

US EPA ARCHIVE DOCUMENT

Technical Memorandum

July 27, 2010

SUPPLEMENTAL ECOLOGICAL RISK ASSESSMENT FOR UNNAMED ISLAND SOILS

Peterson Puritan Superfund Site
Operable Unit 2
Cumberland and Lincoln, Rhode Island

EPA Contract No. EP-S1-06-01
EPA Task Order No. 0004-RS-BD-0140
EPA Project Officer: Heidi Horahan
EPA Task Order Project Officer: David Newton

INTRODUCTION

This memo has been prepared to summarize the results of a supplemental ecological risk assessment performed for the Unnamed Island within the Peterson Puritan Superfund Site, Operable Unit 2 (OU2). The purpose of the memo is to present an evaluation of the ecological risks associated with receptor exposure to soil upon incorporating additional soil sampling data collected at the Unnamed Island.

The Baseline Ecological Risk Assessment (BERA) (EPA, 2009) identified risk from exposure to soils to large and small omnivorous birds and small omnivorous mammals. Residual Risks (RRs) specific for each Contaminant of Potential Concern (COPC) identified in the Screening Level Ecological Risk Assessment (SLERA) were calculated during risk characterization in the BERA by subtracting the COPC-specific background Hazard Quotients (HQs) from the COPC-specific site HQs. The RRs above 1 represented the degree to which the site exposure, adjusted for background, exceeded its toxicity benchmark. Adverse effects were determined to be possible for small or large omnivorous birds feeding at the Unnamed Island. Several COPCs had residual risk RR values greater than 1, including bis(2-ethylhexylphthalate (BEHP), lead (Pb), and zinc (Zn).

Additional surface soil data were collected on the Unnamed Island in November 2009. These nine new sampling locations from 2009 are shown on Figure 1, along with the locations previously sampled and used in support of the SLERA and BERA. Previously, the SLERA used 21 sampling locations for selection of COPCs. A data set which included these 21 samples and an additional 5 samples was the basis of the exposure calculations in the 2009 BERA.

The purpose of this technical memorandum is to present the results of the risk assessment conducted using the additional 2009 soil data for the Unnamed Island. The process included re-screening the data to determine if addition of the 2009 samples caused the identification of additional COPCs, and an evaluation of whether any new or previously identified COPCs are likely to pose a risk of adverse effects on receptors not previously identified, or greater than previously calculated using the BERA data set.

REVISED COPC SCREENING

The same risk assessment approach taken in the Peterson Puritan OU2 SLERA (Arcadis BBL, 2007) and BERA (EPA, 2009) was used in this supplemental analysis. A data set of all available surface soil samples (a total of 34 or 35 samples depending on the analyte; see Appendix C for sample list) was used to calculate current statistics for each chemical in soil (Table 1). New maximum concentration values were then compared to the same screening criteria used in the SLERA to select COPCs. Similar to the SLERA, analytes which had no screening criteria available were initially selected as COPCs. Each

chemical that was higher than the original SLERA screening criterion was flagged in the current screening as a COPC. This resulted in identifying four metals (barium, manganese, nickel, and selenium) which formerly did not exceed screening criteria in the SLERA, but now had new maximum values exceeding these criteria, thereby including these four metals as potential COPCs. In addition, 4-methylphenol, N-nitrosodiphenylamine, alpha-BHC, and endosulfan I were identified as COPCs, since each chemical was now detected in one sample but had no screening benchmark. Each of these organics was then screened out in the current screening (Table 1) since the frequency of detection was less than 5% (see refinement of COPCs in next paragraph). Dioxin (as dioxin toxicity equivalents [TEQs]) was also identified as a new COPC based on the additional Unnamed Island soil data.

A refinement of COPCs was performed using current frequency of detection and revised maximum concentration values (Table 1). Those COPCs identified in the first screening step as having maximum concentrations above SLERA screening criteria and those with no screening criteria were further evaluated. A refinement screening was then performed by evaluating frequency of detection (with a larger sample size) and new reasonable maximum exposure (RME) concentrations. Using the same method as the BERA, a RME concentration for each COPC was calculated as the 95% upper confidence limit of the mean (95% UCL; see Appendix B for calculations). The updated RME values were compared to previously calculated RME values from the BERA. Any COPC that was determined at this step to have a current RME concentration below the BERA RME concentration is assumed to have risk results unchanged from the original BERA and, therefore, is not further analyzed in this Technical Memorandum.

Analytes identified for further evaluation included those whose current RME concentrations were greater than previously calculated in the BERA or those not previously evaluated in the BERA because they were not previously identified as COPCs in the SLERA/BERA screening process. The analyte list for further evaluation (Table 2) includes methyl acetate, 9 SVOCs, 5 pesticides, dioxin, and 10 metals.

SUPPLEMENTAL RISK ANALYSIS

The ecological receptors evaluated in the BERA were selected based on the potential occurrence locally and in the habitats on site, and the potential for exposure to site-related media. Selected receptor species in terrestrial habitats included:

- small and large omnivorous birds
- small and large omnivorous mammals.

The basis of the exposure calculations for large omnivorous birds and large omnivorous mammals was site-wide concentrations of contaminants in soils due to the large foraging area for these species. Since the site-wide scenarios were based on data from across all terrestrial habitats, the risk results are unlikely to be altered by inclusion of new data at Unnamed Island. The focus of this supplemental analysis was on the species whose exposure was calculated for Unnamed Island separately, which included small omnivorous birds and small omnivorous mammals. This case would be more sensitive to changes in exposures due to the new data set than the site-wide scenarios.

Residual Risks (RRs) specific for each COPC were calculated during risk characterization in the BERA by subtracting the COPC-specific background Hazard Quotients (HQs) from the COPC-specific site HQs. The RRs above 1 represented the degree to which the site exposure, adjusted for background, exceeded its toxicity benchmark.

Following this approach, a current RR for each COPC was calculated for multiple scenarios using the current soil RME concentration and the Hazard Quotient (HQ) calculated in the BERA. A simple method, based on calculating the current proportional HQ for each analyte, was applied. The HQ calculated in the BERA for a given analyte represents the computed daily dose of the analyte divided by the toxicity reference value for that analyte for a given species/exposure scenario. The RR was then calculated by subtracting the HQ for the corresponding calculation for the reference area.

Assuming that water intake has a very minor contribution to dietary intake of contaminants, the daily dose of an analyte is derived from ingestion of soil and ingestion of food. Since the concentration of the analyte in food is also derived directly from the soil concentration (multiplied by an uptake factor), a current HQ is directly proportional to the change in soil concentration of the analyte. Therefore, the current HQs for the Unnamed Island exposure area were calculated for each COPC as the proportional change in the ratio of the current soil concentration to the BERA soil concentration:

$$\text{Current proportional HQ} = \text{BERA HQ} * [\text{current soil concentration} / \text{BERA soil concentration}]$$

The HQs calculated for the reference area were subtracted from the current proportional HQs to calculate a new RR based on the updated soil data for small omnivorous birds and small omnivorous mammals (Table 2 and Table 3, respectively). Reference area HQs from the BERA were used to calculate current RRs, as these reference area HQs were unchanged since the new soil data were specific to the Unnamed Island. Similar to the approach taken in the BERA, RRs and HQs were not calculated for compounds when there was no available toxicity reference value.

Tables 2 and 3 present the results of the revised RR calculations for the Unnamed Island soils for two scenarios based on the RME concentrations. The first is the RME dose divided by the no adverse effect level (NOAEL) toxicity reference value (TRV) and the second is the RME dose divided by the lowest adverse effect level (LOAEL) TRV. Consistent with the RR analysis in the BERA, these represent two of the risk scenarios that served as a basis for interpreting risk to wildlife receptors.

Based on the RME evaluation for small omnivorous birds, two COPCs showed risk ($RR > 1$) both at the effect and no effect risk scenarios. Based on the BERA interpretive risk matrix (Table 4), the RR analysis shows, with at least a low level of confidence (Risk Scenario 4), that there are adverse effects possible to small omnivorous birds feeding at Unnamed Island due to exposure to cadmium and lead. 4,4'-DDE only showed risk in small omnivorous birds at the no effect level. Similarly, RR calculations for small mammals (Table 3) show risk for aluminum, cadmium, and lead, for both the RME effect and no effect scenarios. Barium only showed risk in small mammals at the no effect level.

Dioxin, nickel, and selenium were not evaluated in the wildlife models in the BERA because dioxin was not previously identified as a COPC, and the nickel and selenium maximum detected concentrations were not above screening levels based on the data set used in the SLERA. The models for small omnivorous birds and small omnivorous mammals from the BERA were used to calculate the HQs and RRs for these compounds (calculations are presented in Appendix A of this Memorandum). The methods used to calculate residual risk for dioxin, nickel, and selenium (Appendix A) were the same as used in the BERA, with TRVs selected as shown in Appendix A. In addition, it is important to note that no dioxin data were available in the reference data set in the BERA. In order to calculate a residual risk for dioxin, the soil data collected at Pratt Dam in 2009 as part of the sampling event performed at Unnamed Island were used for dioxin as an estimate of reference concentrations.

The COPCs identified with possible adverse effects in Tables 2 and 3, where RRs for both the no effect and effect evaluations were greater than 1, were carried forward for additional analysis (Tables 5 and 6). For small omnivorous birds, these included cadmium and lead. For small omnivorous mammals, the COPCs with RME risks carried forward for further evaluation were aluminum, cadmium, and lead. For these calculations, the central tendency exposures (CTE) were calculated including the 2009 soil data. Similar to the BERA, a geometric mean of the data set was used as the CTE exposure for the Unnamed Island area. The results of CTE exposure scenarios for small birds and small mammals showed similar results to the BERA evaluation. The only COPC with effect CTE (LOAEL) RR levels greater than 1 for small omnivorous birds is lead (Table 5). The RR calculated with the current UI data indicated a higher risk (CTE effect $RR = 31$) as compared to BERA data (CTE effect $RR = 17$). For small omnivorous mammals (Table 6), the only COPC exceeding 1 for both RR levels is aluminum.

The aluminum RR values for small mammals are consistent with what was observed in the BERA. The only COPC in the BERA with effect CTE RR values greater than 1 was aluminum, with a RR equal to 2, which matches the current effect CTE RR. Similar to the conclusions drawn during the evaluation of the

BERA results, impairment of mammalian wildlife due to exposure to aluminum in soil is not expected and no significant risk to small omnivorous mammals at Unnamed Island is expected from exposure to surface soil.

For both the mammal and the bird dietary exposures, the RRs for dioxin (Tables 2 and 3) were greater than 1 for the no effect (NOAEL TRV) RME case and less than 1 for the effect (LOAEL TRV) RME case. According to the interpretive matrix from the BERA (Table 4), this corresponds to a risk scenario 2, indicating that adverse effects are unlikely due to exposure to dioxin in soils on Unnamed Island.

Based on the calculated RRs and lines of evidence for the selected receptor groups, risks identified are similar to those in the BERA. In addition to the risk for lead, the BERA also concluded there was adverse risk to omnivorous birds from exposure to bis(2-ethylhexyl)phthalate and zinc in Unnamed Island soils based on the original Unnamed Island data set. These risks are still applicable; risk from bis(2-ethylhexyl)phthalate and zinc were not part of this current analysis since the new data did not result in RME concentrations for either compound exceeding those in the BERA.

Supporting the BERA conclusions, adverse effects were determined to be possible for small omnivorous birds feeding at the Unnamed Island. COPCs with RR values greater than 1 included bis(2-ethylhexyl)phthalate, lead, and zinc. The risks from exposure to lead are higher than those calculated in the BERA. Due to possible risks to avian species from soil exposures on the Unnamed Island, further consideration in the Feasibility Study is recommended.

CONCLUSIONS

- This supplemental risk evaluation, based on inclusion of additional soil data, resulted in identification of several additional COPCs for further evaluation, including nickel, selenium, and dioxin. Risk calculations for these COPCs resulted in confirmation that none of these poses a high risk for adverse effects on wildlife at Unnamed Island.
- The BERA identified the potential for adverse ecological risk to omnivorous birds feeding at the Unnamed Island. The current analysis confirmed lead as the primary risk driver, with bis(2-ethylhexyl)phthalate and zinc also representing adverse risk to small omnivorous birds, as documented in the BERA.
- Due to possible risks to avian species from soil exposures on the Unnamed Island, further consideration in the Feasibility Study is recommended.

REFERENCES

ARCADIS U.S., Inc. (ARCADIS BBL) 2007. Screening-Level Ecological Risk Assessment. February 2, 2007.

Blasland, Bouck & Lee, Inc. (BBL) 2006a. Revised Phase 1A Database Summary Report. Remedial Investigation Feasibility Study for the Peterson Puritan Superfund Site – Operable Unit 2 Cumberland and Lincoln, Rhode Island (original report written by Shield). February 2006.

Blasland, Bouck & Lee, Inc. (BBL) 2006b. Phase 1B Database Summary Report. Remedial Investigation Feasibility Study for the Peterson Puritan Superfund Site – Operable Unit 2 Cumberland and Lincoln, Rhode Island. July 2006.

Shield Environmental Associates, Inc. 2004. RI/FS Phase 1A Initial Site Characterization Report, Peterson Puritan Superfund Site - Operable Unit 2. Report prepared for Peterson Puritan OU2 PRP Group. February 2004.

US Environmental Protection Agency (EPA), 2009. Baseline Ecological Risk Assessment (BERA) for the Peterson Puritan Superfund Site - Operable Unit 2. Agency Revision of the BERA prepared by Arcadis in September 2008.

