U.S. Army Corps
of Engineers

FINAL VERSION 1

TECHNICAL MEMORANDUM
GROUNDWATER BACKGROUND EVALUATION
FOR
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Contract No. W9126G-12-D-0027
Task Order No. 0002

Prepared for:
U.S. Army Corps of Engineers
Fort Worth District
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September 2014

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14. ABSTRACT

This Technical Memorandum describes the development of background threshold values (BTVs) for naturally occurring chemical constituents in groundwater in the alluvial and bedrock aquifers at the Fort Wingate Depot Activity (FWDA). Groundwater analytical results for dissolved metals, total metals, perchlorate, nitrate, nitrite, and polynuclear aromatic hydrocarbons are included in the background evaluation. Groundwater analytical results from 2012 through 2013 were included in the evaluation for the Alluvial Aquifer; analytical results from 2007 to 2013 were included for the Bedrock Aquifer.

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Background evaluation. groundwater, Fort Wingate Depot Activity, dissolved metals, total metals, perchlorate, nitrate, nitrite, polynuclear aromatic hydrocarbons

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GROUNDWATER BACKGROUND EVALUATION
FOR
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MCKINLEY COUNTY, NEW MEXICO

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Prepared for:
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BIA = Bureau of Indian Affairs
NRO = Navajo Regional Office
DECSM = Division of Environmental, Cultural, and Safety Management
BRACD = United States Army Base Realignment and Closure Division
FWDA = Fort Wingate Depot Activity
ARM = Administrative Records Manager
BEC = Base Realignment and Closure Environmental Coordinator
EIMS = Environmental Information Management System
NMED = New Mexico Environment Department
HWB = Hazardous Waste Bureau
USACE = United States Army Corps of Engineers
SPA = Albuquerque District
SFW = Fort Worth District
USEPA = United Stated Environmental Protection Agency

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TECHNICAL MEMORANDUM CH2MHILL

Groundwater Background Evaluation for Fort Wingate Depot Activity

PREPARED FOR:	U.S. Army Corps of Engineers, Fort Worth District
PREPARED BY:	CH2M HILL/Sundance Consulting
DATE:	September 9, 2014
PROJECT NUMBER:	481737.02.17.03

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Acronyms and Abbreviations

BTV	background threshold value
FWDA	Fort Wingate Depot Activity
MLE	maximum-likelihood estimate
ROS	regression on order statistics
USEPA	U.S. Environmental Protection Agency
UTL	upper tolerance limit

1.0 Introduction

This technical memorandum describes the development of background threshold values (BTVs) for naturally occurring chemical constituents in groundwater in the alluvial and bedrock aquifers at Fort Wingate Depot Activity (FWDA). The BTVs were calculated based on groundwater laboratory analytical data collected from approved background wells for the groundwater monitoring program at the FWDA. The background wells used in the analysis were selected by CH2M HILL and approved for use in the evaluation by the U.S. Army Corps of Engineers, Fort Worth District. The approved background wells are alluvial aquifer wells BGMW01, BGMW02, BGMW03, FW31, TMW25, TMW26, TMW27, and TMW28, (Figure 1) and bedrock wells TMW17 and TMW19 (Figure 2). The methodology utilized in this evaluation is primarily from the framework provided in the ProUCL Technical Guide (U.S. Environmental Protection Agency [USEPA], 2010). The statistical methods used in the evaluation are summarized in Table 1.

The groundwater analytical results for dissolved metals, total metals, perchlorate, nitrate, nitrite, and polynuclear aromatic hydrocarbons are included in the background evaluation. The full complement of groundwater analytical results for the alluvial aquifer background wells is only available for the period of 2012 through 2013, so this evaluation focuses on data from 32 results in that period. The 32 sample results used in the evaluation for the alluvial aquifer were derived from the eight background locations, sampled at a frequency of two times per year, for a period of two years. A full complement of groundwater analytical results from the two bedrock wells is available for a longer period, resulting in a greater number of results from each well for BTV calculations, so this evaluation focuses on data from 24 results in the period of 2007 through 2013. The 24 sample results used in the evaluation for the bedrock aquifer were derived from the two background locations, sampled at a frequency of two times per year, for a period of six years.

Duplicate results (for a given well, constituent, and event) were present in the data set. The statistical analyses performed on the data, such as development of BTVs, depend on an assumption of independent data, so each set of duplicates were reconciled to a single value. When the duplicates contained both detect and nondetect results, the nondetect results were excluded. When multiple detect or nondetect results were available, the lower of the two values was chosen in deference to a conservative background data set.

The evaluation of the groundwater background data includes the following:

- A trend evaluation (by well) to determine if concentrations at the background wells are relatively constant
- An outlier evaluation to identify elevated results that should be excluded to preserve a defensible background data set
- The development of BTVs for the purpose of comparing individual groundwater results to determine if those results are consistent with background values

2.0 Trend Evaluation

Although a trend can be evaluated by exploring the slope of a linear regression line, defensible statements of confidence depend on a making a valid distributional assumption inhibits routine application of the test. The Mann-Kendall trend evaluation is is one of the commonly used trend analysis methods for environmental data largely because it is a nonparametric method, so there are no distributional assumptions, missing data values (nondetects) are easily handled through assignment of a common value less than detected values, and irregularly spaced sampling intervals are permitted (Gilbert, 1987; Gibbons, 1994, USEPA, 2006). The Mann-Kendall evaluation can be viewed as a nonparametric test for a zero slope in the linear regression of time-ordered data versus time. This test was performed with a standard significance level of 0.05 (that is, cases with calculated probabilities less than 0.05 were concluded to be significant).

The results of this trend evaluation for groundwater data from the FWDA are presented in Table 2. Of the 560 trend evaluations performed, 17 evaluations (3.0 percent) were significantly decreasing and 9 evaluations (1.6 percent) were significantly increasing. The rest of the trend evaluations were concluded to have no significant change. Because a significance level of 0.05 was used, approximately 5 percent false indications of significant decreases and approximately 5 percent false indications of significant increases would be expected. Thus, the 3.0 percent and 1.6 percent rates represent expected levels for a data set with virtually no temporal trend. A Mann-Kendall evaluation of such a large number of cases without a small percentage of significant decreases or increases would be a signal of faulty calculations. Thus, the chosen background data represents a temporally stable population for the time intervals being used.

3.0 Outlier Evaluation

Outliers are extremely elevated measurements that are sometimes referred to as “spurious” data because they are mathematically divergent from the main population of data. Outliers may arise from matrix interferences or errors in transcription, sampling technique, data coding, analytical methods, or instrument calibration.

3.1 Identification of Mathematical Outliers

Identification as a mathematical outlier does not necessarily mean that an elevated value is inappropriate for the background data set. Such values may be legitimate members of the upper tail of the background distribution. Nevertheless, to maintain a conservative background data set, outliers were reviewed for potential exclusion from background calculations.

For 25 or fewer results for a specific constituent, Dixon’s test was applied to the data; for larger numbers of results, Rosner’s test was applied to the data (USEPA, 2006). These tests were applied sequentially to the highest value, second highest value, and so on to include a search for multiple outliers. This approach was used because with multiple outliers, a given extreme value may be masked by another, slightly lower outlier and initially be found not to be a mathematical outlier. However, when testing for multiple outliers, multiple clustered values can be identified as outliers.

Both Dixon’s and Rosner’s tests are based on an assumption of normality for those concentrations remaining after each potential mathematical outlier is excluded. This is a standard approach, but leads to false identification of a suspect member of the population when that population is positively skewed. For this reason, a second outlier test was performed whereby the data were transformed in an effort to improve adherence to normality (USEPA, 2006). By themselves, elevated outliers can promote a false indication of a skewed population, but the normality testing applied here is directed to the results after exclusion of each potential outlier. Neither the original identification as an outlier (using raw data) nor this subsequent evaluation (using potential transformations) was treated as a definitive tool for excluding results. However, both are reported to increase the amount of information available for outlier decisions.

In the subsequent evaluation, the data were transformed using each of three transformations: square root transformation, cubic root transformation, and natural logarithmic transformation. The logarithmic transformation is a standard transformation in environmental applications, while the square root and cubic root offer options appropriate for intermediate levels of skewness in a data set. The Shapiro-Wilk test for normality was applied to the untransformed data and three sets of transformed data to determine which provided the best adherence to normality with the remaining concentrations (Gilbert, 1987; USEPA, 2006).

The outcomes of these outlier tests are presented in Table 3. In addition to the outlier test decisions, this table lists the percent difference between a potential outlier and the next highest value. When outliers are present in clusters (multiple points that have similar concentration that are elevated above all other concentrations), this value can be quite small. It is offered as an additional piece of information and not as a numerical value that definitively drives outlier decisions.

3.2 Visual Inspection of Outliers

Observational data of the groundwater analytical results indicate that wells BGMW03 and FW31 often produce groundwater samples with high suspended solids and may demonstrate poor well development. The results from these wells are considered valid, but for the outlier evaluation, mathematical outliers from these wells were excluded in the interest of a conservative background data set.

In some cases, a cluster of elevated results exist for different sampling events from a single well.One example is the set of four mathematical outliers for dissolved barium, each of which was measured from well TMW27. When such a cluster was noted (as opposed to the outliers representing a more random contribution from multiple wells), those mathematical outliers were excluded, again in the interest of a conservative background data set.

Other mathematical outliers were evaluated using a combined inspection of Table 3 and probability plots presented for each detected constituent. Figures 3 and 4 present normal probability plots for the data from the alluvial and bedrock wells, respectively. These plots compare the measured concentrations to the expected concentrations if the data are normally distributed. (The data points tend to form straight lines when the data resemble a normal distribution.) While these probability plots can be helpful in understanding whether the data should be considered normally distributed or not, that role can be easily fulfilled by formal distributional tests during the calculation of the BTVs. For outlier inspection, these distribution tests serve primarily as a visual check of how elevated values compare with the lower values in a given sample population.

3.3 Outliers Identified for Exclusion

Professional review of the information in Table 3 and the probability plots resulted in the decisions provided in Table 3. The mathematical outliers excluded from calculation of the background threshold values are indicated in this table along with a footnote of why the outlier was excluded. These excluded values are indicated by red X’s on the probability plots (Figures 3 and 4).

4.0 Calculation of Background Threshold Values

The primary statistic used to calculate the BTVs in this report was a 95 percent upper confidence limit of the 95th percentile, known as a 95/95 upper tolerance limit (UTL). These 95/95 UTLs, were calculated using either a nonparametric (no distributional assumption) approach when evidence for a particular distribution was not available or using a distributional assumption (when deemed appropriate for the approved background data). The distribution possibilities included those computed by the USEPA's ProUCL software: the normal, lognormal, and gamma distributions (USEPA, 2010).

When fewer than 50 percent detections were available (or at least 50 percent of the results were detected, but no discernible distribution was available), a nonparametric approach was used to calculate the UTL. When all results were detected, a nonparametric UTL, based on ranks of the data was applied. The Kaplan-Meier approach was applied as the nonparametric method when at least one of the results was nondetect. The Kaplan-Meier method offers nonparametric estimates of summary statistics when a portion of the data includes nondetects (USEPA, 2010). Such data is known as censored data since some of the data lacks actual numerical values. Although the original development of this technique was to deal with right-censored survival data (where some of the censored data was known to be high or on the right side of the distribution) it has been pursued in recent years to handle left-censored data (such as data sets including nondetect censored data known to be on the low or left side of the distribution).

When at least 60 percent of the results were detected, the distributions that appeared most appropriate based on ProUCL's distributional checks were used to calculate the UTL. In these cases, when data include nondetects, ProUCL algorithms seek to offer statistical estimates using maximum-likelihood-estimate (MLE) or the assignment of proxy values for the nondetects such as regression on order statistics (ROS) techniques.

UTLs were calculated whenever at least four detected values were available. When fewer than four detections were available, the BTV was assigned the maximum detected value.

Summary statistics including the BTVs and other statistics (for example, percent detects, minimum and maximum values, qualifying flag [if any] for the maximum detected result, etc.) are presented in Table 4. These BTVs are recommended for comparison with individual well concentrations to determine whether those concentrations are consistent with background.

5.0 Conclusions

Groundwater analytical results were statistically evaluated to determine background concentrations following USEPA methodologies. The BTVs were calculated for dissolved metals, total metals, perchlorate, nitrate, nitrite, and polynuclear aromatic hydrocarbons. The BTVs can be used to compare groundwater analytical results from FWDA monitoring wells to determine if anthropogenic contamination is present in the groundwater.

6.0 References

Gibbons, Robert D., 1994. *Statistical Methods for Groundwater Monitoring*. John Wiley & Sons: New York, New York.

Gilbert, Richard O., 1987. *Statistical Methods for Environmental Pollution Monitoring*. Van Nostrand Reinhold Company: New York, New York.

United States Environmental Protection Agency (USEPA), 2006. *Data Quality Assessment: Statistical Methods for Practitioners*. Office of Environmental Information: Washington, DC.

United States Environmental Protection Agency (USEPA), 2010. *ProUCL Version 4.1 Technical Guide*, Draft. Office of Research and Development: Washington, DC.

TABLE 1
Summary of Statistical Methods used in the FWDA Groundwater Background Evaluation

Trend Evaluation	
Mann-Kendall Trend Test	Nonparametric test for linear trend. Concludes whether a significantly increasing or decreasing trend exists in the data.
Outlier Evaluation	
Mathematical Outlier Tests	Dixon's test was used to test for statistical outliers when the sample size is less than or equal to 25. Rosner's test was used when the sample size was greater than 25. Both tests rely on an assumption of normality for the result(s) remaining after hypothetical removal of the result being tested as an outlier.
Transformations	Three transformations were considered in attempts to improve adherence to normality (as measured using the Shapiro-Wilk test) for the results used in Dixon's and Rosner's test. These included the square root transformation, the cubic root transformation, and the log transformation.
Probability Plot	Graphical presentation of adherence to a normal distribution. For outlier evaluation they provide a visual inspection of extreme values relative to other values in the data set.
Calculation of BTVs	
95/95 Upper Tolerance Limit (UTL)	95% upper confidence bounds on the 95th percentile of the background population.
Parametric UTLs	UTLs developed using perceived adherence to a statistical distribution (.e.g. normal, gamma, or lognormal)
Nonparametric UTLs	UTLs developed without adherence to a statistical distribution. When all results are detects this is typically a rank-based decision. When nondetects are present, this is typically pursued using a Kaplan-Meier approach.
Managing Nondetects	Techniques used to manage nondetects when calculating UTLS from a single distribution include: Regression on Order Statistics, Maximum Likelihood Estimates, and Kaplan Meier. Simple substitution (e.g. ½ the limit of detection) are typically avoided in favor of these other techniques.
Regression on Order Statistics	Estimates of summary statistics based upon the perceived adherence to a statistical distribution when a portion of the data includes nondetects. For the group of nondetects multiple values are calculated without an association between each value and any given sample.
Maximum Likelihood Estimates	Estimates of summary statistics based upon the perceived adherence to a statistical distribution when a portion of the data includes nondetects without assigning individual proxies for the nondetects.
Kaplan Meier	This technique nonparametric estimates of summary statistics when a portion of the data includes nondetects without assigning individual proxies for the nondetects.
Maximum Detect	Using the maximum detect as a BTV is often similar to providing the maximum detect as a nonparametric UTL, but occasionally it is chosen when data is particularly limited (e.g. < 4 detects) and the resulting BTV is not considered a calculated UTL.

