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MEMORANDUM REGARDING THE RE-EVALUATION OF FACILITY BACKGROUND REPORT NSY PORTSMOUTH ME
4/15/2014
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Memorandum

To: Linda Cole, NAVFAC Mid-Atlantic

From: Debbie Cohen

Date: April 27, 2012, Revised April 15, 2014

Re: Re-Evaluation of Facility Background Report

Contract/CTO Number: N62470-08-D-1001/WE13

Introduction

This Technical Memorandum presents revised summary statistics for the Facility Background Report (Tetra Tech, May 2000) based on updated statistical methodologies. These updated summary statistics provide a more in-depth evaluation of the background soil and groundwater data sets for Portsmouth Naval Shipyard (PNS). The analysis of data in the Facility Background Report included methods for evaluation of outliers and calculations of representative concentrations that are no longer used by the Navy based on updated United States Environmental Protection Agency (USEPA) guidance. This Technical Memorandum provides an update to the evaluation of outliers, presents the complete facility background data set, and calculates updated representative concentrations [95-percent Upper Confidence Limits (UCLs), 95-percent Upper Prediction Limits (UPLs), and 95-percent Upper Tolerance Limits (UTLs)]. Current State of Maine background soil levels from Remedial Action Guidelines (RAGs) For Sites Contaminated with Hazardous Substances (MEDEP, May 2013) are also provided.

Background sampling is conducted to distinguish site-related contamination from non-site-related chemical concentrations that may be naturally occurring or anthropogenic. Also, defining background concentrations at PNS assists risk assessors and risk managers to differentiate between Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and non-CERCLA-related chemical concentrations at a site. Risk assessors and risk managers consider background or upgradient concentrations when distinguishing the source of environmental contamination and determining the need for environmental remediation. Background concentrations are often used to select chemicals of potential concern (COPCs) for risk assessments or to determine whether a site warrants additional investigation.

As part of the Facility Background Report, background data sets were developed for surface soil and groundwater (Tetra Tech, May 2000). Figure 1 presents the background soil and groundwater sampling locations. Attachment A provides a printout of the complete background soil and groundwater data set. For surface soil, 25 background samples were evaluated. Of the 25 samples, 21 were from non-fill areas and four were from fill areas. The fill samples, BGS-01, BGS-04, BGS-06, and BGS-08, were collected in fill areas that were not related to CERCLA sites. The Facility Background Report concluded that there were no statistical differences between concentrations in the non-fill and fill areas; therefore, all soil samples were combined into one soil background data set. Background dioxin/furan soil data were collected in 2003 as part of the Phase I remedial investigation (RI) at Operable Unit 7 (Tetra Tech, January 2004) after the Facility Background Report was completed. Nineteen of the 25 locations were sampled and analyzed for dioxins/furans. In risk assessment, dioxins/furans and carcinogenic polycyclic aromatic hydrocarbons (PAHs) may be represented by toxicity equivalency concentrations based on one compound. For dioxin/furans, total toxic equivalency concentrations based on toxicity equivalence to 2,3,7,8-tetrachloro-p-dioxin (2,3,7,8-TCDD) is calculated and referred to herein as 2,3,7,8-TCDD toxicity equivalency quotient (TEQ). For carcinogenic PAHs, toxic equivalency concentration is based on toxicity equivalence to benzo(a)pyrene and is referred to herein as benzo(a)pyrene equivalent concentration. For each sample, 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations were calculated in two ways for this Technical Memorandum, using only the detected concentrations for dioxins/furans and using detected concentrations and one-half of detection limits for non-detected dioxins/furans.

As part of the Facility Background Report, four rounds of groundwater data (collected in 1996 and 1997) from six monitoring wells were evaluated. All groundwater samples were collected using low-flow sampling techniques. Field measurements (pH, specific conductance, temperature, turbidity, dissolved oxygen, salinity, and Eh) for the groundwater samples included in the Facility Background Report are from Table 3-2 of the Groundwater Monitoring Summary Report (December, 1996 – November, 1997) (Tetra Tech, August 1999). Salinity data (or values) from all rounds were evaluated in the Facility Background Report to determine whether groundwater at each well was consistently freshwater [salinity of 0.5 part per thousand (ppt) or less] or saline/brackish water (salinity greater than 0.5 ppt). Groundwater at four of the monitoring well locations (JW-3, JW-4, GW-1, and SI-01DB) was identified as freshwater, and groundwater at two locations (DI-01B and SI-01B) was identified as saline/brackish water. The Facility Background Report considered these two data sets as separate populations; therefore, all analyses presented in this Technical Memorandum considered the data sets as two separate populations. It is noted that the salinity of facility background saline/brackish monitoring wells is low (approximately 0.5 and 1 ppt); therefore, tidal influence, which is identified at many of the PNS

CERCLA sites with brackish/saline groundwater, is not significant at the facility background groundwater wells.

Statistical Methodology

Re-evaluation of PNS facility background soil, groundwater (freshwater), and groundwater (saline/brackish) data was conducted to provide summary statistics based on updated statistical methodologies for outlier identification presented in USEPA's Data Quality Assessment: Statistical Methods for Practitioners guidance (February 2006) and calculating updated UCLs, UPLs, and UTLs. A 95-percent UCL is the upper limit of the confidence interval based on the sampled data below which the true population mean falls 95 percent of the time. A 95-percent UPL is the upper limit of the interval based on the sampled data below which a newly and independently obtained observation is expected to fall 95 percent of the time. A 95-percent UTL is the upper limit of a 95-percent UCL placed on the 95th percentile.

The first step of the re-evaluation was to examine the background data sets and determine if any statistical outliers were present. Outliers are highly divergent from the main population of data and outliers can be identified visually by inspecting graphical representations of the data set and using an appropriate outlier hypothesis test (either Dixon's Extreme Value Test or Tukey's Nonparametric outlier rule of thumb) to determine statistical significance. Dixon's Extreme Value hypothesis test was used if the data could be modeled by a normal distribution; otherwise, Tukey's Nonparametric outlier rule of thumb was used. Box plots, normal probability plots, and histograms were used to identify potential outliers and were constructed using untransformed and log-transformed data. Plots of the untransformed data were first visually inspected to see whether the data could be modeled by a normal distribution. If the data could not be modeled by a normal distribution, the log-transformed data were visually inspected. After determining which distribution, if any, could be used to model the data, an appropriate outlier test was computed.

Box plots show the central tendency, degree of symmetry, range of variation, and potential outliers of a data set. The data set is shown as a rectangular box that represents the 25th percentile at the bottom, 50th percentile (or median) at the middle, and the 75th percentile at the top. Typically, potential outliers on box plots are values greater than 1.5 times the difference between the 75th and the 25th percentiles and are identified as circles on the plot. Non-detected results were identified by plotting solid squares on the box plot at the reporting limit.

Normal probability plots also are visual methods to determine how well the data set is modeled by a normal distribution. Normal probability plots also help to identify potential outliers. The normal probability

plot is a graph of the quantiles of the data set against the quantiles from the normal distribution. If the normal probability plot is approximately linear, this indicates that the data are normally distributed. A hypothesis test is then performed to determine if the data can be modeled by a normal distribution. Potential outliers on the normal probability plot will appear distant from the other values, which will be concentrated in the center of the graph. To determine if the data follow a lognormal distribution, the normal probability plot is constructed using the log-transformed data. If the normal probability plot using the log-transformed data is approximately linear, this is an indication that the data are lognormally distributed. Detected concentrations were plotted using an open triangle and non-detected results were plotted using a solid circle.

To determine if the data could be modeled by a normal distribution, the Shapiro Wilk Hypothesis Test was performed. The null hypothesis is that the underlying data distribution is normally distributed. If the p-value for this test is less than 0.05, it is concluded with 95-percent confidence that the underlying data distribution does not follow a normal distribution. For these analyses, the Shapiro Wilk p-value is displayed on the bottom of the normal probability plots. The Shapiro Wilk Test can also be used to determine if the data can be modeled by a lognormal distribution. The test is the same as described above except that the test is conducted using log-transformed data. The null hypothesis is that the underlying data distribution is lognormally distributed. If the p-value for this test is less than 0.05, it is concluded with at least 95-percent confidence that the underlying data do not follow a lognormal distribution.

A histogram also is a visual representation of the data displayed in groups called bins. This graphical technique provides a visual method of assessing location, shape, and spread of the data. Also, extreme values and multiple modes (most frequent values) can be identified.

If the data were determined to be normally or lognormally distributed, potential outliers were identified using the visual plots described above. If the data did not follow either a normal or lognormal distribution, potential outliers were identified using the plots of both untransformed data and log-transformed data. The appropriate outlier test then was conducted on any potential outliers visually identified on the plots. The appropriate outlier test was determined based on sample size and data distribution. Dixon's Extreme Value outlier test as presented in USEPA's Data Quality Assessment: Statistical Methods for Practitioners guidance (February 2006) was conducted if the data were determined to follow either a normal or lognormal distribution. The null hypothesis was that there are no outliers. If the p-value for this test was less than 0.05, it was concluded that the result was a statistically significant outlier. Tukey's outlier rule-of-thumb was conducted if the data were determined not to follow either a normal or lognormal distribution. Tukey's outlier test identifies outliers as concentrations greater than 1.5 times the

interquartile range (75th percentile minus the 25th percentile). If either outlier test identified outliers, the sample location was evaluated visually on a map for proximity to known CERCLA site activities to determine if concentrations could potentially be related to these activities.

After the background data set was determined (i.e., removing any outliers related to PNS activities), basic summary statistics were calculated for each chemical detected in at least three samples because meaningful summary statistics cannot be computed when the majority of the data set is non-detected results. The background summary statistics included 95-percent UCLs, 95-percent UPLs, and 95-percent UTLs. For all statistical analyses, detection limits were used for non-detected concentrations, and average concentrations were used at locations where duplicate samples were collected. The statistical software R version 2.13.0 was used for the graphical displays, Shapiro Wilks Normality Test, Dixon's Extreme Value Test, and Tukey's outlier rule-of-thumb. USEPA software ProUCL version 4.1.00 was used to calculate the UCLs, UPLs, and UTLs for each chemical detected in at least three samples.

Soil

Attachment B (on CD) presents the results of the statistical evaluations conducted on the soil background data. For chemicals with at least three detections, box plots, probability plots, and histograms were constructed on both the untransformed and log-transformed data. Table B-1 presents the data distribution that can be used to model the data, identification of any potential outliers, the outlier test that was conducted, and the results of the outlier test.

Table 1 provides the results of the soil outlier analysis, including the location of potential outliers, whether the outlier is statistically significant, and whether the result was retained in the data set. As shown in Table 1, several results were identified as statistical outliers; however, none of these statistically significant outliers were collected at locations that are expected to have been impacted by a CERCLA site at PNS. The typical COPCs for PNS sites that have concentrations that may be similar to background are arsenic, lead, and PAHs. Therefore, outliers for these chemicals were evaluated further in comparison to available background data for other areas of the United States.

One arsenic potential outlier and one lead potential outlier were identified, both at BGS-07. BGS-07 is located in a residential area (Shipyard Commander's Residence) and is away from any PNS sites and is therefore not likely to represent contamination from a Navy site. Shacklett and Boerngen (1984) list the range of arsenic concentrations from eastern United States soil samples as <0.1 to 73 milligrams per kilogram (mg/kg). The potential arsenic outlier of 58.6 mg/kg is within this range. The Agency for Toxic

Substances and Disease Registry (ATSDR, 2007) reported anthropogenic lead concentrations ranging from 30 to 2,000 mg/kg near roadways and greater than 1,000 mg/kg by homes built prior to 1950. Based on the location being historically residential and concentrations within reported anthropogenic ranges, the arsenic and lead concentrations were concluded to represent anthropogenic background concentrations and were retained in the background dataset.

Three PAHs [benzo(a)pyrene, benzo(b)fluroanthene, and benzo(k)fluoranthene] and benzo(a)pyrene equivalents identified a statistical outlier at BGS-14. BGS-14 is located in an undeveloped area of PNS away from any PNS sites and therefore not likely to represent contamination from a Navy site. The following table shows the concentration of the outliers, the range and average concentrations found in New England Urban Soils (Bradley, 1994) and MEDEP urban background concentrations. The benzo(a)pyrene, benzo(b)fluroanthene, and benzo(k)fluoranthene outlier concentrations [1,100 to 1,700 micrograms per kilogram (µg/kg)] were within the concentration range and similar to the average concentration reported in New England soil (Bradley, 1994) and most were less than the urban background value presented by MEDEP. Therefore, it is likely that these samples represent anthropogenic concentrations and do not need to be removed from the background data set.

Parameter	**PNS Outlier concentration (µg/kg)**	**New England Urban Range (µg/kg)**	**New England Urban Average (µg/kg)**	**MEDEP Urban Developed Area Background (µg/kg)**
Benzo(a)pyrene	1100	40-13000	1323	1700
Benzo(b)fluoranthene	1700	49-12000	1435	2000
Benzo(k)fluoranthene	1100	43-25000	1681	760

Therefore, data from these samples were retained in the background data set. Table 2 presents the frequency of detection, range of detection limits, range of detected concentrations, and average concentration for every chemical for which soil samples were analyzed.

Freshwater Groundwater

Attachment C (on CD) presents the results of the statistical evaluations conducted on the freshwater groundwater background data. For chemicals with at least three detections, box plots, probability plots, and histograms were constructed on untransformed data and log-transformed data. Table C-1 presents the data distribution used to model the data, identification of any outliers and the outlier test that was used in that identification, and the results of the outlier test.

Table 3 provides the results of the freshwater groundwater outlier analysis, including the location of potential outliers, whether the outlier is statistically significant, and whether the result was retained in the data set. As shown on Table 3, results for four chemicals were identified as statistical outliers; however, none of these locations are expected to have been impacted by CERCLA site activities at PNS. Therefore, data from these samples were retained in the background data set. Table 4 presents the frequency of detection, range of detection limits, range of detected concentrations, and average concentration for every chemical analyzed in freshwater groundwater.

Saline/Brackish Groundwater

Attachment D (on CD) presents the results of the statistical evaluations conducted on the saline/brackish groundwater background data. For chemicals with at least three detections, box plots, probability plots, and histograms were constructed on the untransformed and log-transformed data. Table D-1 presents the data distribution used to model the data, identification of any outliers and the outlier test that was used in that identification, and the results of the outlier test.

No potential outliers were identified for the saline/brackish groundwater data set. Table 5 presents the frequency of detection, range of detection limits, range of detected concentrations, and average concentration for every chemical analyzed in saline/brackish groundwater.

Uncertainty

Uncertainties associated with the PNS background datasets are discussed in this section and include uncertainties for small sample sizes, chemicals with elevated detection limits, chemicals with large percentages of non-detected results, and identification of BGS-10 and BGS-26 as separate environmental samples. Uncertainties in the facility background data set should be considered before using the data to make risk management decisions.

The background groundwater samples were collected in 1996 and 1997 prior to the release of the current Navy Guidance on Background Comparisons and therefore the Data Quality Objectives (DQO) process was not used to determine the minimum number of background samples needed to statistically compare site data to background data. A small sample size affects the statistical power of the tests which may result in concluding that the site concentrations are greater than background when the site concentrations are actually consistent with background.

Some of the non-detected concentrations had detection limits that were greater than the detected concentrations. The elevated detection limits result in some uncertainty of the true concentration of the non-detected sample. Additionally, some of the chemicals in the soil and groundwater background samples were infrequently detected. The low frequency of detection results in some uncertainty in the statistical methods used to evaluate background concentrations. The high percentage of non-detected results was noted on the summary statistics presented in Tables 2, 4 and 5 along with the uncertainty of the accuracy of the presented summary statistics. The methodology for the background comparisons presented in the RI Reports for Operable Units 7 and 9 will be followed for future comparisons of site and background data (Tetra Tech, July 2011 and June 2012).

Duplicate samples are typically averaged for calculation of dataset averages and other statistics in risk assessment. However, BGS-26 was not identified as a duplicate sample in the database and therefore, was not averaged with BGS-10 as part of previous data evaluations or in this technical memorandum. Review of the data shows that the results for the two samples are similar (relative percent difference is generally less than 20 percent), are in the middle to lower end of the range of detections, and are less than the 95-percent UCL. Therefore, including BGS-26 as an additional sample in the dataset as is presented in the technical memorandum and previous data evaluations tends toward a slightly lower average for the facility background dataset.

Application of Facility Background Data

The Navy will use the PNS facility background data qualitatively to assist in distinguishing site-related contamination from non-site-related chemical concentrations that may be naturally occurring or anthropogenic as part of the evaluation of nature and extent of site-related contamination. During this stage, site concentrations will be compared to background range of detected chemical concentrations representative background chemical concentrations (e.g., 95-percent UCL). The Navy will use the PNS facility background data quantitatively as part of risk assessment for a site. In the risk assessment, a statistical comparison of the site data set to the facility background data set will be conducted as part of the COPC selection process. A chemical that is detected at concentrations greater than a risk-based screening level, but is not statistically greater than background, will not be selected as a COPC for the baseline risk assessment, but will be evaluated in the uncertainty section of the risk assessment. For risk management decisions based on the risk assessment results, the representative facility background concentrations will be considered to ensure that remediation or removal action goals are not set at levels that are less than facility background. In addition, the facility background data may be used as

appropriate in remedial or removal actions for evaluation of clean fill soil to ensure criteria for acceptability of fill material for use at a site are not less than facility background.

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Tables

1 – Summary of Outlier Analysis for Soil Samples
2 – Facility Background Soil Representative Statistics
3 – Summary of Outlier Analysis for Freshwater Groundwater Representative Statistics
4 – Facility Background Freshwater Groundwater Representative Statistics
5 – Facility Background Saline/Brackish Groundwater Representative Concentrations

Figure

1 – Soil and Groundwater Background Sampling Locations

Attachments

A – Database Printouts and Example Calculations
B – Facility Background Soil Statistics
C – Facility Background Freshwater Groundwater Statistics
D – Facility Background Saline/Brackish Groundwater Statistics
E – Responses to Comments on Draft Technical Memorandum and MEDEP March 2014 Letter

TABLE 1
SUMMARY OF OUTLIER ANALYSIS FOR SOIL SAMPLES
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FRACTION	POTENTIAL OUTLIER LOCATION	SAMPLE LOCATION DESCRIPTION	STATISTICAL OUTLIER?	RETAINED IN DATA SET?
1,2,3,4,6,7,8-HPCDD	Dioxins/Furans	BGS-12	Industrial area to west of a ballfield	Yes	Yes
1,2,3,4,6,7,8,9-OCDF	Dioxins/Furans	BGS-12 BGS-17	Industrial area to west of a ballfield Adjacent to Building 337	No	Yes
1,2,3,4,7,8,9-HPCDF	Dioxin/Furan	BGS-17	Adjacent to Building 337	Yes	Yes
2,3,7,8-TCDD TEQ	Dioxin/Furan	BGS-12	Industrial area to west of a ballfield	Yes	Yes
Total HPCDD	Dioxin/Furan	BGS-12	Industrial area to west of a ballfield	Yes	Yes
Total HXCDD	Dioxin/Furan	BGS-12	Industrial area to west of a ballfield	No	Yes
Arsenic	Metal	BGS-07	Residential area/Shipyard Commanders' residence.	Yes	Yes
Calcium	Metal	BGS-17	Adjacent to Building 337	Yes	Yes
Cobalt	Metal	BGS-13	Football field/residential area	Yes	Yes
Iron	Metal	BGS-13	Football field/residential area	No	Yes
Lead	Metal	BGS-07	Residential area/Shipyard Commanders' residence.	No	Yes
Magnesium	Metal	BGS-25	Off Shipyard	Yes	Yes
Manganese	Metal	BGS-25	Off Shipyard	Yes	Yes
Mercury	Metal	BGS-18	Underdeveloped area adjacent to cemetery	Yes	Yes
Nickel	Metal	BGS-16	Undeveloped area on uninhabited island	No	Yes
Potassium	Metal	BGS25 BGS-16	Off Shipyard Undeveloped area on uninhabited island	Yes	Yes
Zinc	Metal	BGS-18	Underdeveloped area adjacent to cemetery	Yes	Yes
pH	Miscellaneous	BGS-02	Undeveloped area on uninhabited island	Yes	Yes
Benzo(a)pyrene	PAH	BGS-14	Undeveloped area	Yes	Yes
Benzo(a)pyrene Equivalents	PAH	BGS-14	Undeveloped area	Yes	Yes
Benzo(a)pyrene Equivalent (Half ND)	PAH	BGS-14	Undeveloped area	Yes	Yes

TABLE 1
SUMMARY OF OUTLIER ANALYSIS FOR SOIL SAMPLES
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FRACTION	POTENTIAL OUTLIER LOCATION	SAMPLE LOCATION DESCRIPTION	STATISTICAL OUTLIER?	RETAINED IN DATA SET?
Benzo(b)fluoranthene	PAH	BGS-14	Undeveloped area	Yes	Yes
Benzo(k)fluoranthene	PAH	BGS-14	Undeveloped area	Yes	Yes
4,4'-DDD	Pesticide	BGS-14	Undeveloped area	No	Yes

TABLE 2
FACILITY BACKGROUND SOIL REPRESENATITVE STATISTICS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER[1]	FOD	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECTED RESULTS	AVERAGE ALL SAMPLES[2]	STATE OF MAINE BACKGROUND[3]	95% UCL[4]	UCL Type	95% UPL[4]	UPL TYPE	95% UTL[4,5]	UTL TYPE
DIOXINS/FURANS (ng/kg)											
1,2,3,4,6,7,8,9-OCDD	19/19	18 - 6460	NA	897	---	1560	95% Approximate Gamma UCL	3230	95% WH Approx. Gamma UPL	5090	95% WH Approx. Gamma UTL
1,2,3,4,6,7,8,9-OCDF	17/19	1.9 - 129	0.8 - 2.4	19.7	---	68.0	97.5% KM (Chebyshev) UCL	85.4	95% UPL (t)	129	95% Bootstrap (%) UTL
1,2,3,4,6,7,8-HPCDD	19/19	1.3 - 826	NA	64.5	---	251	95% Chebyshev (Mean, Sd) UCL	191	95% UPL (t)	455	95% UTL
1,2,3,4,6,7,8-HPCDF	18/19	1.8 - 48.2	0.3 - 0.3	14.9	---	28.1	95% KM (Chebyshev) UCL	51.7	95% WH Approx. Gamma UPL	78.3	95% WH Approx. Gamma UTL
1,2,3,4,7,8,9-HPCDF[6]	6/19	0.48 - 1.7	0.3 - 3.4	0.72	---	1.0	95% KM (t) UCL	2.2	95% WH Approx. Gamma UPL	4.4	95% WH Approx. Gamma UTL
1,2,3,4,7,8-HXCDD[7]	9/19	0.23 - 4.2	0.25 - 2.6	0.93	---	1.3	95% KM (t) UCL	2.8	95% UPL (t)	3.5	95% UTL
1,2,3,4,7,8-HXCDF	15/19	0.93 - 12.7	0.1 - 0.2	3.6	---	5.1	95% KM (BCA) UCL	16.7	95% WH Approx. Gamma UPL	28.3	95% WH Approx. Gamma UTL
1,2,3,6,7,8-HXCDD	16/19	0.445 - 9.6	0.4 - 0.7	2.2	---	3.2	95% KM (BCA) UCL	9.1	95% WH Approx. Gamma UPL	15	95% WH Approx. Gamma UTL
1,2,3,6,7,8-HXCDF	17/19	0.385 - 5.4	0.2 - 0.3	2.0	---	2.7	95% KM (BCA) UCL	7.9	95% WH Approx. Gamma UPL	12.4	95% WH Approx. Gamma UTL
1,2,3,7,8,9-HXCDD	16/19	0.445 - 15.2	0.4 - 0.7	2.9	---	4.3	95% KM (BCA) UCL	12.3	95% WH Approx. Gamma UPL	20.4	95% WH Approx. Gamma UTL
1,2,3,7,8,9-HXCDF	12/19	0.2 - 2.3	0.15 - 1.6	0.55	---	0.76	95% KM (Percentile Bootstrap) UCL	2.3	95% WH Approx. Gamma UPL	3.8	95% WH Approx. Gamma UTL
1,2,3,7,8-PECDD[8]	8/19	0.55 - 3.3	0.15 - 1.7	0.79	---	1.3	95% KM (t) UCL	3.7	95% UPL (t)	4.1	95% UTL
1,2,3,7,8-PECDF	10/19	0.41 - 3.1	0.085 - 0.8	0.77	---	1.2	95% KM (t) UCL	2.8	95% UPL (t)	3.8	95% UTL
2,3,4,6,7,8-HXCDF	17/19	0.545 - 7.7	0.2 - 0.3	3.0	---	4.0	95% KM (t) UCL	7.5	95% UPL (t)	9.2	95% UTL
2,3,4,7,8-PECDF	16/19	0.335 - 7.7	0.3 - 0.5	2.5	---	3.3	95% KM (t) UCL	6.7	95% UPL (t)	8.3	95% UTL
2,3,7,8-TCDF	18/19	0.48 - 8.9	0.2 - 0.2	2.2	---	4.6	95% KM (Chebyshev) UCL	7.6	95% WH Approx. Gamma UPL	11.5	95% WH Approx. Gamma UTL
2,3,7,8-TCDD TEQ [9]	19/19	0.018 - 15.7	NA	4.2	---	7.0	95% Approximate Gamma UCL	14.8	95% WH Approx. Gamma UPL	22.7	95% WH Approx. Gamma UTL
2,3,7,8-TCDD TEQ - HALFND[10]	19/19	0.54 - 15.8	NA	4.5	---	6.7	95% Approximate Gamma UCL	13.5	95% WH Approx. Gamma UPL	19.5	95% WH Approx. Gamma UTL
TOTAL HPCDD	19/19	2.6 - 7430	NA	437	---	4310	99% Chebyshev (Mean, Sd) UCL	7430	95% UPL	7430	95% UTL
TOTAL HPCDF	18/19	3.7 - 118	0.3 - 0.3	30.3	---	64.0	95% KM (Chebyshev) UCL	109	95% WH Approx. Gamma UPL	169	95% WH Approx. Gamma UTL
TOTAL HXCDD	17/19	2.3 - 516	0.4 - 6.6	46.9	---	213	97.5% KM (Chebyshev) UCL	201	95% UPL (t)	516	95% Bootstrap (%) UTL
TOTAL HXCDF	19/19	0.44 - 193	NA	42.5	---	67.7	95% Approximate Gamma UCL	141	95% WH Approx. Gamma UPL	212	95% WH Approx. Gamma UTL
TOTAL PECDD	16/19	0.925 - 50.6	0.4 - 0.7	9.8	---	22.7	95% KM (Chebyshev) UCL	43.4	95% WH Approx. Gamma UPL	72.8	95% WH Approx. Gamma UTL
TOTAL PECDF	19/19	1.1 - 363	NA	79.7	---	129	95% Approximate Gamma UCL	271	95% WH Approx. Gamma UPL	413	95% WH Approx. Gamma UTL
TOTAL TCDD	17/19	0.99 - 30.1	0.3 - 0.3	8.2	---	11.5	95% KM (BCA) UCL	33.0	95% WH Approx. Gamma UPL	52.3	95% WH Approx. Gamma UTL
TOTAL TCDF	19/19	4.2 - 461	NA	115	---	178	95% Approximate Gamma UCL	367	95% WH Approx. Gamma UPL	544	95% WH Approx. Gamma UTL
METALS (mg/kg)											
ALUMINUM	25/25	4930 - 33500	NA	18700	---	20900	95% Student's-t UCL	30100	95% UPL (t)	33700	95% UTL
ARSENIC	25/25	4.4 - 58.6	NA	14.5	16	17.9	95% Student's-t UCL	47.7	95% UPL (t)	58.6	95% BCA Bootstrap UTL
BARIUM	25/25	22.3 - 223	NA	75.7	470	91.6	95% Approximate Gamma UCL	157	95% WH Approx. Gamma UPL	195	95% WH Approx. Gamma UTL
BERYLLIUM	25/25	0.34 - 1.1	NA	0.7	2.4	0.79	95% Approximate Gamma UCL	1.2	95% WH Approx. Gamma UPL	1.4	95% WH Approx. Gamma UTL
CADMIUM	21/25	0.82 - 3.4	0.74 - 0.88	1.7	0.26	2.1	95% KM (t) UCL	3.4	95% UPL (t)	3.9	95% UTL
CALCIUM	25/25	682 - 7910	NA	1960	---	2380	95% H-UCL	4230	95% UPL (t)	5680	95% UTL
CHROMIUM	25/25	11.6 - 103	NA	57.7	---	65.8	95% Student's-t UCL	99.1	95% UPL (t)	112	95% UTL
COBALT	25/25	3.1 - 24.2	NA	11	15	12.5	95% Student's-t UCL	18.8	95% UPL (t)	21.3	95% UTL
COPPER	25/25	8.5 - 316	NA	67	23	95.6	95% Approximate Gamma UCL	201	95% WH Approx. Gamma UPL	282	95% WH Approx. Gamma UTL
IRON	25/25	8730 - 45000	NA	22200	---	24700	95% Student's-t UCL	35100	95% WH Approx. Gamma UPL	39200	95% WH Approx. Gamma UTL
LEAD	25/25	9.5 - 1100	NA	177	32	271	95% Approximate Gamma UCL	591	95% WH Approx. Gamma UPL	861	95% WH Approx. Gamma UTL
MAGNESIUM	25/25	1500 - 17200	NA	7210	---	8450	95% Student's-t UCL	13500	95% WH Approx. Gamma UPL	1550	95% WH Approx. Gamma UTL
MANGANESE	25/25	110 - 611	NA	308	840	344	95% Student's-t UCL	494	95% UPL (t)	552	95% UTL
MERCURY[6]	6/25	0.0825 - 1.8	0.1 - 0.31	0.19	---	0.32	95% KM (t) UCL	0.59	95% WH Approx. Gamma UPL	1.1	95% WH Approx. Gamma UTL
NICKEL	25/25	8.1 - 73.2	NA	38.1	39	43.6	95% Student's-t UCL	65.9	95% UPL (t)	74.6	95% UTL
POTASSIUM	25/25	585 - 6580	NA	1830	---	2300	95% H-UCL	4250	95% UPL (t)	5880	95% UTL
SELENIUM	12/25	0.32 - 2.1	0.38 - 1.1	0.52	0.61	0.66	95% KM (t) UCL	1.1	95% KM UPL (t)	1.3	95% KM UTL
SODIUM	25/25	35.1 - 1345	NA	398	---	778	95% Chebyshev (Mean, Sd) UCL	1260	95% UPL	1290	95% BCA Bootstrap UTL
VANADIUM	25/25	13.5 - 89.5	NA	49.5	100	55.8	95% Student's-t UCL	81.4	95% UPL (t)	91.4	95% UTL
ZINC	25/25	23.1 - 1390	NA	162	100	392	95% Chebyshev (Mean, Sd) UCL	1050	95% UPL	1390	95% BCA Bootstrap UTL
MISCELLANEOUS											
PH (S.U.)[8]	8/8	5.9 - 8.3	NA	6.9	---	7.4	95% Student's-t UCL	8.3	95% UPL (t)	9.1	95% UTL

TABLE 2
FACILITY BACKGROUND SOIL REPRESENATITVE STATISTICS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER[1]	FOD	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECTED RESULTS	AVERAGE ALL SAMPLES[2]	STATE OF MAINE BACKGROUND[3]	95% UCL[4]	UCL Type	95% UPL[4]	UPL TYPE	95% UTL[4,5]	UTL TYPE
TOTAL ORGANIC CARBON (%)[8]	8/8	0.6 - 4.65	NA	2.3	---	3.3	95% Student's-t UCL	5.3	95% UPL (t)	7.1	95% UTL
SEMIVOLATILES (µg/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE[11]	3/25	58 - 650	39 - 410	113	---	133	95% KM (t) UCL	336	95% UPL (t)	406	95% UTL
VOLATILES (µg/kg)											
METHYLENE CHLORIDE[12]	3/24	1 - 2	5 - 13	4.6	---	2.2	95% KM (t) UCL	2.5	95% KM UPL (t)	2.8	95% KM UTL
POLYCYCLIC AROMATIC HYDROCARBONS (µg/kg)											
BENZO(A)ANTHRACENE	15/25	37 - 640	350 - 400	164	1600	174	95% KM (t) UCL	307	95% UPL (t)	449	95% UTL
BENZO(A)PYRENE	15/25	36 - 1100	350 - 400	184	1700	222	95% KM (t) UCL	523	95% KM UPL (t)	642	95% KM UTL
BENZO(A)PYRENE EQUIVALENTS[13]	20/25	435 - 1571	350 - 400	568	---	714	95% KM (BCA) UCL	1050	95% KM UPL (t)	1190	95% KM UTL
BENZO(A)PYRENE EQUIVALENTS - HALFND[14]	20/25	243 - 1479	175 - 200	372	---	514	95% KM (BCA) UCL	890	95% KM UPL (t)	1040	95% KM UTL
BENZO(B)FLUORANTHENE	18/25	41 - 1700	350 - 400	219	2000	496	95% KM (Chebyshev) UCL	632	95% WH Approx. Gamma UPL	888	95% WH Approx. Gamma UTL
BENZO(G,H,I)PERYLENE[15]	7/25	39 - 410	350 - 410	178	790	121	95% KM (t) UCL	457	95% WH Approx. Gamma UPL	700	95% WH Approx. Gamma UTL
BENZO(K)FLUORANTHENE[7]	9/25	38 - 1100	350 - 430	214	760	224	95% KM (BCA) UCL	402	95% UPL (t)	632	95% UTL
CHRYSENE	20/25	37 - 1600	350 - 400	201	2300	310	95% KM (BCA) UCL	733	95% KM UPL (t)	906	95% KM UTL
FLUORANTHENE	20/25	43 - 1700	350 - 390	250	3200	375	95% KM (BCA) UCL	873	95% KM UPL (t)	1070	95% KM UTL
INDENO(1,2,3-CD)PYRENE[8]	8/25	38 - 440	350 - 410	176	740	132	95% KM (t) UCL	239	95% UPL (t)	341	95% UTL
PHENANTHRENE	14/25	40 - 470	350 - 400	163	1600	178	95% KM (t) UCL	321	95% WH Approx. Gamma UPL	409	95% WH Approx. Gamma UTL
PYRENE	21/25	42 - 1400	350 - 390	218	2800	482	95% KM (Chebyshev) UCL	740	95% KM UPL (t)	907	95% KM UTL
PESTICIDES (µg/kg)											
4,4'-DDD	19/25	0.6 - 170	17 - 20	19.6	---	48.8	95% KM (Chebyshev) UCL	71.3	95% WH Approx. Gamma UPL	110	95% WH Approx. Gamma UTL
4,4'-DDE	22/25	5.2 - 7100	17 - 19	419	---	3220	99% KM (Chebyshev) UCL	1590	95% UPL (t)	4170	95% UTL
4,4'-DDT	22/25	5.1 - 4100	17 - 19	317	---	1030	95% KM (Chebyshev) UCL	1230	95% WH Approx. Gamma UPL	1990	95% WH Approx. Gamma UTL

Footnotes:

1. Chemical is presented only if it was detected in at least three samples.
2. One-half the detection limit was used for the calculation of the average concentration.
3. Background values are from Maine Remedial Actionl Guidelines for Sites Contaminated with Hazardous Substances May 2013.
   Metal values are the Undeveloped Maine Background UPL. Polycyclic aromatic hydrocarbons are the Urban Developed Maine Background UPL.
4. Upper Confidence Limts, Upper Prediction Limits, and Upper Tolerance Limits were calculated using USEPA's ProUCL version 4.1.00.
5. UTL were calculated using 95 percent coverage.
6. ProUCL warning message: Warning there are only 6 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
7. ProUCL warning message: Warning there are only 9 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
8. ProUCL warning message: Warning there are only 8 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
9. For each sample, 2,3,7,8-TCDD TEQ was calucted using 2005 WHO Toxicity Equivalent Factors (TEFs) and detected dioxin/furan concentrations only.
10. For each sample, 2,3,7,8-TCDD TEQ-HalfND was calucted using 2005 WHO Toxicity Equivalent Factors (TEFs), detected dioxin/furan concentrations, and one half the detection limit for non-detected dioxins/furans.
11. ProUCL warning message: Warning there are only 3 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
12. ProUCL warning message: Warning Data set has only 2 distinct values. This may not be adequate enough to compute meaningful and reliable test statistics and estimates. The Project Team may decide to use alterante site specific values to estimte enviornmental parameters.
13. For each sample, benzo(a)pyrene equivalent concentrations were calculated using detected carcinogenic PAH concentrations only.
14. For each sample, benzo(a)pyrene equivalent - HalfND concentrations were calculated using detected carcinogenic PAH concentrations and one-half the detection limit for non-detected carcinogenic PAH concentrations.
15. ProUCL warning message: Warning there are only 7 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.

Acronyms:

BCA = Bias corrected acceleraged bootstrap method
FOD = Frequency of detection
KM = Kaplan Meier
NA = Not applicable
t = T distribution
UCL = Upper confidence limit
UPL = Upper prediction limit
UTL = Upper tolerance limit
WH = Wilson Hilferty
WHO = World Health Organization

TABLE 3
SUMMARY OF OUTLIER ANALYSIS FOR FRESHWATER GROUNDWATER SAMPLES
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FRACTION	POTENTIAL OUTLIER SAMPLE	SAMPLE LOCATION DESCRIPTION	STATISTICAL OUTLIER?	RETAINED IN DATA SET?
Arsenic	Metal	JILF-01-GW-09	GW-01; located in non-industrial, vegetated area	Yes	Yes
Bromide	Miscellaneous	JILF-04-GW08, JILF-04-GW-10	JW-4; located in non-industrial, vegetated area	Yes	Yes
Diesel Range Organics	Petroleum	SI-01DB-GW07, SI-01DB-GW-09, JILF-01-GW-08,	SI-01DB and GW-01; located in non-industrial, vegetated areas	Yes	Yes
Gasoline Range Organics	Petroleum	JILF-01-GW-08	GW-01; located in non-industrial, vegetated area	Yes	Yes

TABLE 4
FACILITY BACKGROUND FRESHWATER GROUNDWATER REPRESENTATIVE STATISTICS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER[1]	FOD	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECTED RESULTS	AVERAGE ALL SAMPLES[2]	95% UCL[3]	UCL Type	95% UPL[3]	UPL TYPE	95% UTL[3,4]	UTL TYPE
TOTAL METALS (µg/L)										
ALUMINUM[5]	4/16	996 - 1070	10 - 193	273	1010	95% KM (t) UCL	1080	95% UPL (t)	1401	95% UTL
ARSENIC[6]	3/16	6.3 - 10	1.8 - 17.5	3.1	7.1	95% KM (t) UCL	8.8	95% UPL (t)	11.01	95% UTL
BARIUM	16/16	7.6 - 52.6	NA	27	36.7	95% Approximate Gamma UCL	65.7	95% WH Approx. Gamma UPL	91.0	95% WH Approx. Gamma UTL
CALCIUM	16/16	5260 - 77700	NA	37800	48400	95% Student's-t UCL	81700	95% UPL (t)	99100	95% UTL
CHROMIUM[6]	3/16	0.86 - 1.4	0.63 - 4	1	1.1	95% KM (t) UCL	2.2	95% UPL (t)	2.7	95% UTL
COBALT[6]	3/16	0.82 - 1.7	0.79 - 5	1.3	1.2	95% KM (t) UCL	2.7	95% UPL (t)	3.3	95% UTL
COPPER[5]	4/16	2 - 3.8	1 - 4.8	1.6	2.7	95% KM (t) UCL	3.6	95% UPL (t)	4.3	95% UTL
IRON[7]	5/16	66.6 - 755	6.8 - 524	164	299	95% KM (t) UCL	736	95% UPL (t)	899	95% UTL
LEAD[8]	7/16	1.5 - 3.7	1.3 - 14.2	1.9	2.2	95% KM (t) UCL	4.9	95% UPL (t)	6.1	95% UTL
MAGNESIUM	16/16	1200 - 8590	NA	4780	5940	95% Student's-t UCL	9570	95% UPL (t)	11500	95% UTL
MANGANESE	13/16	3 - 3580	0.7 - 2.5	739	4060	99% KM (Chebyshev) UCL	3060	95% KM UPL (t)	3970	95% WH Approx. Gamma UTL
MERCURY[4]	3/16	0.02 - 0.098	0.01 - 0.12	0.026	0.038	95% KM (t) UCL	0.072	95% UPL (t)	0.090	95% UTL
NICKEL[7]	5/16	0.81 - 2.9	0.9 - 9	2.3	2.0	95% KM (t) UCL	5.1	95% UPL (t)	6.1	95% UTL
POTASSIUM	14/16	2400 - 5180	2210 - 2500	3880	4450	95% KM (t) UCL	5910	95% UPL (t)	6690	95% UTL
SODIUM	16/16	12900 - 157000	NA	68700	99000	95% Approximate Gamma UCL	187000	95% WH Approx. Gamma UPL	270000	95% WH Approx. Gamma UTL
VANADIUM[6]	3/16	0.64 - 1.9	0.55 - 4.2	0.96	1.0	95% KM (t) UCL	2.3	95% UPL (t)	2.9	95% UTL
ZINC[6]	3/16	15.8 - 52.4	2.8 - 26.6	12.3	25.7	95% KM (t) UCL	38.7	95% UPL (t)	49.1	95% UTL
MISCELLANEOUS (µg/L)										
ALKALINITY	16/16	35 - 260	NA	142	174	95% Student's-t UCL	275	95% UPL (t)	328	95% UTL
BROMIDE[7]	5/16	2.8 - 5	2 - 2.6	2	3.6	95% KM (t) UCL	5.5	95% UPL (t)	7.0	95% UTL
CARBONATE ALKALINITY	16/16	35 - 260	NA	142	174	95% Student's-t UCL	275	95% UPL (t)	328	95% UTL
CHLORIDE	16/16	5.1 - 180	NA	69.5	118	95% Approximate Gamma UCL	244	95% WH Approx. Gamma UPL	386	95% WH Approx. Gamma UTL
NITRATE	13/15	0.061 - 6.2	0.05 - 0.05	1.4	3.7	95% KM (Chebyshev) UCL	6.7	95% WH Approx. Gamma UPL	12.3	95% WH Approx. Gamma UTL
PH	16/16	6.8 - 8.3	NA	7.4	7.7	95% Approximate Gamma UCL	8.4	95% WH Approx. Gamma UPL	8.9	95% WH Approx. Gamma UTL
SULFATE	16/16	11 - 60	NA	28.4	36.8	95% Approximate Gamma UCL	62.1	95% WH Approx. Gamma UPL	82.8	95% WH Approx. Gamma UTL
TOTAL ORGANIC CARBON	16/16	1.1 - 7.2	NA	2.3	2.9	95% Approximate Gamma UCL	4.8	95% WH Approx. Gamma UPL	6.3	95% WH Approx. Gamma UTL
TOTAL ORGANIC HALIDES	12/16	0.011 - 2.1	0.018 - 1.8	0.33	1.1	97.5% KM (Chebyshev) UCL	1.2	95% UPL (t)	3.4	95% UTL
PETROLEUM (µg/L)										
DIESEL-RANGE ORGANICS[7]	5/16	55 - 200	50 - 55	60.5	105	95% KM (t) UCL	218	95% UPL (t)	307	95% UTL
GASOLINE-RANGE ORGANICS[9]	5/12	11 - 47	10 - 24	13.1	22.1	95% KM (t) UCL	36.7	95% UPL (t)	47.6	95% UTL

Footnotes:

1. Chemical is presented only if it was detected in at least three samples.
2. One-half the detection limit was used for the calculation of the average concentration.
3. Upper Confidence Limits, Upper Prediction LImits, and Upper Tolerance Limits were calculated using USEPA's ProUCL version 4.1.00.
4. Upper Tolerance Limits were calculated using 95 percent coverage.
5. ProUCL warning message: Warning there are only 4 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
6. ProUCL warning message: Warning there are only 3 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
7. ProUCL warning message: Warning there are only 5 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
8. ProUCL warning message: Warning there are only 7 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
9. ProUCL warning message: Warning there are only 4 distinct detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.

Acronyms:

FOD = Frequency of detection
KM = Kaplan Meier
NA = Not applicable
t = T distribution
UCL = Upper confidence Limit
UPL = Upper prediction Limit
UTL = Upper tolerance Limit
WH = Wilson Hilferty

TABLE 5
FACILITY BACKGROUND SALINE/BRACKISH GROUNDWATER REPRESENTATIVE STATISTICS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER[1]	FOD	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECTED RESULTS	AVERAGE ALL SAMPLES[2]	95% UCL[3]	UCL Type	95% UPL[3]	UPL TYPE	95% UTL[3,4]	UTL TYPE
TOTAL METALS (µg/L)										
BARIUM[5]	8/8	23.1 - 80.3	NA	48.6	60.6	95% Student's-t UCL	84.5	95% UPL (t)	106	95% UTL
CALCIUM[5]	8/8	44200 - 130000	NA	90500	109000	95% Student's-t UCL	145000	95% UPL (t)	178000	95% UTL
CHROMIUM[6]	3/8	0.76 - 5.5	0.53 - 4	1.6	3.1	95% KM (t) UCL	5.4	95% UPL (t)	7.6	95% UTL
IRON[7]	4/8	597 - 728	20 - 132	345	666	95% KM (t) UCL	1200	95% UPL (t)	1780	95% UTL
MAGNESIUM[5]	8/8	4010 - 23100	NA	12000	16300	95% Student's-t UCL	24900	95% UPL (t)	32500	95% UTL
MANGANESE[5]	8/8	6.1 - 340	NA	150	237	95% Student's-t UCL	410	95% UPL (t)	563	95% UTL
POTASSIUM[5]	8/8	4730 - 17200	NA	9990	12800	95% Student's-t UCL	18300	95% UPL (t)	23200	95% UTL
SODIUM[5]	8/8	95800 - 208000	NA	133000	158000	95% Student's-t UCL	206000	95% UPL (t)	249000	95% UTL
MISCELLANEOUS (µg/L)										
ALKALINITY[8]	8/8	140 - 220	NA	200	222	95% Approximate Gamma UCL	264	95% WH Approx. Gamma UPL	307	95% WH Approx. Gamma UTL
CARBONATE ALKALINITY[8]	8/8	140 - 220	NA	200	222	95% Approximate Gamma UCL	264	95% WH Approx. Gamma UPL	307	95% WH Approx. Gamma UTL
CHLORIDE[5]	8/8	130 - 440	NA	259	322	95% Student's-t UCL	448	95% UPL (t)	559	95% UTL
NITRATE[8]	5/7	0.067 - 3.4	0.05 - 0.05	0.62	2.7	95% KM (Chebyshev) UCL	4.2	95% WH Approx. Gamma UPL	11.9	95% WH Approx. Gamma UTL
PH[5]	8/8	7.2 - 8	NA	7.6	7.8	95% Student's-t UCL	8.2	95% UPL (t)	8.5	95% UTL
SULFATE[9]	7/8	19 - 67	34 - 34	42.1	56.2	95% KM (t) UCL	82.6	95% UPL (t)	106	95% UTL
TOTAL ORGANIC CARBON[5]	8/8	2.4 - 8	NA	3.6	5.0	95% Approximate Gamma UCL	7.4	95% WH Approx. Gamma UPL	10.8	95% WH Approx. Gamma UTL
TOTAL ORGANIC HALIDES[10]	5/8	0.022 - 0.93	0.054 - 0.71	0.21	0.40	95% KM (BCA) UCL	0.95	95% WH Approx. Gamma UPL	2.5	95% WH Approx. Gamma UTL
PETROLEUM (µg/L)										
DIESEL-RANGE ORGANICS[11]	6/8	64 - 190	50 - 50	89.1	129	95% KM (t) UCL	198	95% UPL (t)	263	95% UTL

Footnotes:

1. Chemical is presented only if it was detected in at least three samples.
2 One-half the detection limit was used for the calculation of the average concentration.
3. Upper Confidence Limits, Upper Prediction LImits, and Upper Tolerance Limits were calculated using USEPA's ProUCL version 4.1.00.
4. Upper Tolerance Limits were calculated using 95 percent coverage.
5. ProUCL warning message: Warning there are only 8 values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
6. ProUCL warning message: Warning there are only 3 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
7. ProUCL warning message: Warning there are only 4 detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
8. ProUCL warning message: Warning there are only 4 distinct values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
9. ProUCL warning message: Warning there are only 7 distinct detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
10. ProUCL warning message: Warning there are only 5 distinct detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.
11. ProUCL warning message: Warning there are only 6 distinct detected values in this data. Note: It should be noted that even though bootstrap may be performed on this dataset the resulting calculation may not be reliable enough to draw conclusions.

Acronyms:
BCA = Bias corrected acceleraged bootstrap method
FOD = Frequency of detection
KM = Kaplan Meier
NA = Not applicable
t = T distribution
UCL = Upper confidence limit
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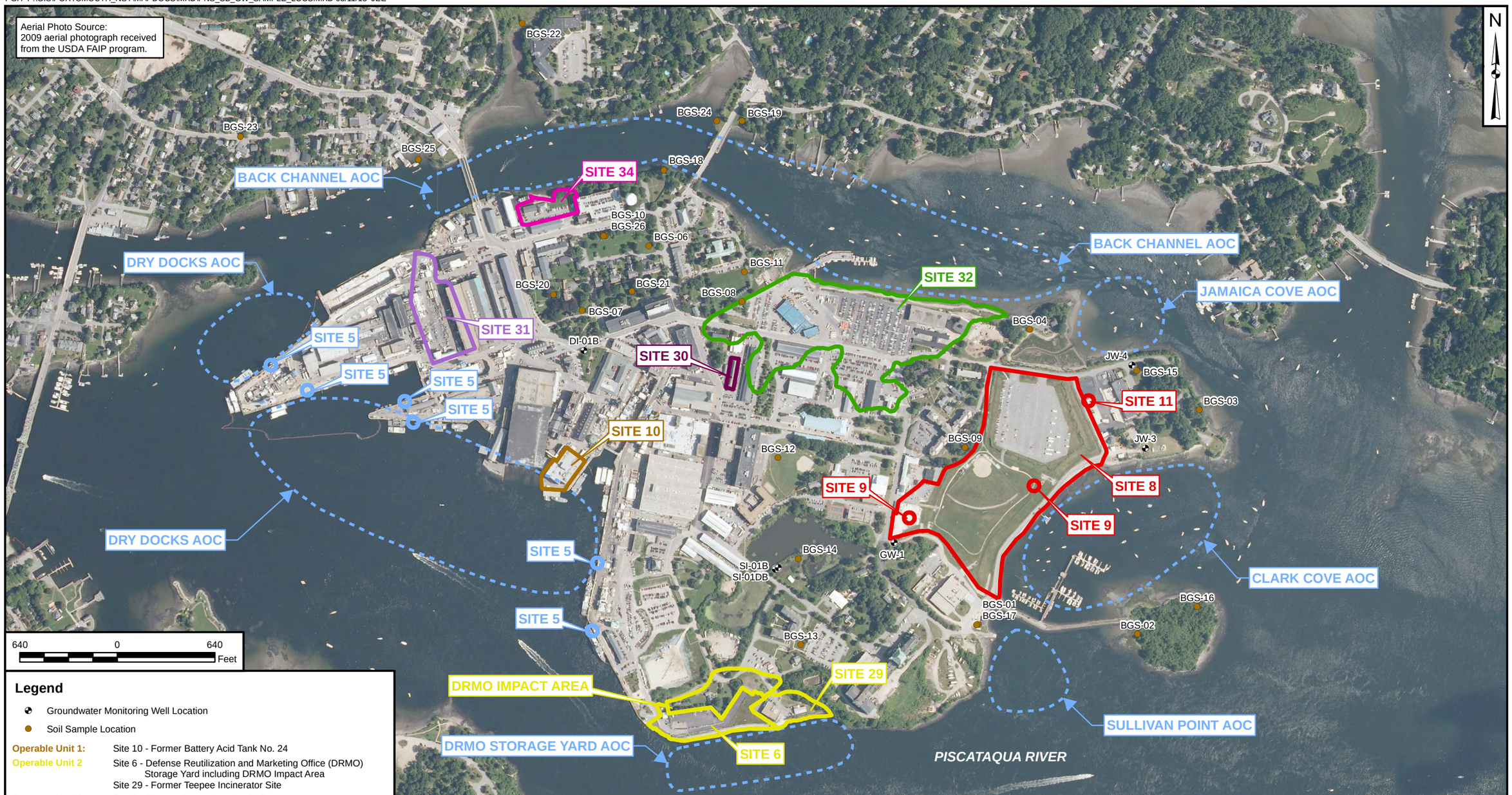
UTL = Upper tolerance limit
WH = Wilson Hilferty

PGH P:\GIS\PORTSMOUTH_NSY\MAPDOCS\MXD\PNS_SB_GW_SAMPLE_LOCS.MXD 03/11/13 JEE



Legend

- Groundwater Monitoring Well Location
- Soil Sample Location

Operable Unit 1:	Site 10 - Former Battery Acid Tank No. 24
Operable Unit 2	Site 6 - Defense Reutilization and Marketing Office (DRMO) Storage Yard including DRMO Impact Area Site 29 - Former Teepee Incinerator Site
Operable Unit 3	Site 8 - Jamaica Island Landfill (JILF) Site 9 - Former Mercury Burial Site Site 11 - Former Waste Oil Tanks Nos. 6 & 7
Operable Unit 4	Site 5 - Former Industrial Waste Outfalls Offshore Areas potentially impacted by onshore IRP sites (Six Areas of Concern have been delineated)
Operable Unit 7	Site 32 - Topeka Pier Site
Operable Unit 8	Site 31 - West Timber Basin
Operable Unit 9	Site 34 - Former Oil Gasification Plant, Building 62
Site Screening Area	Site 30 - Galvanizing Plant, Building 184

DRAWN BY J. NOVAK	DATE 01/17/12	TETRA TECH	CONTRACT NUMBER 1456 / CTO NUMBER 533
CHECKED BY D. COHEN	DATE 03/11/13	SOIL AND GROUNDWATER BACKGROUND SAMPLING LOCATIONS FACILITY BACKGROUND TECHNICAL MEMORANDUM PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY — / DATE —
REVISED BY K. MOORE	DATE 03/11/13		APPROVED BY — / DATE —
SCALE AS NOTED			FIGURE NO. 1 / REV 0

ATTACHMENT A

DATABASE PRINTOUTS AND EXAMPLE CALCULATIONS

TABLE A.1 FACILITY BACKGROUND SOIL DATA SET

TABLE A.1
FACILITY BACKGROUND SOIL DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-01				BGS-02		BGS-03		BGS-04			
SAMPLE ID	**BGS-01**	**BGS-01-AVG**	**BGS-01-D**	**TPBGS010001**	**BGS-02**	**TPBGS020001**	**BGS-03**	**TPBGS030001**	**BGS-04**	**TPBGS040001**	**TPBGS040001-AVG**	**TPBGS040001-D**
SAMPLE DATE	**99990101**	**99990101**	**99990101**	**20030416**	**99990101**	**20030416**	**99990101**	**20030417**	**99990101**	**20030417**	**20030417**	**20030417**
SAMPLE CODE	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**
MATRIX	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**	**SO**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SUBMATRIX	**NA**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**
DIOXINS/FURANS (NG/KG)												
1,2,3,4,6,7,8,9-OCDD	--	--	--	26.5	--	18	--	132 J	--	202	221	240
1,2,3,4,6,7,8,9-OCDF	--	--	--	2.4 U	--	0.80 U	--	10.5 J	--	5 J	5.35 J	5.7 J
1,2,3,4,6,7,8-HPCDD	--	--	--	4.6 J	--	1.3 J	--	12.9	--	7.2	7.55	7.9
1,2,3,4,6,7,8-HPCDF	--	--	--	2.6 J	--	0.30 U	--	8.4	--	5.9	6.7	7.5
1,2,3,4,7,8,9-HPCDF	--	--	--	0.80 U	--	0.40 U	--	0.50 U	--	0.20 U	0.30 U	0.40 U
1,2,3,4,7,8-HXCDD	--	--	--	0.70 U	--	0.40 U	--	2.7 J	--	0.20 U	0.25 U	0.30 U
1,2,3,4,7,8-HXCDF	--	--	--	0.93 J	--	0.20 U	--	4.9 J	--	0.87 J	0.935 J	1 J
1,2,3,6,7,8-HXCDD	--	--	--	0.70 U	--	0.40 U	--	2.8 J	--	0.42 J	0.445 J	0.47 J
1,2,3,6,7,8-HXCDF	--	--	--	0.48 J	--	0.20 U	--	3.1 J	--	0.43 J	0.385 J	0.34 J
1,2,3,7,8,9-HXCDD	--	--	--	0.70 U	--	0.40 U	--	3.3 J	--	0.39 J	0.445 J	0.50 J
1,2,3,7,8,9-HXCDF	--	--	--	0.75 J	--	0.30 U	--	2.3 J	--	0.10 U	0.15 U	0.20 U
1,2,3,7,8-PECDD	--	--	--	0.70 U	--	0.40 U	--	2.3 J	--	0.10 U	0.15 U	0.20 U
1,2,3,7,8-PECDF	--	--	--	0.40 U	--	0.20 U	--	2 J	--	0.08 U	0.085 U	0.09 U
2,3,4,6,7,8-HXCDF	--	--	--	0.63 J	--	0.20 U	--	3.6 J	--	0.59 J	0.545 J	0.50 J
2,3,4,7,8-PECDF	--	--	--	0.50 U	--	0.30 U	--	3.6 J	--	0.34 J	0.335 J	0.33 J
2,3,7,8-TCDD	--	--	--	0.50 U	--	0.30 U	--	0.47 J	--	0.10 U	0.10 U	0.10 U
2,3,7,8-TCDF	--	--	--	0.54 J	--	0.20 U	--	1.6	--	0.48 J	0.48 J	0.48 J
2,3,7,8-TCDD TEQ (WHO-2005)	--	--	--	0.41295	--	0.0184	--	6.59575	--	0.6131	0.634405	0.65571
2,3,7,8-TCDD TEQ - HALFND (WHO 2005)	--	--	--	1.20331	--	0.53502	--	6.59825	--	0.7303	0.78218	0.83406
TOTAL HPCDD	--	--	--	9.4 J	--	2.6	--	26.5	--	15	15.85	16.7
TOTAL HPCDF	--	--	--	4.3	--	0.30 U	--	13.7 J	--	11.2	12.7 J	14.2 J
TOTAL HXCDD	--	--	--	2.9 J	--	0.40 U	--	19.1 J	--	4.5 J	5.35 J	6.2 J
TOTAL HXCDF	--	--	--	8.1 J	--	0.44	--	29.3 J	--	12.1 J	11.1 J	10.1 J
TOTAL PECDD	--	--	--	0.70 U	--	0.40 U	--	9 J	--	0.10 U	0.925 J	1.8 J
TOTAL PECDF	--	--	--	15 J	--	1.1 J	--	139 J	--	29.4 J	25.4 J	21.4 J
TOTAL TCDD	--	--	--	0.99	--	0.30 U	--	5.2 J	--	1.7 J	1.5 J	1.3 J
TOTAL TCDF	--	--	--	32.6 J	--	4.2 J	--	64 J	--	58.3 J	52.85 J	47.4 J
METALS (MG/KG)												
ALUMINUM	19500	21300	23100	--	26500	--	25900	--	11700	--	--	--
ANTIMONY	7 J	5.125 U	6.5 U	--	9.4 J	--	7.4 U	--	5.6 U	--	--	--
ARSENIC	10.6 J	11.45 J	12.3 J	--	10.8 J	--	14.1 J	--	12.7 J	--	--	--
BARIUM	98.3	94.1	89.9	--	62.3	--	44.1 J	--	42.2	--	--	--
BERYLLIUM	0.78 J	0.82 J	0.86 J	--	1.1	--	1.1	--	0.54 J	--	--	--
CADMIUM	2.4	2.7	3	--	2.7	--	2.8	--	2.3	--	--	--
CALCIUM	3220	2620	2020	--	1150	--	876 J	--	1410	--	--	--
CHROMIUM	68.6	75.6	82.6	--	78	--	91.9	--	46.1	--	--	--
COBALT	12.8	14.1	15.4	--	14.6	--	14.8	--	12	--	--	--
COPPER	61.1	188.55	316	--	16.8	--	13.2	--	89.9	--	--	--
CYANIDE	2 U	1.55 U	1.1 U	--	2.6 U	--	1.6 U	--	2 U	--	--	--
IRON	22500	24200	25900	--	27200	--	24500	--	21900	--	--	--
LEAD	112 J	115.5	119	--	9.5 J	--	10.8 J	--	89.7 J	--	--	--
MAGNESIUM	9650	10425	11200	--	10800	--	10500	--	7040	--	--	--
MANGANESE	263	294	325	--	295	--	196	--	381	--	--	--
MERCURY	0.11 U	0.0825	0.11	--	0.10 U	--	0.11 U	--	0.11	--	--	--
NICKEL	49.5	51.5	53.5	--	50	--	52.2	--	42.8	--	--	--
POTASSIUM	2190	2425	2660	--	2830	--	1110 J	--	1860	--	--	--
SELENIUM	0.97 U	0.675 U	0.38 U	--	0.98 U	--	1.1 U	--	1 U	--	--	--
SILVER	1.5 R	0.60 U	0.60 U	--	1.6 R	--	1.6 R	--	1.2 R	--	--	--
SODIUM	1320	1345	1370	--	933 J	--	931 J	--	817 J	--	--	--
THALLIUM	0.22 J	0.1575 U	0.19 U	--	0.23 J	--	0.21 U	--	0.20 U	--	--	--
VANADIUM	47.7	52.25	56.8	--	53.6	--	52.4	--	30.6	--	--	--
ZINC	187	168.5	150	--	46.6	--	43.9	--	108	--	--	--

LOCATION	BGS-01				BGS-02		BGS-03		BGS-04			
SAMPLE ID	BGS-01	BGS-01-AVG	BGS-01-D	TPBGS010001	BGS-02	TPBGS020001	BGS-03	TPBGS030001	BGS-04	TPBGS040001	TPBGS040001-AVG	TPBGS040001-D
SAMPLE DATE	99990101	99990101	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030417	20030417	20030417
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
MISCELLANEOUS PARAMETERS (%)												
TOTAL ORGANIC CARBON	5.3	4.65	4	--	0.60	--	1.3	--	0.70	--	--	--
MISCELLANEOUS PARAMETERS (S.U.)												
PH	7.8	6.9	6	--	8.3	--	7	--	7.1	--	--	--
PESTICIDES/PCBS (UG/KG)												
4,4'-DDD	19 U	24.5	41	--	19 U	--	19 U	--	17 U	--	--	--
4,4'-DDE	19 U	249	490	--	19 U	--	19 U	--	17 U	--	--	--
4,4'-DDT	19 U	94.5	180	--	19 U	--	19 U	--	17 U	--	--	--
ALDRIN	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
ALPHA-BHC	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
ALPHA-CHLORDANE	97 U	52.15 U	7.3 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1016	97 U	97.5 U	98 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1221	97 U	97.5 U	98 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1232	97 U	97.5 U	98 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1242	97 U	97.5 U	98 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1248	97 U	97.5 U	98 U	--	94 U	--	95 U	--	87 U	--	--	--
AROCLOR-1254	190 U	165 U	140 U	--	190 U	--	190 U	--	170 U	--	--	--
AROCLOR-1260	190 U	165 U	140 U	--	190 U	--	190 U	--	170 U	--	--	--
BETA-BHC	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
DELTA-BHC	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
DIELDRIN	19 U	16.5 U	14 U	--	19 U	--	19 U	--	17 U	--	--	--
ENDOSULFAN I	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
ENDOSULFAN II	19 U	16.5 U	14 U	--	19 U	--	19 U	--	17 U	--	--	--
ENDOSULFAN SULFATE	19 U	16.5 U	14 U	--	19 U	--	19 U	--	17 U	--	--	--
ENDRIN	19 U	16.5 U	14 U	--	19 U	--	19 U	--	17 U	--	--	--
ENDRIN ALDEHYDE	--	14 U	14 U	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	19 U	16.5 U	14 U	--	19 U	--	19 U	--	17 U	--	--	--
GAMMA-BHC (LINDANE)	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
GAMMA-CHLORDANE	97 U	52.15 U	7.3 U	--	94 U	--	95 U	--	87 U	--	--	--
HEPTACHLOR	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
HEPTACHLOR EPOXIDE	9.7 U	8.5 U	7.3 U	--	9.4 U	--	9.5 U	--	8.7 U	--	--	--
METHOXYCHLOR	97 U	85 U	73 U	--	94 U	--	95 U	--	87 U	--	--	--
TOXAPHENE	190 U	195 U	200 U	--	190 U	--	190 U	--	170 U	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)												
ACENAPHTHENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
ACENAPHTHYLENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
ANTHRACENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
BAP EQUIVALENT-HALFND	347.9	305.66	273.5	--	390 U	--	390 U	--	260.714	--	--	--
BAP EQUIVALENT-POS	147.9	115.66	75.52	--	0.00 U	--	0.00 U	--	60.914	--	--	--
BENZO(A)ANTHRACENE	140 J	100.5 J	61 J	--	390 U	--	390 U	--	59 J	--	--	--
BENZO(A)PYRENE	110 J	85 J	60 J	--	390 U	--	390 U	--	50 J	--	--	--
BENZO(B)FLUORANTHENE	140 J	112 J	84 J	--	390 U	--	390 U	--	44 J	--	--	--
BENZO(G,H,I)PERYLENE	66 J	55 J	44 J	--	390 U	--	390 U	--	360 U	--	--	--
BENZO(K)FLUORANTHENE	110 J	78 J	46 J	--	390 U	--	390 U	--	55 J	--	--	--
DIBENZO(A,H)ANTHRACENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
DIBENZOFURAN	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
FLUORANTHENE	180 J	155 J	130 J	--	390 U	--	390 U	--	120 J	--	--	--
FLUORENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
INDENO(1,2,3-CD)PYRENE	79 J	79 J	360 U	--	390 U	--	390 U	--	360 U	--	--	--
NAPHTHALENE	43 J	43 J	360 U	--	390 U	--	390 U	--	360 U	--	--	--
PHENANTHRENE	210 J	175 J	140 J	--	390 U	--	390 U	--	75 J	--	--	--
PYRENE	180 J	145 J	110 J	--	390 U	--	390 U	--	97 J	--	--	--

LOCATION	BGS-01				BGS-02		BGS-03		BGS-04			
SAMPLE ID	BGS-01	BGS-01-AVG	BGS-01-D	TPBGS010001	BGS-02	TPBGS020001	BGS-03	TPBGS030001	BGS-04	TPBGS040001	TPBGS040001-AVG	TPBGS040001-D
SAMPLE DATE	99990101	99990101	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030417	20030417	20030417
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SEMIVOLATILES (UG/KG)												
1,2,4-TRICHLOROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
1,2-DICHLOROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
1,3-DICHLOROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
1,4-DICHLOROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	360 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,4,5-TRICHLOROPHENOL	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
2,4,6-TRICHLOROPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,4-DICHLOROPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,4-DIMETHYLPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,4-DINITROPHENOL	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
2,4-DINITROTOLUENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2,6-DINITROTOLUENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2-CHLORONAPHTHALENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2-CHLOROPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2-METHYLNAPHTHALENE	44 J	44 J	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2-METHYLPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
2-NITROANILINE	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
2-NITROPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
3,3'-DICHLOROBENZIDINE	810 U	585 U	360 U	--	780 U	--	790 U	--	730 U	--	--	--
3-NITROANILINE	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
4,6-DINITRO-2-METHYLPHENOL	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
4-BROMOPHENYL PHENYL ETHER	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
4-CHLORO-3-METHYLPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
4-CHLOROANILINE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
4-CHLOROPHENYL PHENYL ETHER	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
4-HYDROXY-4-METHYL-2-PENTANONE (1)	21000 J	35500	50000	--	16000 J	--	16000 J	--	19000 J	--	--	--
4-METHYLPHENOL	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
4-NITROANILINE	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
4-NITROPHENOL	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
BENZOIC ACID	2000 U	2000 U	2000 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
BENZYL ALCOHOL	400 U	405 U	410 U	--	390 U	--	390 U	--	360 U	--	--	--
BIS(2-CHLOROETHOXY)METHANE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
BIS(2-CHLOROETHYL)ETHER	400 U	380 U	360 U	--	390 U	--	98 UJ	--	360 U	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	58 J	58 J	62 U	--	390 U	--	390 U	--	360 U	--	--	--
BUTYL BENZYL PHTHALATE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
CARBAZOLE	--	360 U	360 U	--	--	--	--	--	--	--	--	--
CHRYSENE	240 J	180 J	120 J	--	390 U	--	390 U	--	64 J	--	--	--
DIETHYL PHTHALATE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
DIMETHYL PHTHALATE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
DI-N-BUTYL PHTHALATE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
DI-N-OCTYL PHTHALATE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
HEXACHLOROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
HEXACHLOROBUTADIENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
HEXACHLOROCYCLOPENTADIENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
HEXACHLOROETHANE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
ISOPHORONE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
NITROBENZENE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
N-NITROSO-DI-N-PROPYLAMINE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
N-NITROSODIPHENYLAMINE	400 U	380 U	360 U	--	390 U	--	390 U	--	360 U	--	--	--
PENTACHLOROPHENOL	2000 U	1430 U	860 U	--	1900 U	--	1900 U	--	1800 U	--	--	--
PHENOL	400 U	380 U	360 U	--	390 U	--	98 J	--	360 U	--	--	--
TOTAL PETROLEUM HYDROCARBONS	--	--	--	--	--	--	--	--	--	--	--	--

LOCATION	BGS-01				BGS-02		BGS-03		BGS-04			
SAMPLE ID	BGS-01	BGS-01-AVG	BGS-01-D	TPBGS010001	BGS-02	TPBGS020001	BGS-03	TPBGS030001	BGS-04	TPBGS040001	TPBGS040001-AVG	TPBGS040001-D
SAMPLE DATE	99990101	99990101	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030417	20030417	20030417
SAMPLE CODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	NA	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
VOLATILES (UG/KG)												
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,1-DICHLOROETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,1-DICHLOROETHENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,2-DICHLOROETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
1,2-DICHLOROPROPANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
2-BUTANONE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
2-HEXANONE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
4-METHYL-2-PENTANONE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
ACETONE	5 U	8 U	11 U	--	6 U	--	6 U	--	5 U	--	--	--
BENZENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
BROMODICHLOROMETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
BROMOFORM	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
BROMOMETHANE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
CARBON DISULFIDE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
CARBON TETRACHLORIDE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
CHLOROBENZENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
CHLORODIBROMOMETHANE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
CHLOROETHANE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
CHLOROFORM	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
CHLOROMETHANE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
ETHYLBENZENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
METHYLENE CHLORIDE	2 J	2 J	6 U	--	2 J	--	6 U	--	1 J	--	--	--
STYRENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
TETRACHLOROETHENE	6 U	5.5 J	8 J	--	6 U	--	6 U	--	5 U	--	--	--
TOLUENE	6 U	1 J	1 J	--	6 U	--	6 U	--	5 U	--	--	--
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
TOTAL XYLENES	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
TRICHLOROETHENE	6 U	6 U	6 U	--	6 U	--	6 U	--	5 U	--	--	--
VINYL ACETATE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--
VINYL CHLORIDE	12 U	11.5 U	11 U	--	12 U	--	12 U	--	11 U	--	--	--

1. 4-hydroxy-4-mthyl-2-pentanone is a tentatively identified compound that is not used in formal background comparisons or statistical evaluations.

LOCATION	BGS-06		BGS-07		BGS-08		BGS-09		BGS-10		BGS-11		BGS-12	
SAMPLE ID	BGS-06	TPBGS060001	BGS-07	TPBGS070001	BGS-08	TPBGS080001	BGS-09	TPBGS090001	BGS-10	TPBGS100001	BGS-11	TPBGS110001	BGS-12	TPBGS120001
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030416	99990101	20030416	99990101	20030417
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
DIOXINS/FURANS (NG/KG)														
1,2,3,4,6,7,8,9-OCDD	--	669	--	1410 J	--	1120	--	462	--	374 J	--	301	--	6460 J
1,2,3,4,6,7,8,9-OCDF	--	11.9	--	26.8 J	--	3.5 J	--	9.2 J	--	16.7 J	--	9.6 J	--	129
1,2,3,4,6,7,8-HPCDD	--	22	--	33.6 J	--	10.8	--	10.7	--	31.4 J	--	19.1	--	826
1,2,3,4,6,7,8-HPCDF	--	13.1	--	27.2 J	--	5.3	--	16.1	--	35.9	--	8.3	--	32
1,2,3,4,7,8,9-HPCDF	--	0.70 U	--	1.7 J	--	0.30 U	--	0.50 U	--	2.1 U	--	0.40 U	--	1.5 J
1,2,3,4,7,8-HXCDD	--	0.70 U	--	1.2 J	--	0.30 U	--	0.30 U	--	1.6 U	--	0.53 J	--	4.2 J
1,2,3,4,7,8-HXCDF	--	3.9 J	--	9.4 J	--	0.20 U	--	2.3 J	--	12.2	--	3.3 J	--	3.9 J
1,2,3,6,7,8-HXCDD	--	1.8 J	--	2 J	--	0.58 J	--	1.5 J	--	5.8	--	1.1 J	--	9.6
1,2,3,6,7,8-HXCDF	--	1.8 J	--	3.3 J	--	0.89 J	--	0.82 J	--	4.7 J	--	1.5 J	--	1.3 J
1,2,3,7,8,9-HXCDD	--	1.8 J	--	3.5 J	--	1.1 J	--	0.78 J	--	6	--	1.2 J	--	15.2
1,2,3,7,8,9-HXCDF	--	0.42 J	--	0.81 J	--	0.22 J	--	0.30 U	--	1.1 U	--	0.44 J	--	0.69 J
1,2,3,7,8-PECDD	--	0.70 U	--	1.3 J	--	0.30 U	--	0.30 U	--	3.3 J	--	0.73 J	--	0.69 J
1,2,3,7,8-PECDF	--	0.30 U	--	1.6 J	--	0.48 J	--	0.41 J	--	0.60 U	--	1.2 J	--	0.20 U
2,3,4,6,7,8-HXCDF	--	2.6 J	--	5.4 J	--	1.7 J	--	2.1 J	--	5.9	--	2.1 J	--	2.4 J
2,3,4,7,8-PECDF	--	2.1 J	--	4.1 J	--	1.2 J	--	1.3 J	--	5.5 J	--	2.3 J	--	1.9 J
2,3,7,8-TCDD	--	0.30 U	--	0.20 UJ	--	0.20 U	--	0.20 U	--	0.50 U	--	0.30 U	--	0.20 U
2,3,7,8-TCDF	--	0.92 J	--	8.9 J	--	0.99	--	0.68 J	--	2.9	--	2.3	--	1
2,3,7,8-TCDD TEQ (WHO-2005)	--	2.50927	--	7.08504	--	1.42045	--	1.62966	--	9.49021	--	3.07018	--	15.6607
2,3,7,8-TCDD TEQ - HALFND (WHO 2005)	--	3.05227	--	7.18504	--	1.69695	--	1.91216	--	9.89471	--	3.22218	--	15.7637
TOTAL HPCDD	--	43.9	--	72.4 J	--	24.2	--	27.2	--	79.3 J	--	43.6	--	7430 J
TOTAL HPCDF	--	24.3 J	--	48 J	--	7.9	--	36.8	--	50.3	--	15.6	--	118 J
TOTAL HXCDD	--	19.8 J	--	30.4 J	--	10.2 J	--	9.7 J	--	78.2	--	13.8 J	--	516
TOTAL HXCDF	--	41.4 J	--	61.6 J	--	16.8 J	--	20.2 J	--	78.7	--	28.2 J	--	84 J
TOTAL PECDD	--	2.4	--	16.4 J	--	2.7	--	1.7 J	--	50.6 J	--	9.3	--	10.9 J
TOTAL PECDF	--	90.9 J	--	109 J	--	24.5 J	--	12 J	--	153 J	--	47.6 J	--	76.4 J
TOTAL TCDD	--	6.2 J	--	16.9 J	--	4.8 J	--	2.2 J	--	30.1 J	--	14.6 J	--	9.4 J
TOTAL TCDF	--	132 J	--	186 J	--	48.3 J	--	16 J	--	220 J	--	77.7 J	--	106 J
METALS (MG/KG)														
ALUMINUM	19000	--	20800	--	16500	--	25800	--	17100	--	4930	--	15900	--
ANTIMONY	6.4 U	--	7.5 U	--	6.1 U	--	7 J	--	9.1 U	--	8.2 U	--	7 U	--
ARSENIC	20.5 J	--	58.6 J	--	11.5 J	--	11 J	--	17.1	--	6.2	--	13	--
BARIUM	109	--	223	--	39.7	--	49.1	--	54.5	--	58.3	--	65.1	--
BERYLLIUM	0.79 J	--	1.1	--	0.85 J	--	0.77 J	--	0.52 B	--	0.44 B	--	0.54 B	--
CADMIUM	2.6	--	2.8	--	2.7	--	3.4	--	0.93 B	--	0.80 U	--	1.5	--
CALCIUM	2620	--	1390	--	1440	--	1510	--	1730	--	1280	--	2420	--
CHROMIUM	67.3	--	73.2	--	50	--	103	--	49	--	16.2	--	55	--
COBALT	10.3	--	12.4	--	12.4	--	12.7	--	10.5	--	4.1 B	--	10.9	--
COPPER	97.5	--	232	--	59	--	18.5	--	33.3	--	316	--	50.4	--
CYANIDE	1.9 U	--	2 U	--	1.4 U	--	1.9 U	--	1.1 U	--	1.1 U	--	1.1 U	--
IRON	20600	--	22800	--	23400	--	26400	--	21700	--	9450	--	18900	--
LEAD	543 J	--	1100	--	88.5 J	--	40.1 J	--	96	--	119	--	50.7	--
MAGNESIUM	6960	--	7550	--	7750	--	9620	--	6110	--	1500	--	6350	--
MANGANESE	323	--	330	--	350	--	460	--	254	--	110	--	298	--
MERCURY	0.32	--	0.57	--	0.11 U	--	0.27	--	0.31 U	--	0.23 U	--	0.16 U	--
NICKEL	37.2	--	42.9	--	38.2	--	44.6	--	33.6	--	11.2	--	42	--
POTASSIUM	1340	--	1840	--	1860	--	837 J	--	1270	--	585 B	--	1880	--
SELENIUM	1 U	--	0.97 U	--	1.1 U	--	1.1 U	--	0.52 B	--	0.38 U	--	0.32 B	--
SILVER	1.4 R	--	1.6 R	--	1.3 R	--	1.5 R	--	0.67 U	--	0.60 U	--	0.51 U	--
SODIUM	820 J	--	858 J	--	1060	--	1030 J	--	48 B	--	35.1 B	--	82.2 B	--
THALLIUM	0.20 U	--	0.19 U	--	0.21 U	--	0.21 U	--	0.49 U	--	0.58 U	--	0.47 U	--
VANADIUM	46.8	--	62.7	--	43.9	--	66.7	--	36.7	--	28.5	--	62.1	--
ZINC	246	--	237	--	88.4	--	73.7	--	91.9	--	150	--	82.1	--

TABLE A.1
FACILITY BACKGROUND SOIL DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	BGS-06		BGS-07		BGS-08		BGS-09		BGS-10		BGS-11		BGS-12	
SAMPLE ID	BGS-06	TPBGS060001	BGS-07	TPBGS070001	BGS-08	TPBGS080001	BGS-09	TPBGS090001	BGS-10	TPBGS100001	BGS-11	TPBGS110001	BGS-12	TPBGS120001
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030416	99990101	20030416	99990101	20030417
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
MISCELLANEOUS PARAMETERS (%)														
TOTAL ORGANIC CARBON	3.1	--	2.6	--	1.6	--	3.9	--	--	--	--	--	--	--
MISCELLANEOUS PARAMETERS (S.U.)														
PH	7.1	--	5.9	--	6.5	--	6.6	--	--	--	--	--	--	--
PESTICIDES/PCBS (UG/KG)														
4,4'-DDD	20 U	--	55	--	18 U	--	18 U	--	2.2	--	21	--	2	--
4,4'-DDE	49	--	110	--	37	--	110	--	71	--	340	--	17	--
4,4'-DDT	63	--	580	--	29	--	110	--	51	--	110	--	5.1	--
ALDRIN	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
ALPHA-BHC	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
ALPHA-CHLORDANE	98 U	--	100 U	--	91 U	--	91 U	--	19 U	--	73 U	--	2 U	--
AROCLOR-1016	98 U	--	100 U	--	91 U	--	91 U	--	360 U	--	1400 U	--	38 U	--
AROCLOR-1221	98 U	--	100 U	--	91 U	--	91 U	--	740 U	--	2900 U	--	78 U	--
AROCLOR-1232	98 U	--	100 U	--	91 U	--	91 U	--	360 U	--	1400 U	--	38 U	--
AROCLOR-1242	98 U	--	100 U	--	91 U	--	91 U	--	360 U	--	1400 U	--	38 U	--
AROCLOR-1248	98 U	--	100 U	--	91 U	--	91 U	--	360 U	--	1400 U	--	38 U	--
AROCLOR-1254	200 U	--	200 U	--	180 U	--	180 U	--	360 U	--	1400 U	--	38 U	--
AROCLOR-1260	200 U	--	200 U	--	180 U	--	180 U	--	260 U	--	1400 U	--	38 U	--
BETA-BHC	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
DELTA-BHC	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
DIELDRIN	20 U	--	20 U	--	18 U	--	18 U	--	36 U	--	140 U	--	3.8 U	--
ENDOSULFAN I	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
ENDOSULFAN II	20 U	--	20 U	--	18 U	--	18 U	--	36 U	--	140 U	--	3.8 U	--
ENDOSULFAN SULFATE	20 U	--	20 U	--	18 U	--	18 U	--	36 U	--	140 U	--	3.8 U	--
ENDRIN	20 U	--	20 U	--	18 U	--	18 U	--	36 U	--	140 U	--	3.8 U	--
ENDRIN ALDEHYDE	--	--	--	--	--	--	--	--	36 U	--	140 U	--	3.8 U	--
ENDRIN KETONE	20 U	--	20 U	--	18 U	--	18 U	--	36 U	--	140 U	--	3.8 U	--
GAMMA-BHC (LINDANE)	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
GAMMA-CHLORDANE	98 U	--	100 U	--	91 U	--	91 U	--	19 U	--	73 U	--	2 U	--
HEPTACHLOR	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
HEPTACHLOR EPOXIDE	9.8 U	--	10 U	--	9.1 U	--	9.1 U	--	19 U	--	73 U	--	2 U	--
METHOXYCHLOR	98 U	--	100 U	--	91 U	--	91 U	--	190 U	--	730 U	--	20 U	--
TOXAPHENE	200 U	--	200 U	--	180 U	--	180 U	--	1900 U	--	7300 U	--	200 U	--
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)														
ACENAPHTHENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
ACENAPHTHYLENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
ANTHRACENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
BAP EQUIVALENT-HALFND	334.128	--	463.46	--	266.253	--	440.84	--	405.846	--	248.64	--	357.26	--
BAP EQUIVALENT-POS	106.578	--	258.46	--	53.453	--	0.04	--	6.246	--	48.84	--	167.26	--
BENZO(A)ANTHRACENE	89 J	--	210 J	--	47 J	--	380 U	--	360 U	--	37 J	--	120 J	--
BENZO(A)PYRENE	88 J	--	200 J	--	43 J	--	380 U	--	360 U	--	39 J	--	130 J	--
BENZO(B)FLUORANTHENE	87 J	--	250 J	--	57 J	--	380 U	--	62 J	--	56 J	--	170 J	--
BENZO(G,H,I)PERYLENE	410 U	--	72 J	--	380 U	--	380 U	--	360 U	--	360 U	--	59 J	--
BENZO(K)FLUORANTHENE	88 J	--	150 J	--	380 U	--	380 U	--	360 U	--	47 J	--	110 J	--
DIBENZO(A,H)ANTHRACENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
DIBENZOFURAN	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
FLUORANTHENE	150 J	--	340 J	--	71 J	--	60 J	--	63 J	--	90 J	--	300 J	--
FLUORENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
INDENO(1,2,3-CD)PYRENE	410 U	--	100 J	--	380 U	--	380 U	--	360 U	--	360 U	--	64 J	--
NAPHTHALENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
PHENANTHRENE	92 J	--	190 J	--	380 U	--	380 U	--	360 U	--	54 J	--	160 J	--
PYRENE	140 J	--	320 J	--	68 J	--	53 J	--	84 J	--	110 J	--	220 J	--

LOCATION	BGS-06		BGS-07		BGS-08		BGS-09		BGS-10		BGS-11		BGS-12	
SAMPLE ID	BGS-06	TPBGS060001	BGS-07	TPBGS070001	BGS-08	TPBGS080001	BGS-09	TPBGS090001	BGS-10	TPBGS100001	BGS-11	TPBGS110001	BGS-12	TPBGS120001
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030416	99990101	20030416	99990101	20030417
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SEMIVOLATILES (UG/KG)														
1,2,4-TRICHLOROBENZENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
1,2-DICHLOROBENZENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
1,3-DICHLOROBENZENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
1,4-DICHLOROBENZENE	410 U	--	67 J	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,2'-OXYBIS(1-CHLOROPROPANE)	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,4,5-TRICHLOROPHENOL	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
2,4,6-TRICHLOROPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,4-DICHLOROPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,4-DIMETHYLPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,4-DINITROPHENOL	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
2,4-DINITROTOLUENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2,6-DINITROTOLUENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2-CHLORONAPHTHALENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2-CHLOROPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2-METHYLNAPHTHALENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2-METHYLPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
2-NITROANILINE	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
2-NITROPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
3,3'-DICHLOROBENZIDINE	820 U	--	820 U	--	760 U	--	760 U	--	360 U	--	360 U	--	380 U	--
3-NITROANILINE	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
4,6-DINITRO-2-METHYLPHENOL	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
4-BROMOPHENYL PHENYL ETHER	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
4-CHLORO-3-METHYLPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
4-CHLOROANILINE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
4-CHLOROPHENYL PHENYL ETHER	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
4-HYDROXY-4-METHYL-2-PENTANONE (1)	25000 J	--	21000 J	--	19000 J	--	19000 J	--	44000	--	47000	--	58000	--
4-METHYLPHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
4-NITROANILINE	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
4-NITROPHENOL	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
BENZOIC ACID	2000 U	--	2000 U	--	1800 U	--	340 J	--	--	--	--	--	--	--
BENZYL ALCOHOL	410 U	--	410 U	--	380 U	--	380 U	--	--	--	--	--	--	--
BIS(2-CHLOROETHOXY)METHANE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
BIS(2-CHLOROETHYL)ETHER	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
BIS(2-ETHYLHEXYL)PHTHALATE	77 J	--	410 U	--	380 U	--	380 U	--	120 U	--	95 U	--	79 U	--
BUTYL BENZYL PHTHALATE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
CARBAZOLE	--	--	--	--	--	--	--	--	360 U	--	360 U	--	380 U	--
CHRYSENE	98 J	--	240 J	--	53 J	--	40 J	--	46 J	--	70 J	--	170 J	--
DIETHYL PHTHALATE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
DIMETHYL PHTHALATE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
DI-N-BUTYL PHTHALATE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
DI-N-OCTYL PHTHALATE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
HEXACHLOROBENZENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
HEXACHLOROBUTADIENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
HEXACHLOROCYCLOPENTADIENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
HEXACHLOROETHANE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
ISOPHORONE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
NITROBENZENE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
N-NITROSO-DI-N-PROPYLAMINE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
N-NITROSODIPHENYLAMINE	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
PENTACHLOROPHENOL	2000 U	--	2000 U	--	1800 U	--	1800 U	--	880 U	--	860 U	--	930 U	--
PHENOL	410 U	--	410 U	--	380 U	--	380 U	--	360 U	--	360 U	--	380 U	--
TOTAL PETROLEUM HYDROCARBONS	--	--	--	--	--	--	--	--	220 J	--	--	--	350 J	--

LOCATION	BGS-06		BGS-07		BGS-08		BGS-09		BGS-10		BGS-11		BGS-12	
SAMPLE ID	BGS-06	TPBGS060001	BGS-07	TPBGS070001	BGS-08	TPBGS080001	BGS-09	TPBGS090001	BGS-10	TPBGS100001	BGS-11	TPBGS110001	BGS-12	TPBGS120001
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	20030417	99990101	20030416	99990101	20030416	99990101	20030417
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
VOLATILES (UG/KG)														
1,1,1-TRICHLOROETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
1,1,2,2-TETRACHLOROETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
1,1,2-TRICHLOROETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
1,1-DICHLOROETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
1,1-DICHLOROETHENE	7 U	--	6 U	--	3 J	--	6 U	--	11 U	--	--	--	11 U	--
1,2-DICHLOROETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
1,2-DICHLOROPROPANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
2-BUTANONE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
2-HEXANONE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
4-METHYL-2-PENTANONE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
ACETONE	8 U	--	13 U	--	7 U	--	11 U	--	13 U	--	--	--	7 U	--
BENZENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
BROMODICHLOROMETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
BROMOFORM	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
BROMOMETHANE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
CARBON DISULFIDE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
CARBON TETRACHLORIDE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
CHLOROBENZENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
CHLORODIBROMOMETHANE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
CHLOROETHANE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
CHLOROFORM	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
CHLOROMETHANE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--
CIS-1,3-DICHLOROPROPENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
ETHYLBENZENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
METHYLENE CHLORIDE	7 U	--	6 U	--	5 U	--	6 U	--	11 U	--	--	--	11 U	--
STYRENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TETRACHLOROETHENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TOLUENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TOTAL 1,2-DICHLOROETHENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TOTAL XYLENES	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TRANS-1,3-DICHLOROPROPENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
TRICHLOROETHENE	7 U	--	6 U	--	6 U	--	6 U	--	11 U	--	--	--	11 U	--
VINYL ACETATE	13 U	--	13 U	--	11 U	--	11 U	--	--	--	--	--	--	--
VINYL CHLORIDE	13 U	--	13 U	--	11 U	--	11 U	--	11 U	--	--	--	11 U	--

1. 4-hydroxy-4-mthyl-2-pentanone is a tentatively identified compound that is not used in formal background comparisons or statistical evaluations.

LOCATION	BGS-13	BGS-14		BGS-15		BGS-16		BGS-17		BGS-18			
SAMPLE ID	BGS-13	BGS-14	TPBGS140001	BGS-15	TPBGS150001	BGS-16	TPBGS160001	BGS-17	TPBGS170001	BGS-18	TPBGS180001	TPBGS180001-AVG	TPBGS180001-D
SAMPLE DATE	99990101	99990101	20030417	99990101	20030508	99990101	20030416	99990101	20030416	99990101	20030416	20030416	20030416
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
DIOXINS/FURANS (NG/KG)													
1,2,3,4,6,7,8,9-OCDD	--	--	221	--	678	--	35.6	--	1130 J	--	272	282.5	293
1,2,3,4,6,7,8,9-OCDF	--	--	5.2 J	--	1.9 J	--	2.2 J	--	94 J	--	8.1 J	7.95 J	7.8 J
1,2,3,4,6,7,8-HPCDD	--	--	7.4	--	12.4	--	5.4	--	120	--	11.5	11.65	11.8
1,2,3,4,6,7,8-HPCDF	--	--	5.7	--	3.6 J	--	1.8 J	--	48.2	--	6.7 J	7 J	7.3
1,2,3,4,7,8,9-HPCDF	--	--	0.40 U	--	0.40 U	--	0.50 U	--	3.4 U	--	0.37 J	0.48 J	0.59 J
1,2,3,4,7,8-HXCDD	--	--	0.40 U	--	0.23 J	--	0.50 U	--	2.6 U	--	0.40 J	0.45 J	0.50 J
1,2,3,4,7,8-HXCDF	--	--	2.8 J	--	1 J	--	1 J	--	7.2	--	0.20 U	1.65 J	3.2 J
1,2,3,6,7,8-HXCDD	--	--	0.57 J	--	0.59 J	--	0.50 U	--	5.4	--	0.87 J	0.865 J	0.86 J
1,2,3,6,7,8-HXCDF	--	--	1 J	--	0.46 J	--	0.30 U	--	5.4	--	1.6 J	1.45 J	1.3 J
1,2,3,7,8,9-HXCDD	--	--	0.86 J	--	0.56 J	--	0.50 U	--	5.4	--	1.5 J	1.3 J	1.1 J
1,2,3,7,8,9-HXCDF	--	--	0.20 J	--	0.30 U	--	0.40 U	--	1.6 U	--	0.54 J	0.32 J	0.20 U
1,2,3,7,8-PECDD	--	--	0.40 U	--	0.40 U	--	0.50 U	--	1.7 U	--	0.61 J	0.55 J	0.49 J
1,2,3,7,8-PECDF	--	--	0.49 J	--	0.20 U	--	0.30 U	--	0.80 U	--	0.82 J	0.435 J	0.10 U
2,3,4,6,7,8-HXCDF	--	--	1.5 J	--	0.70 J	--	0.30 U	--	7.4	--	2 J	1.8 J	1.6 J
2,3,4,7,8-PECDF	--	--	1.1 J	--	0.46 J	--	0.30 U	--	3.9 J	--	2.1 J	1.9 J	1.7 J
2,3,7,8-TCDD	--	--	0.20 U	--	0.30 U	--	0.40 U	--	0.80 U	--	0.30 U	0.25 U	0.20 U
2,3,7,8-TCDF	--	--	2.5 J	--	0.60 J	--	0.54 J	--	2.2	--	1.3	1.25	1.2
2,3,7,8-TCDD TEQ (WHO-2005)	--	--	1.48656	--	0.91597	--	0.23734	--	6.5192	--	2.35533	2.319985	2.26314
2,3,7,8-TCDD TEQ - HALFND (WHO 2005)	--	--	1.80856	--	1.28597	--	0.86434	--	8.0082	--	2.51533	2.444985	2.37464
TOTAL HPCDD	--	--	16.3 J	--	27	--	10.8	--	250	--	24.4	24.15	23.9
TOTAL HPCDF	--	--	9.5	--	6.5 J	--	3.7 J	--	113	--	8.5 J	10.65 J	12.8 J
TOTAL HXCDD	--	--	8.5	--	6.6 U	--	2.3 J	--	50 J	--	12 J	12.1 J	12.2 J
TOTAL HXCDF	--	--	19.9 J	--	6.9 J	--	4	--	193 J	--	24.3 J	23.15 J	22 J
TOTAL PECDD	--	--	3.2 J	--	1.3	--	0.50 U	--	4.5 J	--	4.3 J	5.85 J	7.4 J
TOTAL PECDF	--	--	39.7 J	--	6	--	11.1 J	--	363 J	--	50.6 J	51.05 J	51.5 J
TOTAL TCDD	--	--	6.3 J	--	0.30 U	--	0.99	--	14 J	--	6.4 J	5.65 J	4.9 J
TOTAL TCDF	--	--	74.6 J	--	9.1 J	--	29.2 J	--	461 J	--	87.5 J	89.05 J	90.6 J
METALS (MG/KG)													
ALUMINUM	33500	14200	--	13200	--	22800	--	9680	--	23200	--	--	--
ANTIMONY	8.5 U	7.3 U	--	8.7 U	--	9.4 U	--	7.6 U	--	9 U	--	--	--
ARSENIC	8.9	16.8	--	14.2	--	12.5	--	6.7	--	7.3	--	--	--
BARIUM	57.9	67.2	--	44.2	--	113	--	22.3 B	--	172	--	--	--
BERYLLIUM	0.83 B	0.44 B	--	0.44 B	--	0.44 B	--	0.39 B	--	1.1	--	--	--
CADMIUM	2.4	1.1	--	1.6	--	1.6	--	0.74 U	--	2.1	--	--	--
CALCIUM	990 B	1560	--	1140	--	2700	--	7910	--	4420	--	--	--
CHROMIUM	92.8	69.2	--	36.9	--	85.1	--	11.6	--	58.9	--	--	--
COBALT	24.2	10.3	--	7.6 B	--	17	--	3.1 B	--	11.2	--	--	--
COPPER	24	65.5	--	21.6	--	31.4	--	14.7	--	41.6	--	--	--
CYANIDE	1.1 U	1 U	--	1 U	--	1.2 U	--	1.1 U	--	1.1 U	--	--	--
IRON	45000	20800	--	17900	--	32100	--	8730	--	27200	--	--	--
LEAD	50.9	173	--	67	--	55.2	--	12.8	--	316	--	--	--
MAGNESIUM	11500	5990	--	4870	--	13200	--	1670	--	4130	--	--	--
MANGANESE	243	242	--	285	--	427	--	154	--	271	--	--	--
MERCURY	0.19 U	0.21 U	--	0.13 U	--	0.13 U	--	0.11 U	--	1.8	--	--	--
NICKEL	65	44.7	--	28.5	--	73.2	--	8.1	--	29.5	--	--	--
POTASSIUM	705 B	1350	--	987 B	--	6030	--	670 B	--	1750	--	--	--
SELENIUM	2.1	0.71 B	--	0.40 B	--	0.49 B	--	0.38 U	--	0.45 B	--	--	--
SILVER	0.62 U	0.53 U	--	0.64 U	--	0.69 U	--	0.56 U	--	0.66 U	--	--	--
SODIUM	75.9 B	78.6 B	--	44.7 B	--	397 B	--	35.1 B	--	676 B	--	--	--
THALLIUM	0.65 U	0.56 U	--	0.60 U	--	0.64 U	--	0.57 U	--	0.49 U	--	--	--
VANADIUM	89.5	85.4	--	42.5	--	73.1	--	13.5	--	54.5	--	--	--
ZINC	109	208	--	72.3	--	95.2	--	23.1	--	1390	--	--	--

LOCATION	BGS-13	BGS-14		BGS-15		BGS-16		BGS-17		BGS-18			
SAMPLE ID	BGS-13	BGS-14	TPBGS140001	BGS-15	TPBGS150001	BGS-16	TPBGS160001	BGS-17	TPBGS170001	BGS-18	TPBGS180001	TPBGS180001-AVG	TPBGS180001-D
SAMPLE DATE	99990101	99990101	20030417	99990101	20030508	99990101	20030416	99990101	20030416	99990101	20030416	20030416	20030416
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
MISCELLANEOUS PARAMETERS (%)													
TOTAL ORGANIC CARBON	--	--	--	--	--	--	--	--	--	--	--	--	--
MISCELLANEOUS PARAMETERS (S.U.)													
PH	--	--	--	--	--	--	--	--	--	--	--	--	--
PESTICIDES/PCBS (UG/KG)													
4,4'-DDD	8.5	170	--	5.5	--	2.2	--	11	--	10	--	--	--
4,4'-DDE	340	7100	--	180	--	5.2	--	280	--	200	--	--	--
4,4'-DDT	260	4100	--	280	--	15	--	390	--	170	--	--	--
ALDRIN	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
ALPHA-BHC	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
ALPHA-CHLORDANE	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
AROCLOR-1016	110 U	350 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
AROCLOR-1221	220 U	710 U	--	220 U	--	77 U	--	360 U	--	140 U	--	--	--
AROCLOR-1232	110 U	0.50 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
AROCLOR-1242	110 U	350 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
AROCLOR-1248	110 U	350 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
AROCLOR-1254	110 U	350 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
AROCLOR-1260	110 U	350 U	--	110 U	--	38 U	--	180 U	--	71 U	--	--	--
BETA-BHC	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
DELTA-BHC	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
DIELDRIN	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
ENDOSULFAN I	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
ENDOSULFAN II	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
ENDOSULFAN SULFATE	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
ENDRIN	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
ENDRIN ALDEHYDE	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
ENDRIN KETONE	11 U	35 U	--	11 U	--	3.8 U	--	18 U	--	7.1 U	--	--	--
GAMMA-BHC (LINDANE)	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
GAMMA-CHLORDANE	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
HEPTACHLOR	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
HEPTACHLOR EPOXIDE	5.6 U	18 U	--	5.5 U	--	2 U	--	9.1 U	--	3.7 U	--	--	--
METHOXYCHLOR	56 U	180 U	--	55 U	--	20 U	--	91 U	--	37 U	--	--	--
TOXAPHENE	560 U	1800 U	--	550 U	--	200 U	--	910 U	--	370 U	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)													
ACENAPHTHENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
ACENAPHTHYLENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
ANTHRACENE	360 U	62 J	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
BAP EQUIVALENT-HALFND	267.461	1574.7	--	242.762	--	427.85	--	350 U	--	405.14	--	--	--
BAP EQUIVALENT-POS	47.861	1574.7	--	46.762	--	6.05	--	0.00 U	--	5.547	--	--	--
BENZO(A)ANTHRACENE	48 J	640	--	41 J	--	380 U	--	350 U	--	360 U	--	--	--
BENZO(A)PYRENE	43 J	1100	--	36 J	--	380 U	--	350 U	--	360 U	--	--	--
BENZO(B)FLUORANTHENE	360 U	1700	--	66 J	--	60 J	--	350 U	--	55 J	--	--	--
BENZO(G,H,I)PERYLENE	360 U	410	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
BENZO(K)FLUORANTHENE	360 U	1100	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
DIBENZO(A,H)ANTHRACENE	360 U	180 J	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
DIBENZOFURAN	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
FLUORANTHENE	110 J	1700	--	350 U	--	86 J	--	350 U	--	74 J	--	--	--
FLUORENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
INDENO(1,2,3-CD)PYRENE	360 U	440	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
NAPHTHALENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
PHENANTHRENE	67 J	330 J	--	350 U	--	40 J	--	350 U	--	360 U	--	--	--
PYRENE	83 J	1400	--	84 J	--	64 J	--	350 U	--	58 J	--	--	--

LOCATION	BGS-13	BGS-14		BGS-15		BGS-16		BGS-17		BGS-18			
SAMPLE ID	BGS-13	BGS-14	TPBGS140001	BGS-15	TPBGS150001	BGS-16	TPBGS160001	BGS-17	TPBGS170001	BGS-18	TPBGS180001	TPBGS180001-AVG	TPBGS180001-D
SAMPLE DATE	99990101	99990101	20030417	99990101	20030508	99990101	20030416	99990101	20030416	99990101	20030416	20030416	20030416
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SEMIVOLATILES (UG/KG)													
1,2,4-TRICHLOROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
1,2-DICHLOROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
1,3-DICHLOROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
1,4-DICHLOROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,4,5-TRICHLOROPHENOL	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
2,4,6-TRICHLOROPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,4-DICHLOROPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,4-DIMETHYLPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,4-DINITROPHENOL	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
2,4-DINITROTOLUENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2,6-DINITROTOLUENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2-CHLORONAPHTHALENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2-CHLOROPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2-METHYLNAPHTHALENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2-METHYLPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
2-NITROANILINE	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
2-NITROPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
3,3'-DICHLOROBENZIDINE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
3-NITROANILINE	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
4,6-DINITRO-2-METHYLPHENOL	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
4-BROMOPHENYL PHENYL ETHER	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
4-CHLORO-3-METHYLPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
4-CHLOROANILINE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
4-CHLOROPHENYL PHENYL ETHER	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
4-HYDROXY-4-METHYL-2-PENTANONE (1)	55000	66000	--	36000	--	57000	--	54000	--	28000	--	--	--
4-METHYLPHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
4-NITROANILINE	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
4-NITROPHENOL	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
BENZOIC ACID	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZYL ALCOHOL	--	--	--	--	--	--	--	--	--	--	--	--	--
BIS(2-CHLOROETHOXY)METHANE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
BIS(2-CHLOROETHYL)ETHER	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	52 U	140 U	--	39 U	--	160 U	--	53 U	--	150 U	--	--	--
BUTYL BENZYL PHTHALATE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
CARBAZOLE	360 U	94 J	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
CHRYSENE	61 J	1600	--	62 J	--	50 J	--	350 U	--	47 J	--	--	--
DIETHYL PHTHALATE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
DIMETHYL PHTHALATE	360 U	42 J	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
DI-N-BUTYL PHTHALATE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
DI-N-OCTYL PHTHALATE	360 U	100 J	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
HEXACHLOROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
HEXACHLOROBUTADIENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
HEXACHLOROCYCLOPENTADIENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
HEXACHLOROETHANE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
ISOPHORONE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
NITROBENZENE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
N-NITROSO-DI-N-PROPYLAMINE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
N-NITROSODIPHENYLAMINE	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
PENTACHLOROPHENOL	880 U	840 U	--	860 U	--	920 U	--	860 U	--	860 U	--	--	--
PHENOL	360 U	350 U	--	350 U	--	380 U	--	350 U	--	360 U	--	--	--
TOTAL PETROLEUM HYDROCARBONS	--	140 J	--	--	--	--	--	--	--	--	--	--	--

LOCATION	BGS-13	BGS-14		BGS-15		BGS-16		BGS-17		BGS-18			
SAMPLE ID	BGS-13	BGS-14	TPBGS140001	BGS-15	TPBGS150001	BGS-16	TPBGS160001	BGS-17	TPBGS170001	BGS-18	TPBGS180001	TPBGS180001-AVG	TPBGS180001-D
SAMPLE DATE	99990101	99990101	20030417	99990101	20030508	99990101	20030416	99990101	20030416	99990101	20030416	20030416	20030416
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
VOLATILES (UG/KG)													
1,1,1-TRICHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,1,2-TRICHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,1-DICHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,1-DICHLOROETHENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,2-DICHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
1,2-DICHLOROPROPANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
2-BUTANONE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
2-HEXANONE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
4-METHYL-2-PENTANONE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
ACETONE	9 U	17 U	--	11 U	--	7 U	--	11 U	--	9 U	--	--	--
BENZENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
BROMODICHLOROMETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
BROMOFORM	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
BROMOMETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CARBON DISULFIDE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CARBON TETRACHLORIDE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CHLOROBENZENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CHLORODIBROMOMETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CHLOROETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CHLOROFORM	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CHLOROMETHANE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
CIS-1,3-DICHLOROPROPENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
ETHYLBENZENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
METHYLENE CHLORIDE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
STYRENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TETRACHLOROETHENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TOLUENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TOTAL XYLENES	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
TRICHLOROETHENE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--
VINYL ACETATE	--	--	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE	11 U	11 U	--	11 U	--	11 U	--	11 U	--	11 U	--	--	--

1. 4-hydroxy-4-mthyl-2-pentanone is a tentatively identified compound that is not used in formal background comparisons or statistical evaluations.

LOCATION	BGS-19		BGS-20		BGS-21		BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE ID	BGS-19	TPBGS190001	BGS-20	TPBGS200001	BGS-21	TPBGS210001	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	99990101	99990101	99990101	99990101
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
DIOXINS/FURANS (NG/KG)											
1,2,3,4,6,7,8,9-OCDD	--	601	--	945	--	1950	--	--	--	--	--
1,2,3,4,6,7,8,9-OCDF	--	7.3 J	--	19.7 J	--	12.2	--	--	--	--	--
1,2,3,4,6,7,8-HPCDD	--	24	--	33.7	--	31.3	--	--	--	--	--
1,2,3,4,6,7,8-HPCDF	--	17.5	--	23.1	--	19.5	--	--	--	--	--
1,2,3,4,7,8,9-HPCDF	--	1.6 J	--	1.3 J	--	1.7 J	--	--	--	--	--
1,2,3,4,7,8-HXCDD	--	1.9 J	--	1.2 J	--	1.3 J	--	--	--	--	--
1,2,3,4,7,8-HXCDF	--	12.7	--	0.20 U	--	0.10 U	--	--	--	--	--
1,2,3,6,7,8-HXCDD	--	2.4 J	--	2.2 J	--	2.5 J	--	--	--	--	--
1,2,3,6,7,8-HXCDF	--	5.2	--	3.1 J	--	3.4 J	--	--	--	--	--
1,2,3,7,8,9-HXCDD	--	4.5	--	3.3 J	--	4.5 J	--	--	--	--	--
1,2,3,7,8,9-HXCDF	--	0.87 J	--	0.76 J	--	0.66 J	--	--	--	--	--
1,2,3,7,8-PECDD	--	1.9 J	--	0.40 U	--	1.2 J	--	--	--	--	--
1,2,3,7,8-PECDF	--	3.1 J	--	1.1 J	--	2.2 J	--	--	--	--	--
2,3,4,6,7,8-HXCDF	--	7.7	--	4.7 J	--	6.2	--	--	--	--	--
2,3,4,7,8-PECDF	--	7.7	--	3.7 J	--	5.2	--	--	--	--	--
2,3,7,8-TCDD	--	0.30 U	--	0.20 U	--	0.48 J	--	--	--	--	--
2,3,7,8-TCDF	--	4	--	7.8 J	--	2.1	--	--	--	--	--
2,3,7,8-TCDD TEQ (WHO-2005)	--	8.8434	--	4.31941	--	6.48566	--	--	--	--	--
2,3,7,8-TCDD TEQ - HALFND (WHO 2005)	--	8.9934	--	4.62941	--	6.49066	--	--	--	--	--
TOTAL HPCDD	--	51	--	80.1	--	73.5	--	--	--	--	--
TOTAL HPCDF	--	27.6	--	40.2 J	--	32.6	--	--	--	--	--
TOTAL HXCDD	--	39.2 J	--	33.5	--	37.2 J	--	--	--	--	--
TOTAL HXCDF	--	65.5 J	--	64.5 J	--	51.5 J	--	--	--	--	--
TOTAL PECDD	--	27.5 J	--	15.3 J	--	24.1 J	--	--	--	--	--
TOTAL PECDF	--	113 J	--	161 J	--	75.1 J	--	--	--	--	--
TOTAL TCDD	--	12.7 J	--	11.7 J	--	13.2 J	--	--	--	--	--
TOTAL TCDF	--	147 J	--	318 J	--	118 J	--	--	--	--	--
METALS (MG/KG)											
ALUMINUM	17200	--	20800	--	18200	--	15000	14200	10900	29600	18900
ANTIMONY	7.4 U	--	10.2 U	--	9 U	--	8.3 U	8.1 U	9 U	9.7 U	8.7 U
ARSENIC	12.6	--	15.7	--	13.1	--	13.7	16.2	4.4 B	22.2	10.6 B
BARIUM	115	--	108	--	74.7	--	64.2	38.4 B	32.5 B	83	58.4
BERYLLIUM	0.76 B	--	1 B	--	0.58 B	--	0.59 B	0.52 B	0.34 B	0.85 B	0.63 B
CADMIUM	0.82 B	--	2.5	--	1.1 B	--	1.4	1.1	0.88 U	1.3	0.85 U
CALCIUM	1450	--	2530	--	682 B	--	1650	923 B	983 B	1780	1780
CHROMIUM	34.9	--	55.2	--	56.7	--	43.6	29.2	33.9	77.1	52.7
COBALT	7.7 B	--	10 B	--	7.3 B	--	7.4 B	7.7	5.2 B	16.1	10.5
COPPER	25.4	--	161	--	68	--	29.9	11.8	8.5	19.7	35.8
CYANIDE	1.1 U	--	1.3 U	--	1.2 U	--	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U
IRON	20200	--	21100	--	18200	--	16600	20000	12800	32200	21000
LEAD	191	--	526	--	387	--	160	75.3	11.7	23.1	106
MAGNESIUM	4180	--	5630	--	7090	--	5670	3770	3980	17200	6810
MANGANESE	350	--	393	--	208	--	290	440	218	611	265
MERCURY	0.18 U	--	0.18 U	--	0.30 U	--	0.22 U	0.14 U	0.15 U	0.11 U	0.15 U
NICKEL	20.3	--	38.8	--	37.9	--	28.6	16.1	20.8	59.4	36.1
POTASSIUM	1810	--	1400	--	1800	--	1600	689 B	1180	6580	1460
SELENIUM	0.52 B	--	0.68 B	--	0.72 B	--	0.41 U	0.55 B	0.39 U	0.56 B	0.43 U
SILVER	0.54 U	--	0.74 U	--	0.66 U	--	0.61 U	0.59 U	0.66 U	0.71 U	0.64 U
SODIUM	79.9 B	--	105 B	--	55.6 B	--	172 B	54.2 B	43.9 B	110 B	59 B
THALLIUM	0.67 U	--	0.76 U	--	0.63 U	--	0.61 U	0.53 U	0.58 U	0.71 U	0.64 U
VANADIUM	38.7	--	64.5	--	43.7	--	43	37.8	20.9	56.4	38.7
ZINC	105	--	267	--	81.8	--	91.5	71.9	29.6	78.9	87.8

LOCATION	BGS-19		BGS-20		BGS-21		BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE ID	BGS-19	TPBGS190001	BGS-20	TPBGS200001	BGS-21	TPBGS210001	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	99990101	99990101	99990101	99990101
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
MISCELLANEOUS PARAMETERS (%)											
TOTAL ORGANIC CARBON	--	--	--	--	--	--	--	--	--	--	--
MISCELLANEOUS PARAMETERS (S.U.)											
PH	--	--	--	--	--	--	--	--	--	--	--
PESTICIDES/PCBS (UG/KG)											
4,4'-DDD	4.4	--	9.6	--	26	--	33 J	9.5	3.1	0.60	36
4,4'-DDE	71	--	580	--	61 J	--	46	510	19	5.7	74
4,4'-DDT	83	--	680	--	240	--	100	420	55	7	60
ALDRIN	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
ALPHA-BHC	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
ALPHA-CHLORDANE	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
AROCLOR-1016	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
AROCLOR-1221	750 U	--	440 U	--	160 U	--	740 U	360 U	150 U	81 U	720 U
AROCLOR-1232	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
AROCLOR-1242	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
AROCLOR-1248	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
AROCLOR-1254	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
AROCLOR-1260	370 U	--	220 U	--	79 U	--	360 U	180 U	73 U	40 U	360 U
BETA-BHC	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
DELTA-BHC	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
DIELDRIN	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
ENDOSULFAN I	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
ENDOSULFAN II	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
ENDOSULFAN SULFATE	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
ENDRIN	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
ENDRIN ALDEHYDE	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
ENDRIN KETONE	37 U	--	22 U	--	7.9 U	--	36 U	18 U	7.3 U	4 U	36 U
GAMMA-BHC (LINDANE)	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
GAMMA-CHLORDANE	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
HEPTACHLOR	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
HEPTACHLOR EPOXIDE	19 U	--	11 U	--	4.1 U	--	19 U	9.1 U	3.7 U	2 U	18 U
METHOXYCHLOR	190 U	--	110 U	--	41 U	--	190 U	91 U	37 U	20 U	180 U
TOXAPHENE	1900 U	--	1100 U	--	410 U	--	1900 U	910 U	370 U	200 U	1800 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)											
ACENAPHTHENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
ACENAPHTHYLENE	370 U	--	430 U	--	400 U	--	74 J	350 U	360 U	400 U	360 U
ANTHRACENE	370 U	--	430 U	--	400 U	--	58 J	350 U	360 U	400 U	360 U
BAP EQUIVALENT-HALFND	325.69	--	408.98	--	324.01	--	856.47	296.06	360 U	400 U	403.737
BAP EQUIVALENT-POS	138.84	--	191.83	--	100.01	--	856.47	119.31	0.00 U	0.00 U	4.137
BENZO(A)ANTHRACENE	96 J	--	130 J	--	69 J	--	480	60 J	360 U	400 U	360 U
BENZO(A)PYRENE	100 J	--	140 J	--	76 J	--	520	89 J	360 U	400 U	360 U
BENZO(B)FLUORANTHENE	240 J	--	320 J	--	170 J	--	470	200 J	360 U	400 U	41 J
BENZO(G,H,I)PERYLENE	39 J	--	54 J	--	400 U	--	400	350 U	360 U	400 U	360 U
BENZO(K)FLUORANTHENE	370 U	--	430 U	--	400 U	--	680	38 J	360 U	400 U	360 U
DIBENZO(A,H)ANTHRACENE	370 U	--	430 U	--	400 U	--	190 J	350 U	360 U	400 U	360 U
DIBENZOFURAN	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
FLUORANTHENE	200 J	--	290 J	--	160 J	--	1100	160 J	360 U	43 J	50 J
FLUORENE	370 U	--	430 U	--	400 U	--	42 J	350 U	360 U	400 U	360 U
INDENO(1,2,3-CD)PYRENE	47 J	--	61 J	--	400 U	--	400	38 J	360 U	400 U	360 U
NAPHTHALENE	370 U	--	430 U	--	400 U	--	42 J	350 U	360 U	400 U	360 U
PHENANTHRENE	91 J	--	130 J	--	78 J	--	470	82 J	360 U	400 U	360 U
PYRENE	180 J	--	240 J	--	130 J	--	990	160 J	360 U	47 J	42 J

LOCATION	BGS-19		BGS-20		BGS-21		BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE ID	BGS-19	TPBGS190001	BGS-20	TPBGS200001	BGS-21	TPBGS210001	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	99990101	99990101	99990101	99990101
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SEMIVOLATILES (UG/KG)											
1,2,4-TRICHLOROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
1,2-DICHLOROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
1,3-DICHLOROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
1,4-DICHLOROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,4,5-TRICHLOROPHENOL	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
2,4,6-TRICHLOROPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,4-DICHLOROPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,4-DIMETHYLPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,4-DINITROPHENOL	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
2,4-DINITROTOLUENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2,6-DINITROTOLUENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2-CHLORONAPHTHALENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2-CHLOROPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2-METHYLNAPHTHALENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2-METHYLPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
2-NITROANILINE	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
2-NITROPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
3,3'-DICHLOROBENZIDINE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
3-NITROANILINE	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
4,6-DINITRO-2-METHYLPHENOL	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
4-BROMOPHENYL PHENYL ETHER	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
4-CHLORO-3-METHYLPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
4-CHLOROANILINE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
4-CHLOROPHENYL PHENYL ETHER	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
4-HYDROXY-4-METHYL-2-PENTANONE (1)	56000	--	61000	--	56000	--	48000	50000	55000	60000	50000
4-METHYLPHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
4-NITROANILINE	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
4-NITROPHENOL	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
BENZOIC ACID	--	--	--	--	--	--	--	--	--	--	--
BENZYL ALCOHOL	--	--	--	--	--	--	--	--	--	--	--
BIS(2-CHLOROETHOXY)METHANE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
BIS(2-CHLOROETHYL)ETHER	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	66 U	--	140 U	--	160 U	--	650 B	72 U	110 U	180 U	130 U
BUTYL BENZYL PHTHALATE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
CARBAZOLE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
CHRYSENE	150 J	--	190 J	--	110 J	--	670	130 J	360 U	400 U	37 J
DIETHYL PHTHALATE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
DIMETHYL PHTHALATE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
DI-N-BUTYL PHTHALATE	370 U	--	100 J	--	400 U	--	360 U	350 U	360 U	400 U	360 U
DI-N-OCTYL PHTHALATE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
HEXACHLOROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
HEXACHLOROBUTADIENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
HEXACHLOROCYCLOPENTADIENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
HEXACHLOROETHANE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
ISOPHORONE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
NITROBENZENE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
N-NITROSODIPHENYLAMINE	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
PENTACHLOROPHENOL	900 U	--	1000 U	--	960 U	--	880 U	860 U	880 U	960 U	860 U
PHENOL	370 U	--	430 U	--	400 U	--	360 U	350 U	360 U	400 U	360 U
TOTAL PETROLEUM HYDROCARBONS	--	--	130 J	--	--	--	--	--	--	--	--

LOCATION	BGS-19		BGS-20		BGS-21		BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE ID	BGS-19	TPBGS190001	BGS-20	TPBGS200001	BGS-21	TPBGS210001	BGS-22	BGS-23	BGS-24	BGS-25	BGS-26
SAMPLE DATE	99990101	20030416	99990101	20030416	99990101	20030416	99990101	99990101	99990101	99990101	99990101
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
VOLATILES (UG/KG)											
1,1,1-TRICHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
2-BUTANONE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
2-HEXANONE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
4-METHYL-2-PENTANONE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
ACETONE	12 U	--	13 U	--	12 U	--	7 U	11 U	9 U	15 U	11 U
BENZENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
BROMOFORM	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
BROMOMETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CARBON DISULFIDE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CHLOROBENZENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CHLORODIBROMOMETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CHLOROETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CHLOROFORM	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CHLOROMETHANE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
ETHYLBENZENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
METHYLENE CHLORIDE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
STYRENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TETRACHLOROETHENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TOLUENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TOTAL XYLENES	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
TRICHLOROETHENE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U
VINYL ACETATE	--	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE	11 U	--	13 U	--	12 U	--	11 U	11 U	11 U	12 U	11 U

1. 4-hydroxy-4-mthyl-2-pentanone is a tentatively identified compound that is not used in formal background comparisons or statistical evaluations.

TABLE A.2 FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	GW-1				JW-3			
SAMPLE ID	**JILF-01-GW-07**	**JILF-01-GW-08**	**JILF-01-GW-09**	**JILF-01-GW-10**	**JILF-03-GW-07**	**JILF-03-GW-08**	**JILF-03-GW-09**	**JILF-03-GW-10**
SAMPLE DATE	**19961203**	**19970414**	**19970805**	**19971031**	**19961216**	**19970429**	**19970820**	**19971114**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
DISSOLVED METALS (µg/L)								
ALUMINUM	--	--	--	--	--	--	--	--
ANTIMONY	--	--	--	--	--	--	--	--
ARSENIC	--	--	--	--	--	--	--	--
BARIUM	--	--	--	--	--	--	--	--
BERYLLIUM	--	--	--	--	--	--	--	--
CADMIUM	--	--	--	--	--	--	--	--
CALCIUM	--	--	--	--	--	--	--	--
CHROMIUM	--	--	--	--	--	--	--	--
COBALT	--	--	--	--	--	--	--	--
COPPER	--	--	--	--	--	--	--	--
IRON	--	--	--	--	--	--	--	--
LEAD	--	--	--	--	--	--	--	--
MAGNESIUM	--	--	--	--	--	--	--	--
MANGANESE	--	--	--	--	--	--	--	--
MERCURY	--	--	--	--	--	--	--	--
NICKEL	--	--	--	--	--	--	--	--
POTASSIUM	--	--	--	--	--	--	--	--
SELENIUM	--	--	--	--	--	--	--	--
SILVER	--	--	--	--	--	--	--	--
SODIUM	--	--	--	--	--	--	--	--
THALLIUM	--	--	--	--	--	--	--	--
VANADIUM	--	--	--	--	--	--	--	--
ZINC	--	--	--	--	--	--	--	--
METALS (µg/L)								
ALUMINUM	46.7 U	20 UJ	45.4 U	10 UJ	70.7 U	20 U	13.1 UJ	12.5 U
ANTIMONY	2.1 U	3 U	21.2 U	2.5 U	2.1 U	3 U	2.1 U	2.5 U
ARSENIC	2.1 U	3 U	17.5 UJ	2.5 U	2.1 U	3 U	1.8 U	2.5 U
BARIUM	49.6	38.2	52.6	48.1	17.5	11.6	16	17.6 J
BERYLLIUM	0.13 U	0.26	0.30 UJ	0.11 UJ	0.13 U	0.20 U	0.58 U	0.19 U
CADMIUM	0.27 U	0.30 U	1.9 U	0.22 U	0.27 U	0.30 U	0.19 U	0.22 U
CALCIUM	77700	63800	67100	70000 J	45800	33900	37000	38500
CHROMIUM	0.83 U	1.4	4 U	0.68 U	1.2 U	0.90 U	0.63 U	3.1 U
COBALT	1.4 J	5 U	3.8 U	1.7	0.82 J	0.80 U	3.8 U	2.9 U
COPPER	1.5 U	4.8 U	1.4 UJ	2.9	3.2 U	2	4.1 U	3.8
IRON	12 U	66.6	6.8 U	13 U	46.6 U	40 U	9.9 U	32.6 U
LEAD	2	2 U	14.2 U	1.3 U	2.7	2 U	2.1 J	2.4 J
MAGNESIUM	8420	7480	6810 J	7730	5520 J	4300	4540 J	4550
MANGANESE	3580	2510	2460	3140	3	8.7	1.7 U	4.7
MERCURY	0.02 U	0.05 U	0.01 UJ	0.12 U	0.03 J	0.01 U	0.06 U	0.01 UJ
NICKEL	2.4 U	2.5 U	8.4 UJ	2.7	1.4 J	0.90 U	0.81 J	9 U
POTASSIUM	4900 J	5020	5180 J	4840	3760 J	2500 U	3390 J	3440
SELENIUM	3.1 U	4 U	29 UR	1.9 UJ	3.1 U	4 U	2.9 U	1.9 UR
SILVER	1.2 U	2 U	2.7 U	1.1 U	1.2 U	5 U	0.82 U	2.8 U
SODIUM	48200 J	38700	97000	46800	17900	12900	18800	17900
THALLIUM	3.7 U	4 U	39.2 U	4.8 U	3.7 U	5 U	3.9 U	4.8 U
VANADIUM	0.58 U	0.64	4.2 U	0.82 J	0.58 U	0.60 U	0.57 U	2.9 U
ZINC	2.8 U	23.4 U	12.6 U	9.5 U	44	8.1 U	8.9 U	15.8

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	**GW-1**				**JW-3**			
SAMPLE ID	**JILF-01-GW-07**	**JILF-01-GW-08**	**JILF-01-GW-09**	**JILF-01-GW-10**	**JILF-03-GW-07**	**JILF-03-GW-08**	**JILF-03-GW-09**	**JILF-03-GW-10**
SAMPLE DATE	**19961203**	**19970414**	**19970805**	**19971031**	**19961216**	**19970429**	**19970820**	**19971114**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	160	160 J	130 J	160	120	99	130	92
BROMIDE	2 U	2.6 U	2 U	2 U	2 U	2 U	2 UJ	2 U
CARBONATE ALKALINITY	160	160	130	160	120	99	130	92
CHLORIDE	140	93 J	150	120 J	5.7	6	5.1 J	9.8
NITRATE	0.20	0.096 J	0.26	0.18 J	6.2	3.7	3.2	4.7
SULFATE	18	26 J	25	20	35 J	16	14	22
TOTAL ORGANIC CARBON	1.4	1.8	1.3	2.9 J	1.7 J	1.4	1.3	2.9 J
TOTAL ORGANIC HALIDES	1.8 U	0.018 U	0.12 J	0.064 J	2.1 J	0.35 J	0.14 J	0.028
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.2	7.4	7.2	7.7	6.9	7.5	7.1	6.9
MISCELLANEOUS PARAMETERS (µg/L)								
CYANIDE	--	--	--	--	--	--	--	--
PHENOL	--	--	--	--	--	5 UJ	--	--
PHENOLS	5 U	5 UJ	5 UJ	5 U	5 U	--	5 UJ	5 U
PESTICIDES/PCBS (µg/L)								
4,4'-DDD	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
4,4'-DDE	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
4,4'-DDT	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ALDRIN	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
ALPHA-BHC	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
ALPHA-CHLORDANE	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
AROCLOR-1016	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
AROCLOR-1221	2 U	2.1 U	2.4 U	2 U	2.2 U	2.3 U	2.1 U	2.2 U
AROCLOR-1232	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
AROCLOR-1242	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
AROCLOR-1248	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
AROCLOR-1254	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
AROCLOR-1260	1 U	1 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U
BETA-BHC	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
DELTA-BHC	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
DIELDRIN	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ENDOSULFAN I	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
ENDOSULFAN II	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ENDOSULFAN SULFATE	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ENDRIN	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ENDRIN ALDEHYDE	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
ENDRIN KETONE	0.10 U	0.10 U	0.12 U	0.10 U	0.11 U	0.11 U	0.10 U	0.11 U
GAMMA-BHC (LINDANE)	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
GAMMA-CHLORDANE	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
HEPTACHLOR	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
HEPTACHLOR EPOXIDE	0.051 U	0.052 U	0.06 U	0.05 U	0.054 U	0.057 U	0.052 U	0.054 U
METHOXYCHLOR	0.51 U	0.52 U	0.60 U	0.50 U	0.54 U	0.57 U	0.52 U	0.54 U
TOXAPHENE	5.1 U	5.2 U	6 U	5 U	5.4 U	5.7 U	5.2 U	5.4 U
PETROLEUM HYDROCARBONS (µg/L)								
DIESEL RANGE ORGANICS	50 U	190	50 U	55 U	55	55 U	50 U	55 U
GASOLINE RANGE ORGANICS	10 U	47	10 UJ	22	11	24	24 U	10 U

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	GW-1				JW-3			
SAMPLE ID	**JILF-01-GW-07**	**JILF-01-GW-08**	**JILF-01-GW-09**	**JILF-01-GW-10**	**JILF-03-GW-07**	**JILF-03-GW-08**	**JILF-03-GW-09**	**JILF-03-GW-10**
SAMPLE DATE	**19961203**	**19970414**	**19970805**	**19971031**	**19961216**	**19970429**	**19970820**	**19971114**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
POLYCYCLIC AROMATIC HYDROCARBONS (µg/L)								
ACENAPHTHENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
ACENAPHTHYLENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
ANTHRACENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BENZO(A)ANTHRACENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BENZO(A)PYRENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BENZO(B)FLUORANTHENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BENZO(G,H,I)PERYLENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BENZO(K)FLUORANTHENE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
DIBENZO(A,H)ANTHRACENE	10 U	11 U	12 U	10 U	11 U	12 U	11 UJ	11 U
DIBENZOFURAN	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
FLUORANTHENE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
FLUORENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
INDENO(1,2,3-CD)PYRENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
NAPHTHALENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
PHENANTHRENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
PYRENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
SEMIVOLATILES (µg/L)								
1,2,4-TRICHLOROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
1,2-DICHLOROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
1,3-DICHLOROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
1,4-DICHLOROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
2,4-DINITROTOLUENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
2,6-DINITROTOLUENE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
2-CHLORONAPHTHALENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
2-METHYLNAPHTHALENE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
2-NITROANILINE	25 U	28 U	30 U	25 U	28 U	30 U	28 U	28 U
3,3'-DICHLOROBENZIDINE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
3-NITROANILINE	25 U	28 U	30 U	25 U	28 U	30 U	28 U	28 U
4-BROMOPHENYL PHENYL ETHER	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
4-CHLOROANILINE	10 U	11 U	12 U	10 U	11 UJ	12 U	11 U	11 U
4-CHLOROPHENYL PHENYL ETHER	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
4-NITROANILINE	25 U	28 UJ	30 U	25 U	28 U	30 U	28 U	28 U
BIS(2-CHLOROETHOXY)METHANE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BIS(2-CHLOROETHYL)ETHER	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
BUTYL BENZYL PHTHALATE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
CARBAZOLE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
CHRYSENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
DIETHYL PHTHALATE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
DIMETHYL PHTHALATE	10 U	11 U	12 U	10 U	1 J	12 U	11 U	11 U
DI-N-BUTYL PHTHALATE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 U	11 U
DI-N-OCTYL PHTHALATE	10 U	11 UJ	12 U	10 U	11 U	12 U	11 UJ	11 U
HEXACHLOROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
HEXACHLOROBUTADIENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
HEXACHLOROCYCLOPENTADIENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
HEXACHLOROETHANE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
ISOPHORONE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
NITROBENZENE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U
N-NITROSO-DI-N-PROPYLAMINE	10 UJ	11 U	12 U	10 U	11 U	12 U	11 U	11 U
N-NITROSODIPHENYLAMINE	10 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	GW-1				JW-3			
SAMPLE ID	**JILF-01-GW-07**	**JILF-01-GW-08**	**JILF-01-GW-09**	**JILF-01-GW-10**	**JILF-03-GW-07**	**JILF-03-GW-08**	**JILF-03-GW-09**	**JILF-03-GW-10**
SAMPLE DATE	**19961203**	**19970414**	**19970805**	**19971031**	**19961216**	**19970429**	**19970820**	**19971114**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
VOLATILES (µg/L)								
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5 U	5 U	5 U	10 U	5 U	5 U	--	5 U
1,1-DICHLOROETHANE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-BUTANONE	10 U	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ	10 U
2-HEXANONE	10 U	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
ACETONE	10 U	10 U	10 U	10 UJ	10 U	10 U	10 UJ	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CARBON DISULFIDE	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLORODIBROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROMETHANE	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TOTAL 1,2-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	JW-4				SI-01DB						
SAMPLE ID	JILF-04-GW-07	JILF-04-GW-08	JILF-04-GW-09	JILF-04-GW-10	SI-01DB-GW-07	SI-01DB-GW-08	SI-01DB-GW-08-	SI-01DB-GW-09	SI-01DB-GW-09-	SI-01DB-GW-10	SI-01DB-GW-10-
SAMPLE DATE	19961208	19970411	19970807	19971101	19961203	19970412	19970412	19970815	19970815	19971104	19971104
ROUND	07	08	09	10	07	08	08	09	09	10	10
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DISSOLVED METALS (µg/L)											
ALUMINUM	--	--	--	--	--	--	252 J	--	547 J	--	201 U
ANTIMONY	--	--	--	--	--	--	3 U	--	2.1 U	--	2.5 U
ARSENIC	--	--	--	--	--	--	5.6	--	9.3	--	10.6 U
BARIUM	--	--	--	--	--	--	5.9	--	5.5 U	--	5.2 U
BERYLLIUM	--	--	--	--	--	--	0.33 U	--	0.30 U	--	0.19 UJ
CADMIUM	--	--	--	--	--	--	0.30 U	--	0.24 U	--	0.22 U
CALCIUM	--	--	--	--	--	--	5280	--	5660 J	--	4810
CHROMIUM	--	--	--	--	--	--	0.90 U	--	4.2 J	--	3.1 U
COBALT	--	--	--	--	--	--	5 U	--	3.8 U	--	2.9 U
COPPER	--	--	--	--	--	--	2.9 U	--	1.4 U	--	1.5 UJ
IRON	--	--	--	--	--	--	144	--	283 J	--	149 U
LEAD	--	--	--	--	--	--	2 U	--	1.9 J	--	1.4 U
MAGNESIUM	--	--	--	--	--	--	1040	--	1140 J	--	1010
MANGANESE	--	--	--	--	--	--	11.3	--	33.7	--	23.4
MERCURY	--	--	--	--	--	--	0.06 U	--	0.01 UJ	--	0.09 U
NICKEL	--	--	--	--	--	--	1.2 U	--	8.4 U	--	9 U
POTASSIUM	--	--	--	--	--	--	4750	--	4920	--	4320
SELENIUM	--	--	--	--	--	--	4 U	--	2.9 U	--	1.9 UJ
SILVER	--	--	--	--	--	--	2 U	--	2.7 U	--	2.8 U
SODIUM	--	--	--	--	--	--	150000	--	148000	--	142000
THALLIUM	--	--	--	--	--	--	4 U	--	3.9 U	--	4.8 U
VANADIUM	--	--	--	--	--	--	1.1 U	--	4.2 U	--	2.9 U
ZINC	--	--	--	--	--	--	13.5 U	--	5.5 U	--	6.6 U
METALS (µg/L)											
ALUMINUM	193 U	100 U	33.7 U	17.1 U	998 J	996	--	1070 J	--	1020 J	--
ANTIMONY	2.1 U	3 U	2.1 U	2.5 U	2.1 U	3 U	--	2.1 U	--	2.5 U	--
ARSENIC	2.1 U	3 U	1.8 U	2.5 U	6.3	6.5	--	10	--	11.1 U	--
BARIUM	22.6	27.3	43.6	48	14	7.6	--	9.2	--	8.4	--
BERYLLIUM	0.13 U	0.50 U	0.30 U	0.11 UJ	0.13 U	0.32 U	--	0.30 U	--	0.19 UJ	--
CADMIUM	0.27 U	0.30 U	0.19 U	0.22 U	0.27 U	0.30 U	--	0.19 U	--	0.22 U	--
CALCIUM	21300	31700 J	44900	49600 J	5820	5650	--	6270 J	--	5260	--
CHROMIUM	0.86 J	0.90 U	4 U	0.68 U	1.3 J	0.90 U	--	4 U	--	3.1 U	--
COBALT	0.79 U	0.80 U	3.8 U	0.80 U	0.79 U	5 U	--	3.8 U	--	2.9 U	--
COPPER	3.6	1 U	1.4 U	2.1 U	2.1 U	3 U	--	1.4 U	--	1.5 UJ	--
IRON	192	50 U	37 U	13 U	755	532	--	678	--	524 U	--
LEAD	3.7	2 U	1.4 U	1.3 U	2.6	2 U	--	1.5 J	--	1.3 U	--
MAGNESIUM	2780	3860	6660 J	8590	1520	1200	--	1330 J	--	1220	--
MANGANESE	6.6	0.70 U	2.5 U	3.6	27.8	13.9	--	39.4	--	27.2	--
MERCURY	0.098	0.01 U	0.02 J	0.10 U	0.04 U	0.03 U	--	0.01 UJ	--	0.06 U	--
NICKEL	2.2 U	1.6 J	8.4 U	2.9	3.1 U	2 U	--	8.4 U	--	9 U	--
POTASSIUM	2210 UJ	2400	4080	4420	4360 J	4430	--	4780	--	4660	--
SELENIUM	3.1 U	4 U	2.9 U	1.9 UJ	3.1 U	4 U	--	2.9 U	--	1.9 UR	--
SILVER	1.2 U	2 U	2.7 U	2.7	1.2 U	2 U	--	2.7 U	--	2.8 U	--
SODIUM	33700	49000	65200	72500	134000 J	145000	--	157000	--	145000	--
THALLIUM	3.7 U	4 U	3.9 U	4.8 U	3.7 U	4 U	--	3.9 U	--	4.8 U	--
VANADIUM	0.58 U	0.60 U	4.2 U	0.55 U	1.9	1.5 U	--	4.2 U	--	2.9 U	--
ZINC	52.4	16.3 U	10.2 U	26.6 U	16 U	17.2 U	--	8.9 U	--	7.9 U	--

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	JW-4				SI-01DB						
SAMPLE ID	JILF-04-GW-07	JILF-04-GW-08	JILF-04-GW-09	JILF-04-GW-10	SI-01DB-GW-07	SI-01DB-GW-08	SI-01DB-GW-08-	SI-01DB-GW-09	SI-01DB-GW-09-	SI-01DB-GW-10	SI-01DB-GW-10-
SAMPLE DATE	19961208	19970411	19970807	19971101	19961203	19970412	19970412	19970815	19970815	19971104	19971104
ROUND	07	08	09	10	07	08	08	09	09	10	10
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MISCELLANEOUS PARAMETERS (MG/L)											
ALKALINITY	46	35	64 J	78	250	240 J	--	260 J	--	240	--
BROMIDE	2 U	5	2.8 J	4.9	2 U	2 U	--	4.5 J	--	3.3	--
CARBONATE ALKALINITY	46	35	64	78	250	240	--	260	--	240	--
CHLORIDE	66 J	110 J	140 J	180 J	21	22 J	--	21 J	--	22	--
NITRATE	0.74	0.76	0.61	0.72 J	0.061	0.05 UR	--	0.05 U	--	0.05 U	--
SULFATE	11	12	20	20	51	60 J	--	45	--	60	--
TOTAL ORGANIC CARBON	1.6 J	1.1	1.4	3.2 J	2.3	2.5	--	2.7	--	7.2 J	--
TOTAL ORGANIC HALIDES	0.89 J	0.049 J	0.091 J	0.086 J	0.81 U	0.022 U	--	0.056 J	--	0.011 J	--
MISCELLANEOUS PARAMETERS (S.U.)											
PH	7.5	6.8	6.8	6.9	8.3	8.2	--	8.2	--	8.2	--
MISCELLANEOUS PARAMETERS (µg/L)											
CYANIDE	--	--	--	--	10 U	20 U	--	20 U	--	20 U	--
PHENOL	--	5 U	--	--	--	--	--	--	--	--	--
PHENOLS	5 U	--	5 UJ	5 U	--	--	--	--	--	--	--
PESTICIDES/PCBS (µg/L)											
4,4'-DDD	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
4,4'-DDE	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
4,4'-DDT	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ALDRIN	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
ALPHA-BHC	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
ALPHA-CHLORDANE	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
AROCLOR-1016	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
AROCLOR-1221	2.1 U	2.4 UJ	2.2 U	2.2 U	2.1 U	2 U	--	2 U	--	2.2 U	--
AROCLOR-1232	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
AROCLOR-1242	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
AROCLOR-1248	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
AROCLOR-1254	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
AROCLOR-1260	1 U	1.2 UJ	1.1 U	1.1 U	1 U	1 U	--	1 U	--	1.1 U	--
BETA-BHC	0.052 UJ	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
DELTA-BHC	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
DIELDRIN	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ENDOSULFAN I	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
ENDOSULFAN II	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ENDOSULFAN SULFATE	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ENDRIN	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ENDRIN ALDEHYDE	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
ENDRIN KETONE	0.10 U	0.12 UJ	0.11 U	0.11 U	0.10 U	0.10 U	--	0.10 U	--	0.11 U	--
GAMMA-BHC (LINDANE)	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
GAMMA-CHLORDANE	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
HEPTACHLOR	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
HEPTACHLOR EPOXIDE	0.052 U	0.06 UJ	0.054 U	0.056 U	0.052 U	0.05 U	--	0.051 U	--	0.054 U	--
METHOXYCHLOR	0.52 U	0.60 UJ	0.54 U	0.56 U	0.52 U	0.50 U	--	0.51 U	--	0.54 U	--
TOXAPHENE	5.2 U	6 UJ	5.4 U	5.6 U	5.2 U	5 U	--	5.1 U	--	5.4 U	--
PETROLEUM HYDROCARBONS (µg/L)											
DIESEL RANGE ORGANICS	55 U	55 U	55 U	55 U	170	50 U	--	200	--	60	--
GASOLINE RANGE ORGANICS	11	10 U	10 U	10 U	--	--	--	--	--	--	--

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	JW-4				SI-01DB						
SAMPLE ID	JILF-04-GW-07	JILF-04-GW-08	JILF-04-GW-09	JILF-04-GW-10	SI-01DB-GW-07	SI-01DB-GW-08	SI-01DB-GW-08-	SI-01DB-GW-09	SI-01DB-GW-09-	SI-01DB-GW-10	SI-01DB-GW-10-
SAMPLE DATE	19961208	19970411	19970807	19971101	19961203	19970412	19970412	19970815	19970815	19971104	19971104
ROUND	07	08	09	10	07	08	08	09	09	10	10
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
POLYCYCLIC AROMATIC HYDROCARBONS (µg/L)											
ACENAPHTHENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
ACENAPHTHYLENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
ANTHRACENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BENZO(A)ANTHRACENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BENZO(A)PYRENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BENZO(B)FLUORANTHENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BENZO(G,H,I)PERYLENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	10 U	11 UJ	11 U	10 U	--	--	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
DIBENZOFURAN	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
FLUORANTHENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
FLUORENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
NAPHTHALENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
PHENANTHRENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
PYRENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
SEMIVOLATILES (µg/L)											
1,2,4-TRICHLOROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
1,2-DICHLOROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
1,3-DICHLOROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
1,4-DICHLOROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2,4-DINITROTOLUENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2,6-DINITROTOLUENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2-CHLORONAPHTHALENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
2-NITROANILINE	25 U	28 U	28 U	25 U	--	--	--	--	--	--	--
3,3'-DICHLOROBENZIDINE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
3-NITROANILINE	25 U	28 U	28 U	25 U	--	--	--	--	--	--	--
4-BROMOPHENYL PHENYL ETHER	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
4-CHLOROANILINE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
4-CHLOROPHENYL PHENYL ETHER	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
4-NITROANILINE	25 U	28 U	28 U	25 U	--	--	--	--	--	--	--
BIS(2-CHLOROETHOXY)METHANE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BIS(2-CHLOROETHYL)ETHER	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	11 UJ	12 U	10 U	--	--	--	--	--	--	--
BUTYL BENZYL PHTHALATE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
CARBAZOLE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
CHRYSENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
DIETHYL PHTHALATE	10 U	11 UJ	11 U	10 U	--	--	--	--	--	--	--
DIMETHYL PHTHALATE	2 J	11 U	11 U	10 U	--	--	--	--	--	--	--
DI-N-BUTYL PHTHALATE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
DI-N-OCTYL PHTHALATE	10 U	11 UJ	11 U	10 U	--	--	--	--	--	--	--
HEXACHLOROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
HEXACHLOROBUTADIENE	10 U	11 UJ	11 U	10 U	--	--	--	--	--	--	--
HEXACHLOROCYCLOPENTADIENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
HEXACHLOROETHANE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
ISOPHORONE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
NITROBENZENE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
N-NITROSO-DI-N-PROPYLAMINE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--
N-NITROSODIPHENYLAMINE	10 U	11 U	11 U	10 U	--	--	--	--	--	--	--

TABLE A.2
FACILITY BACKGROUND FRESHWATER GROUNDWATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	JW-4				SI-01DB						
SAMPLE ID	JILF-04-GW-07	JILF-04-GW-08	JILF-04-GW-09	JILF-04-GW-10	SI-01DB-GW-07	SI-01DB-GW-08	SI-01DB-GW-08-	SI-01DB-GW-09	SI-01DB-GW-09-	SI-01DB-GW-10	SI-01DB-GW-10-
SAMPLE DATE	19961208	19970411	19970807	19971101	19961203	19970412	19970412	19970815	19970815	19971104	19971104
ROUND	07	08	09	10	07	08	08	09	09	10	10
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
VOLATILES (µg/L)											
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
1,1,2-TRICHLOROTRIFLUOROETHANE	5 U	5 U	5 U	10 U	--	--	--	--	--	--	--
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
1,1-DICHLOROETHENE	10 U	10 UJ	10 U	10 U	--	--	--	--	--	--	--
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
2-BUTANONE	10 U	10 UJ	10 UJ	10 UJ	--	--	--	--	--	--	--
2-HEXANONE	10 U	10 UJ	10 U	10 U	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE	10 UJ	10 UJ	10 U	10 U	--	--	--	--	--	--	--
ACETONE	10 U	10 UJ	10 UJ	10 UJ	--	--	--	--	--	--	--
BENZENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
BROMOFORM	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
BROMOMETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CARBON DISULFIDE	10 U	10 UJ	10 U	10 U	--	--	--	--	--	--	--
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CHLOROBENZENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CHLORODIBROMOMETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CHLOROETHANE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CHLOROFORM	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
CHLOROMETHANE	10 U	10 U	10 U	10 UJ	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
ETHYLBENZENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
METHYLENE CHLORIDE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
STYRENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TOLUENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TOTAL 1,2-DICHLOROETHENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TOTAL XYLENES	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
TRICHLOROETHENE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--
VINYL CHLORIDE	10 U	10 U	10 U	10 U	--	--	--	--	--	--	--

TABLE A.3 FACILITY BACKGROUND SALINE/BRACKISH GROUNDWATER DATA SET

TABLE A.3
FACILITY BACKGROUND SALINE/BRACKISH GROUNDATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	DI-01B				SI-01B			
SAMPLE ID	**DI-01B-GW-**	**DI-01B-GW-**	**DI-01B-GW-09**	**DI-01B-GW-10**	**SI-01B-GW-07**	**SI-01B-GW-08**	**SI-01B-GW-09**	**SI-01B-GW-**
SAMPLE DATE	**19961206**	**19970414**	**19970803**	**19971101**	**19961203**	**19970412**	**19970814**	**19971105**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
METALS (µg/L)								
ALUMINUM	88.1 U	20 UJ	65 U	10 UJ	40.5 U	20 UJ	33 U	10 UJ
ANTIMONY	2.1 U	3 U	2.1 U	2.5 U	2.1 U	3 U	2.1 U	2.5 U
ARSENIC	2.1 U	3 U	1.8 U	2.5 U	2.1 U	3 U	1.8 U	2.5 U
BARIUM	42.4	23.1	31.1	42.6	80.3	55.9	58.4	55.3
BERYLLIUM	0.13 U	0.85 U	0.14 U	0.11 UJ	0.13 U	0.20 U	0.30 U	0.11 UJ
CADMIUM	0.27 U	0.30 U	0.19 U	0.22 U	0.27 U	0.30 U	0.35 U	0.22 U
CALCIUM	82200	44200	61200	95400 J	130000	98700	109000	103000 J
CHROMIUM	5.5	3.2	0.53 U	0.76 J	0.83 U	0.90 U	4 U	0.68 U
COBALT	0.79 U	5 U	0.51 U	0.80 U	0.79 U	5 U	3.8 U	0.80 U
COPPER	22.2	6.6 U	2.4 J	4.2 U	2.4 U	2.6 U	1.4 U	3.2 U
IRON	132 U	20 U	31.1 U	39.6 U	728	667	597	660
LEAD	2.7	2 U	1.4 UJ	1.3 U	1.3 U	2 U	1.4 U	1.3 UJ
MAGNESIUM	8540	4010	5920	8240	23100	16400	15600	14400
MANGANESE	41	6.1	26.6 J	64.5	245	217	340	263
MERCURY	0.0078 U	0.07 U	0.01 UJ	0.14 U	0.04 U	0.04 U	0.06 J	0.01 U
NICKEL	3.8 U	3.1 U	3.2 U	4.2	2.9 U	0.90 U	8.4 U	1.2 U
POTASSIUM	7410 J	4730	5850	9750	17200	13900	11200	9900
SELENIUM	3.1 U	4 U	2.9 UR	1.9 UJ	3.1 U	4 U	2.9 U	1.9 UR
SILVER	1.2 U	2 U	0.82 U	1.1 U	1.2 U	2 U	2.7 U	1.1 U
SODIUM	154000	110000	142000	208000	135000 J	120000	101000	95800
THALLIUM	3.7 U	4 U	3.9 UJ	4.8 U	3.7 U	4 U	3.9 U	4.8 U
VANADIUM	0.85 J	0.60 U	0.75 U	0.87 J	0.58 U	0.60 U	4.2 U	0.55 U
ZINC	15.7	22.7 U	8 U	23.1 U	6.6 U	11.1 U	5.9 U	12.4 U
MISCELLANEOUS PARAMETERS (MG/L)								
ALKALINITY	220	190 J	190	140	210	220 J	220 J	210
BROMIDE	2 U	2 U	2 U	2 U	2 U	2 U	9.8 J	2 U
CARBONATE ALKALINITY	220	190	190	140	210	220	220	210
CHLORIDE	240 J	130 J	200 J	440 J	340	230 J	220 J	270 J
NITRATE	0.34	0.14 J	0.34 J	3.4 J	0.067	0.05 UR	0.05 U	0.05 UJ
SULFATE	34 U	19 J	25	36	49	67 J	60	64
TOTAL ORGANIC CARBON	2.4	3.7	2.4	4.1 J	2.5	3	2.8	8 J
TOTAL ORGANIC HALIDES	0.93 J	0.06 U	0.15 J	0.022 J	0.71 U	0.054 U	0.092 J	0.042 J
MISCELLANEOUS PARAMETERS (S.U.)								
PH	7.9	7.6	8	7.7	7.2	7.6	7.4	7.3
MISCELLANEOUS PARAMETERS (µg/L)								
CYANIDE	--	20 U	20 U	20 U	10 U	20 U	20 U	20 U

TABLE A.3
FACILITY BACKGROUND SALINE/BRACKISH GROUNDATER DATA SET
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	DI-01B				SI-01B			
SAMPLE ID	**DI-01B-GW-**	**DI-01B-GW-**	**DI-01B-GW-09**	**DI-01B-GW-10**	**SI-01B-GW-07**	**SI-01B-GW-08**	**SI-01B-GW-09**	**SI-01B-GW-**
SAMPLE DATE	**19961206**	**19970414**	**19970803**	**19971101**	**19961203**	**19970412**	**19970814**	**19971105**
ROUND	**07**	**08**	**09**	**10**	**07**	**08**	**09**	**10**
SAMPLE CODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
MATRIX	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
SAMPLE TYPE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
PESTICIDES/PCBS (µg/L)								
4,4'-DDD	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
4,4'-DDE	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
4,4'-DDT	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ALDRIN	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
ALPHA-BHC	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
ALPHA-CHLORDANE	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
AROCLOR-1016	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
AROCLOR-1221	2.4 U	2.2 U	2.2 U	2.2 U	2.2 U	2.4 U	2.2 U	2 U
AROCLOR-1232	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
AROCLOR-1242	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
AROCLOR-1248	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
AROCLOR-1254	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
AROCLOR-1260	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U	1 U
BETA-BHC	0.061 UJ	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
DELTA-BHC	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
DIELDRIN	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ENDOSULFAN I	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
ENDOSULFAN II	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ENDOSULFAN SULFATE	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ENDRIN	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ENDRIN ALDEHYDE	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
ENDRIN KETONE	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.10 U
GAMMA-BHC (LINDANE)	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
GAMMA-CHLORDANE	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
HEPTACHLOR	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
HEPTACHLOR EPOXIDE	0.061 U	0.054 U	0.055 U	0.054 U	0.056 U	0.06 U	0.054 U	0.05 U
METHOXYCHLOR	0.61 U	0.54 U	0.55 U	0.54 U	0.56 U	0.60 U	0.54 U	0.50 U
TOXAPHENE	6.1 U	5.4 U	5.5 U	5.4 U	5.6 U	6 U	5.4 U	5 U
PETROLEUM HYDROCARBONS (µg/L)								
DIESEL RANGE ORGANICS	99	50 UJ	50 U	64	130	88	92	190 J
GASOLINE RANGE ORGANICS	0.00	--	--	--	--	--	--	--

EXAMPLE CALCULATIONS

Example Calculation - Benzo(a)pyrene Equivalent

Sample Results		
Chemical	**Concentration (µg/kg)**	
BENZO(A)ANTHRACENE	570	
BENZO(A)PYRENE	426	U
BENZO(B)FLUORANTHENE	847	
BENZO(K)FLUORANTHENE	120	
CHRYSENE	380	U
DIBENZO(A,H)ANTHRACENE	82.7	
INDENO(1,2,3-CD)PYRENE	2364	

Method:
- Positive results accepted
- Only detected results are used in the final calculation.
- Rejected results (R) are not used

Used in Calculation:

Carcinogenic PAH	TEF	(µg/kg)
BENZO(A)ANTHRACENE	0.1	570
BENZO(A)PYRENE	1	0
BENZO(B)FLUORANTHENE	0.1	847
BENZO(K)FLUORANTHENE	0.01	1.2
CHRYSENE	0.001	0
DIBENZO(A,H)ANTHRACENE	1	82.7
INDENO(1,2,3-CD)PYRENE	0.1	2364

Benzo(a)pyrene Equivalents = Σ(Sample Result$_{\text{chemical 1}}$ x TEF$_{\text{chemical 1}}$ + Sample Result$_{\text{chemical 2}}$ x TEF$_{\text{chemical 2}}$...)

= [(0.01 x 570) + (1 x 0) + (0.1 x 847) + (0.01 x 120) + (0.001 x 0) + (1 x 82.7) + (0.1 x 2364)]

= 461 ug/kg

U = Non-detected
TEF = Toxicity Equivalence Factor
TEF Source: USEPA, July 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. Office of Research and Development. Washington, DC 20460.

Example Calculation - Benzo(a)pyrene Equivalent- HALFND

Sample Results		
Chemical	**Concentration (µg/kg)**	
BENZO(A)ANTHRACENE	570	
BENZO(A)PYRENE	426	U
BENZO(B)FLUORANTHENE	847	
BENZO(K)FLUORANTHENE	120	
CHRYSENE	380	U
DIBENZO(A,H)ANTHRACENE	82.7	
INDENO(1,2,3-CD)PYRENE	2364	

Method:
- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used
- If all individual cPAHs are non-detected, BAP Equivalent = the quantitation limit for benzo(a)pyrene

Benzo(a)pyrene Equivalents = Σ(Sample Result$_{chemical\ 1}$ x TEF$_{chemical\ 1}$ + Sample Result$_{chemical\ 2}$ x TEF$_{chemical\ 2}$...)

= [(0.01 x 570) + (1 x 213) + (0.1 x 847) + (0.01 x 120) + (0.001 x 190) + (1 x 82.7) + (0.1 x 2364)]

= 674 ug/kg

Used in Calculation:

Carcinogenic PAH	TEF	(µg/kg)
BENZO(A)ANTHRACENE	0.1	570
BENZO(A)PYRENE	1	213
BENZO(B)FLUORANTHENE	0.1	847
BENZO(K)FLUORANTHENE	0.01	1.2
CHRYSENE	0.001	190
DIBENZO(A,H)ANTHRACENE	1	82.7
INDENO(1,2,3-CD)PYRENE	0.1	2364

U = Non-detected
TEF = Toxicity Equivalence Factor
TEF Source: USEPA, July 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. Office of Research and Development. Washington, DC 20460.