TABLES

TABLE 1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Current Screening				SLERA Screening					Current Refinement					
									Concentration Used for Screening	Screening Toxicity Value	COPC Flag (Y/N)	Rationale for Selection or Deletion	SLERA Screening Concentration	COPC in SLERA Table 18a-d? (Y/N)	Rationale for Selection or Deletion	COPC in SLERA Table 32? (Refinement) (Y/N)	Rationale for Selection or Deletion	Current Frequency of Detection	COPC Now? (Y/N)	Rationale for Selection or Deletion	Current RME Concentration	BERA Unnamed Island RME Conc.	Current RME Conc Above BERA RME Conc? (Y/N) [9]
			[1]	[1]					[2]	[3]		[4]	[5]		[4]	(Y/N)	[4]	[6]		[4]	[7]	[8]	
Unnamed Island	75-35-4	1,1-Dichloroethene	0.005 J	0.005 J	mg/Kg	SO-007-UI	1 / 35	0.00157 - 0.014	0.005	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	3%	N	FOD		0.007	
	120-82-1	1,2,4-Trichlorobenzene	0.011	0.011	mg/Kg	SO-W01-UI	1 / 35	0.00157 - 0.014	0.011	20	N	BSL	0.007	N	BSL								
	106-46-7	1,4-Dichlorobenzene	0.003 J	0.075	mg/Kg	SO-W01-UI	2 / 35	0.00157 - 0.014	0.075	20	N	BSL	0.007	N	BSL								
	78-93-3	2-Butanone	0.012	0.044	mg/Kg	SO-W01-UI	2 / 35	0.00393 - 0.014	0.044	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	6%	Y	NSL	0.0154	0.044	N
	67-64-1	Acetone	0.00309 J	0.13	mg/Kg	SO-W01-UI	10 / 35	0.0052 - 0.051	0.13	N/A	Y	NSL	0.064	Y	NSL	Y	NSL	29%	Y	NSL	0.0221	0.027	N
	71-43-2	Benzene	0.002 J	0.002 J	mg/Kg	SO-W03-UI	1 / 35	0.00157 - 0.014	0.002	N/A	Y	NSL	0.007	Y	NSL	N	NSL, ND	3%	N	FOD		N/A	
	75-15-0	Carbon disulfide	0.005 J	0.005 J	mg/Kg	SO-013-UI	1 / 35	0.00157 - 0.014	0.005	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	3%	N	FOD		0.007	
	56-23-5	Carbon tetrachloride	0.004 J	0.00602	mg/Kg	SO-209-UI (0-1')	2 / 35	0.00157 - 0.014	0.00602	1000	N	BSL	0.007	N	BSL								
	108-90-7	Chlorobenzene	0.003 J	0.005 J	mg/Kg	SO-W01-UI	2 / 35	0.00157 - 0.014	0.005	40	N	BSL	0.007	N	BSL								
	110-82-7	Cyclohexane	0.002 J	0.002 J	mg/Kg	SO-W01-UI	1 / 35	0.00157 - 0.014	0.002	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	3%	N	FOD		0.007	
	108-87-2	Cyclohexane, methyl-	0.004 J	0.004 J	mg/Kg	SO-W01-UI	1 / 35	0.00157 - 0.014	0.004	N/A	Y	NSL	0.007	Y	NSL	N	NSL, ND	3%	N	FOD		N/A	
	100-41-4	Ethylbenzene	0.001 J	0.001 J	mg/Kg	SO-W01-UI	1 / 35	0.00157 - 0.014	0.001	N/A	Y	NSL	0.007	Y	NSL	N	NSL, ND	3%	N	FOD		N/A	
	98-82-8	Isopropylbenzene	0.006 J	0.006 J	mg/Kg	SO-W01-UI	1 / 35	0.00157 - 0.014	0.006	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	3%	N	FOD		0.007	
	79-20-9	Methyl acetate	0.00211 J	0.00825 J	mg/Kg	SO-223F-UI-0-1'	2 / 35	0.00208 - 0.014	0.00825	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	6%	Y	NSL	0.00825	0.007	Y
	75-09-2	Methylene chloride	0.004 J	0.004 J	mg/Kg	SO-200-UI (0-1')	1 / 35	0.00393 - 0.025	0.004	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	3%	N	FOD		0.0125	
	127-18-4	Tetrachloroethene	0.00212 J	0.025	mg/Kg	SO-W03-UI	4 / 35	0.00157 - 0.014	0.025	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	11%	Y	NSL	0.00443	0.025	N
	108-88-3	Toluene	0.0008 J	0.002 J	mg/Kg	SO-FD02	6 / 35	0.00157 - 0.014	0.002	200	N	BSL	0.007	N	BSL								
	1330-20-7	Xylene (Total)	0.015	0.015	mg/Kg	SO-W01-UI	1 / 27	0.006 - 0.014	0.015	N/A	Y	NSL	0.007	Y	NSL	Y	NSL	4%	N	FOD		0.015	
	92-52-4	1,1'-Biphenyl	0.027 J	0.11 J	mg/Kg	SO-015-UI	6 / 34	0.148 - 0.764	0.11	60	N	BSL	0.195	N	BSL								
	91-57-6	2-Methylnaphthalene	0.0322	0.37 J	mg/Kg	SO-015-UI	19 / 34	0.34 - 0.4	0.37	N/A	Y	NSL	0.195	Y	NSL	Y	NSL	56%	Y	NSL	0.154	0.173	N
	106-44-5	4-Methylphenol	0.059 J	0.059 J	mg/Kg	SO-W02-UI	1 / 34	0.148 - 0.764	0.059	N/A	Y	NSL	0.255	N	FOD			3%	N	FOD		0.255	
	83-32-9	Acenaphthene	0.0248	1.3	mg/Kg	SO-015-UI	18 / 34	0.34 - 0.41	1.3	20	N	BSL	1.3	N	BSL								
	208-96-8	Acenaphthylene	0.024 J	0.43	mg/Kg	SO-078-UI	25 / 34	0.34 - 0.4	0.43	N/A	Y	NSL	0.43	Y	NSL	Y	NSL	74%	Y	NSL	0.15	0.127	Y
	98-86-2	Acetophenone	0.053 J	0.86 J	mg/Kg	SO-086-UI	4 / 34	0.148 - 0.764	0.86	N/A	Y	NSL	0.86	Y	NSL	Y	NSL	12%	Y	NSL	0.178	0.86	N
	120-12-7	Anthracene	0.037 J	1.1	mg/Kg	SO-015-UI	30 / 34	0.35 - 0.38	1.1	N/A	Y	NSL	1.1	Y	NSL	Y	NSL	88%	Y	NSL	0.372	0.378	N
	100-52-7	Benzaldehyde	0.021 J	0.33 J	mg/Kg	SO-200-UI (0-1')	19 / 34	0.18 - 0.764	0.33	N/A	Y	NSL	0.215	Y	NSL	Y	NSL	56%	Y	NSL	0.182	0.163	Y
	50-32-8	Benzo(a)pyrene	0.085 J	4 J	mg/Kg	SO-015-UI	34 / 34	N/A	4	N/A	Y	NSL	4	Y	NSL	Y	NSL	100%	Y	NSL	1.348	1.29	Y
	205-99-2	Benzo(b)fluoranthene	0.12 J	6.4	mg/Kg	SO-015-UI	31 / 31	N/A	6.4	N/A	Y	NSL	6.4	Y	NSL	Y	NSL	100%	Y	NSL	2.036	2.11	N
	191-24-2	Benzo(g,h,i)perylene	0.043 J	2.7	mg/Kg	SO-015-UI	34 / 34	N/A	2.7	N/A	Y	NSL	2.7	Y	NSL	Y	NSL	100%	Y	NSL	0.961	0.934	Y
	207-08-9	Benzo(k)fluoranthene	0.036 J	2.41	mg/Kg	SO-200-UI (0-1')	34 / 34	N/A	2.41	N/A	Y	NSL	2.3	Y	NSL	Y	NSL	100%	Y	NSL	0.869	0.698	Y
	56-55-3	Benzo[a]anthracene	0.08 J	4.5	mg/Kg	SO-015-UI	34 / 34	N/A	4.5	N/A	Y	NSL	4.5	Y	NSL	Y	NSL	100%	Y	NSL	1.515	1.39	Y
	117-81-7	bis(2-Ethylhexyl)phthalate	0.13 J	260 J	mg/Kg	SO-086-UI	21 / 34	0.34 - 0.64	260	N/A	Y	NSL	260	Y	NSL	Y	NSL	62%	Y	NSL	35.82	39.4	N
	85-68-7	Butyl benzyl phthalate	0.038 J	0.29 J	mg/Kg	SO-W02-UI	7 / 34	0.148 - 3.4	0.29	N/A	Y	NSL	1.7	Y	NSL	Y	NSL	21%	Y	NSL	0.123	0.174	N
	86-74-8	Carbazole	0.024 J	0.99	mg/Kg	SO-015-UI	18 / 34	0.148 - 0.764	0.99	N/A	Y	NSL	0.99	Y	NSL	Y	NSL	53%	Y	NSL	0.241	0.241	N
	218-01-9	Chrysene	0.092 J	5	mg/Kg	SO-015-UI	33 / 34	0.37	5	N/A	Y	NSL	5	Y	NSL	Y	NSL	97%	Y	NSL	1.928	2.01	N
	53-70-3	Dibenz[a,h]anthracene	0.041 J	0.75	mg/Kg	SO-015-UI	29 / 34	0.35 - 3.4	0.75	N/A	Y	NSL	1.7	Y	NSL	Y	NSL	85%	Y	NSL	0.257	0.252	Y
	132-64-9	Dibenzofuran	0.061 J	1.1	mg/Kg	SO-015-UI	14 / 34	0.148 - 0.764	1.1	N/A	Y	NSL	1.1	Y	NSL	Y	NSL	41%	Y	NSL	0.215	0.237	N
	84-66-2	Diethylphthalate	0.56 J	0.56 J	mg/Kg	SO-W02-UI	1 / 34	0.148 - 0.764	0.56	100	N	BSL	0.255	N	BSL								
	84-74-2	Di-N-Butyl phthalate	0.023 J	0.39 J	mg/Kg	SO-W02-UI	11 / 34	0.148 - 0.764	0.39	200	N	BSL	0.255	N	BSL								
	117-84-0	Di-N-Octyl phthalate	0.145 J	27 J	mg/Kg	SO-W04-UI	9 / 34	0.148 - 3.4	27	N/A	Y	NSL	14	Y	NSL	Y	NSL	26%	Y	NSL	2.325	3.11	N
	206-44-0	Fluoranthene	0.14 J	9 J	mg/Kg	SO-015-UI	34 / 34	N/A	9	N/A	Y	NSL	9	Y	NSL	Y	NSL	100%	Y	NSL	2.814	2.3	Y
	86-73-7	Fluorene	0.0327	1.1	mg/Kg	SO-015-UI	21 / 34	0.34 - 0.4	1.1	30	N	BSL	1.1	N	BSL								
	193-39-5	Indeno(1,2,3-cd)pyrene	0.052 J	2.4	mg/Kg	SO-015-UI	34 / 34	N/A	2.4	N/A	Y	NSL	2.4	Y	NSL	Y	NSL	100%	Y	NSL	0.812	0.771	Y
	91-20-3	Naphthalene	0.04 J	0.87	mg/Kg	SO-015-UI	26 / 37	0.0048 - 0.4	0.87	N/A	Y	NSL	0.87	Y	NSL	Y	NSL	70%	Y	NSL	0.242	0.25	N
	98-95-3	Nitrobenzene	0.53 J	0.53 J	mg/Kg	SO-W02-UI	1 / 34	0.148 - 0.764	0.53	1000	N	BSL	0.255	N	BSL								
	86-30-6	N-Nitrosodiphenylamine	1.8	1.8	mg/Kg	SO-W01-UI	1 / 34	0.148 - 0.764	1.8	N/A	Y	NSL	0.255	N	FOD			3%	N	FOD		N/A	
	85-01-8	Phenanthrene	0.061 J	13 J	mg/Kg	SO-015-UI	34 / 34	N/A	13	N/A	Y	NSL	13	Y	NSL	Y	NSL	100%	Y	NSL	2.216	2.35	N
	108-95-2	Phenol	0.009 J	0.647 J	mg/Kg	SO-223F-UI-0-1'	4 / 34	0.148 - 0.764	0.647	70	N	BSL	0.255	N	BSL								
	129-00-0	Pyrene	0.17 J	18	mg/Kg	SO-015-UI	34 / 34	N/A	18	N/A	Y	NSL	18	Y	NSL	Y	NSL	100%	Y	NSL	3.406	3.59	N
	72-54-8	4,4'-DDD	0.0023 J	0.0537	mg/Kg	SO-211-UI (0-1')	17 / 30	0.000336 - 0.0043	0.0537	N/A	Y	NSL	0.028	Y	NSL	Y	NSL	57%	Y	NSL	0.0113	0.00928	Y
	72-55-9	4,4'-DDE	0.0016 J	0.07	mg/Kg	SO-010-UI	19 / 29	0.0035 - 0.042	0.07	N/A	Y	NSL	0.07	Y	NSL	Y	NSL	66%	Y	NSL	0.0158	0.0135	Y
	50-29-3	4,4'-DDT	0.0018 J	0.025 J	mg/Kg	SO-078-UI	7 / 23	0.0034 - 0.052	0.025	N/A	Y	NSL	0.026	Y	NSL	Y	NSL	30%	Y	NSL	0.00726	0.00667	Y
	319-84-6	alpha-BHC	0.00125	0.00125	mg/Kg	SO-209-UI (0-1')	1 / 34	0.00029 - 0.0027	0.00125	N/A	Y	NSL	0.00135	N	FOD			3%	N	FOD		N/A	