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	BGMW01	2-Chloronaphthalene	0.625	No Significant Change
Alluvial	BGMW02	2-Chloronaphthalene	0.625	No Significant Change
Alluvial	BGMW03	2-Chloronaphthalene	0.625	No Significant Change
Alluvial	BGMW01	2-Methylnaphthalene	0.625	No Significant Change
Alluvial	BGMW02	2-Methylnaphthalene	0.625	No Significant Change
Alluvial	BGMW03	2-Methylnaphthalene	0.625	No Significant Change
Alluvial	BGMW01	Acenaphthene	0.625	No Significant Change
Alluvial	BGMW02	Acenaphthene	0.625	No Significant Change
Alluvial	BGMW03	Acenaphthene	0.625	No Significant Change
Alluvial	BGMW01	Acenaphthylene	0.625	No Significant Change
Alluvial	BGMW02	Acenaphthylene	0.625	No Significant Change
Alluvial	BGMW03	Acenaphthylene	0.625	No Significant Change
Alluvial	BGMW01	Aluminum, Dissolved	0.235	No Significant Change
Alluvial	BGMW02	Aluminum, Dissolved	0.186	No Significant Change
Alluvial	BGMW03	Aluminum, Dissolved	0.375	No Significant Change
Alluvial	FW31	Aluminum, Dissolved	0.167	No Significant Change
Alluvial	TMW25	Aluminum, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Aluminum, Dissolved	0.367	No Significant Change
Alluvial	TMW27	Aluminum, Dissolved	0.186	No Significant Change
Alluvial	TMW28	Aluminum, Dissolved	0.186	No Significant Change
Alluvial	BGMW01	Aluminum, Total	0.625	No Significant Change
Alluvial	BGMW02	Aluminum, Total	0.625	No Significant Change
Alluvial	BGMW03	Aluminum, Total	0.375	No Significant Change
Alluvial	FW31	Aluminum, Total	0.375	No Significant Change
Alluvial	TMW25	Aluminum, Total	0.235	No Significant Change
Alluvial	TMW26	Aluminum, Total	0.375	No Significant Change
Alluvial	TMW27	Aluminum, Total	0.625	No Significant Change
Alluvial	TMW28	Aluminum, Total	0.500	No Significant Change
Alluvial	BGMW01	Anthracene	0.625	No Significant Change
Alluvial	BGMW02	Anthracene	0.625	No Significant Change
Alluvial	BGMW03	Anthracene	0.625	No Significant Change
Alluvial	BGMW01	Antimony, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Antimony, Dissolved	0.500	No Significant Change
Alluvial	BGMW03	Antimony, Dissolved	0.271	No Significant Change
Alluvial	FW31	Antimony, Dissolved	0.186	No Significant Change
Alluvial	TMW25	Antimony, Dissolved	0.186	No Significant Change
Alluvial	TMW26	Antimony, Dissolved	0.271	No Significant Change
Alluvial	TMW27	Antimony, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Antimony, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Antimony, Total	0.625	No Significant Change
Alluvial	BGMW02	Antimony, Total	0.625	No Significant Change
Alluvial	BGMW03	Antimony, Total	0.500	No Significant Change
Alluvial	FW31	Antimony, Total	0.186	No Significant Change
Alluvial	TMW25	Antimony, Total	0.625	No Significant Change
Alluvial	TMW26	Antimony, Total	0.367	No Significant Change
Alluvial	TMW27	Antimony, Total	0.186	No Significant Change
Alluvial	TMW28	Antimony, Total	0.186	No Significant Change
Alluvial	BGMW01	Arsenic, Dissolved	0.154	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	BGMW02	Arsenic, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Arsenic, Dissolved	0.154	No Significant Change
Alluvial	FW31	Arsenic, Dissolved	0.375	No Significant Change
Alluvial	TMW25	Arsenic, Dissolved	0.074	No Significant Change
Alluvial	TMW26	Arsenic, Dissolved	0.045	Significantly Decreasing
Alluvial	TMW27	Arsenic, Dissolved	0.186	No Significant Change
Alluvial	TMW28	Arsenic, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Arsenic, Total	0.154	No Significant Change
Alluvial	BGMW02	Arsenic, Total	0.154	No Significant Change
Alluvial	BGMW03	Arsenic, Total	0.154	No Significant Change
Alluvial	FW31	Arsenic, Total	0.375	No Significant Change
Alluvial	TMW25	Arsenic, Total	0.045	Significantly Decreasing
Alluvial	TMW26	Arsenic, Total	0.367	No Significant Change
Alluvial	TMW27	Arsenic, Total	0.271	No Significant Change
Alluvial	TMW28	Arsenic, Total	0.625	No Significant Change
Alluvial	BGMW01	Barium, Dissolved	0.154	No Significant Change
Alluvial	BGMW02	Barium, Dissolved	0.367	No Significant Change
Alluvial	BGMW03	Barium, Dissolved	0.375	No Significant Change
Alluvial	FW31	Barium, Dissolved	0.500	No Significant Change
Alluvial	TMW25	Barium, Dissolved	0.500	No Significant Change
Alluvial	TMW26	Barium, Dissolved	0.625	No Significant Change
Alluvial	TMW27	Barium, Dissolved	0.375	No Significant Change
Alluvial	TMW28	Barium, Dissolved	0.375	No Significant Change
Alluvial	BGMW01	Barium, Total	0.235	No Significant Change
Alluvial	BGMW02	Barium, Total	0.271	No Significant Change
Alluvial	BGMW03	Barium, Total	0.375	No Significant Change
Alluvial	FW31	Barium, Total	0.375	No Significant Change
Alluvial	TMW25	Barium, Total	0.500	No Significant Change
Alluvial	TMW26	Barium, Total	0.375	No Significant Change
Alluvial	TMW27	Barium, Total	0.625	No Significant Change
Alluvial	TMW28	Barium, Total	0.500	No Significant Change
Alluvial	BGMW01	Benzo(a)anthracene	0.625	No Significant Change
Alluvial	BGMW02	Benzo(a)anthracene	0.625	No Significant Change
Alluvial	BGMW03	Benzo(a)anthracene	0.625	No Significant Change
Alluvial	BGMW01	Benzo(a)pyrene	0.625	No Significant Change
Alluvial	BGMW02	Benzo(a)pyrene	0.625	No Significant Change
Alluvial	BGMW03	Benzo(a)pyrene	0.625	No Significant Change
Alluvial	BGMW01	Benzo(b)fluoranthene	0.625	No Significant Change
Alluvial	BGMW02	Benzo(b)fluoranthene	0.625	No Significant Change
Alluvial	BGMW03	Benzo(b)fluoranthene	0.625	No Significant Change
Alluvial	BGMW01	Benzo(g,h,i)perylene	0.625	No Significant Change
Alluvial	BGMW02	Benzo(g,h,i)perylene	0.625	No Significant Change
Alluvial	BGMW03	Benzo(g,h,i)perylene	0.625	No Significant Change
Alluvial	BGMW01	Benzo(k)fluoranthene	0.625	No Significant Change
Alluvial	BGMW02	Benzo(k)fluoranthene	0.625	No Significant Change
Alluvial	BGMW03	Benzo(k)fluoranthene	0.625	No Significant Change
Alluvial	BGMW01	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Beryllium, Dissolved	0.500	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	BGMW03	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	FW31	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	TMW27	Beryllium, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Beryllium, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Beryllium, Total	0.625	No Significant Change
Alluvial	BGMW02	Beryllium, Total	0.625	No Significant Change
Alluvial	BGMW03	Beryllium, Total	0.375	No Significant Change
Alluvial	FW31	Beryllium, Total	0.271	No Significant Change
Alluvial	TMW25	Beryllium, Total	0.625	No Significant Change
Alluvial	TMW26	Beryllium, Total	0.500	No Significant Change
Alluvial	TMW27	Beryllium, Total	0.625	No Significant Change
Alluvial	TMW28	Beryllium, Total	0.271	No Significant Change
Alluvial	BGMW01	Cadmium, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Cadmium, Dissolved	0.500	No Significant Change
Alluvial	BGMW03	Cadmium, Dissolved	0.625	No Significant Change
Alluvial	FW31	Cadmium, Dissolved	0.186	No Significant Change
Alluvial	TMW25	Cadmium, Dissolved	0.186	No Significant Change
Alluvial	TMW26	Cadmium, Dissolved	0.625	No Significant Change
Alluvial	TMW27	Cadmium, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Cadmium, Dissolved	0.625	No Significant Change
Alluvial	BGMW01	Cadmium, Total	0.186	No Significant Change
Alluvial	BGMW02	Cadmium, Total	0.625	No Significant Change
Alluvial	BGMW03	Cadmium, Total	0.500	No Significant Change
Alluvial	FW31	Cadmium, Total	0.500	No Significant Change
Alluvial	TMW25	Cadmium, Total	0.625	No Significant Change
Alluvial	TMW26	Cadmium, Total	0.500	No Significant Change
Alluvial	TMW27	Cadmium, Total	0.625	No Significant Change
Alluvial	TMW28	Cadmium, Total	0.625	No Significant Change
Alluvial	BGMW01	Calcium, Dissolved	0.367	No Significant Change
Alluvial	BGMW02	Calcium, Dissolved	0.154	No Significant Change
Alluvial	BGMW03	Calcium, Dissolved	0.167	No Significant Change
Alluvial	FW31	Calcium, Dissolved	0.167	No Significant Change
Alluvial	TMW25	Calcium, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Calcium, Dissolved	0.375	No Significant Change
Alluvial	TMW27	Calcium, Dissolved	0.500	No Significant Change
Alluvial	TMW28	Calcium, Dissolved	0.167	No Significant Change
Alluvial	BGMW01	Calcium, Total	0.154	No Significant Change
Alluvial	BGMW02	Calcium, Total	0.074	No Significant Change
Alluvial	BGMW03	Calcium, Total	0.375	No Significant Change
Alluvial	FW31	Calcium, Total	0.625	No Significant Change
Alluvial	TMW25	Calcium, Total	0.625	No Significant Change
Alluvial	TMW26	Calcium, Total	0.167	No Significant Change
Alluvial	TMW27	Calcium, Total	0.235	No Significant Change
Alluvial	TMW28	Calcium, Total	0.625	No Significant Change
Alluvial	BGMW01	Chromium, Dissolved	0.186	No Significant Change
Alluvial	BGMW02	Chromium, Dissolved	0.074	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	BGMW03	Chromium, Dissolved	0.154	No Significant Change
Alluvial	FW31	Chromium, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Chromium, Dissolved	0.186	No Significant Change
Alluvial	TMW26	Chromium, Dissolved	0.074	No Significant Change
Alluvial	TMW27	Chromium, Dissolved	0.186	No Significant Change
Alluvial	TMW28	Chromium, Dissolved	0.186	No Significant Change
Alluvial	BGMW01	Chromium, Total	0.186	No Significant Change
Alluvial	BGMW02	Chromium, Total	0.235	No Significant Change
Alluvial	BGMW03	Chromium, Total	0.500	No Significant Change
Alluvial	FW31	Chromium, Total	0.167	No Significant Change
Alluvial	TMW25	Chromium, Total	0.186	No Significant Change
Alluvial	TMW26	Chromium, Total	0.375	No Significant Change
Alluvial	TMW27	Chromium, Total	0.625	No Significant Change
Alluvial	TMW28	Chromium, Total	0.186	No Significant Change
Alluvial	BGMW01	Chrysene	0.625	No Significant Change
Alluvial	BGMW02	Chrysene	0.625	No Significant Change
Alluvial	BGMW03	Chrysene	0.625	No Significant Change
Alluvial	BGMW01	Cobalt, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Cobalt, Dissolved	0.367	No Significant Change
Alluvial	BGMW03	Cobalt, Dissolved	0.367	No Significant Change
Alluvial	FW31	Cobalt, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Cobalt, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Cobalt, Dissolved	0.625	No Significant Change
Alluvial	TMW27	Cobalt, Dissolved	0.500	No Significant Change
Alluvial	TMW28	Cobalt, Dissolved	0.625	No Significant Change
Alluvial	BGMW01	Cobalt, Total	0.625	No Significant Change
Alluvial	BGMW02	Cobalt, Total	0.625	No Significant Change
Alluvial	BGMW03	Cobalt, Total	0.625	No Significant Change
Alluvial	FW31	Cobalt, Total	0.375	No Significant Change
Alluvial	TMW25	Cobalt, Total	0.167	No Significant Change
Alluvial	TMW26	Cobalt, Total	0.375	No Significant Change
Alluvial	TMW27	Cobalt, Total	0.235	No Significant Change
Alluvial	TMW28	Cobalt, Total	0.625	No Significant Change
Alluvial	BGMW01	Copper, Dissolved	0.074	No Significant Change
Alluvial	BGMW02	Copper, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Copper, Dissolved	0.367	No Significant Change
Alluvial	FW31	Copper, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Copper, Dissolved	0.154	No Significant Change
Alluvial	TMW26	Copper, Dissolved	0.074	No Significant Change
Alluvial	TMW27	Copper, Dissolved	0.074	No Significant Change
Alluvial	TMW28	Copper, Dissolved	0.186	No Significant Change
Alluvial	BGMW01	Copper, Total	0.154	No Significant Change
Alluvial	BGMW02	Copper, Total	0.367	No Significant Change
Alluvial	BGMW03	Copper, Total	0.367	No Significant Change
Alluvial	FW31	Copper, Total	0.625	No Significant Change
Alluvial	TMW25	Copper, Total	0.045	Significantly Decreasing
Alluvial	TMW26	Copper, Total	0.045	Significantly Decreasing
Alluvial	TMW27	Copper, Total	0.186	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	TMW28	Copper, Total	0.500	No Significant Change
Alluvial	BGMW01	Dibenz(a,h)anthracene	0.625	No Significant Change
Alluvial	BGMW02	Dibenz(a,h)anthracene	0.625	No Significant Change
Alluvial	BGMW03	Dibenz(a,h)anthracene	0.625	No Significant Change
Alluvial	BGMW01	Fluoranthene	0.625	No Significant Change
Alluvial	BGMW02	Fluoranthene	0.625	No Significant Change
Alluvial	BGMW03	Fluoranthene	0.625	No Significant Change
Alluvial	BGMW01	Fluorene	0.625	No Significant Change
Alluvial	BGMW02	Fluorene	0.625	No Significant Change
Alluvial	BGMW03	Fluorene	0.625	No Significant Change
Alluvial	BGMW01	Indeno(1,2,3-Cd)pyrene	0.625	No Significant Change
Alluvial	BGMW02	Indeno(1,2,3-Cd)pyrene	0.625	No Significant Change
Alluvial	BGMW03	Indeno(1,2,3-Cd)pyrene	0.625	No Significant Change
Alluvial	BGMW01	Iron, Dissolved	0.500	No Significant Change
Alluvial	BGMW02	Iron, Dissolved	0.500	No Significant Change
Alluvial	BGMW03	Iron, Dissolved	0.500	No Significant Change
Alluvial	FW31	Iron, Dissolved	0.271	No Significant Change
Alluvial	TMW25	Iron, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Iron, Dissolved	0.500	No Significant Change
Alluvial	TMW27	Iron, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Iron, Dissolved	0.167	No Significant Change
Alluvial	BGMW01	Iron, Total	0.367	No Significant Change
Alluvial	BGMW02	Iron, Total	0.625	No Significant Change
Alluvial	BGMW03	Iron, Total	0.375	No Significant Change
Alluvial	FW31	Iron, Total	0.167	No Significant Change
Alluvial	TMW25	Iron, Total	0.074	No Significant Change
Alluvial	TMW26	Iron, Total	0.167	No Significant Change
Alluvial	TMW27	Iron, Total	0.045	Significantly Decreasing
Alluvial	TMW28	Iron, Total	0.167	No Significant Change
Alluvial	BGMW01	Lead, Dissolved	0.186	No Significant Change
Alluvial	BGMW02	Lead, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Lead, Dissolved	0.500	No Significant Change
Alluvial	FW31	Lead, Dissolved	0.186	No Significant Change
Alluvial	TMW25	Lead, Dissolved	0.186	No Significant Change
Alluvial	TMW26	Lead, Dissolved	0.235	No Significant Change
Alluvial	TMW27	Lead, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Lead, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Lead, Total	0.186	No Significant Change
Alluvial	BGMW02	Lead, Total	0.235	No Significant Change
Alluvial	BGMW03	Lead, Total	0.375	No Significant Change
Alluvial	FW31	Lead, Total	0.375	No Significant Change
Alluvial	TMW25	Lead, Total	0.186	No Significant Change
Alluvial	TMW26	Lead, Total	0.375	No Significant Change
Alluvial	TMW27	Lead, Total	0.625	No Significant Change
Alluvial	TMW28	Lead, Total	0.625	No Significant Change
Alluvial	BGMW01	Magnesium, Dissolved	0.367	No Significant Change
Alluvial	BGMW02	Magnesium, Dissolved	0.271	No Significant Change
Alluvial	BGMW03	Magnesium, Dissolved	0.105	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	FW31	Magnesium, Dissolved	0.500	No Significant Change
Alluvial	TMW25	Magnesium, Dissolved	0.271	No Significant Change
Alluvial	TMW26	Magnesium, Dissolved	0.375	No Significant Change
Alluvial	TMW27	Magnesium, Dissolved	0.367	No Significant Change
Alluvial	TMW28	Magnesium, Dissolved	0.167	No Significant Change
Alluvial	BGMW01	Magnesium, Total	0.500	No Significant Change
Alluvial	BGMW02	Magnesium, Total	0.375	No Significant Change
Alluvial	BGMW03	Magnesium, Total	0.105	No Significant Change
Alluvial	FW31	Magnesium, Total	0.375	No Significant Change
Alluvial	TMW25	Magnesium, Total	0.500	No Significant Change
Alluvial	TMW26	Magnesium, Total	0.105	No Significant Change
Alluvial	TMW27	Magnesium, Total	0.375	No Significant Change
Alluvial	TMW28	Magnesium, Total	0.105	No Significant Change
Alluvial	BGMW01	Manganese, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Manganese, Dissolved	0.154	No Significant Change
Alluvial	BGMW03	Manganese, Dissolved	0.625	No Significant Change
Alluvial	FW31	Manganese, Dissolved	0.167	No Significant Change
Alluvial	TMW25	Manganese, Dissolved	0.271	No Significant Change
Alluvial	TMW26	Manganese, Dissolved	0.367	No Significant Change
Alluvial	TMW27	Manganese, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Manganese, Dissolved	0.167	No Significant Change
Alluvial	BGMW01	Manganese, Total	0.500	No Significant Change
Alluvial	BGMW02	Manganese, Total	0.375	No Significant Change