Example Calculation - 2,3,7,8-TCDD TEQ

Sample Results		
Chemical	**Concentration (ng/kg)**	
1,2,3,4,6,7,8,9-OCDD	26.5	
1,2,3,4,6,7,8,9-OCDF	2.4	U
1,2,3,4,6,7,8-HPCDD	4.6	
1,2,3,4,6,7,8-HPCDF	2.6	
1,2,3,4,7,8,9-HPCDF	0.8	U
1,2,3,4,7,8-HXCDD	0.7	U
1,2,3,4,7,8-HXCDF	0.93	
1,2,3,6,7,8-HXCDD	0.7	U
1,2,3,6,7,8-HXCDF	0.48	
1,2,3,7,8,9-HXCDD	0.7	U
1,2,3,7,8,9-HXCDF	0.75	
1,2,3,7,8-PECDD	0.7	U
1,2,3,7,8-PECDF	0.4	U
2,3,4,6,7,8-HXCDF	0.63	
2,3,4,7,8-PECDF	0.5	U
2,3,7,8-TCDD	0.5	U
2,3,7,8-TCDF	0.54	

Used in Calculation:

Dioxins/Furans	TEF	Concentration (ng/kg)
1,2,3,4,6,7,8,9-OCDD	3E-04	26.5
1,2,3,4,6,7,8,9-OCDF	3E-04	0
1,2,3,4,6,7,8-HPCDD	0.01	4.6
1,2,3,4,6,7,8-HPCDF	0.01	2.6
1,2,3,4,7,8,9-HPCDF	0.01	0
1,2,3,4,7,8-HXCDD	0.1	0
1,2,3,4,7,8-HXCDF	0.1	0.93
1,2,3,6,7,8-HXCDD	0.1	0
1,2,3,6,7,8-HXCDF	0.1	0.48
1,2,3,7,8,9-HXCDD	0.1	0
1,2,3,7,8,9-HXCDF	0.1	0.75
1,2,3,7,8-PECDD	1	0
1,2,3,7,8-PECDF	0.03	0
2,3,4,6,7,8-HXCDF	0.1	0.63
2,3,4,7,8-PECDF	0.3	0
2,3,7,8-TCDD	1	0
2,3,7,8-TCDF	0.1	0.54

Method:

- Positive results accepted
- Only detected results are used in the final calculation.
- Rejected results (R) are not used

$$\text{2,3,7,8-TCDD TEQ} = \Sigma(\text{Sample Result}_{\text{chemical 1}} \times \text{TEF}_{\text{chemical 1}} + \text{Sample Result}_{\text{chemical 2}} \times \text{TEF}_{\text{chemical 2}} \cdots)$$

$$= [(26.5 \times 0.0003) + (1.2 \times 0.0003) \ldots.]$$

$$= 0.41 \quad \text{ng/kg}$$

U = non-detected

TEF = Toxicity Equivalence Factor

TEF Source = van dan Berg, et al. *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.* http://epa-prgs.ornl.gov/chemicals/help/documents/vandenberg2006.pdf

Example Calculation - 2,3,7,8-TCDD TEQ - HALFND

Sample Results		
Chemical	**Concentration (ng/kg)**	
1,2,3,4,6,7,8,9-OCDD	26.5	
1,2,3,4,6,7,8,9-OCDF	2.4	U
1,2,3,4,6,7,8-HPCDD	4.6	
1,2,3,4,6,7,8-HPCDF	2.6	
1,2,3,4,7,8,9-HPCDF	0.8	U
1,2,3,4,7,8-HXCDD	0.7	U
1,2,3,4,7,8-HXCDF	0.93	
1,2,3,6,7,8-HXCDD	0.7	U
1,2,3,6,7,8-HXCDF	0.48	
1,2,3,7,8,9-HXCDD	0.7	U
1,2,3,7,8,9-HXCDF	0.75	
1,2,3,7,8-PECDD	0.7	U
1,2,3,7,8-PECDF	0.4	U
2,3,4,6,7,8-HXCDF	0.63	
2,3,4,7,8-PECDF	0.5	U
2,3,7,8-TCDD	0.5	U
2,3,7,8-TCDF	0.54	

Used in Calculation:

Dioxins/Furans	TEF	Concentration (ng/kg)
1,2,3,4,6,7,8,9-OCDD	3E-04	26.5
1,2,3,4,6,7,8,9-OCDF	3E-04	1.2
1,2,3,4,6,7,8-HPCDD	0.01	4.6
1,2,3,4,6,7,8-HPCDF	0.01	2.6
1,2,3,4,7,8,9-HPCDF	0.01	0.4
1,2,3,4,7,8-HXCDD	0.1	0.35
1,2,3,4,7,8-HXCDF	0.1	0.93
1,2,3,6,7,8-HXCDD	0.1	0.35
1,2,3,6,7,8-HXCDF	0.1	0.48
1,2,3,7,8,9-HXCDD	0.1	0.35
1,2,3,7,8,9-HXCDF	0.1	0.75
1,2,3,7,8-PECDD	1	0.35
1,2,3,7,8-PECDF	0.03	0.2
2,3,4,6,7,8-HXCDF	0.1	0.63
2,3,4,7,8-PECDF	0.3	0.25
2,3,7,8-TCDD	1	0.25
2,3,7,8-TCDF	0.1	0.54

Method:

- Positive results accepted
- Non-detected results are assumed to be 1/2 quantitation limit
- Rejected results (R) are not used
- If all individual dioxins/furans are non-detected, TCDD TEQ = the quantitation limit for 2,3,7,8-TCDD

$$\text{2,3,7,8-TCDD TEQ} = \Sigma(\text{Sample Result}_{\text{chemical 1}} \times \text{TEF}_{\text{chemical 1}} + \text{Sample Result}_{\text{chemical 2}} \times \text{TEF}_{\text{chemical 2}} \cdots)$$

$$= [(26.5 \times 0.0003) + (1.2 \times 0.0003) \ldots]$$

$$= 1.20 \text{ ng/kg}$$

U = non-detected
TEF = Toxicity Equivalence Factor
TEF Source = van dan Berg, et al. *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.* http://epa-prgs.ornl.gov/chemicals/help/documents/vandenberg2006.pdf

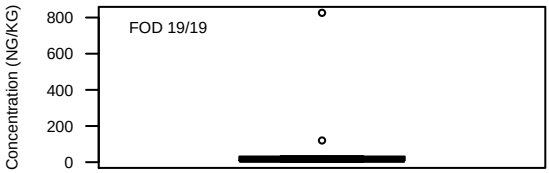
ATTACHMENT B

FACILITY BACKGROUND SOIL STATISTICS

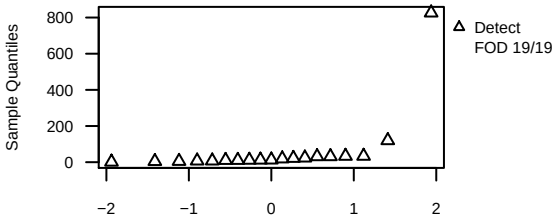
B.1 SOIL OUTLIER ANALYSIS

1,2,3,4,6,7,8−HPCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 1 OF 68

BOXPLOT

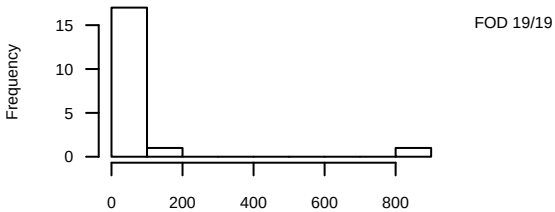


NORMAL PROBABILITY PLOT



Theoretical Quantiles
Shapiro Wilk P−Value = 0

HISTOGRAM

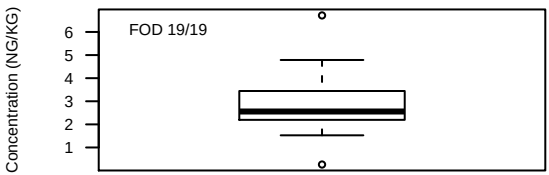


Concentration (NG/KG)

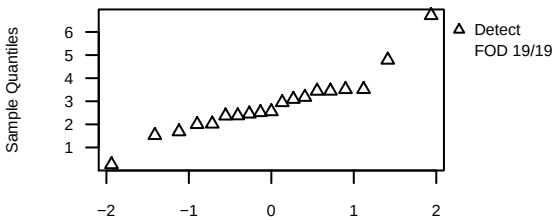
SUMMARY STATISTICS

Minimum	1.3
1st Quantile	9.12
Median	12.9
3rd Quantile	31.35
Maximum	826
FOD	19/19

BOXPLOT OF LOGNORMAL CONCENTRATIONS

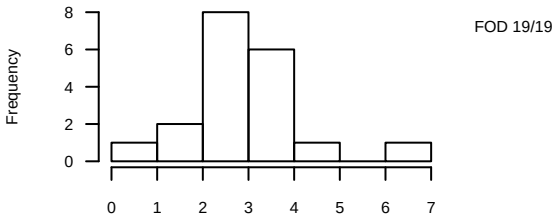


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Theoretical Quantiles
Shapiro Wilk P−Value 0.07

HISTOGRAM OF LOGNORMAL CONCENTRATIONS



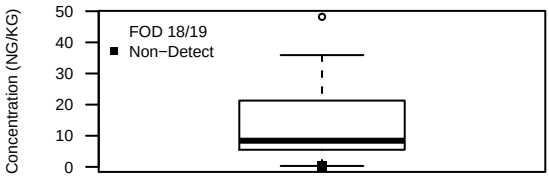
Concentration (NG/KG)

SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

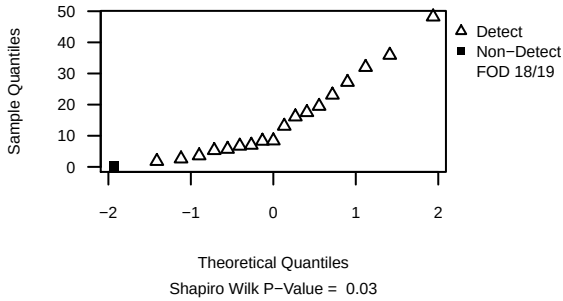
Minimum	0.26
1st Quantile	2.2
Median	2.56
3rd Quantile	3.44
Maximum	6.72
FOD	19/19

1,2,3,4,6,7,8−HPCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 2 OF 68

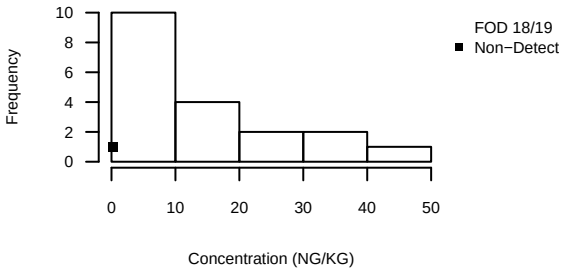
BOXPLOT



NORMAL PROBABILITY PLOT



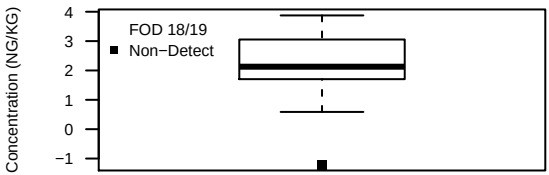
HISTOGRAM



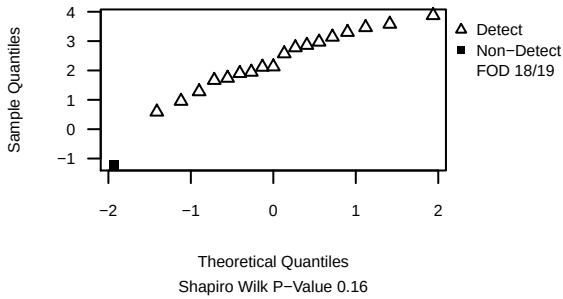
SUMMARY STATISTICS

Minimum	0.3
1st Quantile	5.5
Median	8.4
3rd Quantile	21.3
Maximum	48.2
FOD	18/19

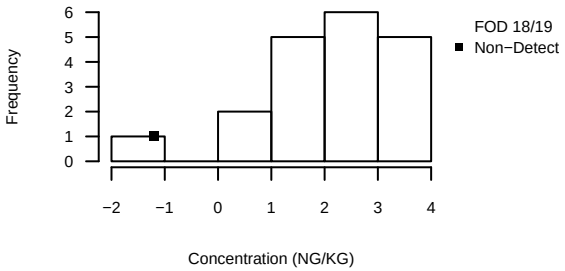
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

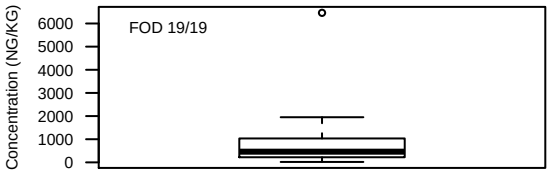


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

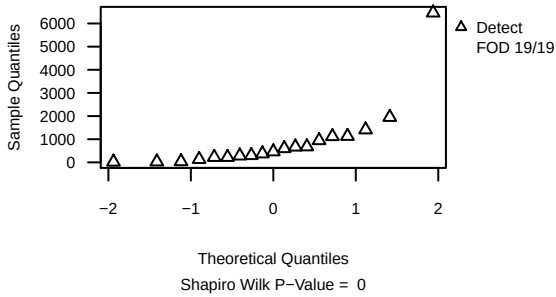
Minimum	−1.2
1st Quantile	1.7
Median	2.13
3rd Quantile	3.06
Maximum	3.88
FOD	18/19

1,2,3,4,6,7,8,9−OCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 3 OF 68

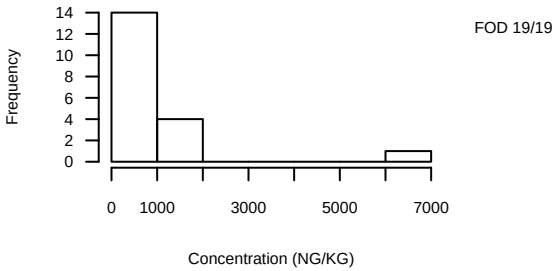
BOXPLOT



NORMAL PROBABILITY PLOT



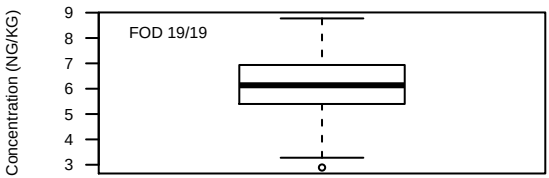
HISTOGRAM



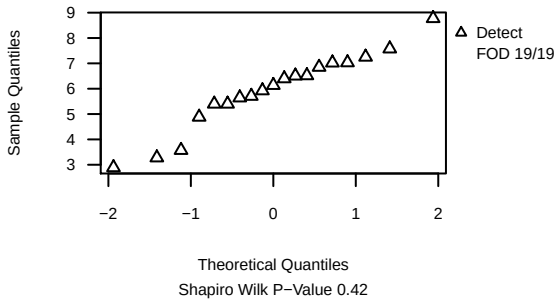
SUMMARY STATISTICS

Minimum	18
1st Quantile	221
Median	462
3rd Quantile	1032
Maximum	6460
FOD	19/19

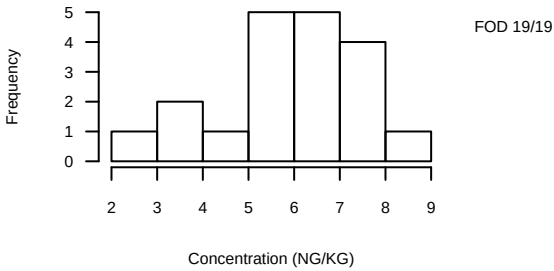
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

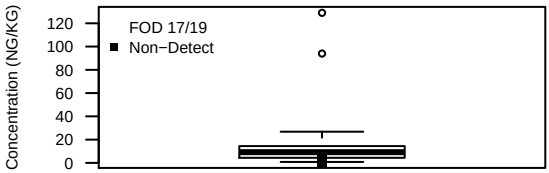


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

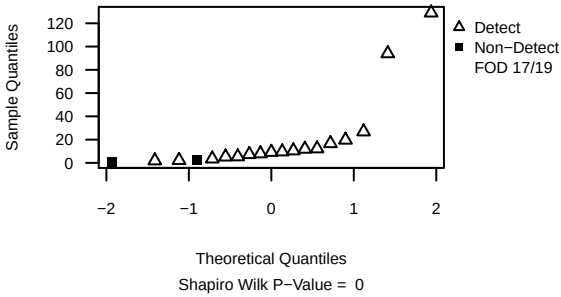
Minimum	2.89
1st Quantile	5.4
Median	6.14
3rd Quantile	6.94
Maximum	8.77
FOD	19/19

1,2,3,4,6,7,8,9−OCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 4 OF 68

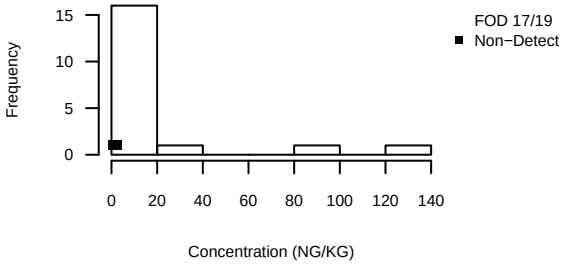
BOXPLOT



NORMAL PROBABILITY PLOT



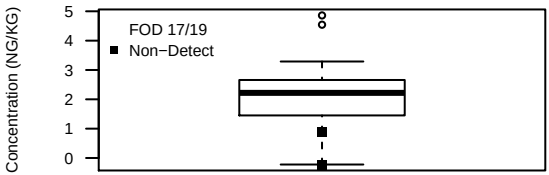
HISTOGRAM



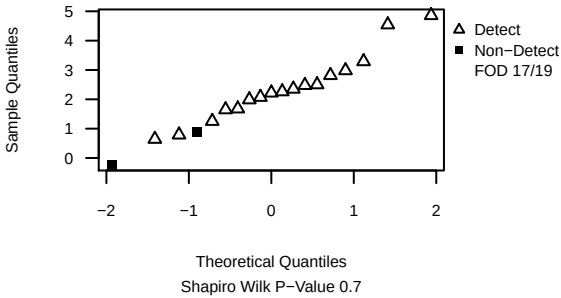
SUMMARY STATISTICS

Minimum	0.8
1st Quantile	4.35
Median	9.2
3rd Quantile	14.45
Maximum	129
FOD	17/19

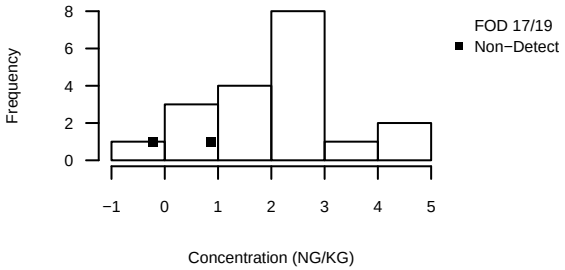
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

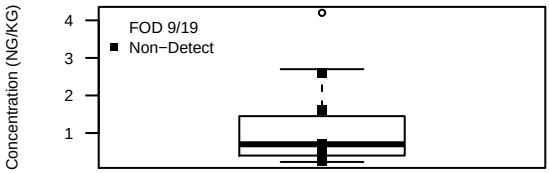


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

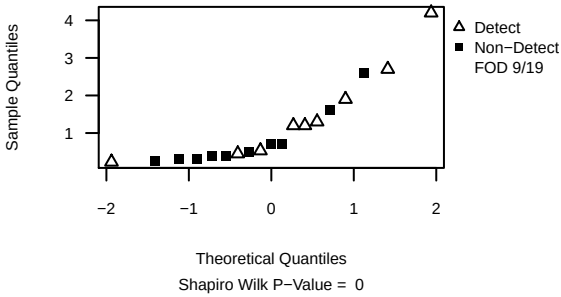
Minimum	−0.22
1st Quantile	1.45
Median	2.22
3rd Quantile	2.66
Maximum	4.86
FOD	17/19

1,2,3,4,7,8−HXCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 5 OF 68

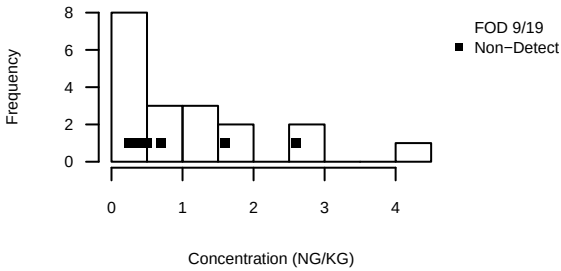
BOXPLOT



NORMAL PROBABILITY PLOT



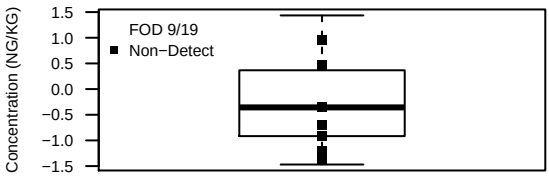
HISTOGRAM



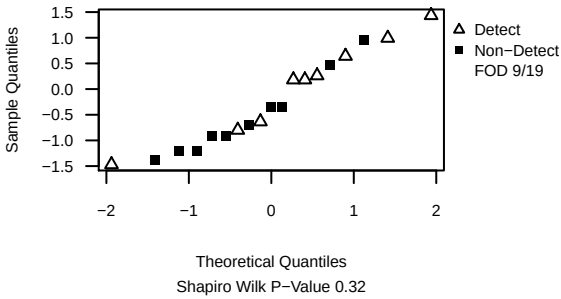
SUMMARY STATISTICS

Minimum	0.23
1st Quantile	0.4
Median	0.7
3rd Quantile	1.45
Maximum	4.2
FOD	9/19

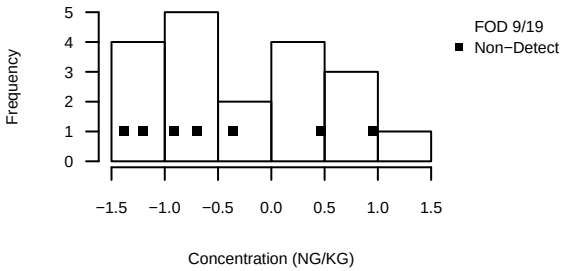
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

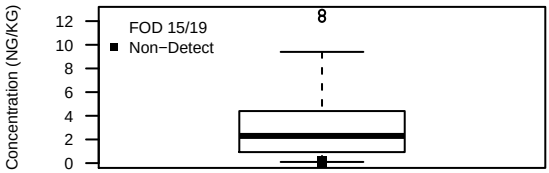


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

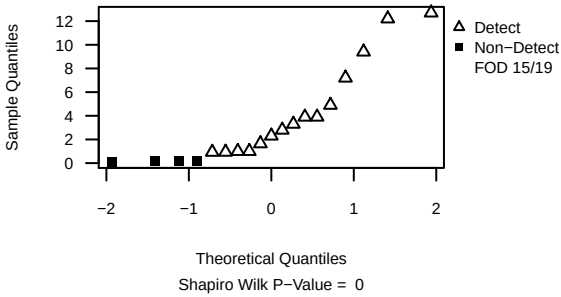
Minimum	−1.47
1st Quantile	−0.92
Median	−0.36
3rd Quantile	0.37
Maximum	1.44
FOD	9/19

1,2,3,4,7,8−HXCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 6 OF 68

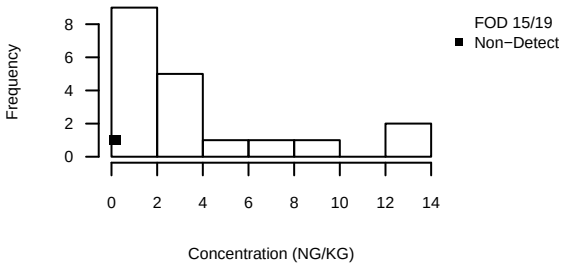
BOXPLOT



NORMAL PROBABILITY PLOT



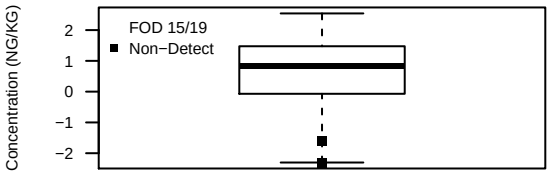
HISTOGRAM



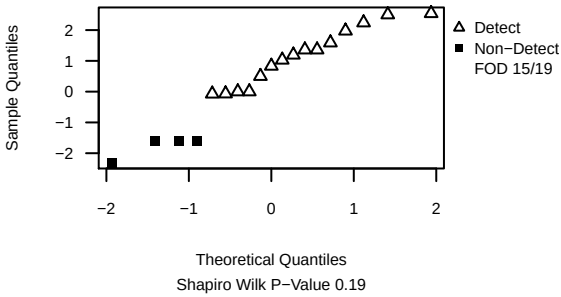
SUMMARY STATISTICS

Minimum	0.1
1st Quantile	0.93
Median	2.3
3rd Quantile	4.4
Maximum	12.7
FOD	15/19

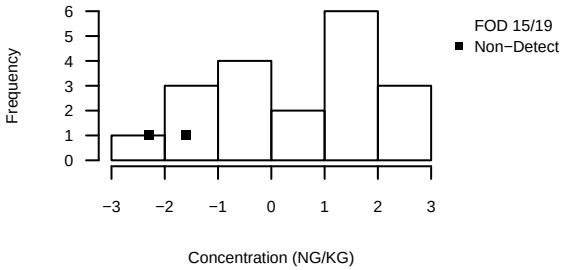
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

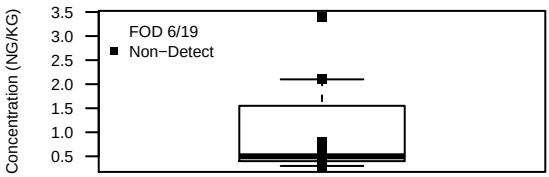


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

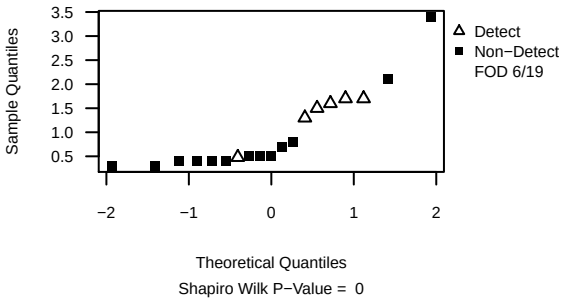
Minimum	−2.3
1st Quantile	−0.07
Median	0.83
3rd Quantile	1.48
Maximum	2.54
FOD	15/19

1,2,3,4,7,8,9−HPCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 7 OF 68

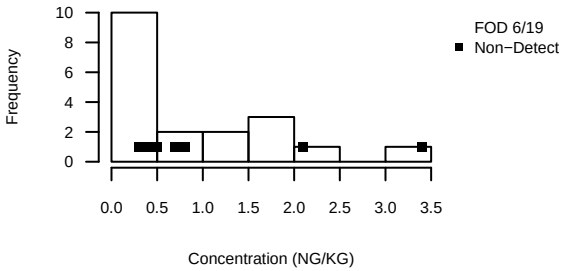
BOXPLOT



NORMAL PROBABILITY PLOT



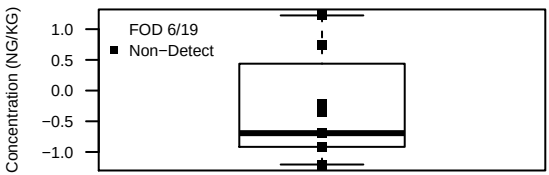
HISTOGRAM



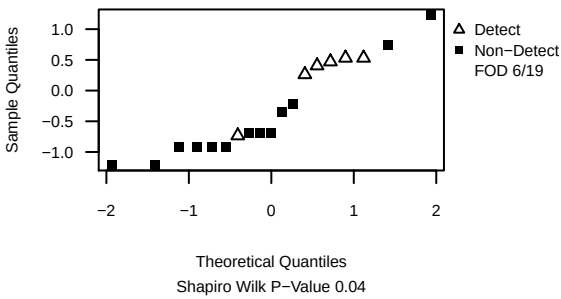
SUMMARY STATISTICS

Minimum	0.3
1st Quantile	0.4
Median	0.5
3rd Quantile	1.55
Maximum	3.4
FOD	6/19

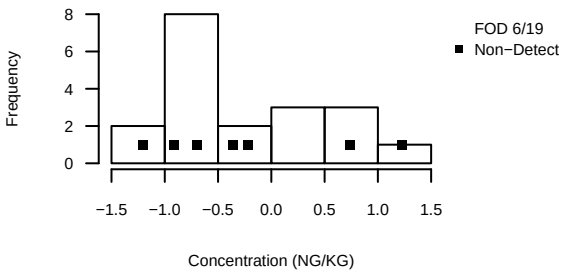
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

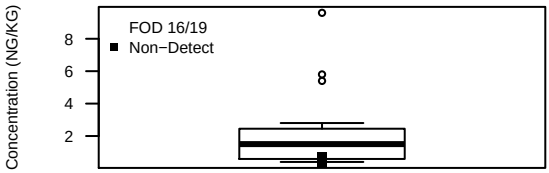


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

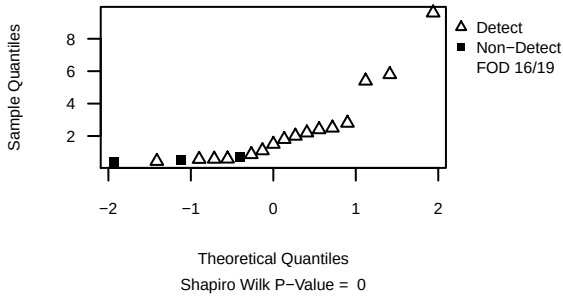
Minimum	−1.2
1st Quantile	−0.92
Median	−0.69
3rd Quantile	0.44
Maximum	1.22
FOD	6/19

1,2,3,6,7,8−HXCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 8 OF 68

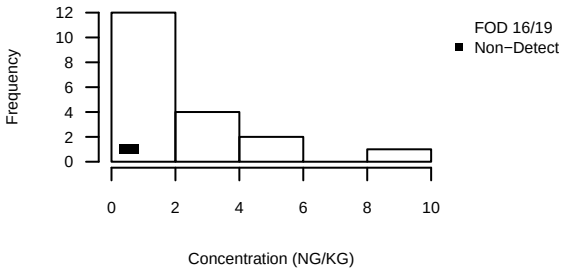
BOXPLOT



NORMAL PROBABILITY PLOT



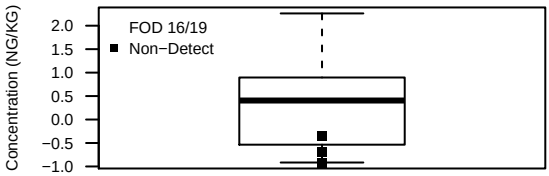
HISTOGRAM



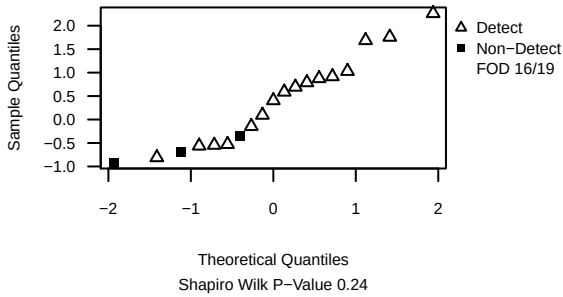
SUMMARY STATISTICS

Minimum	0.4
1st Quantile	0.58
Median	1.5
3rd Quantile	2.45
Maximum	9.6
FOD	16/19

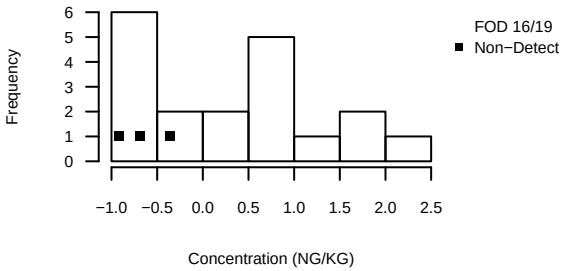
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

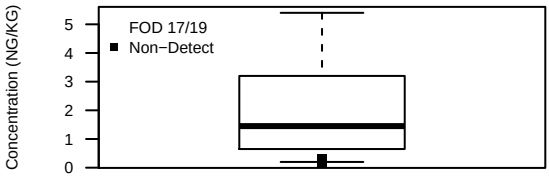


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

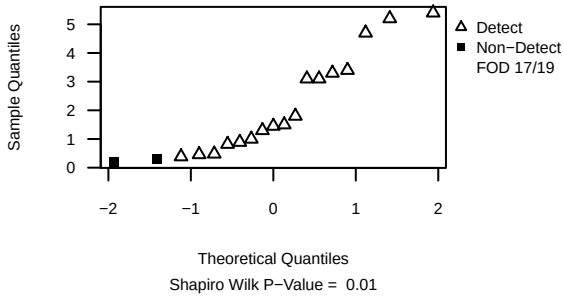
Minimum	−0.92
1st Quantile	−0.54
Median	0.41
3rd Quantile	0.9
Maximum	2.26
FOD	16/19

1,2,3,6,7,8−HXCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 9 OF 68

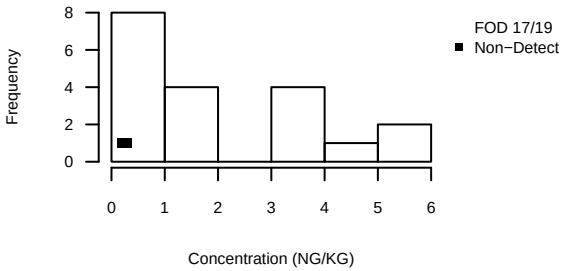
BOXPLOT



NORMAL PROBABILITY PLOT



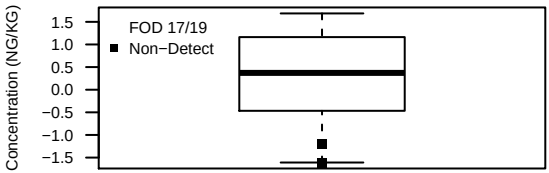
HISTOGRAM



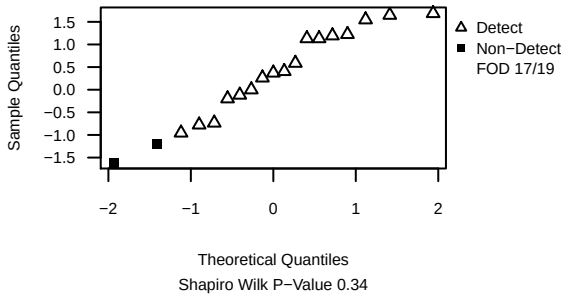
SUMMARY STATISTICS

Minimum	0.2
1st Quantile	0.65
Median	1.45
3rd Quantile	3.2
Maximum	5.4
FOD	17/19

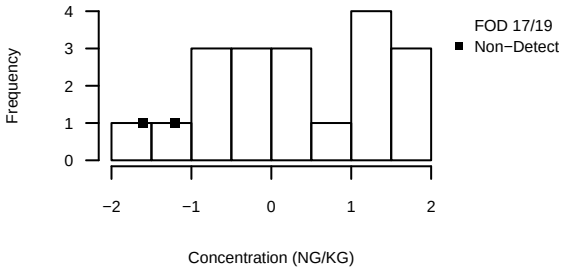
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

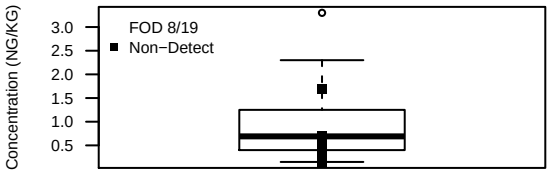


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

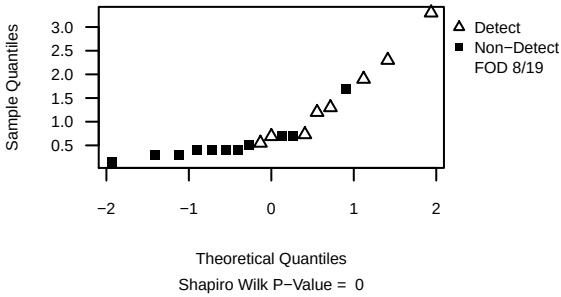
Minimum	−1.61
1st Quantile	−0.47
Median	0.37
3rd Quantile	1.16
Maximum	1.69
FOD	17/19

1,2,3,7,8−PECDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 10 OF 68

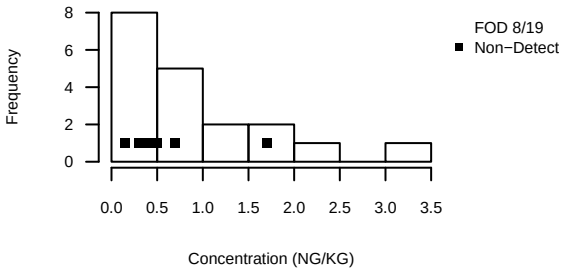
BOXPLOT



NORMAL PROBABILITY PLOT



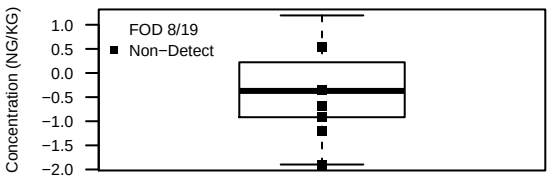
HISTOGRAM



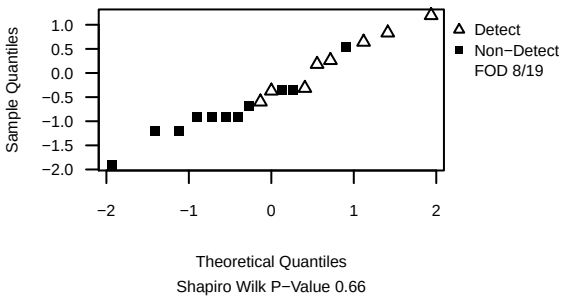
SUMMARY STATISTICS

Minimum	0.15
1st Quantile	0.4
Median	0.69
3rd Quantile	1.25
Maximum	3.3
FOD	8/19

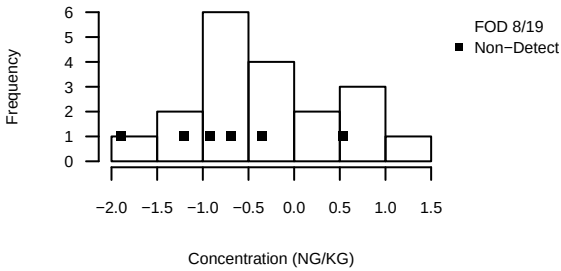
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

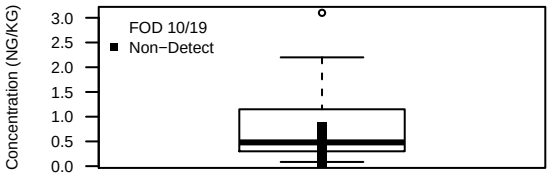


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

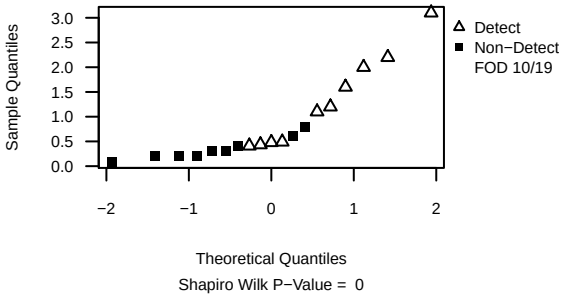
Minimum	−1.9
1st Quantile	−0.92
Median	−0.37
3rd Quantile	0.22
Maximum	1.19
FOD	8/19

1,2,3,7,8−PECDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 11 OF 68

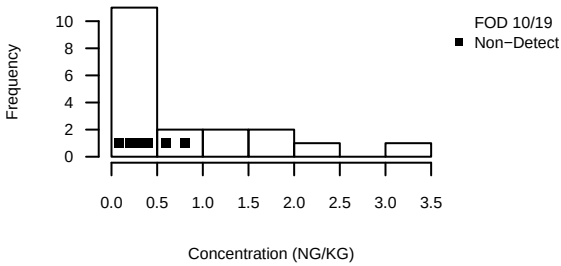
BOXPLOT



NORMAL PROBABILITY PLOT



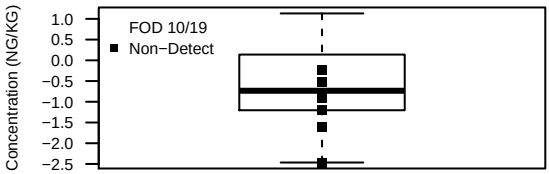
HISTOGRAM



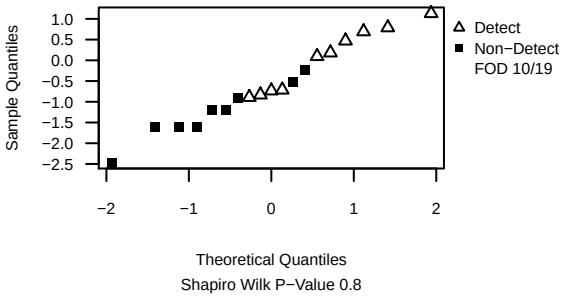
SUMMARY STATISTICS

Minimum	0.08
1st Quantile	0.3
Median	0.48
3rd Quantile	1.15
Maximum	3.1
FOD	10/19

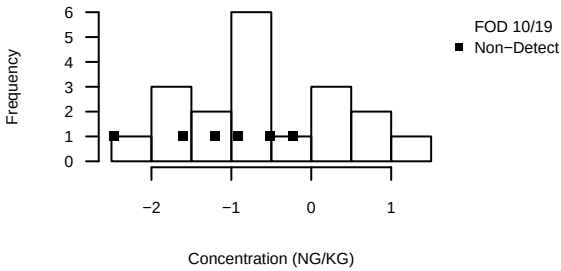
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

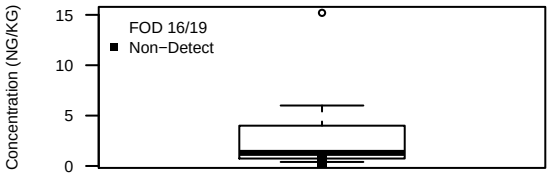


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

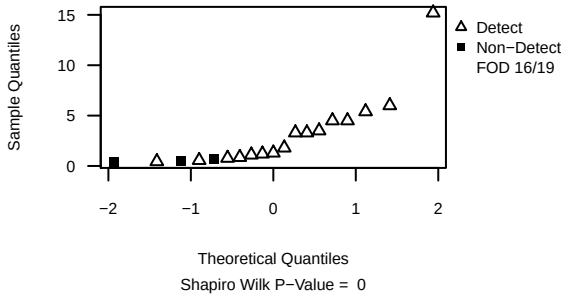
Minimum	−2.46
1st Quantile	−1.2
Median	−0.73
3rd Quantile	0.14
Maximum	1.13
FOD	10/19

1,2,3,7,8,9−HXCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 12 OF 68

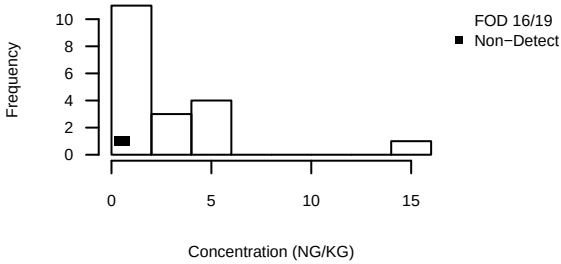
BOXPLOT



NORMAL PROBABILITY PLOT



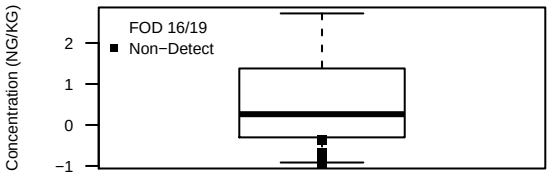
HISTOGRAM



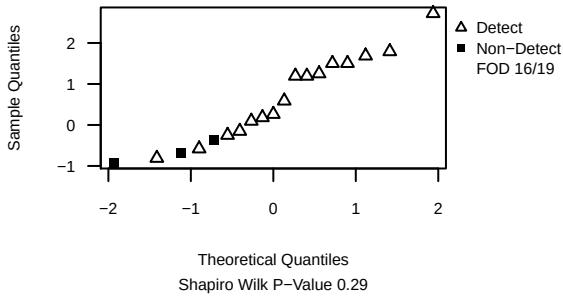
SUMMARY STATISTICS

Minimum	0.4
1st Quantile	0.74
Median	1.3
3rd Quantile	4
Maximum	15.2
FOD	16/19

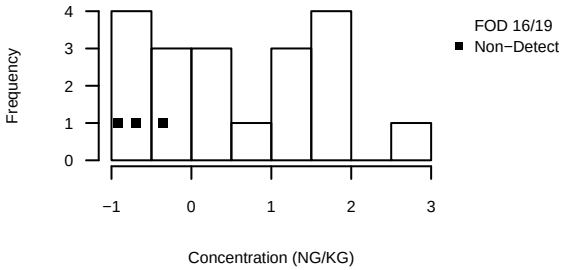
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

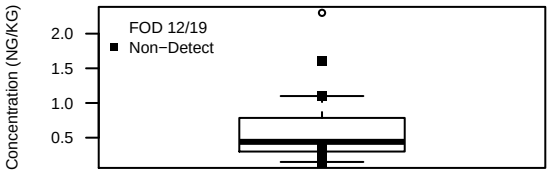


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

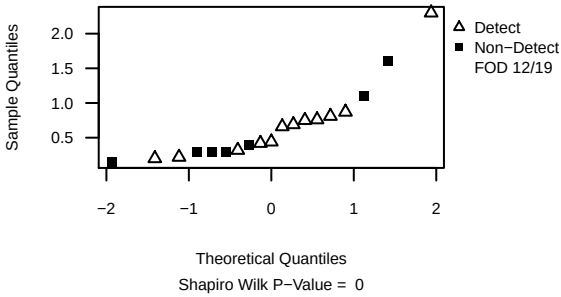
Minimum	−0.92
1st Quantile	−0.3
Median	0.26
3rd Quantile	1.38
Maximum	2.72
FOD	16/19

1,2,3,7,8,9−HXCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 13 OF 68

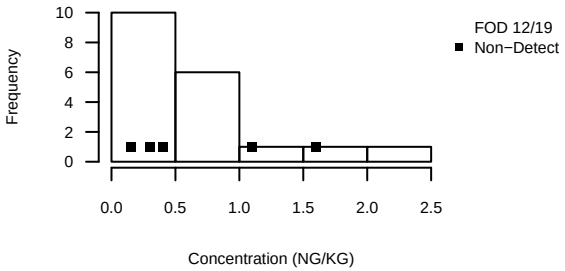
BOXPLOT



NORMAL PROBABILITY PLOT



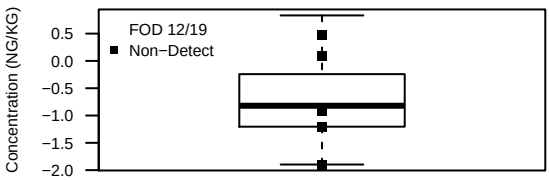
HISTOGRAM



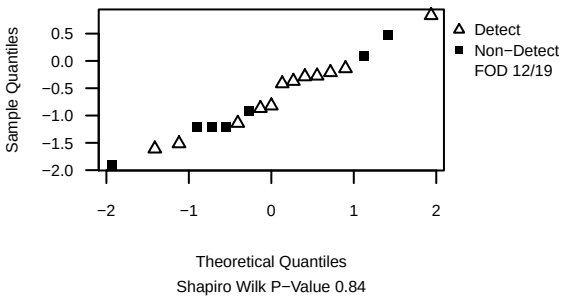
SUMMARY STATISTICS

Minimum	0.15
1st Quantile	0.3
Median	0.44
3rd Quantile	0.78
Maximum	2.3
FOD	12/19

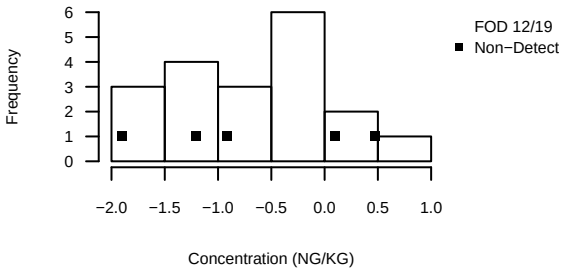
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

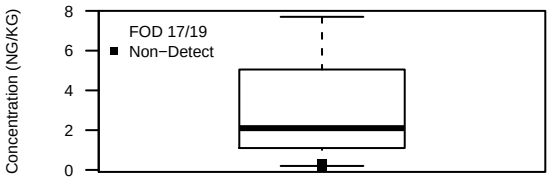


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

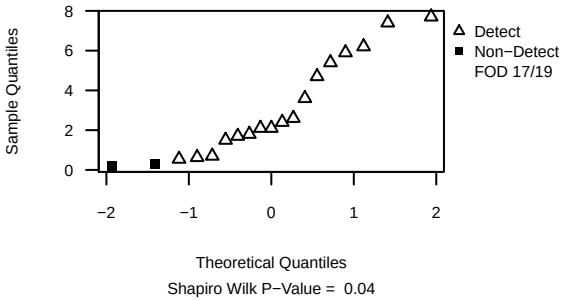
Minimum	−1.9
1st Quantile	−1.2
Median	−0.82
3rd Quantile	−0.24
Maximum	0.83
FOD	12/19

2,3,4,6,7,8−HXCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 14 OF 68

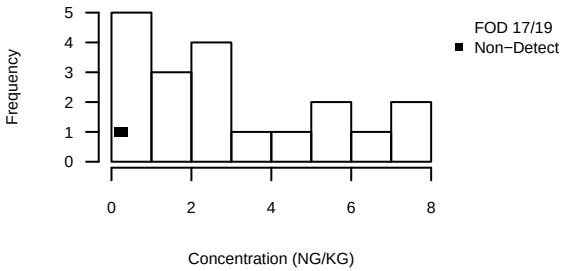
BOXPLOT



NORMAL PROBABILITY PLOT



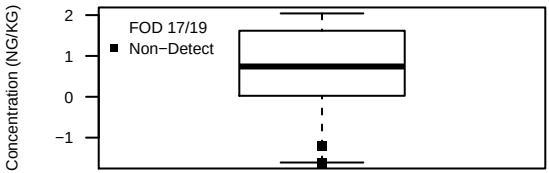
HISTOGRAM



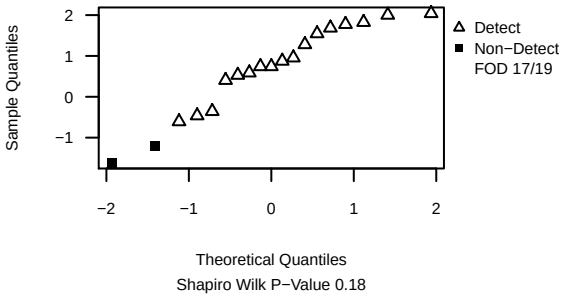
SUMMARY STATISTICS

Minimum	0.2
1st Quantile	1.1
Median	2.1
3rd Quantile	5.05
Maximum	7.7
FOD	17/19

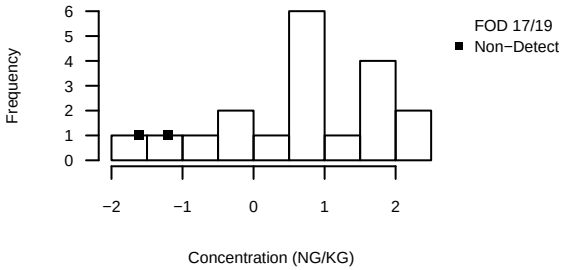
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



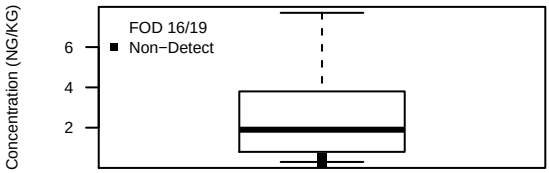
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



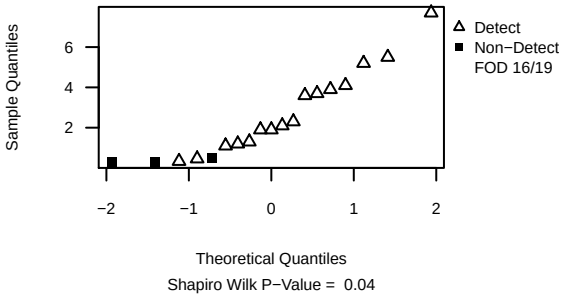
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−1.61
1st Quantile	0.02
Median	0.74
3rd Quantile	1.62
Maximum	2.04
FOD	17/19

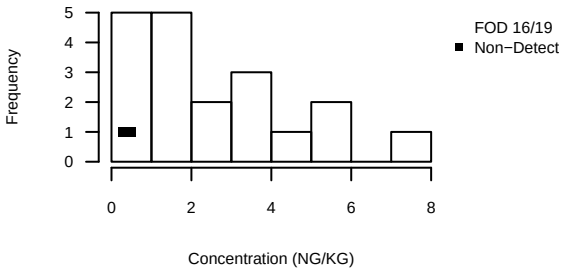
BOXPLOT



NORMAL PROBABILITY PLOT



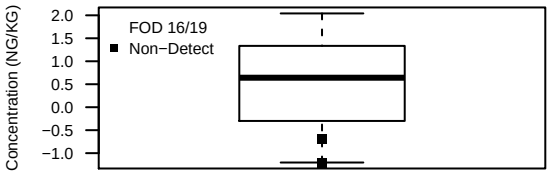
HISTOGRAM



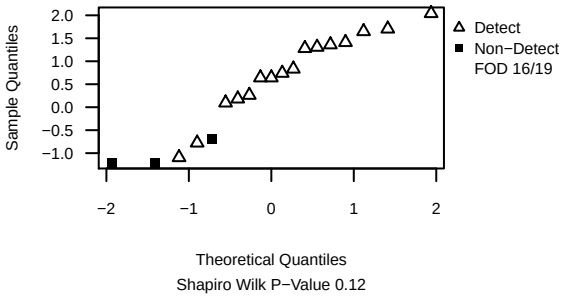
SUMMARY STATISTICS

Minimum	0.3
1st Quantile	0.8
Median	1.9
3rd Quantile	3.8
Maximum	7.7
FOD	16/19

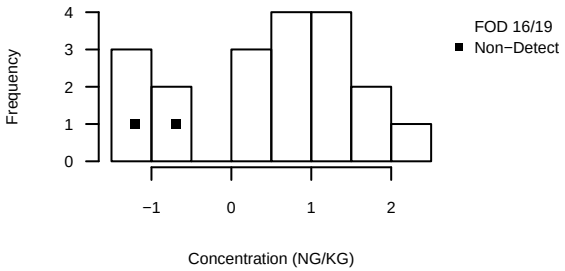
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

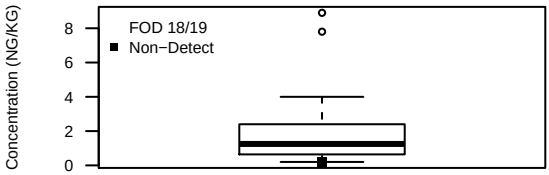


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

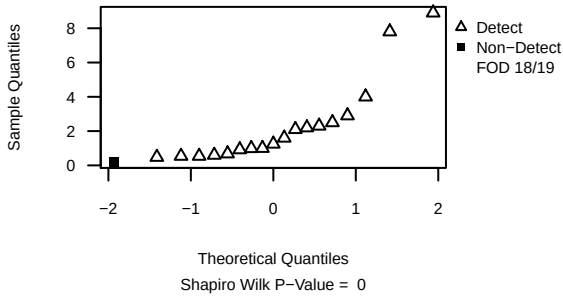
Minimum	−1.2
1st Quantile	−0.3
Median	0.64
3rd Quantile	1.34
Maximum	2.04
FOD	16/19

2,3,7,8−TCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 16 OF 68

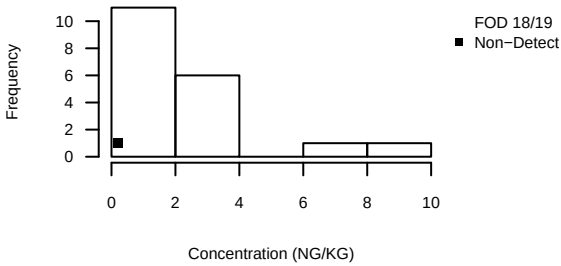
BOXPLOT



NORMAL PROBABILITY PLOT



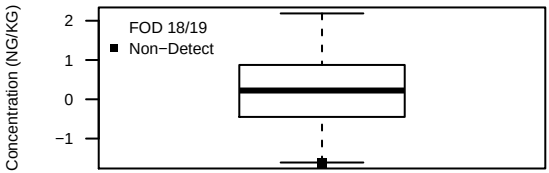
HISTOGRAM



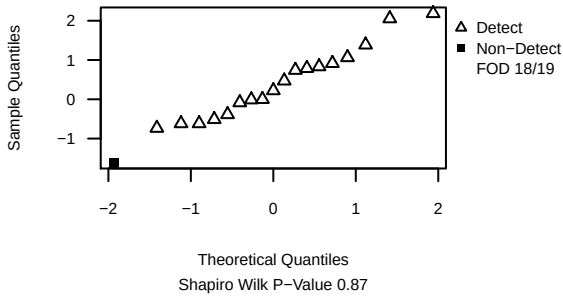
SUMMARY STATISTICS

Minimum	0.2
1st Quantile	0.64
Median	1.25
3rd Quantile	2.4
Maximum	8.9
FOD	18/19

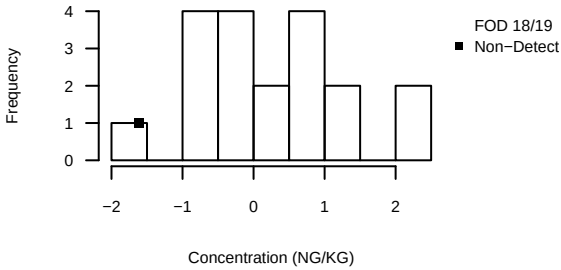
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

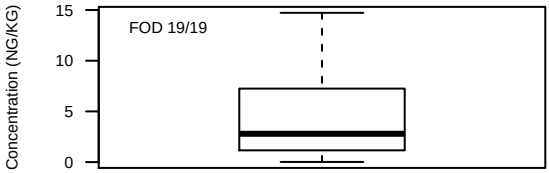


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

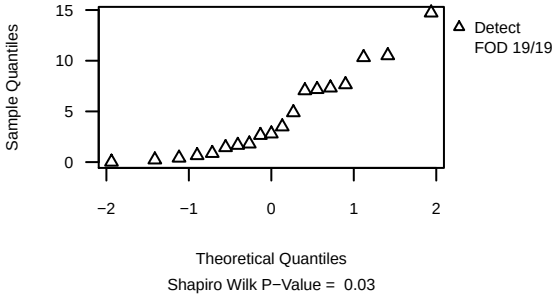
Minimum	−1.61
1st Quantile	−0.45
Median	0.22
3rd Quantile	0.87
Maximum	2.19
FOD	18/19

TEQ WHO−1998 SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 17 OF 68

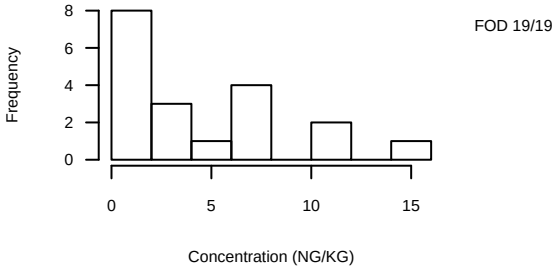
BOXPLOT



NORMAL PROBABILITY PLOT



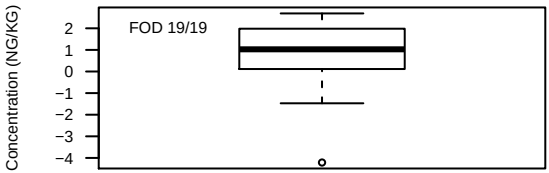
HISTOGRAM



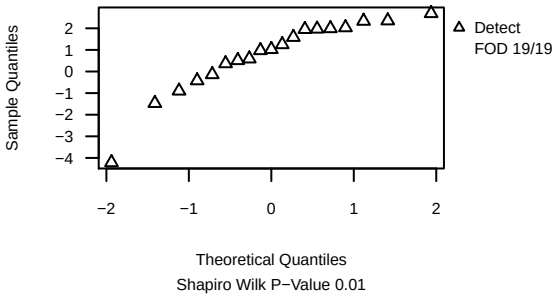
SUMMARY STATISTICS

Minimum	0.01
1st Quantile	1.16
Median	2.79
3rd Quantile	7.25
Maximum	14.72
FOD	19/19

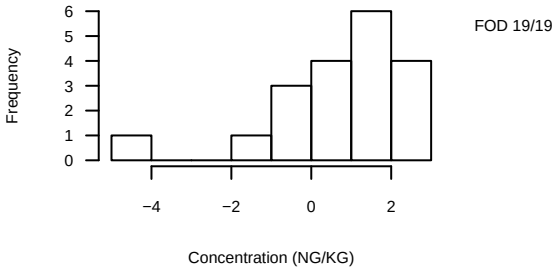
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



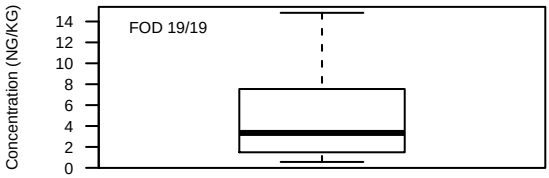
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



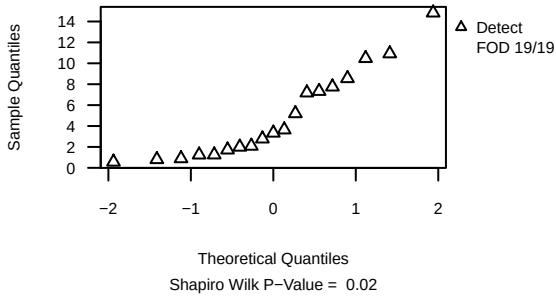
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−4.21
1st Quantile	0.12
Median	1.03
3rd Quantile	1.98
Maximum	2.69
FOD	19/19

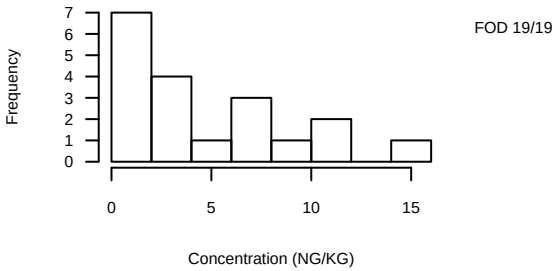
BOXPLOT



NORMAL PROBABILITY PLOT



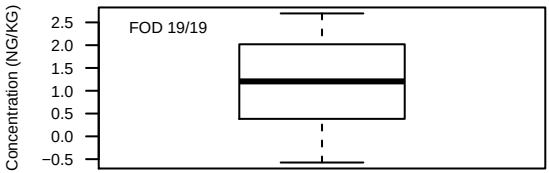
HISTOGRAM



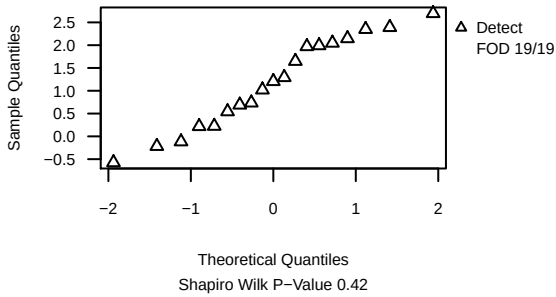
SUMMARY STATISTICS

Minimum	0.56
1st Quantile	1.49
Median	3.34
3rd Quantile	7.54
Maximum	14.83
FOD	19/19

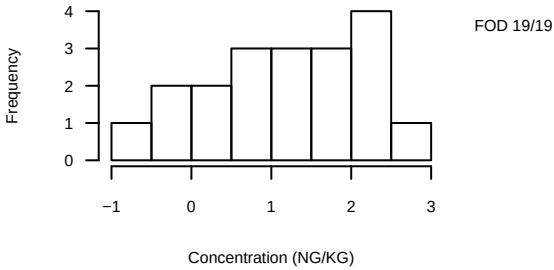
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



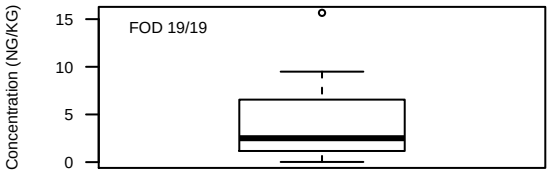
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



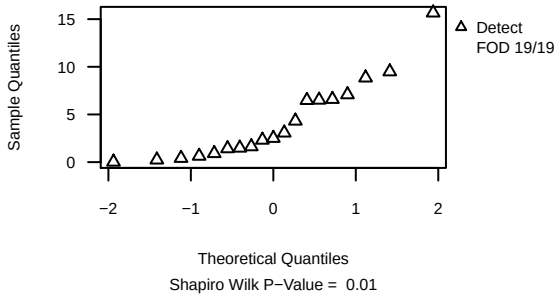
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−0.57
1st Quantile	0.38
Median	1.21
3rd Quantile	2.02
Maximum	2.7
FOD	19/19

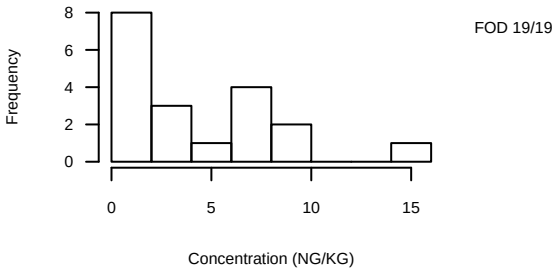
BOXPLOT



NORMAL PROBABILITY PLOT



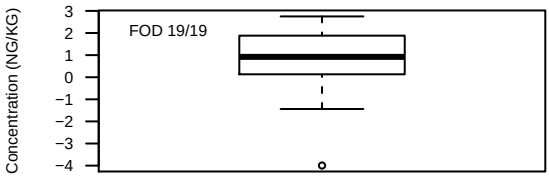
HISTOGRAM



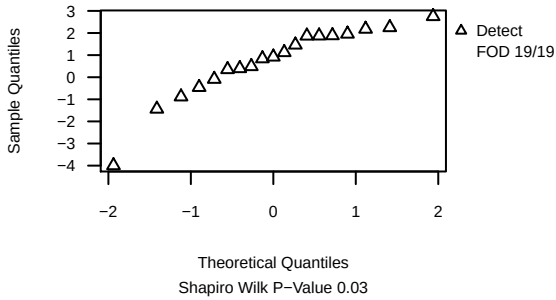
SUMMARY STATISTICS

Minimum	0.02
1st Quantile	1.17
Median	2.51
3rd Quantile	6.56
Maximum	15.66
FOD	19/19

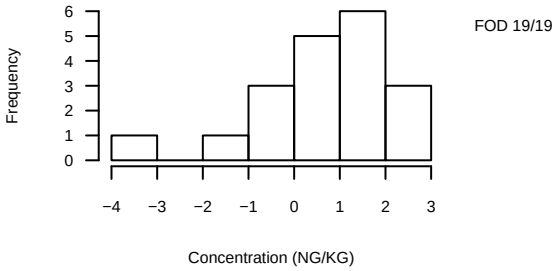
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

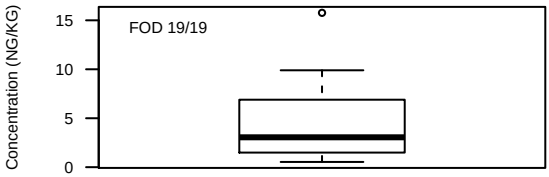


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

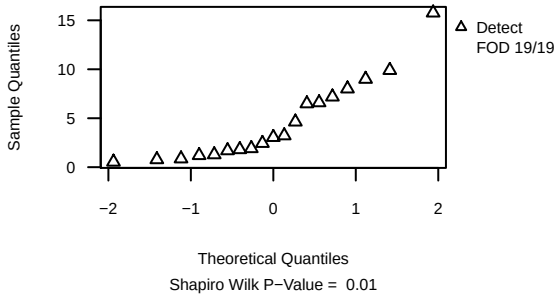
Minimum	−4
1st Quantile	0.13
Median	0.92
3rd Quantile	1.88
Maximum	2.75
FOD	19/19

TEQ WHO−2005 − HALFND SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 20 OF 68

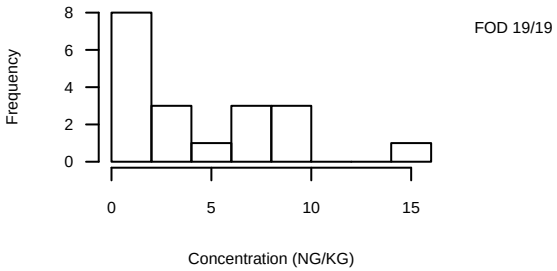
BOXPLOT



NORMAL PROBABILITY PLOT



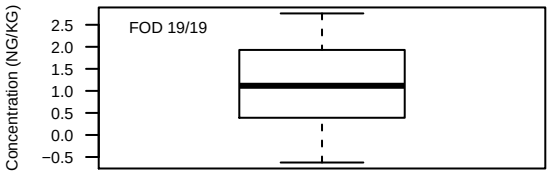
HISTOGRAM



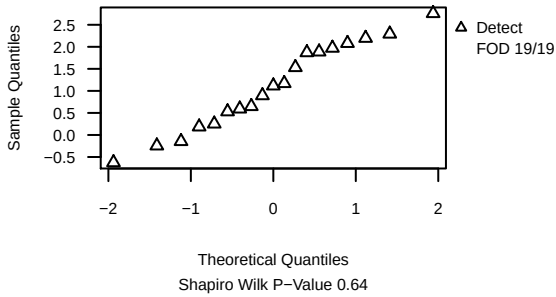
SUMMARY STATISTICS

Minimum	0.54
1st Quantile	1.49
Median	3.05
3rd Quantile	6.89
Maximum	15.76
FOD	19/19

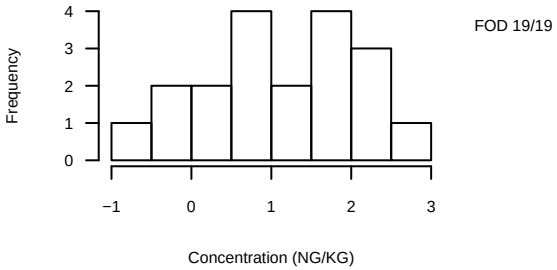
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

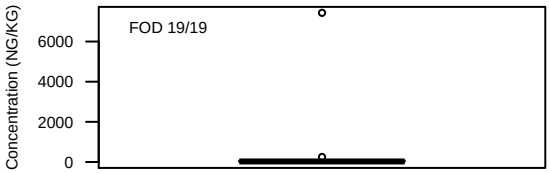


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

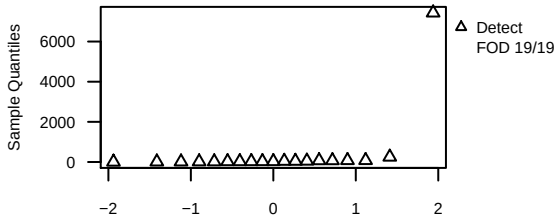
Minimum	−0.63
1st Quantile	0.39
Median	1.12
3rd Quantile	1.93
Maximum	2.76
FOD	19/19

TOTAL HPCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 21 OF 68

BOXPLOT

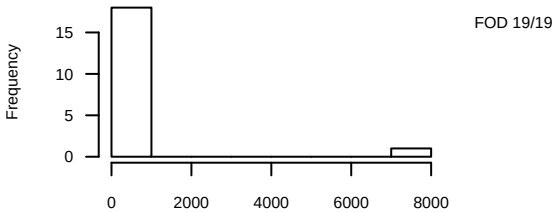


NORMAL PROBABILITY PLOT



Theoretical Quantiles
Shapiro Wilk P−Value = 0

HISTOGRAM

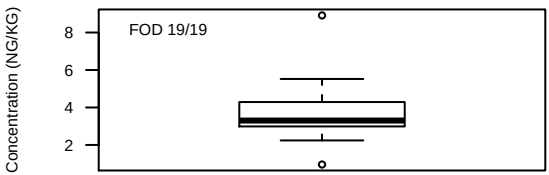


Concentration (NG/KG)

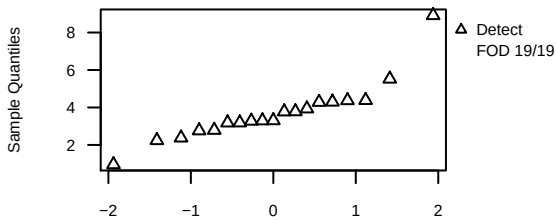
SUMMARY STATISTICS

Minimum	2.6
1st Quantile	20.23
Median	27.2
3rd Quantile	72.95
Maximum	7430
FOD	19/19

BOXPLOT OF LOGNORMAL CONCENTRATIONS

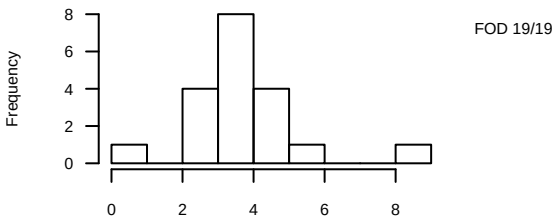


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Theoretical Quantiles
Shapiro Wilk P−Value 0

HISTOGRAM OF LOGNORMAL CONCENTRATIONS



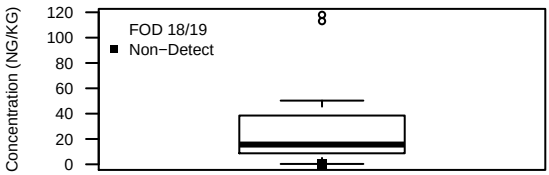
Concentration (NG/KG)

SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

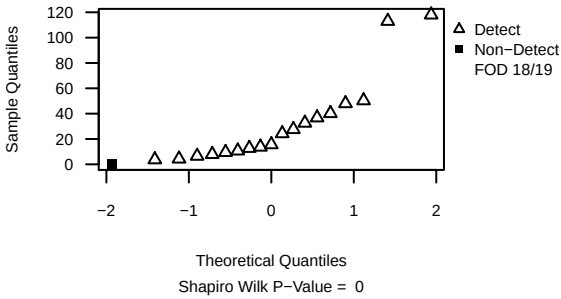
Minimum	0.96
1st Quantile	2.99
Median	3.3
3rd Quantile	4.29
Maximum	8.91
FOD	19/19

TOTAL HPCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 22 OF 68

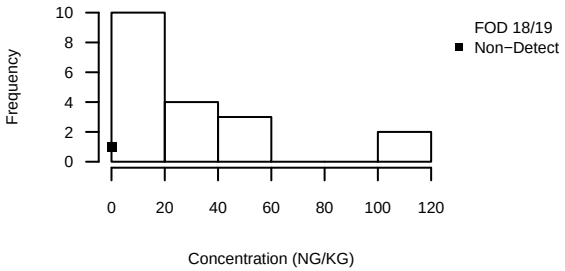
BOXPLOT



NORMAL PROBABILITY PLOT



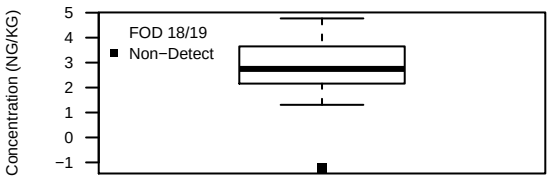
HISTOGRAM



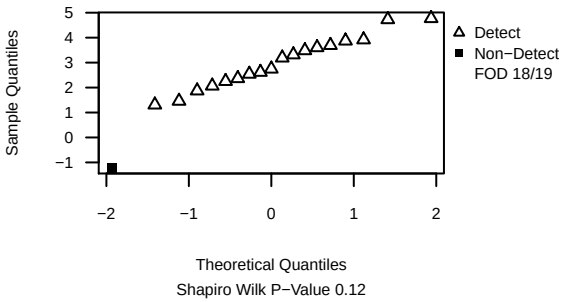
SUMMARY STATISTICS

Minimum	0.3
1st Quantile	8.7
Median	15.6
3rd Quantile	38.5
Maximum	118
FOD	18/19

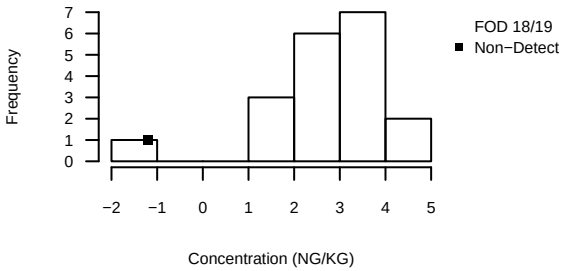
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

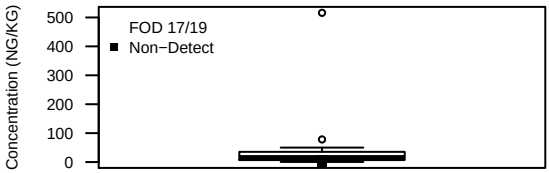


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

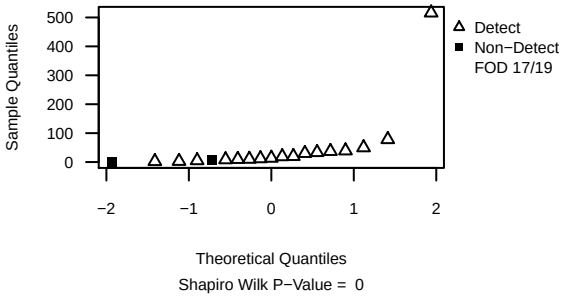
Minimum	−1.2
1st Quantile	2.16
Median	2.75
3rd Quantile	3.65
Maximum	4.77
FOD	18/19

TOTAL HXCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 23 OF 68

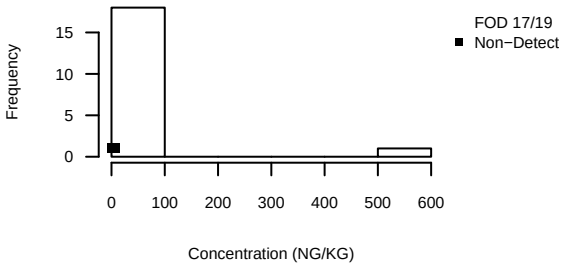
BOXPLOT



NORMAL PROBABILITY PLOT



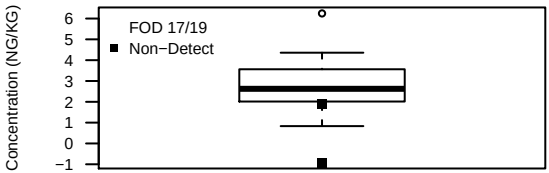
HISTOGRAM



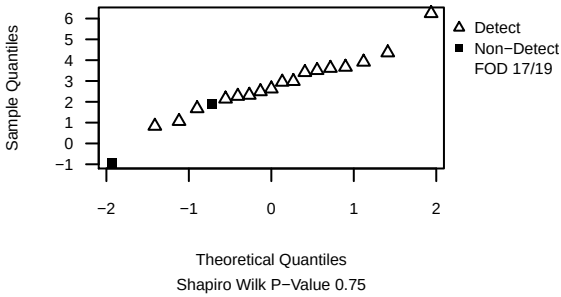
SUMMARY STATISTICS

Minimum	0.4
1st Quantile	7.55
Median	13.8
3rd Quantile	35.35
Maximum	516
FOD	17/19

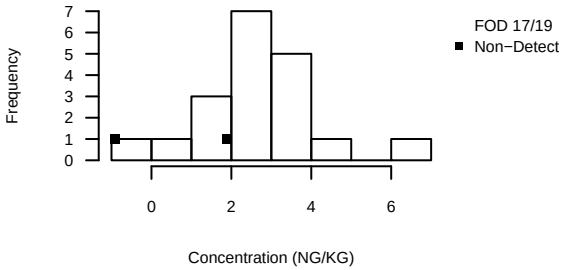
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

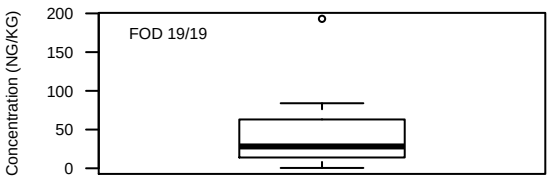


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

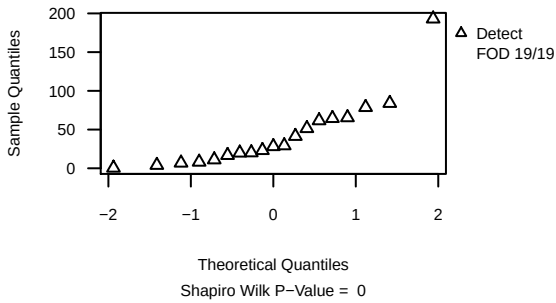
Minimum	−0.92
1st Quantile	2.01
Median	2.62
3rd Quantile	3.56
Maximum	6.25
FOD	17/19

TOTAL HXCDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 24 OF 68

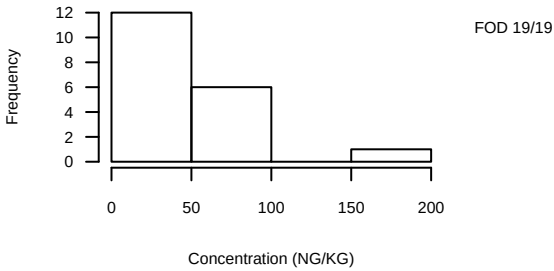
BOXPLOT



NORMAL PROBABILITY PLOT



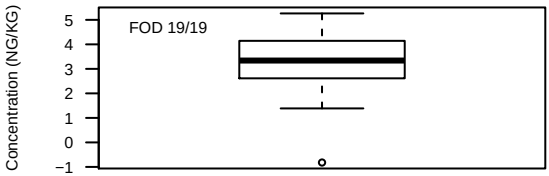
HISTOGRAM



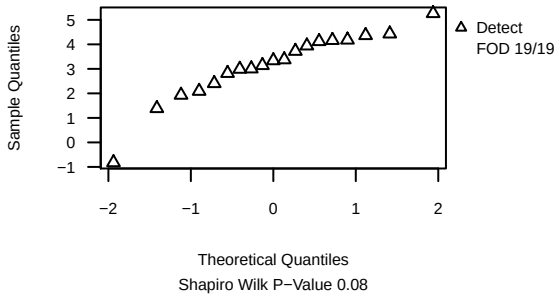
SUMMARY STATISTICS

Minimum	0.44
1st Quantile	13.95
Median	28.2
3rd Quantile	63.05
Maximum	193
FOD	19/19

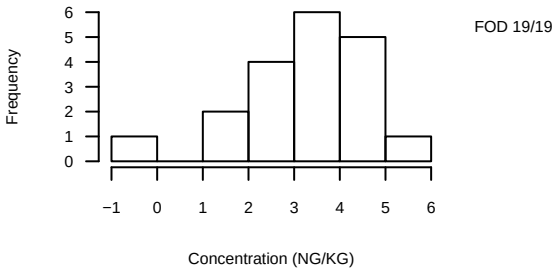
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

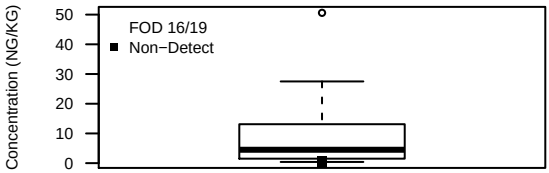


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

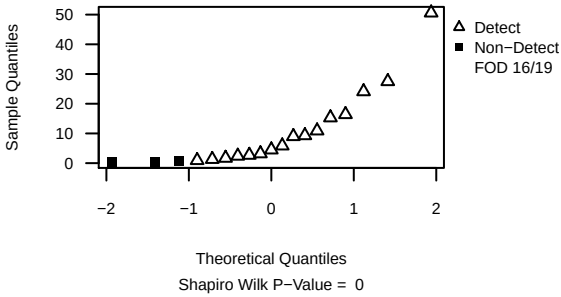
Minimum	−0.82
1st Quantile	2.61
Median	3.34
3rd Quantile	4.14
Maximum	5.26
FOD	19/19

TOTAL PECDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 25 OF 68

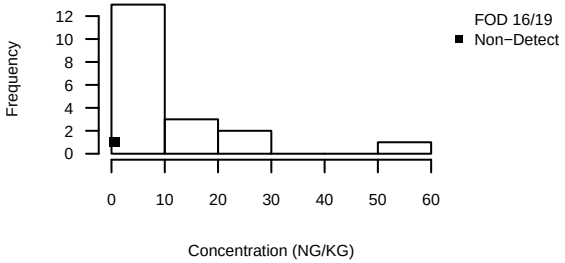
BOXPLOT



NORMAL PROBABILITY PLOT



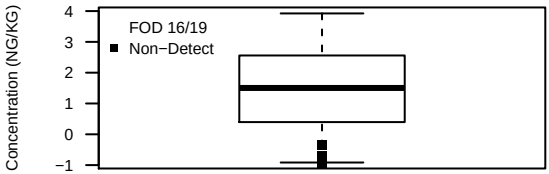
HISTOGRAM



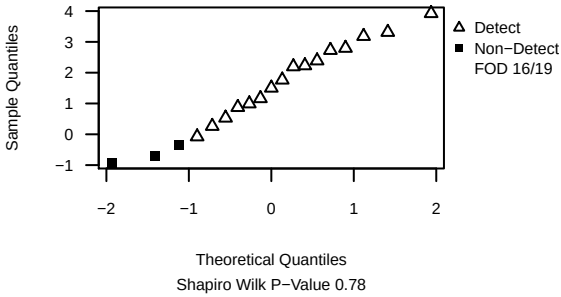
SUMMARY STATISTICS

Minimum	0.4
1st Quantile	1.5
Median	4.5
3rd Quantile	13.1
Maximum	50.6
FOD	16/19

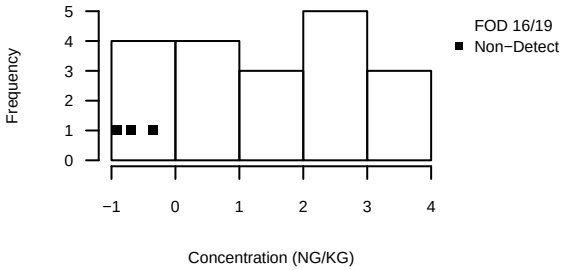
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

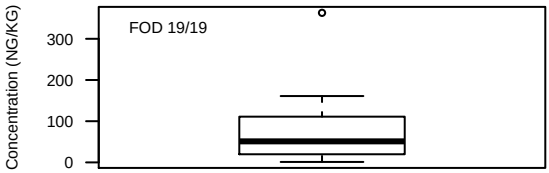


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

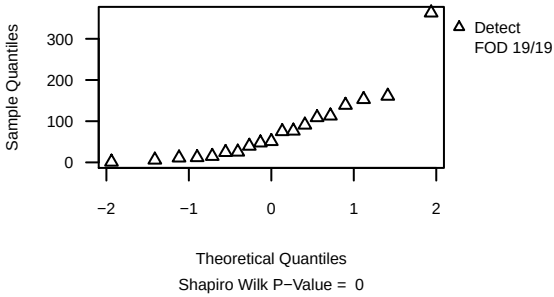
Minimum	−0.92
1st Quantile	0.4
Median	1.5
3rd Quantile	2.56
Maximum	3.92
FOD	16/19

TOTAL PECDF SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 26 OF 68

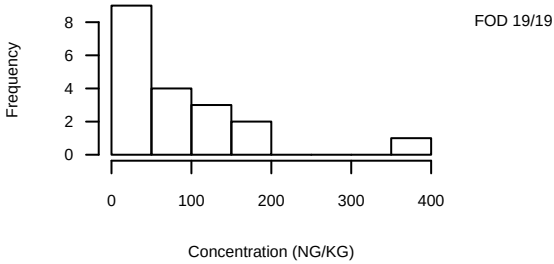
BOXPLOT



NORMAL PROBABILITY PLOT



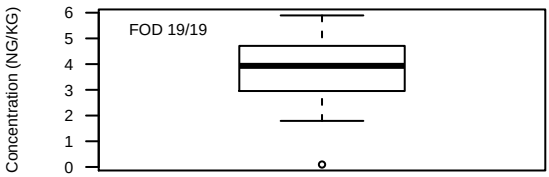
HISTOGRAM



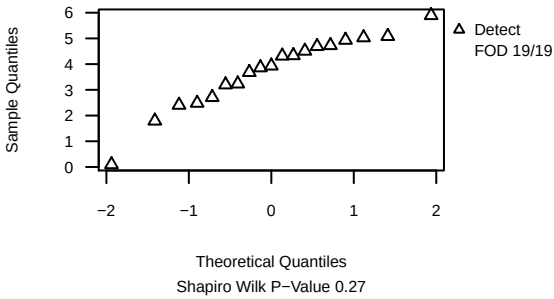
SUMMARY STATISTICS

Minimum	1.1
1st Quantile	19.75
Median	51.05
3rd Quantile	111
Maximum	363
FOD	19/19

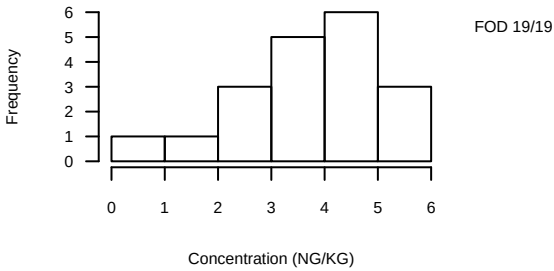
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

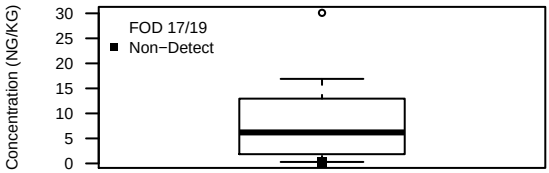


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

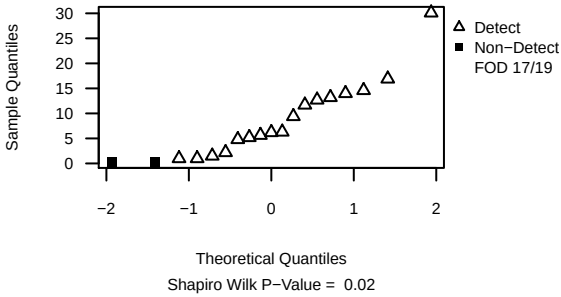
Minimum	0.1
1st Quantile	2.95
Median	3.93
3rd Quantile	4.71
Maximum	5.89
FOD	19/19

TOTAL TCDD SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 27 OF 68

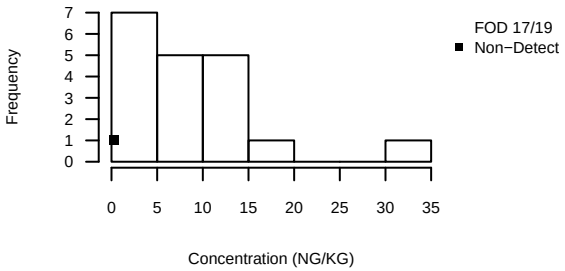
BOXPLOT



NORMAL PROBABILITY PLOT



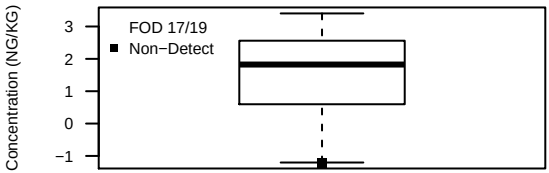
HISTOGRAM



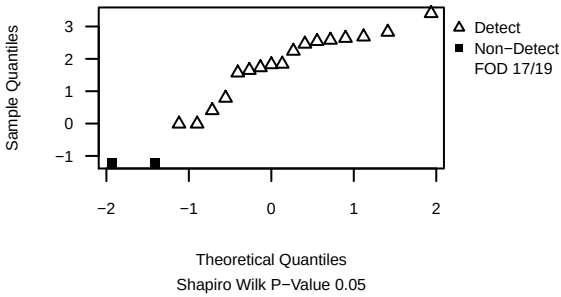
SUMMARY STATISTICS

Minimum	0.3
1st Quantile	1.85
Median	6.2
3rd Quantile	12.95
Maximum	30.1
FOD	17/19

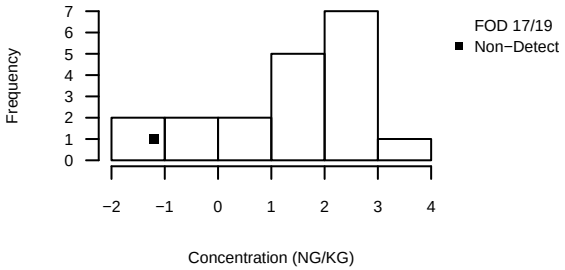
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



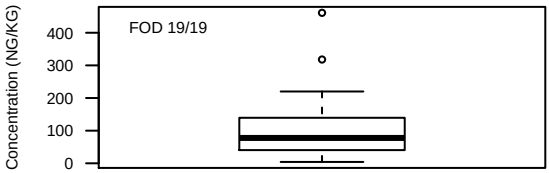
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



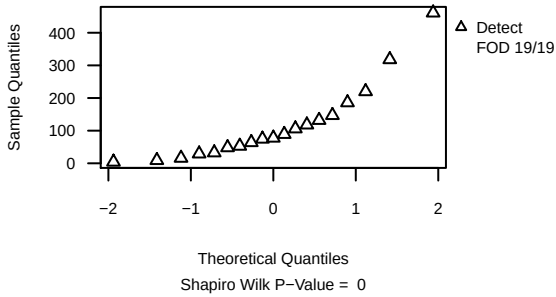
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−1.2
1st Quantile	0.6
Median	1.82
3rd Quantile	2.56
Maximum	3.4
FOD	17/19

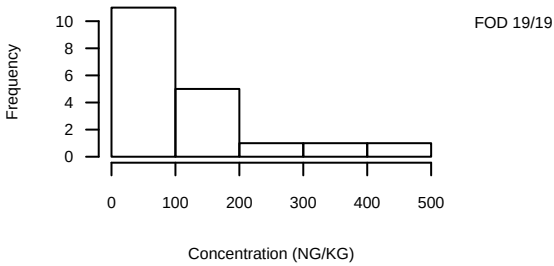
BOXPLOT



NORMAL PROBABILITY PLOT



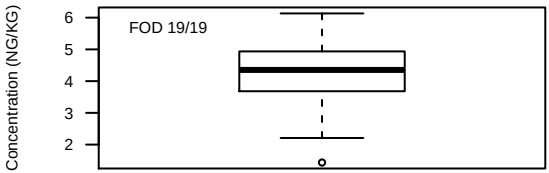
HISTOGRAM



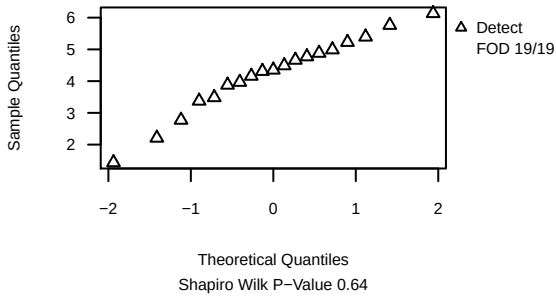
SUMMARY STATISTICS

Minimum	4.2
1st Quantile	40.45
Median	77.7
3rd Quantile	139.5
Maximum	461
FOD	19/19

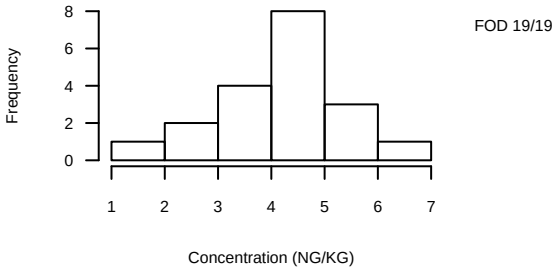
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

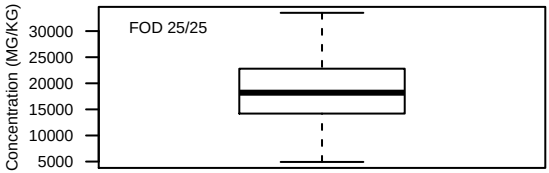


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

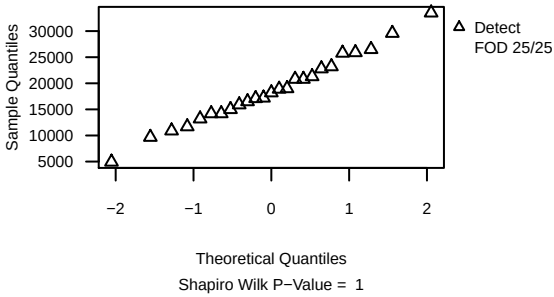
Minimum	1.44
1st Quantile	3.68
Median	4.35
3rd Quantile	4.94
Maximum	6.13
FOD	19/19

ALUMINUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 29 OF 68

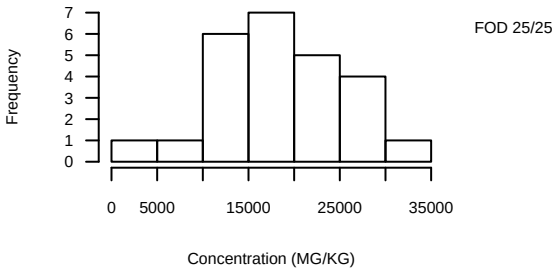
BOXPLOT



NORMAL PROBABILITY PLOT



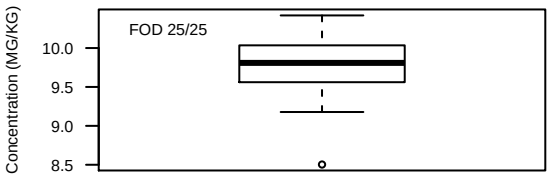
HISTOGRAM



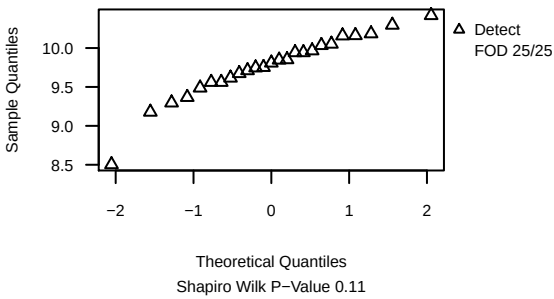
SUMMARY STATISTICS

Minimum	4930
1st Quantile	14200
Median	18200
3rd Quantile	22800
Maximum	33500
FOD	25/25

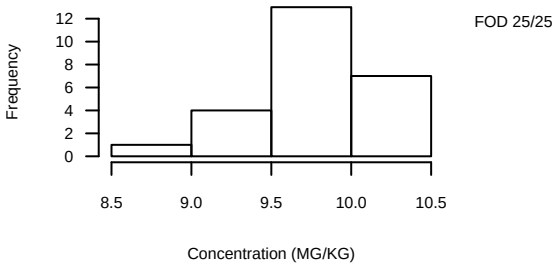
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

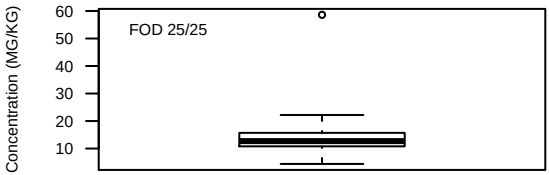


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

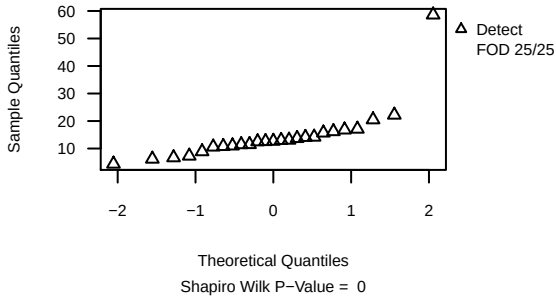
Minimum	8.5
1st Quantile	9.56
Median	9.81
3rd Quantile	10.03
Maximum	10.42
FOD	25/25

ARSENIC SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 30 OF 68

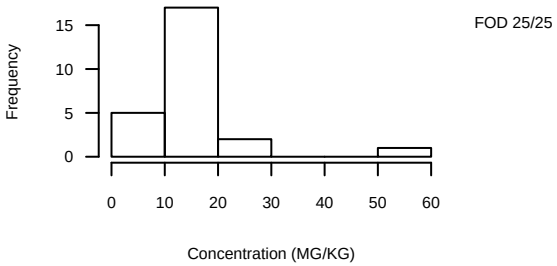
BOXPLOT



NORMAL PROBABILITY PLOT



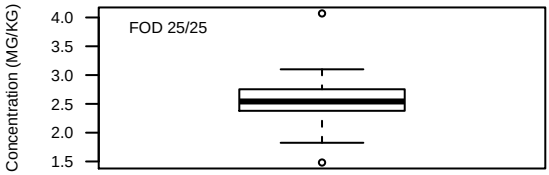
HISTOGRAM



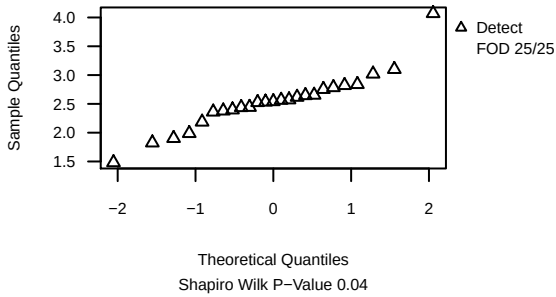
SUMMARY STATISTICS

Minimum	4.4
1st Quantile	10.8
Median	12.7
3rd Quantile	15.7
Maximum	58.6
FOD	25/25

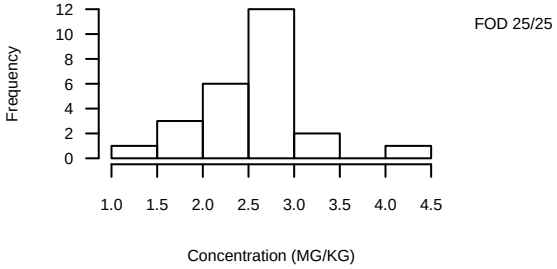
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

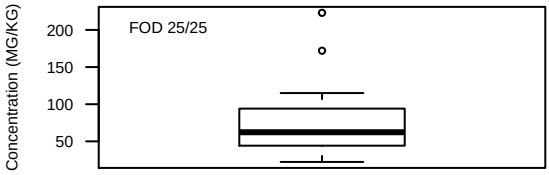


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

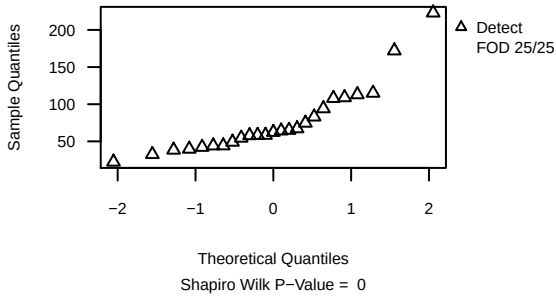
Minimum	1.48
1st Quantile	2.38
Median	2.54
3rd Quantile	2.75
Maximum	4.07
FOD	25/25

BARIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 31 OF 68

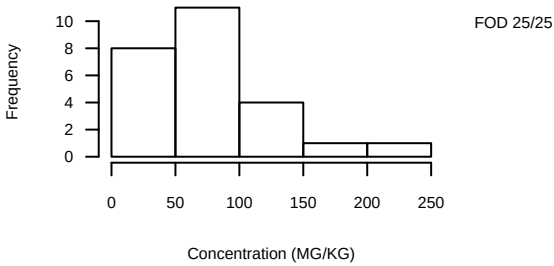
BOXPLOT



NORMAL PROBABILITY PLOT



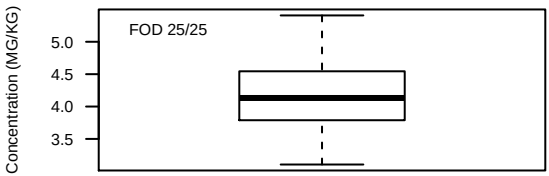
HISTOGRAM



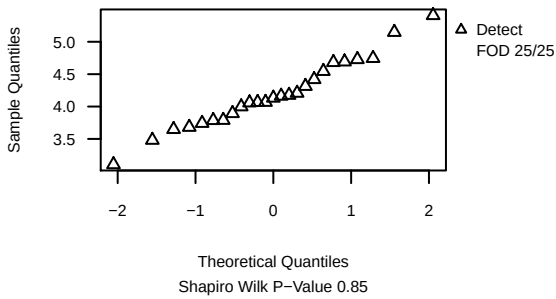
SUMMARY STATISTICS

Minimum	22.3
1st Quantile	44.2
Median	62.3
3rd Quantile	94.1
Maximum	223
FOD	25/25

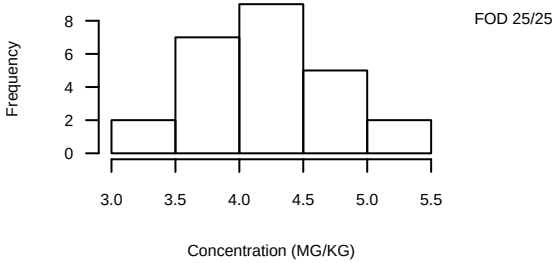
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



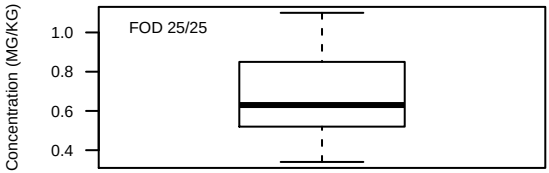
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



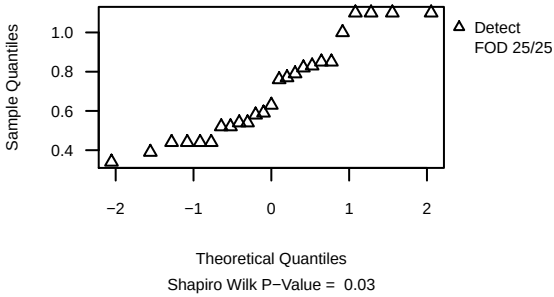
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.1
1st Quantile	3.79
Median	4.13
3rd Quantile	4.54
Maximum	5.41
FOD	25/25

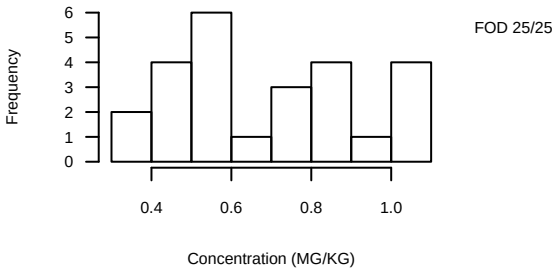
BOXPLOT



NORMAL PROBABILITY PLOT



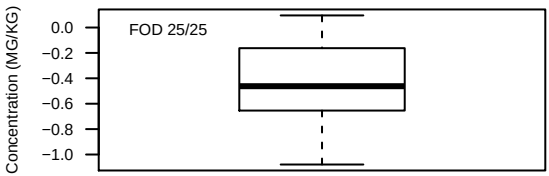
HISTOGRAM



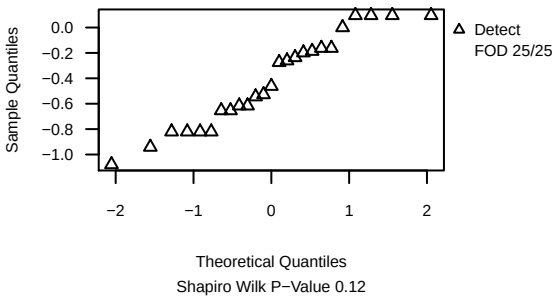
SUMMARY STATISTICS

Minimum	0.34
1st Quantile	0.52
Median	0.63
3rd Quantile	0.85
Maximum	1.1
FOD	25/25

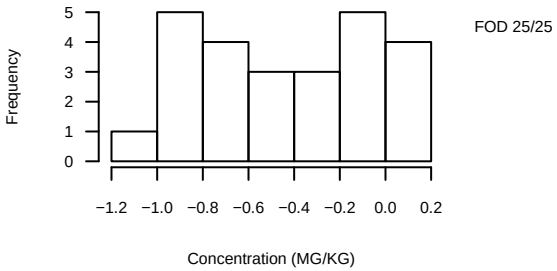
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

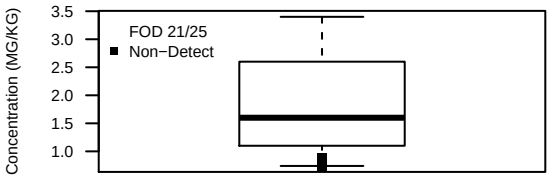


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

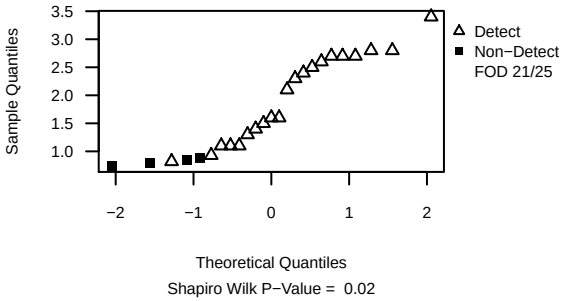
Minimum	−1.08
1st Quantile	−0.65
Median	−0.46
3rd Quantile	−0.16
Maximum	0.1
FOD	25/25

CADMIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 33 OF 68

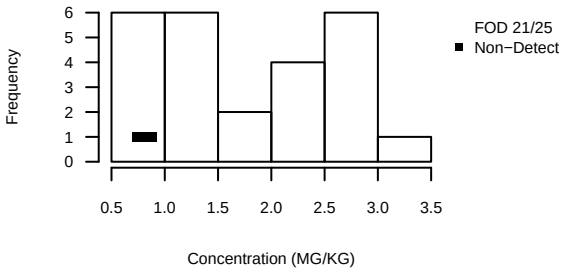
BOXPLOT



NORMAL PROBABILITY PLOT



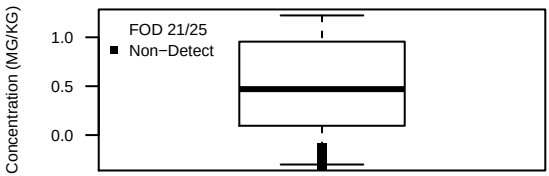
HISTOGRAM



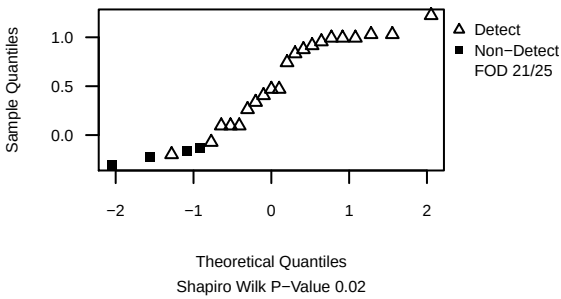
SUMMARY STATISTICS

Minimum	0.74
1st Quantile	1.1
Median	1.6
3rd Quantile	2.6
Maximum	3.4
FOD	21/25

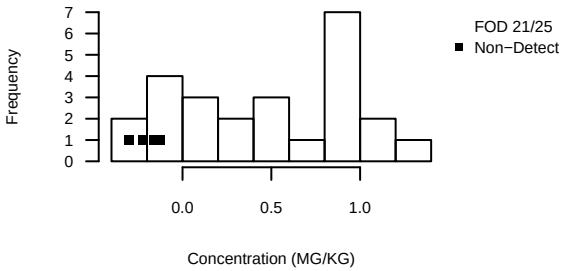
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

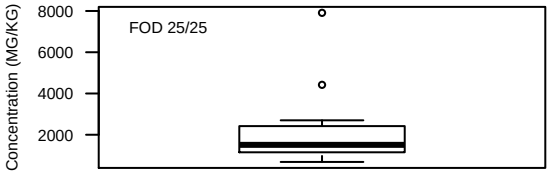


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

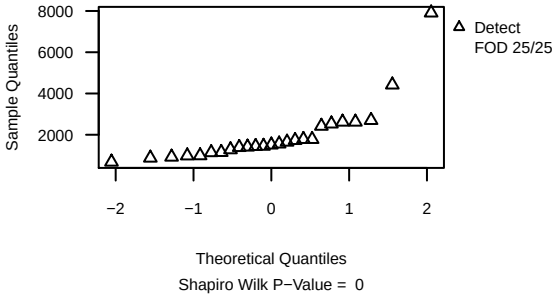
Minimum	−0.3
1st Quantile	0.1
Median	0.47
3rd Quantile	0.96
Maximum	1.22
FOD	21/25

CALCIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 34 OF 68

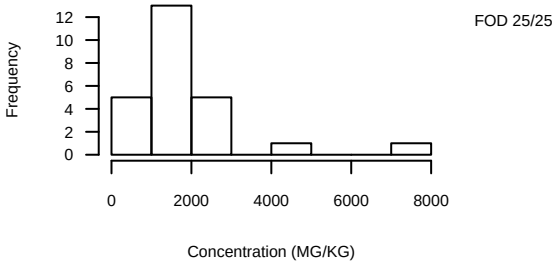
BOXPLOT



NORMAL PROBABILITY PLOT



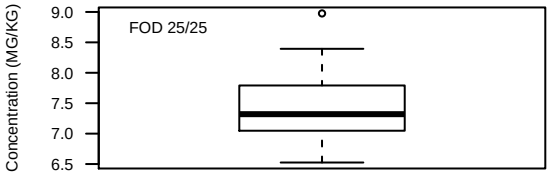
HISTOGRAM



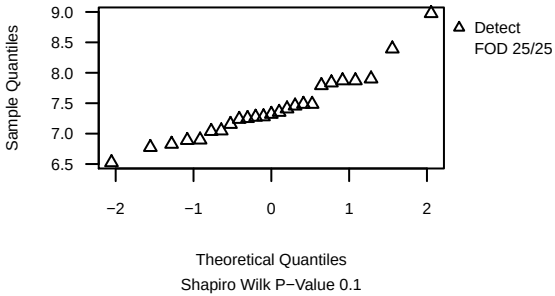
SUMMARY STATISTICS

Minimum	682
1st Quantile	1150
Median	1510
3rd Quantile	2420
Maximum	7910
FOD	25/25

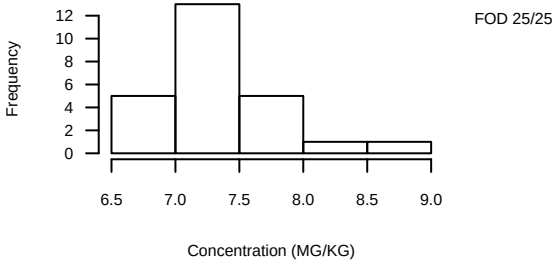
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

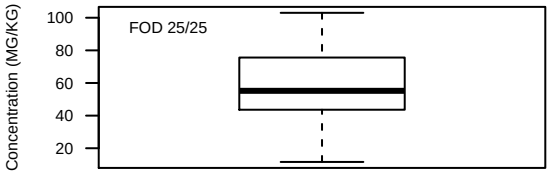


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

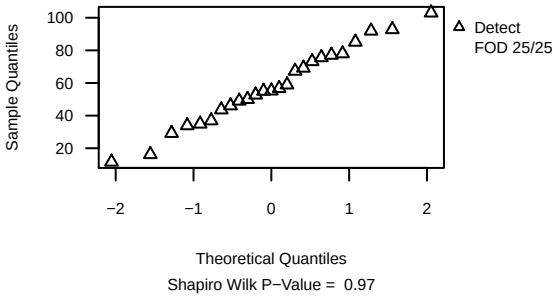
Minimum	6.53
1st Quantile	7.05
Median	7.32
3rd Quantile	7.79
Maximum	8.98
FOD	25/25

CHROMIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 35 OF 68

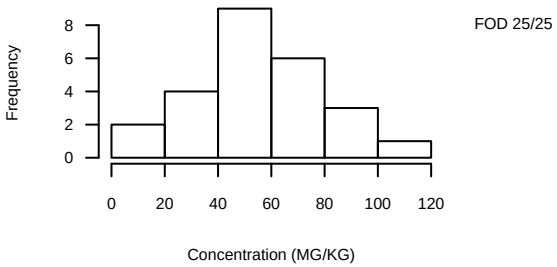
BOXPLOT



NORMAL PROBABILITY PLOT



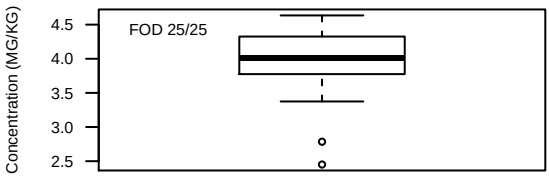
HISTOGRAM



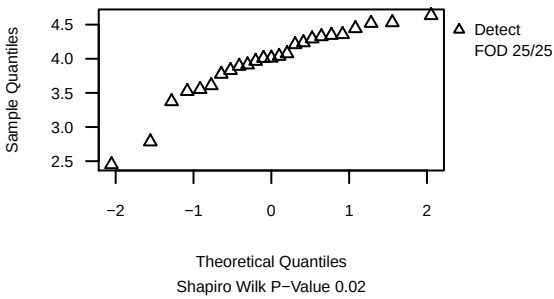
SUMMARY STATISTICS

Minimum	11.6
1st Quantile	43.6
Median	55.2
3rd Quantile	75.6
Maximum	103
FOD	25/25

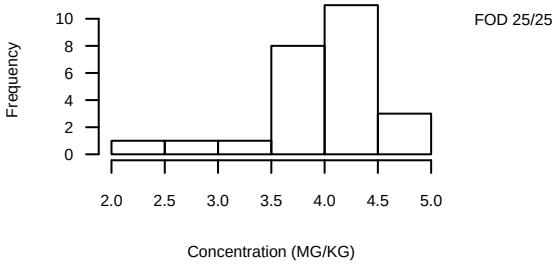
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



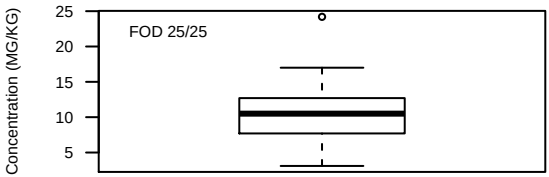
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



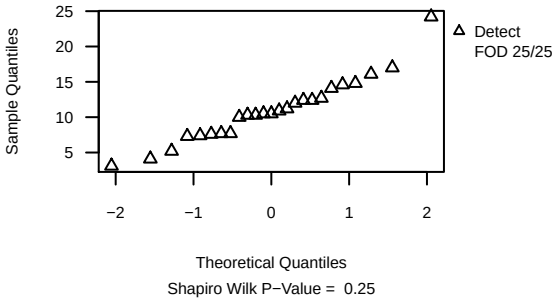
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	2.45
1st Quantile	3.77
Median	4.01
3rd Quantile	4.33
Maximum	4.63
FOD	25/25

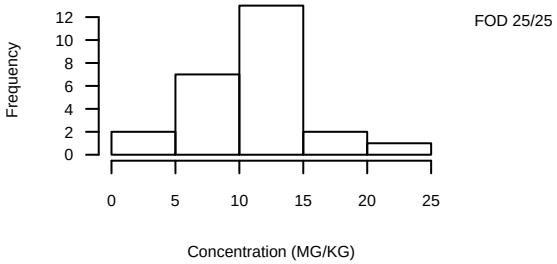
BOXPLOT



NORMAL PROBABILITY PLOT



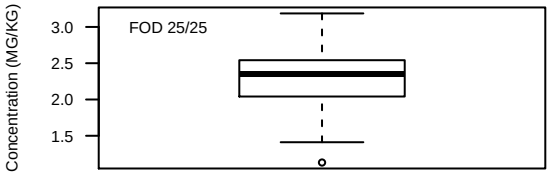
HISTOGRAM



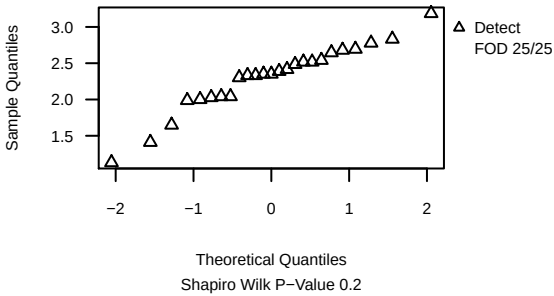
SUMMARY STATISTICS

Minimum	3.1
1st Quantile	7.7
Median	10.5
3rd Quantile	12.7
Maximum	24.2
FOD	25/25

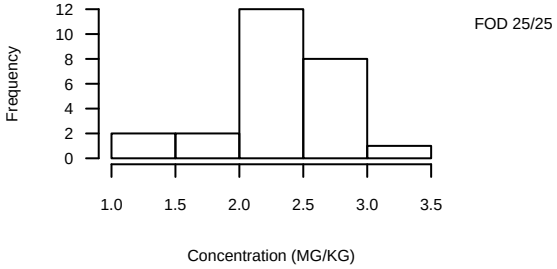
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



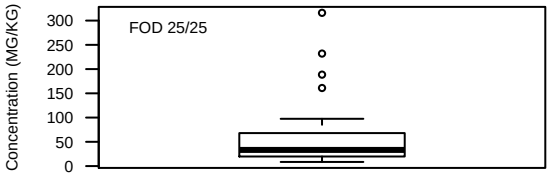
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



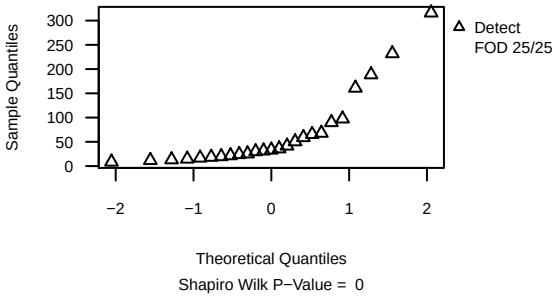
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	1.13
1st Quantile	2.04
Median	2.35
3rd Quantile	2.54
Maximum	3.19
FOD	25/25

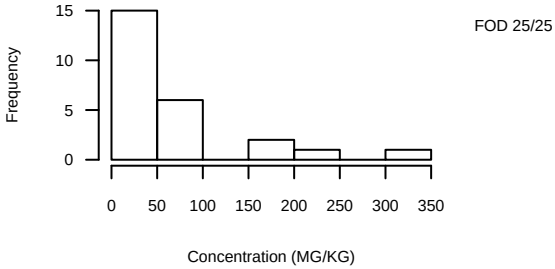
BOXPLOT



NORMAL PROBABILITY PLOT



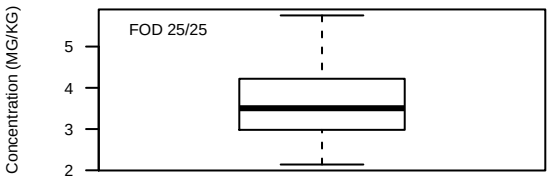
HISTOGRAM



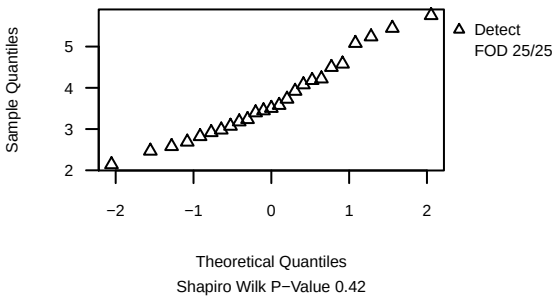
SUMMARY STATISTICS

Minimum	8.5
1st Quantile	19.7
Median	33.3
3rd Quantile	68
Maximum	316
FOD	25/25

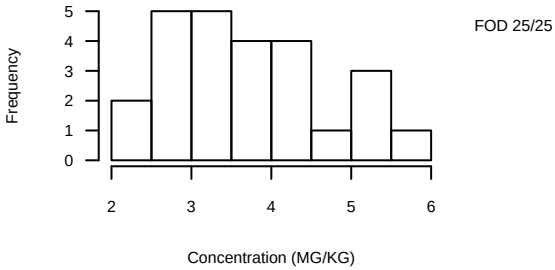
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

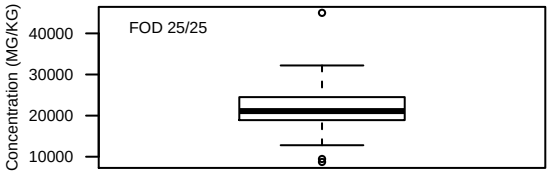


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

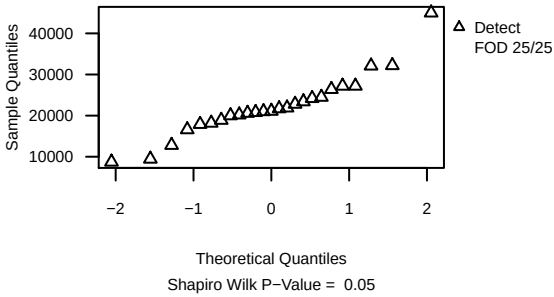
Minimum	2.14
1st Quantile	2.98
Median	3.51
3rd Quantile	4.22
Maximum	5.76
FOD	25/25

IRON SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 38 OF 68

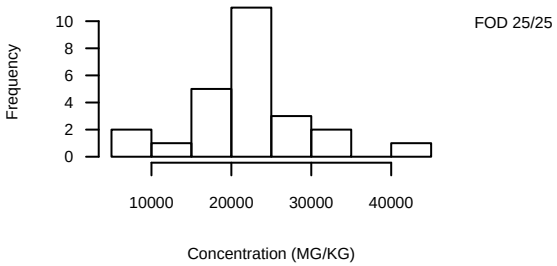
BOXPLOT



NORMAL PROBABILITY PLOT



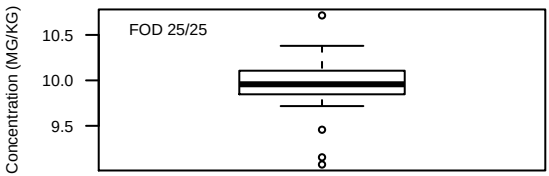
HISTOGRAM



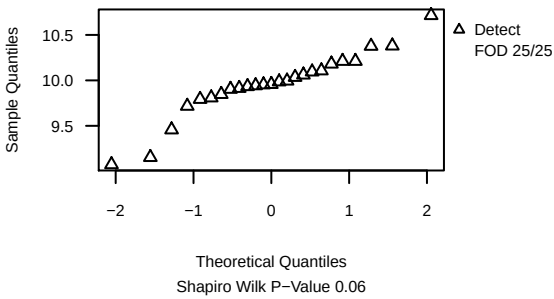
SUMMARY STATISTICS

Minimum	8730
1st Quantile	18900
Median	21100
3rd Quantile	24500
Maximum	45000
FOD	25/25

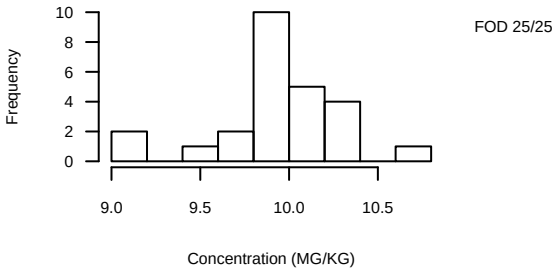
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



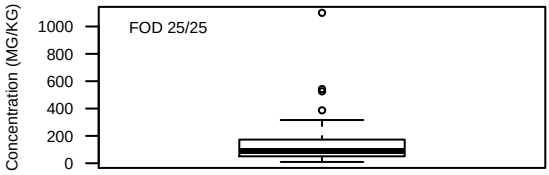
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



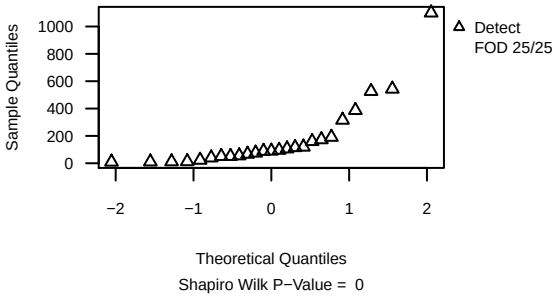
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	9.07
1st Quantile	9.85
Median	9.96
3rd Quantile	10.11
Maximum	10.71
FOD	25/25

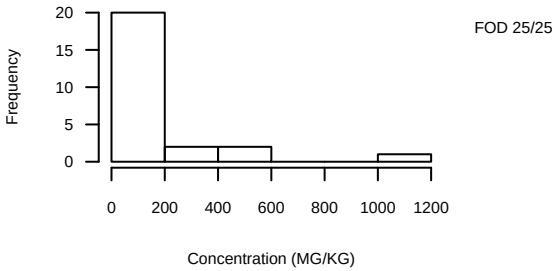
BOXPLOT



NORMAL PROBABILITY PLOT



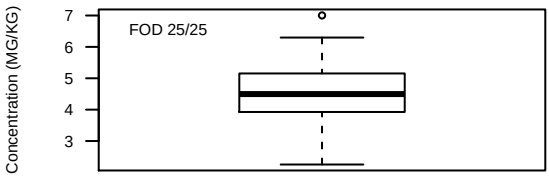
HISTOGRAM



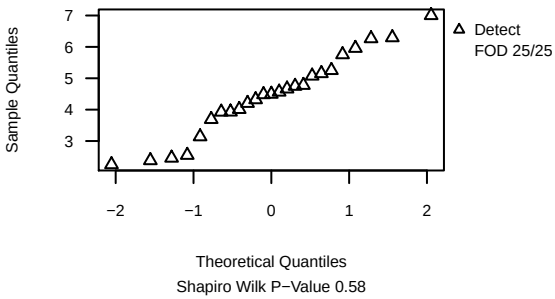
SUMMARY STATISTICS

Minimum	9.5
1st Quantile	50.7
Median	89.7
3rd Quantile	173
Maximum	1100
FOD	25/25

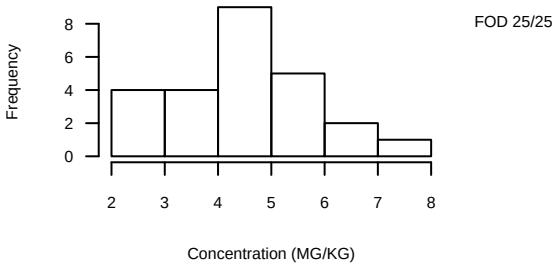
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

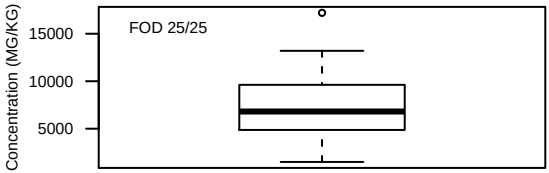


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

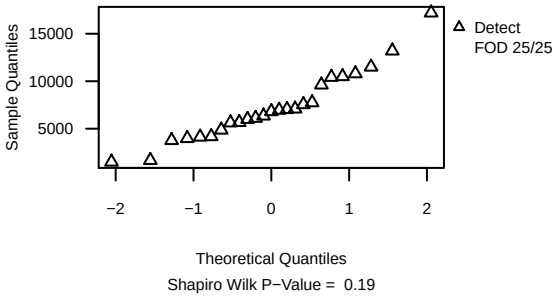
Minimum	2.25
1st Quantile	3.93
Median	4.5
3rd Quantile	5.15
Maximum	7
FOD	25/25

MAGNESIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 40 OF 68

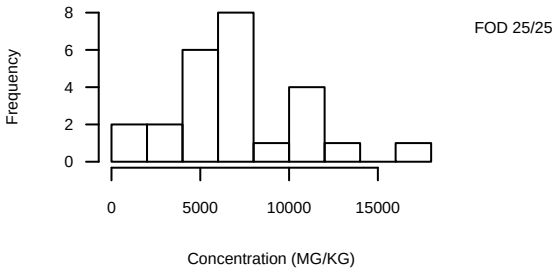
BOXPLOT



NORMAL PROBABILITY PLOT



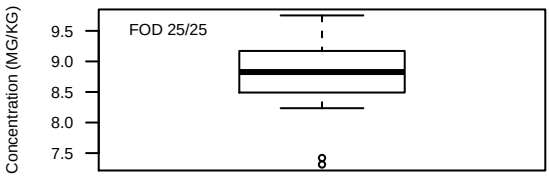
HISTOGRAM



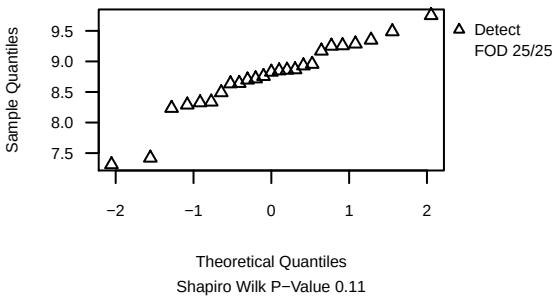
SUMMARY STATISTICS

Minimum	1500
1st Quantile	4870
Median	6810
3rd Quantile	9620
Maximum	17200
FOD	25/25

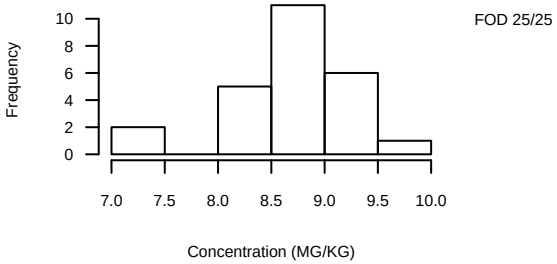
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

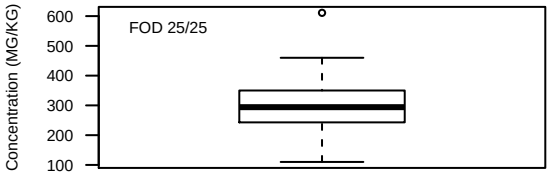


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

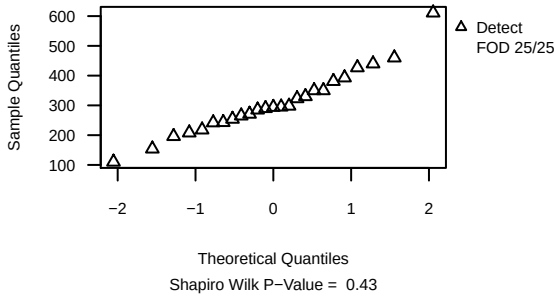
Minimum	7.31
1st Quantile	8.49
Median	8.83
3rd Quantile	9.17
Maximum	9.75
FOD	25/25

MANGANESE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 41 OF 68

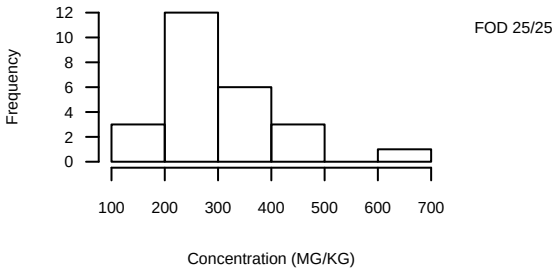
BOXPLOT



NORMAL PROBABILITY PLOT



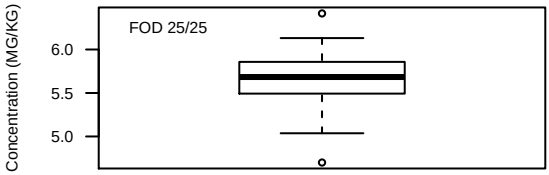
HISTOGRAM



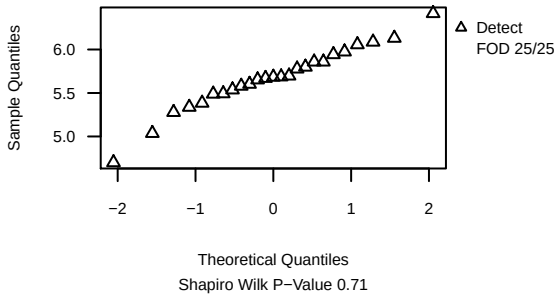
SUMMARY STATISTICS

Minimum	110
1st Quantile	243
Median	294
3rd Quantile	350
Maximum	611
FOD	25/25

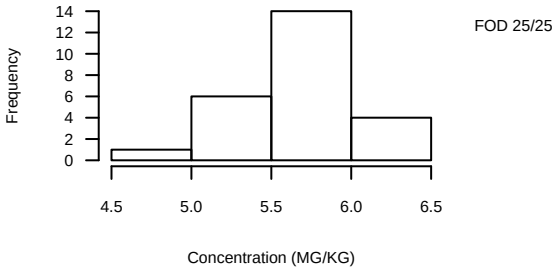
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

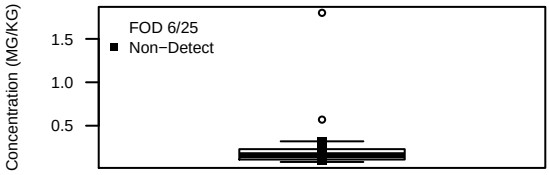


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

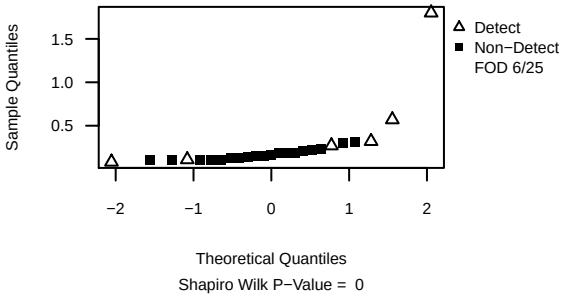
Minimum	4.7
1st Quantile	5.49
Median	5.68
3rd Quantile	5.86
Maximum	6.42
FOD	25/25

MERCURY SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 42 OF 68

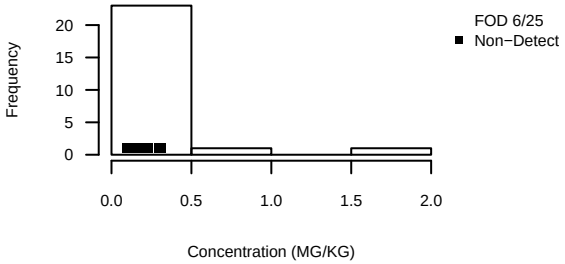
BOXPLOT



NORMAL PROBABILITY PLOT



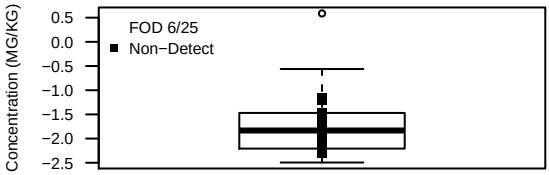
HISTOGRAM



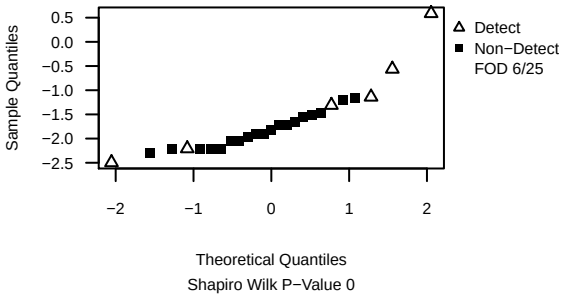
SUMMARY STATISTICS

Minimum	0.08
1st Quantile	0.11
Median	0.16
3rd Quantile	0.23
Maximum	1.8
FOD	6/25

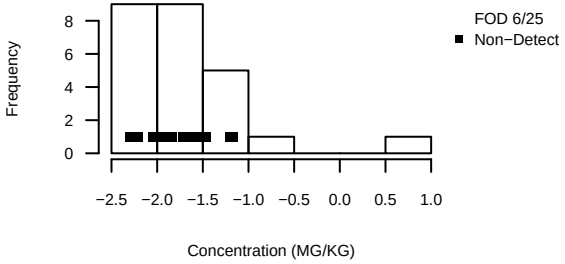
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



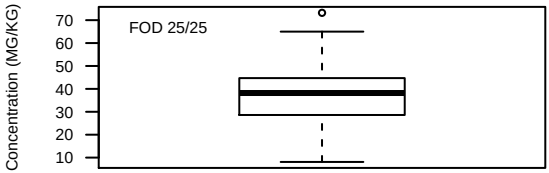
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



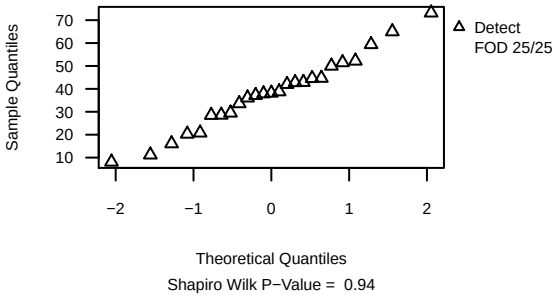
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−2.5
1st Quantile	−2.21
Median	−1.83
3rd Quantile	−1.47
Maximum	0.59
FOD	6/25

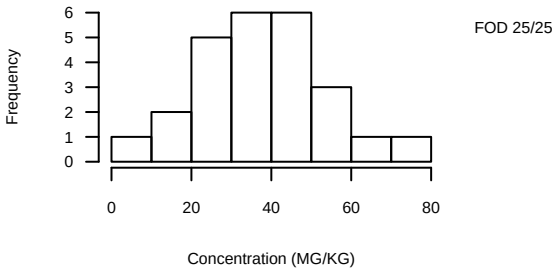
BOXPLOT



NORMAL PROBABILITY PLOT



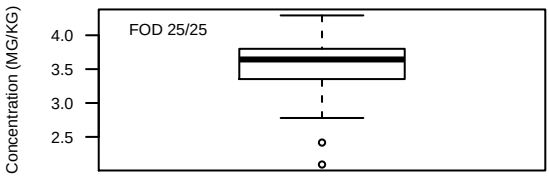
HISTOGRAM



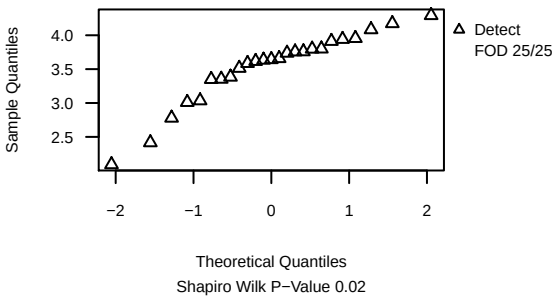
SUMMARY STATISTICS

Minimum	8.1
1st Quantile	28.6
Median	38.2
3rd Quantile	44.7
Maximum	73.2
FOD	25/25

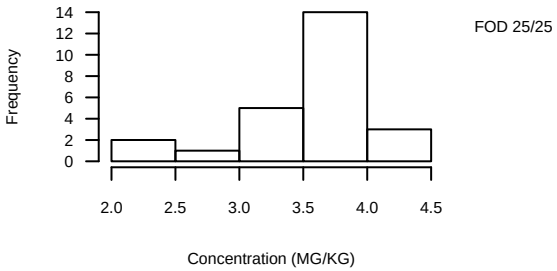
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

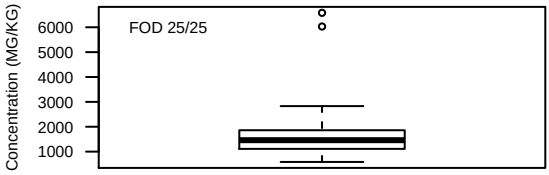


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

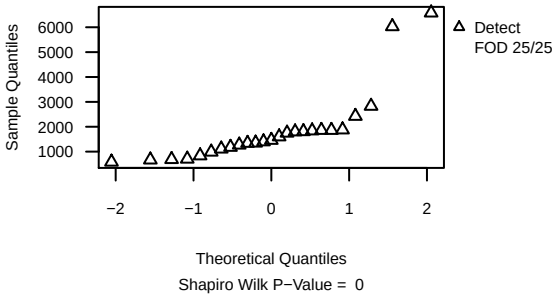
Minimum	2.09
1st Quantile	3.35
Median	3.64
3rd Quantile	3.8
Maximum	4.29
FOD	25/25

POTASSIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 44 OF 68

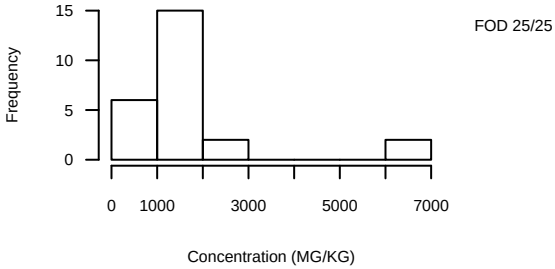
BOXPLOT



NORMAL PROBABILITY PLOT



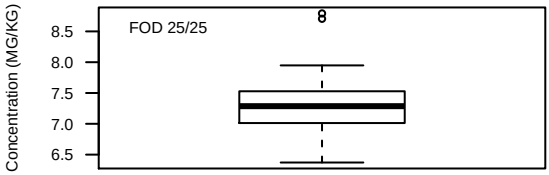
HISTOGRAM



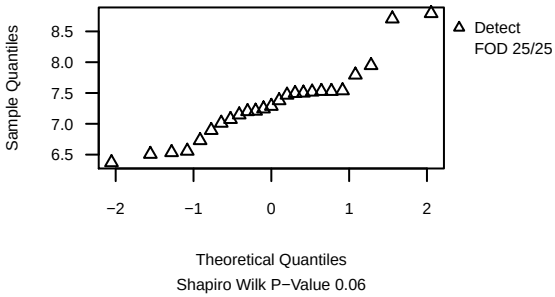
SUMMARY STATISTICS

Minimum	585
1st Quantile	1110
Median	1460
3rd Quantile	1860
Maximum	6580
FOD	25/25

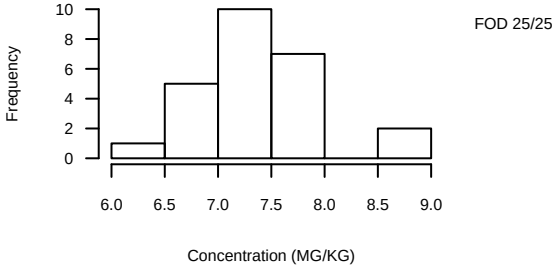
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

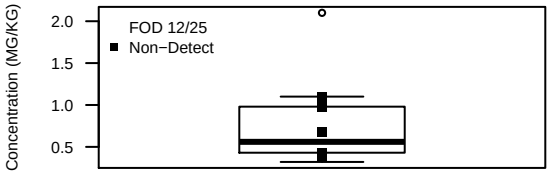


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

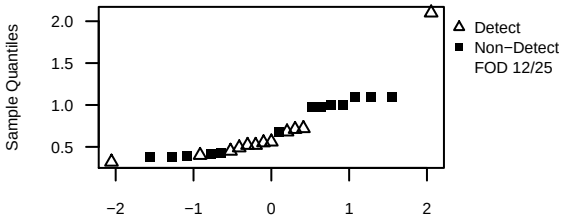
Minimum	6.37
1st Quantile	7.01
Median	7.29
3rd Quantile	7.53
Maximum	8.79
FOD	25/25

SELENIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 45 OF 68

BOXPLOT

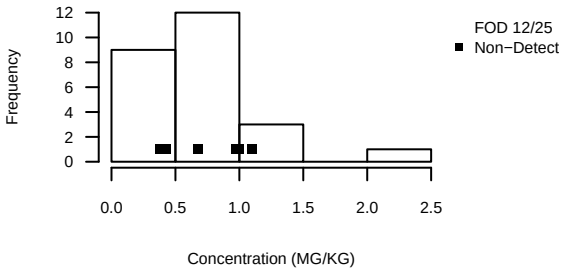


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0

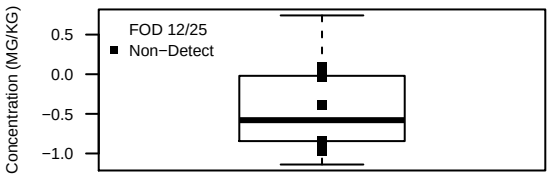
HISTOGRAM



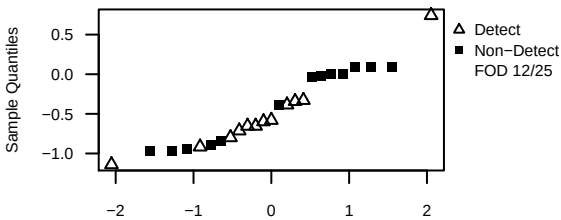
SUMMARY STATISTICS

Minimum	0.32
1st Quantile	0.43
Median	0.56
3rd Quantile	0.98
Maximum	2.1
FOD	12/25

BOXPLOT OF LOGNORMAL CONCENTRATIONS

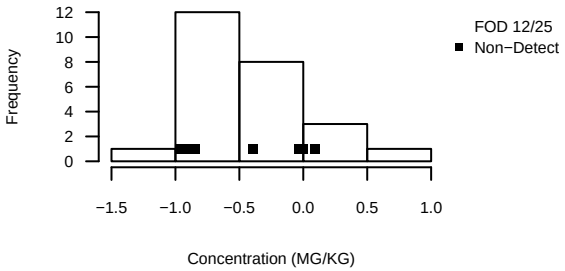


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.1

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

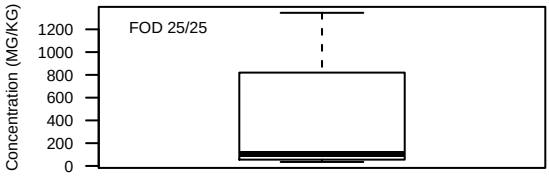


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

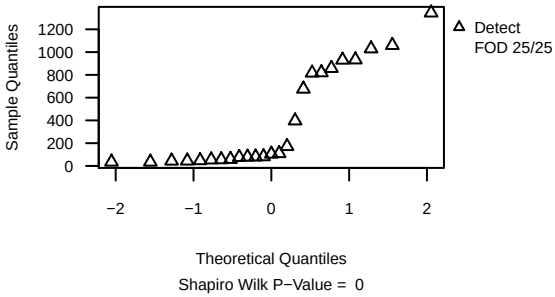
Minimum	−1.14
1st Quantile	−0.84
Median	−0.58
3rd Quantile	−0.02
Maximum	0.74
FOD	12/25

SODIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 46 OF 68

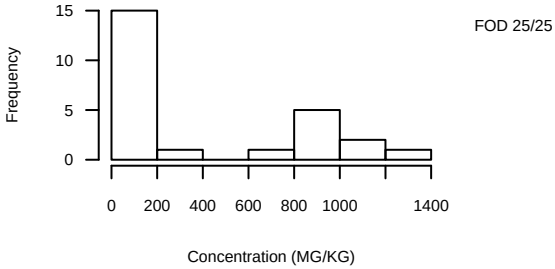
BOXPLOT



NORMAL PROBABILITY PLOT



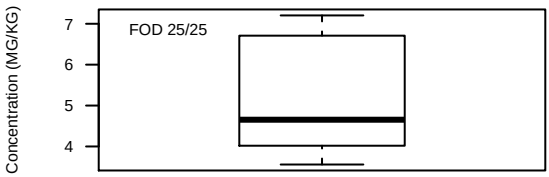
HISTOGRAM



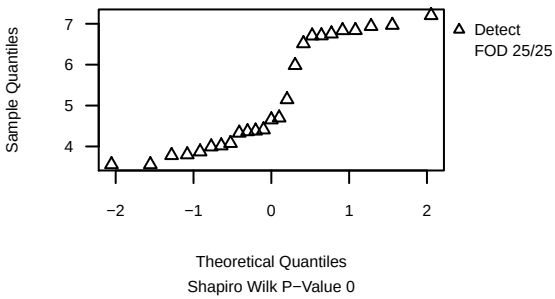
SUMMARY STATISTICS

Minimum	35.1
1st Quantile	55.6
Median	105
3rd Quantile	820
Maximum	1345
FOD	25/25

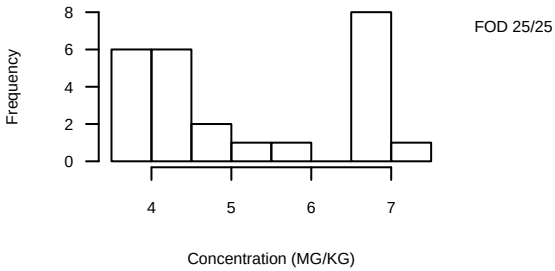
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

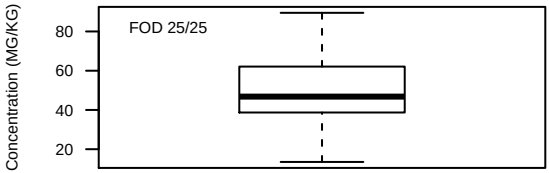


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

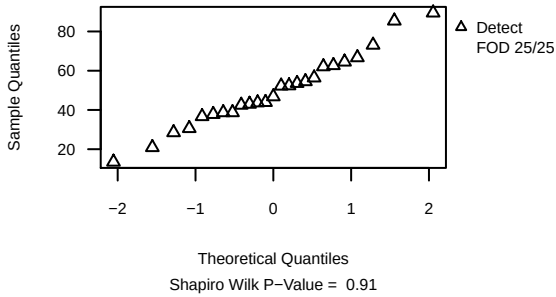
Minimum	3.56
1st Quantile	4.02
Median	4.65
3rd Quantile	6.71
Maximum	7.2
FOD	25/25

VANADIUM SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 47 OF 68

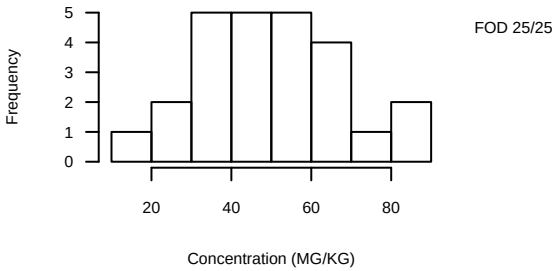
BOXPLOT



NORMAL PROBABILITY PLOT



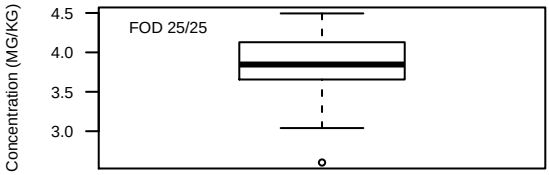
HISTOGRAM



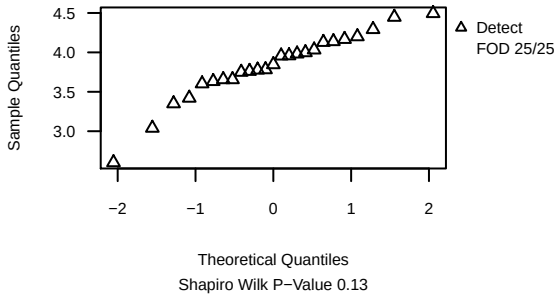
SUMMARY STATISTICS

Minimum	13.5
1st Quantile	38.7
Median	46.8
3rd Quantile	62.1
Maximum	89.5
FOD	25/25

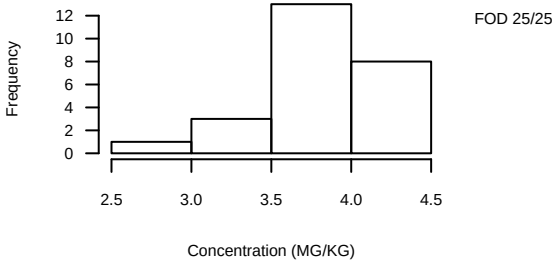
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

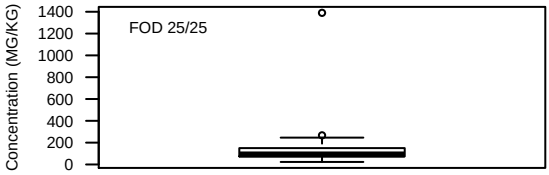


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

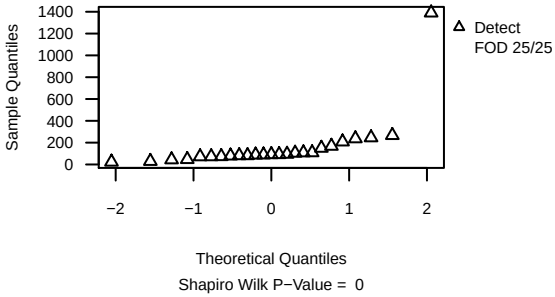
Minimum	2.6
1st Quantile	3.66
Median	3.85
3rd Quantile	4.13
Maximum	4.49
FOD	25/25

ZINC SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 48 OF 68

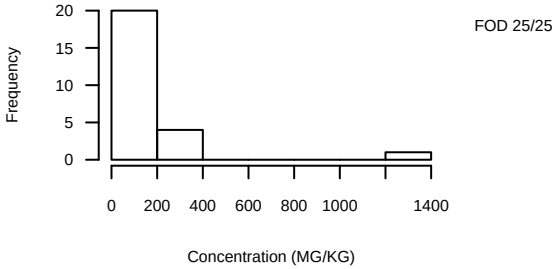
BOXPLOT



NORMAL PROBABILITY PLOT



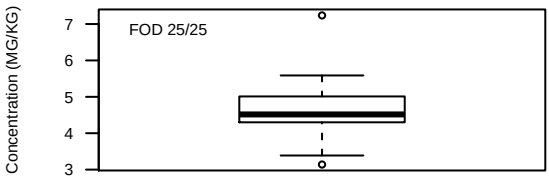
HISTOGRAM



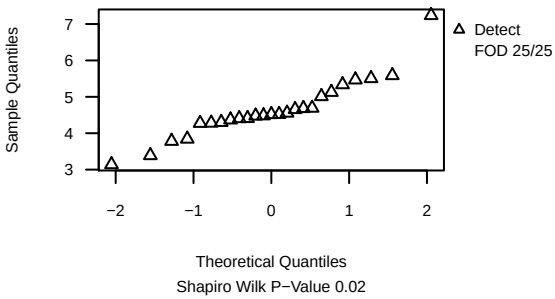
SUMMARY STATISTICS

Minimum	23.1
1st Quantile	73.7
Median	91.5
3rd Quantile	150
Maximum	1390
FOD	25/25

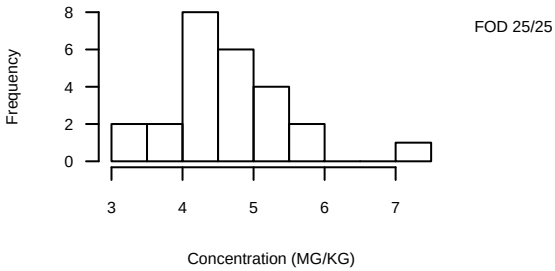
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



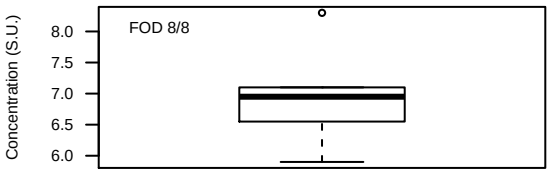
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



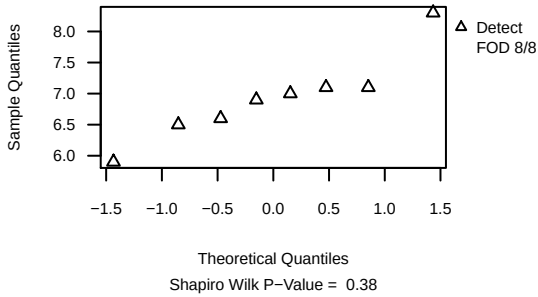
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.14
1st Quantile	4.3
Median	4.52
3rd Quantile	5.01
Maximum	7.24
FOD	25/25

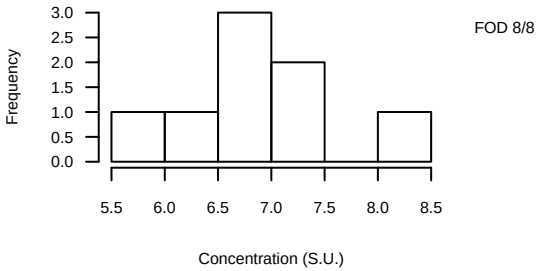
BOXPLOT



NORMAL PROBABILITY PLOT



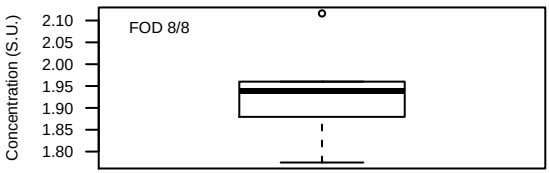
HISTOGRAM



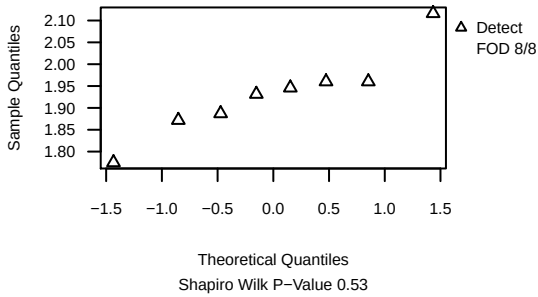
SUMMARY STATISTICS

Minimum	5.9
1st Quantile	6.58
Median	6.95
3rd Quantile	7.1
Maximum	8.3
FOD	8/8

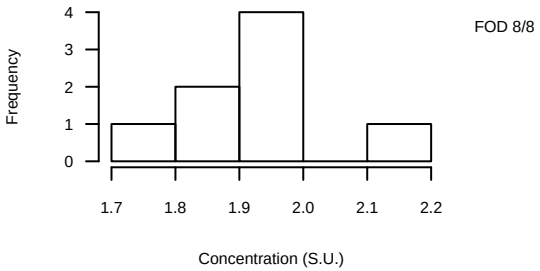
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

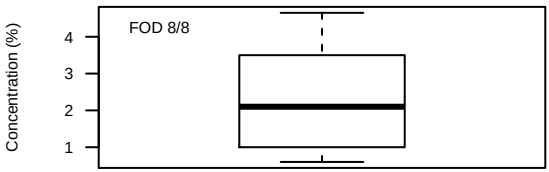


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

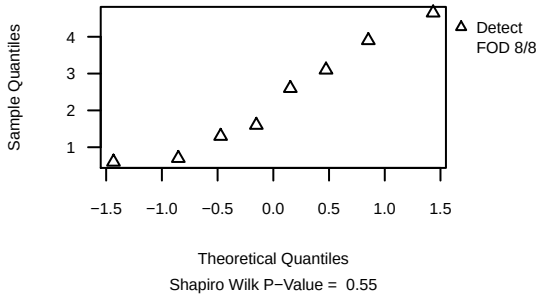
Minimum	1.77
1st Quantile	1.88
Median	1.94
3rd Quantile	1.96
Maximum	2.12
FOD	8/8

TOTAL ORGANIC CARBON SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 50 OF 68

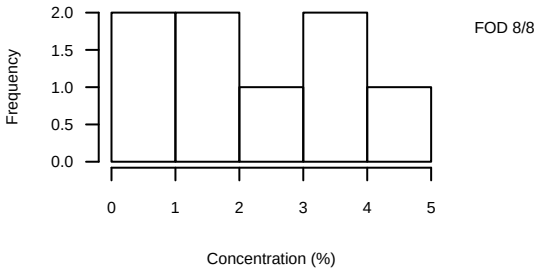
BOXPLOT



NORMAL PROBABILITY PLOT



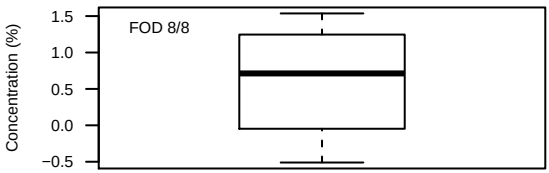
HISTOGRAM



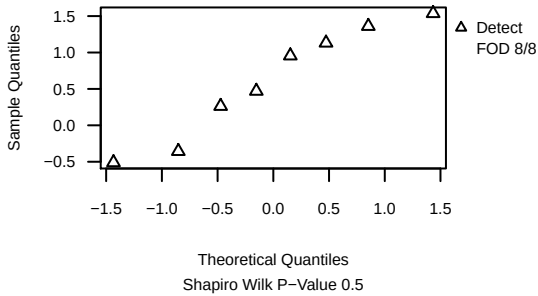
SUMMARY STATISTICS

Minimum	0.6
1st Quantile	1.15
Median	2.1
3rd Quantile	3.3
Maximum	4.65
FOD	8/8

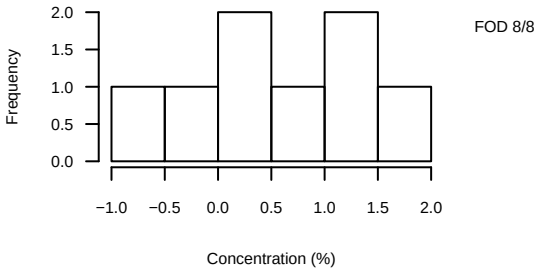
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

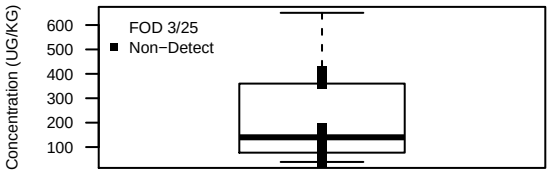


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

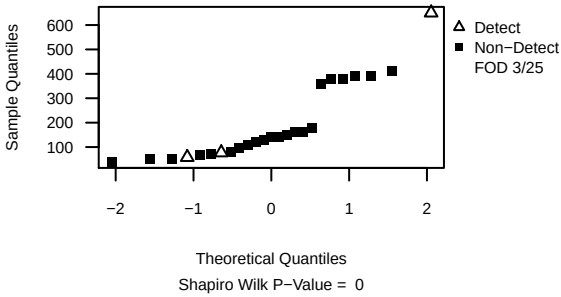
Minimum	−0.51
1st Quantile	0.11
Median	0.71
3rd Quantile	1.19
Maximum	1.54
FOD	8/8

BIS(2−ETHYLHEXYL)PHTHALATE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 51 OF 68

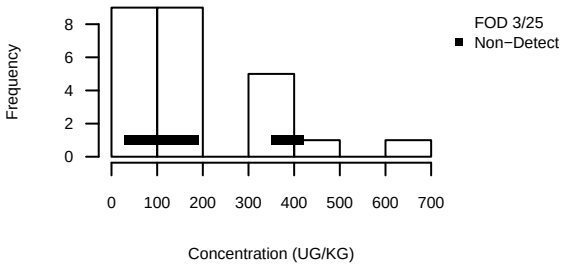
BOXPLOT



NORMAL PROBABILITY PLOT



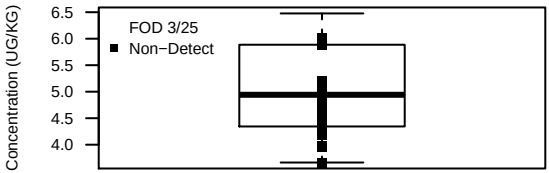
HISTOGRAM



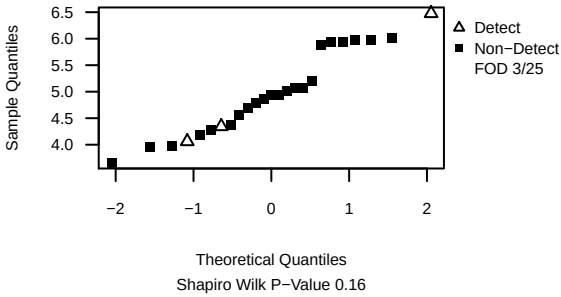
SUMMARY STATISTICS

Minimum	39
1st Quantile	77
Median	140
3rd Quantile	360
Maximum	650
FOD	3/25

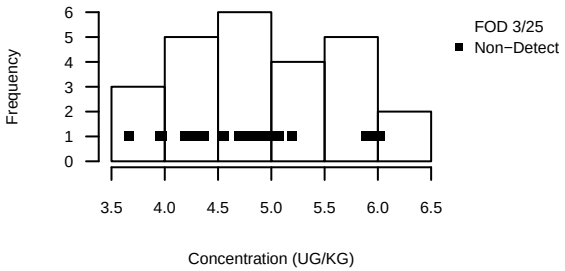
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

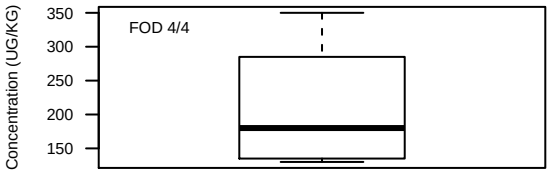


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

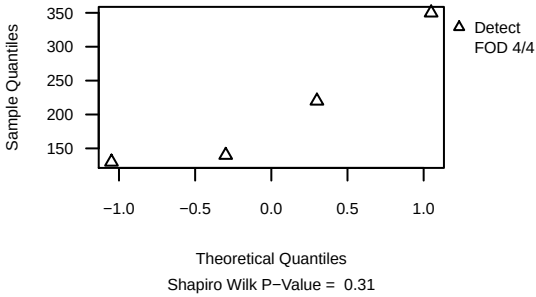
Minimum	3.66
1st Quantile	4.34
Median	4.94
3rd Quantile	5.89
Maximum	6.48
FOD	3/25

TOTAL PETROLEUM HYDROCARBONS SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 52 OF 68

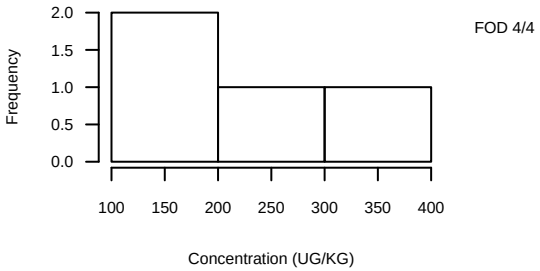
BOXPLOT



NORMAL PROBABILITY PLOT



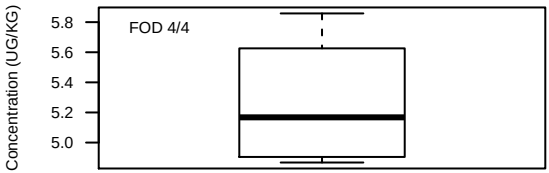
HISTOGRAM



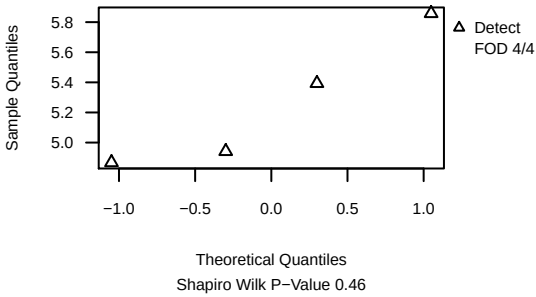
SUMMARY STATISTICS

Minimum	130
1st Quantile	137.5
Median	180
3rd Quantile	252.5
Maximum	350
FOD	4/4

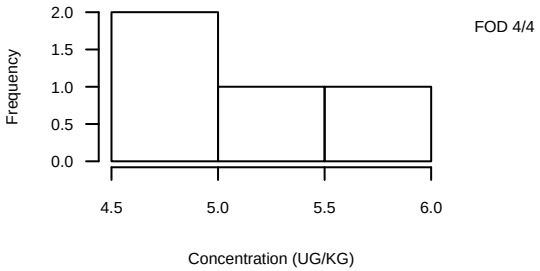
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

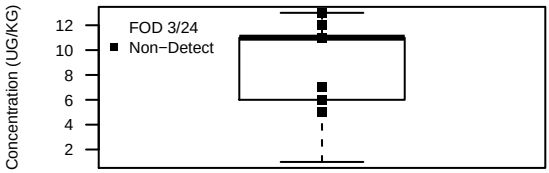


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

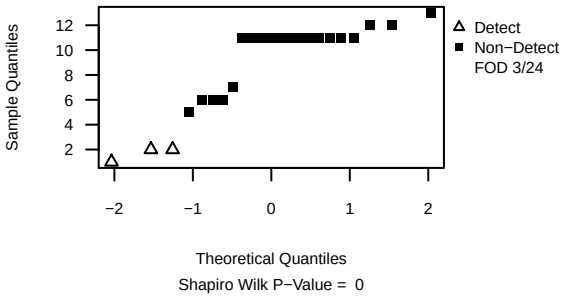
Minimum	4.87
1st Quantile	4.92
Median	5.17
3rd Quantile	5.51
Maximum	5.86
FOD	4/4