TABLE 1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier)	Maximum Concentration (Qualifier)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Current Screening			
									Concentration Used for Screening	Screening Toxicity Value	COPC Flag (Y/N)	Rationale for Selection or Deletion
			[1]	[1]					[2]	[3]		[4]
	5103-71-9	alpha-Chlordane	0.00129 J	0.0195 J	mg/Kg	SO-211-UI (0-1')	18 / 34	0.0018 - 0.0024	0.0195	N/A	Y	NSL
	60-57-1	Dieldrin	0.0031 J	0.81	mg/Kg	SO-010-UI	31 / 34	0.0035 - 0.0038	0.81	N/A	Y	NSL
	959-98-8	Endosulfan I	0.00412 J	0.00412 J	mg/Kg	SO-217-UI (0-1')	1 / 33	0.00029 - 0.0027	0.00412	N/A	Y	NSL
	33213-65-9	Endosulfan II	0.0061 J	0.00754 J	mg/Kg	SO-223F-UI-0-1'	2 / 34	0.00029 - 0.0052	0.00754	N/A	Y	NSL
	1031-07-8	Endosulfan Sulfate	0.003 J	0.01 J	mg/Kg	SO-014-UI	6 / 29	0.00029 - 0.052	0.01	N/A	Y	NSL
	7421-36-3	Endrin Aldehyde	0.0044	0.022 J	mg/Kg	SO-080-UI	5 / 29	0.00029 - 0.0047	0.022	N/A	Y	NSL
	53494-70-5	Endrin Ketone	0.014 J	0.014 J	mg/Kg	SO-016-UI	1 / 32	0.00029 - 0.0052	0.014	N/A	Y	NSL
	5103-74-2	Gamma-Chlordane	0.00135 J	0.018 J	mg/Kg	SO-010-UI	9 / 23	0.00167 - 0.022	0.018	N/A	Y	NSL
	1024-57-3	Heptachlor Epoxide	0.013 J	0.013 J	mg/Kg	SO-083-UI	1 / 33	0.00029 - 0.0027	0.013	N/A	Y	NSL
	72-43-5	Methoxychlor	0.028 J	0.028 J	mg/Kg	SO-W02-UI	2 / 33	0.00029 - 0.027	0.028	N/A	Y	NSL
	12767-79-2	Aroclor 1268	0.033 J	0.196 J	mg/Kg	SO-211-UI (0-1')	3 / 8	0.0186 - 0.0673	0.196	40	N	BSL
	53469-21-9	Aroclor-1242	0.24 J	0.24 J	mg/Kg	SO-208B-UI (0-1')	1 / 34	0.0186 - 0.0767	0.24	40	N	BSL
	11097-69-1	Aroclor-1254	0.077 J	1.34 J	mg/Kg	SO-211-UI (0-1')	11 / 34	0.034 - 0.0673	1.34	40	N	BSL
	11096-82-5	Aroclor-1260	0.045	1.47 J	mg/Kg	SO-217-UI (0-1')	28 / 34	0.035 - 0.038	1.47	40	N	BSL
	1746-01-6	Dioxin TEQ	0.0000088	0.0000671	mg/Kg	SO-203-UI-0-1'	6 / 6	N/A	6.71E-05	1.99E-07	Y	ASL
	7429-90-5	Aluminum	3370	11400	mg/Kg	SO-200-UI (0-1')	34 / 34	N/A	11400	50	Y	ASL
	7440-36-0	Antimony	0.377 J	63.6 J	mg/Kg	SO-W01-UI	14 / 34	0.95 - 15	63.6	0.27	Y	ASL
	7440-38-2	Arsenic	2	26.1	mg/Kg	SO-010-UI	34 / 34	N/A	26.1	18	Y	ASL
	7440-39-3	Barium	27.5 J	881 J	mg/Kg	SO-W03-UI	24 / 34	31 - 50	881	330	Y	ASL
	7440-41-7	Beryllium	0.15 J	2.4	mg/Kg	SO-W02-UI	30 / 34	0.073 - 0.075	2.4	21	N	BSL
	7440-43-9	Cadmium	0.31 J	21.8	mg/Kg	SO-W03-UI	31 / 34	0.87 - 1.1	21.8	0.36	Y	ASL
	7440-70-2	Calcium	336 J	11600 J	mg/Kg	SO-W03-UI	22 / 34	770 - 1435	11600	N/A	N	NUT
	7440-47-3	Chromium	21.4 J	471 J	mg/Kg	SO-W02-UI	34 / 34	N/A	471	26	Y	ASL
	7440-48-4	Cobalt	2 J	12.8	mg/Kg	SO-W04-UI	21 / 34	7.2 - 13	12.8	13	N	BSL
	7440-50-8	Copper	15.7	1420 J	mg/Kg	SO-W04-UI	34 / 34	N/A	1420	28	Y	ASL
	57-12-5	Cyanide	0.09	3.8	mg/Kg	SO-083-UI	17 / 34	0.066 - 0.55	3.8	N/A	Y	NSL
	7439-89-6	Iron	6130	69200 J	mg/Kg	SO-W04-UI	34 / 34	N/A	69200	200	Y	ASL
	7439-92-1	Lead	19.1 J	2230 J	mg/Kg	SO-W03-UI	34 / 34	N/A	2230	11	Y	ASL
	7439-95-4	Magnesium	1320 J	3420	mg/Kg	SO-010-UI	34 / 34	N/A	3420	N/A	N	NUT
	7439-96-5	Manganese	86.1 J	1680	mg/Kg	SO-200-UI (0-1')	32 / 34	N/A	1680	500	Y	ASL
	7439-97-6	Mercury	0.037	1.8 J	mg/Kg	SO-W02-UI	34 / 34	N/A	1.8	0.3	Y	ASL
	7440-02-0	Nickel	4.6 J	158 J	mg/Kg	SO-W02-UI	32 / 34	7 - 9	158	30	Y	ASL
	7440-09-7	Potassium	359 J	1360	mg/Kg	SO-010-UI	9 / 34	720 - 1435	1360	N/A	N	NUT
	7782-49-2	Selenium	0.324 J	1.73	mg/Kg	SO-200-UI (0-1')	11 / 30	0.29 - 0.77	1.73	1	Y	ASL
	7440-22-4	Silver	0.584	8.5 J	mg/Kg	SO-W04-UI	23 / 34	0.35 - 2.5	8.5	2	Y	ASL
	7440-23-5	Sodium	39.9 J	170	mg/Kg	SO-209-UI (0-1')	9 / 34	720 - 1435	170	N/A	N	NUT
	7440-28-0	Thallium	0.059	1.2 J	mg/Kg	SO-085-UI	11 / 34	0.29 - 1.1	1.2	1	Y	ASL
	7440-62-2	Vanadium	8	33.3	mg/Kg	SO-010-UI	33 / 34	12	33.3	7.8	Y	ASL
	7440-66-6	Zinc	25.9	1570 J	mg/Kg	SO-W03-UI	34 / 34	N/A	1570	50	Y	ASL

SLERA Screening				
SLERA Screening Concentration	COPC in SLERA Table 18a-d? (Y/N)	Rationale for Selection or Deletion	COPC in SLERA Table 32? (Y/N)	Rationale for Selection or Deletion
[5]		[4]	(Y/N)	[4]
0.012	Y	NSL	Y	NSL
0.81	Y	NSL	Y	NSL
0.00135	N	FOD		
0.0061	Y	NSL	Y	NSL
0.026	Y	NSL	Y	NSL
0.022	Y	NSL	Y	NSL
0.014	Y	NSL	Y	NSL
0.018	Y	NSL	Y	NSL
0.013	Y	NSL	Y	NSL
0.028	Y	NSL	Y	NSL
N/A	N/A	N/A		
0.026	N	BSL		
1.2	N	BSL		
0.72	N	BSL		
N/A	N/A	N/A		
10100	Y	ASL	Y	ASL
39.4	Y	ASL	Y	ASL
26.1	Y	ASL	Y	ASL
183	N	BSL		
0.72	N	BSL		
4.5	Y	ASL	Y	ASL
N/A	N/A	N/A		
370	Y	ASL	Y	ASL
5.5	N	BSL		
1310	Y	ASL	Y	ASL
3.8	Y	NSL	Y	NSL
21500	Y	ASL	Y	ASL
1570	Y	ASL	Y	ASL
N/A	N/A	N/A		
373	N	BSL		
1.4	Y	ASL	Y	ASL
21.8	N	BSL		
N/A	N/A	N/A		
0.385	N	BSL		
8.1	Y	ASL	Y	ASL
N/A	N/A	N/A		
1.2	Y	ASL	Y	ASL
33.3	Y	ASL	Y	ASL
699	Y	ASL	Y	ASL

Current Refinement					
Current Frequency of Detection	COPC Now? (Y/N)	Rationale for Selection or Deletion	Current RME Concentration	BERA Unnamed Island RME Conc.	Current RME Conc Above BERA
[6]		[4]	[7]	[8]	(Y/N) [9]
53%	Y	NSL	0.00443	0.00355	Y
91%	Y	NSL	0.26	0.295	N
3%	N	FOD		N/A	
6%	Y	NSL	0.00625	0.0061	Y
21%	Y	NSL	0.00435	0.00486	N
17%	Y	NSL	0.0067	0.00762	N
3%	Y	NSL	0.014	0.014	N
39%	Y	NSL	0.00516	0.018	N
3%	Y	NSL	0.013	0.013	N
6%	Y	NSL	0.028	0.028	N
100%	Y	ASL	0.00005127	N/A	N/A
100%	Y	ASL	6581	6000	Y
41%	Y	ASL	9.485	15.7	N
100%	Y	ASL	11.57	11.1	Y
71%	Y	ASL	180.5	167	Y
91%	Y	ASL	6.923	4.61	Y
100%	Y	ASL	143.3	153	N
100%	Y	ASL	325.8	333	N
50%	Y	NSL	0.754	0.933	N
100%	Y	ASL	24292	24500	N
100%	Y	ASL	1366	1360	Y
94%	Y	ASL	342.4	289	Y
100%	Y	ASL	0.548	0.545	Y
94%	Y	ASL	42.13	N/A	N/A
37%	Y	ASL	0.785	N/A	N/A
68%	Y	ASL	3.951	4.59	N
32%	Y	ASL	0.302	1.2	N
97%	Y	ASL	17.35	16.6	Y
100%	Y	ASL	1047	1070	N

Notes:
N/A = Not Applicable or Not Available
RME = Reasonable Maximum Exposure
CTE = Central Tendency Exposure
[1] Data Qualifiers
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
[2] The maximum concentration was used. Duplicate samples were treated as discrete samples in the identification of maxima. However, duplicate samples will be averaged prior to further evaluation (i.e., development of Exposure Point Concentrations [EPCs]).
[3] Taken from Tables 18a to 18d in SLERA
[4] Codes used for rationale are as follows:
Selection Reason: Above Screening Levels (ASL)
No Screening Level (NSL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)
Frequency of Detection (FOD) [less than 5%]
Not Detected (ND) in any media of concern
No Toxicity Value (NTX)
[5] Taken from Tables 18a to 18d in SLERA
[6] Only includes results for analytes selected during current screening.
[7] RME Concentration is 95% UCL unless not able to be calculated or greater than maximum detection, in which case the RME concentration is the maximum detection.
[8] Taken from Table 7-18c in BERA. Note that some BERA RME concentrations are greater than SLERA screening concentrations due both to decision criteria used and samples that were not initially used in the SLERA, but were used in the BERA.
[9] Analytes with their current data set RME concentrations above the BERA RME concentrations will be evaluated further. Remaining analytes are assumed to have the same results as the original BERA.

TABLE 2
RME CALCULATIONS - SMALL OMNIVOROUS BIRDS - UNNAMED ISLAND
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	RME Concentrations (mg/kg)			RME - No Effect Evaluation				RME - Effect Evaluation			
			Current	BERA Unnamed	BERA	BERA Reference	BERA Unnamed Island	Current UI Proportional	Current UI	BERA Reference	BERA Unnamed Island	Current UI Proportional	Current UI
			RME Concentration	RME Conc.	RME Conc.								
			[1]	[2]	[3]	HQ	HQ	HQ	RR	HQ	HQ	HQ	RR
						[3]	[2]	[4]	[5]	[3]	[2]	[4]	[5]
Unnamed Island	79-20-9	Methyl acetate	0.00825	0.007	0.005	--	--	--	--	--	--	--	--
	208-96-8	Acenaphthylene	0.15	0.127	0.73	3.93E+00	6.84E-01	8.08E-01	<1	3.93E-01	6.84E-02	8.08E-02	<1
	100-52-7	Benzaldehyde	0.182	0.163	0.2	--	--	--	--	--	--	--	--
	50-32-8	Benzo(a)pyrene	1.348	1.29	7.5	2.89E-01	4.97E-02	5.19E-02	<1	1.44E-01	2.48E-02	2.60E-02	<1
	191-24-2	Benzo(g,h,i)perylene	0.961	0.934	4.4	1.77E+00	3.75E-01	3.86E-01	<1	1.77E-01	3.75E-02	3.86E-02	<1
	207-08-9	Benzo(k)fluoranthene	0.869	0.698	3.4	1.21E+00	2.49E-01	3.10E-01	<1	1.21E-01	2.49E-02	3.10E-02	<1
	56-55-3	Benzo[a]anthracene	1.515	1.39	9.3	--	--	--	--	--	--	--	--
	53-70-3	Dibenz[a,h]anthracene	0.257	0.252	0.94	--	--	--	--	--	--	--	--
	206-44-0	Fluoranthene	2.814	2.3	15	6.21E+00	9.53E-01	1.17E+00	<1	6.21E-01	9.53E-02	1.17E-01	<1
	193-39-5	Indeno(1,2,3-cd)pyrene	0.812	0.771	2.6	1.02E+00	3.01E-01	3.17E-01	<1	1.02E-01	3.01E-02	3.17E-02	<1
	72-54-8	4,4'-DDD	0.0113	0.00928	0.0081	2.51E+00	2.88E+00	3.50E+00	<1	2.51E-01	2.88E-01	3.50E-01	<1
	72-55-9	4,4'-DDE	0.0158	0.0135	0.0059	6.59E+00	1.51E+01	1.76E+01	11	6.59E-01	1.51E+00	1.76E+00	1
	50-29-3	4,4'-DDT	0.00726	0.00667	0.0098	7.73E+00	5.26E+00	5.73E+00	<1	7.73E-01	5.26E-01	5.73E-01	<1
	5103-71-9	alpha-Chlordane	0.00443	0.00355	0.00125	2.76E-02	7.83E-02	9.77E-02	<1	2.76E-03	7.83E-03	9.77E-03	<1
	33213-65-9	Endosulfan II	0.00625	0.0061	0.00245	1.05E-02	2.62E-02	2.69E-02	<1	1.05E-03	2.62E-03	2.69E-03	<1
	1746-01-6	Dioxin TEQ [6]	0.00005127	N/A	N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	<1
	7429-90-5	Aluminum	6581	6000	6350	1.68E+01	1.58E+01	1.74E+01	<1	1.68E+00	1.58E+00	1.74E+00	<1
	7440-38-2	Arsenic	11.57	11.1	9.5	5.29E-01	6.18E-01	6.44E-01	<1	2.52E-01	2.95E-01	3.07E-01	<1
	7440-39-3	Barium	180.5	167	49.6	1.53E-01	5.16E-01	5.58E-01	<1	7.65E-02	2.57E-01	2.78E-01	<1
	7440-43-9	Cadmium	6.923	4.61	1.9	2.87E+00	6.95E+00	1.04E+01	8	1.36E+00	3.30E+00	4.96E+00	4
	7439-92-1	Lead	1366	1360	161	3.51E+03	2.97E+04	2.98E+04	26296	3.51E+02	2.97E+03	2.98E+03	2630
	7439-96-5	Manganese	342.4	289	136	2.73E-01	5.82E-01	6.89E-01	<1	2.73E-02	5.82E-02	6.89E-02	<1
	7439-97-6	Mercury	0.548	0.545	0.7	5.97E+01	4.65E+01	4.67E+01	<1	5.97E+00	4.65E+00	4.67E+00	<1
	7440-02-0	Nickel [6]	42.13	N/A	4.7	5.90E-02	N/A	N/A	<1	3.27E-02	N/A	N/A	<1
	7782-49-2	Selenium [6]	0.785	N/A	0.235	--	N/A	N/A	<1	--	N/A	N/A	<1
	7440-62-2	Vanadium	17.35	16.6	21.2	9.57E-02	7.46E-02	7.80E-02	<1	4.79E-02	3.73E-02	3.90E-02	<1

Notes:

-- = Benchmark not available

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

[1] The maximum concentration was used. Duplicate samples were treated as discrete samples in the identification of maxima. However, duplicate samples will be averaged prior to further evaluation (i.e., development of Exposure Point Concentrations [EPCs]).