Alluvial	BGMW03	Manganese, Total	0.625	No Significant Change
Alluvial	FW31	Manganese, Total	0.375	No Significant Change
Alluvial	TMW25	Manganese, Total	0.042	Significantly Increasing
Alluvial	TMW26	Manganese, Total	0.625	No Significant Change
Alluvial	TMW27	Manganese, Total	0.367	No Significant Change
Alluvial	TMW28	Manganese, Total	0.167	No Significant Change
Alluvial	BGMW01	Mercury, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Mercury, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Mercury, Dissolved	0.625	No Significant Change
Alluvial	FW31	Mercury, Dissolved	0.500	No Significant Change
Alluvial	TMW25	Mercury, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Mercury, Dissolved	0.625	No Significant Change
Alluvial	TMW27	Mercury, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Mercury, Dissolved	0.625	No Significant Change
Alluvial	BGMW01	Mercury, Total	0.625	No Significant Change
Alluvial	BGMW02	Mercury, Total	0.625	No Significant Change
Alluvial	BGMW03	Mercury, Total	0.500	No Significant Change
Alluvial	FW31	Mercury, Total	0.625	No Significant Change
Alluvial	TMW25	Mercury, Total	0.625	No Significant Change
Alluvial	TMW26	Mercury, Total	0.625	No Significant Change
Alluvial	TMW27	Mercury, Total	0.625	No Significant Change
Alluvial	TMW28	Mercury, Total	0.625	No Significant Change
Alluvial	BGMW01	Naphthalene	0.625	No Significant Change
Alluvial	BGMW02	Naphthalene	0.625	No Significant Change
Alluvial	BGMW03	Naphthalene	0.625	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	BGMW01	Nickel, Dissolved	0.154	No Significant Change
Alluvial	BGMW02	Nickel, Dissolved	0.154	No Significant Change
Alluvial	BGMW03	Nickel, Dissolved	0.154	No Significant Change
Alluvial	FW31	Nickel, Dissolved	0.500	No Significant Change
Alluvial	TMW25	Nickel, Dissolved	0.045	Significantly Decreasing
Alluvial	TMW26	Nickel, Dissolved	0.375	No Significant Change
Alluvial	TMW27	Nickel, Dissolved	0.154	No Significant Change
Alluvial	TMW28	Nickel, Dissolved	0.154	No Significant Change
Alluvial	BGMW01	Nickel, Total	0.375	No Significant Change
Alluvial	BGMW02	Nickel, Total	0.625	No Significant Change
Alluvial	BGMW03	Nickel, Total	0.235	No Significant Change
Alluvial	FW31	Nickel, Total	0.167	No Significant Change
Alluvial	TMW25	Nickel, Total	0.625	No Significant Change
Alluvial	TMW26	Nickel, Total	0.123	No Significant Change
Alluvial	TMW27	Nickel, Total	0.367	No Significant Change
Alluvial	TMW28	Nickel, Total	0.154	No Significant Change
Alluvial	BGMW01	Nitrate as N	0.186	No Significant Change
Alluvial	BGMW02	Nitrate as N	0.367	No Significant Change
Alluvial	BGMW03	Nitrate as N	0.045	Significantly Decreasing
Alluvial	FW31	Nitrate as N	0.045	Significantly Decreasing
Alluvial	TMW25	Nitrate as N	0.154	No Significant Change
Alluvial	TMW26	Nitrate as N	0.625	No Significant Change
Alluvial	BGMW01	Nitrite as N	0.625	No Significant Change
Alluvial	BGMW02	Nitrite as N	0.625	No Significant Change
Alluvial	BGMW03	Nitrite as N	0.367	No Significant Change
Alluvial	FW31	Nitrite as N	0.625	No Significant Change
Alluvial	TMW25	Nitrite as N	0.625	No Significant Change
Alluvial	TMW26	Nitrite as N	0.625	No Significant Change
Alluvial	BGMW01	Perchlorate	0.625	No Significant Change
Alluvial	BGMW02	Perchlorate	0.367	No Significant Change
Alluvial	BGMW03	Perchlorate	0.367	No Significant Change
Alluvial	TMW26	Perchlorate	0.500	No Significant Change
Alluvial	TMW27	Perchlorate	0.625	No Significant Change
Alluvial	BGMW01	Phenanthrene	0.625	No Significant Change
Alluvial	BGMW02	Phenanthrene	0.625	No Significant Change
Alluvial	BGMW03	Phenanthrene	0.625	No Significant Change
Alluvial	BGMW01	Potassium, Dissolved	0.375	No Significant Change
Alluvial	BGMW02	Potassium, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Potassium, Dissolved	0.167	No Significant Change
Alluvial	FW31	Potassium, Dissolved	0.167	No Significant Change
Alluvial	TMW25	Potassium, Dissolved	0.375	No Significant Change
Alluvial	TMW26	Potassium, Dissolved	0.167	No Significant Change
Alluvial	TMW27	Potassium, Dissolved	0.375	No Significant Change
Alluvial	TMW28	Potassium, Dissolved	0.375	No Significant Change
Alluvial	BGMW01	Potassium, Total	0.625	No Significant Change
Alluvial	BGMW02	Potassium, Total	0.042	Significantly Increasing
Alluvial	BGMW03	Potassium, Total	0.625	No Significant Change
Alluvial	FW31	Potassium, Total	0.375	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	TMW25	Potassium, Total	0.167	No Significant Change
Alluvial	TMW26	Potassium, Total	0.375	No Significant Change
Alluvial	TMW27	Potassium, Total	0.105	No Significant Change
Alluvial	TMW28	Potassium, Total	0.375	No Significant Change
Alluvial	BGMW01	Pyrene	0.625	No Significant Change
Alluvial	BGMW02	Pyrene	0.625	No Significant Change
Alluvial	BGMW03	Pyrene	0.625	No Significant Change
Alluvial	BGMW01	Selenium, Dissolved	0.186	No Significant Change
Alluvial	BGMW02	Selenium, Dissolved	0.367	No Significant Change
Alluvial	BGMW03	Selenium, Dissolved	0.154	No Significant Change
Alluvial	FW31	Selenium, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Selenium, Dissolved	0.074	No Significant Change
Alluvial	TMW26	Selenium, Dissolved	0.074	No Significant Change
Alluvial	TMW27	Selenium, Dissolved	0.186	No Significant Change
Alluvial	TMW28	Selenium, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Selenium, Total	0.186	No Significant Change
Alluvial	BGMW02	Selenium, Total	0.625	No Significant Change
Alluvial	BGMW03	Selenium, Total	0.154	No Significant Change
Alluvial	FW31	Selenium, Total	0.625	No Significant Change
Alluvial	TMW25	Selenium, Total	0.186	No Significant Change
Alluvial	TMW26	Selenium, Total	0.186	No Significant Change
Alluvial	TMW27	Selenium, Total	0.625	No Significant Change
Alluvial	TMW28	Selenium, Total	0.625	No Significant Change
Alluvial	BGMW01	Silver, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Silver, Dissolved	0.500	No Significant Change
Alluvial	BGMW03	Silver, Dissolved	0.625	No Significant Change
Alluvial	FW31	Silver, Dissolved	0.186	No Significant Change
Alluvial	TMW25	Silver, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Silver, Dissolved	0.500	No Significant Change
Alluvial	TMW27	Silver, Dissolved	0.500	No Significant Change
Alluvial	TMW28	Silver, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Silver, Total	0.625	No Significant Change
Alluvial	BGMW02	Silver, Total	0.625	No Significant Change
Alluvial	BGMW03	Silver, Total	0.500	No Significant Change
Alluvial	FW31	Silver, Total	0.271	No Significant Change
Alluvial	TMW25	Silver, Total	0.074	No Significant Change
Alluvial	TMW26	Silver, Total	0.375	No Significant Change
Alluvial	TMW27	Silver, Total	0.625	No Significant Change
Alluvial	TMW28	Silver, Total	0.625	No Significant Change
Alluvial	BGMW01	Sodium, Dissolved	0.367	No Significant Change
Alluvial	BGMW03	Sodium, Dissolved	0.167	No Significant Change
Alluvial	FW31	Sodium, Dissolved	0.105	No Significant Change
Alluvial	TMW25	Sodium, Dissolved	0.625	No Significant Change
Alluvial	TMW26	Sodium, Dissolved	0.167	No Significant Change
Alluvial	TMW27	Sodium, Dissolved	0.271	No Significant Change
Alluvial	TMW28	Sodium, Dissolved	0.042	Significantly Increasing
Alluvial	BGMW01	Sodium, Total	0.625	No Significant Change
Alluvial	BGMW03	Sodium, Total	0.375	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	FW31	Sodium, Total	0.271	No Significant Change
Alluvial	TMW25	Sodium, Total	0.154	No Significant Change
Alluvial	TMW26	Sodium, Total	0.500	No Significant Change
Alluvial	TMW27	Sodium, Total	0.625	No Significant Change
Alluvial	TMW28	Sodium, Total	0.042	Significantly Increasing
Alluvial	BGMW01	Thallium, Dissolved	0.625	No Significant Change
Alluvial	BGMW02	Thallium, Dissolved	0.500	No Significant Change
Alluvial	BGMW03	Thallium, Dissolved	0.105	No Significant Change
Alluvial	FW31	Thallium, Dissolved	0.625	No Significant Change
Alluvial	TMW25	Thallium, Dissolved	0.186	No Significant Change
Alluvial	TMW26	Thallium, Dissolved	0.500	No Significant Change
Alluvial	TMW27	Thallium, Dissolved	0.625	No Significant Change
Alluvial	TMW28	Thallium, Dissolved	0.271	No Significant Change
Alluvial	BGMW01	Thallium, Total	0.625	No Significant Change
Alluvial	BGMW02	Thallium, Total	0.271	No Significant Change
Alluvial	BGMW03	Thallium, Total	0.375	No Significant Change
Alluvial	FW31	Thallium, Total	0.625	No Significant Change
Alluvial	TMW25	Thallium, Total	0.625	No Significant Change
Alluvial	TMW26	Thallium, Total	0.271	No Significant Change
Alluvial	TMW27	Thallium, Total	0.625	No Significant Change
Alluvial	TMW28	Thallium, Total	0.271	No Significant Change
Alluvial	BGMW01	Vanadium, Dissolved	0.154	No Significant Change
Alluvial	BGMW02	Vanadium, Dissolved	0.625	No Significant Change
Alluvial	BGMW03	Vanadium, Dissolved	0.625	No Significant Change
Alluvial	FW31	Vanadium, Dissolved	0.500	No Significant Change
Alluvial	TMW25	Vanadium, Dissolved	0.045	Significantly Decreasing
Alluvial	TMW26	Vanadium, Dissolved	0.154	No Significant Change
Alluvial	TMW27	Vanadium, Dissolved	0.074	No Significant Change
Alluvial	TMW28	Vanadium, Dissolved	0.045	Significantly Decreasing
Alluvial	BGMW01	Vanadium, Total	0.045	Significantly Decreasing
Alluvial	BGMW02	Vanadium, Total	0.167	No Significant Change
Alluvial	BGMW03	Vanadium, Total	0.625	No Significant Change
Alluvial	FW31	Vanadium, Total	0.271	No Significant Change
Alluvial	TMW25	Vanadium, Total	0.045	Significantly Decreasing
Alluvial	TMW26	Vanadium, Total	0.375	No Significant Change
Alluvial	TMW27	Vanadium, Total	0.500	No Significant Change
Alluvial	TMW28	Vanadium, Total	0.625	No Significant Change
Alluvial	BGMW01	Zinc, Dissolved	0.074	No Significant Change
Alluvial	BGMW02	Zinc, Dissolved	0.074	No Significant Change
Alluvial	BGMW03	Zinc, Dissolved	0.154	No Significant Change
Alluvial	FW31	Zinc, Dissolved	0.154	No Significant Change
Alluvial	TMW25	Zinc, Dissolved	0.154	No Significant Change
Alluvial	TMW26	Zinc, Dissolved	0.367	No Significant Change
Alluvial	TMW27	Zinc, Dissolved	0.235	No Significant Change
Alluvial	TMW28	Zinc, Dissolved	0.367	No Significant Change
Alluvial	BGMW01	Zinc, Total	0.186	No Significant Change
Alluvial	BGMW02	Zinc, Total	0.625	No Significant Change
Alluvial	BGMW03	Zinc, Total	0.367	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Alluvial	FW31	Zinc, Total	0.375	No Significant Change
Alluvial	TMW25	Zinc, Total	0.045	Significantly Decreasing
Alluvial	TMW26	Zinc, Total	0.154	No Significant Change
Alluvial	TMW27	Zinc, Total	0.367	No Significant Change
Alluvial	TMW28	Zinc, Total	0.367	No Significant Change
Alluvial	BGMW01	m,p-Cresol	0.625	No Significant Change
Alluvial	BGMW02	m,p-Cresol	0.625	No Significant Change
Alluvial	BGMW03	m,p-Cresol	0.625	No Significant Change
Bedrock	TMW19	2-Chloronaphthalene	0.500	No Significant Change
Bedrock	TMW19	2-Methylnaphthalene	0.500	No Significant Change
Bedrock	TMW19	Acenaphthene	0.500	No Significant Change
Bedrock	TMW19	Acenaphthylene	0.500	No Significant Change
Bedrock	TMW17	Aluminum, Dissolved	0.152	No Significant Change
Bedrock	TMW19	Aluminum, Dissolved	0.823	No Significant Change
Bedrock	TMW17	Aluminum, Total	0.032	Significantly Decreasing
Bedrock	TMW19	Aluminum, Total	0.366	No Significant Change
Bedrock	TMW19	Anthracene	0.500	No Significant Change
Bedrock	TMW17	Antimony, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Antimony, Dissolved	0.386	No Significant Change
Bedrock	TMW17	Antimony, Total	0.665	No Significant Change
Bedrock	TMW19	Antimony, Total	0.585	No Significant Change
Bedrock	TMW17	Arsenic, Dissolved	0.585	No Significant Change
Bedrock	TMW19	Arsenic, Dissolved	0.794	No Significant Change
Bedrock	TMW17	Arsenic, Total	0.032	Significantly Increasing
Bedrock	TMW19	Arsenic, Total	0.415	No Significant Change
Bedrock	TMW17	Barium, Dissolved	0.026	Significantly Increasing
Bedrock	TMW19	Barium, Dissolved	0.122	No Significant Change
Bedrock	TMW17	Barium, Total	0.166	No Significant Change
Bedrock	TMW19	Barium, Total	0.186	No Significant Change
Bedrock	TMW19	Benzo(a)anthracene	0.500	No Significant Change
Bedrock	TMW19	Benzo(a)pyrene	0.500	No Significant Change
Bedrock	TMW19	Benzo(b)fluoranthene	0.500	No Significant Change
Bedrock	TMW19	Benzo(g,h,i)perylene	0.500	No Significant Change
Bedrock	TMW19	Benzo(k)fluoranthene	0.500	No Significant Change
Bedrock	TMW17	Beryllium, Dissolved	0.123	No Significant Change
Bedrock	TMW19	Beryllium, Dissolved	0.500	No Significant Change
Bedrock	TMW17	Beryllium, Total	0.808	No Significant Change
Bedrock	TMW19	Beryllium, Total	0.158	No Significant Change
Bedrock	TMW17	Cadmium, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Cadmium, Dissolved	0.261	No Significant Change
Bedrock	TMW17	Cadmium, Total	0.500	No Significant Change
Bedrock	TMW19	Cadmium, Total	0.614	No Significant Change
Bedrock	TMW17	Calcium, Dissolved	0.832	No Significant Change
Bedrock	TMW19	Calcium, Dissolved	0.634	No Significant Change
Bedrock	TMW17	Calcium, Total	0.814	No Significant Change
Bedrock	TMW19	Calcium, Total	0.096	No Significant Change
Bedrock	TMW19	Chloronaphthalene, beta-	0.500	No Significant Change
Bedrock	TMW17	Chromium, Dissolved	0.660	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Bedrock	TMW19	Chromium, Dissolved	0.384	No Significant Change
Bedrock	TMW17	Chromium, Total	0.644	No Significant Change
Bedrock	TMW19	Chromium, Total	0.057	No Significant Change
Bedrock	TMW19	Chrysene	0.500	No Significant Change
Bedrock	TMW17	Cobalt, Dissolved	0.067	No Significant Change
Bedrock	TMW19	Cobalt, Dissolved	0.142	No Significant Change
Bedrock	TMW17	Cobalt, Total	0.839	No Significant Change
Bedrock	TMW19	Cobalt, Total	0.823	No Significant Change
Bedrock	TMW17	Copper, Dissolved	0.585	No Significant Change
Bedrock	TMW19	Copper, Dissolved	0.678	No Significant Change
Bedrock	TMW17	Copper, Total	0.225	No Significant Change
Bedrock	TMW19	Copper, Total	0.152	No Significant Change
Bedrock	TMW19	Cresol, o-	0.360	No Significant Change
Bedrock	TMW19	Dibenz(a,h)anthracene	0.500	No Significant Change
Bedrock	TMW19	Dinitro-o-Cresol, 4,6-	0.500	No Significant Change
Bedrock	TMW19	Fluoranthene	0.500	No Significant Change
Bedrock	TMW19	Fluorene	0.500	No Significant Change
Bedrock	TMW19	Indeno(1,2,3-Cd)pyrene	0.500	No Significant Change
Bedrock	TMW17	Iron, Dissolved	0.231	No Significant Change
Bedrock	TMW19	Iron, Dissolved	0.083	No Significant Change
Bedrock	TMW17	Iron, Total	0.391	No Significant Change
Bedrock	TMW19	Iron, Total	0.152	No Significant Change
Bedrock	TMW17	Lead, Dissolved	0.528	No Significant Change
Bedrock	TMW19	Lead, Dissolved	0.719	No Significant Change
Bedrock	TMW17	Lead, Total	0.777	No Significant Change
Bedrock	TMW19	Lead, Total	0.070	No Significant Change
Bedrock	TMW17	Magnesium, Dissolved	0.108	No Significant Change
Bedrock	TMW19	Magnesium, Dissolved	0.816	No Significant Change
Bedrock	TMW17	Magnesium, Total	0.500	No Significant Change
Bedrock	TMW19	Magnesium, Total	0.291	No Significant Change
Bedrock	TMW17	Manganese, Dissolved	0.755	No Significant Change
Bedrock	TMW19	Manganese, Dissolved	0.315	No Significant Change
Bedrock	TMW17	Manganese, Total	0.246	No Significant Change
Bedrock	TMW19	Manganese, Total	0.185	No Significant Change
Bedrock	TMW17	Mercury, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Mercury, Dissolved	0.500	No Significant Change
Bedrock	TMW17	Mercury, Total	0.500	No Significant Change
Bedrock	TMW19	Mercury, Total	0.500	No Significant Change
Bedrock	TMW19	Methylnaphthalene, 2-	0.500	No Significant Change
Bedrock	TMW19	Naphthalene	0.500	No Significant Change
Bedrock	TMW17	Nickel, Dissolved	0.045	Significantly Increasing
Bedrock	TMW19	Nickel, Dissolved	0.555	No Significant Change
Bedrock	TMW17	Nickel, Total	0.142	No Significant Change
Bedrock	TMW19	Nickel, Total	0.168	No Significant Change
Bedrock	TMW17	Nitrate as N	0.386	No Significant Change
Bedrock	TMW17	Nitrite as N	0.500	No Significant Change
Bedrock	TMW17	Perchlorate	0.364	No Significant Change
Bedrock	TMW19	Perchlorate	0.500	No Significant Change