METHYLENE CHLORIDE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 53 OF 68

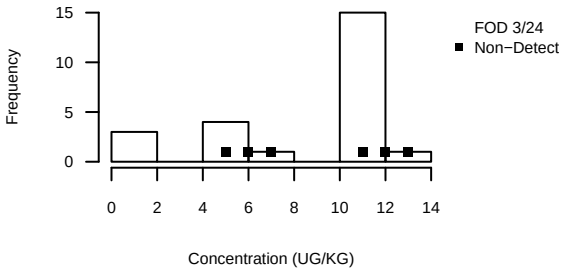
BOXPLOT



NORMAL PROBABILITY PLOT



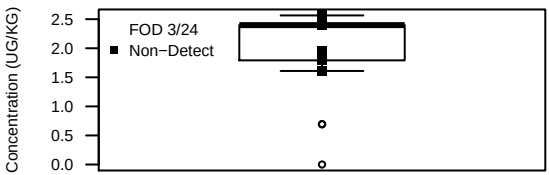
HISTOGRAM



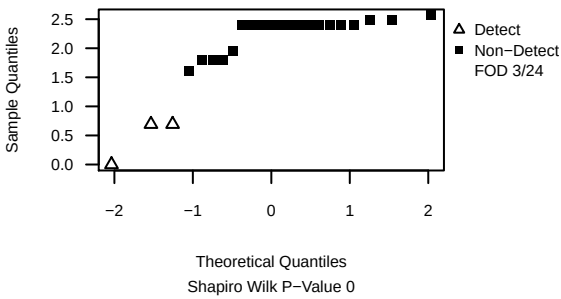
SUMMARY STATISTICS

Minimum	1
1st Quantile	6
Median	11
3rd Quantile	11
Maximum	13
FOD	3/24

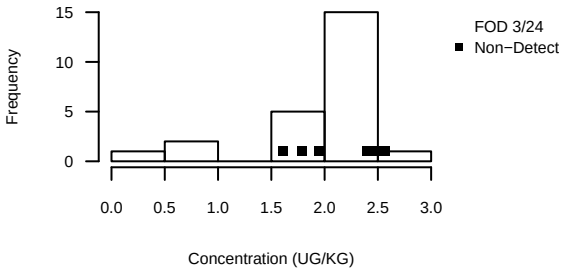
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

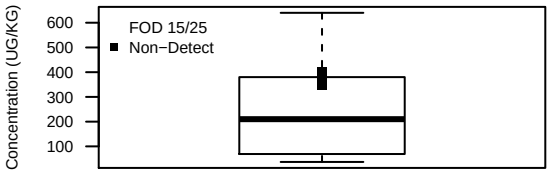


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

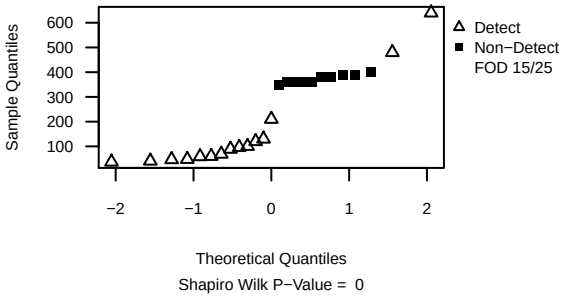
Minimum	0
1st Quantile	1.79
Median	2.4
3rd Quantile	2.4
Maximum	2.56
FOD	3/24

BENZO(A)ANTHRACENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 54 OF 68

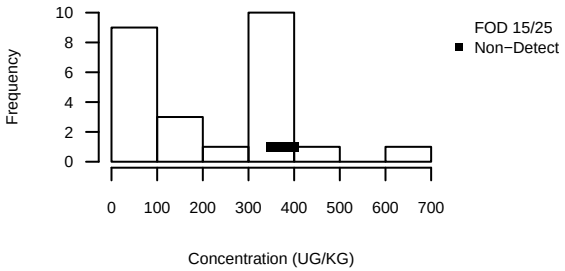
BOXPLOT



NORMAL PROBABILITY PLOT



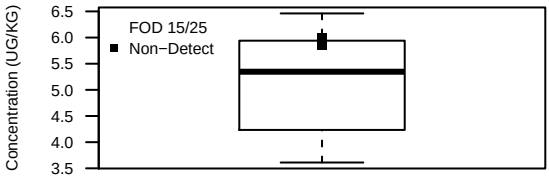
HISTOGRAM



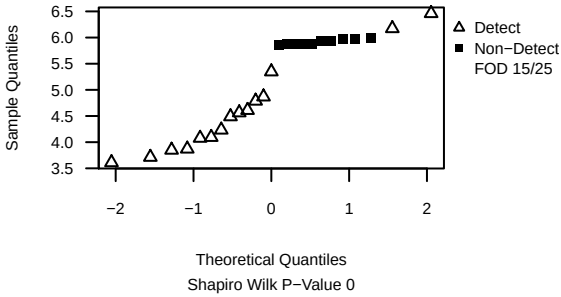
SUMMARY STATISTICS

Minimum	37
1st Quantile	69
Median	210
3rd Quantile	380
Maximum	640
FOD	15/25

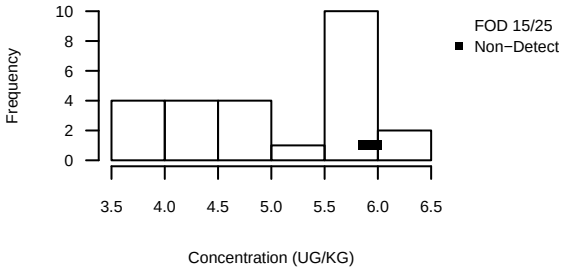
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

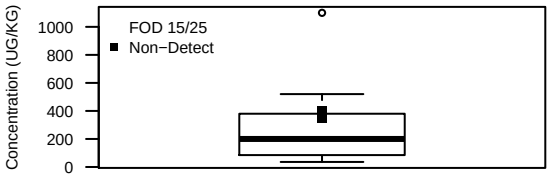


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

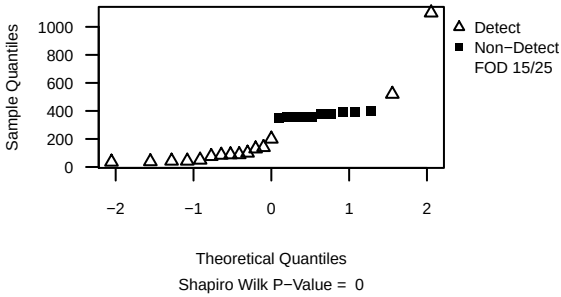
Minimum	3.61
1st Quantile	4.23
Median	5.35
3rd Quantile	5.94
Maximum	6.46
FOD	15/25

BENZO(A)PYRENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 55 OF 68

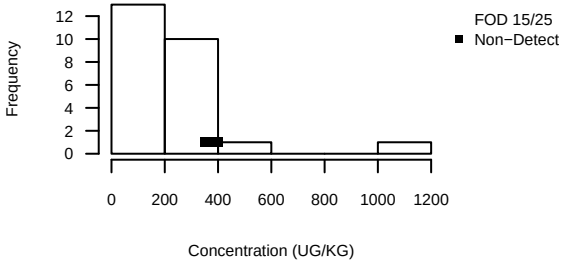
BOXPLOT



NORMAL PROBABILITY PLOT



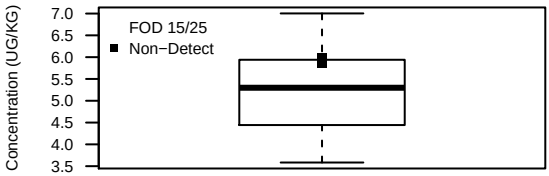
HISTOGRAM



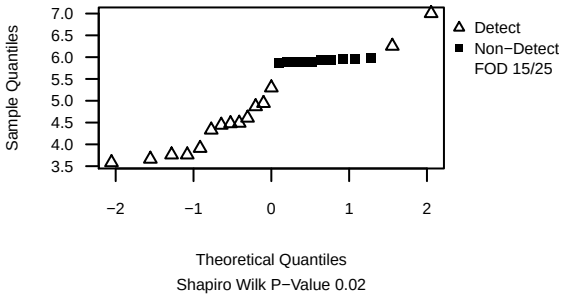
SUMMARY STATISTICS

Minimum	36
1st Quantile	85
Median	200
3rd Quantile	380
Maximum	1100
FOD	15/25

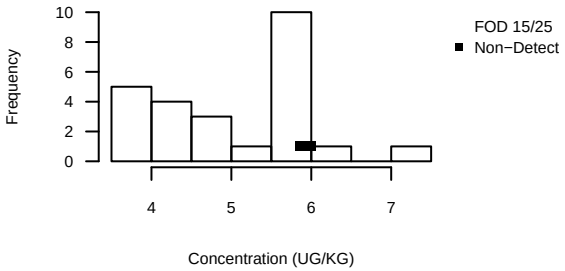
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

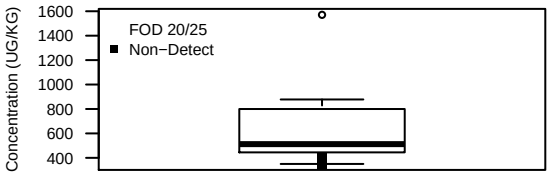


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

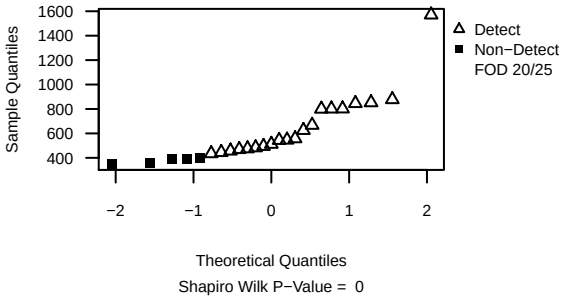
Minimum	3.58
1st Quantile	4.44
Median	5.3
3rd Quantile	5.94
Maximum	7
FOD	15/25

BENZO(A)PYRENE EQUIVALENTS SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 56 OF 68

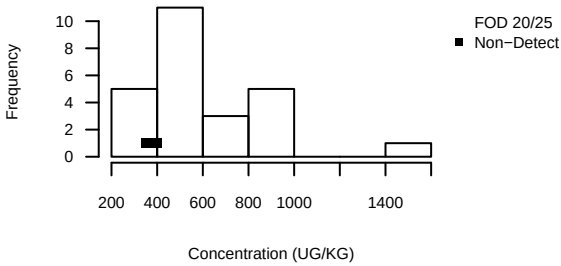
BOXPLOT



NORMAL PROBABILITY PLOT



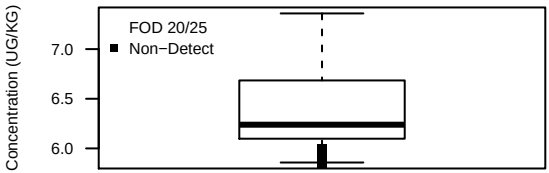
HISTOGRAM



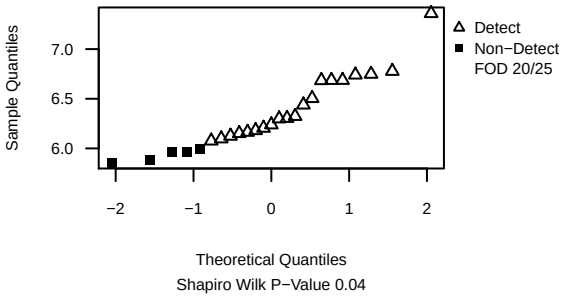
SUMMARY STATISTICS

Minimum	350
1st Quantile	444.8
Median	512.2
3rd Quantile	799.7
Maximum	1571
FOD	20/25

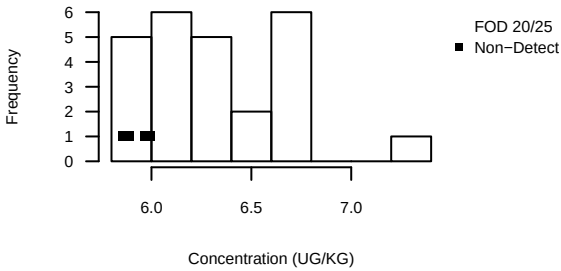
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

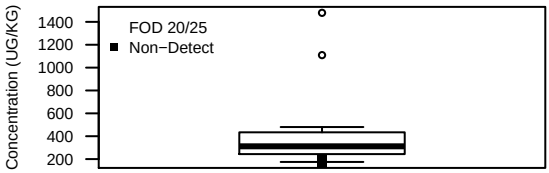


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

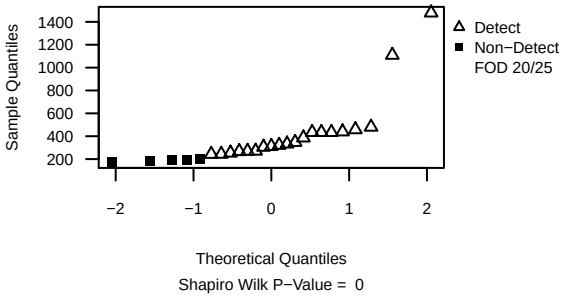
Minimum	5.86
1st Quantile	6.1
Median	6.24
3rd Quantile	6.68
Maximum	7.36
FOD	20/25

BENZO(A)PYRENE EQUIVALENTS−HALF ND SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 57 OF 68

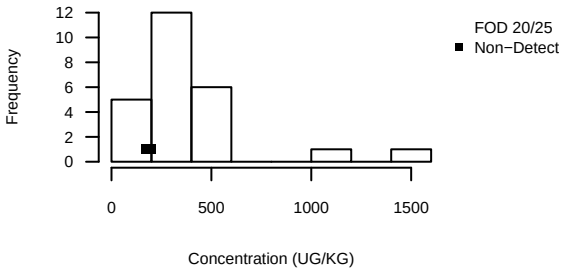
BOXPLOT



NORMAL PROBABILITY PLOT



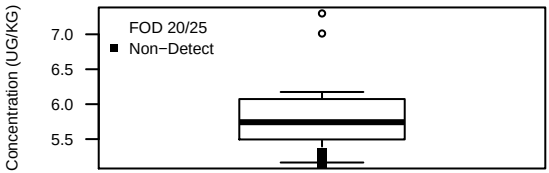
HISTOGRAM



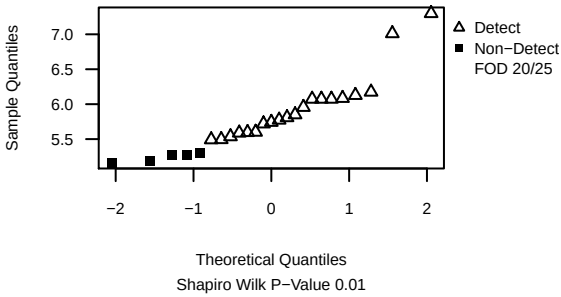
SUMMARY STATISTICS

Minimum	175
1st Quantile	243.5
Median	311.7
3rd Quantile	434.2
Maximum	1479
FOD	20/25

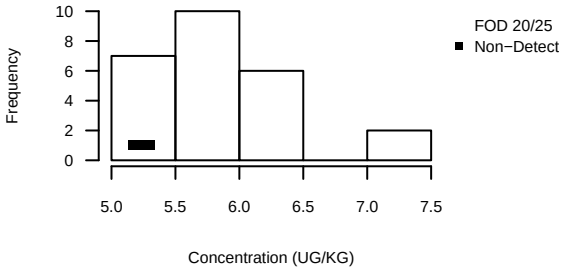
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

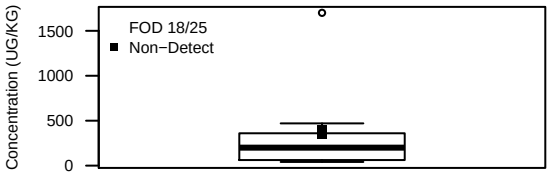


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

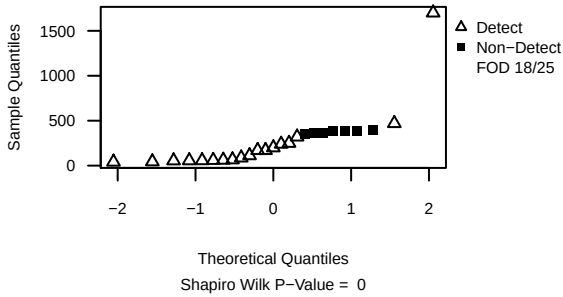
Minimum	5.17
1st Quantile	5.5
Median	5.74
3rd Quantile	6.07
Maximum	7.3
FOD	20/25

BENZO(B)FLUORANTHENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 58 OF 68

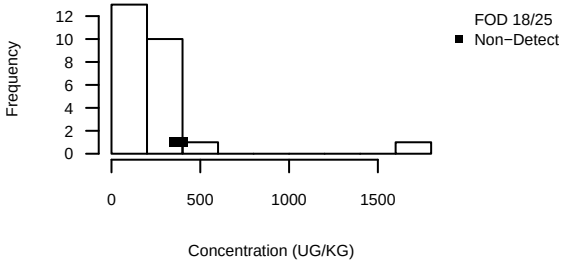
BOXPLOT



NORMAL PROBABILITY PLOT



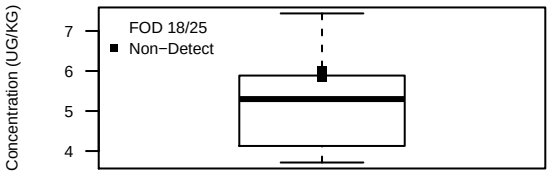
HISTOGRAM



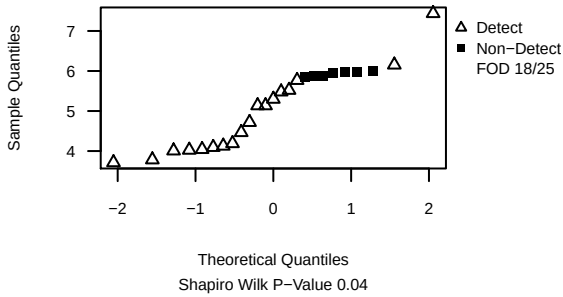
SUMMARY STATISTICS

Minimum	41
1st Quantile	62
Median	200
3rd Quantile	360
Maximum	1700
FOD	18/25

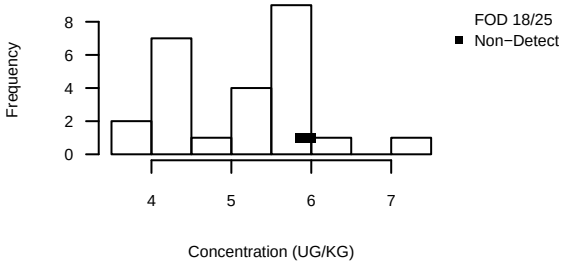
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

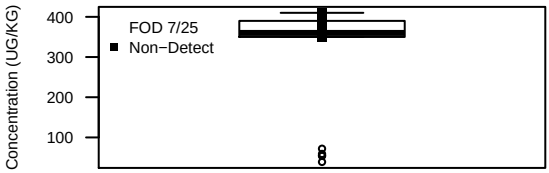


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

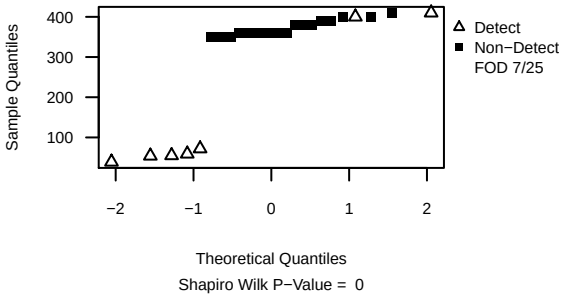
Minimum	3.71
1st Quantile	4.13
Median	5.3
3rd Quantile	5.89
Maximum	7.44
FOD	18/25

BENZO(G,H,I)PERYLENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 59 OF 68

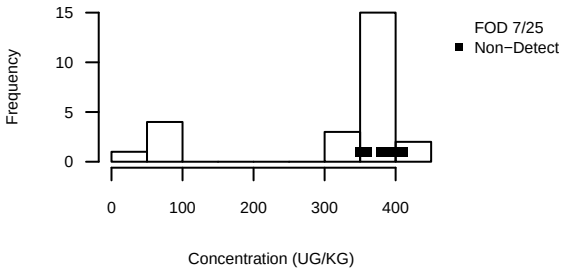
BOXPLOT



NORMAL PROBABILITY PLOT



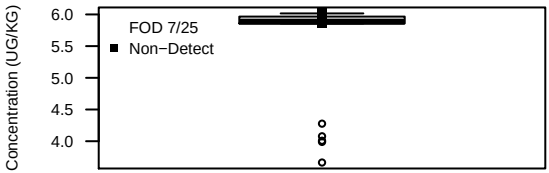
HISTOGRAM



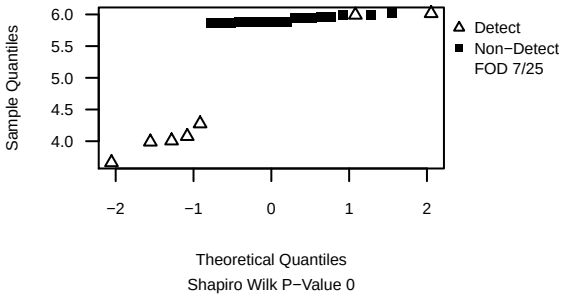
SUMMARY STATISTICS

Minimum	39
1st Quantile	350
Median	360
3rd Quantile	390
Maximum	410
FOD	7/25

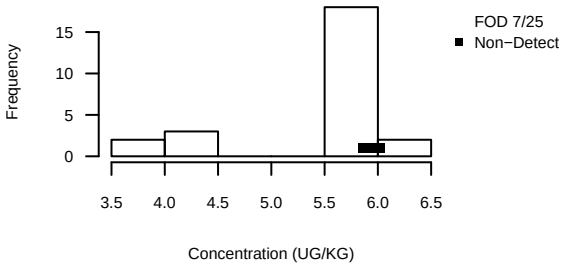
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

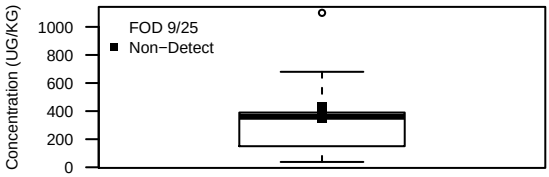


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

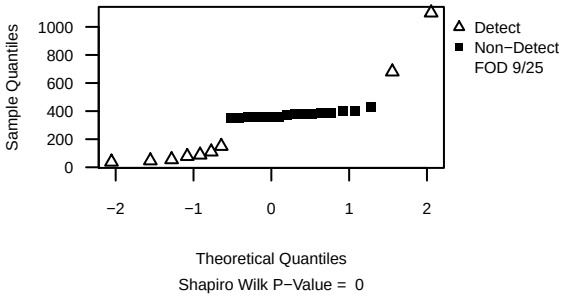
Minimum	3.66
1st Quantile	5.86
Median	5.89
3rd Quantile	5.97
Maximum	6.02
FOD	7/25

BENZO(K)FLUORANTHENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 60 OF 68

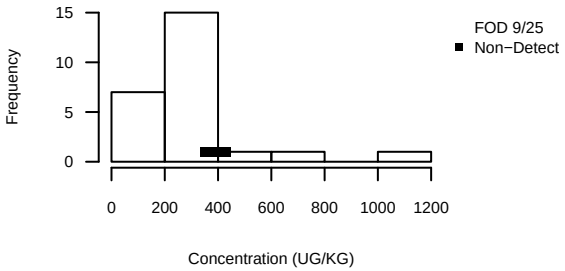
BOXPLOT



NORMAL PROBABILITY PLOT



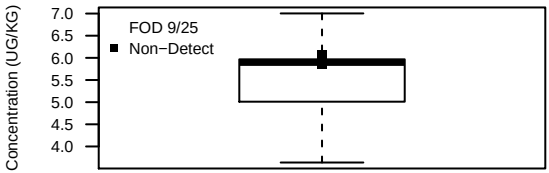
HISTOGRAM



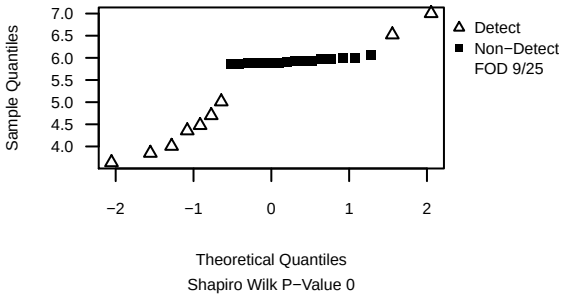
SUMMARY STATISTICS

Minimum	38
1st Quantile	150
Median	360
3rd Quantile	390
Maximum	1100
FOD	9/25

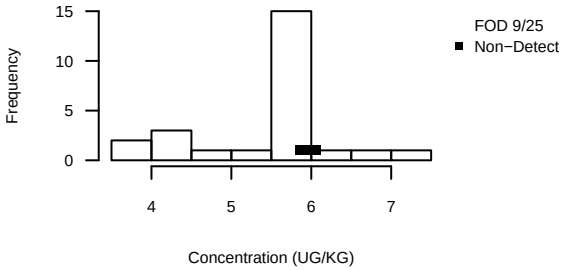
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

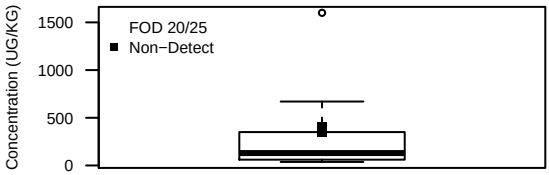


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

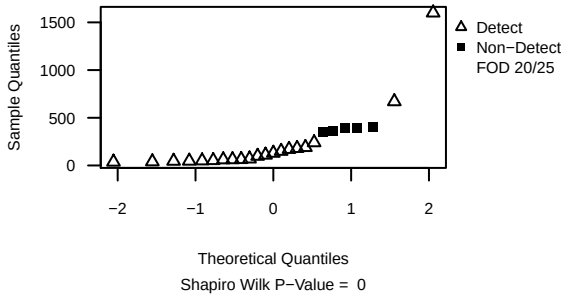
Minimum	3.64
1st Quantile	5.01
Median	5.89
3rd Quantile	5.97
Maximum	7
FOD	9/25

CHRYSENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 61 OF 68

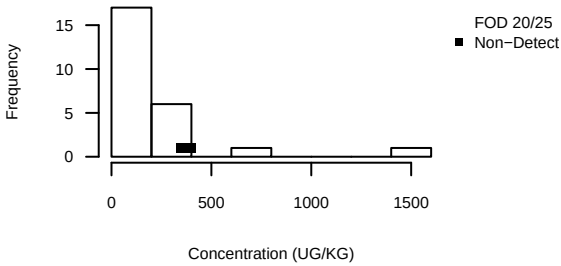
BOXPLOT



NORMAL PROBABILITY PLOT



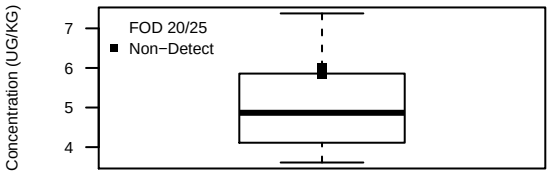
HISTOGRAM



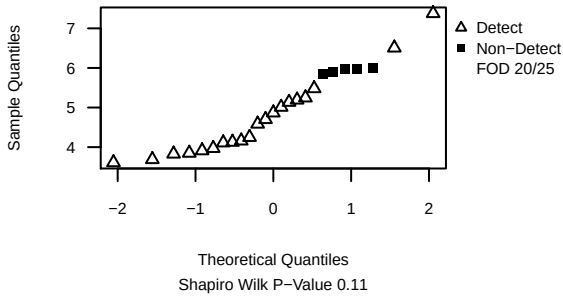
SUMMARY STATISTICS

Minimum	37
1st Quantile	61
Median	130
3rd Quantile	350
Maximum	1600
FOD	20/25

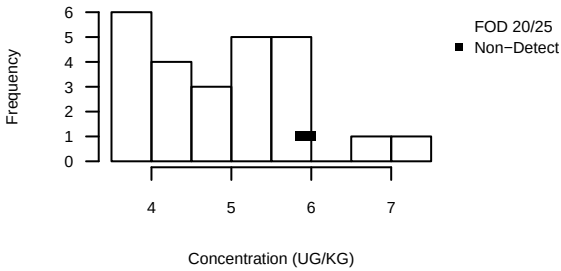
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

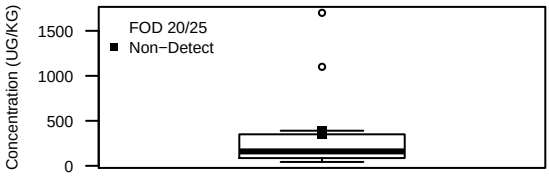


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

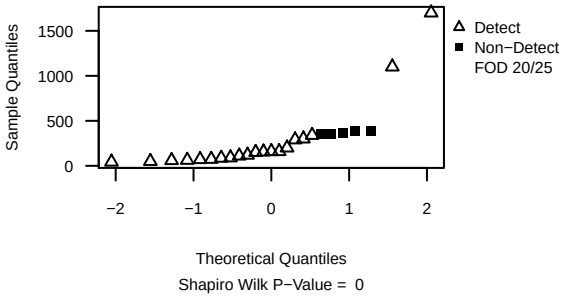
Minimum	3.61
1st Quantile	4.11
Median	4.87
3rd Quantile	5.86
Maximum	7.38
FOD	20/25

FLUORANTHENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 62 OF 68

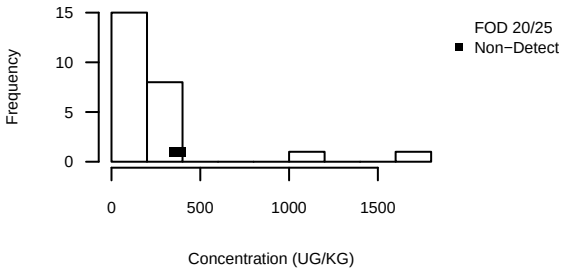
BOXPLOT



NORMAL PROBABILITY PLOT



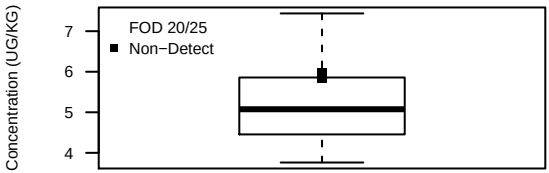
HISTOGRAM



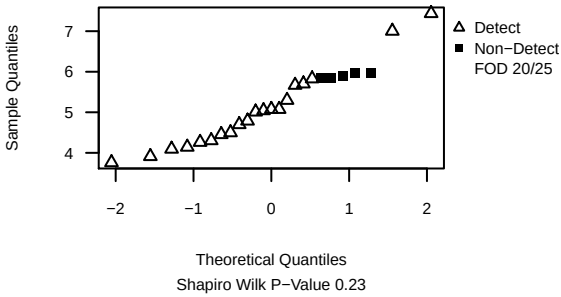
SUMMARY STATISTICS

Minimum	43
1st Quantile	86
Median	160
3rd Quantile	350
Maximum	1700
FOD	20/25

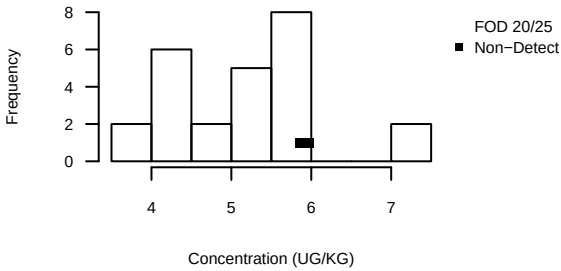
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

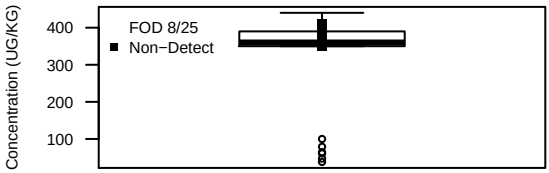


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

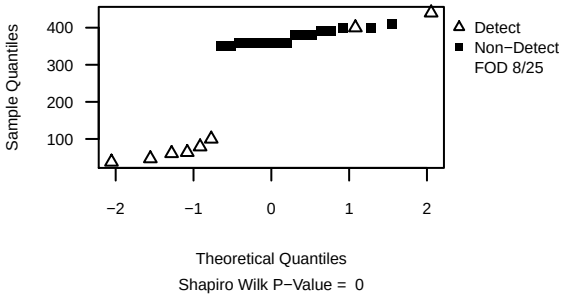
Minimum	3.76
1st Quantile	4.45
Median	5.08
3rd Quantile	5.86
Maximum	7.44
FOD	20/25

INDENO(1,2,3−CD)PYRENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 63 OF 68

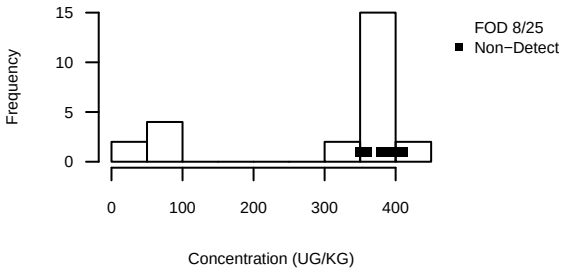
BOXPLOT



NORMAL PROBABILITY PLOT



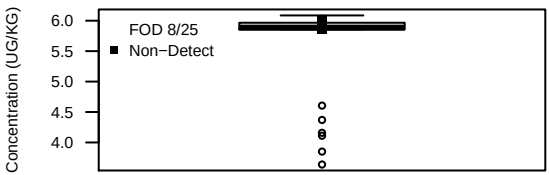
HISTOGRAM



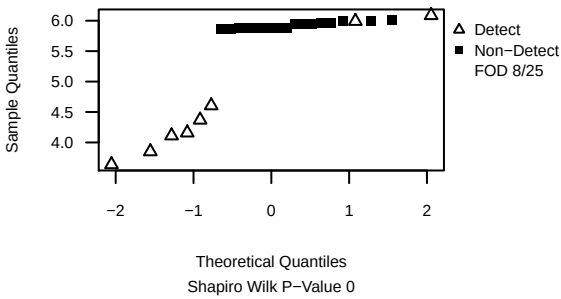
SUMMARY STATISTICS

Minimum	38
1st Quantile	350
Median	360
3rd Quantile	390
Maximum	440
FOD	8/25

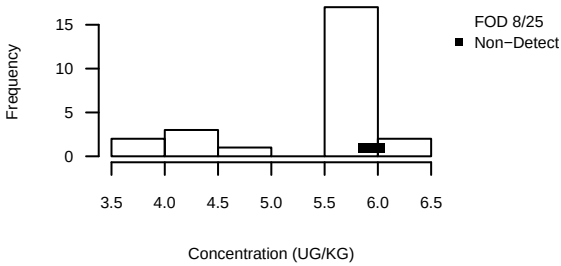
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

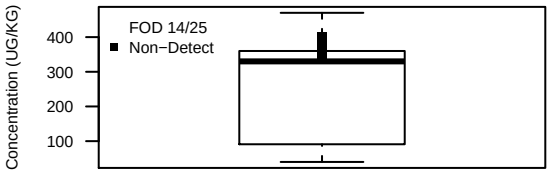


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

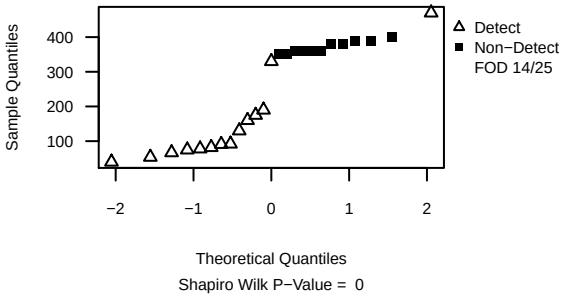
Minimum	3.64
1st Quantile	5.86
Median	5.89
3rd Quantile	5.97
Maximum	6.09
FOD	8/25

PHENANTHRENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 64 OF 68

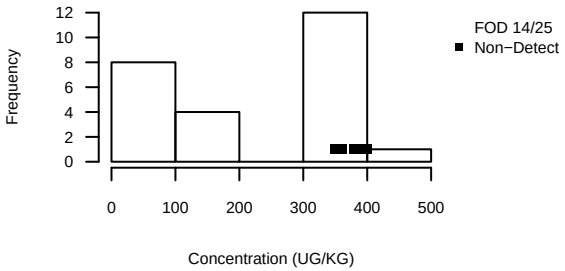
BOXPLOT



NORMAL PROBABILITY PLOT



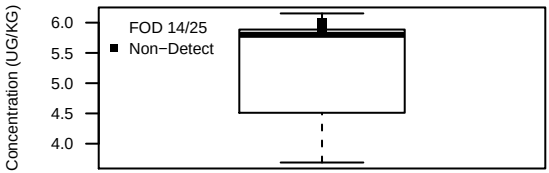
HISTOGRAM



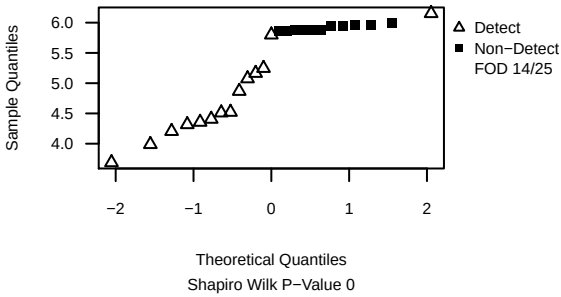
SUMMARY STATISTICS

Minimum	40
1st Quantile	91
Median	330
3rd Quantile	360
Maximum	470
FOD	14/25

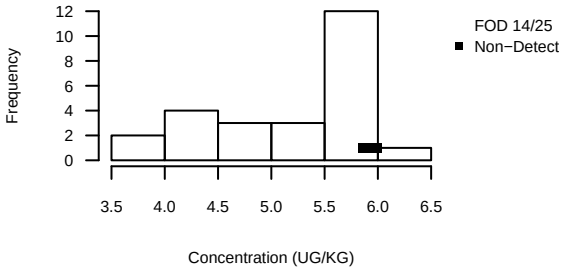
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

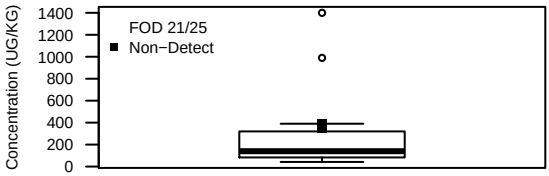


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

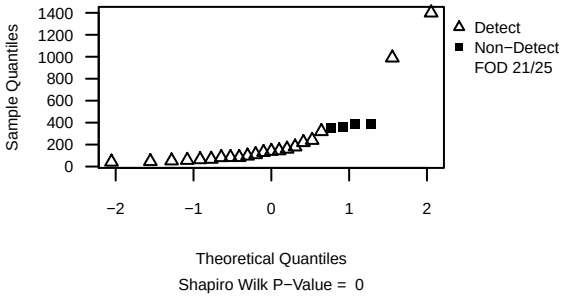
Minimum	3.69
1st Quantile	4.51
Median	5.8
3rd Quantile	5.89
Maximum	6.15
FOD	14/25

PYRENE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 65 OF 68

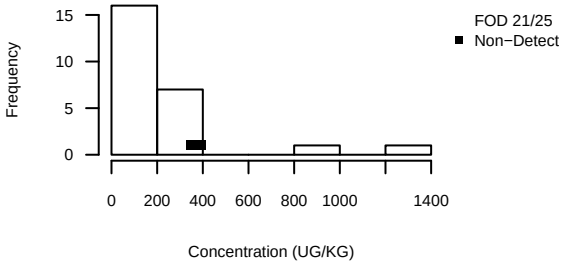
BOXPLOT



NORMAL PROBABILITY PLOT



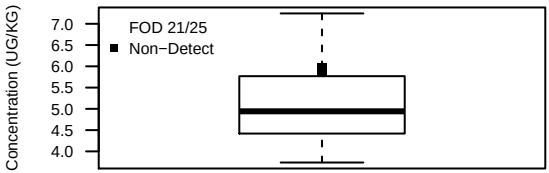
HISTOGRAM



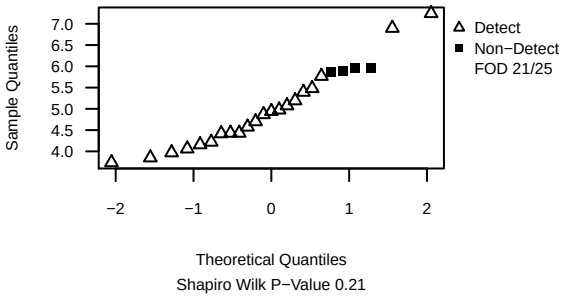
SUMMARY STATISTICS

Minimum	42
1st Quantile	83
Median	140
3rd Quantile	320
Maximum	1400
FOD	21/25

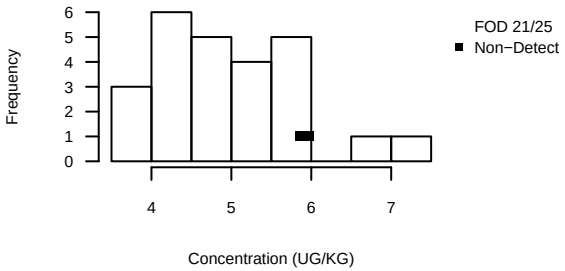
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



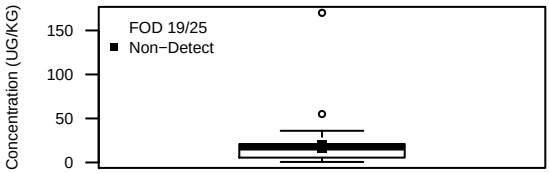
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



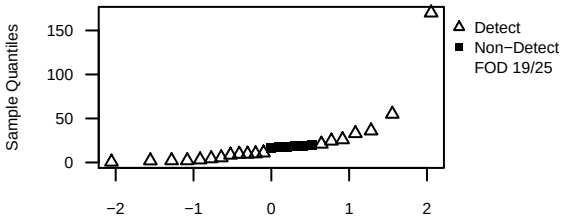
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.74
1st Quantile	4.42
Median	4.94
3rd Quantile	5.77
Maximum	7.24
FOD	21/25

BOXPLOT

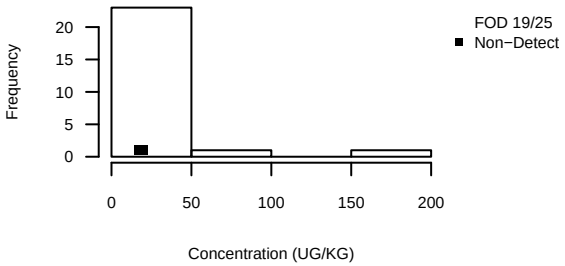


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0

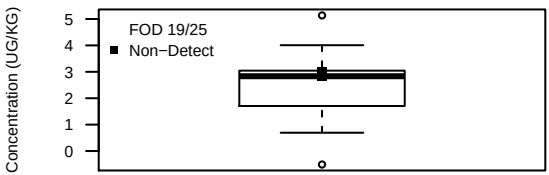
HISTOGRAM



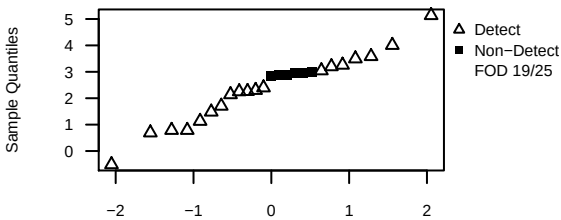
SUMMARY STATISTICS

Minimum	0.6
1st Quantile	5.5
Median	17
3rd Quantile	21
Maximum	170
FOD	19/25

BOXPLOT OF LOGNORMAL CONCENTRATIONS

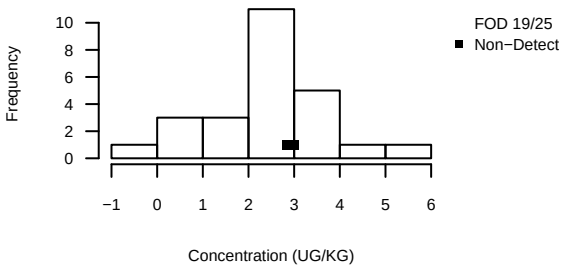


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.5

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

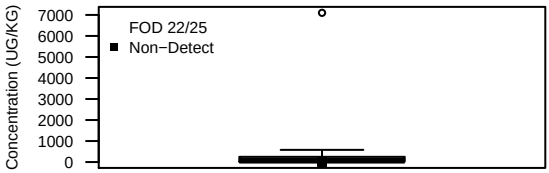


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

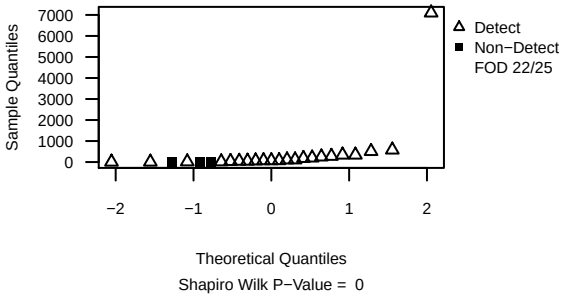
Minimum	−0.51
1st Quantile	1.7
Median	2.83
3rd Quantile	3.04
Maximum	5.14
FOD	19/25

4,4'−DDE SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 67 OF 68

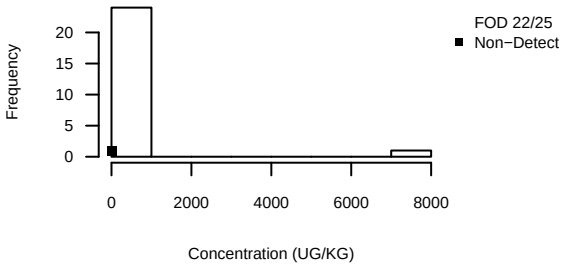
BOXPLOT



NORMAL PROBABILITY PLOT



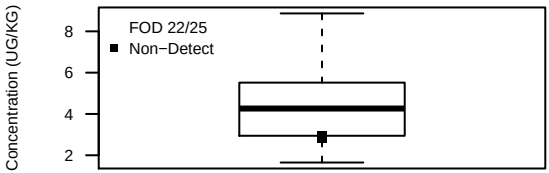
HISTOGRAM



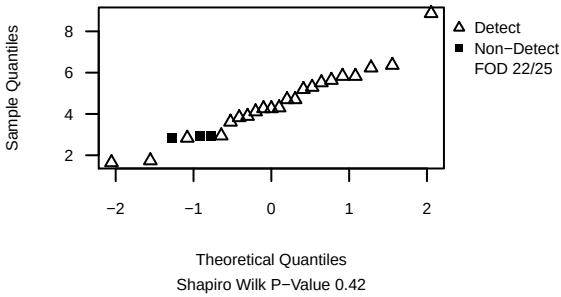
SUMMARY STATISTICS

Minimum	5.2
1st Quantile	19
Median	71
3rd Quantile	249
Maximum	7100
FOD	22/25

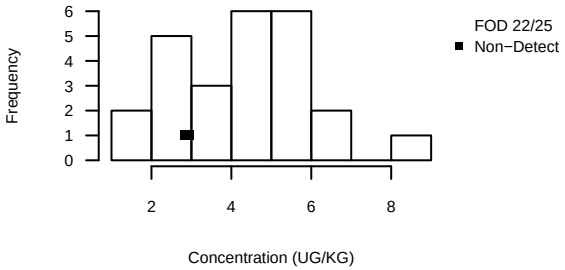
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

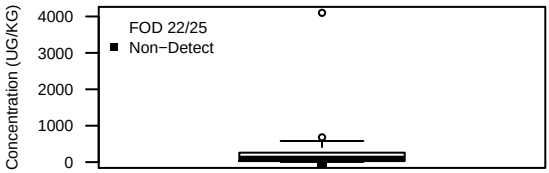


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

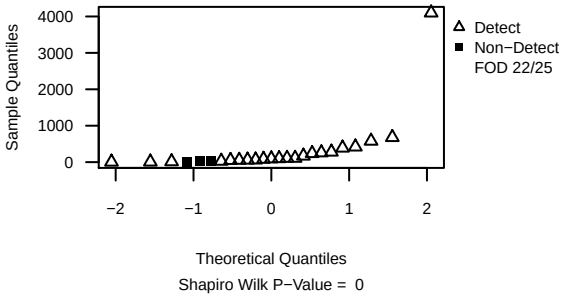
Minimum	1.65
1st Quantile	2.94
Median	4.26
3rd Quantile	5.52
Maximum	8.87
FOD	22/25

4,4'−DDT SOIL BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 68 OF 68

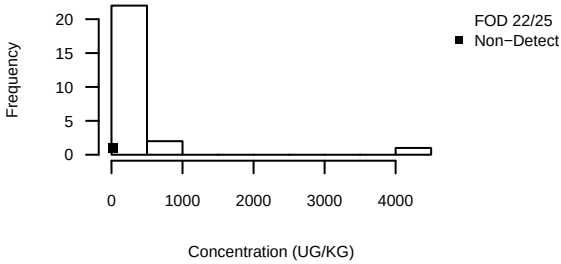
BOXPLOT



NORMAL PROBABILITY PLOT



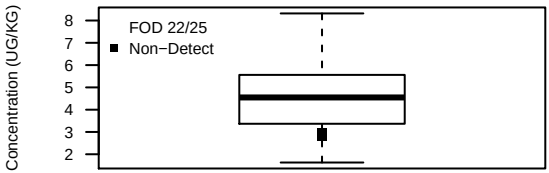
HISTOGRAM



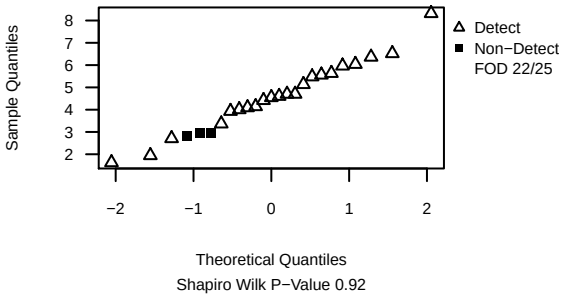
SUMMARY STATISTICS

Minimum	5.1
1st Quantile	29
Median	94.5
3rd Quantile	260
Maximum	4100
FOD	22/25

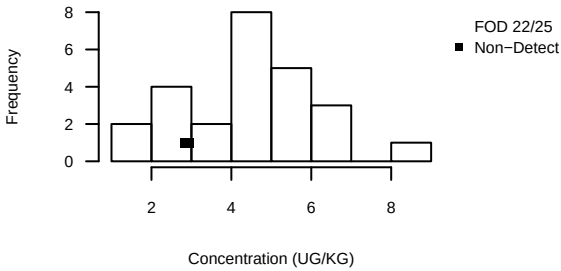
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS



SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	1.63
1st Quantile	3.37
Median	4.55
3rd Quantile	5.56
Maximum	8.32
FOD	22/25

TABLE B-1
FACILITY BACKGROUND SOIL OUTLIER EVALUATION
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FOD	DATA DISTRIBUTION	POTENTIAL OUTLIER	OUTLIER TEST	OUTLIER TEST RESULT
DIOXINS (NG/KG)					
1,2,3,4,6,7,8-HPCDD	19/19	Lognormal	BGS-12	Extreme Value Test	Outlier
1,2,3,4,6,7,8-HPCDF	18/19	Lognormal	None	NA	NA
1,2,3,4,6,7,8,9-OCDD	19/19	Lognormal	None	NA	NA
1,2,3,4,6,7,8,9-OCDF	17/19	Lognormal	BGS-12, BGS-17	Extreme Value Test	Not Outlier
1,2,3,4,7,8-HXCDD	9/19	Lognormal	None	NA	NA
1,2,3,4,7,8-HXCDF	15/19	Lognormal	None	NA	NA
1,2,3,4,7,8,9-HPCDF	6/19	Nonparametric	BGS-17	Nonparametric Outlier Test	Outlier
1,2,3,6,7,8-HXCDD	16/19	Lognormal	None	NA	NA
1,2,3,6,7,8-HXCDF	17/19	Lognormal	None	NA	NA
1,2,3,7,8-PECDD	8/19	Lognormal	None	NA	NA
1,2,3,7,8-PECDF	10/19	Lognormal	None	NA	NA
1,2,3,7,8,9-HXCDD	16/19	Lognormal	None	NA	NA
1,2,3,7,8,9-HXCDF	12/19	Lognormal	None	NA	NA
2,3,4,6,7,8-HXCDF	17/19	Lognormal	None	NA	NA
2,3,4,7,8-PECDF	16/19	Lognormal	None	NA	NA
2,3,7,8-TCDF	18/19	Lognormal	None	NA	NA
TEQ WHO-1998	19/19	Nonparametric	None	NA	NA
TEQ WHO-1998 - HALFND	19/19	Lognormal	None	NA	NA
TEQ WHO-2005	19/19	Nonparametric	BGS-12	Nonparametric Outlier Test	Outlier
TEQ WHO-2005 - HALFND	19/19	Lognormal	None	NA	NA
TOTAL HPCDD	19/19	Nonparametric	BGS-12	Nonparametric Outlier Test	Outlier
TOTAL HPCDF	18/19	Lognormal	None	NA	NA
TOTAL HXCDD	17/19	Lognormal	BGS-12	Extreme Value Test	Not Outlier
TOTAL HXCDF	19/19	Lognormal	None	NA	NA
TOTAL PECDD	16/19	Lognormal	None	NA	NA
TOTAL PECDF	19/19	Lognormal	None	NA	NA
TOTAL TCDD	17/19	Lognormal	None	NA	NA
TOTAL TCDF	19/19	Lognormal	None	NA	NA
METALS (MG/KG)					
ALUMINUM	25/25	Normal	None	NA	NA
ARSENIC	25/25	Nonparametric	BGS-07	Nonparametric Outlier Test	Outlier
BARIUM	25/25	Lognormal	None	NA	NA
BERYLLIUM	25/25	Lognormal	None	NA	NA
CADMIUM	21/25	Nonparametric	None	NA	NA
CALCIUM	25/25	Lognormal	BGS-17	Extreme Value Test	Outlier
CHROMIUM	25/25	Normal	None	NA	NA
COBALT	25/25	Normal	BGS-13	Extreme Value Test	Outlier

TABLE B-1
FACILITY BACKGROUND SOIL OUTLIER EVALUATION
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FOD	DATA DISTRIBUTION	POTENTIAL OUTLIER	OUTLIER TEST	OUTLIER TEST RESULT
COPPER	25/25	Lognormal	None	NA	NA
IRON	25/25	Normal	BGS-13	Extreme Value Test	Not Outlier
LEAD	25/25	Lognormal	BGS-07	Extreme Value Test	Not Outlier
MAGNESIUM	25/25	Normal	BGS-25	Extreme Value Test	Outlier
MANGANESE	25/25	Normal	BGS-25	Extreme Value Test	Outlier
MERCURY	6/25	Lognormal without max	BGS-18	Extreme Value Test	Outlier
NICKEL	25/25	Normal	BGS-16	Extreme Value Test	Not Outlier
POTASSIUM	25/25	Lognormal	BGS-25, BGS-16	Extreme Value Test	Outlier
SELENIUM	12/25	Lognormal	None	NA	NA
SODIUM	25/25	Nonparametric	None	NA	NA
VANADIUM	25/25	Normal	None	NA	NA
ZINC	25/25	Lognormal without maximum	BGS-18	Extreme Value Test	Outlier
MISCELLANEOUS					
PH (S.U.)	8/8	Normal	BGS-02	Extreme Value Test	Outlier
TOTAL ORGANIC CARBON (%)	8/8	Normal	None	NA	NA
SEMIVOLATILES (UG/KG)					
BIS(2-ETHYLHEXYL)PHTHALATE	3/25	Lognormal	None	NA	NA
TOTAL PETROLEUM HYDROCARBONS	4/4	Normal	None	NA	NA
VOLATILES (UG/KG)					
METHYLENE CHLORIDE	3/24	Nonparametric	None	NA	NA
PAH (UG/KG)					
BENZO(A)ANTHRACENE	15/25	Nonparametric	None	NA	NA
BENZO(A)PYRENE	15/25	Nonparametric	BGS-14	Nonparametric Outlier Test	Outlier
BENZO(A)PYRENE EQUIVALENTS	20/25	Nonparametric	BGS-14	Nonparametric Outlier Test	Outlier
BENZO(A)PYRENE EQUIVALENTS-HALF ND	20/25	Nonparametric	BGS-14, BGS-22	Nonparametric Outlier Test	Outlier
BENZO(B)FLUORANTHENE	18/25	Nonparametric	BGS-14	Nonparametric Outlier Test	Outlier
BENZO(G,H,I)PERYLENE	7/25	Nonparametric	None	NA	NA
BENZO(K)FLUORANTHENE	9/25	Nonparametric	BGS-14	Nonparametric Outlier Test	Outlier
CHRYSENE	20/25	Lognormal	None	NA	NA
FLUORANTHENE	20/25	Lognormal	None	NA	NA
INDENO(1,2,3-CD)PYRENE	8/25	Nonparametric	None	NA	NA
PHENANTHRENE	14/25	Nonparametric	None	NA	NA
PYRENE	21/25	Lognormal	None	NA	NA
PEST/PCB (UG/KG)					
4,4'-DDD	19/25	Lognormal	BGS-14	Extreme Value Test	Not Outlier
4,4'-DDE	22/25	Lognormal	None	NA	NA
4,4'-DDT	22/25	Lognormal	None	NA	NA

B.2 SOIL UCLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Full Data Sets								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	1,2,3,4,6,7,8,9-OCDD											
10												
11						General Statistics						
12						Number of Valid Observations	19			Number of Distinct Observations	18	
13						Number of Missing Values	25					
14												
15						Raw Statistics				Log-transformed Statistics		
16						Minimum	18			Minimum of Log Data	2.89	
17						Maximum	6460			Maximum of Log Data	8.773	
18						Mean	896.7			Mean of log Data	5.935	
19						Median	462			SD of log Data	1.497	
20						SD	1445					
21						Std. Error of Mean	331.5					
22						Coefficient of Variation	1.611					
23						Skewness	3.494					
24												
25						Relevant UCL Statistics						
26						Normal Distribution Test				Lognormal Distribution Test		
27						Shapiro Wilk Test Statistic	0.559			Shapiro Wilk Test Statistic	0.952	
28						Shapiro Wilk Critical Value	0.901			Shapiro Wilk Critical Value	0.901	
29						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
30												
31						Assuming Normal Distribution				Assuming Lognormal Distribution		
32						95% Student's-t UCL	1471			95% H-UCL	3827	
33						95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	2885	
34						95% Adjusted-CLT UCL (Chen-1995)	1726			97.5% Chebyshev (MVUE) UCL	3684	
35						95% Modified-t UCL (Johnson-1978)	1516			99% Chebyshev (MVUE) UCL	5253	
36												
37						Gamma Distribution Test				Data Distribution		
38						k star (bias corrected)	0.624			Data appear Gamma Distributed at 5% Significance Level		
39						Theta Star	1437					
40						MLE of Mean	896.7					
41						MLE of Standard Deviation	1135					
42						nu star	23.71					
43						Approximate Chi Square Value (.05)	13.63			Nonparametric Statistics		
44						Adjusted Level of Significance	0.0369			95% CLT UCL	1442	
45						Adjusted Chi Square Value	12.97			95% Jackknife UCL	1471	
46										95% Standard Bootstrap UCL	1420	
47						Anderson-Darling Test Statistic	0.361			95% Bootstrap-t UCL	2404	
48						Anderson-Darling 5% Critical Value	0.784			95% Hall's Bootstrap UCL	3585	
49						Kolmogorov-Smirnov Test Statistic	0.117			95% Percentile Bootstrap UCL	1471	
50						Kolmogorov-Smirnov 5% Critical Value	0.207			95% BCA Bootstrap UCL	1829	
51						Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	2342	
52										97.5% Chebyshev(Mean, Sd) UCL	2967	
53						Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	4195	
54						95% Approximate Gamma UCL	1560					
55						95% Adjusted Gamma UCL	1640					

	A	B	C	D	E	F	G	H	I	J	K	L
56												
57				Potential UCL to Use						Use 95% Approximate Gamma UCL		1560
58												
59	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
60	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
61	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
62												
63												
64	1,2,3,4,6,7,8-HPCDD											
65												
66					General Statistics							
67					Number of Valid Observations	19				Number of Distinct Observations		19
68					Number of Missing Values	25						
69												
70				Raw Statistics						Log-transformed Statistics		
71					Minimum	1.3				Minimum of Log Data		0.262
72					Maximum	826				Maximum of Log Data		6.717
73					Mean	64.52				Mean of log Data		2.864
74					Median	12.9				SD of log Data		1.343
75					SD	186.2						
76					Std. Error of Mean	42.72						
77					Coefficient of Variation	2.886						
78					Skewness	4.228						
79												
80					Relevant UCL Statistics							
81				Normal Distribution Test						Lognormal Distribution Test		
82					Shapiro Wilk Test Statistic	0.332				Shapiro Wilk Test Statistic		0.909
83					Shapiro Wilk Critical Value	0.901				Shapiro Wilk Critical Value		0.901
84				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
85												
86				Assuming Normal Distribution						Assuming Lognormal Distribution		
87					95% Student's-t UCL	138.6				95% H-UCL		116.5
88				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		102.4
89					95% Adjusted-CLT UCL (Chen-1995)	179.1				97.5% Chebyshev (MVUE) UCL		129.5
90					95% Modified-t UCL (Johnson-1978)	145.5				99% Chebyshev (MVUE) UCL		182.6
91												
92				Gamma Distribution Test						Data Distribution		
93					k star (bias corrected)	0.447				Data appear Lognormal at 5% Significance Level		
94					Theta Star	144.3						
95					MLE of Mean	64.52						
96					MLE of Standard Deviation	96.48						
97					nu star	16.99						
98					Approximate Chi Square Value (.05)	8.666				Nonparametric Statistics		
99					Adjusted Level of Significance	0.0369				95% CLT UCL		134.8
100					Adjusted Chi Square Value	8.149				95% Jackknife UCL		138.6
101										95% Standard Bootstrap UCL		135.4
102					Anderson-Darling Test Statistic	2.417				95% Bootstrap-t UCL		969.3
103					Anderson-Darling 5% Critical Value	0.805				95% Hall's Bootstrap UCL		469.3
104					Kolmogorov-Smirnov Test Statistic	0.361				95% Percentile Bootstrap UCL		147.8
105					Kolmogorov-Smirnov 5% Critical Value	0.21				95% BCA Bootstrap UCL		190.8
106				Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		250.7
107										97.5% Chebyshev(Mean, Sd) UCL		331.3
108				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		489.6
109					95% Approximate Gamma UCL	126.5						
110					95% Adjusted Gamma UCL	134.5						

	A	B	C	D	E	F	G	H	I	J	K	L
111												
112	Potential UCL to Use						Use 95% Chebyshev (Mean, Sd) UCL					250.7
113												
114	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
115	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
116	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
117												
118												
119	TEQ WHO-1998											
120												
121	General Statistics											
122	Number of Valid Observations					19	Number of Distinct Observations					19
123	Number of Missing Values					25						
124												
125	Raw Statistics						Log-transformed Statistics					
126	Minimum					0.0148	Minimum of Log Data					-4.213
127	Maximum					14.72	Maximum of Log Data					2.689
128	Mean					4.51	Mean of log Data					0.763
129	Median					2.793	SD of log Data					1.678
130	SD					4.225						
131	Std. Error of Mean					0.969						
132	Coefficient of Variation					0.937						
133	Skewness					0.938						
134												
135	Relevant UCL Statistics											
136	Normal Distribution Test						Lognormal Distribution Test					
137	Shapiro Wilk Test Statistic					0.887	Shapiro Wilk Test Statistic					0.871
138	Shapiro Wilk Critical Value					0.901	Shapiro Wilk Critical Value					0.901
139	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
140												
141	Assuming Normal Distribution						Assuming Lognormal Distribution					
142	95% Student's-t UCL					6.191	95% H-UCL					37.75
143	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					22.77
144	95% Adjusted-CLT UCL (Chen-1995)					6.327	97.5% Chebyshev (MVUE) UCL					29.36
145	95% Modified-t UCL (Johnson-1978)					6.226	99% Chebyshev (MVUE) UCL					42.31
146												
147	Gamma Distribution Test						Data Distribution					
148	k star (bias corrected)					0.708	Data appear Gamma Distributed at 5% Significance Level					
149	Theta Star					6.373						
150	MLE of Mean					4.51						
151	MLE of Standard Deviation					5.361						
152	nu star					26.89						
153	Approximate Chi Square Value (.05)					16.07	Nonparametric Statistics					
154	Adjusted Level of Significance					0.0369	95% CLT UCL					6.104
155	Adjusted Chi Square Value					15.34	95% Jackknife UCL					6.191
156							95% Standard Bootstrap UCL					6.05
157	Anderson-Darling Test Statistic					0.262	95% Bootstrap-t UCL					6.585
158	Anderson-Darling 5% Critical Value					0.777	95% Hall's Bootstrap UCL					6.29
159	Kolmogorov-Smirnov Test Statistic					0.156	95% Percentile Bootstrap UCL					6.068
160	Kolmogorov-Smirnov 5% Critical Value					0.206	95% BCA Bootstrap UCL					6.27
161	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					8.735
162							97.5% Chebyshev(Mean, Sd) UCL					10.56
163	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					14.15
164	95% Approximate Gamma UCL					7.548						
165	95% Adjusted Gamma UCL					7.908						

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167	Potential UCL to Use						Use 95% Approximate Gamma UCL					7.548
168												
169	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
170	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
171	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
172												
173												
174	TEQ WHO-1998 - HALFND											
175												
176	General Statistics											
177	Number of Valid Observations					19	Number of Distinct Observations					19
178	Number of Missing Values					25						
179												
180	Raw Statistics						Log-transformed Statistics					
181	Minimum					0.563	Minimum of Log Data					-0.574
182	Maximum					14.83	Maximum of Log Data					2.697
183	Mean					4.871	Mean of log Data					1.172
184	Median					3.339	SD of log Data					0.993
185	SD					4.162						
186	Std. Error of Mean					0.955						
187	Coefficient of Variation					0.855						
188	Skewness					0.937						
189												
190	Relevant UCL Statistics											
191	Normal Distribution Test						Lognormal Distribution Test					
192	Shapiro Wilk Test Statistic					0.88	Shapiro Wilk Test Statistic					0.952
193	Shapiro Wilk Critical Value					0.901	Shapiro Wilk Critical Value					0.901
194	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
195												
196	Assuming Normal Distribution						Assuming Lognormal Distribution					
197	95% Student's-t UCL					6.527	95% H-UCL					9.716
198	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					10.73
199	95% Adjusted-CLT UCL (Chen-1995)					6.661	97.5% Chebyshev (MVUE) UCL					13.17
200	95% Modified-t UCL (Johnson-1978)					6.561	99% Chebyshev (MVUE) UCL					17.96
201												
202	Gamma Distribution Test						Data Distribution					
203	k star (bias corrected)					1.178	Data appear Gamma Distributed at 5% Significance Level					
204	Theta Star					4.134						
205	MLE of Mean					4.871						
206	MLE of Standard Deviation					4.487						
207	nu star					44.78						
208	Approximate Chi Square Value (.05)					30.43	Nonparametric Statistics					
209	Adjusted Level of Significance					0.0369	95% CLT UCL					6.442
210	Adjusted Chi Square Value					29.4	95% Jackknife UCL					6.527
211							95% Standard Bootstrap UCL					6.383
212	Anderson-Darling Test Statistic					0.398	95% Bootstrap-t UCL					6.928
213	Anderson-Darling 5% Critical Value					0.76	95% Hall's Bootstrap UCL					6.593
214	Kolmogorov-Smirnov Test Statistic					0.146	95% Percentile Bootstrap UCL					6.425
215	Kolmogorov-Smirnov 5% Critical Value					0.203	95% BCA Bootstrap UCL					6.62
216	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					9.033
217							97.5% Chebyshev(Mean, Sd) UCL					10.83
218	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					14.37
219	95% Approximate Gamma UCL					7.168						
220	95% Adjusted Gamma UCL					7.42						

	A	B	C	D	E	F	G	H	I	J	K	L
221												
222	Potential UCL to Use						Use 95% Approximate Gamma UCL					7.168
223												
224	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
225	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
226	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
227												
228												
229	TEQ WHO-2005											
230												
231	General Statistics											
232					Number of Valid Observations	19	Number of Distinct Observations					19
233					Number of Missing Values	25						
234												
235	Raw Statistics						Log-transformed Statistics					
236					Minimum	0.0184	Minimum of Log Data					-3.995
237					Maximum	15.66	Maximum of Log Data					2.751
238					Mean	4.192	Mean of log Data					0.71
239					Median	2.509	SD of log Data					1.611
240					SD	4.123						
241					Std. Error of Mean	0.946						
242					Coefficient of Variation	0.983						
243					Skewness	1.312						
244												
245	Relevant UCL Statistics											
246	Normal Distribution Test						Lognormal Distribution Test					
247					Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic					0.888
248					Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value					0.901
249	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
250												
251	Assuming Normal Distribution						Assuming Lognormal Distribution					
252					95% Student's-t UCL	5.833	95% H-UCL					28.91
253	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					19.06
254					95% Adjusted-CLT UCL (Chen-1995)	6.052	97.5% Chebyshev (MVUE) UCL					24.5
255					95% Modified-t UCL (Johnson-1978)	5.88	99% Chebyshev (MVUE) UCL					35.17
256												
257	Gamma Distribution Test						Data Distribution					
258					k star (bias corrected)	0.724	Data appear Gamma Distributed at 5% Significance Level					
259					Theta Star	5.79						
260					MLE of Mean	4.192						
261					MLE of Standard Deviation	4.927						
262					nu star	27.52						
263					Approximate Chi Square Value (.05)	16.55	Nonparametric Statistics					
264					Adjusted Level of Significance	0.0369	95% CLT UCL					5.748
265					Adjusted Chi Square Value	15.81	95% Jackknife UCL					5.833
266							95% Standard Bootstrap UCL					5.793
267					Anderson-Darling Test Statistic	0.222	95% Bootstrap-t UCL					6.238
268					Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL					6.317
269					Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL					5.836
270					Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL					6.078
271	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					8.315
272							97.5% Chebyshev(Mean, Sd) UCL					10.1
273	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					13.6
274					95% Approximate Gamma UCL	6.969						
275					95% Adjusted Gamma UCL	7.296						

	A	B	C	D	E	F	G	H	I	J	K	L
276												
277				Potential UCL to Use						Use 95% Approximate Gamma UCL		6.969
278												
279	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
280	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
281	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
282												
283												
284	TEQ WHO-2005 - HALFND											
285												
286					General Statistics							
287					Number of Valid Observations	19				Number of Distinct Observations		19
288					Number of Missing Values	25						
289												
290				Raw Statistics						Log-transformed Statistics		
291					Minimum	0.535				Minimum of Log Data		-0.625
292					Maximum	15.76				Maximum of Log Data		2.758
293					Mean	4.546				Mean of log Data		1.103
294					Median	3.052				SD of log Data		0.978
295					SD	4.067						
296					Std. Error of Mean	0.933						
297					Coefficient of Variation	0.895						
298					Skewness	1.303						
299												
300					Relevant UCL Statistics							
301				Normal Distribution Test						Lognormal Distribution Test		
302					Shapiro Wilk Test Statistic	0.856				Shapiro Wilk Test Statistic		0.963
303					Shapiro Wilk Critical Value	0.901				Shapiro Wilk Critical Value		0.901
304				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
305												
306				Assuming Normal Distribution						Assuming Lognormal Distribution		
307					95% Student's-t UCL	6.164				95% H-UCL		8.814
308				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		9.798
309					95% Adjusted-CLT UCL (Chen-1995)	6.379				97.5% Chebyshev (MVUE) UCL		12.01
310					95% Modified-t UCL (Johnson-1978)	6.21				99% Chebyshev (MVUE) UCL		16.34
311												
312				Gamma Distribution Test						Data Distribution		
313					k star (bias corrected)	1.179				Data appear Gamma Distributed at 5% Significance Level		
314					Theta Star	3.855						
315					MLE of Mean	4.546						
316					MLE of Standard Deviation	4.186						
317					nu star	44.81						
318					Approximate Chi Square Value (.05)	30.45				Nonparametric Statistics		
319					Adjusted Level of Significance	0.0369				95% CLT UCL		6.081
320					Adjusted Chi Square Value	29.42				95% Jackknife UCL		6.164
321										95% Standard Bootstrap UCL		6.058
322					Anderson-Darling Test Statistic	0.375				95% Bootstrap-t UCL		6.611
323					Anderson-Darling 5% Critical Value	0.76				95% Hall's Bootstrap UCL		6.775
324					Kolmogorov-Smirnov Test Statistic	0.14				95% Percentile Bootstrap UCL		6.121
325					Kolmogorov-Smirnov 5% Critical Value	0.203				95% BCA Bootstrap UCL		6.29
326				Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		8.613
327										97.5% Chebyshev(Mean, Sd) UCL		10.37
328				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		13.83
329					95% Approximate Gamma UCL	6.689						
330					95% Adjusted Gamma UCL	6.924						

	A	B	C	D	E	F	G	H	I	J	K	L
331												
332	Potential UCL to Use						Use 95% Approximate Gamma UCL					6.689
333												
334	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
335	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
336	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
337												
338												
339	TOTAL HPCDD											
340												
341	General Statistics											
342	Number of Valid Observations					19	Number of Distinct Observations					19
343	Number of Missing Values					25						
344												
345	Raw Statistics						Log-transformed Statistics					
346	Minimum					2.6	Minimum of Log Data					0.956
347	Maximum					7430	Maximum of Log Data					8.913
348	Mean					437.3	Mean of log Data					3.718
349	Median					27.2	SD of log Data					1.604
350	SD					1694						
351	Std. Error of Mean					388.7						
352	Coefficient of Variation					3.875						
353	Skewness					4.351						
354												
355	Relevant UCL Statistics											
356	Normal Distribution Test						Lognormal Distribution Test					
357	Shapiro Wilk Test Statistic					0.265	Shapiro Wilk Test Statistic					0.839
358	Shapiro Wilk Critical Value					0.901	Shapiro Wilk Critical Value					0.901
359	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
360												
361	Assuming Normal Distribution						Assuming Lognormal Distribution					
362	95% Student's-t UCL					1111	95% H-UCL					572.9
363	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					381
364	95% Adjusted-CLT UCL (Chen-1995)					1491	97.5% Chebyshev (MVUE) UCL					489.4
365	95% Modified-t UCL (Johnson-1978)					1176	99% Chebyshev (MVUE) UCL					702.4
366												
367	Gamma Distribution Test						Data Distribution					
368	k star (bias corrected)					0.282	Data do not follow a Discernable Distribution (0.05)					
369	Theta Star					1552						
370	MLE of Mean					437.3						
371	MLE of Standard Deviation					823.7						
372	nu star					10.71						
373	Approximate Chi Square Value (.05)					4.389	Nonparametric Statistics					
374	Adjusted Level of Significance					0.0369	95% CLT UCL					1077
375	Adjusted Chi Square Value					4.041	95% Jackknife UCL					1111
376							95% Standard Bootstrap UCL					1067
377	Anderson-Darling Test Statistic					3.837	95% Bootstrap-t UCL					28346
378	Anderson-Darling 5% Critical Value					0.846	95% Hall's Bootstrap UCL					10526
379	Kolmogorov-Smirnov Test Statistic					0.428	95% Percentile Bootstrap UCL					1210
380	Kolmogorov-Smirnov 5% Critical Value					0.215	95% BCA Bootstrap UCL					1619
381	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					2132
382							97.5% Chebyshev(Mean, Sd) UCL					2865
383	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					4305
384	95% Approximate Gamma UCL					1067						
385	95% Adjusted Gamma UCL					1159						

	A	B	C	D	E	F	G	H	I	J	K	L
386												
387	Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL					4305
388												
389	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
390	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
391	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
392												
393												
394	TOTAL HXCDF											
395												
396	General Statistics											
397	Number of Valid Observations					19	Number of Distinct Observations					19
398	Number of Missing Values					25						
399												
400	Raw Statistics						Log-transformed Statistics					
401	Minimum					0.44	Minimum of Log Data					-0.821
402	Maximum					193	Maximum of Log Data					5.263
403	Mean					42.54	Mean of log Data					3.151
404	Median					28.2	SD of log Data					1.371
405	SD					44.88						
406	Std. Error of Mean					10.3						
407	Coefficient of Variation					1.055						
408	Skewness					2.235						
409												
410	Relevant UCL Statistics											
411	Normal Distribution Test						Lognormal Distribution Test					
412	Shapiro Wilk Test Statistic					0.774	Shapiro Wilk Test Statistic					0.912
413	Shapiro Wilk Critical Value					0.901	Shapiro Wilk Critical Value					0.901
414	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
415												
416	Assuming Normal Distribution						Assuming Lognormal Distribution					
417	95% Student's-t UCL					60.4	95% H-UCL					167
418	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					143.1
419	95% Adjusted-CLT UCL (Chen-1995)					65.12	97.5% Chebyshev (MVUE) UCL					181.3
420	95% Modified-t UCL (Johnson-1978)					61.27	99% Chebyshev (MVUE) UCL					256.2
421												
422	Gamma Distribution Test						Data Distribution					
423	k star (bias corrected)					0.849	Data appear Gamma Distributed at 5% Significance Level					
424	Theta Star					50.11						
425	MLE of Mean					42.54						
426	MLE of Standard Deviation					46.17						
427	nu star					32.26						
428	Approximate Chi Square Value (.05)					20.28	Nonparametric Statistics					
429	Adjusted Level of Significance					0.0369	95% CLT UCL					59.48
430	Adjusted Chi Square Value					19.45	95% Jackknife UCL					60.4
431							95% Standard Bootstrap UCL					58.83
432	Anderson-Darling Test Statistic					0.186	95% Bootstrap-t UCL					71.31
433	Anderson-Darling 5% Critical Value					0.771	95% Hall's Bootstrap UCL					135
434	Kolmogorov-Smirnov Test Statistic					0.0878	95% Percentile Bootstrap UCL					61.28
435	Kolmogorov-Smirnov 5% Critical Value					0.205	95% BCA Bootstrap UCL					64.81
436	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					87.42
437							97.5% Chebyshev(Mean, Sd) UCL					106.8
438	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					145
439	95% Approximate Gamma UCL					67.68						
440	95% Adjusted Gamma UCL					70.56						

	A	B	C	D	E	F	G	H	I	J	K	L
441												
442	Potential UCL to Use						Use 95% Approximate Gamma UCL					67.68
443												
444	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
445	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
446	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
447												
448												
449	TOTAL PECDF											
450												
451	General Statistics											
452					Number of Valid Observations	19				Number of Distinct Observations		19
453					Number of Missing Values	25						
454												
455	Raw Statistics						Log-transformed Statistics					
456					Minimum	1.1				Minimum of Log Data		0.0953
457					Maximum	363				Maximum of Log Data		5.894
458					Mean	79.68				Mean of log Data		3.733
459					Median	51.05				SD of log Data		1.39
460					SD	85.77						
461					Std. Error of Mean	19.68						
462					Coefficient of Variation	1.076						
463					Skewness	2.137						
464												
465	Relevant UCL Statistics											
466	Normal Distribution Test						Lognormal Distribution Test					
467					Shapiro Wilk Test Statistic	0.786				Shapiro Wilk Test Statistic		0.941
468					Shapiro Wilk Critical Value	0.901				Shapiro Wilk Critical Value		0.901
469	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
470												
471	Assuming Normal Distribution						Assuming Lognormal Distribution					
472					95% Student's-t UCL	113.8				95% H-UCL		314.3
473	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		264.5
474					95% Adjusted-CLT UCL (Chen-1995)	122.3				97.5% Chebyshev (MVUE) UCL		335.5
475					95% Modified-t UCL (Johnson-1978)	115.4				99% Chebyshev (MVUE) UCL		474.9
476												
477	Gamma Distribution Test						Data Distribution					
478					k star (bias corrected)	0.797	Data appear Gamma Distributed at 5% Significance Level					
479					Theta Star	99.91						
480					MLE of Mean	79.68						
481					MLE of Standard Deviation	89.22						
482					nu star	30.3						
483					Approximate Chi Square Value (.05)	18.73	Nonparametric Statistics					
484					Adjusted Level of Significance	0.0369				95% CLT UCL		112
485					Adjusted Chi Square Value	17.94				95% Jackknife UCL		113.8
486										95% Standard Bootstrap UCL		111.4
487					Anderson-Darling Test Statistic	0.157				95% Bootstrap-t UCL		130.6
488					Anderson-Darling 5% Critical Value	0.773				95% Hall's Bootstrap UCL		253
489					Kolmogorov-Smirnov Test Statistic	0.0918				95% Percentile Bootstrap UCL		113.6
490					Kolmogorov-Smirnov 5% Critical Value	0.205				95% BCA Bootstrap UCL		121.7
491	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		165.4
492										97.5% Chebyshev(Mean, Sd) UCL		202.6
493	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		275.5
494					95% Approximate Gamma UCL	128.9						
495					95% Adjusted Gamma UCL	134.6						

	A	B	C	D	E	F	G	H	I	J	K	L
496												
497	Potential UCL to Use						Use 95% Approximate Gamma UCL					128.9
498												
499	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
500	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
501	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
502												
503												
504	TOTAL TCDF											
505												
506	General Statistics											
507	Number of Valid Observations					19	Number of Distinct Observations					19
508	Number of Missing Values					25						
509												
510	Raw Statistics						Log-transformed Statistics					
511	Minimum					4.2	Minimum of Log Data					1.435
512	Maximum					461	Maximum of Log Data					6.133
513	Mean					115	Mean of log Data					4.224
514	Median					77.7	SD of log Data					1.188
515	SD					115.6						
516	Std. Error of Mean					26.52						
517	Coefficient of Variation					1.005						
518	Skewness					1.842						
519												
520	Relevant UCL Statistics											
521	Normal Distribution Test						Lognormal Distribution Test					
522	Shapiro Wilk Test Statistic					0.814	Shapiro Wilk Test Statistic					0.963
523	Shapiro Wilk Critical Value					0.901	Shapiro Wilk Critical Value					0.901
524	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
525												
526	Assuming Normal Distribution						Assuming Lognormal Distribution					
527	95% Student's-t UCL					161	95% H-UCL					310.4
528	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					308
529	95% Adjusted-CLT UCL (Chen-1995)					170.6	97.5% Chebyshev (MVUE) UCL					384.8
530	95% Modified-t UCL (Johnson-1978)					162.9	99% Chebyshev (MVUE) UCL					535.7
531												
532	Gamma Distribution Test						Data Distribution					
533	k star (bias corrected)					0.958	Data appear Gamma Distributed at 5% Significance Level					
534	Theta Star					120.1						
535	MLE of Mean					115						
536	MLE of Standard Deviation					117.5						
537	nu star					36.4						
538	Approximate Chi Square Value (.05)					23.59	Nonparametric Statistics					
539	Adjusted Level of Significance					0.0369	95% CLT UCL					158.6
540	Adjusted Chi Square Value					22.69	95% Jackknife UCL					161
541							95% Standard Bootstrap UCL					156.9
542	Anderson-Darling Test Statistic					0.102	95% Bootstrap-t UCL					186.6
543	Anderson-Darling 5% Critical Value					0.767	95% Hall's Bootstrap UCL					212.5
544	Kolmogorov-Smirnov Test Statistic					0.0691	95% Percentile Bootstrap UCL					160.1
545	Kolmogorov-Smirnov 5% Critical Value					0.204	95% BCA Bootstrap UCL					169.3
546	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					230.6
547							97.5% Chebyshev(Mean, Sd) UCL					280.6
548	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					378.9
549	95% Approximate Gamma UCL					177.5						
550	95% Adjusted Gamma UCL					184.5						

	A	B	C	D	E	F	G	H	I	J	K	L
551												
552	Potential UCL to Use								Use 95% Approximate Gamma UCL			177.5
553												
554	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
555	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
556	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
557												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	1,2,3,4,6,7,8,9-OCDF											
10												
11						General Statistics						
12						Number of Valid Data	19			Number of Detected Data		17
13						Number of Distinct Detected Data	17			Number of Non-Detect Data		2
14						Number of Missing Values	25			Percent Non-Detects		10.53%
15												
16						Raw Statistics				Log-transformed Statistics		
17						Minimum Detected	1.9			Minimum Detected		0.642
18						Maximum Detected	129			Maximum Detected		4.86
19						Mean of Detected	21.94			Mean of Detected		2.375
20						SD of Detected	34.86			SD of Detected		1.128
21						Minimum Non-Detect	0.8			Minimum Non-Detect		-0.223
22						Maximum Non-Detect	2.4			Maximum Non-Detect		0.875
23												
24				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect		4
25				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected		15
26				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		21.05%
27												
28						UCL Statistics						
29						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
30						Shapiro Wilk Test Statistic	0.563			Shapiro Wilk Test Statistic		0.938
31						5% Shapiro Wilk Critical Value	0.892			5% Shapiro Wilk Critical Value		0.892
32						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
33												
34						Assuming Normal Distribution				Assuming Lognormal Distribution		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	19.72			Mean		2.086
37						SD	33.54			SD		1.383
38						95% DL/2 (t) UCL	33.06			95% H-Stat (DL/2) UCL		59.36
39												
40						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
41						Mean	14.32			Mean in Log Scale		2.126
42						SD	38.27			SD in Log Scale		1.305
43						95% MLE (t) UCL	29.55			Mean in Original Scale		19.75
44						95% MLE (Tiku) UCL	29.35			SD in Original Scale		33.52
45										95% t UCL		33.08
46										95% Percentile Bootstrap UCL		33.61
47										95% BCA Bootstrap UCL		38.61
48										95% H UCL		50.46
49												
50						Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only		
51						k star (bias corrected)	0.721			Data appear Lognormal at 5% Significance Level		
52						Theta Star	30.44					
53						nu star	24.51					
54												
55						A-D Test Statistic	1.244			Nonparametric Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
56					5% A-D Critical Value	0.773					Kaplan-Meier (KM) Method	
57					K-S Test Statistic	0.773					Mean	19.84
58					5% K-S Critical Value	0.217					SD	32.58
59			Data not Gamma Distributed at 5% Significance Level								SE of Mean	7.704
60											95% KM (t) UCL	33.2
61			Assuming Gamma Distribution								95% KM (z) UCL	32.51
62				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	33.13
63					Minimum	0.000001					95% KM (bootstrap t) UCL	76.94
64					Maximum	129					95% KM (BCA) UCL	34.46
65					Mean	19.63					95% KM (Percentile Bootstrap) UCL	33.53
66					Median	9.2					95% KM (Chebyshev) UCL	53.42
67					SD	33.59					97.5% KM (Chebyshev) UCL	67.95
68					k star	0.287					99% KM (Chebyshev) UCL	96.49
69					Theta star	68.42						
70					Nu star	10.9					Potential UCLs to Use	
71					AppChi2	4.514					97.5% KM (Chebyshev) UCL	67.95
72					95% Gamma Approximate UCL	47.42						
73					95% Adjusted Gamma UCL	51.46						
74	Note: DL/2 is not a recommended method.											
75												
76			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
77			These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).									
78			For additional insight, the user may want to consult a statistician.									
79												
80												
81	1,2,3,4,6,7,8-HPCDF											
82												
83					General Statistics							
84					Number of Valid Data	19					Number of Detected Data	18
85					Number of Distinct Detected Data	18					Number of Non-Detect Data	1
86					Number of Missing Values	25					Percent Non-Detects	5.26%
87												
88					Raw Statistics						Log-transformed Statistics	
89					Minimum Detected	1.8					Minimum Detected	0.588
90					Maximum Detected	48.2					Maximum Detected	3.875
91					Mean of Detected	15.67					Mean of Detected	2.382
92					SD of Detected	13.12					SD of Detected	0.939
93					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
94					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
95												
96												
97					UCL Statistics							
98					Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only	
99					Shapiro Wilk Test Statistic	0.883					Shapiro Wilk Test Statistic	0.972
100					5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897
101					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
102												
103					Assuming Normal Distribution						Assuming Lognormal Distribution	
104					DL/2 Substitution Method						DL/2 Substitution Method	
105					Mean	14.85					Mean	2.157
106					SD	13.24					SD	1.34
107					95% DL/2 (t) UCL	20.12					95% H-Stat (DL/2) UCL	56.94
108												
109					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
110					Mean	14.49					Mean in Log Scale	2.26

	A	B	C	D	E	F	G	H	I	J	K	L
111					SD	13.44					SD in Log Scale	1.056
112					95% MLE (t) UCL	19.84					Mean in Original Scale	14.9
113					95% MLE (Tiku) UCL	19.66					SD in Original Scale	13.18
114											95% t UCL	20.14
115											95% Percentile Bootstrap UCL	20.08
116											95% BCA Bootstrap UCL	20.89
117											95% H UCL	32.71
118												
119				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
120					k star (bias corrected)	1.285				Data appear Gamma Distributed at 5% Significance Level		
121					Theta Star	12.19						
122					nu star	46.26						
123												
124					A-D Test Statistic	0.237				Nonparametric Statistics		
125					5% A-D Critical Value	0.756					Kaplan-Meier (KM) Method	
126					K-S Test Statistic	0.756					Mean	14.94
127					5% K-S Critical Value	0.207					SD	12.79
128				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	3.019
129											95% KM (t) UCL	20.17
130				Assuming Gamma Distribution							95% KM (z) UCL	19.9
131					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	20.14
132					Minimum	0.000001					95% KM (bootstrap t) UCL	21.33
133					Maximum	48.2					95% KM (BCA) UCL	19.89
134					Mean	14.84					95% KM (Percentile Bootstrap) UCL	19.96
135					Median	8.4					95% KM (Chebyshev) UCL	28.1
136					SD	13.25					97.5% KM (Chebyshev) UCL	33.79
137					k star	0.488					99% KM (Chebyshev) UCL	44.98
138					Theta star	30.42						
139					Nu star	18.54				Potential UCLs to Use		
140					AppChi2	9.783					95% KM (Chebyshev) UCL	28.1
141					95% Gamma Approximate UCL	28.13						
142					95% Adjusted Gamma UCL	29.82						
143	Note: DL/2 is not a recommended method.											
144												
145				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
146				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
147				For additional insight, the user may want to consult a statistician.								
148												
149												
150	1,2,3,4,7,8,9-HPCDF											
151												
152					General Statistics							
153					Number of Valid Data	19					Number of Detected Data	6
154					Number of Distinct Detected Data	5					Number of Non-Detect Data	13
155					Number of Missing Values	25					Percent Non-Detects	68.42%
156												
157				Raw Statistics						Log-transformed Statistics		
158					Minimum Detected	0.48					Minimum Detected	-0.734
159					Maximum Detected	1.7					Maximum Detected	0.531
160					Mean of Detected	1.38					Mean of Detected	0.244
161					SD of Detected	0.466					SD of Detected	0.49
162					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
163					Maximum Non-Detect	3.4					Maximum Non-Detect	1.224
164												
165	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	19

	A	B	C	D	E	F	G	H	I	J	K	L
166	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
167	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
168												
169	Warning: There are only 6 Detected Values in this data											
170	Note: It should be noted that even though bootstrap may be performed on this data set											
171	the resulting calculations may not be reliable enough to draw conclusions											
172												
173	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
174												
175												
176	UCL Statistics											
177	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
178					Shapiro Wilk Test Statistic	0.757					Shapiro Wilk Test Statistic	0.667
179					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
180	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
181												
182	Assuming Normal Distribution						Assuming Lognormal Distribution					
183					DL/2 Substitution Method						DL/2 Substitution Method	
184					Mean	0.717					Mean	-0.753
185					SD	0.641					SD	0.952
186					95% DL/2 (t) UCL	0.972					95% H-Stat (DL/2) UCL	1.311
187												
188					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
189	MLE method failed to converge properly										Mean in Log Scale	-0.567
190											SD in Log Scale	0.679
191											Mean in Original Scale	0.716
192											SD in Original Scale	0.534
193											95% t UCL	0.928
194											95% Percentile Bootstrap UCL	0.909
195											95% BCA Bootstrap UCL	0.932
196											95% H-UCL	1.015
197												
198	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
199					k star (bias corrected)	3.402	Data Follow Appr. Gamma Distribution at 5% Significance Level					
200					Theta Star	0.406						
201					nu star	40.82						
202												
203					A-D Test Statistic	0.947	Nonparametric Statistics					
204					5% A-D Critical Value	0.698					Kaplan-Meier (KM) Method	
205					K-S Test Statistic	0.698					Mean	0.798
206					5% K-S Critical Value	0.333					SD	0.499
207	Data follow Appr. Gamma Distribution at 5% Significance Level										SE of Mean	0.133
208											95% KM (t) UCL	1.027
209	Assuming Gamma Distribution										95% KM (z) UCL	1.016
210					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.248
211					Minimum	0.000001					95% KM (bootstrap t) UCL	0.979
212					Maximum	1.7					95% KM (BCA) UCL	1.619
213					Mean	0.441					95% KM (Percentile Bootstrap) UCL	1.556
214					Median	0.000001					95% KM (Chebyshev) UCL	1.375
215					SD	0.7					97.5% KM (Chebyshev) UCL	1.625
216					k star	0.121					99% KM (Chebyshev) UCL	2.116
217					Theta star	3.646						
218					Nu star	4.593	Potential UCLs to Use					
219					AppChi2	0.969					95% KM (t) UCL	1.027
220					95% Gamma Approximate UCL	2.089						

	A	B	C	D	E	F	G	H	I	J	K	L
221					95% Adjusted Gamma UCL	2.423						
222	Note: DL/2 is not a recommended method.											
223												
224	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
225	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
226	For additional insight, the user may want to consult a statistician.											
227												
228												
229	1,2,3,4,7,8-HXCDD											
230												
231	General Statistics											
232					Number of Valid Data	19				Number of Detected Data		9
233					Number of Distinct Detected Data	8				Number of Non-Detect Data		10
234					Number of Missing Values	25				Percent Non-Detects		52.63%
235												
236	Raw Statistics						Log-transformed Statistics					
237					Minimum Detected	0.23				Minimum Detected		-1.47
238					Maximum Detected	4.2				Maximum Detected		1.435
239					Mean of Detected	1.523				Mean of Detected		0.0882
240					SD of Detected	1.263				SD of Detected		0.917
241					Minimum Non-Detect	0.25				Minimum Non-Detect		-1.386
242					Maximum Non-Detect	2.6				Maximum Non-Detect		0.956
243												
244	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		17
245	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
246	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		89.47%
247												
248	Warning: There are only 9 Detected Values in this data											
249	Note: It should be noted that even though bootstrap may be performed on this data set											
250	the resulting calculations may not be reliable enough to draw conclusions											
251												
252	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
253												
254												
255	UCL Statistics											
256	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
257					Shapiro Wilk Test Statistic	0.878				Shapiro Wilk Test Statistic		0.968
258					5% Shapiro Wilk Critical Value	0.829				5% Shapiro Wilk Critical Value		0.829
259	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
260												
261	Assuming Normal Distribution						Assuming Lognormal Distribution					
262					DL/2 Substitution Method					DL/2 Substitution Method		
263					Mean	0.926				Mean		-0.618
264					SD	1.058				SD		1.067
265					95% DL/2 (t) UCL	1.346				95% H-Stat (DL/2) UCL		1.88
266												
267					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
268	MLE method failed to converge properly									Mean in Log Scale		-0.686
269										SD in Log Scale		1.008
270										Mean in Original Scale		0.862
271										SD in Original Scale		1.063
272										95% t UCL		1.285
273										95% Percentile Bootstrap UCL		1.29
274										95% BCA Bootstrap UCL		1.397
275										95% H-UCL		1.56

	A	B	C	D	E	F	G	H	I	J	K	L
276												
277	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
278					k star (bias corrected)	1.174	Data appear Normal at 5% Significance Level					
279					Theta Star	1.297						
280					nu star	21.13						
281												
282					A-D Test Statistic	0.214	Nonparametric Statistics					
283					5% A-D Critical Value	0.733				Kaplan-Meier (KM) Method		
284					K-S Test Statistic	0.733				Mean		0.883
285					5% K-S Critical Value	0.284				SD		1.035
286	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.255
287										95% KM (t) UCL		1.326
288	Assuming Gamma Distribution									95% KM (z) UCL		1.303
289				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.272
290					Minimum	0.000001				95% KM (bootstrap t) UCL		1.531
291					Maximum	4.2				95% KM (BCA) UCL		1.559
292					Mean	0.762				95% KM (Percentile Bootstrap) UCL		1.434
293					Median	0.275				95% KM (Chebyshev) UCL		1.995
294					SD	1.126				97.5% KM (Chebyshev) UCL		2.477
295					k star	0.164				99% KM (Chebyshev) UCL		3.422
296					Theta star	4.64						
297					Nu star	6.241	Potential UCLs to Use					
298					AppChi2	1.764				95% KM (t) UCL		1.326
299					95% Gamma Approximate UCL	2.696				95% KM (Percentile Bootstrap) UCL		1.434
300					95% Adjusted Gamma UCL	3.039						
301	Note: DL/2 is not a recommended method.											
302												
303	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
304	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
305	For additional insight, the user may want to consult a statistician.											
306												
307												
308	1,2,3,4,7,8-HXCDF											
309												
310	General Statistics											
311					Number of Valid Data	19				Number of Detected Data		15
312					Number of Distinct Detected Data	13				Number of Non-Detect Data		4
313					Number of Missing Values	25				Percent Non-Detects		21.05%
314												
315	Raw Statistics						Log-transformed Statistics					
316					Minimum Detected	0.93				Minimum Detected		-0.0726
317					Maximum Detected	12.7				Maximum Detected		2.542
318					Mean of Detected	4.541				Mean of Detected		1.132
319					SD of Detected	4.017				SD of Detected		0.928
320					Minimum Non-Detect	0.1				Minimum Non-Detect		-2.303
321					Maximum Non-Detect	0.2				Maximum Non-Detect		-1.609
322												
323	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		4
324	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		15
325	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		21.05%
326												
327	UCL Statistics											
328	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
329					Shapiro Wilk Test Statistic	0.828				Shapiro Wilk Test Statistic		0.921
330					5% Shapiro Wilk Critical Value	0.881				5% Shapiro Wilk Critical Value		0.881

	A	B	C	D	E	F	G	H	I	J	K	L
331	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
332												
333	Assuming Normal Distribution						Assuming Lognormal Distribution					
334					DL/2 Substitution Method						DL/2 Substitution Method	
335					Mean	3.603					Mean	0.373
336					SD	4.004					SD	1.725
337					95% DL/2 (t) UCL	5.196					95% H-Stat (DL/2) UCL	29.73
338												
339					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
340					Mean	3.027					Mean in Log Scale	0.673
341					SD	4.651					SD in Log Scale	1.235
342					95% MLE (t) UCL	4.877					Mean in Original Scale	3.662
343					95% MLE (Tiku) UCL	4.901					SD in Original Scale	3.951
344											95% t UCL	5.234
345											95% Percentile Bootstrap UCL	5.17
346											95% BCA Bootstrap UCL	5.516
347											95% H UCL	9.947
348												
349	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
350					k star (bias corrected)	1.21	Data appear Gamma Distributed at 5% Significance Level					
351					Theta Star	3.751						
352					nu star	36.31						
353												
354					A-D Test Statistic	0.444	Nonparametric Statistics					
355					5% A-D Critical Value	0.755					Kaplan-Meier (KM) Method	
356					K-S Test Statistic	0.755					Mean	3.781
357					5% K-S Critical Value	0.226					SD	3.749
358	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.89
359											95% KM (t) UCL	5.325
360	Assuming Gamma Distribution										95% KM (z) UCL	5.245
361					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	5.313
362					Minimum	0.000001					95% KM (bootstrap t) UCL	6.026
363					Maximum	12.7					95% KM (BCA) UCL	5.136
364					Mean	3.585					95% KM (Percentile Bootstrap) UCL	5.355
365					Median	2.3					95% KM (Chebyshev) UCL	7.662
366					SD	4.021					97.5% KM (Chebyshev) UCL	9.341
367					k star	0.221					99% KM (Chebyshev) UCL	12.64
368					Theta star	16.26						
369					Nu star	8.381	Potential UCLs to Use					
370					AppChi2	2.957					95% KM (BCA) UCL	5.136
371					95% Gamma Approximate UCL	10.16						
372					95% Adjusted Gamma UCL	11.2						
373	Note: DL/2 is not a recommended method.											
374												
375	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
376	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
377	For additional insight, the user may want to consult a statistician.											
378												
379												
380	1,2,3,6,7,8-HXCDD											
381												
382	General Statistics											
383					Number of Valid Data	19					Number of Detected Data	16
384					Number of Distinct Detected Data	16					Number of Non-Detect Data	3
385					Number of Missing Values	25					Percent Non-Detects	15.79%

	A	B	C	D	E	F	G	H	I	J	K	L
386												
387				Raw Statistics						Log-transformed Statistics		
388					Minimum Detected	0.445					Minimum Detected	-0.81
389					Maximum Detected	9.6					Maximum Detected	2.262
390					Mean of Detected	2.509					Mean of Detected	0.532
391					SD of Detected	2.471					SD of Detected	0.908
392					Minimum Non-Detect	0.4					Minimum Non-Detect	-0.916
393					Maximum Non-Detect	0.7					Maximum Non-Detect	-0.357
394												
395	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	7
396	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	12
397	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	36.84%
398												
399					UCL Statistics							
400				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
401					Shapiro Wilk Test Statistic	0.772					Shapiro Wilk Test Statistic	0.954
402					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
403				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
404												
405				Assuming Normal Distribution						Assuming Lognormal Distribution		
406					DL/2 Substitution Method						DL/2 Substitution Method	
407					Mean	2.155					Mean	0.235
408					SD	2.407					SD	1.092
409					95% DL/2 (t) UCL	3.113					95% H-Stat (DL/2) UCL	4.654
410												
411					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
412					Mean	1.403					Mean in Log Scale	0.246
413					SD	3.202					SD in Log Scale	1.082
414					95% MLE (t) UCL	2.677					Mean in Original Scale	2.16
415					95% MLE (Tiku) UCL	2.801					SD in Original Scale	2.403
416											95% t UCL	3.116
417											95% Percentile Bootstrap UCL	3.11
418											95% BCA Bootstrap UCL	3.285
419											95% H UCL	4.606
420												
421				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
422					k star (bias corrected)	1.205				Data appear Gamma Distributed at 5% Significance Level		
423					Theta Star	2.083						
424					nu star	38.55						
425												
426					A-D Test Statistic	0.443				Nonparametric Statistics		
427					5% A-D Critical Value	0.756					Kaplan-Meier (KM) Method	
428					K-S Test Statistic	0.756					Mean	2.187
429					5% K-S Critical Value	0.219					SD	2.318
430				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.549
431											95% KM (t) UCL	3.139
432				Assuming Gamma Distribution							95% KM (z) UCL	3.09
433					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.124
434					Minimum	0.000001					95% KM (bootstrap t) UCL	3.71
435					Maximum	9.6					95% KM (BCA) UCL	3.189
436					Mean	2.113					95% KM (Percentile Bootstrap) UCL	3.121
437					Median	1.5					95% KM (Chebyshev) UCL	4.581
438					SD	2.443					97.5% KM (Chebyshev) UCL	5.617
439					k star	0.272					99% KM (Chebyshev) UCL	7.652
440					Theta star	7.78						

	A	B	C	D	E	F	G	H	I	J	K	L
441					Nu star	10.32	Potential UCLs to Use					
442					AppChi2	4.143				95% KM (BCA) UCL		3.189
443				95% Gamma Approximate UCL		5.264						
444				95% Adjusted Gamma UCL		5.73						
445	Note: DL/2 is not a recommended method.											
446												
447	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
448	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
449	For additional insight, the user may want to consult a statistician.											
450												
451												
452	1,2,3,6,7,8-HXCDF											
453												
454	General Statistics											
455					Number of Valid Data	19				Number of Detected Data		17
456					Number of Distinct Detected Data	16				Number of Non-Detect Data		2
457					Number of Missing Values	25				Percent Non-Detects		10.53%
458												
459	Raw Statistics						Log-transformed Statistics					
460					Minimum Detected	0.385				Minimum Detected		-0.955
461					Maximum Detected	5.4				Maximum Detected		1.686
462					Mean of Detected	2.252				Mean of Detected		0.495
463					SD of Detected	1.697				SD of Detected		0.87
464					Minimum Non-Detect	0.2				Minimum Non-Detect		-1.609
465					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
466												
467	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		2
468	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		17
469	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		10.53%
470												
471	UCL Statistics											
472	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
473					Shapiro Wilk Test Statistic	0.881				Shapiro Wilk Test Statistic		0.935
474					5% Shapiro Wilk Critical Value	0.892				5% Shapiro Wilk Critical Value		0.892
475	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
476												
477	Assuming Normal Distribution						Assuming Lognormal Distribution					
478					DL/2 Substitution Method					DL/2 Substitution Method		
479					Mean	2.028				Mean		0.222
480					SD	1.735				SD		1.16
481					95% DL/2 (t) UCL	2.718				95% H-Stat (DL/2) UCL		5.328
482												
483					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
484					Mean	1.942				Mean in Log Scale		0.283
485					SD	1.821				SD in Log Scale		1.037
486					95% MLE (t) UCL	2.666				Mean in Original Scale		2.038
487					95% MLE (Tiku) UCL	2.652				SD in Original Scale		1.724
488										95% t UCL		2.724
489										95% Percentile Bootstrap UCL		2.692
490										95% BCA Bootstrap UCL		2.725
491										95% H UCL		4.354
492												
493	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
494					k star (bias corrected)	1.459	Data appear Gamma Distributed at 5% Significance Level					
495					Theta Star	1.543						

	A	B	C	D	E	F	G	H	I	J	K	L
496					nu star	49.62						
497												
498					A-D Test Statistic	0.417	Nonparametric Statistics					
499					5% A-D Critical Value	0.753				Kaplan-Meier (KM) Method		
500					K-S Test Statistic	0.753				Mean		2.056
501					5% K-S Critical Value	0.212				SD		1.659
502	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.392
503										95% KM (t) UCL		2.736
504	Assuming Gamma Distribution									95% KM (z) UCL		2.701
505				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		2.729
506					Minimum	0.000001				95% KM (bootstrap t) UCL		2.906
507					Maximum	5.4				95% KM (BCA) UCL		2.747
508					Mean	2.015				95% KM (Percentile Bootstrap) UCL		2.691
509					Median	1.45				95% KM (Chebyshev) UCL		3.766
510					SD	1.75				97.5% KM (Chebyshev) UCL		4.506
511					k star	0.361				99% KM (Chebyshev) UCL		5.96
512					Theta star	5.589						
513					Nu star	13.7	Potential UCLs to Use					
514					AppChi2	6.366				95% KM (BCA) UCL		2.747
515					95% Gamma Approximate UCL	4.336						
516					95% Adjusted Gamma UCL	4.653						
517	Note: DL/2 is not a recommended method.											
518												
519	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
520	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
521	For additional insight, the user may want to consult a statistician.											
522												
523												
524	1,2,3,7,8,9-HXCDD											
525												
526	General Statistics											
527					Number of Valid Data	19				Number of Detected Data		16
528					Number of Distinct Detected Data	14				Number of Non-Detect Data		3
529					Number of Missing Values	25				Percent Non-Detects		15.79%
530												
531	Raw Statistics						Log-transformed Statistics					
532					Minimum Detected	0.445				Minimum Detected		-0.81
533					Maximum Detected	15.2				Maximum Detected		2.721
534					Mean of Detected	3.359				Mean of Detected		0.762
535					SD of Detected	3.648				SD of Detected		0.988
536					Minimum Non-Detect	0.4				Minimum Non-Detect		-0.916
537					Maximum Non-Detect	0.7				Maximum Non-Detect		-0.357
538												
539	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		5
540	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		14
541	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		26.32%
542												
543	UCL Statistics											
544	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
545					Shapiro Wilk Test Statistic	0.72				Shapiro Wilk Test Statistic		0.961
546					5% Shapiro Wilk Critical Value	0.887				5% Shapiro Wilk Critical Value		0.887
547	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
548												
549	Assuming Normal Distribution						Assuming Lognormal Distribution					
550					DL/2 Substitution Method					DL/2 Substitution Method		

	A	B	C	D	E	F	G	H	I	J	K	L
551					Mean	2.871					Mean	0.429
552					SD	3.526					SD	1.203
553					95% DL/2 (t) UCL	4.274					95% H-Stat (DL/2) UCL	7.23
554												
555					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
556					Mean	2.206					Mean in Log Scale	0.432
557					SD	4.209					SD in Log Scale	1.2
558					95% MLE (t) UCL	3.88					Mean in Original Scale	2.872
559					95% MLE (Tiku) UCL	3.922					SD in Original Scale	3.525
560											95% t UCL	4.275
561											95% Percentile Bootstrap UCL	4.325
562											95% BCA Bootstrap UCL	4.86
563											95% H UCL	7.196
564												
565				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
566					k star (bias corrected)	1.059				Data appear Gamma Distributed at 5% Significance Level		
567					Theta Star	3.173						
568					nu star	33.88						
569												
570					A-D Test Statistic	0.423				Nonparametric Statistics		
571					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
572					K-S Test Statistic	0.759					Mean	2.9
573					5% K-S Critical Value	0.22					SD	3.41
574				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.808
575											95% KM (t) UCL	4.302
576				Assuming Gamma Distribution							95% KM (z) UCL	4.23
577					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.283
578					Minimum	0.000001					95% KM (bootstrap t) UCL	5.274
579					Maximum	15.2					95% KM (BCA) UCL	4.344
580					Mean	2.829					95% KM (Percentile Bootstrap) UCL	4.313
581					Median	1.3					95% KM (Chebyshev) UCL	6.422
582					SD	3.56					97.5% KM (Chebyshev) UCL	7.946
583					k star	0.264					99% KM (Chebyshev) UCL	10.94
584					Theta star	10.72						
585					Nu star	10.03				Potential UCLs to Use		
586					AppChi2	3.958					95% KM (BCA) UCL	4.344
587					95% Gamma Approximate UCL	7.165						
588					95% Adjusted Gamma UCL	7.812						
589	Note: DL/2 is not a recommended method.											
590												
591	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
592	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
593	For additional insight, the user may want to consult a statistician.											
594												
595												
596	1,2,3,7,8,9-HXCDF											
597												
598					General Statistics							
599					Number of Valid Data	19					Number of Detected Data	12
600					Number of Distinct Detected Data	12					Number of Non-Detect Data	7
601					Number of Missing Values	25					Percent Non-Detects	36.84%
602												
603				Raw Statistics						Log-transformed Statistics		
604					Minimum Detected	0.2					Minimum Detected	-1.609
605					Maximum Detected	2.3					Maximum Detected	0.833

	A–E	F	G–K	L
606	Mean of Detected	0.703	Mean of Detected	-0.568
607	SD of Detected	0.554	SD of Detected	0.672
608	Minimum Non-Detect	0.15	Minimum Non-Detect	-1.897
609	Maximum Non-Detect	1.6	Maximum Non-Detect	0.47
610				
611	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	18
612	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
613	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.74%
614				
615	**UCL Statistics**			
616	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
617	Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.938
618	5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
619	Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
620				
621	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
622	DL/2 Substitution Method		DL/2 Substitution Method	
623	Mean	0.553	Mean	-0.923
624	SD	0.503	SD	0.855
625	95% DL/2 (t) UCL	0.753	95% H-Stat (DL/2) UCL	0.932
626				
627	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
628	**MLE method failed to converge properly**		Mean in Log Scale	-0.938
629			SD in Log Scale	0.775
630			Mean in Original Scale	0.528
631			SD in Original Scale	0.497
632			95% t UCL	0.726
633			95% Percentile Bootstrap UCL	0.732
634			95% BCA Bootstrap UCL	0.816
635			95% H-UCL	0.806
636				
637	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
638	k star (bias corrected)	1.906	Data appear Gamma Distributed at 5% Significance Level	
639	Theta Star	0.369		
640	nu star	45.74		
641				
642	A-D Test Statistic	0.491	**Nonparametric Statistics**	
643	5% A-D Critical Value	0.74	Kaplan-Meier (KM) Method	
644	K-S Test Statistic	0.74	Mean	0.546
645	5% K-S Critical Value	0.248	SD	0.481
646	Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.117
647			95% KM (t) UCL	0.749
648	**Assuming Gamma Distribution**		95% KM (z) UCL	0.739
649	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.744
650	Minimum	0.000001	95% KM (bootstrap t) UCL	0.855
651	Maximum	2.3	95% KM (BCA) UCL	0.772
652	Mean	0.495	95% KM (Percentile Bootstrap) UCL	0.763
653	Median	0.438	95% KM (Chebyshev) UCL	1.057
654	SD	0.53	97.5% KM (Chebyshev) UCL	1.278
655	k star	0.25	99% KM (Chebyshev) UCL	1.712
656	Theta star	1.983		
657	Nu star	9.486	**Potential UCLs to Use**	
658	AppChi2	3.623	95% KM (Percentile Bootstrap) UCL	0.763
659	95% Gamma Approximate UCL	1.296		
660	95% Adjusted Gamma UCL	1.417		

	A	B	C	D	E	F	G	H	I	J	K	L
661	Note: DL/2 is not a recommended method.											
662												
663	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
664	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
665	For additional insight, the user may want to consult a statistician.											
666												
667												
668	1,2,3,7,8-PECDD											
669												
670	General Statistics											
671	Number of Valid Data					19	Number of Detected Data					8
672	Number of Distinct Detected Data					8	Number of Non-Detect Data					11
673	Number of Missing Values					25	Percent Non-Detects					57.89%
674												
675	Raw Statistics						Log-transformed Statistics					
676	Minimum Detected					0.55	Minimum Detected					-0.598
677	Maximum Detected					3.3	Maximum Detected					1.194
678	Mean of Detected					1.496	Mean of Detected					0.229
679	SD of Detected					0.95	SD of Detected					0.633
680	Minimum Non-Detect					0.15	Minimum Non-Detect					-1.897
681	Maximum Non-Detect					1.7	Maximum Non-Detect					0.531
682												
683	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					16
684	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					3
685	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					84.21%
686												
687	Warning: There are only 8 Detected Values in this data											
688	Note: It should be noted that even though bootstrap may be performed on this data set											
689	the resulting calculations may not be reliable enough to draw conclusions											
690												
691	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
692												
693												
694	UCL Statistics											
695	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
696	Shapiro Wilk Test Statistic					0.899	Shapiro Wilk Test Statistic					0.953
697	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
698	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
699												
700	Assuming Normal Distribution						Assuming Lognormal Distribution					
701	DL/2 Substitution Method						DL/2 Substitution Method					
702	Mean					0.787	Mean					-0.771
703	SD					0.873	SD					1.064
704	95% DL/2 (t) UCL					1.134	95% H-Stat (DL/2) UCL					1.604
705												
706	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
707	Mean					2.647	Mean in Log Scale					-0.742
708	SD					0.589	SD in Log Scale					0.985
709	95% MLE (t) UCL					2.881	Mean in Original Scale					0.776
710	95% MLE (Tiku) UCL					3.223	SD in Original Scale					0.869
711							95% t UCL					1.121
712							95% Percentile Bootstrap UCL					1.108
713							95% BCA Bootstrap UCL					1.171
714							95% H UCL					1.41
715												

	A	B	C	D	E	F	G	H	I	J	K	L
716	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
717					k star (bias corrected)	1.975	Data appear Normal at 5% Significance Level					
718					Theta Star	0.758						
719					nu star	31.59						
720												
721					A-D Test Statistic	0.268	Nonparametric Statistics					
722					5% A-D Critical Value	0.721					Kaplan-Meier (KM) Method	
723					K-S Test Statistic	0.721					Mean	0.956
724					5% K-S Critical Value	0.296					SD	0.741
725	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.182
726											95% KM (t) UCL	1.272
727	Assuming Gamma Distribution										95% KM (z) UCL	1.256
728				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	1.227
729					Minimum	0.000001					95% KM (bootstrap t) UCL	1.483
730					Maximum	3.3					95% KM (BCA) UCL	1.474
731					Mean	0.63					95% KM (Percentile Bootstrap) UCL	1.357
732					Median	0.000001					95% KM (Chebyshev) UCL	1.75
733					SD	0.963					97.5% KM (Chebyshev) UCL	2.094
734					k star	0.126					99% KM (Chebyshev) UCL	2.769
735					Theta star	4.996						
736					Nu star	4.792	Potential UCLs to Use					
737					AppChi2	1.057					95% KM (t) UCL	1.272
738					95% Gamma Approximate UCL	2.855					95% KM (Percentile Bootstrap) UCL	1.357
739					95% Adjusted Gamma UCL	3.299						
740	Note: DL/2 is not a recommended method.											
741												
742	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
743	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
744	For additional insight, the user may want to consult a statistician.											
745												
746												
747	1,2,3,7,8-PECDF											
748												
749	General Statistics											
750					Number of Valid Data	19					Number of Detected Data	10
751					Number of Distinct Detected Data	10					Number of Non-Detect Data	9
752					Number of Missing Values	25					Percent Non-Detects	47.37%
753												
754				Raw Statistics						Log-transformed Statistics		
755					Minimum Detected	0.41					Minimum Detected	-0.892
756					Maximum Detected	3.1					Maximum Detected	1.131
757					Mean of Detected	1.302					Mean of Detected	0.0189
758					SD of Detected	0.916					SD of Detected	0.758
759					Minimum Non-Detect	0.085					Minimum Non-Detect	-2.465
760					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
761												
762	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
763	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	6
764	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	68.42%
765												
766	UCL Statistics											
767	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
768					Shapiro Wilk Test Statistic	0.889					Shapiro Wilk Test Statistic	0.891
769					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
770	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
771												
772				Assuming Normal Distribution						Assuming Lognormal Distribution		
773					DL/2 Substitution Method						DL/2 Substitution Method	
774					Mean	0.766					Mean	-0.916
775					SD	0.872					SD	1.229
776					95% DL/2 (t) UCL	1.113					95% H-Stat (DL/2) UCL	2.004
777												
778					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
779					Mean	0.103					Mean in Log Scale	-0.859
780					SD	1.53					SD in Log Scale	1.121
781					95% MLE (t) UCL	0.711					Mean in Original Scale	0.765
782					95% MLE (Tiku) UCL	1.113					SD in Original Scale	0.871
783											95% t UCL	1.112
784											95% Percentile Bootstrap UCL	1.124
785											95% BCA Bootstrap UCL	1.172
786											95% H UCL	1.659
787												
788				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
789					k star (bias corrected)	1.604				Data appear Normal at 5% Significance Level		
790					Theta Star	0.811						
791					nu star	32.08						
792												
793					A-D Test Statistic	0.472				Nonparametric Statistics		
794					5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method	
795					K-S Test Statistic	0.735					Mean	0.881
796					5% K-S Critical Value	0.27					SD	0.771
797				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.186
798											95% KM (t) UCL	1.204
799				Assuming Gamma Distribution							95% KM (z) UCL	1.187
800					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.188
801					Minimum	0.000001					95% KM (bootstrap t) UCL	1.329
802					Maximum	3.1					95% KM (BCA) UCL	1.206
803					Mean	0.685					95% KM (Percentile Bootstrap) UCL	1.209
804					Median	0.41					95% KM (Chebyshev) UCL	1.693
805					SD	0.93					97.5% KM (Chebyshev) UCL	2.045
806					k star	0.143					99% KM (Chebyshev) UCL	2.735
807					Theta star	4.802						
808					Nu star	5.421				Potential UCLs to Use		
809					AppChi2	1.351					95% KM (t) UCL	1.204
810					95% Gamma Approximate UCL	2.748					95% KM (Percentile Bootstrap) UCL	1.209
811					95% Adjusted Gamma UCL	3.137						
812	Note: DL/2 is not a recommended method.											
813												
814	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
815	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
816	For additional insight, the user may want to consult a statistician.											
817												
818												
819	2,3,4,6,7,8-HXCDF											
820												
821				General Statistics								
822					Number of Valid Data	19					Number of Detected Data	17
823					Number of Distinct Detected Data	16					Number of Non-Detect Data	2
824					Number of Missing Values	25					Percent Non-Detects	10.53%
825												

	A	B	C	D	E	F	G	H	I	J	K	L
826	Raw Statistics						Log-transformed Statistics					
827					Minimum Detected	0.545					Minimum Detected	-0.607
828					Maximum Detected	7.7					Maximum Detected	2.041
829					Mean of Detected	3.351					Mean of Detected	0.916
830					SD of Detected	2.391					SD of Detected	0.85
831					Minimum Non-Detect	0.2					Minimum Non-Detect	-1.609
832					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
833												
834	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	2
835	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	17
836	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	10.53%
837												
838	UCL Statistics											
839	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
840					Shapiro Wilk Test Statistic	0.896					Shapiro Wilk Test Statistic	0.93
841					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
842	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
843												
844	Assuming Normal Distribution						Assuming Lognormal Distribution					
845					DL/2 Substitution Method						DL/2 Substitution Method	
846					Mean	3.012					Mean	0.598
847					SD	2.473					SD	1.245
848					95% DL/2 (t) UCL	3.996					95% H-Stat (DL/2) UCL	9.462
849												
850					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
851					Mean	2.886					Mean in Log Scale	0.711
852					SD	2.608					SD in Log Scale	1.009
853					95% MLE (t) UCL	3.923					Mean in Original Scale	3.036
854					95% MLE (Tiku) UCL	3.912					SD in Original Scale	2.444
855											95% t UCL	4.009
856											95% Percentile Bootstrap UCL	3.917
857											95% BCA Bootstrap UCL	3.945
858											95% H UCL	6.322
859												
860	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
861					k star (bias corrected)	1.565	Data appear Normal at 5% Significance Level					
862					Theta Star	2.141						
863					nu star	53.21						
864												
865					A-D Test Statistic	0.373	Nonparametric Statistics					
866					5% A-D Critical Value	0.751					Kaplan-Meier (KM) Method	
867					K-S Test Statistic	0.751					Mean	3.056
868					5% K-S Critical Value	0.212					SD	2.357
869	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.557
870											95% KM (t) UCL	4.023
871	Assuming Gamma Distribution										95% KM (z) UCL	3.973
872					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.014
873					Minimum	0.000001					95% KM (bootstrap t) UCL	4.154
874					Maximum	7.7					95% KM (BCA) UCL	3.965
875					Mean	2.999					95% KM (Percentile Bootstrap) UCL	4.029
876					Median	2.1					95% KM (Chebyshev) UCL	5.486
877					SD	2.49					97.5% KM (Chebyshev) UCL	6.537
878					k star	0.357					99% KM (Chebyshev) UCL	8.602
879					Theta star	8.396						
880					Nu star	13.57	Potential UCLs to Use					

	A	B	C	D	E	F	G	H	I	J	K	L
881					AppChi2	6.28					95% KM (t) UCL	4.023
882					95% Gamma Approximate UCL	6.481					95% KM (Percentile Bootstrap) UCL	4.029
883					95% Adjusted Gamma UCL	6.957						
884	Note: DL/2 is not a recommended method.											
885												
886	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
887	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
888	For additional insight, the user may want to consult a statistician.											
889												
890												
891	2,3,4,7,8-PECDF											
892												
893	General Statistics											
894					Number of Valid Data	19					Number of Detected Data	16
895					Number of Distinct Detected Data	15					Number of Non-Detect Data	3
896					Number of Missing Values	25					Percent Non-Detects	15.79%
897												
898	Raw Statistics						Log-transformed Statistics					
899					Minimum Detected	0.335					Minimum Detected	-1.094
900					Maximum Detected	7.7					Maximum Detected	2.041
901					Mean of Detected	2.893					Mean of Detected	0.768
902					SD of Detected	2.047					SD of Detected	0.877
903					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
904					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
905												
906	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	5
907	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	14
908	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	26.32%
909												
910	UCL Statistics											
911	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
912					Shapiro Wilk Test Statistic	0.928					Shapiro Wilk Test Statistic	0.942
913					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
914	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
915												
916	Assuming Normal Distribution						Assuming Lognormal Distribution					
917					DL/2 Substitution Method						DL/2 Substitution Method	
918					Mean	2.466					Mean	0.374
919					SD	2.127					SD	1.234
920					95% DL/2 (t) UCL	3.312					95% H-Stat (DL/2) UCL	7.367
921												
922					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
923					Mean	2.116					Mean in Log Scale	0.47
924					SD	2.568					SD in Log Scale	1.073
925					95% MLE (t) UCL	3.137					Mean in Original Scale	2.49
926					95% MLE (Tiku) UCL	3.189					SD in Original Scale	2.1
927											95% t UCL	3.326
928											95% Percentile Bootstrap UCL	3.242
929											95% BCA Bootstrap UCL	3.396
930											95% H UCL	5.658
931												
932	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
933					k star (bias corrected)	1.542	Data appear Normal at 5% Significance Level					
934					Theta Star	1.877						
935					nu star	49.33						

	A	B	C	D	E	F	G	H	I	J	K	L
936												
937					A-D Test Statistic	0.224			Nonparametric Statistics			
938					5% A-D Critical Value	0.752					Kaplan-Meier (KM) Method	
939					K-S Test Statistic	0.752					Mean	2.491
940					5% K-S Critical Value	0.218					SD	2.043
941		Data appear Gamma Distributed at 5% Significance Level									SE of Mean	0.484
942											95% KM (t) UCL	3.33
943			Assuming Gamma Distribution								95% KM (z) UCL	3.287
944				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	3.317
945					Minimum	0.000001					95% KM (bootstrap t) UCL	3.573
946					Maximum	7.7					95% KM (BCA) UCL	3.419
947					Mean	2.437					95% KM (Percentile Bootstrap) UCL	3.337
948					Median	1.9					95% KM (Chebyshev) UCL	4.601
949					SD	2.161					97.5% KM (Chebyshev) UCL	5.514
950					k star	0.276					99% KM (Chebyshev) UCL	7.307
951					Theta star	8.818						
952					Nu star	10.5			Potential UCLs to Use			
953					AppChi2	4.257					95% KM (t) UCL	3.33
954					95% Gamma Approximate UCL	6.01					95% KM (Percentile Bootstrap) UCL	3.337
955					95% Adjusted Gamma UCL	6.536						
956	Note: DL/2 is not a recommended method.											
957												
958			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
959			These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).									
960			For additional insight, the user may want to consult a statistician.									
961												
962												
963	2,3,7,8-TCDD											
964												
965					General Statistics							
966					Number of Valid Data	19					Number of Detected Data	2
967					Number of Distinct Detected Data	2					Number of Non-Detect Data	17
968					Number of Missing Values	25					Percent Non-Detects	89.47%
969												
970					Raw Statistics				Log-transformed Statistics			
971					Minimum Detected	0.47					Minimum Detected	-0.755
972					Maximum Detected	0.48					Maximum Detected	-0.734
973					Mean of Detected	0.475					Mean of Detected	-0.744
974					SD of Detected	0.00707					SD of Detected	0.0149
975					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
976					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
977												
978	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	19
979	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
980	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
981												
982			Warning: Data set has only 2 Distinct Detected Values.									
983			This may not be adequate enough to compute meaningful and reliable test statistics and estimates.									
984			The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).									
985												
986			Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.									
987												
988			The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.									
989			Those methods will return a 'N/A' value on your output display!									
990												

	A	B	C	D	E	F	G	H	I	J	K	L
991	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
992	However, results obtained using 4 to 9 distinct values may not be reliable.											
993	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
994												
995												
996	UCL Statistics											
997	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
998					Shapiro Wilk Test Statistic	N/A				Shapiro Wilk Test Statistic		N/A
999					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value		N/A
1000	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
1001												
1002	Assuming Normal Distribution						Assuming Lognormal Distribution					
1003					DL/2 Substitution Method					DL/2 Substitution Method		
1004					Mean	0.188				Mean		-1.851
1005					SD	0.128				SD		0.597
1006					95% DL/2 (t) UCL	0.239				95% H-Stat (DL/2) UCL		0.252
1007												
1008					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1009	MLE method failed to converge properly									Mean in Log Scale		N/A
1010										SD in Log Scale		N/A
1011										Mean in Original Scale		N/A
1012										SD in Original Scale		N/A
1013										95% t UCL		N/A
1014										95% Percentile Bootstrap UCL		N/A
1015										95% BCA Bootstrap UCL		N/A
1016										95% H-UCL		N/A
1017												
1018	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1019					k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)					
1020					Theta Star	N/A						
1021					nu star	N/A						
1022												
1023					A-D Test Statistic	N/A	Nonparametric Statistics					
1024					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
1025					K-S Test Statistic	N/A				Mean		0.471
1026					5% K-S Critical Value	N/A				SD		0.00242
1027	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.0008558
1028										95% KM (t) UCL		0.472
1029	Assuming Gamma Distribution									95% KM (z) UCL		0.472
1030					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.477
1031					Minimum	N/A				95% KM (bootstrap t) UCL		0.471
1032					Maximum	N/A				95% KM (BCA) UCL		0.48
1033					Mean	N/A				95% KM (Percentile Bootstrap) UCL		0.48
1034					Median	N/A				95% KM (Chebyshev) UCL		0.474
1035					SD	N/A				97.5% KM (Chebyshev) UCL		0.476
1036					k star	N/A				99% KM (Chebyshev) UCL		0.479
1037					Theta star	N/A						
1038					Nu star	N/A	Potential UCLs to Use					
1039					AppChi2	N/A				95% KM (t) UCL		0.472
1040					95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL		0.48
1041					95% Adjusted Gamma UCL	N/A						
1042	Note: DL/2 is not a recommended method.											
1043												
1044	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1045	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											

	A	B	C	D	E	F	G	H	I	J	K	L
1046	For additional insight, the user may want to consult a statistician.											
1047												
1048												
1049	2,3,7,8-TCDF											
1050												
1051	General Statistics											
1052					Number of Valid Data	19				Number of Detected Data		18
1053					Number of Distinct Detected Data	17				Number of Non-Detect Data		1
1054					Number of Missing Values	25				Percent Non-Detects		5.26%
1055												
1056	Raw Statistics						Log-transformed Statistics					
1057					Minimum Detected	0.48				Minimum Detected		-0.734
1058					Maximum Detected	8.9				Maximum Detected		2.186
1059					Mean of Detected	2.294				Mean of Detected		0.428
1060					SD of Detected	2.414				SD of Detected		0.889
1061					Minimum Non-Detect	0.2				Minimum Non-Detect		-1.609
1062					Maximum Non-Detect	0.2				Maximum Non-Detect		-1.609
1063												
1064												
1065	UCL Statistics											
1066	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1067					Shapiro Wilk Test Statistic	0.719				Shapiro Wilk Test Statistic		0.937
1068					5% Shapiro Wilk Critical Value	0.897				5% Shapiro Wilk Critical Value		0.897
1069	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1070												
1071	Assuming Normal Distribution						Assuming Lognormal Distribution					
1072					DL/2 Substitution Method					DL/2 Substitution Method		
1073					Mean	2.179				Mean		0.284
1074					SD	2.399				SD		1.067
1075					95% DL/2 (t) UCL	3.134				95% H-Stat (DL/2) UCL		4.644
1076												
1077					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1078					Mean	2.111				Mean in Log Scale		0.313
1079					SD	2.426				SD in Log Scale		1
1080					95% MLE (t) UCL	3.077				Mean in Original Scale		2.183
1081					95% MLE (Tiku) UCL	3.021				SD in Original Scale		2.396
1082										95% t UCL		3.136
1083										95% Percentile Bootstrap UCL		3.17
1084										95% BCA Bootstrap UCL		3.471
1085										95% H UCL		4.169
1086												
1087	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1088					k star (bias corrected)	1.192	Data appear Gamma Distributed at 5% Significance Level					
1089					Theta Star	1.925						
1090					nu star	42.91						
1091												
1092					A-D Test Statistic	0.679	Nonparametric Statistics					
1093					5% A-D Critical Value	0.759				Kaplan-Meier (KM) Method		
1094					K-S Test Statistic	0.759				Mean		2.199
1095					5% K-S Critical Value	0.208				SD		2.319
1096	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.547
1097										95% KM (t) UCL		3.148
1098	Assuming Gamma Distribution									95% KM (z) UCL		3.099
1099					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		3.145
1100					Minimum	0.000001				95% KM (bootstrap t) UCL		4.118

	A	B	C	D	E	F	G	H	I	J	K	L
1101					Maximum	8.9				95% KM (BCA) UCL		3.09
1102					Mean	2.174				95% KM (Percentile Bootstrap) UCL		3.102
1103					Median	1.25				95% KM (Chebyshev) UCL		4.585
1104					SD	2.404				97.5% KM (Chebyshev) UCL		5.618
1105					k star	0.513				99% KM (Chebyshev) UCL		7.646
1106					Theta star	4.238						
1107					Nu star	19.49				Potential UCLs to Use		
1108					AppChi2	10.48				95% KM (Chebyshev) UCL		4.585
1109				95% Gamma Approximate UCL		4.044						
1110				95% Adjusted Gamma UCL		4.279						
1111	Note: DL/2 is not a recommended method.											
1112												
1113	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1114	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1115	For additional insight, the user may want to consult a statistician.											
1116												
1117												
1118	TOTAL HPCDF											
1119												
1120					General Statistics							
1121					Number of Valid Data	19				Number of Detected Data		18
1122					Number of Distinct Detected Data	18				Number of Non-Detect Data		1
1123					Number of Missing Values	25				Percent Non-Detects		5.26%
1124												
1125					Raw Statistics					Log-transformed Statistics		
1126					Minimum Detected	3.7				Minimum Detected		1.308
1127					Maximum Detected	118				Maximum Detected		4.771
1128					Mean of Detected	31.96				Mean of Detected		2.989
1129					SD of Detected	33.83				SD of Detected		1.02
1130					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
1131					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
1132												
1133												
1134					UCL Statistics							
1135					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
1136					Shapiro Wilk Test Statistic	0.753				Shapiro Wilk Test Statistic		0.969
1137					5% Shapiro Wilk Critical Value	0.897				5% Shapiro Wilk Critical Value		0.897
1138					Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
1139												
1140					Assuming Normal Distribution					Assuming Lognormal Distribution		
1141					DL/2 Substitution Method					DL/2 Substitution Method		
1142					Mean	30.29				Mean		2.732
1143					SD	33.68				SD		1.497
1144					95% DL/2 (t) UCL	43.69				95% H-Stat (DL/2) UCL		155.3
1145												
1146					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1147					Mean	29.3				Mean in Log Scale		2.856
1148					SD	34.14				SD in Log Scale		1.149
1149					95% MLE (t) UCL	42.88				Mean in Original Scale		30.36
1150					95% MLE (Tiku) UCL	42.17				SD in Original Scale		33.61
1151										95% t UCL		43.73
1152										95% Percentile Bootstrap UCL		43.89
1153										95% BCA Bootstrap UCL		47.15
1154										95% H UCL		72.47
1155												

	A	B	C	D	E	F	G	H	I	J	K	L
1156	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1157					k star (bias corrected)	1.03	Data appear Gamma Distributed at 5% Significance Level					
1158					Theta Star	31.05						
1159					nu star	37.07						
1160												
1161					A-D Test Statistic	0.402	Nonparametric Statistics					
1162					5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method	
1163					K-S Test Statistic	0.763					Mean	30.48
1164					5% K-S Critical Value	0.209					SD	32.62
1165	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	7.699
1166											95% KM (t) UCL	43.83
1167	Assuming Gamma Distribution										95% KM (z) UCL	43.14
1168				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	43.79
1169					Minimum	0.000001					95% KM (bootstrap t) UCL	54.79
1170					Maximum	118					95% KM (BCA) UCL	45.43
1171					Mean	30.28					95% KM (Percentile Bootstrap) UCL	43.38
1172					Median	15.6					95% KM (Chebyshev) UCL	64.04
1173					SD	33.68					97.5% KM (Chebyshev) UCL	78.56
1174					k star	0.446					99% KM (Chebyshev) UCL	107.1
1175					Theta star	67.86						
1176					Nu star	16.96	Potential UCLs to Use					
1177					AppChi2	8.642					95% KM (Chebyshev) UCL	64.04
1178					95% Gamma Approximate UCL	59.42						
1179					95% Adjusted Gamma UCL	63.19						
1180	Note: DL/2 is not a recommended method.											
1181												
1182	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1183	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1184	For additional insight, the user may want to consult a statistician.											
1185												
1186												
1187	TOTAL HXCDD											
1188												
1189	General Statistics											
1190					Number of Valid Data	19					Number of Detected Data	17
1191					Number of Distinct Detected Data	17					Number of Non-Detect Data	2
1192					Number of Missing Values	25					Percent Non-Detects	10.53%
1193												
1194				Raw Statistics			Log-transformed Statistics					
1195					Minimum Detected	2.3					Minimum Detected	0.833
1196					Maximum Detected	516					Maximum Detected	6.246
1197					Mean of Detected	52.25					Mean of Detected	2.947
1198					SD of Detected	121.1					SD of Detected	1.293
1199					Minimum Non-Detect	0.4					Minimum Non-Detect	-0.916
1200					Maximum Non-Detect	6.6					Maximum Non-Detect	1.887
1201												
1202	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	5
1203	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	14
1204	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	26.32%
1205												
1206	UCL Statistics											
1207	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1208					Shapiro Wilk Test Statistic	0.398					Shapiro Wilk Test Statistic	0.956
1209					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
1210	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1211												
1212				Assuming Normal Distribution						Assuming Lognormal Distribution		
1213					DL/2 Substitution Method						DL/2 Substitution Method	
1214					Mean	46.93					Mean	2.614
1215					SD	115.3					SD	1.641
1216					95% DL/2 (t) UCL	92.81					95% H-Stat (DL/2) UCL	213.5
1217												
1218					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1219					Mean	20.67					Mean in Log Scale	2.675
1220					SD	136.1					SD in Log Scale	1.477
1221					95% MLE (t) UCL	74.8					Mean in Original Scale	46.93
1222					95% MLE (Tiku) UCL	75.51					SD in Original Scale	115.3
1223											95% t UCL	92.81
1224											95% Percentile Bootstrap UCL	97.74
1225											95% BCA Bootstrap UCL	133.9
1226											95% H UCL	138.6
1227												
1228				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
1229					k star (bias corrected)	0.542				Data appear Lognormal at 5% Significance Level		
1230					Theta Star	96.41						
1231					nu star	18.43						
1232												
1233					A-D Test Statistic	1.291				Nonparametric Statistics		
1234					5% A-D Critical Value	0.788					Kaplan-Meier (KM) Method	
1235					K-S Test Statistic	0.788					Mean	47.04
1236					5% K-S Critical Value	0.219					SD	112.2
1237				Data not Gamma Distributed at 5% Significance Level							SE of Mean	26.53
1238											95% KM (t) UCL	93.05
1239				Assuming Gamma Distribution							95% KM (z) UCL	90.69
1240					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	92.87
1241					Minimum	0.000001					95% KM (bootstrap t) UCL	293.9
1242					Maximum	516					95% KM (BCA) UCL	99.97
1243					Mean	46.75					95% KM (Percentile Bootstrap) UCL	96.13
1244					Median	13.8					95% KM (Chebyshev) UCL	162.7
1245					SD	115.4					97.5% KM (Chebyshev) UCL	212.7
1246					k star	0.258					99% KM (Chebyshev) UCL	311.1
1247					Theta star	181.4						
1248					Nu star	9.793				Potential UCLs to Use		
1249					AppChi2	3.813					97.5% KM (Chebyshev) UCL	212.7
1250					95% Gamma Approximate UCL	120.1						
1251					95% Adjusted Gamma UCL	131.1						
1252	Note: DL/2 is not a recommended method.											
1253												
1254	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1255	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1256	For additional insight, the user may want to consult a statistician.											
1257												
1258												
1259	TOTAL PECDD											
1260												
1261					General Statistics							
1262					Number of Valid Data	19					Number of Detected Data	16
1263					Number of Distinct Detected Data	16					Number of Non-Detect Data	3
1264					Number of Missing Values	25					Percent Non-Detects	15.79%
1265												

	A	B	C	D	E	F	G	H	I	J	K	L
1266	Raw Statistics						Log-transformed Statistics					
1267					Minimum Detected	0.925					Minimum Detected	-0.078
1268					Maximum Detected	50.6					Maximum Detected	3.924
1269					Mean of Detected	11.6					Mean of Detected	1.861
1270					SD of Detected	13.2					SD of Detected	1.175
1271					Minimum Non-Detect	0.4					Minimum Non-Detect	-0.916
1272					Maximum Non-Detect	0.7					Maximum Non-Detect	-0.357
1273												
1274	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	3
1275	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	16
1276	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	15.79%
1277												
1278	UCL Statistics											
1279	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1280					Shapiro Wilk Test Statistic	0.776					Shapiro Wilk Test Statistic	0.976
1281					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
1282	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1283												
1284	Assuming Normal Distribution						Assuming Lognormal Distribution					
1285					DL/2 Substitution Method						DL/2 Substitution Method	
1286					Mean	9.814					Mean	1.354
1287					SD	12.78					SD	1.614
1288					95% DL/2 (t) UCL	14.9					95% H-Stat (DL/2) UCL	55.6
1289												
1290					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1291					Mean	8.493					Mean in Log Scale	1.431
1292					SD	14.05					SD in Log Scale	1.481
1293					95% MLE (t) UCL	14.08					Mean in Original Scale	9.839
1294					95% MLE (Tiku) UCL	13.95					SD in Original Scale	12.76
1295											95% t UCL	14.92
1296											95% Percentile Bootstrap UCL	14.72
1297											95% BCA Bootstrap UCL	16.5
1298											95% H UCL	40.42
1299												
1300	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1301					k star (bias corrected)	0.838	Data appear Gamma Distributed at 5% Significance Level					
1302					Theta Star	13.85						
1303					nu star	26.82						
1304												
1305					A-D Test Statistic	0.272	Nonparametric Statistics					
1306					5% A-D Critical Value	0.764					Kaplan-Meier (KM) Method	
1307					K-S Test Statistic	0.764					Mean	9.918
1308					5% K-S Critical Value	0.221					SD	12.36
1309	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	2.929
1310											95% KM (t) UCL	15
1311	Assuming Gamma Distribution										95% KM (z) UCL	14.74
1312					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	14.93
1313					Minimum	0.000001					95% KM (bootstrap t) UCL	18.41
1314					Maximum	50.6					95% KM (BCA) UCL	15.55
1315					Mean	9.772					95% KM (Percentile Bootstrap) UCL	14.84
1316					Median	4.5					95% KM (Chebyshev) UCL	22.69
1317					SD	12.81					97.5% KM (Chebyshev) UCL	28.21
1318					k star	0.242					99% KM (Chebyshev) UCL	39.06
1319					Theta star	40.33						
1320					Nu star	9.208	Potential UCLs to Use					

	A	B	C	D	E	F	G	H	I	J	K	L
1321					AppChi2	3.453				95% KM (Chebyshev) UCL		22.69
1322					95% Gamma Approximate UCL	26.06						
1323					95% Adjusted Gamma UCL	28.56						
1324	Note: DL/2 is not a recommended method.											
1325												
1326	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1327	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1328	For additional insight, the user may want to consult a statistician.											
1329												
1330												
1331	TOTAL TCDD											
1332												
1333	General Statistics											
1334					Number of Valid Data	19				Number of Detected Data		17
1335					Number of Distinct Detected Data	16				Number of Non-Detect Data		2
1336					Number of Missing Values	25				Percent Non-Detects		10.53%
1337												
1338	Raw Statistics						Log-transformed Statistics					
1339					Minimum Detected	0.99				Minimum Detected		-0.0101
1340					Maximum Detected	30.1				Maximum Detected		3.405
1341					Mean of Detected	9.202				Mean of Detected		1.833
1342					SD of Detected	7.464				SD of Detected		1.015
1343					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
1344					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
1345												
1346												
1347	UCL Statistics											
1348	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1349					Shapiro Wilk Test Statistic	0.88				Shapiro Wilk Test Statistic		0.919
1350					5% Shapiro Wilk Critical Value	0.892				5% Shapiro Wilk Critical Value		0.892
1351	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1352												
1353	Assuming Normal Distribution						Assuming Lognormal Distribution					
1354					DL/2 Substitution Method					DL/2 Substitution Method		
1355					Mean	8.249				Mean		1.44
1356					SD	7.594				SD		1.516
1357					95% DL/2 (t) UCL	11.27				95% H-Stat (DL/2) UCL		45.17
1358												
1359					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1360					Mean	7.808				Mean in Log Scale		1.59
1361					SD	8.052				SD in Log Scale		1.205
1362					95% MLE (t) UCL	11.01				Mean in Original Scale		8.3
1363					95% MLE (Tiku) UCL	10.96				SD in Original Scale		7.538
1364										95% t UCL		11.3
1365										95% Percentile Bootstrap UCL		11.34
1366										95% BCA Bootstrap UCL		11.48
1367										95% H UCL		23.19
1368												
1369	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1370					k star (bias corrected)	1.224	Data appear Gamma Distributed at 5% Significance Level					
1371					Theta Star	7.521						
1372					nu star	41.6						
1373												
1374					A-D Test Statistic	0.351	Nonparametric Statistics					
1375					5% A-D Critical Value	0.757				Kaplan-Meier (KM) Method		

	A	B	C	D	E	F	G	H	I	J	K	L
1376					K-S Test Statistic	0.757					Mean	8.337
1377					5% K-S Critical Value	0.213					SD	7.298
1378	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	1.726
1379											95% KM (t) UCL	11.33
1380			Assuming Gamma Distribution								95% KM (z) UCL	11.18
1381				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	11.32
1382					Minimum	0.000001					95% KM (bootstrap t) UCL	11.99
1383					Maximum	30.1					95% KM (BCA) UCL	11.46
1384					Mean	8.233					95% KM (Percentile Bootstrap) UCL	11.19
1385					Median	6.2					95% KM (Chebyshev) UCL	15.86
1386					SD	7.612					97.5% KM (Chebyshev) UCL	19.12
1387					k star	0.33					99% KM (Chebyshev) UCL	25.51
1388					Theta star	24.97						
1389					Nu star	12.53			Potential UCLs to Use			
1390					AppChi2	5.577					95% KM (BCA) UCL	11.46
1391				95% Gamma Approximate UCL		18.5						
1392				95% Adjusted Gamma UCL		19.93						
1393	Note: DL/2 is not a recommended method.											
1394												
1395	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1396	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1397	For additional insight, the user may want to consult a statistician.											
1398												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	ALUMINUM											
10												
11						General Statistics						
12						Number of Valid Observations	25			Number of Distinct Observations	23	
13												
14						Raw Statistics				Log-transformed Statistics		
15						Minimum	4930			Minimum of Log Data	8.503	
16						Maximum	33500			Maximum of Log Data	10.42	
17						Mean	18672			Mean of log Data	9.765	
18						Median	18200			SD of log Data	0.407	
19						SD	6572					
20						Std. Error of Mean	1314					
21						Coefficient of Variation	0.352					
22						Skewness	0.227					
23												
24						Relevant UCL Statistics						
25						Normal Distribution Test				Lognormal Distribution Test		
26						Shapiro Wilk Test Statistic	0.992			Shapiro Wilk Test Statistic	0.935	
27						Shapiro Wilk Critical Value	0.918			Shapiro Wilk Critical Value	0.918	
28						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
29												
30						Assuming Normal Distribution				Assuming Lognormal Distribution		
31						95% Student's-t UCL	20921			95% H-UCL	22129	
32						95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	25729	
33						95% Adjusted-CLT UCL (Chen-1995)	20898			97.5% Chebyshev (MVUE) UCL	28706	
34						95% Modified-t UCL (Johnson-1978)	20931			99% Chebyshev (MVUE) UCL	34554	
35												
36						Gamma Distribution Test				Data Distribution		
37						k star (bias corrected)	6.461			Data appear Normal at 5% Significance Level		
38						Theta Star	2890					
39						MLE of Mean	18672					
40						MLE of Standard Deviation	7346					
41						nu star	323.1					
42						Approximate Chi Square Value (.05)	282.4			Nonparametric Statistics		
43						Adjusted Level of Significance	0.0395			95% CLT UCL	20834	
44						Adjusted Chi Square Value	279.8			95% Jackknife UCL	20921	
45										95% Standard Bootstrap UCL	20790	
46						Anderson-Darling Test Statistic	0.185			95% Bootstrap-t UCL	21007	
47						Anderson-Darling 5% Critical Value	0.746			95% Hall's Bootstrap UCL	20990	
48						Kolmogorov-Smirnov Test Statistic	0.0803			95% Percentile Bootstrap UCL	20756	
49						Kolmogorov-Smirnov 5% Critical Value	0.175			95% BCA Bootstrap UCL	20901	
50						Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	24402	
51										97.5% Chebyshev(Mean, Sd) UCL	26881	
52						Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	31751	
53						95% Approximate Gamma UCL	21360					
54						95% Adjusted Gamma UCL	21557					
55												

	A	B	C	D	E	F	G	H	I	J	K	L
56	Potential UCL to Use						Use 95% Student's-t UCL					
57												
58	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
59	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
60	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
61												
62												
63	ARSENIC											
64												
65	General Statistics											
66	Number of Valid Observations					25	Number of Distinct Observations					25
67												
68	Raw Statistics						Log-transformed Statistics					
69	Minimum					4.4	Minimum of Log Data					1.482
70	Maximum					58.6	Maximum of Log Data					4.071
71	Mean					14.47	Mean of log Data					2.538
72	Median					12.7	SD of log Data					0.49
73	SD					10.1						
74	Std. Error of Mean					2.019						
75	Coefficient of Variation					0.698						
76	Skewness					3.687						
77												
78	Relevant UCL Statistics											
79	Normal Distribution Test						Lognormal Distribution Test					
80	Shapiro Wilk Test Statistic					0.599	Shapiro Wilk Test Statistic					0.916
81	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
82	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
83												
84	Assuming Normal Distribution						Assuming Lognormal Distribution					
85	95% Student's-t UCL					17.93	95% H-UCL					17.34
86	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					20.49
87	95% Adjusted-CLT UCL (Chen-1995)					19.39	97.5% Chebyshev (MVUE) UCL					23.22
88	95% Modified-t UCL (Johnson-1978)					18.18	99% Chebyshev (MVUE) UCL					28.57
89												
90	Gamma Distribution Test						Data Distribution					
91	k star (bias corrected)					3.438	Data do not follow a Discernable Distribution (0.05)					
92	Theta Star					4.21						
93	MLE of Mean					14.47						
94	MLE of Standard Deviation					7.806						
95	nu star					171.9						
96	Approximate Chi Square Value (.05)					142.6	Nonparametric Statistics					
97	Adjusted Level of Significance					0.0395	95% CLT UCL					17.8
98	Adjusted Chi Square Value					140.8	95% Jackknife UCL					17.93
99							95% Standard Bootstrap UCL					17.56
100	Anderson-Darling Test Statistic					1.149	95% Bootstrap-t UCL					21.76
101	Anderson-Darling 5% Critical Value					0.749	95% Hall's Bootstrap UCL					32.42
102	Kolmogorov-Smirnov Test Statistic					0.187	95% Percentile Bootstrap UCL					18.15
103	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					19.64
104	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					23.28
105							97.5% Chebyshev(Mean, Sd) UCL					27.09
106	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					34.57
107	95% Approximate Gamma UCL					17.45						
108	95% Adjusted Gamma UCL					17.68						
109												
110	Potential UCL to Use						Use 95% Student's-t UCL					17.93

	A	B	C	D	E	F	G	H	I	J	K	L
111											or 95% Modified-t UCL	18.18
112												
113	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
114	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
115	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
116												
117												
118	BARIUM											
119												
120	General Statistics											
121	Number of Valid Observations					25	Number of Distinct Observations					25
122												
123	Raw Statistics						Log-transformed Statistics					
124	Minimum					22.3	Minimum of Log Data					3.105
125	Maximum					223	Maximum of Log Data					5.407
126	Mean					75.69	Mean of log Data					4.187
127	Median					62.3	SD of log Data					0.525
128	SD					45.43						
129	Std. Error of Mean					9.087						
130	Coefficient of Variation					0.6						
131	Skewness					1.834						
132												
133	Relevant UCL Statistics											
134	Normal Distribution Test						Lognormal Distribution Test					
135	Shapiro Wilk Test Statistic					0.823	Shapiro Wilk Test Statistic					0.978
136	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
137	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
138												
139	Assuming Normal Distribution						Assuming Lognormal Distribution					
140	95% Student's-t UCL					91.23	95% H-UCL					93.4
141	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					111
142	95% Adjusted-CLT UCL (Chen-1995)					94.2	97.5% Chebyshev (MVUE) UCL					126.5
143	95% Modified-t UCL (Johnson-1978)					91.79	99% Chebyshev (MVUE) UCL					157
144												
145	Gamma Distribution Test						Data Distribution					
146	k star (bias corrected)					3.314	Data appear Gamma Distributed at 5% Significance Level					
147	Theta Star					22.84						
148	MLE of Mean					75.69						
149	MLE of Standard Deviation					41.58						
150	nu star					165.7						
151	Approximate Chi Square Value (.05)					136.9	Nonparametric Statistics					
152	Adjusted Level of Significance					0.0395	95% CLT UCL					90.63
153	Adjusted Chi Square Value					135.2	95% Jackknife UCL					91.23
154							95% Standard Bootstrap UCL					90.37
155	Anderson-Darling Test Statistic					0.529	95% Bootstrap-t UCL					97.53
156	Anderson-Darling 5% Critical Value					0.749	95% Hall's Bootstrap UCL					103.7
157	Kolmogorov-Smirnov Test Statistic					0.16	95% Percentile Bootstrap UCL					91.66
158	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					95.23
159	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					115.3
160							97.5% Chebyshev(Mean, Sd) UCL					132.4
161	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					166.1
162	95% Approximate Gamma UCL					91.59						
163	95% Adjusted Gamma UCL					92.79						
164												
165	Potential UCL to Use						Use 95% Approximate Gamma UCL					91.59

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

BERYLLIUM

General Statistics			
Number of Valid Observations	25	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.699	Mean of log Data	-0.419
Median	0.63	SD of log Data	0.361
SD	0.247		
Std. Error of Mean	0.0494		
Coefficient of Variation	0.354		
Skewness	0.385		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.784	95% H-UCL	0.804
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.925
95% Adjusted-CLT UCL (Chen-1995)	0.785	97.5% Chebyshev (MVUE) UCL	1.022
95% Modified-t UCL (Johnson-1978)	0.784	99% Chebyshev (MVUE) UCL	1.213

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.343	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0952		
MLE of Mean	0.699		
MLE of Standard Deviation	0.258		
nu star	367.1		
Approximate Chi Square Value (.05)	323.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	0.781
Adjusted Chi Square Value	321	95% Jackknife UCL	0.784
		95% Standard Bootstrap UCL	0.777
Anderson-Darling Test Statistic	0.608	95% Bootstrap-t UCL	0.791
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.785
Kolmogorov-Smirnov Test Statistic	0.124	95% Percentile Bootstrap UCL	0.778
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	0.782
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.915
		97.5% Chebyshev(Mean, Sd) UCL	1.008
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.191
95% Approximate Gamma UCL	0.793		
95% Adjusted Gamma UCL	0.8		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.793

	A	B	C	D	E	F	G	H	I	J	K	L
221	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
222	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
223	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
224												
225												
226	CALCIUM											
227												
228	General Statistics											
229	Number of Valid Observations					25	Number of Distinct Observations					23
230												
231	Raw Statistics						Log-transformed Statistics					
232	Minimum					682	Minimum of Log Data					6.525
233	Maximum					7910	Maximum of Log Data					8.976
234	Mean					1958	Mean of log Data					7.414
235	Median					1510	SD of log Data					0.537
236	SD					1482						
237	Std. Error of Mean					296.4						
238	Coefficient of Variation					0.757						
239	Skewness					3.041						
240												
241	Relevant UCL Statistics											
242	Normal Distribution Test						Lognormal Distribution Test					
243	Shapiro Wilk Test Statistic					0.659	Shapiro Wilk Test Statistic					0.933
244	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
245	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
246												
247	Assuming Normal Distribution						Assuming Lognormal Distribution					
248	95% Student's-t UCL					2465	95% H-UCL					2383
249	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					2836
250	95% Adjusted-CLT UCL (Chen-1995)					2638	97.5% Chebyshev (MVUE) UCL					3240
251	95% Modified-t UCL (Johnson-1978)					2495	99% Chebyshev (MVUE) UCL					4033
252												
253	Gamma Distribution Test						Data Distribution					
254	k star (bias corrected)					2.818	Data appear Lognormal at 5% Significance Level					
255	Theta Star					694.7						
256	MLE of Mean					1958						
257	MLE of Standard Deviation					1166						
258	nu star					140.9						
259	Approximate Chi Square Value (.05)					114.5	Nonparametric Statistics					
260	Adjusted Level of Significance					0.0395	95% CLT UCL					2445
261	Adjusted Chi Square Value					112.8	95% Jackknife UCL					2465
262							95% Standard Bootstrap UCL					2431
263	Anderson-Darling Test Statistic					1.052	95% Bootstrap-t UCL					2963
264	Anderson-Darling 5% Critical Value					0.751	95% Hall's Bootstrap UCL					4775
265	Kolmogorov-Smirnov Test Statistic					0.211	95% Percentile Bootstrap UCL					2490
266	Kolmogorov-Smirnov 5% Critical Value					0.176	95% BCA Bootstrap UCL					2731
267	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					3250
268							97.5% Chebyshev(Mean, Sd) UCL					3809
269	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					4907
270	95% Approximate Gamma UCL					2410						
271	95% Adjusted Gamma UCL					2444						
272												
273	Potential UCL to Use						Use 95% H-UCL					2383
274												
275	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											

	A	B	C	D	E	F	G	H	I	J	K	L
276	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
277	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
278	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
279												
280	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
281	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
282	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
283												
284												
285	CHROMIUM											
286												
287	General Statistics											
288	Number of Valid Observations					25	Number of Distinct Observations					25
289												
290	Raw Statistics						Log-transformed Statistics					
291	Minimum					11.6	Minimum of Log Data					2.451
292	Maximum					103	Maximum of Log Data					4.635
293	Mean					57.72	Mean of log Data					3.948
294	Median					55.2	SD of log Data					0.524
295	SD					23.69						
296	Std. Error of Mean					4.737						
297	Coefficient of Variation					0.41						
298	Skewness					-0.0314						
299												
300	Relevant UCL Statistics											
301	Normal Distribution Test						Lognormal Distribution Test					
302	Shapiro Wilk Test Statistic					0.984	Shapiro Wilk Test Statistic					0.896
303	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
304	Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
305												
306	Assuming Normal Distribution						Assuming Lognormal Distribution					
307	95% Student's-t UCL					65.83	95% H-UCL					73.43
308	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					87.24
309	95% Adjusted-CLT UCL (Chen-1995)					65.48	97.5% Chebyshev (MVUE) UCL					99.43
310	95% Modified-t UCL (Johnson-1978)					65.82	99% Chebyshev (MVUE) UCL					123.4
311												
312	Gamma Distribution Test						Data Distribution					
313	k star (bias corrected)					4.25	Data appear Normal at 5% Significance Level					
314	Theta Star					13.58						
315	MLE of Mean					57.72						
316	MLE of Standard Deviation					28						
317	nu star					212.5						
318	Approximate Chi Square Value (.05)					179.7	Nonparametric Statistics					
319	Adjusted Level of Significance					0.0395	95% CLT UCL					65.52
320	Adjusted Chi Square Value					177.7	95% Jackknife UCL					65.83
321							95% Standard Bootstrap UCL					65.39
322	Anderson-Darling Test Statistic					0.402	95% Bootstrap-t UCL					65.57
323	Anderson-Darling 5% Critical Value					0.747	95% Hall's Bootstrap UCL					65.82
324	Kolmogorov-Smirnov Test Statistic					0.103	95% Percentile Bootstrap UCL					65.23
325	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					65.12
326	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					78.37
327							97.5% Chebyshev(Mean, Sd) UCL					87.31
328	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					104.9
329	95% Approximate Gamma UCL					68.24						
330	95% Adjusted Gamma UCL					69.02						

	A	B	C	D	E	F	G	H	I	J	K	L
331												
332	Potential UCL to Use						Use 95% Student's-t UCL					65.83
333												
334	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
335	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
336	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
337												
338	Note: For highly negative-skewed data, confidence limits											
339	(e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
340	reliable. Chen's and Johnson's methods provide											
341	adjustments for positvely skewed data sets.											
342												
343												
344	COBALT											
345												
346	General Statistics											
347	Number of Valid Observations					25	Number of Distinct Observations					21
348												
349	Raw Statistics						Log-transformed Statistics					
350	Minimum					3.1	Minimum of Log Data					1.131
351	Maximum					24.2	Maximum of Log Data					3.186
352	Mean					10.96	Mean of log Data					2.306
353	Median					10.5	SD of log Data					0.452
354	SD					4.506						
355	Std. Error of Mean					0.901						
356	Coefficient of Variation					0.411						
357	Skewness					0.801						
358												
359	Relevant UCL Statistics											
360	Normal Distribution Test						Lognormal Distribution Test					
361	Shapiro Wilk Test Statistic					0.951	Shapiro Wilk Test Statistic					0.945
362	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
363	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
364												
365	Assuming Normal Distribution						Assuming Lognormal Distribution					
366	95% Student's-t UCL					12.51	95% H-UCL					13.27
367	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					15.58
368	95% Adjusted-CLT UCL (Chen-1995)					12.6	97.5% Chebyshev (MVUE) UCL					17.53
369	95% Modified-t UCL (Johnson-1978)					12.53	99% Chebyshev (MVUE) UCL					21.36
370												
371	Gamma Distribution Test						Data Distribution					
372	k star (bias corrected)					5.128	Data appear Normal at 5% Significance Level					
373	Theta Star					2.138						
374	MLE of Mean					10.96						
375	MLE of Standard Deviation					4.842						
376	nu star					256.4						
377	Approximate Chi Square Value (.05)					220.3	Nonparametric Statistics					
378	Adjusted Level of Significance					0.0395	95% CLT UCL					12.45
379	Adjusted Chi Square Value					218.1	95% Jackknife UCL					12.51
380							95% Standard Bootstrap UCL					12.44
381	Anderson-Darling Test Statistic					0.382	95% Bootstrap-t UCL					12.66
382	Anderson-Darling 5% Critical Value					0.747	95% Hall's Bootstrap UCL					12.9
383	Kolmogorov-Smirnov Test Statistic					0.149	95% Percentile Bootstrap UCL					12.41
384	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					12.57
385	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					14.89

	A	B	C	D	E	F	G	H	I	J	K	L
386											97.5% Chebyshev(Mean, Sd) UCL	16.59
387				Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL	19.93
388					95% Approximate Gamma UCL	12.76						
389					95% Adjusted Gamma UCL	12.89						
390												
391				Potential UCL to Use							Use 95% Student's-t UCL	12.51
392												
393	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
394	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
395	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
396												
397												
398	COPPER											
399												
400				General Statistics								
401					Number of Valid Observations	25					Number of Distinct Observations	25
402												
403				Raw Statistics							Log-transformed Statistics	
404					Minimum	8.5					Minimum of Log Data	2.14
405					Maximum	316					Maximum of Log Data	5.756
406					Mean	66.96					Mean of log Data	3.71
407					Median	33.3					SD of log Data	0.976
408					SD	77.7						
409					Std. Error of Mean	15.54						
410					Coefficient of Variation	1.16						
411					Skewness	2.044						
412												
413				Relevant UCL Statistics								
414				Normal Distribution Test							Lognormal Distribution Test	
415					Shapiro Wilk Test Statistic	0.715					Shapiro Wilk Test Statistic	0.959
416					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
417				Data not Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level	
418												
419				Assuming Normal Distribution							Assuming Lognormal Distribution	
420					95% Student's-t UCL	93.55					95% H-UCL	107.5
421				95% UCLs (Adjusted for Skewness)							95% Chebyshev (MVUE) UCL	125.7
422					95% Adjusted-CLT UCL (Chen-1995)	99.31					97.5% Chebyshev (MVUE) UCL	152.4
423					95% Modified-t UCL (Johnson-1978)	94.61					99% Chebyshev (MVUE) UCL	204.8
424												
425				Gamma Distribution Test							Data Distribution	
426					k star (bias corrected)	1.038					Data Follow Appr. Gamma Distribution at 5% Significance Level	
427					Theta Star	64.53						
428					MLE of Mean	66.96						
429					MLE of Standard Deviation	65.73						
430					nu star	51.89						
431					Approximate Chi Square Value (.05)	36.34					Nonparametric Statistics	
432					Adjusted Level of Significance	0.0395					95% CLT UCL	92.52
433					Adjusted Chi Square Value	35.46					95% Jackknife UCL	93.55
434											95% Standard Bootstrap UCL	91.51
435					Anderson-Darling Test Statistic	0.952					95% Bootstrap-t UCL	110.9
436					Anderson-Darling 5% Critical Value	0.77					95% Hall's Bootstrap UCL	102.2
437					Kolmogorov-Smirnov Test Statistic	0.171					95% Percentile Bootstrap UCL	94.47
438					Kolmogorov-Smirnov 5% Critical Value	0.179					95% BCA Bootstrap UCL	99.01
439				Data follow Appr. Gamma Distribution at 5% Significance Level							95% Chebyshev(Mean, Sd) UCL	134.7
440											97.5% Chebyshev(Mean, Sd) UCL	164

