-10		pCi/L	1.04	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-1	11/29/1989	Uranium	2E-10	U	pCi/L	0.15	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-11	4/29/1987	Uranium	0.3		mg/L	0.3	ug/L**	Units changed from mg/L to ug/L
MW-11	1/27/1988	Uranium	2E-10	U	pCi/L	0.15	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-11	6/1/1988	Uranium	5E-10		pCi/L	0.75	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-11	10/31/1989	Uranium	7E-10		pCi/L	1.04	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-11	11/29/1989	Uranium	6E-10		pCi/L	0.9	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-12	4/29/1987	Uranium	10.5		mg/L	10.5	ug/L**	Units changed from mg/L to ug/L
MW-12	1/27/1988	Uranium	8.9E-09		pCi/L	13.28	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-12	6/1/1988	Uranium	1.23E-08		pCi/L	18.36	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-12	10/31/1989	Uranium	9.5E-09		pCi/L	14.18	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-12	11/29/1989	Uranium	5.6E-09		pCi/L	8.36	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-14	10/31/1989	Uranium	3.90E-08		pCi/L	58.21	ug/L	Units reported as pCi/L when they were in uCi/mL

Appendix F - Data That Have Been Modified Prior to Statistical Analysis

Well	Date	Analyte	Result	Qualifier*	Units	Final Result	Final Units	Reason Changed
MW-14	11/29/1989	Uranium	2.70E-08		pCi/L	40.3	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-14	9/10/2002	Chloride	18.4		mg/L	18.1	mg/L	Value found to be correct at 18.1, not at 18.4 as initially listed
MW-15	10/31/1989	Uranium	3.80E-08		pCi/L	56.72	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-2	5/19/1980	Uranium	10		mg/L	10	ug/L**	Units changed from mg/L to ug/L
MW-2	6/16/1980	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-2	7/16/1980	Uranium	14		mg/L	14	ug/L**	Units changed from mg/L to ug/L
MW-2	8/19/1980	Uranium	4		mg/L	4	ug/L**	Units changed from mg/L to ug/L
MW-2	9/1/1980	Uranium	67		mg/L	67	ug/L**	Units changed from mg/L to ug/L
MW-2	10/1/1980	Uranium	5		ppm	5	ug/L**	ppm unit assumed mass, then converted into ppb or ug/L
MW-2	11/13/1980	Uranium	8		ppm	8	ug/L**	ppm unit assumed mass, then converted into ppb or ug/L
MW-2	12/10/1980	Uranium	18		ppm	18	ug/L**	ppm unit assumed mass, then converted into ppb or ug/L
MW-2	1/22/1981	Uranium	17		mg/L	17	ug/L**	Units changed from mg/L to ug/L
MW-2	2/11/1981	Uranium	9		mg/L	9	ug/L**	Units changed from mg/L to ug/L
MW-2	6/24/1981	Uranium	15		mg/L	15	ug/L**	Units changed from mg/L to ug/L
MW-2	6/24/1981	Uranium	18		mg/L	18	ug/L**	Units changed from mg/L to ug/L
MW-2	9/1/1981	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-2	12/4/1984	Uranium	-4.71E-10		uCi/mL	0.7	ug/L	Value was changed from negative to positive
MW-2	4/29/1987	Uranium	3.1		mg/L	3.1	ug/L**	Units changed from mg/L to ug/L
MW-2	1/27/1988	Uranium	4.1E-09		pCi/L	6.12	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-2	6/1/1988	Uranium	4.7E-09		pCi/L	7.01	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-2	11/29/1989	Uranium	9.5E-09		pCi/L	14.18	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-2	2/27/1991	Uranium	35		pCi/L	5.22	ug/L	Off by a factor of 10 from correct data point
MW-3	5/19/1980	Uranium	15		mg/L	15	ug/L**	Units changed from mg/L to ug/L
MW-3	6/16/1980	Uranium	18		mg/L	18	ug/L**	Units changed from mg/L to ug/L
MW-3	7/16/1980	Uranium	21		mg/L	21	ug/L**	Units changed from mg/L to ug/L
MW-3	8/19/1980	Uranium	4		mg/L	4	ug/L**	Units changed from mg/L to ug/L
MW-3	9/1/1980	Uranium	21		mg/L	21	ug/L**	Units changed from mg/L to ug/L
MW-3	10/1/1980	Uranium	3		mg/L	3	ug/L**	Units changed from mg/L to ug/L
MW-3	11/11/1980	Uranium	9		mg/L	9	ug/L**	Units changed from mg/L to ug/L
MW-3	12/10/1980	Uranium	23		mg/L	23	ug/L**	Units changed from mg/L to ug/L
MW-3	1/22/1981	Uranium	13		mg/L	13	ug/L**	Units changed from mg/L to ug/L
MW-3	2/12/1981	Uranium	7		mg/L	7	ug/L**	Units changed from mg/L to ug/L
MW-3	3/18/1981	Uranium	32		mg/L	32	ug/L**	Units changed from mg/L to ug/L
MW-3	4/13/1981	Uranium	15		mg/L	15	ug/L**	Units changed from mg/L to ug/L
MW-3	6/24/1981	Uranium	18		mg/L	18	ug/L**	Units changed from mg/L to ug/L
MW-3	9/1/1981	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-3	4/29/1987	Uranium	12.6		mg/L	12.6	ug/L**	Units changed from mg/L to ug/L
MW-3	1/27/1988	Uranium	2.00E-08		pCi/L	29.85	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-3	6/1/1988	Uranium	1.84E-08		pCi/L	27.46	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-3	8/18/1994	Uranium	1.47E-08		mg/L	21.94	ug/L	Units changed from mg/L to uCi/mL
MW-5	5/19/1980	Uranium	8		mg/L	8	ug/L**	Units changed from mg/L to ug/L
MW-5	6/16/1980	Uranium	8		mg/L	8	ug/L**	Units changed from mg/L to ug/L
MW-5	7/16/1980	Uranium	8		mg/L	8	ug/L**	Units changed from mg/L to ug/L
MW-5	8/19/1980	Uranium	10		mg/L	10	ug/L**	Units changed from mg/L to ug/L
MW-5	9/1/1980	Uranium	8		mg/L	8	ug/L**	Units changed from mg/L to ug/L
MW-5	10/1/1980	Uranium	8		mg/L	8	ug/L**	Units changed from mg/L to ug/L
MW-5	11/11/1980	Uranium	1		mg/L	1	ug/L**	Units changed from mg/L to ug/L
MW-5	12/9/1980	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-5	1/22/1981	Uranium	13		mg/L	13	ug/L**	Units changed from mg/L to ug/L
MW-5	2/11/1981	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-5	3/17/1981	Uranium	30		mg/L	30	ug/L**	Units changed from mg/L to ug/L
MW-5	6/18/1981	Uranium	12		mg/L	12	ug/L**	Units changed from mg/L to ug/L