TABLE 2
Mann-Kendall Trend Evaluation (by well)

	Number	Percent
Total Evaluations	560	
Significantly Decreasing	17	3.0%
Significantly Increasing	9	1.6%

Aquifer	Well	Constituent	Calculated Probability	Conclusion (using 0.05 significance level)
Bedrock	TMW19	Phenanthrene	0.500	No Significant Change
Bedrock	TMW17	Potassium, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Potassium, Dissolved	0.684	No Significant Change
Bedrock	TMW17	Potassium, Total	0.500	No Significant Change
Bedrock	TMW19	Potassium, Total	0.205	No Significant Change
Bedrock	TMW19	Pyrene	0.500	No Significant Change
Bedrock	TMW17	Selenium, Dissolved	0.585	No Significant Change
Bedrock	TMW19	Selenium, Dissolved	0.585	No Significant Change
Bedrock	TMW17	Selenium, Total	0.678	No Significant Change
Bedrock	TMW19	Selenium, Total	0.108	No Significant Change
Bedrock	TMW17	Silver, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Silver, Dissolved	0.500	No Significant Change
Bedrock	TMW17	Silver, Total	0.018	Significantly Increasing
Bedrock	TMW19	Silver, Total	0.081	No Significant Change
Bedrock	TMW17	Sodium, Dissolved	0.108	No Significant Change
Bedrock	TMW19	Sodium, Dissolved	0.581	No Significant Change
Bedrock	TMW17	Sodium, Total	0.003	Significantly Increasing
Bedrock	TMW19	Sodium, Total	0.418	No Significant Change
Bedrock	TMW17	Thallium, Dissolved	0.500	No Significant Change
Bedrock	TMW19	Thallium, Dissolved	0.500	No Significant Change
Bedrock	TMW17	Thallium, Total	0.386	No Significant Change
Bedrock	TMW19	Thallium, Total	0.281	No Significant Change
Bedrock	TMW17	Vanadium, Dissolved	0.001	Significantly Decreasing
Bedrock	TMW19	Vanadium, Dissolved	0.050	Significantly Decreasing
Bedrock	TMW17	Vanadium, Total	0.042	Significantly Decreasing
Bedrock	TMW19	Vanadium, Total	0.057	No Significant Change
Bedrock	TMW17	Zinc, Dissolved	0.609	No Significant Change
Bedrock	TMW19	Zinc, Dissolved	0.718	No Significant Change
Bedrock	TMW17	Zinc, Total	0.057	No Significant Change
Bedrock	TMW19	Zinc, Total	0.500	No Significant Change
Bedrock	TMW19	m,p-Cresol	0.196	No Significant Change

TABLE 3
Evaluation of Outliers

Date	Aquifer	Well	Constituent	Units	Qualifer	Result	[1] Mathematical Outlier Using Untransformed Data?	[1] Mathematical Outlier Considering Transformations to Improve Adherence to Normality?	Percent Difference from Next Highest Value	Exclude or Retain Result in Background Data Set	Justification for Exclusion of Outlier
10/25/2012	Alluvial	TMW26	Aluminum, Dissolved	µg/L	J	1100	yes	yes	206%	exclude	c
4/17/2013	Alluvial	TMW26	Aluminum, Dissolved	µg/L		360	yes	yes	13%	exclude	c
4/12/2013	Alluvial	FW31	Aluminum, Dissolved	µg/L		320	yes	yes	371%	exclude	a
10/31/2012	Alluvial	BGMW03	Aluminum, Total	µg/L	J	26000	yes		117%	exclude	a
11/1/2013	Alluvial	FW31	Aluminum, Total	µg/L		12000	yes		380%	exclude	a
11/5/2013	Alluvial	BGMW03	Aluminum, Total	µg/L		2500	yes		19%	exclude	a
4/20/2012	Alluvial	FW31	Aluminum, Total	µg/L		2100	yes		40%	exclude	a
4/20/2012	Alluvial	FW31	Antimony, Dissolved	µg/L	J	1.2	yes	yes	9%	exclude	a
11/5/2013	Alluvial	TMW28	Antimony, Dissolved	µg/L	J	1.1	yes	yes	10%	retain	
4/17/2012	Alluvial	TMW25	Antimony, Dissolved	µg/L	J	1	yes	yes	32%	retain	
11/4/2013	Alluvial	TMW26	Antimony, Dissolved	µg/L	J	0.76	yes	yes	15%	retain	
4/20/2012	Alluvial	FW31	Antimony, Total	µg/L	J	1.3	yes	yes	8%	exclude	a
4/25/2012	Alluvial	TMW27	Antimony, Total	µg/L	J	0.9	yes		3%	retain	
11/5/2013	Alluvial	BGMW03	Antimony, Total	µg/L	J	0.87	yes		6%	exclude	a
4/17/2013	Alluvial	TMW26	Antimony, Total	µg/L	J	0.82	yes		3%	retain	
4/25/2012	Alluvial	TMW27	Arsenic, Dissolved	µg/L		21	yes		0%	exclude	b
4/12/2013	Alluvial	TMW27	Arsenic, Dissolved	µg/L		21	yes		0%	exclude	b
11/1/2012	Alluvial	TMW27	Arsenic, Dissolved	µg/L		21	yes		5%	exclude	b
11/5/2013	Alluvial	TMW27	Arsenic, Dissolved	µg/L		20	yes		82%	exclude	b
4/12/2013	Alluvial	TMW27	Arsenic, Total	µg/L		21	yes		5%	exclude	b
11/5/2013	Alluvial	TMW27	Arsenic, Total	µg/L		20	yes		5%	exclude	b
4/25/2012	Alluvial	TMW27	Arsenic, Total	µg/L		19	yes		0%	exclude	b
11/1/2012	Alluvial	TMW27	Arsenic, Total	µg/L		19	yes		107%	exclude	b
11/1/2012	Alluvial	TMW27	Barium, Dissolved	µg/L		130	yes		8%	exclude	b
11/5/2013	Alluvial	TMW27	Barium, Dissolved	µg/L		130	yes		0%	exclude	b
4/25/2012	Alluvial	TMW27	Barium, Dissolved	µg/L		120	yes		60%	exclude	b
4/12/2013	Alluvial	TMW27	Barium, Dissolved	µg/L		120	yes		0%	exclude	b
11/1/2013	Alluvial	FW31	Barium, Total	µg/L		480	yes		140%	exclude	a
10/31/2012	Alluvial	BGMW03	Barium, Total	µg/L	J	200	yes		54%	exclude	a
10/31/2012	Alluvial	BGMW03	Beryllium, Total	µg/L		1.3	yes	yes	171%	exclude	a
11/1/2013	Alluvial	FW31	Beryllium, Total	µg/L	J	0.46	yes	yes	70%	exclude	a
4/20/2012	Alluvial	FW31	Cadmium, Total	µg/L	J	0.4	yes		33%	exclude	a
10/30/2012	Alluvial	BGMW02	Calcium, Dissolved	µg/L		300000	yes	yes	36%	exclude	c
11/5/2013	Alluvial	TMW28	Calcium, Dissolved	µg/L		220000	yes	yes	100%	exclude	c
11/5/2013	Alluvial	TMW28	Calcium, Total	µg/L		210000	yes		75%	retain	
4/17/2012	Alluvial	TMW25	Chromium, Dissolved	µg/L		11	yes		62%	exclude	c
4/24/2012	Alluvial	BGMW03	Chromium, Dissolved	µg/L	J	6.8	yes		11%	exclude	a
4/12/2013	Alluvial	FW31	Chromium, Dissolved	µg/L	J	6.1	yes		5%	exclude	a
4/21/2012	Alluvial	TMW28	Chromium, Dissolved	µg/L	J	5.8	yes		41%	retain	
10/31/2012	Alluvial	BGMW03	Chromium, Total	µg/L		15	yes	yes	88%	exclude	a
11/1/2013	Alluvial	FW31	Chromium, Total	µg/L	J	8	yes	yes	5%	exclude	a
4/12/2013	Alluvial	FW31	Chromium, Total	µg/L	J	7.6	yes	yes	153%	exclude	a
10/30/2012	Alluvial	BGMW02	Cobalt, Dissolved	µg/L		2.2	yes		100%	exclude	c
10/26/2012	Alluvial	BGMW01	Cobalt, Dissolved	µg/L		1.1	yes		53%	retain	
10/31/2012	Alluvial	BGMW03	Cobalt, Total	µg/L		7.1	yes		78%	exclude	a
11/1/2013	Alluvial	FW31	Cobalt, Total	µg/L		4	yes		186%	exclude	a
4/25/2012	Alluvial	BGMW02	Copper, Dissolved	µg/L		15	yes	yes	7%	exclude	c
4/25/2012	Alluvial	BGMW01	Copper, Dissolved	µg/L		14	yes	yes	8%	exclude	c
4/17/2012	Alluvial	TMW25	Copper, Dissolved	µg/L		13	yes	yes	8%	exclude	c
4/20/2012	Alluvial	TMW26	Copper, Dissolved	µg/L		12	yes	yes	145%	exclude	c
10/31/2012	Alluvial	BGMW03	Copper, Total	µg/L		17	yes		42%	exclude	a
10/31/2012	Alluvial	BGMW03	Iron, Total	µg/L	J	15000	yes		241%	exclude	a
11/1/2013	Alluvial	FW31	Iron, Total	µg/L		4400	yes		144%	exclude	a
11/5/2013	Alluvial	BGMW03	Iron, Total	µg/L		1800	yes		20%	exclude	a
4/25/2012	Alluvial	TMW27	Iron, Total	µg/L		1500	yes		79%	retain	
10/31/2012	Alluvial	BGMW03	Lead, Total	µg/L		11	yes	yes	134%	exclude	a
11/1/2013	Alluvial	FW31	Lead, Total	µg/L		4.7	yes	yes	161%	exclude	a
11/5/2013	Alluvial	BGMW03	Lead, Total	µg/L	J	1.8	yes		29%	exclude	a
4/20/2012	Alluvial	FW31	Lead, Total	µg/L		1.4	yes		40%	exclude	a
4/3/2013	Alluvial	BGMW02	Magnesium, Dissolved	µg/L		130000	yes		0%	exclude	b
11/5/2013	Alluvial	BGMW02	Magnesium, Dissolved	µg/L		130000	yes		8%	exclude	b
4/25/2012	Alluvial	BGMW02	Magnesium, Dissolved	µg/L		120000	yes		32%	exclude	b

TABLE 3
Evaluation of Outliers

Date	Aquifer	Well	Constituent	Units	Qualifer	Result	[1] Mathematical Outlier Using Untransformed Data?	[1] Mathematical Outlier Considering Transformations to Improve Adherence to Normality?	Percent Difference from Next Highest Value	Exclude or Retain Result in Background Data Set	Justification for Exclusion of Outlier
10/30/2012	Alluvial	BGMW02	Magnesium, Dissolved	µg/L		91000	yes		40%	exclude	b
11/5/2013	Alluvial	TMW28	Magnesium, Dissolved	µg/L		65000	yes		124%	exclude	c
10/30/2012	Alluvial	BGMW02	Magnesium, Total	µg/L		130000	yes		8%	exclude	b
11/5/2013	Alluvial	BGMW02	Magnesium, Total	µg/L		130000	yes		0%	exclude	b
4/25/2012	Alluvial	BGMW02	Magnesium, Total	µg/L		120000	yes		88%	exclude	b
4/3/2013	Alluvial	BGMW02	Magnesium, Total	µg/L		120000	yes		0%	exclude	b
11/5/2013	Alluvial	TMW28	Magnesium, Total	µg/L		64000	yes		106%	exclude	c
10/30/2012	Alluvial	BGMW02	Nickel, Dissolved	µg/L		12	yes		186%	exclude	c
4/12/2013	Alluvial	FW31	Nickel, Dissolved	µg/L		4.2	yes		2%	exclude	a
11/4/2013	Alluvial	TMW26	Nickel, Dissolved	µg/L		4.2	yes		0%	retain	
4/25/2012	Alluvial	BGMW02	Nickel, Dissolved	µg/L	J	4.1	yes		32%	retain	
10/31/2012	Alluvial	BGMW03	Nickel, Total	µg/L		11	yes	yes	49%	exclude	a
11/1/2013	Alluvial	FW31	Nickel, Total	µg/L		7.4	yes	yes	80%	exclude	a
4/25/2012	Alluvial	BGMW02	Nitrate as N	mg/L		18	yes		43%	retain	
11/5/2013	Alluvial	BGMW02	Nitrate as N	mg/L		12.6	yes		5%	retain	
10/30/2012	Alluvial	BGMW02	Nitrate as N	mg/L		12	yes		1%	retain	
4/3/2013	Alluvial	BGMW02	Nitrate as N	mg/L		11.9	yes		43%	retain	
4/24/2012	Alluvial	BGMW03	Nitrate as N	mg/L		8.3	yes		43%	retain	
4/24/2012	Alluvial	BGMW03	Nitrite as N	mg/L		0.35	yes		75%	retain	
10/31/2012	Alluvial	BGMW03	Perchlorate	µg/L		3.1	yes	yes	435%	exclude	a
10/30/2012	Alluvial	BGMW02	Potassium, Dissolved	µg/L		15000	yes	yes	456%	exclude	c
10/31/2012	Alluvial	BGMW03	Potassium, Total	µg/L		5800	yes		41%	retain	
11/1/2013	Alluvial	FW31	Potassium, Total	µg/L		4100	yes		44%	retain	
4/25/2012	Alluvial	BGMW02	Selenium, Dissolved	µg/L		110	yes		36%	exclude	b
4/3/2013	Alluvial	BGMW02	Selenium, Dissolved	µg/L		81	yes		1%	exclude	b
11/5/2013	Alluvial	BGMW02	Selenium, Dissolved	µg/L		80	yes		74%	exclude	b
10/31/2012	Alluvial	BGMW03	Selenium, Dissolved	µg/L		46	yes		7%	exclude	a
4/24/2012	Alluvial	BGMW03	Selenium, Dissolved	µg/L		43	yes		48%	exclude	a
4/25/2012	Alluvial	BGMW02	Selenium, Total	µg/L		95	yes		9%	exclude	b
11/5/2013	Alluvial	BGMW02	Selenium, Total	µg/L		87	yes		4%	exclude	b
4/3/2013	Alluvial	BGMW02	Selenium, Total	µg/L		84	yes		6%	exclude	b
10/30/2012	Alluvial	BGMW02	Selenium, Total	µg/L		79	yes		68%	exclude	b
4/24/2012	Alluvial	BGMW03	Selenium, Total	µg/L		47	yes		18%	exclude	a
4/20/2012	Alluvial	FW31	Silver, Dissolved	µg/L		1.9	yes	yes	217%	exclude	a
4/17/2012	Alluvial	TMW25	Silver, Total	µg/L	J	1.1	yes	yes	450%	exclude	c
4/17/2012	Alluvial	TMW25	Thallium, Dissolved	µg/L	J	1	yes	yes	150%	exclude	c
10/31/2012	Alluvial	BGMW03	Vanadium, Total	µg/L		43	yes	yes	115%	exclude	a
11/1/2013	Alluvial	FW31	Vanadium, Total	µg/L		20	yes		43%	exclude	a
4/2/2013	Alluvial	TMW28	Zinc, Dissolved	µg/L		30	yes	yes	100%	exclude	c
4/2/2013	Alluvial	TMW28	Zinc, Total	µg/L		120	yes		118%	exclude	c
4/25/2012	Alluvial	TMW27	Zinc, Total	µg/L		55	yes		4%	retain	
11/1/2013	Alluvial	FW31	Zinc, Total	µg/L		53	yes		2%	retain	
10/31/2012	Alluvial	BGMW03	Zinc, Total	µg/L		52	yes		30%	retain	
4/25/2012	Alluvial	BGMW01	Zinc, Total	µg/L	J	40	yes		25%	retain	
10/20/2008	Bedrock	TMW17	Aluminum, Dissolved	µg/L	J	384	yes		2%	exclude	c
4/20/2009	Bedrock	TMW19	Aluminum, Dissolved	µg/L		378	yes		103%	exclude	c
5/7/2008	Bedrock	TMW19	Aluminum, Total	µg/L		26000	yes		63%	exclude	c
4/9/2011	Bedrock	TMW19	Aluminum, Total	µg/L	J	16000	yes		63%	exclude	c
4/12/2013	Bedrock	TMW19	Aluminum, Total	µg/L		9800	yes		27%	exclude	c
4/17/2010	Bedrock	TMW19	Aluminum, Total	µg/L		7690	yes		156%	exclude	c
5/7/2008	Bedrock	TMW19	Arsenic, Total	µg/L	J	49.9	yes		13%	exclude	c
11/9/2012	Bedrock	TMW17	Barium, Dissolved	µg/L		21	yes		31%	retain	
5/7/2008	Bedrock	TMW19	Barium, Total	µg/L		82.5	yes	yes	29%	retain	
11/9/2012	Bedrock	TMW17	Barium, Total	µg/L		64	yes		2%	retain	
4/9/2011	Bedrock	TMW19	Barium, Total	µg/L		63	yes	yes	43%	retain	
4/12/2013	Bedrock	TMW19	Barium, Total	µg/L		44	yes	yes	41%	retain	
4/17/2010	Bedrock	TMW19	Chromium, Dissolved	µg/L		6.1	yes	yes	56%	retain	
5/7/2008	Bedrock	TMW19	Chromium, Total	µg/L	J	19.5	yes		150%	exclude	c
11/9/2012	Bedrock	TMW17	Copper, Total	µg/L		28	yes		4%	retain	
5/7/2008	Bedrock	TMW19	Copper, Total	µg/L	J	26.8	yes		18%	retain	
5/7/2008	Bedrock	TMW17	Copper, Total	µg/L	J	22.8	yes		14%	retain	
4/9/2011	Bedrock	TMW19	Copper, Total	µg/L		20	yes		0%	retain	