	A	B	C	D	E	F	G	H	I	J	K	L
441	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					221.6
442			95% Approximate Gamma UCL			95.6						
443			95% Adjusted Gamma UCL			98						
444												
445	Potential UCL to Use						Use 95% Approximate Gamma UCL					95.6
446												
447	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
448	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
449	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
450												
451												
452	IRON											
453												
454	General Statistics											
455			Number of Valid Observations			25	Number of Distinct Observations					24
456												
457	Raw Statistics						Log-transformed Statistics					
458			Minimum			8730	Minimum of Log Data					9.075
459			Maximum			45000	Maximum of Log Data					10.71
460			Mean			22195	Mean of log Data					9.952
461			Median			21100	SD of log Data					0.351
462			SD			7422						
463			Std. Error of Mean			1484						
464			Coefficient of Variation			0.334						
465			Skewness			0.937						
466												
467	Relevant UCL Statistics											
468	Normal Distribution Test						Lognormal Distribution Test					
469			Shapiro Wilk Test Statistic			0.92	Shapiro Wilk Test Statistic					0.922
470			Shapiro Wilk Critical Value			0.918	Shapiro Wilk Critical Value					0.918
471	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
472												
473	Assuming Normal Distribution						Assuming Lognormal Distribution					
474			95% Student's-t UCL			24735	95% H-UCL					25498
475	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					29244
476			95% Adjusted-CLT UCL (Chen-1995)			24934	97.5% Chebyshev (MVUE) UCL					32259
477			95% Modified-t UCL (Johnson-1978)			24781	99% Chebyshev (MVUE) UCL					38182
478												
479	Gamma Distribution Test						Data Distribution					
480			k star (bias corrected)			8.091	Data appear Normal at 5% Significance Level					
481			Theta Star			2743						
482			MLE of Mean			22195						
483			MLE of Standard Deviation			7803						
484			nu star			404.5						
485			Approximate Chi Square Value (.05)			358.9	Nonparametric Statistics					
486			Adjusted Level of Significance			0.0395	95% CLT UCL					24637
487			Adjusted Chi Square Value			356	95% Jackknife UCL					24735
488							95% Standard Bootstrap UCL					24547
489			Anderson-Darling Test Statistic			0.668	95% Bootstrap-t UCL					25128
490			Anderson-Darling 5% Critical Value			0.745	95% Hall's Bootstrap UCL					25570
491			Kolmogorov-Smirnov Test Statistic			0.143	95% Percentile Bootstrap UCL					24684
492			Kolmogorov-Smirnov 5% Critical Value			0.175	95% BCA Bootstrap UCL					24694
493	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					28665
494							97.5% Chebyshev(Mean, Sd) UCL					31465
495	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					36965

	A	B	C	D	E	F	G	H	I	J	K	L
496					95% Approximate Gamma UCL	25016						
497					95% Adjusted Gamma UCL	25222						
498												
499					Potential UCL to Use						Use 95% Student's-t UCL	24735
500												
501	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
502	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
503	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
504												
505												
506	LEAD											
507												
508					General Statistics							
509					Number of Valid Observations	25					Number of Distinct Observations	25
510												
511					Raw Statistics						Log-transformed Statistics	
512					Minimum	9.5					Minimum of Log Data	2.251
513					Maximum	1100					Maximum of Log Data	7.003
514					Mean	176.7					Mean of log Data	4.454
515					Median	89.7					SD of log Data	1.271
516					SD	243.9						
517					Std. Error of Mean	48.77						
518					Coefficient of Variation	1.38						
519					Skewness	2.672						
520												
521					Relevant UCL Statistics							
522					Normal Distribution Test						Lognormal Distribution Test	
523					Shapiro Wilk Test Statistic	0.663					Shapiro Wilk Test Statistic	0.966
524					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
525					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
526												
527					Assuming Normal Distribution						Assuming Lognormal Distribution	
528					95% Student's-t UCL	260.2					95% H-UCL	405.4
529					95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	424.4
530					95% Adjusted-CLT UCL (Chen-1995)	284.8					97.5% Chebyshev (MVUE) UCL	529
531					95% Modified-t UCL (Johnson-1978)	264.5					99% Chebyshev (MVUE) UCL	734.3
532												
533					Gamma Distribution Test						Data Distribution	
534					k star (bias corrected)	0.749					Data appear Gamma Distributed at 5% Significance Level	
535					Theta Star	235.8						
536					MLE of Mean	176.7						
537					MLE of Standard Deviation	204.1						
538					nu star	37.47						
539					Approximate Chi Square Value (.05)	24.46					Nonparametric Statistics	
540					Adjusted Level of Significance	0.0395					95% CLT UCL	256.9
541					Adjusted Chi Square Value	23.74					95% Jackknife UCL	260.2
542											95% Standard Bootstrap UCL	254.7
543					Anderson-Darling Test Statistic	0.574					95% Bootstrap-t UCL	319.1
544					Anderson-Darling 5% Critical Value	0.78					95% Hall's Bootstrap UCL	344.2
545					Kolmogorov-Smirnov Test Statistic	0.162					95% Percentile Bootstrap UCL	262.5
546					Kolmogorov-Smirnov 5% Critical Value	0.181					95% BCA Bootstrap UCL	280.9
547					Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	389.3
548											97.5% Chebyshev(Mean, Sd) UCL	481.3
549					Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL	662
550					95% Approximate Gamma UCL	270.8						

	A	B	C	D	E	F	G	H	I	J	K	L
551					95% Adjusted Gamma UCL	278.9						
552												
553				Potential UCL to Use						Use 95% Approximate Gamma UCL		270.8
554												
555	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
556	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
557	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
558												
559												
560	MAGNESIUM											
561												
562					General Statistics							
563					Number of Valid Observations	25				Number of Distinct Observations		25
564												
565				Raw Statistics						Log-transformed Statistics		
566					Minimum	1500				Minimum of Log Data		7.313
567					Maximum	17200				Maximum of Log Data		9.753
568					Mean	7212				Mean of log Data		8.748
569					Median	6810				SD of log Data		0.569
570					SD	3609						
571					Std. Error of Mean	721.8						
572					Coefficient of Variation	0.5						
573					Skewness	0.873						
574												
575					Relevant UCL Statistics							
576				Normal Distribution Test						Lognormal Distribution Test		
577					Shapiro Wilk Test Statistic	0.944				Shapiro Wilk Test Statistic		0.933
578					Shapiro Wilk Critical Value	0.918				Shapiro Wilk Critical Value		0.918
579				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
580												
581				Assuming Normal Distribution						Assuming Lognormal Distribution		
582					95% Student's-t UCL	8447				95% H-UCL		9360
583				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		11184
584					95% Adjusted-CLT UCL (Chen-1995)	8534				97.5% Chebyshev (MVUE) UCL		12842
585					95% Modified-t UCL (Johnson-1978)	8468				99% Chebyshev (MVUE) UCL		16100
586												
587				Gamma Distribution Test						Data Distribution		
588					k star (bias corrected)	3.422				Data appear Normal at 5% Significance Level		
589					Theta Star	2107						
590					MLE of Mean	7212						
591					MLE of Standard Deviation	3898						
592					nu star	171.1						
593					Approximate Chi Square Value (.05)	141.9				Nonparametric Statistics		
594					Adjusted Level of Significance	0.0395				95% CLT UCL		8399
595					Adjusted Chi Square Value	140.1				95% Jackknife UCL		8447
596										95% Standard Bootstrap UCL		8368
597					Anderson-Darling Test Statistic	0.321				95% Bootstrap-t UCL		8532
598					Anderson-Darling 5% Critical Value	0.749				95% Hall's Bootstrap UCL		8704
599					Kolmogorov-Smirnov Test Statistic	0.105				95% Percentile Bootstrap UCL		8391
600					Kolmogorov-Smirnov 5% Critical Value	0.175				95% BCA Bootstrap UCL		8534
601				Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		10358
602										97.5% Chebyshev(Mean, Sd) UCL		11720
603				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		14394
604					95% Approximate Gamma UCL	8699						
605					95% Adjusted Gamma UCL	8811						

	A	B	C	D	E	F	G	H	I	J	K	L
606												
607	Potential UCL to Use						Use 95% Student's-t UCL					8447
608												
609	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
610	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
611	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
612												
613												
614	MANGANESE											
615												
616	General Statistics											
617	Number of Valid Observations					25	Number of Distinct Observations					24
618												
619	Raw Statistics						Log-transformed Statistics					
620	Minimum					110	Minimum of Log Data					4.7
621	Maximum					611	Maximum of Log Data					6.415
622	Mean					307.5	Mean of log Data					5.669
623	Median					294	SD of log Data					0.362
624	SD					106.6						
625	Std. Error of Mean					21.33						
626	Coefficient of Variation					0.347						
627	Skewness					0.801						
628												
629	Relevant UCL Statistics											
630	Normal Distribution Test						Lognormal Distribution Test					
631	Shapiro Wilk Test Statistic					0.961	Shapiro Wilk Test Statistic					0.973
632	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
633	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
634												
635	Assuming Normal Distribution						Assuming Lognormal Distribution					
636	95% Student's-t UCL					344	95% H-UCL					354.7
637	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					407.9
638	95% Adjusted-CLT UCL (Chen-1995)					346.3	97.5% Chebyshev (MVUE) UCL					450.9
639	95% Modified-t UCL (Johnson-1978)					344.6	99% Chebyshev (MVUE) UCL					535.5
640												
641	Gamma Distribution Test						Data Distribution					
642	k star (bias corrected)					7.575	Data appear Normal at 5% Significance Level					
643	Theta Star					40.6						
644	MLE of Mean					307.5						
645	MLE of Standard Deviation					111.7						
646	nu star					378.7						
647	Approximate Chi Square Value (.05)					334.6	Nonparametric Statistics					
648	Adjusted Level of Significance					0.0395	95% CLT UCL					342.6
649	Adjusted Chi Square Value					331.8	95% Jackknife UCL					344
650							95% Standard Bootstrap UCL					341.8
651	Anderson-Darling Test Statistic					0.196	95% Bootstrap-t UCL					349.6
652	Anderson-Darling 5% Critical Value					0.745	95% Hall's Bootstrap UCL					351.8
653	Kolmogorov-Smirnov Test Statistic					0.0909	95% Percentile Bootstrap UCL					342.5
654	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					348.6
655	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					400.5
656							97.5% Chebyshev(Mean, Sd) UCL					440.7
657	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					519.7
658	95% Approximate Gamma UCL					348.1						
659	95% Adjusted Gamma UCL					351						
660												

	A	B	C	D	E	F	G	H	I	J	K	L
661	Potential UCL to Use						Use 95% Student's-t UCL					344
662												
663	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
664	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
665	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
666												
667												
668	NICKEL											
669												
670	General Statistics											
671	Number of Valid Observations					25	Number of Distinct Observations					25
672												
673	Raw Statistics						Log-transformed Statistics					
674	Minimum					8.1	Minimum of Log Data					2.092
675	Maximum					73.2	Maximum of Log Data					4.293
676	Mean					38.13	Mean of log Data					3.531
677	Median					38.2	SD of log Data					0.525
678	SD					15.92						
679	Std. Error of Mean					3.184						
680	Coefficient of Variation					0.417						
681	Skewness					0.103						
682												
683	Relevant UCL Statistics											
684	Normal Distribution Test						Lognormal Distribution Test					
685	Shapiro Wilk Test Statistic					0.982	Shapiro Wilk Test Statistic					0.901
686	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
687	Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
688												
689	Assuming Normal Distribution						Assuming Lognormal Distribution					
690	95% Student's-t UCL					43.57	95% H-UCL					48.5
691	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					57.62
692	95% Adjusted-CLT UCL (Chen-1995)					43.43	97.5% Chebyshev (MVUE) UCL					65.69
693	95% Modified-t UCL (Johnson-1978)					43.59	99% Chebyshev (MVUE) UCL					81.54
694												
695	Gamma Distribution Test						Data Distribution					
696	k star (bias corrected)					4.184	Data appear Normal at 5% Significance Level					
697	Theta Star					9.114						
698	MLE of Mean					38.13						
699	MLE of Standard Deviation					18.64						
700	nu star					209.2						
701	Approximate Chi Square Value (.05)					176.7	Nonparametric Statistics					
702	Adjusted Level of Significance					0.0395	95% CLT UCL					43.36
703	Adjusted Chi Square Value					174.7	95% Jackknife UCL					43.57
704							95% Standard Bootstrap UCL					43.2
705	Anderson-Darling Test Statistic					0.543	95% Bootstrap-t UCL					43.95
706	Anderson-Darling 5% Critical Value					0.747	95% Hall's Bootstrap UCL					43.69
707	Kolmogorov-Smirnov Test Statistic					0.155	95% Percentile Bootstrap UCL					43.36
708	Kolmogorov-Smirnov 5% Critical Value					0.175	95% BCA Bootstrap UCL					42.87
709	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					52
710							97.5% Chebyshev(Mean, Sd) UCL					58.01
711	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					69.8
712	95% Approximate Gamma UCL					45.13						
713	95% Adjusted Gamma UCL					45.66						
714												
715	Potential UCL to Use						Use 95% Student's-t UCL					43.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

POTASSIUM

General Statistics

Number of Valid Observations	25	Number of Distinct Observations	24

Raw Statistics		**Log-transformed Statistics**	
Minimum	585	Minimum of Log Data	6.372
Maximum	6580	Maximum of Log Data	8.792
Mean	1834	Mean of log Data	7.318
Median	1460	SD of log Data	0.594
SD	1455		
Std. Error of Mean	291.1		
Coefficient of Variation	0.794		
Skewness	2.538		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.664	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2332	95% H-UCL	2304
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2760
95% Adjusted-CLT UCL (Chen-1995)	2471	97.5% Chebyshev (MVUE) UCL	3183
95% Modified-t UCL (Johnson-1978)	2357	99% Chebyshev (MVUE) UCL	4012

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.41	Data appear Lognormal at 5% Significance Level	
Theta Star	760.8		
MLE of Mean	1834		
MLE of Standard Deviation	1181		
nu star	120.5		
Approximate Chi Square Value (.05)	96.17	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	2313
Adjusted Chi Square Value	94.69	95% Jackknife UCL	2332
		95% Standard Bootstrap UCL	2311
Anderson-Darling Test Statistic	1.163	95% Bootstrap-t UCL	2914
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	5061
Kolmogorov-Smirnov Test Statistic	0.243	95% Percentile Bootstrap UCL	2354
Kolmogorov-Smirnov 5% Critical Value	0.176	95% BCA Bootstrap UCL	2502
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3103
		97.5% Chebyshev(Mean, Sd) UCL	3652
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4730
95% Approximate Gamma UCL	2298		
95% Adjusted Gamma UCL	2334		
Potential UCL to Use		Use 95% H-UCL	2304

	A	B	C	D	E	F	G	H	I	J	K	L
771	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
772	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
773	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
774	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
775												
776	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
777	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
778	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
779												
780												
781	SODIUM											
782												
783	General Statistics											
784	Number of Valid Observations					25	Number of Distinct Observations					24
785												
786	Raw Statistics						Log-transformed Statistics					
787	Minimum					35.1	Minimum of Log Data					3.558
788	Maximum					1345	Maximum of Log Data					7.204
789	Mean					397.8	Mean of log Data					5.204
790	Median					105	SD of log Data					1.344
791	SD					435.9						
792	Std. Error of Mean					87.18						
793	Coefficient of Variation					1.096						
794	Skewness					0.781						
795												
796	Relevant UCL Statistics											
797	Normal Distribution Test						Lognormal Distribution Test					
798	Shapiro Wilk Test Statistic					0.77	Shapiro Wilk Test Statistic					0.837
799	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
800	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
801												
802	Assuming Normal Distribution						Assuming Lognormal Distribution					
803	95% Student's-t UCL					547	95% H-UCL					1013
804	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					1018
805	95% Adjusted-CLT UCL (Chen-1995)					555.8	97.5% Chebyshev (MVUE) UCL					1276
806	95% Modified-t UCL (Johnson-1978)					549.3	99% Chebyshev (MVUE) UCL					1782
807												
808	Gamma Distribution Test						Data Distribution					
809	k star (bias corrected)					0.698	Data do not follow a Discernable Distribution (0.05)					
810	Theta Star					569.6						
811	MLE of Mean					397.8						
812	MLE of Standard Deviation					476						
813	nu star					34.92						
814	Approximate Chi Square Value (.05)					22.4	Nonparametric Statistics					
815	Adjusted Level of Significance					0.0395	95% CLT UCL					541.2
816	Adjusted Chi Square Value					21.72	95% Jackknife UCL					547
817							95% Standard Bootstrap UCL					537.5
818	Anderson-Darling Test Statistic					2.009	95% Bootstrap-t UCL					572
819	Anderson-Darling 5% Critical Value					0.783	95% Hall's Bootstrap UCL					544.3
820	Kolmogorov-Smirnov Test Statistic					0.258	95% Percentile Bootstrap UCL					533.8
821	Kolmogorov-Smirnov 5% Critical Value					0.181	95% BCA Bootstrap UCL					568.1
822	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					777.9
823							97.5% Chebyshev(Mean, Sd) UCL					942.3
824	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1265
825	95% Approximate Gamma UCL					620.2						

	A	B	C	D	E	F	G	H	I	J	K	L
826					95% Adjusted Gamma UCL	639.7						
827												
828				Potential UCL to Use						Use 95% Chebyshev (Mean, Sd) UCL		777.9
829												
830	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
831	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
832	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
833												
834												
835	VANADIUM											
836												
837					General Statistics							
838					Number of Valid Observations	25				Number of Distinct Observations		24
839					Raw Statistics					Log-transformed Statistics		
840					Minimum	13.5				Minimum of Log Data		2.603
841					Maximum	89.5				Maximum of Log Data		4.494
842					Mean	49.54				Mean of log Data		3.827
843					Median	46.8				SD of log Data		0.423
844					SD	18.27						
845					Std. Error of Mean	3.655						
846					Coefficient of Variation	0.369						
847					Skewness	0.316						
848												
849					Relevant UCL Statistics							
850					Normal Distribution Test					Lognormal Distribution Test		
851					Shapiro Wilk Test Statistic	0.98				Shapiro Wilk Test Statistic		0.938
852					Shapiro Wilk Critical Value	0.918				Shapiro Wilk Critical Value		0.918
853					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
854												
855					Assuming Normal Distribution					Assuming Lognormal Distribution		
856					95% Student's-t UCL	55.79				95% H-UCL		59.15
857					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL		69.01
858					95% Adjusted-CLT UCL (Chen-1995)	55.8				97.5% Chebyshev (MVUE) UCL		77.22
859					95% Modified-t UCL (Johnson-1978)	55.83				99% Chebyshev (MVUE) UCL		93.36
860												
861					Gamma Distribution Test					Data Distribution		
862					k star (bias corrected)	5.965				Data appear Normal at 5% Significance Level		
863					Theta Star	8.305						
864					MLE of Mean	49.54						
865					MLE of Standard Deviation	20.28						
866					nu star	298.3						
867					Approximate Chi Square Value (.05)	259.3				Nonparametric Statistics		
868					Adjusted Level of Significance	0.0395				95% CLT UCL		55.55
869					Adjusted Chi Square Value	256.8				95% Jackknife UCL		55.79
870										95% Standard Bootstrap UCL		55.54
871					Anderson-Darling Test Statistic	0.253				95% Bootstrap-t UCL		56.38
872					Anderson-Darling 5% Critical Value	0.746				95% Hall's Bootstrap UCL		56.25
873					Kolmogorov-Smirnov Test Statistic	0.111				95% Percentile Bootstrap UCL		55.8
874					Kolmogorov-Smirnov 5% Critical Value	0.175				95% BCA Bootstrap UCL		55.64
875					Data appear Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL		65.47
876										97.5% Chebyshev(Mean, Sd) UCL		72.36
877					Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL		85.9
878					95% Approximate Gamma UCL	56.99						
879					95% Adjusted Gamma UCL	57.54						
880												

	A	B	C	D	E	F	G	H	I	J	K	L
881	Potential UCL to Use						Use 95% Student's-t UCL					55.79
882												
883	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
884	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
885	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
886												
887												
888												
889	ZINC											
890												
891	General Statistics											
892												
893												
894	Number of Valid Observations					25	Number of Distinct Observations					25
895												
896	Raw Statistics						Log-transformed Statistics					
897	Minimum					23.1	Minimum of Log Data					3.14
898	Maximum					1390	Maximum of Log Data					7.237
899	Mean					161.9	Mean of log Data					4.642
900	Median					91.5	SD of log Data					0.811
901	SD					264.3						
902	Std. Error of Mean					52.85						
903	Coefficient of Variation					1.632						
904	Skewness					4.517						
905	Relevant UCL Statistics											
906	Normal Distribution Test						Lognormal Distribution Test					
907	Shapiro Wilk Test Statistic					0.411	Shapiro Wilk Test Statistic					0.904
908	Shapiro Wilk Critical Value					0.918	Shapiro Wilk Critical Value					0.918
909	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
910												
911	Assuming Normal Distribution						Assuming Lognormal Distribution					
912	95% Student's-t UCL					252.3	95% H-UCL					209.7
913	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					251.6
914	95% Adjusted-CLT UCL (Chen-1995)					299.8	97.5% Chebyshev (MVUE) UCL					299.1
915	95% Modified-t UCL (Johnson-1978)					260.3	99% Chebyshev (MVUE) UCL					392.5
916												
917	Gamma Distribution Test						Data Distribution					
918	k star (bias corrected)					1.138	Data do not follow a Discernable Distribution (0.05)					
919	Theta Star					142.2						
920	MLE of Mean					161.9						
921	MLE of Standard Deviation					151.7						
922	nu star					56.92						
923	Approximate Chi Square Value (.05)					40.58	Nonparametric Statistics					
924	Adjusted Level of Significance					0.0395	95% CLT UCL					248.8
925	Adjusted Chi Square Value					39.63	95% Jackknife UCL					252.3
926							95% Standard Bootstrap UCL					244.8
927	Anderson-Darling Test Statistic					1.979	95% Bootstrap-t UCL					479.3
928	Anderson-Darling 5% Critical Value					0.767	95% Hall's Bootstrap UCL					558.8
929	Kolmogorov-Smirnov Test Statistic					0.263	95% Percentile Bootstrap UCL					259.6
930	Kolmogorov-Smirnov 5% Critical Value					0.179	95% BCA Bootstrap UCL					322.8
931	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					392.3
932							97.5% Chebyshev(Mean, Sd) UCL					491.9
933	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					687.8
934	95% Approximate Gamma UCL					227.1						
935	95% Adjusted Gamma UCL					232.5						

	A	B	C	D	E	F	G	H	I	J	K	L
936												
937				Potential UCL to Use						Use 95% Chebyshev (Mean, Sd) UCL		392.3
938												
939	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
940	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
941	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
942												
943												
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998												
999												
1000												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	CADMIUM											
10												
11						General Statistics						
12						Number of Valid Data	25			Number of Detected Data		21
13						Number of Distinct Detected Data	15			Number of Non-Detect Data		4
14										Percent Non-Detects		16.00%
15												
16						Raw Statistics				Log-transformed Statistics		
17						Minimum Detected	0.82			Minimum Detected		-0.198
18						Maximum Detected	3.4			Maximum Detected		1.224
19						Mean of Detected	1.974			Mean of Detected		0.597
20						SD of Detected	0.773			SD of Detected		0.431
21						Minimum Non-Detect	0.74			Minimum Non-Detect		-0.301
22						Maximum Non-Detect	0.88			Maximum Non-Detect		-0.128
23												
24				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect		5
25				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected		20
26				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		20.00%
27												
28						UCL Statistics						
29						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
30						Shapiro Wilk Test Statistic	0.92			Shapiro Wilk Test Statistic		0.913
31						5% Shapiro Wilk Critical Value	0.908			5% Shapiro Wilk Critical Value		0.908
32						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
33												
34						Assuming Normal Distribution				Assuming Lognormal Distribution		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	1.723			Mean		0.358
37						SD	0.917			SD		0.684
38						95% DL/2 (t) UCL	2.037			95% H-Stat (DL/2) UCL		2.434
39												
40						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
41						Mean	1.695			Mean in Log Scale		0.45
42						SD	0.957			SD in Log Scale		0.524
43						95% MLE (t) UCL	2.022			Mean in Original Scale		1.774
44						95% MLE (Tiku) UCL	2.033			SD in Original Scale		0.847
45										95% t UCL		2.064
46										95% Percentile Bootstrap UCL		2.055
47										95% BCA Bootstrap UCL		2.042
48										95% H UCL		2.222
49												
50						Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only		
51						k star (bias corrected)	5.357			Data appear Normal at 5% Significance Level		
52						Theta Star	0.368					
53						nu star	225					
54												
55						A-D Test Statistic	0.801			Nonparametric Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
56					5% A-D Critical Value	0.745				Kaplan-Meier (KM) Method		
57					K-S Test Statistic	0.745					Mean	1.789
58					5% K-S Critical Value	0.19					SD	0.811
59	Data follow Appr. Gamma Distribution at 5% Significance Level										SE of Mean	0.166
60											95% KM (t) UCL	2.073
61			Assuming Gamma Distribution								95% KM (z) UCL	2.062
62				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	2.063
63					Minimum	0.000001					95% KM (bootstrap t) UCL	2.06
64					Maximum	3.4					95% KM (BCA) UCL	2.093
65					Mean	1.658					95% KM (Percentile Bootstrap) UCL	2.064
66					Median	1.6					95% KM (Chebyshev) UCL	2.513
67					SD	1.022					97.5% KM (Chebyshev) UCL	2.827
68					k star	0.299					99% KM (Chebyshev) UCL	3.442
69					Theta star	5.54						
70					Nu star	14.96				Potential UCLs to Use		
71					AppChi2	7.236					95% KM (t) UCL	2.073
72					95% Gamma Approximate UCL	3.429					95% KM (Percentile Bootstrap) UCL	2.064
73					95% Adjusted Gamma UCL	3.611						
74	Note: DL/2 is not a recommended method.											
75												
76				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
77				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
78				For additional insight, the user may want to consult a statistician.								
79												
80												
81	MERCURY											
82												
83					General Statistics							
84					Number of Valid Data	25					Number of Detected Data	6
85					Number of Distinct Detected Data	6					Number of Non-Detect Data	19
86											Percent Non-Detects	76.00%
87												
88				Raw Statistics						Log-transformed Statistics		
89					Minimum Detected	0.0825					Minimum Detected	-2.495
90					Maximum Detected	1.8					Maximum Detected	0.588
91					Mean of Detected	0.525					Mean of Detected	-1.188
92					SD of Detected	0.648					SD of Detected	1.123
93					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
94					Maximum Non-Detect	0.31					Maximum Non-Detect	-1.171
95												
96	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	22
97	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
98	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	88.00%
99												
100				Warning: There are only 6 Detected Values in this data								
101				Note: It should be noted that even though bootstrap may be performed on this data set								
102				the resulting calculations may not be reliable enough to draw conclusions								
103												
104				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
105												
106												
107					UCL Statistics							
108				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
109					Shapiro Wilk Test Statistic	0.729					Shapiro Wilk Test Statistic	0.958
110					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788

	A	B	C	D	E	F	G	H	I	J	K	L
111	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
112												
113	Assuming Normal Distribution						Assuming Lognormal Distribution					
114					DL/2 Substitution Method						DL/2 Substitution Method	
115					Mean	0.191					Mean	-2.204
116					SD	0.354					SD	0.831
117					95% DL/2 (t) UCL	0.312					95% H-Stat (DL/2) UCL	0.23
118												
119					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
120	MLE yields a negative mean										Mean in Log Scale	-2.437
121											SD in Log Scale	0.947
122											Mean in Original Scale	0.174
123											SD in Original Scale	0.359
124											95% t UCL	0.297
125											95% Percentile Bootstrap UCL	0.301
126											95% BCA Bootstrap UCL	0.411
127											95% H-UCL	0.219
128												
129	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
130					k star (bias corrected)	0.638	Data appear Gamma Distributed at 5% Significance Level					
131					Theta Star	0.823						
132					nu star	7.661						
133												
134					A-D Test Statistic	0.353	Nonparametric Statistics					
135					5% A-D Critical Value	0.714					Kaplan-Meier (KM) Method	
136					K-S Test Statistic	0.714					Mean	0.192
137					5% K-S Critical Value	0.34					SD	0.346
138	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.0758
139											95% KM (t) UCL	0.321
140	Assuming Gamma Distribution										95% KM (z) UCL	0.316
141					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.3
142					Minimum	0.000001					95% KM (bootstrap t) UCL	0.565
143					Maximum	1.8					95% KM (BCA) UCL	0.619
144					Mean	0.141					95% KM (Percentile Bootstrap) UCL	0.398
145					Median	0.000001					95% KM (Chebyshev) UCL	0.522
146					SD	0.371					97.5% KM (Chebyshev) UCL	0.665
147					k star	0.127					99% KM (Chebyshev) UCL	0.946
148					Theta star	1.112						
149					Nu star	6.355	Potential UCLs to Use					
150					AppChi2	1.824					95% KM (t) UCL	0.321
151					95% Gamma Approximate UCL	0.492						
152					95% Adjusted Gamma UCL	0.54						
153	Note: DL/2 is not a recommended method.											
154												
155	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
156	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
157	For additional insight, the user may want to consult a statistician.											
158												
159												
160	SELENIUM											
161												
162	General Statistics											
163					Number of Valid Data	25					Number of Detected Data	12
164					Number of Distinct Detected Data	11					Number of Non-Detect Data	13
165											Percent Non-Detects	52.00%

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167	**Raw Statistics**						**Log-transformed Statistics**					
168					Minimum Detected	0.32				Minimum Detected		-1.139
169					Maximum Detected	2.1				Maximum Detected		0.742
170					Mean of Detected	0.668				Mean of Detected		-0.531
171					SD of Detected	0.467				SD of Detected		0.465
172					Minimum Non-Detect	0.38				Minimum Non-Detect		-0.968
173					Maximum Non-Detect	1.1				Maximum Non-Detect		0.0953
174												
175	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		24
176	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
177	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		96.00%
178												
179	**UCL Statistics**											
180	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
181					Shapiro Wilk Test Statistic	0.578				Shapiro Wilk Test Statistic		0.816
182					5% Shapiro Wilk Critical Value	0.859				5% Shapiro Wilk Critical Value		0.859
183	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
184												
185	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
186					DL/2 Substitution Method					DL/2 Substitution Method		
187					Mean	0.519				Mean		-0.806
188					SD	0.366				SD		0.533
189					95% DL/2 (t) UCL	0.644				95% H-Stat (DL/2) UCL		0.639
190												
191					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
192	**MLE method failed to converge properly**									Mean in Log Scale		-0.777
193										SD in Log Scale		0.444
194										Mean in Original Scale		0.518
195										SD in Original Scale		0.357
196										95% t UCL		0.641
197										95% Percentile Bootstrap UCL		0.642
198										95% BCA Bootstrap UCL		0.713
199										95% H-UCL		0.604
200												
201	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
202					k star (bias corrected)	3.112	Data do not follow a Discernable Distribution (0.05)					
203					Theta Star	0.215						
204					nu star	74.69						
205												
206					A-D Test Statistic	1.229	**Nonparametric Statistics**					
207					5% A-D Critical Value	0.736				Kaplan-Meier (KM) Method		
208					K-S Test Statistic	0.736				Mean		0.534
209					5% K-S Critical Value	0.246				SD		0.347
210	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.0752
211										95% KM (t) UCL		0.663
212	**Assuming Gamma Distribution**									95% KM (z) UCL		0.658
213					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.65
214					Minimum	0.000001				95% KM (bootstrap t) UCL		0.77
215					Maximum	2.1				95% KM (BCA) UCL		0.73
216					Mean	0.489				95% KM (Percentile Bootstrap) UCL		0.682
217					Median	0.509				95% KM (Chebyshev) UCL		0.862
218					SD	0.404				97.5% KM (Chebyshev) UCL		1.003
219					k star	0.712				99% KM (Chebyshev) UCL		1.282
220					Theta star	0.687						

	A	B	C	D	E	F	G	H	I	J	K	L
221					Nu star	35.61	Potential UCLs to Use					
222					AppChi2	22.95				95% KM (t) UCL		0.663
223				95% Gamma Approximate UCL		0.759				95% KM (% Bootstrap) UCL		0.682
224				95% Adjusted Gamma UCL		0.783						
225	Note: DL/2 is not a recommended method.											
226												
227	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
228	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
229	For additional insight, the user may want to consult a statistician.											
230												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	PH											
10												
11						General Statistics						
12						Number of Valid Observations	8			Number of Distinct Observations	7	
13												
14						Raw Statistics				Log-transformed Statistics		
15						Minimum	5.9			Minimum of Log Data	1.775	
16						Maximum	8.3			Maximum of Log Data	2.116	
17						Mean	6.925			Mean of log Data	1.931	
18						Median	6.95			SD of log Data	0.0971	
19						SD	0.686					
20						Std. Error of Mean	0.243					
21						Coefficient of Variation	0.0991					
22						Skewness	0.839					
23												
24												
25						Warning: There are only 8 Values in this data						
26						Note: It should be noted that even though bootstrap methods may be performed on this data set,						
27						the resulting calculations may not be reliable enough to draw conclusions						
28												
29						The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.						
30												
31						Relevant UCL Statistics						
32						Normal Distribution Test				Lognormal Distribution Test		
33						Shapiro Wilk Test Statistic	0.914			Shapiro Wilk Test Statistic	0.932	
34						Shapiro Wilk Critical Value	0.818			Shapiro Wilk Critical Value	0.818	
35						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
36												
37						Assuming Normal Distribution				Assuming Lognormal Distribution		
38						95% Student's-t UCL	7.385			95% H-UCL	N/A	
39						95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	7.961	
40						95% Adjusted-CLT UCL (Chen-1995)	7.401			97.5% Chebyshev (MVUE) UCL	8.41	
41						95% Modified-t UCL (Johnson-1978)	7.397			99% Chebyshev (MVUE) UCL	9.291	
42												
43						Gamma Distribution Test				Data Distribution		
44						k star (bias corrected)	75.03			Data appear Normal at 5% Significance Level		
45						Theta Star	0.0923					
46						MLE of Mean	6.925					
47						MLE of Standard Deviation	0.799					
48						nu star	1200					
49						Approximate Chi Square Value (.05)	1121			Nonparametric Statistics		
50						Adjusted Level of Significance	0.0195			95% CLT UCL	7.324	
51						Adjusted Chi Square Value	1101			95% Jackknife UCL	7.385	
52										95% Standard Bootstrap UCL	7.302	
53						Anderson-Darling Test Statistic	0.395			95% Bootstrap-t UCL	7.466	
54						Anderson-Darling 5% Critical Value	0.715			95% Hall's Bootstrap UCL	7.818	
55						Kolmogorov-Smirnov Test Statistic	0.255			95% Percentile Bootstrap UCL	7.325	

	A	B	C	D	E	F	G	H	I	J	K	L
56					Kolmogorov-Smirnov 5% Critical Value	0.294				95% BCA Bootstrap UCL		7.388
57			Data appear Gamma Distributed at 5% Significance Level							95% Chebyshev(Mean, Sd) UCL		7.982
58										97.5% Chebyshev(Mean, Sd) UCL		8.44
59			Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL		9.339
60					95% Approximate Gamma UCL	7.416						
61					95% Adjusted Gamma UCL	7.547						
62												
63			Potential UCL to Use							Use 95% Student's-t UCL		7.385
64												
65			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
66			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
67			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
68												
69												
70	TOTAL ORGANIC CARBON											
71												
72					General Statistics							
73					Number of Valid Observations	8				Number of Distinct Observations		8
74												
75					Raw Statistics					Log-transformed Statistics		
76					Minimum	0.6				Minimum of Log Data		-0.511
77					Maximum	4.65				Maximum of Log Data		1.537
78					Mean	2.306				Mean of log Data		0.606
79					Median	2.1				SD of log Data		0.77
80					SD	1.5						
81					Std. Error of Mean	0.53						
82					Coefficient of Variation	0.65						
83					Skewness	0.393						
84												
85												
86			Warning: There are only 8 Values in this data									
87			Note: It should be noted that even though bootstrap methods may be performed on this data set,									
88			the resulting calculations may not be reliable enough to draw conclusions									
89												
90			The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.									
91												
92					Relevant UCL Statistics							
93			Normal Distribution Test							Lognormal Distribution Test		
94					Shapiro Wilk Test Statistic	0.933				Shapiro Wilk Test Statistic		0.928
95					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
96			Data appear Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level		
97												
98			Assuming Normal Distribution							Assuming Lognormal Distribution		
99					95% Student's-t UCL	3.311				95% H-UCL		5.704
100			95% UCLs (Adjusted for Skewness)							95% Chebyshev (MVUE) UCL		5.207
101					95% Adjusted-CLT UCL (Chen-1995)	3.257				97.5% Chebyshev (MVUE) UCL		6.439
102					95% Modified-t UCL (Johnson-1978)	3.323				99% Chebyshev (MVUE) UCL		8.86
103												
104			Gamma Distribution Test							Data Distribution		
105					k star (bias corrected)	1.541				Data appear Normal at 5% Significance Level		
106					Theta Star	1.496						
107					MLE of Mean	2.306						
108					MLE of Standard Deviation	1.858						
109					nu star	24.66						
110					Approximate Chi Square Value (.05)	14.35				Nonparametric Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
111					Adjusted Level of Significance	0.0195					95% CLT UCL	3.179
112					Adjusted Chi Square Value	12.41					95% Jackknife UCL	3.311
113											95% Standard Bootstrap UCL	3.12
114					Anderson-Darling Test Statistic	0.265					95% Bootstrap-t UCL	3.477
115					Anderson-Darling 5% Critical Value	0.723					95% Hall's Bootstrap UCL	3.207
116					Kolmogorov-Smirnov Test Statistic	0.157					95% Percentile Bootstrap UCL	3.156
117					Kolmogorov-Smirnov 5% Critical Value	0.297					95% BCA Bootstrap UCL	3.169
118			Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	4.618
119											97.5% Chebyshev(Mean, Sd) UCL	5.618
120			Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	7.583
121					95% Approximate Gamma UCL	3.963						
122					95% Adjusted Gamma UCL	4.584						
123												
124			Potential UCL to Use								Use 95% Student's-t UCL	3.311
125												
126			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
127			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
128			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
129												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	BIS(2-ETHYLHEXYL)PHTHALATE											
10												
11	General Statistics											
12			Number of Valid Data			25			Number of Detected Data			3
13			Number of Distinct Detected Data			3			Number of Non-Detect Data			22
14									Percent Non-Detects			88.00%
15												
16	Raw Statistics						Log-transformed Statistics					
17			Minimum Detected			58			Minimum Detected			4.06
18			Maximum Detected			650			Maximum Detected			6.477
19			Mean of Detected			261.7			Mean of Detected			4.96
20			SD of Detected			336.4			SD of Detected			1.321
21			Minimum Non-Detect			39			Minimum Non-Detect			3.664
22			Maximum Non-Detect			410			Maximum Non-Detect			6.016
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			24
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			96.00%
27												
28	Warning: There are only 3 Distinct Detected Values in this data set											
29	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
30	Those methods will return a 'N/A' value on your output display!											
31												
32	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
33	However, results obtained using 4 to 9 distinct values may not be reliable.											
34	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
35												
36												
37	UCL Statistics											
38	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
39			Shapiro Wilk Test Statistic			0.774			Shapiro Wilk Test Statistic			0.837
40			5% Shapiro Wilk Critical Value			0.767			5% Shapiro Wilk Critical Value			0.767
41	Data appear Normal at 5% Significance Level								Data appear Lognormal at 5% Significance Level			
42												
43	Assuming Normal Distribution						Assuming Lognormal Distribution					
44			DL/2 Substitution Method						DL/2 Substitution Method			
45			Mean			112.5			Mean			4.357
46			SD			128			SD			0.819
47			95% DL/2 (t) UCL			156.3			95% H-Stat (DL/2) UCL			159.5
48												
49			Maximum Likelihood Estimate(MLE) Method			N/A			Log ROS Method			
50	MLE method failed to converge properly								Mean in Log Scale			2.858
51									SD in Log Scale			0.999
52									Mean in Original Scale			44.45
53									SD in Original Scale			127.2
54									95% t UCL			87.99
55									95% Percentile Bootstrap UCL			94.34

	A	B	C	D	E	F	G	H	I	J	K	L
56											95% BCA Bootstrap UCL	124.5
57											95% H-UCL	47.69
58												
59				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
60					k star (bias corrected)	N/A				Data appear Normal at 5% Significance Level		
61					Theta Star	N/A						
62					nu star	N/A						
63												
64					A-D Test Statistic	N/A				Nonparametric Statistics		
65					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
66					K-S Test Statistic	N/A					Mean	84.29
67					5% K-S Critical Value	N/A					SD	115.7
68				Data not Gamma Distributed at 5% Significance Level							SE of Mean	28.44
69											95% KM (t) UCL	132.9
70				Assuming Gamma Distribution							95% KM (z) UCL	131.1
71					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	118.6
72					Minimum	N/A					95% KM (bootstrap t) UCL	338.8
73					Maximum	N/A					95% KM (BCA) UCL	N/A
74					Mean	N/A					95% KM (Percentile Bootstrap) UCL	650
75					Median	N/A					95% KM (Chebyshev) UCL	208.3
76					SD	N/A					97.5% KM (Chebyshev) UCL	261.9
77					k star	N/A					99% KM (Chebyshev) UCL	367.3
78					Theta star	N/A						
79					Nu star	N/A				Potential UCLs to Use		
80					AppChi2	N/A					95% KM (t) UCL	132.9
81					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	650
82					95% Adjusted Gamma UCL	N/A						
83	Note: DL/2 is not a recommended method.											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
87	For additional insight, the user may want to consult a statistician.											
88												
89												
90	TOTAL PETROLEUM HYDROCARBONS											
91												
92					General Statistics							
93					Number of Valid Observations	4				Number of Distinct Observations		4
94					Number of Missing Values	15						
95												
96												
97	Warning: This data set only has 4 observations!											
98	Data set is too small to compute reliable and meaningful statistics and estimates!											
99	The data set for variable TOTAL PETROLEUM HYDROCARBONS was not processed!											
100												
101	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
102	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
103												
104												
105												
106	METHYLENE CHLORIDE											
107												
108					General Statistics							
109					Number of Valid Data	24				Number of Detected Data		3
110					Number of Distinct Detected Data	2				Number of Non-Detect Data		21

	A	B	C	D	E	F	G	H	I	J	K	L
111					Number of Missing Values	1				Percent Non-Detects		87.50%
112												
113				Raw Statistics						Log-transformed Statistics		
114					Minimum Detected	1				Minimum Detected		0
115					Maximum Detected	2				Maximum Detected		0.693
116					Mean of Detected	1.667				Mean of Detected		0.462
117					SD of Detected	0.577				SD of Detected		0.4
118					Minimum Non-Detect	5				Minimum Non-Detect		1.609
119					Maximum Non-Detect	13				Maximum Non-Detect		2.565
120												
121	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		24
122	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
123	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
124												
125	Warning: Data set has only 2 Distinct Detected Values.											
126	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
127	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
128												
129	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
130												
131	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
132	Those methods will return a 'N/A' value on your output display!											
133												
134	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
135	However, results obtained using 4 to 9 distinct values may not be reliable.											
136	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
137												
138												
139				UCL Statistics								
140				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
141					Shapiro Wilk Test Statistic	0.75				Shapiro Wilk Test Statistic		0.75
142					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
143				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
144												
145				Assuming Normal Distribution						Assuming Lognormal Distribution		
146					DL/2 Substitution Method					DL/2 Substitution Method		
147					Mean	4.583				Mean		1.436
148					SD	1.586				SD		0.475
149					95% DL/2 (t) UCL	5.138				95% H-Stat (DL/2) UCL		5.715
150												
151					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
152				MLE method failed to converge properly						Mean in Log Scale		0.462
153										SD in Log Scale		0.36
154										Mean in Original Scale		1.688
155										SD in Original Scale		0.612
156										95% t UCL		1.902
157										95% Percentile Bootstrap UCL		1.89
158										95% BCA Bootstrap UCL		1.925
159										95% H-UCL		1.949
160												
161				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
162					k star (bias corrected)	N/A				Data do not follow a Discernable Distribution (0.05)		
163					Theta Star	N/A						
164					nu star	N/A						
165												

	A	B	C	D	E	F	G	H	I	J	K	L
166					A-D Test Statistic	N/A	Nonparametric Statistics					
167					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
168					K-S Test Statistic	N/A					Mean	1.667
169					5% K-S Critical Value	N/A					SD	0.471
170			Data not Gamma Distributed at 5% Significance Level								SE of Mean	0.333
171											95% KM (t) UCL	2.238
172			Assuming Gamma Distribution								95% KM (z) UCL	2.215
173				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	2.352
174					Minimum	N/A					95% KM (bootstrap t) UCL	2.222
175					Maximum	N/A					95% KM (BCA) UCL	2
176					Mean	N/A					95% KM (Percentile Bootstrap) UCL	2
177					Median	N/A					95% KM (Chebyshev) UCL	3.12
178					SD	N/A					97.5% KM (Chebyshev) UCL	3.748
179					k star	N/A					99% KM (Chebyshev) UCL	4.983
180					Theta star	N/A						
181					Nu star	N/A			Potential UCLs to Use			
182					AppChi2	N/A					95% KM (t) UCL	2.238
183					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	2
184					95% Adjusted Gamma UCL	N/A						
185					Warning: Recommended UCL exceeds the maximum observation							
186	Note: DL/2 is not a recommended method.											
187												
188					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
189					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
190					For additional insight, the user may want to consult a statistician.							
191												
192												
193	BENZO(A)ANTHRACENE											
194												
195					General Statistics							
196					Number of Valid Data	25					Number of Detected Data	15
197					Number of Distinct Detected Data	15					Number of Non-Detect Data	10
198											Percent Non-Detects	40.00%
199												
200					Raw Statistics		Log-transformed Statistics					
201					Minimum Detected	37					Minimum Detected	3.611
202					Maximum Detected	640					Maximum Detected	6.461
203					Mean of Detected	148.4					Mean of Detected	4.583
204					SD of Detected	175.6					SD of Detected	0.851
205					Minimum Non-Detect	350					Minimum Non-Detect	5.858
206					Maximum Non-Detect	400					Maximum Non-Detect	5.991
207												
208	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
209	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
210	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.00%
211												
212					UCL Statistics							
213					Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only					
214					Shapiro Wilk Test Statistic	0.638					Shapiro Wilk Test Statistic	0.887
215					5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881
216					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
217												
218					Assuming Normal Distribution		Assuming Lognormal Distribution					
219					DL/2 Substitution Method						DL/2 Substitution Method	
220					Mean	163.7					Mean	4.841

	A	B	C	D	E	F	G	H	I	J	K	L
221					SD	135.5					SD	0.726
222					95% DL/2 (t) UCL	210					95% H-Stat (DL/2) UCL	227.3
223												
224				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
225				MLE method failed to converge properly							Mean in Log Scale	4.507
226											SD in Log Scale	0.699
227											Mean in Original Scale	123.6
228											SD in Original Scale	139.1
229											95% t UCL	171.2
230											95% Percentile Bootstrap UCL	176.4
231											95% BCA Bootstrap UCL	193.1
232											95% H-UCL	157
233												
234				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
235					k star (bias corrected)	1.118				Data appear Lognormal at 5% Significance Level		
236					Theta Star	132.7						
237					nu star	33.55						
238												
239					A-D Test Statistic	1.175				Nonparametric Statistics		
240					5% A-D Critical Value	0.757					Kaplan-Meier (KM) Method	
241					K-S Test Statistic	0.757					Mean	123.1
242					5% K-S Critical Value	0.226					SD	138.1
243				Data not Gamma Distributed at 5% Significance Level							SE of Mean	29.71
244											95% KM (t) UCL	173.9
245				Assuming Gamma Distribution							95% KM (z) UCL	172
246					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	173.5
247					Minimum	0.000001					95% KM (bootstrap t) UCL	232.6
248					Maximum	640					95% KM (BCA) UCL	174.7
249					Mean	137.7					95% KM (Percentile Bootstrap) UCL	172.6
250					Median	96					95% KM (Chebyshev) UCL	252.6
251					SD	142.4					97.5% KM (Chebyshev) UCL	308.7
252					k star	0.565					99% KM (Chebyshev) UCL	418.7
253					Theta star	243.5						
254					Nu star	28.27				Potential UCLs to Use		
255					AppChi2	17.14					95% KM (t) UCL	173.9
256					95% Gamma Approximate UCL	227.1					95% KM (% Bootstrap) UCL	172.6
257					95% Adjusted Gamma UCL	235.2						
258	Note: DL/2 is not a recommended method.											
259												
260	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
261	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
262	For additional insight, the user may want to consult a statistician.											
263												
264												
265	BENZO(A)PYRENE											
266												
267					General Statistics							
268					Number of Valid Data	25					Number of Detected Data	15
269					Number of Distinct Detected Data	14					Number of Non-Detect Data	10
270											Percent Non-Detects	40.00%
271												
272				Raw Statistics						Log-transformed Statistics		
273					Minimum Detected	36					Minimum Detected	3.584
274					Maximum Detected	1100					Maximum Detected	7.003
275					Mean of Detected	182.6					Mean of Detected	4.626

	A	B	C	D	E	F	G	H	I	J	K	L
276					SD of Detected	280.9					SD of Detected	0.967
277					Minimum Non-Detect	350					Minimum Non-Detect	5.858
278					Maximum Non-Detect	400					Maximum Non-Detect	5.991
279												
280	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
281	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
282	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.00%
283												
284					UCL Statistics							
285				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
286					Shapiro Wilk Test Statistic	0.547					Shapiro Wilk Test Statistic	0.872
287					5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881
288				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
289												
290				Assuming Normal Distribution						Assuming Lognormal Distribution		
291					DL/2 Substitution Method						DL/2 Substitution Method	
292					Mean	184.2					Mean	4.867
293					SD	214.6					SD	0.798
294					95% DL/2 (t) UCL	257.6					95% H-Stat (DL/2) UCL	257.7
295												
296					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
297				MLE method failed to converge properly							Mean in Log Scale	4.54
298											SD in Log Scale	0.792
299											Mean in Original Scale	145.3
300											SD in Original Scale	220.8
301											95% t UCL	220.9
302											95% Percentile Bootstrap UCL	223.3
303											95% BCA Bootstrap UCL	264.1
304											95% H-UCL	184.4
305												
306				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
307					k star (bias corrected)	0.839				Data do not follow a Discernable Distribution (0.05)		
308					Theta Star	217.5						
309					nu star	25.18						
310												
311					A-D Test Statistic	1.403				Nonparametric Statistics		
312					5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method	
313					K-S Test Statistic	0.763					Mean	144
314					5% K-S Critical Value	0.228					SD	217.4
315				Data not Gamma Distributed at 5% Significance Level							SE of Mean	45.73
316											95% KM (t) UCL	222.2
317				Assuming Gamma Distribution							95% KM (z) UCL	219.2
318					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	221.3
319					Minimum	0.000001					95% KM (bootstrap t) UCL	379.5
320					Maximum	1100					95% KM (BCA) UCL	220.7
321					Mean	163.6					95% KM (Percentile Bootstrap) UCL	223.8
322					Median	89					95% KM (Chebyshev) UCL	343.3
323					SD	225.1					97.5% KM (Chebyshev) UCL	429.6
324					k star	0.501					99% KM (Chebyshev) UCL	599
325					Theta star	326.9						
326					Nu star	25.03				Potential UCLs to Use		
327					AppChi2	14.63					95% KM (t) UCL	222.2
328					95% Gamma Approximate UCL	279.9					95% KM (% Bootstrap) UCL	223.8
329					95% Adjusted Gamma UCL	290.6						
330	Note: DL/2 is not a recommended method.											

	A	B	C	D	E	F	G	H	I	J	K	L
331												
332	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
333	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
334	For additional insight, the user may want to consult a statistician.											
335												
336												
337	BENZO(A)PYRENE EQUIVALENTS											
338												
339	General Statistics											
340					Number of Valid Data	25	Number of Detected Data					20
341					Number of Distinct Detected Data	20	Number of Non-Detect Data					5
342							Percent Non-Detects					20.00%
343												
344	Raw Statistics						Log-transformed Statistics					
345					Minimum Detected	435.3	Minimum Detected					6.076
346					Maximum Detected	1571	Maximum Detected					7.359
347					Mean of Detected	663.2	Mean of Detected					6.439
348					SD of Detected	265	SD of Detected					0.329
349					Minimum Non-Detect	350	Minimum Non-Detect					5.858
350					Maximum Non-Detect	400	Maximum Non-Detect					5.991
351												
352	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					5
353	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					20
354	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					20.00%
355												
356	UCL Statistics											
357	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
358					Shapiro Wilk Test Statistic	0.749	Shapiro Wilk Test Statistic					0.872
359					5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value					0.905
360	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
361												
362	Assuming Normal Distribution						Assuming Lognormal Distribution					
363					DL/2 Substitution Method		DL/2 Substitution Method					
364					Mean	568.3	Mean					6.2
365					SD	305.1	SD					0.571
366					95% DL/2 (t) UCL	672.7	95% H-Stat (DL/2) UCL					733.6
367												
368					Maximum Likelihood Estimate(MLE) Method		Log ROS Method					
369					Mean	573.2	Mean in Log Scale					6.293
370					SD	300.7	SD in Log Scale					0.419
371					95% MLE (t) UCL	676.1	Mean in Original Scale					590.9
372					95% MLE (Tiku) UCL	676.4	SD in Original Scale					278.3
373							95% t UCL					686.1
374							95% Percentile Bootstrap UCL					684.8
375							95% BCA Bootstrap UCL					701.1
376							95% H UCL					694.2
377												
378	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
379					k star (bias corrected)	7.554	Data do not follow a Discernable Distribution (0.05)					
380					Theta Star	87.8						
381					nu star	302.1						
382												
383					A-D Test Statistic	0.991	Nonparametric Statistics					
384					5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method					
385					K-S Test Statistic	0.743	Mean					617.6

	A	B	C	D	E	F	G	H	I	J	K	L
386					5% K-S Critical Value	0.194					SD	248.4
387	Data not Gamma Distributed at 5% Significance Level										SE of Mean	50.96
388											95% KM (t) UCL	704.8
389	Assuming Gamma Distribution										95% KM (z) UCL	701.4
390				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	703
391					Minimum	0.000001					95% KM (bootstrap t) UCL	749.9
392					Maximum	1571					95% KM (BCA) UCL	714.4
393					Mean	532.8					95% KM (Percentile Bootstrap) UCL	705.5
394					Median	512.2					95% KM (Chebyshev) UCL	839.7
395					SD	355.6					97.5% KM (Chebyshev) UCL	935.9
396					k star	0.227					99% KM (Chebyshev) UCL	1125
397					Theta star	2352						
398					Nu star	11.33			Potential UCLs to Use			
399					AppChi2	4.789					95% KM (BCA) UCL	714.4
400					95% Gamma Approximate UCL	1261						
401					95% Adjusted Gamma UCL	1341						
402	Note: DL/2 is not a recommended method.											
403												
404	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
405	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
406	For additional insight, the user may want to consult a statistician.											
407												
408												
409	BENZO(A)PYRENE EQUIVALENTS-HALF ND											
410												
411	General Statistics											
412					Number of Valid Data	25					Number of Detected Data	20
413					Number of Distinct Detected Data	18					Number of Non-Detect Data	5
414											Percent Non-Detects	20.00%
415												
416	Raw Statistics						Log-transformed Statistics					
417					Minimum Detected	242.8					Minimum Detected	5.492
418					Maximum Detected	1479					Maximum Detected	7.299
419					Mean of Detected	441.1					Mean of Detected	5.954
420					SD of Detected	307.9					SD of Detected	0.471
421					Minimum Non-Detect	175					Minimum Non-Detect	5.165
422					Maximum Non-Detect	200					Maximum Non-Detect	5.298
423												
424	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	5
425	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	20
426	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	20.00%
427												
428	UCL Statistics											
429	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
430					Shapiro Wilk Test Statistic	0.596					Shapiro Wilk Test Statistic	0.796
431					5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905
432	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
433												
434	Assuming Normal Distribution						Assuming Lognormal Distribution					
435					DL/2 Substitution Method						DL/2 Substitution Method	
436					Mean	371.8					Mean	5.673
437					SD	308.3					SD	0.711
438					95% DL/2 (t) UCL	477.3					95% H-Stat (DL/2) UCL	512.2
439												
440					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	

	A	B	C	D	E	F	G	H	I	J	K	L
441					Mean	348.9				Mean in Log Scale		5.753
442					SD	335.1				SD in Log Scale		0.587
443					95% MLE (t) UCL	463.5				Mean in Original Scale		381.1
444					95% MLE (Tiku) UCL	462.4				SD in Original Scale		300
445										95% t UCL		483.8
446										95% Percentile Bootstrap UCL		487.9
447										95% BCA Bootstrap UCL		512
448										95% H UCL		478.1
449												
450				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
451					k star (bias corrected)	3.31				Data do not follow a Discernable Distribution (0.05)		
452					Theta Star	133.2						
453					nu star	132.4						
454												
455					A-D Test Statistic	1.913				Nonparametric Statistics		
456					5% A-D Critical Value	0.746				Kaplan-Meier (KM) Method		
457					K-S Test Statistic	0.746				Mean		401.4
458					5% K-S Critical Value	0.195				SD		279.9
459				Data not Gamma Distributed at 5% Significance Level						SE of Mean		57.43
460										95% KM (t) UCL		499.7
461				Assuming Gamma Distribution						95% KM (z) UCL		495.9
462					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		499
463					Minimum	0.000001				95% KM (bootstrap t) UCL		693.8
464					Maximum	1479				95% KM (BCA) UCL		513.7
465					Mean	352.9				95% KM (Percentile Bootstrap) UCL		504.3
466					Median	311.7				95% KM (Chebyshev) UCL		651.7
467					SD	327.8				97.5% KM (Chebyshev) UCL		760.1
468					k star	0.195				99% KM (Chebyshev) UCL		972.8
469					Theta star	1807						
470					Nu star	9.765				Potential UCLs to Use		
471					AppChi2	3.795				95% KM (BCA) UCL		513.7
472					95% Gamma Approximate UCL	907.8						
473					95% Adjusted Gamma UCL	972.1						
474	Note: DL/2 is not a recommended method.											
475												
476	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
477	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
478	For additional insight, the user may want to consult a statistician.											
479												
480												
481	BENZO(B)FLUORANTHENE											
482												
483					General Statistics							
484					Number of Valid Data	25				Number of Detected Data		18
485					Number of Distinct Detected Data	17				Number of Non-Detect Data		7
486										Percent Non-Detects		28.00%
487												
488				Raw Statistics						Log-transformed Statistics		
489					Minimum Detected	41				Minimum Detected		3.714
490					Maximum Detected	1700				Maximum Detected		7.438
491					Mean of Detected	231.1				Mean of Detected		4.839
492					SD of Detected	384.6				SD of Detected		0.989
493					Minimum Non-Detect	350				Minimum Non-Detect		5.858
494					Maximum Non-Detect	400				Maximum Non-Detect		5.991
495												

	A	B	C	D	E	F	G	H	I	J	K	L
496	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
497	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
498	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.00%
499												
500					UCL Statistics							
501				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
502					Shapiro Wilk Test Statistic	0.496					Shapiro Wilk Test Statistic	0.893
503					5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897
504					Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level	
505												
506				Assuming Normal Distribution						Assuming Lognormal Distribution		
507					DL/2 Substitution Method						DL/2 Substitution Method	
508					Mean	219					Mean	4.95
509					SD	324.3					SD	0.852
510					95% DL/2 (t) UCL	330					95% H-Stat (DL/2) UCL	303.4
511												
512					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
513					MLE method failed to converge properly						Mean in Log Scale	4.79
514											SD in Log Scale	0.851
515											Mean in Original Scale	197.4
516											SD in Original Scale	328.8
517											95% t UCL	309.9
518											95% Percentile Bootstrap UCL	317.4
519											95% BCA Bootstrap UCL	397.7
520											95% H-UCL	258.2
521												
522				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
523					k star (bias corrected)	0.837					Data Follow Appr. Gamma Distribution at 5% Significance Level	
524					Theta Star	276						
525					nu star	30.14						
526												
527					A-D Test Statistic	1.283				Nonparametric Statistics		
528					5% A-D Critical Value	0.768					Kaplan-Meier (KM) Method	
529					K-S Test Statistic	0.768					Mean	201.2
530					5% K-S Critical Value	0.21					SD	324
531					Data follow Appr. Gamma Distribution at 5% Significance Level						SE of Mean	67.6
532											95% KM (t) UCL	316.9
533				Assuming Gamma Distribution							95% KM (z) UCL	312.4
534					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	316.2
535					Minimum	41					95% KM (bootstrap t) UCL	499.6
536					Maximum	1700					95% KM (BCA) UCL	319.4
537					Mean	214.3					95% KM (Percentile Bootstrap) UCL	322.2
538					Median	168.5					95% KM (Chebyshev) UCL	495.9
539					SD	329.1					97.5% KM (Chebyshev) UCL	623.4
540					k star	1.011					99% KM (Chebyshev) UCL	873.9
541					Theta star	212						
542					Nu star	50.55				Potential UCLs to Use		
543					AppChi2	35.22					95% KM (Chebyshev) UCL	495.9
544					95% Gamma Approximate UCL	307.5						
545					95% Adjusted Gamma UCL	315.3						
546	Note: DL/2 is not a recommended method.											
547												
548	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
549	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
550	For additional insight, the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
551												
552												
553	BENZO(G,H,I)PERYLENE											
554												
555					General Statistics							
556					Number of Valid Data	25				Number of Detected Data		7
557					Number of Distinct Detected Data	7				Number of Non-Detect Data		18
558										Percent Non-Detects		72.00%
559												
560				Raw Statistics						Log-transformed Statistics		
561					Minimum Detected	39				Minimum Detected		3.664
562					Maximum Detected	410				Maximum Detected		6.016
563					Mean of Detected	155.6				Mean of Detected		4.575
564					SD of Detected	170.7				SD of Detected		0.993
565					Minimum Non-Detect	350				Minimum Non-Detect		5.858
566					Maximum Non-Detect	410				Maximum Non-Detect		6.016
567												
568				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect		24
569				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected		1
570				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		96.00%
571												
572					Warning: There are only 7 Detected Values in this data							
573					Note: It should be noted that even though bootstrap may be performed on this data set							
574					the resulting calculations may not be reliable enough to draw conclusions							
575												
576					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
577												
578												
579					UCL Statistics							
580				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
581					Shapiro Wilk Test Statistic	0.655				Shapiro Wilk Test Statistic		0.753
582					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
583				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
584												
585				Assuming Normal Distribution						Assuming Lognormal Distribution		
586					DL/2 Substitution Method					DL/2 Substitution Method		
587					Mean	177.6				Mean		5.043
588					SD	86.86				SD		0.581
589					95% DL/2 (t) UCL	207.3				95% H-Stat (DL/2) UCL		233.3
590												
591					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
592				MLE method failed to converge properly						Mean in Log Scale		4.248
593										SD in Log Scale		0.665
594										Mean in Original Scale		92.46
595										SD in Original Scale		97.76
596										95% t UCL		125.9
597										95% Percentile Bootstrap UCL		123.6
598										95% BCA Bootstrap UCL		136.6
599										95% H-UCL		116.1
600												
601				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
602					k star (bias corrected)	0.779				Data do not follow a Discernable Distribution (0.05)		
603					Theta Star	199.6						
604					nu star	10.91						
605												

	A	B	C	D	E	F	G	H	I	J	K	L
606					A-D Test Statistic	1.108	Nonparametric Statistics					
607					5% A-D Critical Value	0.725					Kaplan-Meier (KM) Method	
608					K-S Test Statistic	0.725					Mean	84.33
609					5% K-S Critical Value	0.319					SD	96.19
610			Data not Gamma Distributed at 5% Significance Level								SE of Mean	21.41
611											95% KM (t) UCL	121
612			Assuming Gamma Distribution								95% KM (z) UCL	119.6
613				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	119.3
614					Minimum	0.000001					95% KM (bootstrap t) UCL	248.7
615					Maximum	410					95% KM (BCA) UCL	120.7
616					Mean	109.1					95% KM (Percentile Bootstrap) UCL	122
617					Median	81.11					95% KM (Chebyshev) UCL	177.7
618					SD	112.2					97.5% KM (Chebyshev) UCL	218.1
619					k star	0.231					99% KM (Chebyshev) UCL	297.4
620					Theta star	472.6						
621					Nu star	11.55			Potential UCLs to Use			
622					AppChi2	4.93					95% KM (t) UCL	121
623					95% Gamma Approximate UCL	255.6					95% KM (% Bootstrap) UCL	122
624					95% Adjusted Gamma UCL	271.8						
625	Note: DL/2 is not a recommended method.											
626												
627				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
628				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
629				For additional insight, the user may want to consult a statistician.								
630												
631												
632	BENZO(K)FLUORANTHENE											
633												
634					General Statistics							
635					Number of Valid Data	25					Number of Detected Data	9
636					Number of Distinct Detected Data	9					Number of Non-Detect Data	16
637											Percent Non-Detects	64.00%
638												
639					Raw Statistics		Log-transformed Statistics					
640					Minimum Detected	38					Minimum Detected	3.638
641					Maximum Detected	1100					Maximum Detected	7.003
642					Mean of Detected	260.7					Mean of Detected	4.841
643					SD of Detected	373.5					SD of Detected	1.175
644					Minimum Non-Detect	350					Minimum Non-Detect	5.858
645					Maximum Non-Detect	430					Maximum Non-Detect	6.064
646												
647	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
648	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
649	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.00%
650												
651				Warning: There are only 9 Detected Values in this data								
652				Note: It should be noted that even though bootstrap may be performed on this data set								
653				the resulting calculations may not be reliable enough to draw conclusions								
654												
655				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
656												
657												
658					UCL Statistics							
659				Normal Distribution Test with Detected Values Only			Lognormal Distribution Test with Detected Values Only					
660					Shapiro Wilk Test Statistic	0.651					Shapiro Wilk Test Statistic	0.859

	A	B	C	D	E	F	G	H	I	J	K	L
661					5% Shapiro Wilk Critical Value	0.829				5% Shapiro Wilk Critical Value		0.829
662	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
663												
664	Assuming Normal Distribution						Assuming Lognormal Distribution					
665					DL/2 Substitution Method					DL/2 Substitution Method		
666					Mean	214.2				Mean		5.093
667					SD	218.7				SD		0.707
668					95% DL/2 (t) UCL	289.1				95% H-Stat (DL/2) UCL		285.3
669												
670					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
671	MLE method failed to converge properly									Mean in Log Scale		4.558
672										SD in Log Scale		0.825
673										Mean in Original Scale		152.9
674										SD in Original Scale		233.9
675										95% t UCL		232.9
676										95% Percentile Bootstrap UCL		234.9
677										95% BCA Bootstrap UCL		283.3
678										95% H-UCL		196.9
679												
680	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
681					k star (bias corrected)	0.62	Data appear Lognormal at 5% Significance Level					
682					Theta Star	420.5						
683					nu star	11.16						
684												
685					A-D Test Statistic	0.97	Nonparametric Statistics					
686					5% A-D Critical Value	0.749				Kaplan-Meier (KM) Method		
687					K-S Test Statistic	0.749				Mean		145.6
688					5% K-S Critical Value	0.289				SD		230.1
689	Data not Gamma Distributed at 5% Significance Level									SE of Mean		50.09
690										95% KM (t) UCL		231.3
691	Assuming Gamma Distribution									95% KM (z) UCL		228
692					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		228.8
693					Minimum	0.000001				95% KM (bootstrap t) UCL		416
694					Maximum	1100				95% KM (BCA) UCL		223.9
695					Mean	183.1				95% KM (Percentile Bootstrap) UCL		233.8
696					Median	108.2				95% KM (Chebyshev) UCL		363.9
697					SD	250.1				97.5% KM (Chebyshev) UCL		458.4
698					k star	0.17				99% KM (Chebyshev) UCL		643.9
699					Theta star	1079						
700					Nu star	8.489	Potential UCLs to Use					
701					AppChi2	3.021				95% KM (BCA) UCL		223.9
702					95% Gamma Approximate UCL	514.5						
703					95% Adjusted Gamma UCL	554.7						
704	Note: DL/2 is not a recommended method.											
705												
706	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
707	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
708	For additional insight, the user may want to consult a statistician.											
709												
710												
711	CHRYSENE											
712												
713	General Statistics											
714					Number of Valid Data	25				Number of Detected Data		20
715					Number of Distinct Detected Data	20				Number of Non-Detect Data		5

	A	B	C	D	E	F	G	H	I	J	K	L
716											Percent Non-Detects	20.00%
717												
718				Raw Statistics						Log-transformed Statistics		
719					Minimum Detected	37					Minimum Detected	3.611
720					Maximum Detected	1600					Maximum Detected	7.378
721					Mean of Detected	203.4					Mean of Detected	4.681
722					SD of Detected	357.4					SD of Detected	0.971
723					Minimum Non-Detect	350					Minimum Non-Detect	5.858
724					Maximum Non-Detect	400					Maximum Non-Detect	5.991
725												
726	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
727	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
728	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.00%
729												
730				UCL Statistics								
731				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
732					Shapiro Wilk Test Statistic	0.477					Shapiro Wilk Test Statistic	0.869
733					5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905
734				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
735												
736				Assuming Normal Distribution						Assuming Lognormal Distribution		
737					DL/2 Substitution Method						DL/2 Substitution Method	
738					Mean	200.5					Mean	4.793
739					SD	318.1					SD	0.894
740					95% DL/2 (t) UCL	309.4					95% H-Stat (DL/2) UCL	277
741												
742					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
743				MLE method failed to converge properly							Mean in Log Scale	4.651
744											SD in Log Scale	0.873
745											Mean in Original Scale	181.9
746											SD in Original Scale	321.2
747											95% t UCL	291.8
748											95% Percentile Bootstrap UCL	294.7
749											95% BCA Bootstrap UCL	383.6
750											95% H-UCL	232.6
751												
752				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
753					k star (bias corrected)	0.814				Data do not follow a Discernable Distribution (0.05)		
754					Theta Star	249.8						
755					nu star	32.57						
756												
757					A-D Test Statistic	1.851				Nonparametric Statistics		
758					5% A-D Critical Value	0.772					Kaplan-Meier (KM) Method	
759					K-S Test Statistic	0.772					Mean	182.7
760					5% K-S Critical Value	0.2					SD	315.5
761				Data not Gamma Distributed at 5% Significance Level							SE of Mean	65.03
762											95% KM (t) UCL	294
763				Assuming Gamma Distribution							95% KM (z) UCL	289.7
764					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	293.4
765					Minimum	32.17					95% KM (bootstrap t) UCL	594.6
766					Maximum	1600					95% KM (BCA) UCL	309.5
767					Mean	192.6					95% KM (Percentile Bootstrap) UCL	295.5
768					Median	110					95% KM (Chebyshev) UCL	466.2
769					SD	320.6					97.5% KM (Chebyshev) UCL	588.8
770					k star	0.94					99% KM (Chebyshev) UCL	829.8

	A	B	C	D	E	F	G	H	I	J	K	L
771					Theta star	204.9						
772					Nu star	47	Potential UCLs to Use					
773					AppChi2	32.27				95% KM (BCA) UCL		309.5
774				95% Gamma Approximate UCL		280.5						
775				95% Adjusted Gamma UCL		288						
776	Note: DL/2 is not a recommended method.											
777												
778	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
779	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
780	For additional insight, the user may want to consult a statistician.											
781												
782												
783	FLUORANTHENE											
784												
785	General Statistics											
786				Number of Valid Data		25				Number of Detected Data		20
787				Number of Distinct Detected Data		19				Number of Non-Detect Data		5
788										Percent Non-Detects		20.00%
789												
790	Raw Statistics						Log-transformed Statistics					
791				Minimum Detected		43				Minimum Detected		3.761
792				Maximum Detected		1700				Maximum Detected		7.438
793				Mean of Detected		266.1				Mean of Detected		5.003
794				SD of Detected		408.8				SD of Detected		0.964
795				Minimum Non-Detect		350				Minimum Non-Detect		5.858
796				Maximum Non-Detect		390				Maximum Non-Detect		5.966
797												
798	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		23
799	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
800	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.00%
801												
802	UCL Statistics											
803	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
804				Shapiro Wilk Test Statistic		0.541				Shapiro Wilk Test Statistic		0.903
805				5% Shapiro Wilk Critical Value		0.905				5% Shapiro Wilk Critical Value		0.905
806	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
807												
808	Assuming Normal Distribution						Assuming Lognormal Distribution					
809				DL/2 Substitution Method						DL/2 Substitution Method		
810				Mean		249.7				Mean		5.045
811				SD		365.3				SD		0.863
812				95% DL/2 (t) UCL		374.7				95% H-Stat (DL/2) UCL		339.5
813												
814				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
815	MLE method failed to converge properly									Mean in Log Scale		4.972
816										SD in Log Scale		0.875
817										Mean in Original Scale		240
818										SD in Original Scale		368.2
819										95% t UCL		366
820										95% Percentile Bootstrap UCL		368.7
821										95% BCA Bootstrap UCL		437.3
822										95% H-UCL		321.7
823												
824	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
825				k star (bias corrected)		0.879	Data do not follow a Discernable Distribution (0.05)					

	A	B	C	D	E	F	G	H	I	J	K	L
826					Theta Star	302.7						
827					nu star	35.16						
828												
829					A-D Test Statistic	1.589			Nonparametric Statistics			
830					5% A-D Critical Value	0.768					Kaplan-Meier (KM) Method	
831					K-S Test Statistic	0.768					Mean	240.9
832					5% K-S Critical Value	0.199					SD	362.1
833			Data not Gamma Distributed at 5% Significance Level								SE of Mean	74.85
834											95% KM (t) UCL	369
835				Assuming Gamma Distribution							95% KM (z) UCL	364
836					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	368.4
837					Minimum	43					95% KM (bootstrap t) UCL	658.1
838					Maximum	1700					95% KM (BCA) UCL	375
839					Mean	254.3					95% KM (Percentile Bootstrap) UCL	374.2
840					Median	150					95% KM (Chebyshev) UCL	567.2
841					SD	369.6					97.5% KM (Chebyshev) UCL	708.4
842					k star	0.981					99% KM (Chebyshev) UCL	985.7
843					Theta star	259.2						
844					Nu star	49.06			Potential UCLs to Use			
845					AppChi2	33.98					95% KM (BCA) UCL	375
846					95% Gamma Approximate UCL	367.2						
847					95% Adjusted Gamma UCL	376.7						
848	Note: DL/2 is not a recommended method.											
849												
850	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
851	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
852	For additional insight, the user may want to consult a statistician.											
853												
854												
855	INDENO(1,2,3-CD)PYRENE											
856												
857					General Statistics							
858					Number of Valid Data	25					Number of Detected Data	8
859					Number of Distinct Detected Data	8					Number of Non-Detect Data	17
860											Percent Non-Detects	68.00%
861												
862					Raw Statistics						Log-transformed Statistics	
863					Minimum Detected	38					Minimum Detected	3.638
864					Maximum Detected	440					Maximum Detected	6.087
865					Mean of Detected	153.6					Mean of Detected	4.601
866					SD of Detected	165.8					SD of Detected	0.935
867					Minimum Non-Detect	350					Minimum Non-Detect	5.858
868					Maximum Non-Detect	410					Maximum Non-Detect	6.016
869												
870	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	24
871	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
872	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.00%
873												
874	Warning: There are only 8 Detected Values in this data											
875	Note: It should be noted that even though bootstrap may be performed on this data set											
876	the resulting calculations may not be reliable enough to draw conclusions											
877												
878	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
879												
880												

	A	B	C	D	E	F	G	H	I	J	K	L
881	UCL Statistics											
882	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
883					Shapiro Wilk Test Statistic	0.683				Shapiro Wilk Test Statistic		0.833
884					5% Shapiro Wilk Critical Value	0.818				5% Shapiro Wilk Critical Value		0.818
885	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
886												
887	Assuming Normal Distribution						Assuming Lognormal Distribution					
888					DL/2 Substitution Method					DL/2 Substitution Method		
889					Mean	176.2				Mean		5.028
890					SD	91.27				SD		0.588
891					95% DL/2 (t) UCL	207.4				95% H-Stat (DL/2) UCL		231.7
892												
893					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
894	MLE method failed to converge properly									Mean in Log Scale		4.335
895										SD in Log Scale		0.654
896										Mean in Original Scale		99.44
897										SD in Original Scale		100.9
898										95% t UCL		134
899										95% Percentile Bootstrap UCL		135.5
900										95% BCA Bootstrap UCL		150.6
901										95% H-UCL		125
902												
903	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
904					k star (bias corrected)	0.893	Data appear Lognormal at 5% Significance Level					
905					Theta Star	172						
906					nu star	14.29						
907												
908					A-D Test Statistic	0.93	Nonparametric Statistics					
909					5% A-D Critical Value	0.731				Kaplan-Meier (KM) Method		
910					K-S Test Statistic	0.731				Mean		93.83
911					5% K-S Critical Value	0.3				SD		99.29
912	Data not Gamma Distributed at 5% Significance Level									SE of Mean		22.56
913										95% KM (t) UCL		132.4
914	Assuming Gamma Distribution									95% KM (z) UCL		130.9
915					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		131.5
916					Minimum	0.000001				95% KM (bootstrap t) UCL		187.5
917					Maximum	440				95% KM (BCA) UCL		132.6
918					Mean	116.9				95% KM (Percentile Bootstrap) UCL		132.4
919					Median	93.78				95% KM (Chebyshev) UCL		192.2
920					SD	113.8				97.5% KM (Chebyshev) UCL		234.7
921					k star	0.282				99% KM (Chebyshev) UCL		318.3
922					Theta star	414.3						
923					Nu star	14.1				Potential UCLs to Use		
924					AppChi2	6.642				95% KM (t) UCL		132.4
925					95% Gamma Approximate UCL	248.1				95% KM (% Bootstrap) UCL		132.4
926					95% Adjusted Gamma UCL	261.8						
927	Note: DL/2 is not a recommended method.											
928												
929	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
930	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
931	For additional insight, the user may want to consult a statistician.											
932												
933												
934	PHENANTHRENE											
935												

	A	B	C	D	E	F	G	H	I	J	K	L
936	General Statistics											
937					Number of Valid Data	25				Number of Detected Data		14
938					Number of Distinct Detected Data	14				Number of Non-Detect Data		11
939										Percent Non-Detects		44.00%
940												
941	Raw Statistics						Log-transformed Statistics					
942					Minimum Detected	40				Minimum Detected		3.689
943					Maximum Detected	470				Maximum Detected		6.153
944					Mean of Detected	145.3				Mean of Detected		4.736
945					SD of Detected	120.2				SD of Detected		0.689
946					Minimum Non-Detect	350				Minimum Non-Detect		5.858
947					Maximum Non-Detect	400				Maximum Non-Detect		5.991
948												
949	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		24
950	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
951	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		96.00%
952												
953	UCL Statistics											
954	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
955					Shapiro Wilk Test Statistic	0.767				Shapiro Wilk Test Statistic		0.953
956					5% Shapiro Wilk Critical Value	0.874				5% Shapiro Wilk Critical Value		0.874
957	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
958												
959	Assuming Normal Distribution						Assuming Lognormal Distribution					
960					DL/2 Substitution Method					DL/2 Substitution Method		
961					Mean	163				Mean		4.95
962					SD	90.92				SD		0.565
963					95% DL/2 (t) UCL	194.1				95% H-Stat (DL/2) UCL		208.8
964												
965					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
966	MLE method failed to converge properly									Mean in Log Scale		4.693
967										SD in Log Scale		0.557
968										Mean in Original Scale		129.4
969										SD in Original Scale		93.49
970										95% t UCL		161.4
971										95% Percentile Bootstrap UCL		160
972										95% BCA Bootstrap UCL		171.5
973										95% H-UCL		160.3
974												
975	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
976					k star (bias corrected)	1.785	Data appear Gamma Distributed at 5% Significance Level					
977					Theta Star	81.38						
978					nu star	49.99						
979												
980					A-D Test Statistic	0.583	Nonparametric Statistics					
981					5% A-D Critical Value	0.745				Kaplan-Meier (KM) Method		
982					K-S Test Statistic	0.745				Mean		134.3
983					5% K-S Critical Value	0.231				SD		100.9
984	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		25.25
985										95% KM (t) UCL		177.5
986	Assuming Gamma Distribution									95% KM (z) UCL		175.8
987					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		177.9
988					Minimum	38.33				95% KM (bootstrap t) UCL		203
989					Maximum	470				95% KM (BCA) UCL		178.3
990					Mean	143.3				95% KM (Percentile Bootstrap) UCL		178.8

	A	B	C	D	E	F	G	H	I	J	K	L
991					Median	113.2				95% KM (Chebyshev) UCL		244.4
992					SD	96.52				97.5% KM (Chebyshev) UCL		292
993					k star	2.565				99% KM (Chebyshev) UCL		385.6
994					Theta star	55.87						
995					Nu star	128.2				Potential UCLs to Use		
996					AppChi2	103.1				95% KM (t) UCL		177.5
997				95% Gamma Approximate UCL		178.3						
998				95% Adjusted Gamma UCL		181						
999	Note: DL/2 is not a recommended method.											
1000												
1001	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1002	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1003	For additional insight, the user may want to consult a statistician.											
1004												
1005												
1006	PYRENE											
1007												
1008					General Statistics							
1009					Number of Valid Data	25				Number of Detected Data		21
1010					Number of Distinct Detected Data	20				Number of Non-Detect Data		4
1011										Percent Non-Detects		16.00%
1012												
1013				Raw Statistics						Log-transformed Statistics		
1014					Minimum Detected	42				Minimum Detected		3.738
1015					Maximum Detected	1400				Maximum Detected		7.244
1016					Mean of Detected	224.5				Mean of Detected		4.876
1017					SD of Detected	336.7				SD of Detected		0.916
1018					Minimum Non-Detect	350				Minimum Non-Detect		5.858
1019					Maximum Non-Detect	390				Maximum Non-Detect		5.966
1020												
1021	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		23
1022	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
1023	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.00%
1024												
1025					UCL Statistics							
1026				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
1027					Shapiro Wilk Test Statistic	0.532				Shapiro Wilk Test Statistic		0.89
1028					5% Shapiro Wilk Critical Value	0.908				5% Shapiro Wilk Critical Value		0.908
1029				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
1030												
1031				Assuming Normal Distribution						Assuming Lognormal Distribution		
1032					DL/2 Substitution Method					DL/2 Substitution Method		
1033					Mean	218.4				Mean		4.932
1034					SD	307.7				SD		0.847
1035					95% DL/2 (t) UCL	323.7				95% H-Stat (DL/2) UCL		295.7
1036												
1037					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1038				MLE method failed to converge properly						Mean in Log Scale		4.854
1039										SD in Log Scale		0.845
1040										Mean in Original Scale		207.6
1041										SD in Original Scale		310.1
1042										95% t UCL		313.7
1043										95% Percentile Bootstrap UCL		318.3
1044										95% BCA Bootstrap UCL		367.4
1045										95% H-UCL		272.7

	A	B	C	D	E	F	G	H	I	J	K	L
1046												
1047	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1048					k star (bias corrected)	0.944	Data do not follow a Discernable Distribution (0.05)					
1049					Theta Star	237.7						
1050					nu star	39.66						
1051												
1052					A-D Test Statistic	1.77	Nonparametric Statistics					
1053					5% A-D Critical Value	0.768				Kaplan-Meier (KM) Method		
1054					K-S Test Statistic	0.768				Mean		208.2
1055					5% K-S Critical Value	0.195				SD		304.8
1056	Data not Gamma Distributed at 5% Significance Level									SE of Mean		62.82
1057										95% KM (t) UCL		315.7
1058	Assuming Gamma Distribution									95% KM (z) UCL		311.5
1059				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		315.3
1060					Minimum	42				95% KM (bootstrap t) UCL		566.7
1061					Maximum	1400				95% KM (BCA) UCL		327.5
1062					Mean	217.8				95% KM (Percentile Bootstrap) UCL		316.5
1063					Median	130				95% KM (Chebyshev) UCL		482
1064					SD	309.7				97.5% KM (Chebyshev) UCL		600.5
1065					k star	1.069				99% KM (Chebyshev) UCL		833.2
1066					Theta star	203.7						
1067					Nu star	53.45	Potential UCLs to Use					
1068					AppChi2	37.66				95% KM (Chebyshev) UCL		482
1069					95% Gamma Approximate UCL	309.1						
1070					95% Adjusted Gamma UCL	316.7						
1071	Note: DL/2 is not a recommended method.											
1072												
1073	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1074	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1075	For additional insight, the user may want to consult a statistician.											
1076												
1077												
1078	4,4'-DDD											
1079												
1080	General Statistics											
1081					Number of Valid Data	25				Number of Detected Data		19
1082					Number of Distinct Detected Data	18				Number of Non-Detect Data		6
1083										Percent Non-Detects		24.00%
1084												
1085	Raw Statistics						Log-transformed Statistics					
1086					Minimum Detected	0.6				Minimum Detected		-0.511
1087					Maximum Detected	170				Maximum Detected		5.136
1088					Mean of Detected	22.85				Mean of Detected		2.271
1089					SD of Detected	38.48				SD of Detected		1.37
1090					Minimum Non-Detect	17				Minimum Non-Detect		2.833
1091					Maximum Non-Detect	20				Maximum Non-Detect		2.996
1092												
1093	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		18
1094	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		7
1095	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		72.00%
1096												
1097	UCL Statistics											
1098	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1099					Shapiro Wilk Test Statistic	0.554				Shapiro Wilk Test Statistic		0.985
1100					5% Shapiro Wilk Critical Value	0.901				5% Shapiro Wilk Critical Value		0.901

	A	B	C	D	E	F	G	H	I	J	K	L
1101	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1102												
1103	Assuming Normal Distribution						Assuming Lognormal Distribution					
1104					DL/2 Substitution Method						DL/2 Substitution Method	
1105					Mean	19.58					Mean	2.26
1106					SD	33.85					SD	1.187
1107					95% DL/2 (t) UCL	31.17					95% H-Stat (DL/2) UCL	37.65
1108												
1109					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1110	MLE yields a negative mean										Mean in Log Scale	2.093
1111											SD in Log Scale	1.245
1112											Mean in Original Scale	18.55
1113											SD in Original Scale	34.24
1114											95% t UCL	30.27
1115											95% Percentile Bootstrap UCL	30.46
1116											95% BCA Bootstrap UCL	38.46
1117											95% H-UCL	36.03
1118												
1119	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1120					k star (bias corrected)	0.628	Data appear Gamma Distributed at 5% Significance Level					
1121					Theta Star	36.38						
1122					nu star	23.87						
1123												
1124					A-D Test Statistic	0.539	Nonparametric Statistics					
1125					5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method	
1126					K-S Test Statistic	0.783					Mean	18.74
1127					5% K-S Critical Value	0.207					SD	33.51
1128	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	6.9
1129											95% KM (t) UCL	30.54
1130	Assuming Gamma Distribution										95% KM (z) UCL	30.09
1131					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	30.47
1132					Minimum	0.000001					95% KM (bootstrap t) UCL	50.62
1133					Maximum	170					95% KM (BCA) UCL	32.06
1134					Mean	18.65					95% KM (Percentile Bootstrap) UCL	31.56
1135					Median	9.5					95% KM (Chebyshev) UCL	48.81
1136					SD	34.29					97.5% KM (Chebyshev) UCL	61.83
1137					k star	0.324					99% KM (Chebyshev) UCL	87.39
1138					Theta star	57.65						
1139					Nu star	16.18	Potential UCLs to Use					
1140					AppChi2	8.09					95% KM (Chebyshev) UCL	48.81
1141					95% Gamma Approximate UCL	37.31						
1142					95% Adjusted Gamma UCL	39.2						
1143	Note: DL/2 is not a recommended method.											
1144												
1145	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1146	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1147	For additional insight, the user may want to consult a statistician.											
1148												
1149												
1150	4,4'-DDE											
1151												
1152	General Statistics											
1153					Number of Valid Data	25					Number of Detected Data	22
1154					Number of Distinct Detected Data	19					Number of Non-Detect Data	3
1155											Percent Non-Detects	12.00%

	A	B	C	D	E	F	G	H	I	J	K	L
1156												
1157	Raw Statistics						Log-transformed Statistics					
1158					Minimum Detected	5.2					Minimum Detected	1.649
1159					Maximum Detected	7100					Maximum Detected	8.868
1160					Mean of Detected	475.2					Mean of Detected	4.618
1161					SD of Detected	1489					SD of Detected	1.621
1162					Minimum Non-Detect	17					Minimum Non-Detect	2.833
1163					Maximum Non-Detect	19					Maximum Non-Detect	2.944
1164												
1165	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	6
1166	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	19
1167	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	24.00%
1168												
1169	UCL Statistics											
1170	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1171					Shapiro Wilk Test Statistic	0.304					Shapiro Wilk Test Statistic	0.962
1172					5% Shapiro Wilk Critical Value	0.911					5% Shapiro Wilk Critical Value	0.911
1173	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1174												
1175	Assuming Normal Distribution						Assuming Lognormal Distribution					
1176					DL/2 Substitution Method						DL/2 Substitution Method	
1177					Mean	419.3					Mean	4.33
1178					SD	1401					SD	1.713
1179					95% DL/2 (t) UCL	898.7					95% H-Stat (DL/2) UCL	1128
1180												
1181					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1182					Mean	119.3					Mean in Log Scale	4.297
1183					SD	1624					SD in Log Scale	1.762
1184					95% MLE (t) UCL	674.9					Mean in Original Scale	419.1
1185					95% MLE (Tiku) UCL	673.6					SD in Original Scale	1401
1186											95% t UCL	898.5
1187											95% Percentile Bootstrap UCL	973.6
1188											95% BCA Bootstrap UCL	1266
1189											95% H UCL	1264
1190												
1191	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1192					k star (bias corrected)	0.395	Data appear Lognormal at 5% Significance Level					
1193					Theta Star	1203						
1194					nu star	17.38						
1195												
1196					A-D Test Statistic	1.825	Nonparametric Statistics					
1197					5% A-D Critical Value	0.821					Kaplan-Meier (KM) Method	
1198					K-S Test Statistic	0.821					Mean	419.1
1199					5% K-S Critical Value	0.198					SD	1373
1200	Data not Gamma Distributed at 5% Significance Level										SE of Mean	281
1201											95% KM (t) UCL	899.9
1202	Assuming Gamma Distribution										95% KM (z) UCL	881.3
1203					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	898.5
1204					Minimum	0.000001					95% KM (bootstrap t) UCL	3792
1205					Maximum	7100					95% KM (BCA) UCL	991.3
1206					Mean	418.2					95% KM (Percentile Bootstrap) UCL	975.7
1207					Median	71					95% KM (Chebyshev) UCL	1644
1208					SD	1401					97.5% KM (Chebyshev) UCL	2174
1209					k star	0.205					99% KM (Chebyshev) UCL	3215
1210					Theta star	2042						

	A	B	C	D	E	F	G	H	I	J	K	L
1211					Nu star	10.24	Potential UCLs to Use					
1212					AppChi2	4.091				99% KM (Chebyshev) UCL		3215
1213				95% Gamma Approximate UCL		1047						
1214				95% Adjusted Gamma UCL		1118						
1215	Note: DL/2 is not a recommended method.											
1216												
1217	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1218	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1219	For additional insight, the user may want to consult a statistician.											
1220												
1221												
1222	4,4'-DDT											
1223												
1224	General Statistics											
1225				Number of Valid Data		25				Number of Detected Data		22
1226				Number of Distinct Detected Data		21				Number of Non-Detect Data		3
1227										Percent Non-Detects		12.00%
1228												
1229	Raw Statistics						Log-transformed Statistics					
1230				Minimum Detected		5.1				Minimum Detected		1.629
1231				Maximum Detected		4100				Maximum Detected		8.319
1232				Mean of Detected		359.2				Mean of Detected		4.719
1233				SD of Detected		856.2				SD of Detected		1.537
1234				Minimum Non-Detect		17				Minimum Non-Detect		2.833
1235				Maximum Non-Detect		19				Maximum Non-Detect		2.944
1236												
1237	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
1238	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		19
1239	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		24.00%
1240												
1241	UCL Statistics											
1242	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1243				Shapiro Wilk Test Statistic		0.392				Shapiro Wilk Test Statistic		0.975
1244				5% Shapiro Wilk Critical Value		0.911				5% Shapiro Wilk Critical Value		0.911
1245	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1246												
1247	Assuming Normal Distribution						Assuming Lognormal Distribution					
1248				DL/2 Substitution Method						DL/2 Substitution Method		
1249				Mean		317.2				Mean		4.419
1250				SD		809.3				SD		1.661
1251				95% DL/2 (t) UCL		594.1				95% H-Stat (DL/2) UCL		1057
1252												
1253				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1254				Mean		149.6				Mean in Log Scale		4.426
1255				SD		944.8				SD in Log Scale		1.654
1256				95% MLE (t) UCL		472.9				Mean in Original Scale		317.3
1257				95% MLE (Tiku) UCL		472.3				SD in Original Scale		809.2
1258										95% t UCL		594.2
1259										95% Percentile Bootstrap UCL		625.6
1260										95% BCA Bootstrap UCL		801.9
1261										95% H UCL		1044
1262												
1263	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1264				k star (bias corrected)		0.496	Data Follow Appr. Gamma Distribution at 5% Significance Level					
1265				Theta Star		724.4						

	A	B	C	D	E	F	G	H	I	J	K	L
1266					nu star	21.82						
1267												
1268					A-D Test Statistic	1.027				Nonparametric Statistics		
1269					5% A-D Critical Value	0.801					Kaplan-Meier (KM) Method	
1270					K-S Test Statistic	0.801					Mean	317.2
1271					5% K-S Critical Value	0.195					SD	793
1272		Data follow Appr. Gamma Distribution at 5% Significance Level									SE of Mean	162.3
1273											95% KM (t) UCL	594.9
1274			Assuming Gamma Distribution								95% KM (z) UCL	584.2
1275				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	594.1
1276					Minimum	0.000001					95% KM (bootstrap t) UCL	1468
1277					Maximum	4100					95% KM (BCA) UCL	630.4
1278					Mean	316.1					95% KM (Percentile Bootstrap) UCL	637.9
1279					Median	94.5					95% KM (Chebyshev) UCL	1025
1280					SD	809.7					97.5% KM (Chebyshev) UCL	1331
1281					k star	0.222					99% KM (Chebyshev) UCL	1932
1282					Theta star	1424						
1283					Nu star	11.1				Potential UCLs to Use		
1284					AppChi2	4.641					95% KM (Chebyshev) UCL	1025
1285					95% Gamma Approximate UCL	756.1						
1286					95% Adjusted Gamma UCL	805.1						
1287	Note: DL/2 is not a recommended method.											
1288												
1289	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1290	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1291	For additional insight, the user may want to consult a statistician.											
1292												

B.3 SOIL UPLs AND UTLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	1,2,3,4,6,7,8,9-OCDD											
12												
13						General Statistics						
14						Total Number of Observations	19			Number of Distinct Observations	18	
15						Tolerance Factor	2.423			Number of Missing Values	25	
16												
17						Raw Statistics				Log-Transformed Statistics		
18						Minimum	18			Minimum	2.89	
19						Maximum	6460			Maximum	8.773	
20						Second Largest	1950			Second Largest	7.576	
21						First Quartile	221			First Quartile	5.398	
22						Median	462			Median	6.136	
23						Third Quartile	1033			Third Quartile	6.936	
24						Mean	896.7			Mean	5.935	
25						SD	1445			SD	1.497	
26						Coefficient of Variation	1.611					
27						Skewness	3.494					
28												
29						Background Statistics						
30						Normal Distribution Test				Lognormal Distribution Test		
31						Shapiro Wilk Test Statistic	0.559			Shapiro Wilk Test Statistic	0.952	
32						Shapiro Wilk Critical Value	0.901			Shapiro Wilk Critical Value	0.901	
33						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
34												
35						Assuming Normal Distribution				Assuming Lognormal Distribution		
36						95% UTL with 95% Coverage	4398			95% UTL with 95% Coverage	14223	
37						95% UPL (t)	3467			95% UPL (t)	5423	
38						90% Percentile (z)	2748			90% Percentile (z)	2575	
39						95% Percentile (z)	3273			95% Percentile (z)	4436	
40						99% Percentile (z)	4258			99% Percentile (z)	12306	
41												
42						Gamma Distribution Test				Data Distribution Test		
43						k star	0.624			Data appear Gamma Distributed at 5% Significance Level		
44						Theta Star	1437					
45						MLE of Mean	896.7					
46						MLE of Standard Deviation	1135					
47						nu star	23.71					
48												
49						A-D Test Statistic	0.361			Nonparametric Statistics		
50						5% A-D Critical Value	0.784			90% Percentile	1518	
51						K-S Test Statistic	0.117			95% Percentile	2401	
52						5% K-S Critical Value	0.207			99% Percentile	5648	
53						Data appear Gamma Distributed at 5% Significance Level						
54												
55						Assuming Gamma Distribution				95% UTL with 95% Coverage	6460	

	A	B	C	D	E	F	G	H	I	J	K	L
56					90% Percentile	2311			95% Percentile Bootstrap UTL with		95% Coverage	6460
57					95% Percentile	3181			95% BCA Bootstrap UTL with		95% Coverage	6460
58					99% Percentile	5277					95% UPL	6460
59											95% Chebyshev UPL	7359
60					95% WH Approx. Gamma UPL	3227					Upper Threshold Limit Based upon IQR	2250
61					95% HW Approx. Gamma UPL	3406						
62				95% WH Approx. Gamma UTL with	95% Coverage	5094						
63				95% HW Approx. Gamma UTL with	95% Coverage	5743						
64												
65												
66												
67	1,2,3,4,6,7,8-HPCDD											
68												
69					General Statistics							
70					Total Number of Observations	19					Number of Distinct Observations	19
71					Tolerance Factor	2.423					Number of Missing Values	25
72												
73					Raw Statistics						Log-Transformed Statistics	
74					Minimum	1.3					Minimum	0.262
75					Maximum	826					Maximum	6.717
76					Second Largest	120					Second Largest	4.787
77					First Quartile	9.125					First Quartile	2.196
78					Median	12.9					Median	2.557
79					Third Quartile	31.35					Third Quartile	3.445
80					Mean	64.52					Mean	2.864
81					SD	186.2					SD	1.343
82					Coefficient of Variation	2.886						
83					Skewness	4.228						
84												
85					Background Statistics							
86					Normal Distribution Test						Lognormal Distribution Test	
87					Shapiro Wilk Test Statistic	0.332					Shapiro Wilk Test Statistic	0.909
88					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
89					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
90												
91					Assuming Normal Distribution						Assuming Lognormal Distribution	
92					95% UTL with	95% Coverage	515.7				95% UTL with	95% Coverage	454.6
93					95% UPL (t)	395.8					95% UPL (t)	191.4
94					90% Percentile (z)	303.1					90% Percentile (z)	98.1
95					95% Percentile (z)	370.8					95% Percentile (z)	159.8
96					99% Percentile (z)	497.7					99% Percentile (z)	399.2
97												
98					Gamma Distribution Test						Data Distribution Test	
99					k star	0.447					Data appear Lognormal at 5% Significance Level	
100					Theta Star	144.3						
101					MLE of Mean	64.52						
102					MLE of Standard Deviation	96.48						
103					nu star	16.99						
104												
105					A-D Test Statistic	2.417					Nonparametric Statistics	
106					5% A-D Critical Value	0.805					90% Percentile	50.96
107					K-S Test Statistic	0.361					95% Percentile	190.6
108					5% K-S Critical Value	0.21					99% Percentile	698.9
109					Data not Gamma Distributed at 5% Significance Level							
110												

	A	B	C	D	E	F	G	H	I	J	K	L
111				Assuming Gamma Distribution						95% UTL with	95% Coverage	826
112					90% Percentile	178.5			95% Percentile Bootstrap UTL with		95% Coverage	826
113					95% Percentile	257.8			95% BCA Bootstrap UTL with		95% Coverage	826
114					99% Percentile	455.1					95% UPL	826
115											95% Chebyshev UPL	897.2
116					95% WH Approx. Gamma UPL	222.1					Upper Threshold Limit Based upon IQR	64.69
117					95% HW Approx. Gamma UPL	206.4						
118				95% WH Approx. Gamma UTL with	95% Coverage	372.8						
119				95% HW Approx. Gamma UTL with	95% Coverage	366.5						
120												
121												
122												
123	TEQ WHO-1998											
124												
125					General Statistics							
126					Total Number of Observations	19					Number of Distinct Observations	19
127					Tolerance Factor	2.423					Number of Missing Values	25
128												
129				Raw Statistics						Log-Transformed Statistics		
130					Minimum	0.0148					Minimum	-4.213
131					Maximum	14.72					Maximum	2.689
132					Second Largest	10.51					Second Largest	2.353
133					First Quartile	1.159					First Quartile	0.116
134					Median	2.793					Median	1.027
135					Third Quartile	7.252					Third Quartile	1.981
136					Mean	4.51					Mean	0.763
137					SD	4.225					SD	1.678
138					Coefficient of Variation	0.937						
139					Skewness	0.938						
140												
141					Background Statistics							
142				Normal Distribution Test						Lognormal Distribution Test		
143					Shapiro Wilk Test Statistic	0.887					Shapiro Wilk Test Statistic	0.871
144					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
145				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
146												
147				Assuming Normal Distribution						Assuming Lognormal Distribution		
148					95% UTL with	95% Coverage	14.75				95% UTL with	95% Coverage	125.2
149					95% UPL (t)	12.03					95% UPL (t)	42.49
150					90% Percentile (z)	9.925					90% Percentile (z)	18.43
151					95% Percentile (z)	11.46					95% Percentile (z)	33.92
152					99% Percentile (z)	14.34					99% Percentile (z)	106.5
153												
154				Gamma Distribution Test						Data Distribution Test		
155					k star	0.708				Data appear Gamma Distributed at 5% Significance Level		
156					Theta Star	6.373						
157					MLE of Mean	4.51						
158					MLE of Standard Deviation	5.361						
159					nu star	26.89						
160												
161					A-D Test Statistic	0.262				Nonparametric Statistics		
162					5% A-D Critical Value	0.777					90% Percentile	10.36
163					K-S Test Statistic	0.156					95% Percentile	10.93
164					5% K-S Critical Value	0.206					99% Percentile	13.96
165				Data appear Gamma Distributed at 5% Significance Level								

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167				Assuming Gamma Distribution						95% UTL with	95% Coverage	14.72
168					90% Percentile	11.29			95% Percentile Bootstrap UTL with		95% Coverage	14.72
169					95% Percentile	15.29			95% BCA Bootstrap UTL with		95% Coverage	14.72
170					99% Percentile	24.83					95% UPL	14.72
171											95% Chebyshev UPL	23.41
172					95% WH Approx. Gamma UPL	16.1					Upper Threshold Limit Based upon IQR	16.39
173					95% HW Approx. Gamma UPL	18.07						
174				95% WH Approx. Gamma UTL with	95% Coverage	24.74						
175				95% HW Approx. Gamma UTL with	95% Coverage	29.91						
176												
177												
178												
179	TEQ WHO-1998 - HALFND											
180												
181					General Statistics							
182					Total Number of Observations	19					Number of Distinct Observations	19
183					Tolerance Factor	2.423					Number of Missing Values	25
184												
185				Raw Statistics						Log-Transformed Statistics		
186					Minimum	0.563					Minimum	-0.574
187					Maximum	14.83					Maximum	2.697
188					Second Largest	10.92					Second Largest	2.391
189					First Quartile	1.487					First Quartile	0.384
190					Median	3.339					Median	1.206
191					Third Quartile	7.54					Third Quartile	2.02
192					Mean	4.871					Mean	1.172
193					SD	4.162					SD	0.993
194					Coefficient of Variation	0.855						
195					Skewness	0.937						
196												
197					Background Statistics							
198				Normal Distribution Test						Lognormal Distribution Test		
199					Shapiro Wilk Test Statistic	0.88					Shapiro Wilk Test Statistic	0.952
200					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
201				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
202												
203				Assuming Normal Distribution						Assuming Lognormal Distribution		
204					95% UTL with	95% Coverage	14.96				95% UTL with	95% Coverage	35.81
205					95% UPL (t)	12.28					95% UPL (t)	18.89
206					90% Percentile (z)	10.21					90% Percentile (z)	11.53
207					95% Percentile (z)	11.72					95% Percentile (z)	16.53
208					99% Percentile (z)	14.55					99% Percentile (z)	32.53
209												
210				Gamma Distribution Test						Data Distribution Test		
211					k star	1.178				Data appear Gamma Distributed at 5% Significance Level		
212					Theta Star	4.134						
213					MLE of Mean	4.871						
214					MLE of Standard Deviation	4.487						
215					nu star	44.78						
216												
217					A-D Test Statistic	0.398				Nonparametric Statistics		
218					5% A-D Critical Value	0.76					90% Percentile	10.56
219					K-S Test Statistic	0.146					95% Percentile	11.31
220					5% K-S Critical Value	0.203					99% Percentile	14.12

	A	B	C	D	E	F	G	H	I	J	K	L
221	Data appear Gamma Distributed at 5% Significance Level											
222												
223	Assuming Gamma Distribution						95% UTL with 95% Coverage					14.83
224					90% Percentile	10.77	95% Percentile Bootstrap UTL with 95% Coverage					14.83
225					95% Percentile	13.78	95% BCA Bootstrap UTL with 95% Coverage					14.83
226					99% Percentile	20.68					95% UPL	14.83
227											95% Chebyshev UPL	23.49
228					95% WH Approx. Gamma UPL	14.5	Upper Threshold Limit Based upon IQR					16.62
229					95% HW Approx. Gamma UPL	15.19						
230					95% WH Approx. Gamma UTL with 95% Coverage	20.99						
231					95% HW Approx. Gamma UTL with 95% Coverage	22.98						
232												
233												
234												
235	TEQ WHO-2005											
236												
237	General Statistics											
238					Total Number of Observations	19	Number of Distinct Observations					19
239					Tolerance Factor	2.423	Number of Missing Values					25
240												
241	Raw Statistics						Log-Transformed Statistics					
242					Minimum	0.0184					Minimum	-3.995
243					Maximum	15.66					Maximum	2.751
244					Second Largest	9.49					Second Largest	2.25
245					First Quartile	1.168					First Quartile	0.132
246					Median	2.509					Median	0.92
247					Third Quartile	6.557					Third Quartile	1.881
248					Mean	4.192					Mean	0.71
249					SD	4.123					SD	1.611
250					Coefficient of Variation	0.983						
251					Skewness	1.312						
252												
253	Background Statistics											
254	Normal Distribution Test						Lognormal Distribution Test					
255					Shapiro Wilk Test Statistic	0.861					Shapiro Wilk Test Statistic	0.888
256					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
257	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
258												
259	Assuming Normal Distribution						Assuming Lognormal Distribution					
260					95% UTL with 95% Coverage	14.18					95% UTL with 95% Coverage	100.8
261					95% UPL (t)	11.53					95% UPL (t)	35.73
262					90% Percentile (z)	9.476					90% Percentile (z)	16.03
263					95% Percentile (z)	10.97					95% Percentile (z)	28.78
264					99% Percentile (z)	13.78					99% Percentile (z)	86.27
265												
266	Gamma Distribution Test						Data Distribution Test					
267					k star	0.724	Data appear Gamma Distributed at 5% Significance Level					
268					Theta Star	5.79						
269					MLE of Mean	4.192						
270					MLE of Standard Deviation	4.927						
271					nu star	27.52						
272												
273					A-D Test Statistic	0.222	Nonparametric Statistics					
274					5% A-D Critical Value	0.776					90% Percentile	8.973
275					K-S Test Statistic	0.153					95% Percentile	10.11

	A	B	C	D	E	F	G	H	I	J	K	L
276					5% K-S Critical Value	0.206					99% Percentile	14.55
277	Data appear Gamma Distributed at 5% Significance Level											
278												
279	Assuming Gamma Distribution						95% UTL with 95% Coverage					15.66
280					90% Percentile	10.44	95% Percentile Bootstrap UTL with 95% Coverage					15.66
281					95% Percentile	14.1	95% BCA Bootstrap UTL with 95% Coverage					15.66
282					99% Percentile	22.8					95% UPL	15.66
283											95% Chebyshev UPL	22.63
284					95% WH Approx. Gamma UPL	14.81	Upper Threshold Limit Based upon IQR					14.64
285					95% HW Approx. Gamma UPL	16.47						
286					95% WH Approx. Gamma UTL with 95% Coverage	22.73						
287					95% HW Approx. Gamma UTL with 95% Coverage	27.14						
288												
289												
290												
291	TEQ WHO-2005 - HALFND											
292												
293	General Statistics											
294					Total Number of Observations	19	Number of Distinct Observations					19
295					Tolerance Factor	2.423	Number of Missing Values					25
296												
297	Raw Statistics						Log-Transformed Statistics					
298					Minimum	0.535					Minimum	-0.625
299					Maximum	15.76					Maximum	2.758
300					Second Largest	9.895					Second Largest	2.292
301					First Quartile	1.491					First Quartile	0.39
302					Median	3.052					Median	1.116
303					Third Quartile	6.892					Third Quartile	1.929
304					Mean	4.546					Mean	1.103
305					SD	4.067					SD	0.978
306					Coefficient of Variation	0.895						
307					Skewness	1.303						
308												
309	Background Statistics											
310	Normal Distribution Test						Lognormal Distribution Test					
311					Shapiro Wilk Test Statistic	0.856					Shapiro Wilk Test Statistic	0.963
312					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
313	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
314												
315	Assuming Normal Distribution						Assuming Lognormal Distribution					
316					95% UTL with 95% Coverage	14.4					95% UTL with 95% Coverage	32.24
317					95% UPL (t)	11.78					95% UPL (t)	17.17
318					90% Percentile (z)	9.758					90% Percentile (z)	10.56
319					95% Percentile (z)	11.24					95% Percentile (z)	15.06
320					99% Percentile (z)	14.01					99% Percentile (z)	29.33
321												
322	Gamma Distribution Test						Data Distribution Test					
323					k star	1.179	Data appear Gamma Distributed at 5% Significance Level					
324					Theta Star	3.855						
325					MLE of Mean	4.546						
326					MLE of Standard Deviation	4.186						
327					nu star	44.81						
328												
329					A-D Test Statistic	0.375	Nonparametric Statistics					
330					5% A-D Critical Value	0.76					90% Percentile	9.174

	A	B	C	D	E	F	G	H	I	J	K	L
331					K-S Test Statistic	0.14					95% Percentile	10.48
332					5% K-S Critical Value	0.203					99% Percentile	14.71
333			Data appear Gamma Distributed at 5% Significance Level									
334												
335			Assuming Gamma Distribution							95% UTL with	95% Coverage	15.76
336					90% Percentile	10.05			95% Percentile Bootstrap UTL with		95% Coverage	15.76
337					95% Percentile	12.85			95% BCA Bootstrap UTL with		95% Coverage	15.76
338					99% Percentile	19.29					95% UPL	15.76
339											95% Chebyshev UPL	22.73
340					95% WH Approx. Gamma UPL	13.49					Upper Threshold Limit Based upon IQR	14.99
341					95% HW Approx. Gamma UPL	14.06						
342				95% WH Approx. Gamma UTL with	95% Coverage	19.53						
343				95% HW Approx. Gamma UTL with	95% Coverage	21.25						
344												
345												
346												
347	TOTAL HPCDD											
348												
349					General Statistics							
350					Total Number of Observations	19					Number of Distinct Observations	19
351					Tolerance Factor	2.423					Number of Missing Values	25
352												
353			Raw Statistics						Log-Transformed Statistics			
354					Minimum	2.6					Minimum	0.956
355					Maximum	7430					Maximum	8.913
356					Second Largest	250					Second Largest	5.521
357					First Quartile	20.23					First Quartile	2.988
358					Median	27.2					Median	3.303
359					Third Quartile	72.95					Third Quartile	4.29
360					Mean	437.3					Mean	3.718
361					SD	1694					SD	1.604
362					Coefficient of Variation	3.875						
363					Skewness	4.351						
364												
365					Background Statistics							
366			Normal Distribution Test						Lognormal Distribution Test			
367					Shapiro Wilk Test Statistic	0.265					Shapiro Wilk Test Statistic	0.839
368					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
369			Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level			
370												
371			Assuming Normal Distribution						Assuming Lognormal Distribution			
372					95% UTL with	95% Coverage	4542				95% UTL with	95% Coverage	2007
373					95% UPL (t)	3452					95% UPL (t)	714.4
374					90% Percentile (z)	2609					90% Percentile (z)	321.6
375					95% Percentile (z)	3224					95% Percentile (z)	576
376					99% Percentile (z)	4379					99% Percentile (z)	1718
377												
378			Gamma Distribution Test						Data Distribution Test			
379					k star	0.282			Data do not follow a Discernable Distribution (0.05)			
380					Theta Star	1552						
381					MLE of Mean	437.3						
382					MLE of Standard Deviation	823.7						
383					nu star	10.71						
384												
385					A-D Test Statistic	3.837			Nonparametric Statistics			

	A	B	C	D	E	F	G	H	I	J	K	L
386					5% A-D Critical Value	0.846					90% Percentile	114.1
387					K-S Test Statistic	0.428					95% Percentile	968
388					5% K-S Critical Value	0.215					99% Percentile	6138
389				**Data not Gamma Distributed at 5% Significance Level**								
390												
391				**Assuming Gamma Distribution**							95% UTL with 95% Coverage	7430
392					90% Percentile	1299					95% Percentile Bootstrap UTL with 95% Coverage	7430
393					95% Percentile	2040					95% BCA Bootstrap UTL with 95% Coverage	7430
394					99% Percentile	3983					95% UPL	7430
395											95% Chebyshev UPL	8014
396					95% WH Approx. Gamma UPL	1348					Upper Threshold Limit Based upon IQR	152
397					95% HW Approx. Gamma UPL	1116						
398					95% WH Approx. Gamma UTL with 95% Coverage	2482						
399					95% HW Approx. Gamma UTL with 95% Coverage	2217						
400												
401												
402												
403	**TOTAL HXCDF**											
404												
405					**General Statistics**							
406					Total Number of Observations	19					Number of Distinct Observations	19
407					Tolerance Factor	2.423					Number of Missing Values	25
408												
409				**Raw Statistics**						**Log-Transformed Statistics**		
410					Minimum	0.44					Minimum	-0.821
411					Maximum	193					Maximum	5.263
412					Second Largest	84					Second Largest	4.431
413					First Quartile	13.95					First Quartile	2.614
414					Median	28.2					Median	3.339
415					Third Quartile	63.05					Third Quartile	4.144
416					Mean	42.54					Mean	3.151
417					SD	44.88					SD	1.371
418					Coefficient of Variation	1.055						
419					Skewness	2.235						
420												
421					**Background Statistics**							
422				**Normal Distribution Test**						**Lognormal Distribution Test**		
423					Shapiro Wilk Test Statistic	0.774					Shapiro Wilk Test Statistic	0.912
424					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
425				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
426												
427				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
428					95% UTL with 95% Coverage	151.3					95% UTL with 95% Coverage	648
429					95% UPL (t)	122.4					95% UPL (t)	267.9
430					90% Percentile (z)	100.1					90% Percentile (z)	135.4
431					95% Percentile (z)	116.4					95% Percentile (z)	222.9
432					99% Percentile (z)	146.9					99% Percentile (z)	567.5
433												
434				**Gamma Distribution Test**						**Data Distribution Test**		
435					k star	0.849				**Data appear Gamma Distributed at 5% Significance Level**		
436					Theta Star	50.11						
437					MLE of Mean	42.54						
438					MLE of Standard Deviation	46.17						
439					nu star	32.26						
440												

	A–E	F	G–K	L
441	A-D Test Statistic	0.186	**Nonparametric Statistics**	
442	5% A-D Critical Value	0.771	90% Percentile	79.76
443	K-S Test Statistic	0.0878	95% Percentile	94.9
444	5% K-S Critical Value	0.205	99% Percentile	173.4
445	**Data appear Gamma Distributed at 5% Significance Level**			
446				
447	**Assuming Gamma Distribution**		95% UTL with 95% Coverage	193
448	90% Percentile	102	95% Percentile Bootstrap UTL with 95% Coverage	193
449	95% Percentile	135.1	95% BCA Bootstrap UTL with 95% Coverage	193
450	99% Percentile	213	95% UPL	193
451			95% Chebyshev UPL	243.2
452	95% WH Approx. Gamma UPL	140.9	Upper Threshold Limit Based upon IQR	136.7
453	95% HW Approx. Gamma UPL	152.6		
454	95% WH Approx. Gamma UTL with 95% Coverage	211.8		
455	95% HW Approx. Gamma UTL with 95% Coverage	243.7		
456				
457				
458				
459	**TOTAL PECDF**			
460				
461	**General Statistics**			
462	Total Number of Observations	19	Number of Distinct Observations	19
463	Tolerance Factor	2.423	Number of Missing Values	25
464				
465	**Raw Statistics**		**Log-Transformed Statistics**	
466	Minimum	1.1	Minimum	0.0953
467	Maximum	363	Maximum	5.894
468	Second Largest	161	Second Largest	5.081
469	First Quartile	19.75	First Quartile	2.953
470	Median	51.05	Median	3.933
471	Third Quartile	111	Third Quartile	4.709
472	Mean	79.68	Mean	3.733
473	SD	85.77	SD	1.39
474	Coefficient of Variation	1.076		
475	Skewness	2.137		
476				
477	**Background Statistics**			
478	**Normal Distribution Test**		**Lognormal Distribution Test**	
479	Shapiro Wilk Test Statistic	0.786	Shapiro Wilk Test Statistic	0.941
480	Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
481	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
482				
483	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
484	95% UTL with 95% Coverage	287.5	95% UTL with 95% Coverage	1214
485	95% UPL (t)	232.3	95% UPL (t)	495.9
486	90% Percentile (z)	189.6	90% Percentile (z)	248.3
487	95% Percentile (z)	220.8	95% Percentile (z)	411.4
488	99% Percentile (z)	279.2	99% Percentile (z)	1061
489				
490	**Gamma Distribution Test**		**Data Distribution Test**	
491	k star	0.797	**Data appear Gamma Distributed at 5% Significance Level**	
492	Theta Star	99.91		
493	MLE of Mean	79.68		
494	MLE of Standard Deviation	89.22		
495	nu star	30.3		

	A	B	C	D	E	F	G	H	I	J	K	L
496												
497					A-D Test Statistic	0.157				Nonparametric Statistics		
498					5% A-D Critical Value	0.773					90% Percentile	154.6
499					K-S Test Statistic	0.0918					95% Percentile	181.2
500					5% K-S Critical Value	0.205					99% Percentile	326.6
501		Data appear Gamma Distributed at 5% Significance Level										
502												
503				Assuming Gamma Distribution						95% UTL with	95% Coverage	363
504					90% Percentile	193.9			95% Percentile Bootstrap UTL with		95% Coverage	363
505					95% Percentile	258.8			95% BCA Bootstrap UTL with		95% Coverage	363
506					99% Percentile	412					95% UPL	363
507											95% Chebyshev UPL	463.2
508					95% WH Approx. Gamma UPL	271.4					Upper Threshold Limit Based upon IQR	247.9
509					95% HW Approx. Gamma UPL	293.8						
510				95% WH Approx. Gamma UTL with	95% Coverage	412.5						
511				95% HW Approx. Gamma UTL with	95% Coverage	475.4						
512												
513												
514												
515	TOTAL TCDF											
516												
517					General Statistics							
518					Total Number of Observations	19					Number of Distinct Observations	19
519					Tolerance Factor	2.423					Number of Missing Values	25
520												
521				Raw Statistics						Log-Transformed Statistics		
522					Minimum	4.2					Minimum	1.435
523					Maximum	461					Maximum	6.133
524					Second Largest	318					Second Largest	5.762
525					First Quartile	40.45					First Quartile	3.681
526					Median	77.7					Median	4.353
527					Third Quartile	139.5					Third Quartile	4.937
528					Mean	115					Mean	4.224
529					SD	115.6					SD	1.188
530					Coefficient of Variation	1.005						
531					Skewness	1.842						
532												
533					Background Statistics							
534				Normal Distribution Test						Lognormal Distribution Test		
535					Shapiro Wilk Test Statistic	0.814					Shapiro Wilk Test Statistic	0.963
536					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
537				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
538												
539				Assuming Normal Distribution						Assuming Lognormal Distribution		
540					95% UTL with	95% Coverage	395.1				95% UTL with	95% Coverage	1215
541					95% UPL (t)	320.7					95% UPL (t)	565.2
542					90% Percentile (z)	263.2					90% Percentile (z)	313
543					95% Percentile (z)	305.1					95% Percentile (z)	481.9
544					99% Percentile (z)	383.9					99% Percentile (z)	1083
545												
546				Gamma Distribution Test						Data Distribution Test		
547					k star	0.958				Data appear Gamma Distributed at 5% Significance Level		
548					Theta Star	120.1						
549					MLE of Mean	115						
550					MLE of Standard Deviation	117.5						

	A	B	C	D	E	F	G	H	I	J	K	L
551					nu star	36.4						
552												
553					A-D Test Statistic	0.102	**Nonparametric Statistics**					
554					5% A-D Critical Value	0.767					90% Percentile	239.6
555					K-S Test Statistic	0.0691					95% Percentile	332.3
556					5% K-S Critical Value	0.204					99% Percentile	435.3
557	**Data appear Gamma Distributed at 5% Significance Level**											
558												
559			**Assuming Gamma Distribution**							95% UTL with	95% Coverage	461
560					90% Percentile	267.7				95% Percentile Bootstrap UTL with	95% Coverage	461
561					95% Percentile	349.9				95% BCA Bootstrap UTL with	95% Coverage	461
562					99% Percentile	541.4					95% UPL	461
563											95% Chebyshev UPL	631.9
564					95% WH Approx. Gamma UPL	366.6					Upper Threshold Limit Based upon IQR	288.1
565					95% HW Approx. Gamma UPL	390						
566				95% WH Approx. Gamma UTL with	95% Coverage	544						
567				95% HW Approx. Gamma UTL with	95% Coverage	610.3						
568												
569												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	1,2,3,4,6,7,8,9-OCDF											
12												
13						General Statistics						
14						Number of Valid Data	19			Number of Detected Data	17	
15						Number of Distinct Detected Data	17			Number of Non-Detect Data	2	
16						Tolerance Factor	2.423			Percent Non-Detects	10.53%	
17						Number of Missing Values	25					
18												
19				Raw Statistics						Log-transformed Statistics		
20						Minimum Detected	1.9			Minimum Detected	0.642	
21						Maximum Detected	129			Maximum Detected	4.86	
22						Mean of Detected	21.94			Mean of Detected	2.375	
23						SD of Detected	34.86			SD of Detected	1.128	
24						Minimum Non-Detect	0.8			Minimum Non-Detect	-0.223	
25						Maximum Non-Detect	2.4			Maximum Non-Detect	0.875	
26												
27				Data with Multiple Detection Limits						Single Detection Limit Scenario		
28				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL	4	
29				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL	15	
30				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	21.05%	
31												
32						Background Statistics						
33				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
34						Shapiro Wilk Test Statistic	0.563			Shapiro Wilk Test Statistic	0.938	
35						5% Shapiro Wilk Critical Value	0.892			5% Shapiro Wilk Critical Value	0.892	
36				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
37												
38				Assuming Normal Distribution						Assuming Lognormal Distribution		
39						DL/2 Substitution Method				DL/2 Substitution Method		
40						Mean	19.72			Mean (Log Scale)	2.086	
41						SD	33.54			SD (Log Scale)	1.383	
42						95% UTL 95% Coverage	101			95% UTL 95% Coverage	229.7	
43						95% UPL (t)	79.39			95% UPL (t)	94.29	
44						90% Percentile (z)	62.7			90% Percentile (z)	47.38	
45						95% Percentile (z)	74.88			95% Percentile (z)	78.31	
46						99% Percentile (z)	97.74			99% Percentile (z)	201	
47												
48						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
49						Mean	14.32			Mean in Original Scale	19.75	
50						SD	38.27			SD in Original Scale	33.52	
51						95% UTL with 95% Coverage	107.1			95% UTL with 95% Coverage	197.8	
52										95% BCA UTL with 95% Coverage	129	
53										95% Bootstrap (%) UTL with 95% Coverage	129	
54						95% UPL (t)	82.41			95% UPL (t)	85.39	
55						90% Percentile (z)	63.37			90% Percentile (z)	44.62	

	A–E	F	G–K	L
56	95% Percentile (z)	77.27	95% Percentile (z)	71.67
57	99% Percentile (z)	103.4	99% Percentile (z)	174.4
58				
59	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
60	k star (bias corrected)	0.721	Data appear Lognormal at 5% Significance Level	
61	Theta Star	30.44		
62	nu star	24.51		
63				
64	A-D Test Statistic	1.244	**Nonparametric Statistics**	
65	5% A-D Critical Value	0.773	Kaplan-Meier (KM) Method	
66	K-S Test Statistic	0.247	Mean	19.84
67	5% K-S Critical Value	0.217	SD	32.58
68	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	7.704
69			95% KM UTL with 95% Coverage	98.77
70	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	165.5
71	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	77.79
72	Mean	19.63	90% Percentile (z)	61.59
73	Median	9.2	95% Percentile (z)	73.42
74	SD	33.59	99% Percentile (z)	95.62
75	k star	0.287		
76	Theta star	68.42	**Gamma ROS Limits with Extrapolated Data**	
77	Nu star	10.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	79.39
78	95% Percentile of Chisquare (2k)	2.663	95% Hawkins Wixley (HW) Approx. Gamma UPL	95.27
79			95% WH Approx. Gamma UTL with 95% Coverage	131.5
80	90% Percentile	58.2	95% HW Approx. Gamma UTL with 95% Coverage	176.2
81	95% Percentile	91.09		
82	99% Percentile	177		
83				
84	**Note: DL/2 is not a recommended method.**			
85				
86				
87	**1,2,3,4,6,7,8-HPCDF**			
88				
89	**General Statistics**			
90	Number of Valid Data	19	Number of Detected Data	18
91	Number of Distinct Detected Data	18	Number of Non-Detect Data	1
92	Tolerance Factor	2.423	Percent Non-Detects	5.26%
93	Number of Missing Values	25		
94				
95	**Raw Statistics**		**Log-transformed Statistics**	
96	Minimum Detected	1.8	Minimum Detected	0.588
97	Maximum Detected	48.2	Maximum Detected	3.875
98	Mean of Detected	15.67	Mean of Detected	2.382
99	SD of Detected	13.12	SD of Detected	0.939
100	Minimum Non-Detect	0.3	Minimum Non-Detect	-1.204
101	Maximum Non-Detect	0.3	Maximum Non-Detect	-1.204
102				
103				
104	**Background Statistics**			
105	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
106	Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Test Statistic	0.972
107	5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
108	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
109				
110	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	

	A	B	C	D	E	F	G	H	I	J	K	L
111					DL/2 Substitution Method						DL/2 Substitution Method	
112					Mean	14.85					Mean (Log Scale)	2.157
113					SD	13.24					SD (Log Scale)	1.34
114					95% UTL 95% Coverage	46.92					95% UTL 95% Coverage	222.2
115					95% UPL (t)	38.4					95% UPL (t)	93.77
116					90% Percentile (z)	31.81					90% Percentile (z)	48.14
117					95% Percentile (z)	36.62					95% Percentile (z)	78.33
118					99% Percentile (z)	45.64					99% Percentile (z)	195.2
119												
120					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
121					Mean	14.49					Mean in Original Scale	14.9
122					SD	13.44					SD in Original Scale	13.18
123					95% UTL with 95% Coverage	47.05					95% UTL with 95% Coverage	123.8
124											95% BCA UTL with 95% Coverage	48.2
125											95% Bootstrap (%) UTL with 95% Coverage	48.2
126					95% UPL (t)	38.4					95% UPL (t)	62.73
127					90% Percentile (z)	31.71					90% Percentile (z)	37.09
128					95% Percentile (z)	36.6					95% Percentile (z)	54.43
129					99% Percentile (z)	45.75					99% Percentile (z)	111.8
130												
131				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
132					k star (bias corrected)	1.285				Data appear Gamma Distributed at 5% Significance Level		
133					Theta Star	12.19						
134					nu star	46.26						
135												
136					A-D Test Statistic	0.237				**Nonparametric Statistics**		
137					5% A-D Critical Value	0.756					Kaplan-Meier (KM) Method	
138					K-S Test Statistic	0.157					Mean	14.94
139					5% K-S Critical Value	0.207					SD	12.79
140				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	3.019
141											95% KM UTL with 95% Coverage	45.93
142				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	72.13
143					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	37.69
144					Mean	14.84					90% Percentile (z)	31.33
145					Median	8.4					95% Percentile (z)	35.97
146					SD	13.25					99% Percentile (z)	44.69
147					k star	0.488						
148					Theta star	30.42				**Gamma ROS Limits with Extrapolated Data**		
149					Nu star	18.54					95% Wilson Hilferty (WH) Approx. Gamma UPL	51.65
150					95% Percentile of Chisquare (2k)	3.781					95% Hawkins Wixley (HW) Approx. Gamma UPL	62.58
151											95% WH Approx. Gamma UTL with 95% Coverage	78.31
152					90% Percentile	40.36					95% HW Approx. Gamma UTL with 95% Coverage	103.8
153					95% Percentile	57.51						
154					99% Percentile	99.8						
155												
156	**Note: DL/2 is not a recommended method.**											
157												
158												
159	**1,2,3,4,7,8,9-HPCDF**											
160												
161					**General Statistics**							
162					Number of Valid Data	19					Number of Detected Data	6
163					Number of Distinct Detected Data	5					Number of Non-Detect Data	13
164					Tolerance Factor	2.423					Percent Non-Detects	68.42%
165					Number of Missing Values	25						

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167	**Raw Statistics**						**Log-transformed Statistics**					
168					Minimum Detected	0.48					Minimum Detected	-0.734
169					Maximum Detected	1.7					Maximum Detected	0.531
170					Mean of Detected	1.38					Mean of Detected	0.244
171					SD of Detected	0.466					SD of Detected	0.49
172					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
173					Maximum Non-Detect	3.4					Maximum Non-Detect	1.224
174												
175	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
176	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		19
177	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		0
178	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
179												
180												
181	**Warning: There are only 6 Detected Values in this data**											
182	**Note: It should be noted that even though bootstrap may be performed on this data set**											
183	**the resulting calculations may not be reliable enough to draw conclusions**											
184												
185	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
186												
187	**Background Statistics**											
188	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
189					Shapiro Wilk Test Statistic	0.757					Shapiro Wilk Test Statistic	0.667
190					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
191	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
192												
193	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
194					DL/2 Substitution Method						DL/2 Substitution Method	
195					Mean	0.717					Mean (Log Scale)	-0.753
196					SD	0.641					SD (Log Scale)	0.952
197					95% UTL 95% Coverage	2.271					95% UTL 95% Coverage	4.731
198					95% UPL (t)	1.858					95% UPL (t)	2.563
199					90% Percentile (z)	1.539					90% Percentile (z)	1.595
200					95% Percentile (z)	1.772					95% Percentile (z)	2.255
201					99% Percentile (z)	2.209					99% Percentile (z)	4.315
202												
203					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
204											Mean in Original Scale	0.716
205											SD in Original Scale	0.534
206											Mean in Log Scale	-0.567
207											SD in Log Scale	0.679
208											95% UTL 95% Coverage	2.939
209											95% UPL (t)	1.898
210											90% Percentile (z)	1.354
211											95% Percentile (z)	1.733
212											99% Percentile (z)	2.752
213												
214	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
215					k star (bias corrected)	3.402	Data follow Appr. Gamma Distribution at 5% Significance Level					
216					Theta Star	0.406						
217					nu star	40.82						
218												
219					A-D Test Statistic	0.947	**Nonparametric Statistics**					
220					5% A-D Critical Value	0.698					Kaplan-Meier (KM) Method	

	A	B	C	D	E	F	G	H	I	J	K	L
221					K-S Test Statistic	0.325					Mean	0.798
222					5% K-S Critical Value	0.333					SD	0.499
223	Data follow Appx. Gamma Distribution at 5% Significance Level										SE of Mean	0.133
224										95% KM UTL with	95% Coverage	2.006
225	Assuming Gamma Distribution										95% KM Chebyshev UPL	3.028
226			Gamma ROS Statistics with Extrapolated Data								95% KM UPL (t)	1.685
227					Mean	0.441					90% Percentile (z)	1.437
228					Median	0.000001					95% Percentile (z)	1.618
229					SD	0.7					99% Percentile (z)	1.958
230					k star	0.121						
231					Theta star	3.646	Gamma ROS Limits with Extrapolated Data					
232					Nu star	4.593			95% Wilson Hilferty (WH) Approx. Gamma UPL			2.194
233					95% Percentile of Chisquare (2k)	1.378			95% Hawkins Wixley (HW) Approx. Gamma UPL			2.575
234									95% WH Approx. Gamma UTL with		95% Coverage	4.359
235					90% Percentile	1.251			95% HW Approx. Gamma UTL with		95% Coverage	6.316
236					95% Percentile	2.512						
237					99% Percentile	6.355						
238												
239	Note: DL/2 is not a recommended method.											
240												
241												
242	1,2,3,4,7,8-HXCDD											
243												
244	General Statistics											
245					Number of Valid Data	19					Number of Detected Data	9
246					Number of Distinct Detected Data	8					Number of Non-Detect Data	10
247					Tolerance Factor	2.423					Percent Non-Detects	52.63%
248					Number of Missing Values	25						
249												
250	Raw Statistics						Log-transformed Statistics					
251					Minimum Detected	0.23					Minimum Detected	-1.47
252					Maximum Detected	4.2					Maximum Detected	1.435
253					Mean of Detected	1.523					Mean of Detected	0.0882
254					SD of Detected	1.263					SD of Detected	0.917
255					Minimum Non-Detect	0.25					Minimum Non-Detect	-1.386
256					Maximum Non-Detect	2.6					Maximum Non-Detect	0.956
257												
258	Data with Multiple Detection Limits						Single Detection Limit Scenario					
259	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect with Single DL			17
260	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected with Single DL			2
261	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			89.47%
262												
263												
264	Warning: There are only 9 Detected Values in this data											
265	Note: It should be noted that even though bootstrap may be performed on this data set											
266	the resulting calculations may not be reliable enough to draw conclusions											
267												
268	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
269												
270	Background Statistics											
271	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
272					Shapiro Wilk Test Statistic	0.878					Shapiro Wilk Test Statistic	0.968
273					5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
274	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
275												

	A	B	C	D	E	F	G	H	I	J	K	L
276	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
277					DL/2 Substitution Method						DL/2 Substitution Method	
278					Mean	0.926					Mean (Log Scale)	-0.618
279					SD	1.058					SD (Log Scale)	1.067
280				95% UTL	95% Coverage	3.489				95% UTL	95% Coverage	7.145
281					95% UPL (t)	2.808					95% UPL (t)	3.595
282					90% Percentile (z)	2.281					90% Percentile (z)	2.115
283					95% Percentile (z)	2.666					95% Percentile (z)	3.115
284					99% Percentile (z)	3.387					99% Percentile (z)	6.445
285												
286			Maximum Likelihood Estimate(MLE) Method			N/A					Log ROS Method	
287											Mean in Original Scale	0.862
288											SD in Original Scale	1.063
289											Mean in Log Scale	-0.686
290											SD in Log Scale	1.008
291										95% UTL	95% Coverage	5.788
292											95% UPL (t)	3.025
293											90% Percentile (z)	1.832
294											95% Percentile (z)	2.642
295											99% Percentile (z)	5.251
296												
297	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
298					k star (bias corrected)	1.174	Data appear Normal at 5% Significance Level					
299					Theta Star	1.297						
300					nu star	21.13						
301												
302					A-D Test Statistic	0.214	**Nonparametric Statistics**					
303					5% A-D Critical Value	0.733					Kaplan-Meier (KM) Method	
304					K-S Test Statistic	0.155					Mean	0.883
305					5% K-S Critical Value	0.284					SD	1.035
306	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.255
307										95% KM UTL with	95% Coverage	3.392
308	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	5.514
309			Gamma ROS Statistics with Extrapolated Data								95% KM UPL (t)	2.725
310					Mean	0.762					90% Percentile (z)	2.21
311					Median	0.275					95% Percentile (z)	2.586
312					SD	1.126					99% Percentile (z)	3.292
313					k star	0.164						
314					Theta star	4.64	**Gamma ROS Limits with Extrapolated Data**					
315					Nu star	6.241				95% Wilson Hilferty (WH) Approx. Gamma UPL		3.884
316					95% Percentile of Chisquare (2k)	1.774				95% Hawkins Wixley (HW) Approx. Gamma UPL		5.203
317										95% WH Approx. Gamma UTL with	95% Coverage	7.074
318					90% Percentile	2.283				95% HW Approx. Gamma UTL with	95% Coverage	11.29
319					95% Percentile	4.116						
320					99% Percentile	9.342						
321												
322	**Note: DL/2 is not a recommended method.**											
323												
324												
325	**1,2,3,4,7,8-HXCDF**											
326												
327	**General Statistics**											
328					Number of Valid Data	19					Number of Detected Data	15
329					Number of Distinct Detected Data	13					Number of Non-Detect Data	4
330					Tolerance Factor	2.423					Percent Non-Detects	21.05%

	A	B	C	D	E	F	G	H	I	J	K	L
331					Number of Missing Values	25						
332												
333				Raw Statistics						Log-transformed Statistics		
334					Minimum Detected	0.93					Minimum Detected	-0.0726
335					Maximum Detected	12.7					Maximum Detected	2.542
336					Mean of Detected	4.541					Mean of Detected	1.132
337					SD of Detected	4.017					SD of Detected	0.928
338					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
339					Maximum Non-Detect	0.2					Maximum Non-Detect	-1.609
340												
341				Data with Multiple Detection Limits						Single Detection Limit Scenario		
342			Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect with Single DL	4
343			For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected with Single DL	15
344			Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	21.05%
345												
346					Background Statistics							
347				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
348					Shapiro Wilk Test Statistic	0.828					Shapiro Wilk Test Statistic	0.921
349					5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881
350				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
351												
352				Assuming Normal Distribution						Assuming Lognormal Distribution		
353					DL/2 Substitution Method						DL/2 Substitution Method	
354					Mean	3.603					Mean (Log Scale)	0.373
355					SD	4.004					SD (Log Scale)	1.725
356					95% UTL 95% Coverage	13.3					95% UTL 95% Coverage	94.8
357					95% UPL (t)	10.73					95% UPL (t)	31.23
358					90% Percentile (z)	8.735					90% Percentile (z)	13.24
359					95% Percentile (z)	10.19					95% Percentile (z)	24.77
360					99% Percentile (z)	12.92					99% Percentile (z)	80.25
361												
362					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
363					Mean	3.027					Mean in Original Scale	3.662
364					SD	4.651					SD in Original Scale	3.951
365					95% UTL with 95% Coverage	14.3					95% UTL with 95% Coverage	39.06
366											95% BCA UTL with 95% Coverage	12.7
367											95% Bootstrap (%) UTL with 95% Coverage	12.7
368					95% UPL (t)	11.3					95% UPL (t)	17.64
369					90% Percentile (z)	8.988					90% Percentile (z)	9.542
370					95% Percentile (z)	10.68					95% Percentile (z)	14.94
371					99% Percentile (z)	13.85					99% Percentile (z)	34.67
372												
373				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
374					k star (bias corrected)	1.21				Data appear Gamma Distributed at 5% Significance Level		
375					Theta Star	3.751						
376					nu star	36.31						
377												
378					A-D Test Statistic	0.444				Nonparametric Statistics		
379					5% A-D Critical Value	0.755					Kaplan-Meier (KM) Method	
380					K-S Test Statistic	0.144					Mean	3.781
381					5% K-S Critical Value	0.226					SD	3.749
382				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.89
383											95% KM UTL with 95% Coverage	12.87
384				Assuming Gamma Distribution							95% KM Chebyshev UPL	20.55
385					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	10.45

	A	B	C	D	E	F	G	H	I	J	K	L
386					Mean	3.585					90% Percentile (z)	8.586
387					Median	2.3					95% Percentile (z)	9.948
388					SD	4.021					99% Percentile (z)	12.5
389					k star	0.221						
390					Theta star	16.26			**Gamma ROS Limits with Extrapolated Data**			
391					Nu star	8.381			95% Wilson Hilferty (WH) Approx. Gamma UPL			16.72
392				95% Percentile of Chisquare (2k)		2.214			95% Hawkins Wixley (HW) Approx. Gamma UPL			22.98
393									95% WH Approx. Gamma UTL with		95% Coverage	28.25
394					90% Percentile	10.83			95% HW Approx. Gamma UTL with		95% Coverage	45.04
395					95% Percentile	17.99						
396					99% Percentile	37.41						
397												
398	**Note: DL/2 is not a recommended method.**											
399												
400												
401	**1,2,3,6,7,8-HXCDD**											
402												
403					**General Statistics**							
404					Number of Valid Data	19					Number of Detected Data	16
405					Number of Distinct Detected Data	16					Number of Non-Detect Data	3
406					Tolerance Factor	2.423					Percent Non-Detects	15.79%
407					Number of Missing Values	25						
408												
409					**Raw Statistics**						**Log-transformed Statistics**	
410					Minimum Detected	0.445					Minimum Detected	-0.81
411					Maximum Detected	9.6					Maximum Detected	2.262
412					Mean of Detected	2.509					Mean of Detected	0.532
413					SD of Detected	2.471					SD of Detected	0.908
414					Minimum Non-Detect	0.4					Minimum Non-Detect	-0.916
415					Maximum Non-Detect	0.7					Maximum Non-Detect	-0.357
416												
417					**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**	
418	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	7
419	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	12
420	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	36.84%
421												
422					**Background Statistics**							
423					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
424					Shapiro Wilk Test Statistic	0.772					Shapiro Wilk Test Statistic	0.954
425					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
426					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
427												
428					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
429					DL/2 Substitution Method						DL/2 Substitution Method	
430					Mean	2.155					Mean (Log Scale)	0.235
431					SD	2.407					SD (Log Scale)	1.092
432					95% UTL 95% Coverage	7.987					95% UTL 95% Coverage	17.84
433					95% UPL (t)	6.437					95% UPL (t)	8.828
434					90% Percentile (z)	5.24					90% Percentile (z)	5.127
435					95% Percentile (z)	6.114					95% Percentile (z)	7.624
436					99% Percentile (z)	7.754					99% Percentile (z)	16.05
437												
438					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
439					Mean	1.403					Mean in Original Scale	2.16
440					SD	3.202					SD in Original Scale	2.403

	A	B	C	D	E	F	G	H	I	J	K	L
441					95% UTL with 95% Coverage	9.162				95% UTL with 95% Coverage		17.6
442										95% BCA UTL with 95% Coverage		9.6
443										95% Bootstrap (%) UTL with 95% Coverage		9.6
444					95% UPL (t)	7.1					95% UPL (t)	8.767
445					90% Percentile (z)	5.507					90% Percentile (z)	5.118
446					95% Percentile (z)	6.67					95% Percentile (z)	7.582
447					99% Percentile (z)	8.852					99% Percentile (z)	15.85
448												
449				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
450					k star (bias corrected)	1.205				Data appear Gamma Distributed at 5% Significance Level		
451					Theta Star	2.083						
452					nu star	38.55						
453												
454					A-D Test Statistic	0.443				**Nonparametric Statistics**		
455					5% A-D Critical Value	0.756				Kaplan-Meier (KM) Method		
456					K-S Test Statistic	0.152				Mean		2.187
457					5% K-S Critical Value	0.219				SD		2.318
458				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.549
459										95% KM UTL with 95% Coverage		7.804
460				**Assuming Gamma Distribution**						95% KM Chebyshev UPL		12.55
461					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		6.311
462					Mean	2.113				90% Percentile (z)		5.158
463					Median	1.5				95% Percentile (z)		6
464					SD	2.443				99% Percentile (z)		7.58
465					k star	0.272						
466					Theta star	7.78				**Gamma ROS Limits with Extrapolated Data**		
467					Nu star	10.32				95% Wilson Hilferty (WH) Approx. Gamma UPL		9.138
468					95% Percentile of Chisquare (2k)	2.564				95% Hawkins Wixley (HW) Approx. Gamma UPL		12.2
469										95% WH Approx. Gamma UTL with 95% Coverage		15.01
470					90% Percentile	6.299				95% HW Approx. Gamma UTL with 95% Coverage		22.86
471					95% Percentile	9.975						
472					99% Percentile	19.65						
473												
474	**Note: DL/2 is not a recommended method.**											
475												
476												
477	**1,2,3,6,7,8-HXCDF**											
478												
479					**General Statistics**							
480					Number of Valid Data	19				Number of Detected Data		17
481					Number of Distinct Detected Data	16				Number of Non-Detect Data		2
482					Tolerance Factor	2.423				Percent Non-Detects		10.53%
483					Number of Missing Values	25						
484												
485				**Raw Statistics**						**Log-transformed Statistics**		
486					Minimum Detected	0.385				Minimum Detected		-0.955
487					Maximum Detected	5.4				Maximum Detected		1.686
488					Mean of Detected	2.252				Mean of Detected		0.495
489					SD of Detected	1.697				SD of Detected		0.87
490					Minimum Non-Detect	0.2				Minimum Non-Detect		-1.609
491					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
492												
493				**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**		
494	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		2
495	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		17

	A	B	C	D	E	F	G	H	I	J	K	L
496	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	10.53%
497												
498					Background Statistics							
499				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
500					Shapiro Wilk Test Statistic	0.881					Shapiro Wilk Test Statistic	0.935
501					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
502				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
503												
504				Assuming Normal Distribution						Assuming Lognormal Distribution		
505					DL/2 Substitution Method						DL/2 Substitution Method	
506					Mean	2.028					Mean (Log Scale)	0.222
507					SD	1.735					SD (Log Scale)	1.16
508					95% UTL 95% Coverage	6.232					95% UTL 95% Coverage	20.76
509					95% UPL (t)	5.115					95% UPL (t)	9.834
510					90% Percentile (z)	4.251					90% Percentile (z)	5.521
511					95% Percentile (z)	4.882					95% Percentile (z)	8.415
512					99% Percentile (z)	6.064					99% Percentile (z)	18.55
513												
514					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
515					Mean	1.942					Mean in Original Scale	2.038
516					SD	1.821					SD in Original Scale	1.724
517					95% UTL with 95% Coverage	6.354					95% UTL with 95% Coverage	16.36
518											95% BCA UTL with 95% Coverage	5.4
519											95% Bootstrap (%) UTL with 95% Coverage	5.4
520					95% UPL (t)	5.182					95% UPL (t)	8.391
521					90% Percentile (z)	4.276					90% Percentile (z)	5.01
522					95% Percentile (z)	4.937					95% Percentile (z)	7.301
523					99% Percentile (z)	6.178					99% Percentile (z)	14.8
524												
525				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
526					k star (bias corrected)	1.459				Data appear Gamma Distributed at 5% Significance Level		
527					Theta Star	1.543						
528					nu star	49.62						
529												
530					A-D Test Statistic	0.417				Nonparametric Statistics		
531					5% A-D Critical Value	0.753					Kaplan-Meier (KM) Method	
532					K-S Test Statistic	0.168					Mean	2.056
533					5% K-S Critical Value	0.212					SD	1.659
534				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.392
535											95% KM UTL with 95% Coverage	6.076
536				Assuming Gamma Distribution							95% KM Chebyshev UPL	9.476
537					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	5.008
538					Mean	2.015					90% Percentile (z)	4.182
539					Median	1.45					95% Percentile (z)	4.785
540					SD	1.75					99% Percentile (z)	5.916
541					k star	0.361						
542					Theta star	5.589				Gamma ROS Limits with Extrapolated Data		
543					Nu star	13.7					95% Wilson Hilferty (WH) Approx. Gamma UPL	7.877
544					95% Percentile of Chisquare (2k)	3.104					95% Hawkins Wixley (HW) Approx. Gamma UPL	10.3
545											95% WH Approx. Gamma UTL with 95% Coverage	12.37
546					90% Percentile	5.792					95% HW Approx. Gamma UTL with 95% Coverage	18.15
547					95% Percentile	8.675						
548					99% Percentile	16.01						
549												
550	Note: DL/2 is not a recommended method.											