[2] Taken from Table 7-18c in BERA.

[3] Taken from Table 7-18a in BERA.

[4] Current UI HQ = BERA UI HQ/BERA Conc. * Current Conc.

[5] Residual Risk (RR) = Current UI HQ - BERA Ref. HQ

[6] Residual Risk (RR) was not calculated in the BERA for dioxin, nickel, or selenium. The BERA models were used to calculate Current UI RR values for these COPCs; calculations are presented in Appendix A.

TABLE 3
RME CALCULATIONS - SMALL OMNIVOROUS MAMMALS - UNNAMED ISLAND
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	RME Concentrations (mg/kg)		
			Current RME Concentration	BERA Unnamed Island RME Conc.	BERA Reference RME Conc.
			[1]	[2]	[3]
Unnamed Island	79-20-9	Methyl acetate	0.00825	0.007	0.005
	208-96-8	Acenaphthylene	0.15	0.127	0.73
	100-52-7	Benzaldehyde	0.182	0.163	0.2
	50-32-8	Benzo(a)pyrene	1.348	1.29	7.5
	191-24-2	Benzo(g,h,i)perylene	0.961	0.934	4.4
	207-08-9	Benzo(k)fluoranthene	0.869	0.698	3.4
	56-55-3	Benzo[a]anthracene	1.515	1.39	9.3
	53-70-3	Dibenz[a,h]anthracene	0.257	0.252	0.94
	206-44-0	Fluoranthene	2.814	2.3	15
	193-39-5	Indeno(1,2,3-cd)pyrene	0.812	0.771	2.6
	72-54-8	4,4'-DDD	0.0113	0.00928	0.0081
	72-55-9	4,4'-DDE	0.0158	0.0135	0.0059
	50-29-3	4,4'-DDT	0.00726	0.00667	0.0098
	5103-71-9	alpha-Chlordane	0.00443	0.00355	0.00125
	33213-65-9	Endosulfan II	0.00625	0.0061	0.00245
	1746-01-6	Dioxin TEQ [6]	0.00005127	N/A	N/A
	7429-90-5	Aluminum	6581	6000	6350
	7440-38-2	Arsenic	11.57	11.1	9.5
	7440-39-3	Barium	180.5	167	49.6
	7440-43-9	Cadmium	6.923	4.61	1.9
	7439-92-1	Lead	1366	1360	161
	7439-96-5	Manganese	342.4	289	136
	7439-97-6	Mercury	0.548	0.545	0.7
	7440-02-0	Nickel [6]	42.13	N/A	4.7
	7782-49-2	Selenium [6]	0.785	N/A	0.235
	7440-62-2	Vanadium	17.35	16.6	21.2

RME - No Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
--	--	--	--
4.50E-01	7.83E-02	9.25E-02	<1
--	--	--	--
1.38E+00	2.37E-01	2.48E-01	<1
1.76E+00	3.74E-01	3.84E-01	<1
--	--	--	--
--	--	--	--
--	--	--	--
6.20E+00	9.51E-01	1.16E+00	<1
1.01E+00	3.00E-01	3.16E-01	<1
4.40E-03	5.04E-03	6.14E-03	<1
1.18E-02	2.71E-02	3.17E-02	<1
1.38E-02	9.42E-03	1.03E-02	<1
--	--	--	--
--	--	--	--
N/A	N/A	N/A	2
4.41E+02	4.17E+02	4.58E+02	17
2.82E+00	3.29E+00	3.43E+00	<1
1.72E+00	5.77E+00	6.23E+00	5
2.12E+00	5.15E+00	7.74E+00	6
2.27E+00	1.92E+01	1.93E+01	17
1.00E-01	2.15E-01	2.54E-01	<1
1.25E+01	9.70E+00	9.75E+00	<1
1.73E-02	N/A	N/A	<1
--	N/A	N/A	<1
1.10E+00	8.33E-01	8.70E-01	<1

RME - Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
--	--	--	--
2.25E-01	3.92E-02	4.62E-02	<1
--	--	--	--
1.38E-01	2.37E-02	2.48E-02	<1
8.80E-01	1.87E-01	1.92E-01	<1
--	--	--	--
--	--	--	--
--	--	--	--
3.10E+00	4.75E-01	5.82E-01	<1
--	--	--	--
8.79E-04	1.01E-03	1.23E-03	<1
2.37E-03	5.42E-03	6.34E-03	<1
2.77E-03	1.88E-03	2.05E-03	<1
--	--	--	--
--	--	--	--
N/A	N/A	N/A	<1
4.41E+01	4.17E+01	4.58E+01	2
2.82E-01	3.29E-01	3.43E-01	<1
4.44E-02	1.49E-01	1.61E-01	<1
8.43E-01	2.04E+00	3.07E+00	2
2.27E-01	1.92E+00	1.93E+00	2
3.11E-02	6.65E-02	7.88E-02	<1
7.47E+00	5.82E+00	5.85E+00	<1
8.66E-03	N/A	N/A	<1
--	N/A	N/A	<1
1.10E-01	8.33E-02	8.70E-02	<1

Notes:

-- = Benchmark not available

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

[1] The maximum concentration was used. Duplicate samples were treated as discrete samples in the identification of maxima. However, duplicate samples will be averaged prior to further evaluation (i.e., development of Exposure Point Concentrations [EPCs]).

[2] Taken from Table 7-23c in BERA.

[3] Taken from Table 7-23a in BERA.

[4] Current UI HQ = BERA UI HQ/BERA Conc. * Current Conc.

[5] Residual Risk (RR) = Current UI HQ - BERA Ref. HQ

[6] Residual Risk (RR) was not calculated in the BERA for dioxin, nickel, or selenium. The BERA models were used to calculate Current UI RR values for these COPCs; calculations are presented in Appendix A.

TABLE 4
INTERPRETIVE RISK MATRIX FOR CHARACTERIZATION OF RISK IN THE BASELINE ECOLOGICAL RISK ASSESSMENT

^a Interpretive Risk Matrix for sediment benchmarks, fish CBRs, and wildlife TRVs						
Risk Scenario	No effect (NOAEL)		Effect (LOAEL)		Potential for Adverse Population-level Effects	Confidence Level
	RME	CTE	RME	CTE		
1	RR ≤ 1	RR ≤ 1	RR ≤ 1	RR ≤ 1	Adverse effects are unlikely	High
2	RR > 1	RR ≤ 1	RR ≤ 1	RR ≤ 1	Adverse effects are unlikely	Moderate
3	RR > 1	RR > 1	RR ≤ 1	RR ≤ 1	Adverse effects are unlikely	Low
4	RR > 1	RR ≤ 1	RR > 1	RR ≤ 1	Adverse effects are possible	Low
5	RR > 1	RR > 1	RR > 1	RR ≤ 1	Adverse effects are possible	Moderate
6	RR > 1	RR > 1	RR > 1	RR > 1	Adverse effects are possible	High (increase with higher HQ)

^a Interpretive Risk Matrix for surface water				
Risk Scenario	Chronic Toxicity		Potential for Adverse Population-level Effects	Confidence Level
	RME	CTE		
1,2 & 3	RR ≤ 1	RR ≤ 1	Adverse effects are unlikely	High
4 & 5	RR > 1	RR ≤ 1	Adverse effects are possible	Moderate
6	RR > 1	RR > 1	Adverse effects are possible	High (increase with higher HQs)

- ^a Residual risks (RR) were calculated by subtracting reference Hazard Quotients (HQs) from site HQs for each COPEC. This matrix was used to characterize the relative risk represented by each RR value for the various risk scenarios.
- CTE = central tendency exposure
 CBR = critical body residue
 COPEC = Contaminant of potential ecological concern
 HQ = Hazard Quotient
 LOAEL = lowest observed adverse effect level
 NOAEL = no observed adverse effect level
 RME = reasonable maximum exposure
 RR = residual risk
 TRV = toxicity reference value

TABLE 5
CTE CALCULATIONS - SMALL OMNIVOROUS BIRDS - UNNAMED ISLAND
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	CTE Concentrations (mg/kg)		
			Current Geomean (CTE)	BERA Unnamed Island CTE Conc.	BERA Reference CTE Conc.
			[1]	[2]	[3]
Unnamed Island	7440-43-9	Cadmium	2.3	2	1.14
	7439-92-1	Lead	147	120	92.8

CTE - No Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
4.69E-01	8.23E-01	9.42E-01	<1
5.26E+02	6.80E+02	8.34E+02	308

CTE - Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
2.23E-01	3.91E-01	4.48E-01	<1
5.26E+01	6.80E+01	8.34E+01	31

Notes:

This evaluation is only performed on those analytes where the RR under both the RME No Effect and Effect evaluations were greater than 1.

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

[1] Geomean of dataset was used. Duplicate samples were averaged prior to generation of CTE concentrations.

[2] Taken from Table 7-18c in BERA.

[3] Taken from Table 7-18a in BERA

[4] Current UI HQ = BERA UI HQ/BERA Conc. * Current Conc.

[5] Residual Risk (RR) = Current UI HQ - BERA Ref. HQ

[6] Residual Risk (RR) was not calculated in the BERA for dioxin, nickel or delenium. The BERA models were used to calculate Current UI RR values for these COPCs; calculations are presented in Appendix A.

TABLE 6
CTE CALCULATIONS - SMALL OMNIVOROUS MAMMALS - UNNAMED ISLAND
PETERSON PURITAN SUPERFUND SITE - OPERABLE UNIT 2

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	CTE Concentrations (mg/kg)		
			Current Geomean (CTE)	BERA Unnamed Island CTE Conc.	BERA Reference CTE Conc.
			[1]	[2]	[3]
Unnamed Island	7429-90-5	Aluminum	5636	5340	4640
	7440-43-9	Cadmium	2.3	2	1.14
	7439-92-1	Lead	147	120	92.8

CTE - No Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
1.05E+02	1.21E+02	1.28E+02	23
4.20E-01	7.37E-01	8.43E-01	<1
4.27E-01	5.52E-01	6.76E-01	<1

CTE - Effect Evaluation			
BERA Reference HQ	BERA Unnamed Island HQ	Current UI Proportional HQ	Current UI RR
[3]	[2]	[4]	[5]
1.05E+01	1.21E+01	1.28E+01	2
1.67E-01	2.93E-01	3.35E-01	<1
4.27E-02	5.52E-02	6.76E-02	<1

Notes:

This evaluation is only performed on those analytes where the RR under both the RME No Effect and Effect evaluations were greater than 1.

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

[1] Geomean of dataset was used. Duplicate samples were averaged prior to generation of CTE concentrations.

[2] Taken from Table 7-23c in BERA.

[3] Taken from Table 7-23a in BERA

[4] Current UI HQ = BERA UI HQ/BERA Conc. * Current Conc.

[5] Residual Risk (RR) = Current UI HQ - BERA Ref. HQ

[6] Residual Risk (RR) was not calculated in the BERA for dioxin, nickel or delenium. The BERA models were used to calculate Current UI RR values for these COPCs; calculations are presented in Appendix A.

FIGURES

CITY:CLE DIV/GROUP: AIT DB1.GREENE LD: PIC: PM: TM: TR:
Project (Project #)Peterson/Puritan 80037902.0000.00500
G:\GIS\Project Files\Peterson_Puritan\UnamedIsland\Workplan\mxd\SoilSampPhase1aand1b-topobasemap.mxd - 6/14/2010 @ 9:56:50 AM



LEGEND:

MONITOR WELL

SURFACE AND SUBSURFACE SAMPLE

OBSERVATION

SURFACE SOIL SAMPLE

SUBSURFACE SOIL SAMPLE

SUBSURFACE/TEMP WELL

PHASE 1A MONITORING WELL

PHASE 1A SURFACE SOIL SAMPLE LOCATION

PHASE 1A SOIL SAMPLE LOCATION - DEPTH UNSPECIFIED

PHASE 1B SOIL SAMPLE LOCATION

RAILROAD

OU2 BOUNDARY

HISTORICAL ACCESS ROAD

WATER

HISTORICAL POND

BURIED WASTE

J.M. MILLS LANDFILL

UNNAMED ISLAND

SOLID WASTE TRANSFER STATION (NFO NUNES DISPOSAL, INC.)

DIRECTION OF SURFACE WATER FLOW

NOTES:

1. SAMPLE LOCATIONS AND BASEMAPPING ARE IN THE COORDINATE SYSTEM: STATE PLANE RHODE ISLAND NAD 83 FEET. LOCATIONS HAVE BEEN RECORDED IN THE FIELD USING GPS.

2. SOME HISTORICAL SUBSURFACE SOIL LOCATIONS HAVE MULTIPLE DEPTH INTERVALS COLLECTED. SAMPLE IDs FOR SOIL SAMPLES COLLECTED AT DEPTH DIFFER FROM THEIR SAMPLE STATION ID.

3. BURIED WASTE AREA DELINEATION IS BASED ON AN INTERPRETATION BY SHIELD ENVIRONMENTAL ASSOCIATES, INC (GEOPHYSICAL AND MIP SURVEY LOCATIONS, PLATE 2, FEBRUARY 2006).