TABLE 3
Evaluation of Outliers

Date	Aquifer	Well	Constituent	Units	Qualifer	Result	[1] Mathematical Outlier Using Untransformed Data?	[1] Mathematical Outlier Considering Transformations to Improve Adherence to Normality?	Percent Difference from Next Highest Value	Exclude or Retain Result in Background Data Set	Justification for Exclusion of Outlier
5/7/2008	Bedrock	TMW19	Iron, Total	µg/L		13100	yes		157%	exclude	c
4/12/2013	Bedrock	TMW19	Iron, Total	µg/L		5100	yes		16%	retain	
4/9/2011	Bedrock	TMW19	Iron, Total	µg/L		4400	yes		42%	retain	
4/17/2010	Bedrock	TMW19	Iron, Total	µg/L		3100	yes		20%	retain	
4/20/2009	Bedrock	TMW19	Iron, Total	µg/L		2580	yes		12%	retain	
11/9/2012	Bedrock	TMW17	Lead, Total	µg/L		22	yes	yes	20%	exclude	c
10/15/2011	Bedrock	TMW19	Magnesium, Dissolved	µg/L		2600	yes		73%	retain	
5/7/2008	Bedrock	TMW19	Magnesium, Total	µg/L		8340	yes		57%	retain	
4/9/2011	Bedrock	TMW19	Magnesium, Total	µg/L		5300	yes		47%	retain	
4/12/2013	Bedrock	TMW19	Magnesium, Total	µg/L		3600	yes		9%	retain	
4/17/2010	Bedrock	TMW19	Magnesium, Total	µg/L		3300	yes		57%	retain	
10/28/2008	Bedrock	TMW19	Nickel, Dissolved	µg/L		9.4	yes	yes	3%	exclude	c
4/21/2012	Bedrock	TMW19	Nickel, Dissolved	µg/L	J	9.1	yes	yes	117%	exclude	c
4/12/2013	Bedrock	TMW19	Nickel, Dissolved	µg/L		4.2	yes		27%	retain	
4/20/2009	Bedrock	TMW19	Potassium, Dissolved	µg/L	J	4370	yes		6%	retain	
10/14/2010	Bedrock	TMW17	Potassium, Dissolved	µg/L	J	4140	yes		57%	retain	
5/7/2008	Bedrock	TMW19	Potassium, Total	µg/L		5260	yes		37%	retain	
4/17/2010	Bedrock	TMW19	Potassium, Total	µg/L		3850	yes		25%	retain	
5/7/2008	Bedrock	TMW17	Vanadium, Dissolved	µg/L		51	yes	yes	2%	exclude	c
5/7/2008	Bedrock	TMW19	Vanadium, Total	µg/L	J	92.2	yes	yes	105%	exclude	c
5/7/2008	Bedrock	TMW17	Vanadium, Total	µg/L	J	45	yes	yes	200%	exclude	c
11/9/2012	Bedrock	TMW17	Zinc, Dissolved	µg/L		370	yes		270%	exclude	c
11/9/2012	Bedrock	TMW17	Zinc, Total	µg/L		54000	yes	yes	4809%	exclude	c
4/9/2013	Bedrock	TMW17	Zinc, Total	µg/L		1100	yes		72%	exclude	b
4/15/2011	Bedrock	TMW17	Zinc, Total	µg/L		640	yes		45%	exclude	b
4/29/2010	Bedrock	TMW17	Zinc, Total	µg/L		442	yes		52%	exclude	b
5/1/2009	Bedrock	TMW17	Zinc, Total	µg/L		290	yes		190%	exclude	b

J = detected result, concentration estimated
µg/L = micrograms per liter
a = mathematical outlier from well BGMW03 or FW31
b = one well dominates most elevated results
c = result appears unusually distant from the main population
[1] These mathematical outliers were calculated via Dixon's or Rosner's test, depending on whether more than 25 results are being evaluated

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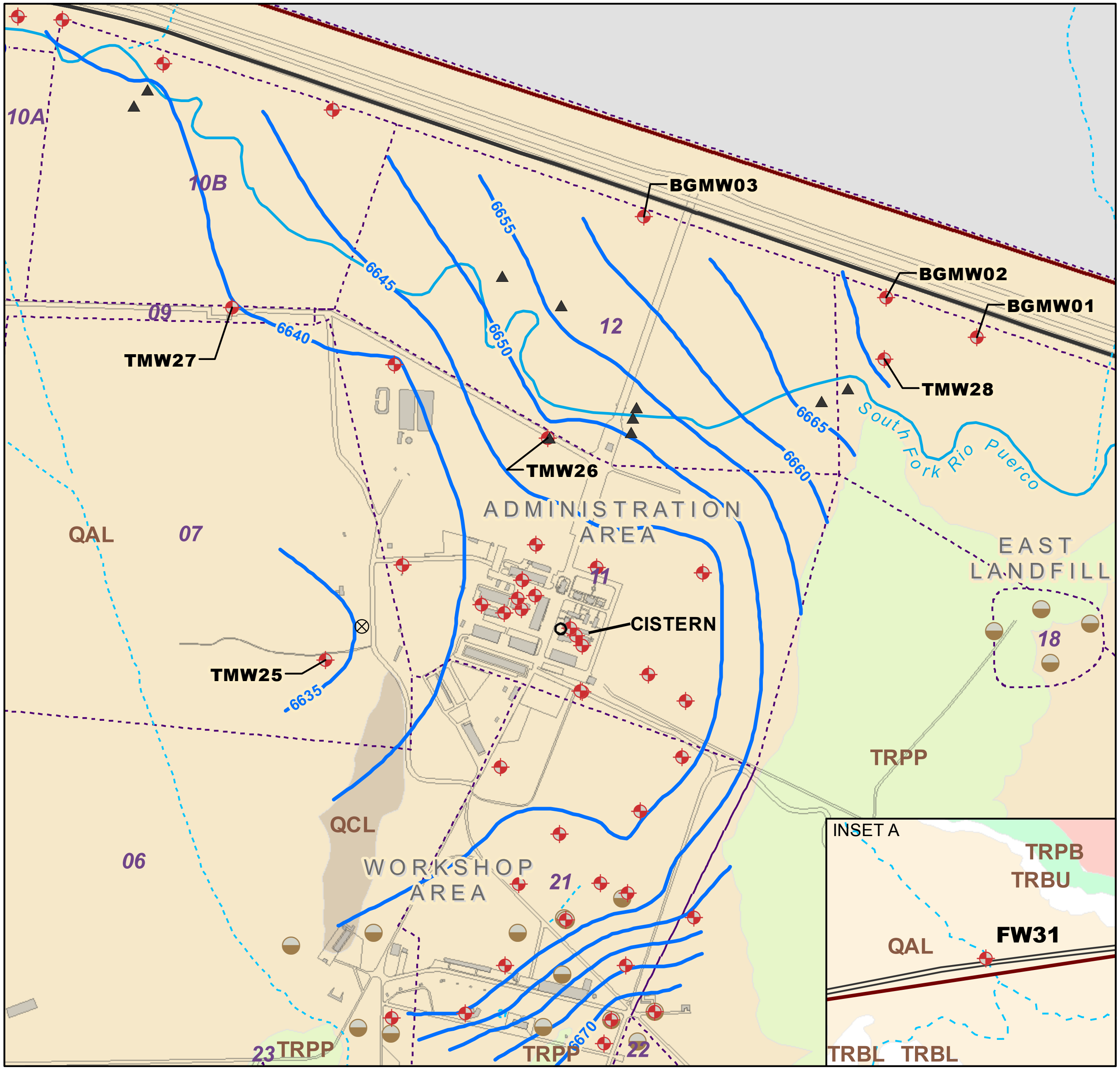
Table 4
Summary Statistics for Background Data

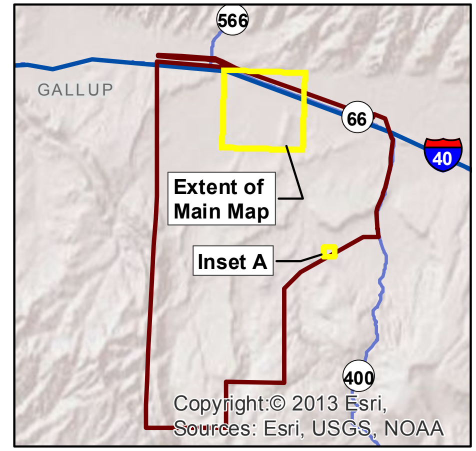
Aquifer	Chemical Group	Constituent	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum RL for Non-detects	Maximum RL for Non-detects	Location of Maximum Detected Concentration	Qualifier of Maximum Detected Concentration	Background Threshold Value	Basis for Background Threshold Value	Outliers Excluded
Alluvial	Dissolved Metals	Aluminum, Dissolved	13	29	45	µg/L	2.1	68	2.8	62	FW31	J	62	Kaplan Meier UTL	1100, 360, 320
Alluvial	Dissolved Metals	Antimony, Dissolved	5	31	16	µg/L	0.53	1.1	1	2.4	TMW28	J	1.11	Kaplan Meier UTL	1.20
Alluvial	Dissolved Metals	Arsenic, Dissolved	24	28	86	µg/L	0.36	11	1.2	2	BGMW02		12.9	Lognormal UTL	21.0, 21.0, 21.0, 20.0
Alluvial	Dissolved Metals	Barium, Dissolved	28	28	100	µg/L	11	75	NA	NA	TMW28		75	Nonparametric UTL	130, 130, 120, 120
Alluvial	Dissolved Metals	Beryllium, Dissolved	2	32	6	µg/L	0.1	0.47	0.4	0.96	TMW28	J	0.47	Maximum Detect	
Alluvial	Dissolved Metals	Cadmium, Dissolved	3	32	9	µg/L	0.14	0.3	0.24	0.48	TMW25	J	0.3	Maximum Detect	
Alluvial	Dissolved Metals	Calcium, Dissolved	30	30	100	µg/L	4900	110000	NA	NA	BGMW02		109000	Normal UTL	300000, 220000
Alluvial	Dissolved Metals	Chromium, Dissolved	13	29	45	µg/L	0.51	5.8	3	6	TMW28	J	4.83	Kaplan Meier UTL	11.0, 6.80, 6.10
Alluvial	Dissolved Metals	Cobalt, Dissolved	30	31	97	µg/L	0.055	1.1	0.2	0.2	BGMW01		0.984	Gamma UTL	2.20
Alluvial	Dissolved Metals	Copper, Dissolved	18	28	64	µg/L	0.75	4.9	1.56	3	BGMW03		5.35	Normal UTL	15.0, 14.0, 13.0, 12.0
Alluvial	Dissolved Metals	Iron, Dissolved	20	32	63	µg/L	25	590	56	96	TMW27		625	Kaplan Meier UTL	
Alluvial	Dissolved Metals	Lead, Dissolved	7	32	22	µg/L	0.2	0.5	0.4	2	FW31	J	0.448	Kaplan Meier UTL	
Alluvial	Dissolved Metals	Magnesium, Dissolved	27	27	100	µg/L	1800	29000	NA	NA	BGMW01		36900	Gamma UTL	130000, 130000, 120000, 91000, 65000
Alluvial	Dissolved Metals	Manganese, Dissolved	32	32	100	µg/L	0.7	840	NA	NA	BGMW02		1080	Gamma UTL	
Alluvial	Dissolved Metals	Mercury, Dissolved	2	32	6	µg/L	0	0.028	0	0.16	FW31	J	0.028	Maximum Detect	
Alluvial	Dissolved Metals	Nickel, Dissolved	27	30	90	µg/L	0.2	4.2	1.36	1.8	TMW26		4.38	Gamma UTL	12.0, 4.20
Alluvial	Dissolved Metals	Potassium, Dissolved	31	31	100	µg/L	290	2700	NA	NA	TMW28	J	2490	Normal UTL	15000
Alluvial	Dissolved Metals	Selenium, Dissolved	9	27	33	µg/L	0.74	29	3	8	BGMW03		19.9	Kaplan Meier UTL	110, 81.0, 80.0, 46.0, 43.0
Alluvial	Dissolved Metals	Silver, Dissolved	4	31	13	µg/L	0.037	0.067	0.2	1.2	TMW28	J	0.0742	Kaplan Meier UTL	1.90
Alluvial	Dissolved Metals	Sodium, Dissolved	31	31	100	µg/L	100000	970000	NA	NA	TMW26		970000	Nonparametric UTL	
Alluvial	Dissolved Metals	Thallium, Dissolved	7	31	23	µg/L	0.057	0.29	0.2	0.8	TMW28	J	0.217	Kaplan Meier UTL	1.00
Alluvial	Dissolved Metals	Vanadium, Dissolved	29	32	91	µg/L	0.52	14	2	2	BGMW03	J	18.7	Gamma UTL	
Alluvial	Dissolved Metals	Zinc, Dissolved	21	31	68	µg/L	2.2	15	12	24	BGMW02	J	15.8	Kaplan Meier UTL	30.0
Bedrock	Dissolved Metals	Aluminum, Dissolved	16	22	73	µg/L	0.7	186	62	1200	TMW17		202	Kaplan Meier UTL	384, 378
Bedrock	Dissolved Metals	Antimony, Dissolved	2	24	8	µg/L	0.2	0.9	0.4	120	TMW19	J	0.9	Maximum Detect	
Bedrock	Dissolved Metals	Arsenic, Dissolved	5	24	21	µg/L	0.5	0.8	1.2	100	TMW17		0.961	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Barium, Dissolved	22	24	92	µg/L	7.8	21	23.4	29.8	TMW17		19.7	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Beryllium, Dissolved	1	24	4	µg/L	0.08	0.08	0.2	3.6	TMW17	J	0.08	Single Detect	
Bedrock	Dissolved Metals	Cadmium, Dissolved	2	24	8	µg/L	0.1	0.7	0.2	100	TMW19	J	0.7	Maximum Detect	
Bedrock	Dissolved Metals	Calcium, Dissolved	23	24	96	µg/L	2900	18000	7680	7680	TMW19		17100	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Chromium, Dissolved	10	24	42	µg/L	0.2	6.1	3	20.6	TMW19		4.98	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Cobalt, Dissolved	9	24	38	µg/L	0	2	0.2	100	TMW19	J	1.57	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Copper, Dissolved	12	24	50	µg/L	0.89	10	0.8	400	TMW19		8.69	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Iron, Dissolved	11	24	46	µg/L	31	222	38	1090	TMW17	J	175	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Lead, Dissolved	8	24	33	µg/L	0.2	2.8	0	100	TMW17	J	2.44	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Magnesium, Dissolved	22	24	92	µg/L	270	2600	1280	3000	TMW19		2090	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Manganese, Dissolved	19	24	79	µg/L	4.3	66.6	20	1000	TMW19		99.1	Gamma UTL	
Bedrock	Dissolved Metals	Mercury, Dissolved	1	24	4	µg/L	0.288	0.288	0	0.4	TMW17	J	0.288	Single Detect	
Bedrock	Dissolved Metals	Nickel, Dissolved	14	22	64	µg/L	0.1	4.2	1.38	40	TMW19		3.91	Kaplan Meier UTL	9.40, 9.10
Bedrock	Dissolved Metals	Potassium, Dissolved	22	24	92	µg/L	759	4370	10000	10000	TMW19	J	3770	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Selenium, Dissolved	4	24	17	µg/L	1.4	2.6	3	200	TMW19		3.18	Kaplan Meier UTL	
Bedrock	Dissolved Metals	Sodium, Dissolved	24	24	100	µg/L	250000	851000	NA	NA	TMW19		906000	Normal UTL	
Bedrock	Dissolved Metals	Vanadium, Dissolved	18	23	78	µg/L	0.5	7.6	2	100	TMW19		7.99	Kaplan Meier UTL	51.0
Bedrock	Dissolved Metals	Zinc, Dissolved	12	23	52	µg/L	5.1	48	3.8	200	TMW19		44.1	Kaplan Meier UTL	370
Alluvial	Nitrogen	Nitrate as N	17	24	71	mg/L	0.098	18	0.096	0.4	BGMW02		24.8	Gamma UTL	
Alluvial	Nitrogen	Nitrite as N	3	24	13	mg/L	0.11	0.35	0.108	0.4	BGMW03		0.35	Maximum Detect	
Bedrock	Nitrogen	Nitrate as N	5	13	38	mg/L	0.04	0.23	0.096	1	TMW17	J	0.324	Kaplan Meier UTL	
Bedrock	Nitrogen	Nitrate as Nitrate	1	2	50	mg/L	0.0195	0.0195	0.1	0.1	TMW17	J	0.0195	Single Detect	
Bedrock	Nitrogen	Nitrite as N	1	13	8	mg/L	0.054	0.054	0.108	1	TMW17		0.054	Single Detect	
Bedrock	PAHs	Cresol, o-	2	9	22	µg/L	0.667	3.1	10	10.6	TMW19	J	3.1	Maximum Detect	
Bedrock	PAHs	m,p-Cresol	2	15	13	µg/L	0.72	5.8	0.72	10.6	TMW19		5.8	Maximum Detect	
Alluvial	Perchlorate	Perchlorate	7	19	37	µg/L	0.055	0.579	0.04	0.6	BGMW03		0.667	Kaplan Meier UTL	3.10
Bedrock	Perchlorate	Perchlorate	1	16	6	µg/L	0.019	0.019	0.018	4	TMW17	J	0.019	Single Detect	
Alluvial	Total Metals	Aluminum, Total	22	28	79	µg/L	24	1500	9.4	62	TMW26	J	1310	Kaplan Meier UTL	26000, 12000, 2500, 2100
Alluvial	Total Metals	Antimony, Total	6	30	20	µg/L	0.42	0.9	1	2.4	TMW27	J	1.06	Kaplan Meier UTL	1.30, 0.870