	A	B	C	D	E	F	G	H	I	J	K	L
551												
552												
553	1,2,3,7,8,9-HXCDD											
554												
555					General Statistics							
556					Number of Valid Data	19				Number of Detected Data		16
557					Number of Distinct Detected Data	14				Number of Non-Detect Data		3
558					Tolerance Factor	2.423				Percent Non-Detects		15.79%
559					Number of Missing Values	25						
560												
561				Raw Statistics						Log-transformed Statistics		
562					Minimum Detected	0.445				Minimum Detected		-0.81
563					Maximum Detected	15.2				Maximum Detected		2.721
564					Mean of Detected	3.359				Mean of Detected		0.762
565					SD of Detected	3.648				SD of Detected		0.988
566					Minimum Non-Detect	0.4				Minimum Non-Detect		-0.916
567					Maximum Non-Detect	0.7				Maximum Non-Detect		-0.357
568												
569				Data with Multiple Detection Limits						Single Detection Limit Scenario		
570				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL		5
571				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL		14
572				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		26.32%
573												
574					Background Statistics							
575				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
576					Shapiro Wilk Test Statistic	0.72				Shapiro Wilk Test Statistic		0.961
577					5% Shapiro Wilk Critical Value	0.887				5% Shapiro Wilk Critical Value		0.887
578				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
579												
580				Assuming Normal Distribution						Assuming Lognormal Distribution		
581					DL/2 Substitution Method					DL/2 Substitution Method		
582					Mean	2.871				Mean (Log Scale)		0.429
583					SD	3.526				SD (Log Scale)		1.203
584					95% UTL 95% Coverage	11.41				95% UTL 95% Coverage		28.34
585					95% UPL (t)	9.144				95% UPL (t)		13.06
586					90% Percentile (z)	7.39				90% Percentile (z)		7.175
587					95% Percentile (z)	8.671				95% Percentile (z)		11.11
588					99% Percentile (z)	11.07				99% Percentile (z)		25.22
589												
590					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
591					Mean	2.206				Mean in Original Scale		2.872
592					SD	4.209				SD in Original Scale		3.525
593					95% UTL with 95% Coverage	12.4				95% UTL with 95% Coverage		28.19
594										95% BCA UTL with 95% Coverage		15.2
595										95% Bootstrap (%) UTL with 95% Coverage		15.2
596					95% UPL (t)	9.694				95% UPL (t)		13.02
597					90% Percentile (z)	7.6				90% Percentile (z)		7.168
598					95% Percentile (z)	9.129				95% Percentile (z)		11.08
599					99% Percentile (z)	12				99% Percentile (z)		25.1
600												
601				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
602					k star (bias corrected)	1.059				Data appear Gamma Distributed at 5% Significance Level		
603					Theta Star	3.173						
604					nu star	33.88						
605												

	A	B	C	D	E	F	G	H	I	J	K	L
606					A-D Test Statistic	0.423	Nonparametric Statistics					
607					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
608					K-S Test Statistic	0.163					Mean	2.9
609					5% K-S Critical Value	0.22					SD	3.41
610	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.808
611										95% KM UTL with	95% Coverage	11.16
612	Assuming Gamma Distribution										95% KM Chebyshev UPL	18.15
613				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	8.967
614					Mean	2.829					90% Percentile (z)	7.271
615					Median	1.3					95% Percentile (z)	8.51
616					SD	3.56					99% Percentile (z)	10.83
617					k star	0.264						
618					Theta star	10.72	Gamma ROS Limits with Extrapolated Data					
619					Nu star	10.03				95% Wilson Hilferty (WH) Approx. Gamma UPL		12.31
620					95% Percentile of Chisquare (2k)	2.513				95% Hawkins Wixley (HW) Approx. Gamma UPL		16.27
621										95% WH Approx. Gamma UTL with	95% Coverage	20.35
622					90% Percentile	8.455				95% HW Approx. Gamma UTL with	95% Coverage	30.71
623					95% Percentile	13.47						
624					99% Percentile	26.73						
625												
626	Note: DL/2 is not a recommended method.											
627												
628												
629	1,2,3,7,8,9-HXCDF											
630												
631					General Statistics							
632					Number of Valid Data	19					Number of Detected Data	12
633					Number of Distinct Detected Data	12					Number of Non-Detect Data	7
634					Tolerance Factor	2.423					Percent Non-Detects	36.84%
635					Number of Missing Values	25						
636												
637				Raw Statistics						Log-transformed Statistics		
638					Minimum Detected	0.2					Minimum Detected	-1.609
639					Maximum Detected	2.3					Maximum Detected	0.833
640					Mean of Detected	0.703					Mean of Detected	-0.568
641					SD of Detected	0.554					SD of Detected	0.672
642					Minimum Non-Detect	0.15					Minimum Non-Detect	-1.897
643					Maximum Non-Detect	1.6					Maximum Non-Detect	0.47
644												
645	Data with Multiple Detection Limits						Single Detection Limit Scenario					
646	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	18
647	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	1
648	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	94.74%
649												
650					Background Statistics							
651	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
652					Shapiro Wilk Test Statistic	0.724					Shapiro Wilk Test Statistic	0.938
653					5% Shapiro Wilk Critical Value	0.859					5% Shapiro Wilk Critical Value	0.859
654	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
655												
656	Assuming Normal Distribution						Assuming Lognormal Distribution					
657					DL/2 Substitution Method						DL/2 Substitution Method	
658					Mean	0.553					Mean (Log Scale)	-0.923
659					SD	0.503					SD (Log Scale)	0.855
660					95% UTL 95% Coverage	1.772					95% UTL 95% Coverage	3.157

	A	B	C	D	E	F	G	H	I	J	K	L
661					95% UPL (t)	1.448					95% UPL (t)	1.82
662					90% Percentile (z)	1.198					90% Percentile (z)	1.189
663					95% Percentile (z)	1.381					95% Percentile (z)	1.623
664					99% Percentile (z)	1.723					99% Percentile (z)	2.907
665												
666				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
667											Mean in Original Scale	0.528
668											SD in Original Scale	0.497
669											Mean in Log Scale	-0.938
670											SD in Log Scale	0.775
671											95% UTL 95% Coverage	2.557
672											95% UPL (t)	1.553
673											90% Percentile (z)	1.056
674											95% Percentile (z)	1.399
675											99% Percentile (z)	2.373
676												
677				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
678					k star (bias corrected)	1.906				Data appear Gamma Distributed at 5% Significance Level		
679					Theta Star	0.369						
680					nu star	45.74						
681												
682					A-D Test Statistic	0.491				**Nonparametric Statistics**		
683					5% A-D Critical Value	0.74					Kaplan-Meier (KM) Method	
684					K-S Test Statistic	0.206					Mean	0.546
685					5% K-S Critical Value	0.248					SD	0.481
686				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.117
687											95% KM UTL with 95% Coverage	1.712
688				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	2.697
689					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	1.402
690					Mean	0.495					90% Percentile (z)	1.163
691					Median	0.438					95% Percentile (z)	1.337
692					SD	0.53					99% Percentile (z)	1.665
693					k star	0.25						
694					Theta star	1.983				**Gamma ROS Limits with Extrapolated Data**		
695					Nu star	9.486					95% Wilson Hilferty (WH) Approx. Gamma UPL	2.277
696					95% Percentile of Chisquare (2k)	2.418					95% Hawkins Wixley (HW) Approx. Gamma UPL	3.168
697											95% WH Approx. Gamma UTL with 95% Coverage	3.797
698					90% Percentile	1.486					95% HW Approx. Gamma UTL with 95% Coverage	6.111
699					95% Percentile	2.397						
700					99% Percentile	4.822						
701												
702	**Note: DL/2 is not a recommended method.**											
703												
704												
705	**1,2,3,7,8-PECDD**											
706												
707					**General Statistics**							
708					Number of Valid Data	19					Number of Detected Data	8
709					Number of Distinct Detected Data	8					Number of Non-Detect Data	11
710					Tolerance Factor	2.423					Percent Non-Detects	57.89%
711					Number of Missing Values	25						
712												
713				**Raw Statistics**						**Log-transformed Statistics**		
714					Minimum Detected	0.55					Minimum Detected	-0.598
715					Maximum Detected	3.3					Maximum Detected	1.194

	A–E	F	G–K	L
716	Mean of Detected	1.496	Mean of Detected	0.229
717	SD of Detected	0.95	SD of Detected	0.633
718	Minimum Non-Detect	0.15	Minimum Non-Detect	-1.897
719	Maximum Non-Detect	1.7	Maximum Non-Detect	0.531
720				
721	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
722	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	16
723	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	3
724	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	84.21%
725				
726				
727	**Warning: There are only 8 Detected Values in this data**			
728	**Note: It should be noted that even though bootstrap may be performed on this data set**			
729	**the resulting calculations may not be reliable enough to draw conclusions**			
730				
731	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**			
732				
733	**Background Statistics**			
734	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
735	Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.953
736	5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
737	**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
738				
739	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
740	DL/2 Substitution Method		DL/2 Substitution Method	
741	Mean	0.787	Mean (Log Scale)	-0.771
742	SD	0.873	SD (Log Scale)	1.064
743	95% UTL 95% Coverage	2.902	95% UTL 95% Coverage	6.091
744	95% UPL (t)	2.34	95% UPL (t)	3.071
745	90% Percentile (z)	1.905	90% Percentile (z)	1.809
746	95% Percentile (z)	2.222	95% Percentile (z)	2.662
747	99% Percentile (z)	2.817	99% Percentile (z)	5.496
748				
749	Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
750	Mean	2.647	Mean in Original Scale	0.776
751	SD	0.589	SD in Original Scale	0.869
752	95% UTL with 95% Coverage	4.074	95% UTL with 95% Coverage	5.174
753			95% BCA UTL with 95% Coverage	3.3
754			95% Bootstrap (%) UTL with 95% Coverage	3.3
755	95% UPL (t)	3.695	95% UPL (t)	2.745
756	90% Percentile (z)	3.402	90% Percentile (z)	1.682
757	95% Percentile (z)	3.616	95% Percentile (z)	2.405
758	99% Percentile (z)	4.017	99% Percentile (z)	4.704
759				
760	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
761	k star (bias corrected)	1.975	Data appear Normal at 5% Significance Level	
762	Theta Star	0.758		
763	nu star	31.59		
764				
765	A-D Test Statistic	0.268	**Nonparametric Statistics**	
766	5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method	
767	K-S Test Statistic	0.194	Mean	0.956
768	5% K-S Critical Value	0.296	SD	0.741
769	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	0.182
770			95% KM UTL with 95% Coverage	2.751

	A	B	C	D	E	F	G	H	I	J	K	L
771	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	4.269
772					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	2.274
773					Mean	0.63					90% Percentile (z)	1.905
774					Median	0.000001					95% Percentile (z)	2.174
775					SD	0.963					99% Percentile (z)	2.679
776					k star	0.126						
777					Theta star	4.996	**Gamma ROS Limits with Extrapolated Data**					
778					Nu star	4.792					95% Wilson Hilferty (WH) Approx. Gamma UPL	3.29
779					95% Percentile of Chisquare (2k)	1.43					95% Hawkins Wixley (HW) Approx. Gamma UPL	4.132
780											95% WH Approx. Gamma UTL with 95% Coverage	6.391
781					90% Percentile	1.808					95% HW Approx. Gamma UTL with 95% Coverage	9.858
782					95% Percentile	3.571						
783					99% Percentile	8.888						
784												
785	**Note: DL/2 is not a recommended method.**											
786												
787												
788	**1,2,3,7,8-PECDF**											
789												
790					**General Statistics**							
791					Number of Valid Data	19					Number of Detected Data	10
792					Number of Distinct Detected Data	10					Number of Non-Detect Data	9
793					Tolerance Factor	2.423					Percent Non-Detects	47.37%
794					Number of Missing Values	25						
795												
796					**Raw Statistics**		**Log-transformed Statistics**					
797					Minimum Detected	0.41					Minimum Detected	-0.892
798					Maximum Detected	3.1					Maximum Detected	1.131
799					Mean of Detected	1.302					Mean of Detected	0.0189
800					SD of Detected	0.916					SD of Detected	0.758
801					Minimum Non-Detect	0.085					Minimum Non-Detect	-2.465
802					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
803												
804					**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**					
805					Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL	13
806					For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL	6
807					Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	68.42%
808												
809					**Background Statistics**							
810					**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**					
811					Shapiro Wilk Test Statistic	0.889					Shapiro Wilk Test Statistic	0.891
812					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
813					**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**					
814												
815					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
816					DL/2 Substitution Method						DL/2 Substitution Method	
817					Mean	0.766					Mean (Log Scale)	-0.916
818					SD	0.872					SD (Log Scale)	1.229
819					95% UTL 95% Coverage	2.88					95% UTL 95% Coverage	7.868
820					95% UPL (t)	2.318					95% UPL (t)	3.565
821					90% Percentile (z)	1.884					90% Percentile (z)	1.934
822					95% Percentile (z)	2.201					95% Percentile (z)	3.023
823					99% Percentile (z)	2.796					99% Percentile (z)	6.987
824												
825					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	

	A	B	C	D	E	F	G	H	I	J	K	L
826					Mean	0.103				Mean in Original Scale		0.765
827					SD	1.53				SD in Original Scale		0.871
828				95% UTL with	95% Coverage	3.81				95% UTL with	95% Coverage	6.408
829										95% BCA UTL with	95% Coverage	3.1
830										95% Bootstrap (%) UTL with	95% Coverage	3.1
831					95% UPL (t)	2.825					95% UPL (t)	3.113
832					90% Percentile (z)	2.063					90% Percentile (z)	1.782
833					95% Percentile (z)	2.619					95% Percentile (z)	2.678
834					99% Percentile (z)	3.662					99% Percentile (z)	5.75
835												
836				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
837					k star (bias corrected)	1.604				Data appear Normal at 5% Significance Level		
838					Theta Star	0.811						
839					nu star	32.08						
840												
841					A-D Test Statistic	0.472				Nonparametric Statistics		
842					5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method	
843					K-S Test Statistic	0.243					Mean	0.881
844					5% K-S Critical Value	0.27					SD	0.771
845				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.186
846										95% KM UTL with	95% Coverage	2.748
847				Assuming Gamma Distribution							95% KM Chebyshev UPL	4.328
848				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	2.252
849					Mean	0.685					90% Percentile (z)	1.869
850					Median	0.41					95% Percentile (z)	2.149
851					SD	0.93					99% Percentile (z)	2.674
852					k star	0.143						
853					Theta star	4.802				Gamma ROS Limits with Extrapolated Data		
854					Nu star	5.421				95% Wilson Hilferty (WH) Approx. Gamma UPL		3.659
855					95% Percentile of Chisquare (2k)	1.585				95% Hawkins Wixley (HW) Approx. Gamma UPL		4.894
856										95% WH Approx. Gamma UTL with	95% Coverage	6.856
857					90% Percentile	2.016				95% HW Approx. Gamma UTL with	95% Coverage	11.11
858					95% Percentile	3.806						
859					99% Percentile	9.056						
860												
861	Note: DL/2 is not a recommended method.											
862												
863												
864	2,3,4,6,7,8-HXCDF											
865												
866					General Statistics							
867					Number of Valid Data	19				Number of Detected Data		17
868					Number of Distinct Detected Data	16				Number of Non-Detect Data		2
869					Tolerance Factor	2.423				Percent Non-Detects		10.53%
870					Number of Missing Values	25						
871												
872				Raw Statistics						Log-transformed Statistics		
873					Minimum Detected	0.545					Minimum Detected	-0.607
874					Maximum Detected	7.7					Maximum Detected	2.041
875					Mean of Detected	3.351					Mean of Detected	0.916
876					SD of Detected	2.391					SD of Detected	0.85
877					Minimum Non-Detect	0.2					Minimum Non-Detect	-1.609
878					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
879												
880				Data with Multiple Detection Limits						Single Detection Limit Scenario		

	A	B	C	D	E	F	G	H	I	J	K	L
881	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		2
882	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		17
883	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		10.53%
884												
885	**Background Statistics**											
886	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
887					Shapiro Wilk Test Statistic	0.896				Shapiro Wilk Test Statistic		0.93
888					5% Shapiro Wilk Critical Value	0.892				5% Shapiro Wilk Critical Value		0.892
889	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
890												
891	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
892					DL/2 Substitution Method					DL/2 Substitution Method		
893					Mean	3.012				Mean (Log Scale)		0.598
894					SD	2.473				SD (Log Scale)		1.245
895					95% UTL 95% Coverage	9.004				95% UTL 95% Coverage		37.17
896					95% UPL (t)	7.412				95% UPL (t)		16.67
897					90% Percentile (z)	6.181				90% Percentile (z)		8.973
898					95% Percentile (z)	7.08				95% Percentile (z)		14.11
899					99% Percentile (z)	8.765				99% Percentile (z)		32.96
900												
901					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
902					Mean	2.886				Mean in Original Scale		3.036
903					SD	2.608				SD in Original Scale		2.444
904					95% UTL with 95% Coverage	9.205				95% UTL with 95% Coverage		23.47
905										95% BCA UTL with 95% Coverage		7.7
906										95% Bootstrap (%) UTL with 95% Coverage		7.7
907					95% UPL (t)	7.526				95% UPL (t)		12.26
908					90% Percentile (z)	6.228				90% Percentile (z)		7.419
909					95% Percentile (z)	7.175				95% Percentile (z)		10.7
910					99% Percentile (z)	8.953				99% Percentile (z)		21.29
911												
912	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
913					k star (bias corrected)	1.565	Data appear Normal at 5% Significance Level					
914					Theta Star	2.141						
915					nu star	53.21						
916												
917					A-D Test Statistic	0.373	**Nonparametric Statistics**					
918					5% A-D Critical Value	0.751				Kaplan-Meier (KM) Method		
919					K-S Test Statistic	0.121				Mean		3.056
920					5% K-S Critical Value	0.212				SD		2.357
921	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.557
922										95% KM UTL with 95% Coverage		8.767
923	**Assuming Gamma Distribution**									95% KM Chebyshev UPL		13.6
924					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		7.25
925					Mean	2.999				90% Percentile (z)		6.077
926					Median	2.1				95% Percentile (z)		6.933
927					SD	2.49				99% Percentile (z)		8.539
928					k star	0.357						
929					Theta star	8.396	**Gamma ROS Limits with Extrapolated Data**					
930					Nu star	13.57				95% Wilson Hilferty (WH) Approx. Gamma UPL		11.66
931					95% Percentile of Chisquare (2k)	3.085				95% Hawkins Wixley (HW) Approx. Gamma UPL		15.37
932										95% WH Approx. Gamma UTL with 95% Coverage		18.23
933					90% Percentile	8.632				95% HW Approx. Gamma UTL with 95% Coverage		27.01
934					95% Percentile	12.95						
935					99% Percentile	23.95						

	A	B	C	D	E	F	G	H	I	J	K	L
936												
937	Note: DL/2 is not a recommended method.											
938												
939												
940	2,3,4,7,8-PECDF											
941												
942					General Statistics							
943					Number of Valid Data	19				Number of Detected Data		16
944					Number of Distinct Detected Data	15				Number of Non-Detect Data		3
945					Tolerance Factor	2.423				Percent Non-Detects		15.79%
946					Number of Missing Values	25						
947												
948					Raw Statistics					Log-transformed Statistics		
949					Minimum Detected	0.335				Minimum Detected		-1.094
950					Maximum Detected	7.7				Maximum Detected		2.041
951					Mean of Detected	2.893				Mean of Detected		0.768
952					SD of Detected	2.047				SD of Detected		0.877
953					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
954					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
955												
956					Data with Multiple Detection Limits					Single Detection Limit Scenario		
957					Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL		5
958					For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL		14
959					Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage		26.32%
960												
961					Background Statistics							
962					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
963					Shapiro Wilk Test Statistic	0.928				Shapiro Wilk Test Statistic		0.942
964					5% Shapiro Wilk Critical Value	0.887				5% Shapiro Wilk Critical Value		0.887
965					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
966												
967					Assuming Normal Distribution					Assuming Lognormal Distribution		
968					DL/2 Substitution Method					DL/2 Substitution Method		
969					Mean	2.466				Mean (Log Scale)		0.374
970					SD	2.127				SD (Log Scale)		1.234
971					95% UTL 95% Coverage	7.62				95% UTL 95% Coverage		28.93
972					95% UPL (t)	6.25				95% UPL (t)		13.07
973					90% Percentile (z)	5.192				90% Percentile (z)		7.07
974					95% Percentile (z)	5.964				95% Percentile (z)		11.07
975					99% Percentile (z)	7.414				99% Percentile (z)		25.68
976												
977					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
978					Mean	2.116				Mean in Original Scale		2.49
979					SD	2.568				SD in Original Scale		2.1
980					95% UTL with 95% Coverage	8.337				95% UTL with 95% Coverage		21.55
981										95% BCA UTL with 95% Coverage		7.7
982										95% Bootstrap (%) UTL with 95% Coverage		7.7
983					95% UPL (t)	6.684				95% UPL (t)		10.8
984					90% Percentile (z)	5.406				90% Percentile (z)		6.331
985					95% Percentile (z)	6.339				95% Percentile (z)		9.35
986					99% Percentile (z)	8.089				99% Percentile (z)		19.43
987												
988					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
989					k star (bias corrected)	1.542				Data appear Normal at 5% Significance Level		
990					Theta Star	1.877						

	A	B	C	D	E	F	G	H	I	J	K	L
991					nu star	49.33						
992												
993					A-D Test Statistic	0.224	**Nonparametric Statistics**					
994					5% A-D Critical Value	0.752					Kaplan-Meier (KM) Method	
995					K-S Test Statistic	0.147					Mean	2.491
996					5% K-S Critical Value	0.218					SD	2.043
997	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.484
998										95% KM UTL with	95% Coverage	7.441
999			**Assuming Gamma Distribution**								95% KM Chebyshev UPL	11.63
1000				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	6.125
1001					Mean	2.437					90% Percentile (z)	5.109
1002					Median	1.9					95% Percentile (z)	5.851
1003					SD	2.161					99% Percentile (z)	7.243
1004					k star	0.276						
1005					Theta star	8.818	**Gamma ROS Limits with Extrapolated Data**					
1006					Nu star	10.5				95% Wilson Hilferty (WH) Approx. Gamma UPL		10.54
1007					95% Percentile of Chisquare (2k)	2.595				95% Hawkins Wixley (HW) Approx. Gamma UPL		14.49
1008										95% WH Approx. Gamma UTL with	95% Coverage	17.12
1009					90% Percentile	7.251				95% HW Approx. Gamma UTL with	95% Coverage	26.93
1010					95% Percentile	11.44						
1011					99% Percentile	22.44						
1012												
1013	**Note: DL/2 is not a recommended method.**											
1014												
1015												
1016	**2,3,7,8-TCDD**											
1017												
1018					**General Statistics**							
1019					Number of Valid Data	19					Number of Detected Data	2
1020					Number of Distinct Detected Data	2					Number of Non-Detect Data	17
1021					**Warning: Data set has only 2 Detected Values.**							
1022					**This is not enough to compute meaningful and reliable test statistics and estimates.**							
1023					**No statistics will be produced!**							
1024												
1025					Tolerance Factor	2.423					Percent Non-Detects	89.47%
1026					Number of Missing Values	25						
1027												
1028					**Raw Statistics**		**Log-transformed Statistics**					
1029					Minimum Detected	0.47					Minimum Detected	-0.755
1030					Maximum Detected	0.48					Maximum Detected	-0.734
1031					Mean of Detected	0.475					Mean of Detected	-0.744
1032					SD of Detected	0.00707					SD of Detected	0.0149
1033					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
1034					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
1035												
1036					**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**					
1037					Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL	19
1038					For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL	0
1039					Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%
1040												
1041												
1042					**Warning: Data set has only 2 Distinct Detected Values.**							
1043					**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**							
1044					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
1045												

	A	B	C	D	E	F	G	H	I	J	K	L
1046	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
1047												
1048	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
1049	Those methods will return a 'N/A' value on your output display!											
1050												
1051	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1052	However, results obtained using 4 to 9 distinct values may not be reliable.											
1053	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1054												
1055	Background Statistics											
1056	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1057					Shapiro Wilk Test Statistic	N/A				Shapiro Wilk Test Statistic		N/A
1058					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value		N/A
1059	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
1060												
1061	Assuming Normal Distribution						Assuming Lognormal Distribution					
1062					DL/2 Substitution Method					DL/2 Substitution Method		
1063					Mean	0.188				Mean (Log Scale)		-1.851
1064					SD	0.128				SD (Log Scale)		0.597
1065					95% UTL 95% Coverage	0.498				95% UTL 95% Coverage		0.667
1066					95% UPL (t)	0.416				95% UPL (t)		0.454
1067					90% Percentile (z)	0.352				90% Percentile (z)		0.338
1068					95% Percentile (z)	0.398				95% Percentile (z)		0.419
1069					99% Percentile (z)	0.486				99% Percentile (z)		0.63
1070												
1071					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1072										Mean in Original Scale		N/A
1073										SD in Original Scale		N/A
1074										Mean in Log Scale		N/A
1075										SD in Log Scale		N/A
1076										95% UTL 95% Coverage		N/A
1077										95% UPL (t)		N/A
1078										90% Percentile (z)		N/A
1079										95% Percentile (z)		N/A
1080										99% Percentile (z)		N/A
1081												
1082	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1083					k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)					
1084					Theta Star	N/A						
1085					nu star	N/A						
1086												
1087					A-D Test Statistic	N/A	Nonparametric Statistics					
1088					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
1089					K-S Test Statistic	N/A				Mean		0.471
1090					5% K-S Critical Value	N/A				SD		0.00242
1091	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.0008558
1092										95% KM UTL with 95% Coverage		0.476
1093	Assuming Gamma Distribution									95% KM Chebyshev UPL		0.481
1094					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		0.475
1095					Mean	N/A				90% Percentile (z)		0.474
1096					Median	N/A				95% Percentile (z)		0.475
1097					SD	N/A				99% Percentile (z)		0.476
1098					k star	N/A						
1099					Theta star	N/A	Gamma ROS Limits with Extrapolated Data					
1100					Nu star	N/A				95% Wilson Hilferty (WH) Approx. Gamma UPL		N/A

	A	B	C	D	E	F	G	H	I	J	K	L
1101					95% Percentile of Chisquare (2k)	N/A			95% Hawkins Wixley (HW) Approx. Gamma UPL			N/A
1102									95% WH Approx. Gamma UTL with		95% Coverage	N/A
1103					90% Percentile	N/A			95% HW Approx. Gamma UTL with		95% Coverage	N/A
1104					95% Percentile	N/A						
1105					99% Percentile	N/A						
1106												
1107	Note: DL/2 is not a recommended method.											
1108												
1109												
1110	2,3,7,8-TCDF											
1111												
1112					General Statistics							
1113					Number of Valid Data	19			Number of Detected Data			18
1114					Number of Distinct Detected Data	17			Number of Non-Detect Data			1
1115					Tolerance Factor	2.423			Percent Non-Detects			5.26%
1116					Number of Missing Values	25						
1117												
1118					Raw Statistics				Log-transformed Statistics			
1119					Minimum Detected	0.48			Minimum Detected			-0.734
1120					Maximum Detected	8.9			Maximum Detected			2.186
1121					Mean of Detected	2.294			Mean of Detected			0.428
1122					SD of Detected	2.414			SD of Detected			0.889
1123					Minimum Non-Detect	0.2			Minimum Non-Detect			-1.609
1124					Maximum Non-Detect	0.2			Maximum Non-Detect			-1.609
1125												
1126												
1127					Background Statistics							
1128					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
1129					Shapiro Wilk Test Statistic	0.719			Shapiro Wilk Test Statistic			0.937
1130					5% Shapiro Wilk Critical Value	0.897			5% Shapiro Wilk Critical Value			0.897
1131					Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
1132												
1133					Assuming Normal Distribution				Assuming Lognormal Distribution			
1134					DL/2 Substitution Method				DL/2 Substitution Method			
1135					Mean	2.179			Mean (Log Scale)			0.284
1136					SD	2.399			SD (Log Scale)			1.067
1137					95% UTL 95% Coverage	7.993			95% UTL 95% Coverage			17.65
1138					95% UPL (t)	6.448			95% UPL (t)			8.878
1139					90% Percentile (z)	5.254			90% Percentile (z)			5.22
1140					95% Percentile (z)	6.126			95% Percentile (z)			7.692
1141					99% Percentile (z)	7.761			99% Percentile (z)			15.92
1142												
1143					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
1144					Mean	2.111			Mean in Original Scale			2.183
1145					SD	2.426			SD in Original Scale			2.396
1146					95% UTL with 95% Coverage	7.991			95% UTL with 95% Coverage			15.41
1147									95% BCA UTL with 95% Coverage			8.9
1148									95% Bootstrap (%) UTL with 95% Coverage			8.9
1149					95% UPL (t)	6.428			95% UPL (t)			8.096
1150					90% Percentile (z)	5.221			90% Percentile (z)			4.923
1151					95% Percentile (z)	6.103			95% Percentile (z)			7.079
1152					99% Percentile (z)	7.756			99% Percentile (z)			13.99
1153												
1154					Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only			
1155					k star (bias corrected)	1.192			Data appear Gamma Distributed at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
1156					Theta Star	1.925						
1157					nu star	42.91						
1158												
1159					A-D Test Statistic	0.679	**Nonparametric Statistics**					
1160					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
1161					K-S Test Statistic	0.156					Mean	2.199
1162					5% K-S Critical Value	0.208					SD	2.319
1163	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.547
1164										95% KM UTL with	95% Coverage	7.818
1165	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	12.57
1166				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	6.325
1167					Mean	2.174					90% Percentile (z)	5.171
1168					Median	1.25					95% Percentile (z)	6.014
1169					SD	2.404					99% Percentile (z)	7.594
1170					k star	0.513						
1171					Theta star	4.238	**Gamma ROS Limits with Extrapolated Data**					
1172					Nu star	19.49				95% Wilson Hilferty (WH) Approx. Gamma UPL		7.557
1173				95% Percentile of Chisquare (2k)		3.905				95% Hawkins Wixley (HW) Approx. Gamma UPL		8.915
1174										95% WH Approx. Gamma UTL with	95% Coverage	11.54
1175					90% Percentile	5.85				95% HW Approx. Gamma UTL with	95% Coverage	14.81
1176					95% Percentile	8.274						
1177					99% Percentile	14.22						
1178												
1179	**Note: DL/2 is not a recommended method.**											
1180												
1181												
1182	**TOTAL HPCDF**											
1183												
1184					**General Statistics**							
1185					Number of Valid Data	19					Number of Detected Data	18
1186					Number of Distinct Detected Data	18					Number of Non-Detect Data	1
1187					Tolerance Factor	2.423					Percent Non-Detects	5.26%
1188					Number of Missing Values	25						
1189												
1190				**Raw Statistics**					**Log-transformed Statistics**			
1191					Minimum Detected	3.7					Minimum Detected	1.308
1192					Maximum Detected	118					Maximum Detected	4.771
1193					Mean of Detected	31.96					Mean of Detected	2.989
1194					SD of Detected	33.83					SD of Detected	1.02
1195					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
1196					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
1197												
1198												
1199					**Background Statistics**							
1200				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
1201					Shapiro Wilk Test Statistic	0.753					Shapiro Wilk Test Statistic	0.969
1202					5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897
1203				**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
1204												
1205				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
1206					DL/2 Substitution Method						DL/2 Substitution Method	
1207					Mean	30.29					Mean (Log Scale)	2.732
1208					SD	33.68					SD (Log Scale)	1.497
1209					95% UTL 95% Coverage	111.9					95% UTL 95% Coverage	577.5
1210					95% UPL (t)	90.2					95% UPL (t)	220.3

	A–E	F	G–K	L
1211	90% Percentile (z)	73.45	90% Percentile (z)	104.6
1212	95% Percentile (z)	85.68	95% Percentile (z)	180.2
1213	99% Percentile (z)	108.6	99% Percentile (z)	499.7
1214				
1215	Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
1216	Mean	29.3	Mean in Original Scale	30.36
1217	SD	34.14	SD in Original Scale	33.61
1218	95% UTL with 95% Coverage	112	95% UTL with 95% Coverage	281.8
1219			95% BCA UTL with 95% Coverage	118
1220			95% Bootstrap (%) UTL with 95% Coverage	118
1221	95% UPL (t)	90.03	95% UPL (t)	134.4
1222	90% Percentile (z)	73.04	90% Percentile (z)	75.87
1223	95% Percentile (z)	85.45	95% Percentile (z)	115.2
1224	99% Percentile (z)	108.7	99% Percentile (z)	252.1
1225				
1226	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
1227	k star (bias corrected)	1.03	Data appear Gamma Distributed at 5% Significance Level	
1228	Theta Star	31.05		
1229	nu star	37.07		
1230				
1231	A-D Test Statistic	0.402	**Nonparametric Statistics**	
1232	5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method	
1233	K-S Test Statistic	0.147	Mean	30.48
1234	5% K-S Critical Value	0.209	SD	32.62
1235	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	7.699
1236			95% KM UTL with 95% Coverage	109.5
1237	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	176.3
1238	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	88.5
1239	Mean	30.28	90% Percentile (z)	72.27
1240	Median	15.6	95% Percentile (z)	84.12
1241	SD	33.68	99% Percentile (z)	106.4
1242	k star	0.446		
1243	Theta star	67.86	**Gamma ROS Limits with Extrapolated Data**	
1244	Nu star	16.96	95% Wilson Hilferty (WH) Approx. Gamma UPL	109.3
1245	95% Percentile of Chisquare (2k)	3.569	95% Hawkins Wixley (HW) Approx. Gamma UPL	129.5
1246			95% WH Approx. Gamma UTL with 95% Coverage	169.1
1247	90% Percentile	83.82	95% HW Approx. Gamma UTL with 95% Coverage	219.1
1248	95% Percentile	121.1		
1249	99% Percentile	213.8		
1250				
1251	**Note: DL/2 is not a recommended method.**			
1252				
1253				
1254	**TOTAL HXCDD**			
1255				
1256	**General Statistics**			
1257	Number of Valid Data	19	Number of Detected Data	17
1258	Number of Distinct Detected Data	17	Number of Non-Detect Data	2
1259	Tolerance Factor	2.423	Percent Non-Detects	10.53%
1260	Number of Missing Values	25		
1261				
1262	**Raw Statistics**		**Log-transformed Statistics**	
1263	Minimum Detected	2.3	Minimum Detected	0.833
1264	Maximum Detected	516	Maximum Detected	6.246
1265	Mean of Detected	52.25	Mean of Detected	2.947

	A	B	C	D	E	F	G	H	I	J	K	L
1266					SD of Detected	121.1					SD of Detected	1.293
1267					Minimum Non-Detect	0.4					Minimum Non-Detect	-0.916
1268					Maximum Non-Detect	6.6					Maximum Non-Detect	1.887
1269												
1270	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
1271	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	5
1272	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	14
1273	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	26.32%
1274												
1275	**Background Statistics**											
1276	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1277					Shapiro Wilk Test Statistic	0.398					Shapiro Wilk Test Statistic	0.956
1278					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
1279	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1280												
1281	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1282					DL/2 Substitution Method						DL/2 Substitution Method	
1283					Mean	46.93					Mean (Log Scale)	2.614
1284					SD	115.3					SD (Log Scale)	1.641
1285				95% UTL	95% Coverage	326.4				95% UTL	95% Coverage	728.6
1286					95% UPL (t)	252.1					95% UPL (t)	253.2
1287					90% Percentile (z)	194.7					90% Percentile (z)	111.9
1288					95% Percentile (z)	236.6					95% Percentile (z)	203.2
1289					99% Percentile (z)	315.2					99% Percentile (z)	621.7
1290												
1291					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1292					Mean	20.67					Mean in Original Scale	46.93
1293					SD	136.1					SD in Original Scale	115.3
1294				95% UTL with	95% Coverage	350.3				95% UTL with	95% Coverage	520
1295										95% BCA UTL with	95% Coverage	516
1296										95% Bootstrap (%) UTL with	95% Coverage	516
1297					95% UPL (t)	262.7					95% UPL (t)	200.9
1298					90% Percentile (z)	195					90% Percentile (z)	96.36
1299					95% Percentile (z)	244.5					95% Percentile (z)	164.8
1300					99% Percentile (z)	337.2					99% Percentile (z)	450.8
1301												
1302	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1303					k star (bias corrected)	0.542	Data appear Lognormal at 5% Significance Level					
1304					Theta Star	96.41						
1305					nu star	18.43						
1306												
1307					A-D Test Statistic	1.291	**Nonparametric Statistics**					
1308					5% A-D Critical Value	0.788					Kaplan-Meier (KM) Method	
1309					K-S Test Statistic	0.235					Mean	47.04
1310					5% K-S Critical Value	0.219					SD	112.2
1311	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	26.53
1312										95% KM UTL with	95% Coverage	318.9
1313	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	548.8
1314					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	246.7
1315					Mean	46.75					90% Percentile (z)	190.8
1316					Median	13.8					95% Percentile (z)	231.6
1317					SD	115.4					99% Percentile (z)	308.1
1318					k star	0.258						
1319					Theta star	181.4	**Gamma ROS Limits with Extrapolated Data**					
1320					Nu star	9.793					95% Wilson Hilferty (WH) Approx. Gamma UPL	184.2

	A	B	C	D	E	F	G	H	I	J	K	L
1321					95% Percentile of Chisquare (2k)	2.472			95% Hawkins Wixley (HW) Approx. Gamma UPL			209.5
1322									95% WH Approx. Gamma UTL with		95% Coverage	314.1
1323					90% Percentile	140			95% HW Approx. Gamma UTL with		95% Coverage	398.1
1324					95% Percentile	224.2						
1325					99% Percentile	447.5						
1326												
1327	Note: DL/2 is not a recommended method.											
1328												
1329												
1330	TOTAL PECDD											
1331												
1332					General Statistics							
1333					Number of Valid Data	19				Number of Detected Data		16
1334					Number of Distinct Detected Data	16				Number of Non-Detect Data		3
1335					Tolerance Factor	2.423				Percent Non-Detects		15.79%
1336					Number of Missing Values	25						
1337												
1338				Raw Statistics						Log-transformed Statistics		
1339					Minimum Detected	0.925				Minimum Detected		-0.078
1340					Maximum Detected	50.6				Maximum Detected		3.924
1341					Mean of Detected	11.6				Mean of Detected		1.861
1342					SD of Detected	13.2				SD of Detected		1.175
1343					Minimum Non-Detect	0.4				Minimum Non-Detect		-0.916
1344					Maximum Non-Detect	0.7				Maximum Non-Detect		-0.357
1345												
1346				Data with Multiple Detection Limits						Single Detection Limit Scenario		
1347	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		3
1348	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		16
1349	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		15.79%
1350												
1351					Background Statistics							
1352				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
1353					Shapiro Wilk Test Statistic	0.776				Shapiro Wilk Test Statistic		0.976
1354					5% Shapiro Wilk Critical Value	0.887				5% Shapiro Wilk Critical Value		0.887
1355				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
1356												
1357				Assuming Normal Distribution						Assuming Lognormal Distribution		
1358					DL/2 Substitution Method					DL/2 Substitution Method		
1359					Mean	9.814				Mean (Log Scale)		1.354
1360					SD	12.78				SD (Log Scale)		1.614
1361					95% UTL 95% Coverage	40.78				95% UTL 95% Coverage		193.4
1362					95% UPL (t)	32.55				95% UPL (t)		68.43
1363					90% Percentile (z)	26.19				90% Percentile (z)		30.65
1364					95% Percentile (z)	30.84				95% Percentile (z)		55.1
1365					99% Percentile (z)	39.55				99% Percentile (z)		165.5
1366												
1367					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1368					Mean	8.493				Mean in Original Scale		9.839
1369					SD	14.05				SD in Original Scale		12.76
1370					95% UTL with 95% Coverage	42.53				95% UTL with 95% Coverage		151.3
1371										95% BCA UTL with 95% Coverage		50.6
1372										95% Bootstrap (%) UTL with 95% Coverage		50.6
1373					95% UPL (t)	33.49				95% UPL (t)		58.31
1374					90% Percentile (z)	26.5				90% Percentile (z)		27.9
1375					95% Percentile (z)	31.6				95% Percentile (z)		47.79

	A	B	C	D	E	F	G	H	I	J	K	L
1376					99% Percentile (z)	41.18					99% Percentile (z)	131.1
1377												
1378				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
1379					k star (bias corrected)	0.838				Data appear Gamma Distributed at 5% Significance Level		
1380					Theta Star	13.85						
1381					nu star	26.82						
1382												
1383					A-D Test Statistic	0.272				Nonparametric Statistics		
1384					5% A-D Critical Value	0.764					Kaplan-Meier (KM) Method	
1385					K-S Test Statistic	0.13					Mean	9.918
1386					5% K-S Critical Value	0.221					SD	12.36
1387				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	2.929
1388											95% KM UTL with 95% Coverage	39.87
1389				Assuming Gamma Distribution							95% KM Chebyshev UPL	65.2
1390					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	31.91
1391					Mean	9.772					90% Percentile (z)	25.76
1392					Median	4.5					95% Percentile (z)	30.25
1393					SD	12.81					99% Percentile (z)	38.68
1394					k star	0.242						
1395					Theta star	40.33				Gamma ROS Limits with Extrapolated Data		
1396					Nu star	9.208					95% Wilson Hilferty (WH) Approx. Gamma UPL	43.35
1397					95% Percentile of Chisquare (2k)	2.368					95% Hawkins Wixley (HW) Approx. Gamma UPL	56.47
1398											95% WH Approx. Gamma UTL with 95% Coverage	72.79
1399					90% Percentile	29.39					95% HW Approx. Gamma UTL with 95% Coverage	108.4
1400					95% Percentile	47.74						
1401					99% Percentile	96.8						
1402												
1403	Note: DL/2 is not a recommended method.											
1404												
1405												
1406	TOTAL TCDD											
1407												
1408					General Statistics							
1409					Number of Valid Data	19					Number of Detected Data	17
1410					Number of Distinct Detected Data	16					Number of Non-Detect Data	2
1411					Tolerance Factor	2.423					Percent Non-Detects	10.53%
1412					Number of Missing Values	25						
1413												
1414				Raw Statistics						Log-transformed Statistics		
1415					Minimum Detected	0.99					Minimum Detected	-0.0101
1416					Maximum Detected	30.1					Maximum Detected	3.405
1417					Mean of Detected	9.202					Mean of Detected	1.833
1418					SD of Detected	7.464					SD of Detected	1.015
1419					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
1420					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
1421												
1422												
1423					Background Statistics							
1424				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
1425					Shapiro Wilk Test Statistic	0.88					Shapiro Wilk Test Statistic	0.919
1426					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
1427				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
1428												
1429				Assuming Normal Distribution						Assuming Lognormal Distribution		
1430					DL/2 Substitution Method						DL/2 Substitution Method	

	A	B	C	D	E	F	G	H	I	J	K	L
1431					Mean	8.249					Mean (Log Scale)	1.44
1432					SD	7.594					SD (Log Scale)	1.516
1433				95% UTL	95% Coverage	26.65				95% UTL	95% Coverage	166.4
1434					95% UPL (t)	21.76					95% UPL (t)	62.68
1435					90% Percentile (z)	17.98					90% Percentile (z)	29.48
1436					95% Percentile (z)	20.74					95% Percentile (z)	51.13
1437					99% Percentile (z)	25.91					99% Percentile (z)	143.7
1438												
1439			Maximum Likelihood Estimate(MLE) Method								Log ROS Method	
1440					Mean	7.808					Mean in Original Scale	8.3
1441					SD	8.052					SD in Original Scale	7.538
1442				95% UTL with	95% Coverage	27.32				95% UTL with	95% Coverage	90.92
1443										95% BCA UTL with	95% Coverage	30.1
1444										95% Bootstrap (%) UTL with	95% Coverage	30.1
1445					95% UPL (t)	22.13					95% UPL (t)	41.84
1446					90% Percentile (z)	18.13					90% Percentile (z)	22.97
1447					95% Percentile (z)	21.05					95% Percentile (z)	35.59
1448					99% Percentile (z)	26.54					99% Percentile (z)	80.92
1449												
1450			**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**			
1451					k star (bias corrected)	1.224			Data appear Gamma Distributed at 5% Significance Level			
1452					Theta Star	7.521						
1453					nu star	41.6						
1454												
1455					A-D Test Statistic	0.351			**Nonparametric Statistics**			
1456					5% A-D Critical Value	0.757					Kaplan-Meier (KM) Method	
1457					K-S Test Statistic	0.129					Mean	8.337
1458					5% K-S Critical Value	0.213					SD	7.298
1459			**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean	1.726
1460										95% KM UTL with	95% Coverage	26.02
1461			**Assuming Gamma Distribution**								95% KM Chebyshev UPL	40.98
1462			Gamma ROS Statistics with Extrapolated Data								95% KM UPL (t)	21.32
1463					Mean	8.233					90% Percentile (z)	17.69
1464					Median	6.2					95% Percentile (z)	20.34
1465					SD	7.612					99% Percentile (z)	25.32
1466					k star	0.33						
1467					Theta star	24.97			**Gamma ROS Limits with Extrapolated Data**			
1468					Nu star	12.53			95% Wilson Hilferty (WH) Approx. Gamma UPL			32.97
1469					95% Percentile of Chisquare (2k)	2.925			95% Hawkins Wixley (HW) Approx. Gamma UPL			43.12
1470									95% WH Approx. Gamma UTL with		95% Coverage	52.29
1471					90% Percentile	23.99			95% HW Approx. Gamma UTL with		95% Coverage	76.95
1472					95% Percentile	36.52						
1473					99% Percentile	68.74						
1474												
1475	**Note: DL/2 is not a recommended method.**											
1476												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	ALUMINUM											
12												
13						General Statistics						
14						Total Number of Observations	25			Number of Distinct Observations		23
15						Tolerance Factor	2.292					
16												
17						Raw Statistics				Log-Transformed Statistics		
18						Minimum	4930			Minimum		8.503
19						Maximum	33500			Maximum		10.42
20						Second Largest	29600			Second Largest		10.3
21						First Quartile	14200			First Quartile		9.561
22						Median	18200			Median		9.809
23						Third Quartile	22800			Third Quartile		10.03
24						Mean	18672			Mean		9.765
25						SD	6572			SD		0.407
26						Coefficient of Variation	0.352					
27						Skewness	0.227					
28												
29						Background Statistics						
30						Normal Distribution Test				Lognormal Distribution Test		
31						Shapiro Wilk Test Statistic	0.992			Shapiro Wilk Test Statistic		0.935
32						Shapiro Wilk Critical Value	0.918			Shapiro Wilk Critical Value		0.918
33						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
34												
35						Assuming Normal Distribution				Assuming Lognormal Distribution		
36						95% UTL with 95% Coverage	33736			95% UTL with 95% Coverage		44286
37						95% UPL (t)	30140			95% UPL (t)		35438
38						90% Percentile (z)	27095			90% Percentile (z)		29344
39						95% Percentile (z)	29483			95% Percentile (z)		34025
40						99% Percentile (z)	33962			99% Percentile (z)		44910
41												
42						Gamma Distribution Test				Data Distribution Test		
43						k star	6.461			Data appear Normal at 5% Significance Level		
44						Theta Star	2890					
45						MLE of Mean	18672					
46						MLE of Standard Deviation	7346					
47						nu star	323.1					
48												
49						A-D Test Statistic	0.185			Nonparametric Statistics		
50						5% A-D Critical Value	0.746			90% Percentile		26260
51						K-S Test Statistic	0.0803			95% Percentile		28980
52						5% K-S Critical Value	0.175			99% Percentile		32564
53						Data appear Gamma Distributed at 5% Significance Level						
54												
55						Assuming Gamma Distribution				95% UTL with 95% Coverage		33500

	A	B	C	D	E	F	G	H	I	J	K	L
56					90% Percentile	28486				95% Percentile Bootstrap UTL with	95% Coverage	33500
57					95% Percentile	32163				95% BCA Bootstrap UTL with	95% Coverage	33500
58					99% Percentile	39844					95% UPL	32330
59											95% Chebyshev UPL	47888
60					95% WH Approx. Gamma UPL	32609					Upper Threshold Limit Based upon IQR	35700
61					95% HW Approx. Gamma UPL	33159						
62				95% WH Approx. Gamma UTL with	95% Coverage	38514						
63				95% HW Approx. Gamma UTL with	95% Coverage	39599						
64												
65												
66												
67	ARSENIC											
68												
69						General Statistics						
70					Total Number of Observations	25					Number of Distinct Observations	25
71					Tolerance Factor	2.292						
72												
73				Raw Statistics						Log-Transformed Statistics		
74					Minimum	4.4					Minimum	1.482
75					Maximum	58.6					Maximum	4.071
76					Second Largest	22.2					Second Largest	3.1
77					First Quartile	10.8					First Quartile	2.38
78					Median	12.7					Median	2.542
79					Third Quartile	15.7					Third Quartile	2.754
80					Mean	14.47					Mean	2.538
81					SD	10.1					SD	0.49
82					Coefficient of Variation	0.698						
83					Skewness	3.687						
84												
85						Background Statistics						
86				Normal Distribution Test						Lognormal Distribution Test		
87					Shapiro Wilk Test Statistic	0.599					Shapiro Wilk Test Statistic	0.916
88					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
89				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
90												
91				Assuming Normal Distribution						Assuming Lognormal Distribution		
92					95% UTL with	95% Coverage	37.62				95% UTL with	95% Coverage	38.89
93					95% UPL (t)	32.09					95% UPL (t)	29.75
94					90% Percentile (z)	27.41					90% Percentile (z)	23.71
95					95% Percentile (z)	31.08					95% Percentile (z)	28.32
96					99% Percentile (z)	37.96					99% Percentile (z)	39.55
97												
98				Gamma Distribution Test						Data Distribution Test		
99					k star	3.438				Data do not follow a Discernable Distribution (0.05)		
100					Theta Star	4.21						
101					MLE of Mean	14.47						
102					MLE of Standard Deviation	7.806						
103					nu star	171.9						
104												
105					A-D Test Statistic	1.149				Nonparametric Statistics		
106					5% A-D Critical Value	0.749					90% Percentile	19.14
107					K-S Test Statistic	0.187					95% Percentile	21.86
108					5% K-S Critical Value	0.175					99% Percentile	49.86
109				Data not Gamma Distributed at 5% Significance Level								
110												

	A	B	C	D	E	F	G	H	I	J	K	L
111	Assuming Gamma Distribution						95% UTL with 95% Coverage					58.6
112					90% Percentile	24.94	95% Percentile Bootstrap UTL with 95% Coverage					58.6
113					95% Percentile	29.23	95% BCA Bootstrap UTL with 95% Coverage					58.6
114					99% Percentile	38.46					95% UPL	47.68
115											95% Chebyshev UPL	59.36
116					95% WH Approx. Gamma UPL	29.51					Upper Threshold Limit Based upon IQR	23.05
117					95% HW Approx. Gamma UPL	29.43						
118					95% WH Approx. Gamma UTL with 95% Coverage	36.55						
119					95% HW Approx. Gamma UTL with 95% Coverage	36.85						
120												
121												
122												
123	BARIUM											
124												
125	General Statistics											
126					Total Number of Observations	25	Number of Distinct Observations					25
127					Tolerance Factor	2.292						
128												
129	Raw Statistics						Log-Transformed Statistics					
130					Minimum	22.3					Minimum	3.105
131					Maximum	223					Maximum	5.407
132					Second Largest	172					Second Largest	5.147
133					First Quartile	44.2					First Quartile	3.789
134					Median	62.3					Median	4.132
135					Third Quartile	94.1					Third Quartile	4.544
136					Mean	75.69					Mean	4.187
137					SD	45.43					SD	0.525
138					Coefficient of Variation	0.6						
139					Skewness	1.834						
140												
141	Background Statistics											
142	Normal Distribution Test						Lognormal Distribution Test					
143					Shapiro Wilk Test Statistic	0.823					Shapiro Wilk Test Statistic	0.978
144					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
145	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
146												
147	Assuming Normal Distribution						Assuming Lognormal Distribution					
148					95% UTL with 95% Coverage	179.8					95% UTL with 95% Coverage	219.2
149					95% UPL (t)	155					95% UPL (t)	164.5
150					90% Percentile (z)	133.9					90% Percentile (z)	129
151					95% Percentile (z)	150.4					95% Percentile (z)	156.1
152					99% Percentile (z)	181.4					99% Percentile (z)	223.2
153												
154	Gamma Distribution Test						Data Distribution Test					
155					k star	3.314	Data appear Gamma Distributed at 5% Significance Level					
156					Theta Star	22.84						
157					MLE of Mean	75.69						
158					MLE of Standard Deviation	41.58						
159					nu star	165.7						
160												
161					A-D Test Statistic	0.529	Nonparametric Statistics					
162					5% A-D Critical Value	0.749					90% Percentile	114.2
163					K-S Test Statistic	0.16					95% Percentile	160.6
164					5% K-S Critical Value	0.175					99% Percentile	210.8
165	Data appear Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167				Assuming Gamma Distribution						95% UTL with	95% Coverage	223
168					90% Percentile	131.4			95% Percentile Bootstrap UTL with		95% Coverage	223
169					95% Percentile	154.4			95% BCA Bootstrap UTL with		95% Coverage	223
170					99% Percentile	204					95% UPL	207.7
171											95% Chebyshev UPL	277.7
172					95% WH Approx. Gamma UPL	157.1					Upper Threshold Limit Based upon IQR	169
173					95% HW Approx. Gamma UPL	158.3						
174				95% WH Approx. Gamma UTL with	95% Coverage	195.4						
175				95% HW Approx. Gamma UTL with	95% Coverage	199.7						
176												
177												
178												
179	BERYLLIUM											
180												
181					General Statistics							
182					Total Number of Observations	25					Number of Distinct Observations	16
183					Tolerance Factor	2.292						
184												
185				Raw Statistics						Log-Transformed Statistics		
186					Minimum	0.34					Minimum	-1.079
187					Maximum	1.1					Maximum	0.0953
188					Second Largest	1.1					Second Largest	0.0953
189					First Quartile	0.52					First Quartile	-0.654
190					Median	0.63					Median	-0.462
191					Third Quartile	0.85					Third Quartile	-0.163
192					Mean	0.699					Mean	-0.419
193					SD	0.247					SD	0.361
194					Coefficient of Variation	0.354						
195					Skewness	0.385						
196												
197					Background Statistics							
198				Normal Distribution Test						Lognormal Distribution Test		
199					Shapiro Wilk Test Statistic	0.91					Shapiro Wilk Test Statistic	0.935
200					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
201				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
202												
203				Assuming Normal Distribution						Assuming Lognormal Distribution		
204					95% UTL with	95% Coverage	1.266				95% UTL with	95% Coverage	1.503
205					95% UPL (t)	1.13					95% UPL (t)	1.234
206					90% Percentile (z)	1.016					90% Percentile (z)	1.044
207					95% Percentile (z)	1.106					95% Percentile (z)	1.19
208					99% Percentile (z)	1.274					99% Percentile (z)	1.521
209												
210				Gamma Distribution Test						Data Distribution Test		
211					k star	7.343				Data appear Gamma Distributed at 5% Significance Level		
212					Theta Star	0.0952						
213					MLE of Mean	0.699						
214					MLE of Standard Deviation	0.258						
215					nu star	367.1						
216												
217					A-D Test Statistic	0.608				Nonparametric Statistics		
218					5% A-D Critical Value	0.746					90% Percentile	1.1
219					K-S Test Statistic	0.124					95% Percentile	1.1
220					5% K-S Critical Value	0.175					99% Percentile	1.1

	A	B	C	D	E	F	G	H	I	J	K	L
221	Data appear Gamma Distributed at 5% Significance Level											
222												
223	Assuming Gamma Distribution						95% UTL with 95% Coverage					1.1
224					90% Percentile	1.044	95% Percentile Bootstrap UTL with 95% Coverage					1.1
225					95% Percentile	1.171	95% BCA Bootstrap UTL with 95% Coverage					1.1
226					99% Percentile	1.434					95% UPL	1.1
227											95% Chebyshev UPL	1.798
228					95% WH Approx. Gamma UPL	1.186	Upper Threshold Limit Based upon IQR					1.345
229					95% HW Approx. Gamma UPL	1.196						
230				95% WH Approx. Gamma UTL with	95% Coverage	1.39						
231				95% HW Approx. Gamma UTL with	95% Coverage	1.413						
232												
233												
234												
235	CALCIUM											
236												
237	General Statistics											
238					Total Number of Observations	25	Number of Distinct Observations					23
239					Tolerance Factor	2.292						
240												
241	Raw Statistics						Log-Transformed Statistics					
242					Minimum	682					Minimum	6.525
243					Maximum	7910					Maximum	8.976
244					Second Largest	4420					Second Largest	8.394
245					First Quartile	1150					First Quartile	7.048
246					Median	1510					Median	7.32
247					Third Quartile	2420					Third Quartile	7.792
248					Mean	1958					Mean	7.414
249					SD	1482					SD	0.537
250					Coefficient of Variation	0.757						
251					Skewness	3.041						
252												
253	Background Statistics											
254	Normal Distribution Test						Lognormal Distribution Test					
255					Shapiro Wilk Test Statistic	0.659					Shapiro Wilk Test Statistic	0.933
256					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
257	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
258												
259	Assuming Normal Distribution						Assuming Lognormal Distribution					
260				95% UTL with	95% Coverage	5355				95% UTL with	95% Coverage	5679
261					95% UPL (t)	4544					95% UPL (t)	4233
262					90% Percentile (z)	3857					90% Percentile (z)	3301
263					95% Percentile (z)	4395					95% Percentile (z)	4012
264					99% Percentile (z)	5405					99% Percentile (z)	5784
265												
266	Gamma Distribution Test						Data Distribution Test					
267					k star	2.818	Data appear Lognormal at 5% Significance Level					
268					Theta Star	694.7						
269					MLE of Mean	1958						
270					MLE of Standard Deviation	1166						
271					nu star	140.9						
272												
273					A-D Test Statistic	1.052	Nonparametric Statistics					
274					5% A-D Critical Value	0.751					90% Percentile	2668
275					K-S Test Statistic	0.211					95% Percentile	4076

	A	B	C	D	E	F	G	H	I	J	K	L
276					5% K-S Critical Value	0.176					99% Percentile	7072
277			Data not Gamma Distributed at 5% Significance Level									
278												
279			Assuming Gamma Distribution								95% UTL with 95% Coverage	7910
280					90% Percentile	3521					95% Percentile Bootstrap UTL with 95% Coverage	7910
281					95% Percentile	4184					95% BCA Bootstrap UTL with 95% Coverage	7910
282					99% Percentile	5625					95% UPL	6863
283											95% Chebyshev UPL	8546
284					95% WH Approx. Gamma UPL	4233					Upper Threshold Limit Based upon IQR	4325
285					95% HW Approx. Gamma UPL	4220						
286					95% WH Approx. Gamma UTL with 95% Coverage	5338						
287					95% HW Approx. Gamma UTL with 95% Coverage	5389						
288												
289												
290												
291	CHROMIUM											
292												
293					General Statistics							
294					Total Number of Observations	25					Number of Distinct Observations	25
295					Tolerance Factor	2.292						
296												
297			Raw Statistics						Log-Transformed Statistics			
298					Minimum	11.6					Minimum	2.451
299					Maximum	103					Maximum	4.635
300					Second Largest	92.8					Second Largest	4.53
301					First Quartile	43.6					First Quartile	3.775
302					Median	55.2					Median	4.011
303					Third Quartile	75.6					Third Quartile	4.325
304					Mean	57.72					Mean	3.948
305					SD	23.69					SD	0.524
306					Coefficient of Variation	0.41						
307					Skewness	-0.0314						
308												
309					Background Statistics							
310			Normal Distribution Test						Lognormal Distribution Test			
311					Shapiro Wilk Test Statistic	0.984					Shapiro Wilk Test Statistic	0.896
312					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
313			Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level			
314												
315			Assuming Normal Distribution						Assuming Lognormal Distribution			
316					95% UTL with 95% Coverage	112					95% UTL with 95% Coverage	172.1
317					95% UPL (t)	99.05					95% UPL (t)	129.2
318					90% Percentile (z)	88.08					90% Percentile (z)	101.4
319					95% Percentile (z)	96.69					95% Percentile (z)	122.6
320					99% Percentile (z)	112.8					99% Percentile (z)	175.2
321												
322			Gamma Distribution Test						Data Distribution Test			
323					k star	4.25			Data appear Normal at 5% Significance Level			
324					Theta Star	13.58						
325					MLE of Mean	57.72						
326					MLE of Standard Deviation	28						
327					nu star	212.5						
328												
329					A-D Test Statistic	0.402			Nonparametric Statistics			
330					5% A-D Critical Value	0.747					90% Percentile	89.18

	A	B	C	D	E	F	G	H	I	J	K	L
331					K-S Test Statistic	0.103					95% Percentile	92.62
332					5% K-S Critical Value	0.175					99% Percentile	100.6
333			Data appear Gamma Distributed at 5% Significance Level									
334												
335			Assuming Gamma Distribution								95% UTL with 95% Coverage	103
336					90% Percentile	95.25					95% Percentile Bootstrap UTL with 95% Coverage	103
337					95% Percentile	110.1					95% BCA Bootstrap UTL with 95% Coverage	103
338					99% Percentile	141.8					95% UPL	99.94
339											95% Chebyshev UPL	163
340					95% WH Approx. Gamma UPL	112.2					Upper Threshold Limit Based upon IQR	123.6
341					95% HW Approx. Gamma UPL	115.3						
342					95% WH Approx. Gamma UTL with 95% Coverage	136.6						
343					95% HW Approx. Gamma UTL with 95% Coverage	142.8						
344												
345												
346												
347	COBALT											
348												
349					General Statistics							
350					Total Number of Observations	25					Number of Distinct Observations	21
351					Tolerance Factor	2.292						
352												
353			Raw Statistics						Log-Transformed Statistics			
354					Minimum	3.1					Minimum	1.131
355					Maximum	24.2					Maximum	3.186
356					Second Largest	17					Second Largest	2.833
357					First Quartile	7.7					First Quartile	2.041
358					Median	10.5					Median	2.351
359					Third Quartile	12.7					Third Quartile	2.542
360					Mean	10.96					Mean	2.306
361					SD	4.506					SD	0.452
362					Coefficient of Variation	0.411						
363					Skewness	0.801						
364												
365					Background Statistics							
366			Normal Distribution Test						Lognormal Distribution Test			
367					Shapiro Wilk Test Statistic	0.951					Shapiro Wilk Test Statistic	0.945
368					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
369			Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level			
370												
371			Assuming Normal Distribution						Assuming Lognormal Distribution			
372					95% UTL with 95% Coverage	21.29					95% UTL with 95% Coverage	28.29
373					95% UPL (t)	18.83					95% UPL (t)	22.09
374					90% Percentile (z)	16.74					90% Percentile (z)	17.91
375					95% Percentile (z)	18.38					95% Percentile (z)	21.11
376					99% Percentile (z)	21.45					99% Percentile (z)	28.73
377												
378			Gamma Distribution Test						Data Distribution Test			
379					k star	5.128			Data appear Normal at 5% Significance Level			
380					Theta Star	2.138						
381					MLE of Mean	10.96						
382					MLE of Standard Deviation	4.842						
383					nu star	256.4						
384												
385					A-D Test Statistic	0.382			Nonparametric Statistics			

	A	B	C	D	E	F	G	H	I	J	K	L
386					5% A-D Critical Value	0.747					90% Percentile	15.58
387					K-S Test Statistic	0.149					95% Percentile	16.82
388					5% K-S Critical Value	0.175					99% Percentile	22.47
389			Data appear Gamma Distributed at 5% Significance Level									
390												
391			Assuming Gamma Distribution								95% UTL with 95% Coverage	24.2
392					90% Percentile	17.44					95% Percentile Bootstrap UTL with 95% Coverage	24.2
393					95% Percentile	19.95					95% BCA Bootstrap UTL with 95% Coverage	22.76
394					99% Percentile	25.23					95% UPL	22.04
395											95% Chebyshev UPL	30.99
396					95% WH Approx. Gamma UPL	20.27					Upper Threshold Limit Based upon IQR	20.2
397					95% HW Approx. Gamma UPL	20.61						
398					95% WH Approx. Gamma UTL with 95% Coverage	24.33						
399					95% HW Approx. Gamma UTL with 95% Coverage	25.07						
400												
401												
402												
403	COPPER											
404												
405					General Statistics							
406					Total Number of Observations	25					Number of Distinct Observations	25
407					Tolerance Factor	2.292						
408												
409				Raw Statistics						Log-Transformed Statistics		
410					Minimum	8.5					Minimum	2.14
411					Maximum	316					Maximum	5.756
412					Second Largest	232					Second Largest	5.447
413					First Quartile	19.7					First Quartile	2.981
414					Median	33.3					Median	3.506
415					Third Quartile	68					Third Quartile	4.22
416					Mean	66.96					Mean	3.71
417					SD	77.7					SD	0.976
418					Coefficient of Variation	1.16						
419					Skewness	2.044						
420												
421					Background Statistics							
422				Normal Distribution Test						Lognormal Distribution Test		
423					Shapiro Wilk Test Statistic	0.715					Shapiro Wilk Test Statistic	0.959
424					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
425				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
426												
427				Assuming Normal Distribution						Assuming Lognormal Distribution		
428					95% UTL with 95% Coverage	245					95% UTL with 95% Coverage	382.8
429					95% UPL (t)	202.5					95% UPL (t)	224.3
430					90% Percentile (z)	166.5					90% Percentile (z)	142.7
431					95% Percentile (z)	194.8					95% Percentile (z)	203.5
432					99% Percentile (z)	247.7					99% Percentile (z)	395.8
433												
434				Gamma Distribution Test						Data Distribution Test		
435					k star	1.038				Data Follow Appr. Gamma Distribution at 5% Significance Level		
436					Theta Star	64.53						
437					MLE of Mean	66.96						
438					MLE of Standard Deviation	65.73						
439					nu star	51.89						
440												

	A–E	F	G–K	L
441	A-D Test Statistic	0.952	**Nonparametric Statistics**	
442	5% A-D Critical Value	0.77	90% Percentile	177.5
443	K-S Test Statistic	0.171	95% Percentile	223.3
444	5% K-S Critical Value	0.179	99% Percentile	295.8
445	**Data follow Appx. Gamma Distribution at 5% Significance Level**			
446				
447	**Assuming Gamma Distribution**		95% UTL with 95% Coverage	316
448	90% Percentile	152.8	95% Percentile Bootstrap UTL with 95% Coverage	316
449	95% Percentile	198	95% BCA Bootstrap UTL with 95% Coverage	316
450	99% Percentile	302.7	95% UPL	290.8
451			95% Chebyshev UPL	412.3
452	95% WH Approx. Gamma UPL	201.2	Upper Threshold Limit Based upon IQR	140.5
453	95% HW Approx. Gamma UPL	204.2		
454	95% WH Approx. Gamma UTL with 95% Coverage	282.2		
455	95% HW Approx. Gamma UTL with 95% Coverage	296.4		
456				
457				
458				
459	**IRON**			
460				
461	**General Statistics**			
462	Total Number of Observations	25	Number of Distinct Observations	24
463	Tolerance Factor	2.292		
464				
465	**Raw Statistics**		**Log-Transformed Statistics**	
466	Minimum	8730	Minimum	9.075
467	Maximum	45000	Maximum	10.71
468	Second Largest	32200	Second Largest	10.38
469	First Quartile	18900	First Quartile	9.847
470	Median	21100	Median	9.957
471	Third Quartile	24500	Third Quartile	10.11
472	Mean	22195	Mean	9.952
473	SD	7422	SD	0.351
474	Coefficient of Variation	0.334		
475	Skewness	0.937		
476				
477	**Background Statistics**			
478	**Normal Distribution Test**		**Lognormal Distribution Test**	
479	Shapiro Wilk Test Statistic	0.92	Shapiro Wilk Test Statistic	0.922
480	Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
481	**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
482				
483	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
484	95% UTL with 95% Coverage	39206	95% UTL with 95% Coverage	46989
485	95% UPL (t)	35145	95% UPL (t)	38767
486	90% Percentile (z)	31707	90% Percentile (z)	32943
487	95% Percentile (z)	34403	95% Percentile (z)	37429
488	99% Percentile (z)	39461	99% Percentile (z)	47560
489				
490	**Gamma Distribution Test**		**Data Distribution Test**	
491	k star	8.091	**Data appear Normal at 5% Significance Level**	
492	Theta Star	2743		
493	MLE of Mean	22195		
494	MLE of Standard Deviation	7803		
495	nu star	404.5		

	A	B	C	D	E	F	G	H	I	J	K	L
496												
497					A-D Test Statistic	0.668				Nonparametric Statistics		
498					5% A-D Critical Value	0.745					90% Percentile	30140
499					K-S Test Statistic	0.143					95% Percentile	32180
500					5% K-S Critical Value	0.175					99% Percentile	41928
501		Data appear Gamma Distributed at 5% Significance Level										
502												
503			Assuming Gamma Distribution								95% UTL with 95% Coverage	45000
504					90% Percentile	32597				95% Percentile Bootstrap UTL with 95% Coverage		45000
505					95% Percentile	36391				95% BCA Bootstrap UTL with 95% Coverage		42440
506					99% Percentile	44244					95% UPL	41160
507											95% Chebyshev UPL	55187
508					95% WH Approx. Gamma UPL	36818				Upper Threshold Limit Based upon IQR		32900
509					95% HW Approx. Gamma UPL	37206						
510				95% WH Approx. Gamma UTL with	95% Coverage	42850						
511				95% HW Approx. Gamma UTL with	95% Coverage	43662						
512												
513												
514												
515	LEAD											
516												
517					General Statistics							
518					Total Number of Observations	25				Number of Distinct Observations		25
519					Tolerance Factor	2.292						
520												
521				Raw Statistics						Log-Transformed Statistics		
522					Minimum	9.5					Minimum	2.251
523					Maximum	1100					Maximum	7.003
524					Second Largest	543					Second Largest	6.297
525					First Quartile	50.7					First Quartile	3.926
526					Median	89.7					Median	4.496
527					Third Quartile	173					Third Quartile	5.153
528					Mean	176.7					Mean	4.454
529					SD	243.9					SD	1.271
530					Coefficient of Variation	1.38						
531					Skewness	2.672						
532												
533					Background Statistics							
534				Normal Distribution Test						Lognormal Distribution Test		
535					Shapiro Wilk Test Statistic	0.663					Shapiro Wilk Test Statistic	0.966
536					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
537				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
538												
539				Assuming Normal Distribution						Assuming Lognormal Distribution		
540					95% UTL with 95% Coverage	735.7					95% UTL with 95% Coverage	1585
541					95% UPL (t)	602.2					95% UPL (t)	790.5
542					90% Percentile (z)	489.2					90% Percentile (z)	438.7
543					95% Percentile (z)	577.8					95% Percentile (z)	696.2
544					99% Percentile (z)	744					99% Percentile (z)	1656
545												
546				Gamma Distribution Test						Data Distribution Test		
547					k star	0.749				Data appear Gamma Distributed at 5% Significance Level		
548					Theta Star	235.8						
549					MLE of Mean	176.7						
550					MLE of Standard Deviation	204.1						

	A	B	C	D	E	F	G	H	I	J	K	L
551					nu star	37.47						
552												
553					A-D Test Statistic	0.574	**Nonparametric Statistics**					
554					5% A-D Critical Value	0.78					90% Percentile	470.4
555					K-S Test Statistic	0.162					95% Percentile	539.6
556					5% K-S Critical Value	0.181					99% Percentile	966.3
557	**Data appear Gamma Distributed at 5% Significance Level**											
558												
559			**Assuming Gamma Distribution**							95% UTL with	95% Coverage	1100
560					90% Percentile	436.5			95% Percentile Bootstrap UTL with		95% Coverage	1100
561					95% Percentile	586.9			95% BCA Bootstrap UTL with		95% Coverage	1100
562					99% Percentile	943.9					95% UPL	932.9
563											95% Chebyshev UPL	1261
564					95% WH Approx. Gamma UPL	590.6					Upper Threshold Limit Based upon IQR	356.5
565					95% HW Approx. Gamma UPL	611.5						
566				95% WH Approx. Gamma UTL with	95% Coverage	861.1						
567				95% HW Approx. Gamma UTL with	95% Coverage	935.3						
568												
569												
570												
571	**MAGNESIUM**											
572												
573					**General Statistics**							
574					Total Number of Observations	25					Number of Distinct Observations	25
575					Tolerance Factor	2.292						
576												
577			**Raw Statistics**				**Log-Transformed Statistics**					
578					Minimum	1500					Minimum	7.313
579					Maximum	17200					Maximum	9.753
580					Second Largest	13200					Second Largest	9.488
581					First Quartile	4870					First Quartile	8.491
582					Median	6810					Median	8.826
583					Third Quartile	9620					Third Quartile	9.172
584					Mean	7212					Mean	8.748
585					SD	3609					SD	0.569
586					Coefficient of Variation	0.5						
587					Skewness	0.873						
588												
589					**Background Statistics**							
590			**Normal Distribution Test**				**Lognormal Distribution Test**					
591					Shapiro Wilk Test Statistic	0.944					Shapiro Wilk Test Statistic	0.933
592					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
593			**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**					
594												
595			**Assuming Normal Distribution**				**Assuming Lognormal Distribution**					
596					95% UTL with	95% Coverage	15484			95% UTL with	95% Coverage	23188
597					95% UPL (t)	13509					95% UPL (t)	16988
598					90% Percentile (z)	11837					90% Percentile (z)	13055
599					95% Percentile (z)	13148					95% Percentile (z)	16050
600					99% Percentile (z)	15608					99% Percentile (z)	23646
601												
602			**Gamma Distribution Test**				**Data Distribution Test**					
603					k star	3.422	**Data appear Normal at 5% Significance Level**					
604					Theta Star	2107						
605					MLE of Mean	7212						

	A	B	C	D	E	F	G	H	I	J	K	L
606					MLE of Standard Deviation	3898						
607					nu star	171.1						
608												
609					A-D Test Statistic	0.321	**Nonparametric Statistics**					
610					5% A-D Critical Value	0.749					90% Percentile	11220
611					K-S Test Statistic	0.105					95% Percentile	12860
612					5% K-S Critical Value	0.175					99% Percentile	16240
613	**Data appear Gamma Distributed at 5% Significance Level**											
614												
615			**Assuming Gamma Distribution**							95% UTL with	95% Coverage	17200
616					90% Percentile	12439			95% Percentile Bootstrap UTL with		95% Coverage	17200
617					95% Percentile	14583			95% BCA Bootstrap UTL with		95% Coverage	16400
618					99% Percentile	19197					95% UPL	16000
619											95% Chebyshev UPL	23255
620					95% WH Approx. Gamma UPL	14877					Upper Threshold Limit Based upon IQR	16745
621					95% HW Approx. Gamma UPL	15251						
622					95% WH Approx. Gamma UTL with 95% Coverage	18442						
623					95% HW Approx. Gamma UTL with 95% Coverage	19242						
624												
625												
626												
627	**MANGANESE**											
628												
629					**General Statistics**							
630					Total Number of Observations	25					Number of Distinct Observations	24
631					Tolerance Factor	2.292						
632												
633				**Raw Statistics**						**Log-Transformed Statistics**		
634					Minimum	110					Minimum	4.7
635					Maximum	611					Maximum	6.415
636					Second Largest	460					Second Largest	6.131
637					First Quartile	243					First Quartile	5.493
638					Median	294					Median	5.684
639					Third Quartile	350					Third Quartile	5.858
640					Mean	307.5					Mean	5.669
641					SD	106.6					SD	0.362
642					Coefficient of Variation	0.347						
643					Skewness	0.801						
644												
645					**Background Statistics**							
646				**Normal Distribution Test**						**Lognormal Distribution Test**		
647					Shapiro Wilk Test Statistic	0.961					Shapiro Wilk Test Statistic	0.973
648					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
649				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
650												
651				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
652					95% UTL with 95% Coverage	551.9					95% UTL with 95% Coverage	663.8
653					95% UPL (t)	493.6					95% UPL (t)	544.6
654					90% Percentile (z)	444.2					90% Percentile (z)	460.6
655					95% Percentile (z)	482.9					95% Percentile (z)	525.3
656					99% Percentile (z)	555.6					99% Percentile (z)	672.1
657												
658				**Gamma Distribution Test**						**Data Distribution Test**		
659					k star	7.575				**Data appear Normal at 5% Significance Level**		
660					Theta Star	40.6						

	A	B	C	D	E	F	G	H	I	J	K	L
661					MLE of Mean	307.5						
662					MLE of Standard Deviation	111.7						
663					nu star	378.7						
664												
665					A-D Test Statistic	0.196	Nonparametric Statistics					
666					5% A-D Critical Value	0.745					90% Percentile	434.8
667					K-S Test Statistic	0.0909					95% Percentile	456
668					5% K-S Critical Value	0.175					99% Percentile	574.8
669	Data appear Gamma Distributed at 5% Significance Level											
670												
671			Assuming Gamma Distribution							95% UTL with	95% Coverage	611
672					90% Percentile	456.6			95% Percentile Bootstrap UTL with		95% Coverage	611
673					95% Percentile	511.4			95% BCA Bootstrap UTL with		95% Coverage	611
674					99% Percentile	625					95% UPL	565.7
675											95% Chebyshev UPL	781.5
676				95% WH Approx. Gamma UPL		517.7					Upper Threshold Limit Based upon IQR	510.5
677				95% HW Approx. Gamma UPL		523.1						
678			95% WH Approx. Gamma UTL with		95% Coverage	605.1						
679			95% HW Approx. Gamma UTL with		95% Coverage	616.6						
680												
681												
682												
683	NICKEL											
684												
685					General Statistics							
686					Total Number of Observations	25					Number of Distinct Observations	25
687					Tolerance Factor	2.292						
688												
689			Raw Statistics				Log-Transformed Statistics					
690					Minimum	8.1					Minimum	2.092
691					Maximum	73.2					Maximum	4.293
692					Second Largest	65					Second Largest	4.174
693					First Quartile	28.6					First Quartile	3.353
694					Median	38.2					Median	3.643
695					Third Quartile	44.7					Third Quartile	3.8
696					Mean	38.13					Mean	3.531
697					SD	15.92					SD	0.525
698					Coefficient of Variation	0.417						
699					Skewness	0.103						
700												
701					Background Statistics							
702			Normal Distribution Test				Lognormal Distribution Test					
703					Shapiro Wilk Test Statistic	0.982					Shapiro Wilk Test Statistic	0.901
704					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
705			Data appear Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level					
706												
707			Assuming Normal Distribution				Assuming Lognormal Distribution					
708					95% UTL with 95% Coverage	74.61					95% UTL with 95% Coverage	113.8
709					95% UPL (t)	65.9					95% UPL (t)	85.41
710					90% Percentile (z)	58.53					90% Percentile (z)	66.97
711					95% Percentile (z)	64.31					95% Percentile (z)	81.05
712					99% Percentile (z)	75.16					99% Percentile (z)	115.9
713												
714			Gamma Distribution Test				Data Distribution Test					
715					k star	4.184	Data appear Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
716					Theta Star	9.114						
717					MLE of Mean	38.13						
718					MLE of Standard Deviation	18.64						
719					nu star	209.2						
720												
721					A-D Test Statistic	0.543			Nonparametric Statistics			
722					5% A-D Critical Value	0.747					90% Percentile	56.52
723					K-S Test Statistic	0.155					95% Percentile	63.88
724					5% K-S Critical Value	0.175					99% Percentile	71.23
725		Data appear Gamma Distributed at 5% Significance Level										
726												
727			Assuming Gamma Distribution							95% UTL with	95% Coverage	73.2
728					90% Percentile	63.11			95% Percentile Bootstrap UTL with		95% Coverage	73.2
729					95% Percentile	73.04			95% BCA Bootstrap UTL with		95% Coverage	73.2
730					99% Percentile	94.2					95% UPL	70.74
731											95% Chebyshev UPL	108.9
732					95% WH Approx. Gamma UPL	74.43					Upper Threshold Limit Based upon IQR	68.85
733					95% HW Approx. Gamma UPL	76.46						
734				95% WH Approx. Gamma UTL with	95% Coverage	90.75						
735				95% HW Approx. Gamma UTL with	95% Coverage	94.79						
736												
737												
738												
739	POTASSIUM											
740												
741					General Statistics							
742					Total Number of Observations	25					Number of Distinct Observations	24
743					Tolerance Factor	2.292						
744												
745				Raw Statistics						Log-Transformed Statistics		
746					Minimum	585					Minimum	6.372
747					Maximum	6580					Maximum	8.792
748					Second Largest	6030					Second Largest	8.705
749					First Quartile	1110					First Quartile	7.012
750					Median	1460					Median	7.286
751					Third Quartile	1860					Third Quartile	7.528
752					Mean	1834					Mean	7.318
753					SD	1455					SD	0.594
754					Coefficient of Variation	0.794						
755					Skewness	2.538						
756												
757					Background Statistics							
758				Normal Distribution Test						Lognormal Distribution Test		
759					Shapiro Wilk Test Statistic	0.664					Shapiro Wilk Test Statistic	0.922
760					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
761				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
762												
763				Assuming Normal Distribution						Assuming Lognormal Distribution		
764					95% UTL with	95% Coverage	5169				95% UTL with	95% Coverage	5884
765					95% UPL (t)	4373					95% UPL (t)	4251
766					90% Percentile (z)	3699					90% Percentile (z)	3228
767					95% Percentile (z)	4228					95% Percentile (z)	4006
768					99% Percentile (z)	5219					99% Percentile (z)	6005
769												
770				Gamma Distribution Test						Data Distribution Test		

	A	B	C	D	E	F	G	H	I	J	K	L
771					k star	2.41	Data appear Lognormal at 5% Significance Level					
772					Theta Star	760.8						
773					MLE of Mean	1834						
774					MLE of Standard Deviation	1181						
775					nu star	120.5						
776												
777					A-D Test Statistic	1.163	Nonparametric Statistics					
778					5% A-D Critical Value	0.753					90% Percentile	2668
779					K-S Test Statistic	0.243					95% Percentile	5390
780					5% K-S Critical Value	0.176					99% Percentile	6448
781	Data not Gamma Distributed at 5% Significance Level											
782												
783	Assuming Gamma Distribution									95% UTL with	95% Coverage	6580
784					90% Percentile	3416			95% Percentile Bootstrap UTL with		95% Coverage	6580
785					95% Percentile	4105			95% BCA Bootstrap UTL with		95% Coverage	6580
786					99% Percentile	5618					95% UPL	6415
787											95% Chebyshev UPL	8303
788					95% WH Approx. Gamma UPL	4163					Upper Threshold Limit Based upon IQR	2985
789					95% HW Approx. Gamma UPL	4167						
790				95% WH Approx. Gamma UTL with	95% Coverage	5327						
791				95% HW Approx. Gamma UTL with	95% Coverage	5415						
792												
793												
794												
795	SODIUM											
796												
797					General Statistics							
798					Total Number of Observations	25					Number of Distinct Observations	24
799					Tolerance Factor	2.292						
800												
801				Raw Statistics			Log-Transformed Statistics					
802					Minimum	35.1					Minimum	3.558
803					Maximum	1345					Maximum	7.204
804					Second Largest	1060					Second Largest	6.966
805					First Quartile	55.6					First Quartile	4.018
806					Median	105					Median	4.654
807					Third Quartile	820					Third Quartile	6.709
808					Mean	397.8					Mean	5.204
809					SD	435.9					SD	1.344
810					Coefficient of Variation	1.096						
811					Skewness	0.781						
812												
813					Background Statistics							
814				Normal Distribution Test			Lognormal Distribution Test					
815					Shapiro Wilk Test Statistic	0.77					Shapiro Wilk Test Statistic	0.837
816					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
817				Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level					
818												
819				Assuming Normal Distribution			Assuming Lognormal Distribution					
820					95% UTL with	95% Coverage	1397			95% UTL with	95% Coverage	3963
821					95% UPL (t)	1158					95% UPL (t)	1899
822					90% Percentile (z)	956.5					90% Percentile (z)	1019
823					95% Percentile (z)	1115					95% Percentile (z)	1661
824					99% Percentile (z)	1412					99% Percentile (z)	4151
825												

	A	B	C	D	E	F	G	H	I	J	K	L
826	**Gamma Distribution Test**						**Data Distribution Test**					
827					k star	0.698	**Data do not follow a Discernable Distribution (0.05)**					
828					Theta Star	569.6						
829					MLE of Mean	397.8						
830					MLE of Standard Deviation	476						
831					nu star	34.92						
832												
833					A-D Test Statistic	2.009	**Nonparametric Statistics**					
834					5% A-D Critical Value	0.783					90% Percentile	991.2
835					K-S Test Statistic	0.258					95% Percentile	1054
836					5% K-S Critical Value	0.181					99% Percentile	1277
837	**Data not Gamma Distributed at 5% Significance Level**											
838												
839	**Assuming Gamma Distribution**									95% UTL with	95% Coverage	1345
840					90% Percentile	999.2			95% Percentile Bootstrap UTL with		95% Coverage	1345
841					95% Percentile	1355			95% BCA Bootstrap UTL with		95% Coverage	1288
842					99% Percentile	2205					95% UPL	1260
843											95% Chebyshev UPL	2336
844					95% WH Approx. Gamma UPL	1401					Upper Threshold Limit Based upon IQR	1967
845					95% HW Approx. Gamma UPL	1476						
846				95% WH Approx. Gamma UTL with	95% Coverage	2068						
847				95% HW Approx. Gamma UTL with	95% Coverage	2300						
848												
849												
850												
851	**THALLIUM**											
852												
853					**General Statistics**							
854					Total Number of Observations	25					Number of Distinct Observations	19
855					Tolerance Factor	2.292						
856												
857	**Raw Statistics**						**Log-Transformed Statistics**					
858					Minimum	0.158					Minimum	-1.848
859					Maximum	0.76					Maximum	-0.274
860					Second Largest	0.71					Second Largest	-0.342
861					First Quartile	0.21					First Quartile	-1.561
862					Median	0.56					Median	-0.58
863					Third Quartile	0.63					Third Quartile	-0.462
864					Mean	0.472					Mean	-0.869
865					SD	0.2					SD	0.533
866					Coefficient of Variation	0.425						
867					Skewness	-0.491						
868												
869					**Background Statistics**							
870	**Normal Distribution Test**						**Lognormal Distribution Test**					
871					Shapiro Wilk Test Statistic	0.846					Shapiro Wilk Test Statistic	0.791
872					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
873	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
874												
875	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
876					95% UTL with	95% Coverage	0.931				95% UTL with	95% Coverage	1.422
877					95% UPL (t)	0.821					95% UPL (t)	1.062
878					90% Percentile (z)	0.728					90% Percentile (z)	0.83
879					95% Percentile (z)	0.801					95% Percentile (z)	1.007
880					99% Percentile (z)	0.937					99% Percentile (z)	1.448

	A	B	C	D	E	F	G	H	I	J	K	L
881												
882				Gamma Distribution Test						Data Distribution Test		
883					k star	3.909				Data do not follow a Discernable Distribution (0.05)		
884					Theta Star	0.121						
885					MLE of Mean	0.472						
886					MLE of Standard Deviation	0.238						
887					nu star	195.5						
888												
889					A-D Test Statistic	2.26				Nonparametric Statistics		
890					5% A-D Critical Value	0.748					90% Percentile	0.662
891					K-S Test Statistic	0.241					95% Percentile	0.702
892					5% K-S Critical Value	0.175					99% Percentile	0.748
893			Data not Gamma Distributed at 5% Significance Level									
894												
895				Assuming Gamma Distribution						95% UTL with 95% Coverage		0.76
896					90% Percentile	0.791				95% Percentile Bootstrap UTL with 95% Coverage		0.76
897					95% Percentile	0.92				95% BCA Bootstrap UTL with 95% Coverage		0.76
898					99% Percentile	1.194					95% UPL	0.745
899											95% Chebyshev UPL	1.362
900					95% WH Approx. Gamma UPL	0.94				Upper Threshold Limit Based upon IQR		1.26
901					95% HW Approx. Gamma UPL	0.964						
902					95% WH Approx. Gamma UTL with 95% Coverage	1.153						
903					95% HW Approx. Gamma UTL with 95% Coverage	1.203						
904												
905												
906												
907	VANADIUM											
908												
909				General Statistics								
910					Total Number of Observations	25				Number of Distinct Observations		24
911					Tolerance Factor	2.292						
912												
913				Raw Statistics						Log-Transformed Statistics		
914					Minimum	13.5					Minimum	2.603
915					Maximum	89.5					Maximum	4.494
916					Second Largest	85.4					Second Largest	4.447
917					First Quartile	38.7					First Quartile	3.656
918					Median	46.8					Median	3.846
919					Third Quartile	62.1					Third Quartile	4.129
920					Mean	49.54					Mean	3.827
921					SD	18.27					SD	0.423
922					Coefficient of Variation	0.369						
923					Skewness	0.316						
924												
925				Background Statistics								
926				Normal Distribution Test						Lognormal Distribution Test		
927					Shapiro Wilk Test Statistic	0.98					Shapiro Wilk Test Statistic	0.938
928					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
929				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
930												
931				Assuming Normal Distribution						Assuming Lognormal Distribution		
932					95% UTL with 95% Coverage	91.42					95% UTL with 95% Coverage	121
933					95% UPL (t)	81.42					95% UPL (t)	96.02
934					90% Percentile (z)	72.96					90% Percentile (z)	78.94
935					95% Percentile (z)	79.6					95% Percentile (z)	92.05

	A	B	C	D	E	F	G	H	I	J	K	L
936					99% Percentile (z)	92.05					99% Percentile (z)	122.8
937												
938				Gamma Distribution Test						Data Distribution Test		
939					k star	5.965				Data appear Normal at 5% Significance Level		
940					Theta Star	8.305						
941					MLE of Mean	49.54						
942					MLE of Standard Deviation	20.28						
943					nu star	298.3						
944												
945					A-D Test Statistic	0.253				Nonparametric Statistics		
946					5% A-D Critical Value	0.746					90% Percentile	70.54
947					K-S Test Statistic	0.111					95% Percentile	82.94
948					5% K-S Critical Value	0.175					99% Percentile	88.52
949			Data appear Gamma Distributed at 5% Significance Level									
950												
951				Assuming Gamma Distribution						95% UTL with	95% Coverage	89.5
952					90% Percentile	76.66				95% Percentile Bootstrap UTL with	95% Coverage	89.5
953					95% Percentile	86.92				95% BCA Bootstrap UTL with	95% Coverage	89.5
954					99% Percentile	108.4					95% UPL	88.27
955											95% Chebyshev UPL	130.8
956				95% WH Approx. Gamma UPL		88.2				Upper Threshold Limit Based upon IQR		97.2
957				95% HW Approx. Gamma UPL		89.72						
958			95% WH Approx. Gamma UTL with		95% Coverage	104.8						
959			95% HW Approx. Gamma UTL with		95% Coverage	107.8						
960												
961												
962												
963	ZINC											
964												
965					General Statistics							
966					Total Number of Observations	25				Number of Distinct Observations		25
967					Tolerance Factor	2.292						
968												
969				Raw Statistics						Log-Transformed Statistics		
970					Minimum	23.1					Minimum	3.14
971					Maximum	1390					Maximum	7.237
972					Second Largest	267					Second Largest	5.587
973					First Quartile	73.7					First Quartile	4.3
974					Median	91.5					Median	4.516
975					Third Quartile	150					Third Quartile	5.011
976					Mean	161.9					Mean	4.642
977					SD	264.3					SD	0.811
978					Coefficient of Variation	1.632						
979					Skewness	4.517						
980												
981					Background Statistics							
982				Normal Distribution Test						Lognormal Distribution Test		
983					Shapiro Wilk Test Statistic	0.411					Shapiro Wilk Test Statistic	0.904
984					Shapiro Wilk Critical Value	0.918					Shapiro Wilk Critical Value	0.918
985				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
986												
987				Assuming Normal Distribution						Assuming Lognormal Distribution		
988					95% UTL with	95% Coverage	767.6				95% UTL with	95% Coverage	665.3
989					95% UPL (t)	623					95% UPL (t)	426.9
990					90% Percentile (z)	500.6					90% Percentile (z)	293.2

	A	B	C	D	E	F	G	H	I	J	K	L
991					95% Percentile (z)	596.6					95% Percentile (z)	393.6
992					99% Percentile (z)	776.6					99% Percentile (z)	684.1
993												
994			**Gamma Distribution Test**						**Data Distribution Test**			
995					k star	1.138			**Data do not follow a Discernable Distribution (0.05)**			
996					Theta Star	142.2						
997					MLE of Mean	161.9						
998					MLE of Standard Deviation	151.7						
999					nu star	56.92						
1000												
1001					A-D Test Statistic	1.979			**Nonparametric Statistics**			
1002					5% A-D Critical Value	0.767					90% Percentile	242.4
1003					K-S Test Statistic	0.263					95% Percentile	262.8
1004					5% K-S Critical Value	0.179					99% Percentile	1120
1005		**Data not Gamma Distributed at 5% Significance Level**										
1006												
1007			**Assuming Gamma Distribution**							95% UTL with	95% Coverage	1390
1008					90% Percentile	361				95% Percentile Bootstrap UTL with	95% Coverage	1390
1009					95% Percentile	463.4				95% BCA Bootstrap UTL with	95% Coverage	1390
1010					99% Percentile	698.9					95% UPL	1053
1011											95% Chebyshev UPL	1337
1012					95% WH Approx. Gamma UPL	451.4					Upper Threshold Limit Based upon IQR	264.5
1013					95% HW Approx. Gamma UPL	439.4						
1014				95% WH Approx. Gamma UTL with	95% Coverage	623.9						
1015				95% HW Approx. Gamma UTL with	95% Coverage	620.9						
1016												
1017												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	CADMIUM											
12												
13						General Statistics						
14						Number of Valid Data	25			Number of Detected Data	21	
15						Number of Distinct Detected Data	15			Number of Non-Detect Data	4	
16						Tolerance Factor	2.292			Percent Non-Detects	16.00%	
17												
18						Raw Statistics				Log-transformed Statistics		
19						Minimum Detected	0.82			Minimum Detected	-0.198	
20						Maximum Detected	3.4			Maximum Detected	1.224	
21						Mean of Detected	1.974			Mean of Detected	0.597	
22						SD of Detected	0.773			SD of Detected	0.431	
23						Minimum Non-Detect	0.74			Minimum Non-Detect	-0.301	
24						Maximum Non-Detect	0.88			Maximum Non-Detect	-0.128	
25												
26						Data with Multiple Detection Limits				Single Detection Limit Scenario		
27						Note: Data have multiple DLs - Use of KM Method is recommended				Number treated as Non-Detect with Single DL	5	
28						For all methods (except KM, DL/2, and ROS Methods),				Number treated as Detected with Single DL	20	
29						Observations < Largest ND are treated as NDs				Single DL Non-Detect Percentage	20.00%	
30												
31						Background Statistics						
32						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
33						Shapiro Wilk Test Statistic	0.92			Shapiro Wilk Test Statistic	0.913	
34						5% Shapiro Wilk Critical Value	0.908			5% Shapiro Wilk Critical Value	0.908	
35						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
36												
37						Assuming Normal Distribution				Assuming Lognormal Distribution		
38						DL/2 Substitution Method				DL/2 Substitution Method		
39						Mean	1.723			Mean (Log Scale)	0.358	
40						SD	0.917			SD (Log Scale)	0.684	
41						95% UTL 95% Coverage	3.825			95% UTL 95% Coverage	6.861	
42						95% UPL (t)	3.324			95% UPL (t)	4.719	
43						90% Percentile (z)	2.899			90% Percentile (z)	3.438	
44						95% Percentile (z)	3.232			95% Percentile (z)	4.407	
45						99% Percentile (z)	3.857			99% Percentile (z)	7.024	
46												
47						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
48						Mean	1.695			Mean in Original Scale	1.774	
49						SD	0.957			SD in Original Scale	0.847	
50						95% UTL with 95% Coverage	3.888			95% UTL with 95% Coverage	5.206	
51										95% BCA UTL with 95% Coverage	3.28	
52										95% Bootstrap (%) UTL with 95% Coverage	3.4	
53						95% UPL (t)	3.364			95% UPL (t)	3.909	
54						90% Percentile (z)	2.921			90% Percentile (z)	3.067	
55						95% Percentile (z)	3.269			95% Percentile (z)	3.71	

	A	B	C	D	E	F	G	H	I	J	K	L
56					99% Percentile (z)	3.921					99% Percentile (z)	5.3
57												
58				Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only			
59					k star (bias corrected)	5.357			Data appear Normal at 5% Significance Level			
60					Theta Star	0.368						
61					nu star	225						
62												
63					A-D Test Statistic	0.801			Nonparametric Statistics			
64					5% A-D Critical Value	0.745					Kaplan-Meier (KM) Method	
65					K-S Test Statistic	0.176					Mean	1.789
66					5% K-S Critical Value	0.19					SD	0.811
67				Data follow Appx. Gamma Distribution at 5% Significance Level							SE of Mean	0.166
68											95% KM UTL with 95% Coverage	3.647
69				Assuming Gamma Distribution							95% KM Chebyshev UPL	5.392
70					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	3.203
71					Mean	1.658					90% Percentile (z)	2.828
72					Median	1.6					95% Percentile (z)	3.122
73					SD	1.022					99% Percentile (z)	3.675
74					k star	0.299						
75					Theta star	5.54			Gamma ROS Limits with Extrapolated Data			
76					Nu star	14.96					95% Wilson Hilferty (WH) Approx. Gamma UPL	6.647
77					95% Percentile of Chisquare (2k)	2.74					95% Hawkins Wixley (HW) Approx. Gamma UPL	9.436
78											95% WH Approx. Gamma UTL with 95% Coverage	9.867
79					90% Percentile	4.891					95% HW Approx. Gamma UTL with 95% Coverage	15.78
80					95% Percentile	7.59						
81					99% Percentile	14.61						
82												
83	Note: DL/2 is not a recommended method.											
84												
85												
86	MERCURY											
87												
88					General Statistics							
89					Number of Valid Data	25					Number of Detected Data	6
90					Number of Distinct Detected Data	6					Number of Non-Detect Data	19
91					Tolerance Factor	2.292					Percent Non-Detects	76.00%
92												
93				Raw Statistics					Log-transformed Statistics			
94					Minimum Detected	0.0825					Minimum Detected	-2.495
95					Maximum Detected	1.8					Maximum Detected	0.588
96					Mean of Detected	0.525					Mean of Detected	-1.188
97					SD of Detected	0.648					SD of Detected	1.123
98					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
99					Maximum Non-Detect	0.31					Maximum Non-Detect	-1.171
100												
101				Data with Multiple Detection Limits					Single Detection Limit Scenario			
102	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	22
103	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	3
104	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	88.00%
105												
106												
107					Warning: There are only 6 Detected Values in this data							
108					Note: It should be noted that even though bootstrap may be performed on this data set							
109					the resulting calculations may not be reliable enough to draw conclusions							
110												

	A	B	C	D	E	F	G	H	I	J	K	L
111	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
112												
113	Background Statistics											
114	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
115					Shapiro Wilk Test Statistic	0.729				Shapiro Wilk Test Statistic		0.958
116					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
117	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
118												
119	Assuming Normal Distribution						Assuming Lognormal Distribution					
120					DL/2 Substitution Method					DL/2 Substitution Method		
121					Mean	0.191				Mean (Log Scale)		-2.204
122					SD	0.354				SD (Log Scale)		0.831
123					95% UTL 95% Coverage	1.002				95% UTL 95% Coverage		0.741
124					95% UPL (t)	0.808				95% UPL (t)		0.47
125					90% Percentile (z)	0.644				90% Percentile (z)		0.32
126					95% Percentile (z)	0.773				95% Percentile (z)		0.433
127					99% Percentile (z)	1.014				99% Percentile (z)		0.762
128												
129					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
130					Mean	-1.217				Mean in Original Scale		0.174
131					SD	1.288				SD in Original Scale		0.359
132					95% UTL with 95% Coverage	1.734				95% UTL with 95% Coverage		0.767
133										95% BCA UTL with 95% Coverage		1.8
134										95% Bootstrap (%) UTL with 95% Coverage		1.8
135					95% UPL (t)	1.03				95% UPL (t)		0.457
136					90% Percentile (z)	0.433				90% Percentile (z)		0.294
137					95% Percentile (z)	0.901				95% Percentile (z)		0.415
138					99% Percentile (z)	1.779				99% Percentile (z)		0.792
139												
140	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
141					k star (bias corrected)	0.638	Data appear Gamma Distributed at 5% Significance Level					
142					Theta Star	0.823						
143					nu star	7.661						
144												
145					A-D Test Statistic	0.353	Nonparametric Statistics					
146					5% A-D Critical Value	0.714				Kaplan-Meier (KM) Method		
147					K-S Test Statistic	0.219				Mean		0.192
148					5% K-S Critical Value	0.34				SD		0.346
149	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.0758
150										95% KM UTL with 95% Coverage		0.984
151	Assuming Gamma Distribution									95% KM Chebyshev UPL		1.728
152					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		0.795
153					Mean	0.141				90% Percentile (z)		0.635
154					Median	0.000001				95% Percentile (z)		0.76
155					SD	0.371				99% Percentile (z)		0.996
156					k star	0.127						
157					Theta star	1.112	Gamma ROS Limits with Extrapolated Data					
158					Nu star	6.355				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.592
159					95% Percentile of Chisquare (2k)	1.439				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.656
160										95% WH Approx. Gamma UTL with 95% Coverage		1.075
161					90% Percentile	0.406				95% HW Approx. Gamma UTL with 95% Coverage		1.415
162					95% Percentile	0.8						
163					99% Percentile	1.985						
164												
165	Note: DL/2 is not a recommended method.											

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167												
168	SELENIUM											
169												
170					General Statistics							
171					Number of Valid Data	25				Number of Detected Data		12
172					Number of Distinct Detected Data	11				Number of Non-Detect Data		13
173					Tolerance Factor	2.292				Percent Non-Detects		52.00%
174												
175					Raw Statistics					Log-transformed Statistics		
176					Minimum Detected	0.32				Minimum Detected		-1.139
177					Maximum Detected	2.1				Maximum Detected		0.742
178					Mean of Detected	0.668				Mean of Detected		-0.531
179					SD of Detected	0.467				SD of Detected		0.465
180					Minimum Non-Detect	0.38				Minimum Non-Detect		-0.968
181					Maximum Non-Detect	1.1				Maximum Non-Detect		0.0953
182												
183					Data with Multiple Detection Limits					Single Detection Limit Scenario		
184					Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL		24
185					For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL		1
186					Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage		96.00%
187												
188					Background Statistics							
189					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
190					Shapiro Wilk Test Statistic	0.578				Shapiro Wilk Test Statistic		0.816
191					5% Shapiro Wilk Critical Value	0.859				5% Shapiro Wilk Critical Value		0.859
192					Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
193												
194					Assuming Normal Distribution					Assuming Lognormal Distribution		
195					DL/2 Substitution Method					DL/2 Substitution Method		
196					Mean	0.519				Mean (Log Scale)		-0.806
197					SD	0.366				SD (Log Scale)		0.533
198					95% UTL 95% Coverage	1.358				95% UTL 95% Coverage		1.517
199					95% UPL (t)	1.158				95% UPL (t)		1.133
200					90% Percentile (z)	0.988				90% Percentile (z)		0.885
201					95% Percentile (z)	1.121				95% Percentile (z)		1.074
202					99% Percentile (z)	1.371				99% Percentile (z)		1.545
203												
204					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
205										Mean in Original Scale		0.518
206										SD in Original Scale		0.357
207										Mean in Log Scale		-0.777
208										SD in Log Scale		0.444
209										95% UTL 95% Coverage		1.273
210										95% UPL (t)		0.998
211										90% Percentile (z)		0.812
212										95% Percentile (z)		0.955
213										99% Percentile (z)		1.292
214												
215					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
216					k star (bias corrected)	3.112				Data do not follow a Discernable Distribution (0.05)		
217					Theta Star	0.215						
218					nu star	74.69						
219												
220					A-D Test Statistic	1.229				Nonparametric Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
221					5% A-D Critical Value	0.736					Kaplan-Meier (KM) Method	
222					K-S Test Statistic	0.292					Mean	0.534
223					5% K-S Critical Value	0.246					SD	0.347
224			**Data not Gamma Distributed at 5% Significance Level**								SE of Mean	0.0752
225										95% KM UTL with	95% Coverage	1.331
226			**Assuming Gamma Distribution**								95% KM Chebyshev UPL	2.079
227				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	1.14
228					Mean	0.489					90% Percentile (z)	0.979
229					Median	0.509					95% Percentile (z)	1.106
230					SD	0.404					99% Percentile (z)	1.343
231					k star	0.712						
232					Theta star	0.687			**Gamma ROS Limits with Extrapolated Data**			
233					Nu star	35.61					95% Wilson Hilferty (WH) Approx. Gamma UPL	1.507
234					95% Percentile of Chisquare (2k)	4.818					95% Hawkins Wixley (HW) Approx. Gamma UPL	1.79
235											95% WH Approx. Gamma UTL with 95% Coverage	2.093
236					90% Percentile	1.224					95% HW Approx. Gamma UTL with 95% Coverage	2.661
237					95% Percentile	1.656						
238					99% Percentile	2.686						
239												
240	**Note: DL/2 is not a recommended method.**											
241												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Full Data Sets								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	PH											
12												
13					General Statistics							
14					Total Number of Observations	8			Number of Distinct Observations		7	
15					Tolerance Factor	3.187						
16												
17				Raw Statistics					Log-Transformed Statistics			
18					Minimum	5.9			Minimum		1.775	
19					Maximum	8.3			Maximum		2.116	
20					Second Largest	7.1			Second Largest		1.96	
21					First Quartile	6.575			First Quartile		1.883	
22					Median	6.95			Median		1.939	
23					Third Quartile	7.1			Third Quartile		1.96	
24					Mean	6.925			Mean		1.931	
25					SD	0.686			SD		0.0971	
26					Coefficient of Variation	0.0991						
27					Skewness	0.839						
28												
29												
30					Warning: There are only 8 Values in this data							
31					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
32					the resulting calculations may not be reliable enough to draw conclusions							
33												
34					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
35												
36					Background Statistics							
37				Normal Distribution Test					Lognormal Distribution Test			
38					Shapiro Wilk Test Statistic	0.914			Shapiro Wilk Test Statistic		0.932	
39					Shapiro Wilk Critical Value	0.818			Shapiro Wilk Critical Value		0.818	
40				Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level			
41												
42				Assuming Normal Distribution					Assuming Lognormal Distribution			
43					95% UTL with 95% Coverage	9.112			95% UTL with 95% Coverage		9.398	
44					95% UPL (t)	8.304			95% UPL (t)		8.382	
45					90% Percentile (z)	7.804			90% Percentile (z)		7.81	
46					95% Percentile (z)	8.054			95% Percentile (z)		8.091	
47					99% Percentile (z)	8.521			99% Percentile (z)		8.644	
48												
49				Gamma Distribution Test					Data Distribution Test			
50					k star	75.03			Data appear Normal at 5% Significance Level			
51					Theta Star	0.0923						
52					MLE of Mean	6.925						
53					MLE of Standard Deviation	0.799						
54					nu star	1200						
55												

	A	B	C	D	E	F	G	H	I	J	K	L
56					A-D Test Statistic	0.395	Nonparametric Statistics					
57					5% A-D Critical Value	0.715					90% Percentile	7.46
58					K-S Test Statistic	0.255					95% Percentile	7.88
59					5% K-S Critical Value	0.294					99% Percentile	8.216
60	Data appear Gamma Distributed at 5% Significance Level											
61												
62	Assuming Gamma Distribution									95% UTL with	95% Coverage	8.3
63					90% Percentile	7.967			95% Percentile Bootstrap UTL with		95% Coverage	8.3
64					95% Percentile	8.29			95% BCA Bootstrap UTL with		95% Coverage	8.3
65					99% Percentile	8.919					95% UPL	8.3
66											95% Chebyshev UPL	10.1
67					95% WH Approx. Gamma UPL	8.352					Upper Threshold Limit Based upon IQR	7.888
68					95% HW Approx. Gamma UPL	8.359						
69				95% WH Approx. Gamma UTL with	95% Coverage	9.287						
70				95% HW Approx. Gamma UTL with	95% Coverage	9.313						
71												
72												
73												
74	TOTAL ORGANIC CARBON											
75												
76	General Statistics											
77					Total Number of Observations	8					Number of Distinct Observations	8
78					Tolerance Factor	3.187						
79												
80	Raw Statistics						Log-Transformed Statistics					
81					Minimum	0.6					Minimum	-0.511
82					Maximum	4.65					Maximum	1.537
83					Second Largest	3.9					Second Largest	1.361
84					First Quartile	1.15					First Quartile	0.108
85					Median	2.1					Median	0.713
86					Third Quartile	3.3					Third Quartile	1.189
87					Mean	2.306					Mean	0.606
88					SD	1.5					SD	0.77
89					Coefficient of Variation	0.65						
90					Skewness	0.393						
91												
92												
93	Warning: There are only 8 Values in this data											
94	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
95	the resulting calculations may not be reliable enough to draw conclusions											
96												
97	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
98												
99	Background Statistics											
100	Normal Distribution Test						Lognormal Distribution Test					
101					Shapiro Wilk Test Statistic	0.933					Shapiro Wilk Test Statistic	0.928
102					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
103	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
104												
105	Assuming Normal Distribution						Assuming Lognormal Distribution					
106					95% UTL with	95% Coverage	7.087			95% UTL with	95% Coverage	21.3
107					95% UPL (t)	5.321					95% UPL (t)	8.607
108					90% Percentile (z)	4.229					90% Percentile (z)	4.916
109					95% Percentile (z)	4.774					95% Percentile (z)	6.501
110					99% Percentile (z)	5.796					99% Percentile (z)	10.98

	A	B	C	D	E	F	G	H	I	J	K	L
111												
112				**Gamma Distribution Test**					**Data Distribution Test**			
113					k star	1.541			**Data appear Normal at 5% Significance Level**			
114					Theta Star	1.496						
115					MLE of Mean	2.306						
116					MLE of Standard Deviation	1.858						
117					nu star	24.66						
118												
119					A-D Test Statistic	0.265			**Nonparametric Statistics**			
120					5% A-D Critical Value	0.723					90% Percentile	4.125
121					K-S Test Statistic	0.157					95% Percentile	4.388
122					5% K-S Critical Value	0.297					99% Percentile	4.598
123				**Data appear Gamma Distributed at 5% Significance Level**								
124												
125				**Assuming Gamma Distribution**						95% UTL with	95% Coverage	4.65
126					90% Percentile	4.774				95% Percentile Bootstrap UTL with	95% Coverage	4.65
127					95% Percentile	5.954				95% BCA Bootstrap UTL with	95% Coverage	4.65
128					99% Percentile	8.612					95% UPL	4.65
129											95% Chebyshev UPL	9.242
130					95% WH Approx. Gamma UPL	6.633					Upper Threshold Limit Based upon IQR	6.525
131					95% HW Approx. Gamma UPL	6.969						
132					95% WH Approx. Gamma UTL with 95% Coverage	11.28						
133					95% HW Approx. Gamma UTL with 95% Coverage	12.6						
134												
135												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	BIS(2-ETHYLHEXYL)PHTHALATE											
12												
13				General Statistics								
14				Number of Valid Data	25			Number of Detected Data	3			
15				Number of Distinct Detected Data	3			Number of Non-Detect Data	22			
16				Warning: Data set has only 3 Detected Values.								
17				This is not enough to compute meaningful and reliable test statistics and estimates.								
18				No statistics will be produced!								
19												
20				Tolerance Factor	2.292			Percent Non-Detects	88.00%			
21												
22				Raw Statistics				Log-transformed Statistics				
23				Minimum Detected	58			Minimum Detected	4.06			
24				Maximum Detected	650			Maximum Detected	6.477			
25				Mean of Detected	261.7			Mean of Detected	4.96			
26				SD of Detected	336.4			SD of Detected	1.321			
27				Minimum Non-Detect	39			Minimum Non-Detect	3.664			
28				Maximum Non-Detect	410			Maximum Non-Detect	6.016			
29												
30				Data with Multiple Detection Limits				Single Detection Limit Scenario				
31				Note: Data have multiple DLs - Use of KM Method is recommended				Number treated as Non-Detect with Single DL	24			
32				For all methods (except KM, DL/2, and ROS Methods),				Number treated as Detected with Single DL	1			
33				Observations < Largest ND are treated as NDs				Single DL Non-Detect Percentage	96.00%			
34												
35												
36				Warning: There are only 3 Distinct Detected Values in this data set								
37				The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.								
38				Those methods will return a 'N/A' value on your output display!								
39												
40				It is necessary to have 4 or more Distinct Values for bootstrap methods.								
41				However, results obtained using 4 to 9 distinct values may not be reliable.								
42				It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.								
43												
44				Background Statistics								
45				Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only				
46				Shapiro Wilk Test Statistic	0.774			Shapiro Wilk Test Statistic	0.837			
47				5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value	0.767			
48				Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
49												
50				Assuming Normal Distribution				Assuming Lognormal Distribution				
51				DL/2 Substitution Method				DL/2 Substitution Method				
52				Mean	112.5			Mean (Log Scale)	4.357			
53				SD	128			SD (Log Scale)	0.819			
54				95% UTL 95% Coverage	405.8			95% UTL 95% Coverage	509.5			
55				95% UPL (t)	335.8			95% UPL (t)	325.5			

	A–E	F	G–K	L
56	90% Percentile (z)	276.5	90% Percentile (z)	222.7
57	95% Percentile (z)	323	95% Percentile (z)	299.9
58	99% Percentile (z)	410.2	99% Percentile (z)	524
59				
60	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
61			Mean in Original Scale	44.45
62			SD in Original Scale	127.2
63			Mean in Log Scale	2.858
64			SD in Log Scale	0.999
65			95% UTL 95% Coverage	171.9
66			95% UPL (t)	99.51
67			90% Percentile (z)	62.66
68			95% Percentile (z)	90.06
69			99% Percentile (z)	177.9
70				
71	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
72	k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
73	Theta Star	N/A		
74	nu star	N/A		
75				
76	A-D Test Statistic	N/A	**Nonparametric Statistics**	
77	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
78	K-S Test Statistic	N/A	Mean	84.29
79	5% K-S Critical Value	N/A	SD	115.7
80	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	28.44
81			95% KM UTL with 95% Coverage	349.4
82	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	598.4
83	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	286.1
84	Mean	N/A	90% Percentile (z)	232.5
85	Median	N/A	95% Percentile (z)	274.5
86	SD	N/A	99% Percentile (z)	353.4
87	k star	N/A		
88	Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
89	Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
90	95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
91			95% WH Approx. Gamma UTL with 95% Coverage	N/A
92	90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
93	95% Percentile	N/A		
94	99% Percentile	N/A		
95				
96	**Note: DL/2 is not a recommended method.**			
97				
98				
99	**TOTAL PETROLEUM HYDROCARBONS**			
100				
101	**General Statistics**			
102	Total Number of Observations	4	Number of Distinct Observations	4
103	Tolerance Factor	5.144	Number of Missing Values	15
104				
105				
106	**Warning: This data set only has 4 observations!**			
107	**Data set is too small to compute reliable and meaningful statistics and estimates!**			
108	**The data set for variable TOTAL PETROLEUM HYDROCARBONS was not processed!**			
109				
110	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**			

	A	B	C	D	E	F	G	H	I	J	K	L
111	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
112												
113												
114												
115	METHYLENE CHLORIDE											
116												
117	General Statistics											
118					Number of Valid Data	24				Number of Detected Data		3
119					Number of Distinct Detected Data	2				Number of Non-Detect Data		21
120	Warning: Data set has only 3 Detected Values.											
121	This is not enough to compute meaningful and reliable test statistics and estimates.											
122	No statistics will be produced!											
123												
124					Tolerance Factor	2.309				Percent Non-Detects		87.50%
125					Number of Missing Values	1						
126												
127	Raw Statistics						Log-transformed Statistics					
128					Minimum Detected	1				Minimum Detected		0
129					Maximum Detected	2				Maximum Detected		0.693
130					Mean of Detected	1.667				Mean of Detected		0.462
131					SD of Detected	0.577				SD of Detected		0.4
132					Minimum Non-Detect	5				Minimum Non-Detect		1.609
133					Maximum Non-Detect	13				Maximum Non-Detect		2.565
134												
135	Data with Multiple Detection Limits						Single Detection Limit Scenario					
136	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		24
137	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		0
138	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
139												
140												
141	Warning: Data set has only 2 Distinct Detected Values.											
142	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
143	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
144												
145	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
146												
147	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
148	Those methods will return a 'N/A' value on your output display!											
149												
150	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
151	However, results obtained using 4 to 9 distinct values may not be reliable.											
152	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
153												
154	Background Statistics											
155	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
156					Shapiro Wilk Test Statistic	0.75				Shapiro Wilk Test Statistic		0.75
157					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
158	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
159												
160	Assuming Normal Distribution						Assuming Lognormal Distribution					
161					DL/2 Substitution Method					DL/2 Substitution Method		
162					Mean	4.583				Mean (Log Scale)		1.436
163					SD	1.586				SD (Log Scale)		0.475
164					95% UTL 95% Coverage	8.245				95% UTL 95% Coverage		12.6
165					95% UPL (t)	7.357				95% UPL (t)		9.654

	A	B	C	D	E	F	G	H	I	J	K	L
166					90% Percentile (z)	6.616					90% Percentile (z)	7.73
167					95% Percentile (z)	7.192					95% Percentile (z)	9.187
168					99% Percentile (z)	8.272					99% Percentile (z)	12.7
169												
170				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
171											Mean in Original Scale	1.688
172											SD in Original Scale	0.612
173											Mean in Log Scale	0.462
174											SD in Log Scale	0.36
175											95% UTL 95% Coverage	3.645
176											95% UPL (t)	2.98
177											90% Percentile (z)	2.518
178											95% Percentile (z)	2.87
179											99% Percentile (z)	3.668
180												
181				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
182					k star (bias corrected)	N/A				Data do not follow a Discernable Distribution (0.05)		
183					Theta Star	N/A						
184					nu star	N/A						
185												
186					A-D Test Statistic	N/A				**Nonparametric Statistics**		
187					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
188					K-S Test Statistic	N/A					Mean	1.667
189					5% K-S Critical Value	N/A					SD	0.471
190				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.333
191											95% KM UTL with 95% Coverage	2.755
192				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	3.764
193				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	2.491
194					Mean	N/A					90% Percentile (z)	2.271
195					Median	N/A					95% Percentile (z)	2.442
196					SD	N/A					99% Percentile (z)	2.763
197					k star	N/A						
198					Theta star	N/A				**Gamma ROS Limits with Extrapolated Data**		
199					Nu star	N/A					95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
200					95% Percentile of Chisquare (2k)	N/A					95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
201											95% WH Approx. Gamma UTL with 95% Coverage	N/A
202					90% Percentile	N/A					95% HW Approx. Gamma UTL with 95% Coverage	N/A
203					95% Percentile	N/A						
204					99% Percentile	N/A						
205												
206	**Note: DL/2 is not a recommended method.**											
207												
208												
209	**BENZO(A)ANTHRACENE**											
210												
211					**General Statistics**							
212					Number of Valid Data	25					Number of Detected Data	15
213					Number of Distinct Detected Data	15					Number of Non-Detect Data	10
214					Tolerance Factor	2.292					Percent Non-Detects	40.00%
215												
216				**Raw Statistics**						**Log-transformed Statistics**		
217					Minimum Detected	37					Minimum Detected	3.611
218					Maximum Detected	640					Maximum Detected	6.461
219					Mean of Detected	148.4					Mean of Detected	4.583
220					SD of Detected	175.6					SD of Detected	0.851

	A–E	F	G–K	L
221	Minimum Non-Detect	350	Minimum Non-Detect	5.858
222	Maximum Non-Detect	400	Maximum Non-Detect	5.991
223				
224	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
225	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	23
226	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	2
227	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.00%
228				
229	**Background Statistics**			
230	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
231	Shapiro Wilk Test Statistic	0.638	Shapiro Wilk Test Statistic	0.887
232	5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
233	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
234				
235	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
236	DL/2 Substitution Method		DL/2 Substitution Method	
237	Mean	163.7	Mean (Log Scale)	4.841
238	SD	135.5	SD (Log Scale)	0.726
239	95% UTL 95% Coverage	474.3	95% UTL 95% Coverage	668.3
240	95% UPL (t)	400.1	95% UPL (t)	449.2
241	90% Percentile (z)	337.4	90% Percentile (z)	320.9
242	95% Percentile (z)	386.6	95% Percentile (z)	417.8
243	99% Percentile (z)	479	99% Percentile (z)	685.1
244				
245	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
246			Mean in Original Scale	123.6
247			SD in Original Scale	139.1
248			Mean in Log Scale	4.507
249			SD in Log Scale	0.699
250			95% UTL 95% Coverage	449.2
251			95% UPL (t)	306.5
252			90% Percentile (z)	221.8
253			95% Percentile (z)	285.9
254			99% Percentile (z)	460.1
255				
256	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
257	k star (bias corrected)	1.118	Data appear Lognormal at 5% Significance Level	
258	Theta Star	132.7		
259	nu star	33.55		
260				
261	A-D Test Statistic	1.175	**Nonparametric Statistics**	
262	5% A-D Critical Value	0.757	Kaplan-Meier (KM) Method	
263	K-S Test Statistic	0.243	Mean	123.1
264	5% K-S Critical Value	0.226	SD	138.1
265	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	29.71
266			95% KM UTL with 95% Coverage	439.7
267	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	737.2
268	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	364.1
269	Mean	137.7	90% Percentile (z)	300.1
270	Median	96	95% Percentile (z)	350.3
271	SD	142.4	99% Percentile (z)	444.5
272	k star	0.565		
273	Theta star	243.5	**Gamma ROS Limits with Extrapolated Data**	
274	Nu star	28.27	95% Wilson Hilferty (WH) Approx. Gamma UPL	424.5
275	95% Percentile of Chisquare (2k)	4.157	95% Hawkins Wixley (HW) Approx. Gamma UPL	494.1

	A	B	C	D	E	F	G	H	I	J	K	L
276										95% WH Approx. Gamma UTL with	95% Coverage	593.8
277					90% Percentile	362.8				95% HW Approx. Gamma UTL with	95% Coverage	737.6
278					95% Percentile	506.1						
279					99% Percentile	854.4						
280												
281	Note: DL/2 is not a recommended method.											
282												
283												
284	BENZO(A)PYRENE											
285												
286					General Statistics							
287					Number of Valid Data	25				Number of Detected Data		15
288					Number of Distinct Detected Data	14				Number of Non-Detect Data		10
289					Tolerance Factor	2.292				Percent Non-Detects		40.00%
290												
291				Raw Statistics						Log-transformed Statistics		
292					Minimum Detected	36				Minimum Detected		3.584
293					Maximum Detected	1100				Maximum Detected		7.003
294					Mean of Detected	182.6				Mean of Detected		4.626
295					SD of Detected	280.9				SD of Detected		0.967
296					Minimum Non-Detect	350				Minimum Non-Detect		5.858
297					Maximum Non-Detect	400				Maximum Non-Detect		5.991
298												
299				Data with Multiple Detection Limits						Single Detection Limit Scenario		
300				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL		23
301				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL		2
302				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		92.00%
303												
304					Background Statistics							
305				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
306					Shapiro Wilk Test Statistic	0.547				Shapiro Wilk Test Statistic		0.872
307					5% Shapiro Wilk Critical Value	0.881				5% Shapiro Wilk Critical Value		0.881
308				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
309												
310				Assuming Normal Distribution						Assuming Lognormal Distribution		
311					DL/2 Substitution Method					DL/2 Substitution Method		
312					Mean	184.2				Mean (Log Scale)		4.867
313					SD	214.6				SD (Log Scale)		0.798
314					95% UTL 95% Coverage	676				95% UTL 95% Coverage		808.7
315					95% UPL (t)	558.6				95% UPL (t)		522.6
316					90% Percentile (z)	459.2				90% Percentile (z)		361.1
317					95% Percentile (z)	537.1				95% Percentile (z)		482.5
318					99% Percentile (z)	683.4				99% Percentile (z)		831.2
319												
320					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
321										Mean in Original Scale		145.3
322										SD in Original Scale		220.8
323										Mean in Log Scale		4.54
324										SD in Log Scale		0.792
325										95% UTL 95% Coverage		575.9
326										95% UPL (t)		373.3
327										90% Percentile (z)		258.6
328										95% Percentile (z)		344.9
329										99% Percentile (z)		591.8
330												

	A	B	C	D	E	F	G	H	I	J	K	L
331	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
332					k star (bias corrected)	0.839	Data do not follow a Discernable Distribution (0.05)					
333					Theta Star	217.5						
334					nu star	25.18						
335												
336					A-D Test Statistic	1.403	Nonparametric Statistics					
337					5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method	
338					K-S Test Statistic	0.264					Mean	144
339					5% K-S Critical Value	0.228					SD	217.4
340	Data not Gamma Distributed at 5% Significance Level										SE of Mean	45.73
341										95% KM UTL with	95% Coverage	642.3
342	Assuming Gamma Distribution										95% KM Chebyshev UPL	1110
343				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	523.3
344					Mean	163.6					90% Percentile (z)	422.6
345					Median	89					95% Percentile (z)	501.6
346					SD	225.1					99% Percentile (z)	649.8
347					k star	0.501						
348					Theta star	326.9	Gamma ROS Limits with Extrapolated Data					
349					Nu star	25.03				95% Wilson Hilferty (WH) Approx. Gamma UPL		538.9
350					95% Percentile of Chisquare (2k)	3.844				95% Hawkins Wixley (HW) Approx. Gamma UPL		608.9
351										95% WH Approx. Gamma UTL with	95% Coverage	777
352					90% Percentile	442.6				95% HW Approx. Gamma UTL with	95% Coverage	936.3
353					95% Percentile	628.3						
354					99% Percentile	1085						
355												
356	Note: DL/2 is not a recommended method.											
357												
358												
359	BENZO(A)PYRENE EQUIVALENTS											
360												
361	General Statistics											
362					Number of Valid Data	25					Number of Detected Data	20
363					Number of Distinct Detected Data	20					Number of Non-Detect Data	5
364					Tolerance Factor	2.292					Percent Non-Detects	20.00%
365												
366	Raw Statistics						Log-transformed Statistics					
367					Minimum Detected	435.3					Minimum Detected	6.076
368					Maximum Detected	1571					Maximum Detected	7.359
369					Mean of Detected	663.2					Mean of Detected	6.439
370					SD of Detected	265					SD of Detected	0.329
371					Minimum Non-Detect	350					Minimum Non-Detect	5.858
372					Maximum Non-Detect	400					Maximum Non-Detect	5.991
373												
374	Data with Multiple Detection Limits						Single Detection Limit Scenario					
375	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	5
376	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	20
377	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	20.00%
378												
379	Background Statistics											
380	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
381					Shapiro Wilk Test Statistic	0.749					Shapiro Wilk Test Statistic	0.872
382					5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905
383	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
384												
385	Assuming Normal Distribution						Assuming Lognormal Distribution					

	A	B	C	D	E	F	G	H	I	J	K	L
386					DL/2 Substitution Method						DL/2 Substitution Method	
387					Mean	568.3					Mean (Log Scale)	6.2
388					SD	305.1					SD (Log Scale)	0.571
389					95% UTL 95% Coverage	1268					95% UTL 95% Coverage	1822
390					95% UPL (t)	1101					95% UPL (t)	1333
391					90% Percentile (z)	959.3					90% Percentile (z)	1024
392					95% Percentile (z)	1070					95% Percentile (z)	1259
393					99% Percentile (z)	1278					99% Percentile (z)	1858
394												
395					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
396					Mean	573.2					Mean in Original Scale	590.9
397					SD	300.7					SD in Original Scale	278.3
398					95% UTL with 95% Coverage	1262					95% UTL with 95% Coverage	1412
399											95% BCA UTL with 95% Coverage	1571
400											95% Bootstrap (%) UTL with 95% Coverage	1571
401					95% UPL (t)	1098					95% UPL (t)	1123
402					90% Percentile (z)	958.5					90% Percentile (z)	925
403					95% Percentile (z)	1068					95% Percentile (z)	1077
404					99% Percentile (z)	1273					99% Percentile (z)	1433
405												
406					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
407					k star (bias corrected)	7.554					Data do not follow a Discernable Distribution (0.05)	
408					Theta Star	87.8						
409					nu star	302.1						
410												
411					A-D Test Statistic	0.991					**Nonparametric Statistics**	
412					5% A-D Critical Value	0.743					Kaplan-Meier (KM) Method	
413					K-S Test Statistic	0.201					Mean	617.6
414					5% K-S Critical Value	0.194					SD	248.4
415					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	50.96
416											95% KM UTL with 95% Coverage	1187
417					**Assuming Gamma Distribution**						95% KM Chebyshev UPL	1722
418					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	1051
419					Mean	532.8					90% Percentile (z)	935.9
420					Median	512.2					95% Percentile (z)	1026
421					SD	355.6					99% Percentile (z)	1195
422					k star	0.227						
423					Theta star	2352					**Gamma ROS Limits with Extrapolated Data**	
424					Nu star	11.33					95% Wilson Hilferty (WH) Approx. Gamma UPL	2175
425					95% Percentile of Chisquare (2k)	2.257					95% Hawkins Wixley (HW) Approx. Gamma UPL	3128
426											95% WH Approx. Gamma UTL with 95% Coverage	3249
427					90% Percentile	1608					95% HW Approx. Gamma UTL with 95% Coverage	5292
428					95% Percentile	2654						
429					99% Percentile	5478						
430												
431	**Note: DL/2 is not a recommended method.**											
432												
433												
434	**BENZO(A)PYRENE EQUIVALENTS-HALF ND**											
435												
436					**General Statistics**							
437					Number of Valid Data	25					Number of Detected Data	20
438					Number of Distinct Detected Data	18					Number of Non-Detect Data	5
439					Tolerance Factor	2.292					Percent Non-Detects	20.00%
440												

	A–F	G–L
441	**Raw Statistics**	**Log-transformed Statistics**
442	Minimum Detected 242.8	Minimum Detected 5.492
443	Maximum Detected 1479	Maximum Detected 7.299
444	Mean of Detected 441.1	Mean of Detected 5.954
445	SD of Detected 307.9	SD of Detected 0.471
446	Minimum Non-Detect 175	Minimum Non-Detect 5.165
447	Maximum Non-Detect 200	Maximum Non-Detect 5.298
448		
449	**Data with Multiple Detection Limits**	**Single Detection Limit Scenario**
450	Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL 5
451	For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL 20
452	Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage 20.00%
453		
454	**Background Statistics**	
455	**Normal Distribution Test with Detected Values Only**	**Lognormal Distribution Test with Detected Values Only**
456	Shapiro Wilk Test Statistic 0.596	Shapiro Wilk Test Statistic 0.796
457	5% Shapiro Wilk Critical Value 0.905	5% Shapiro Wilk Critical Value 0.905
458	**Data not Normal at 5% Significance Level**	**Data not Lognormal at 5% Significance Level**
459		
460	**Assuming Normal Distribution**	**Assuming Lognormal Distribution**
461	DL/2 Substitution Method	DL/2 Substitution Method
462	Mean 371.8	Mean (Log Scale) 5.673
463	SD 308.3	SD (Log Scale) 0.711
464	95% UTL 95% Coverage 1078	95% UTL 95% Coverage 1485
465	95% UPL (t) 909.7	95% UPL (t) 1006
466	90% Percentile (z) 766.9	90% Percentile (z) 723.6
467	95% Percentile (z) 878.9	95% Percentile (z) 936.9
468	99% Percentile (z) 1089	99% Percentile (z) 1521
469		
470	Maximum Likelihood Estimate(MLE) Method	Log ROS Method
471	Mean 348.9	Mean in Original Scale 381.1
472	SD 335.1	SD in Original Scale 300
473	95% UTL with 95% Coverage 1117	95% UTL with 95% Coverage 1211
474		95% BCA UTL with 95% Coverage 1405
475		95% Bootstrap (%) UTL with 95% Coverage 1479
476	95% UPL (t) 933.5	95% UPL (t) 878.3
477	90% Percentile (z) 778.3	90% Percentile (z) 669.1
478	95% Percentile (z) 900	95% Percentile (z) 828.2
479	99% Percentile (z) 1128	99% Percentile (z) 1236
480		
481	**Gamma Distribution Test with Detected Values Only**	**Data Distribution Test with Detected Values Only**
482	k star (bias corrected) 3.31	Data do not follow a Discernable Distribution (0.05)
483	Theta Star 133.2	
484	nu star 132.4	
485		
486	A-D Test Statistic 1.913	**Nonparametric Statistics**
487	5% A-D Critical Value 0.746	Kaplan-Meier (KM) Method
488	K-S Test Statistic 0.267	Mean 401.4
489	5% K-S Critical Value 0.195	SD 279.9
490	**Data not Gamma Distributed at 5% Significance Level**	SE of Mean 57.43
491		95% KM UTL with 95% Coverage 1043
492	**Assuming Gamma Distribution**	95% KM Chebyshev UPL 1645
493	Gamma ROS Statistics with Extrapolated Data	95% KM UPL (t) 889.7
494	Mean 352.9	90% Percentile (z) 760.1
495	Median 311.7	95% Percentile (z) 861.8

	A	B	C	D	E	F	G	H	I	J	K	L
496					SD	327.8				99% Percentile (z)		1052
497					k star	0.195						
498					Theta star	1807		Gamma ROS Limits with Extrapolated Data				
499					Nu star	9.765			95% Wilson Hilferty (WH) Approx. Gamma UPL			1531
500				95% Percentile of Chisquare (2k)		2.025			95% Hawkins Wixley (HW) Approx. Gamma UPL			2210
501									95% WH Approx. Gamma UTL with		95% Coverage	2348
502					90% Percentile	1067			95% HW Approx. Gamma UTL with		95% Coverage	3867
503					95% Percentile	1829						
504					99% Percentile	3936						
505												
506	Note: DL/2 is not a recommended method.											
507												
508												
509	BENZO(B)FLUORANTHENE											
510												
511					General Statistics							
512					Number of Valid Data	25				Number of Detected Data		18
513					Number of Distinct Detected Data	17				Number of Non-Detect Data		7
514					Tolerance Factor	2.292				Percent Non-Detects		28.00%
515												
516				Raw Statistics						Log-transformed Statistics		
517					Minimum Detected	41				Minimum Detected		3.714
518					Maximum Detected	1700				Maximum Detected		7.438
519					Mean of Detected	231.1				Mean of Detected		4.839
520					SD of Detected	384.6				SD of Detected		0.989
521					Minimum Non-Detect	350				Minimum Non-Detect		5.858
522					Maximum Non-Detect	400				Maximum Non-Detect		5.991
523												
524				Data with Multiple Detection Limits						Single Detection Limit Scenario		
525	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		23
526	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		2
527	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.00%
528												
529					Background Statistics							
530				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
531					Shapiro Wilk Test Statistic	0.496				Shapiro Wilk Test Statistic		0.893
532					5% Shapiro Wilk Critical Value	0.897				5% Shapiro Wilk Critical Value		0.897
533				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
534												
535				Assuming Normal Distribution						Assuming Lognormal Distribution		
536					DL/2 Substitution Method					DL/2 Substitution Method		
537					Mean	219				Mean (Log Scale)		4.95
538					SD	324.3				SD (Log Scale)		0.852
539					95% UTL 95% Coverage	962.4				95% UTL 95% Coverage		994.6
540					95% UPL (t)	784.9				95% UPL (t)		624
541					90% Percentile (z)	634.7				90% Percentile (z)		420.5
542					95% Percentile (z)	752.5				95% Percentile (z)		573.1
543					99% Percentile (z)	973.5				99% Percentile (z)		1024
544												
545					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
546										Mean in Original Scale		197.4
547										SD in Original Scale		328.8
548										Mean in Log Scale		4.79
549										SD in Log Scale		0.851
550										95% UTL 95% Coverage		845.7

	A	B	C	D	E	F	G	H	I	J	K	L
551											95% UPL (t)	530.9
552											90% Percentile (z)	357.9
553											95% Percentile (z)	487.6
554											99% Percentile (z)	870.8
555												
556	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
557					k star (bias corrected)	0.837	Data follow Appr. Gamma Distribution at 5% Significance Level					
558					Theta Star	276						
559					nu star	30.14						
560												
561					A-D Test Statistic	1.283	**Nonparametric Statistics**					
562					5% A-D Critical Value	0.768					Kaplan-Meier (KM) Method	
563					K-S Test Statistic	0.187					Mean	201.2
564					5% K-S Critical Value	0.21					SD	324
565	**Data follow Appx. Gamma Distribution at 5% Significance Level**										SE of Mean	67.6
566										95% KM UTL with	95% Coverage	943.7
567	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	1641
568				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	766.4
569					Mean	214.3					90% Percentile (z)	616.4
570					Median	168.5					95% Percentile (z)	734.1
571					SD	329.1					99% Percentile (z)	954.9
572					k star	1.011						
573					Theta star	212	**Gamma ROS Limits with Extrapolated Data**					
574					Nu star	50.55					95% Wilson Hilferty (WH) Approx. Gamma UPL	632.2
575					95% Percentile of Chisquare (2k)	6.034					95% Hawkins Wixley (HW) Approx. Gamma UPL	627.4
576											95% WH Approx. Gamma UTL with 95% Coverage	887.6
577					90% Percentile	492.1					95% HW Approx. Gamma UTL with 95% Coverage	907.7
578					95% Percentile	639.5						
579					99% Percentile	981.4						
580												
581	**Note: DL/2 is not a recommended method.**											
582												
583												
584	**BENZO(G,H,I)PERYLENE**											
585												
586					**General Statistics**							
587					Number of Valid Data	25					Number of Detected Data	7
588					Number of Distinct Detected Data	7					Number of Non-Detect Data	18
589					Tolerance Factor	2.292					Percent Non-Detects	72.00%
590												
591					**Raw Statistics**		**Log-transformed Statistics**					
592					Minimum Detected	39					Minimum Detected	3.664
593					Maximum Detected	410					Maximum Detected	6.016
594					Mean of Detected	155.6					Mean of Detected	4.575
595					SD of Detected	170.7					SD of Detected	0.993
596					Minimum Non-Detect	350					Minimum Non-Detect	5.858
597					Maximum Non-Detect	410					Maximum Non-Detect	6.016
598												
599	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
600	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	24
601	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	1
602	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.00%
603												
604												
605	**Warning: There are only 7 Detected Values in this data**											

	A	B	C	D	E	F	G	H	I	J	K	L
606	Note: It should be noted that even though bootstrap may be performed on this data set											
607	the resulting calculations may not be reliable enough to draw conclusions											
608												
609	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
610												
611	Background Statistics											
612	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
613					Shapiro Wilk Test Statistic	0.655				Shapiro Wilk Test Statistic		0.753
614					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
615	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
616												
617	Assuming Normal Distribution						Assuming Lognormal Distribution					
618					DL/2 Substitution Method					DL/2 Substitution Method		
619					Mean	177.6				Mean (Log Scale)		5.043
620					SD	86.86				SD (Log Scale)		0.581
621					95% UTL 95% Coverage	376.7				95% UTL 95% Coverage		586.4
622					95% UPL (t)	329.1				95% UPL (t)		426.7
623					90% Percentile (z)	288.9				90% Percentile (z)		326.1
624					95% Percentile (z)	320.4				95% Percentile (z)		402.7
625					99% Percentile (z)	379.6				99% Percentile (z)		598.2
626												
627					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
628										Mean in Original Scale		92.46
629										SD in Original Scale		97.76
630										Mean in Log Scale		4.248
631										SD in Log Scale		0.665
632										95% UTL 95% Coverage		320.9
633										95% UPL (t)		223
634										90% Percentile (z)		163.9
635										95% Percentile (z)		208.7
636										99% Percentile (z)		328.3
637												
638	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
639					k star (bias corrected)	0.779	Data do not follow a Discernable Distribution (0.05)					
640					Theta Star	199.6						
641					nu star	10.91						
642												
643					A-D Test Statistic	1.108	Nonparametric Statistics					
644					5% A-D Critical Value	0.725				Kaplan-Meier (KM) Method		
645					K-S Test Statistic	0.379				Mean		84.33
646					5% K-S Critical Value	0.319				SD		96.19
647	Data not Gamma Distributed at 5% Significance Level									SE of Mean		21.41
648										95% KM UTL with 95% Coverage		304.8
649	Assuming Gamma Distribution									95% KM Chebyshev UPL		511.9
650					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		252.2
651					Mean	109.1				90% Percentile (z)		207.6
652					Median	81.11				95% Percentile (z)		242.5
653					SD	112.2				99% Percentile (z)		308.1
654					k star	0.231						
655					Theta star	472.6	Gamma ROS Limits with Extrapolated Data					
656					Nu star	11.55				95% Wilson Hilferty (WH) Approx. Gamma UPL		457.1
657					95% Percentile of Chisquare (2k)	2.288				95% Hawkins Wixley (HW) Approx. Gamma UPL		621.8
658										95% WH Approx. Gamma UTL with 95% Coverage		699.6
659					90% Percentile	329.1				95% HW Approx. Gamma UTL with 95% Coverage		1072
660					95% Percentile	540.7						

	A	B	C	D	E	F	G	H	I	J	K	L
661					99% Percentile	1110						
662												
663	Note: DL/2 is not a recommended method.											
664												
665												
666	BENZO(K)FLUORANTHENE											
667												
668					General Statistics							
669					Number of Valid Data	25				Number of Detected Data		9
670					Number of Distinct Detected Data	9				Number of Non-Detect Data		16
671					Tolerance Factor	2.292				Percent Non-Detects		64.00%
672												
673					Raw Statistics					Log-transformed Statistics		
674					Minimum Detected	38				Minimum Detected		3.638
675					Maximum Detected	1100				Maximum Detected		7.003
676					Mean of Detected	260.7				Mean of Detected		4.841
677					SD of Detected	373.5				SD of Detected		1.175
678					Minimum Non-Detect	350				Minimum Non-Detect		5.858
679					Maximum Non-Detect	430				Maximum Non-Detect		6.064
680												
681					Data with Multiple Detection Limits					Single Detection Limit Scenario		
682					Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL		23
683					For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL		2
684					Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage		92.00%
685												
686												
687					Warning: There are only 9 Detected Values in this data							
688					Note: It should be noted that even though bootstrap may be performed on this data set							
689					the resulting calculations may not be reliable enough to draw conclusions							
690												
691					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
692												
693					Background Statistics							
694					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
695					Shapiro Wilk Test Statistic	0.651				Shapiro Wilk Test Statistic		0.859
696					5% Shapiro Wilk Critical Value	0.829				5% Shapiro Wilk Critical Value		0.829
697					Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
698												
699					Assuming Normal Distribution					Assuming Lognormal Distribution		
700					DL/2 Substitution Method					DL/2 Substitution Method		
701					Mean	214.2				Mean (Log Scale)		5.093
702					SD	218.7				SD (Log Scale)		0.707
703					95% UTL 95% Coverage	715.5				95% UTL 95% Coverage		823.3
704					95% UPL (t)	595.8				95% UPL (t)		559.2
705					90% Percentile (z)	494.5				90% Percentile (z)		403.1
706					95% Percentile (z)	574				95% Percentile (z)		521.1
707					99% Percentile (z)	723.1				99% Percentile (z)		843.5
708												
709					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
710										Mean in Original Scale		152.9
711										SD in Original Scale		233.9
712										Mean in Log Scale		4.558
713										SD in Log Scale		0.825
714										95% UTL 95% Coverage		632
715										95% UPL (t)		402.4

	A	B	C	D	E	F	G	H	I	J	K	L
716										90% Percentile (z)		274.6
717										95% Percentile (z)		370.6
718										99% Percentile (z)		650.2
719												
720	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
721					k star (bias corrected)	0.62	Data appear Lognormal at 5% Significance Level					
722					Theta Star	420.5						
723					nu star	11.16						
724												
725					A-D Test Statistic	0.97	**Nonparametric Statistics**					
726					5% A-D Critical Value	0.749				Kaplan-Meier (KM) Method		
727					K-S Test Statistic	0.307				Mean		145.6
728					5% K-S Critical Value	0.289				SD		230.1
729	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		50.09
730									95% KM UTL with	95% Coverage		673
731	**Assuming Gamma Distribution**									95% KM Chebyshev UPL		1168
732				Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)		547
733					Mean	183.1				90% Percentile (z)		440.5
734					Median	108.2				95% Percentile (z)		524.1
735					SD	250.1				99% Percentile (z)		680.9
736					k star	0.17						
737					Theta star	1079	**Gamma ROS Limits with Extrapolated Data**					
738					Nu star	8.489				95% Wilson Hilferty (WH) Approx. Gamma UPL		834.8
739					95% Percentile of Chisquare (2k)	1.821				95% Hawkins Wixley (HW) Approx. Gamma UPL		1144
740										95% WH Approx. Gamma UTL with	95% Coverage	1337
741					90% Percentile	550.2				95% HW Approx. Gamma UTL with	95% Coverage	2099
742					95% Percentile	982						
743					99% Percentile	2205						
744												
745	**Note: DL/2 is not a recommended method.**											
746												
747												
748	**CHRYSENE**											
749												
750					**General Statistics**							
751					Number of Valid Data	25				Number of Detected Data		20
752					Number of Distinct Detected Data	20				Number of Non-Detect Data		5
753					Tolerance Factor	2.292				Percent Non-Detects		20.00%
754												
755	**Raw Statistics**						**Log-transformed Statistics**					
756					Minimum Detected	37				Minimum Detected		3.611
757					Maximum Detected	1600				Maximum Detected		7.378
758					Mean of Detected	203.4				Mean of Detected		4.681
759					SD of Detected	357.4				SD of Detected		0.971
760					Minimum Non-Detect	350				Minimum Non-Detect		5.858
761					Maximum Non-Detect	400				Maximum Non-Detect		5.991
762												
763	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
764	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		23
765	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		2
766	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.00%
767												
768					**Background Statistics**							
769	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
770					Shapiro Wilk Test Statistic	0.477				Shapiro Wilk Test Statistic		0.869

	A	B	C	D	E	F	G	H	I	J	K	L
771					5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905
772				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
773												
774				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
775					DL/2 Substitution Method						DL/2 Substitution Method	
776					Mean	200.5					Mean (Log Scale)	4.793
777					SD	318.1					SD (Log Scale)	0.894
778					95% UTL 95% Coverage	929.5					95% UTL 95% Coverage	936.4
779					95% UPL (t)	755.5					95% UPL (t)	574.1
780					90% Percentile (z)	608.1					90% Percentile (z)	379.4
781					95% Percentile (z)	723.7					95% Percentile (z)	525
782					99% Percentile (z)	940.5					99% Percentile (z)	965.6
783												
784					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
785											Mean in Original Scale	181.9
786											SD in Original Scale	321.2
787											Mean in Log Scale	4.651
788											SD in Log Scale	0.873
789											95% UTL 95% Coverage	774.8
790											95% UPL (t)	480.4
791											90% Percentile (z)	320.6
792											95% Percentile (z)	440.3
793											99% Percentile (z)	798.4
794												
795				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
796					k star (bias corrected)	0.814				Data do not follow a Discernable Distribution (0.05)		
797					Theta Star	249.8						
798					nu star	32.57						
799												
800					A-D Test Statistic	1.851				**Nonparametric Statistics**		
801					5% A-D Critical Value	0.772					Kaplan-Meier (KM) Method	
802					K-S Test Statistic	0.236					Mean	182.7
803					5% K-S Critical Value	0.2					SD	315.5
804				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	65.03
805											95% KM UTL with 95% Coverage	905.7
806				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	1585
807					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	733.1
808					Mean	192.6					90% Percentile (z)	587
809					Median	110					95% Percentile (z)	701.6
810					SD	320.6					99% Percentile (z)	916.6
811					k star	0.94						
812					Theta star	204.9				**Gamma ROS Limits with Extrapolated Data**		
813					Nu star	47					95% Wilson Hilferty (WH) Approx. Gamma UPL	575.5
814					95% Percentile of Chisquare (2k)	5.757					95% Hawkins Wixley (HW) Approx. Gamma UPL	563.7
815											95% WH Approx. Gamma UTL with 95% Coverage	815.5
816					90% Percentile	450.3					95% HW Approx. Gamma UTL with 95% Coverage	822.3
817					95% Percentile	589.8						
818					99% Percentile	915.2						
819												
820	**Note: DL/2 is not a recommended method.**											
821												
822												
823	**FLUORANTHENE**											
824												
825					**General Statistics**							

	A–E	F	G–K	L
826	Number of Valid Data	25	Number of Detected Data	20
827	Number of Distinct Detected Data	19	Number of Non-Detect Data	5
828	Tolerance Factor	2.292	Percent Non-Detects	20.00%
829				
830	**Raw Statistics**		**Log-transformed Statistics**	
831	Minimum Detected	43	Minimum Detected	3.761
832	Maximum Detected	1700	Maximum Detected	7.438
833	Mean of Detected	266.1	Mean of Detected	5.003
834	SD of Detected	408.8	SD of Detected	0.964
835	Minimum Non-Detect	350	Minimum Non-Detect	5.858
836	Maximum Non-Detect	390	Maximum Non-Detect	5.966
837				
838	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
839	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	23
840	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	2
841	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.00%
842				
843	**Background Statistics**			
844	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
845	Shapiro Wilk Test Statistic	0.541	Shapiro Wilk Test Statistic	0.903
846	5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
847	**Data not Normal at 5% Significance Level**		**Data not Lognormal at 5% Significance Level**	
848				
849	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
850	DL/2 Substitution Method		DL/2 Substitution Method	
851	Mean	249.7	Mean (Log Scale)	5.045
852	SD	365.3	SD (Log Scale)	0.863
853	95% UTL 95% Coverage	1087	95% UTL 95% Coverage	1122
854	95% UPL (t)	887.1	95% UPL (t)	699.7
855	90% Percentile (z)	717.9	90% Percentile (z)	469.2
856	95% Percentile (z)	850.6	95% Percentile (z)	641.9
857	99% Percentile (z)	1100	99% Percentile (z)	1156
858				
859	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
860			Mean in Original Scale	240
861			SD in Original Scale	368.2
862			Mean in Log Scale	4.972
863			SD in Log Scale	0.875
864			95% UTL 95% Coverage	1073
865			95% UPL (t)	664.6
866			90% Percentile (z)	443.1
867			95% Percentile (z)	608.9
868			99% Percentile (z)	1105
869				
870	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
871	k star (bias corrected)	0.879	Data do not follow a Discernable Distribution (0.05)	
872	Theta Star	302.7		
873	nu star	35.16		
874				
875	A-D Test Statistic	1.589	**Nonparametric Statistics**	
876	5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method	
877	K-S Test Statistic	0.247	Mean	240.9
878	5% K-S Critical Value	0.199	SD	362.1
879	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	74.85
880			95% KM UTL with 95% Coverage	1071

	A	B	C	D	E	F	G	H	I	J	K	L
881	Assuming Gamma Distribution										95% KM Chebyshev UPL	1850
882				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	872.7
883					Mean	254.3					90% Percentile (z)	704.9
884					Median	150					95% Percentile (z)	836.5
885					SD	369.6					99% Percentile (z)	1083
886					k star	0.981						
887					Theta star	259.2	Gamma ROS Limits with Extrapolated Data					
888					Nu star	49.06				95% Wilson Hilferty (WH) Approx. Gamma UPL		761.2
889					95% Percentile of Chisquare (2k)	5.918				95% Hawkins Wixley (HW) Approx. Gamma UPL		755
890										95% WH Approx. Gamma UTL with	95% Coverage	1074
891					90% Percentile	588.3				95% HW Approx. Gamma UTL with	95% Coverage	1098
892					95% Percentile	767						
893					99% Percentile	1182						
894												
895	Note: DL/2 is not a recommended method.											
896												
897												
898	INDENO(1,2,3-CD)PYRENE											
899												
900	General Statistics											
901					Number of Valid Data	25					Number of Detected Data	8
902					Number of Distinct Detected Data	8					Number of Non-Detect Data	17
903					Tolerance Factor	2.292					Percent Non-Detects	68.00%
904												
905	Raw Statistics						Log-transformed Statistics					
906					Minimum Detected	38					Minimum Detected	3.638
907					Maximum Detected	440					Maximum Detected	6.087
908					Mean of Detected	153.6					Mean of Detected	4.601
909					SD of Detected	165.8					SD of Detected	0.935
910					Minimum Non-Detect	350					Minimum Non-Detect	5.858
911					Maximum Non-Detect	410					Maximum Non-Detect	6.016
912												
913	Data with Multiple Detection Limits						Single Detection Limit Scenario					
914	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		24
915	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		1
916	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		96.00%
917												
918												
919	Warning: There are only 8 Detected Values in this data											
920	Note: It should be noted that even though bootstrap may be performed on this data set											
921	the resulting calculations may not be reliable enough to draw conclusions											
922												
923	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
924												
925	Background Statistics											
926	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
927					Shapiro Wilk Test Statistic	0.683					Shapiro Wilk Test Statistic	0.833
928					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
929	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
930												
931	Assuming Normal Distribution						Assuming Lognormal Distribution					
932					DL/2 Substitution Method						DL/2 Substitution Method	
933					Mean	176.2					Mean (Log Scale)	5.028
934					SD	91.27					SD (Log Scale)	0.588
935					95% UTL 95% Coverage	385.4					95% UTL 95% Coverage	587.6

	A	B	C	D	E	F	G	H	I	J	K	L
936					95% UPL (t)	335.4					95% UPL (t)	425.9
937					90% Percentile (z)	293.1					90% Percentile (z)	324.3
938					95% Percentile (z)	326.3					95% Percentile (z)	401.6
939					99% Percentile (z)	388.5					99% Percentile (z)	599.6
940												
941				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
942											Mean in Original Scale	99.44
943											SD in Original Scale	100.9
944											Mean in Log Scale	4.335
945											SD in Log Scale	0.654
946											95% UTL 95% Coverage	341.3
947											95% UPL (t)	238.7
948											90% Percentile (z)	176.4
949											95% Percentile (z)	223.6
950											99% Percentile (z)	349.1
951												
952				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
953					k star (bias corrected)	0.893				Data appear Lognormal at 5% Significance Level		
954					Theta Star	172						
955					nu star	14.29						
956												
957					A-D Test Statistic	0.93				**Nonparametric Statistics**		
958					5% A-D Critical Value	0.731					Kaplan-Meier (KM) Method	
959					K-S Test Statistic	0.31					Mean	93.83
960					5% K-S Critical Value	0.3					SD	99.29
961				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	22.56
962											95% KM UTL with 95% Coverage	321.4
963				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	535.2
964					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	267.1
965					Mean	116.9					90% Percentile (z)	221.1
966					Median	93.78					95% Percentile (z)	257.2
967					SD	113.8					99% Percentile (z)	324.8
968					k star	0.282						
969					Theta star	414.3				**Gamma ROS Limits with Extrapolated Data**		
970					Nu star	14.1					95% Wilson Hilferty (WH) Approx. Gamma UPL	452.7
971					95% Percentile of Chisquare (2k)	2.632					95% Hawkins Wixley (HW) Approx. Gamma UPL	600.6
972											95% WH Approx. Gamma UTL with 95% Coverage	674.7
973					90% Percentile	347.1					95% HW Approx. Gamma UTL with 95% Coverage	995.8
974					95% Percentile	545.2						
975					99% Percentile	1064						
976												
977	**Note: DL/2 is not a recommended method.**											
978												
979												
980	**PHENANTHRENE**											
981												
982					**General Statistics**							
983					Number of Valid Data	25					Number of Detected Data	14
984					Number of Distinct Detected Data	14					Number of Non-Detect Data	11
985					Tolerance Factor	2.292					Percent Non-Detects	44.00%
986												
987				**Raw Statistics**						**Log-transformed Statistics**		
988					Minimum Detected	40					Minimum Detected	3.689
989					Maximum Detected	470					Maximum Detected	6.153
990					Mean of Detected	145.3					Mean of Detected	4.736

	A	B	C	D	E	F	G	H	I	J	K	L
991					SD of Detected	120.2					SD of Detected	0.689
992					Minimum Non-Detect	350					Minimum Non-Detect	5.858
993					Maximum Non-Detect	400					Maximum Non-Detect	5.991
994												
995	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
996	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	24
997	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	1
998	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.00%
999												
1000	**Background Statistics**											
1001	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1002					Shapiro Wilk Test Statistic	0.767					Shapiro Wilk Test Statistic	0.953
1003					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
1004	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1005												
1006	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1007					DL/2 Substitution Method						DL/2 Substitution Method	
1008					Mean	163					Mean (Log Scale)	4.95
1009					SD	90.92					SD (Log Scale)	0.565
1010					95% UTL 95% Coverage	371.4					95% UTL 95% Coverage	514.9
1011					95% UPL (t)	321.6					95% UPL (t)	378
1012					90% Percentile (z)	279.5					90% Percentile (z)	291
1013					95% Percentile (z)	312.5					95% Percentile (z)	357.3
1014					99% Percentile (z)	374.5					99% Percentile (z)	524.9
1015												
1016					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1017											Mean in Original Scale	129.4
1018											SD in Original Scale	93.49
1019											Mean in Log Scale	4.693
1020											SD in Log Scale	0.557
1021											95% UTL 95% Coverage	391.5
1022											95% UPL (t)	288.6
1023											90% Percentile (z)	223
1024											95% Percentile (z)	273
1025											99% Percentile (z)	399.1
1026												
1027	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1028					k star (bias corrected)	1.785	Data appear Gamma Distributed at 5% Significance Level					
1029					Theta Star	81.38						
1030					nu star	49.99						
1031												
1032					A-D Test Statistic	0.583	**Nonparametric Statistics**					
1033					5% A-D Critical Value	0.745					Kaplan-Meier (KM) Method	
1034					K-S Test Statistic	0.226					Mean	134.3
1035					5% K-S Critical Value	0.231					SD	100.9
1036	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	25.25
1037											95% KM UTL with 95% Coverage	365.4
1038	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	582.6
1039					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	310.3
1040					Mean	143.3					90% Percentile (z)	263.5
1041					Median	113.2					95% Percentile (z)	300.2
1042					SD	96.52					99% Percentile (z)	368.9
1043					k star	2.565						
1044					Theta star	55.87	**Gamma ROS Limits with Extrapolated Data**					
1045					Nu star	128.2					95% Wilson Hilferty (WH) Approx. Gamma UPL	321.3

	A	B	C	D	E	F	G	H	I	J	K	L
1046					95% Percentile of Chisquare (2k)	11.27			95% Hawkins Wixley (HW) Approx. Gamma UPL			325.7
1047									95% WH Approx. Gamma UTL with		95% Coverage	408.8
1048					90% Percentile	263.2			95% HW Approx. Gamma UTL with		95% Coverage	422
1049					95% Percentile	314.8						
1050					99% Percentile	427.8						
1051												
1052	Note: DL/2 is not a recommended method.											
1053												
1054												
1055	PYRENE											
1056												
1057					General Statistics							
1058					Number of Valid Data	25				Number of Detected Data		21
1059					Number of Distinct Detected Data	20				Number of Non-Detect Data		4
1060					Tolerance Factor	2.292				Percent Non-Detects		16.00%
1061												
1062					Raw Statistics					Log-transformed Statistics		
1063					Minimum Detected	42				Minimum Detected		3.738
1064					Maximum Detected	1400				Maximum Detected		7.244
1065					Mean of Detected	224.5				Mean of Detected		4.876
1066					SD of Detected	336.7				SD of Detected		0.916
1067					Minimum Non-Detect	350				Minimum Non-Detect		5.858
1068					Maximum Non-Detect	390				Maximum Non-Detect		5.966
1069												
1070					Data with Multiple Detection Limits					Single Detection Limit Scenario		
1071	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL		23
1072	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		2
1073	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.00%
1074												
1075					Background Statistics							
1076					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
1077					Shapiro Wilk Test Statistic	0.532				Shapiro Wilk Test Statistic		0.89
1078					5% Shapiro Wilk Critical Value	0.908				5% Shapiro Wilk Critical Value		0.908
1079					Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
1080												
1081					Assuming Normal Distribution					Assuming Lognormal Distribution		
1082					DL/2 Substitution Method					DL/2 Substitution Method		
1083					Mean	218.4				Mean (Log Scale)		4.932
1084					SD	307.7				SD (Log Scale)		0.847
1085					95% UTL 95% Coverage	923.6				95% UTL 95% Coverage		965.4
1086					95% UPL (t)	755.2				95% UPL (t)		607.4
1087					90% Percentile (z)	612.7				90% Percentile (z)		410.3
1088					95% Percentile (z)	724.5				95% Percentile (z)		558.1
1089					99% Percentile (z)	934.2				99% Percentile (z)		993.9
1090												
1091					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1092										Mean in Original Scale		207.6
1093										SD in Original Scale		310.1
1094										Mean in Log Scale		4.854
1095										SD in Log Scale		0.845
1096										95% UTL 95% Coverage		888.8
1097										95% UPL (t)		559.9
1098										90% Percentile (z)		378.6
1099										95% Percentile (z)		514.6
1100										99% Percentile (z)		915

	A	B	C	D	E	F	G	H	I	J	K	L
1101												
1102	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1103					k star (bias corrected)	0.944	Data do not follow a Discernable Distribution (0.05)					
1104					Theta Star	237.7						
1105					nu star	39.66						
1106												
1107					A-D Test Statistic	1.77	**Nonparametric Statistics**					
1108					5% A-D Critical Value	0.768					Kaplan-Meier (KM) Method	
1109					K-S Test Statistic	0.217					Mean	208.2
1110					5% K-S Critical Value	0.195					SD	304.8
1111	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	62.82
1112										95% KM UTL with	95% Coverage	906.9
1113	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	1563
1114				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	740
1115					Mean	217.8					90% Percentile (z)	598.8
1116					Median	130					95% Percentile (z)	709.6
1117					SD	309.7					99% Percentile (z)	917.3
1118					k star	1.069						
1119					Theta star	203.7	**Gamma ROS Limits with Extrapolated Data**					
1120					Nu star	53.45					95% Wilson Hilferty (WH) Approx. Gamma UPL	631.8
1121					95% Percentile of Chisquare (2k)	6.256					95% Hawkins Wixley (HW) Approx. Gamma UPL	623.1
1122											95% WH Approx. Gamma UTL with 95% Coverage	881.9
1123					90% Percentile	493.2					95% HW Approx. Gamma UTL with 95% Coverage	893.6
1124					95% Percentile	637.2						
1125					99% Percentile	969.8						
1126												
1127	**Note: DL/2 is not a recommended method.**											
1128												
1129												
1130	**4,4'-DDD**											
1131												
1132					**General Statistics**							
1133					Number of Valid Data	25					Number of Detected Data	19
1134					Number of Distinct Detected Data	18					Number of Non-Detect Data	6
1135					Tolerance Factor	2.292					Percent Non-Detects	24.00%
1136												
1137				**Raw Statistics**						**Log-transformed Statistics**		
1138					Minimum Detected	0.6					Minimum Detected	-0.511
1139					Maximum Detected	170					Maximum Detected	5.136
1140					Mean of Detected	22.85					Mean of Detected	2.271
1141					SD of Detected	38.48					SD of Detected	1.37
1142					Minimum Non-Detect	17					Minimum Non-Detect	2.833
1143					Maximum Non-Detect	20					Maximum Non-Detect	2.996
1144												
1145				**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**		
1146				Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect with Single DL	18
1147				For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected with Single DL	7
1148				Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	72.00%
1149												
1150					**Background Statistics**							
1151				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1152					Shapiro Wilk Test Statistic	0.554					Shapiro Wilk Test Statistic	0.985
1153					5% Shapiro Wilk Critical Value	0.901					5% Shapiro Wilk Critical Value	0.901
1154				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1155												

	A	B	C	D	E	F	G	H	I	J	K	L
1156	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1157					DL/2 Substitution Method						DL/2 Substitution Method	
1158					Mean	19.58					Mean (Log Scale)	2.26
1159					SD	33.85					SD (Log Scale)	1.187
1160				95% UTL	95% Coverage	97.17				95% UTL	95% Coverage	145.5
1161					95% UPL (t)	78.65					95% UPL (t)	75.99
1162					90% Percentile (z)	62.97					90% Percentile (z)	43.85
1163					95% Percentile (z)	75.27					95% Percentile (z)	67.49
1164					99% Percentile (z)	98.33					99% Percentile (z)	151.5
1165												
1166				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
1167					Mean	-26.03					Mean in Original Scale	18.55
1168					SD	70.29					SD in Original Scale	34.24
1169				95% UTL with	95% Coverage	135.1				95% UTL with	95% Coverage	140.5
1170										95% BCA UTL with	95% Coverage	147
1171										95% Bootstrap (%) UTL with	95% Coverage	170
1172					95% UPL (t)	96.61					95% UPL (t)	71.12
1173					90% Percentile (z)	64.05					90% Percentile (z)	39.95
1174					95% Percentile (z)	89.59					95% Percentile (z)	62.8
1175					99% Percentile (z)	137.5					99% Percentile (z)	146.7
1176												
1177	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1178					k star (bias corrected)	0.628	Data appear Gamma Distributed at 5% Significance Level					
1179					Theta Star	36.38						
1180					nu star	23.87						
1181												
1182					A-D Test Statistic	0.539	**Nonparametric Statistics**					
1183					5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method	
1184					K-S Test Statistic	0.183					Mean	18.74
1185					5% K-S Critical Value	0.207					SD	33.51
1186	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	6.9
1187										95% KM UTL with	95% Coverage	95.54
1188	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	167.7
1189				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	77.2
1190					Mean	18.65					90% Percentile (z)	61.68
1191					Median	9.5					95% Percentile (z)	73.86
1192					SD	34.29					99% Percentile (z)	96.69
1193					k star	0.324						
1194					Theta star	57.65	**Gamma ROS Limits with Extrapolated Data**					
1195					Nu star	16.18				95% Wilson Hilferty (WH) Approx. Gamma UPL		71.26
1196					95% Percentile of Chisquare (2k)	2.889				95% Hawkins Wixley (HW) Approx. Gamma UPL		82.61
1197										95% WH Approx. Gamma UTL with	95% Coverage	109.8
1198					90% Percentile	54.49				95% HW Approx. Gamma UTL with	95% Coverage	139
1199					95% Percentile	83.26						
1200					99% Percentile	157.4						
1201												
1202	**Note: DL/2 is not a recommended method.**											
1203												
1204												
1205	**4,4'-DDE**											
1206												
1207					**General Statistics**							
1208					Number of Valid Data	25					Number of Detected Data	22
1209					Number of Distinct Detected Data	19					Number of Non-Detect Data	3
1210					Tolerance Factor	2.292					Percent Non-Detects	12.00%

	A	B	C	D	E	F	G	H	I	J	K	L
1211												
1212	**Raw Statistics**						**Log-transformed Statistics**					
1213					Minimum Detected	5.2					Minimum Detected	1.649
1214					Maximum Detected	7100					Maximum Detected	8.868
1215					Mean of Detected	475.2					Mean of Detected	4.618
1216					SD of Detected	1489					SD of Detected	1.621
1217					Minimum Non-Detect	17					Minimum Non-Detect	2.833
1218					Maximum Non-Detect	19					Maximum Non-Detect	2.944
1219												
1220	**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**					
1221	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	6
1222	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	19
1223	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	24.00%
1224												
1225	**Background Statistics**											
1226	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1227					Shapiro Wilk Test Statistic	0.304					Shapiro Wilk Test Statistic	0.962
1228					5% Shapiro Wilk Critical Value	0.911					5% Shapiro Wilk Critical Value	0.911
1229	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1230												
1231	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1232					DL/2 Substitution Method						DL/2 Substitution Method	
1233					Mean	419.3					Mean (Log Scale)	4.33
1234					SD	1401					SD (Log Scale)	1.713
1235					95% UTL 95% Coverage	3630					95% UTL 95% Coverage	3851
1236					95% UPL (t)	2864					95% UPL (t)	1508
1237					90% Percentile (z)	2215					90% Percentile (z)	682.2
1238					95% Percentile (z)	2724					95% Percentile (z)	1271
1239					99% Percentile (z)	3678					99% Percentile (z)	4085
1240												
1241					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1242					Mean	119.3					Mean in Original Scale	419.1
1243					SD	1624					SD in Original Scale	1401
1244					95% UTL with 95% Coverage	3841					95% UTL with 95% Coverage	4165
1245											95% BCA UTL with 95% Coverage	7100
1246											95% Bootstrap (%) UTL with 95% Coverage	7100
1247					95% UPL (t)	2953					95% UPL (t)	1588
1248					90% Percentile (z)	2200					90% Percentile (z)	702.3
1249					95% Percentile (z)	2790					95% Percentile (z)	1332
1250					99% Percentile (z)	3897					99% Percentile (z)	4425
1251												
1252	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1253					k star (bias corrected)	0.395	Data appear Lognormal at 5% Significance Level					
1254					Theta Star	1203						
1255					nu star	17.38						
1256												
1257					A-D Test Statistic	1.825	**Nonparametric Statistics**					
1258					5% A-D Critical Value	0.821					Kaplan-Meier (KM) Method	
1259					K-S Test Statistic	0.239					Mean	419.1
1260					5% K-S Critical Value	0.198					SD	1373
1261	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	281
1262											95% KM UTL with 95% Coverage	3565
1263	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	6521
1264					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	2814
1265					Mean	418.2					90% Percentile (z)	2178

	A	B	C	D	E	F	G	H	I	J	K	L
1266					Median	71					95% Percentile (z)	2677
1267					SD	1401					99% Percentile (z)	3613
1268					k star	0.205						
1269					Theta star	2042			Gamma ROS Limits with Extrapolated Data			
1270					Nu star	10.24					95% Wilson Hilferty (WH) Approx. Gamma UPL	1497
1271					95% Percentile of Chisquare (2k)	2.097					95% Hawkins Wixley (HW) Approx. Gamma UPL	1588
1272											95% WH Approx. Gamma UTL with 95% Coverage	2478
1273					90% Percentile	1265					95% HW Approx. Gamma UTL with 95% Coverage	2904
1274					95% Percentile	2142						
1275					99% Percentile	4546						
1276												
1277	Note: DL/2 is not a recommended method.											
1278												
1279												
1280	4,4'-DDT											
1281												
1282					General Statistics							
1283					Number of Valid Data	25					Number of Detected Data	22
1284					Number of Distinct Detected Data	21					Number of Non-Detect Data	3
1285					Tolerance Factor	2.292					Percent Non-Detects	12.00%
1286												
1287					Raw Statistics						Log-transformed Statistics	
1288					Minimum Detected	5.1					Minimum Detected	1.629
1289					Maximum Detected	4100					Maximum Detected	8.319
1290					Mean of Detected	359.2					Mean of Detected	4.719
1291					SD of Detected	856.2					SD of Detected	1.537
1292					Minimum Non-Detect	17					Minimum Non-Detect	2.833
1293					Maximum Non-Detect	19					Maximum Non-Detect	2.944
1294												
1295					Data with Multiple Detection Limits						Single Detection Limit Scenario	
1296					Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL	6
1297					For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL	19
1298					Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	24.00%
1299												
1300					Background Statistics							
1301					Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only	
1302					Shapiro Wilk Test Statistic	0.392					Shapiro Wilk Test Statistic	0.975
1303					5% Shapiro Wilk Critical Value	0.911					5% Shapiro Wilk Critical Value	0.911
1304					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
1305												
1306					Assuming Normal Distribution						Assuming Lognormal Distribution	
1307					DL/2 Substitution Method						DL/2 Substitution Method	
1308					Mean	317.2					Mean (Log Scale)	4.419
1309					SD	809.3					SD (Log Scale)	1.661
1310					95% UTL 95% Coverage	2172					95% UTL 95% Coverage	3731
1311					95% UPL (t)	1729					95% UPL (t)	1504
1312					90% Percentile (z)	1354					90% Percentile (z)	696.9
1313					95% Percentile (z)	1648					95% Percentile (z)	1274
1314					99% Percentile (z)	2200					99% Percentile (z)	3951
1315												
1316					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1317					Mean	149.6					Mean in Original Scale	317.3
1318					SD	944.8					SD in Original Scale	809.2
1319					95% UTL with 95% Coverage	2315					95% UTL with 95% Coverage	3701
1320											95% BCA UTL with 95% Coverage	4100

	A	B	C	D	E	F	G	H	I	J	K	L
1321											95% Bootstrap (%) UTL with 95% Coverage	4100
1322					95% UPL (t)	1798					95% UPL (t)	1497
1323					90% Percentile (z)	1360					90% Percentile (z)	696
1324					95% Percentile (z)	1704					95% Percentile (z)	1269
1325					99% Percentile (z)	2348					99% Percentile (z)	3918
1326												
1327	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1328					k star (bias corrected)	0.496	Data follow Appr. Gamma Distribution at 5% Significance Level					
1329					Theta Star	724.4						
1330					nu star	21.82						
1331												
1332					A-D Test Statistic	1.027	**Nonparametric Statistics**					
1333					5% A-D Critical Value	0.801					Kaplan-Meier (KM) Method	
1334					K-S Test Statistic	0.188					Mean	317.2
1335					5% K-S Critical Value	0.195					SD	793
1336	**Data follow Appx. Gamma Distribution at 5% Significance Level**										SE of Mean	162.3
1337											95% KM UTL with 95% Coverage	2135
1338	**Assuming Gamma Distribution**										95% KM Chebyshev UPL	3842
1339				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	1701
1340					Mean	316.1					90% Percentile (z)	1333
1341					Median	94.5					95% Percentile (z)	1621
1342					SD	809.7					99% Percentile (z)	2162
1343					k star	0.222						
1344					Theta star	1424	**Gamma ROS Limits with Extrapolated Data**					
1345					Nu star	11.1					95% Wilson Hilferty (WH) Approx. Gamma UPL	1231
1346					95% Percentile of Chisquare (2k)	2.224					95% Hawkins Wixley (HW) Approx. Gamma UPL	1409
1347											95% WH Approx. Gamma UTL with 95% Coverage	1985
1348					90% Percentile	954.7					95% HW Approx. Gamma UTL with 95% Coverage	2518
1349					95% Percentile	1583						
1350					99% Percentile	3286						
1351												
1352	**Note: DL/2 is not a recommended method.**											
1353												

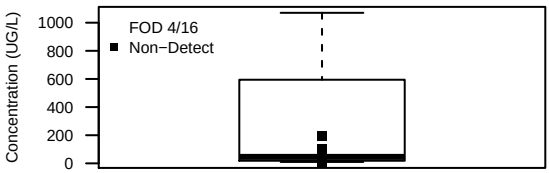
ATTACHMENT C

FACILITY BACKGROUND FRESHWATER GROUNDWATER STATISTICS

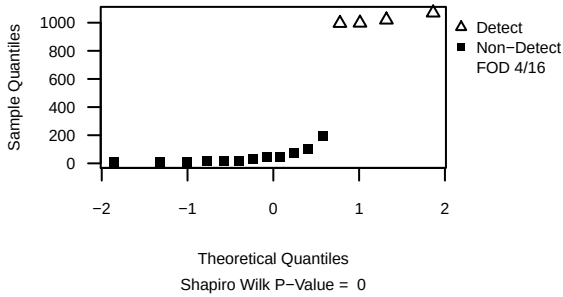
C.1 FRESHWATER GROUNDWATER OUTLIER ANALYSIS

ALUMINUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 1 OF 33

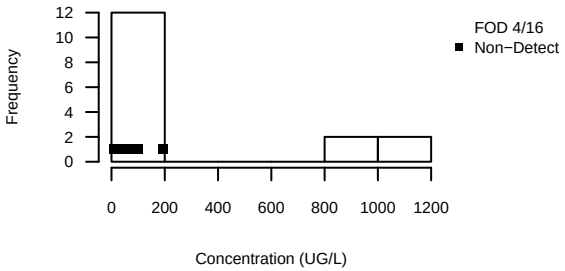
BOXPLOT



NORMAL PROBABILITY PLOT



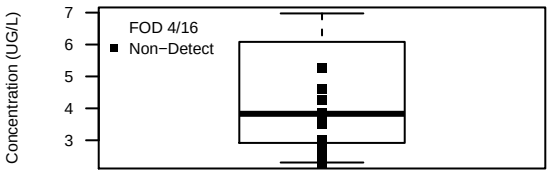
HISTOGRAM



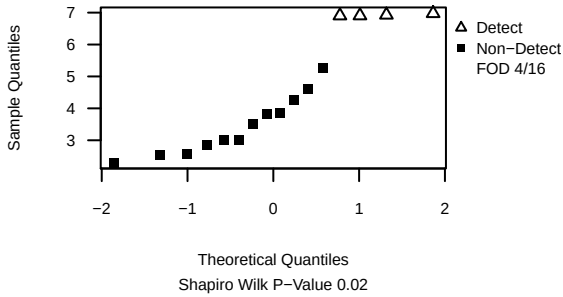
SUMMARY STATISTICS

Minimum	10
1st Quantile	19.27
Median	46.05
3rd Quantile	393.8
Maximum	1070
FOD	4/16

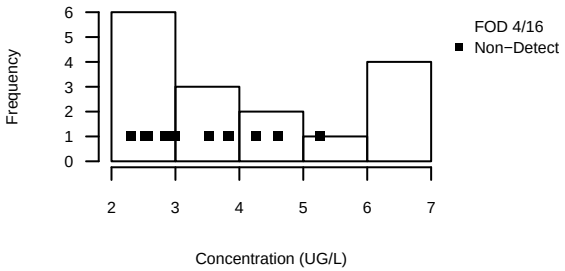
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

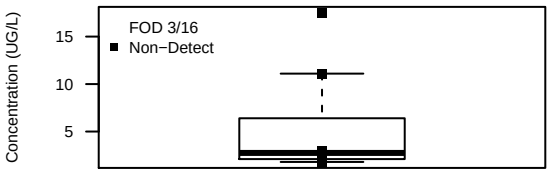


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

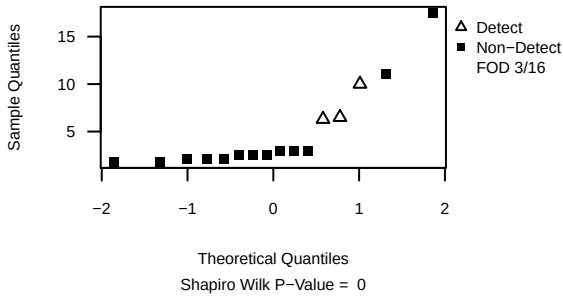
Minimum	2.3
1st Quantile	2.96
Median	3.83
3rd Quantile	5.67
Maximum	6.97
FOD	4/16

ARSENIC FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 2 OF 33

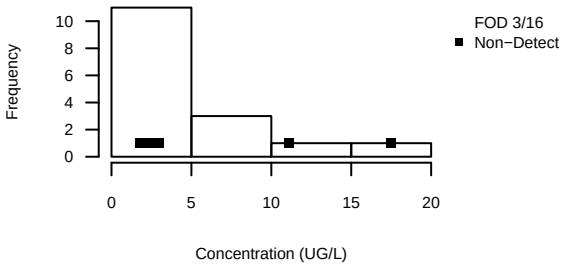
BOXPLOT



NORMAL PROBABILITY PLOT



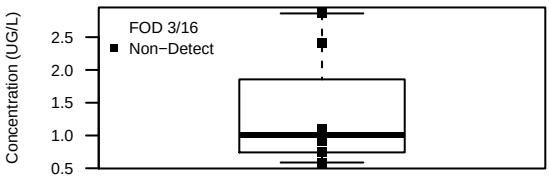
HISTOGRAM



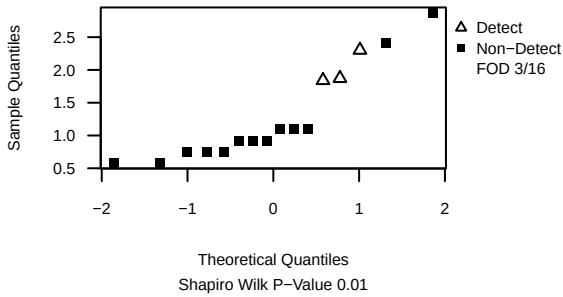
SUMMARY STATISTICS

Minimum	1.8
1st Quantile	2.1
Median	2.75
3rd Quantile	6.35
Maximum	17.5
FOD	3/16

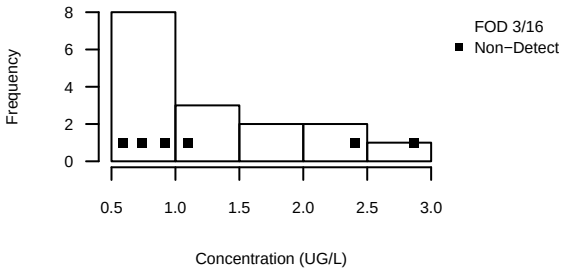
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

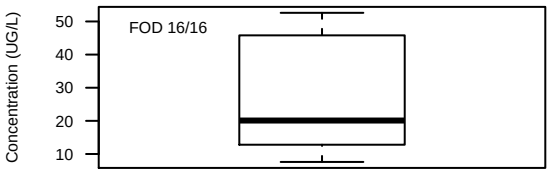


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

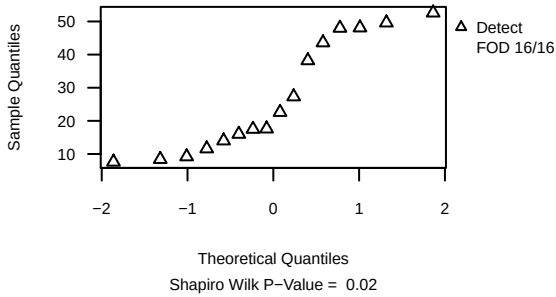
Minimum	0.59
1st Quantile	0.74
Median	1.01
3rd Quantile	1.85
Maximum	2.86
FOD	3/16

BARIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 3 OF 33

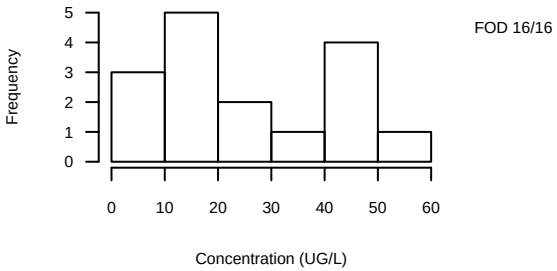
BOXPLOT



NORMAL PROBABILITY PLOT



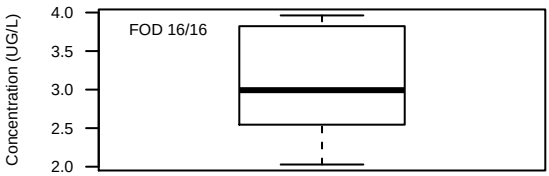
HISTOGRAM



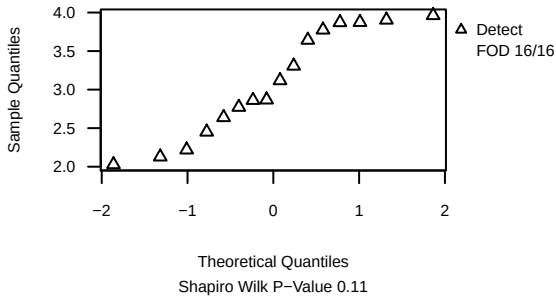
SUMMARY STATISTICS

Minimum	7.6
1st Quantile	13.4
Median	20.1
3rd Quantile	44.7
Maximum	52.6
FOD	16/16

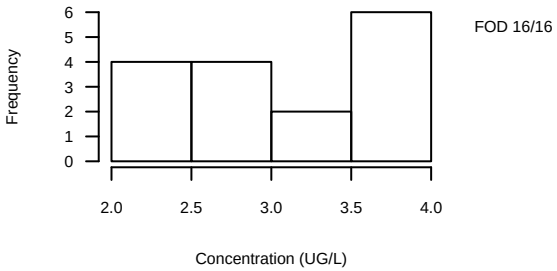
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

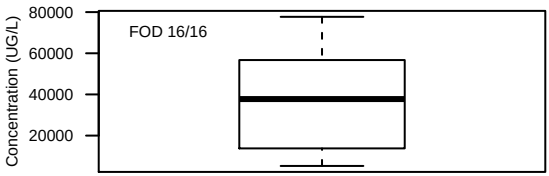


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

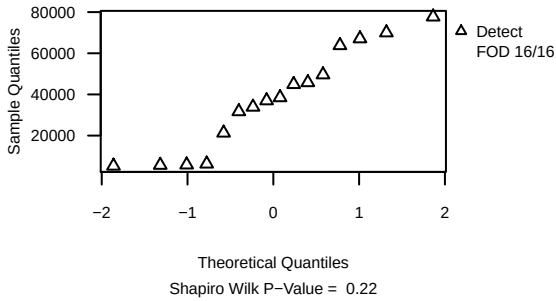
Minimum	2.03
1st Quantile	2.59
Median	2.99
3rd Quantile	3.8
Maximum	3.96
FOD	16/16

CALCIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 4 OF 33

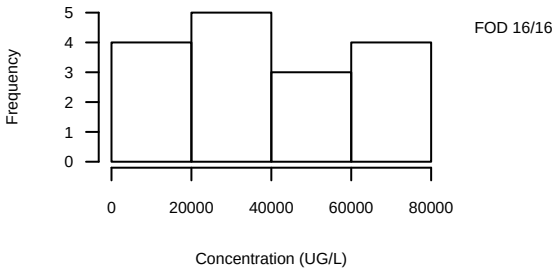
BOXPLOT



NORMAL PROBABILITY PLOT



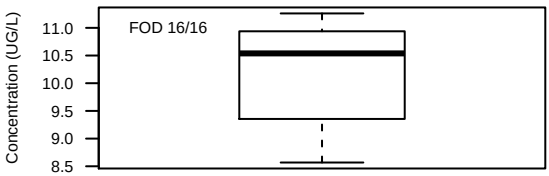
HISTOGRAM



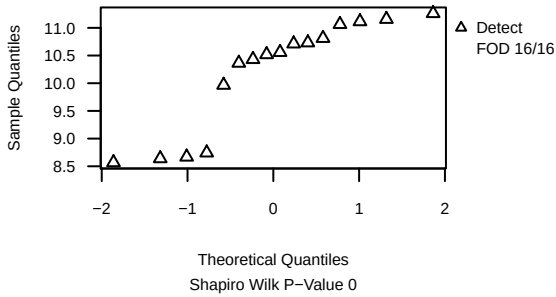
SUMMARY STATISTICS

Minimum	5260
1st Quantile	17540
Median	37750
3rd Quantile	53150
Maximum	77700
FOD	16/16

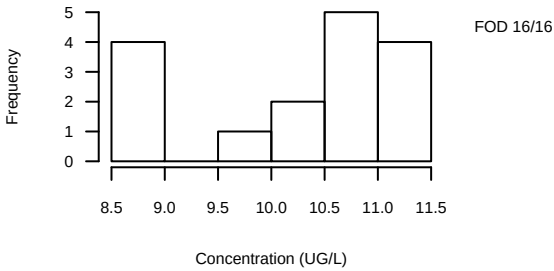
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

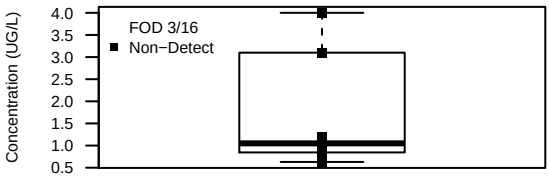


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

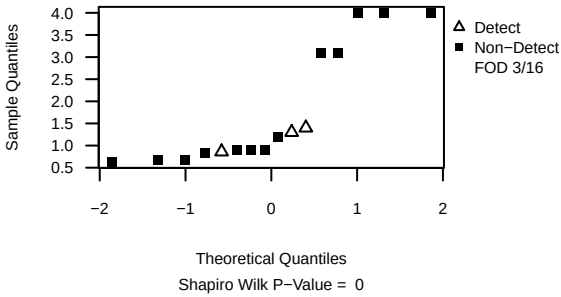
Minimum	8.57
1st Quantile	9.66
Median	10.54
3rd Quantile	10.87
Maximum	11.26
FOD	16/16

CHROMIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 5 OF 33

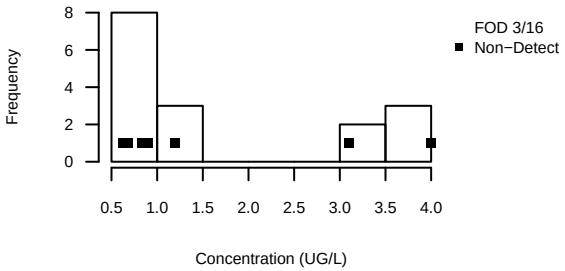
BOXPLOT



NORMAL PROBABILITY PLOT



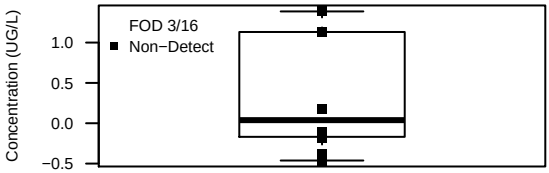
HISTOGRAM



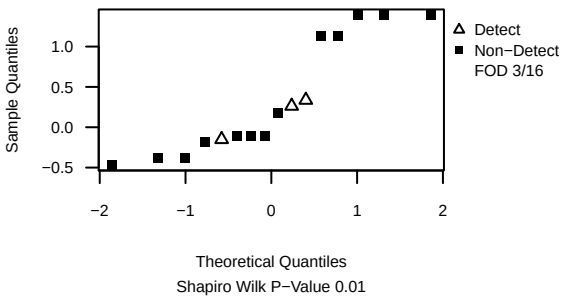
SUMMARY STATISTICS

Minimum	0.63
1st Quantile	0.85
Median	1.05
3rd Quantile	3.1
Maximum	4
FOD	3/16

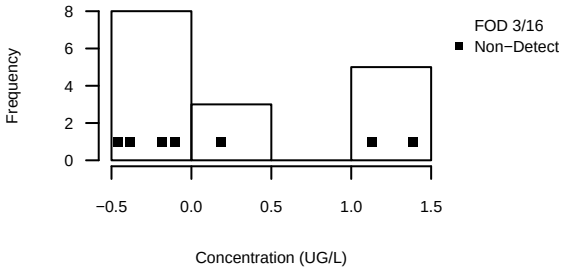
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

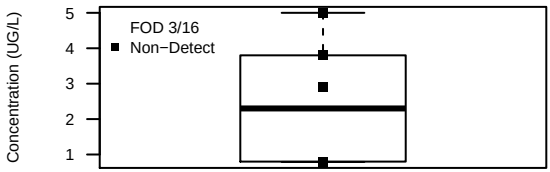


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

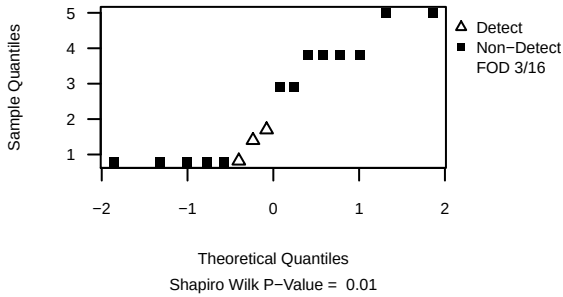
Minimum	−0.46
1st Quantile	−0.16
Median	0.04
3rd Quantile	1.13
Maximum	1.39
FOD	3/16

COBALT FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 6 OF 33

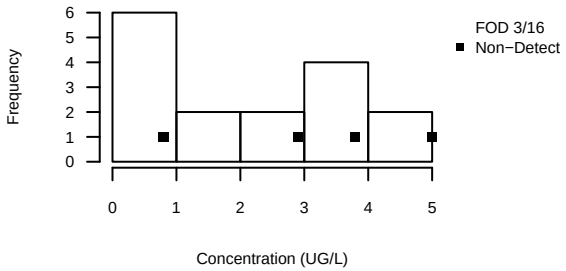
BOXPLOT



NORMAL PROBABILITY PLOT



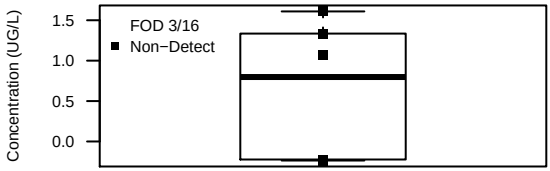
HISTOGRAM



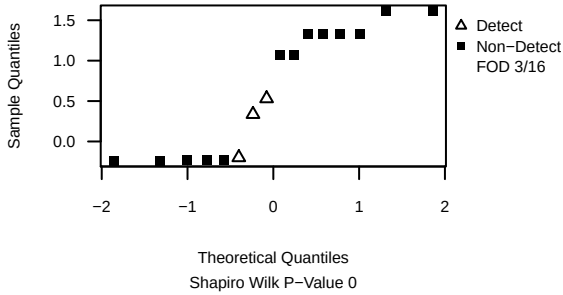
SUMMARY STATISTICS

Minimum	0.79
1st Quantile	0.8
Median	2.3
3rd Quantile	3.8
Maximum	5
FOD	3/16

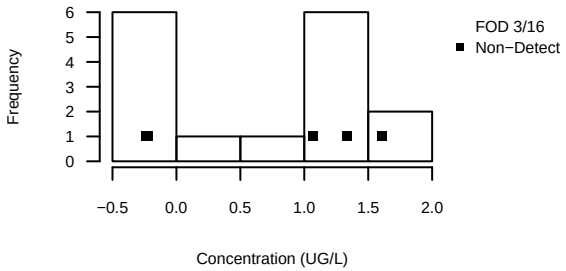
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

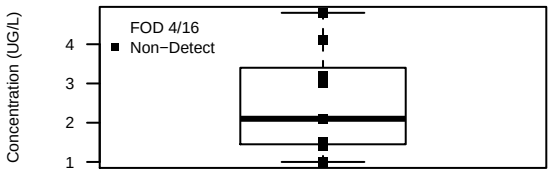


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

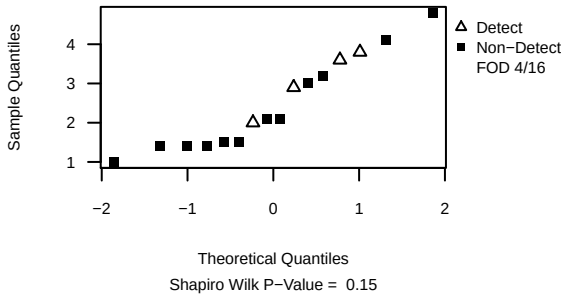
Minimum	−0.24
1st Quantile	−0.22
Median	0.8
3rd Quantile	1.34
Maximum	1.61
FOD	3/16

COPPER FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 7 OF 33

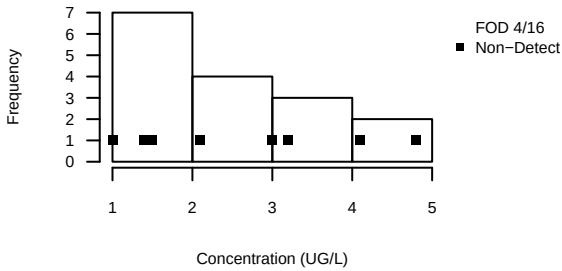
BOXPLOT



NORMAL PROBABILITY PLOT



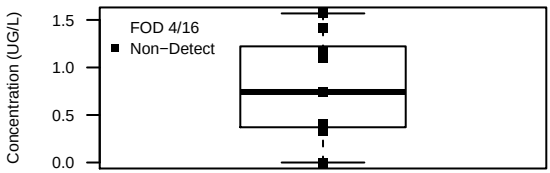
HISTOGRAM



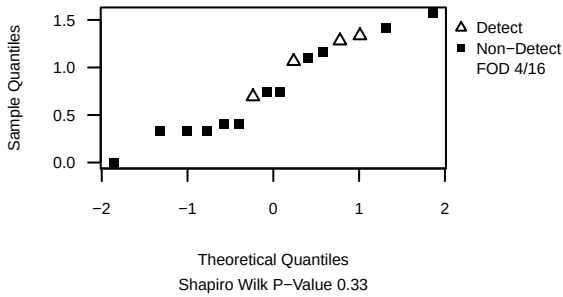
SUMMARY STATISTICS

Minimum	1
1st Quantile	1.48
Median	2.1
3rd Quantile	3.3
Maximum	4.8
FOD	4/16

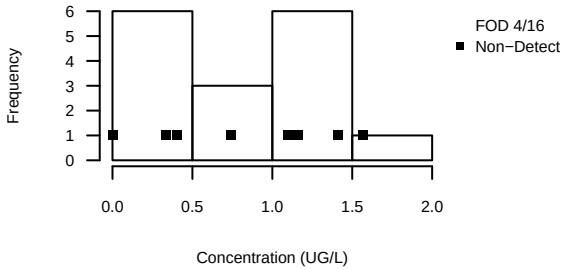
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

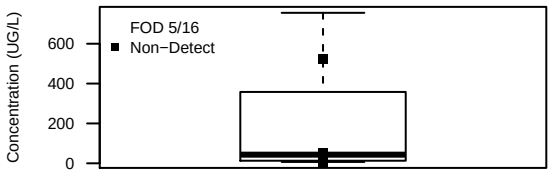


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

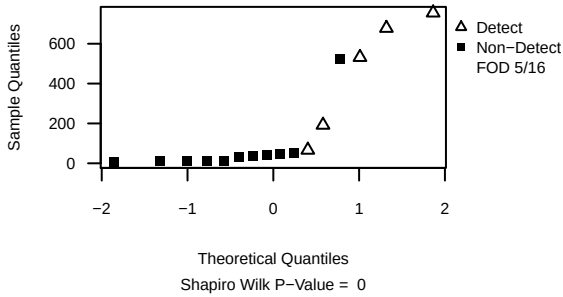
Minimum	0
1st Quantile	0.39
Median	0.74
3rd Quantile	1.19
Maximum	1.57
FOD	4/16

IRON FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 8 OF 33

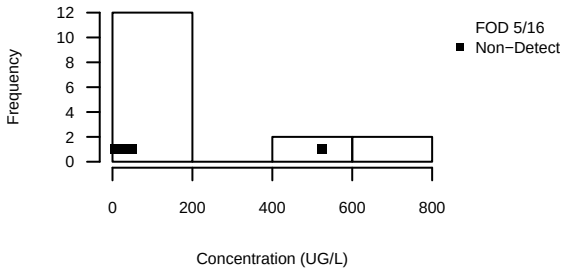
BOXPLOT



NORMAL PROBABILITY PLOT



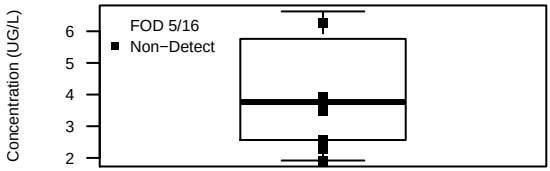
HISTOGRAM



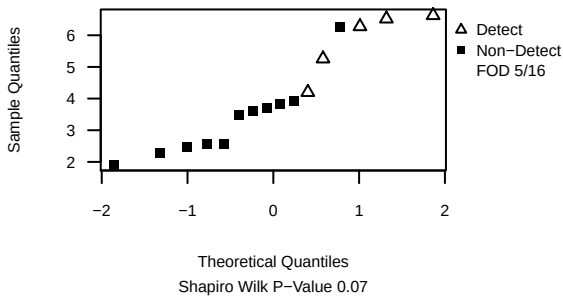
SUMMARY STATISTICS

Minimum	6.8
1st Quantile	13
Median	43.3
3rd Quantile	275
Maximum	755
FOD	5/16

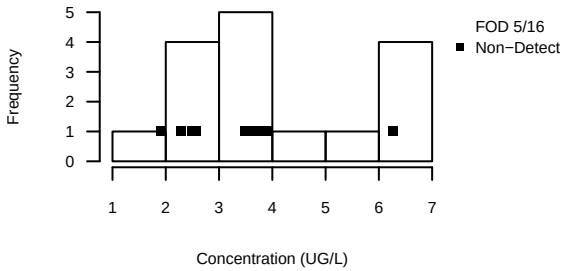
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



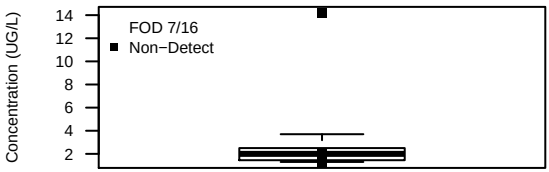
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



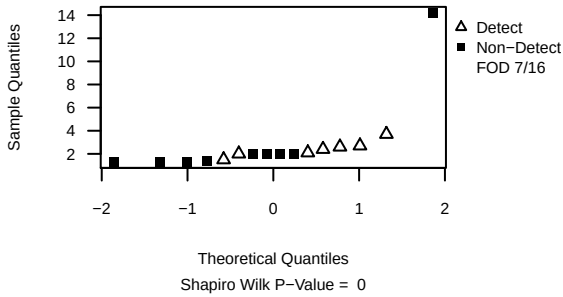
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	1.92
1st Quantile	2.56
Median	3.77
3rd Quantile	5.51
Maximum	6.63
FOD	5/16

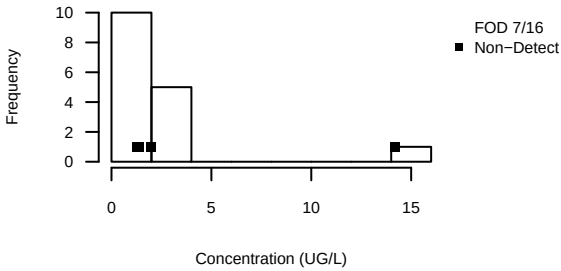
BOXPLOT



NORMAL PROBABILITY PLOT



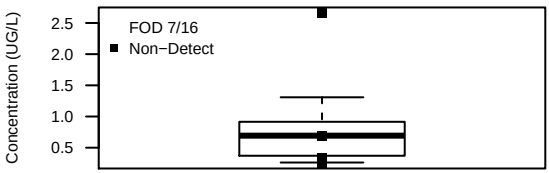
HISTOGRAM



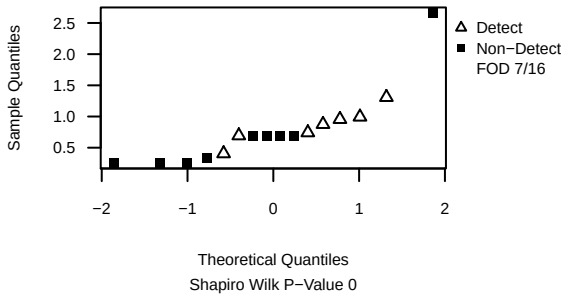
SUMMARY STATISTICS

Minimum	1.3
1st Quantile	1.48
Median	2
3rd Quantile	2.45
Maximum	14.2
FOD	7/16

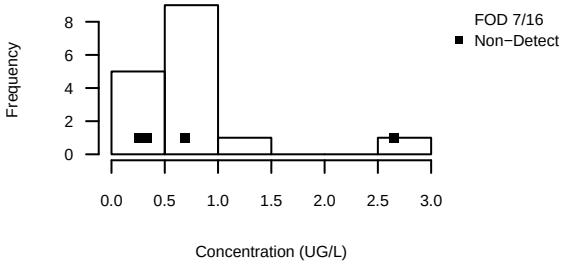
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

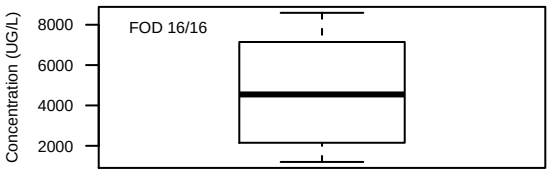


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

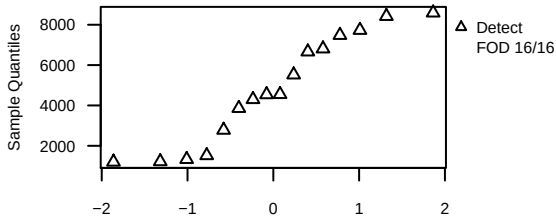
Minimum	0.26
1st Quantile	0.39
Median	0.69
3rd Quantile	0.9
Maximum	2.65
FOD	7/16

MAGNESIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 10 OF 33

BOXPLOT

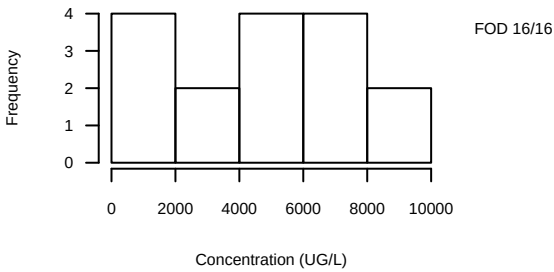


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0.14

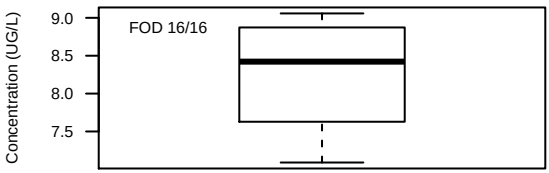
HISTOGRAM



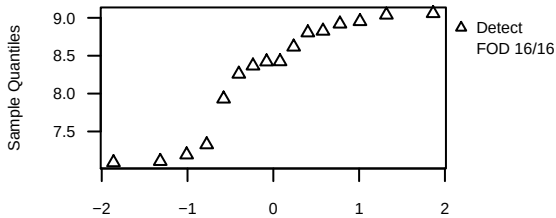
SUMMARY STATISTICS

Minimum	1200
1st Quantile	2465
Median	4545
3rd Quantile	6978
Maximum	8590
FOD	16/16

BOXPLOT OF LOGNORMAL CONCENTRATIONS

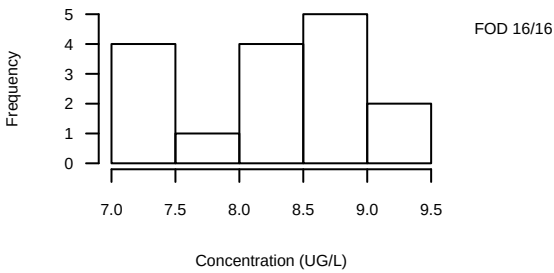


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.02

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

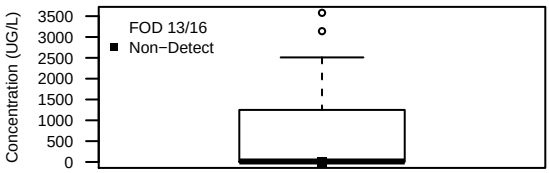


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

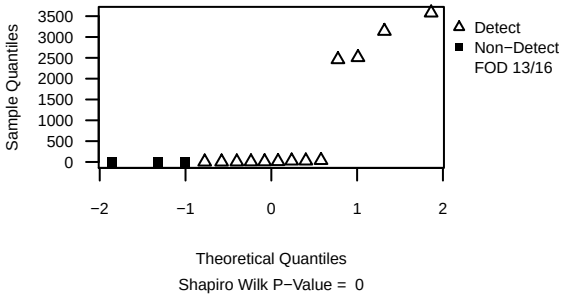
Minimum	7.09
1st Quantile	7.78
Median	8.42
3rd Quantile	8.85
Maximum	9.06
FOD	16/16

MANGANESE FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 11 OF 33

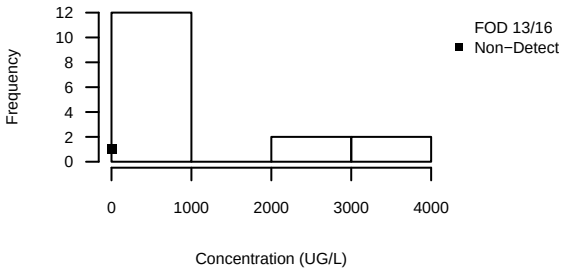
BOXPLOT



NORMAL PROBABILITY PLOT



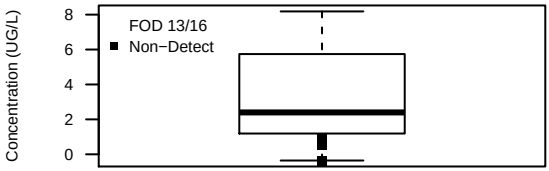
HISTOGRAM



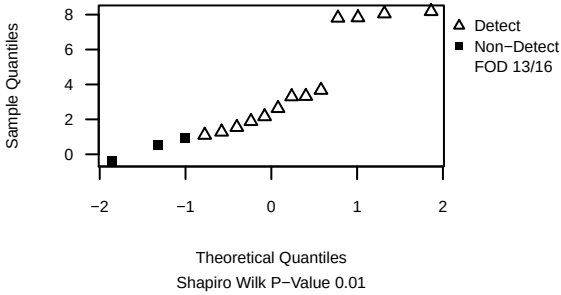
SUMMARY STATISTICS

Minimum	0.7
1st Quantile	3.45
Median	11.3
3rd Quantile	644.6
Maximum	3580
FOD	13/16

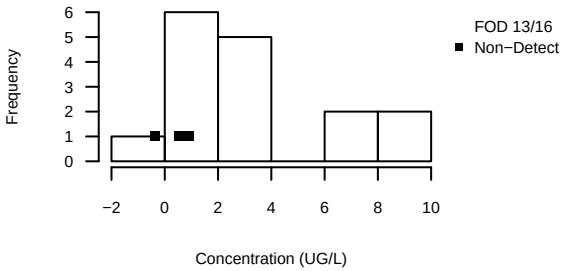
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

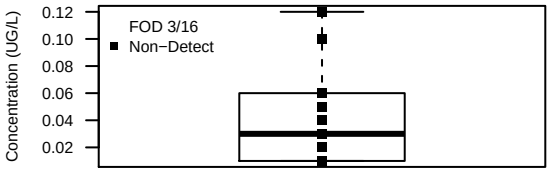


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

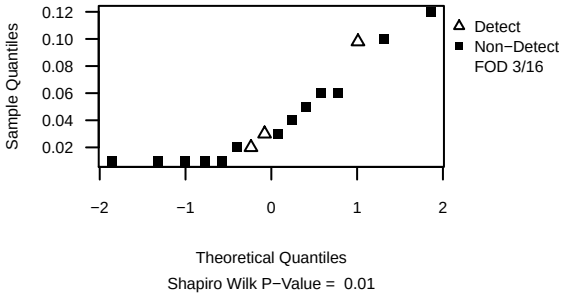
Minimum	−0.36
1st Quantile	1.24
Median	2.4
3rd Quantile	4.71
Maximum	8.18
FOD	13/16

MERCURY FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 12 OF 33

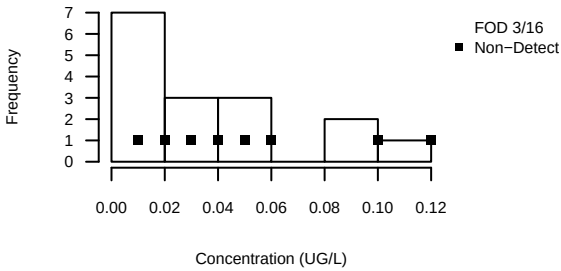
BOXPLOT



NORMAL PROBABILITY PLOT



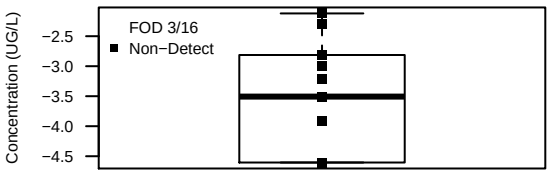
HISTOGRAM



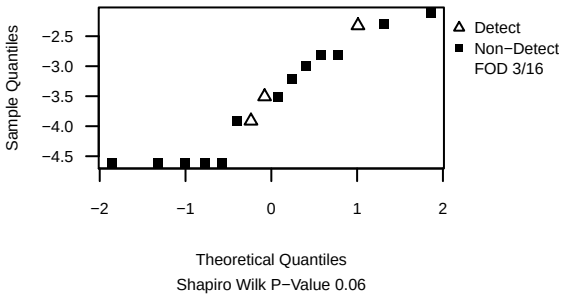
SUMMARY STATISTICS

Minimum	0.01
1st Quantile	0.01
Median	0.03
3rd Quantile	0.06
Maximum	0.12
FOD	3/16

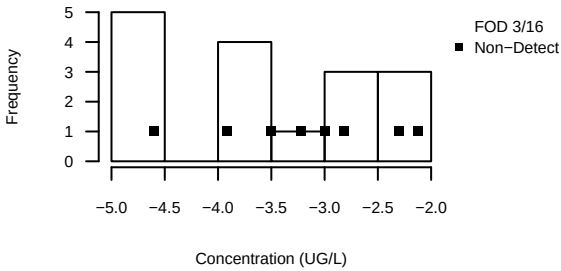
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

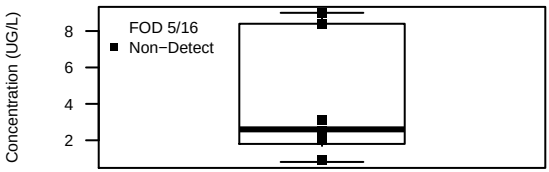


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

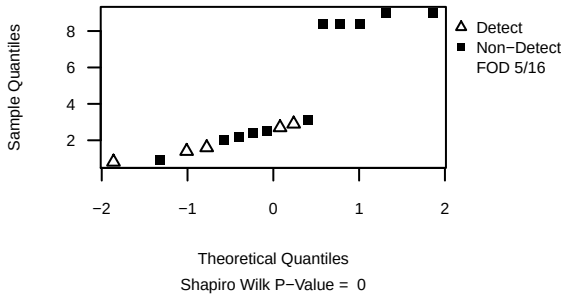
Minimum	−4.61
1st Quantile	−4.61
Median	−3.51
3rd Quantile	−2.81
Maximum	−2.12
FOD	3/16

NICKEL FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 13 OF 33

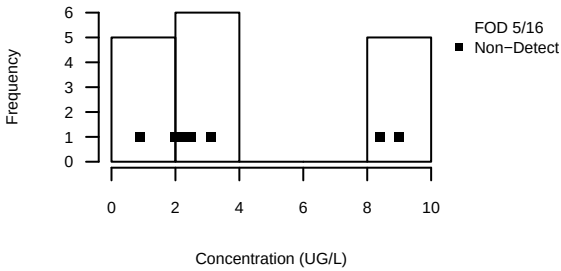
BOXPLOT



NORMAL PROBABILITY PLOT



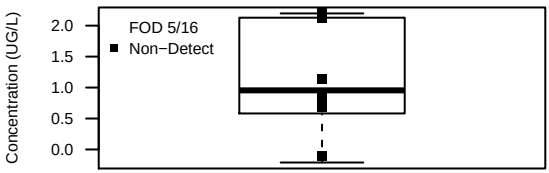
HISTOGRAM



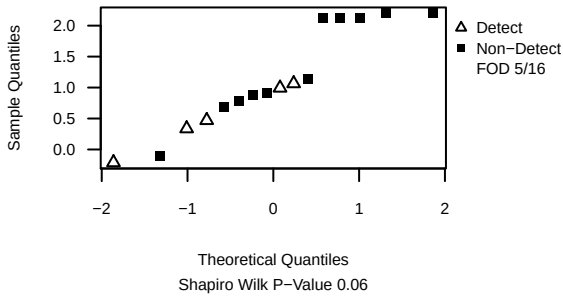
SUMMARY STATISTICS

Minimum	0.81
1st Quantile	1.9
Median	2.6
3rd Quantile	8.4
Maximum	9
FOD	5/16

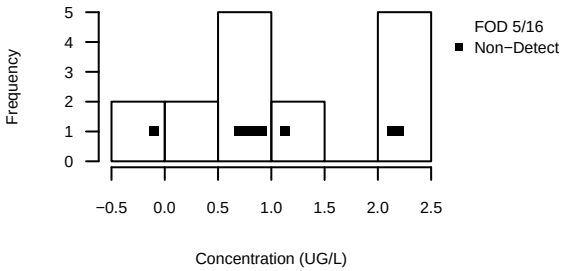
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

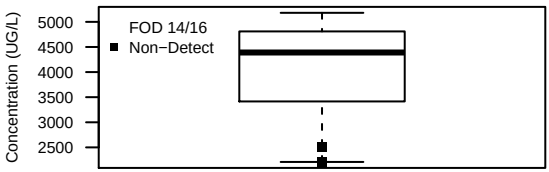


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

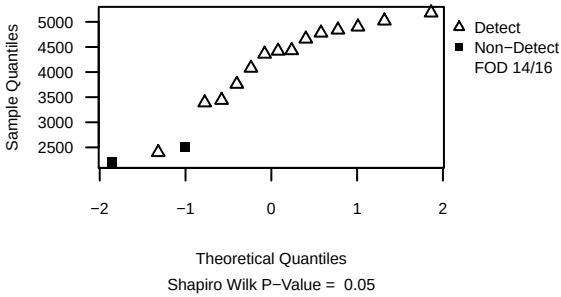
Minimum	−0.21
1st Quantile	0.64
Median	0.95
3rd Quantile	2.13
Maximum	2.2
FOD	5/16

POTASSIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 14 OF 33

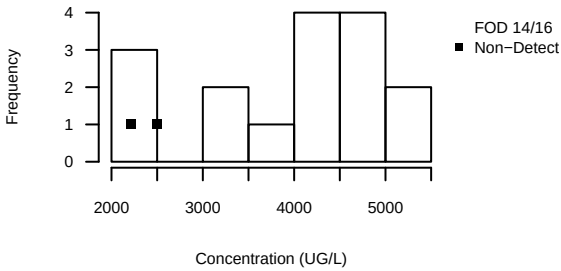
BOXPLOT



NORMAL PROBABILITY PLOT



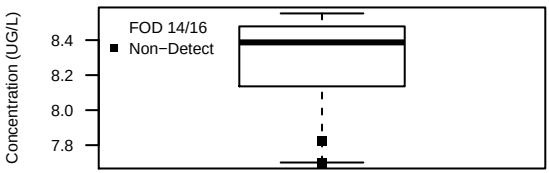
HISTOGRAM



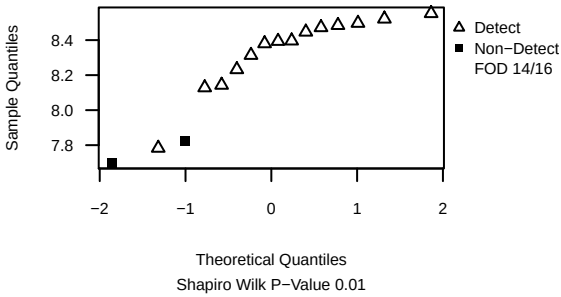
SUMMARY STATISTICS

Minimum	2210
1st Quantile	3428
Median	4390
3rd Quantile	4795
Maximum	5180
FOD	14/16

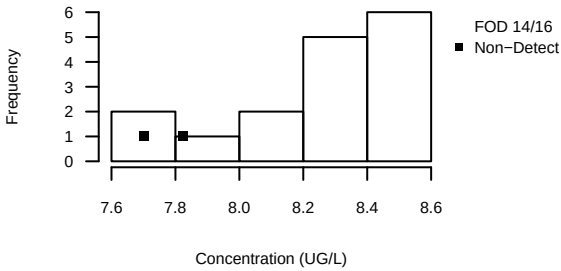
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

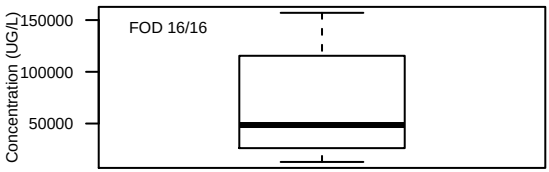


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

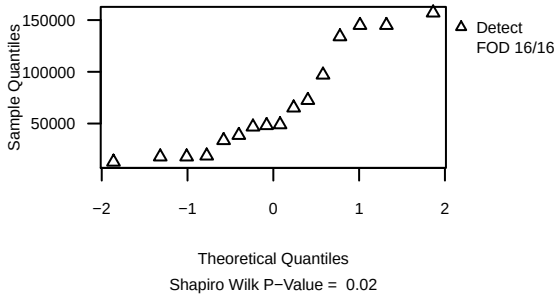
Minimum	7.7
1st Quantile	8.14
Median	8.39
3rd Quantile	8.47
Maximum	8.55
FOD	14/16

SODIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 15 OF 33

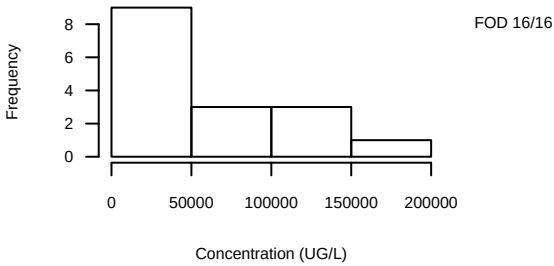
BOXPLOT



NORMAL PROBABILITY PLOT



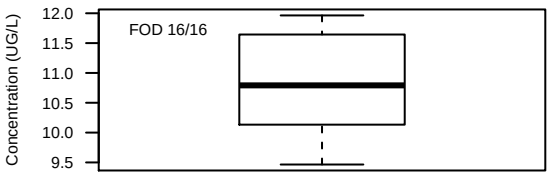
HISTOGRAM



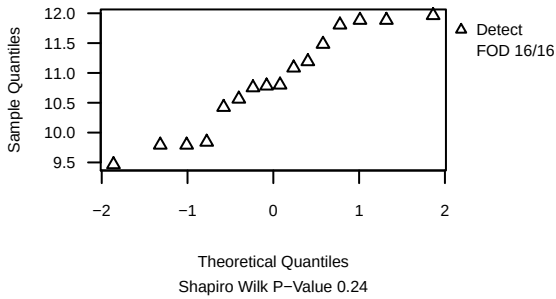
SUMMARY STATISTICS

Minimum	12900
1st Quantile	29980
Median	48600
3rd Quantile	106200
Maximum	157000
FOD	16/16

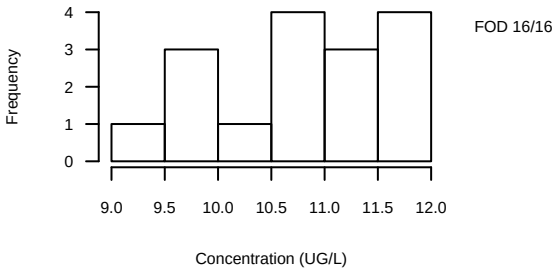
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

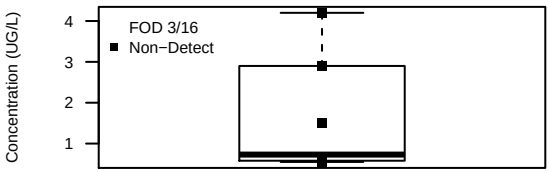


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

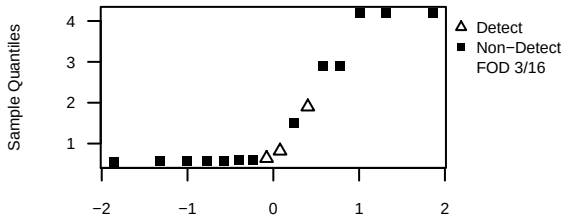
Minimum	9.46
1st Quantile	10.28
Median	10.79
3rd Quantile	11.56
Maximum	11.96
FOD	16/16

VANADIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 16 OF 33

BOXPLOT

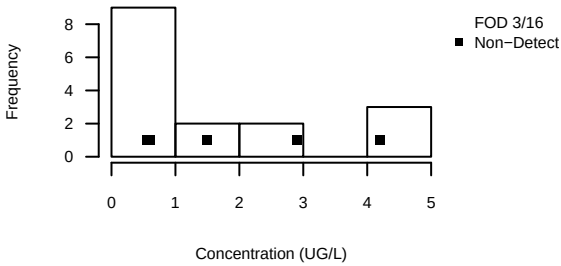


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0

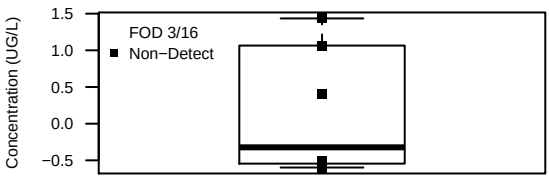
HISTOGRAM



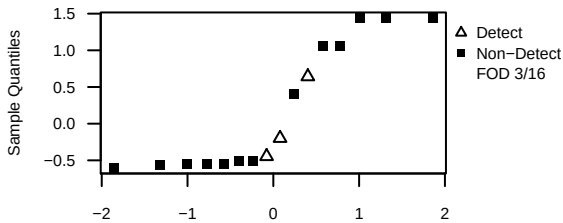
SUMMARY STATISTICS

Minimum	0.55
1st Quantile	0.58
Median	0.73
3rd Quantile	2.9
Maximum	4.2
FOD	3/16

BOXPLOT OF LOGNORMAL CONCENTRATIONS

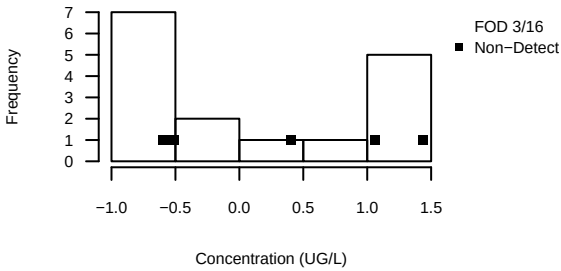


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

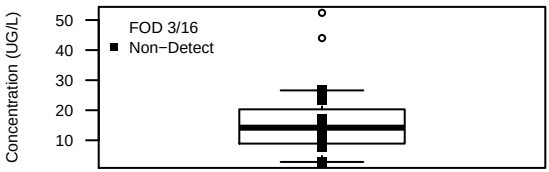


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

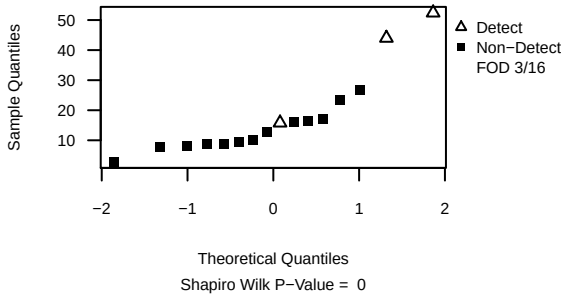
Minimum	−0.6
1st Quantile	−0.54
Median	−0.32
3rd Quantile	1.06
Maximum	1.44
FOD	3/16

ZINC FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 17 OF 33

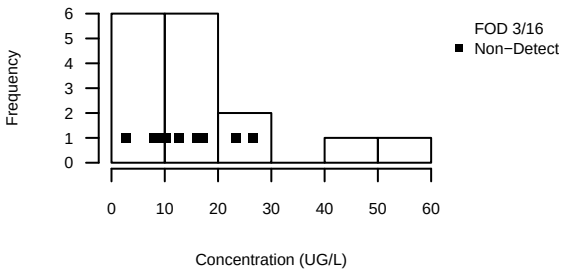
BOXPLOT



NORMAL PROBABILITY PLOT



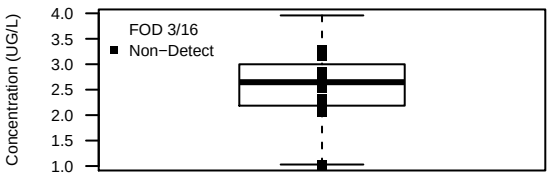
HISTOGRAM



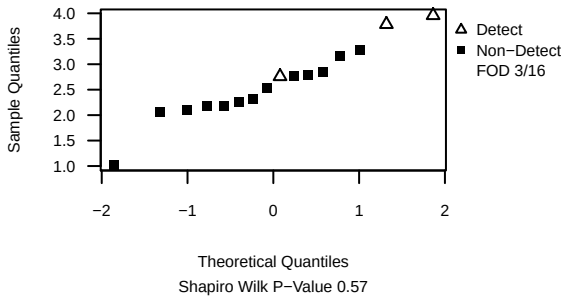
SUMMARY STATISTICS

Minimum	2.8
1st Quantile	8.9
Median	14.2
3rd Quantile	18.75
Maximum	52.4
FOD	3/16

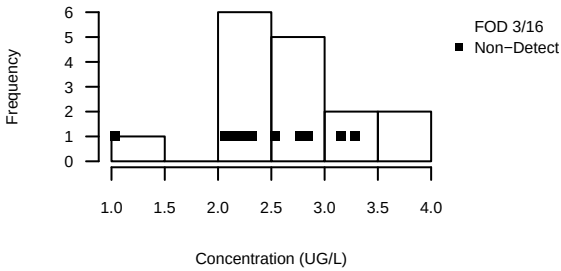
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

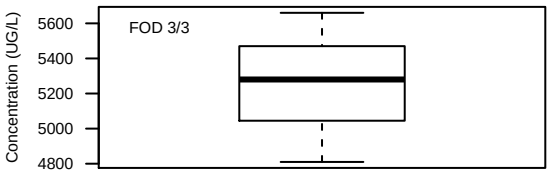


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

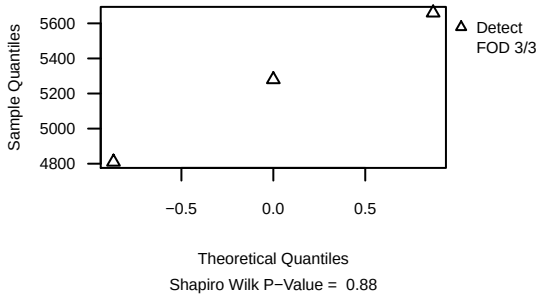
Minimum	1.03
1st Quantile	2.19
Median	2.65
3rd Quantile	2.92
Maximum	3.96
FOD	3/16

DISSOLVED CALCIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 18 OF 33

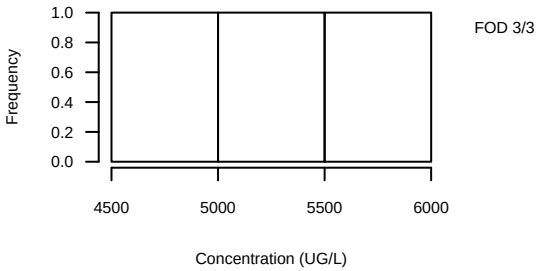
BOXPLOT



NORMAL PROBABILITY PLOT



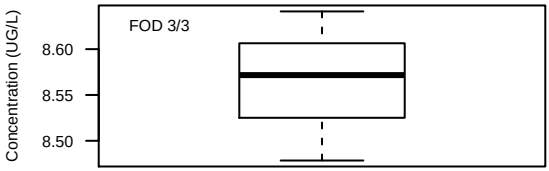
HISTOGRAM



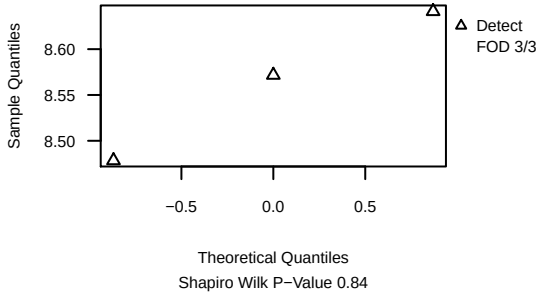
SUMMARY STATISTICS

Minimum	4810
1st Quantile	5045
Median	5280
3rd Quantile	5470
Maximum	5660
FOD	3/3

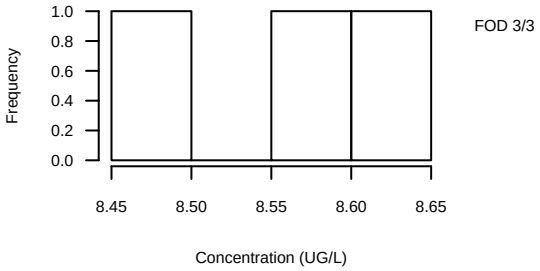
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

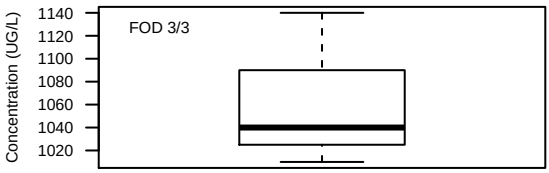


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

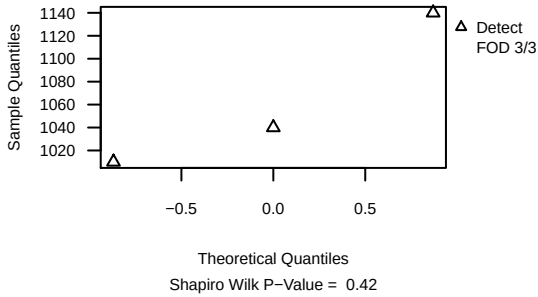
Minimum	8.48
1st Quantile	8.53
Median	8.57
3rd Quantile	8.61
Maximum	8.64
FOD	3/3

DISSOLVED MAGNESIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 19 OF 33

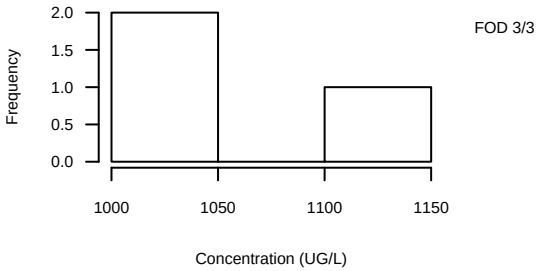
BOXPLOT



NORMAL PROBABILITY PLOT



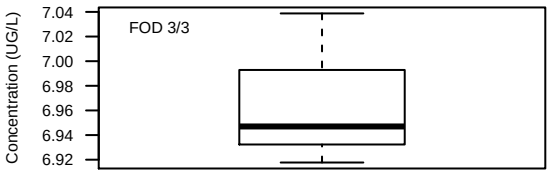
HISTOGRAM



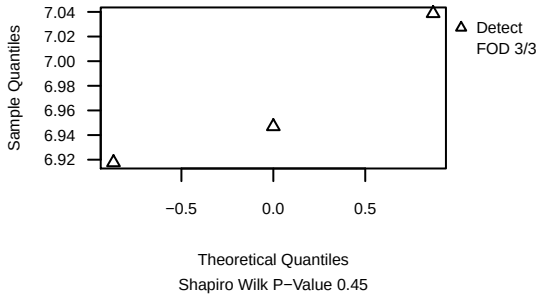
SUMMARY STATISTICS

Minimum	1010
1st Quantile	1025
Median	1040
3rd Quantile	1090
Maximum	1140
FOD	3/3

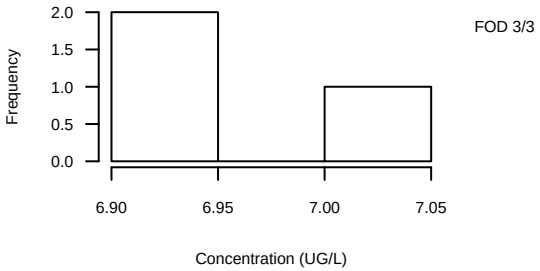
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

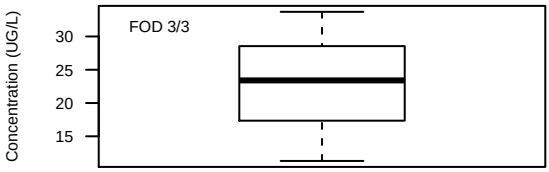


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

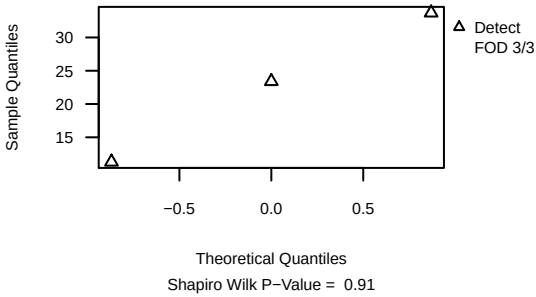
Minimum	6.92
1st Quantile	6.93
Median	6.95
3rd Quantile	6.99
Maximum	7.04
FOD	3/3

DISSOLVED MANGANESE FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 20 OF 33

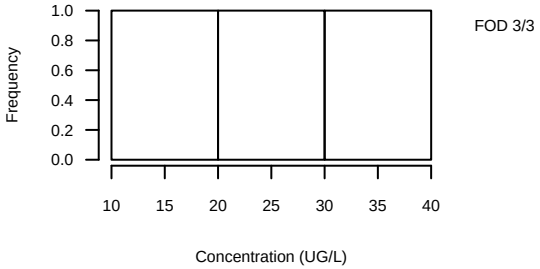
BOXPLOT



NORMAL PROBABILITY PLOT



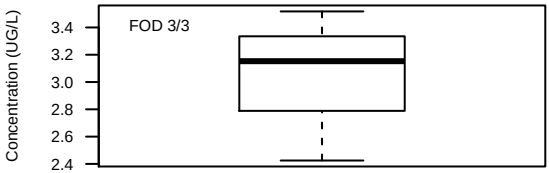
HISTOGRAM



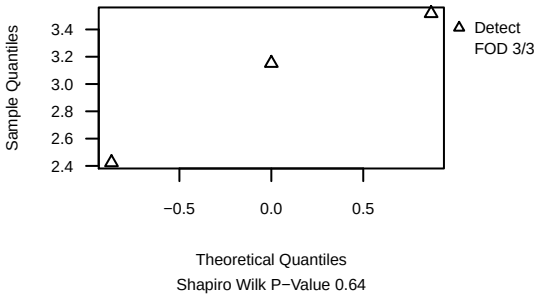
SUMMARY STATISTICS

Minimum	11.3
1st Quantile	17.35
Median	23.4
3rd Quantile	28.55
Maximum	33.7
FOD	3/3

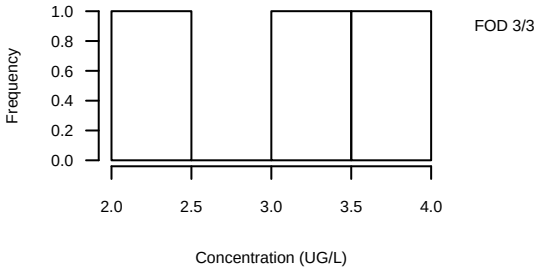
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

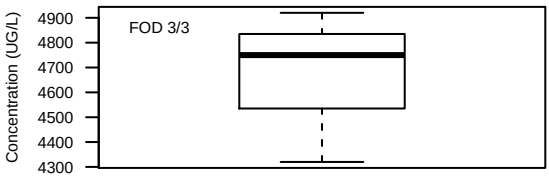


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

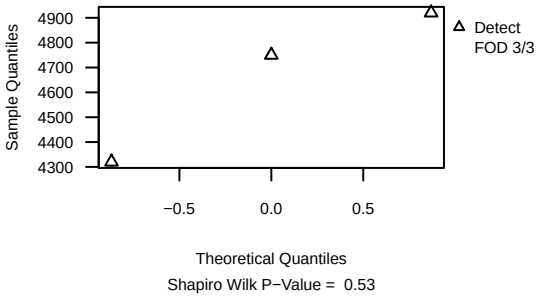
Minimum	2.42
1st Quantile	2.79
Median	3.15
3rd Quantile	3.34
Maximum	3.52
FOD	3/3

DISSOLVED POTASSIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 21 OF 33

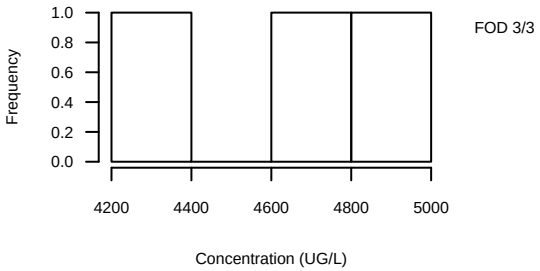
BOXPLOT



NORMAL PROBABILITY PLOT



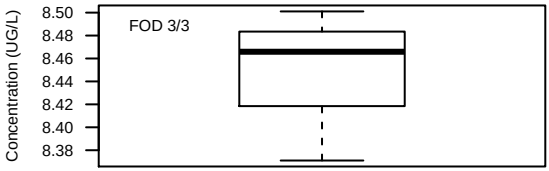
HISTOGRAM



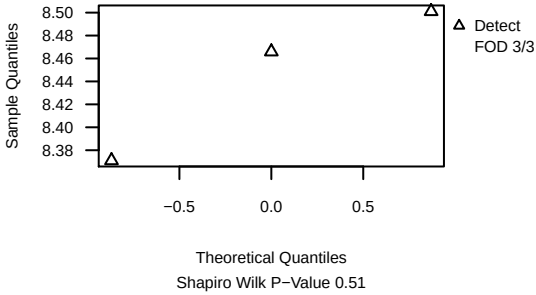
SUMMARY STATISTICS

Minimum	4320
1st Quantile	4535
Median	4750
3rd Quantile	4835
Maximum	4920
FOD	3/3

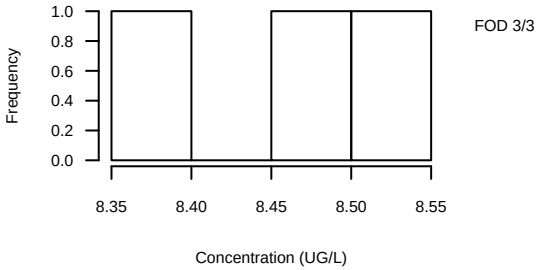
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

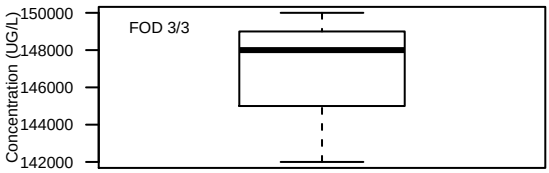


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

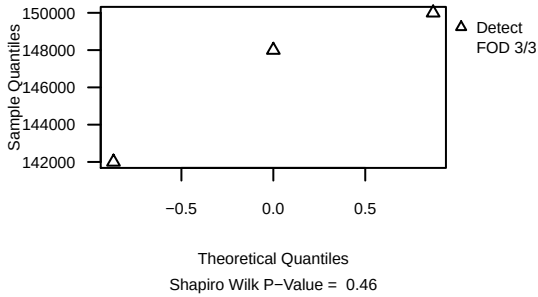
Minimum	8.37
1st Quantile	8.42
Median	8.47
3rd Quantile	8.48
Maximum	8.5
FOD	3/3

DISSOLVED SODIUM FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 22 OF 33

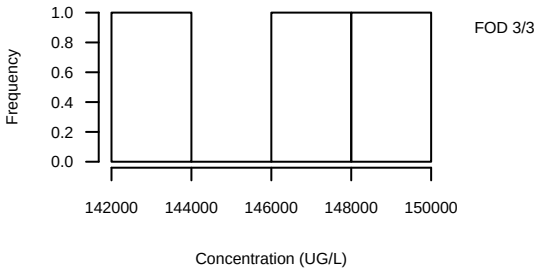
BOXPLOT



NORMAL PROBABILITY PLOT



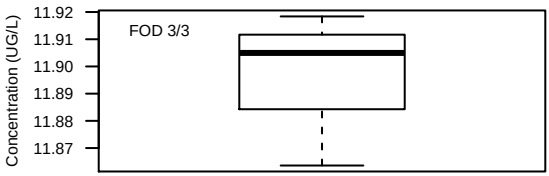
HISTOGRAM



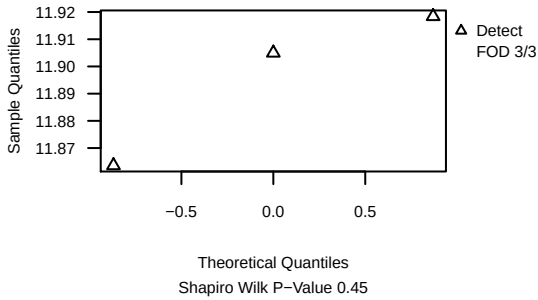
SUMMARY STATISTICS

Minimum	142000
1st Quantile	145000
Median	148000
3rd Quantile	149000
Maximum	150000
FOD	3/3

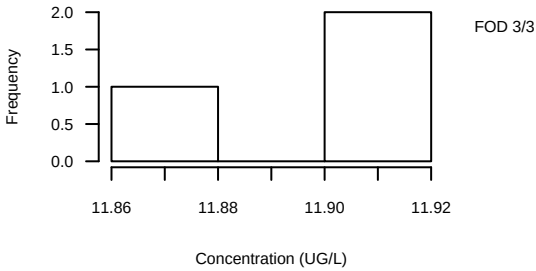
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

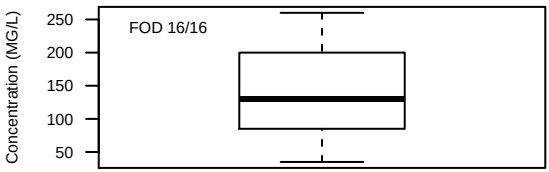


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

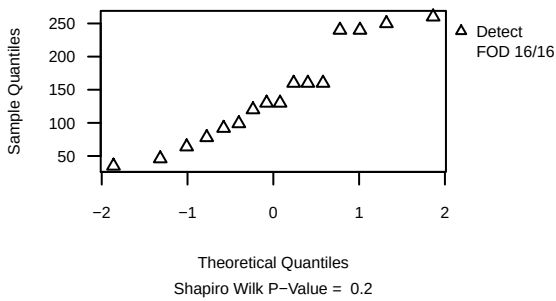
Minimum	11.86
1st Quantile	11.88
Median	11.9
3rd Quantile	11.91
Maximum	11.92
FOD	3/3

ALKALINITY FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 23 OF 33

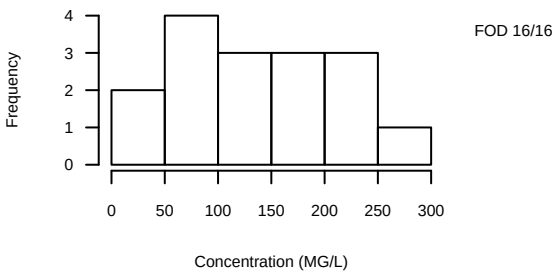
BOXPLOT



NORMAL PROBABILITY PLOT



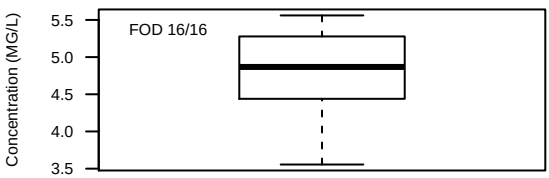
HISTOGRAM



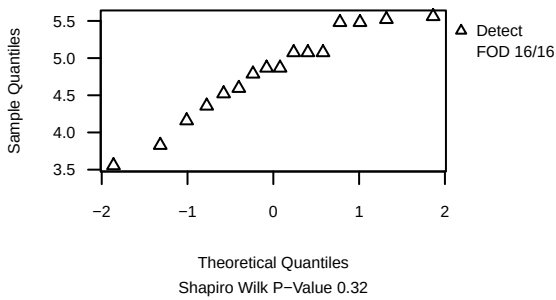
SUMMARY STATISTICS

Minimum	35
1st Quantile	88.5
Median	130
3rd Quantile	180
Maximum	260
FOD	16/16

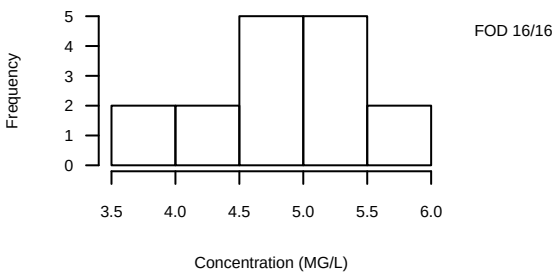
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



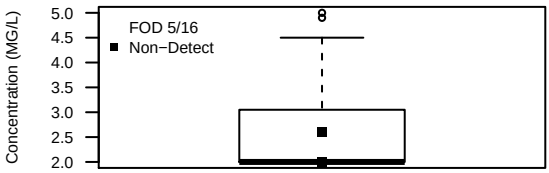
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



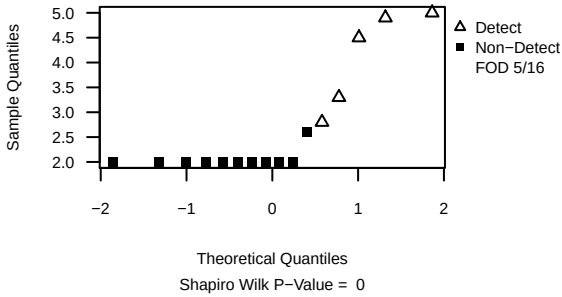
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.56
1st Quantile	4.48
Median	4.87
3rd Quantile	5.18
Maximum	5.56
FOD	16/16

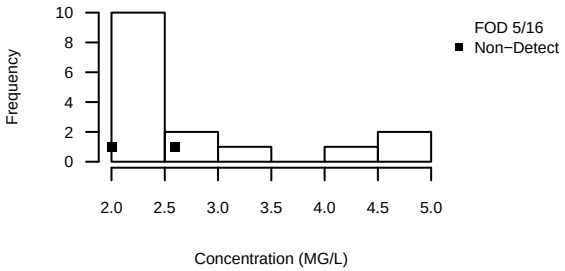
BOXPLOT



NORMAL PROBABILITY PLOT



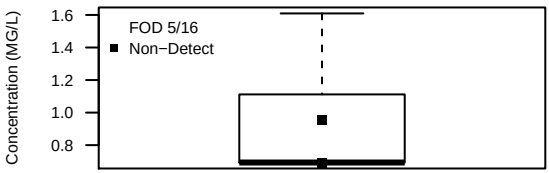
HISTOGRAM



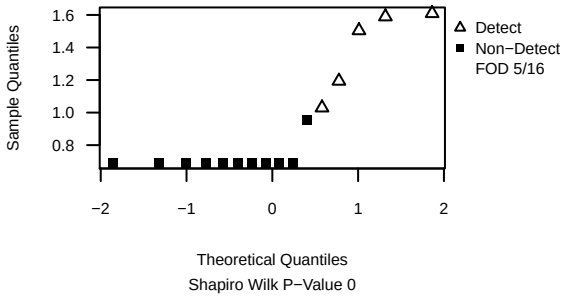
SUMMARY STATISTICS

Minimum	2
1st Quantile	2
Median	2
3rd Quantile	2.92
Maximum	5
FOD	5/16

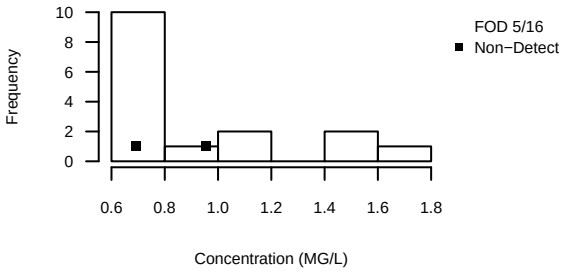
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

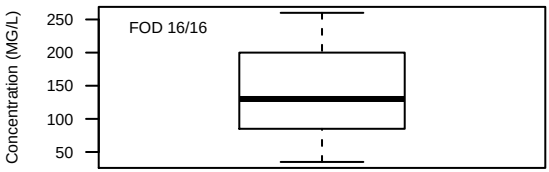


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

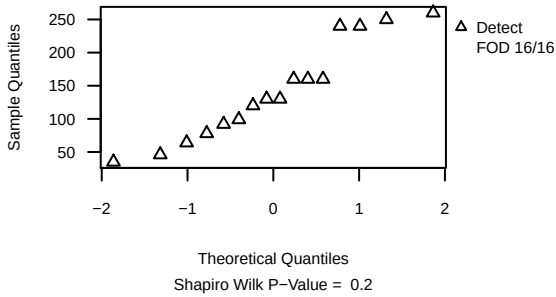
Minimum	0.69
1st Quantile	0.69
Median	0.69
3rd Quantile	1.07
Maximum	1.61
FOD	5/16

CARBONATE ALKALINITY FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 25 OF 33

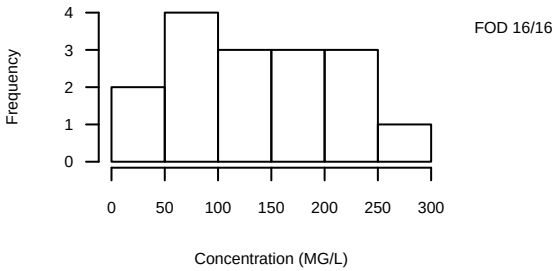
BOXPLOT



NORMAL PROBABILITY PLOT



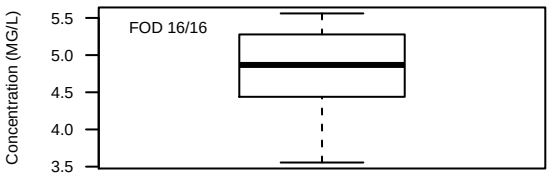
HISTOGRAM



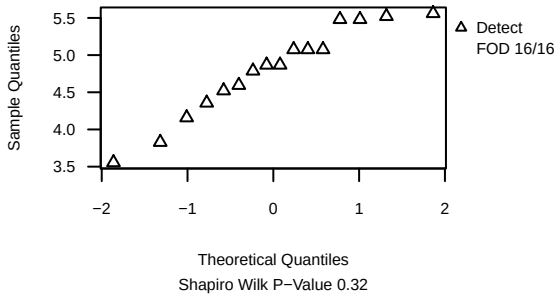
SUMMARY STATISTICS

Minimum	35
1st Quantile	88.5
Median	130
3rd Quantile	180
Maximum	260
FOD	16/16

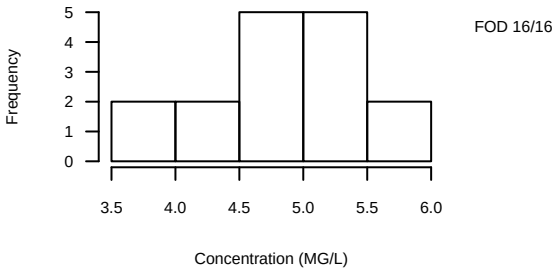
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

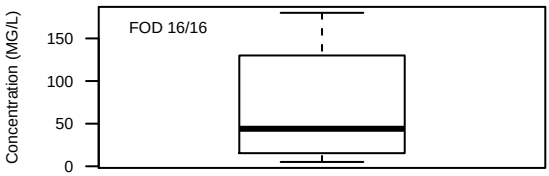


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

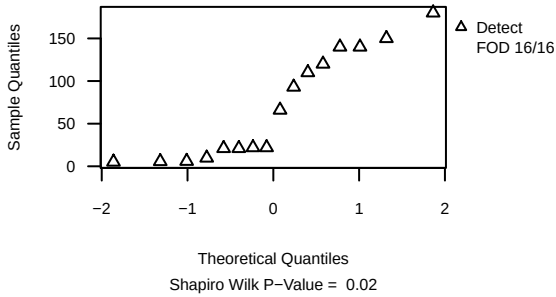
Minimum	3.56
1st Quantile	4.48
Median	4.87
3rd Quantile	5.18
Maximum	5.56
FOD	16/16

CHLORIDE FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 26 OF 33

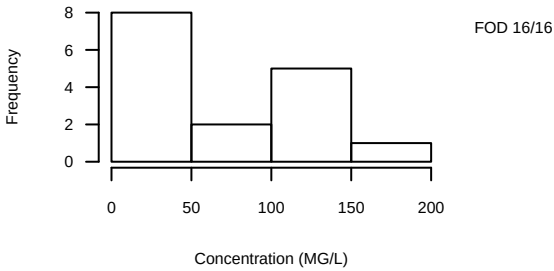
BOXPLOT



NORMAL PROBABILITY PLOT



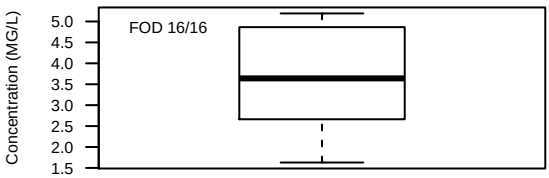
HISTOGRAM



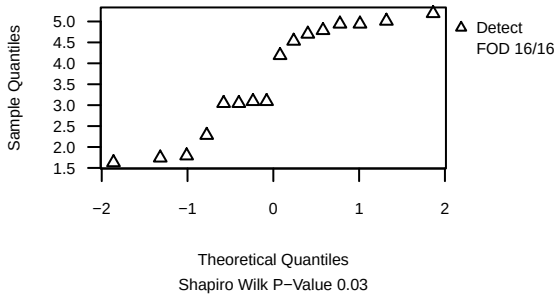
SUMMARY STATISTICS

Minimum	5.1
1st Quantile	18.2
Median	44
3rd Quantile	125
Maximum	180
FOD	16/16

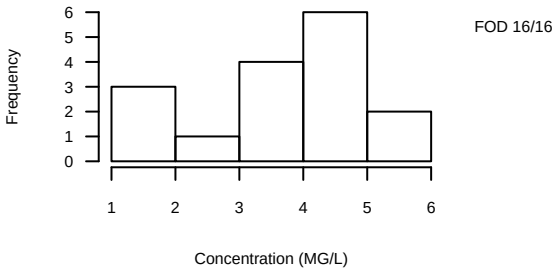
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



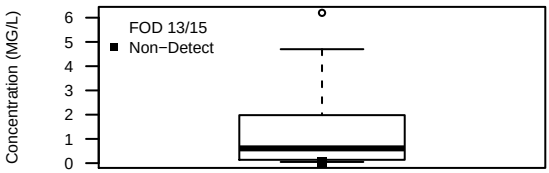
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



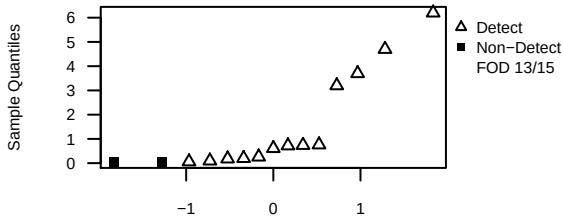
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	1.63
1st Quantile	2.85
Median	3.64
3rd Quantile	4.83
Maximum	5.19
FOD	16/16

BOXPLOT

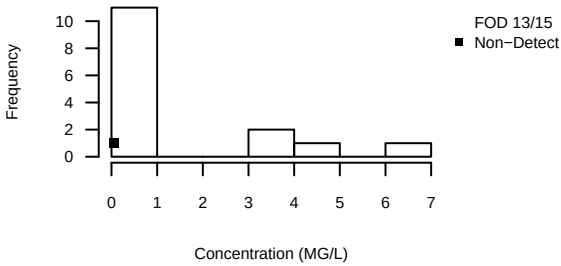


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0

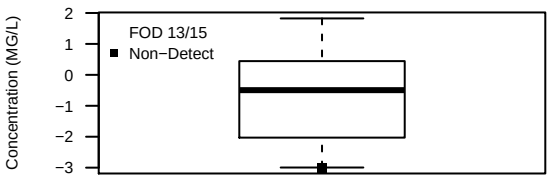
HISTOGRAM



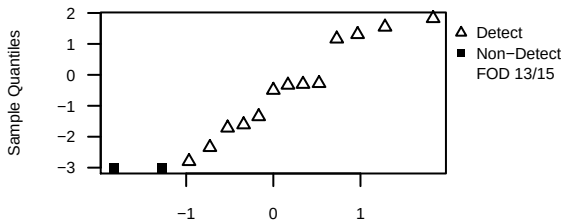
SUMMARY STATISTICS

Minimum	0.05
1st Quantile	0.14
Median	0.61
3rd Quantile	1.98
Maximum	6.2
FOD	13/15

BOXPLOT OF LOGNORMAL CONCENTRATIONS

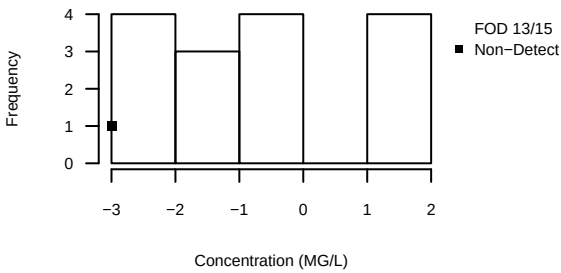


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.21

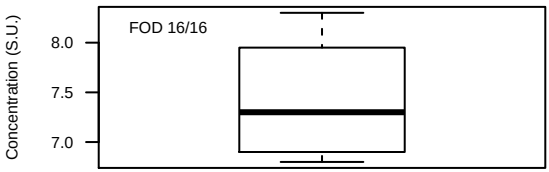
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



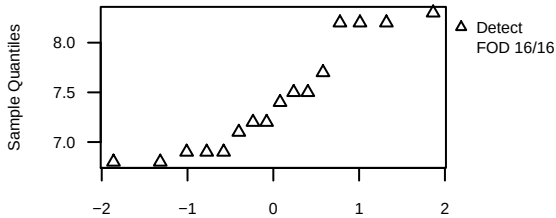
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−3
1st Quantile	−2.03
Median	−0.49
3rd Quantile	0.44
Maximum	1.82
FOD	13/15

BOXPLOT

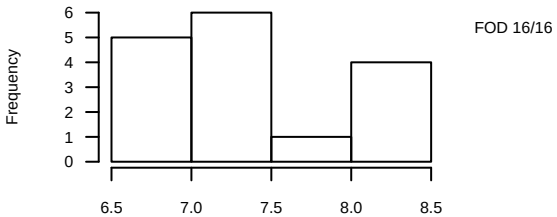


NORMAL PROBABILITY PLOT



Theoretical Quantiles
Shapiro Wilk P−Value = 0.03

HISTOGRAM

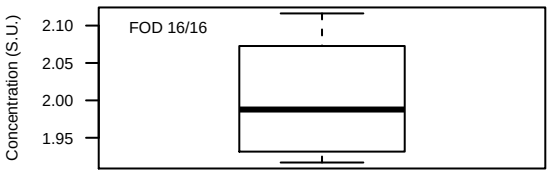


Concentration (S.U.)

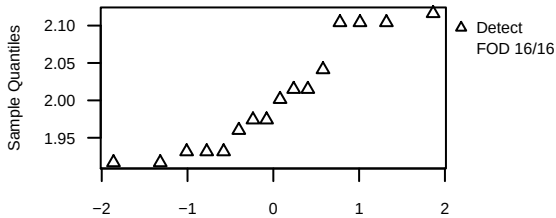
SUMMARY STATISTICS

Minimum	6.8
1st Quantile	6.9
Median	7.3
3rd Quantile	7.83
Maximum	8.3
FOD	16/16

BOXPLOT OF LOGNORMAL CONCENTRATIONS

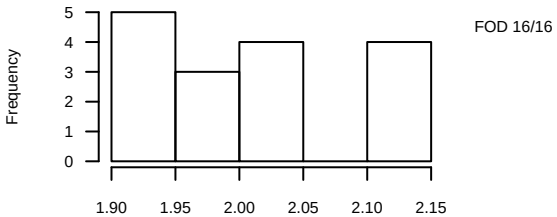


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Theoretical Quantiles
Shapiro Wilk P−Value 0.04

HISTOGRAM OF LOGNORMAL CONCENTRATIONS



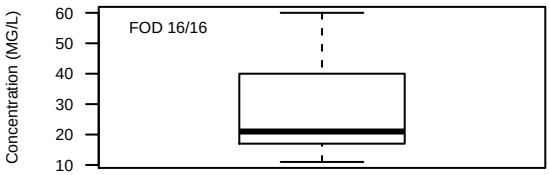
Concentration (S.U.)

SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

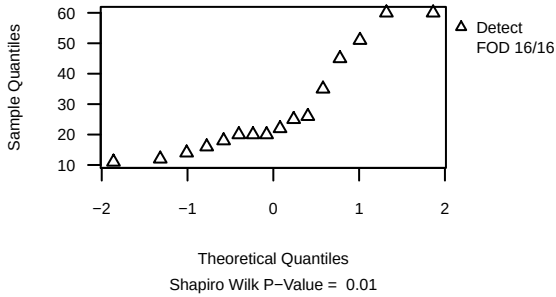
Minimum	1.92
1st Quantile	1.93
Median	1.99
3rd Quantile	2.06
Maximum	2.12
FOD	16/16

SULFATE FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 29 OF 33

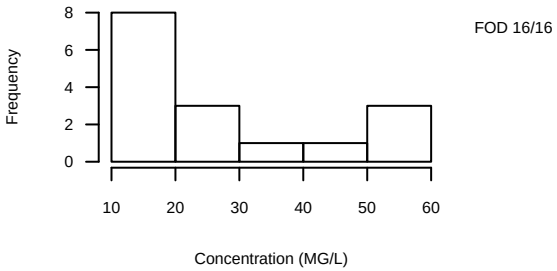
BOXPLOT



NORMAL PROBABILITY PLOT



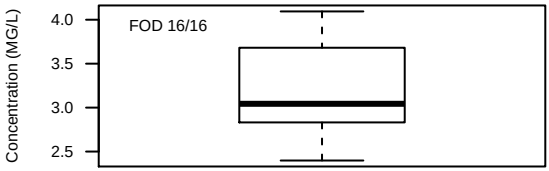
HISTOGRAM



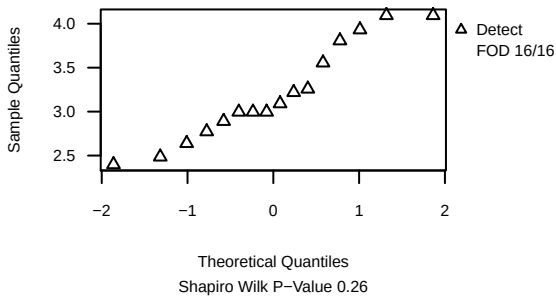
SUMMARY STATISTICS

Minimum	11
1st Quantile	17.5
Median	21
3rd Quantile	37.5
Maximum	60
FOD	16/16

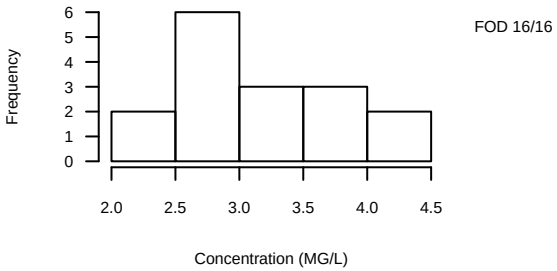
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

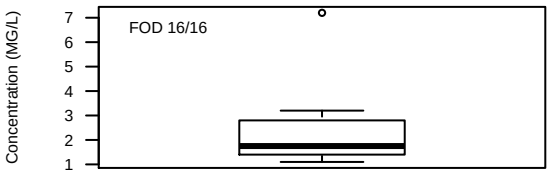


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

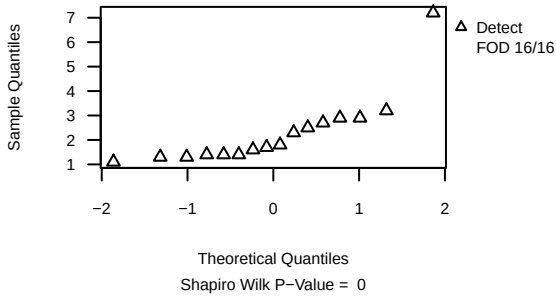
Minimum	2.4
1st Quantile	2.86
Median	3.04
3rd Quantile	3.62
Maximum	4.09
FOD	16/16

TOTAL ORGANIC CARBON FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 30 OF 33

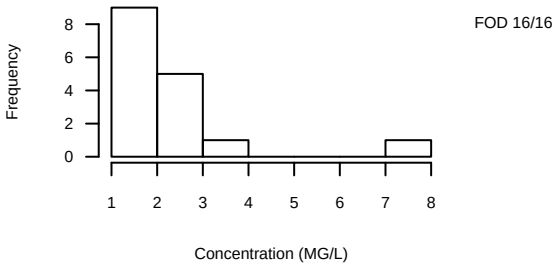
BOXPLOT



NORMAL PROBABILITY PLOT



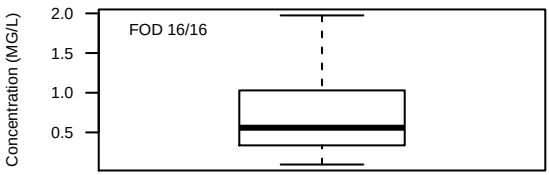
HISTOGRAM



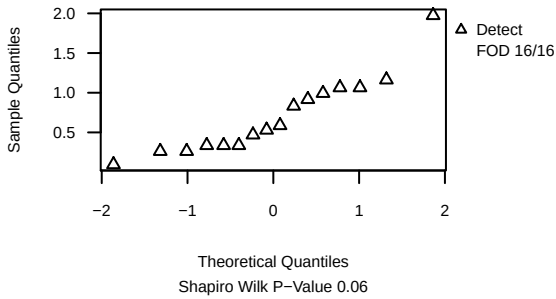
SUMMARY STATISTICS

Minimum	1.1
1st Quantile	1.4
Median	1.75
3rd Quantile	2.75
Maximum	7.2
FOD	16/16

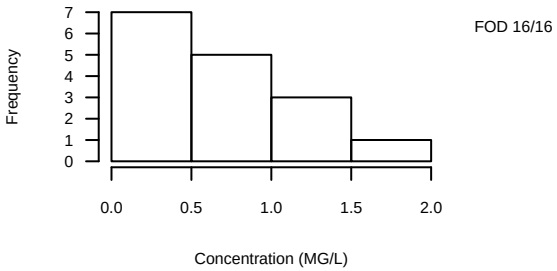
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

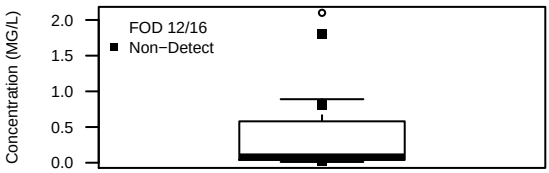


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

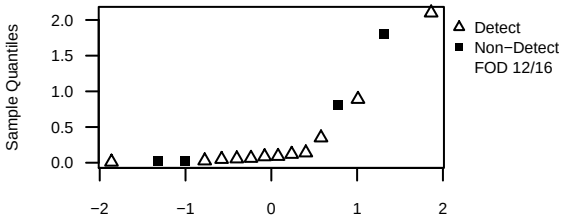
Minimum	0.1
1st Quantile	0.34
Median	0.56
3rd Quantile	1.01
Maximum	1.97
FOD	16/16

TOTAL ORGANIC HALIDES FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 31 OF 33

BOXPLOT

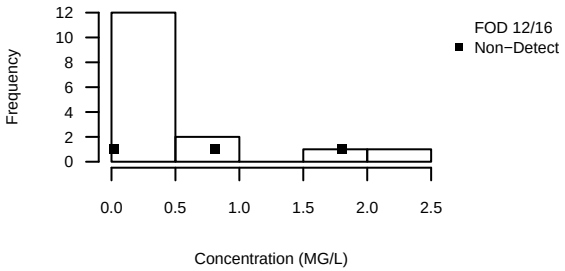


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0

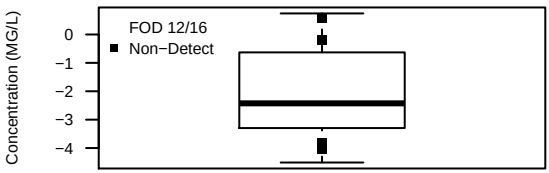
HISTOGRAM



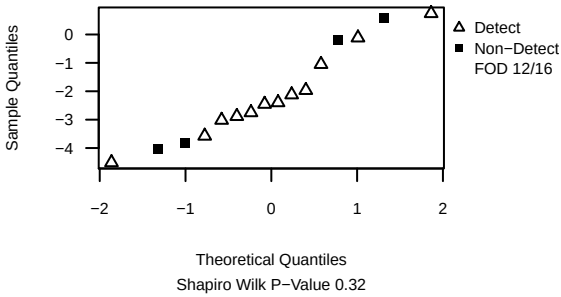
SUMMARY STATISTICS

Minimum	0.01
1st Quantile	0.04
Median	0.09
3rd Quantile	0.46
Maximum	2.1
FOD	12/16

BOXPLOT OF LOGNORMAL CONCENTRATIONS

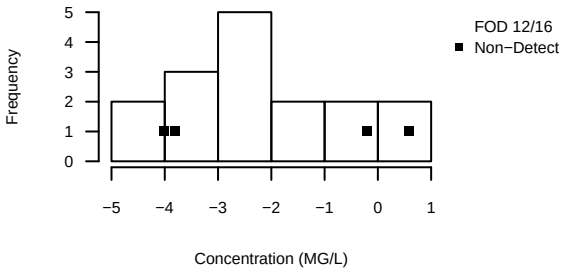


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.32

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

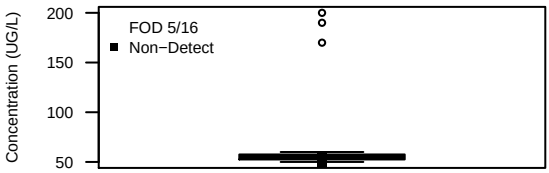


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

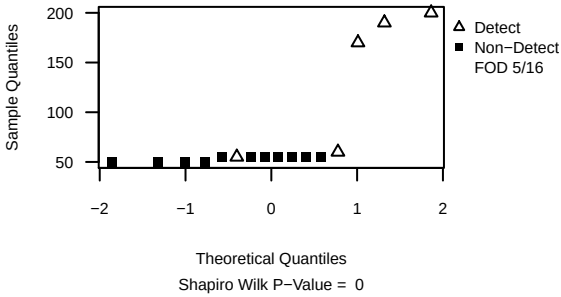
Minimum	−4.51
1st Quantile	−3.16
Median	−2.42
3rd Quantile	−0.84
Maximum	0.74
FOD	12/16

DIESEL RANGE ORGANICS FRESHWATER GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 32 OF 33

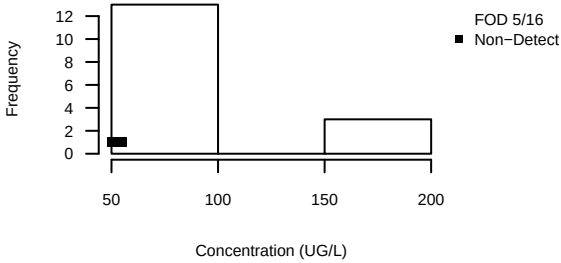
BOXPLOT



NORMAL PROBABILITY PLOT



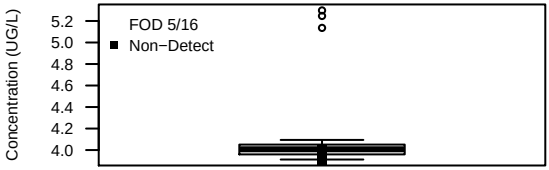
HISTOGRAM



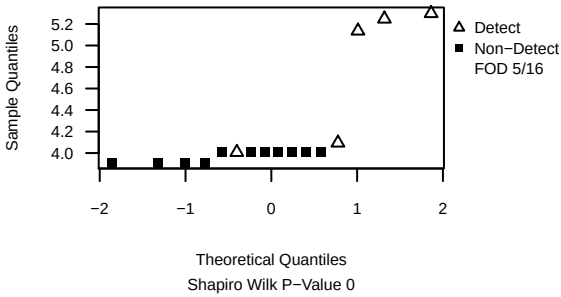
SUMMARY STATISTICS

Minimum	50
1st Quantile	53.75
Median	55
3rd Quantile	56.25
Maximum	200
FOD	5/16

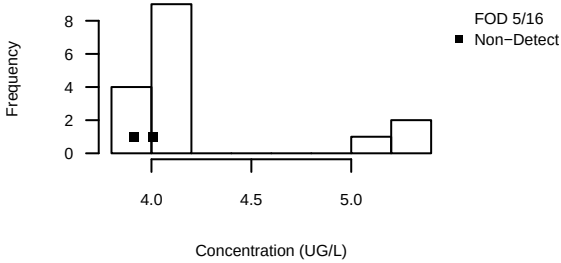
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



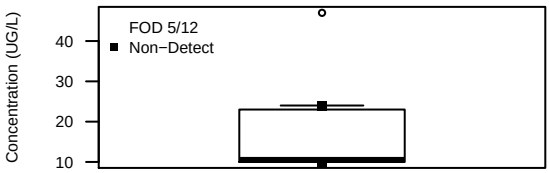
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



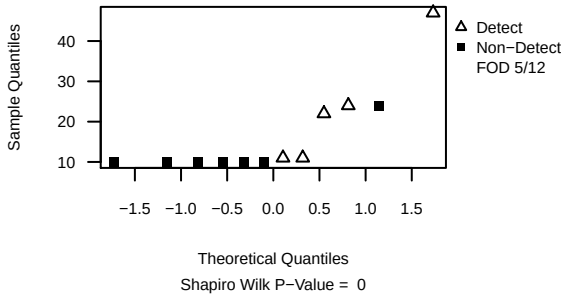
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.91
1st Quantile	3.98
Median	4.01
3rd Quantile	4.03
Maximum	5.3
FOD	5/16

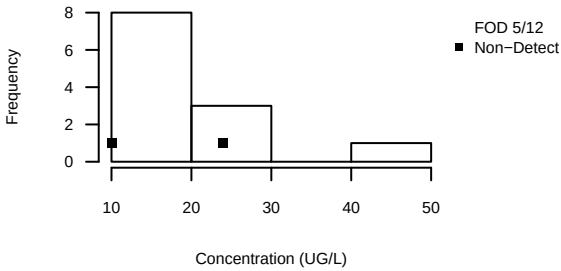
BOXPLOT



NORMAL PROBABILITY PLOT



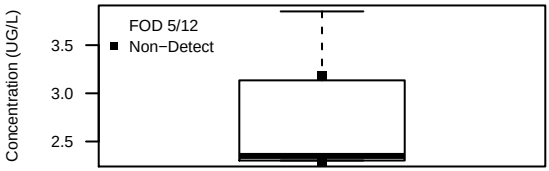
HISTOGRAM



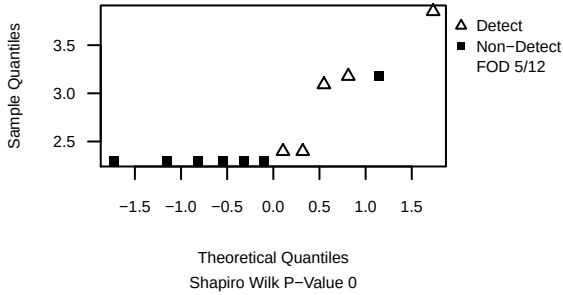
SUMMARY STATISTICS

Minimum	10
1st Quantile	10
Median	10.5
3rd Quantile	22.5
Maximum	47
FOD	5/12

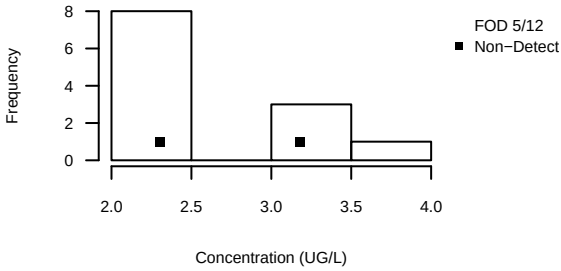
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS



SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	2.3
1st Quantile	2.3
Median	2.35
3rd Quantile	3.11
Maximum	3.85
FOD	5/12

TABLE C-1
FACILITY BACKGROUND FRESHWATER GROUNDWATER OUTLIER EVALUATION
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FOD	DATA DISTRIBUTION	POTENTIAL OUTLIER	OUTLIER TEST	OUTLIER TEST RESULT
TOTAL METALS (µg/L)					
ALUMINUM	4/16	Nonparametric	None	NA	NA
ARSENIC	3/16	Nonparametric	JILF-01-GW-09	Tukey	Outlier
BARIUM	16/16	Lognormal	None	NA	NA
CALCIUM	16/16	Normal	None	NA	NA
CHROMIUM	3/16	Nonparametric	None	NA	NA
COBALT	3/16	Nonparametric	None	NA	NA
COPPER	4/16	Normal	None	NA	NA
IRON	5/16	Lognormal	None	NA	NA
LEAD	7/16	Nonparametric	None	NA	NA
MAGNESIUM	16/16	Normal	None	NA	NA
MANGANESE	13/16	Nonparametric	None	NA	NA
MERCURY	3/16	Lognormal	None	NA	NA
NICKEL	5/16	Lognormal	None	NA	NA
POTASSIUM	14/16	Normal	None	NA	NA
SODIUM	16/16	Lognormal	None	NA	NA
VANADIUM	3/16	Nonparametric	None	NA	NA
ZINC	3/16	Lognormal	None	NA	NA
DISSOLVED METALS (µg/L)					
CALCIUM	3/3	Normal	None	NA	NA
MAGNESIUM	3/3	Normal	None	NA	NA
MANGANESE	3/3	Normal	None	NA	NA
POTASSIUM	3/3	Normal	None	NA	NA
SODIUM	3/3	Normal	None	NA	NA
MISCELLANEOUS (µg/L)					
ALKALINITY	16/16	Normal	None	None	NA
BROMIDE	5/16	Nonparametric	JILF-04-GW08, JILF-04-GW-10	Tukey	Outlier
CARBONATE ALKALINITY	16/16	Normal	None	None	NA
CHLORIDE	16/16	Nonparametric	None	None	NA
NITRATE	13/15	Lognormal	None	None	NA
PH	16/16	Nonparametric	None	None	NA
SULFATE	16/16	Lognormal	None	None	NA
TOTAL ORGANIC CARBON	16/16	Lognormal	None	None	NA
TOTAL ORGANIC HALIDES	12/16	Lognormal	None	None	NA
PETROLEUM (µg/L)					
DIESEL RANGE ORGANICS	5/16	Nonparametric	SI-01DB-GW-09, JILF-01-GW-08, SI-01DB-GW07	Tukey	Outlier
GASOLINE RANGE ORGANICS	5/12	Nonparametric	JILF-01-GW-08	Tukey	Outlier

C.2 FRESHWATER GROUNDWATER UCLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	ALUMINUM											
10												
11						General Statistics						
12						Number of Valid Data	16			Number of Detected Data		4
13						Number of Distinct Detected Data	4			Number of Non-Detect Data		12
14						Number of Missing Values	2			Percent Non-Detects		75.00%
15												
16						Raw Statistics				Log-transformed Statistics		
17						Minimum Detected	996			Minimum Detected		6.904
18						Maximum Detected	1070			Maximum Detected		6.975
19						Mean of Detected	1021			Mean of Detected		6.928
20						SD of Detected	34.43			SD of Detected		0.0333
21						Minimum Non-Detect	10			Minimum Non-Detect		2.303
22						Maximum Non-Detect	193			Maximum Non-Detect		5.263
23												
24				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect		12
25				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected		4
26				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		75.00%
27												
28						Warning: There are only 4 Distinct Detected Values in this data						
29						Note: It should be noted that even though bootstrap may be performed on this data set						
30						the resulting calculations may not be reliable enough to draw conclusions						
31												
32						It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.						
33												
34												
35						UCL Statistics						
36						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
37						Shapiro Wilk Test Statistic	0.837			Shapiro Wilk Test Statistic		0.84
38						5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value		0.748
39						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
40												
41						Assuming Normal Distribution				Assuming Lognormal Distribution		
42						DL/2 Substitution Method				DL/2 Substitution Method		
43						Mean	273.4			Mean		3.808
44						SD	446.6			SD		2.02
45						95% DL/2 (t) UCL	469.2			95% H-Stat (DL/2) UCL		3641
46												
47						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
48						MLE method failed to converge properly				Mean in Log Scale		6.822
49										SD in Log Scale		0.0659
50										Mean in Original Scale		919.8
51										SD in Original Scale		63.07
52										95% t UCL		947.5
53										95% Percentile Bootstrap UCL		946.6
54										95% BCA Bootstrap UCL		949.4
55										95% H-UCL		N/A

	A	B	C	D	E	F	G	H	I	J	K	L
56												
57	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
58					k star (bias corrected)	298	Data appear Normal at 5% Significance Level					
59					Theta Star	3.426						
60					nu star	2384						
61												
62					A-D Test Statistic	0.475	Nonparametric Statistics					
63					5% A-D Critical Value	0.657				Kaplan-Meier (KM) Method		
64					K-S Test Statistic	0.657				Mean		1002
65					5% K-S Critical Value	0.394				SD		18.42
66	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		5.319
67										95% KM (t) UCL		1012
68	Assuming Gamma Distribution									95% KM (z) UCL		1011
69				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1010
70					Minimum	554				95% KM (bootstrap t) UCL		1017
71					Maximum	1070				95% KM (BCA) UCL		1070
72					Mean	773.3				95% KM (Percentile Bootstrap) UCL		1026
73					Median	693.7				95% KM (Chebyshev) UCL		1025
74					SD	155.2				97.5% KM (Chebyshev) UCL		1035
75					k star	23.48				99% KM (Chebyshev) UCL		1055
76					Theta star	32.93						
77					Nu star	751.4	Potential UCLs to Use					
78					AppChi2	688.8				95% KM (t) UCL		1012
79					95% Gamma Approximate UCL	843.6				95% KM (Percentile Bootstrap) UCL		1026
80					95% Adjusted Gamma UCL	N/A						
81	Note: DL/2 is not a recommended method.											
82												
83	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
84	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
85	For additional insight, the user may want to consult a statistician.											
86												
87												
88	ARSENIC											
89												
90	General Statistics											
91					Number of Valid Data	16				Number of Detected Data		3
92					Number of Distinct Detected Data	3				Number of Non-Detect Data		13
93					Number of Missing Values	2				Percent Non-Detects		81.25%
94												
95	Raw Statistics						Log-transformed Statistics					
96					Minimum Detected	6.3				Minimum Detected		1.841
97					Maximum Detected	10				Maximum Detected		2.303
98					Mean of Detected	7.6				Mean of Detected		2.005
99					SD of Detected	2.081				SD of Detected		0.258
100					Minimum Non-Detect	1.8				Minimum Non-Detect		0.588
101					Maximum Non-Detect	17.5				Maximum Non-Detect		2.862
102												
103	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		16
104	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
105	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
106												
107	Warning: There are only 3 Distinct Detected Values in this data set											
108	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
109	Those methods will return a 'N/A' value on your output display!											
110												

	A	B	C	D	E	F	G	H	I	J	K	L
111	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
112	However, results obtained using 4 to 9 distinct values may not be reliable.											
113	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
114												
115												
116	UCL Statistics											
117	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
118					Shapiro Wilk Test Statistic	0.79				Shapiro Wilk Test Statistic		0.8
119					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
120	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
121												
122	Assuming Normal Distribution						Assuming Lognormal Distribution					
123					DL/2 Substitution Method					DL/2 Substitution Method		
124					Mean	3.144				Mean		0.732
125					SD	3.136				SD		0.892
126					95% DL/2 (t) UCL	4.518				95% H-Stat (DL/2) UCL		5.557
127												
128					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
129	MLE method failed to converge properly									Mean in Log Scale		1.036
130										SD in Log Scale		0.571
131										Mean in Original Scale		3.345
132										SD in Original Scale		2.335
133										95% t UCL		4.369
134										95% Percentile Bootstrap UCL		4.283
135										95% BCA Bootstrap UCL		4.674
136										95% H-UCL		4.541
137												
138	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
139					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
140					Theta Star	N/A						
141					nu star	N/A						
142												
143					A-D Test Statistic	N/A	Nonparametric Statistics					
144					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
145					K-S Test Statistic	N/A				Mean		6.579
146					5% K-S Critical Value	N/A				SD		0.95
147	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.311
148										95% KM (t) UCL		7.124
149	Assuming Gamma Distribution									95% KM (z) UCL		7.09
150					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		6.98
151					Minimum	N/A				95% KM (bootstrap t) UCL		11
152					Maximum	N/A				95% KM (BCA) UCL		10
153					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
154					Median	N/A				95% KM (Chebyshev) UCL		7.934
155					SD	N/A				97.5% KM (Chebyshev) UCL		8.521
156					k star	N/A				99% KM (Chebyshev) UCL		9.674
157					Theta star	N/A						
158					Nu star	N/A	Potential UCLs to Use					
159					AppChi2	N/A				95% KM (t) UCL		7.124
160					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		N/A
161					95% Adjusted Gamma UCL	N/A						
162	Note: DL/2 is not a recommended method.											
163												
164	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
165	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											

	A	B	C	D	E	F	G	H	I	J	K	L
166	For additional insight, the user may want to consult a statistician.											
167												
168												
169	BERYLLIUM											
170												
171	General Statistics											
172	Number of Valid Data					16	Number of Detected Data					1
173	Number of Distinct Detected Data					1	Number of Non-Detect Data					15
174	Number of Missing Values					2	Percent Non-Detects					93.75%
175												
176	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
177	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
178												
179	The data set for variable BERYLLIUM was not processed!											
180												
181												
182												
183	CHROMIUM											
184												
185	General Statistics											
186	Number of Valid Data					16	Number of Detected Data					3
187	Number of Distinct Detected Data					3	Number of Non-Detect Data					13
188	Number of Missing Values					2	Percent Non-Detects					81.25%
189												
190	Raw Statistics						Log-transformed Statistics					
191	Minimum Detected					0.86	Minimum Detected					-0.151
192	Maximum Detected					1.4	Maximum Detected					0.336
193	Mean of Detected					1.187	Mean of Detected					0.149
194	SD of Detected					0.287	SD of Detected					0.263
195	Minimum Non-Detect					0.63	Minimum Non-Detect					-0.462
196	Maximum Non-Detect					4	Maximum Non-Detect					1.386
197												
198	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					16
199	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
200	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
201												
202	Warning: There are only 3 Distinct Detected Values in this data set											
203	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
204	Those methods will return a 'N/A' value on your output display!											
205												
206	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
207	However, results obtained using 4 to 9 distinct values may not be reliable.											
208	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
209												
210												
211	UCL Statistics											
212	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
213	Shapiro Wilk Test Statistic					0.883	Shapiro Wilk Test Statistic					0.861
214	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
215	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
216												
217	Assuming Normal Distribution						Assuming Lognormal Distribution					
218	DL/2 Substitution Method						DL/2 Substitution Method					
219	Mean					1.001	Mean					-0.231
220	SD					0.665	SD					0.72

	A	B	C	D	E	F	G	H	I	J	K	L
221					95% DL/2 (t) UCL	1.293				95% H-Stat (DL/2) UCL		1.58
222												
223				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
224				**MLE method failed to converge properly**						Mean in Log Scale		-0.444
225										SD in Log Scale		0.383
226										Mean in Original Scale		0.691
227										SD in Original Scale		0.301
228										95% t UCL		0.823
229										95% Percentile Bootstrap UCL		0.819
230										95% BCA Bootstrap UCL		0.844
231										95% H-UCL		0.837
232												
233				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
234				k star (bias corrected)		N/A				Data appear Normal at 5% Significance Level		
235				Theta Star		N/A						
236				nu star		N/A						
237												
238				A-D Test Statistic		N/A				**Nonparametric Statistics**		
239				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
240				K-S Test Statistic		N/A				Mean		0.949
241				5% K-S Critical Value		N/A				SD		0.19
242				Data not Gamma Distributed at 5% Significance Level						SE of Mean		0.0702
243										95% KM (t) UCL		1.072
244				**Assuming Gamma Distribution**						95% KM (z) UCL		1.065
245				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.223
246				Minimum		N/A				95% KM (bootstrap t) UCL		1.011
247				Maximum		N/A				95% KM (BCA) UCL		1.4
248				Mean		N/A				95% KM (Percentile Bootstrap) UCL		1.4
249				Median		N/A				95% KM (Chebyshev) UCL		1.255
250				SD		N/A				97.5% KM (Chebyshev) UCL		1.388
251				k star		N/A				99% KM (Chebyshev) UCL		1.648
252				Theta star		N/A						
253				Nu star		N/A				Potential UCLs to Use		
254				AppChi2		N/A				95% KM (t) UCL		1.072
255				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		1.4
256				95% Adjusted Gamma UCL		N/A						
257	Note: DL/2 is not a recommended method.											
258												
259	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
260	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
261	For additional insight, the user may want to consult a statistician.											
262												
263												
264	COBALT											
265												
266				**General Statistics**								
267				Number of Valid Data		16				Number of Detected Data		3
268				Number of Distinct Detected Data		3				Number of Non-Detect Data		13
269				Number of Missing Values		2				Percent Non-Detects		81.25%
270												
271				**Raw Statistics**						**Log-transformed Statistics**		
272				Minimum Detected		0.82				Minimum Detected		-0.198
273				Maximum Detected		1.7				Maximum Detected		0.531
274				Mean of Detected		1.307				Mean of Detected		0.223
275				SD of Detected		0.447				SD of Detected		0.378

	A	B	C	D	E	F	G	H	I	J	K	L
276					Minimum Non-Detect	0.79					Minimum Non-Detect	-0.236
277					Maximum Non-Detect	5					Maximum Non-Detect	1.609
278												
279	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	16
280	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
281	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
282												
283	Warning: There are only 3 Distinct Detected Values in this data set											
284	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
285	Those methods will return a 'N/A' value on your output display!											
286												
287	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
288	However, results obtained using 4 to 9 distinct values may not be reliable.											
289	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
290												
291												
292	UCL Statistics											
293	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
294					Shapiro Wilk Test Statistic	0.967					Shapiro Wilk Test Statistic	0.932
295					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
296	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
297												
298	Assuming Normal Distribution						Assuming Lognormal Distribution					
299					DL/2 Substitution Method						DL/2 Substitution Method	
300					Mean	1.338					Mean	0.0753
301					SD	0.766					SD	0.739
302					95% DL/2 (t) UCL	1.674					95% H-Stat (DL/2) UCL	2.21
303												
304					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
305	MLE method failed to converge properly										Mean in Log Scale	-0.65
306											SD in Log Scale	0.658
307											Mean in Original Scale	0.642
308											SD in Original Scale	0.444
309											95% t UCL	0.837
310											95% Percentile Bootstrap UCL	0.824
311											95% BCA Bootstrap UCL	0.872
312											95% H-UCL	0.946
313												
314	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
315					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
316					Theta Star	N/A						
317					nu star	N/A						
318												
319					A-D Test Statistic	N/A	Nonparametric Statistics					
320					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
321					K-S Test Statistic	N/A					Mean	1.003
322					5% K-S Critical Value	N/A					SD	0.325
323	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.141
324											95% KM (t) UCL	1.249
325	Assuming Gamma Distribution										95% KM (z) UCL	1.234
326					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.373
327					Minimum	N/A					95% KM (bootstrap t) UCL	1.146
328					Maximum	N/A					95% KM (BCA) UCL	1.7
329					Mean	N/A					95% KM (Percentile Bootstrap) UCL	1.7
330					Median	N/A					95% KM (Chebyshev) UCL	1.616

	A	B	C	D	E	F	G	H	I	J	K	L
331					SD	N/A				97.5% KM (Chebyshev) UCL		1.881
332					k star	N/A				99% KM (Chebyshev) UCL		2.402
333					Theta star	N/A						
334					Nu star	N/A			Potential UCLs to Use			
335					AppChi2	N/A				95% KM (t) UCL		1.249
336				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		1.7
337				95% Adjusted Gamma UCL		N/A						
338	Note: DL/2 is not a recommended method.											
339												
340	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
341	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
342	For additional insight, the user may want to consult a statistician.											
343												
344												
345	COPPER											
346												
347					General Statistics							
348				Number of Valid Data		16				Number of Detected Data		4
349				Number of Distinct Detected Data		4				Number of Non-Detect Data		12
350				Number of Missing Values		2				Percent Non-Detects		75.00%
351												
352				Raw Statistics						Log-transformed Statistics		
353				Minimum Detected		2				Minimum Detected		0.693
354				Maximum Detected		3.8				Maximum Detected		1.335
355				Mean of Detected		3.075				Mean of Detected		1.093
356				SD of Detected		0.814				SD of Detected		0.291
357				Minimum Non-Detect		1				Minimum Non-Detect		0
358				Maximum Non-Detect		4.8				Maximum Non-Detect		1.569
359												
360	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		16
361	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
362	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
363												
364	Warning: There are only 4 Distinct Detected Values in this data											
365	Note: It should be noted that even though bootstrap may be performed on this data set											
366	the resulting calculations may not be reliable enough to draw conclusions											
367												
368	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
369												
370												
371					UCL Statistics							
372				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
373				Shapiro Wilk Test Statistic		0.923				Shapiro Wilk Test Statistic		0.895
374				5% Shapiro Wilk Critical Value		0.748				5% Shapiro Wilk Critical Value		0.748
375				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
376												
377				Assuming Normal Distribution						Assuming Lognormal Distribution		
378				DL/2 Substitution Method						DL/2 Substitution Method		
379				Mean		1.628				Mean		0.288
380				SD		1.071				SD		0.654
381				95% DL/2 (t) UCL		2.098				95% H-Stat (DL/2) UCL		2.403
382												
383				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
384				MLE method failed to converge properly						Mean in Log Scale		0.482
385										SD in Log Scale		0.421

	A	B	C	D	E	F	G	H	I	J	K	L
386											Mean in Original Scale	1.776
387											SD in Original Scale	0.881
388											95% t UCL	2.162
389											95% Percentile Bootstrap UCL	2.144
390											95% BCA Bootstrap UCL	2.181
391											95% H-UCL	2.193
392												
393				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
394					k star (bias corrected)	4.395				Data appear Normal at 5% Significance Level		
395					Theta Star	0.7						
396					nu star	35.16						
397												
398					A-D Test Statistic	0.352				Nonparametric Statistics		
399					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
400					K-S Test Statistic	0.657					Mean	2.32
401					5% K-S Critical Value	0.394					SD	0.618
402				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.194
403											95% KM (t) UCL	2.66
404				Assuming Gamma Distribution							95% KM (z) UCL	2.639
405					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.883
406					Minimum	0.000001					95% KM (bootstrap t) UCL	2.516
407					Maximum	3.8					95% KM (BCA) UCL	3.643
408					Mean	0.782					95% KM (Percentile Bootstrap) UCL	3.629
409					Median	0.000001					95% KM (Chebyshev) UCL	3.164
410					SD	1.415					97.5% KM (Chebyshev) UCL	3.529
411					k star	0.126					99% KM (Chebyshev) UCL	4.247
412					Theta star	6.232						
413					Nu star	4.016				Potential UCLs to Use		
414					AppChi2	0.728					95% KM (t) UCL	2.66
415					95% Gamma Approximate UCL	4.314					95% KM (Percentile Bootstrap) UCL	3.629
416					95% Adjusted Gamma UCL	N/A						
417	Note: DL/2 is not a recommended method.											
418												
419				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
420				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
421				For additional insight, the user may want to consult a statistician.								
422												
423												
424	IRON											
425												
426					General Statistics							
427					Number of Valid Data	16					Number of Detected Data	5
428					Number of Distinct Detected Data	5					Number of Non-Detect Data	11
429					Number of Missing Values	2					Percent Non-Detects	68.75%
430												
431				Raw Statistics						Log-transformed Statistics		
432					Minimum Detected	66.6					Minimum Detected	4.199
433					Maximum Detected	755					Maximum Detected	6.627
434					Mean of Detected	444.7					Mean of Detected	5.776
435					SD of Detected	302.1					SD of Detected	1.035
436					Minimum Non-Detect	6.8					Minimum Non-Detect	1.917
437					Maximum Non-Detect	524					Maximum Non-Detect	6.261
438												
439	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
440	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3

	A	B	C	D	E	F	G	H	I	J	K	L
441	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	81.25%
442												
443	Warning: There are only 5 Detected Values in this data											
444	Note: It should be noted that even though bootstrap may be performed on this data set											
445	the resulting calculations may not be reliable enough to draw conclusions											
446												
447	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
448												
449												
450	UCL Statistics											
451	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
452					Shapiro Wilk Test Statistic	0.905					Shapiro Wilk Test Statistic	0.859
453					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
454	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
455												
456	Assuming Normal Distribution						Assuming Lognormal Distribution					
457					DL/2 Substitution Method						DL/2 Substitution Method	
458					Mean	163.5					Mean	3.617
459					SD	257.8					SD	1.872
460					95% DL/2 (t) UCL	276.5					95% H-Stat (DL/2) UCL	1655
461												
462					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
463					Mean	324.1					Mean in Log Scale	3.622
464					SD	227.8					SD in Log Scale	1.614
465					95% MLE (t) UCL	423.9					Mean in Original Scale	149.1
466					95% MLE (Tiku) UCL	576.1					SD in Original Scale	258.3
467											95% t UCL	262.3
468											95% Percentile Bootstrap UCL	262.1
469											95% BCA Bootstrap UCL	281.7
470											95% H UCL	655.5
471												
472	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
473					k star (bias corrected)	0.814	Data appear Normal at 5% Significance Level					
474					Theta Star	546.3						
475					nu star	8.141						
476												
477					A-D Test Statistic	0.419	Nonparametric Statistics					
478					5% A-D Critical Value	0.686					Kaplan-Meier (KM) Method	
479					K-S Test Statistic	0.686					Mean	185.4
480					5% K-S Critical Value	0.361					SD	231.2
481	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	64.68
482											95% KM (t) UCL	298.8
483	Assuming Gamma Distribution										95% KM (z) UCL	291.8
484					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	293.9
485					Minimum	0.000001					95% KM (bootstrap t) UCL	278.3
486					Maximum	755					95% KM (BCA) UCL	687.6
487					Mean	139					95% KM (Percentile Bootstrap) UCL	569
488					Median	0.000001					95% KM (Chebyshev) UCL	467.3
489					SD	263.9					97.5% KM (Chebyshev) UCL	589.3
490					k star	0.0964					99% KM (Chebyshev) UCL	829
491					Theta star	1442						
492					Nu star	3.084	Potential UCLs to Use					
493					AppChi2	0.398					95% KM (t) UCL	298.8
494					95% Gamma Approximate UCL	1078					95% KM (Percentile Bootstrap) UCL	569
495					95% Adjusted Gamma UCL	1376						

	A	B	C	D	E	F	G	H	I	J	K	L
496	Note: DL/2 is not a recommended method.											
497												
498	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
499	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
500	For additional insight, the user may want to consult a statistician.											
501												
502												
503	LEAD											
504												
505	General Statistics											
506	Number of Valid Data					16	Number of Detected Data					7
507	Number of Distinct Detected Data					7	Number of Non-Detect Data					9
508	Number of Missing Values					2	Percent Non-Detects					56.25%
509												
510	Raw Statistics						Log-transformed Statistics					
511	Minimum Detected					1.5	Minimum Detected					0.405
512	Maximum Detected					3.7	Maximum Detected					1.308
513	Mean of Detected					2.429	Mean of Detected					0.853
514	SD of Detected					0.692	SD of Detected					0.282
515	Minimum Non-Detect					1.3	Minimum Non-Detect					0.262
516	Maximum Non-Detect					14.2	Maximum Non-Detect					2.653
517												
518	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					16
519	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
520	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
521												
522	Warning: There are only 7 Detected Values in this data											
523	Note: It should be noted that even though bootstrap may be performed on this data set											
524	the resulting calculations may not be reliable enough to draw conclusions											
525												
526	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
527												
528												
529	UCL Statistics											
530	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
531	Shapiro Wilk Test Statistic					0.951	Shapiro Wilk Test Statistic					0.981
532	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
533	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
534												
535	Assuming Normal Distribution						Assuming Lognormal Distribution					
536	DL/2 Substitution Method						DL/2 Substitution Method					
537	Mean					1.922	Mean					0.393
538	SD					1.658	SD					0.713
539	95% DL/2 (t) UCL					2.648	95% H-Stat (DL/2) UCL					2.916
540												
541	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
542	MLE method failed to converge properly						Mean in Log Scale					0.426
543							SD in Log Scale					0.462
544							Mean in Original Scale					1.695
545							SD in Original Scale					0.821
546							95% t UCL					2.055
547							95% Percentile Bootstrap UCL					2.023
548							95% BCA Bootstrap UCL					2.076
549							95% H-UCL					2.165
550												

	A	B	C	D	E	F	G	H	I	J	K	L
551	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
552					k star (bias corrected)	8.592	Data appear Normal at 5% Significance Level					
553					Theta Star	0.283						
554					nu star	120.3						
555												
556					A-D Test Statistic	0.204	Nonparametric Statistics					
557					5% A-D Critical Value	0.708					Kaplan-Meier (KM) Method	
558					K-S Test Statistic	0.708					Mean	1.933
559					5% K-S Critical Value	0.312					SD	0.637
560	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.178
561											95% KM (t) UCL	2.245
562	Assuming Gamma Distribution										95% KM (z) UCL	2.226
563			Gamma ROS Statistics using Extrapolated Data								95% KM (jackknife) UCL	2.266
564					Minimum	0.000001					95% KM (bootstrap t) UCL	2.284
565					Maximum	3.7					95% KM (BCA) UCL	2.6
566					Mean	1.215					95% KM (Percentile Bootstrap) UCL	2.464
567					Median	1.048					95% KM (Chebyshev) UCL	2.708
568					SD	1.233					97.5% KM (Chebyshev) UCL	3.043
569					k star	0.182					99% KM (Chebyshev) UCL	3.702
570					Theta star	6.671						
571					Nu star	5.828	Potential UCLs to Use					
572					AppChi2	1.553					95% KM (t) UCL	2.245
573					95% Gamma Approximate UCL	4.56					95% KM (Percentile Bootstrap) UCL	2.464
574					95% Adjusted Gamma UCL	5.378						
575	Note: DL/2 is not a recommended method.											
576												
577	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
578	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
579	For additional insight, the user may want to consult a statistician.											
580												
581												
582	MANGANESE											
583												
584	General Statistics											
585					Number of Valid Data	16					Number of Detected Data	13
586					Number of Distinct Detected Data	13					Number of Non-Detect Data	3
587					Number of Missing Values	2					Percent Non-Detects	18.75%
588												
589	Raw Statistics						Log-transformed Statistics					
590					Minimum Detected	3					Minimum Detected	1.099
591					Maximum Detected	3580					Maximum Detected	8.183
592					Mean of Detected	909.6					Mean of Detected	4.06
593					SD of Detected	1422					SD of Detected	2.823
594					Minimum Non-Detect	0.7					Minimum Non-Detect	-0.357
595					Maximum Non-Detect	2.5					Maximum Non-Detect	0.916
596												
597	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	3
598	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	13
599	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	18.75%
600												
601	UCL Statistics											
602	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
603					Shapiro Wilk Test Statistic	0.655					Shapiro Wilk Test Statistic	0.806
604					5% Shapiro Wilk Critical Value	0.866					5% Shapiro Wilk Critical Value	0.866
605	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
606												
607	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
608					DL/2 Substitution Method						DL/2 Substitution Method	
609					Mean	739.2					Mean	3.237
610					SD	1324					SD	3.092
611					95% DL/2 (t) UCL	1319					95% H-Stat (DL/2) UCL	592581
612												
613					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
614					Mean	551.5					Mean in Log Scale	2.885
615					SD	1481					SD in Log Scale	3.572
616					95% MLE (t) UCL	1200					Mean in Original Scale	739.1
617					95% MLE (Tiku) UCL	1185					SD in Original Scale	1324
618											95% t UCL	1319
619											95% Percentile Bootstrap UCL	1303
620											95% BCA Bootstrap UCL	1367
621											95% H UCL	11323356
622												
623	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
624					k star (bias corrected)	0.249	Data do not follow a Discernable Distribution (0.05)					
625					Theta Star	3655						
626					nu star	6.471						
627												
628					A-D Test Statistic	1.569	**Nonparametric Statistics**					
629					5% A-D Critical Value	0.846					Kaplan-Meier (KM) Method	
630					K-S Test Statistic	0.846					Mean	739.6
631					5% K-S Critical Value	0.258					SD	1282
632	Data not Gamma Distributed at 5% Significance Level										SE of Mean	333.5
633											95% KM (t) UCL	1324
634	**Assuming Gamma Distribution**										95% KM (z) UCL	1288
635					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1320
636					Minimum	0.000001					95% KM (bootstrap t) UCL	1492
637					Maximum	3580					95% KM (BCA) UCL	1305
638					Mean	739.1					95% KM (Percentile Bootstrap) UCL	1285
639					Median	11.3					95% KM (Chebyshev) UCL	2193
640					SD	1324					97.5% KM (Chebyshev) UCL	2822
641					k star	0.149					99% KM (Chebyshev) UCL	4058
642					Theta star	4946						
643					Nu star	4.782	Potential UCLs to Use					
644					AppChi2	1.053					99% KM (Chebyshev) UCL	4058
645					95% Gamma Approximate UCL	3357						
646					95% Adjusted Gamma UCL	4057						
647	Warning: Recommended UCL exceeds the maximum observation											
648	Note: DL/2 is not a recommended method.											
649												
650	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
651	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
652	For additional insight, the user may want to consult a statistician.											
653												
654												
655	MERCURY											
656												
657	**General Statistics**											
658					Number of Valid Data	16					Number of Detected Data	3
659					Number of Distinct Detected Data	3					Number of Non-Detect Data	13
660					Number of Missing Values	2					Percent Non-Detects	81.25%

	A	B	C	D	E	F	G	H	I	J	K	L
661												
662	Raw Statistics						Log-transformed Statistics					
663					Minimum Detected	0.02					Minimum Detected	-3.912
664					Maximum Detected	0.098					Maximum Detected	-2.323
665					Mean of Detected	0.0493					Mean of Detected	-3.247
666					SD of Detected	0.0424					SD of Detected	0.826
667					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
668					Maximum Non-Detect	0.12					Maximum Non-Detect	-2.12
669												
670	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	16
671	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
672	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
673												
674	Warning: There are only 3 Distinct Detected Values in this data set											
675	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
676	Those methods will return a 'N/A' value on your output display!											
677												
678	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
679	However, results obtained using 4 to 9 distinct values may not be reliable.											
680	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
681												
682												
683	UCL Statistics											
684	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
685					Shapiro Wilk Test Statistic	0.844					Shapiro Wilk Test Statistic	0.926
686					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
687	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
688												
689	Assuming Normal Distribution						Assuming Lognormal Distribution					
690					DL/2 Substitution Method						DL/2 Substitution Method	
691					Mean	0.0258					Mean	-4.091
692					SD	0.0253					SD	0.992
693					95% DL/2 (t) UCL	0.0369					95% H-Stat (DL/2) UCL	0.0545
694												
695					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
696	MLE method failed to converge properly										Mean in Log Scale	-5.043
697											SD in Log Scale	1.084
698											Mean in Original Scale	0.0132
699											SD in Original Scale	0.0238
700											95% t UCL	0.0237
701											95% Percentile Bootstrap UCL	0.0239
702											95% BCA Bootstrap UCL	0.0303
703											95% H-UCL	0.0257
704												
705	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
706					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
707					Theta Star	N/A						
708					nu star	N/A						
709												
710					A-D Test Statistic	N/A	Nonparametric Statistics					
711					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
712					K-S Test Statistic	N/A					Mean	0.0266
713					5% K-S Critical Value	N/A					SD	0.02
714	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.00659
715											95% KM (t) UCL	0.0382

	A	B	C	D	E	F	G	H	I	J	K	L
716	Assuming Gamma Distribution						95% KM (z) UCL					0.0374
717	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0363
718					Minimum	N/A	95% KM (bootstrap t) UCL					0.0555
719					Maximum	N/A	95% KM (BCA) UCL					0.098
720					Mean	N/A	95% KM (Percentile Bootstrap) UCL					0.098
721					Median	N/A	95% KM (Chebyshev) UCL					0.0553
722					SD	N/A	97.5% KM (Chebyshev) UCL					0.0678
723					k star	N/A	99% KM (Chebyshev) UCL					0.0922
724					Theta star	N/A						
725					Nu star	N/A	Potential UCLs to Use					
726					AppChi2	N/A	95% KM (t) UCL					0.0382
727				95% Gamma Approximate UCL		N/A	95% KM (Percentile Bootstrap) UCL					0.098
728				95% Adjusted Gamma UCL		N/A						
729	Note: DL/2 is not a recommended method.											
730												
731	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
732	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
733	For additional insight, the user may want to consult a statistician.											
734												
735												
736	NICKEL											
737												
738	General Statistics											
739					Number of Valid Data	16	Number of Detected Data					5
740					Number of Distinct Detected Data	5	Number of Non-Detect Data					11
741					Number of Missing Values	2	Percent Non-Detects					68.75%
742												
743	Raw Statistics						Log-transformed Statistics					
744					Minimum Detected	0.81	Minimum Detected					-0.211
745					Maximum Detected	2.9	Maximum Detected					1.065
746					Mean of Detected	1.882	Mean of Detected					0.531
747					SD of Detected	0.89	SD of Detected					0.522
748					Minimum Non-Detect	0.9	Minimum Non-Detect					-0.105
749					Maximum Non-Detect	9	Maximum Non-Detect					2.197
750												
751	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					16
752	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
753	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
754												
755	Warning: There are only 5 Detected Values in this data											
756	Note: It should be noted that even though bootstrap may be performed on this data set											
757	the resulting calculations may not be reliable enough to draw conclusions											
758												
759	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
760												
761												
762	UCL Statistics											
763	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
764					Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic					0.929
765					5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value					0.762
766	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
767												
768	Assuming Normal Distribution						Assuming Lognormal Distribution					
769					DL/2 Substitution Method		DL/2 Substitution Method					
770					Mean	2.348	Mean					0.632

	A	B	C	D	E	F	G	H	I	J	K	L
771					SD	1.504					SD	0.718
772					95% DL/2 (t) UCL	3.007					95% H-Stat (DL/2) UCL	3.731
773												
774				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
775				MLE method failed to converge properly							Mean in Log Scale	0.287
776											SD in Log Scale	0.378
777											Mean in Original Scale	1.432
778											SD in Original Scale	0.616
779											95% t UCL	1.702
780											95% Percentile Bootstrap UCL	1.7
781											95% BCA Bootstrap UCL	1.727
782											95% H-UCL	1.728
783												
784				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
785					k star (bias corrected)	2.166				Data appear Normal at 5% Significance Level		
786					Theta Star	0.869						
787					nu star	21.66						
788												
789					A-D Test Statistic	0.307				Nonparametric Statistics		
790					5% A-D Critical Value	0.681					Kaplan-Meier (KM) Method	
791					K-S Test Statistic	0.681					Mean	1.484
792					5% K-S Critical Value	0.358					SD	0.731
793				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.281
794											95% KM (t) UCL	1.977
795				Assuming Gamma Distribution							95% KM (z) UCL	1.947
796					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.993
797					Minimum	0.569					95% KM (bootstrap t) UCL	1.946
798					Maximum	2.9					95% KM (BCA) UCL	2.356
799					Mean	1.524					95% KM (Percentile Bootstrap) UCL	2.108
800					Median	1.343					95% KM (Chebyshev) UCL	2.711
801					SD	0.657					97.5% KM (Chebyshev) UCL	3.241
802					k star	4.782					99% KM (Chebyshev) UCL	4.284
803					Theta star	0.319						
804					Nu star	153				Potential UCLs to Use		
805					AppChi2	125.4					95% KM (t) UCL	1.977
806					95% Gamma Approximate UCL	1.859					95% KM (Percentile Bootstrap) UCL	2.108
807					95% Adjusted Gamma UCL	1.902						
808	Note: DL/2 is not a recommended method.											
809												
810	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
811	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
812	For additional insight, the user may want to consult a statistician.											
813												
814												
815	POTASSIUM											
816												
817					General Statistics							
818					Number of Valid Data	16					Number of Detected Data	14
819					Number of Distinct Detected Data	14					Number of Non-Detect Data	2
820					Number of Missing Values	2					Percent Non-Detects	12.50%
821												
822				Raw Statistics						Log-transformed Statistics		
823					Minimum Detected	2400					Minimum Detected	7.783
824					Maximum Detected	5180					Maximum Detected	8.553
825					Mean of Detected	4261					Mean of Detected	8.339

	A	B	C	D	E	F	G	H	I	J	K	L
826					SD of Detected	776.4					SD of Detected	0.209
827					Minimum Non-Detect	2210					Minimum Non-Detect	7.701
828					Maximum Non-Detect	2500					Maximum Non-Detect	7.824
829												
830	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	3
831	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	13
832	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	18.75%
833												
834					UCL Statistics							
835					Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only	
836					Shapiro Wilk Test Statistic	0.905					Shapiro Wilk Test Statistic	0.845
837					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
838					Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level	
839												
840					Assuming Normal Distribution						Assuming Lognormal Distribution	
841					DL/2 Substitution Method						DL/2 Substitution Method	
842					Mean	3876					Mean	8.18
843					SD	1278					SD	0.476
844					95% DL/2 (t) UCL	4436					95% H-Stat (DL/2) UCL	5127
845												
846					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
847					Mean	3953					Mean in Log Scale	8.286
848					SD	1084					SD in Log Scale	0.243
849					95% MLE (t) UCL	4428					Mean in Original Scale	4072
850					95% MLE (Tiku) UCL	4460					SD in Original Scale	890.5
851											95% t UCL	4462
852											95% Percentile Bootstrap UCL	4431
853											95% BCA Bootstrap UCL	4403
854											95% H UCL	4583
855												
856					Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only	
857					k star (bias corrected)	21.55					Data appear Normal at 5% Significance Level	
858					Theta Star	197.7						
859					nu star	603.4						
860												
861					A-D Test Statistic	0.677					Nonparametric Statistics	
862					5% A-D Critical Value	0.734					Kaplan-Meier (KM) Method	
863					K-S Test Statistic	0.734					Mean	4029
864					5% K-S Critical Value	0.228					SD	932.1
865					Data appear Gamma Distributed at 5% Significance Level						SE of Mean	241.8
866											95% KM (t) UCL	4453
867					Assuming Gamma Distribution						95% KM (z) UCL	4426
868					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4460
869					Minimum	1491					95% KM (bootstrap t) UCL	4394
870					Maximum	5180					95% KM (BCA) UCL	4510
871					Mean	3957					95% KM (Percentile Bootstrap) UCL	4471
872					Median	4390					95% KM (Chebyshev) UCL	5083
873					SD	1108					97.5% KM (Chebyshev) UCL	5539
874					k star	8.307					99% KM (Chebyshev) UCL	6435
875					Theta star	476.4						
876					Nu star	265.8					Potential UCLs to Use	
877					AppChi2	229.1					95% KM (t) UCL	4453
878					95% Gamma Approximate UCL	4592					95% KM (Percentile Bootstrap) UCL	4471
879					95% Adjusted Gamma UCL	4672						
880	Note: DL/2 is not a recommended method.											

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

SILVER

General Statistics

Number of Valid Data	16	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	15
Number of Missing Values	2	Percent Non-Detects	93.75%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable SILVER was not processed!

VANADIUM

General Statistics

Number of Valid Data	16	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	13
Number of Missing Values	2	Percent Non-Detects	81.25%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.64	Minimum Detected	-0.446
Maximum Detected	1.9	Maximum Detected	0.642
Mean of Detected	1.12	Mean of Detected	-0.000961
SD of Detected	0.681	SD of Detected	0.57
Minimum Non-Detect	0.55	Minimum Non-Detect	-0.598
Maximum Non-Detect	4.2	Maximum Non-Detect	1.435
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.91
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

	A	B	C	D	E	F	G	H	I	J	K	L
936					DL/2 Substitution Method						DL/2 Substitution Method	
937					Mean	0.959					Mean	-0.374
938					SD	0.756					SD	0.862
939					95% DL/2 (t) UCL	1.29					95% H-Stat (DL/2) UCL	1.74
940												
941				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
942				**MLE method failed to converge properly**							Mean in Log Scale	-1.308
943											SD in Log Scale	0.831
944											Mean in Original Scale	0.397
945											SD in Original Scale	0.454
946											95% t UCL	0.595
947											95% Percentile Bootstrap UCL	0.581
948											95% BCA Bootstrap UCL	0.696
949											95% H-UCL	0.647
950												
951				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
952					k star (bias corrected)	N/A				Data appear Normal at 5% Significance Level		
953					Theta Star	N/A						
954					nu star	N/A						
955												
956					A-D Test Statistic	N/A				**Nonparametric Statistics**		
957					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
958					K-S Test Statistic	N/A					Mean	0.773
959					5% K-S Critical Value	N/A					SD	0.361
960				Data not Gamma Distributed at 5% Significance Level							SE of Mean	0.133
961											95% KM (t) UCL	1.006
962				**Assuming Gamma Distribution**							95% KM (z) UCL	0.992
963					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.966
964					Minimum	N/A					95% KM (bootstrap t) UCL	1.377
965					Maximum	N/A					95% KM (BCA) UCL	N/A
966					Mean	N/A					95% KM (Percentile Bootstrap) UCL	1.9
967					Median	N/A					95% KM (Chebyshev) UCL	1.354
968					SD	N/A					97.5% KM (Chebyshev) UCL	1.605
969					k star	N/A					99% KM (Chebyshev) UCL	2.099
970					Theta star	N/A						
971					Nu star	N/A					**Potential UCLs to Use**	
972					AppChi2	N/A					95% KM (t) UCL	1.006
973					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	1.9
974					95% Adjusted Gamma UCL	N/A						
975	Note: DL/2 is not a recommended method.											
976												
977	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
978	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
979	For additional insight, the user may want to consult a statistician.											
980												
981												
982	ZINC											
983												
984					**General Statistics**							
985					Number of Valid Data	16					Number of Detected Data	3
986					Number of Distinct Detected Data	3					Number of Non-Detect Data	13
987					Number of Missing Values	2					Percent Non-Detects	81.25%
988												
989				**Raw Statistics**						**Log-transformed Statistics**		
990					Minimum Detected	15.8					Minimum Detected	2.76

	A	B	C	D	E	F	G	H	I	J	K	L
991					Maximum Detected	52.4					Maximum Detected	3.959
992					Mean of Detected	37.4					Mean of Detected	3.501
993					SD of Detected	19.17					SD of Detected	0.648
994					Minimum Non-Detect	2.8					Minimum Non-Detect	1.03
995					Maximum Non-Detect	26.6					Maximum Non-Detect	3.281
996												
997	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
998	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
999	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	87.50%
1000												
1001	Warning: There are only 3 Distinct Detected Values in this data set											
1002	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
1003	Those methods will return a 'N/A' value on your output display!											
1004												
1005	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1006	However, results obtained using 4 to 9 distinct values may not be reliable.											
1007	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1008												
1009												
1010	UCL Statistics											
1011	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1012					Shapiro Wilk Test Statistic	0.911					Shapiro Wilk Test Statistic	0.857
1013					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1014	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1015												
1016	Assuming Normal Distribution						Assuming Lognormal Distribution					
1017					DL/2 Substitution Method						DL/2 Substitution Method	
1018					Mean	12.28					Mean	2.063
1019					SD	14.61					SD	0.914
1020					95% DL/2 (t) UCL	18.68					95% H-Stat (DL/2) UCL	21.92
1021												
1022					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1023	MLE method failed to converge properly										Mean in Log Scale	1.501
1024											SD in Log Scale	1.043
1025											Mean in Original Scale	9.369
1026											SD in Original Scale	15.58
1027											95% t UCL	16.2
1028											95% Percentile Bootstrap UCL	16.11
1029											95% BCA Bootstrap UCL	18.82
1030											95% H-UCL	16.29
1031												
1032	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1033					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
1034					Theta Star	N/A						
1035					nu star	N/A						
1036												
1037					A-D Test Statistic	N/A	Nonparametric Statistics					
1038					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1039					K-S Test Statistic	N/A					Mean	19.85
1040					5% K-S Critical Value	N/A					SD	10.82
1041	Data not Gamma Distributed at 5% Significance Level										SE of Mean	3.312
1042											95% KM (t) UCL	25.66
1043	Assuming Gamma Distribution										95% KM (z) UCL	25.3
1044					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	37.87
1045					Minimum	N/A					95% KM (bootstrap t) UCL	22.21

1046					Maximum	N/A				95% KM (BCA) UCL		52.4
1047					Mean	N/A				95% KM (Percentile Bootstrap) UCL		52.4
1048					Median	N/A				95% KM (Chebyshev) UCL		34.29
1049					SD	N/A				97.5% KM (Chebyshev) UCL		40.53
1050					k star	N/A				99% KM (Chebyshev) UCL		52.81
1051					Theta star	N/A						
1052					Nu star	N/A				Potential UCLs to Use		
1053					AppChi2	N/A				95% KM (t) UCL		25.66
1054				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		52.4
1055				95% Adjusted Gamma UCL		N/A						
1056	Note: DL/2 is not a recommended method.											
1057												
1058	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1059	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1060	For additional insight, the user may want to consult a statistician.											
1061												
1062												
1063	BROMIDE											
1064												
1065	General Statistics											
1066				Number of Valid Data		16				Number of Detected Data		5
1067				Number of Distinct Detected Data		5				Number of Non-Detect Data		11
1068				Number of Missing Values		2				Percent Non-Detects		68.75%
1069												
1070	Raw Statistics						Log-transformed Statistics					
1071				Minimum Detected		2.8				Minimum Detected		1.03
1072				Maximum Detected		5				Maximum Detected		1.609
1073				Mean of Detected		4.1				Mean of Detected		1.385
1074				SD of Detected		0.992				SD of Detected		0.259
1075				Minimum Non-Detect		2				Minimum Non-Detect		0.693
1076				Maximum Non-Detect		2.6				Maximum Non-Detect		0.956
1077												
1078	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		11
1079	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
1080	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		68.75%
1081												
1082	Warning: There are only 5 Detected Values in this data											
1083	Note: It should be noted that even though bootstrap may be performed on this data set											
1084	the resulting calculations may not be reliable enough to draw conclusions											
1085												
1086	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1087												
1088												
1089	UCL Statistics											
1090	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1091				Shapiro Wilk Test Statistic		0.867				Shapiro Wilk Test Statistic		0.859
1092				5% Shapiro Wilk Critical Value		0.762				5% Shapiro Wilk Critical Value		0.762
1093	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1094												
1095	Assuming Normal Distribution						Assuming Lognormal Distribution					
1096				DL/2 Substitution Method						DL/2 Substitution Method		
1097				Mean		1.988				Mean		0.449
1098				SD		1.559				SD		0.668
1099				95% DL/2 (t) UCL		2.671				95% H-Stat (DL/2) UCL		2.885
1100												

	A	B	C	D	E	F	G	H	I	J	K	L
1101				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
1102					Mean	1.625					Mean in Log Scale	0.753
1103					SD	2.121					SD in Log Scale	0.536
1104					95% MLE (t) UCL	2.555					Mean in Original Scale	2.431
1105					95% MLE (Tiku) UCL	3.178					SD in Original Scale	1.341
1106											95% t UCL	3.019
1107											95% Percentile Bootstrap UCL	2.989
1108											95% BCA Bootstrap UCL	3.017
1109											95% H UCL	3.274
1110												
1111				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
1112					k star (bias corrected)	7.973				Data appear Normal at 5% Significance Level		
1113					Theta Star	0.514						
1114					nu star	79.73						
1115												
1116					A-D Test Statistic	0.467				Nonparametric Statistics		
1117					5% A-D Critical Value	0.679					Kaplan-Meier (KM) Method	
1118					K-S Test Statistic	0.679					Mean	3.206
1119					5% K-S Critical Value	0.357					SD	0.781
1120				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.218
1121											95% KM (t) UCL	3.589
1122				Assuming Gamma Distribution							95% KM (z) UCL	3.565
1123				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	3.601
1124					Minimum	0.000001					95% KM (bootstrap t) UCL	3.54
1125					Maximum	5					95% KM (BCA) UCL	4.906
1126					Mean	1.393					95% KM (Percentile Bootstrap) UCL	4.613
1127					Median	0.000001					95% KM (Chebyshev) UCL	4.157
1128					SD	1.982					97.5% KM (Chebyshev) UCL	4.569
1129					k star	0.127					99% KM (Chebyshev) UCL	5.377
1130					Theta star	10.98						
1131					Nu star	4.058				Potential UCLs to Use		
1132					AppChi2	0.745					95% KM (t) UCL	3.589
1133					95% Gamma Approximate UCL	7.59					95% KM (Percentile Bootstrap) UCL	4.613
1134					95% Adjusted Gamma UCL	9.379						
1135	Note: DL/2 is not a recommended method.											
1136												
1137	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1138	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1139	For additional insight, the user may want to consult a statistician.											
1140												
1141												
1142	NITRATE											
1143												
1144					General Statistics							
1145					Number of Valid Data	15					Number of Detected Data	13
1146					Number of Distinct Detected Data	13					Number of Non-Detect Data	2
1147					Number of Missing Values	3					Percent Non-Detects	13.33%
1148												
1149				Raw Statistics						Log-transformed Statistics		
1150					Minimum Detected	0.061					Minimum Detected	-2.797
1151					Maximum Detected	6.2					Maximum Detected	1.825
1152					Mean of Detected	1.648					Mean of Detected	-0.413
1153					SD of Detected	2.068					SD of Detected	1.521
1154					Minimum Non-Detect	0.05					Minimum Non-Detect	-2.996
1155					Maximum Non-Detect	0.05					Maximum Non-Detect	-2.996

	A	B	C	D	E	F	G	H	I	J	K	L
1156												
1157												
1158					UCL Statistics							
1159				Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only			
1160					Shapiro Wilk Test Statistic	0.76				Shapiro Wilk Test Statistic		0.938
1161					5% Shapiro Wilk Critical Value	0.866				5% Shapiro Wilk Critical Value		0.866
1162				Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level			
1163												
1164				Assuming Normal Distribution					Assuming Lognormal Distribution			
1165					DL/2 Substitution Method					DL/2 Substitution Method		
1166					Mean	1.432				Mean		-0.85
1167					SD	1.998				SD		1.82
1168					95% DL/2 (t) UCL	2.34				95% H-Stat (DL/2) UCL		17.38
1169												
1170					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1171					Mean	1.257				Mean in Log Scale		-0.893
1172					SD	2.138				SD in Log Scale		1.899
1173					95% MLE (t) UCL	2.23				Mean in Original Scale		1.431
1174					95% MLE (Tiku) UCL	2.193				SD in Original Scale		1.998
1175										95% t UCL		2.34
1176										95% Percentile Bootstrap UCL		2.285
1177										95% BCA Bootstrap UCL		2.444
1178										95% H UCL		22.81
1179												
1180				Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only			
1181					k star (bias corrected)	0.564			Data appear Gamma Distributed at 5% Significance Level			
1182					Theta Star	2.921						
1183					nu star	14.67						
1184												
1185					A-D Test Statistic	0.592			Nonparametric Statistics			
1186					5% A-D Critical Value	0.777				Kaplan-Meier (KM) Method		
1187					K-S Test Statistic	0.777				Mean		1.437
1188					5% K-S Critical Value	0.247				SD		1.927
1189				Data appear Gamma Distributed at 5% Significance Level						SE of Mean		0.518
1190										95% KM (t) UCL		2.349
1191				Assuming Gamma Distribution						95% KM (z) UCL		2.288
1192					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		2.34
1193					Minimum	0.000001				95% KM (bootstrap t) UCL		2.809
1194					Maximum	6.2				95% KM (BCA) UCL		2.337
1195					Mean	1.428				95% KM (Percentile Bootstrap) UCL		2.31
1196					Median	0.61				95% KM (Chebyshev) UCL		3.693
1197					SD	2				97.5% KM (Chebyshev) UCL		4.67
1198					k star	0.263				99% KM (Chebyshev) UCL		6.588
1199					Theta star	5.422						
1200					Nu star	7.904			Potential UCLs to Use			
1201					AppChi2	2.68				95% KM (Chebyshev) UCL		3.693
1202					95% Gamma Approximate UCL	4.214						
1203					95% Adjusted Gamma UCL	4.868						
1204	Note: DL/2 is not a recommended method.											
1205												
1206	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1207	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1208	For additional insight, the user may want to consult a statistician.											
1209												
1210												

	A	B	C	D	E	F	G	H	I	J	K	L
1211	TOTAL ORGANIC HALIDES											
1212												
1213					General Statistics							
1214					Number of Valid Data	16				Number of Detected Data		12
1215					Number of Distinct Detected Data	12				Number of Non-Detect Data		4
1216					Number of Missing Values	2				Percent Non-Detects		25.00%
1217												
1218					Raw Statistics					Log-transformed Statistics		
1219					Minimum Detected	0.011				Minimum Detected		-4.51
1220					Maximum Detected	2.1				Maximum Detected		0.742
1221					Mean of Detected	0.332				Mean of Detected		-2.174
1222					SD of Detected	0.608				SD of Detected		1.45
1223					Minimum Non-Detect	0.018				Minimum Non-Detect		-4.017
1224					Maximum Non-Detect	1.8				Maximum Non-Detect		0.588
1225												
1226	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
1227	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
1228	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		93.75%
1229												
1230					UCL Statistics							
1231					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
1232					Shapiro Wilk Test Statistic	0.569				Shapiro Wilk Test Statistic		0.952
1233					5% Shapiro Wilk Critical Value	0.859				5% Shapiro Wilk Critical Value		0.859
1234					Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
1235												
1236					Assuming Normal Distribution					Assuming Lognormal Distribution		
1237					DL/2 Substitution Method					DL/2 Substitution Method		
1238					Mean	0.332				Mean		-2.27
1239					SD	0.554				SD		1.649
1240					95% DL/2 (t) UCL	0.574				95% H-Stat (DL/2) UCL		2.037
1241												
1242					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1243					MLE method failed to converge properly					Mean in Log Scale		-2.567
1244										SD in Log Scale		1.507
1245										Mean in Original Scale		0.258
1246										SD in Original Scale		0.537
1247										95% t UCL		0.493
1248										95% Percentile Bootstrap UCL		0.494
1249										95% BCA Bootstrap UCL		0.635
1250										95% H-UCL		0.955
1251												
1252					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
1253					k star (bias corrected)	0.49				Data appear Lognormal at 5% Significance Level		
1254					Theta Star	0.678						
1255					nu star	11.76						
1256												
1257					A-D Test Statistic	0.94				Nonparametric Statistics		
1258					5% A-D Critical Value	0.779				Kaplan-Meier (KM) Method		
1259					K-S Test Statistic	0.779				Mean		0.265
1260					5% K-S Critical Value	0.257				SD		0.521
1261					Data not Gamma Distributed at 5% Significance Level					SE of Mean		0.137
1262										95% KM (t) UCL		0.505
1263					Assuming Gamma Distribution					95% KM (z) UCL		0.49
1264					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.501
1265					Minimum	0.000001				95% KM (bootstrap t) UCL		1.34

1266					Maximum	2.1				95% KM (BCA) UCL		0.546
1267					Mean	0.252				95% KM (Percentile Bootstrap) UCL		0.503
1268					Median	0.06				95% KM (Chebyshev) UCL		0.862
1269					SD	0.54				97.5% KM (Chebyshev) UCL		1.121
1270					k star	0.253				99% KM (Chebyshev) UCL		1.629
1271					Theta star	0.995						
1272					Nu star	8.107				Potential UCLs to Use		
1273					AppChi2	2.797				97.5% KM (Chebyshev) UCL		1.121
1274				95% Gamma Approximate UCL		0.731						
1275				95% Adjusted Gamma UCL		0.833						
1276	Note: DL/2 is not a recommended method.											
1277												
1278	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1279	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1280	For additional insight, the user may want to consult a statistician.											
1281												
1282												
1283	DIMETHYL PHTHALATE											
1284												
1285	General Statistics											
1286				Number of Valid Data		12				Number of Detected Data		2
1287				Number of Distinct Detected Data		2				Number of Non-Detect Data		10
1288										Percent Non-Detects		83.33%
1289												
1290	Raw Statistics						Log-transformed Statistics					
1291				Minimum Detected		1				Minimum Detected		0
1292				Maximum Detected		2				Maximum Detected		0.693
1293				Mean of Detected		1.5				Mean of Detected		0.347
1294				SD of Detected		0.707				SD of Detected		0.49
1295				Minimum Non-Detect		10				Minimum Non-Detect		2.303
1296				Maximum Non-Detect		12				Maximum Non-Detect		2.485
1297												
1298	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		12
1299	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1300	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1301												
1302	Warning: Data set has only 2 Distinct Detected Values.											
1303	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
1304	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1305												
1306	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
1307												
1308	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
1309	Those methods will return a 'N/A' value on your output display!											
1310												
1311	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1312	However, results obtained using 4 to 9 distinct values may not be reliable.											
1313	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1314												
1315												
1316	UCL Statistics											
1317	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1318				Shapiro Wilk Test Statistic		N/A				Shapiro Wilk Test Statistic		N/A
1319				5% Shapiro Wilk Critical Value		N/A				5% Shapiro Wilk Critical Value		N/A
1320	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1321												
1322				Assuming Normal Distribution						Assuming Lognormal Distribution		
1323					DL/2 Substitution Method						DL/2 Substitution Method	
1324					Mean	4.792					Mean	1.469
1325					SD	1.588					SD	0.548
1326					95% DL/2 (t) UCL	5.615					95% H-Stat (DL/2) UCL	7.266
1327												
1328					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1329					MLE method failed to converge properly						Mean in Log Scale	N/A
1330											SD in Log Scale	N/A
1331											Mean in Original Scale	N/A
1332											SD in Original Scale	N/A
1333											95% t UCL	N/A
1334											95% Percentile Bootstrap UCL	N/A
1335											95% BCA Bootstrap UCL	N/A
1336											95% H-UCL	N/A
1337												
1338				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
1339					k star (bias corrected)	N/A				Data do not follow a Discernable Distribution (0.05)		
1340					Theta Star	N/A						
1341					nu star	N/A						
1342												
1343					A-D Test Statistic	N/A				Nonparametric Statistics		
1344					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1345					K-S Test Statistic	N/A					Mean	1.5
1346					5% K-S Critical Value	N/A					SD	0.5
1347					Data not Gamma Distributed at 5% Significance Level						SE of Mean	0.5
1348											95% KM (t) UCL	2.398
1349					Assuming Gamma Distribution						95% KM (z) UCL	2.322
1350					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.716
1351					Minimum	N/A					95% KM (bootstrap t) UCL	N/A
1352					Maximum	N/A					95% KM (BCA) UCL	2
1353					Mean	N/A					95% KM (Percentile Bootstrap) UCL	2
1354					Median	N/A					95% KM (Chebyshev) UCL	3.679
1355					SD	N/A					97.5% KM (Chebyshev) UCL	4.622
1356					k star	N/A					99% KM (Chebyshev) UCL	6.475
1357					Theta star	N/A						
1358					Nu star	N/A				Potential UCLs to Use		
1359					AppChi2	N/A					95% KM (t) UCL	2.398
1360					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	2
1361					95% Adjusted Gamma UCL	N/A						
1362					Warning: Recommended UCL exceeds the maximum observation							
1363	Note: DL/2 is not a recommended method.											
1364												
1365					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1366					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1367					For additional insight, the user may want to consult a statistician.							
1368												
1369												
1370	DIESEL RANGE ORGANICS											
1371												
1372					General Statistics							
1373					Number of Valid Data	16					Number of Detected Data	5
1374					Number of Distinct Detected Data	5					Number of Non-Detect Data	11
1375					Number of Missing Values	2					Percent Non-Detects	68.75%

	A	B	C	D	E	F	G	H	I	J	K	L
1376												
1377	Raw Statistics						Log-transformed Statistics					
1378					Minimum Detected	55				Minimum Detected		4.007
1379					Maximum Detected	200				Maximum Detected		5.298
1380					Mean of Detected	135				Mean of Detected		4.757
1381					SD of Detected	71.59				SD of Detected		0.648
1382					Minimum Non-Detect	50				Minimum Non-Detect		3.912
1383					Maximum Non-Detect	55				Maximum Non-Detect		4.007
1384												
1385	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		11
1386	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
1387	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		68.75%
1388												
1389	Warning: There are only 5 Detected Values in this data											
1390	Note: It should be noted that even though bootstrap may be performed on this data set											
1391	the resulting calculations may not be reliable enough to draw conclusions											
1392												
1393	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1394												
1395												
1396	UCL Statistics											
1397	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1398					Shapiro Wilk Test Statistic	0.796				Shapiro Wilk Test Statistic		0.769
1399					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1400	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1401												
1402	Assuming Normal Distribution						Assuming Lognormal Distribution					
1403					DL/2 Substitution Method					DL/2 Substitution Method		
1404					Mean	60.47				Mean		3.741
1405					SD	63.73				SD		0.783
1406					95% DL/2 (t) UCL	88.4				95% H-Stat (DL/2) UCL		92.84
1407												
1408					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1409	MLE yields a negative mean									Mean in Log Scale		3.241
1410										SD in Log Scale		1.269
1411										Mean in Original Scale		53.33
1412										SD in Original Scale		68.39
1413										95% t UCL		83.31
1414										95% Percentile Bootstrap UCL		82.4
1415										95% BCA Bootstrap UCL		89.32
1416										95% H-UCL		159.8
1417												
1418	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1419					k star (bias corrected)	1.541	Data appear Normal at 5% Significance Level					
1420					Theta Star	87.58						
1421					nu star	15.41						
1422												
1423					A-D Test Statistic	0.69	Nonparametric Statistics					
1424					5% A-D Critical Value	0.682				Kaplan-Meier (KM) Method		
1425					K-S Test Statistic	0.682				Mean		80
1426					5% K-S Critical Value	0.359				SD		51.54
1427	Data follow Appr. Gamma Distribution at 5% Significance Level									SE of Mean		14.41
1428										95% KM (t) UCL		105.3
1429	Assuming Gamma Distribution									95% KM (z) UCL		103.7
1430					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		101.4

1431					Minimum	0.000001				95% KM (bootstrap t) UCL		104.4
1432					Maximum	200				95% KM (BCA) UCL		191.3
1433					Mean	42.19				95% KM (Percentile Bootstrap) UCL		175.6
1434					Median	0.000001				95% KM (Chebyshev) UCL		142.8
1435					SD	74.45				97.5% KM (Chebyshev) UCL		170
1436					k star	0.1				99% KM (Chebyshev) UCL		223.3
1437					Theta star	421.8						
1438					Nu star	3.201				Potential UCLs to Use		
1439					AppChi2	0.434				95% KM (t) UCL		105.3
1440				95% Gamma Approximate UCL		310.9				95% KM (Percentile Bootstrap) UCL		175.6
1441				95% Adjusted Gamma UCL		395.6						
1442	Note: DL/2 is not a recommended method.											
1443												
1444	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1445	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1446	For additional insight, the user may want to consult a statistician.											
1447												
1448												
1449	GASOLINE RANGE ORGANICS											
1450												
1451	General Statistics											
1452					Number of Valid Data	12				Number of Detected Data		5
1453					Number of Distinct Detected Data	4				Number of Non-Detect Data		7
1454										Percent Non-Detects		58.33%
1455												
1456	Raw Statistics						Log-transformed Statistics					
1457					Minimum Detected	11				Minimum Detected		2.398
1458					Maximum Detected	47				Maximum Detected		3.85
1459					Mean of Detected	23				Mean of Detected		2.983
1460					SD of Detected	14.71				SD of Detected		0.61
1461					Minimum Non-Detect	10				Minimum Non-Detect		2.303
1462					Maximum Non-Detect	24				Maximum Non-Detect		3.178
1463												
1464	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		10
1465	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
1466	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		83.33%
1467												
1468	Warning: There are only 4 Distinct Detected Values in this data											
1469	Note: It should be noted that even though bootstrap may be performed on this data set											
1470	the resulting calculations may not be reliable enough to draw conclusions											
1471												
1472	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1473												
1474												
1475	UCL Statistics											
1476	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1477					Shapiro Wilk Test Statistic	0.846				Shapiro Wilk Test Statistic		0.895
1478					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1479	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1480												
1481	Assuming Normal Distribution						Assuming Lognormal Distribution					
1482					DL/2 Substitution Method					DL/2 Substitution Method		
1483					Mean	13.08				Mean		2.255
1484					SD	12.62				SD		0.78
1485					95% DL/2 (t) UCL	19.62				95% H-Stat (DL/2) UCL		23.46

	A	B	C	D	E	F	G	H	I	J	K	L
1486												
1487				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
1488				**MLE method failed to converge properly**							Mean in Log Scale	2.045
1489											SD in Log Scale	0.987
1490											Mean in Original Scale	12.15
1491											SD in Original Scale	13.14
1492											95% t UCL	18.96
1493											95% Percentile Bootstrap UCL	19.06
1494											95% BCA Bootstrap UCL	21.27
1495											95% H-UCL	29.75
1496												
1497				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1498					k star (bias corrected)	1.508				**Data appear Normal at 5% Significance Level**		
1499					Theta Star	15.25						
1500					nu star	15.08						
1501												
1502					A-D Test Statistic	0.388				**Nonparametric Statistics**		
1503					5% A-D Critical Value	0.682					Kaplan-Meier (KM) Method	
1504					K-S Test Statistic	0.682					Mean	16.1
1505					5% K-S Critical Value	0.359					SD	10.36
1506				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	3.36
1507											95% KM (t) UCL	22.14
1508				**Assuming Gamma Distribution**							95% KM (z) UCL	21.63
1509					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	21.75
1510					Minimum	0.000001					95% KM (bootstrap t) UCL	24.57
1511					Maximum	47					95% KM (BCA) UCL	27.83
1512					Mean	9.583					95% KM (Percentile Bootstrap) UCL	25.1
1513					Median	0.000001					95% KM (Chebyshev) UCL	30.75
1514					SD	14.8					97.5% KM (Chebyshev) UCL	37.08
1515					k star	0.123					99% KM (Chebyshev) UCL	49.53
1516					Theta star	77.61						
1517					Nu star	2.964				**Potential UCLs to Use**		
1518					AppChi2	0.362					95% KM (t) UCL	22.14
1519					95% Gamma Approximate UCL	78.51					95% KM (Percentile Bootstrap) UCL	25.1
1520					95% Adjusted Gamma UCL	109.4						
1521	Note: DL/2 is not a recommended method.											
1522												
1523	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1524	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1525	For additional insight, the user may want to consult a statistician.											
1526												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	BARIUM											
10												
11						General Statistics						
12						Number of Valid Observations	16			Number of Distinct Observations	16	
13						Number of Missing Values	2					
14												
15						Raw Statistics				Log-transformed Statistics		
16						Minimum	7.6			Minimum of Log Data	2.028	
17						Maximum	52.6			Maximum of Log Data	3.963	
18						Mean	26.99			Mean of log Data	3.089	
19						Median	20.1			SD of log Data	0.688	
20						SD	16.77					
21						Std. Error of Mean	4.192					
22						Coefficient of Variation	0.621					
23						Skewness	0.399					
24												
25						Relevant UCL Statistics						
26						Normal Distribution Test				Lognormal Distribution Test		
27						Shapiro Wilk Test Statistic	0.864			Shapiro Wilk Test Statistic	0.908	
28						Shapiro Wilk Critical Value	0.887			Shapiro Wilk Critical Value	0.887	
29						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
30												
31						Assuming Normal Distribution				Assuming Lognormal Distribution		
32						95% Student's-t UCL	34.34			95% H-UCL	41.58	
33						95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	48.94	
34						95% Adjusted-CLT UCL (Chen-1995)	34.34			97.5% Chebyshev (MVUE) UCL	58.29	
35						95% Modified-t UCL (Johnson-1978)	34.41			99% Chebyshev (MVUE) UCL	76.66	
36												
37						Gamma Distribution Test				Data Distribution		
38						k star (bias corrected)	2.132			Data appear Gamma Distributed at 5% Significance Level		
39						Theta Star	12.66					
40						MLE of Mean	26.99					
41						MLE of Standard Deviation	18.49					
42						nu star	68.24					
43						Approximate Chi Square Value (.05)	50.22			Nonparametric Statistics		
44						Adjusted Level of Significance	0.0335			95% CLT UCL	33.89	
45						Adjusted Chi Square Value	48.47			95% Jackknife UCL	34.34	
46										95% Standard Bootstrap UCL	33.73	
47						Anderson-Darling Test Statistic	0.623			95% Bootstrap-t UCL	34.29	
48						Anderson-Darling 5% Critical Value	0.747			95% Hall's Bootstrap UCL	33.82	
49						Kolmogorov-Smirnov Test Statistic	0.164			95% Percentile Bootstrap UCL	33.86	
50						Kolmogorov-Smirnov 5% Critical Value	0.217			95% BCA Bootstrap UCL	34.03	
51						Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	45.27	
52										97.5% Chebyshev(Mean, Sd) UCL	53.17	
53						Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	68.7	
54						95% Approximate Gamma UCL	36.68					
55						95% Adjusted Gamma UCL	38					