PETERSON PURITAN SUPERFUND SITE - OU2
CUMBERLAND AND LINCOLN, RHODE ISLAND
UNNAMED ISLAND INVESTIGATION - NOVEMBER 2009

SOIL SAMPLE LOCATIONS

FIGURE
1

APPENDIX A
WILDLIFE EXPOSURE MODELS

Exposure Parameters for Wildlife Models

Input values from Table 7-2a of BERA Small Omnivorous Birds

P_f	P_f	FIR	FIR	P_s	P_s	SIR	SIR	C_f	C_f
CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
0.5		1	0.89	1.62	0.0166	0.0249	0.015	0.04	BSoilAF* C_s

P_f = Proportion of contaminated food (unitless)

FIR = Food intake Rate (kg food ww/kg bw/day)

P_s = Proportion of ingested food that is soil (wet weight basis, unitless)

SIR = Soil intake rate normalized to body weight (kg soil dw/kg bw-day)

C_f = Concentration in food (mg/kg food dw)

BsoilAF = Biota-Soil Accumulation Factor from Table 7-17 of BERA unless otherwise noted

C_s = Concentration in soil (mg/kg soil dw)

Input values from Table 7-2c of BERA Small Omnivorous Mammals

P_f	P_f	FIR	FIR	P_s	P_s	SIR	SIR	C_f	C_f
CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
0.5		1	0.555	0.84	0.00384	0.00576	0.0024	0.0048	BSoilAF* C_s

P_f = Proportion of contaminated food (unitless)

FIR = Food intake Rate (kg food ww/kg bw/day)

P_s = Proportion of ingested food that is soil (wet weight basis, unitless)

SIR = Soil intake rate normalized to body weight (kg soil dw/kg bw-day)

C_f = Concentration in food (mg/kg food dw)

BsoilAF = Biota-Soil Accumulation Factor from Table 7-17 of BERA unless otherwise noted

C_s = Concentration in soil (mg/kg soil dw)

Unnamed Island Small Omnivorous Birds Dietary modeling calculations

COPC	Exposure Point Concentrations							Dose (mg/kg BW/day)		TRVs (mg/kg BW/day)		No Effect HQ		Effect HQ		Residual Risk			
	Surface water		Soil (dw)		Food (ww)			TDI				CTE/NOAEL	RME/NOAEL	CTE/LOAEL	RME/LOAEL	No Effect RR		Effect RR	
	CTE	RME	CTE [1]	RME [2]	BSoilAF (ww/dw)[3]	CTE	RME	CTE	RME	NOAEL [4]	LOAEL [4]	CTE	RME	CTE	RME	CTE	RME	CTE	RME
BERA Pb	2.38E-03	3.26E-02	120.0	1360.0	0.13	15.44	174.98	7.77	337.87	0.0114	0.114	682	29638	68	2964	155	26129	15	2613
Lead	2.38E-03	3.26E-02	147.0	1366.0	0.13	18.91	175.75	9.52	339.36	0.0114	0.114	835	29768	83	2977	308	26260	31	2626
Ref Lead	3.16E-03	1.10E-02	92.8	161.0	0.13	11.94	20.71	6.01	40.00	0.0114	0.114	527	3509	53	351	N/A	N/A	N/A	N/A
Nickel	-	-	14.0	42.1	0.17	2.37	7.14	0.11	1.69	25.1	45.3	0.004	0.07	0.002	0.04	<1	<1	<1	<1
Ref Ni	3.21E-03	4.10E-03	4.4	4.7	0.17	0.74	0.80	0.03	0.19	25.1	45.3	0.001	0.007	0.0007	0.004	N/A	N/A	N/A	N/A
Se	-	-	0.40	0.79	0.15	0.06	0.12	2.94E-02	2.20E-01	0.4	0.603	0.07	0.6	0.05	0.4	<1	<1	<1	<1
Ref Se	8.78E-04	3.70E-03	0.22	0.24	0.15	0.03	0.03	1.60E-02	6.59E-02	0.4	0.603	0.04	0.2	0.03	0.1	N/A	N/A	N/A	N/A
Dioxin	-	-	3.00E-05	5.13E-05	0.17	5.10E-06	8.72E-06	2.49E-06	1.62E-05	1.00E-06	1.00E-05	2	16	0.2	2	<1	6	<1	<1
Ref Dioxin	-	-	2.27E-05	3.12E-05	0.17	3.86E-06	5.30E-06	1.89E-06	9.84E-06	1.00E-06	1.00E-05	2	10	0.2	1	N/A	N/A	N/A	N/A

Notes:

COPC = Contaminant of Potential Concern

BERA = Baseline Ecological Risk Assessment (USEPA, 2009, Revision of Arcadis, 2008)

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

BSoilAF = Biota-Soil Accumulation Factor

NOAEL = No Observed Effects Level

LOAEL = Lowest Observed Effects Level

TRV = Toxicity Reference Value

BW = Body weight

ww = Wet Weight

dw = Dry weight

RR = Residual Risk

TDI = Total Daily Intake (daily dose), as calculated below

[1] CTE values for Pb, Ni and Se are from Table 3 and correspond to the geometric mean including the new soil data.
Reference CTE values are from Appendix BB of the BERA, except for dioxin (calculated from 2009 data); CTE values are based on using 1/2 method reporting limit for non-detect concentrations

[2] RME values are from Table 1 of this Tech Memo and correspond to the 95% UCL including the new soil data.
Reference RME values are from Appendix BB of the BERA

[3] From Table 7-3 of BERA; Dioxin BSaF from Fagervold et al., 2010

[4] From Table 7-4a of the BERA; Dioxin TRVs for TCDD from Sample, et al., 1996

TDI = P (FIR*Cf+SIR*Cs)

Water intake assumed minimal

	Case	COPC	P	FIR	C _f	SIR	C _s	TDI
Ref	CTE	Lead	0.5	0.89	1.19E+01	0.015	92.8	6.01
Ref	RME	Lead	1	1.62	2.07E+01	0.04	161.0	40.00
UI	CTE	Lead	0.5	0.89	1.89E+01	0.015	147.0	9.52
UI	RME	Lead	1	1.62	1.76E+02	0.04	1366.0	339.36
BERA UI	CTE	Lead	0.5	0.89	1.54E+01	0.015	120.0	7.77
BERA UI	RME	Lead	1	1.62	1.75E+02	0.04	1360.0	337.87
Ref	CTE	Nickel	0.5	0.89	3.86E-06	0.015	4.4	0.03
Ref	RME	Nickel	1	1.62	5.30E-06	0.04	4.7	0.19
UI	CTE	Nickel	0.5	0.89	5.10E-06	0.015	14.0	0.11
UI	RME	Nickel	1	1.62	8.72E-06	0.04	42.1	1.69
Ref	CTE	Selenium	0.5	0.89	3.24E-02	0.015	0.22	0.02
Ref	RME	Selenium	1	1.62	3.49E-02	0.04	0.24	0.07
UI	CTE	Selenium	0.5	0.89	5.94E-02	0.015	0.40	0.03
UI	RME	Selenium	1	1.62	1.17E-01	0.04	0.79	0.22
Ref	CTE	Dioxin	0.5	0.89	3.86E-06	0.015	2.27E-05	1.89E-06
Ref	RME	Dioxin	1	1.62	5.30E-06	0.04	3.12E-05	9.84E-06
UI	CTE	Dioxin	0.5	0.89	5.10E-06	0.015	3.00E-05	2.49E-06
UI	RME	Dioxin	1	1.62	8.72E-06	0.04	5.13E-05	1.62E-05

P = Proportion of diet

P_f = Proportion of contaminated food (unitless)

FIR = Food intake Rate (kg food ww/kg bw/day)

P_s = Proportion of ingested food that is soil (wet weight basis, unitless)

SIR = Soil intake rate normalized to body weight (kg soil dw/kg bw/day)

C_f = Concentration in food (mg/kg food ww); C_s * BSoilAF

C_s = Concentration in soil (mg/kg soil dw)

UI = Unnamed Island

BERA UI = calculation based on BERA dataset for the Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

TDI = Total daily intake (mg/kg BW/day)

Ref = Reference Area from BERA Data upstream in the Blackstone River except for dioxin, which was from the Pratt Dam/Southern Bank area

Unnamed Island Small Omnivorous Mammals Dietary modeling calculations

COPC	Exposure Point Concentrations							Dose (mg/kg BW/day)		TRVs (mg/kg BW/day)		No Effect HQ		Effect HQ		Residual Risk			
	Surface water		Soil (dw)		Food (ww)			TDI				CTE/NOAEL	RME/NOAEL	CTE/LOAEL	RME/LOAEL	No Effect RR		Effect RR	
	CTE	RME	CTE [1]	RME [2]	BSoilAF (ww/dw)[3]	CTE	RME	CTE	RME	NOAEL [4]	LOAEL [4]	CTE	RME	CTE	RME	CTE	RME	CTE	RME
BERA Pb	2.38E-03	3.26E-02	120.0	1360.0	0.13	15.44	174.98	4.43	153.51	8	80	0.6	19	0.06	2	<1	17	<1	2
Lead	2.38E-03	3.26E-02	147.0	1366.0	0.13	18.91	175.75	5.42	154.19	8	80	0.7	19	0.07	2	<1	17	<1	2
Ref Lead	3.16E-03	1.10E-02	92.8	161.0	0.13	11.94	20.71	3.42	18.17	8	80	0.4	2	0.04	0.23	N/A	N/A	N/A	N/A
Nickel	-	-	14.0	42.1	0.17	2.37	7.14	0.02	0.20	40	80	0.0004	0.005	0.0002	0.0025	<1	<1	<1	<1
Ref Ni	3.21E-03	4.10E-03	4.4	4.7	0.17	0.74	0.80	0.01	0.02	40	80	0.0001	0.0006	0.00007	0.00028	N/A	N/A	N/A	N/A
Se	-	-	0.40	0.79	0.15	0.06	0.12	1.70E-02	1.02E-01	0.2	0.33	0.08	0.5	0.05	0.31	<1	<1	<1	<1
Ref Se	8.78E-04	3.70E-03	0.22	0.24	0.15	0.03	0.03	9.24E-03	3.04E-02	0.2	0.33	0.05	0.2	0.03	0.092	N/A	N/A	N/A	N/A
Dioxin	-	-	3.00E-05	5.13E-05	0.17	5.10E-06	8.72E-06	1.45E-06	7.57E-06	1.40E-06	1.40E-05	1	5	0.1	0.5	<1	2	<1	<1
Ref Dioxin	-	-	2.27E-05	3.12E-05	0.17	3.86E-06	5.30E-06	1.10E-06	4.61E-06	1.40E-06	1.40E-05	0.8	3	0.08	0.3	N/A	N/A	N/A	N/A

Notes:

COPC = Contaminant of Potential Concern

BERA = Baseline Ecological Risk Assessment (USEPA, 2009, Revision of Arcadis, 2008)

N/A = Not Applicable or Not Available

UI = Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

HQ = Hazard Quotient

BSoilAF = Biota-Soil Accumulation Factor

NOAEL = No Observed Effects Level

LOAEL = Lowest Observed Effects Level

TRV = Toxicity Reference Value

BW = Body weight

ww = Wet Weight

dw = Dry weight

RR = Residual Risk

TDI = Total Daily Intake (daily dose), as calculated below

[1] CTE values for Pb, Ni and Se are from Table 3 and correspond to the geometric mean including the new soil data.
Reference CTE values are from Appendix BB of the BERA, except for dioxin (calculated from 2009 data); CTE values are based on using 1/2 method reporting limit for non-detect concentrations

[2] RME values are from Table 1 of this Tech Memo and correspond to the 95% UCL including the new soil data.
Reference RME values are from Appendix BB of the BERA

[3] From Table 7-3 of BERA; Dioxin BSaF from Fagervold et al., 2010

[4] From Table 7-4a of the BERA; Dioxin TRVs for TCDD from Sample, et al., 1996

SOM

MODEL CALCULATIONS

TDI = P (FIR*Cf+SIR*Cs)

Water intake assumed minimal

	Case	COC	P	FIR	C _f	SIR	C _s	TDI
Ref	CTE	Lead	0.5	0.555	1.19E+01	0.0024	92.8	3.42
Ref	RME	Lead	1	0.84	2.07E+01	0.0048	161.0	18.17
UI	CTE	Lead	0.5	0.555	1.89E+01	0.0024	147.0	5.42
UI	RME	Lead	1	0.84	1.76E+02	0.0048	1366.0	154.19
BERA UI	CTE	Lead	0.5	0.555	1.54E+01	0.0024	120.0	4.43
BERA UI	RME	Lead	1	0.84	1.75E+02	0.0048	1360.0	153.51
Ref	CTE	Nickel	0.5	0.555	3.86E-06	0.0024	4.4	0.01
Ref	RME	Nickel	1	0.84	5.30E-06	0.0048	4.7	0.02
UI	CTE	Nickel	0.5	0.555	5.10E-06	0.0024	14.0	0.02
UI	RME	Nickel	1	0.84	8.72E-06	0.0048	42.1	0.20
Ref	CTE	Selenium	0.5	0.555	3.24E-02	0.0024	0.22	0.01
Ref	RME	Selenium	1	0.84	3.49E-02	0.0048	0.24	0.03
UI	CTE	Selenium	0.5	0.555	5.94E-02	0.0024	0.40	0.02
UI	RME	Selenium	1	0.84	1.17E-01	0.0048	0.79	0.10
Ref	CTE	Dioxin	0.5	0.555	3.86E-06	0.0024	2.27E-05	1.10E-06
Ref	RME	Dioxin	1	0.84	5.30E-06	0.0048	3.12E-05	4.61E-06
UI	CTE	Dioxin	0.5	0.555	5.10E-06	0.0024	3.00E-05	1.45E-06
UI	RME	Dioxin	1	0.84	8.72E-06	0.0048	5.13E-05	7.57E-06

P = Proportion of diet

P_f = Proportion of contaminated food (unitless)

FIR = Food intake Rate (kg food ww/kg bw/day)

P_s = Proportion of ingested food that is soil (wet weight basis, unitless)

SIR = Soil intake rate normalized to body weight (kg soil dw/kg bw/day)

C_f = Concentration in food (mg/kg food ww); C_s * BSoilAF

C_s = Concentration in soil (mg/kg soil dw)

UI = Unnamed Island

BERA UI = calculation based on BERA dataset for the Unnamed Island

RME = Reasonable Maximum Exposure

CTE = Central Tendency Exposure

TDI = Total daily intake (mg/kg BW/day)