Table 4
Summary Statistics for Background Data

Aquifer	Chemical Group	Constituent	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum RL for Non-detects	Maximum RL for Non-detects	Location of Maximum Detected Concentration	Qualifier of Maximum Detected Concentration	Background Threshold Value	Basis for Background Threshold Value	Outliers Excluded
Alluvial	Total Metals	Arsenic, Total	24	28	86	µg/L	0.56	9.2	1.2	2	FW31		8.86	Kaplan Meier UTL	21.0, 20.0, 19.0, 19.0
Alluvial	Total Metals	Barium, Total	30	30	100	µg/L	13	130	NA	NA	TMW27		130	Nonparametric UTL	480, 200
Alluvial	Total Metals	Beryllium, Total	4	30	13	µg/L	0.088	0.27	0.4	0.96	BGMW03	J	0.325	Kaplan Meier UTL	1.30, 0.460
Alluvial	Total Metals	Cadmium, Total	4	31	13	µg/L	0.11	0.3	0.24	0.48	BGMW01	J	0.233	Kaplan Meier UTL	0.400
Alluvial	Total Metals	Calcium, Total	32	32	100	µg/L	5800	210000	NA	NA	TMW28		178000	Gamma UTL	
Alluvial	Total Metals	Chromium, Total	13	29	45	µg/L	0.4	3	0.6	6	BGMW03	J	2.68	Kaplan Meier UTL	15.0, 8.00, 7.60
Alluvial	Total Metals	Cobalt, Total	28	30	93	µg/L	0.073	1.4	0.2	0.6	BGMW03		1.53	Gamma UTL	7.10, 4.00
Alluvial	Total Metals	Copper, Total	25	31	81	µg/L	0.69	12	3	3	TMW26		15.7	Gamma UTL	17.0
Alluvial	Total Metals	Iron, Total	28	29	97	µg/L	22	1500	96	96	TMW27		1480	Gamma UTL	15000, 4400, 1800
Alluvial	Total Metals	Lead, Total	9	28	32	µg/L	0.24	1	0.4	2	BGMW03		0.778	Kaplan Meier UTL	11.0, 4.70, 1.80, 1.40
Alluvial	Total Metals	Magnesium, Total	27	27	100	µg/L	2600	31000	NA	NA	BGMW01		39800	Gamma UTL	130000, 130000, 120000, 120000, 64000
Alluvial	Total Metals	Manganese, Total	32	32	100	µg/L	8.3	870	NA	NA	TMW25		1130	Gamma UTL	
Alluvial	Total Metals	Mercury, Total	1	32	3	µg/L	0.028	0.028	0	0.16	BGMW03	J	0.028	Single Detect	
Alluvial	Total Metals	Nickel, Total	27	30	90	µg/L	0.31	4.1	1.8	3.2	FW31		4.08	Normal UTL	11.0, 7.40
Alluvial	Total Metals	Potassium, Total	32	32	100	µg/L	260	5800	NA	NA	BGMW03		4250	Gamma UTL	
Alluvial	Total Metals	Selenium, Total	6	27	22	µg/L	1.6	40	3	8	BGMW03		27.4	Kaplan Meier UTL	95.0, 87.0, 84.0, 79.0, 47.0
Alluvial	Total Metals	Silver, Total	7	31	23	µg/L	0.034	0.13	0.2	0.4	FW31	J	0.142	Kaplan Meier UTL	1.10
Alluvial	Total Metals	Sodium, Total	31	31	100	µg/L	100000	960000	NA	NA	TMW25		960000	Nonparametric UTL	
Alluvial	Total Metals	Thallium, Total	8	32	25	µg/L	0.056	0.21	0.2	0.4	TMW28	J	0.217	Kaplan Meier UTL	
Alluvial	Total Metals	Vanadium, Total	28	30	93	µg/L	0.5	14	2	2	FW31		19.2	Gamma UTL	43.0, 20.0
Alluvial	Total Metals	Zinc, Total	27	31	87	µg/L	2.4	55	12	24	TMW27		71	Lognormal UTL	120
Bedrock	Total Metals	Aluminum, Total	20	20	100	µg/L	120	3000	NA	NA	TMW17		3760	Gamma UTL	26000, 16000, 9800, 7690
Bedrock	Total Metals	Antimony, Total	4	24	17	µg/L	0.5	1.2	1	1200	TMW19	J	1.06	Kaplan Meier UTL	
Bedrock	Total Metals	Arsenic, Total	11	23	48	µg/L	0.34	16.4	1.2	88.6	TMW19	J	10.5	Kaplan Meier UTL	49.9
Bedrock	Total Metals	Barium, Total	24	24	100	µg/L	7.8	82.5	NA	NA	TMW19		82.5	Nonparametric UTL	
Bedrock	Total Metals	Beryllium, Total	5	24	21	µg/L	0.18	0.43	0.2	20	TMW19	J	0.445	Kaplan Meier UTL	
Bedrock	Total Metals	Cadmium, Total	6	24	25	µg/L	0.1	0.7	0.2	100	TMW17	J	0.624	Kaplan Meier UTL	
Bedrock	Total Metals	Calcium, Total	24	24	100	µg/L	3030	25300	NA	NA	TMW19		25300	Nonparametric UTL	
Bedrock	Total Metals	Chromium, Total	16	23	70	µg/L	0.5	7.8	0.6	8	TMW19		7.47	Kaplan Meier UTL	19.5
Bedrock	Total Metals	Cobalt, Total	11	24	46	µg/L	0.093	3.2	0	100	TMW19		3.04	Kaplan Meier UTL	
Bedrock	Total Metals	Copper, Total	22	24	92	µg/L	0.73	28	3	40	TMW17		34	Gamma UTL	
Bedrock	Total Metals	Iron, Total	20	23	87	µg/L	61	5100	494	600	TMW19		6320	Gamma UTL	13100
Bedrock	Total Metals	Lead, Total	14	23	61	µg/L	0.44	5.3	1	100	TMW19		5.42	Kaplan Meier UTL	22.0
Bedrock	Total Metals	Magnesium, Total	24	24	100	µg/L	364	8340	NA	NA	TMW19		8350	Lognormal UTL	
Bedrock	Total Metals	Manganese, Total	20	24	83	µg/L	7.9	315	1000	1000	TMW19		335	Gamma UTL	
Bedrock	Total Metals	Mercury, Total	1	24	4	µg/L	0	0.06	0	0.4	TMW17	J	0.06	Single Detect	
Bedrock	Total Metals	Nickel, Total	18	24	75	µg/L	0.43	12.4	0.6	40	TMW19		20.2	Gamma UTL	
Bedrock	Total Metals	Potassium, Total	23	24	96	µg/L	660	5260	1130	1130	TMW19		4285	Gamma UTL	
Bedrock	Total Metals	Selenium, Total	9	24	38	µg/L	0.77	3.3	4	200	TMW17	J	3.4	Kaplan Meier UTL	
Bedrock	Total Metals	Silver, Total	7	24	29	µg/L	0.047	7.4	0.2	100	TMW19	J	5.38	Kaplan Meier UTL	
Bedrock	Total Metals	Sodium, Total	24	24	100	µg/L	319000	740000	NA	NA	TMW19		740000	Nonparametric UTL	
Bedrock	Total Metals	Thallium, Total	2	24	8	µg/L	0.3	3.7	0	100	TMW19	J	3.7	Maximum Detect	
Bedrock	Total Metals	Vanadium, Total	20	22	91	µg/L	0.5	15	2	20	TMW19		15.8	Kaplan Meier UTL	92.2, 45.0
Bedrock	Total Metals	Zinc, Total	14	19	74	µg/L	7	100	5.2	200	TMW17		104	Kaplan Meier UTL	54000, 1100, 640, 442, 290

J = analyte was positively identified; reported value is estimated
µg/L = micrograms per liter
NA = not applicable
RL = reporting limit
UTL = upper threshold limit





Legend

TMW11 Well Identifier

- Alluvial Monitoring Well
- Bedrock Monitoring Well
- Piezometer
- Dry Well
- Water Supply Well 69
- 6635 Alluvial Groundwater Contours, October 2013
- Building
- 10A Property Transfer Parcel
- Fort Wingate Installation Boundary

Surface Geology

- QAL - Quaternary Alluvial Deposits
- QCL - Quaternary Colluvial and Gravel Deposits
- TRPP - Petrified Forest Formation, Painted Desert Member
- Arroyo
- Stream
- Road

State Plane Coordinate System, New Mexico West,
North American Datum 1983, US Feet.
North American Vertical Datum 1988, US Feet.

Data Sources:
Roads, Railroad: Tele Atlas GDT-Dynamap, 2008;
Populated Places: ESRI 2005;
Fort Wingate Environmental Restoration Detail: USACE.

0 500 1,000 1,500 2,000 ft

0 100 200 300 400 500 m

N

FIGURE 1
Northern Area Alluvial Background Wells

Groundwater Background Evaluation
Fort Wingate Depot Activity,
McKinley County, New Mexico

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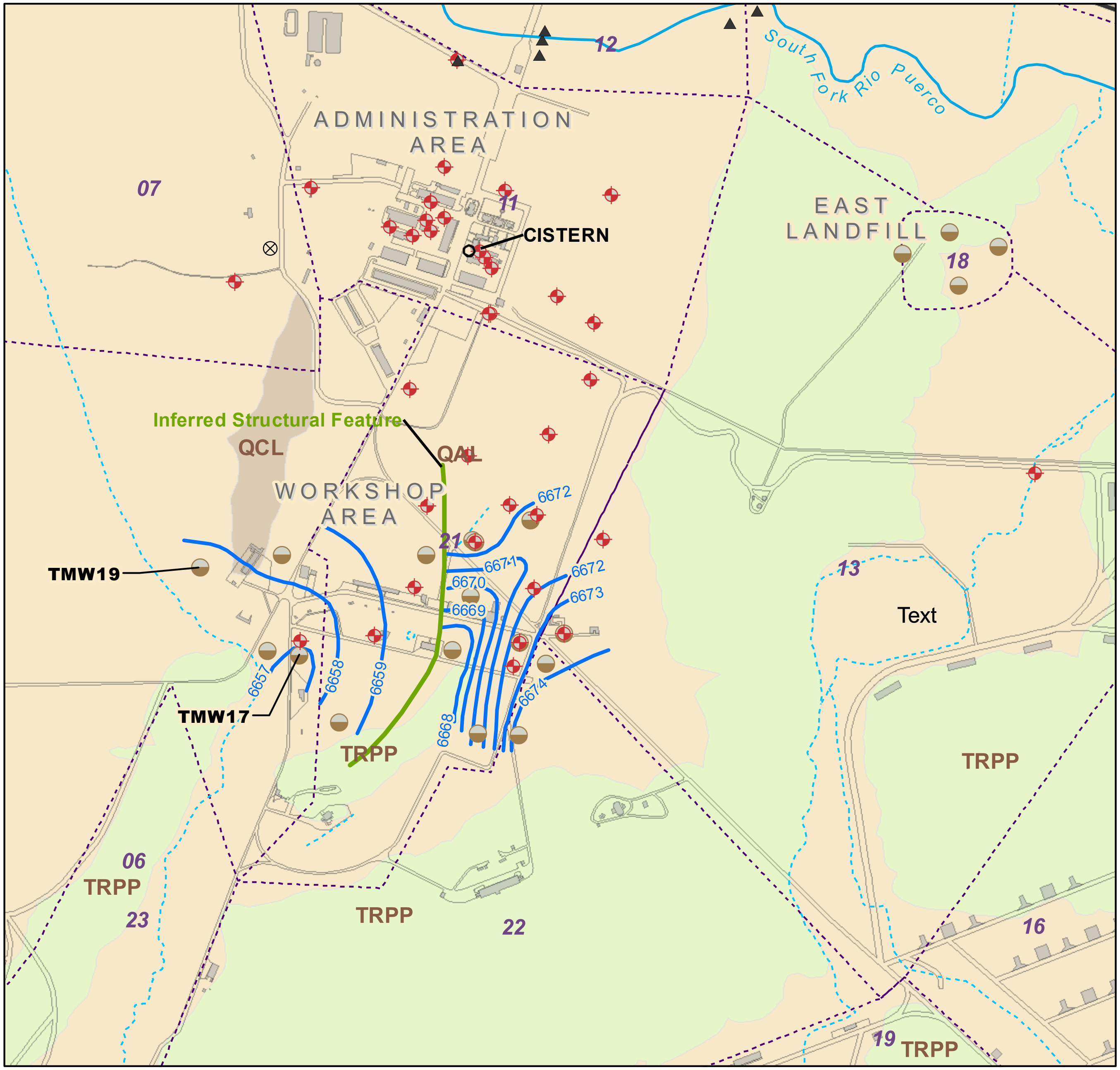
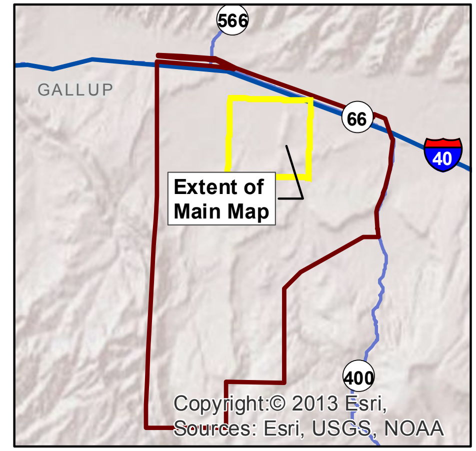




Legend

TMW11 Well Identifier

Alluvial Monitoring Well

Bedrock Monitoring Well

Piezometer

Dry Well

Water Supply Well 69

6672 Bedrock Groundwater Contours, April 2014

Building

10A Property Transfer Parcel

Fort Wingate Installation Boundary

Surface Geology

QAL - Quaternary Alluvial Deposits

QCL - Quaternary Colluvial and Gravel Deposits

TRPP - Petrified Forest Formation, Painted Desert Member

Arroyo

Stream

Road

State Plane Coordinate System, New Mexico West,
North American Datum 1983, US Feet.
North American Vertical Datum 1988, US Feet.