	A	B	C	D	E	F	G	H	I	J	K	L
56												
57	Potential UCL to Use						Use 95% Approximate Gamma UCL					36.68
58												
59	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
60	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
61	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
62												
63												
64	CALCIUM											
65												
66	General Statistics											
67	Number of Valid Observations					16	Number of Distinct Observations					16
68	Number of Missing Values					2						
69												
70	Raw Statistics						Log-transformed Statistics					
71	Minimum					5260	Minimum of Log Data					8.568
72	Maximum					77700	Maximum of Log Data					11.26
73	Mean					37769	Mean of log Data					10.21
74	Median					37750	SD of log Data					0.982
75	SD					24293						
76	Std. Error of Mean					6073						
77	Coefficient of Variation					0.643						
78	Skewness					0.0344						
79												
80	Relevant UCL Statistics											
81	Normal Distribution Test						Lognormal Distribution Test					
82	Shapiro Wilk Test Statistic					0.927	Shapiro Wilk Test Statistic					0.814
83	Shapiro Wilk Critical Value					0.887	Shapiro Wilk Critical Value					0.887
84	Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
85												
86	Assuming Normal Distribution						Assuming Lognormal Distribution					
87	95% Student's-t UCL					48415	95% H-UCL					86494
88	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					91487
89	95% Adjusted-CLT UCL (Chen-1995)					47814	97.5% Chebyshev (MVUE) UCL					112860
90	95% Modified-t UCL (Johnson-1978)					48424	99% Chebyshev (MVUE) UCL					154843
91												
92	Gamma Distribution Test						Data Distribution					
93	k star (bias corrected)					1.383	Data appear Normal at 5% Significance Level					
94	Theta Star					27306						
95	MLE of Mean					37769						
96	MLE of Standard Deviation					32114						
97	nu star					44.26						
98	Approximate Chi Square Value (.05)					30	Nonparametric Statistics					
99	Adjusted Level of Significance					0.0335	95% CLT UCL					47758
100	Adjusted Chi Square Value					28.67	95% Jackknife UCL					48415
101							95% Standard Bootstrap UCL					47575
102	Anderson-Darling Test Statistic					0.905	95% Bootstrap-t UCL					48515
103	Anderson-Darling 5% Critical Value					0.753	95% Hall's Bootstrap UCL					47831
104	Kolmogorov-Smirnov Test Statistic					0.206	95% Percentile Bootstrap UCL					47208
105	Kolmogorov-Smirnov 5% Critical Value					0.219	95% BCA Bootstrap UCL					47629
106	Data follow Appr. Gamma Distribution at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					64241
107							97.5% Chebyshev(Mean, Sd) UCL					75696
108	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					98196
109	95% Approximate Gamma UCL					55718						
110	95% Adjusted Gamma UCL					58309						

	A	B	C	D	E	F	G	H	I	J	K	L
111												
112				Potential UCL to Use						Use 95% Student's-t UCL		48415
113												
114	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
115	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
116	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
117												
118												
119	MAGNESIUM											
120												
121					General Statistics							
122					Number of Valid Observations	16				Number of Distinct Observations		16
123					Number of Missing Values	2						
124												
125				Raw Statistics						Log-transformed Statistics		
126					Minimum	1200				Minimum of Log Data		7.09
127					Maximum	8590				Maximum of Log Data		9.058
128					Mean	4782				Mean of log Data		8.271
129					Median	4545				SD of log Data		0.72
130					SD	2648						
131					Std. Error of Mean	662						
132					Coefficient of Variation	0.554						
133					Skewness	-0.0489						
134												
135					Relevant UCL Statistics							
136				Normal Distribution Test						Lognormal Distribution Test		
137					Shapiro Wilk Test Statistic	0.915				Shapiro Wilk Test Statistic		0.857
138					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
139				Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
140												
141				Assuming Normal Distribution						Assuming Lognormal Distribution		
142					95% Student's-t UCL	5942				95% H-UCL		7776
143				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		9098
144					95% Adjusted-CLT UCL (Chen-1995)	5862				97.5% Chebyshev (MVUE) UCL		10886
145					95% Modified-t UCL (Johnson-1978)	5941				99% Chebyshev (MVUE) UCL		14397
146												
147				Gamma Distribution Test						Data Distribution		
148					k star (bias corrected)	2.179				Data appear Normal at 5% Significance Level		
149					Theta Star	2194						
150					MLE of Mean	4782						
151					MLE of Standard Deviation	3239						
152					nu star	69.73						
153					Approximate Chi Square Value (.05)	51.51				Nonparametric Statistics		
154					Adjusted Level of Significance	0.0335				95% CLT UCL		5871
155					Adjusted Chi Square Value	49.73				95% Jackknife UCL		5942
156										95% Standard Bootstrap UCL		5817
157					Anderson-Darling Test Statistic	0.692				95% Bootstrap-t UCL		5907
158					Anderson-Darling 5% Critical Value	0.747				95% Hall's Bootstrap UCL		5805
159					Kolmogorov-Smirnov Test Statistic	0.16				95% Percentile Bootstrap UCL		5866
160					Kolmogorov-Smirnov 5% Critical Value	0.217				95% BCA Bootstrap UCL		5798
161				Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		7667
162										97.5% Chebyshev(Mean, Sd) UCL		8916
163				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		11368
164					95% Approximate Gamma UCL	6474						
165					95% Adjusted Gamma UCL	6705						

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167	Potential UCL to Use										Use 95% Student's-t UCL	5942
168												
169	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
170	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
171	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
172												
173	Note: For highly negative-skewed data, confidence limits											
174	(e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
175	reliable. Chen's and Johnson's methods provide											
176	adjustments for positvely skewed data sets.											
177												
178												
179	SODIUM											
180												
181	General Statistics											
182	Number of Valid Observations					16	Number of Distinct Observations					14
183	Number of Missing Values					2						
184												
185	Raw Statistics						Log-transformed Statistics					
186	Minimum					12900	Minimum of Log Data					9.465
187	Maximum					157000	Maximum of Log Data					11.96
188	Mean					68725	Mean of log Data					10.84
189	Median					48600	SD of log Data					0.829
190	SD					50800						
191	Std. Error of Mean					12700						
192	Coefficient of Variation					0.739						
193	Skewness					0.708						
194												
195	Relevant UCL Statistics											
196	Normal Distribution Test						Lognormal Distribution Test					
197	Shapiro Wilk Test Statistic					0.862	Shapiro Wilk Test Statistic					0.929
198	Shapiro Wilk Critical Value					0.887	Shapiro Wilk Critical Value					0.887
199	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
200												
201	Assuming Normal Distribution						Assuming Lognormal Distribution					
202	95% Student's-t UCL					90989	95% H-UCL					122233
203	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					138692
204	95% Adjusted-CLT UCL (Chen-1995)					92017	97.5% Chebyshev (MVUE) UCL					168266
205	95% Modified-t UCL (Johnson-1978)					91363	99% Chebyshev (MVUE) UCL					226358
206												
207	Gamma Distribution Test						Data Distribution					
208	k star (bias corrected)					1.548	Data appear Gamma Distributed at 5% Significance Level					
209	Theta Star					44383						
210	MLE of Mean					68725						
211	MLE of Standard Deviation					55229						
212	nu star					49.55						
213	Approximate Chi Square Value (.05)					34.39	Nonparametric Statistics					
214	Adjusted Level of Significance					0.0335	95% CLT UCL					89615
215	Adjusted Chi Square Value					32.95	95% Jackknife UCL					90989
216							95% Standard Bootstrap UCL					88977
217	Anderson-Darling Test Statistic					0.447	95% Bootstrap-t UCL					96443
218	Anderson-Darling 5% Critical Value					0.752	95% Hall's Bootstrap UCL					88780
219	Kolmogorov-Smirnov Test Statistic					0.145	95% Percentile Bootstrap UCL					88781
220	Kolmogorov-Smirnov 5% Critical Value					0.218	95% BCA Bootstrap UCL					91400

	A	B	C	D	E	F	G	H	I	J	K	L
221	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		124083
222										97.5% Chebyshev(Mean, Sd) UCL		148037
223	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		195089
224					95% Approximate Gamma UCL	99024						
225					95% Adjusted Gamma UCL	103336						
226												
227	Potential UCL to Use									Use 95% Approximate Gamma UCL		99024
228												
229	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
230	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
231	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
232												
233												
234	ALKALINITY											
235												
236	General Statistics											
237					Number of Valid Observations	16				Number of Distinct Observations		12
238					Number of Missing Values	2						
239												
240	Raw Statistics						Log-transformed Statistics					
241					Minimum	35				Minimum of Log Data		3.555
242					Maximum	260				Maximum of Log Data		5.561
243					Mean	141.5				Mean of log Data		4.8
244					Median	130				SD of log Data		0.605
245					SD	73.82						
246					Std. Error of Mean	18.45						
247					Coefficient of Variation	0.522						
248					Skewness	0.352						
249												
250	Relevant UCL Statistics											
251	Normal Distribution Test						Lognormal Distribution Test					
252					Shapiro Wilk Test Statistic	0.925				Shapiro Wilk Test Statistic		0.938
253					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
254	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
255												
256	Assuming Normal Distribution						Assuming Lognormal Distribution					
257					95% Student's-t UCL	173.9				95% H-UCL		204.6
258	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		243.1
259					95% Adjusted-CLT UCL (Chen-1995)	173.6				97.5% Chebyshev (MVUE) UCL		286
260					95% Modified-t UCL (Johnson-1978)	174.1				99% Chebyshev (MVUE) UCL		370.3
261												
262	Gamma Distribution Test						Data Distribution					
263					k star (bias corrected)	2.846	Data appear Normal at 5% Significance Level					
264					Theta Star	49.72						
265					MLE of Mean	141.5						
266					MLE of Standard Deviation	83.88						
267					nu star	91.07						
268					Approximate Chi Square Value (.05)	70.07	Nonparametric Statistics					
269					Adjusted Level of Significance	0.0335				95% CLT UCL		171.9
270					Adjusted Chi Square Value	67.97				95% Jackknife UCL		173.9
271										95% Standard Bootstrap UCL		171
272					Anderson-Darling Test Statistic	0.299				95% Bootstrap-t UCL		176.4
273					Anderson-Darling 5% Critical Value	0.743				95% Hall's Bootstrap UCL		172.7
274					Kolmogorov-Smirnov Test Statistic	0.144				95% Percentile Bootstrap UCL		170.6
275					Kolmogorov-Smirnov 5% Critical Value	0.216				95% BCA Bootstrap UCL		173.4

	A	B	C	D	E	F	G	H	I	J	K	L
276	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		221.9
277										97.5% Chebyshev(Mean, Sd) UCL		256.7
278	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		325.1
279					95% Approximate Gamma UCL	183.9						
280					95% Adjusted Gamma UCL	189.6						
281												
282	Potential UCL to Use									Use 95% Student's-t UCL		173.9
283												
284	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
285	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
286	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
287												
288												
289	CARBONATE ALKALINITY											
290												
291	General Statistics											
292					Number of Valid Observations	16				Number of Distinct Observations		12
293					Number of Missing Values	2						
294												
295	Raw Statistics						Log-transformed Statistics					
296					Minimum	35				Minimum of Log Data		3.555
297					Maximum	260				Maximum of Log Data		5.561
298					Mean	141.5				Mean of log Data		4.8
299					Median	130				SD of log Data		0.605
300					SD	73.82						
301					Std. Error of Mean	18.45						
302					Coefficient of Variation	0.522						
303					Skewness	0.352						
304												
305	Relevant UCL Statistics											
306	Normal Distribution Test						Lognormal Distribution Test					
307					Shapiro Wilk Test Statistic	0.925				Shapiro Wilk Test Statistic		0.938
308					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
309	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
310												
311	Assuming Normal Distribution						Assuming Lognormal Distribution					
312					95% Student's-t UCL	173.9				95% H-UCL		204.6
313	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		243.1
314					95% Adjusted-CLT UCL (Chen-1995)	173.6				97.5% Chebyshev (MVUE) UCL		286
315					95% Modified-t UCL (Johnson-1978)	174.1				99% Chebyshev (MVUE) UCL		370.3
316												
317	Gamma Distribution Test						Data Distribution					
318					k star (bias corrected)	2.846	Data appear Normal at 5% Significance Level					
319					Theta Star	49.72						
320					MLE of Mean	141.5						
321					MLE of Standard Deviation	83.88						
322					nu star	91.07						
323					Approximate Chi Square Value (.05)	70.07	Nonparametric Statistics					
324					Adjusted Level of Significance	0.0335				95% CLT UCL		171.9
325					Adjusted Chi Square Value	67.97				95% Jackknife UCL		173.9
326										95% Standard Bootstrap UCL		170.8
327					Anderson-Darling Test Statistic	0.299				95% Bootstrap-t UCL		177
328					Anderson-Darling 5% Critical Value	0.743				95% Hall's Bootstrap UCL		172.8
329					Kolmogorov-Smirnov Test Statistic	0.144				95% Percentile Bootstrap UCL		170.6
330					Kolmogorov-Smirnov 5% Critical Value	0.216				95% BCA Bootstrap UCL		172.8

	A	B	C	D	E	F	G	H	I	J	K	L
331	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					221.9
332							97.5% Chebyshev(Mean, Sd) UCL					256.7
333	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					325.1
334					95% Approximate Gamma UCL	183.9						
335					95% Adjusted Gamma UCL	189.6						
336												
337	Potential UCL to Use						Use 95% Student's-t UCL					173.9
338												
339	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
340	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
341	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
342												
343												
344	CHLORIDE											
345												
346	General Statistics											
347					Number of Valid Observations	16	Number of Distinct Observations					13
348					Number of Missing Values	2						
349												
350	Raw Statistics						Log-transformed Statistics					
351					Minimum	5.1	Minimum of Log Data					1.629
352					Maximum	180	Maximum of Log Data					5.193
353					Mean	69.48	Mean of log Data					3.626
354					Median	44	SD of log Data					1.302
355					SD	62.41						
356					Std. Error of Mean	15.6						
357					Coefficient of Variation	0.898						
358					Skewness	0.422						
359												
360	Relevant UCL Statistics											
361	Normal Distribution Test						Lognormal Distribution Test					
362					Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Test Statistic					0.873
363					Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value					0.887
364	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
365												
366	Assuming Normal Distribution						Assuming Lognormal Distribution					
367					95% Student's-t UCL	96.83	95% H-UCL					256.9
368	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					210
369					95% Adjusted-CLT UCL (Chen-1995)	96.9	97.5% Chebyshev (MVUE) UCL					266.1
370					95% Modified-t UCL (Johnson-1978)	97.1	99% Chebyshev (MVUE) UCL					376.3
371												
372	Gamma Distribution Test						Data Distribution					
373					k star (bias corrected)	0.809	Data Follow Appr. Gamma Distribution at 5% Significance Level					
374					Theta Star	85.86						
375					MLE of Mean	69.48						
376					MLE of Standard Deviation	77.23						
377					nu star	25.89						
378					Approximate Chi Square Value (.05)	15.3	Nonparametric Statistics					
379					Adjusted Level of Significance	0.0335	95% CLT UCL					95.14
380					Adjusted Chi Square Value	14.38	95% Jackknife UCL					96.83
381							95% Standard Bootstrap UCL					94.18
382					Anderson-Darling Test Statistic	0.813	95% Bootstrap-t UCL					99.28
383					Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL					93.77
384					Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL					95.09
385					Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL					98.74

	A	B	C	D	E	F	G	H	I	J	K	L
386	Data follow Appr. Gamma Distribution at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		137.5
387										97.5% Chebyshev(Mean, Sd) UCL		166.9
388	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		224.7
389					95% Approximate Gamma UCL	117.6						
390					95% Adjusted Gamma UCL	125.1						
391												
392	Potential UCL to Use									Use 95% Approximate Gamma UCL		117.6
393												
394	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
395	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
396	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
397												
398												
399	PH											
400												
401	General Statistics											
402					Number of Valid Observations	16				Number of Distinct Observations		9
403					Number of Missing Values	2						
404												
405	Raw Statistics						Log-transformed Statistics					
406					Minimum	6.8				Minimum of Log Data		1.917
407					Maximum	8.3				Maximum of Log Data		2.116
408					Mean	7.425				Mean of log Data		2.002
409					Median	7.3				SD of log Data		0.0725
410					SD	0.546						
411					Std. Error of Mean	0.136						
412					Coefficient of Variation	0.0735						
413					Skewness	0.519						
414												
415												
416	Relevant UCL Statistics											
417	Normal Distribution Test						Lognormal Distribution Test					
418					Shapiro Wilk Test Statistic	0.874				Shapiro Wilk Test Statistic		0.881
419					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
420	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
421												
422	Assuming Normal Distribution						Assuming Lognormal Distribution					
423					95% Student's-t UCL	7.664				95% H-UCL		N/A
424	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		8.012
425					95% Adjusted-CLT UCL (Chen-1995)	7.668				97.5% Chebyshev (MVUE) UCL		8.266
426					95% Modified-t UCL (Johnson-1978)	7.667				99% Chebyshev (MVUE) UCL		8.765
427												
428	Gamma Distribution Test						Data Distribution					
429					k star (bias corrected)	163.4	Data Follow Appr. Gamma Distribution at 5% Significance Level					
430					Theta Star	0.0454						
431					MLE of Mean	7.425						
432					MLE of Standard Deviation	0.581						
433					nu star	5230						
434					Approximate Chi Square Value (.05)	5063	Nonparametric Statistics					
435					Adjusted Level of Significance	0.0335				95% CLT UCL		7.649
436					Adjusted Chi Square Value	5044				95% Jackknife UCL		7.664
437										95% Standard Bootstrap UCL		7.644
438					Anderson-Darling Test Statistic	0.738				95% Bootstrap-t UCL		7.7
439					Anderson-Darling 5% Critical Value	0.736				95% Hall's Bootstrap UCL		7.657
440					Kolmogorov-Smirnov Test Statistic	0.177				95% Percentile Bootstrap UCL		7.631

	A	B	C	D	E	F	G	H	I	J	K	L
441					Kolmogorov-Smirnov 5% Critical Value	0.214				95% BCA Bootstrap UCL		7.65
442	Data follow Appr. Gamma Distribution at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		8.02
443										97.5% Chebyshev(Mean, Sd) UCL		8.277
444			Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL		8.783
445					95% Approximate Gamma UCL	7.67						
446					95% Adjusted Gamma UCL	7.698						
447												
448			Potential UCL to Use							Use 95% Approximate Gamma UCL		7.67
449												
450	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
451	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
452	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
453												
454												
455	SULFATE											
456												
457					General Statistics							
458					Number of Valid Observations	16				Number of Distinct Observations		13
459					Number of Missing Values	2						
460												
461					Raw Statistics					Log-transformed Statistics		
462					Minimum	11				Minimum of Log Data		2.398
463					Maximum	60				Maximum of Log Data		4.094
464					Mean	28.44				Mean of log Data		3.201
465					Median	21				SD of log Data		0.549
466					SD	16.61						
467					Std. Error of Mean	4.152						
468					Coefficient of Variation	0.584						
469					Skewness	1.019						
470												
471					Relevant UCL Statistics							
472					Normal Distribution Test					Lognormal Distribution Test		
473					Shapiro Wilk Test Statistic	0.839				Shapiro Wilk Test Statistic		0.931
474					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
475					Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
476												
477					Assuming Normal Distribution					Assuming Lognormal Distribution		
478					95% Student's-t UCL	35.72				95% H-UCL		38.47
479					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL		45.79
480					95% Adjusted-CLT UCL (Chen-1995)	36.4				97.5% Chebyshev (MVUE) UCL		53.38
481					95% Modified-t UCL (Johnson-1978)	35.89				99% Chebyshev (MVUE) UCL		68.28
482												
483					Gamma Distribution Test					Data Distribution		
484					k star (bias corrected)	2.947				Data appear Gamma Distributed at 5% Significance Level		
485					Theta Star	9.65						
486					MLE of Mean	28.44						
487					MLE of Standard Deviation	16.57						
488					nu star	94.3						
489					Approximate Chi Square Value (.05)	72.91				Nonparametric Statistics		
490					Adjusted Level of Significance	0.0335				95% CLT UCL		35.27
491					Adjusted Chi Square Value	70.77				95% Jackknife UCL		35.72
492										95% Standard Bootstrap UCL		35.17
493					Anderson-Darling Test Statistic	0.629				95% Bootstrap-t UCL		37.13
494					Anderson-Darling 5% Critical Value	0.743				95% Hall's Bootstrap UCL		34.84
495					Kolmogorov-Smirnov Test Statistic	0.183				95% Percentile Bootstrap UCL		34.94

	A	B	C	D	E	F	G	H	I	J	K	L
496					Kolmogorov-Smirnov 5% Critical Value	0.216				95% BCA Bootstrap UCL		36.13
497			Data appear Gamma Distributed at 5% Significance Level							95% Chebyshev(Mean, Sd) UCL		46.54
498										97.5% Chebyshev(Mean, Sd) UCL		54.37
499			Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL		69.75
500					95% Approximate Gamma UCL	36.78						
501					95% Adjusted Gamma UCL	37.9						
502												
503			Potential UCL to Use							Use 95% Approximate Gamma UCL		36.78
504												
505			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
506			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
507			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
508												
509												
510	TOTAL ORGANIC CARBON											
511												
512					General Statistics							
513					Number of Valid Observations	16				Number of Distinct Observations		12
514					Number of Missing Values	2						
515												
516			Raw Statistics							Log-transformed Statistics		
517					Minimum	1.1				Minimum of Log Data		0.0953
518					Maximum	7.2				Maximum of Log Data		1.974
519					Mean	2.294				Mean of log Data		0.702
520					Median	1.75				SD of log Data		0.483
521					SD	1.477						
522					Std. Error of Mean	0.369						
523					Coefficient of Variation	0.644						
524					Skewness	2.671						
525												
526					Relevant UCL Statistics							
527			Normal Distribution Test							Lognormal Distribution Test		
528					Shapiro Wilk Test Statistic	0.689				Shapiro Wilk Test Statistic		0.892
529					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
530			Data not Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level		
531												
532			Assuming Normal Distribution							Assuming Lognormal Distribution		
533					95% Student's-t UCL	2.941				95% H-UCL		2.919
534			95% UCLs (Adjusted for Skewness)							95% Chebyshev (MVUE) UCL		3.466
535					95% Adjusted-CLT UCL (Chen-1995)	3.164				97.5% Chebyshev (MVUE) UCL		3.992
536					95% Modified-t UCL (Johnson-1978)	2.982				99% Chebyshev (MVUE) UCL		5.027
537												
538			Gamma Distribution Test							Data Distribution		
539					k star (bias corrected)	3.332				Data Follow Appr. Gamma Distribution at 5% Significance Level		
540					Theta Star	0.688						
541					MLE of Mean	2.294						
542					MLE of Standard Deviation	1.257						
543					nu star	106.6						
544					Approximate Chi Square Value (.05)	83.81				Nonparametric Statistics		
545					Adjusted Level of Significance	0.0335				95% CLT UCL		2.901
546					Adjusted Chi Square Value	81.5				95% Jackknife UCL		2.941
547										95% Standard Bootstrap UCL		2.882
548					Anderson-Darling Test Statistic	0.82				95% Bootstrap-t UCL		3.53
549					Anderson-Darling 5% Critical Value	0.742				95% Hall's Bootstrap UCL		5.393
550					Kolmogorov-Smirnov Test Statistic	0.18				95% Percentile Bootstrap UCL		2.963

	A	B	C	D	E	F	G	H	I	J	K	L
551					Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	3.231
552	Data follow Appr. Gamma Distribution at 5% Significance Level										95% Chebyshev(Mean, Sd) UCL	3.903
553											97.5% Chebyshev(Mean, Sd) UCL	4.599
554	Assuming Gamma Distribution										99% Chebyshev(Mean, Sd) UCL	5.967
555					95% Approximate Gamma UCL	2.919						
556					95% Adjusted Gamma UCL	3.001						
557												
558	Potential UCL to Use										Use 95% Approximate Gamma UCL	2.919
559												
560	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
561	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
562	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
563												

C.3 FRESHWATER GROUNDWATER UPLs AND UTLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	BARIUM											
12												
13						General Statistics						
14						Total Number of Observations	16			Number of Distinct Observations	16	
15						Tolerance Factor	2.524			Number of Missing Values	2	
16												
17						Raw Statistics				Log-Transformed Statistics		
18						Minimum	7.6			Minimum	2.028	
19						Maximum	52.6			Maximum	3.963	
20						Second Largest	49.6			Second Largest	3.904	
21						First Quartile	13.4			First Quartile	2.592	
22						Median	20.1			Median	2.993	
23						Third Quartile	44.7			Third Quartile	3.799	
24						Mean	26.99			Mean	3.089	
25						SD	16.77			SD	0.688	
26						Coefficient of Variation	0.621					
27						Skewness	0.399					
28												
29						Background Statistics						
30						Normal Distribution Test				Lognormal Distribution Test		
31						Shapiro Wilk Test Statistic	0.864			Shapiro Wilk Test Statistic	0.908	
32						Shapiro Wilk Critical Value	0.887			Shapiro Wilk Critical Value	0.887	
33						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
34												
35						Assuming Normal Distribution				Assuming Lognormal Distribution		
36						95% UTL with 95% Coverage	69.32			95% UTL with 95% Coverage	124.6	
37						95% UPL (t)	57.29			95% UPL (t)	76.07	
38						90% Percentile (z)	48.48			90% Percentile (z)	53	
39						95% Percentile (z)	54.58			95% Percentile (z)	68.04	
40						99% Percentile (z)	66			99% Percentile (z)	108.7	
41												
42						Gamma Distribution Test				Data Distribution Test		
43						k star	2.132			Data appear Gamma Distributed at 5% Significance Level		
44						Theta Star	12.66					
45						MLE of Mean	26.99					
46						MLE of Standard Deviation	18.49					
47						nu star	68.24					
48												
49						A-D Test Statistic	0.623			Nonparametric Statistics		
50						5% A-D Critical Value	0.747			90% Percentile	48.85	
51						K-S Test Statistic	0.164			95% Percentile	50.35	
52						5% K-S Critical Value	0.217			99% Percentile	52.15	
53						Data appear Gamma Distributed at 5% Significance Level						
54												
55						Assuming Gamma Distribution				95% UTL with 95% Coverage	52.6	

	A	B	C	D	E	F	G	H	I	J	K	L
56					90% Percentile	51.72				95% Percentile Bootstrap UTL with	95% Coverage	52.6
57					95% Percentile	62.75				95% BCA Bootstrap UTL with	95% Coverage	52.6
58					99% Percentile	87.13					95% UPL	52.6
59											95% Chebyshev UPL	102.3
60					95% WH Approx. Gamma UPL	65.69					Upper Threshold Limit Based upon IQR	91.65
61					95% HW Approx. Gamma UPL	67.63						
62				95% WH Approx. Gamma UTL with	95% Coverage	90.98						
63				95% HW Approx. Gamma UTL with	95% Coverage	96.56						
64												
65												
66												
67	**CALCIUM**											
68												
69					**General Statistics**							
70					Total Number of Observations	16					Number of Distinct Observations	16
71					Tolerance Factor	2.524					Number of Missing Values	2
72												
73					**Raw Statistics**						**Log-Transformed Statistics**	
74					Minimum	5260					Minimum	8.568
75					Maximum	77700					Maximum	11.26
76					Second Largest	70000					Second Largest	11.16
77					First Quartile	17543					First Quartile	9.661
78					Median	37750					Median	10.54
79					Third Quartile	53150					Third Quartile	10.87
80					Mean	37769					Mean	10.21
81					SD	24293					SD	0.982
82					Coefficient of Variation	0.643						
83					Skewness	0.0344						
84												
85					**Background Statistics**							
86					**Normal Distribution Test**						**Lognormal Distribution Test**	
87					Shapiro Wilk Test Statistic	0.927					Shapiro Wilk Test Statistic	0.814
88					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
89					Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level	
90												
91					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
92					95% UTL with	95% Coverage	99084				95% UTL with	95% Coverage	323088
93					95% UPL (t)	81666					95% UPL (t)	159772
94					90% Percentile (z)	68901					90% Percentile (z)	95363
95					95% Percentile (z)	77727					95% Percentile (z)	136251
96					99% Percentile (z)	94282					99% Percentile (z)	266082
97												
98					**Gamma Distribution Test**						**Data Distribution Test**	
99					k star	1.383					Data appear Normal at 5% Significance Level	
100					Theta Star	27306						
101					MLE of Mean	37769						
102					MLE of Standard Deviation	32114						
103					nu star	44.26						
104												
105					A-D Test Statistic	0.905					**Nonparametric Statistics**	
106					5% A-D Critical Value	0.753					90% Percentile	68550
107					K-S Test Statistic	0.206					95% Percentile	71925
108					5% K-S Critical Value	0.219					99% Percentile	76545
109					Data follow Appx. Gamma Distribution at 5% Significance Level							
110												

	A	B	C	D	E	F	G	H	I	J	K	L
111	Assuming Gamma Distribution						95% UTL with 95% Coverage					77700
112					90% Percentile	80279	95% Percentile Bootstrap UTL with 95% Coverage					77700
113					95% Percentile	101108	95% BCA Bootstrap UTL with 95% Coverage					77700
114					99% Percentile	148392					95% UPL	77700
115											95% Chebyshev UPL	146918
116					95% WH Approx. Gamma UPL	107815					Upper Threshold Limit Based upon IQR	106561
117					95% HW Approx. Gamma UPL	115625						
118				95% WH Approx. Gamma UTL with	95% Coverage	157517						
119				95% HW Approx. Gamma UTL with	95% Coverage	177663						
120												
121												
122												
123	MAGNESIUM											
124												
125					General Statistics							
126					Total Number of Observations	16					Number of Distinct Observations	16
127					Tolerance Factor	2.524					Number of Missing Values	2
128												
129					Raw Statistics						Log-Transformed Statistics	
130					Minimum	1200					Minimum	7.09
131					Maximum	8590					Maximum	9.058
132					Second Largest	8420					Second Largest	9.038
133					First Quartile	2465					First Quartile	7.779
134					Median	4545					Median	8.422
135					Third Quartile	6978					Third Quartile	8.85
136					Mean	4782					Mean	8.271
137					SD	2648					SD	0.72
138					Coefficient of Variation	0.554						
139					Skewness	-0.0489						
140												
141					Background Statistics							
142					Normal Distribution Test						Lognormal Distribution Test	
143					Shapiro Wilk Test Statistic	0.915					Shapiro Wilk Test Statistic	0.857
144					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
145					Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level	
146												
147					Assuming Normal Distribution						Assuming Lognormal Distribution	
148					95% UTL with 95% Coverage	11465					95% UTL with 95% Coverage	24067
149					95% UPL (t)	9567					95% UPL (t)	14360
150					90% Percentile (z)	8175					90% Percentile (z)	9835
151					95% Percentile (z)	9137					95% Percentile (z)	12777
152					99% Percentile (z)	10942					99% Percentile (z)	20874
153												
154					Gamma Distribution Test						Data Distribution Test	
155					k star	2.179					Data appear Normal at 5% Significance Level	
156					Theta Star	2194						
157					MLE of Mean	4782						
158					MLE of Standard Deviation	3239						
159					nu star	69.73						
160												
161					A-D Test Statistic	0.692					Nonparametric Statistics	
162					5% A-D Critical Value	0.747					90% Percentile	8075
163					K-S Test Statistic	0.16					95% Percentile	8463
164					5% K-S Critical Value	0.217					99% Percentile	8565
165					Data appear Gamma Distributed at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167				Assuming Gamma Distribution						95% UTL with	95% Coverage	8590
168					90% Percentile	9116			95% Percentile Bootstrap UTL with		95% Coverage	8590
169					95% Percentile	11041			95% BCA Bootstrap UTL with		95% Coverage	8590
170					99% Percentile	15291					95% UPL	8590
171											95% Chebyshev UPL	16679
172					95% WH Approx. Gamma UPL	11576					Upper Threshold Limit Based upon IQR	13746
173					95% HW Approx. Gamma UPL	12069						
174				95% WH Approx. Gamma UTL with	95% Coverage	15975						
175				95% HW Approx. Gamma UTL with	95% Coverage	17230						
176												
177												
178												
179	SODIUM											
180												
181					General Statistics							
182					Total Number of Observations	16					Number of Distinct Observations	14
183					Tolerance Factor	2.524					Number of Missing Values	2
184												
185				Raw Statistics						Log-Transformed Statistics		
186					Minimum	12900					Minimum	9.465
187					Maximum	157000					Maximum	11.96
188					Second Largest	145000					Second Largest	11.88
189					First Quartile	29975					First Quartile	10.28
190					Median	48600					Median	10.79
191					Third Quartile	106250					Third Quartile	11.56
192					Mean	68725					Mean	10.84
193					SD	50800					SD	0.829
194					Coefficient of Variation	0.739						
195					Skewness	0.708						
196												
197					Background Statistics							
198				Normal Distribution Test						Lognormal Distribution Test		
199					Shapiro Wilk Test Statistic	0.862					Shapiro Wilk Test Statistic	0.929
200					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
201				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
202												
203				Assuming Normal Distribution						Assuming Lognormal Distribution		
204					95% UTL with	95% Coverage	196945				95% UTL with	95% Coverage	415739
205					95% UPL (t)	160521					95% UPL (t)	229396
206					90% Percentile (z)	133828					90% Percentile (z)	148368
207					95% Percentile (z)	152284					95% Percentile (z)	200533
208					99% Percentile (z)	186904					99% Percentile (z)	352886
209												
210				Gamma Distribution Test						Data Distribution Test		
211					k star	1.548				Data appear Gamma Distributed at 5% Significance Level		
212					Theta Star	44383						
213					MLE of Mean	68725						
214					MLE of Standard Deviation	55229						
215					nu star	49.55						
216												
217					A-D Test Statistic	0.447				Nonparametric Statistics		
218					5% A-D Critical Value	0.752					90% Percentile	145000
219					K-S Test Statistic	0.145					95% Percentile	148000
220					5% K-S Critical Value	0.218					99% Percentile	155200

	A	B	C	D	E	F	G	H	I	J	K	L
221	Data appear Gamma Distributed at 5% Significance Level											
222												
223	Assuming Gamma Distribution						95% UTL with 95% Coverage					157000
224					90% Percentile	142104	95% Percentile Bootstrap UTL with 95% Coverage					157000
225					95% Percentile	177133	95% BCA Bootstrap UTL with 95% Coverage					157000
226					99% Percentile	256069					95% UPL	157000
227											95% Chebyshev UPL	296973
228					95% WH Approx. Gamma UPL	187061	Upper Threshold Limit Based upon IQR					220663
229					95% HW Approx. Gamma UPL	194226						
230				95% WH Approx. Gamma UTL with	95% Coverage	269805						
231				95% HW Approx. Gamma UTL with	95% Coverage	291339						
232												
233												
234												
235	ALKALINITY											
236												
237					General Statistics							
238					Total Number of Observations	16				Number of Distinct Observations		12
239					Tolerance Factor	2.524				Number of Missing Values		2
240												
241				Raw Statistics						Log-Transformed Statistics		
242					Minimum	35					Minimum	3.555
243					Maximum	260					Maximum	5.561
244					Second Largest	250					Second Largest	5.521
245					First Quartile	88.5					First Quartile	4.481
246					Median	130					Median	4.868
247					Third Quartile	180					Third Quartile	5.177
248					Mean	141.5					Mean	4.8
249					SD	73.82					SD	0.605
250					Coefficient of Variation	0.522						
251					Skewness	0.352						
252												
253					Background Statistics							
254				Normal Distribution Test						Lognormal Distribution Test		
255					Shapiro Wilk Test Statistic	0.925					Shapiro Wilk Test Statistic	0.938
256					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
257				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
258												
259				Assuming Normal Distribution						Assuming Lognormal Distribution		
260					95% UTL with 95% Coverage	327.8					95% UTL with 95% Coverage	559.1
261					95% UPL (t)	274.9					95% UPL (t)	362.4
262					90% Percentile (z)	236.1					90% Percentile (z)	263.8
263					95% Percentile (z)	262.9					95% Percentile (z)	328.6
264					99% Percentile (z)	313.2					99% Percentile (z)	496.1
265												
266				Gamma Distribution Test						Data Distribution Test		
267					k star	2.846				Data appear Normal at 5% Significance Level		
268					Theta Star	49.72						
269					MLE of Mean	141.5						
270					MLE of Standard Deviation	83.88						
271					nu star	91.07						
272												
273					A-D Test Statistic	0.299				Nonparametric Statistics		
274					5% A-D Critical Value	0.743					90% Percentile	245
275					K-S Test Statistic	0.144					95% Percentile	252.5

	A	B	C	D	E	F	G	H	I	J	K	L
276					5% K-S Critical Value	0.216					99% Percentile	258.5
277	Data appear Gamma Distributed at 5% Significance Level											
278												
279				Assuming Gamma Distribution							95% UTL with 95% Coverage	260
280					90% Percentile	253.9					95% Percentile Bootstrap UTL with 95% Coverage	260
281					95% Percentile	301.5					95% BCA Bootstrap UTL with 95% Coverage	260
282					99% Percentile	404.9					95% UPL	260
283											95% Chebyshev UPL	473.2
284					95% WH Approx. Gamma UPL	313.1					Upper Threshold Limit Based upon IQR	317.3
285					95% HW Approx. Gamma UPL	322.2						
286					95% WH Approx. Gamma UTL with 95% Coverage	418.9						
287					95% HW Approx. Gamma UTL with 95% Coverage	442.4						
288												
289												
290												
291	CARBONATE ALKALINITY											
292												
293					General Statistics							
294					Total Number of Observations	16					Number of Distinct Observations	12
295					Tolerance Factor	2.524					Number of Missing Values	2
296												
297				Raw Statistics						Log-Transformed Statistics		
298					Minimum	35					Minimum	3.555
299					Maximum	260					Maximum	5.561
300					Second Largest	250					Second Largest	5.521
301					First Quartile	88.5					First Quartile	4.481
302					Median	130					Median	4.868
303					Third Quartile	180					Third Quartile	5.177
304					Mean	141.5					Mean	4.8
305					SD	73.82					SD	0.605
306					Coefficient of Variation	0.522						
307					Skewness	0.352						
308												
309					Background Statistics							
310				Normal Distribution Test						Lognormal Distribution Test		
311					Shapiro Wilk Test Statistic	0.925					Shapiro Wilk Test Statistic	0.938
312					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
313				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
314												
315				Assuming Normal Distribution						Assuming Lognormal Distribution		
316					95% UTL with 95% Coverage	327.8					95% UTL with 95% Coverage	559.1
317					95% UPL (t)	274.9					95% UPL (t)	362.4
318					90% Percentile (z)	236.1					90% Percentile (z)	263.8
319					95% Percentile (z)	262.9					95% Percentile (z)	328.6
320					99% Percentile (z)	313.2					99% Percentile (z)	496.1
321												
322				Gamma Distribution Test						Data Distribution Test		
323					k star	2.846				Data appear Normal at 5% Significance Level		
324					Theta Star	49.72						
325					MLE of Mean	141.5						
326					MLE of Standard Deviation	83.88						
327					nu star	91.07						
328												
329					A-D Test Statistic	0.299				Nonparametric Statistics		
330					5% A-D Critical Value	0.743					90% Percentile	245

	A	B	C	D	E	F	G	H	I	J	K	L
331					K-S Test Statistic	0.144					95% Percentile	252.5
332					5% K-S Critical Value	0.216					99% Percentile	258.5
333		Data appear Gamma Distributed at 5% Significance Level										
334												
335			Assuming Gamma Distribution							95% UTL with	95% Coverage	260
336					90% Percentile	253.9			95% Percentile Bootstrap UTL with		95% Coverage	260
337					95% Percentile	301.5			95% BCA Bootstrap UTL with		95% Coverage	260
338					99% Percentile	404.9					95% UPL	260
339											95% Chebyshev UPL	473.2
340					95% WH Approx. Gamma UPL	313.1					Upper Threshold Limit Based upon IQR	317.3
341					95% HW Approx. Gamma UPL	322.2						
342				95% WH Approx. Gamma UTL with	95% Coverage	418.9						
343				95% HW Approx. Gamma UTL with	95% Coverage	442.4						
344												
345												
346												
347	CHLORIDE											
348												
349					General Statistics							
350					Total Number of Observations	16					Number of Distinct Observations	13
351					Tolerance Factor	2.524					Number of Missing Values	2
352												
353				Raw Statistics						Log-Transformed Statistics		
354					Minimum	5.1					Minimum	1.629
355					Maximum	180					Maximum	5.193
356					Second Largest	150					Second Largest	5.011
357					First Quartile	18.2					First Quartile	2.854
358					Median	44					Median	3.64
359					Third Quartile	125					Third Quartile	4.826
360					Mean	69.48					Mean	3.626
361					SD	62.41					SD	1.302
362					Coefficient of Variation	0.898						
363					Skewness	0.422						
364												
365					Background Statistics							
366				Normal Distribution Test						Lognormal Distribution Test		
367					Shapiro Wilk Test Statistic	0.853					Shapiro Wilk Test Statistic	0.873
368					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
369				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
370												
371				Assuming Normal Distribution						Assuming Lognormal Distribution		
372					95% UTL with	95% Coverage	227				95% UTL with	95% Coverage	1005
373					95% UPL (t)	182.2					95% UPL (t)	395
374					90% Percentile (z)	149.5					90% Percentile (z)	199.3
375					95% Percentile (z)	172.1					95% Percentile (z)	319.8
376					99% Percentile (z)	214.7					99% Percentile (z)	776.9
377												
378				Gamma Distribution Test						Data Distribution Test		
379					k star	0.809				Data Follow Appr. Gamma Distribution at 5% Significance Level		
380					Theta Star	85.86						
381					MLE of Mean	69.48						
382					MLE of Standard Deviation	77.23						
383					nu star	25.89						
384												
385					A-D Test Statistic	0.813				Nonparametric Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
386					5% A-D Critical Value	0.766					90% Percentile	145
387					K-S Test Statistic	0.216					95% Percentile	157.5
388					5% K-S Critical Value	0.222					99% Percentile	175.5
389	Data follow Appx. Gamma Distribution at 5% Significance Level											
390												
391				Assuming Gamma Distribution						95% UTL with	95% Coverage	180
392					90% Percentile	168.5				95% Percentile Bootstrap UTL with	95% Coverage	180
393					95% Percentile	224.5				95% BCA Bootstrap UTL with	95% Coverage	180
394					99% Percentile	356.5					95% UPL	180
395											95% Chebyshev UPL	349.9
396					95% WH Approx. Gamma UPL	243.8					Upper Threshold Limit Based upon IQR	285.2
397					95% HW Approx. Gamma UPL	264						
398				95% WH Approx. Gamma UTL with	95% Coverage	386.1						
399				95% HW Approx. Gamma UTL with	95% Coverage	447.9						
400												
401												
402												
403	PH											
404												
405					General Statistics							
406					Total Number of Observations	16					Number of Distinct Observations	9
407					Tolerance Factor	2.524					Number of Missing Values	2
408												
409				Raw Statistics						Log-Transformed Statistics		
410					Minimum	6.8					Minimum	1.917
411					Maximum	8.3					Maximum	2.116
412					Second Largest	8.2					Second Largest	2.104
413					First Quartile	6.9					First Quartile	1.932
414					Median	7.3					Median	1.988
415					Third Quartile	7.825					Third Quartile	2.057
416					Mean	7.425					Mean	2.002
417					SD	0.546					SD	0.0725
418					Coefficient of Variation	0.0735						
419					Skewness	0.519						
420												
421												
422					Background Statistics							
423				Normal Distribution Test						Lognormal Distribution Test		
424					Shapiro Wilk Test Statistic	0.874					Shapiro Wilk Test Statistic	0.881
425					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
426				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
427												
428				Assuming Normal Distribution						Assuming Lognormal Distribution		
429					95% UTL with	95% Coverage	8.803				95% UTL with	95% Coverage	8.894
430					95% UPL (t)	8.411					95% UPL (t)	8.444
431					90% Percentile (z)	8.125					90% Percentile (z)	8.128
432					95% Percentile (z)	8.323					95% Percentile (z)	8.345
433					99% Percentile (z)	8.695					99% Percentile (z)	8.768
434												
435				Gamma Distribution Test						Data Distribution Test		
436					k star	163.4				Data Follow Appr. Gamma Distribution at 5% Significance Level		
437					Theta Star	0.0454						
438					MLE of Mean	7.425						
439					MLE of Standard Deviation	0.581						
440					nu star	5230						

	A	B	C	D	E	F	G	H	I	J	K	L
441												
442					A-D Test Statistic	0.738				Nonparametric Statistics		
443					5% A-D Critical Value	0.736					90% Percentile	8.2
444					K-S Test Statistic	0.177					95% Percentile	8.225
445					5% K-S Critical Value	0.214					99% Percentile	8.285
446		Data follow Appx. Gamma Distribution at 5% Significance Level										
447												
448				Assuming Gamma Distribution						95% UTL with 95% Coverage		8.3
449					90% Percentile	8.178				95% Percentile Bootstrap UTL with 95% Coverage		8.3
450					95% Percentile	8.405				95% BCA Bootstrap UTL with 95% Coverage		8.3
451					99% Percentile	8.843					95% UPL	8.3
452											95% Chebyshev UPL	9.878
453					95% WH Approx. Gamma UPL	8.432					Upper Threshold Limit Based upon IQR	9.213
454					95% HW Approx. Gamma UPL	8.435						
455					95% WH Approx. Gamma UTL with 95% Coverage	8.861						
456					95% HW Approx. Gamma UTL with 95% Coverage	8.869						
457												
458												
459												
460	SULFATE											
461												
462					General Statistics							
463					Total Number of Observations	16				Number of Distinct Observations		13
464					Tolerance Factor	2.524				Number of Missing Values		2
465												
466				Raw Statistics						Log-Transformed Statistics		
467					Minimum	11					Minimum	2.398
468					Maximum	60					Maximum	4.094
469					Second Largest	60					Second Largest	4.094
470					First Quartile	17.5					First Quartile	2.861
471					Median	21					Median	3.043
472					Third Quartile	37.5					Third Quartile	3.618
473					Mean	28.44					Mean	3.201
474					SD	16.61					SD	0.549
475					Coefficient of Variation	0.584						
476					Skewness	1.019						
477												
478					Background Statistics							
479				Normal Distribution Test						Lognormal Distribution Test		
480					Shapiro Wilk Test Statistic	0.839					Shapiro Wilk Test Statistic	0.931
481					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
482				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
483												
484				Assuming Normal Distribution						Assuming Lognormal Distribution		
485					95% UTL with 95% Coverage	70.36					95% UTL with 95% Coverage	98.17
486					95% UPL (t)	58.45					95% UPL (t)	66.23
487					90% Percentile (z)	49.72					90% Percentile (z)	49.64
488					95% Percentile (z)	55.76					95% Percentile (z)	60.59
489					99% Percentile (z)	67.08					99% Percentile (z)	88.07
490												
491				Gamma Distribution Test						Data Distribution Test		
492					k star	2.947				Data appear Gamma Distributed at 5% Significance Level		
493					Theta Star	9.65						
494					MLE of Mean	28.44						
495					MLE of Standard Deviation	16.57						

	A	B	C	D	E	F	G	H	I	J	K	L
496					nu star	94.3						
497												
498					A-D Test Statistic	0.629	Nonparametric Statistics					
499					5% A-D Critical Value	0.743					90% Percentile	55.5
500					K-S Test Statistic	0.183					95% Percentile	60
501					5% K-S Critical Value	0.216					99% Percentile	60
502	Data appear Gamma Distributed at 5% Significance Level											
503												
504			Assuming Gamma Distribution							95% UTL with	95% Coverage	60
505					90% Percentile	50.65			95% Percentile Bootstrap UTL with		95% Coverage	60
506					95% Percentile	59.99			95% BCA Bootstrap UTL with		95% Coverage	60
507					99% Percentile	80.25					95% UPL	60
508											95% Chebyshev UPL	103.1
509					95% WH Approx. Gamma UPL	62.08					Upper Threshold Limit Based upon IQR	67.5
510					95% HW Approx. Gamma UPL	62.89						
511				95% WH Approx. Gamma UTL with	95% Coverage	82.8						
512				95% HW Approx. Gamma UTL with	95% Coverage	85.65						
513												
514												
515												
516	TOTAL ORGANIC CARBON											
517												
518					General Statistics							
519					Total Number of Observations	16					Number of Distinct Observations	12
520					Tolerance Factor	2.524					Number of Missing Values	2
521												
522					Raw Statistics		Log-Transformed Statistics					
523					Minimum	1.1					Minimum	0.0953
524					Maximum	7.2					Maximum	1.974
525					Second Largest	3.2					Second Largest	1.163
526					First Quartile	1.4					First Quartile	0.336
527					Median	1.75					Median	0.559
528					Third Quartile	2.75					Third Quartile	1.011
529					Mean	2.294					Mean	0.702
530					SD	1.477					SD	0.483
531					Coefficient of Variation	0.644						
532					Skewness	2.671						
533												
534					Background Statistics							
535					Normal Distribution Test		Lognormal Distribution Test					
536					Shapiro Wilk Test Statistic	0.689					Shapiro Wilk Test Statistic	0.892
537					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
538					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
539												
540					Assuming Normal Distribution		Assuming Lognormal Distribution					
541					95% UTL with	95% Coverage	6.021				95% UTL with	95% Coverage	6.819
542					95% UPL (t)	4.962					95% UPL (t)	4.825
543					90% Percentile (z)	4.186					90% Percentile (z)	3.744
544					95% Percentile (z)	4.723					95% Percentile (z)	4.462
545					99% Percentile (z)	5.729					99% Percentile (z)	6.199
546												
547					Gamma Distribution Test		Data Distribution Test					
548					k star	3.332	Data Follow Appr. Gamma Distribution at 5% Significance Level					
549					Theta Star	0.688						
550					MLE of Mean	2.294						

	A	B	C	D	E	F	G	H	I	J	K	L
551					MLE of Standard Deviation	1.257						
552					nu star	106.6						
553												
554					A-D Test Statistic	0.82				Nonparametric Statistics		
555					5% A-D Critical Value	0.742					90% Percentile	3.05
556					K-S Test Statistic	0.18					95% Percentile	4.2
557					5% K-S Critical Value	0.216					99% Percentile	6.6
558	Data follow Appx. Gamma Distribution at 5% Significance Level											
559												
560				Assuming Gamma Distribution						95% UTL with	95% Coverage	7.2
561					90% Percentile	3.979				95% Percentile Bootstrap UTL with	95% Coverage	7.2
562					95% Percentile	4.673				95% BCA Bootstrap UTL with	95% Coverage	7.2
563					99% Percentile	6.169					95% UPL	7.2
564											95% Chebyshev UPL	8.929
565					95% WH Approx. Gamma UPL	4.794				Upper Threshold Limit Based upon IQR		4.775
566					95% HW Approx. Gamma UPL	4.792						
567				95% WH Approx. Gamma UTL with	95% Coverage	6.305						
568				95% HW Approx. Gamma UTL with	95% Coverage	6.397						
569												
570												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	ALUMINUM											
12												
13						General Statistics						
14						Number of Valid Data	16			Number of Detected Data	4	
15						Number of Distinct Detected Data	4			Number of Non-Detect Data	12	
16						Tolerance Factor	2.524			Percent Non-Detects	75.00%	
17						Number of Missing Values	2					
18												
19						Raw Statistics				Log-transformed Statistics		
20						Minimum Detected	996			Minimum Detected	6.904	
21						Maximum Detected	1070			Maximum Detected	6.975	
22						Mean of Detected	1021			Mean of Detected	6.928	
23						SD of Detected	34.43			SD of Detected	0.0333	
24						Minimum Non-Detect	10			Minimum Non-Detect	2.303	
25						Maximum Non-Detect	193			Maximum Non-Detect	5.263	
26												
27						Data with Multiple Detection Limits				Single Detection Limit Scenario		
28						Note: Data have multiple DLs - Use of KM Method is recommended				Number treated as Non-Detect with Single DL	12	
29						For all methods (except KM, DL/2, and ROS Methods),				Number treated as Detected with Single DL	4	
30						Observations < Largest ND are treated as NDs				Single DL Non-Detect Percentage	75.00%	
31												
32												
33						Warning: There are only 4 Distinct Detected Values in this data						
34						Note: It should be noted that even though bootstrap may be performed on this data set						
35						the resulting calculations may not be reliable enough to draw conclusions						
36												
37						It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.						
38												
39						Background Statistics						
40						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
41						Shapiro Wilk Test Statistic	0.837			Shapiro Wilk Test Statistic	0.84	
42						5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value	0.748	
43						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
44												
45						Assuming Normal Distribution				Assuming Lognormal Distribution		
46						DL/2 Substitution Method				DL/2 Substitution Method		
47						Mean	273.4			Mean (Log Scale)	3.808	
48						SD	446.6			SD (Log Scale)	2.02	
49						95% UTL 95% Coverage	1401			95% UTL 95% Coverage	7383	
50						95% UPL (t)	1080			95% UPL (t)	1734	
51						90% Percentile (z)	845.8			90% Percentile (z)	600	
52						95% Percentile (z)	1008			95% Percentile (z)	1250	
53						99% Percentile (z)	1312			99% Percentile (z)	4952	
54												
55						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		

	A	B	C	D	E	F	G	H	I	J	K	L
56					Mean	N/A				Mean in Original Scale		919.8
57					SD	N/A				SD in Original Scale		63.07
58				95% UTL with	95% Coverage	N/A				95% UTL with	95% Coverage	1084
59										95% BCA UTL with	95% Coverage	1070
60										95% Bootstrap (%) UTL with	95% Coverage	1070
61					95% UPL (t)	N/A					95% UPL (t)	1034
62					90% Percentile (z)	N/A					90% Percentile (z)	998.9
63					95% Percentile (z)	N/A					95% Percentile (z)	1023
64					99% Percentile (z)	N/A					99% Percentile (z)	1070
65												
66				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
67					k star (bias corrected)	298				Data appear Normal at 5% Significance Level		
68					Theta Star	3.426						
69					nu star	2384						
70												
71					A-D Test Statistic	0.475				Nonparametric Statistics		
72					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
73					K-S Test Statistic	0.281					Mean	1002
74					5% K-S Critical Value	0.394					SD	18.42
75				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	5.319
76										95% KM UTL with	95% Coverage	1049
77				Assuming Gamma Distribution							95% KM Chebyshev UPL	1085
78				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	1036
79					Mean	773.3					90% Percentile (z)	1026
80					Median	693.7					95% Percentile (z)	1033
81					SD	155.2					99% Percentile (z)	1045
82					k star	23.48						
83					Theta star	32.93				Gamma ROS Limits with Extrapolated Data		
84					Nu star	751.4				95% Wilson Hilferty (WH) Approx. Gamma UPL		1063
85					95% Percentile of Chisquare (2k)	63.96				95% Hawkins Wixley (HW) Approx. Gamma UPL		1065
86										95% WH Approx. Gamma UTL with	95% Coverage	1201
87					90% Percentile	983.6				95% HW Approx. Gamma UTL with	95% Coverage	1206
88					95% Percentile	1053						
89					99% Percentile	1192						
90												
91	Note: DL/2 is not a recommended method.											
92												
93												
94	ARSENIC											
95												
96					General Statistics							
97					Number of Valid Data	16				Number of Detected Data		3
98					Number of Distinct Detected Data	3				Number of Non-Detect Data		13
99					Warning: Data set has only 3 Detected Values.							
100					This is not enough to compute meaningful and reliable test statistics and estimates.							
101					No statistics will be produced!							
102												
103					Tolerance Factor	2.524				Percent Non-Detects		81.25%
104					Number of Missing Values	2						
105												
106				Raw Statistics						Log-transformed Statistics		
107					Minimum Detected	6.3				Minimum Detected		1.841
108					Maximum Detected	10				Maximum Detected		2.303
109					Mean of Detected	7.6				Mean of Detected		2.005
110					SD of Detected	2.081				SD of Detected		0.258

	A–E	F	G–K	L
111	Minimum Non-Detect	1.8	Minimum Non-Detect	0.588
112	Maximum Non-Detect	17.5	Maximum Non-Detect	2.862
113				
114	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
115	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	16
116	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
117	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
118				
119				
120	Warning: There are only 3 Distinct Detected Values in this data set			
121	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.			
122	Those methods will return a 'N/A' value on your output display!			
123				
124	It is necessary to have 4 or more Distinct Values for bootstrap methods.			
125	However, results obtained using 4 to 9 distinct values may not be reliable.			
126	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.			
127				
128	**Background Statistics**			
129	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
130	Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.8
131	5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
132	Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
133				
134	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
135	DL/2 Substitution Method		DL/2 Substitution Method	
136	Mean	3.144	Mean (Log Scale)	0.732
137	SD	3.136	SD (Log Scale)	0.892
138	95% UTL 95% Coverage	11.06	95% UTL 95% Coverage	19.74
139	95% UPL (t)	8.811	95% UPL (t)	10.42
140	90% Percentile (z)	7.163	90% Percentile (z)	6.521
141	95% Percentile (z)	8.302	95% Percentile (z)	9.015
142	99% Percentile (z)	10.44	99% Percentile (z)	16.55
143				
144	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
145			Mean in Original Scale	3.345
146			SD in Original Scale	2.335
147			Mean in Log Scale	1.036
148			SD in Log Scale	0.571
149			95% UTL 95% Coverage	11.92
150			95% UPL (t)	7.914
151			90% Percentile (z)	5.861
152			95% Percentile (z)	7.214
153			99% Percentile (z)	10.65
154				
155	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
156	k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
157	Theta Star	N/A		
158	nu star	N/A		
159				
160	A-D Test Statistic	N/A	**Nonparametric Statistics**	
161	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
162	K-S Test Statistic	N/A	Mean	6.579
163	5% K-S Critical Value	N/A	SD	0.95
164	Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.311
165			95% KM UTL with 95% Coverage	8.977

	A	B	C	D	E	F	G	H	I	J	K	L
166				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	10.85
167					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	8.296
168					Mean	N/A					90% Percentile (z)	7.796
169					Median	N/A					95% Percentile (z)	8.142
170					SD	N/A					99% Percentile (z)	8.789
171					k star	N/A						
172					Theta star	N/A			**Gamma ROS Limits with Extrapolated Data**			
173					Nu star	N/A					95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
174					95% Percentile of Chisquare (2k)	N/A					95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
175											95% WH Approx. Gamma UTL with 95% Coverage	N/A
176					90% Percentile	N/A					95% HW Approx. Gamma UTL with 95% Coverage	N/A
177					95% Percentile	N/A						
178					99% Percentile	N/A						
179												
180	Note: DL/2 is not a recommended method.											
181												
182												
183	**BERYLLIUM**											
184												
185					**General Statistics**							
186					Number of Valid Data	16					Number of Detected Data	1
187					Number of Distinct Detected Data	1					Number of Non-Detect Data	15
188												
189	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
190	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
191												
192	The data set for variable BERYLLIUM was not processed!											
193												
194												
195												
196	**CHROMIUM**											
197												
198					**General Statistics**							
199					Number of Valid Data	16					Number of Detected Data	3
200					Number of Distinct Detected Data	3					Number of Non-Detect Data	13
201	Warning: Data set has only 3 Detected Values.											
202	This is not enough to compute meaningful and reliable test statistics and estimates.											
203	No statistics will be produced!											
204												
205					Tolerance Factor	2.524					Percent Non-Detects	81.25%
206					Number of Missing Values	2						
207												
208					**Raw Statistics**						**Log-transformed Statistics**	
209					Minimum Detected	0.86					Minimum Detected	-0.151
210					Maximum Detected	1.4					Maximum Detected	0.336
211					Mean of Detected	1.187					Mean of Detected	0.149
212					SD of Detected	0.287					SD of Detected	0.263
213					Minimum Non-Detect	0.63					Minimum Non-Detect	-0.462
214					Maximum Non-Detect	4					Maximum Non-Detect	1.386
215												
216					**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**	
217					Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL	16
218					For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL	0
219					Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%
220												

	A	B	C	D	E	F	G	H	I	J	K	L
221												
222	Warning: There are only 3 Distinct Detected Values in this data set											
223	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
224	Those methods will return a 'N/A' value on your output display!											
225												
226	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
227	However, results obtained using 4 to 9 distinct values may not be reliable.											
228	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
229												
230	Background Statistics											
231	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
232					Shapiro Wilk Test Statistic	0.883				Shapiro Wilk Test Statistic		0.861
233					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
234	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
235												
236	Assuming Normal Distribution						Assuming Lognormal Distribution					
237					DL/2 Substitution Method					DL/2 Substitution Method		
238					Mean	1.001				Mean (Log Scale)		-0.231
239					SD	0.665				SD (Log Scale)		0.72
240					95% UTL 95% Coverage	2.679				95% UTL 95% Coverage		4.892
241					95% UPL (t)	2.202				95% UPL (t)		2.918
242					90% Percentile (z)	1.853				90% Percentile (z)		1.999
243					95% Percentile (z)	2.094				95% Percentile (z)		2.597
244					99% Percentile (z)	2.547				99% Percentile (z)		4.243
245												
246					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
247										Mean in Original Scale		0.691
248										SD in Original Scale		0.301
249										Mean in Log Scale		-0.444
250										SD in Log Scale		0.383
251										95% UTL 95% Coverage		1.688
252										95% UPL (t)		1.283
253										90% Percentile (z)		1.049
254										95% Percentile (z)		1.205
255										99% Percentile (z)		1.565
256												
257	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
258					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
259					Theta Star	N/A						
260					nu star	N/A						
261												
262					A-D Test Statistic	N/A	Nonparametric Statistics					
263					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
264					K-S Test Statistic	N/A				Mean		0.949
265					5% K-S Critical Value	N/A				SD		0.19
266	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.0702
267										95% KM UTL with 95% Coverage		1.429
268	Assuming Gamma Distribution									95% KM Chebyshev UPL		1.804
269					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		1.293
270					Mean	N/A				90% Percentile (z)		1.193
271					Median	N/A				95% Percentile (z)		1.262
272					SD	N/A				99% Percentile (z)		1.392
273					k star	N/A						
274					Theta star	N/A	Gamma ROS Limits with Extrapolated Data					
275					Nu star	N/A				95% Wilson Hilferty (WH) Approx. Gamma UPL		N/A

	A	B	C	D	E	F	G	H	I	J	K	L
276					95% Percentile of Chisquare (2k)	N/A			95% Hawkins Wixley (HW) Approx. Gamma UPL			N/A
277									95% WH Approx. Gamma UTL with		95% Coverage	N/A
278					90% Percentile	N/A			95% HW Approx. Gamma UTL with		95% Coverage	N/A
279					95% Percentile	N/A						
280					99% Percentile	N/A						
281												
282	Note: DL/2 is not a recommended method.											
283												
284												
285	COBALT											
286												
287					General Statistics							
288					Number of Valid Data	16			Number of Detected Data			3
289					Number of Distinct Detected Data	3			Number of Non-Detect Data			13
290					Warning: Data set has only 3 Detected Values.							
291					This is not enough to compute meaningful and reliable test statistics and estimates.							
292					No statistics will be produced!							
293												
294					Tolerance Factor	2.524			Percent Non-Detects			81.25%
295					Number of Missing Values	2						
296												
297					Raw Statistics				Log-transformed Statistics			
298					Minimum Detected	0.82			Minimum Detected			-0.198
299					Maximum Detected	1.7			Maximum Detected			0.531
300					Mean of Detected	1.307			Mean of Detected			0.223
301					SD of Detected	0.447			SD of Detected			0.378
302					Minimum Non-Detect	0.79			Minimum Non-Detect			-0.236
303					Maximum Non-Detect	5			Maximum Non-Detect			1.609
304												
305					Data with Multiple Detection Limits				Single Detection Limit Scenario			
306					Note: Data have multiple DLs - Use of KM Method is recommended				Number treated as Non-Detect with Single DL			16
307					For all methods (except KM, DL/2, and ROS Methods),				Number treated as Detected with Single DL			0
308					Observations < Largest ND are treated as NDs				Single DL Non-Detect Percentage			100.00%
309												
310												
311					Warning: There are only 3 Distinct Detected Values in this data set							
312					The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.							
313					Those methods will return a 'N/A' value on your output display!							
314												
315					It is necessary to have 4 or more Distinct Values for bootstrap methods.							
316					However, results obtained using 4 to 9 distinct values may not be reliable.							
317					It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.							
318												
319					Background Statistics							
320					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
321					Shapiro Wilk Test Statistic	0.967			Shapiro Wilk Test Statistic			0.932
322					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value			0.767
323					Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
324												
325					Assuming Normal Distribution				Assuming Lognormal Distribution			
326					DL/2 Substitution Method				DL/2 Substitution Method			
327					Mean	1.338			Mean (Log Scale)			0.0753
328					SD	0.766			SD (Log Scale)			0.739
329					95% UTL 95% Coverage	3.272			95% UTL 95% Coverage			6.962
330					95% UPL (t)	2.723			95% UPL (t)			4.099

	A–E	F	G–K	L
331	90% Percentile (z)	2.32	90% Percentile (z)	2.78
332	95% Percentile (z)	2.599	95% Percentile (z)	3.636
333	99% Percentile (z)	3.121	99% Percentile (z)	6.016
334				
335	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
336			Mean in Original Scale	0.642
337			SD in Original Scale	0.444
338			Mean in Log Scale	-0.65
339			SD in Log Scale	0.658
340			95% UTL 95% Coverage	2.745
341			95% UPL (t)	1.713
342			90% Percentile (z)	1.213
343			95% Percentile (z)	1.54
344			99% Percentile (z)	2.411
345				
346	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
347	k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
348	Theta Star	N/A		
349	nu star	N/A		
350				
351	A-D Test Statistic	N/A	**Nonparametric Statistics**	
352	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
353	K-S Test Statistic	N/A	Mean	1.003
354	5% K-S Critical Value	N/A	SD	0.325
355	Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.141
356			95% KM UTL with 95% Coverage	1.822
357	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	2.462
358	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.59
359	Mean	N/A	90% Percentile (z)	1.419
360	Median	N/A	95% Percentile (z)	1.537
361	SD	N/A	99% Percentile (z)	1.758
362	k star	N/A		
363	Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
364	Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
365	95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
366			95% WH Approx. Gamma UTL with 95% Coverage	N/A
367	90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
368	95% Percentile	N/A		
369	99% Percentile	N/A		
370				
371	Note: DL/2 is not a recommended method.			
372				
373				
374	**COPPER**			
375				
376	**General Statistics**			
377	Number of Valid Data	16	Number of Detected Data	4
378	Number of Distinct Detected Data	4	Number of Non-Detect Data	12
379	Tolerance Factor	2.524	Percent Non-Detects	75.00%
380	Number of Missing Values	2		
381				
382	**Raw Statistics**		**Log-transformed Statistics**	
383	Minimum Detected	2	Minimum Detected	0.693
384	Maximum Detected	3.8	Maximum Detected	1.335
385	Mean of Detected	3.075	Mean of Detected	1.093

	A	B	C	D	E	F	G	H	I	J	K	L
386					SD of Detected	0.814					SD of Detected	0.291
387					Minimum Non-Detect	1					Minimum Non-Detect	0
388					Maximum Non-Detect	4.8					Maximum Non-Detect	1.569
389												
390			Data with Multiple Detection Limits						Single Detection Limit Scenario			
391		Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect with Single DL	16
392		For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL	0
393		Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
394												
395												
396					Warning: There are only 4 Distinct Detected Values in this data							
397					Note: It should be noted that even though bootstrap may be performed on this data set							
398					the resulting calculations may not be reliable enough to draw conclusions							
399												
400					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
401												
402					Background Statistics							
403			Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only			
404					Shapiro Wilk Test Statistic	0.923					Shapiro Wilk Test Statistic	0.895
405					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
406					Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
407												
408					Assuming Normal Distribution						Assuming Lognormal Distribution	
409					DL/2 Substitution Method						DL/2 Substitution Method	
410					Mean	1.628					Mean (Log Scale)	0.288
411					SD	1.071					SD (Log Scale)	0.654
412					95% UTL 95% Coverage	4.332					95% UTL 95% Coverage	6.945
413					95% UPL (t)	3.564					95% UPL (t)	4.345
414					90% Percentile (z)	3.001					90% Percentile (z)	3.082
415					95% Percentile (z)	3.39					95% Percentile (z)	3.908
416					99% Percentile (z)	4.121					99% Percentile (z)	6.103
417												
418					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
419											Mean in Original Scale	1.776
420											SD in Original Scale	0.881
421											Mean in Log Scale	0.482
422											SD in Log Scale	0.421
423											95% UTL 95% Coverage	4.69
424											95% UPL (t)	3.467
425											90% Percentile (z)	2.779
426											95% Percentile (z)	3.238
427											99% Percentile (z)	4.315
428												
429			Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only			
430					k star (bias corrected)	4.395			Data appear Normal at 5% Significance Level			
431					Theta Star	0.7						
432					nu star	35.16						
433												
434					A-D Test Statistic	0.352			Nonparametric Statistics			
435					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
436					K-S Test Statistic	0.272					Mean	2.32
437					5% K-S Critical Value	0.394					SD	0.618
438					Data appear Gamma Distributed at 5% Significance Level						SE of Mean	0.194
439											95% KM UTL with 95% Coverage	3.879
440					Assuming Gamma Distribution						95% KM Chebyshev UPL	5.094

	A	B	C	D	E	F	G	H	I	J	K	L
441				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	3.436
442					Mean	0.782					90% Percentile (z)	3.111
443					Median	0.000001					95% Percentile (z)	3.336
444					SD	1.415					99% Percentile (z)	3.757
445					k star	0.126						
446					Theta star	6.232			Gamma ROS Limits with Extrapolated Data			
447					Nu star	4.016				95% Wilson Hilferty (WH) Approx. Gamma UPL		3.813
448					95% Percentile of Chisquare (2k)	1.424				95% Hawkins Wixley (HW) Approx. Gamma UPL		4.318
449										95% WH Approx. Gamma UTL with	95% Coverage	8.108
450					90% Percentile	2.242				95% HW Approx. Gamma UTL with	95% Coverage	11.48
451					95% Percentile	4.437						
452					99% Percentile	11.06						
453												
454	Note: DL/2 is not a recommended method.											
455												
456												
457	IRON											
458												
459					General Statistics							
460					Number of Valid Data	16				Number of Detected Data		5
461					Number of Distinct Detected Data	5				Number of Non-Detect Data		11
462					Tolerance Factor	2.524				Percent Non-Detects		68.75%
463					Number of Missing Values	2						
464												
465				Raw Statistics						Log-transformed Statistics		
466					Minimum Detected	66.6				Minimum Detected		4.199
467					Maximum Detected	755				Maximum Detected		6.627
468					Mean of Detected	444.7				Mean of Detected		5.776
469					SD of Detected	302.1				SD of Detected		1.035
470					Minimum Non-Detect	6.8				Minimum Non-Detect		1.917
471					Maximum Non-Detect	524				Maximum Non-Detect		6.261
472												
473				Data with Multiple Detection Limits						Single Detection Limit Scenario		
474				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL		13
475				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL		3
476				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		81.25%
477												
478												
479					Warning: There are only 5 Detected Values in this data							
480					Note: It should be noted that even though bootstrap may be performed on this data set							
481					the resulting calculations may not be reliable enough to draw conclusions							
482												
483					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
484												
485					Background Statistics							
486				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
487					Shapiro Wilk Test Statistic	0.905				Shapiro Wilk Test Statistic		0.859
488					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
489				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
490												
491				Assuming Normal Distribution						Assuming Lognormal Distribution		
492					DL/2 Substitution Method					DL/2 Substitution Method		
493					Mean	163.5				Mean (Log Scale)		3.617
494					SD	257.8				SD (Log Scale)		1.872
495					95% UTL 95% Coverage	814.3				95% UTL 95% Coverage		4194

	A	B	C	D	E	F	G	H	I	J	K	L
496					95% UPL (t)	629.4					95% UPL (t)	1096
497					90% Percentile (z)	493.9					90% Percentile (z)	409.9
498					95% Percentile (z)	587.6					95% Percentile (z)	809.2
499					99% Percentile (z)	763.3					99% Percentile (z)	2897
500												
501				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
502					Mean	324.1					Mean in Original Scale	149.1
503					SD	227.8					SD in Original Scale	258.3
504				95% UTL with	95% Coverage	899.1					95% UTL with 95% Coverage	2196
505											95% BCA UTL with 95% Coverage	755
506											95% Bootstrap (%) UTL with 95% Coverage	755
507					95% UPL (t)	735.8					95% UPL (t)	690.6
508					90% Percentile (z)	616.1					90% Percentile (z)	295.8
509					95% Percentile (z)	698.8					95% Percentile (z)	531.6
510					99% Percentile (z)	854.1					99% Percentile (z)	1596
511												
512				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
513					k star (bias corrected)	0.814				Data appear Normal at 5% Significance Level		
514					Theta Star	546.3						
515					nu star	8.141						
516												
517					A-D Test Statistic	0.419				**Nonparametric Statistics**		
518					5% A-D Critical Value	0.686					Kaplan-Meier (KM) Method	
519					K-S Test Statistic	0.29					Mean	185.4
520					5% K-S Critical Value	0.361					SD	231.2
521				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	64.68
522											95% KM UTL with 95% Coverage	769
523				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	1224
524					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	603.2
525					Mean	139					90% Percentile (z)	481.7
526					Median	0.000001					95% Percentile (z)	565.8
527					SD	263.9					99% Percentile (z)	723.3
528					k star	0.0964						
529					Theta star	1442				**Gamma ROS Limits with Extrapolated Data**		
530					Nu star	3.084					95% Wilson Hilferty (WH) Approx. Gamma UPL	671.6
531					95% Percentile of Chisquare (2k)	1.121					95% Hawkins Wixley (HW) Approx. Gamma UPL	749
532											95% WH Approx. Gamma UTL with 95% Coverage	1459
533					90% Percentile	364					95% HW Approx. Gamma UTL with 95% Coverage	2088
534					95% Percentile	808.2						
535					99% Percentile	2249						
536												
537	Note: DL/2 is not a recommended method.											
538												
539												
540	LEAD											
541												
542					**General Statistics**							
543					Number of Valid Data	16					Number of Detected Data	7
544					Number of Distinct Detected Data	7					Number of Non-Detect Data	9
545					Tolerance Factor	2.524					Percent Non-Detects	56.25%
546					Number of Missing Values	2						
547												
548				**Raw Statistics**						**Log-transformed Statistics**		
549					Minimum Detected	1.5					Minimum Detected	0.405
550					Maximum Detected	3.7					Maximum Detected	1.308

	A–E	F	G–K	L
551	Mean of Detected	2.429	Mean of Detected	0.853
552	SD of Detected	0.692	SD of Detected	0.282
553	Minimum Non-Detect	1.3	Minimum Non-Detect	0.262
554	Maximum Non-Detect	14.2	Maximum Non-Detect	2.653
555				
556	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
557	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	16
558	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
559	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
560				
561				
562	Warning: There are only 7 Detected Values in this data			
563	Note: It should be noted that even though bootstrap may be performed on this data set			
564	the resulting calculations may not be reliable enough to draw conclusions			
565				
566	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.			
567				
568	**Background Statistics**			
569	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
570	Shapiro Wilk Test Statistic	0.951	Shapiro Wilk Test Statistic	0.981
571	5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
572	Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
573				
574	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
575	DL/2 Substitution Method		DL/2 Substitution Method	
576	Mean	1.922	Mean (Log Scale)	0.393
577	SD	1.658	SD (Log Scale)	0.713
578	95% UTL 95% Coverage	6.106	95% UTL 95% Coverage	8.962
579	95% UPL (t)	4.918	95% UPL (t)	5.374
580	90% Percentile (z)	4.047	90% Percentile (z)	3.694
581	95% Percentile (z)	4.649	95% Percentile (z)	4.787
582	99% Percentile (z)	5.779	99% Percentile (z)	7.784
583				
584	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
585			Mean in Original Scale	1.695
586			SD in Original Scale	0.821
587			Mean in Log Scale	0.426
588			SD in Log Scale	0.462
589			95% UTL 95% Coverage	4.914
590			95% UPL (t)	3.528
591			90% Percentile (z)	2.767
592			95% Percentile (z)	3.273
593			99% Percentile (z)	4.485
594				
595	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
596	k star (bias corrected)	8.592	Data appear Normal at 5% Significance Level	
597	Theta Star	0.283		
598	nu star	120.3		
599				
600	A-D Test Statistic	0.204	**Nonparametric Statistics**	
601	5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
602	K-S Test Statistic	0.165	Mean	1.933
603	5% K-S Critical Value	0.312	SD	0.637
604	Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.178
605			95% KM UTL with 95% Coverage	3.542

	A	B	C	D	E	F	G	H	I	J	K	L
606	Assuming Gamma Distribution										95% KM Chebyshev UPL	4.797
607				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	3.085
608					Mean	1.215					90% Percentile (z)	2.75
609					Median	1.048					95% Percentile (z)	2.982
610					SD	1.233					99% Percentile (z)	3.416
611					k star	0.182						
612					Theta star	6.671	Gamma ROS Limits with Extrapolated Data					
613					Nu star	5.828				95% Wilson Hilferty (WH) Approx. Gamma UPL		6.532
614					95% Percentile of Chisquare (2k)	1.922				95% Hawkins Wixley (HW) Approx. Gamma UPL		9.287
615										95% WH Approx. Gamma UTL with	95% Coverage	12.17
616					90% Percentile	3.666				95% HW Approx. Gamma UTL with	95% Coverage	20.86
617					95% Percentile	6.409						
618					99% Percentile	14.08						
619												
620	Note: DL/2 is not a recommended method.											
621												
622												
623	MANGANESE											
624												
625					General Statistics							
626					Number of Valid Data	16				Number of Detected Data		13
627					Number of Distinct Detected Data	13				Number of Non-Detect Data		3
628					Tolerance Factor	2.524				Percent Non-Detects		18.75%
629					Number of Missing Values	2						
630												
631				Raw Statistics						Log-transformed Statistics		
632					Minimum Detected	3				Minimum Detected		1.099
633					Maximum Detected	3580				Maximum Detected		8.183
634					Mean of Detected	909.6				Mean of Detected		4.06
635					SD of Detected	1422				SD of Detected		2.823
636					Minimum Non-Detect	0.7				Minimum Non-Detect		-0.357
637					Maximum Non-Detect	2.5				Maximum Non-Detect		0.916
638												
639				Data with Multiple Detection Limits						Single Detection Limit Scenario		
640				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL		3
641				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL		13
642				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		18.75%
643												
644					Background Statistics							
645				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
646					Shapiro Wilk Test Statistic	0.655				Shapiro Wilk Test Statistic		0.806
647					5% Shapiro Wilk Critical Value	0.866				5% Shapiro Wilk Critical Value		0.866
648				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
649												
650				Assuming Normal Distribution						Assuming Lognormal Distribution		
651					DL/2 Substitution Method					DL/2 Substitution Method		
652					Mean	739.2				Mean (Log Scale)		3.237
653					SD	1324				SD (Log Scale)		3.092
654					95% UTL 95% Coverage	4081				95% UTL 95% Coverage		62442
655					95% UPL (t)	3131				95% UPL (t)		6801
656					90% Percentile (z)	2436				90% Percentile (z)		1339
657					95% Percentile (z)	2917				95% Percentile (z)		4119
658					99% Percentile (z)	3819				99% Percentile (z)		33888
659												
660					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		

	A	B	C	D	E	F	G	H	I	J	K	L
661					Mean	551.5				Mean in Original Scale		739.1
662					SD	1481				SD in Original Scale		1324
663				95% UTL with	95% Coverage	4289				95% UTL with	95% Coverage	147325
664										95% BCA UTL with	95% Coverage	3580
665										95% Bootstrap (%) UTL with	95% Coverage	3580
666					95% UPL (t)	3227					95% UPL (t)	11377
667					90% Percentile (z)	2449					90% Percentile (z)	1741
668					95% Percentile (z)	2987					95% Percentile (z)	6375
669					99% Percentile (z)	3996					99% Percentile (z)	72722
670												
671				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
672					k star (bias corrected)	0.249				Data do not follow a Discernable Distribution (0.05)		
673					Theta Star	3655						
674					nu star	6.471						
675												
676					A-D Test Statistic	1.569				Nonparametric Statistics		
677					5% A-D Critical Value	0.846					Kaplan-Meier (KM) Method	
678					K-S Test Statistic	0.345					Mean	739.6
679					5% K-S Critical Value	0.258					SD	1282
680				Data not Gamma Distributed at 5% Significance Level							SE of Mean	333.5
681											95% KM UTL with	95% Coverage 3974
682				Assuming Gamma Distribution							95% KM Chebyshev UPL	6498
683					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	3055
684					Mean	739.1					90% Percentile (z)	2382
685					Median	11.3					95% Percentile (z)	2848
686					SD	1324					99% Percentile (z)	3721
687					k star	0.149						
688					Theta star	4946				Gamma ROS Limits with Extrapolated Data		
689					Nu star	4.782				95% Wilson Hilferty (WH) Approx. Gamma UPL		3497
690					95% Percentile of Chisquare (2k)	1.646				95% Hawkins Wixley (HW) Approx. Gamma UPL		3865
691										95% WH Approx. Gamma UTL with	95% Coverage	7165
692					90% Percentile	2190				95% HW Approx. Gamma UTL with	95% Coverage	9507
693					95% Percentile	4071						
694					99% Percentile	9531						
695												
696	Note: DL/2 is not a recommended method.											
697												
698												
699	MERCURY											
700												
701					General Statistics							
702					Number of Valid Data	16				Number of Detected Data		3
703					Number of Distinct Detected Data	3				Number of Non-Detect Data		13
704					Warning: Data set has only 3 Detected Values.							
705					This is not enough to compute meaningful and reliable test statistics and estimates.							
706					No statistics will be produced!							
707												
708					Tolerance Factor	2.524				Percent Non-Detects		81.25%
709					Number of Missing Values	2						
710												
711				Raw Statistics						Log-transformed Statistics		
712					Minimum Detected	0.02				Minimum Detected		-3.912
713					Maximum Detected	0.098				Maximum Detected		-2.323
714					Mean of Detected	0.0493				Mean of Detected		-3.247
715					SD of Detected	0.0424				SD of Detected		0.826

	A–E	F	G–K	L
716	Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
717	Maximum Non-Detect	0.12	Maximum Non-Detect	-2.12
718				
719	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
720	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	16
721	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
722	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
723				
724				
725	Warning: There are only 3 Distinct Detected Values in this data set			
726	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.			
727	Those methods will return a 'N/A' value on your output display!			
728				
729	It is necessary to have 4 or more Distinct Values for bootstrap methods.			
730	However, results obtained using 4 to 9 distinct values may not be reliable.			
731	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.			
732				
733	**Background Statistics**			
734	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
735	Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.926
736	5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
737	Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
738				
739	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
740	DL/2 Substitution Method		DL/2 Substitution Method	
741	Mean	0.0258	Mean (Log Scale)	-4.091
742	SD	0.0253	SD (Log Scale)	0.992
743	95% UTL 95% Coverage	0.0897	95% UTL 95% Coverage	0.205
744	95% UPL (t)	0.0716	95% UPL (t)	0.1
745	90% Percentile (z)	0.0583	90% Percentile (z)	0.0596
746	95% Percentile (z)	0.0675	95% Percentile (z)	0.0855
747	99% Percentile (z)	0.0847	99% Percentile (z)	0.168
748				
749	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
750			Mean in Original Scale	0.0132
751			SD in Original Scale	0.0238
752			Mean in Log Scale	-5.043
753			SD in Log Scale	1.084
754			95% UTL 95% Coverage	0.0997
755			95% UPL (t)	0.0458
756			90% Percentile (z)	0.0259
757			95% Percentile (z)	0.0384
758			99% Percentile (z)	0.0805
759				
760	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
761	k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
762	Theta Star	N/A		
763	nu star	N/A		
764				
765	A-D Test Statistic	N/A	**Nonparametric Statistics**	
766	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
767	K-S Test Statistic	N/A	Mean	0.0266
768	5% K-S Critical Value	N/A	SD	0.02
769	Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00659
770			95% KM UTL with 95% Coverage	0.0772

	A	B	C	D	E	F	G	H	I	J	K	L
771	Assuming Gamma Distribution						95% KM Chebyshev UPL					0.117
772	Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)					0.0628
773	Mean					N/A	90% Percentile (z)					0.0523
774	Median					N/A	95% Percentile (z)					0.0596
775	SD					N/A	99% Percentile (z)					0.0732
776	k star					N/A						
777	Theta star					N/A	Gamma ROS Limits with Extrapolated Data					
778	Nu star					N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL					N/A
779	95% Percentile of Chisquare (2k)					N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL					N/A
780							95% WH Approx. Gamma UTL with 95% Coverage					N/A
781	90% Percentile					N/A	95% HW Approx. Gamma UTL with 95% Coverage					N/A
782	95% Percentile					N/A						
783	99% Percentile					N/A						
784												
785	Note: DL/2 is not a recommended method.											
786												
787												
788	NICKEL											
789												
790	General Statistics											
791	Number of Valid Data					16	Number of Detected Data					5
792	Number of Distinct Detected Data					5	Number of Non-Detect Data					11
793	Tolerance Factor					2.524	Percent Non-Detects					68.75%
794	Number of Missing Values					2						
795												
796	Raw Statistics						Log-transformed Statistics					
797	Minimum Detected					0.81	Minimum Detected					-0.211
798	Maximum Detected					2.9	Maximum Detected					1.065
799	Mean of Detected					1.882	Mean of Detected					0.531
800	SD of Detected					0.89	SD of Detected					0.522
801	Minimum Non-Detect					0.9	Minimum Non-Detect					-0.105
802	Maximum Non-Detect					9	Maximum Non-Detect					2.197
803												
804	Data with Multiple Detection Limits						Single Detection Limit Scenario					
805	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect with Single DL					16
806	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected with Single DL					0
807	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
808												
809												
810	Warning: There are only 5 Detected Values in this data											
811	Note: It should be noted that even though bootstrap may be performed on this data set											
812	the resulting calculations may not be reliable enough to draw conclusions											
813												
814	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
815												
816	Background Statistics											
817	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
818	Shapiro Wilk Test Statistic					0.916	Shapiro Wilk Test Statistic					0.929
819	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
820	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
821												
822	Assuming Normal Distribution						Assuming Lognormal Distribution					
823	DL/2 Substitution Method						DL/2 Substitution Method					
824	Mean					2.348	Mean (Log Scale)					0.632
825	SD					1.504	SD (Log Scale)					0.718

	A	B	C	D	E	F	G	H	I	J	K	L
826					95% UTL 95% Coverage	6.144				95% UTL 95% Coverage		11.53
827					95% UPL (t)	5.066				95% UPL (t)		6.887
828					90% Percentile (z)	4.275				90% Percentile (z)		4.722
829					95% Percentile (z)	4.822				95% Percentile (z)		6.13
830					99% Percentile (z)	5.847				99% Percentile (z)		10
831												
832				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
833										Mean in Original Scale		1.432
834										SD in Original Scale		0.616
835										Mean in Log Scale		0.287
836										SD in Log Scale		0.378
837										95% UTL 95% Coverage		3.46
838										95% UPL (t)		2.638
839										90% Percentile (z)		2.163
840										95% Percentile (z)		2.481
841										99% Percentile (z)		3.211
842												
843				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
844					k star (bias corrected)	2.166				Data appear Normal at 5% Significance Level		
845					Theta Star	0.869						
846					nu star	21.66						
847												
848					A-D Test Statistic	0.307				**Nonparametric Statistics**		
849					5% A-D Critical Value	0.681				Kaplan-Meier (KM) Method		
850					K-S Test Statistic	0.244				Mean		1.484
851					5% K-S Critical Value	0.358				SD		0.731
852				Data appear Gamma Distributed at 5% Significance Level						SE of Mean		0.281
853										95% KM UTL with 95% Coverage		3.329
854				**Assuming Gamma Distribution**						95% KM Chebyshev UPL		4.768
855				Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)		2.805
856					Mean	1.524				90% Percentile (z)		2.421
857					Median	1.343				95% Percentile (z)		2.686
858					SD	0.657				99% Percentile (z)		3.184
859					k star	4.782						
860					Theta star	0.319				**Gamma ROS Limits with Extrapolated Data**		
861					Nu star	153				95% Wilson Hilferty (WH) Approx. Gamma UPL		2.895
862					95% Percentile of Chisquare (2k)	17.7				95% Hawkins Wixley (HW) Approx. Gamma UPL		2.935
863										95% WH Approx. Gamma UTL with 95% Coverage		3.672
864					90% Percentile	2.457				95% HW Approx. Gamma UTL with 95% Coverage		3.782
865					95% Percentile	2.821						
866					99% Percentile	3.592						
867												
868	Note: DL/2 is not a recommended method.											
869												
870												
871	**POTASSIUM**											
872												
873					**General Statistics**							
874					Number of Valid Data	16				Number of Detected Data		14
875					Number of Distinct Detected Data	14				Number of Non-Detect Data		2
876					Tolerance Factor	2.524				Percent Non-Detects		12.50%
877					Number of Missing Values	2						
878												
879				**Raw Statistics**						**Log-transformed Statistics**		
880					Minimum Detected	2400				Minimum Detected		7.783

	A–E	F	G–K	L
881	Maximum Detected	5180	Maximum Detected	8.553
882	Mean of Detected	4261	Mean of Detected	8.339
883	SD of Detected	776.4	SD of Detected	0.209
884	Minimum Non-Detect	2210	Minimum Non-Detect	7.701
885	Maximum Non-Detect	2500	Maximum Non-Detect	7.824
886				
887	**Data with Multiple Detection Limits**		**Single Detection Limit Scenario**	
888	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	3
889	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	13
890	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	18.75%
891				
892	**Background Statistics**			
893	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
894	Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.845
895	5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
896	Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
897				
898	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
899	DL/2 Substitution Method		DL/2 Substitution Method	
900	Mean	3876	Mean (Log Scale)	8.18
901	SD	1278	SD (Log Scale)	0.476
902	95% UTL 95% Coverage	7101	95% UTL 95% Coverage	11861
903	95% UPL (t)	6185	95% UPL (t)	8433
904	90% Percentile (z)	5513	90% Percentile (z)	6568
905	95% Percentile (z)	5978	95% Percentile (z)	7807
906	99% Percentile (z)	6848	99% Percentile (z)	10797
907				
908	Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
909	Mean	3953	Mean in Original Scale	4072
910	SD	1084	SD in Original Scale	890.5
911	95% UTL with 95% Coverage	6690	95% UTL with 95% Coverage	7320
912			95% BCA UTL with 95% Coverage	5180
913			95% Bootstrap (%) UTL with 95% Coverage	5180
914	95% UPL (t)	5912	95% UPL (t)	6152
915	90% Percentile (z)	5343	90% Percentile (z)	5415
916	95% Percentile (z)	5737	95% Percentile (z)	5914
917	99% Percentile (z)	6475	99% Percentile (z)	6977
918				
919	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
920	k star (bias corrected)	21.55	Data appear Normal at 5% Significance Level	
921	Theta Star	197.7		
922	nu star	603.4		
923				
924	A-D Test Statistic	0.677	**Nonparametric Statistics**	
925	5% A-D Critical Value	0.734	Kaplan-Meier (KM) Method	
926	K-S Test Statistic	0.216	Mean	4029
927	5% K-S Critical Value	0.228	SD	932.1
928	Data appear Gamma Distributed at 5% Significance Level		SE of Mean	241.8
929			95% KM UTL with 95% Coverage	6381
930	**Assuming Gamma Distribution**		95% KM Chebyshev UPL	8217
931	Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5713
932	Mean	3957	90% Percentile (z)	5223
933	Median	4390	95% Percentile (z)	5562
934	SD	1108	99% Percentile (z)	6197
935	k star	8.307		

	A	B	C	D	E	F	G	H	I	J	K	L
936					Theta star	476.4	Gamma ROS Limits with Extrapolated Data					
937					Nu star	265.8			95% Wilson Hilferty (WH) Approx. Gamma UPL			6574
938				95% Percentile of Chisquare (2k)		27.09			95% Hawkins Wixley (HW) Approx. Gamma UPL			6692
939									95% WH Approx. Gamma UTL with	95% Coverage		7947
940					90% Percentile	5787			95% HW Approx. Gamma UTL with	95% Coverage		8195
941					95% Percentile	6453						
942					99% Percentile	7829						
943												
944	Note: DL/2 is not a recommended method.											
945												
946												
947	SILVER											
948												
949					General Statistics							
950					Number of Valid Data	16			Number of Detected Data			1
951					Number of Distinct Detected Data	1			Number of Non-Detect Data			15
952												
953				Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
954				It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
955												
956				The data set for variable SILVER was not processed!								
957												
958												
959												
960	VANADIUM											
961												
962					General Statistics							
963					Number of Valid Data	16			Number of Detected Data			3
964					Number of Distinct Detected Data	3			Number of Non-Detect Data			13
965				Warning: Data set has only 3 Detected Values.								
966				This is not enough to compute meaningful and reliable test statistics and estimates.								
967				No statistics will be produced!								
968												
969					Tolerance Factor	2.524			Percent Non-Detects			81.25%
970					Number of Missing Values	2						
971												
972				Raw Statistics			Log-transformed Statistics					
973					Minimum Detected	0.64			Minimum Detected			-0.446
974					Maximum Detected	1.9			Maximum Detected			0.642
975					Mean of Detected	1.12			Mean of Detected			-0.000961
976					SD of Detected	0.681			SD of Detected			0.57
977					Minimum Non-Detect	0.55			Minimum Non-Detect			-0.598
978					Maximum Non-Detect	4.2			Maximum Non-Detect			1.435
979												
980				Data with Multiple Detection Limits			Single Detection Limit Scenario					
981				Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL			16
982				For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL			0
983				Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage			100.00%
984												
985												
986				Warning: There are only 3 Distinct Detected Values in this data set								
987				The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.								
988				Those methods will return a 'N/A' value on your output display!								
989												
990				It is necessary to have 4 or more Distinct Values for bootstrap methods.								

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.91
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.959	Mean (Log Scale)	-0.374
SD	0.756	SD (Log Scale)	0.862
95% UTL 95% Coverage	2.867	95% UTL 95% Coverage	6.065
95% UPL (t)	2.325	95% UPL (t)	3.268
90% Percentile (z)	1.928	90% Percentile (z)	2.077
95% Percentile (z)	2.202	95% Percentile (z)	2.841
99% Percentile (z)	2.717	99% Percentile (z)	5.114
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.397
		SD in Original Scale	0.454
		Mean in Log Scale	-1.308
		SD in Log Scale	0.831
		95% UTL 95% Coverage	2.202
		95% UPL (t)	1.214
		90% Percentile (z)	0.784
		95% Percentile (z)	1.061
		99% Percentile (z)	1.868
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.773
5% K-S Critical Value	N/A	SD	0.361
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.133
		95% KM UTL with 95% Coverage	1.683
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.393
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.424
Mean	N/A	90% Percentile (z)	1.235
Median	N/A	95% Percentile (z)	1.366
SD	N/A	99% Percentile (z)	1.611
k star	N/A		
Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

	A	B	C	D	E	F	G	H	I	J	K	L
1046	Note: DL/2 is not a recommended method.											
1047												
1048												
1049	ZINC											
1050												
1051					General Statistics							
1052					Number of Valid Data	16				Number of Detected Data		3
1053					Number of Distinct Detected Data	3				Number of Non-Detect Data		13
1054					Warning: Data set has only 3 Detected Values.							
1055					This is not enough to compute meaningful and reliable test statistics and estimates.							
1056					No statistics will be produced!							
1057												
1058					Tolerance Factor	2.524				Percent Non-Detects		81.25%
1059					Number of Missing Values	2						
1060												
1061					Raw Statistics					Log-transformed Statistics		
1062					Minimum Detected	15.8				Minimum Detected		2.76
1063					Maximum Detected	52.4				Maximum Detected		3.959
1064					Mean of Detected	37.4				Mean of Detected		3.501
1065					SD of Detected	19.17				SD of Detected		0.648
1066					Minimum Non-Detect	2.8				Minimum Non-Detect		1.03
1067					Maximum Non-Detect	26.6				Maximum Non-Detect		3.281
1068												
1069					Data with Multiple Detection Limits					Single Detection Limit Scenario		
1070					Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL		14
1071					For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL		2
1072					Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage		87.50%
1073												
1074												
1075					Warning: There are only 3 Distinct Detected Values in this data set							
1076					The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.							
1077					Those methods will return a 'N/A' value on your output display!							
1078												
1079					It is necessary to have 4 or more Distinct Values for bootstrap methods.							
1080					However, results obtained using 4 to 9 distinct values may not be reliable.							
1081					It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.							
1082												
1083					Background Statistics							
1084					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
1085					Shapiro Wilk Test Statistic	0.911				Shapiro Wilk Test Statistic		0.857
1086					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1087					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
1088												
1089					Assuming Normal Distribution					Assuming Lognormal Distribution		
1090					DL/2 Substitution Method					DL/2 Substitution Method		
1091					Mean	12.28				Mean (Log Scale)		2.063
1092					SD	14.61				SD (Log Scale)		0.914
1093					95% UTL 95% Coverage	49.14				95% UTL 95% Coverage		78.96
1094					95% UPL (t)	38.67				95% UPL (t)		41.01
1095					90% Percentile (z)	30.99				90% Percentile (z)		25.37
1096					95% Percentile (z)	36.3				95% Percentile (z)		35.36
1097					99% Percentile (z)	46.26				99% Percentile (z)		65.92
1098												
1099					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1100										Mean in Original Scale		9.369

	A	B	C	D	E	F	G	H	I	J	K	L
1101											SD in Original Scale	15.58
1102											Mean in Log Scale	1.501
1103											SD in Log Scale	1.043
1104										95% UTL	95% Coverage	62.35
1105											95% UPL (t)	29.52
1106											90% Percentile (z)	17.07
1107											95% Percentile (z)	24.93
1108											99% Percentile (z)	50.74
1109												
1110				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
1111					k star (bias corrected)	N/A			Data appear Normal at 5% Significance Level			
1112					Theta Star	N/A						
1113					nu star	N/A						
1114												
1115					A-D Test Statistic	N/A			**Nonparametric Statistics**			
1116					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1117					K-S Test Statistic	N/A					Mean	19.85
1118					5% K-S Critical Value	N/A					SD	10.82
1119				Data not Gamma Distributed at 5% Significance Level							SE of Mean	3.312
1120										95% KM UTL with	95% Coverage	47.15
1121				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	68.45
1122					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	39.4
1123					Mean	N/A					90% Percentile (z)	33.71
1124					Median	N/A					95% Percentile (z)	37.64
1125					SD	N/A					99% Percentile (z)	45.02
1126					k star	N/A						
1127					Theta star	N/A			**Gamma ROS Limits with Extrapolated Data**			
1128					Nu star	N/A					95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
1129					95% Percentile of Chisquare (2k)	N/A					95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
1130											95% WH Approx. Gamma UTL with 95% Coverage	N/A
1131					90% Percentile	N/A					95% HW Approx. Gamma UTL with 95% Coverage	N/A
1132					95% Percentile	N/A						
1133					99% Percentile	N/A						
1134												
1135	Note: DL/2 is not a recommended method.											
1136												
1137												
1138	**BROMIDE**											
1139												
1140					**General Statistics**							
1141					Number of Valid Data	16					Number of Detected Data	5
1142					Number of Distinct Detected Data	5					Number of Non-Detect Data	11
1143					Tolerance Factor	2.524					Percent Non-Detects	68.75%
1144					Number of Missing Values	2						
1145												
1146				**Raw Statistics**					**Log-transformed Statistics**			
1147					Minimum Detected	2.8					Minimum Detected	1.03
1148					Maximum Detected	5					Maximum Detected	1.609
1149					Mean of Detected	4.1					Mean of Detected	1.385
1150					SD of Detected	0.992					SD of Detected	0.259
1151					Minimum Non-Detect	2					Minimum Non-Detect	0.693
1152					Maximum Non-Detect	2.6					Maximum Non-Detect	0.956
1153												
1154				**Data with Multiple Detection Limits**					**Single Detection Limit Scenario**			
1155	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	11

	A	B	C	D	E	F	G	H	I	J	K	L
1156	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected with Single DL		5
1157	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		68.75%
1158												
1159												
1160	Warning: There are only 5 Detected Values in this data											
1161	Note: It should be noted that even though bootstrap may be performed on this data set											
1162	the resulting calculations may not be reliable enough to draw conclusions											
1163												
1164	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1165												
1166	Background Statistics											
1167	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1168					Shapiro Wilk Test Statistic	0.867				Shapiro Wilk Test Statistic		0.859
1169					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1170	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1171												
1172	Assuming Normal Distribution						Assuming Lognormal Distribution					
1173					DL/2 Substitution Method					DL/2 Substitution Method		
1174					Mean	1.988				Mean (Log Scale)		0.449
1175					SD	1.559				SD (Log Scale)		0.668
1176					95% UTL 95% Coverage	5.924				95% UTL 95% Coverage		8.47
1177					95% UPL (t)	4.805				95% UPL (t)		5.245
1178					90% Percentile (z)	3.986				90% Percentile (z)		3.691
1179					95% Percentile (z)	4.553				95% Percentile (z)		4.706
1180					99% Percentile (z)	5.615				99% Percentile (z)		7.422
1181												
1182					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1183					Mean	1.625				Mean in Original Scale		2.431
1184					SD	2.121				SD in Original Scale		1.341
1185					95% UTL with 95% Coverage	6.98				95% UTL with 95% Coverage		8.22
1186										95% BCA UTL with 95% Coverage		5
1187										95% Bootstrap (%) UTL with 95% Coverage		5
1188					95% UPL (t)	5.459				95% UPL (t)		5.596
1189					90% Percentile (z)	4.344				90% Percentile (z)		4.222
1190					95% Percentile (z)	5.115				95% Percentile (z)		5.13
1191					99% Percentile (z)	6.56				99% Percentile (z)		7.393
1192												
1193	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1194					k star (bias corrected)	7.973	Data appear Normal at 5% Significance Level					
1195					Theta Star	0.514						
1196					nu star	79.73						
1197												
1198					A-D Test Statistic	0.467	Nonparametric Statistics					
1199					5% A-D Critical Value	0.679				Kaplan-Meier (KM) Method		
1200					K-S Test Statistic	0.289				Mean		3.206
1201					5% K-S Critical Value	0.357				SD		0.781
1202	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.218
1203										95% KM UTL with 95% Coverage		5.176
1204	Assuming Gamma Distribution									95% KM Chebyshev UPL		6.714
1205					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		4.617
1206					Mean	1.393				90% Percentile (z)		4.207
1207					Median	0.000001				95% Percentile (z)		4.49
1208					SD	1.982				99% Percentile (z)		5.022
1209					k star	0.127						
1210					Theta star	10.98	Gamma ROS Limits with Extrapolated Data					

	A	B	C	D	E	F	G	H	I	J	K	L
1211					Nu star	4.058			95% Wilson Hilferty (WH) Approx. Gamma UPL			7.663
1212				95% Percentile of Chisquare (2k)		1.437			95% Hawkins Wixley (HW) Approx. Gamma UPL			9.851
1213									95% WH Approx. Gamma UTL with	95% Coverage		15.77
1214					90% Percentile	4.003			95% HW Approx. Gamma UTL with	95% Coverage		25.4
1215					95% Percentile	7.89						
1216					99% Percentile	19.59						
1217												
1218	Note: DL/2 is not a recommended method.											
1219												
1220												
1221	NITRATE											
1222												
1223					General Statistics							
1224					Number of Valid Data	15			Number of Detected Data			13
1225					Number of Distinct Detected Data	13			Number of Non-Detect Data			2
1226					Tolerance Factor	2.566			Percent Non-Detects			13.33%
1227					Number of Missing Values	3						
1228												
1229				Raw Statistics					Log-transformed Statistics			
1230					Minimum Detected	0.061			Minimum Detected			-2.797
1231					Maximum Detected	6.2			Maximum Detected			1.825
1232					Mean of Detected	1.648			Mean of Detected			-0.413
1233					SD of Detected	2.068			SD of Detected			1.521
1234					Minimum Non-Detect	0.05			Minimum Non-Detect			-2.996
1235					Maximum Non-Detect	0.05			Maximum Non-Detect			-2.996
1236												
1237												
1238					Background Statistics							
1239				Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only			
1240					Shapiro Wilk Test Statistic	0.76			Shapiro Wilk Test Statistic			0.938
1241					5% Shapiro Wilk Critical Value	0.866			5% Shapiro Wilk Critical Value			0.866
1242				Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level			
1243												
1244				Assuming Normal Distribution					Assuming Lognormal Distribution			
1245					DL/2 Substitution Method				DL/2 Substitution Method			
1246					Mean	1.432			Mean (Log Scale)			-0.85
1247					SD	1.998			SD (Log Scale)			1.82
1248					95% UTL 95% Coverage	6.558			95% UTL 95% Coverage			45.58
1249					95% UPL (t)	5.066			95% UPL (t)			11.71
1250					90% Percentile (z)	3.992			90% Percentile (z)			4.403
1251					95% Percentile (z)	4.718			95% Percentile (z)			8.528
1252					99% Percentile (z)	6.079			99% Percentile (z)			29.47
1253												
1254					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
1255					Mean	1.257			Mean in Original Scale			1.431
1256					SD	2.138			SD in Original Scale			1.998
1257					95% UTL with 95% Coverage	6.744			95% UTL with 95% Coverage			53.54
1258									95% BCA UTL with	95% Coverage		6.2
1259									95% Bootstrap (%) UTL with	95% Coverage		6.2
1260					95% UPL (t)	5.147			95% UPL (t)			12.96
1261					90% Percentile (z)	3.997			90% Percentile (z)			4.669
1262					95% Percentile (z)	4.774			95% Percentile (z)			9.309
1263					99% Percentile (z)	6.231			99% Percentile (z)			33.96
1264												
1265				Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only			

	A	B	C	D	E	F	G	H	I	J	K	L
1266					k star (bias corrected)	0.564	Data appear Gamma Distributed at 5% Significance Level					
1267					Theta Star	2.921						
1268					nu star	14.67						
1269												
1270					A-D Test Statistic	0.592	Nonparametric Statistics					
1271					5% A-D Critical Value	0.777					Kaplan-Meier (KM) Method	
1272					K-S Test Statistic	0.244					Mean	1.437
1273					5% K-S Critical Value	0.247					SD	1.927
1274	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.518
1275										95% KM UTL with	95% Coverage	6.38
1276	Assuming Gamma Distribution										95% KM Chebyshev UPL	10.11
1277				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	4.941
1278					Mean	1.428					90% Percentile (z)	3.906
1279					Median	0.61					95% Percentile (z)	4.606
1280					SD	2					99% Percentile (z)	5.919
1281					k star	0.263						
1282					Theta star	5.422	Gamma ROS Limits with Extrapolated Data					
1283					Nu star	7.904				95% Wilson Hilferty (WH) Approx. Gamma UPL		6.671
1284					95% Percentile of Chisquare (2k)	2.511				95% Hawkins Wixley (HW) Approx. Gamma UPL		8.268
1285										95% WH Approx. Gamma UTL with	95% Coverage	12.27
1286					90% Percentile	4.27				95% HW Approx. Gamma UTL with	95% Coverage	17.57
1287					95% Percentile	6.806						
1288					99% Percentile	13.51						
1289												
1290	Note: DL/2 is not a recommended method.											
1291												
1292												
1293	TOTAL ORGANIC HALIDES											
1294												
1295					General Statistics							
1296					Number of Valid Data	16					Number of Detected Data	12
1297					Number of Distinct Detected Data	12					Number of Non-Detect Data	4
1298					Tolerance Factor	2.524					Percent Non-Detects	25.00%
1299					Number of Missing Values	2						
1300												
1301				Raw Statistics						Log-transformed Statistics		
1302					Minimum Detected	0.011					Minimum Detected	-4.51
1303					Maximum Detected	2.1					Maximum Detected	0.742
1304					Mean of Detected	0.332					Mean of Detected	-2.174
1305					SD of Detected	0.608					SD of Detected	1.45
1306					Minimum Non-Detect	0.018					Minimum Non-Detect	-4.017
1307					Maximum Non-Detect	1.8					Maximum Non-Detect	0.588
1308												
1309				Data with Multiple Detection Limits						Single Detection Limit Scenario		
1310				Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect with Single DL	15
1311				For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected with Single DL	1
1312				Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	93.75%
1313												
1314					Background Statistics							
1315				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
1316					Shapiro Wilk Test Statistic	0.569					Shapiro Wilk Test Statistic	0.952
1317					5% Shapiro Wilk Critical Value	0.859					5% Shapiro Wilk Critical Value	0.859
1318				Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
1319												
1320				Assuming Normal Distribution						Assuming Lognormal Distribution		

	A	B	C	D	E	F	G	H	I	J	K	L
1321					DL/2 Substitution Method						DL/2 Substitution Method	
1322					Mean	0.332					Mean (Log Scale)	-2.27
1323					SD	0.554					SD (Log Scale)	1.649
1324				95% UTL	95% Coverage	1.729				95% UTL	95% Coverage	6.626
1325					95% UPL (t)	1.332					95% UPL (t)	2.032
1326					90% Percentile (z)	1.041					90% Percentile (z)	0.854
1327					95% Percentile (z)	1.242					95% Percentile (z)	1.555
1328					99% Percentile (z)	1.62					99% Percentile (z)	4.783
1329												
1330				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
1331											Mean in Original Scale	0.258
1332											SD in Original Scale	0.537
1333											Mean in Log Scale	-2.567
1334											SD in Log Scale	1.507
1335										95% UTL	95% Coverage	3.447
1336											95% UPL (t)	1.17
1337											90% Percentile (z)	0.53
1338											95% Percentile (z)	0.916
1339											99% Percentile (z)	2.559
1340												
1341				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1342					k star (bias corrected)	0.49				Data appear Lognormal at 5% Significance Level		
1343					Theta Star	0.678						
1344					nu star	11.76						
1345												
1346					A-D Test Statistic	0.94				**Nonparametric Statistics**		
1347					5% A-D Critical Value	0.779					Kaplan-Meier (KM) Method	
1348					K-S Test Statistic	0.296					Mean	0.265
1349					5% K-S Critical Value	0.257					SD	0.521
1350				Data not Gamma Distributed at 5% Significance Level							SE of Mean	0.137
1351										95% KM UTL with	95% Coverage	1.581
1352				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	2.608
1353				Gamma ROS Statistics with Extrapolated Data							95% KM UPL (t)	1.207
1354					Mean	0.252					90% Percentile (z)	0.933
1355					Median	0.06					95% Percentile (z)	1.122
1356					SD	0.54					99% Percentile (z)	1.478
1357					k star	0.253						
1358					Theta star	0.995				**Gamma ROS Limits with Extrapolated Data**		
1359					Nu star	8.107					95% Wilson Hilferty (WH) Approx. Gamma UPL	1.112
1360					95% Percentile of Chisquare (2k)	2.443					95% Hawkins Wixley (HW) Approx. Gamma UPL	1.287
1361											95% WH Approx. Gamma UTL with 95% Coverage	2.069
1362					90% Percentile	0.756					95% HW Approx. Gamma UTL with 95% Coverage	2.747
1363					95% Percentile	1.216						
1364					99% Percentile	2.437						
1365												
1366	Note: DL/2 is not a recommended method.											
1367												
1368												
1369	DIMETHYL PHTHALATE											
1370												
1371					**General Statistics**							
1372					Number of Valid Data	12					Number of Detected Data	2
1373					Number of Distinct Detected Data	2					Number of Non-Detect Data	10
1374					Warning: Data set has only 2 Detected Values.							
1375					This is not enough to compute meaningful and reliable test statistics and estimates.							

	A	B	C	D	E	F	G	H	I	J	K	L
1376	No statistics will be produced!											
1377												
1378					Tolerance Factor	2.736					Percent Non-Detects	83.33%
1379												
1380				Raw Statistics						Log-transformed Statistics		
1381					Minimum Detected	1					Minimum Detected	0
1382					Maximum Detected	2					Maximum Detected	0.693
1383					Mean of Detected	1.5					Mean of Detected	0.347
1384					SD of Detected	0.707					SD of Detected	0.49
1385					Minimum Non-Detect	10					Minimum Non-Detect	2.303
1386					Maximum Non-Detect	12					Maximum Non-Detect	2.485
1387												
1388				Data with Multiple Detection Limits						Single Detection Limit Scenario		
1389	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	12
1390	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	0
1391	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1392												
1393												
1394	Warning: Data set has only 2 Distinct Detected Values.											
1395	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
1396	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1397												
1398	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
1399												
1400	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
1401	Those methods will return a 'N/A' value on your output display!											
1402												
1403	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1404	However, results obtained using 4 to 9 distinct values may not be reliable.											
1405	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1406												
1407				Background Statistics								
1408				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
1409					Shapiro Wilk Test Statistic	N/A					Shapiro Wilk Test Statistic	N/A
1410					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
1411				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
1412												
1413				Assuming Normal Distribution						Assuming Lognormal Distribution		
1414					DL/2 Substitution Method						DL/2 Substitution Method	
1415					Mean	4.792					Mean (Log Scale)	1.469
1416					SD	1.588					SD (Log Scale)	0.548
1417					95% UTL 95% Coverage	9.136					95% UTL 95% Coverage	19.47
1418					95% UPL (t)	7.759					95% UPL (t)	12.11
1419					90% Percentile (z)	6.826					90% Percentile (z)	8.772
1420					95% Percentile (z)	7.403					95% Percentile (z)	10.7
1421					99% Percentile (z)	8.485					99% Percentile (z)	15.55
1422												
1423					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1424											Mean in Original Scale	N/A
1425											SD in Original Scale	N/A
1426											Mean in Log Scale	N/A
1427											SD in Log Scale	N/A
1428											95% UTL 95% Coverage	N/A
1429											95% UPL (t)	N/A
1430											90% Percentile (z)	N/A

	A	B	C	D	E	F	G	H	I	J	K	L
1431											95% Percentile (z)	N/A
1432											99% Percentile (z)	N/A
1433												
1434				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
1435					k star (bias corrected)	N/A				Data do not follow a Discernable Distribution (0.05)		
1436					Theta Star	N/A						
1437					nu star	N/A						
1438												
1439					A-D Test Statistic	N/A				Nonparametric Statistics		
1440					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1441					K-S Test Statistic	N/A					Mean	1.5
1442					5% K-S Critical Value	N/A					SD	0.5
1443				Data not Gamma Distributed at 5% Significance Level							SE of Mean	0.5
1444											95% KM UTL with 95% Coverage	2.868
1445				Assuming Gamma Distribution							95% KM Chebyshev UPL	3.768
1446					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	2.435
1447					Mean	N/A					90% Percentile (z)	2.141
1448					Median	N/A					95% Percentile (z)	2.322
1449					SD	N/A					99% Percentile (z)	2.663
1450					k star	N/A						
1451					Theta star	N/A				Gamma ROS Limits with Extrapolated Data		
1452					Nu star	N/A					95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
1453					95% Percentile of Chisquare (2k)	N/A					95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
1454											95% WH Approx. Gamma UTL with 95% Coverage	N/A
1455					90% Percentile	N/A					95% HW Approx. Gamma UTL with 95% Coverage	N/A
1456					95% Percentile	N/A						
1457					99% Percentile	N/A						
1458												
1459	Note: DL/2 is not a recommended method.											
1460												
1461												
1462	DIESEL RANGE ORGANICS											
1463												
1464					General Statistics							
1465					Number of Valid Data	16					Number of Detected Data	5
1466					Number of Distinct Detected Data	5					Number of Non-Detect Data	11
1467					Tolerance Factor	2.524					Percent Non-Detects	68.75%
1468					Number of Missing Values	2						
1469												
1470				Raw Statistics						Log-transformed Statistics		
1471					Minimum Detected	55					Minimum Detected	4.007
1472					Maximum Detected	200					Maximum Detected	5.298
1473					Mean of Detected	135					Mean of Detected	4.757
1474					SD of Detected	71.59					SD of Detected	0.648
1475					Minimum Non-Detect	50					Minimum Non-Detect	3.912
1476					Maximum Non-Detect	55					Maximum Non-Detect	4.007
1477												
1478				Data with Multiple Detection Limits						Single Detection Limit Scenario		
1479				Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect with Single DL	11
1480				For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected with Single DL	5
1481				Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	68.75%
1482												
1483												
1484					Warning: There are only 5 Detected Values in this data							
1485					Note: It should be noted that even though bootstrap may be performed on this data set							

	A	B	C	D	E	F	G	H	I	J	K	L
1486	the resulting calculations may not be reliable enough to draw conclusions											
1487												
1488	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1489												
1490	Background Statistics											
1491	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1492					Shapiro Wilk Test Statistic	0.796				Shapiro Wilk Test Statistic		0.769
1493					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1494	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1495												
1496	Assuming Normal Distribution						Assuming Lognormal Distribution					
1497					DL/2 Substitution Method					DL/2 Substitution Method		
1498					Mean	60.47				Mean (Log Scale)		3.741
1499					SD	63.73				SD (Log Scale)		0.783
1500					95% UTL 95% Coverage	221.3				95% UTL 95% Coverage		304.2
1501					95% UPL (t)	175.6				95% UPL (t)		173.5
1502					90% Percentile (z)	142.1				90% Percentile (z)		115
1503					95% Percentile (z)	165.3				95% Percentile (z)		152.8
1504					99% Percentile (z)	208.7				99% Percentile (z)		260.6
1505												
1506					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1507					Mean	-5.409				Mean in Original Scale		53.33
1508					SD	123.8				SD in Original Scale		68.39
1509					95% UTL with 95% Coverage	307.1				95% UTL with 95% Coverage		628.2
1510										95% BCA UTL with 95% Coverage		200
1511										95% Bootstrap (%) UTL with 95% Coverage		200
1512					95% UPL (t)	218.3				95% UPL (t)		253
1513					90% Percentile (z)	153.3				90% Percentile (z)		129.9
1514					95% Percentile (z)	198.3				95% Percentile (z)		205.9
1515					99% Percentile (z)	282.7				99% Percentile (z)		488.9
1516												
1517	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1518					k star (bias corrected)	1.541	Data appear Normal at 5% Significance Level					
1519					Theta Star	87.58						
1520					nu star	15.41						
1521												
1522					A-D Test Statistic	0.69	Nonparametric Statistics					
1523					5% A-D Critical Value	0.682				Kaplan-Meier (KM) Method		
1524					K-S Test Statistic	0.334				Mean		80
1525					5% K-S Critical Value	0.359				SD		51.54
1526	Data follow Appx. Gamma Distribution at 5% Significance Level									SE of Mean		14.41
1527										95% KM UTL with 95% Coverage		210.1
1528	Assuming Gamma Distribution									95% KM Chebyshev UPL		311.6
1529					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		173.1
1530					Mean	42.19				90% Percentile (z)		146
1531					Median	0.000001				95% Percentile (z)		164.8
1532					SD	74.45				99% Percentile (z)		199.9
1533					k star	0.1						
1534					Theta star	421.8	Gamma ROS Limits with Extrapolated Data					
1535					Nu star	3.201				95% Wilson Hilferty (WH) Approx. Gamma UPL		211.3
1536					95% Percentile of Chisquare (2k)	1.161				95% Hawkins Wixley (HW) Approx. Gamma UPL		241.6
1537										95% WH Approx. Gamma UTL with 95% Coverage		456.6
1538					90% Percentile	112.3				95% HW Approx. Gamma UTL with 95% Coverage		669.6
1539					95% Percentile	244.9						
1540					99% Percentile	670.1						

	A	B	C	D	E	F	G	H	I	J	K	L
1541												
1542	Note: DL/2 is not a recommended method.											
1543												
1544												
1545	GASOLINE RANGE ORGANICS											
1546												
1547					General Statistics							
1548					Number of Valid Data	12				Number of Detected Data	5	
1549					Number of Distinct Detected Data	4				Number of Non-Detect Data	7	
1550					Tolerance Factor	2.736				Percent Non-Detects	58.33%	
1551												
1552					Raw Statistics					Log-transformed Statistics		
1553					Minimum Detected	11				Minimum Detected	2.398	
1554					Maximum Detected	47				Maximum Detected	3.85	
1555					Mean of Detected	23				Mean of Detected	2.983	
1556					SD of Detected	14.71				SD of Detected	0.61	
1557					Minimum Non-Detect	10				Minimum Non-Detect	2.303	
1558					Maximum Non-Detect	24				Maximum Non-Detect	3.178	
1559												
1560					Data with Multiple Detection Limits					Single Detection Limit Scenario		
1561					Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect with Single DL	10	
1562					For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected with Single DL	2	
1563					Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	83.33%	
1564												
1565												
1566					Warning: There are only 4 Distinct Detected Values in this data							
1567					Note: It should be noted that even though bootstrap may be performed on this data set							
1568					the resulting calculations may not be reliable enough to draw conclusions							
1569												
1570					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
1571												
1572					Background Statistics							
1573					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
1574					Shapiro Wilk Test Statistic	0.846				Shapiro Wilk Test Statistic	0.895	
1575					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value	0.762	
1576					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
1577												
1578					Assuming Normal Distribution					Assuming Lognormal Distribution		
1579					DL/2 Substitution Method					DL/2 Substitution Method		
1580					Mean	13.08				Mean (Log Scale)	2.255	
1581					SD	12.62				SD (Log Scale)	0.78	
1582					95% UTL 95% Coverage	47.6				95% UTL 95% Coverage	80.51	
1583					95% UPL (t)	36.67				95% UPL (t)	40.95	
1584					90% Percentile (z)	29.25				90% Percentile (z)	25.9	
1585					95% Percentile (z)	33.84				95% Percentile (z)	34.38	
1586					99% Percentile (z)	42.43				99% Percentile (z)	58.49	
1587												
1588					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1589										Mean in Original Scale	12.15	
1590										SD in Original Scale	13.14	
1591										Mean in Log Scale	2.045	
1592										SD in Log Scale	0.987	
1593										95% UTL 95% Coverage	115.1	
1594										95% UPL (t)	48.92	
1595										90% Percentile (z)	27.39	

	A	B	C	D	E	F	G	H	I	J	K	L
1596											95% Percentile (z)	39.2
1597											99% Percentile (z)	76.81
1598												
1599				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1600					k star (bias corrected)	1.508				Data appear Normal at 5% Significance Level		
1601					Theta Star	15.25						
1602					nu star	15.08						
1603												
1604					A-D Test Statistic	0.388				**Nonparametric Statistics**		
1605					5% A-D Critical Value	0.682					Kaplan-Meier (KM) Method	
1606					K-S Test Statistic	0.248					Mean	16.1
1607					5% K-S Critical Value	0.359					SD	10.36
1608				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	3.36
1609											95% KM UTL with 95% Coverage	44.44
1610				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	63.09
1611					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	35.46
1612					Mean	9.583					90% Percentile (z)	29.37
1613					Median	0.000001					95% Percentile (z)	33.14
1614					SD	14.8					99% Percentile (z)	40.19
1615					k star	0.123						
1616					Theta star	77.61				**Gamma ROS Limits with Extrapolated Data**		
1617					Nu star	2.964					95% Wilson Hilferty (WH) Approx. Gamma UPL	57.74
1618					95% Percentile of Chisquare (2k)	1.404					95% Hawkins Wixley (HW) Approx. Gamma UPL	76.45
1619											95% WH Approx. Gamma UTL with 95% Coverage	134.5
1620					90% Percentile	27.36					95% HW Approx. Gamma UTL with 95% Coverage	233.4
1621					95% Percentile	54.48						
1622					99% Percentile	136.7						
1623												
1624	Note: DL/2 is not a recommended method.											
1625												

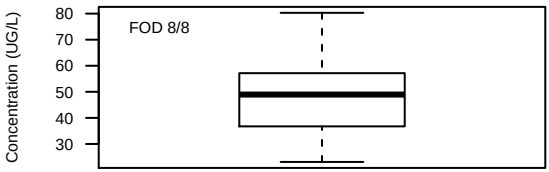
ATTACHMENT D

FACILITY BACKGROUND SALINE/BRACKISH GROUNDWATER STATISTICS

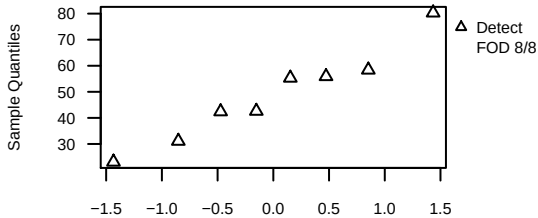
D.1 SALINE/BRACKISH GROUNDWATER OUTLIER ANALYSIS

BARIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 1 OF 17

BOXPLOT

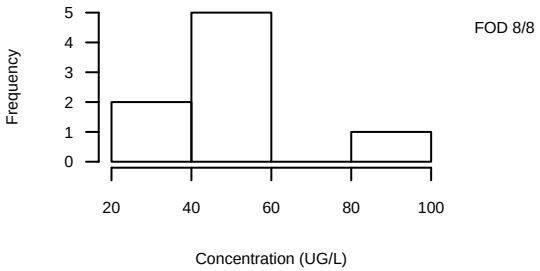


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0.83

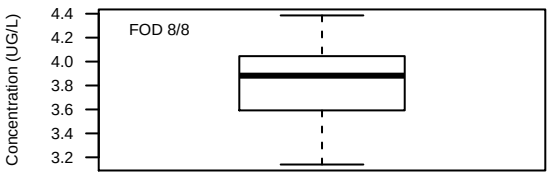
HISTOGRAM



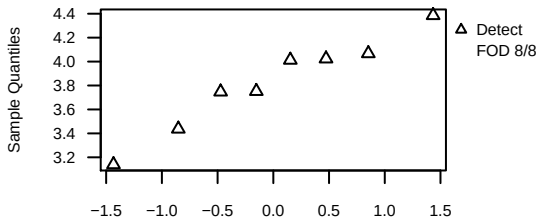
SUMMARY STATISTICS

Minimum	23.1
1st Quantile	39.57
Median	48.95
3rd Quantile	56.52
Maximum	80.3
FOD	8/8

BOXPLOT OF LOGNORMAL CONCENTRATIONS

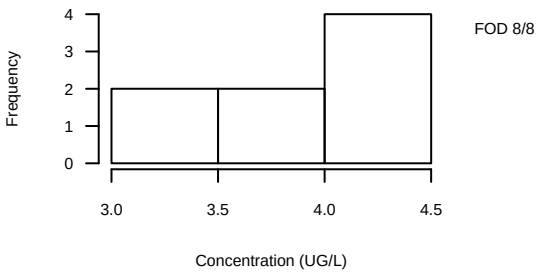


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.78

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

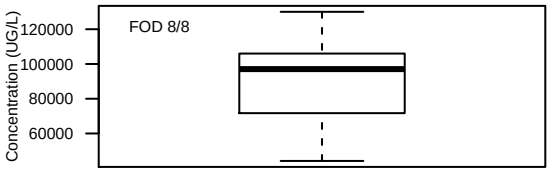


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

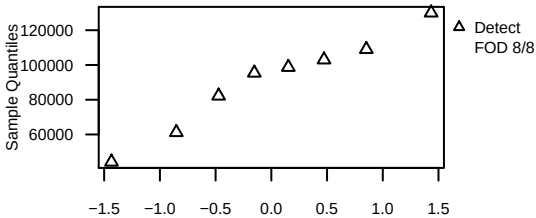
Minimum	3.14
1st Quantile	3.67
Median	3.88
3rd Quantile	4.04
Maximum	4.39
FOD	8/8

CALCIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 2 OF 17

BOXPLOT

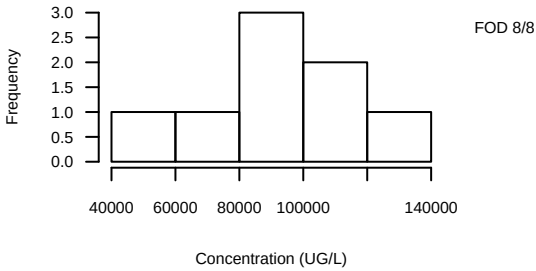


NORMAL PROBABILITY PLOT



Shapiro Wilk P−Value = 0.83

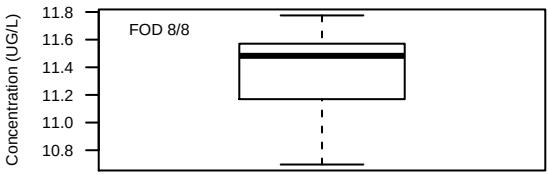
HISTOGRAM



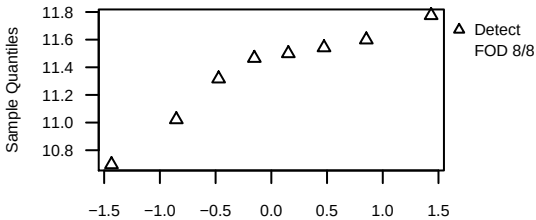
SUMMARY STATISTICS

Minimum	44200
1st Quantile	76950
Median	97050
3rd Quantile	104500
Maximum	130000
FOD	8/8

BOXPLOT OF LOGNORMAL CONCENTRATIONS

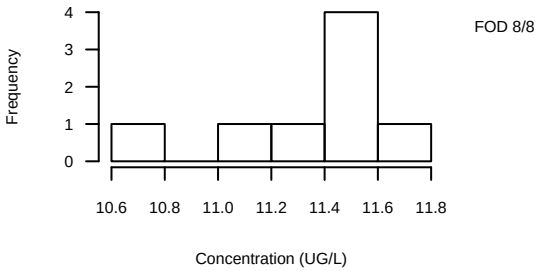


NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



Shapiro Wilk P−Value 0.32

HISTOGRAM OF LOGNORMAL CONCENTRATIONS

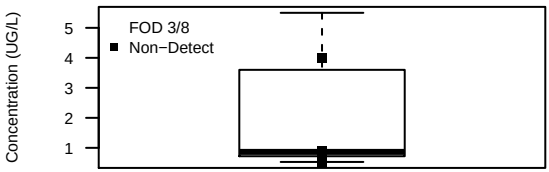


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

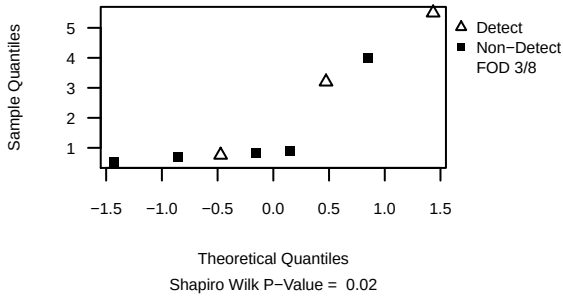
Minimum	10.7
1st Quantile	11.24
Median	11.48
3rd Quantile	11.56
Maximum	11.78
FOD	8/8

CHROMIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 3 OF 17

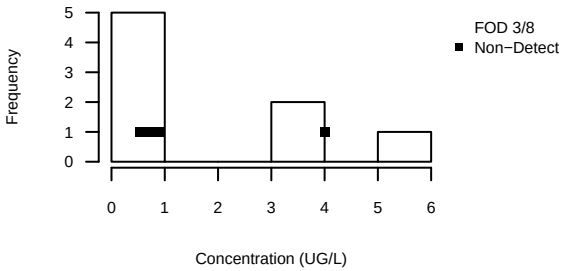
BOXPLOT



NORMAL PROBABILITY PLOT



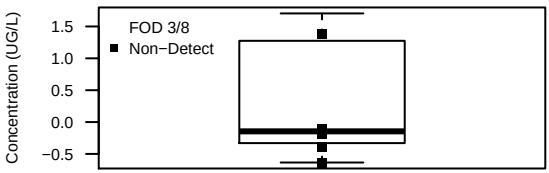
HISTOGRAM



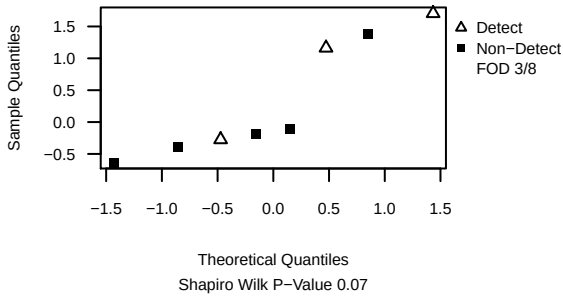
SUMMARY STATISTICS

Minimum	0.53
1st Quantile	0.74
Median	0.86
3rd Quantile	3.4
Maximum	5.5
FOD	3/8

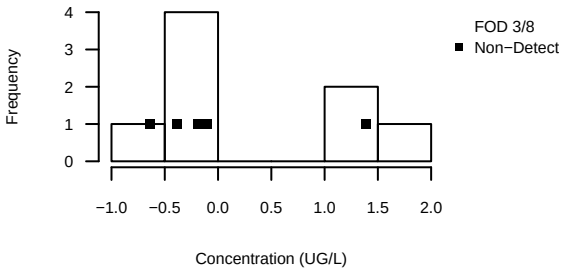
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

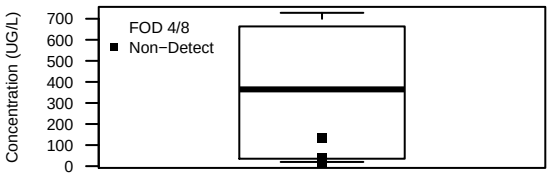


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

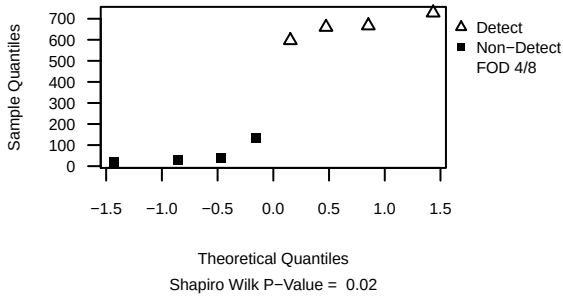
Minimum	−0.63
1st Quantile	−0.3
Median	−0.15
3rd Quantile	1.22
Maximum	1.7
FOD	3/8

IRON SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 4 OF 17

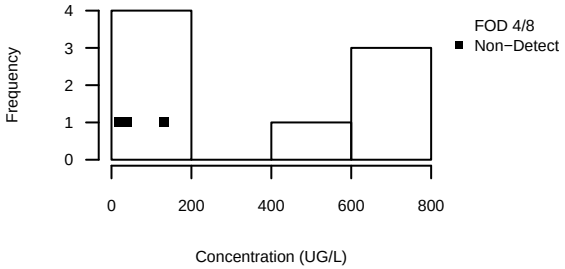
BOXPLOT



NORMAL PROBABILITY PLOT



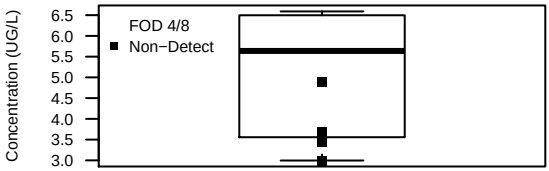
HISTOGRAM



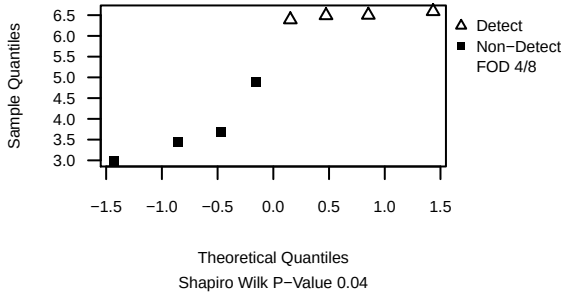
SUMMARY STATISTICS

Minimum	20
1st Quantile	37.48
Median	364.5
3rd Quantile	661.8
Maximum	728
FOD	4/8

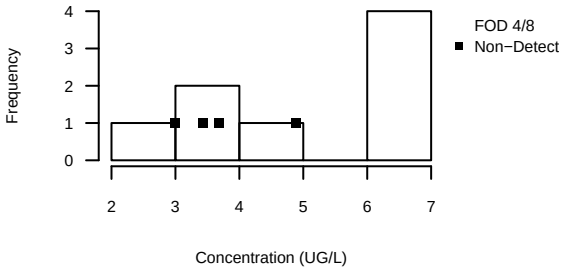
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

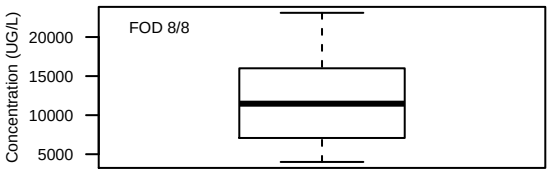


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

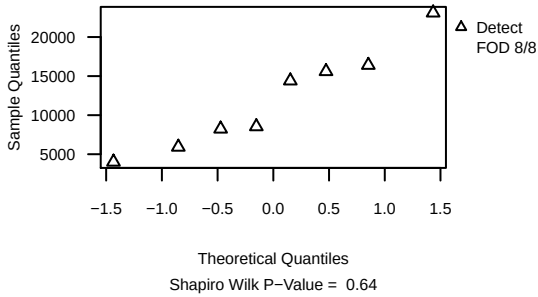
Minimum	3
1st Quantile	3.62
Median	5.64
3rd Quantile	6.5
Maximum	6.59
FOD	4/8

MAGNESIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 5 OF 17

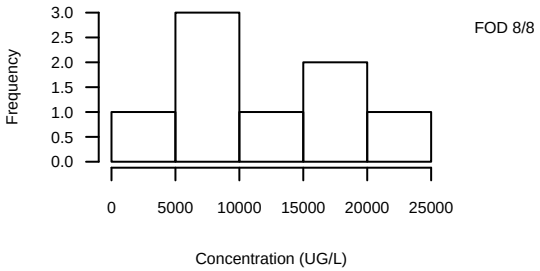
BOXPLOT



NORMAL PROBABILITY PLOT



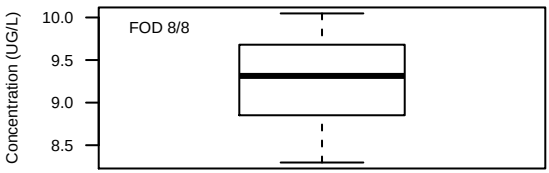
HISTOGRAM



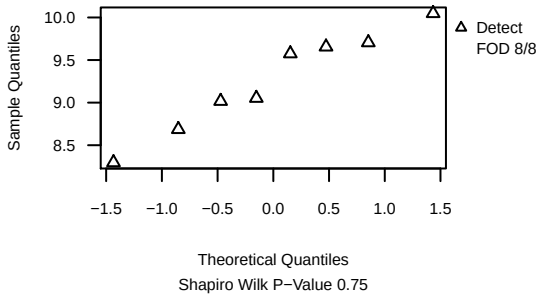
SUMMARY STATISTICS

Minimum	4010
1st Quantile	7660
Median	11470
3rd Quantile	15800
Maximum	23100
FOD	8/8

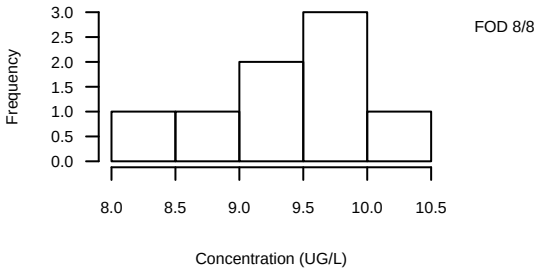
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

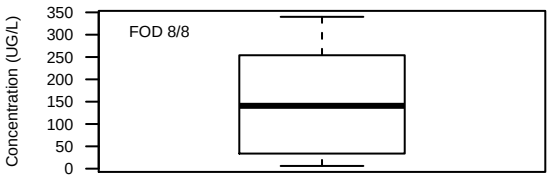


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

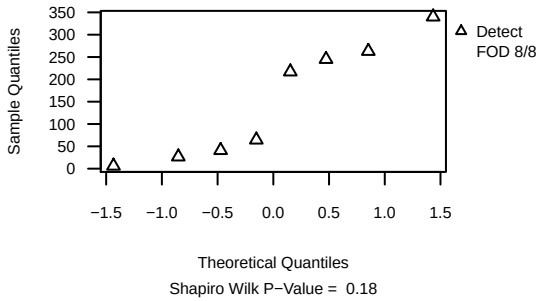
Minimum	8.3
1st Quantile	8.93
Median	9.31
3rd Quantile	9.67
Maximum	10.05
FOD	8/8

MANGANESE SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 6 OF 17

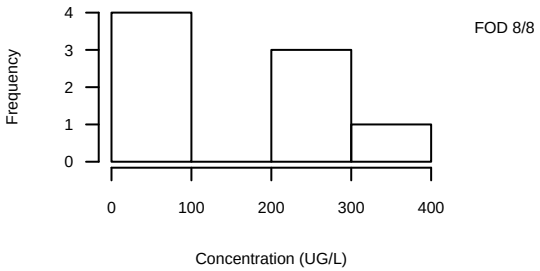
BOXPLOT



NORMAL PROBABILITY PLOT



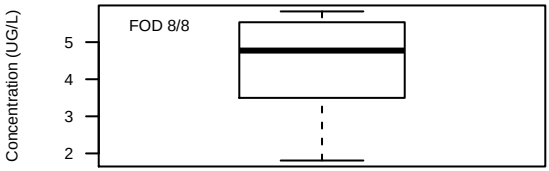
HISTOGRAM



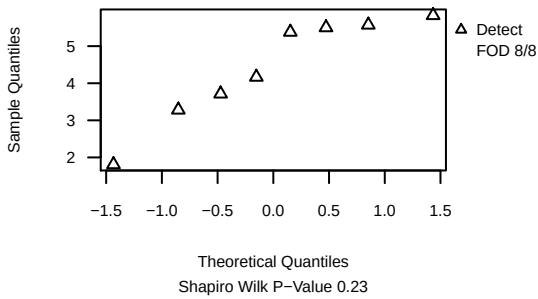
SUMMARY STATISTICS

Minimum	6.1
1st Quantile	37.4
Median	140.8
3rd Quantile	249.5
Maximum	340
FOD	8/8

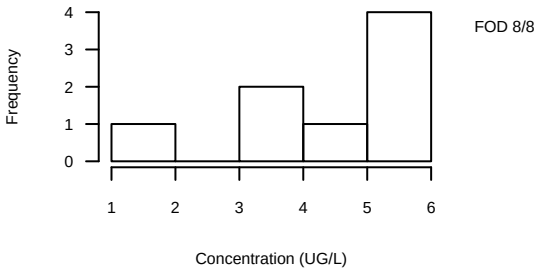
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

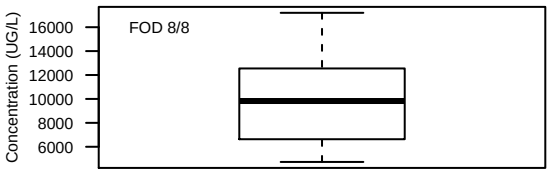


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

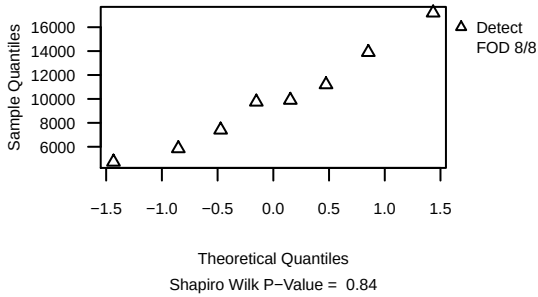
Minimum	1.81
1st Quantile	3.6
Median	4.77
3rd Quantile	5.52
Maximum	5.83
FOD	8/8

POTASSIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 7 OF 17

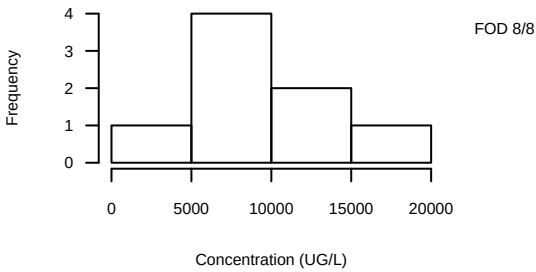
BOXPLOT



NORMAL PROBABILITY PLOT



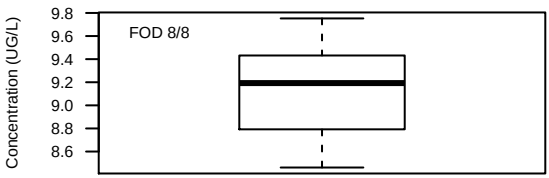
HISTOGRAM



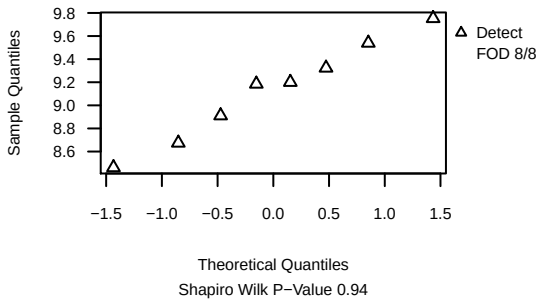
SUMMARY STATISTICS

Minimum	4730
1st Quantile	7020
Median	9825
3rd Quantile	11880
Maximum	17200
FOD	8/8

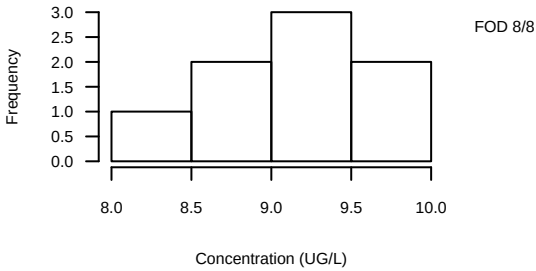
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

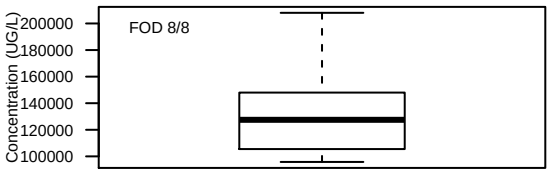


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

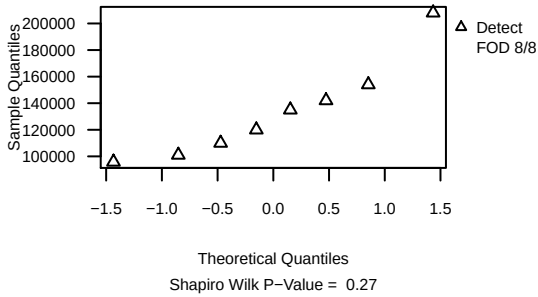
Minimum	8.46
1st Quantile	8.85
Median	9.19
3rd Quantile	9.38
Maximum	9.75
FOD	8/8

SODIUM SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 8 OF 17

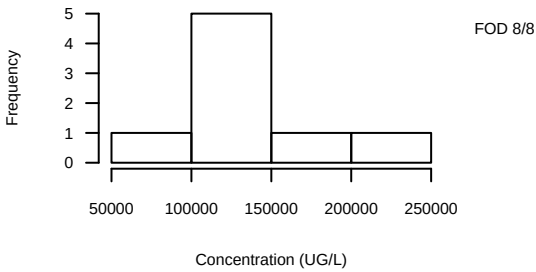
BOXPLOT



NORMAL PROBABILITY PLOT



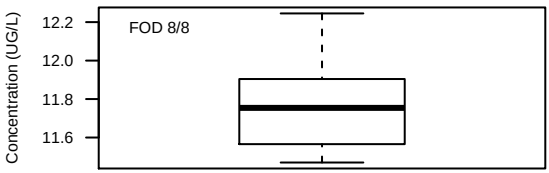
HISTOGRAM



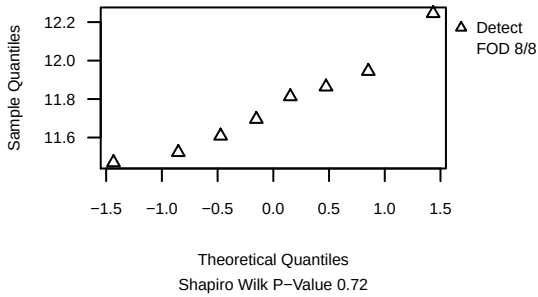
SUMMARY STATISTICS

Minimum	95800
1st Quantile	107800
Median	127500
3rd Quantile	145000
Maximum	208000
FOD	8/8

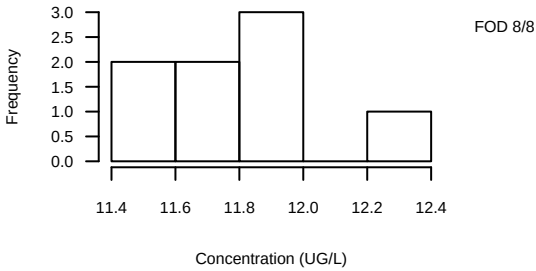
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

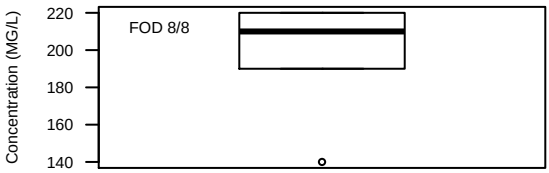


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

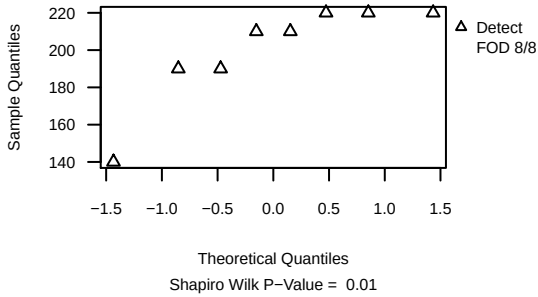
Minimum	11.47
1st Quantile	11.59
Median	11.75
3rd Quantile	11.88
Maximum	12.25
FOD	8/8

ALKALINITY SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 9 OF 17

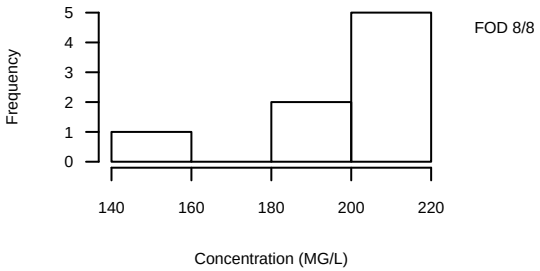
BOXPLOT



NORMAL PROBABILITY PLOT



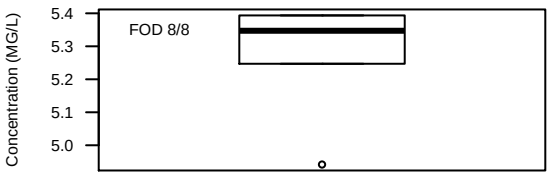
HISTOGRAM



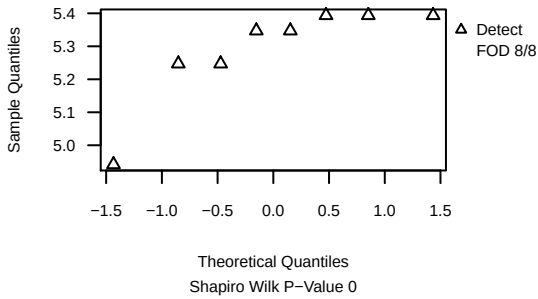
SUMMARY STATISTICS

Minimum	140
1st Quantile	190
Median	210
3rd Quantile	220
Maximum	220
FOD	8/8

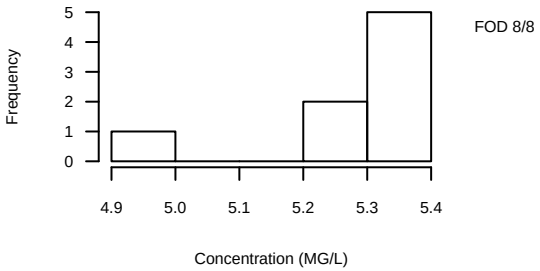
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

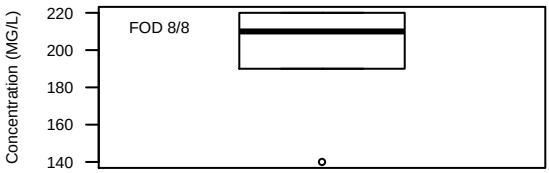


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

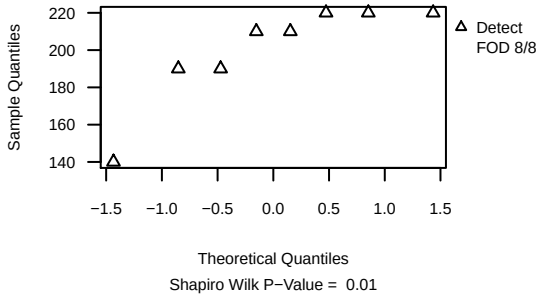
Minimum	4.94
1st Quantile	5.25
Median	5.35
3rd Quantile	5.39
Maximum	5.39
FOD	8/8

CARBONATE ALKALINITY SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 10 OF 17

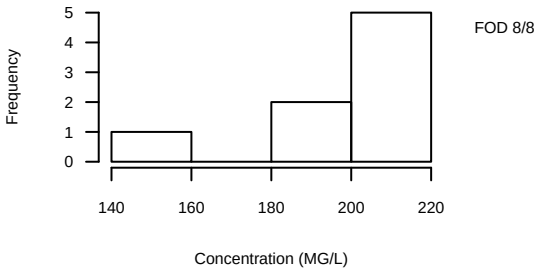
BOXPLOT



NORMAL PROBABILITY PLOT



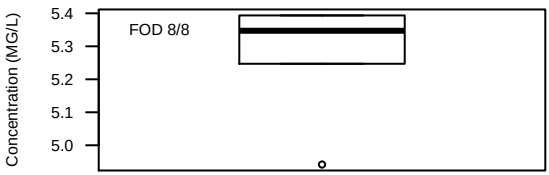
HISTOGRAM



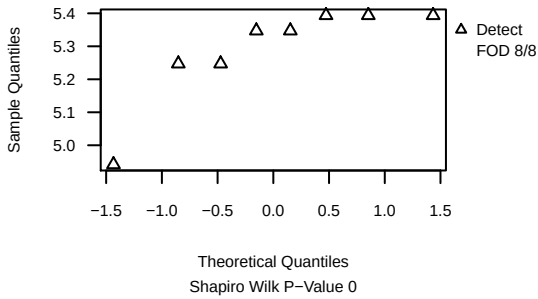
SUMMARY STATISTICS

Minimum	140
1st Quantile	190
Median	210
3rd Quantile	220
Maximum	220
FOD	8/8

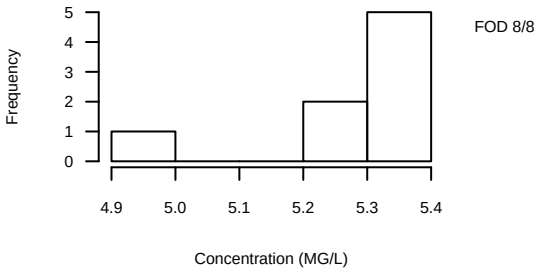
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

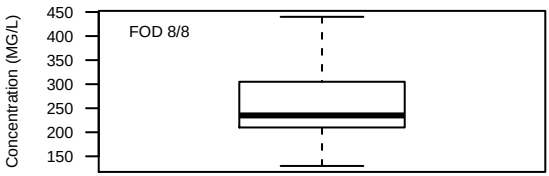


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

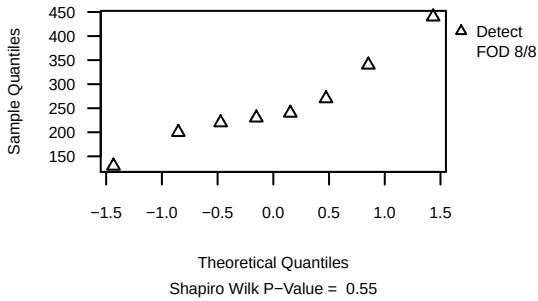
Minimum	4.94
1st Quantile	5.25
Median	5.35
3rd Quantile	5.39
Maximum	5.39
FOD	8/8

CHLORIDE SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 11 OF 17

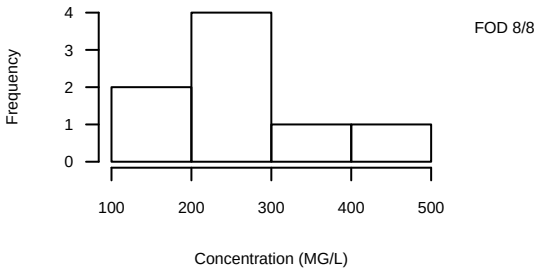
BOXPLOT



NORMAL PROBABILITY PLOT



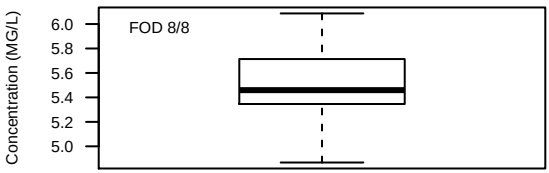
HISTOGRAM



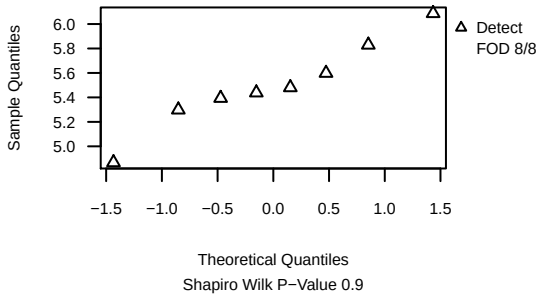
SUMMARY STATISTICS

Minimum	130
1st Quantile	215
Median	235
3rd Quantile	287.5
Maximum	440
FOD	8/8

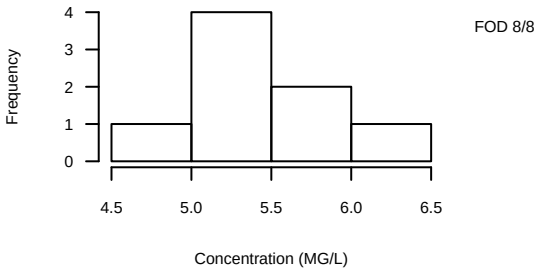
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

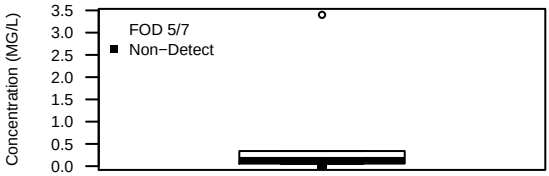


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

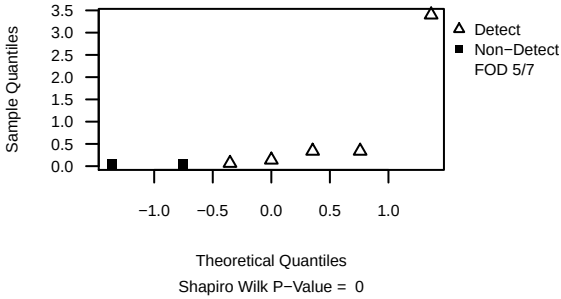
Minimum	4.87
1st Quantile	5.37
Median	5.46
3rd Quantile	5.66
Maximum	6.09
FOD	8/8

NITRATE SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 12 OF 17

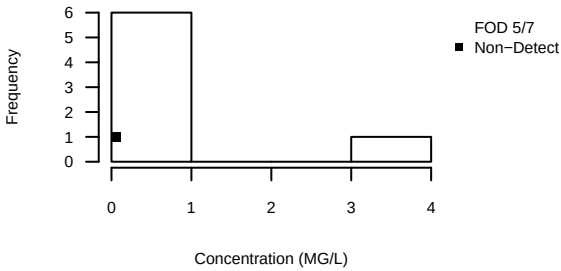
BOXPLOT



NORMAL PROBABILITY PLOT



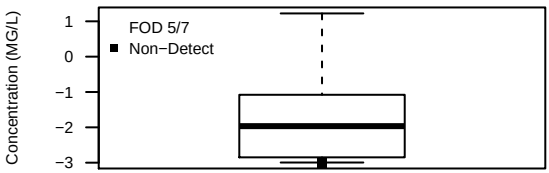
HISTOGRAM



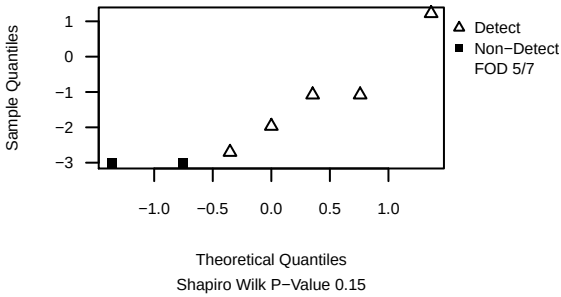
SUMMARY STATISTICS

Minimum	0.05
1st Quantile	0.06
Median	0.14
3rd Quantile	0.34
Maximum	3.4
FOD	5/7

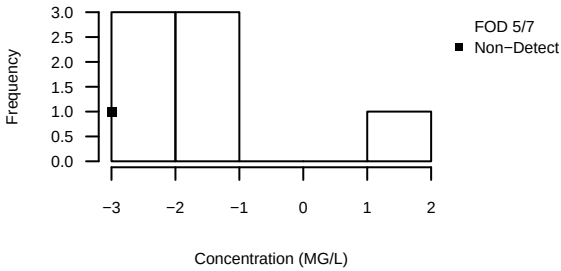
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

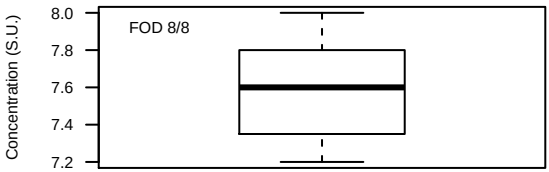


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

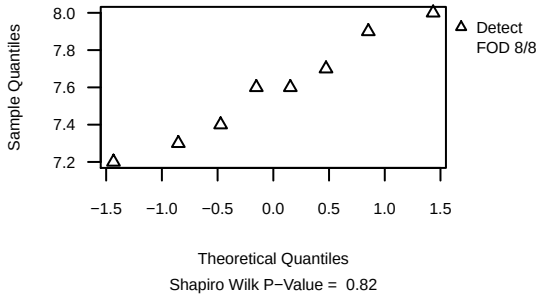
Minimum	−3
1st Quantile	−2.85
Median	−1.97
3rd Quantile	−1.08
Maximum	1.22
FOD	5/7

PH SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 13 OF 17

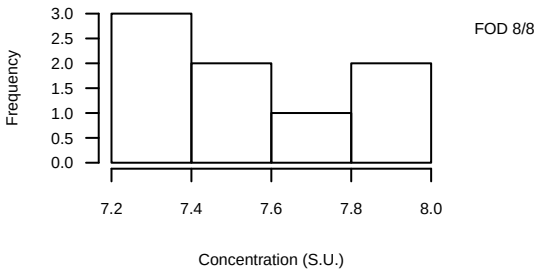
BOXPLOT



NORMAL PROBABILITY PLOT



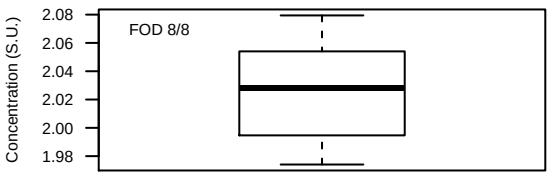
HISTOGRAM



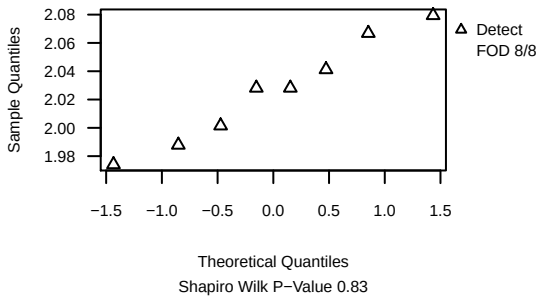
SUMMARY STATISTICS

Minimum	7.2
1st Quantile	7.38
Median	7.6
3rd Quantile	7.75
Maximum	8
FOD	8/8

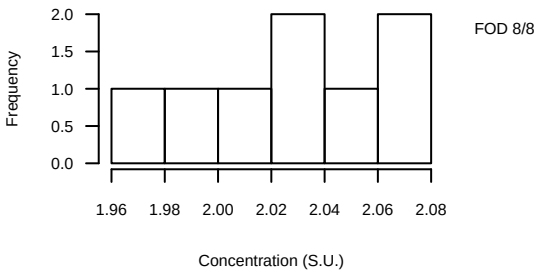
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

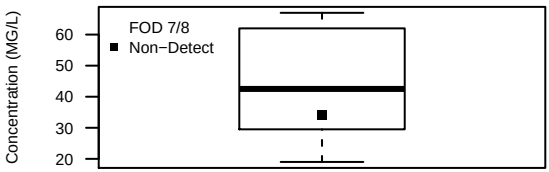


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

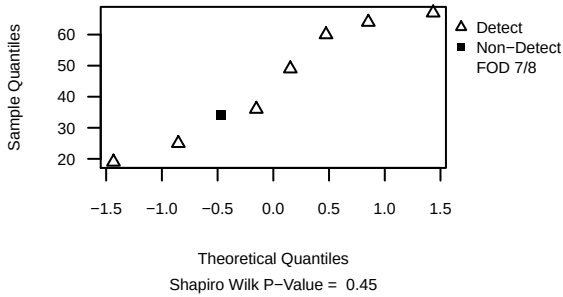
Minimum	1.97
1st Quantile	2
Median	2.03
3rd Quantile	2.05
Maximum	2.08
FOD	8/8

SULFATE SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 14 OF 17

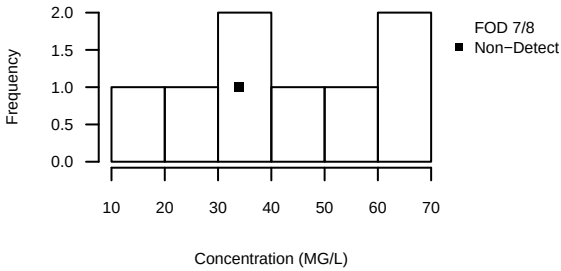
BOXPLOT



NORMAL PROBABILITY PLOT



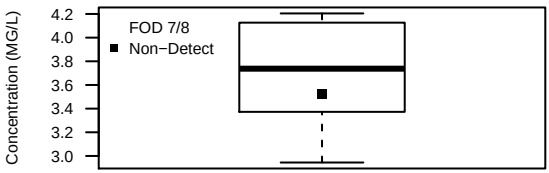
HISTOGRAM



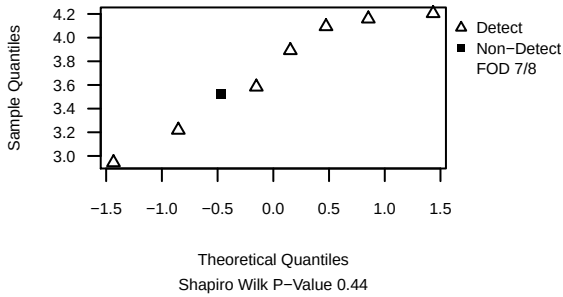
SUMMARY STATISTICS

Minimum	19
1st Quantile	31.75
Median	42.5
3rd Quantile	61
Maximum	67
FOD	7/8

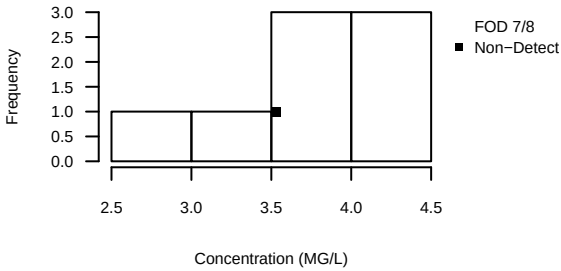
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

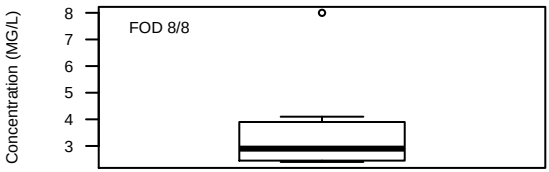


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

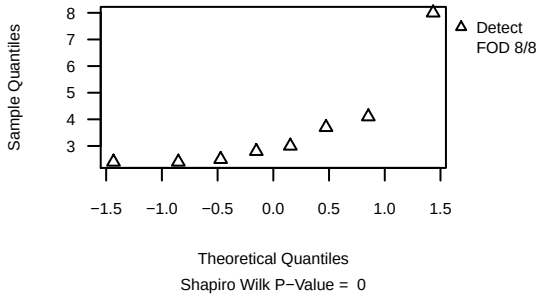
Minimum	2.94
1st Quantile	3.45
Median	3.74
3rd Quantile	4.11
Maximum	4.21
FOD	7/8

TOTAL ORGANIC CARBON SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 15 OF 17

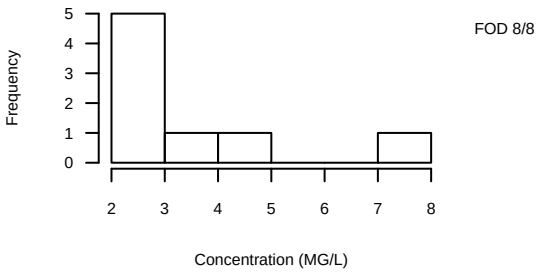
BOXPLOT



NORMAL PROBABILITY PLOT



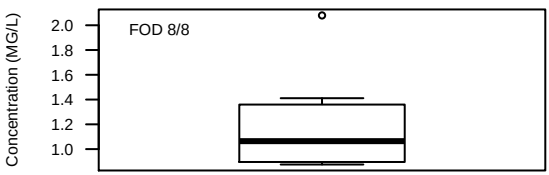
HISTOGRAM



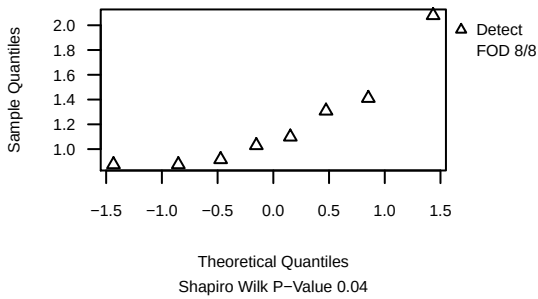
SUMMARY STATISTICS

Minimum	2.4
1st Quantile	2.48
Median	2.9
3rd Quantile	3.8
Maximum	8
FOD	8/8

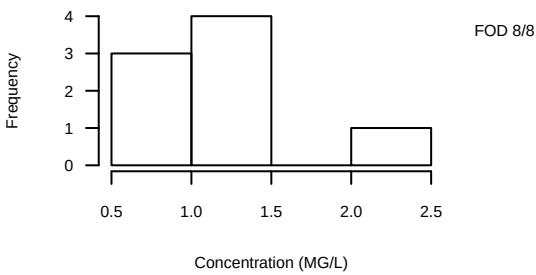
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS

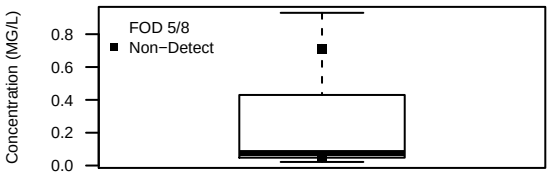


SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

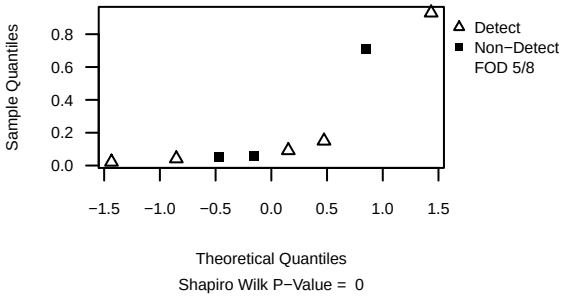
Minimum	0.88
1st Quantile	0.91
Median	1.06
3rd Quantile	1.33
Maximum	2.08
FOD	8/8

TOTAL ORGANIC HALIDES SALINE BRACKISH GROUNDWATER BACKGROUND OUTLIER ANALYSIS
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE
FIGURE 16 OF 17

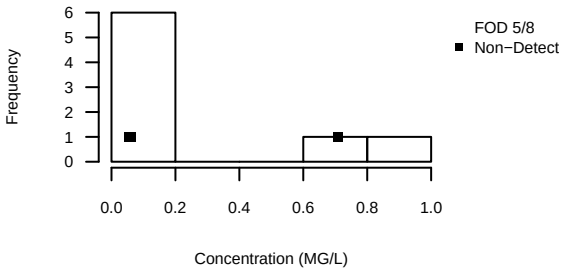
BOXPLOT



NORMAL PROBABILITY PLOT



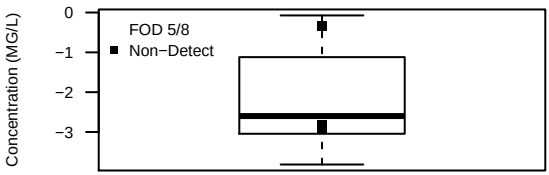
HISTOGRAM



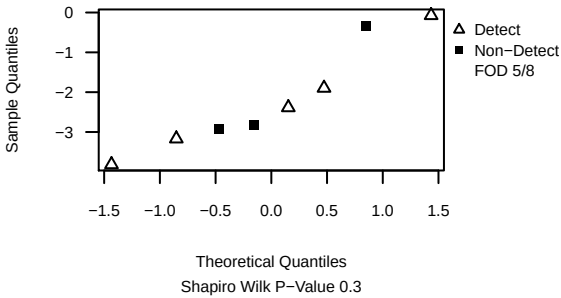
SUMMARY STATISTICS

Minimum	0.02
1st Quantile	0.05
Median	0.08
3rd Quantile	0.29
Maximum	0.93
FOD	5/8

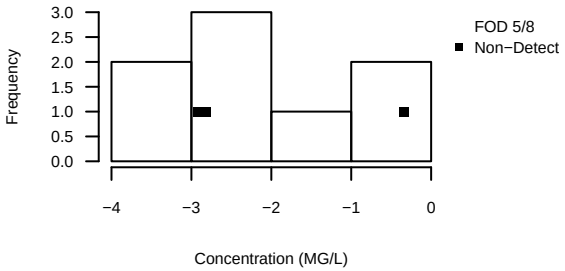
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



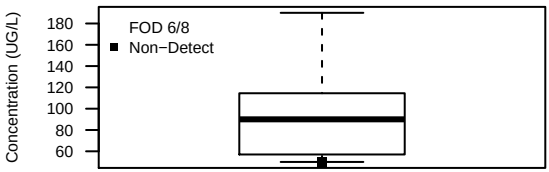
HISTOGRAM OF LOGNORMAL CONCENTRATIONS



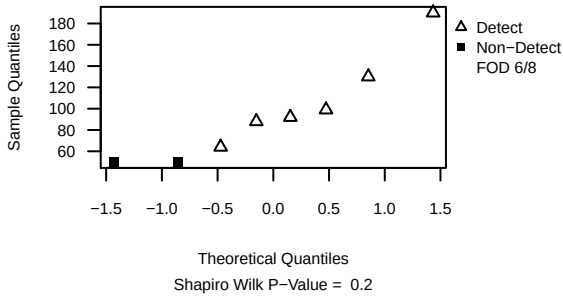
SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	−3.82
1st Quantile	−2.98
Median	−2.6
3rd Quantile	−1.51
Maximum	−0.07
FOD	5/8

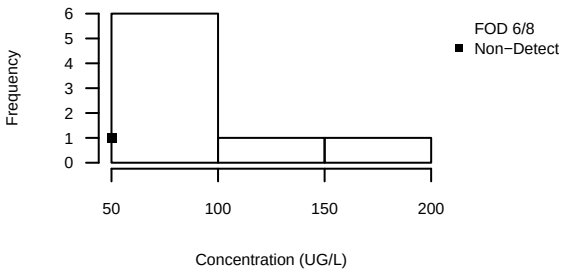
BOXPLOT



NORMAL PROBABILITY PLOT



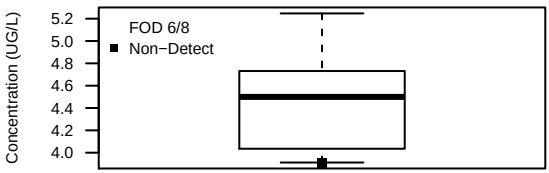
HISTOGRAM



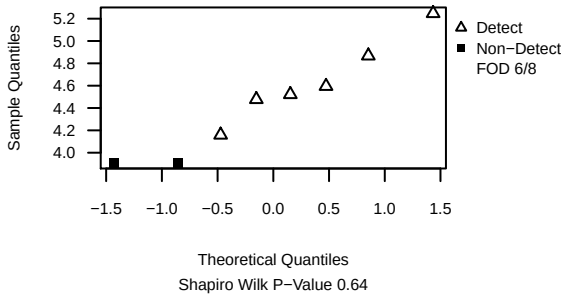
SUMMARY STATISTICS

Minimum	50
1st Quantile	60.5
Median	90
3rd Quantile	106.8
Maximum	190
FOD	6/8

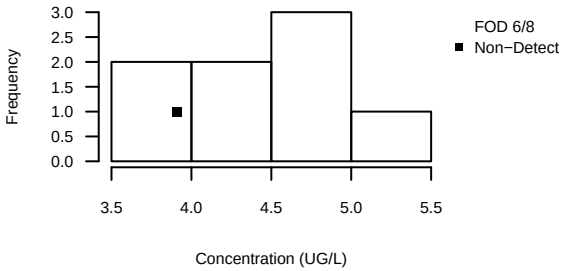
BOXPLOT OF LOGNORMAL CONCENTRATIONS



NORMAL PROBABILITY PLOT OF LOGNORMAL CONCENTRATIONS



HISTOGRAM OF LOGNORMAL CONCENTRATIONS



SUMMARY STATISTICS OF LOGNORMAL CONCENTRATIONS

Minimum	3.91
1st Quantile	4.1
Median	4.5
3rd Quantile	4.66
Maximum	5.25
FOD	6/8

TABLE D-1
FACILITY BACKGROUND SALINE/BRACKISH GROUNDWATER OUTLIER EVALUATION
FACILITY BACKGROUND TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

PARAMETER	FOD	DATA DISTRIBUTION	POTENTIAL OUTLIER	OUTLIER TEST	OUTLIER TEST RESULT
TOTAL METALS (µg/L)					
BARIUM	8/8	Normal	None	NA	NA
CALCIUM	8/8	Normal	None	NA	NA
CHROMIUM	3/8	Lognormal	None	NA	NA
IRON	4/8	Nonparametric	None	NA	NA
MAGNESIUM	8/8	Normal	None	NA	NA
MANGANESE	8/8	Normal	None	NA	NA
POTASSIUM	8/8	Normal	None	NA	NA
SODIUM	8/8	Normal	None	NA	NA
MISCELLANEOUS (µg/L)					
ALKALINITY	8/8	Nonparametric	None	NA	NA
CARBONATE ALKALINITY	8/8	Nonparametric	None	NA	NA
CHLORIDE	8/8	Normal	None	NA	NA
NITRATE	5/7	Lognormal	None	NA	NA
PH	8/8	Normal	None	NA	NA
SULFATE	7/8	Normal	None	NA	NA
TOTAL ORGANIC CARBON	8/8	Nonparametric	None	NA	NA
TOTAL ORGANIC HALIDES	5/8	Lognormal	None	NA	NA
PETROLEUM (µg/L)					
DIESEL RANGE ORGANICS	6/8	Normal	None	NA	NA

D.2 SALINE/BRACKISH GROUNDWATER UCLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	M CHROMIUM											
10												
11						General Statistics						
12						Number of Valid Data	8			Number of Detected Data		3
13						Number of Distinct Detected Data	3			Number of Non-Detect Data		5
14										Percent Non-Detects		62.50%
15												
16				Raw Statistics						Log-transformed Statistics		
17						Minimum Detected	0.76			Minimum Detected		-0.274
18						Maximum Detected	5.5			Maximum Detected		1.705
19						Mean of Detected	3.153			Mean of Detected		0.864
20						SD of Detected	2.37			SD of Detected		1.023
21						Minimum Non-Detect	0.53			Minimum Non-Detect		-0.635
22						Maximum Non-Detect	4			Maximum Non-Detect		1.386
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		7
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		87.50%
27												
28						Warning: There are only 3 Distinct Detected Values in this data set						
29						The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.						
30						Those methods will return a 'N/A' value on your output display!						
31												
32						It is necessary to have 4 or more Distinct Values for bootstrap methods.						
33						However, results obtained using 4 to 9 distinct values may not be reliable.						
34						It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.						
35												
36												
37						UCL Statistics						
38				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
39						Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic		0.936
40						5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value		0.767
41						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
42												
43				Assuming Normal Distribution						Assuming Lognormal Distribution		
44						DL/2 Substitution Method				DL/2 Substitution Method		
45						Mean	1.616			Mean		-0.0998
46						SD	1.88			SD		1.139
47						95% DL/2 (t) UCL	2.875			95% H-Stat (DL/2) UCL		8.784
48												
49						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
50						MLE method failed to converge properly				Mean in Log Scale		-0.424
51										SD in Log Scale		1.231
52										Mean in Original Scale		1.382
53										SD in Original Scale		1.94
54										95% t UCL		2.681
55										95% Percentile Bootstrap UCL		2.45

	A	B	C	D	E	F	G	H	I	J	K	L
56											95% BCA Bootstrap UCL	2.94
57											95% H-UCL	9.049
58												
59	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
60					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
61					Theta Star	N/A						
62					nu star	N/A						
63												
64					A-D Test Statistic	N/A	Nonparametric Statistics					
65					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
66					K-S Test Statistic	N/A					Mean	1.708
67					5% K-S Critical Value	N/A					SD	1.667
68	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.737
69											95% KM (t) UCL	3.105
70	Assuming Gamma Distribution										95% KM (z) UCL	2.921
71					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.523
72					Minimum	N/A					95% KM (bootstrap t) UCL	2.305
73					Maximum	N/A					95% KM (BCA) UCL	5.5
74					Mean	N/A					95% KM (Percentile Bootstrap) UCL	5.5
75					Median	N/A					95% KM (Chebyshev) UCL	4.921
76					SD	N/A					97.5% KM (Chebyshev) UCL	6.312
77					k star	N/A					99% KM (Chebyshev) UCL	9.043
78					Theta star	N/A						
79					Nu star	N/A	Potential UCLs to Use					
80					AppChi2	N/A					95% KM (t) UCL	3.105
81					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	5.5
82					95% Adjusted Gamma UCL	N/A						
83	Note: DL/2 is not a recommended method.											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
87	For additional insight, the user may want to consult a statistician.											
88												
89												
90	M IRON											
91												
92	General Statistics											
93					Number of Valid Data	8					Number of Detected Data	4
94					Number of Distinct Detected Data	4					Number of Non-Detect Data	4
95											Percent Non-Detects	50.00%
96												
97	Raw Statistics						Log-transformed Statistics					
98					Minimum Detected	597					Minimum Detected	6.392
99					Maximum Detected	728					Maximum Detected	6.59
100					Mean of Detected	663					Mean of Detected	6.494
101					SD of Detected	53.56					SD of Detected	0.0812
102					Minimum Non-Detect	20					Minimum Non-Detect	2.996
103					Maximum Non-Detect	132					Maximum Non-Detect	4.883
104												
105	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
106	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	4
107	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	50.00%
108												
109	Warning: There are only 4 Distinct Detected Values in this data											
110	Note: It should be noted that even though bootstrap may be performed on this data set											

	A	B	C	D	E	F	G	H	I	J	K	L
111	the resulting calculations may not be reliable enough to draw conclusions											
112												
113	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
114												
115												
116	UCL Statistics											
117	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
118					Shapiro Wilk Test Statistic	0.966				Shapiro Wilk Test Statistic		0.964
119					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
120	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
121												
122	Assuming Normal Distribution						Assuming Lognormal Distribution					
123					DL/2 Substitution Method					DL/2 Substitution Method		
124					Mean	345.4				Mean		4.775
125					SD	341.7				SD		1.913
126					95% DL/2 (t) UCL	574.3				95% H-Stat (DL/2) UCL		52299
127												
128					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
129					Mean	217.2				Mean in Log Scale		6.371
130					SD	488.7				SD in Log Scale		0.142
131					95% MLE (t) UCL	544.6				Mean in Original Scale		590
132					95% MLE (Tiku) UCL	620.4				SD in Original Scale		85.56
133										95% t UCL		647.3
134										95% Percentile Bootstrap UCL		637.2
135										95% BCA Bootstrap UCL		641.2
136										95% H UCL		653.6
137												
138	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
139					k star (bias corrected)	50.96	Data appear Normal at 5% Significance Level					
140					Theta Star	13.01						
141					nu star	407.7						
142												
143					A-D Test Statistic	0.279	Nonparametric Statistics					
144					5% A-D Critical Value	0.657				Kaplan-Meier (KM) Method		
145					K-S Test Statistic	0.657				Mean		630
146					5% K-S Critical Value	0.394				SD		46.53
147	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		18.99
148										95% KM (t) UCL		666
149	Assuming Gamma Distribution									95% KM (z) UCL		661.2
150					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		674.2
151					Minimum	383.9				95% KM (bootstrap t) UCL		656.4
152					Maximum	728				95% KM (BCA) UCL		689.9
153					Mean	523.5				95% KM (Percentile Bootstrap) UCL		685.5
154					Median	490.5				95% KM (Chebyshev) UCL		712.8
155					SD	153.2				97.5% KM (Chebyshev) UCL		748.6
156					k star	8.392				99% KM (Chebyshev) UCL		819
157					Theta star	62.38						
158					Nu star	134.3	Potential UCLs to Use					
159					AppChi2	108.5				95% KM (t) UCL		666
160					95% Gamma Approximate UCL	647.8				95% KM (Percentile Bootstrap) UCL		685.5
161					95% Adjusted Gamma UCL	N/A						
162	Note: DL/2 is not a recommended method.											
163												
164	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
165	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											

For additional insight, the user may want to consult a statistician.