Ref = Reference Area from BERA Data upstream in the Blackstone River except for dioxin, which was from the Pratt Dam/Southern Bank area

APPENDIX B

ProUCL OUTPUT

Refer to enclosed CD for original ProUCL input/output

	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			J:\NE\US EPA RAC 2\Projects\TO# 0004 Peterson Puritan RI FS OS\400 TECH SUPPORT\Unnamed Island Su								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	2-Butanone											
10												
11	General Statistics											
12	Number of Valid Data				32		Number of Detected Data				2	
13	Number of Distinct Detected Data				2		Number of Non-Detect Data				30	
14							Percent Non-Detects				93.75%	
15												
16	Raw Statistics						Log-transformed Statistics					
17	Minimum Detected				0.012		Minimum Detected				-4.423	
18	Maximum Detected				0.044		Maximum Detected				-3.124	
19	Mean of Detected				0.028		Mean of Detected				-3.773	
20	SD of Detected				0.0226		SD of Detected				0.919	
21	Minimum Non-Detect				0.00393		Minimum Non-Detect				-5.539	
22	Maximum Non-Detect				0.014		Maximum Non-Detect				-4.269	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				31	
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				96.88%	
27												
28	Warning: Data set has only 2 Distinct Detected Values.											
29	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
30	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
31												
32	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
33												
34	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
35	Those methods will return a 'N/A' value on your output display!											
36												
37	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
38	However, results obtained using 4 to 9 distinct values may not be reliable.											
39	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
40												
41												
42	UCL Statistics											
43	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
44	Shapiro Wilk Test Statistic				N/A		Shapiro Wilk Test Statistic				N/A	
45	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value				N/A	
46	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
47												
48	Assuming Normal Distribution						Assuming Lognormal Distribution					
49	DL/2 Substitution Method						DL/2 Substitution Method					
50	Mean				0.00601		Mean				-5.34	
51	SD				0.00719		SD				0.546	
52	95% DL/2 (t) UCL				0.00816		95% H-Stat (DL/2) UCL				0.00626	

	A	B	C	D	E	F	G	H	I	J	K	L
53												
54	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
55	MLE method failed to converge properly						Mean in Log Scale					N/A
56							SD in Log Scale					N/A
57							Mean in Original Scale					N/A
58							SD in Original Scale					N/A
59							95% Percentile Bootstrap UCL					N/A
60							95% BCA Bootstrap UCL					N/A
61												
62	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
63	k star (bias corrected)					N/A	Data do not follow a Discernable Distribution (0.05)					
64	Theta Star					N/A						
65	nu star					N/A						
66												
67	A-D Test Statistic					N/A	Nonparametric Statistics					
68	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
69	K-S Test Statistic					N/A	Mean					0.013
70	5% K-S Critical Value					N/A	SD					0.00557
71	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.00139
72							95% KM (t) UCL					0.0154
73	Assuming Gamma Distribution						95% KM (z) UCL					0.0153
74	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0339
75	Minimum					N/A	95% KM (bootstrap t) UCL					N/A
76	Maximum					N/A	95% KM (BCA) UCL					0.044
77	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.044
78	Median					N/A	95% KM (Chebyshev) UCL					0.0191
79	SD					N/A	97.5% KM (Chebyshev) UCL					0.0217
80	k star					N/A	99% KM (Chebyshev) UCL					0.0268
81	Theta star					N/A						
82	Nu star					N/A	Potential UCLs to Use					
83	AppChi2					N/A	95% KM (t) UCL					0.0154
84	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					0.044
85	95% Adjusted Gamma UCL					N/A						
86	Note: DL/2 is not a recommended method.											
87												
88												
89	2-Methylnaphthalene											
90												
91	General Statistics											
92	Number of Valid Data					32	Number of Detected Data					17
93	Number of Distinct Detected Data					16	Number of Non-Detect Data					15
94							Percent Non-Detects					46.88%
95												
96	Raw Statistics						Log-transformed Statistics					
97	Minimum Detected					0.0322	Minimum Detected					-3.436
98	Maximum Detected					0.37	Maximum Detected					-0.994
99	Mean of Detected					0.131	Mean of Detected					-2.22
100	SD of Detected					0.0832	SD of Detected					0.642
101	Minimum Non-Detect					0.34	Minimum Non-Detect					-1.079
102	Maximum Non-Detect					0.4	Maximum Non-Detect					-0.916
103												
104	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					32

	A	B	C	D	E	F	G	H	I	J	K	L
105	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
106	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
107												
108	UCL Statistics											
109	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
110	Shapiro Wilk Test Statistic				0.882		Shapiro Wilk Test Statistic				0.979	
111	5% Shapiro Wilk Critical Value				0.892		5% Shapiro Wilk Critical Value				0.892	
112	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
113												
114	Assuming Normal Distribution						Assuming Lognormal Distribution					
115	DL/2 Substitution Method						DL/2 Substitution Method					
116	Mean				0.156		Mean				-1.974	
117	SD				0.0659		SD				0.534	
118	95% DL/2 (t) UCL				0.175		95% H-Stat (DL/2) UCL				0.304	
119												
120	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
121	MLE method failed to converge properly						Mean in Log Scale				-2.248	
122							SD in Log Scale				0.515	
123							Mean in Original Scale				0.12	
124							SD in Original Scale				0.0656	
125							95% Percentile Bootstrap UCL				0.14	
126							95% BCA Bootstrap UCL				0.142	
127												
128	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
129	k star (bias corrected)				2.396		Data appear Gamma Distributed at 5% Significance Level					
130	Theta Star				0.0545							
131	nu star				81.45							
132												
133	A-D Test Statistic				0.192		Nonparametric Statistics					
134	5% A-D Critical Value				0.746		Kaplan-Meier (KM) Method					
135	K-S Test Statistic				0.746		Mean				0.125	
136	5% K-S Critical Value				0.211		SD				0.0734	
137	Data appear Gamma Distributed at 5% Significance Level						SE of Mean				0.017	
138							95% KM (t) UCL				0.154	
139	Assuming Gamma Distribution						95% KM (z) UCL				0.153	
140	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL				0.155	
141	Minimum				0.0322		95% KM (bootstrap t) UCL				0.159	
142	Maximum				0.37		95% KM (BCA) UCL				0.153	
143	Mean				0.134		95% KM (Percentile Bootstrap) UCL				0.154	
144	Median				0.134		95% KM (Chebyshev) UCL				0.2	
145	SD				0.0648		97.5% KM (Chebyshev) UCL				0.232	
146	k star				4.049		99% KM (Chebyshev) UCL				0.295	
147	Theta star				0.033							
148	Nu star				259.2		Potential UCLs to Use					
149	AppChi2				222.9		95% KM (t) UCL				0.154	
150	95% Gamma Approximate UCL				0.155							
151	95% Adjusted Gamma UCL				0.157							
152	Note: DL/2 is not a recommended method.											
153												
154												
155	4,4'-DDD											
156												

	A	B	C	D	E	F	G	H	I	J	K	L
157	General Statistics											
158	Number of Valid Data					28	Number of Detected Data					15
159	Number of Distinct Detected Data					15	Number of Non-Detect Data					13
160							Percent Non-Detects					46.43%
161												
162	Raw Statistics						Log-transformed Statistics					
163	Minimum Detected					0.0023	Minimum Detected					-6.075
164	Maximum Detected					0.0537	Maximum Detected					-2.924
165	Mean of Detected					0.0119	Mean of Detected					-4.923
166	SD of Detected					0.0143	SD of Detected					0.961
167	Minimum Non-Detect					0.000336	Minimum Non-Detect					-7.998
168	Maximum Non-Detect					0.0043	Maximum Non-Detect					-5.449
169												
170	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					18
171	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					10
172	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					64.29%
173												
174	UCL Statistics											
175	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
176	Shapiro Wilk Test Statistic					0.689	Shapiro Wilk Test Statistic					0.9
177	5% Shapiro Wilk Critical Value					0.881	5% Shapiro Wilk Critical Value					0.881
178	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
179												
180	Assuming Normal Distribution						Assuming Lognormal Distribution					
181	DL/2 Substitution Method						DL/2 Substitution Method					
182	Mean					0.00718	Mean					-5.646
183	SD					0.0115	SD					1.141
184	95% DL/2 (t) UCL					0.0109	95% H-Stat (DL/2) UCL					0.0119
185												
186	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
187	MLE yields a negative mean						Mean in Log Scale					-5.608
188							SD in Log Scale					1.079
189							Mean in Original Scale					0.00725
190							SD in Original Scale					0.0115
191							95% Percentile Bootstrap UCL					0.0111
192							95% BCA Bootstrap UCL					0.0126
193												
194	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
195	k star (bias corrected)					0.965	Data appear Lognormal at 5% Significance Level					
196	Theta Star					0.0123						
197	nu star					28.96						
198												
199	A-D Test Statistic					1.059	Nonparametric Statistics					
200	5% A-D Critical Value					0.76	Kaplan-Meier (KM) Method					
201	K-S Test Statistic					0.76	Mean					0.00763
202	5% K-S Critical Value					0.227	SD					0.0111
203	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.00217
204							95% KM (t) UCL					0.0113
205	Assuming Gamma Distribution						95% KM (z) UCL					0.0112
206	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0112
207	Minimum					0.0023	95% KM (bootstrap t) UCL					0.0153
208	Maximum					0.0537	95% KM (BCA) UCL					0.0116

	A	B	C	D	E	F	G	H	I	J	K	L
209	Mean					0.0119	95% KM (Percentile Bootstrap) UCL					0.0114
210	Median					0.0118	95% KM (Chebyshev) UCL					0.0171
211	SD					0.0103	97.5% KM (Chebyshev) UCL					0.0212
212	k star					1.847	99% KM (Chebyshev) UCL					0.0293
213	Theta star					0.00646						
214	Nu star					103.4	Potential UCLs to Use					
215	AppChi2					80.95	95% KM (t) UCL					0.0113
216	95% Gamma Approximate UCL					0.0152	95% KM (% Bootstrap) UCL					0.0114
217	95% Adjusted Gamma UCL					0.0155						
218	Note: DL/2 is not a recommended method.											
219												
220												
221	4,4'-DDE											
222												
223	General Statistics											
224	Number of Valid Data					28	Number of Detected Data					19
225	Number of Distinct Detected Data					19	Number of Non-Detect Data					9
226							Percent Non-Detects					32.14%
227												
228	Raw Statistics						Log-transformed Statistics					
229	Minimum Detected					0.0016	Minimum Detected					-6.438
230	Maximum Detected					0.07	Maximum Detected					-2.659
231	Mean of Detected					0.0118	Mean of Detected					-5.079
232	SD of Detected					0.0203	SD of Detected					0.936
233	Minimum Non-Detect					0.0035	Minimum Non-Detect					-5.655
234	Maximum Non-Detect					0.042	Maximum Non-Detect					-3.17
235												
236	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					26
237	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
238	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					92.86%
239												
240	UCL Statistics											
241	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
242	Shapiro Wilk Test Statistic					0.447	Shapiro Wilk Test Statistic					0.727
243	5% Shapiro Wilk Critical Value					0.901	5% Shapiro Wilk Critical Value					0.901
244	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
245												
246	Assuming Normal Distribution						Assuming Lognormal Distribution					
247	DL/2 Substitution Method						DL/2 Substitution Method					
248	Mean					0.00933	Mean					-5.376
249	SD					0.0174	SD					0.984
250	95% DL/2 (t) UCL					0.0149	95% H-Stat (DL/2) UCL					0.0113
251												
252	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
253	MLE method failed to converge properly						Mean in Log Scale					-5.495
254							SD in Log Scale					1.002
255							Mean in Original Scale					0.00862
256							SD in Original Scale					0.0173
257							95% Percentile Bootstrap UCL					0.0149
258							95% BCA Bootstrap UCL					0.0161
259												
260	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	
261	k star (bias corrected)					0.8	Data do not follow a Discernable Distribution (0.05)						
262	Theta Star					0.0148							
263	nu star					30.39							
264													
265	A-D Test Statistic					3.451	Nonparametric Statistics						
266	5% A-D Critical Value					0.773	Kaplan-Meier (KM) Method						
267	K-S Test Statistic					0.773	Mean					0.00892	
268	5% K-S Critical Value					0.205	SD					0.0169	
269	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.00328	
270							95% KM (t) UCL					0.0145	
271	Assuming Gamma Distribution						95% KM (z) UCL					0.0143	
272	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0145	
273	Minimum					1E-09	95% KM (bootstrap t) UCL					0.0452	
274	Maximum					0.07	95% KM (BCA) UCL					0.0158	
275	Mean					0.00924	95% KM (Percentile Bootstrap) UCL					0.0142	
276	Median					0.00445	95% KM (Chebyshev) UCL					0.0232	
277	SD					0.0173	97.5% KM (Chebyshev) UCL					0.0294	
278	k star					0.35	99% KM (Chebyshev) UCL					0.0416	
279	Theta star					0.0264							
280	Nu star					19.63	Potential UCLs to Use						
281	AppChi2					10.58	95% KM (BCA) UCL					0.0158	
282	95% Gamma Approximate UCL					0.0172							
283	95% Adjusted Gamma UCL					0.0178							
284	Note: DL/2 is not a recommended method.												
285													
286													
287	4,4'-DDT												
288													
289	General Statistics												
290	Number of Valid Data					22	Number of Detected Data					7	
291	Number of Distinct Detected Data					7	Number of Non-Detect Data					15	
292							Percent Non-Detects					68.18%	
293													
294	Raw Statistics						Log-transformed Statistics						
295	Minimum Detected					0.0018	Minimum Detected					-6.32	
296	Maximum Detected					0.025	Maximum Detected					-3.689	
297	Mean of Detected					0.0108	Mean of Detected					-4.818	
298	SD of Detected					0.00799	SD of Detected					0.888	
299	Minimum Non-Detect					0.0034	Minimum Non-Detect					-5.684	
300	Maximum Non-Detect					0.052	Maximum Non-Detect					-2.957	
301													
302	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					22	
303	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0	
304	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%	
305													
306	Warning: There are only 7 Detected Values in this data												
307	Note: It should be noted that even though bootstrap may be performed on this data set												
308	the resulting calculations may not be reliable enough to draw conclusions												
309													
310	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.												
311													
312													