Data Sources:
Roads, Railroad: Tele Atlas GDT-Dynamap, 2008;
Populated Places: ESRI 2005;
Fort Wingate Environmental Restoration Detail: USACE.

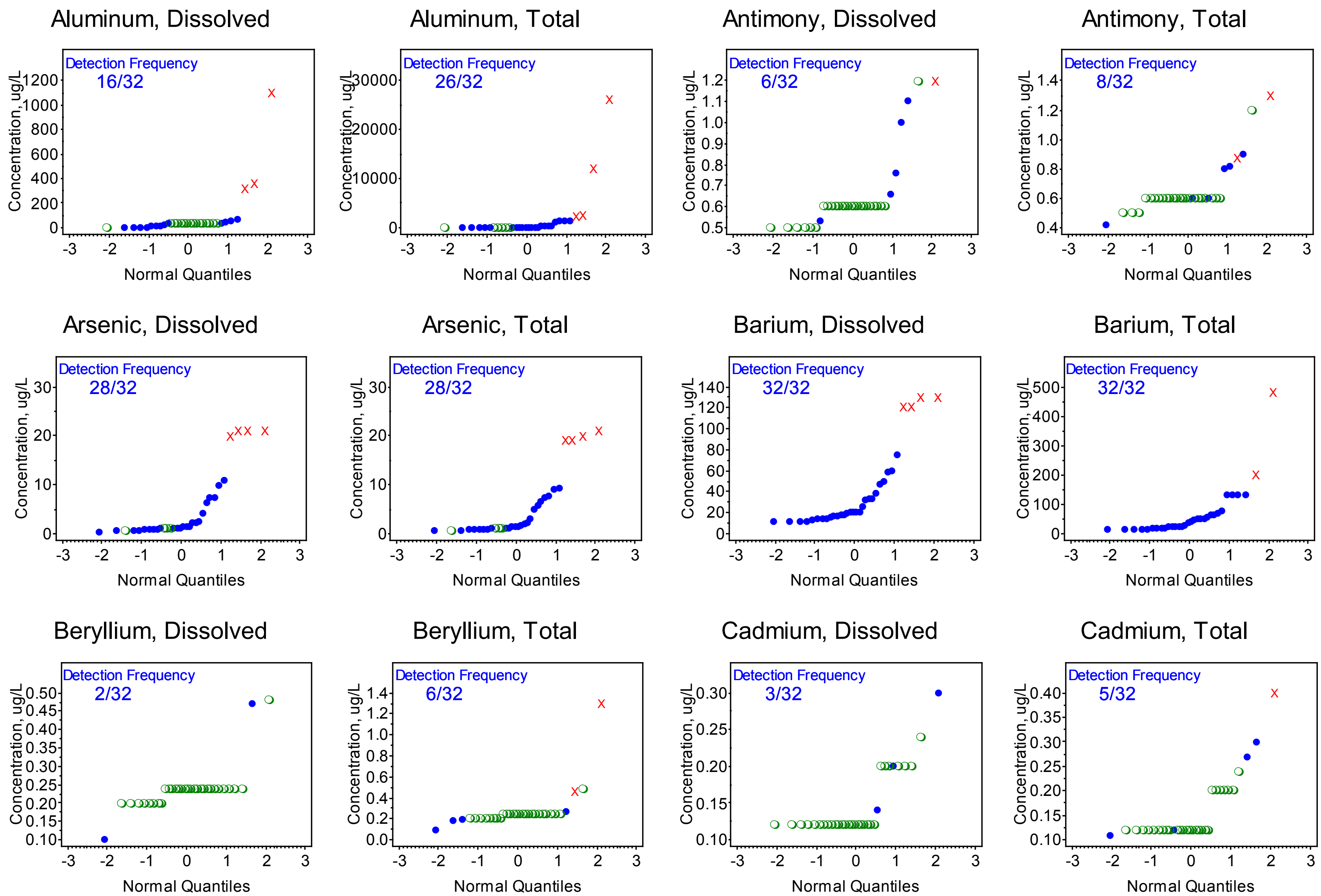
0 500 1,000 1,500 2,000 ft

0 100 200 300 400 500 m

N

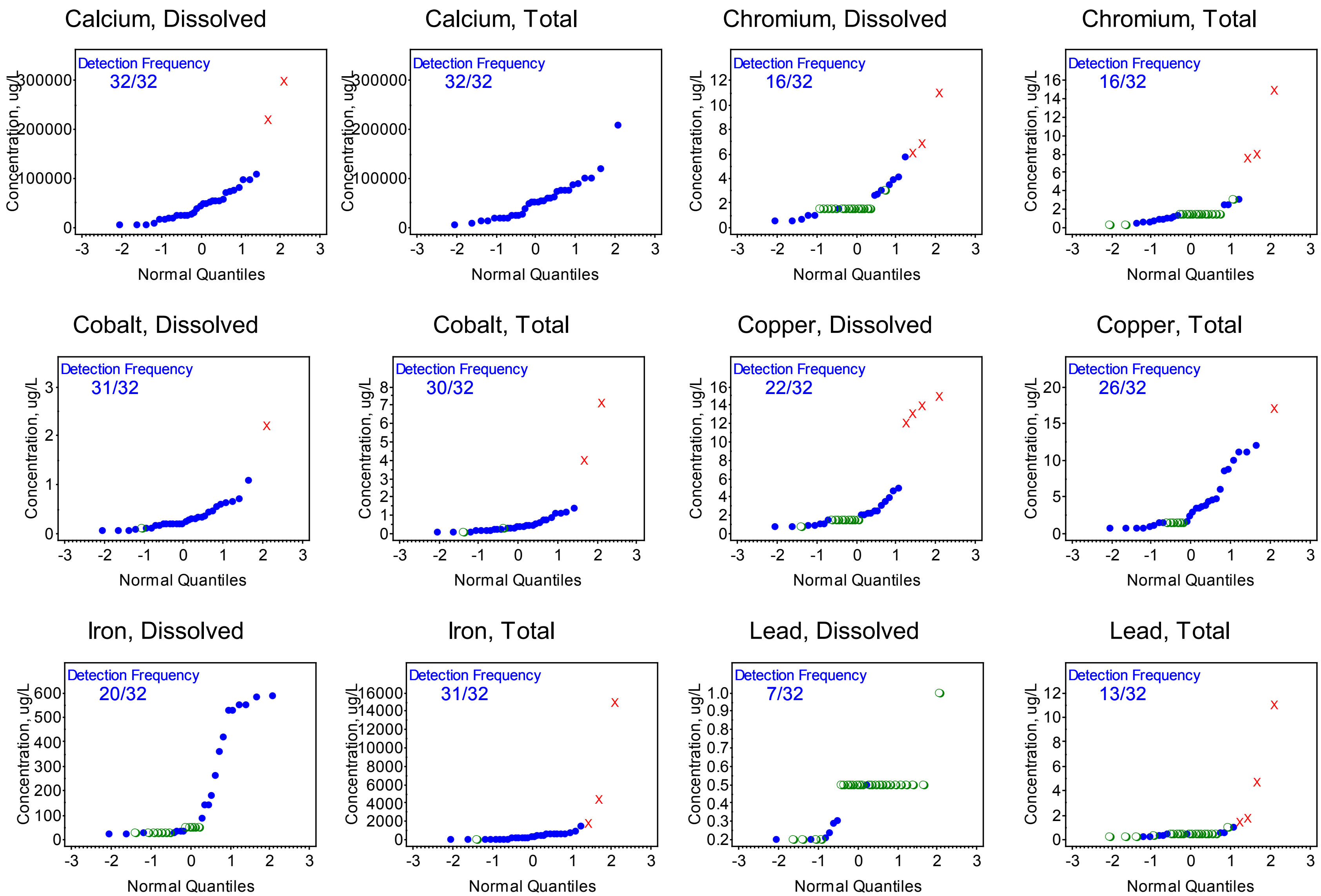
FIGURE 2
Northern Area Bedrock Background Wells
Groundwater Background Evaluation
Fort Wingate Depot Activity,
McKinley County, New Mexico

Figure 3: Normal Probability Plots for Alluvial Background Wells



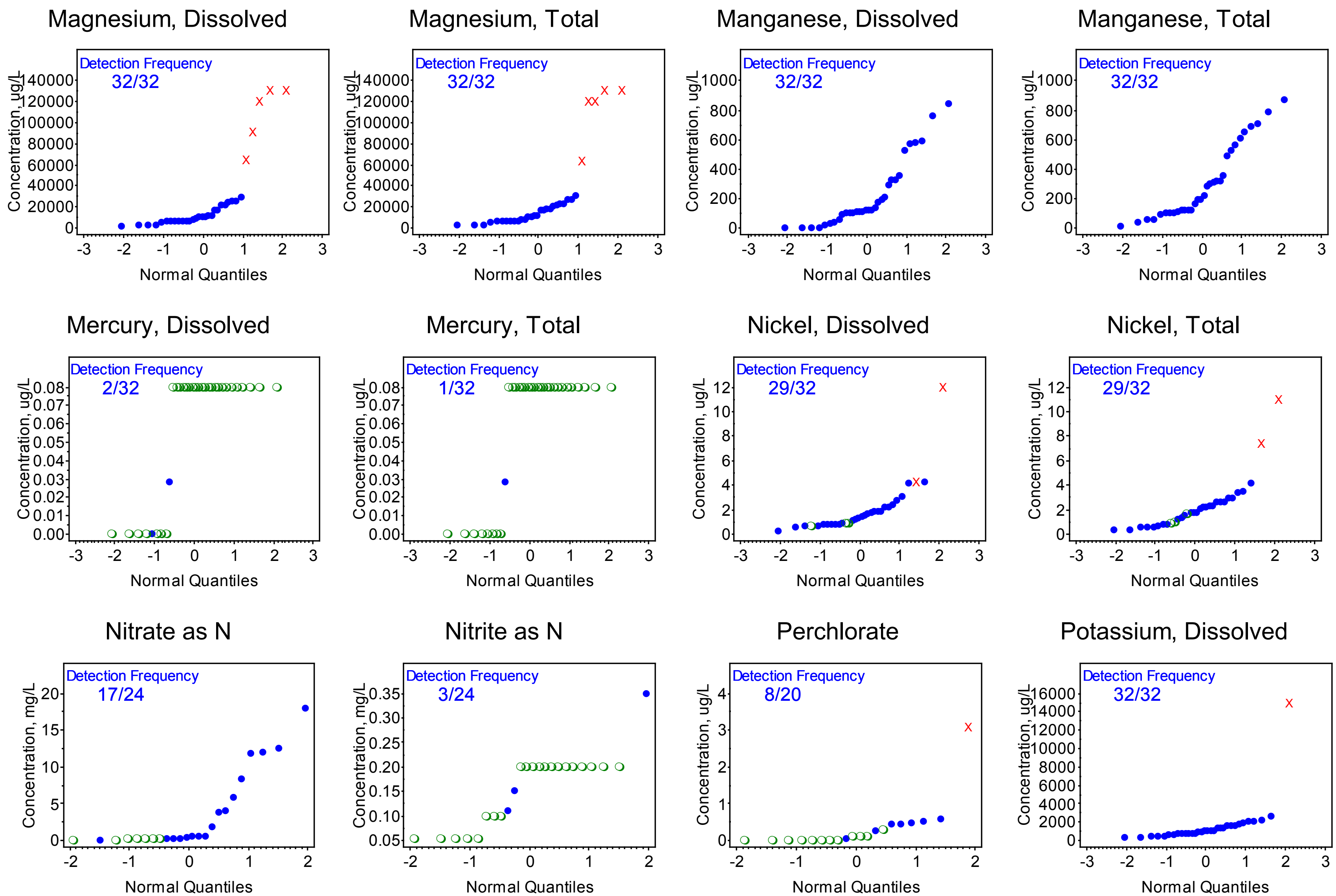
Green Open Circle Represents 1/2 RL Proxy for Nondetects; Closed Blue Symbol Represents Detect
Red X When Mathematical Outlier Chosen for Exclusion

Figure 3: Normal Probability Plots for Alluvial Background Wells



Green Open Circle Represents 1/2 RL Proxy for Nondetects; Closed Blue Symbol Represents Detect
Red X When Mathematical Outlier Chosen for Exclusion

Figure 3: Normal Probability Plots for Alluvial Background Wells



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Red X When Mathematical Outlier Chosen for Exclusion

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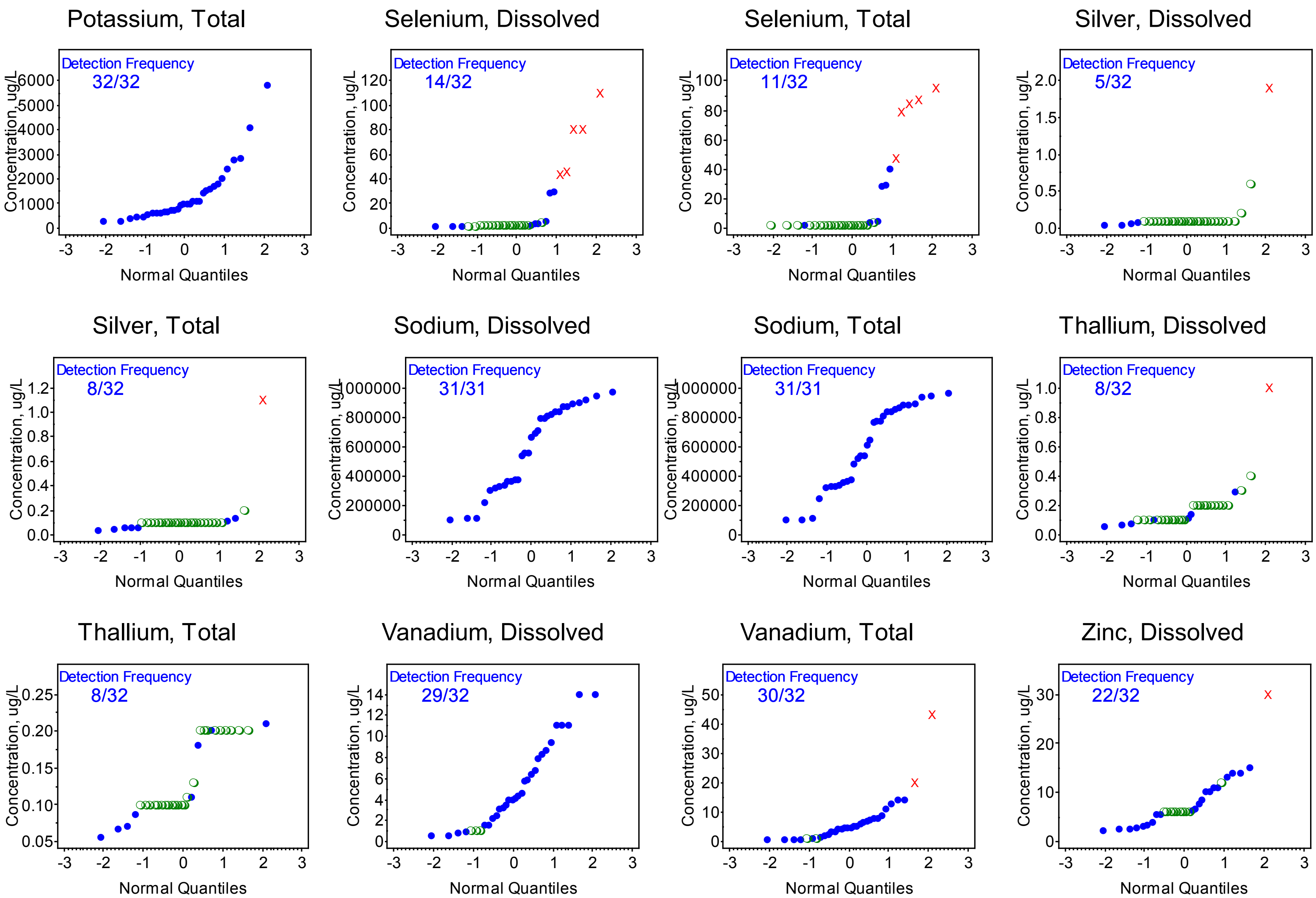