Well	Date	Analyte	Result	Qualifier*	Units	Final Result	Final Units	Reason Changed
MW-5	6/18/1981	Uranium	14		mg/L	14	ug/L**	Units changed from mg/L to ug/L
MW-5	9/1/1981	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-5	9/1/1981	Uranium	1	U	mg/L	0.5	ug/L**	Units changed from mg/L to ug/L
MW-5	12/4/1984	Uranium	-4.71E-10		uCi/mL	0.7	ug/L	Value was changed from negative to positive
MW-5	4/29/1987	Uranium	0.9		mg/L	0.9	ug/L**	Units changed from mg/L to ug/L
MW-5	1/27/1988	Uranium	1.00E-09		pCi/L	1.49	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	6/1/1988	Uranium	9E-10		pCi/L	1.34	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	10/31/1989	Uranium	3E-10		pCi/L	0.45	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	11/29/1989	Uranium	4E-10		pCi/L	0.6	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	11/17/1992	Uranium	6.77E-10		pCi/L	1.01	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	12/9/1992	Uranium	2.03E-10		pCi/L	0.3	ug/L	Units reported as pCi/L when they were in uCi/mL
MW-5	1/8/1998	Uranium	0.0007		ug/L	0.7	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)
MW-5	3/16/1998	Uranium	0.0006		ug/L	0.6	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)
MW-5	5/12/1998	Uranium	0.0012		ug/L	1.2	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)
MW-5	9/24/1998	Uranium	0.0019		ug/L	1.9	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)
MW-5	11/3/1998	Uranium	0.0007		ug/L	0.7	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)
MW-5	6/6/2000	Uranium	0.0004		ug/L	0.4	ug/L	Original data units changed from ug/L to mg/L (then to ug/L for analysis)

Notes:

* - The value corresponding to half of the detection limit was used in analyses where a "U" qualifier was listed in the lab report

** - For these Uranium points, the conversion yielded results significantly higher than the data range for its respective well.
For example, in MW-5 on 8/19/80, the Uranium value was 10 mg/L. When converted to ug/L, the value becomes 10,000 ug/L. Values such as these were then assumed to have been erroneously entered in the original database and/or mis-labeled in the lab results, and the mg/L unit was changed to ug/L, the final unit used for analysis. See also the non-detect values ("U" qualifier) for Uranium with this note (i.e. the detection limit for Uranium is not 1 mg/L or 1,000 ug/L, such as in MW-5 on 9/1/81)

ug/L - micrograms per liter
mg/L - milligrams per liter
pCi/L - picocuries per liter
uCi/mL - microcuries per milliliter

To convert Uranium values in pCi/L to ug/L, the value was divided by 0.67.
To convert from uCi/mL to pCi/L, the value is multiplied by $1x10^{9}$