	A	B	C	D	E	F	G	H	I	J	K	L
313	UCL Statistics											
314	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
315	Shapiro Wilk Test Statistic					0.937	Shapiro Wilk Test Statistic					0.97
316	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
317	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
318												
319	Assuming Normal Distribution						Assuming Lognormal Distribution					
320	DL/2 Substitution Method						DL/2 Substitution Method					
321	Mean					0.00586	Mean					-5.67
322	SD					0.00747	SD					0.941
323	95% DL/2 (t) UCL					0.0086	95% H-Stat (DL/2) UCL					0.00725
324												
325	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
326	MLE method failed to converge properly						Mean in Log Scale					-5.926
327							SD in Log Scale					0.959
328							Mean in Original Scale					0.00458
329							SD in Original Scale					0.00611
330							95% Percentile Bootstrap UCL					0.00674
331							95% BCA Bootstrap UCL					0.00744
332												
333	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
334	k star (bias corrected)					1.173	Data appear Normal at 5% Significance Level					
335	Theta Star					0.0092						
336	nu star					16.42						
337												
338	A-D Test Statistic					0.156	Nonparametric Statistics					
339	5% A-D Critical Value					0.716	Kaplan-Meier (KM) Method					
340	K-S Test Statistic					0.716	Mean					0.00482
341	5% K-S Critical Value					0.316	SD					0.00601
342	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.00142
343							95% KM (t) UCL					0.00726
344	Assuming Gamma Distribution						95% KM (z) UCL					0.00715
345	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00701
346	Minimum					0.0018	95% KM (bootstrap t) UCL					0.00806
347	Maximum					0.025	95% KM (BCA) UCL					0.0109
348	Mean					0.00975	95% KM (Percentile Bootstrap) UCL					0.00936
349	Median					0.00925	95% KM (Chebyshev) UCL					0.011
350	SD					0.00489	97.5% KM (Chebyshev) UCL					0.0137
351	k star					3.621	99% KM (Chebyshev) UCL					0.0189
352	Theta star					0.00269						
353	Nu star					159.3	Potential UCLs to Use					
354	AppChi2					131.1	95% KM (t) UCL					0.00726
355	95% Gamma Approximate UCL					0.0118	95% KM (Percentile Bootstrap) UCL					0.00936
356	95% Adjusted Gamma UCL					0.012						
357	Note: DL/2 is not a recommended method.											
358												
359												
360	Acenaphthylene											
361												
362	General Statistics											
363	Number of Valid Data					32	Number of Detected Data					23
364	Number of Distinct Detected Data					21	Number of Non-Detect Data					9

	A	B	C	D	E	F	G	H	I	J	K	L
365							Percent Non-Detects					28.13%
366												
367	Raw Statistics					Log-transformed Statistics						
368	Minimum Detected					0.024	Minimum Detected					-3.73
369	Maximum Detected					0.43	Maximum Detected					-0.844
370	Mean of Detected					0.121	Mean of Detected					-2.341
371	SD of Detected					0.0958	SD of Detected					0.661
372	Minimum Non-Detect					0.34	Minimum Non-Detect					-1.079
373	Maximum Non-Detect					0.4	Maximum Non-Detect					-0.916
374												
375	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				31	
376	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected				1	
377	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage				96.88%	
378												
379	UCL Statistics											
380	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
381	Shapiro Wilk Test Statistic					0.762	Shapiro Wilk Test Statistic					0.958
382	5% Shapiro Wilk Critical Value					0.914	5% Shapiro Wilk Critical Value					0.914
383	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
384												
385	Assuming Normal Distribution					Assuming Lognormal Distribution						
386	DL/2 Substitution Method						DL/2 Substitution Method					
387	Mean					0.138	Mean					-2.16
388	SD					0.0858	SD					0.63
389	95% DL/2 (t) UCL					0.164	95% H-Stat (DL/2) UCL					0.285
390												
391	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
392	MLE method failed to converge properly						Mean in Log Scale					-2.356
393							SD in Log Scale					0.567
394							Mean in Original Scale					0.113
395							SD in Original Scale					0.0822
396							95% Percentile Bootstrap UCL					0.138
397							95% BCA Bootstrap UCL					0.143
398												
399	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
400	k star (bias corrected)					2.082	Data appear Lognormal at 5% Significance Level					
401	Theta Star					0.058						
402	nu star					95.77						
403												
404	A-D Test Statistic					0.905	Nonparametric Statistics					
405	5% A-D Critical Value					0.753	Kaplan-Meier (KM) Method					
406	K-S Test Statistic					0.753	Mean					0.117
407	5% K-S Critical Value					0.183	SD					0.0875
408	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0176
409							95% KM (t) UCL					0.147
410	Assuming Gamma Distribution						95% KM (z) UCL					0.146
411	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.147
412	Minimum					0.024	95% KM (bootstrap t) UCL					0.158
413	Maximum					0.43	95% KM (BCA) UCL					0.15
414	Mean					0.123	95% KM (Percentile Bootstrap) UCL					0.147
415	Median					0.102	95% KM (Chebyshev) UCL					0.193
416	SD					0.0816	97.5% KM (Chebyshev) UCL					0.227

	A	B	C	D	E	F	G	H	I	J	K	L
417	k star					2.874	99% KM (Chebyshev) UCL					0.292
418	Theta star					0.0427						
419	Nu star					183.9	Potential UCLs to Use					
420	AppChi2					153.5	95% KM (BCA) UCL					0.15
421	95% Gamma Approximate UCL					0.147						
422	95% Adjusted Gamma UCL					0.148						
423	Note: DL/2 is not a recommended method.											
424												
425												
426	Acetone											
427												
428	General Statistics											
429	Number of Valid Data					32	Number of Detected Data					10
430	Number of Distinct Detected Data					10	Number of Non-Detect Data					22
431							Percent Non-Detects					68.75%
432												
433	Raw Statistics						Log-transformed Statistics					
434	Minimum Detected					0.00309	Minimum Detected					-5.78
435	Maximum Detected					0.13	Maximum Detected					-2.04
436	Mean of Detected					0.0346	Mean of Detected					-3.929
437	SD of Detected					0.0385	SD of Detected					1.195
438	Minimum Non-Detect					0.00542	Minimum Non-Detect					-5.218
439	Maximum Non-Detect					0.051	Maximum Non-Detect					-2.976
440												
441	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					30
442	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
443	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					93.75%
444												
445	UCL Statistics											
446	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
447	Shapiro Wilk Test Statistic					0.787	Shapiro Wilk Test Statistic					0.968
448	5% Shapiro Wilk Critical Value					0.842	5% Shapiro Wilk Critical Value					0.842
449	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
450												
451	Assuming Normal Distribution						Assuming Lognormal Distribution					
452	DL/2 Substitution Method						DL/2 Substitution Method					
453	Mean					0.0164	Mean					-4.695
454	SD					0.0248	SD					0.988
455	95% DL/2 (t) UCL					0.0238	95% H-Stat (DL/2) UCL					0.029
456												
457	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
458	MLE method failed to converge properly						Mean in Log Scale					-5.051
459							SD in Log Scale					1.05
460							Mean in Original Scale					0.0136
461							SD in Original Scale					0.0253
462							95% Percentile Bootstrap UCL					0.0219
463							95% BCA Bootstrap UCL					0.0247
464												
465	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
466	k star (bias corrected)					0.779	Data appear Gamma Distributed at 5% Significance Level					
467	Theta Star					0.0445						
468	nu star					15.58						

	A	B	C	D	E	F	G	H	I	J	K	L
469												
470	A-D Test Statistic					0.214	Nonparametric Statistics					
471	5% A-D Critical Value					0.748	Kaplan-Meier (KM) Method					
472	K-S Test Statistic					0.748	Mean					0.0141
473	5% K-S Critical Value					0.274	SD					0.0249
474	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0047
475							95% KM (t) UCL					0.0221
476	Assuming Gamma Distribution						95% KM (z) UCL					0.0218
477	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0218
478	Minimum					0.00309	95% KM (bootstrap t) UCL					0.029
479	Maximum					0.13	95% KM (BCA) UCL					0.0247
480	Mean					0.0388	95% KM (Percentile Bootstrap) UCL					0.0231
481	Median					0.0398	95% KM (Chebyshev) UCL					0.0346
482	SD					0.0233	97.5% KM (Chebyshev) UCL					0.0435
483	k star					2.288	99% KM (Chebyshev) UCL					0.0609
484	Theta star					0.017						
485	Nu star					146.5	Potential UCLs to Use					
486	AppChi2					119.5	95% KM (t) UCL					0.0221
487	95% Gamma Approximate UCL					0.0476						
488	95% Adjusted Gamma UCL					0.0481						
489	Note: DL/2 is not a recommended method.											
490												
491												
492	Acetophenone											
493												
494	General Statistics											
495	Number of Valid Data					32	Number of Detected Data					4
496	Number of Distinct Detected Data					4	Number of Non-Detect Data					28
497							Percent Non-Detects					87.50%
498												
499	Raw Statistics						Log-transformed Statistics					
500	Minimum Detected					0.053	Minimum Detected					-2.937
501	Maximum Detected					0.86	Maximum Detected					-0.151
502	Mean of Detected					0.272	Mean of Detected					-1.996
503	SD of Detected					0.393	SD of Detected					1.253
504	Minimum Non-Detect					0.148	Minimum Non-Detect					-1.911
505	Maximum Non-Detect					0.51	Maximum Non-Detect					-0.673
506												
507	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					31
508	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					1
509	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					96.88%
510												
511	Warning: There are only 4 Distinct Detected Values in this data											
512	Note: It should be noted that even though bootstrap may be performed on this data set											
513	the resulting calculations may not be reliable enough to draw conclusions											
514												
515	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
516												
517												
518	UCL Statistics											
519	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
520	Shapiro Wilk Test Statistic					0.671	Shapiro Wilk Test Statistic					0.8

	A	B	C	D	E	F	G	H	I	J	K	L
521	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
522	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
523												
524	Assuming Normal Distribution						Assuming Lognormal Distribution					
525	DL/2 Substitution Method						DL/2 Substitution Method					
526	Mean					0.183	Mean					-1.836
527	SD					0.133	SD					0.496
528	95% DL/2 (t) UCL					0.223	95% H-Stat (DL/2) UCL					0.261
529												
530	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
531	MLE method failed to converge properly						Mean in Log Scale					-2.471
532							SD in Log Scale					0.604
533							Mean in Original Scale					0.11
534							SD in Original Scale					0.142
535							95% Percentile Bootstrap UCL					0.157
536							95% BCA Bootstrap UCL					0.188
537												
538	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
539	k star (bias corrected)					0.379	Data appear Lognormal at 5% Significance Level					
540	Theta Star					0.716						
541	nu star					3.034						
542												
543	A-D Test Statistic					0.695	Nonparametric Statistics					
544	5% A-D Critical Value					0.669	Kaplan-Meier (KM) Method					
545	K-S Test Statistic					0.669	Mean					0.1
546	5% K-S Critical Value					0.404	SD					0.137
547	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0299
548							95% KM (t) UCL					0.151
549	Assuming Gamma Distribution						95% KM (z) UCL					0.149
550	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.148
551	Minimum					0.053	95% KM (bootstrap t) UCL					0.229
552	Maximum					0.86	95% KM (BCA) UCL					0.178
553	Mean					0.273	95% KM (Percentile Bootstrap) UCL					0.179
554	Median					0.282	95% KM (Chebyshev) UCL					0.23
555	SD					0.127	97.5% KM (Chebyshev) UCL					0.287
556	k star					4.851	99% KM (Chebyshev) UCL					0.398
557	Theta star					0.0562						
558	Nu star					310.5	Potential UCLs to Use					
559	AppChi2					270.7	95% KM (BCA) UCL					0.178
560	95% Gamma Approximate UCL					0.313						
561	95% Adjusted Gamma UCL					N/A						
562	Note: DL/2 is not a recommended method.											
563												
564												
565	alpha-Chlordane											
566												
567	General Statistics											
568	Number of Valid Data					32	Number of Detected Data					17
569	Number of Distinct Detected Data					16	Number of Non-Detect Data					15
570							Percent Non-Detects					46.88%
571												
572	Raw Statistics						Log-transformed Statistics					

	A	B	C	D	E	F	G	H	I	J	K	L
573	Minimum Detected					0.00129	Minimum Detected					-6.653
574	Maximum Detected					0.0195	Maximum Detected					-3.937
575	Mean of Detected					0.00498	Mean of Detected					-5.579
576	SD of Detected					0.00464	SD of Detected					0.711
577	Minimum Non-Detect					0.0018	Minimum Non-Detect					-6.32
578	Maximum Non-Detect					0.0024	Maximum Non-Detect					-6.032
579												
580	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					21
581	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					11
582	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					65.63%
583												
584	UCL Statistics											
585	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
586	Shapiro Wilk Test Statistic					0.706	Shapiro Wilk Test Statistic					0.927
587	5% Shapiro Wilk Critical Value					0.892	5% Shapiro Wilk Critical Value					0.892
588	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
589												
590	Assuming Normal Distribution						Assuming Lognormal Distribution					
591	DL/2 Substitution Method						DL/2 Substitution Method					
592	Mean					0.00311	Mean					-6.207
593	SD					0.0039	SD					0.853
594	95% DL/2 (t) UCL					0.00428	95% H-Stat (DL/2) UCL					0.00346
595												
596	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
597	MLE yields a negative mean						Mean in Log Scale					-6.268
598							SD in Log Scale					0.94
599							Mean in Original Scale					0.00308
600							SD in Original Scale					0.00392
601							95% Percentile Bootstrap UCL					0.00427
602							95% BCA Bootstrap UCL					0.00466
603												
604	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
605	k star (bias corrected)					1.65	Data appear Lognormal at 5% Significance Level					
606	Theta Star					0.00302						
607	nu star					56.1						
608												
609	A-D Test Statistic					0.942	Nonparametric Statistics					
610	5% A-D Critical Value					0.75	Kaplan-Meier (KM) Method					
611	K-S Test Statistic					0.75	Mean					0.00327
612	5% K-S Critical Value					0.212	SD					0.00376
613	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0006848
614							95% KM (t) UCL					0.00443
615	Assuming Gamma Distribution						95% KM (z) UCL					0.0044
616	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00427
617	Minimum					0.0005352	95% KM (bootstrap t) UCL					0.00518
618	Maximum					0.0195	95% KM (BCA) UCL					0.00487
619	Mean					0.00467	95% KM (Percentile Bootstrap) UCL					0.0046
620	Median					0.00378	95% KM (Chebyshev) UCL					0.00626
621	SD					0.00362	97.5% KM (Chebyshev) UCL					0.00755
622	k star					2.116	99% KM (Chebyshev) UCL					0.0101
623	Theta star					0.00221						
624	Nu star					135.4	Potential UCLs to Use					