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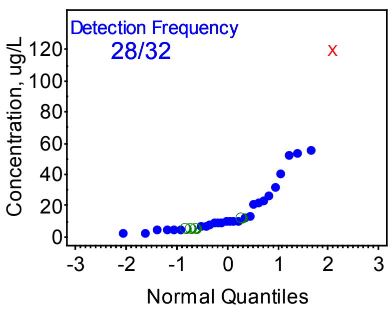
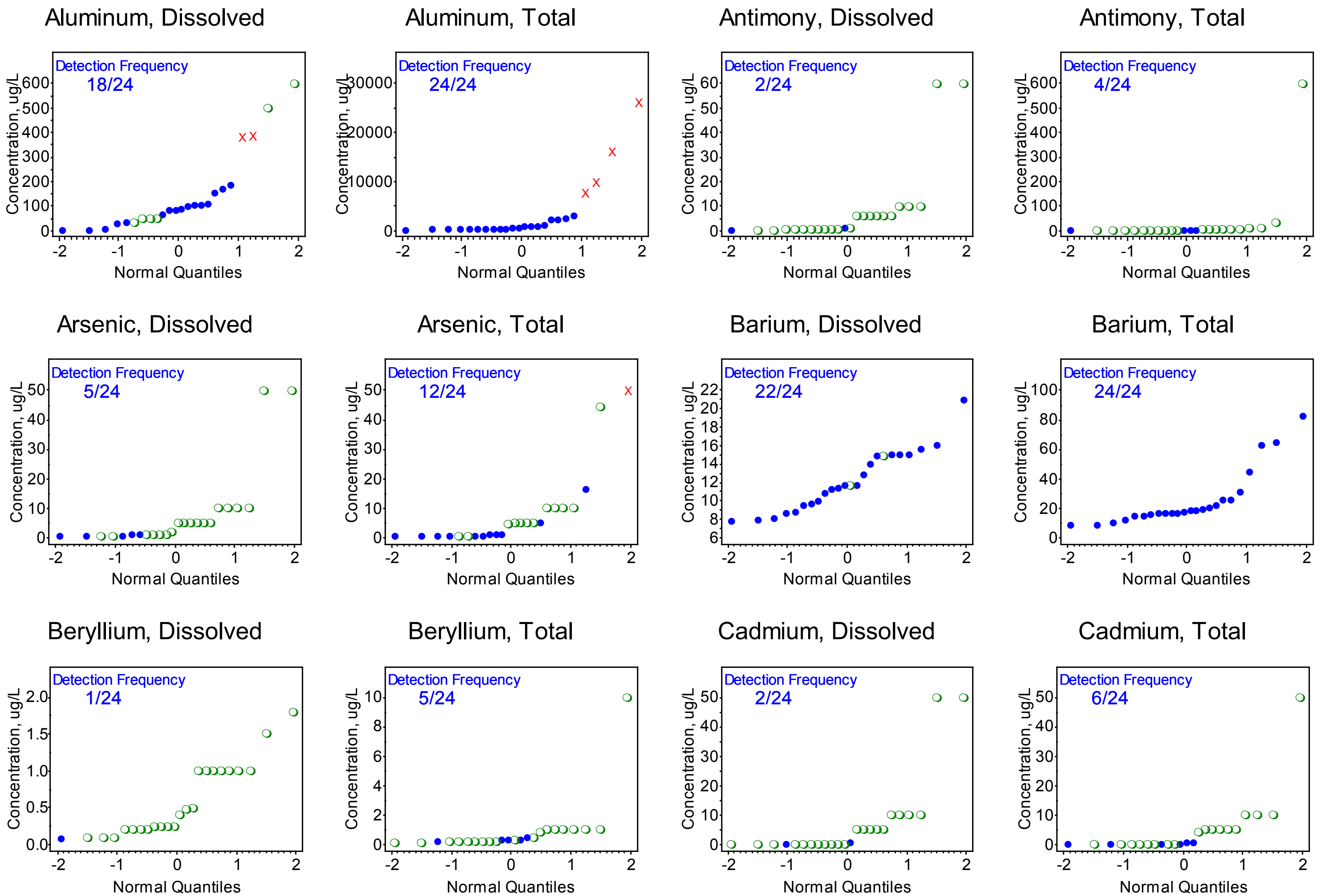
Figure 3: Normal Probability Plots for Alluvial Background Wells

Zinc, Total



Green Open Circle Represents 1/2 RL Proxy for Nondetects; Closed Blue Symbol Represents Detect
Red X When Mathematical Outlier Chosen for Exclusion

Figure 4: Normal Probability Plots for Bedrock Background Wells



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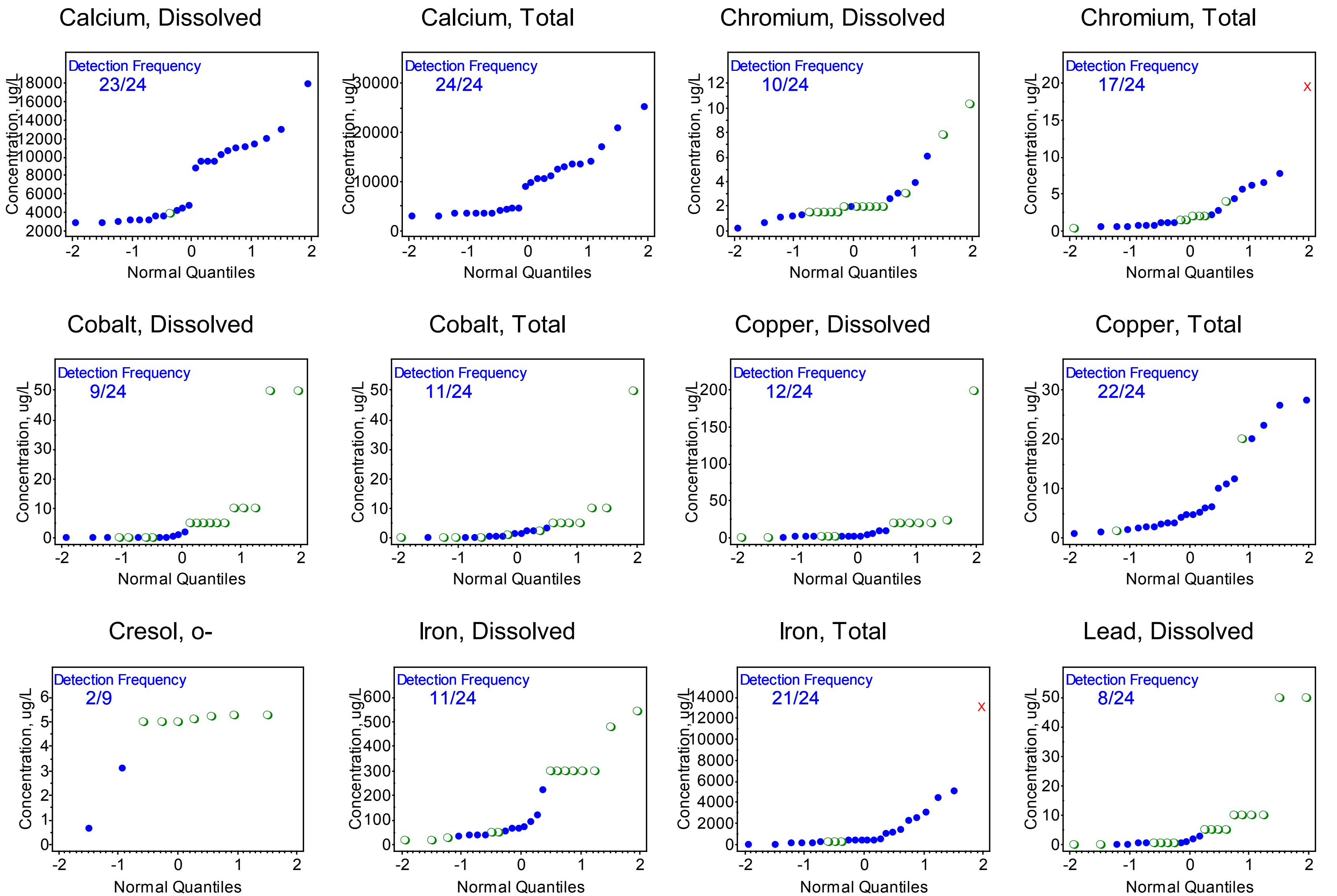

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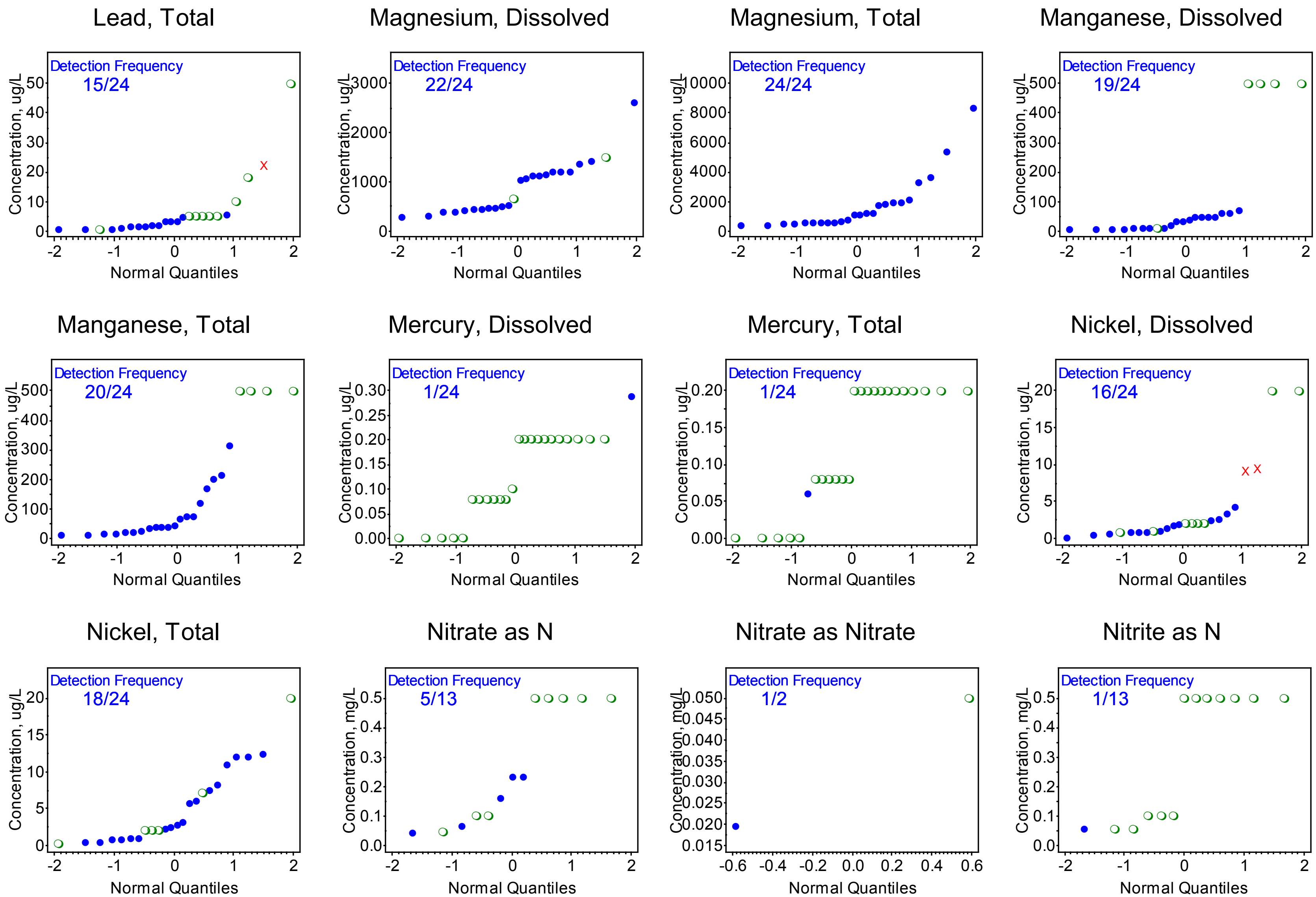

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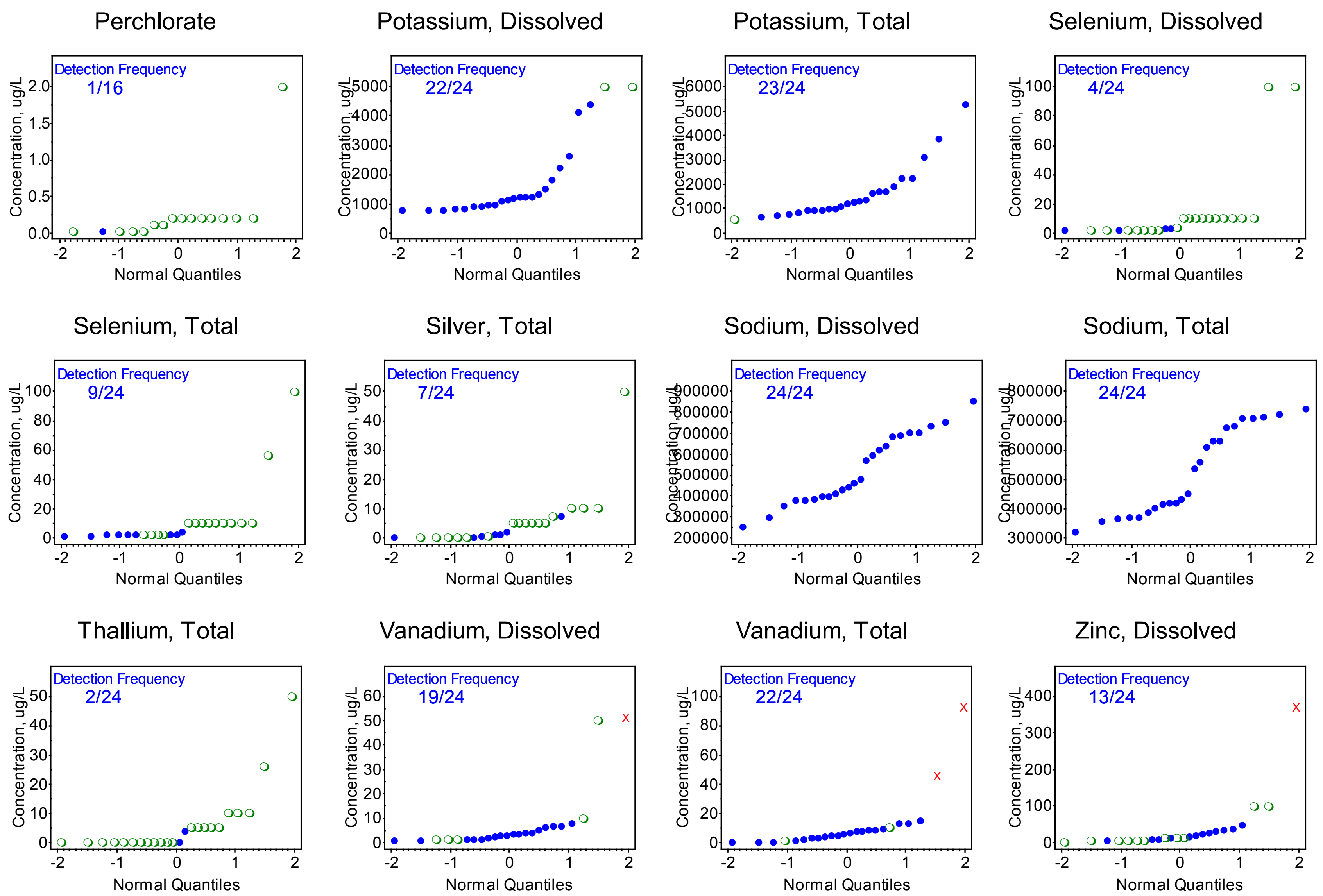

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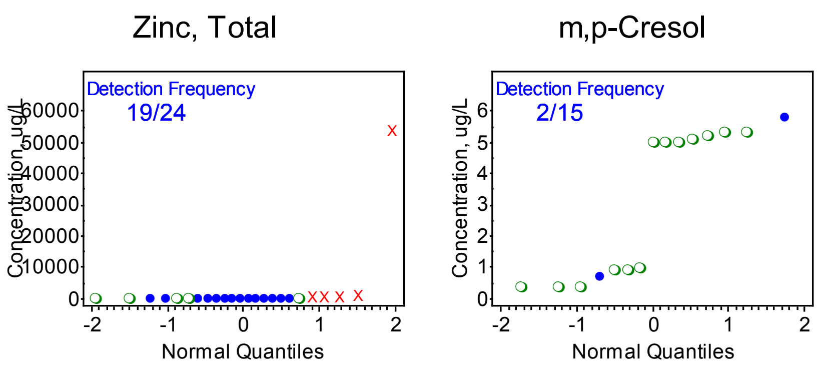

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