MISC NITRATE

General Statistics

Number of Valid Data	7	Number of Detected Data	5
Number of Distinct Detected Data	4	Number of Non-Detect Data	2
Number of Missing Values	1	Percent Non-Detects	28.57%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.067	Minimum Detected	-2.703
Maximum Detected	3.4	Maximum Detected	1.224
Mean of Detected	0.857	Mean of Detected	-1.121
SD of Detected	1.427	SD of Detected	1.476
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.62	Mean	-1.854
SD	1.234	SD	1.739
95% DL/2 (t) UCL	1.526	95% H-Stat (DL/2) UCL	47.63
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.327	Mean in Log Scale	-2.219
SD	1.434	SD in Log Scale	2.253
95% MLE (t) UCL	1.38	Mean in Original Scale	0.615
95% MLE (Tiku) UCL	1.413	SD in Original Scale	1.236
		95% t UCL	1.523
		95% Percentile Bootstrap UCL	1.498
		95% BCA Bootstrap UCL	1.966
		95% H UCL	1422

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	0.387	Data Follow Appr. Gamma Distribution at 5% Significance Level
Theta Star	2.216	
nu star	3.869	
A-D Test Statistic	0.591	**Nonparametric Statistics**
5% A-D Critical Value	0.704	Kaplan-Meier (KM) Method

	A	B	C	D	E	F	G	H	I	J	K	L
221					K-S Test Statistic	0.704					Mean	0.632
222					5% K-S Critical Value	0.369					SD	1.136
223	Data follow Appr. Gamma Distribution at 5% Significance Level										SE of Mean	0.48
224											95% KM (t) UCL	1.564
225			Assuming Gamma Distribution								95% KM (z) UCL	1.421
226				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	1.521
227					Minimum	0.000001					95% KM (bootstrap t) UCL	6.819
228					Maximum	3.4					95% KM (BCA) UCL	1.651
229					Mean	0.612					95% KM (Percentile Bootstrap) UCL	1.545
230					Median	0.14					95% KM (Chebyshev) UCL	2.724
231					SD	1.238					97.5% KM (Chebyshev) UCL	3.629
232					k star	0.196					99% KM (Chebyshev) UCL	5.408
233					Theta star	3.125						
234					Nu star	2.743			Potential UCLs to Use			
235					AppChi2	0.301					95% KM (Chebyshev) UCL	2.724
236					95% Gamma Approximate UCL	5.589						
237					95% Adjusted Gamma UCL	10.82						
238	Note: DL/2 is not a recommended method.											
239												
240	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
241	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
242	For additional insight, the user may want to consult a statistician.											
243												
244												
245	MISC TOTAL ORGANIC HALIDES											
246												
247					General Statistics							
248					Number of Valid Data	8					Number of Detected Data	5
249					Number of Distinct Detected Data	5					Number of Non-Detect Data	3
250											Percent Non-Detects	37.50%
251												
252					Raw Statistics						Log-transformed Statistics	
253					Minimum Detected	0.022					Minimum Detected	-3.817
254					Maximum Detected	0.93					Maximum Detected	-0.0726
255					Mean of Detected	0.247					Mean of Detected	-2.268
256					SD of Detected	0.385					SD of Detected	1.43
257					Minimum Non-Detect	0.054					Minimum Non-Detect	-2.919
258					Maximum Non-Detect	0.71					Maximum Non-Detect	-0.342
259												
260	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	7
261	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
262	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	87.50%
263												
264	Warning: There are only 5 Detected Values in this data											
265	Note: It should be noted that even though bootstrap may be performed on this data set											
266	the resulting calculations may not be reliable enough to draw conclusions											
267												
268	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
269												
270												
271					UCL Statistics							
272					Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only	
273					Shapiro Wilk Test Statistic	0.669					Shapiro Wilk Test Statistic	0.955
274					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
275					Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	

	A	B	C	D	E	F	G	H	I	J	K	L
276												
277				Assuming Normal Distribution						Assuming Lognormal Distribution		
278					DL/2 Substitution Method						DL/2 Substitution Method	
279					Mean	0.206					Mean	-2.437
280					SD	0.313					SD	1.353
281					95% DL/2 (t) UCL	0.416					95% H-Stat (DL/2) UCL	2.01
282												
283					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
284				MLE method failed to converge properly							Mean in Log Scale	-2.687
285											SD in Log Scale	1.239
286											Mean in Original Scale	0.168
287											SD in Original Scale	0.311
288											95% t UCL	0.376
289											95% Percentile Bootstrap UCL	0.379
290											95% BCA Bootstrap UCL	0.483
291											95% H-UCL	0.973
292												
293				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
294					k star (bias corrected)	0.411				Data appear Gamma Distributed at 5% Significance Level		
295					Theta Star	0.601						
296					nu star	4.112						
297												
298					A-D Test Statistic	0.445				Nonparametric Statistics		
299					5% A-D Critical Value	0.701					Kaplan-Meier (KM) Method	
300					K-S Test Statistic	0.701					Mean	0.17
301					5% K-S Critical Value	0.368					SD	0.29
302				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.115
303											95% KM (t) UCL	0.388
304				Assuming Gamma Distribution							95% KM (z) UCL	0.359
305					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.379
306					Minimum	0.000001					95% KM (bootstrap t) UCL	1.325
307					Maximum	0.93					95% KM (BCA) UCL	0.403
308					Mean	0.155					95% KM (Percentile Bootstrap) UCL	0.391
309					Median	0.032					95% KM (Chebyshev) UCL	0.672
310					SD	0.317					97.5% KM (Chebyshev) UCL	0.889
311					k star	0.21					99% KM (Chebyshev) UCL	1.315
312					Theta star	0.74						
313					Nu star	3.361				Potential UCLs to Use		
314					AppChi2	0.487					95% KM (BCA) UCL	0.403
315					95% Gamma Approximate UCL	1.073						
316					95% Adjusted Gamma UCL	1.834						
317	Note: DL/2 is not a recommended method.											
318												
319				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
320				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
321				For additional insight, the user may want to consult a statistician.								
322												
323												
324	PET DIESEL RANGE ORGANICS											
325												
326					General Statistics							
327					Number of Valid Data	8					Number of Detected Data	6
328					Number of Distinct Detected Data	6					Number of Non-Detect Data	2
329											Percent Non-Detects	25.00%
330												

	A	B	C	D	E	F	G	H	I	J	K	L
331	Raw Statistics						Log-transformed Statistics					
332					Minimum Detected	64				Minimum Detected		4.159
333					Maximum Detected	190				Maximum Detected		5.247
334					Mean of Detected	110.5				Mean of Detected		4.645
335					SD of Detected	44.37				SD of Detected		0.373
336					Minimum Non-Detect	50				Minimum Non-Detect		3.912
337					Maximum Non-Detect	50				Maximum Non-Detect		3.912
338												
339												
340	Warning: There are only 6 Detected Values in this data											
341	Note: It should be noted that even though bootstrap may be performed on this data set											
342	the resulting calculations may not be reliable enough to draw conclusions											
343												
344	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
345												
346												
347	UCL Statistics											
348	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
349					Shapiro Wilk Test Statistic	0.887				Shapiro Wilk Test Statistic		0.959
350					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
351	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
352												
353	Assuming Normal Distribution						Assuming Lognormal Distribution					
354					DL/2 Substitution Method					DL/2 Substitution Method		
355					Mean	89.13				Mean		4.288
356					SD	54.52				SD		0.731
357					95% DL/2 (t) UCL	125.6				95% H-Stat (DL/2) UCL		206.4
358												
359					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
360					Mean	87.12				Mean in Log Scale		4.406
361					SD	55.27				SD in Log Scale		0.547
362					95% MLE (t) UCL	124.1				Mean in Original Scale		92.97
363					95% MLE (Tiku) UCL	125.9				SD in Original Scale		49.68
364										95% t UCL		126.2
365										95% Percentile Bootstrap UCL		121.5
366										95% BCA Bootstrap UCL		126
367										95% H UCL		157.4
368												
369	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
370					k star (bias corrected)	4.332	Data appear Normal at 5% Significance Level					
371					Theta Star	25.51						
372					nu star	51.98						
373												
374					A-D Test Statistic	0.315	Nonparametric Statistics					
375					5% A-D Critical Value	0.698				Kaplan-Meier (KM) Method		
376					K-S Test Statistic	0.698				Mean		98.88
377					5% K-S Critical Value	0.333				SD		40.45
378	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		15.66
379										95% KM (t) UCL		128.6
380	Assuming Gamma Distribution									95% KM (z) UCL		124.6
381					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		127.3
382					Minimum	0.000001				95% KM (bootstrap t) UCL		152.2
383					Maximum	190				95% KM (BCA) UCL		134.4
384					Mean	82.88				95% KM (Percentile Bootstrap) UCL		127.9
385					Median	90				95% KM (Chebyshev) UCL		167.2

	A	B	C	D	E	F	G	H	I	J	K	L
386					SD	63.42				97.5% KM (Chebyshev) UCL		196.7
387					k star	0.191				99% KM (Chebyshev) UCL		254.7
388					Theta star	434.7						
389					Nu star	3.05			Potential UCLs to Use			
390					AppChi2	0.387				95% KM (t) UCL		128.6
391				95% Gamma Approximate UCL		652.4				95% KM (Percentile Bootstrap) UCL		127.9
392				95% Adjusted Gamma UCL		1133						
393	Note: DL/2 is not a recommended method.											
394												
395	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
396	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
397	For additional insight, the user may want to consult a statistician.											
398												
399												
400	MISC SULFATE											
401												
402					General Statistics							
403				Number of Valid Data		8				Number of Detected Data		7
404				Number of Distinct Detected Data		7				Number of Non-Detect Data		1
405										Percent Non-Detects		12.50%
406												
407				Raw Statistics						Log-transformed Statistics		
408				Minimum Detected		19				Minimum Detected		2.944
409				Maximum Detected		67				Maximum Detected		4.205
410				Mean of Detected		45.71				Mean of Detected		3.728
411				SD of Detected		19.32				SD of Detected		0.495
412				Minimum Non-Detect		34				Minimum Non-Detect		3.526
413				Maximum Non-Detect		34				Maximum Non-Detect		3.526
414												
415												
416	Warning: There are only 7 Detected Values in this data											
417	Note: It should be noted that even though bootstrap may be performed on this data set											
418	the resulting calculations may not be reliable enough to draw conclusions											
419												
420	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
421												
422												
423					UCL Statistics							
424				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
425				Shapiro Wilk Test Statistic		0.908				Shapiro Wilk Test Statistic		0.888
426				5% Shapiro Wilk Critical Value		0.803				5% Shapiro Wilk Critical Value		0.803
427				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
428												
429				Assuming Normal Distribution						Assuming Lognormal Distribution		
430				DL/2 Substitution Method						DL/2 Substitution Method		
431				Mean		42.13				Mean		3.616
432				SD		20.57				SD		0.557
433				95% DL/2 (t) UCL		55.9				95% H-Stat (DL/2) UCL		72.77
434												
435				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
436				Mean		42.23				Mean in Log Scale		3.655
437				SD		20.11				SD in Log Scale		0.502
438				95% MLE (t) UCL		55.7				Mean in Original Scale		42.9
439				95% MLE (Tiku) UCL		57.28				SD in Original Scale		19.58
440										95% t UCL		56.01

	A	B	C	D	E	F	G	H	I	J	K	L
441											95% Percentile Bootstrap UCL	53.13
442											95% BCA Bootstrap UCL	53.63
443											95% H UCL	68.65
444												
445			Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only			
446					k star (bias corrected)	3.216			Data appear Normal at 5% Significance Level			
447					Theta Star	14.21						
448					nu star	45.03						
449												
450					A-D Test Statistic	0.398			Nonparametric Statistics			
451					5% A-D Critical Value	0.71					Kaplan-Meier (KM) Method	
452					K-S Test Statistic	0.71					Mean	42.75
453					5% K-S Critical Value	0.313					SD	18.51
454			Data appear Gamma Distributed at 5% Significance Level								SE of Mean	7.085
455											95% KM (t) UCL	56.17
456			Assuming Gamma Distribution								95% KM (z) UCL	54.4
457					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	56.11
458					Minimum	19					95% KM (bootstrap t) UCL	55.29
459					Maximum	67					95% KM (BCA) UCL	54.88
460					Mean	42.69					95% KM (Percentile Bootstrap) UCL	54.38
461					Median	42.5					95% KM (Chebyshev) UCL	73.63
462					SD	19.83					97.5% KM (Chebyshev) UCL	87
463					k star	3.07					99% KM (Chebyshev) UCL	113.2
464					Theta star	13.91						
465					Nu star	49.11			Potential UCLs to Use			
466					AppChi2	34.02					95% KM (t) UCL	56.17
467					95% Gamma Approximate UCL	61.62					95% KM (Percentile Bootstrap) UCL	54.38
468					95% Adjusted Gamma UCL	67.9						
469	Note: DL/2 is not a recommended method.											
470												
471	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
472	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
473	For additional insight, the user may want to consult a statistician.											
474												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	M BARIUM											
10												
11						General Statistics						
12						Number of Valid Observations	8			Number of Distinct Observations	8	
13												
14						Raw Statistics				Log-transformed Statistics		
15						Minimum	23.1			Minimum of Log Data	3.14	
16						Maximum	80.3			Maximum of Log Data	4.386	
17						Mean	48.64			Mean of log Data	3.821	
18						Median	48.95			SD of log Data	0.393	
19						SD	17.85					
20						Std. Error of Mean	6.31					
21						Coefficient of Variation	0.367					
22						Skewness	0.363					
23												
24												
25						Warning: There are only 8 Values in this data						
26						Note: It should be noted that even though bootstrap methods may be performed on this data set,						
27						the resulting calculations may not be reliable enough to draw conclusions						
28												
29						The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.						
30												
31						Relevant UCL Statistics						
32						Normal Distribution Test				Lognormal Distribution Test		
33						Shapiro Wilk Test Statistic	0.962			Shapiro Wilk Test Statistic	0.957	
34						Shapiro Wilk Critical Value	0.818			Shapiro Wilk Critical Value	0.818	
35						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
36												
37						Assuming Normal Distribution				Assuming Lognormal Distribution		
38						95% Student's-t UCL	60.59			95% H-UCL	68.16	
39						95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	78.51	
40						95% Adjusted-CLT UCL (Chen-1995)	59.88			97.5% Chebyshev (MVUE) UCL	91.37	
41						95% Modified-t UCL (Johnson-1978)	60.73			99% Chebyshev (MVUE) UCL	116.6	
42												
43						Gamma Distribution Test				Data Distribution		
44						k star (bias corrected)	5.09			Data appear Normal at 5% Significance Level		
45						Theta Star	9.555					
46						MLE of Mean	48.64					
47						MLE of Standard Deviation	21.56					
48						nu star	81.44					
49						Approximate Chi Square Value (.05)	61.65			Nonparametric Statistics		
50						Adjusted Level of Significance	0.0195			95% CLT UCL	59.02	
51						Adjusted Chi Square Value	57.31			95% Jackknife UCL	60.59	
52										95% Standard Bootstrap UCL	58.2	
53						Anderson-Darling Test Statistic	0.252			95% Bootstrap-t UCL	61.15	
54						Anderson-Darling 5% Critical Value	0.717			95% Hall's Bootstrap UCL	62.33	
55						Kolmogorov-Smirnov Test Statistic	0.187			95% Percentile Bootstrap UCL	58.81	

56					Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	59.9
57			Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	76.14
58											97.5% Chebyshev(Mean, Sd) UCL	88.05
59			Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	111.4
60					95% Approximate Gamma UCL	64.26						
61					95% Adjusted Gamma UCL	69.12						
62												
63			Potential UCL to Use								Use 95% Student's-t UCL	60.59
64												
65			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
66			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
67			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
68												
69												
70	MISC ALKALINITY											
71												
72					General Statistics							
73					Number of Valid Observations	8					Number of Distinct Observations	4
74												
75					Raw Statistics						Log-transformed Statistics	
76					Minimum	140					Minimum of Log Data	4.942
77					Maximum	220					Maximum of Log Data	5.394
78					Mean	200					Mean of log Data	5.289
79					Median	210					SD of log Data	0.153
80					SD	27.26						
81					Std. Error of Mean	9.636						
82					Coefficient of Variation	0.136						
83					Skewness	-1.806						
84												
85												
86			Warning: There are only 4 Distinct Values in this data									
87			There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.									
88			Those methods will return a 'N/A' value on your output display!									
89												
90			It is necessary to have 4 or more Distinct Values to compute bootstrap methods.									
91			However, results obtained using 4 to 9 distinct values may not be reliable.									
92			It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.									
93												
94					Relevant UCL Statistics							
95					Normal Distribution Test						Lognormal Distribution Test	
96					Shapiro Wilk Test Statistic	0.767					Shapiro Wilk Test Statistic	0.729
97					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
98			Data not Normal at 5% Significance Level								Data not Lognormal at 5% Significance Level	
99												
100					Assuming Normal Distribution						Assuming Lognormal Distribution	
101					95% Student's-t UCL	218.3					95% H-UCL	223.7
102					95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	247.4
103					95% Adjusted-CLT UCL (Chen-1995)	209.3					97.5% Chebyshev (MVUE) UCL	267.8
104					95% Modified-t UCL (Johnson-1978)	217.2					99% Chebyshev (MVUE) UCL	308
105												
106					Gamma Distribution Test						Data Distribution	
107					k star (bias corrected)	33.19					Data Follow Appr. Gamma Distribution at 5% Significance Level	
108					Theta Star	6.026						
109					MLE of Mean	200						
110					MLE of Standard Deviation	34.72						

	A	B	C	D	E	F	G	H	I	J	K	L
111					nu star	531						
112					Approximate Chi Square Value (.05)	478.6	Nonparametric Statistics					
113					Adjusted Level of Significance	0.0195					95% CLT UCL	215.9
114					Adjusted Chi Square Value	465.9					95% Jackknife UCL	218.3
115											95% Standard Bootstrap UCL	214.9
116					Anderson-Darling Test Statistic	0.906					95% Bootstrap-t UCL	212.8
117					Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	211.1
118					Kolmogorov-Smirnov Test Statistic	0.282					95% Percentile Bootstrap UCL	213.8
119					Kolmogorov-Smirnov 5% Critical Value	0.293					95% BCA Bootstrap UCL	210
120			Data follow Appr. Gamma Distribution at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	242
121											97.5% Chebyshev(Mean, Sd) UCL	260.2
122			Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	295.9
123					95% Approximate Gamma UCL	221.9						
124					95% Adjusted Gamma UCL	227.9						
125												
126			Potential UCL to Use								Use 95% Approximate Gamma UCL	221.9
127					Recommended UCL exceeds the maximum observation							
128												
129					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
130					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
131					and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.							
132												
133					Note: For highly negative-skewed data, confidence limits							
134					(e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
135					reliable. Chen's and Johnson's methods provide							
136					adjustments for positvely skewed data sets.							
137												
138												
139	M CALCIUM											
140												
141					General Statistics							
142					Number of Valid Observations	8					Number of Distinct Observations	8
143												
144					Raw Statistics		Log-transformed Statistics					
145					Minimum	44200					Minimum of Log Data	10.7
146					Maximum	130000					Maximum of Log Data	11.78
147					Mean	90463					Mean of log Data	11.36
148					Median	97050					SD of log Data	0.348
149					SD	27311						
150					Std. Error of Mean	9656						
151					Coefficient of Variation	0.302						
152					Skewness	-0.503						
153												
154												
155					Warning: There are only 8 Values in this data							
156					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
157					the resulting calculations may not be reliable enough to draw conclusions							
158												
159					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
160												
161					Relevant UCL Statistics							
162					Normal Distribution Test		Lognormal Distribution Test					
163					Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.904
164					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
165					Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level					

166												
167	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
168					95% Student's-t UCL	108756					95% H-UCL	121160
169	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	139980
170				95% Adjusted-CLT UCL (Chen-1995)		104509					97.5% Chebyshev (MVUE) UCL	161215
171				95% Modified-t UCL (Johnson-1978)		108470					99% Chebyshev (MVUE) UCL	202929
172												
173	**Gamma Distribution Test**						**Data Distribution**					
174				k star (bias corrected)		6.702	Data appear Normal at 5% Significance Level					
175				Theta Star		13499						
176				MLE of Mean		90463						
177				MLE of Standard Deviation		34944						
178				nu star		107.2						
179				Approximate Chi Square Value (.05)		84.33	**Nonparametric Statistics**					
180				Adjusted Level of Significance		0.0195					95% CLT UCL	106345
181				Adjusted Chi Square Value		79.2					95% Jackknife UCL	108756
182											95% Standard Bootstrap UCL	105664
183				Anderson-Darling Test Statistic		0.378					95% Bootstrap-t UCL	106669
184				Anderson-Darling 5% Critical Value		0.715					95% Hall's Bootstrap UCL	104933
185				Kolmogorov-Smirnov Test Statistic		0.234					95% Percentile Bootstrap UCL	104588
186				Kolmogorov-Smirnov 5% Critical Value		0.294					95% BCA Bootstrap UCL	103575
187	Data appear Gamma Distributed at 5% Significance Level										95% Chebyshev(Mean, Sd) UCL	132551
188											97.5% Chebyshev(Mean, Sd) UCL	150763
189	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	186536
190				95% Approximate Gamma UCL		115026						
191				95% Adjusted Gamma UCL		122472						
192												
193	Potential UCL to Use										Use 95% Student's-t UCL	108756
194												
195	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
196	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
197	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
198												
199	Note: For highly negative-skewed data, confidence limits											
200	(e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
201	reliable. Chen's and Johnson's methods provide											
202	adjustments for positvely skewed data sets.											
203												
204												
205	MISC CARBONATE ALKALINITY											
206												
207	**General Statistics**											
208				Number of Valid Observations		8					Number of Distinct Observations	4
209												
210	**Raw Statistics**						**Log-transformed Statistics**					
211				Minimum		140					Minimum of Log Data	4.942
212				Maximum		220					Maximum of Log Data	5.394
213				Mean		200					Mean of log Data	5.289
214				Median		210					SD of log Data	0.153
215				SD		27.26						
216				Std. Error of Mean		9.636						
217				Coefficient of Variation		0.136						
218				Skewness		-1.806						
219												
220												

	A	B	C	D	E	F	G	H	I	J	K	L
221	Warning: There are only 4 Distinct Values in this data											
222	There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.											
223	Those methods will return a 'N/A' value on your output display!											
224												
225	It is necessary to have 4 or more Distinct Values to compute bootstrap methods.											
226	However, results obtained using 4 to 9 distinct values may not be reliable.											
227	It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.											
228												
229	Relevant UCL Statistics											
230	Normal Distribution Test						Lognormal Distribution Test					
231					Shapiro Wilk Test Statistic	0.767				Shapiro Wilk Test Statistic		0.729
232					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
233	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
234												
235	Assuming Normal Distribution						Assuming Lognormal Distribution					
236					95% Student's-t UCL	218.3				95% H-UCL		223.7
237	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		247.4
238					95% Adjusted-CLT UCL (Chen-1995)	209.3				97.5% Chebyshev (MVUE) UCL		267.8
239					95% Modified-t UCL (Johnson-1978)	217.2				99% Chebyshev (MVUE) UCL		308
240												
241	Gamma Distribution Test						Data Distribution					
242					k star (bias corrected)	33.19	Data Follow Appr. Gamma Distribution at 5% Significance Level					
243					Theta Star	6.026						
244					MLE of Mean	200						
245					MLE of Standard Deviation	34.72						
246					nu star	531						
247					Approximate Chi Square Value (.05)	478.6	Nonparametric Statistics					
248					Adjusted Level of Significance	0.0195				95% CLT UCL		215.9
249					Adjusted Chi Square Value	465.9				95% Jackknife UCL		218.3
250										95% Standard Bootstrap UCL		214.5
251					Anderson-Darling Test Statistic	0.906				95% Bootstrap-t UCL		212.2
252					Anderson-Darling 5% Critical Value	0.715				95% Hall's Bootstrap UCL		211.1
253					Kolmogorov-Smirnov Test Statistic	0.282				95% Percentile Bootstrap UCL		213.8
254					Kolmogorov-Smirnov 5% Critical Value	0.293				95% BCA Bootstrap UCL		210
255	Data follow Appr. Gamma Distribution at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		242
256										97.5% Chebyshev(Mean, Sd) UCL		260.2
257	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		295.9
258					95% Approximate Gamma UCL	221.9						
259					95% Adjusted Gamma UCL	227.9						
260												
261	Potential UCL to Use									Use 95% Approximate Gamma UCL		221.9
262	Recommended UCL exceeds the maximum observation											
263												
264	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
265	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
266	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
267												
268	Note: For highly negative-skewed data, confidence limits											
269	(e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
270	reliable. Chen's and Johnson's methods provide											
271	adjustments for positvely skewed data sets.											
272												
273												
274	MISC CHLORIDE											
275												

	A	B	C	D	E	F	G	H	I	J	K	L
276	General Statistics											
277	Number of Valid Observations					8	Number of Distinct Observations					8
278												
279	Raw Statistics						Log-transformed Statistics					
280	Minimum					130	Minimum of Log Data					4.868
281	Maximum					440	Maximum of Log Data					6.087
282	Mean					258.8	Mean of log Data					5.499
283	Median					235	SD of log Data					0.362
284	SD					94.33						
285	Std. Error of Mean					33.35						
286	Coefficient of Variation					0.365						
287	Skewness					0.923						
288												
289												
290	Warning: There are only 8 Values in this data											
291	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
292	the resulting calculations may not be reliable enough to draw conclusions											
293												
294	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
295												
296	Relevant UCL Statistics											
297	Normal Distribution Test						Lognormal Distribution Test					
298	Shapiro Wilk Test Statistic					0.934	Shapiro Wilk Test Statistic					0.97
299	Shapiro Wilk Critical Value					0.818	Shapiro Wilk Critical Value					0.818
300	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
301												
302	Assuming Normal Distribution						Assuming Lognormal Distribution					
303	95% Student's-t UCL					321.9	95% H-UCL					349.9
304	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					404.1
305	95% Adjusted-CLT UCL (Chen-1995)					325.2	97.5% Chebyshev (MVUE) UCL					467
306	95% Modified-t UCL (Johnson-1978)					323.7	99% Chebyshev (MVUE) UCL					590.5
307												
308	Gamma Distribution Test						Data Distribution					
309	k star (bias corrected)					5.685	Data appear Normal at 5% Significance Level					
310	Theta Star					45.51						
311	MLE of Mean					258.8						
312	MLE of Standard Deviation					108.5						
313	nu star					90.96						
314	Approximate Chi Square Value (.05)					69.97	Nonparametric Statistics					
315	Adjusted Level of Significance					0.0195	95% CLT UCL					313.6
316	Adjusted Chi Square Value					65.33	95% Jackknife UCL					321.9
317							95% Standard Bootstrap UCL					310.5
318	Anderson-Darling Test Statistic					0.256	95% Bootstrap-t UCL					357
319	Anderson-Darling 5% Critical Value					0.716	95% Hall's Bootstrap UCL					680.2
320	Kolmogorov-Smirnov Test Statistic					0.169	95% Percentile Bootstrap UCL					312.5
321	Kolmogorov-Smirnov 5% Critical Value					0.294	95% BCA Bootstrap UCL					320
322	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					404.1
323							97.5% Chebyshev(Mean, Sd) UCL					467
324	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					590.6
325	95% Approximate Gamma UCL					336.4						
326	95% Adjusted Gamma UCL					360.3						
327												
328	Potential UCL to Use						Use 95% Student's-t UCL					321.9
329												
330	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

M MAGNESIUM

General Statistics

Number of Valid Observations	8	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	4010	Minimum of Log Data	8.297
Maximum	23100	Maximum of Log Data	10.05
Mean	12026	Mean of log Data	9.254
Median	11470	SD of log Data	0.59
SD	6416		
Std. Error of Mean	2269		
Coefficient of Variation	0.534		
Skewness	0.477		

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.942	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16324	95% H-UCL	21772
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23304
95% Adjusted-CLT UCL (Chen-1995)	16166	97.5% Chebyshev (MVUE) UCL	28137
95% Modified-t UCL (Johnson-1978)	16388	99% Chebyshev (MVUE) UCL	37630

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.406	Data appear Normal at 5% Significance Level	
Theta Star	4998		
MLE of Mean	12026		
MLE of Standard Deviation	7753		
nu star	38.5		
Approximate Chi Square Value (.05)	25.29	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	15758
Adjusted Chi Square Value	22.62	95% Jackknife UCL	16324
		95% Standard Bootstrap UCL	15570
Anderson-Darling Test Statistic	0.27	95% Bootstrap-t UCL	16606
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	15990
Kolmogorov-Smirnov Test Statistic	0.202	95% Percentile Bootstrap UCL	15233
Kolmogorov-Smirnov 5% Critical Value	0.296	95% BCA Bootstrap UCL	15785
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21915
		97.5% Chebyshev(Mean, Sd) UCL	26193
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	34598

	A	B	C	D	E	F	G	H	I	J	K	L
386					95% Approximate Gamma UCL	18309						
387					95% Adjusted Gamma UCL	20472						
388												
389					Potential UCL to Use						Use 95% Student's-t UCL	16324
390												
391	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
392	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
393	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
394												
395												
396	M MANGANESE											
397												
398					General Statistics							
399					Number of Valid Observations	8				Number of Distinct Observations		8
400												
401					Raw Statistics					Log-transformed Statistics		
402					Minimum	6.1				Minimum of Log Data		1.808
403					Maximum	340				Maximum of Log Data		5.829
404					Mean	150.4				Mean of log Data		4.406
405					Median	140.8				SD of log Data		1.418
406					SD	129.6						
407					Std. Error of Mean	45.81						
408					Coefficient of Variation	0.861						
409					Skewness	0.222						
410												
411												
412	Warning: There are only 8 Values in this data											
413	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
414	the resulting calculations may not be reliable enough to draw conclusions											
415												
416	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
417												
418					Relevant UCL Statistics							
419					Normal Distribution Test					Lognormal Distribution Test		
420					Shapiro Wilk Test Statistic	0.877				Shapiro Wilk Test Statistic		0.889
421					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
422					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
423												
424					Assuming Normal Distribution					Assuming Lognormal Distribution		
425					95% Student's-t UCL	237.2				95% H-UCL		2526
426					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL		590.8
427					95% Adjusted-CLT UCL (Chen-1995)	229.6				97.5% Chebyshev (MVUE) UCL		766.8
428					95% Modified-t UCL (Johnson-1978)	237.8				99% Chebyshev (MVUE) UCL		1113
429												
430					Gamma Distribution Test					Data Distribution		
431					k star (bias corrected)	0.681				Data appear Normal at 5% Significance Level		
432					Theta Star	220.9						
433					MLE of Mean	150.4						
434					MLE of Standard Deviation	182.3						
435					nu star	10.9						
436					Approximate Chi Square Value (.05)	4.509				Nonparametric Statistics		
437					Adjusted Level of Significance	0.0195				95% CLT UCL		225.7
438					Adjusted Chi Square Value	3.529				95% Jackknife UCL		237.2
439										95% Standard Bootstrap UCL		220.5
440					Anderson-Darling Test Statistic	0.441				95% Bootstrap-t UCL		242.2

	A	B	C	D	E	F	G	H	I	J	K	L
441					Anderson-Darling 5% Critical Value	0.737				95% Hall's Bootstrap UCL		206.5
442					Kolmogorov-Smirnov Test Statistic	0.263				95% Percentile Bootstrap UCL		219.9
443					Kolmogorov-Smirnov 5% Critical Value	0.302				95% BCA Bootstrap UCL		219.6
444			Data appear Gamma Distributed at 5% Significance Level							95% Chebyshev(Mean, Sd) UCL		350.1
445										97.5% Chebyshev(Mean, Sd) UCL		436.5
446			Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL		606.2
447					95% Approximate Gamma UCL	363.4						
448					95% Adjusted Gamma UCL	464.4						
449												
450			Potential UCL to Use							Use 95% Student's-t UCL		237.2
451												
452			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
453			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
454			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
455												
456												
457	MISC PH											
458												
459					General Statistics							
460					Number of Valid Observations	8				Number of Distinct Observations		7
461												
462					Raw Statistics					Log-transformed Statistics		
463					Minimum	7.2				Minimum of Log Data		1.974
464					Maximum	8				Maximum of Log Data		2.079
465					Mean	7.588				Mean of log Data		2.026
466					Median	7.6				SD of log Data		0.0369
467					SD	0.28						
468					Std. Error of Mean	0.099						
469					Coefficient of Variation	0.0369						
470					Skewness	0.118						
471												
472												
473			Warning: There are only 8 Values in this data									
474			Note: It should be noted that even though bootstrap methods may be performed on this data set,									
475			the resulting calculations may not be reliable enough to draw conclusions									
476												
477			The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.									
478												
479					Relevant UCL Statistics							
480					Normal Distribution Test					Lognormal Distribution Test		
481					Shapiro Wilk Test Statistic	0.961				Shapiro Wilk Test Statistic		0.962
482					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
483			Data appear Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level		
484												
485					Assuming Normal Distribution					Assuming Lognormal Distribution		
486					95% Student's-t UCL	7.775				95% H-UCL		N/A
487					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL		8.019
488					95% Adjusted-CLT UCL (Chen-1995)	7.755				97.5% Chebyshev (MVUE) UCL		8.205
489					95% Modified-t UCL (Johnson-1978)	7.776				99% Chebyshev (MVUE) UCL		8.572
490												
491					Gamma Distribution Test					Data Distribution		
492					k star (bias corrected)	525.3				Data appear Normal at 5% Significance Level		
493					Theta Star	0.0144						
494					MLE of Mean	7.588						
495					MLE of Standard Deviation	0.331						

	A	B	C	D	E	F	G	H	I	J	K	L
496					nu star	8405						
497					Approximate Chi Square Value (.05)	8193	Nonparametric Statistics					
498					Adjusted Level of Significance	0.0195					95% CLT UCL	7.75
499					Adjusted Chi Square Value	8139					95% Jackknife UCL	7.775
500											95% Standard Bootstrap UCL	7.741
501					Anderson-Darling Test Statistic	0.22					95% Bootstrap-t UCL	7.78
502					Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	7.767
503					Kolmogorov-Smirnov Test Statistic	0.149					95% Percentile Bootstrap UCL	7.738
504					Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	7.738
505			Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	8.019
506											97.5% Chebyshev(Mean, Sd) UCL	8.206
507			Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	8.572
508					95% Approximate Gamma UCL	7.784						
509					95% Adjusted Gamma UCL	7.835						
510												
511			Potential UCL to Use								Use 95% Student's-t UCL	7.775
512												
513			Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.									
514			These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)									
515			and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.									
516												
517												
518	M POTASSIUM											
519												
520					General Statistics							
521					Number of Valid Observations	8					Number of Distinct Observations	8
522												
523			Raw Statistics				Log-transformed Statistics					
524					Minimum	4730					Minimum of Log Data	8.462
525					Maximum	17200					Maximum of Log Data	9.753
526					Mean	9993					Mean of log Data	9.131
527					Median	9825					SD of log Data	0.432
528					SD	4145						
529					Std. Error of Mean	1465						
530					Coefficient of Variation	0.415						
531					Skewness	0.54						
532												
533												
534			Warning: There are only 8 Values in this data									
535			Note: It should be noted that even though bootstrap methods may be performed on this data set,									
536			the resulting calculations may not be reliable enough to draw conclusions									
537												
538			The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.									
539												
540					Relevant UCL Statistics							
541			Normal Distribution Test				Lognormal Distribution Test					
542					Shapiro Wilk Test Statistic	0.963					Shapiro Wilk Test Statistic	0.976
543					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
544			Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level					
545												
546			Assuming Normal Distribution				Assuming Lognormal Distribution					
547					95% Student's-t UCL	12769					95% H-UCL	14616
548			95% UCLs (Adjusted for Skewness)								95% Chebyshev (MVUE) UCL	16725
549					95% Adjusted-CLT UCL (Chen-1995)	12702					97.5% Chebyshev (MVUE) UCL	19630
550					95% Modified-t UCL (Johnson-1978)	12816					99% Chebyshev (MVUE) UCL	25334

	A	B	C	D	E	F	G	H	I	J	K	L
551												
552	**Gamma Distribution Test**						**Data Distribution**					
553					k star (bias corrected)	4.159	Data appear Normal at 5% Significance Level					
554					Theta Star	2402						
555					MLE of Mean	9993						
556					MLE of Standard Deviation	4900						
557					nu star	66.55						
558					Approximate Chi Square Value (.05)	48.78	**Nonparametric Statistics**					
559					Adjusted Level of Significance	0.0195				95% CLT UCL		12403
560					Adjusted Chi Square Value	44.95				95% Jackknife UCL		12769
561										95% Standard Bootstrap UCL		12248
562					Anderson-Darling Test Statistic	0.17				95% Bootstrap-t UCL		13393
563					Anderson-Darling 5% Critical Value	0.718				95% Hall's Bootstrap UCL		14164
564					Kolmogorov-Smirnov Test Statistic	0.152				95% Percentile Bootstrap UCL		12310
565					Kolmogorov-Smirnov 5% Critical Value	0.295				95% BCA Bootstrap UCL		12428
566	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		16380
567										97.5% Chebyshev(Mean, Sd) UCL		19144
568	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		24574
569					95% Approximate Gamma UCL	13634						
570					95% Adjusted Gamma UCL	14794						
571												
572	Potential UCL to Use									Use 95% Student's-t UCL		12769
573												
574	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
575	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
576	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
577												
578												
579	M SODIUM											
580												
581	**General Statistics**											
582					Number of Valid Observations	8				Number of Distinct Observations		8
583												
584	**Raw Statistics**						**Log-transformed Statistics**					
585					Minimum	95800				Minimum of Log Data		11.47
586					Maximum	208000				Maximum of Log Data		12.25
587					Mean	133225				Mean of log Data		11.77
588					Median	127500				SD of log Data		0.254
589					SD	36364						
590					Std. Error of Mean	12857						
591					Coefficient of Variation	0.273						
592					Skewness	1.295						
593												
594												
595	Warning: There are only 8 Values in this data											
596	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
597	the resulting calculations may not be reliable enough to draw conclusions											
598												
599	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
600												
601	**Relevant UCL Statistics**											
602	**Normal Distribution Test**						**Lognormal Distribution Test**					
603					Shapiro Wilk Test Statistic	0.896				Shapiro Wilk Test Statistic		0.95
604					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
605	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
606												
607	Assuming Normal Distribution						Assuming Lognormal Distribution					
608					95% Student's-t UCL	157583					95% H-UCL	161833
609	95% UCLs (Adjusted for Skewness)										95% Chebyshev (MVUE) UCL	185170
610					95% Adjusted-CLT UCL (Chen-1995)	160664					97.5% Chebyshev (MVUE) UCL	207726
611					95% Modified-t UCL (Johnson-1978)	158564					99% Chebyshev (MVUE) UCL	252034
612												
613	Gamma Distribution Test						Data Distribution					
614					k star (bias corrected)	10.81	Data appear Normal at 5% Significance Level					
615					Theta Star	12326						
616					MLE of Mean	133225						
617					MLE of Standard Deviation	40524						
618					nu star	172.9						
619					Approximate Chi Square Value (.05)	143.5	Nonparametric Statistics					
620					Adjusted Level of Significance	0.0195					95% CLT UCL	154372
621					Adjusted Chi Square Value	136.7					95% Jackknife UCL	157583
622											95% Standard Bootstrap UCL	153457
623					Anderson-Darling Test Statistic	0.266					95% Bootstrap-t UCL	169523
624					Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	246430
625					Kolmogorov-Smirnov Test Statistic	0.135					95% Percentile Bootstrap UCL	154475
626					Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	157500
627	Data appear Gamma Distributed at 5% Significance Level										95% Chebyshev(Mean, Sd) UCL	189266
628											97.5% Chebyshev(Mean, Sd) UCL	213515
629	Assuming Gamma Distribution										99% Chebyshev(Mean, Sd) UCL	261147
630					95% Approximate Gamma UCL	160527						
631					95% Adjusted Gamma UCL	168492						
632												
633	Potential UCL to Use										Use 95% Student's-t UCL	157583
634												
635	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
636	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
637	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
638												
639												
640	MISC TOTAL ORGANIC CARBON											
641												
642	General Statistics											
643					Number of Valid Observations	8					Number of Distinct Observations	7
644												
645	Raw Statistics						Log-transformed Statistics					
646					Minimum	2.4					Minimum of Log Data	0.875
647					Maximum	8					Maximum of Log Data	2.079
648					Mean	3.613					Mean of log Data	1.199
649					Median	2.9					SD of log Data	0.407
650					SD	1.879						
651					Std. Error of Mean	0.664						
652					Coefficient of Variation	0.52						
653					Skewness	2.265						
654												
655												
656	Warning: There are only 8 Values in this data											
657	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
658	the resulting calculations may not be reliable enough to draw conclusions											
659												
660	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											

	A	B	C	D	E	F	G	H	I	J	K	L
661												
662					Relevant UCL Statistics							
663				Normal Distribution Test						Lognormal Distribution Test		
664					Shapiro Wilk Test Statistic	0.696				Shapiro Wilk Test Statistic		0.812
665					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
666				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
667												
668				Assuming Normal Distribution						Assuming Lognormal Distribution		
669					95% Student's-t UCL	4.871				95% H-UCL		5.061
670				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		5.818
671					95% Adjusted-CLT UCL (Chen-1995)	5.274				97.5% Chebyshev (MVUE) UCL		6.792
672					95% Modified-t UCL (Johnson-1978)	4.96				99% Chebyshev (MVUE) UCL		8.707
673												
674				Gamma Distribution Test						Data Distribution		
675					k star (bias corrected)	3.856				Data Follow Appr. Gamma Distribution at 5% Significance Level		
676					Theta Star	0.937						
677					MLE of Mean	3.613						
678					MLE of Standard Deviation	1.84						
679					nu star	61.69						
680					Approximate Chi Square Value (.05)	44.62				Nonparametric Statistics		
681					Adjusted Level of Significance	0.0195				95% CLT UCL		4.705
682					Adjusted Chi Square Value	40.98				95% Jackknife UCL		4.871
683										95% Standard Bootstrap UCL		4.622
684					Anderson-Darling Test Statistic	0.778				95% Bootstrap-t UCL		6.962
685					Anderson-Darling 5% Critical Value	0.718				95% Hall's Bootstrap UCL		8.623
686					Kolmogorov-Smirnov Test Statistic	0.245				95% Percentile Bootstrap UCL		4.763
687					Kolmogorov-Smirnov 5% Critical Value	0.295				95% BCA Bootstrap UCL		5.3
688				Data follow Appr. Gamma Distribution at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		6.508
689										97.5% Chebyshev(Mean, Sd) UCL		7.761
690				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		10.22
691					95% Approximate Gamma UCL	4.994						
692					95% Adjusted Gamma UCL	5.438						
693												
694				Potential UCL to Use						Use 95% Approximate Gamma UCL		4.994
695												
696				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
697				These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)								
698				and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.								
699												

D.3 SALINE/BRACKISH GROUNDWATER UPLs AND UTLs

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Full Data Sets								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	MISC ALKALINITY											
12												
13						General Statistics						
14						Total Number of Observations	8			Number of Distinct Observations	4	
15						Tolerance Factor	3.187					
16												
17						Raw Statistics				Log-Transformed Statistics		
18						Minimum	140			Minimum	4.942	
19						Maximum	220			Maximum	5.394	
20						Second Largest	220			Second Largest	5.394	
21						First Quartile	190			First Quartile	5.247	
22						Median	210			Median	5.347	
23						Third Quartile	220			Third Quartile	5.394	
24						Mean	200			Mean	5.289	
25						SD	27.26			SD	0.153	
26						Coefficient of Variation	0.136					
27						Skewness	-1.806					
28												
29												
30						Warning: There are only 4 Distinct Values in this data						
31						There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.						
32						Those methods will return a 'N/A' value on your output display!						
33												
34						It is necessary to have 4 or more Distinct Values to compute bootstrap methods.						
35						However, results obtained using 4 to 9 distinct values may not be reliable.						
36						It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.						
37												
38						Background Statistics						
39						Normal Distribution Test				Lognormal Distribution Test		
40						Shapiro Wilk Test Statistic	0.767			Shapiro Wilk Test Statistic	0.729	
41						Shapiro Wilk Critical Value	0.818			Shapiro Wilk Critical Value	0.818	
42						Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level		
43												
44						Assuming Normal Distribution				Assuming Lognormal Distribution		
45						95% UTL with 95% Coverage	286.9			95% UTL with 95% Coverage	322.6	
46						95% UPL (t)	254.8			95% UPL (t)	269.4	
47						90% Percentile (z)	234.9			90% Percentile (z)	241	
48						95% Percentile (z)	244.8			95% Percentile (z)	254.8	
49						99% Percentile (z)	263.4			99% Percentile (z)	282.8	
50												
51						Gamma Distribution Test				Data Distribution Test		
52						k star	33.19			Data Follow Appr. Gamma Distribution at 5% Significance Level		
53						Theta Star	6.026					
54						MLE of Mean	200					
55						MLE of Standard Deviation	34.72					

	A	B	C	D	E	F	G	H	I	J	K	L
56					nu star	531						
57												
58					A-D Test Statistic	0.906	Nonparametric Statistics					
59					5% A-D Critical Value	0.715					90% Percentile	220
60					K-S Test Statistic	0.282					95% Percentile	220
61					5% K-S Critical Value	0.293					99% Percentile	220
62	Data follow Appx. Gamma Distribution at 5% Significance Level											
63												
64			Assuming Gamma Distribution							95% UTL with	95% Coverage	220
65					90% Percentile	245.6				95% Percentile Bootstrap UTL with	95% Coverage	220
66					95% Percentile	260.3				95% BCA Bootstrap UTL with	95% Coverage	220
67					99% Percentile	289.5					95% UPL	220
68											95% Chebyshev UPL	326
69					95% WH Approx. Gamma UPL	263.5					Upper Threshold Limit Based upon IQR	265
70					95% HW Approx. Gamma UPL	264.9						
71					95% WH Approx. Gamma UTL with	95% Coverage 307.3						
72					95% HW Approx. Gamma UTL with	95% Coverage 310.7						
73												
74												
75												
76	M BARIUM											
77												
78					General Statistics							
79					Total Number of Observations	8					Number of Distinct Observations	8
80					Tolerance Factor	3.187						
81												
82					Raw Statistics		Log-Transformed Statistics					
83					Minimum	23.1					Minimum	3.14
84					Maximum	80.3					Maximum	4.386
85					Second Largest	58.4					Second Largest	4.067
86					First Quartile	39.58					First Quartile	3.67
87					Median	48.95					Median	3.882
88					Third Quartile	56.53					Third Quartile	4.035
89					Mean	48.64					Mean	3.821
90					SD	17.85					SD	0.393
91					Coefficient of Variation	0.367						
92					Skewness	0.363						
93												
94												
95					Warning: There are only 8 Values in this data							
96					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
97					the resulting calculations may not be reliable enough to draw conclusions							
98												
99					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
100												
101					Background Statistics							
102					Normal Distribution Test		Lognormal Distribution Test					
103					Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.957
104					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
105					Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level					
106												
107					Assuming Normal Distribution		Assuming Lognormal Distribution					
108					95% UTL with	95% Coverage 105.5					95% UTL with	95% Coverage 159.5
109					95% UPL (t)	84.5					95% UPL (t)	100.4
110					90% Percentile (z)	71.51					90% Percentile (z)	75.48

	A	B	C	D	E	F	G	H	I	J	K	L
111					95% Percentile (z)	78					95% Percentile (z)	87.05
112					99% Percentile (z)	90.16					99% Percentile (z)	113.8
113												
114				Gamma Distribution Test						Data Distribution Test		
115					k star	5.09				Data appear Normal at 5% Significance Level		
116					Theta Star	9.555						
117					MLE of Mean	48.64						
118					MLE of Standard Deviation	21.56						
119					nu star	81.44						
120												
121					A-D Test Statistic	0.252				Nonparametric Statistics		
122					5% A-D Critical Value	0.717					90% Percentile	64.97
123					K-S Test Statistic	0.187					95% Percentile	72.64
124					5% K-S Critical Value	0.295					99% Percentile	78.77
125				Data appear Gamma Distributed at 5% Significance Level								
126												
127				Assuming Gamma Distribution							95% UTL with 95% Coverage	80.3
128					90% Percentile	77.5					95% Percentile Bootstrap UTL with 95% Coverage	80.3
129					95% Percentile	88.65					95% BCA Bootstrap UTL with 95% Coverage	80.3
130					99% Percentile	112.2					95% UPL	80.3
131											95% Chebyshev UPL	131.2
132					95% WH Approx. Gamma UPL	92.58					Upper Threshold Limit Based upon IQR	81.95
133					95% HW Approx. Gamma UPL	94.19						
134					95% WH Approx. Gamma UTL with 95% Coverage	130						
135					95% HW Approx. Gamma UTL with 95% Coverage	135.4						
136												
137												
138												
139	M CALCIUM											
140												
141					General Statistics							
142					Total Number of Observations	8					Number of Distinct Observations	8
143					Tolerance Factor	3.187						
144												
145				Raw Statistics						Log-Transformed Statistics		
146					Minimum	44200					Minimum	10.7
147					Maximum	130000					Maximum	11.78
148					Second Largest	109000					Second Largest	11.6
149					First Quartile	76950					First Quartile	11.24
150					Median	97050					Median	11.48
151					Third Quartile	104500					Third Quartile	11.56
152					Mean	90463					Mean	11.36
153					SD	27311					SD	0.348
154					Coefficient of Variation	0.302						
155					Skewness	-0.503						
156												
157												
158				Warning: There are only 8 Values in this data								
159				Note: It should be noted that even though bootstrap methods may be performed on this data set,								
160				the resulting calculations may not be reliable enough to draw conclusions								
161												
162				The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.								
163												
164					Background Statistics							
165				Normal Distribution Test						Lognormal Distribution Test		

	A	B	C	D	E	F	G	H	I	J	K	L
166					Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.904
167					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
168					Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
169												
170					Assuming Normal Distribution						Assuming Lognormal Distribution	
171					95% UTL with 95% Coverage	177501					95% UTL with 95% Coverage	261778
172					95% UPL (t)	145343					95% UPL (t)	173676
173					90% Percentile (z)	125462					90% Percentile (z)	134766
174					95% Percentile (z)	135384					95% Percentile (z)	152953
175					99% Percentile (z)	153996					99% Percentile (z)	193950
176												
177					Gamma Distribution Test						Data Distribution Test	
178					k star	6.702					Data appear Normal at 5% Significance Level	
179					Theta Star	13499						
180					MLE of Mean	90463						
181					MLE of Standard Deviation	34944						
182					nu star	107.2						
183												
184					A-D Test Statistic	0.378					Nonparametric Statistics	
185					5% A-D Critical Value	0.715					90% Percentile	115300
186					K-S Test Statistic	0.234					95% Percentile	122650
187					5% K-S Critical Value	0.294					99% Percentile	128530
188					Data appear Gamma Distributed at 5% Significance Level							
189												
190					Assuming Gamma Distribution						95% UTL with 95% Coverage	130000
191					90% Percentile	137133					95% Percentile Bootstrap UTL with 95% Coverage	130000
192					95% Percentile	154538					95% BCA Bootstrap UTL with 95% Coverage	130000
193					99% Percentile	190845					95% UPL	130000
194											95% Chebyshev UPL	216728
195					95% WH Approx. Gamma UPL	160187					Upper Threshold Limit Based upon IQR	145825
196					95% HW Approx. Gamma UPL	163002						
197					95% WH Approx. Gamma UTL with 95% Coverage	217054						
198					95% HW Approx. Gamma UTL with 95% Coverage	225577						
199												
200												
201												
202	MISC CARBONATE ALKALINITY											
203												
204					General Statistics							
205					Total Number of Observations	8					Number of Distinct Observations	4
206					Tolerance Factor	3.187						
207												
208					Raw Statistics						Log-Transformed Statistics	
209					Minimum	140					Minimum	4.942
210					Maximum	220					Maximum	5.394
211					Second Largest	220					Second Largest	5.394
212					First Quartile	190					First Quartile	5.247
213					Median	210					Median	5.347
214					Third Quartile	220					Third Quartile	5.394
215					Mean	200					Mean	5.289
216					SD	27.26					SD	0.153
217					Coefficient of Variation	0.136						
218					Skewness	-1.806						
219												
220												

	A	B	C	D	E	F	G	H	I	J	K	L
221	Warning: There are only 4 Distinct Values in this data											
222	There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.											
223	Those methods will return a 'N/A' value on your output display!											
224												
225	It is necessary to have 4 or more Distinct Values to compute bootstrap methods.											
226	However, results obtained using 4 to 9 distinct values may not be reliable.											
227	It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.											
228												
229	Background Statistics											
230	Normal Distribution Test						Lognormal Distribution Test					
231					Shapiro Wilk Test Statistic	0.767				Shapiro Wilk Test Statistic		0.729
232					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
233	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
234												
235	Assuming Normal Distribution						Assuming Lognormal Distribution					
236				95% UTL with	95% Coverage	286.9				95% UTL with	95% Coverage	322.6
237					95% UPL (t)	254.8					95% UPL (t)	269.4
238					90% Percentile (z)	234.9					90% Percentile (z)	241
239					95% Percentile (z)	244.8					95% Percentile (z)	254.8
240					99% Percentile (z)	263.4					99% Percentile (z)	282.8
241												
242	Gamma Distribution Test						Data Distribution Test					
243					k star	33.19	Data Follow Appr. Gamma Distribution at 5% Significance Level					
244					Theta Star	6.026						
245					MLE of Mean	200						
246					MLE of Standard Deviation	34.72						
247					nu star	531						
248												
249					A-D Test Statistic	0.906	Nonparametric Statistics					
250					5% A-D Critical Value	0.715				90% Percentile		220
251					K-S Test Statistic	0.282				95% Percentile		220
252					5% K-S Critical Value	0.293				99% Percentile		220
253	Data follow Appx. Gamma Distribution at 5% Significance Level											
254												
255	Assuming Gamma Distribution									95% UTL with	95% Coverage	220
256					90% Percentile	245.6				95% Percentile Bootstrap UTL with	95% Coverage	220
257					95% Percentile	260.3				95% BCA Bootstrap UTL with	95% Coverage	220
258					99% Percentile	289.5					95% UPL	220
259											95% Chebyshev UPL	326
260					95% WH Approx. Gamma UPL	263.5				Upper Threshold Limit Based upon IQR		265
261					95% HW Approx. Gamma UPL	264.9						
262				95% WH Approx. Gamma UTL with	95% Coverage	307.3						
263				95% HW Approx. Gamma UTL with	95% Coverage	310.7						
264												
265												
266												
267	MISC CHLORIDE											
268												
269	General Statistics											
270					Total Number of Observations	8				Number of Distinct Observations		8
271					Tolerance Factor	3.187						
272												
273	Raw Statistics						Log-Transformed Statistics					
274					Minimum	130				Minimum		4.868
275					Maximum	440				Maximum		6.087

	A	B	C	D	E	F	G	H	I	J	K	L
276					Second Largest	340					Second Largest	5.829
277					First Quartile	215					First Quartile	5.37
278					Median	235					Median	5.459
279					Third Quartile	287.5					Third Quartile	5.656
280					Mean	258.8					Mean	5.499
281					SD	94.33					SD	0.362
282					Coefficient of Variation	0.365						
283					Skewness	0.923						
284												
285												
286					Warning: There are only 8 Values in this data							
287					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
288					the resulting calculations may not be reliable enough to draw conclusions							
289												
290					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
291												
292					Background Statistics							
293					Normal Distribution Test						Lognormal Distribution Test	
294					Shapiro Wilk Test Statistic	0.934					Shapiro Wilk Test Statistic	0.97
295					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
296					Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
297												
298					Assuming Normal Distribution						Assuming Lognormal Distribution	
299					95% UTL with 95% Coverage	559.4					95% UTL with 95% Coverage	775.4
300					95% UPL (t)	448.3					95% UPL (t)	506.2
301					90% Percentile (z)	379.6					90% Percentile (z)	388.9
302					95% Percentile (z)	413.9					95% Percentile (z)	443.6
303					99% Percentile (z)	478.2					99% Percentile (z)	567.8
304												
305					Gamma Distribution Test						Data Distribution Test	
306					k star	5.685					Data appear Normal at 5% Significance Level	
307					Theta Star	45.51						
308					MLE of Mean	258.8						
309					MLE of Standard Deviation	108.5						
310					nu star	90.96						
311												
312					A-D Test Statistic	0.256					Nonparametric Statistics	
313					5% A-D Critical Value	0.716					90% Percentile	370
314					K-S Test Statistic	0.169					95% Percentile	405
315					5% K-S Critical Value	0.294					99% Percentile	433
316					Data appear Gamma Distributed at 5% Significance Level							
317												
318					Assuming Gamma Distribution						95% UTL with 95% Coverage	440
319					90% Percentile	403.9					95% Percentile Bootstrap UTL with 95% Coverage	440
320					95% Percentile	459.2					95% BCA Bootstrap UTL with 95% Coverage	440
321					99% Percentile	575.3					95% UPL	440
322											95% Chebyshev UPL	694.9
323					95% WH Approx. Gamma UPL	477.6					Upper Threshold Limit Based upon IQR	396.3
324					95% HW Approx. Gamma UPL	483.5						
325					95% WH Approx. Gamma UTL with 95% Coverage	660.8						
326					95% HW Approx. Gamma UTL with 95% Coverage	682.7						
327												
328												
329												
330	M MAGNESIUM											

	A	B	C	D	E	F	G	H	I	J	K	L
331												
332						General Statistics						
333					Total Number of Observations	8				Number of Distinct Observations		8
334					Tolerance Factor	3.187						
335												
336				Raw Statistics						Log-Transformed Statistics		
337					Minimum	4010				Minimum		8.297
338					Maximum	23100				Maximum		10.05
339					Second Largest	16400				Second Largest		9.705
340					First Quartile	7660				First Quartile		8.934
341					Median	11470				Median		9.314
342					Third Quartile	15800				Third Quartile		9.668
343					Mean	12026				Mean		9.254
344					SD	6416				SD		0.59
345					Coefficient of Variation	0.534						
346					Skewness	0.477						
347												
348												
349					Warning: There are only 8 Values in this data							
350					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
351					the resulting calculations may not be reliable enough to draw conclusions							
352												
353					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
354												
355						Background Statistics						
356				Normal Distribution Test						Lognormal Distribution Test		
357					Shapiro Wilk Test Statistic	0.942				Shapiro Wilk Test Statistic		0.953
358					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
359					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
360												
361				Assuming Normal Distribution						Assuming Lognormal Distribution		
362					95% UTL with 95% Coverage	32476				95% UTL with 95% Coverage		68411
363					95% UPL (t)	24920				95% UPL (t)		34169
364					90% Percentile (z)	20249				90% Percentile (z)		22245
365					95% Percentile (z)	22580				95% Percentile (z)		27559
366					99% Percentile (z)	26953				99% Percentile (z)		41187
367												
368				Gamma Distribution Test						Data Distribution Test		
369					k star	2.406				Data appear Normal at 5% Significance Level		
370					Theta Star	4998						
371					MLE of Mean	12026						
372					MLE of Standard Deviation	7753						
373					nu star	38.5						
374												
375					A-D Test Statistic	0.27				Nonparametric Statistics		
376					5% A-D Critical Value	0.719				90% Percentile		18410
377					K-S Test Statistic	0.202				95% Percentile		20755
378					5% K-S Critical Value	0.296				99% Percentile		22631
379					Data appear Gamma Distributed at 5% Significance Level							
380												
381				Assuming Gamma Distribution						95% UTL with 95% Coverage		23100
382					90% Percentile	22409				95% Percentile Bootstrap UTL with 95% Coverage		23100
383					95% Percentile	26937				95% BCA Bootstrap UTL with 95% Coverage		23100
384					99% Percentile	36871				95% UPL		23100
385										95% Chebyshev UPL		41692

	A	B	C	D	E	F	G	H	I	J	K	L
386					95% WH Approx. Gamma UPL	29070				Upper Threshold Limit Based upon IQR		28010
387					95% HW Approx. Gamma UPL	30022						
388				95% WH Approx. Gamma UTL with	95% Coverage	45656						
389				95% HW Approx. Gamma UTL with	95% Coverage	49237						
390												
391												
392												
393	M MANGANESE											
394												
395						General Statistics						
396					Total Number of Observations	8				Number of Distinct Observations		8
397					Tolerance Factor	3.187						
398												
399					Raw Statistics					Log-Transformed Statistics		
400					Minimum	6.1				Minimum		1.808
401					Maximum	340				Maximum		5.829
402					Second Largest	263				Second Largest		5.572
403					First Quartile	37.4				First Quartile		3.605
404					Median	140.8				Median		4.773
405					Third Quartile	249.5				Third Quartile		5.519
406					Mean	150.4				Mean		4.406
407					SD	129.6				SD		1.418
408					Coefficient of Variation	0.861						
409					Skewness	0.222						
410												
411												
412					Warning: There are only 8 Values in this data							
413					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
414					the resulting calculations may not be reliable enough to draw conclusions							
415												
416					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
417												
418						Background Statistics						
419					Normal Distribution Test					Lognormal Distribution Test		
420					Shapiro Wilk Test Statistic	0.877				Shapiro Wilk Test Statistic		0.889
421					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
422					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
423												
424					Assuming Normal Distribution					Assuming Lognormal Distribution		
425					95% UTL with	95% Coverage	563.3			95% UTL with	95% Coverage	7532
426					95% UPL (t)	410.8				95% UPL (t)		1418
427					90% Percentile (z)	316.4				90% Percentile (z)		504.8
428					95% Percentile (z)	363.5				95% Percentile (z)		845.2
429					99% Percentile (z)	451.8				99% Percentile (z)		2222
430												
431					Gamma Distribution Test					Data Distribution Test		
432					k star	0.681				Data appear Normal at 5% Significance Level		
433					Theta Star	220.9						
434					MLE of Mean	150.4						
435					MLE of Standard Deviation	182.3						
436					nu star	10.9						
437												
438					A-D Test Statistic	0.441				Nonparametric Statistics		
439					5% A-D Critical Value	0.737				90% Percentile		286.1
440					K-S Test Statistic	0.263				95% Percentile		313.1

	A	B	C	D	E	F	G	H	I	J	K	L
441					5% K-S Critical Value	0.302					99% Percentile	334.6
442	Data appear Gamma Distributed at 5% Significance Level											
443												
444	Assuming Gamma Distribution						95% UTL with 95% Coverage					340
445					90% Percentile	380	95% Percentile Bootstrap UTL with 95% Coverage					340
446					95% Percentile	517	95% BCA Bootstrap UTL with 95% Coverage					340
447					99% Percentile	845					95% UPL	340
448											95% Chebyshev UPL	749.4
449					95% WH Approx. Gamma UPL	630.3	Upper Threshold Limit Based upon IQR					567.7
450					95% HW Approx. Gamma UPL	712.9						
451					95% WH Approx. Gamma UTL with 95% Coverage	1267						
452					95% HW Approx. Gamma UTL with 95% Coverage	1616						
453												
454												
455												
456	MISC PH											
457												
458	General Statistics											
459					Total Number of Observations	8	Number of Distinct Observations					7
460					Tolerance Factor	3.187						
461												
462	Raw Statistics						Log-Transformed Statistics					
463					Minimum	7.2					Minimum	1.974
464					Maximum	8					Maximum	2.079
465					Second Largest	7.9					Second Largest	2.067
466					First Quartile	7.375					First Quartile	1.998
467					Median	7.6					Median	2.028
468					Third Quartile	7.75					Third Quartile	2.048
469					Mean	7.588					Mean	2.026
470					SD	0.28					SD	0.0369
471					Coefficient of Variation	0.0369						
472					Skewness	0.118						
473												
474												
475	Warning: There are only 8 Values in this data											
476	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
477	the resulting calculations may not be reliable enough to draw conclusions											
478												
479	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
480												
481	Background Statistics											
482	Normal Distribution Test						Lognormal Distribution Test					
483					Shapiro Wilk Test Statistic	0.961					Shapiro Wilk Test Statistic	0.962
484					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
485	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
486												
487	Assuming Normal Distribution						Assuming Lognormal Distribution					
488					95% UTL with 95% Coverage	8.48					95% UTL with 95% Coverage	8.529
489					95% UPL (t)	8.15					95% UPL (t)	8.166
490					90% Percentile (z)	7.946					90% Percentile (z)	7.95
491					95% Percentile (z)	8.048					95% Percentile (z)	8.057
492					99% Percentile (z)	8.239					99% Percentile (z)	8.262
493												
494	Gamma Distribution Test						Data Distribution Test					
495					k star	525.3	Data appear Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
496					Theta Star	0.0144						
497					MLE of Mean	7.588						
498					MLE of Standard Deviation	0.331						
499					nu star	8405						
500												
501					A-D Test Statistic	0.22			Nonparametric Statistics			
502					5% A-D Critical Value	0.715					90% Percentile	7.93
503					K-S Test Statistic	0.149					95% Percentile	7.965
504					5% K-S Critical Value	0.294					99% Percentile	7.993
505			Data appear Gamma Distributed at 5% Significance Level									
506												
507			Assuming Gamma Distribution							95% UTL with	95% Coverage	8
508					90% Percentile	8.015				95% Percentile Bootstrap UTL with	95% Coverage	8
509					95% Percentile	8.14				95% BCA Bootstrap UTL with	95% Coverage	8
510					99% Percentile	8.379					95% UPL	8
511											95% Chebyshev UPL	8.882
512					95% WH Approx. Gamma UPL	8.161					Upper Threshold Limit Based upon IQR	8.313
513					95% HW Approx. Gamma UPL	8.162						
514					95% WH Approx. Gamma UTL with 95% Coverage	8.511						
515					95% HW Approx. Gamma UTL with 95% Coverage	8.516						
516												
517												
518												
519	M POTASSIUM											
520												
521					General Statistics							
522					Total Number of Observations	8					Number of Distinct Observations	8
523					Tolerance Factor	3.187						
524												
525			Raw Statistics						Log-Transformed Statistics			
526					Minimum	4730					Minimum	8.462
527					Maximum	17200					Maximum	9.753
528					Second Largest	13900					Second Largest	9.54
529					First Quartile	7020					First Quartile	8.851
530					Median	9825					Median	9.193
531					Third Quartile	11875					Third Quartile	9.378
532					Mean	9993					Mean	9.131
533					SD	4145					SD	0.432
534					Coefficient of Variation	0.415						
535					Skewness	0.54						
536												
537												
538			Warning: There are only 8 Values in this data									
539			Note: It should be noted that even though bootstrap methods may be performed on this data set,									
540			the resulting calculations may not be reliable enough to draw conclusions									
541												
542			The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.									
543												
544					Background Statistics							
545			Normal Distribution Test						Lognormal Distribution Test			
546					Shapiro Wilk Test Statistic	0.963					Shapiro Wilk Test Statistic	0.976
547					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
548			Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level			
549												
550			Assuming Normal Distribution						Assuming Lognormal Distribution			

	A	B	C	D	E	F	G	H	I	J	K	L
551					95% UTL with 95% Coverage	23203				95% UTL with 95% Coverage		36544
552					95% UPL (t)	18322					95% UPL (t)	21985
553					90% Percentile (z)	15304					90% Percentile (z)	16059
554					95% Percentile (z)	16810					95% Percentile (z)	18784
555					99% Percentile (z)	19635					99% Percentile (z)	25207
556												
557			Gamma Distribution Test						Data Distribution Test			
558					k star	4.159			Data appear Normal at 5% Significance Level			
559					Theta Star	2402						
560					MLE of Mean	9993						
561					MLE of Standard Deviation	4900						
562					nu star	66.55						
563												
564					A-D Test Statistic	0.17			Nonparametric Statistics			
565					5% A-D Critical Value	0.718					90% Percentile	14890
566					K-S Test Statistic	0.152					95% Percentile	16045
567					5% K-S Critical Value	0.295					99% Percentile	16969
568			Data appear Gamma Distributed at 5% Significance Level									
569												
570			Assuming Gamma Distribution								95% UTL with 95% Coverage	17200
571					90% Percentile	16559					95% Percentile Bootstrap UTL with 95% Coverage	17200
572					95% Percentile	19171					95% BCA Bootstrap UTL with 95% Coverage	17200
573					99% Percentile	24740					95% UPL	17200
574											95% Chebyshev UPL	29156
575					95% WH Approx. Gamma UPL	20159					Upper Threshold Limit Based upon IQR	19158
576					95% HW Approx. Gamma UPL	20530						
577					95% WH Approx. Gamma UTL with 95% Coverage	29100						
578					95% HW Approx. Gamma UTL with 95% Coverage	30457						
579												
580												
581												
582	M SODIUM											
583												
584					General Statistics							
585					Total Number of Observations	8					Number of Distinct Observations	8
586					Tolerance Factor	3.187						
587												
588			Raw Statistics						Log-Transformed Statistics			
589					Minimum	95800					Minimum	11.47
590					Maximum	208000					Maximum	12.25
591					Second Largest	154000					Second Largest	11.94
592					First Quartile	107750					First Quartile	11.59
593					Median	127500					Median	11.75
594					Third Quartile	145000					Third Quartile	11.88
595					Mean	133225					Mean	11.77
596					SD	36364					SD	0.254
597					Coefficient of Variation	0.273						
598					Skewness	1.295						
599												
600												
601					Warning: There are only 8 Values in this data							
602					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
603					the resulting calculations may not be reliable enough to draw conclusions							
604												
605					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							

	A	B	C	D	E	F	G	H	I	J	K	L
606												
607					Background Statistics							
608				Normal Distribution Test						Lognormal Distribution Test		
609					Shapiro Wilk Test Statistic	0.896				Shapiro Wilk Test Statistic		0.95
610					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
611				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
612												
613				Assuming Normal Distribution						Assuming Lognormal Distribution		
614					95% UTL with 95% Coverage	249117				95% UTL with 95% Coverage		290190
615					95% UPL (t)	206299				95% UPL (t)		215301
616					90% Percentile (z)	179827				90% Percentile (z)		179020
617					95% Percentile (z)	193039				95% Percentile (z)		196290
618					99% Percentile (z)	217821				99% Percentile (z)		233307
619												
620				Gamma Distribution Test						Data Distribution Test		
621					k star	10.81				Data appear Normal at 5% Significance Level		
622					Theta Star	12326						
623					MLE of Mean	133225						
624					MLE of Standard Deviation	40524						
625					nu star	172.9						
626												
627					A-D Test Statistic	0.266				Nonparametric Statistics		
628					5% A-D Critical Value	0.716				90% Percentile		170200
629					K-S Test Statistic	0.135				95% Percentile		189100
630					5% K-S Critical Value	0.294				99% Percentile		204220
631				Data appear Gamma Distributed at 5% Significance Level								
632												
633				Assuming Gamma Distribution						95% UTL with 95% Coverage		208000
634					90% Percentile	187078				95% Percentile Bootstrap UTL with 95% Coverage		208000
635					95% Percentile	206121				95% BCA Bootstrap UTL with 95% Coverage		208000
636					99% Percentile	245107				95% UPL		208000
637										95% Chebyshev UPL		301348
638					95% WH Approx. Gamma UPL	211351				Upper Threshold Limit Based upon IQR		200875
639					95% HW Approx. Gamma UPL	212227						
640					95% WH Approx. Gamma UTL with 95% Coverage	271353						
641					95% HW Approx. Gamma UTL with 95% Coverage	275378						
642												
643												
644												
645	MISC TOTAL ORGANIC CARBON											
646												
647					General Statistics							
648					Total Number of Observations	8				Number of Distinct Observations		7
649					Tolerance Factor	3.187						
650												
651				Raw Statistics						Log-Transformed Statistics		
652					Minimum	2.4				Minimum		0.875
653					Maximum	8				Maximum		2.079
654					Second Largest	4.1				Second Largest		1.411
655					First Quartile	2.475				First Quartile		0.906
656					Median	2.9				Median		1.064
657					Third Quartile	3.8				Third Quartile		1.334
658					Mean	3.613				Mean		1.199
659					SD	1.879				SD		0.407
660					Coefficient of Variation	0.52						

	A	B	C	D	E	F	G	H	I	J	K	L
661					Skewness	2.265						
662												
663												
664					Warning: There are only 8 Values in this data							
665					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
666					the resulting calculations may not be reliable enough to draw conclusions							
667												
668					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
669												
670					Background Statistics							
671					Normal Distribution Test					Lognormal Distribution Test		
672					Shapiro Wilk Test Statistic	0.696				Shapiro Wilk Test Statistic		0.812
673					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
674					Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
675												
676					Assuming Normal Distribution					Assuming Lognormal Distribution		
677					95% UTL with 95% Coverage	9.6				95% UTL with 95% Coverage		12.14
678					95% UPL (t)	7.388				95% UPL (t)		7.518
679					90% Percentile (z)	6.02				90% Percentile (z)		5.59
680					95% Percentile (z)	6.703				95% Percentile (z)		6.481
681					99% Percentile (z)	7.983				99% Percentile (z)		8.553
682												
683					Gamma Distribution Test					Data Distribution Test		
684					k star	3.856				Data Follow Appr. Gamma Distribution at 5% Significance Level		
685					Theta Star	0.937						
686					MLE of Mean	3.613						
687					MLE of Standard Deviation	1.84						
688					nu star	61.69						
689												
690					A-D Test Statistic	0.778				Nonparametric Statistics		
691					5% A-D Critical Value	0.718				90% Percentile		5.27
692					K-S Test Statistic	0.245				95% Percentile		6.635
693					5% K-S Critical Value	0.295				99% Percentile		7.727
694					Data follow Appx. Gamma Distribution at 5% Significance Level							
695												
696					Assuming Gamma Distribution					95% UTL with 95% Coverage		8
697					90% Percentile	6.079				95% Percentile Bootstrap UTL with 95% Coverage		8
698					95% Percentile	7.071				95% BCA Bootstrap UTL with 95% Coverage		8
699					99% Percentile	9.195				95% UPL		8
700										95% Chebyshev UPL		12.3
701					95% WH Approx. Gamma UPL	7.426				Upper Threshold Limit Based upon IQR		5.788
702					95% HW Approx. Gamma UPL	7.443						
703					95% WH Approx. Gamma UTL with 95% Coverage	10.83						
704					95% HW Approx. Gamma UTL with 95% Coverage	11.09						
705												
706												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Converted_Data.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Coverage	95%								
7			Different or Future K Values	1								
8			Number of Bootstrap Operations	2000								
9												
10												
11	M CHROMIUM											
12												
13					General Statistics							
14					Number of Valid Data	8			Number of Detected Data		3	
15					Number of Distinct Detected Data	3			Number of Non-Detect Data		5	
16					Warning: Data set has only 3 Detected Values.							
17					This is not enough to compute meaningful and reliable test statistics and estimates.							
18					No statistics will be produced!							
19												
20					Tolerance Factor	3.187			Percent Non-Detects		62.50%	
21												
22					Raw Statistics				Log-transformed Statistics			
23					Minimum Detected	0.76			Minimum Detected		-0.274	
24					Maximum Detected	5.5			Maximum Detected		1.705	
25					Mean of Detected	3.153			Mean of Detected		0.864	
26					SD of Detected	2.37			SD of Detected		1.023	
27					Minimum Non-Detect	0.53			Minimum Non-Detect		-0.635	
28					Maximum Non-Detect	4			Maximum Non-Detect		1.386	
29												
30					Data with Multiple Detection Limits				Single Detection Limit Scenario			
31					Note: Data have multiple DLs - Use of KM Method is recommended				Number treated as Non-Detect with Single DL		7	
32					For all methods (except KM, DL/2, and ROS Methods),				Number treated as Detected with Single DL		1	
33					Observations < Largest ND are treated as NDs				Single DL Non-Detect Percentage		87.50%	
34												
35												
36					Warning: There are only 3 Distinct Detected Values in this data set							
37					The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.							
38					Those methods will return a 'N/A' value on your output display!							
39												
40					It is necessary to have 4 or more Distinct Values for bootstrap methods.							
41					However, results obtained using 4 to 9 distinct values may not be reliable.							
42					It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.							
43												
44					Background Statistics							
45					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
46					Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic		0.936	
47					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value		0.767	
48					Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
49												
50					Assuming Normal Distribution				Assuming Lognormal Distribution			
51					DL/2 Substitution Method				DL/2 Substitution Method			
52					Mean	1.616			Mean (Log Scale)		-0.0998	
53					SD	1.88			SD (Log Scale)		1.139	
54					95% UTL 95% Coverage	7.607			95% UTL 95% Coverage		34.08	
55					95% UPL (t)	5.393			95% UPL (t)		8.918	

	A	B	C	D	E	F	G	H	I	J	K	L
56					90% Percentile (z)	4.025					90% Percentile (z)	3.894
57					95% Percentile (z)	4.708					95% Percentile (z)	5.888
58					99% Percentile (z)	5.989					99% Percentile (z)	12.79
59												
60				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
61											Mean in Original Scale	1.382
62											SD in Original Scale	1.94
63											Mean in Log Scale	-0.424
64											SD in Log Scale	1.231
65											95% UTL 95% Coverage	33.08
66											95% UPL (t)	7.765
67											90% Percentile (z)	3.17
68											95% Percentile (z)	4.957
69											99% Percentile (z)	11.47
70												
71				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
72					k star (bias corrected)	N/A				Data appear Normal at 5% Significance Level		
73					Theta Star	N/A						
74					nu star	N/A						
75												
76					A-D Test Statistic	N/A				Nonparametric Statistics		
77					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
78					K-S Test Statistic	N/A					Mean	1.708
79					5% K-S Critical Value	N/A					SD	1.667
80				Data not Gamma Distributed at 5% Significance Level							SE of Mean	0.737
81											95% KM UTL with 95% Coverage	7.02
82				Assuming Gamma Distribution							95% KM Chebyshev UPL	9.413
83					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	5.057
84					Mean	N/A					90% Percentile (z)	3.844
85					Median	N/A					95% Percentile (z)	4.45
86					SD	N/A					99% Percentile (z)	5.585
87					k star	N/A						
88					Theta star	N/A				Gamma ROS Limits with Extrapolated Data		
89					Nu star	N/A					95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
90					95% Percentile of Chisquare (2k)	N/A					95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
91											95% WH Approx. Gamma UTL with 95% Coverage	N/A
92					90% Percentile	N/A					95% HW Approx. Gamma UTL with 95% Coverage	N/A
93					95% Percentile	N/A						
94					99% Percentile	N/A						
95												
96	Note: DL/2 is not a recommended method.											
97												
98												
99	M IRON											
100												
101					General Statistics							
102					Number of Valid Data	8					Number of Detected Data	4
103					Number of Distinct Detected Data	4					Number of Non-Detect Data	4
104					Tolerance Factor	3.187					Percent Non-Detects	50.00%
105												
106				Raw Statistics						Log-transformed Statistics		
107					Minimum Detected	597					Minimum Detected	6.392
108					Maximum Detected	728					Maximum Detected	6.59
109					Mean of Detected	663					Mean of Detected	6.494
110					SD of Detected	53.56					SD of Detected	0.0812

	A	B	C	D	E	F	G	H	I	J	K	L
111					Minimum Non-Detect	20					Minimum Non-Detect	2.996
112					Maximum Non-Detect	132					Maximum Non-Detect	4.883
113												
114				Data with Multiple Detection Limits						Single Detection Limit Scenario		
115	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	4
116	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	4
117	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	50.00%
118												
119												
120				Warning: There are only 4 Distinct Detected Values in this data								
121				Note: It should be noted that even though bootstrap may be performed on this data set								
122				the resulting calculations may not be reliable enough to draw conclusions								
123												
124				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
125												
126				Background Statistics								
127				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
128					Shapiro Wilk Test Statistic	0.966					Shapiro Wilk Test Statistic	0.964
129					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
130				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
131												
132				Assuming Normal Distribution						Assuming Lognormal Distribution		
133					DL/2 Substitution Method						DL/2 Substitution Method	
134					Mean	345.4					Mean (Log Scale)	4.775
135					SD	341.7					SD (Log Scale)	1.913
136					95% UTL 95% Coverage	1435					95% UTL 95% Coverage	52716
137					95% UPL (t)	1032					95% UPL (t)	5540
138					90% Percentile (z)	783.4					90% Percentile (z)	1376
139					95% Percentile (z)	907.5					95% Percentile (z)	2757
140					99% Percentile (z)	1140					99% Percentile (z)	10158
141												
142					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
143					Mean	217.2					Mean in Original Scale	590
144					SD	488.7					SD in Original Scale	85.56
145					95% UTL with 95% Coverage	1775					95% UTL with 95% Coverage	919.3
146											95% BCA UTL with 95% Coverage	728
147											95% Bootstrap (%) UTL with 95% Coverage	728
148					95% UPL (t)	1199					95% UPL (t)	777.8
149					90% Percentile (z)	843.6					90% Percentile (z)	701.4
150					95% Percentile (z)	1021					95% Percentile (z)	738.6
151					99% Percentile (z)	1354					99% Percentile (z)	813.6
152												
153				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
154					k star (bias corrected)	50.96				Data appear Normal at 5% Significance Level		
155					Theta Star	13.01						
156					nu star	407.7						
157												
158					A-D Test Statistic	0.279				Nonparametric Statistics		
159					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
160					K-S Test Statistic	0.234					Mean	630
161					5% K-S Critical Value	0.394					SD	46.53
162				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	18.99
163											95% KM UTL with 95% Coverage	778.3
164				Assuming Gamma Distribution							95% KM Chebyshev UPL	845.1
165					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	723.5

	A	B	C	D	E	F	G	H	I	J	K	L
166					Mean	523.5				90% Percentile (z)		689.6
167					Median	490.5				95% Percentile (z)		706.5
168					SD	153.2				99% Percentile (z)		738.2
169					k star	8.392						
170					Theta star	62.38		Gamma ROS Limits with Extrapolated Data				
171					Nu star	134.3				95% Wilson Hilferty (WH) Approx. Gamma UPL		878.2
172					95% Percentile of Chisquare (2k)	27.31				95% Hawkins Wixley (HW) Approx. Gamma UPL		885.9
173										95% WH Approx. Gamma UTL with	95% Coverage	1159
174					90% Percentile	764.3				95% HW Approx. Gamma UTL with	95% Coverage	1187
175					95% Percentile	851.7						
176					99% Percentile	1033						
177												
178	Note: DL/2 is not a recommended method.											
179												
180												
181	MISC NITRATE											
182												
183					General Statistics							
184					Number of Valid Data	7				Number of Detected Data		5
185					Number of Distinct Detected Data	4				Number of Non-Detect Data		2
186					Tolerance Factor	3.399				Percent Non-Detects		28.57%
187					Number of Missing Values	1						
188												
189					Raw Statistics					Log-transformed Statistics		
190					Minimum Detected	0.067				Minimum Detected		-2.703
191					Maximum Detected	3.4				Maximum Detected		1.224
192					Mean of Detected	0.857				Mean of Detected		-1.121
193					SD of Detected	1.427				SD of Detected		1.476
194					Minimum Non-Detect	0.05				Minimum Non-Detect		-2.996
195					Maximum Non-Detect	0.05				Maximum Non-Detect		-2.996
196												
197												
198												
199					Warning: There are only 4 Distinct Detected Values in this data							
200					Note: It should be noted that even though bootstrap may be performed on this data set							
201					the resulting calculations may not be reliable enough to draw conclusions							
202												
203					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
204												
205					Background Statistics							
206					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
207					Shapiro Wilk Test Statistic	0.629				Shapiro Wilk Test Statistic		0.915
208					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
209					Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
210												
211					Assuming Normal Distribution					Assuming Lognormal Distribution		
212					DL/2 Substitution Method					DL/2 Substitution Method		
213					Mean	0.62				Mean (Log Scale)		-1.854
214					SD	1.234				SD (Log Scale)		1.739
215					95% UTL 95% Coverage	4.812				95% UTL 95% Coverage		57.74
216					95% UPL (t)	3.182				95% UPL (t)		5.8
217					90% Percentile (z)	2.2				90% Percentile (z)		1.454
218					95% Percentile (z)	2.649				95% Percentile (z)		2.734
219					99% Percentile (z)	3.489				99% Percentile (z)		8.942
220												

	A	B	C	D	E	F	G	H	I	J	K	L
221					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
222					Mean	0.327					Mean in Original Scale	0.615
223					SD	1.434					SD in Original Scale	1.236
224					95% UTL with 95% Coverage	5.201					95% UTL with 95% Coverage	229.9
225											95% BCA UTL with 95% Coverage	3.4
226											95% Bootstrap (%) UTL with 95% Coverage	3.4
227					95% UPL (t)	3.306					95% UPL (t)	11.71
228					90% Percentile (z)	2.165					90% Percentile (z)	1.95
229					95% Percentile (z)	2.686					95% Percentile (z)	4.42
230					99% Percentile (z)	3.663					99% Percentile (z)	20.52
231												
232				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
233					k star (bias corrected)	0.387					Data follow Appr. Gamma Distribution at 5% Significance Level	
234					Theta Star	2.216						
235					nu star	3.869						
236												
237					A-D Test Statistic	0.591				**Nonparametric Statistics**		
238					5% A-D Critical Value	0.704					Kaplan-Meier (KM) Method	
239					K-S Test Statistic	0.378					Mean	0.632
240					5% K-S Critical Value	0.369					SD	1.136
241				Data follow Appx. Gamma Distribution at 5% Significance Level							SE of Mean	0.48
242											95% KM UTL with 95% Coverage	4.493
243				**Assuming Gamma Distribution**							95% KM Chebyshev UPL	5.925
244					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	2.991
245					Mean	0.612					90% Percentile (z)	2.087
246					Median	0.14					95% Percentile (z)	2.5
247					SD	1.238					99% Percentile (z)	3.274
248					k star	0.196						
249					Theta star	3.125				**Gamma ROS Limits with Extrapolated Data**		
250					Nu star	2.743					95% Wilson Hilferty (WH) Approx. Gamma UPL	4.157
251					95% Percentile of Chisquare (2k)	2.03					95% Hawkins Wixley (HW) Approx. Gamma UPL	5.636
252											95% WH Approx. Gamma UTL with 95% Coverage	11.87
253					90% Percentile	1.852					95% HW Approx. Gamma UTL with 95% Coverage	21.42
254					95% Percentile	3.172						
255					99% Percentile	6.82						
256												
257	Note: DL/2 is not a recommended method.											
258												
259												
260	MISC TOTAL ORGANIC HALIDES											
261												
262						**General Statistics**						
263					Number of Valid Data	8					Number of Detected Data	5
264					Number of Distinct Detected Data	5					Number of Non-Detect Data	3
265					Tolerance Factor	3.187					Percent Non-Detects	37.50%
266												
267				**Raw Statistics**						**Log-transformed Statistics**		
268					Minimum Detected	0.022					Minimum Detected	-3.817
269					Maximum Detected	0.93					Maximum Detected	-0.0726
270					Mean of Detected	0.247					Mean of Detected	-2.268
271					SD of Detected	0.385					SD of Detected	1.43
272					Minimum Non-Detect	0.054					Minimum Non-Detect	-2.919
273					Maximum Non-Detect	0.71					Maximum Non-Detect	-0.342
274												
275				**Data with Multiple Detection Limits**						**Single Detection Limit Scenario**		

	A	B	C	D	E	F	G	H	I	J	K	L
276	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect with Single DL	7
277	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected with Single DL	1
278	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	87.50%
279												
280												
281	Warning: There are only 5 Detected Values in this data											
282	Note: It should be noted that even though bootstrap may be performed on this data set											
283	the resulting calculations may not be reliable enough to draw conclusions											
284												
285	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
286												
287	Background Statistics											
288	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
289					Shapiro Wilk Test Statistic	0.669					Shapiro Wilk Test Statistic	0.955
290					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
291	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
292												
293	Assuming Normal Distribution						Assuming Lognormal Distribution					
294					DL/2 Substitution Method						DL/2 Substitution Method	
295					Mean	0.206					Mean (Log Scale)	-2.437
296					SD	0.313					SD (Log Scale)	1.353
297					95% UTL 95% Coverage	1.204					95% UTL 95% Coverage	6.52
298					95% UPL (t)	0.835					95% UPL (t)	1.325
299					90% Percentile (z)	0.607					90% Percentile (z)	0.495
300					95% Percentile (z)	0.721					95% Percentile (z)	0.809
301					99% Percentile (z)	0.934					99% Percentile (z)	2.035
302												
303					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
304											Mean in Original Scale	0.168
305											SD in Original Scale	0.311
306											Mean in Log Scale	-2.687
307											SD in Log Scale	1.239
308											95% UTL 95% Coverage	3.533
309											95% UPL (t)	0.821
310											90% Percentile (z)	0.333
311											95% Percentile (z)	0.523
312											99% Percentile (z)	1.216
313												
314	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
315					k star (bias corrected)	0.411	Data appear Gamma Distributed at 5% Significance Level					
316					Theta Star	0.601						
317					nu star	4.112						
318												
319					A-D Test Statistic	0.445	Nonparametric Statistics					
320					5% A-D Critical Value	0.701					Kaplan-Meier (KM) Method	
321					K-S Test Statistic	0.287					Mean	0.17
322					5% K-S Critical Value	0.368					SD	0.29
323	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.115
324											95% KM UTL with 95% Coverage	1.096
325	Assuming Gamma Distribution										95% KM Chebyshev UPL	1.513
326					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	0.754
327					Mean	0.155					90% Percentile (z)	0.542
328					Median	0.032					95% Percentile (z)	0.648
329					SD	0.317					99% Percentile (z)	0.846
330					k star	0.21						

	A	B	C	D	E	F	G	H	I	J	K	L
331					Theta star	0.74	Gamma ROS Limits with Extrapolated Data					
332					Nu star	3.361	95% Wilson Hilferty (WH) Approx. Gamma UPL					0.951
333				95% Percentile of Chisquare (2k)		2.137	95% Hawkins Wixley (HW) Approx. Gamma UPL					1.222
334							95% WH Approx. Gamma UTL with 95% Coverage					2.485
335					90% Percentile	0.47	95% HW Approx. Gamma UTL with 95% Coverage					4.089
336					95% Percentile	0.791						
337					99% Percentile	1.666						
338												
339	Note: DL/2 is not a recommended method.											
340												
341												
342	PET DIESEL RANGE ORGANICS											
343												
344					General Statistics							
345					Number of Valid Data	8	Number of Detected Data					6
346					Number of Distinct Detected Data	6	Number of Non-Detect Data					2
347					Tolerance Factor	3.187	Percent Non-Detects					25.00%
348												
349					Raw Statistics		Log-transformed Statistics					
350					Minimum Detected	64	Minimum Detected					4.159
351					Maximum Detected	190	Maximum Detected					5.247
352					Mean of Detected	110.5	Mean of Detected					4.645
353					SD of Detected	44.37	SD of Detected					0.373
354					Minimum Non-Detect	50	Minimum Non-Detect					3.912
355					Maximum Non-Detect	50	Maximum Non-Detect					3.912
356												
357												
358												
359					Warning: There are only 6 Detected Values in this data							
360					Note: It should be noted that even though bootstrap may be performed on this data set							
361					the resulting calculations may not be reliable enough to draw conclusions							
362												
363					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
364												
365					Background Statistics							
366					Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only					
367					Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Test Statistic					0.959
368					5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value					0.788
369					Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level					
370												
371					Assuming Normal Distribution		Assuming Lognormal Distribution					
372					DL/2 Substitution Method		DL/2 Substitution Method					
373					Mean	89.13	Mean (Log Scale)					4.288
374					SD	54.52	SD (Log Scale)					0.731
375					95% UTL 95% Coverage	262.9	95% UTL 95% Coverage					749
376					95% UPL (t)	198.7	95% UPL (t)					316.6
377					90% Percentile (z)	159	90% Percentile (z)					185.9
378					95% Percentile (z)	178.8	95% Percentile (z)					242.5
379					99% Percentile (z)	216	99% Percentile (z)					399.1
380												
381					Maximum Likelihood Estimate(MLE) Method		Log ROS Method					
382					Mean	87.12	Mean in Original Scale					92.97
383					SD	55.27	SD in Original Scale					49.68
384					95% UTL with 95% Coverage	263.3	95% UTL with 95% Coverage					468.3
385							95% BCA UTL with 95% Coverage					190

	A	B	C	D	E	F	G	H	I	J	K	L
386								95% Bootstrap (%) UTL with			95% Coverage	190
387					95% UPL (t)	198.2					95% UPL (t)	245.9
388					90% Percentile (z)	158					90% Percentile (z)	165.2
389					95% Percentile (z)	178					95% Percentile (z)	201.5
390					99% Percentile (z)	215.7					99% Percentile (z)	292.5
391												
392			**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**				
393					k star (bias corrected)	4.332		Data appear Normal at 5% Significance Level				
394					Theta Star	25.51						
395					nu star	51.98						
396												
397					A-D Test Statistic	0.315			**Nonparametric Statistics**			
398					5% A-D Critical Value	0.698					Kaplan-Meier (KM) Method	
399					K-S Test Statistic	0.245					Mean	98.88
400					5% K-S Critical Value	0.333					SD	40.45
401			Data appear Gamma Distributed at 5% Significance Level								SE of Mean	15.66
402											95% KM UTL with	95% Coverage 227.8
403			**Assuming Gamma Distribution**								95% KM Chebyshev UPL	285.9
404					Gamma ROS Statistics with Extrapolated Data						95% KM UPL (t)	180.2
405					Mean	82.88					90% Percentile (z)	150.7
406					Median	90					95% Percentile (z)	165.4
407					SD	63.42					99% Percentile (z)	193
408					k star	0.191						
409					Theta star	434.7		**Gamma ROS Limits with Extrapolated Data**				
410					Nu star	3.05					95% Wilson Hilferty (WH) Approx. Gamma UPL	524.6
411					95% Percentile of Chisquare (2k)	1.989					95% Hawkins Wixley (HW) Approx. Gamma UPL	856
412											95% WH Approx. Gamma UTL with	95% Coverage 1228
413					90% Percentile	250.5					95% HW Approx. Gamma UTL with	95% Coverage 2636
414					95% Percentile	432.3						
415					99% Percentile	936.9						
416												
417	Note: DL/2 is not a recommended method.											
418												
419												
420	MISC SULFATE											
421												
422					**General Statistics**							
423					Number of Valid Data	8					Number of Detected Data	7
424					Number of Distinct Detected Data	7					Number of Non-Detect Data	1
425					Tolerance Factor	3.187					Percent Non-Detects	12.50%
426												
427			**Raw Statistics**					**Log-transformed Statistics**				
428					Minimum Detected	19					Minimum Detected	2.944
429					Maximum Detected	67					Maximum Detected	4.205
430					Mean of Detected	45.71					Mean of Detected	3.728
431					SD of Detected	19.32					SD of Detected	0.495
432					Minimum Non-Detect	34					Minimum Non-Detect	3.526
433					Maximum Non-Detect	34					Maximum Non-Detect	3.526
434												
435												
436												
437					Warning: There are only 7 Detected Values in this data							
438					Note: It should be noted that even though bootstrap may be performed on this data set							
439					the resulting calculations may not be reliable enough to draw conclusions							
440												

	A	B	C	D	E	F	G	H	I	J	K	L
441	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
442												
443	Background Statistics											
444	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
445					Shapiro Wilk Test Statistic	0.908				Shapiro Wilk Test Statistic		0.888
446					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
447	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
448												
449	Assuming Normal Distribution						Assuming Lognormal Distribution					
450					DL/2 Substitution Method					DL/2 Substitution Method		
451					Mean	42.13				Mean (Log Scale)		3.616
452					SD	20.57				SD (Log Scale)		0.557
453				95% UTL	95% Coverage	107.7			95% UTL	95% Coverage		219.2
454					95% UPL (t)	83.45				95% UPL (t)		113.8
455					90% Percentile (z)	68.48				90% Percentile (z)		75.91
456					95% Percentile (z)	75.95				95% Percentile (z)		92.92
457					99% Percentile (z)	89.97				99% Percentile (z)		135.8
458												
459					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
460					Mean	42.23				Mean in Original Scale		42.9
461					SD	20.11				SD in Original Scale		19.58
462				95% UTL with	95% Coverage	106.3			95% UTL with	95% Coverage		191.8
463									95% BCA UTL with	95% Coverage		67
464									95% Bootstrap (%) UTL with	95% Coverage		67
465					95% UPL (t)	82.64				95% UPL (t)		106.1
466					90% Percentile (z)	68				90% Percentile (z)		73.62
467					95% Percentile (z)	75.3				95% Percentile (z)		88.36
468					99% Percentile (z)	89.01				99% Percentile (z)		124.4
469												
470	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
471					k star (bias corrected)	3.216	Data appear Normal at 5% Significance Level					
472					Theta Star	14.21						
473					nu star	45.03						
474												
475					A-D Test Statistic	0.398	Nonparametric Statistics					
476					5% A-D Critical Value	0.71				Kaplan-Meier (KM) Method		
477					K-S Test Statistic	0.218				Mean		42.75
478					5% K-S Critical Value	0.313				SD		18.51
479	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		7.085
480									95% KM UTL with	95% Coverage		101.7
481	Assuming Gamma Distribution									95% KM Chebyshev UPL		128.3
482					Gamma ROS Statistics with Extrapolated Data					95% KM UPL (t)		79.94
483					Mean	42.69				90% Percentile (z)		66.47
484					Median	42.5				95% Percentile (z)		73.19
485					SD	19.83				99% Percentile (z)		85.81
486					k star	3.07						
487					Theta star	13.91	Gamma ROS Limits with Extrapolated Data					
488					Nu star	49.11				95% Wilson Hilferty (WH) Approx. Gamma UPL		94.91
489					95% Percentile of Chisquare (2k)	12.8				95% Hawkins Wixley (HW) Approx. Gamma UPL		97.43
490										95% WH Approx. Gamma UTL with	95% Coverage	143.4
491					90% Percentile	75.36				95% HW Approx. Gamma UTL with	95% Coverage	152.6
492					95% Percentile	89						
493					99% Percentile	118.5						
494												
495	Note: DL/2 is not a recommended method.											

	A	B	C	D	E	F	G	H	I	J	K	L
496												

ATTACHMENT E

RESPONSES TO COMMENTS ON DRAFT TECHNICAL MEMORANDUM AND MEDEP MARCH 2014 LETTER

TETRA TECH

PITT-02-14-026

February 10, 2014

Project Number 112G02100

Mr. Matthew Audet
USEPA, Region 1
5 Post Office Square
Suite 100
Mail Code OSRR07-3
Boston, Massachusetts 02109-3912

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62470-08-D-1001 (CLEAN)
Contract Task Order No. WE13

Subject: Responses to Comments on Draft Memorandum on Re-Evaluation of Facility Background Report
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Audet/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech is pleased to provide to U.S. Environmental Protection Agency Region I (USEPA) and Maine Department of Environmental Protection (MEDEP) 2 and 3 copies, respectively, of the responses to USEPA comments dated June 27, 2012 and July 10, 2012, MEDEP comments dated July 30, 2012, and MEDEP follow-up comments dated January 8, 2014 on the subject document. USEPA indicated no further comments in an email dated January 24, 2014. An electronic copy of the responses to comments is also being submitted via e-mail.

Comments are requested by **March 11, 2014**.

If you have any comments or questions, or if additional information is required, please contact Ms. Linda Cole at 757.341.2011.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs office at 207.438.1140 or by writing to:

Portsmouth Naval Shipyard
Public Affairs Office
Attn: Danna Eddy
Portsmouth, NH 03804-5000

Sincerely,

Deborah J. Cohen, PE
Project Manager

DJC/clm
Enclosure

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Hard Copy and electronic copy via e-mail
NAVFAC MIDLANT. (Code OPTE3/L. Cole)
NAVFAC MIDLANT PWD ME (Code PRN4, M. Thyng)

RESPONSES TO USEPA COMMENTS DATED JUNE 27, 2012
DRAFT RE-EVALUATION OF FACILITY BACKGROUND REPORT TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

(The Navy provided draft responses to USEPA comments on April 29, 2013. USEPA's email dated January 24, 2014 indicated USEPA had no further comments.)

General Comments

1. **Comment:** The Navy is proposing to establish background concentrations for brackish groundwater based on a very limited data set of eight samples (four samples each collected from two wells). A database of only two wells is insufficient to establish background conditions. Similarly, the freshwater groundwater dataset is being comprised of only four wells, each having four rounds of samples collected. Navy's *Guidance for Environmental Background Analysis Volume III: Groundwater* states in Section 2.1.5: *"The background analysis and comparative statistical methods presented in this guidance document typically require chemical data representing at least 10 groundwater monitoring wells located in both impacted and unimpacted zones, and a series of semiannual or quarterly sampling events."* Also Section 1.6.2 states: *"Variations in chemical characteristics of groundwater over time must also be considered for background groundwater analysis. Temporal variations are typically due to seasonal fluctuations in aquifer recharge rates. Semiannual or more frequent sampling over several years is required to accurately characterize seasonal trends."*

   Response: The groundwater background data were collected in 1996 and 1997 prior to the release of the current Navy Guidance published in 2003. The purpose of this Technical Memorandum was to update the summary statistics characterizing the background data based on updated statistical procedures for the summary statistics since the Facility Background Report (Tetra Tech, May 2000) was prepared. The Navy does not plan to collect any additional background data. An uncertainty section will be added to the Technical Memorandum for the Re-Evaluation of Facility Background Report and the limited number of samples comprising the groundwater background data set will be discussed.

2. **Comment:** The Navy has provided no documentation to demonstrate that the two wells identified as brackish are statistically different from the four freshwater wells. Given the relative locations of brackish and freshwater wells, the distinction appears inappropriate. Please include appropriate justification for distinguishing between these groups of wells.

   Response: The purpose of the Technical Memorandum was to update the summary statistics presented in the Facility Background Report. In the 2000 Facility Background Report, salinity was the major factor used to distinguish between wells and summary statistics were calculated separately for each data set; therefore, the updated summary statistics were also calculated for each data set. Additionally, even though the data sets were not evaluated to determine if they were statistically different, concentrations of chemicals from the freshwater and brackish wells represent different populations and therefore it would not be appropriate to calculate statistics combining two separate populations.

3. **Comment:** The background groundwater dataset should also include geochemical data for temperature, redox potential, dissolved oxygen, and specific conductivity so that appropriate

comparisons can be made among background wells and with site wells when evaluating for COPCs.

Response: Field measurements (pH, specific conductance, temperature, turbidity, dissolved oxygen, salinity, and Eh) for groundwater samples were presented in Appendix B of the Facility Background Report. The data are included in Table 3-2 of the Groundwater Monitoring Summary Report (December, 1996 – November, 1997) (Tetra Tech, August 1999). A reference to these data will be provided.

Specific Comment

1. **Comment:** Table 2: There is a typographical error for the 95% UCL for pH; it should not be 74.

   Response: The 95 percent upper confidence limit (UCL) for pH is 7.4. Table 2 will be updated to show that the UCL is 7.4.

RESPONSES TO USEPA COMMENTS DATED JULY 10, 2012
DRAFT RE-EVALUATION OF FACILITY BACKGROUND REPORT TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

(USEPA comments dated July 10, 2012 are similar in nature to the June 27, 2012 comments. Please see the responses to USEPA comments dated June 27, 2012 for additional information for similar comments.)

1. **Comment:** Navy is proposing to establish background concentrations for brackish groundwater based on a very limited data set of eight samples (four samples each collected from two wells). A database of only two wells is insufficient to establish background conditions. Similarly, the freshwater groundwater dataset is also small being comprised of only four wells, each having four rounds of samples collected.

   Response: An uncertainty section will be added that will discuss uncertainty associated with the limited number of samples comprising the groundwater background data set.

2. **Comment:** Navy has provided no documentation to demonstrate that the two wells identified as brackish are statistically different from the four freshwater wells. Given the relative locations of brackish and freshwater wells, the distinction appears inappropriate. Please include appropriate statistical justification for distinguishing between these groups of wells.

   Response: Salinity was the major factor for distinguishing between the brackish and freshwater wells.

3. **Comment:** The background groundwater dataset should also include geochemical data for temperature, redox potential, dissolved oxygen, and specific conductivity so that appropriate comparisons can be made among background wells and with site wells when evaluating for COPCs.

   Response: Geochemical data were presented in Appendix B of the Facility Background Report, which was taken from the Groundwater Monitoring Summary Report. A reference to the geochemical data will be provided in the Technical Memorandum.

4. **Comment:** As a result of not excluding any potential outliers from the dataset plus the addition of location BGS-26, the calculated background concentrations proposed in the re-evaluation document have changed; the majority are somewhat greater in the re-evaluation document but some values are lower. The most notable differences are for pesticides and zinc for which the proposed background values increased significantly and for some PAHs for which the background values decreased significantly.

   Response: Comment noted.

5. **Comment: Table 2.** There is a typographical error for the 95% UCL for pH; it should not be 74.

   Response: The 95 percent UCL for pH will be updated to 7.4 in Table 2.

RESPONSES TO MEDEP COMMENTS DATED JULY 30, 2012 AND FOLLOW-UP COMMENTS DATED JANUARY 8, 2014
DRAFT RE-EVALUATION OF FACILITY BACKGROUND REPORT TECHNICAL MEMORANDUM
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

(The Navy provided draft responses to MEDEP comments on April 29, 2013. MEDEP follow-up comments on the responses to comments 1, 3, 6, 9, and 12 and an additional comment were received on January 8, 2014. The following provides the July 30, 2012 comments, the April 29, 2013 Navy responses, and the January 2014 MEDEP follow-up comments and Navy responses.)

1. **July 30 2012 Comment:** Previously MEDEP has indicated the two biggest problems with the background data analyses are the improper use of non-detect values and the handling of statistical outliers. We discussed these issues during our June 29, 2012 conference call. The Navy indicated they would show the range of NDs on the report's histograms using different colors or markers to distinguish them. The Navy also stated they would provide detailed justification for including outliers in the dataset. Further discussion of these issues is included in the comments below. Several comments address more specific issues.

   April 29, 2013 Response: The methods mentioned by MEDEP for handling non-detects during the June 29, 2012 conference call still require that a numeric value be entered for these values. The detection limit was entered and noted as a non-detect in the statistical software used to calculate the summary statistics and graphical displays presented in the background re-evaluation. This includes calculations of UCLs, upper prediction limits (UPLs), and upper tolerance limits (UTLs) using USEPA software ProUCL version 4.1.00. The graphical displays in USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (2009) were constructed using the detection limit for non-detected concentrations. Please see the Navy's response to MEDEP Comment No. 9 for details on the changes the Navy made to the graphical displays. For further justification of including the outliers in the dataset please see the Navy's response to MEDEP Comment No. 12.

   January 8, 2014 Follow-up Comment: Response to Comment 1. MEDEP is satisfied with the identification of non-detects in the graphs and the use of ProUCL and the identification of non-detects and their detection levels. This should provide the most appropriate UCLs for each dataset. There are still some issues where there are too many non-detects to calculate a UCL or any other statistics. These should be clearly stated in the results and tables.

   February 10, 2014 Response: Uncertainty regarding non-detects will be noted in the technical memorandum as provided in the April 29, 2013 response to MEDEP Comment No. 11.

2. **July 30, 2012 Comment:** Please submit the data in the Maine EDD format with as many fields completed as possible.

   April 29, 2013 Response: The Navy's background dataset, available in NIRIS and provided in Appendix A of the Technical Memorandum, will be provided to MEDEP in the Maine EDD format. No additional data will be entered into the database for the Maine EDD data submission.

3. **July 30, 2012 Comment:** Introduction, third paragraph. The 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations were calculated by 1) using only the detected

concentrations and 2) using detected concentrations and ½ the detection limit. Neither method is currently recommended for handling non-detects. We are concerned that given the large percentage of the PAH data with detection limits greater than most of the detected values, that there is no appropriate method for calculating equivalent concentrations. Please see references such as the EPA (2009), Hewett and Ganser (2007), and Helsel (2005, 2012) for acceptable ways to handle non-detects other than data substitution.

April 29, 2013 Response: The referenced documents do not discuss how to handle non-detect concentrations when calculating 2,3,7,8-TCDD toxicity equivalent quotients (TEQs) and benzo(a)pyrene equivalent concentrations or any other calculated chemical parameter. Additionally the calculations of 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations for the background data should be conducted in the same manner as site data at PNS. It is common practice to use one-half the detection limit for 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations and this procedure has been used for site data at PNS. Therefore, no change to the calculation of 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations presented in the Technical Memorandum will be made.

To provide a better understanding of how handling of the detection limits may affect the calculation of 2,3,7,8-TCDD TEQs and benzo(a)pyrene equivalents for the facility background data set, the Navy also calculated UCLs, UPLs, and UTLs by summing the ProUCL outputs for UCLs, UPLs, and UTLs for the individual parameters multiplied by their corresponding toxicity equivalency factor (TEF). These were compared with the outputs from ProUCL for 2,3,7,8-TCDD TEQs and benzo(a)pyrene equivalents based on positive detections only and using one-half the detection limit for non-detects. In addition, benzo(a)pyrene equivalents were calculated using the February 2013 proposed Maine Remedial Action Guidelines (RAGs) background concentrations for the individual parameters to provide a comparison to the various facility background calculated benzo(a)pyrene equivalents. The tables with this information are provided at the end of the responses to comments. These tables show that there is little impact to the facility background concentrations using the two methods.

As shown on the table with the 2,3,7,8-TCDD TEQ calculations, there is little difference between the various calculations of TEQs based on the 95-percent UCLs. The lowest value (6.7 ng/kg) was based on using one-half the detection limit to represent non-detects and the calculation based on summation of the UCL for each parameter had the greatest value (9.2 ng/kg). The UPLs and UTLs are greater than the UCLs, but show the same pattern.

For benzo(a)pyrene equivalents, the various calculations for the facility background data are similar and all in the range of approximately 300 to 800 µg/kg, with the ProUCL output for the UCL being the lowest value. These are all less than equivalents based on the background numbers provided in the February 2013 Maine RAGs proposed revisions. The February 2013 Maine RAGs proposed revisions provide UPLs for rural developed areas, urban developed areas, and urban fill. The UPLs for benzo(a)pyrene ranged from 1,500 to 5,200 µg/kg, and benzo(a)pyrene equivalents that were calculated using the February 2013 UPLs for individual parameters ranged from approximately 2,000 to 13,500 µg/kg. The facility background benzo(a)pyrene equivalents (714 and 514 µg/kg) are also less than New England average urban concentrations of benzo(a)pyrene (1,323 µg/kg) (see the Navy's response to MEDEP Comment No. 12).

January 8, 2014 Follow-up Comment: RTC 2. "The referenced documents do not discuss how to handle non-detect concentrations when calculating 2,3,7,8-TCDD toxicity equivalent

quotients (TEQs) and benzo(a)pyrene equivalent concentrations or any other calculated chemical parameter."

Helsel discusses methods for calculating quantitative statistics, such as maximum likelihood estimation (MLE) and robust ROS. Although he does not specifically mention calculating TEQs, these methods provide ways of estimating missing data that are an improvement over arbitrary data substitution. Unfortunately, these methods require a substantial amount of data above the reporting limit in order to be used.

"It is common practice to use one-half the detection limit for 2,3,7,8-TCDD TEQ and benzo(a)pyrene equivalent concentrations and this procedure has been used for site data at PNS."

While we agree that the practice is common we do not believe it is a statistically appropriate practice. Likewise, continuing an inappropriate practice because it is standard practice is not prudent. Indeed, the Navy revised the background evaluation report in order to update statistical methods used in the evaluation. However, as discussed above, based on MEDEP's PAH background evaluation, the PAH background values the Navy has proposed are reasonable for an area with a long history of industrial activity.

February 10, 2014 Response: No change is necessary for the technical memorandum based on this follow-up comment. As provided in MEDEP's follow-up comment, the background values the Navy has proposed are acceptable. However, the following is provided to clarify that the Navy did not use an inappropriate practice to calculate TEQs for the facility background technical memorandum.

There are various methods that USEPA accepts to handle non-detections when calculating TEQs for individual samples, including using 0, ½ the detection limit, or full detection limit. Helsel (2009) proposes another method using the Kaplan-Meier (KM) statistics to calculate TEQs for individual samples. Use of the KM for calculating TEQs for individual samples has not specifically been approved by USEPA; however, USEPA's ProUCL incorporates KM statistical methods.

As stated in the April 29, 2013 response to MEDEP Comment No. 1, to better understand how handling of detection limits may affect the accuracy of calculation of 2,3,7,8-TCDD and benzo(a)pyrene TEQs for the facility background data set, the Navy compared the mean TEQs calculated in the technical memorandum to calculated TEQs using summations of ProUCL outputs for the individual chemicals. As shown in the April 29, 2013 response to MEDEP Comment No.1, the difference between the output of using ½ ND, positive detections only, and summation of ProUCL outputs for individual chemicals are considered insignificant for this project. Therefore, limitations of the method used for calculation of the TEQ mean for the background data set are perceived to have little effect on the outcome of the data analyses and the method used is considered appropriate and acceptable for this project.

4. **July 30, 2012 Comment:** Figure 1. BGS-22 is off the edge of the map. Please correct this.

   April 29, 2013 Response: Figure 1 will be updated to show BGS-22.

5. **July 30, 2012 Comment:** Table 2. In Table 2, how were averages of data with nondetects calculated? Note that it is inappropriate to use quantitation limits (or any other substitution of data) when calculating summary statistics. Please see EPA (2009), Hewett and Ganser (2007), and Helsel (2005, 2012) for alternative methods.

April 29, 2013 Response: One-half the detection limit was used for the average calculation. This was done to be consistent with how average data are presented in risk assessments for PNS. It is common practice to use one-half the detection limit for the average calculations presented in RAGs Table 3s. To be consistent with the presentation of site data and the background data the average calculations will not be changed. A footnote will be added to Tables 2, 4, and 5 indicating that one-half the detection limit was used in the calculation of the average concentrations. Note that UCLs, UPLs, and UTLs are outputs of ProUCL and were calculated in accordance with ProUCL requirements.

6. **July 30, 2012 Comment:** Table 2. The number of samples for metals, SVOC, VOC, PAH, and pesticide analyses is stated as 25, but we count 24 total samples if BGS-26 is a duplicate of BGS-10.

   April 29, 2013 Response: BGS-26 is not listed in the data base as a duplicate sample and therefore, was not treated as a duplicate. The data and the sample type for each location are presented in Table A.1 of Attachment A. Therefore, no changes are required to the number of samples listed in Table 2.

   January 8, 2014 Follow-up Comment: RTC 6. "BGS-26 is not listed in the data base as a duplicate sample and therefore, was not treated as a duplicate. The data and the sample type for each location are presented in Table A.1 of Attachment A. Therefore, no changes are required to the number of samples listed in Table 2."

   Based on the field sheets and figures from the time the data were collected, the database is incorrect. The field log clearly states BGS-26 is a field duplicate of BGS-10. MEDEP can forward a copy of this information if needed. Sample location maps from the era of the original study show there is no unique location for BGS-26. Following the convention used at PNSY the data for BGS-10 and BGS-26 need to be combined, and the database needs to be corrected for the final report.

   February 10, 2014 Response: In consideration that BGS-26 was not identified as a duplicate sample in previous data evaluations and that inclusion of BGS-26 as a separate sample has negligible impact on the evaluation of the facility background evaluation results, the Navy has elected not to make a change to the database at this time and will make a note of this in the technical memorandum. The following provides the justification.

   Duplicate samples for this project are typically averaged for calculation of dataset averages and other statistics in risk assessment. However, BGS-26 was not identified as a duplicate sample in the data base and therefore, was not averaged with BGS-10 as part of previous data evaluations or in this technical memorandum. Review of the data shows that the results for the two samples are similar (relative percent difference is generally less than 20 percent). The results for BGS-26 and BGS-10 are in the middle to lower end of the range of detections and are less than the 95 percent UCL. Therefore, including BGS-26 as an additional sample in the dataset as is presented in the technical memorandum tends toward a slightly lower average for the facility background dataset. This difference is slight because of the concentrations at BGS-26 and BGS-10 compared to the other 23 background samples. Updating the database and calculations to show BGS-26 as a duplicate would not have a significant impact on the output and usefulness of the background technical memorandum compared to the significant time and effort it would require to redo all of the calculations and data plotting.

7. **<u>July 30, 2012 Comment:</u>** In Table 2, the range of detection limits is incomplete. The range shown is only the range for data that have undetected results, which commonly are an order of magnitude greater than the detected values. Please record the detection limits for all the sample analyses.

   <u>April 29, 2013 Response:</u> The range of detection limits in Tables 2, 4, and 5 are the ranges of detection limits for samples with non-detected results. The titles of these columns will be changed to, "Range of Non-detected Results."

8. **<u>July 30, 2012 Comment:</u>** Table A1. The existence of detection limits that exceed detected values makes us question the usability of the data. It is impossible to quantitatively compare data with detection limits 10 times the values of other data. For example, consider the benzo(a)pyrene data where some of the undetected data have detection limits of 350-400 ppm and other data have detected values of 36-110 J ppm. Is 350 U greater or less than, say, 43 J? We have no way of knowing this, making it very problematic to assign a value to 350 U. Please provide a defensible method for handling data with such high detection limits.

   <u>April 29, 2013 Response</u>: Non-detected concentrations were handled in accordance with USEPA (2009) for the graphical displays and the technical guidance for ProUCL for calculating the 95-percent UCLs, UPLs, and UTLs. The Navy agrees that there is uncertainty with the detection limits of the PAH data. The uncertainty of these detection limits will be discussed in the added uncertainty section of the Technical Memorandum.

9. **<u>July 30, 2012 Comment:</u>** Statistical Methodology. The plotting of substituted data, such as quantitation limits, on graphs can show trends or patterns that have more to do with laboratory methods than environmental concerns. The substitution of values for non-detects will alter the plots depending on the value chosen and will not accurately represent the distribution of parameters in soil. In particular, the depiction of mercury, selenium, bis(2-ethylhexyl)phthalate, benzo(a)pyrene (and other PAH) data may be inaccurate due to the plotting of detection limits along with actual data. A probability plot of data where 22 out of 25 points are detection limits (as with the bis(2-ethylhexyl)phthalate data) will show the distribution of the detection limits not the environmental data. Please see EPA (2009) and Helsel (2005, 2012) for alternative plotting methods.

   <u>April 29, 2013 Response:</u> Chapter 9 of USEPA 2009 discusses the use of non-detects and graphical displays of data. Specifically Section 9.2 Box plots states, "It is important to plot the data as reported by the laboratory for non-detects or negative radionuclide data. Proxy values for non-detects should not be plotted since we want to see the distribution of the original data. Different symbols can be used to display non-detects, such as the open symbols described in Section 9.1. The mean will be biased high if using the RL of non-detects in the calculation, but the purpose of the box plot is to assess the distribution of the data, not quantifying a precise estimate of an unbiased mean. Displaying the frequency of detection (number of detected values/number of total sample) under the station name is also helpful. Unlike time series plots, box plots cannot use missing data, so missing data should be removed before producing a box plot." Also, the example box plot, Example 9-2 and Figure 9-2, non-detected data were used in the construction of the box plot. Section 9.3 Histograms states, "Also, use the data as reported by the laboratory for non-detects and eliminate any missing values, since histograms cannot include missing data." The example histograms, Figure 9-3, was constructed using non-detected data as well.

The graphical displays presented in the outlier assessment will be updated with the Frequency of Detection (FOD) added to the box plot, normal probability plot, histogram, and summary statistics. For the box plots solid squares will be added to the box plots displaying the detection limit of the non-detected results. The non-detected results were already plotted with a different symbol on the normal probability plot. For the histograms a solid square will be placed on the histogram denoting the detection limit of non-detected samples. The average concentration presented in the summary statistics will be removed. The non-detected results will continue to be used in the graphical displays as is consistent with the USEPA guidance.

January 8, 2014 Follow-up Comment: RTC 9. MEDEP appreciates the effort the Navy has made to make the non-detect data more obvious, such as plotting them with a different symbol. These changes will help clarify the limitations of a given comparison between site and background concentrations. However, these limitations are great in that creating a probability plot of mostly non-detect values will give you a good assessment of the distribution of the detection limits, but not the parameter of interest. A note should be added to such datasets that we do not have enough data to make valid statistical assessments and, hence, cannot provide an estimate of background concentrations for those parameters.

February 10, 2014 Response: The technical memorandum has been updated to note the limitations.

10. **July 30, 2012 Comment:** Statistical Methodology, last paragraph. Basic summary statistics were computed after assigning the non-detects ½ the detection limit. At the beginning of this section, it was stated that re-evaluation of the background data was based on updated statistical methods. It should be noted that current statistical practice for environmental data strongly discourages the use of replacing a fixed value for non-detects (e.g., USEPA, 2009; Singh et al, 2010; Helsel 2005) especially for calculating summary statistics. For data that have multiple detection limits, as is the case here, substitution of detection limits for non-detects results in the introduction of unrelated patterns into the data. It is highly recommended that other methods, such as maximum likelihood estimation (MLE), Kaplan-Meier nonparametric method, or regression on order statistics (ROS), be used instead of data substitution (Hewett and Ganser (2007); Helsel (2005, 2012)).

    April 29, 2013 Response: The referenced text states that the detection limit was used, not one-half the detection limit, for the statistical calculations. The 95-percent UCLs, UTLs, and UPLs were calculated using ProUCL, which incorporates the methods referenced for handling nondetect data. As stated in the Navy's response to MEDEP Comment No. 1, non-detects have to be assigned a numerical value. The referenced survival methods recommended by MEDEP have to have a value for the non-detects; the calculations do not ignore non-detected results. Therefore the detection limit reported by the laboratory was input into the software and the graphical displays. This procedure for handling non-detects is consistent with USEPA (2009) and in general the use of the methods referenced by MEDEP.

    One-half the detection limit was only used for the average calculations presented on Tables 2, 4 and 5. The average concentration presented on the graphical displays will be removed and the average concentration presented on Tables 2, 4, and 5 will not be changed as stated in the Navy's response to MEDEP Comment No. 5.

11. **July 30, 2012 Comment:** Statistical Methodology, last paragraph. The Navy states that summary statistics cannot be calculated for data where the majority of values are non-detect, therefore they only substituted the detection limit for non-detects if there were three or more detections. The case where there are three detections, however, is where the majority of values

are non-detect. The USEPA's 2006 Data Quality Assessment: Statistical Methods for Practitioners Guidance discourages the use of data substitution of non-detects for datasets with greater than 15% non-detects. It has been shown that even at non-detection percentages as low as 5-10%, substitution gives inconsistent results compared to other methods (Singh et al, 2006). The results from USEPA's ProUCL software in Appendix B warn that the results are likely to be invalid, yet they are presented in Table 2. MEDEP disagrees with this approach and recommends 10-15 measureable observations for the calculation of UCLs and summary statistics.

April 29, 2013 Response: As stated in the Navy's responses to MEDEP Comment Nos. 1 and 10, the methods referenced by MEDEP for handling non-detected concentrations still include the non-detected results. The detection limits are inputted for these results and they are noted as non-detects. The Navy does agree that there is uncertainty with calculations involving a high percentage of non-detects and the warning messages from ProUCL will be added as a footnote to Tables 2, 4, and 5. The uncertainty of these results will also be discussed in the uncertainty section that will be added to the Technical Memorandum. No decisions are being made based on the summary statistics presented in the Technical Memorandum. The methodology that the Navy used for the background comparisons presented in the Remedial Investigation Reports for Operable Units 7 and 9 will be used for statistical comparison of site and background data.

12. **July 30, 2012 Comment:** Soil, second paragraph. The Navy identifies at least 18 potential outliers based on statistical methods then dismisses them as outliers because they are outside of CERCLA sites. This raises the question of why outlier tests were performed if the conclusion is that no sample result could have been an outlier regardless of what proper statistical analyses show.

    The EPA (2002) defines outliers as, "Measurements (usually larger or smaller than other data values) that are not representative of the sample population from which they were drawn. Outliers distort statistics if used in any calculations." Therefore, the identification of outliers is important so that underlying assumptions in statistical analyses, i.e., all data come from the same population, are valid. Singh et al, 2006, recommended that all outliers be removed before calculating a UCL, UPL, or UTL. Although we do not agree with the automatic dismissal of outliers, we think that the reasons for retaining outliers in estimating background concentrations should be strongly supported.

    Outliers may be the result of errors in sampling, recording, or analysis. There is, however, no assessment of data quality in this report. Please evaluate the possibility that outliers are a result of error and provide a data quality assessment of all the data.

    The identification of outliers is not a simple, clear-cut process. The reasons for identifying outliers should have been established prior to evaluating background data. For example, outliers may be helpful for revealing errors in sampling, recording, or analysis and for identifying data belonging to another population (contaminated). On the other hand, outliers may be extreme values within a population (not uncommon in environmental data). The Unified Guidance (EPA, 2009) recommends assessing the possible causes for outliers, and not automatically removing or retaining them.

    Including outliers in the dataset solely because they were from locations outside CERCLA sites is unacceptable to MEDEP. As discussed during our June 29 conference call the Navy will need to provide additional justification for using these data in the background data set.

April 29, 2013 Response: USEPA's Data Quality Assessment: Statistical Methods for Practitioners (2006) states the following:

"Statistical outlier tests give the analyst probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that required further investigation. The tests alone cannot determine whether a statistical outliers should be discarded or corrected within a data set. This decision should be based on judgmental or scientific grounds. There are 5 steps involved in treating extreme values or outliers:

1. Identify extreme values that may be potential outliers.
2. Apply statistical test.
3. Scientifically review statistical outliers and decide on their disposition.
4. Conduct data analyses with and without statistical outliers; and
5. Document the process.

Potential outliers may be identified through the graphical representations of Chapter 2 (step 1 above). Graphs such as box and whisker plots, ranked data plot, normal probability plot, and time plot can all be used to identify observations that are much larger or smaller than the rest of the data. If potential outliers are identified, the next step is to apply one of the statistical tests described in the following sections.

If a data point is found to be an outlier, the analyst may either : 1) correct the data point; 2) discard the data point from the analysis; or 3) use the data point in the analysis. This decision should be based on scientific reasoning in addition to the results of the statistical test. For instance, data points containing transcription errors should be corrected, whereas data points collected while an instrument was malfunctioning may be discarded. Discarding an outlier from a data set should be done with extreme caution, particularly from environmental data sets, which often contain legitimate extreme values. If an outlier is discarded from the data set, all statistical analysis of the data should be applied to both the full and truncated data set so that the effect of discarding observations may be assessed. If scientific reasoning does not explain the outlier, it should be discarded from the data set."

The typical potential chemicals of concern (COPCs) for PNS IRP sites that have concentrations that may be similar to background are arsenic, lead, and PAHs. Therefore, outliers for these chemicals were evaluated further in comparison to available background data for other areas of the United States. Additional rationale is provided below for the soil outliers identified in the Re-Evaluation Technical Memorandum will be added to the outlier discussion in the Technical Memorandum.

One arsenic potential outlier and one lead potential outlier were identified, both at BGS-07. BGS-07 is located in a residential area (Shipyard Commander's Residence) and is away from any IRP Sites and is therefore not likely to represent contamination from a Navy site. Shacklett and Boerngen (1984) list the range of arsenic concentrations from eastern United States soil samples as <0.1 to 73 mg/kg. The potential arsenic outlier of 58.6 mg/kg is within this range; therefore, this concentration is likely representative of anthropogenic background and was retained in the background dataset.

The USEPA's Agency for Toxic Substances and Disease Reigstry (ATSDR, 2007) stated the following about typical anthropogenic lead soil concentrations:

“Anthropogenic sources of lead include the mining and smelting of ore, manufacture of lead-containing products, combustion of coal and oil, and waste incineration. Many anthropogenic sources of lead, most notably leaded gasoline, lead-based paint, lead solder in food cans, lead-arsenate pesticides, and shot and sinkers, have been eliminated or strictly regulated due to lead’s persistence and toxicity. Because lead does not degrades, these former uses leave their legacy as higher concentrations of lead in the environment.“

“The concentration of soil lead generally decreases as distance from contaminating sources increases. The estimated lead levels in the upper layer of soil beside roadways are typically 30–2,000 µg/g higher than natural levels, although these levels drop exponentially up to 25 m from the roadway (EPA 1986a).”

“In the state of Maine, soil samples taken from areas where the risk of lead contamination was considered high (within 1–2 feet of a foundation of a building >30 years old) indicated that 37% of the samples had high lead concentrations (>1,000 µg/g). In 44% of the private dwellings, high lead levels were found in the soil adjacent to the foundation; high levels were found in only 10% of the public locations (playgrounds, parks, etc.). In addition, the largest percentage (54%) of highly contaminated soil was found surrounding homes built prior to 1950; homes built after 1978 did not have any lead contamination in the soil (Krueger and Duguay 1989). Environmental health studies conducted near four NPL sites measured mean concentrations of lead in soil ranging from 317 to 529 mg/kg, and mean concentrations of lead in dust ranging from 206 to 469 mg/kg (Agency for Toxic Substances and Disease Registry 1995).”

Based on these anthropogenic lead concentrations the potential outlier of 1,100 mg/kg at BGS-07 was retained and concluded to represent anthropogenic background concentrations.

Three PAHs [benzo(a)pyrene, benzo(b)fluroanthene, and benzo(k)fluoranthene] and benzo(a)pyrene equivalents were identified as potential statistical outliers at BGS-14. BGS-14 is located in an undeveloped area of PNS away from any IRP sites and is therefore not likely to represent contamination from a Navy site. The following table shows the concentration of the outlier, the range and average concentrations found in New England Urban Soils (Bradley, 1994) and the February 2013 proposed revisions to Maine RAGs for Urban Developed Areas and Urban Fill. The benzo(a)pyrene, benzo(b)fluroanthene, and benzo(k)fluoranthene outlier concentrations were within the range and similar to the average concentrations reported in New England soil (Bradley, 1994). Except for the benzo(k)fluoranthene urban developed area, the outlier concentrations were less than the urban background values in the February 2013 proposed revisions to Maine RAGs. Therefore, it is likely that these samples represent anthropogenic concentrations and do not need to be removed from the background data set.

Parameter	**PNS Outlier concentration (µg/kg)**	**New England Urban Range (µg/kg)**	**New England Urban Average (µg/kg)**	**MEDEP Urban Developed Area/ Urban Fill Background (µg/kg)**
Benzo(a)pyrene	1100	40-13000	1323	1700/5200
Benzo(b)fluoranthene	1700	49-12000	1435	2000/6800
Benzo(k)fluoranthene	1100	43-25000	1681	760/12000

Dioxin/furan potential outliers were also evaluated; however, background values for dioxins/furans were not readily available. Instead, the outliers were multiplied by their TEFs and compared to the industrial USEPA soil regional screening level (RSL) for 2,3,7,8-TCDD of 18

ng/kg. None of the adjusted dioxin outlier concentrations exceed the screening criteria; therefore there is no reason to remove these concentrations from the background dataset.

Parameter	TEF	PNS Outlier Concentration (ng/kg)	Adjusted PNS Outlier Concentration (ng/kg)
1,2,3,4,6,7,8-HPCDD	0.01	826	8.26
1,2,3,4,6,7,8,9-OCDF	0.0001	129 94	0.0129 0.0094
1,2,3,4,7,8,9-HPDCF	0.01	3.4	0.034
2,3,7,8-TCDD TEQ	--	15.7	15.7

January 8, 2014 Follow-up Comment: RTC 12.

a) There are several references to background studies of a national or regional scale. Based on the direct impact of bedrock and soil types on metals in particular, and the effects of sample collection methods, statewide studies such as the recent USGS work cited in Maine's 2013 RAGs (p. 17, footnote: http://www.maine.gov/dep/ftp/RAGS-Background-Documents/Metals-and-PAH-Background-Study-2012/) are more appropriate, and rely on current sample and analytical methods. MEDEP will consider those studies as more relevant than older, less focused work, especially Shacklett and Boerngen (1984) which covers too broad an area to be relevant, especially as it concerns arsenic. We note that the study referenced in the Maine 2013 RAGs indicated the 90th percentile of arsenic in Maine ranged from approximately 13-16 ppm.

b) The urban fill background values listed with MEDEP's draft RAGs are not applicable to the background data, as the sample locations do not meet the criteria for urban fill listed in the document. Please remove them from the table.

c) MEDEP continues to object to inclusion of the outliers in the database. However, it appears that this is a situation in which MEDEP and the Navy will have to agree to disagree. In the future, we will endeavor to ensure that background comparisons are completed without allowing single outlier data points to drive the conclusions.

February 10, 2014 Response: a) No change is required based on this follow-up comment. It is noted that for the PNS facility background data set, the average is 14.5 mg/kg and the 95 percent UCL is 17.9 mg/kg. b) The table in the response to comment provides USEPA and Maine values for comparison, and the Navy believes that the urban fill values are valuable for this comparison, but agrees that the urban fill values will not be included in the technical memorandum outlier discussion. c) Comment noted. The Navy will continue to work with MEDEP to try to address MEDEP's concerns during future site-specific investigation and data evaluation.

13. July 30, 2012 Comment: Soil, 2nd paragraph. The reason given for this re-evaluation of background concentrations was to update statistical methods used in the previous background assessment report, but apparently the evaluation criteria for assessing outliers has also changed. Please explain what has changed between 2000 and now that would allow for a different conclusion on what outliers represent at this site?

April 29, 2013 Response: The purpose of the Technical Memorandum was to update the methodology for identifying outliers and computing UCLs, UPLs, and UTLs that were provided in the Facility Background Report to be consistent with the methodology that the Navy is currently using (e.g., methodology used for the RI Reports for Operable Units 7 and 9). In the Facility Background Report, outliers were identified as concentrations greater than two standard deviations exceeding the mean and were eliminated from the dataset without investigating the outliers. In the Technical Memorandum statistical hypothesis tests were used to identify potential outliers and any potential outliers were investigated for reasons they should be removed from the data sets as stated in USEPA's Data Quality Assessment: Statistical Methods for Practitioners (2006). The UCLs, UPLs, and UTLs presented in the Technical Memorandum were also re-calculated using the updated USEPA methodology for calculating UCLs, UPLs, and UTLs.

14. **July 30, 2012 Comment:** Soil, 4-Hydroxy-4-Methyl-2-Pentanone concentrations. We noticed that 4-Hydroxy-4-Methyl-2-Pentanone concentrations are unusually high and suspect that the lab has misidentified the compound. Please review the 4-Hydroxy-4-Methyl-2-Pentanone data and provide an explanation.

    April 29, 2013 Response: The Facility Background Development report listed 4-Hydroxy-4-Methyl-2-Pentanone as a tentatively identified compound. This result will be removed from the Table 2 and the outlier analysis. The following footnote will be added to 4-Hydroxy-4-Methyl-2-Pentanone in the database tables in Appendix, "tentatively identified compound not used in formal background comparisons or statistical evaluations."

15. **July 30, 2012 Comment:** Groundwater. Groundwater rarely has aluminum concentrations greater than 50 ppb, so four values greater than 800 ppb should raise a red flag. Why are these concentrations so high? Are the data valid? Were the metals samples filtered or is it possible that clay particles were included in the water sample bottles?

    April 29, 2013 Response: The data were validated. The four results referenced were from the four samples collected from the deep bedrock well at SI-01. The results for the total aluminum samples ranged from 996 to 1070 ug/L. The filtered results were less and ranged from 201 to 547 ug/L.

16. **July 30, 2012 Comment:** No spatial assessment of the concentrations was undertaken in this report. Evaluation of the distribution of potential contaminants is important in determining whether outliers indicate possible hotspots or randomly located high concentrations. For example, concentrations for most PAHs at BGS-14 were generally 1-2 orders of magnitude greater than most other locations, a strong indication that the location is contaminated well above typical background PAH values. We note that BGS-22 has PAH concentrations similar to BGS-14. However, BGS-22 is located at the edge of a parking lot where one would expect to see high PAH concentrations. BGS-14, however, is located in an undeveloped location on the Shipyard making such high concentrations suspect.

    April 29, 2013 Response: Background samples were collected from the various locations across the Shipyard and several were taken from locations off the Shipyard. The background samples were intended to represent concentrations across the area without impacts from IRP sites, and were not intended to represent pristine background. However, due to the sampling locations for the most part being relatively far apart a spatial analysis is not entirely appropriate. Please see the Navy's response to MEDEP Comment No. 12 on the additional information on the outlier evaluation. In addition, the February 2013 proposed revisions to Maine RAGs shows

that the concentrations of PAHs in BGS-14 are not dissimilar to the rural developed area background numbers.

Additional Comment from January 8, 2014: Comment No. 1. As we have discussed previously, the high PAH detection limits make comparison to site PAH concentrations difficult at best. Although resampling background soil locations for PAHs would be the most accurate way to address this problem another, though less preferable, approach is to compare the Navy's proposed values to MEDEP's PAH background evaluation. Based on this evaluation, the values being proposed are reasonable for an area with a long history of industrial and other activity.

February 10, 2014 Response: Comment noted. No change is required based on this comment.

2,3,7,8 TCDD TEQ CALCULATION							
Parameter	**TEF**	**UCL (ng/kg)**	**UCL * TEF (ng/kg)**	**UPL (ng/kg)**	**UPL * TEF (ng/kg)**	**UTL (ng/kg)**	**UTL * TEF (ng/kg)**
1,2,3,4,6,7,8,9-OCDD	0.0003	1560	0.468	3230	0.969	5090	1.527
1,2,3,4,6,7,8,9-OCDF	0.0003	68	0.0204	85.4	0.02562	129	0.0387
1,2,3,4,6,7,8-HPCDD	0.01	251	2.51	191	1.91	455	4.55
1,2,3,4,6,7,8-HPCDF	0.01	28.1	0.281	51.7	0.517	78.3	0.783
1,2,3,4,7,8,9-HPCDF	1	1	1	2.2	2.2	4.4	4.4
1,2,3,4,7,8-HXCDD	0.1	1.3	0.13	2.8	0.28	3.5	0.35
1,2,3,4,7,8-HXCDF	0.1	5.1	0.51	16.7	1.67	28.3	2.83
1,2,3,6,7,8-HXCDD	0.1	3.2	0.32	9.1	0.91	15	1.5
1,2,3,6,7,8-HXCDF	0.1	2.7	0.27	7.9	0.79	12.4	1.24
1,2,3,7,8,9-HXCDD	0.1	4.3	0.43	12.3	1.23	20.4	2.04
1,2,3,7,8,9-HXCDF	0.1	0.76	0.076	2.3	0.23	3.8	0.38
1,2,3,7,8-PECDD	1	1.3	1.3	3.7	3.7	4.1	4.1
1,2,3,7,8-PECDF	0.03	1.2	0.036	2.8	0.084	3.8	0.114
2,3,4,6,7,8-HXCDF	0.1	4	0.4	7.5	0.75	9.2	0.92
2,3,4,7,8-PECDF	0.3	3.3	0.99	6.7	2.01	8.3	2.49
2,3,7,8-TCDD	1	not detected	---	not detected	---	not detected	---
2,3,7,8-TCDF	0.1	4.6	0.46	7.6	0.76	11.5	1.15

Calculated 2,3,7,8-TCDD TEQs	**UCL**	**UPL**	**UTL**
2,3,7,8 – TCDD TEQ based on summation of ProUCL output for each individual parameter	9.2 ng/kg	18 ng/kg	28.4 ng/kg
2,3,7,8 - TCDD TEQ ProUCL output for positive detections only	7.0 ng/kg	14.8 ng/kg	22.7 ng/kg
2,3,7,8 - TCDD TEQ ProUCL output for half the detection limit for non-detects	6.7 ng/kg	13.5 ng/kg	19.5 ng/kg

ProUCL output for UCL, UTL, and UPL provided on Table 2 of the Technical Memorandum.

CALCULATION OF BENZO(A)PYRENE EQUIVALENT VALUES

Parameter	PNS Facility Background Using ProUCL Output for BAP Equivalents [1]		TEF	PNS Facility Background Using ProUCL Outputs for Individual PAHs [2]						Maine Background Using Remedial Action Guideline UPL for Individual PAHs (February 2013 proposed numbers) [3]					
	Positive Detections Only (95% UCL)	Half Detection Limits for ND (95% UCL)		95% UCL (µg/kg)	UCL X TEF (µg/kg)	95% UPL (µg/kg)	UPL X TEF (µg/kg)	95% UTL (µg/kg)	UTL X TEF (µg/kg)	Rural Developed Area (µg/kg)	UPL X TEF (µg/kg)	Urban Developed Area (µg/kg)	UPL X TEF (µg/kg)	Urban Fill (µg/kg)	UPL X TEF (µg/kg)
Benzo(a)anthracene	NA	NA	0.1	174	17.4	307	30.7	449	44.9	860	86	1600	160	27000	2700
Benzo(a)pyrene	NA	NA	1	222	222	523	523	642	642	1500	1500	1700	1700	5200	5200
Benzo(b)fluoranthene	NA	NA	0.1	496	49.6	632	63.2	888	88.8	1300	130	2000	200	6800	680
Benzo(k)fluoranthene	NA	NA	0.01	224	2.24	402	4.02	632	6.32	690	6.9	760	7.6	12000	120
Chrysene	NA	NA	0.001	310	0.31	733	0.733	906	0.906	1000	1	2300	2.3	6400	6.4
Dibenzo(a,h)anthracene	NA	NA	1	Non-detect	--	Non-detect	--	Non-detect	--	320	320	230	230	4500	4500
Indeno(1,2,3-cd)pyrene	NA	NA	0.1	132	13.2	239	23.9	341	34.1	400	40	740	74	3300	330
Calculated Benzo(a)pyrene Equivalent on sample by sample basis	714 µg/kg	514 µg/kg	**Calculated Benzo(a)pyrene Equivalent (summation of individual PAHs*TEF)**	NA	304 µg/kg	NA	646 µg/kg	NA	817 µg/kg	Rural	2,084 µg/kg	Urban	2,374 µg/kg	Urban Fill	13,536 µg/kg

1. Benzo(a)pyrene Equivalents and Benzo(a)pyrene Equivalents - HalfND as provided on Table 2
2. Parameter ProUCL outputs provided on Table 2
3. Maine RAGs proposed revisions from February 2013 are provided for comparison.

STATE OF MAINE
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March 17, 2014

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re: Navy responses to MEDEP comments, Facility Background Technical Memorandum, April 29, 2013 updated February 10, 2014.

Dear Linda,

The Maine Department of Environmental Protection has completed its review of the responses to comments referenced above. Our comments follow. No follow-up responses from the Navy are necessary.

1. As we have made clear throughout the comment/response process of this document MEDEP has many reservations regarding development of the facility background values primarily related to evaluation of outliers and high PAH detection limits. As stated in our January 8, 2014 follow-up comment, MEDEP will endeavor to ensure that background comparisons are completed without allowing single outlier data points to drive the conclusions. Furthermore, MEDEP will continue to rely on MEDEP RAGs and appropriate USEPA values to determine whether remediation of lead in soil to residential levels is necessary.

Regarding soil PAH values, as also stated in our January 8, 2014 comment letter, they are comparable to MEDEP's PAH background values (MEDEP, 2013). Therefore, while they may not be truly reflective of Shipyard background values because of the high number of non-detects, they are within the range one might expect to find in an industrial area such as the Shipyard and are therefore reasonable to use. Please include the PAH Urban Developed ME Background values in the Facility Background Soil Representative Statistics table.

2. February 10, 2014 RTC 6. This document already has a fair amount of uncertainty. Therefore, we should be trying to reduce uncertainty as much as possible, not adding to it for sake of convenience. To be consistent with past practice at the Shipyard the Navy should present the data accurately and correct the database and plots to reflect the fact that sample BGS-26 is a duplicate of BGS-10.

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Reference
Maine Department of Environmental Protection, 2013. Maine Remedial Action Guidelines (RAGS) for Sites Contaminated with Hazardous Substances, May 2013. Available at http://maine.gov/dep/spills/publications/guidance/rags/final_5-8-2013/2%20ME-RAGS_Final_5-8-2013%20Corrected%20Copy.pdf

Please feel free to contact me at (207) 287-8010 if you have any questions.

Sincerely,

Iver McLeod
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