	A	B	C	D	E	F	G	H	I	J	K	L
625	AppChi2					109.5	95% KM (t) UCL					0.00443
626	95% Gamma Approximate UCL					0.00577	95% KM (% Bootstrap) UCL					0.0046
627	95% Adjusted Gamma UCL					0.00584						
628	Note: DL/2 is not a recommended method.											
629												
630												
631	Aluminum											
632												
633	General Statistics											
634	Number of Valid Observations					32	Number of Distinct Observations					31
635												
636	Raw Statistics						Log-transformed Statistics					
637	Minimum					3370	Minimum of Log Data					8.123
638	Maximum					11400	Maximum of Log Data					9.341
639	Mean					5931	Mean of log Data					8.637
640	Median					5175	SD of log Data					0.312
641	SD					2113						
642	Coefficient of Variation					0.356						
643	Skewness					1.466						
644												
645	Relevant UCL Statistics											
646	Normal Distribution Test						Lognormal Distribution Test					
647	Shapiro Wilk Test Statistic					0.819	Shapiro Wilk Test Statistic					0.914
648	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
649	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
650												
651	Assuming Normal Distribution						Assuming Lognormal Distribution					
652	95% Student's-t UCL					6565	95% H-UCL					6545
653	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					7353
654	95% Adjusted-CLT UCL					6649	97.5% Chebyshev (MVUE) UCL					7978
655	95% Modified-t UCL					6581	99% Chebyshev (MVUE) UCL					9207
656												
657	Gamma Distribution Test						Data Distribution					
658	k star (bias corrected)					9.027	Data do not follow a Discernable Distribution (0.05)					
659	Theta Star					657.1						
660	MLE of Mean					5931						
661	MLE of Standard Deviation					1974						
662	nu star					577.7						
663	Approximate Chi Square Value (.05)					523	Nonparametric Statistics					
664	Adjusted Level of Significance					0.0416	95% CLT UCL					6546
665	Adjusted Chi Square Value					520.2	95% Jackknife UCL					6565
666							95% Standard Bootstrap UCL					6526
667	Anderson-Darling Test Statistic					1.364	95% Bootstrap-t UCL					6750
668	Anderson-Darling 5% Critical Value					0.747	95% Hall's Bootstrap UCL					6631
669	Kolmogorov-Smirnov Test Statistic					0.159	95% Percentile Bootstrap UCL					6568
670	Kolmogorov-Smirnov 5% Critical Value					0.155	95% BCA Bootstrap UCL					6664
671	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					7559
672							97.5% Chebyshev(Mean, Sd) UCL					8264
673	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					9648
674	95% Approximate Gamma UCL					6552						
675	95% Adjusted Gamma UCL					6587						
676												

	A	B	C	D	E	F	G	H	I	J	K	L
677	Potential UCL to Use						Use 95% Student's-t UCL					6565
678							or 95% Modified-t UCL					6581
679												
680												
681	Anthracene											
682												
683	General Statistics											
684	Number of Valid Data				32		Number of Detected Data				28	
685	Number of Distinct Detected Data				27		Number of Non-Detect Data				4	
686							Percent Non-Detects				12.50%	
687												
688	Raw Statistics					Log-transformed Statistics						
689	Minimum Detected				0.037		Minimum Detected				-3.297	
690	Maximum Detected				1.1		Maximum Detected				0.0953	
691	Mean of Detected				0.316		Mean of Detected				-1.535	
692	SD of Detected				0.277		SD of Detected				0.926	
693	Minimum Non-Detect				0.35		Minimum Non-Detect				-1.05	
694	Maximum Non-Detect				0.38		Maximum Non-Detect				-0.968	
695												
696	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				23	
697	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected				9	
698	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage				71.88%	
699												
700	UCL Statistics											
701	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
702	Shapiro Wilk Test Statistic				0.853		Shapiro Wilk Test Statistic				0.973	
703	5% Shapiro Wilk Critical Value				0.924		5% Shapiro Wilk Critical Value				0.924	
704	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
705												
706	Assuming Normal Distribution					Assuming Lognormal Distribution						
707	DL/2 Substitution Method						DL/2 Substitution Method					
708	Mean				0.299		Mean				-1.557	
709	SD				0.263		SD				0.866	
710	95% DL/2 (t) UCL				0.377		95% H-Stat (DL/2) UCL				0.473	
711												
712	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
713	Mean				0.126		Mean in Log Scale				-1.592	
714	SD				0.435		SD in Log Scale				0.881	
715	95% MLE (t) UCL				0.256		Mean in Original Scale				0.294	
716	95% MLE (Tiku) UCL				0.364		SD in Original Scale				0.265	
717							95% Percentile Bootstrap UCL				0.373	
718							95% BCA Bootstrap UCL				0.387	
719												
720	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
721	k star (bias corrected)				1.323		Data appear Gamma Distributed at 5% Significance Level					
722	Theta Star				0.238							
723	nu star				74.09							
724												
725	A-D Test Statistic				0.288		Nonparametric Statistics					
726	5% A-D Critical Value				0.764		Kaplan-Meier (KM) Method					
727	K-S Test Statistic				0.764		Mean				0.295	
728	5% K-S Critical Value				0.169		SD				0.262	

	A	B	C	D	E	F	G	H	I	J	K	L	
729	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0476	
730							95% KM (t) UCL					0.376	
731	Assuming Gamma Distribution						95% KM (z) UCL					0.374	
732	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.376	
733	Minimum					0.037	95% KM (bootstrap t) UCL					0.398	
734	Maximum					1.1	95% KM (BCA) UCL					0.372	
735	Mean					0.307	95% KM (Percentile Bootstrap) UCL					0.375	
736	Median					0.248	95% KM (Chebyshev) UCL					0.503	
737	SD					0.261	97.5% KM (Chebyshev) UCL					0.592	
738	k star					1.472	99% KM (Chebyshev) UCL					0.768	
739	Theta star					0.209							
740	Nu star					94.2	Potential UCLs to Use						
741	AppChi2					72.81	95% KM (BCA) UCL					0.372	
742	95% Gamma Approximate UCL					0.397							
743	95% Adjusted Gamma UCL					0.403							
744	Note: DL/2 is not a recommended method.												
745													
746													
747	Antimony												
748													
749	General Statistics												
750	Number of Valid Data					32	Number of Detected Data					12	
751	Number of Distinct Detected Data					12	Number of Non-Detect Data					20	
752							Percent Non-Detects					62.50%	
753													
754	Raw Statistics						Log-transformed Statistics						
755	Minimum Detected					0.392	Minimum Detected					-0.936	
756	Maximum Detected					63.6	Maximum Detected					4.153	
757	Mean of Detected					12.47	Mean of Detected					1.233	
758	SD of Detected					19.81	SD of Detected					1.778	
759	Minimum Non-Detect					0.95	Minimum Non-Detect					-0.0513	
760	Maximum Non-Detect					15	Maximum Non-Detect					2.708	
761													
762	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					29	
763	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					3	
764	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					90.63%	
765													
766	UCL Statistics												
767	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only						
768	Shapiro Wilk Test Statistic					0.681	Shapiro Wilk Test Statistic					0.922	
769	5% Shapiro Wilk Critical Value					0.859	5% Shapiro Wilk Critical Value					0.859	
770	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level						
771													
772	Assuming Normal Distribution						Assuming Lognormal Distribution						
773	DL/2 Substitution Method						DL/2 Substitution Method						
774	Mean					6.792	Mean					0.928	
775	SD					12.82	SD					1.367	
776	95% DL/2 (t) UCL					10.63	95% H-Stat (DL/2) UCL					25.63	
777													
778	Maximum Likelihood Estimate(MLE) Method						Log ROS Method						
779	Mean					45.75	Mean in Log Scale					0.37	
780	SD					17.68	SD in Log Scale					1.383	

	A	B	C	D	E	F	G	H	I	J	K	L
781	95% MLE (t) UCL					51.05	Mean in Original Scale					5.382
782	95% MLE (Tiku) UCL					62.74	SD in Original Scale					13.07
783							95% Percentile Bootstrap UCL					9.276
784							95% BCA Bootstrap UCL					11.4
785												
786	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
787	k star (bias corrected)					0.426	Data appear Gamma Distributed at 5% Significance Level					
788	Theta Star					29.29						
789	nu star					10.21						
790												
791	A-D Test Statistic					0.605	Nonparametric Statistics					
792	5% A-D Critical Value					0.786	Kaplan-Meier (KM) Method					
793	K-S Test Statistic					0.786	Mean					5.414
794	5% K-S Critical Value					0.259	SD					12.91
795	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					2.401
796							95% KM (t) UCL					9.485
797	Assuming Gamma Distribution						95% KM (z) UCL					9.363
798	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					9.378
799	Minimum					0.392	95% KM (bootstrap t) UCL					17.38
800	Maximum					63.6	95% KM (BCA) UCL					10.29
801	Mean					12.51	95% KM (Percentile Bootstrap) UCL					9.726
802	Median					11.98	95% KM (Chebyshev) UCL					15.88
803	SD					11.82	97.5% KM (Chebyshev) UCL					20.41
804	k star					1.081	99% KM (Chebyshev) UCL					29.3
805	Theta star					11.57						
806	Nu star					69.17	Potential UCLs to Use					
807	AppChi2					51.02	95% KM (t) UCL					9.485
808	95% Gamma Approximate UCL					16.96						
809	95% Adjusted Gamma UCL					17.24						
810	Note: DL/2 is not a recommended method.											
811												
812												
813	Arsenic											
814												
815	General Statistics											
816	Number of Valid Observations					32	Number of Distinct Observations					28
817												
818	Raw Statistics						Log-transformed Statistics					
819	Minimum					2	Minimum of Log Data					0.693
820	Maximum					26.1	Maximum of Log Data					3.262
821	Mean					9.298	Mean of log Data					1.983
822	Median					7.1	SD of log Data					0.713
823	SD					6.866						
824	Coefficient of Variation					0.738						
825	Skewness					1.192						
826												
827	Relevant UCL Statistics											
828	Normal Distribution Test						Lognormal Distribution Test					
829	Shapiro Wilk Test Statistic					0.843	Shapiro Wilk Test Statistic					0.96
830	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
831	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
832												

	A	B	C	D	E	F	G	H	I	J	K	L
833	Assuming Normal Distribution						Assuming Lognormal Distribution					
834	95% Student's-t UCL					11.36	95% H-UCL					12.29
835	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					14.81
836	95% Adjusted-CLT UCL					11.57	97.5% Chebyshev (MVUE) UCL					17.21
837	95% Modified-t UCL					11.4	99% Chebyshev (MVUE) UCL					21.91
838												
839	Gamma Distribution Test						Data Distribution					
840	k star (bias corrected)					1.996	Data appear Gamma Distributed at 5% Significance Level					
841	Theta Star					4.658						
842	MLE of Mean					9.298						
843	MLE of Standard Deviation					6.581						
844	nu star					127.8						
845	Approximate Chi Square Value (.05)					102.7	Nonparametric Statistics					
846	Adjusted Level of Significance					0.0416	95% CLT UCL					11.29
847	Adjusted Chi Square Value					101.4	95% Jackknife UCL					11.36
848							95% Standard Bootstrap UCL					11.3
849	Anderson-Darling Test Statistic					0.655	95% Bootstrap-t UCL					11.85
850	Anderson-Darling 5% Critical Value					0.758	95% Hall's Bootstrap UCL					11.53
851	Kolmogorov-Smirnov Test Statistic					0.142	95% Percentile Bootstrap UCL					11.3
852	Kolmogorov-Smirnov 5% Critical Value					0.157	95% BCA Bootstrap UCL					11.68
853	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					14.59
854							97.5% Chebyshev(Mean, Sd) UCL					16.88
855	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					21.37
856	95% Approximate Gamma UCL					11.57						
857	95% Adjusted Gamma UCL					11.71						
858												
859	Potential UCL to Use						Use 95% Approximate Gamma UCL					11.57
860												
861												
862	Barium											
863												
864	General Statistics											
865	Number of Valid Data					32	Number of Detected Data					22
866	Number of Distinct Detected Data					22	Number of Non-Detect Data					10
867							Percent Non-Detects					31.25%
868												
869	Raw Statistics						Log-transformed Statistics					
870	Minimum Detected					28.45	Minimum Detected					3.348
871	Maximum Detected					881	Maximum Detected					6.781
872	Mean of Detected					167.9	Mean of Detected					4.664
873	SD of Detected					203.7	SD of Detected					0.917
874	Minimum Non-Detect					31	Minimum Non-Detect					3.434
875	Maximum Non-Detect					50	Maximum Non-Detect					3.912
876												
877	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					15
878	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					17
879	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					46.88%
880												
881	UCL Statistics											
882	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
883	Shapiro Wilk Test Statistic					0.658	Shapiro Wilk Test Statistic					0.95
884	5% Shapiro Wilk Critical Value					0.911	5% Shapiro Wilk Critical Value					0.911

	A	B	C	D	E	F	G	H	I	J	K	L
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				121.6		Mean				4.138	
890	SD				181.6		SD				1.097	
891	95% DL/2 (t) UCL				176		95% H-Stat (DL/2) UCL				182.1	
892												
893	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
894	Mean				28.26		Mean in Log Scale				4.142	
895	SD				269.4		SD in Log Scale				1.098	
896	95% MLE (t) UCL				109		Mean in Original Scale				121.8	
897	95% MLE (Tiku) UCL				125.2		SD in Original Scale				181.5	
898							95% Percentile Bootstrap UCL				180.9	
899							95% BCA Bootstrap UCL				201.1	
900												
901	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
902	k star (bias corrected)				1.092		Data Follow Appr. Gamma Distribution at 5% Significance Level					
903	Theta Star				153.8							
904	nu star				48.03							
905												
906	A-D Test Statistic				0.933		Nonparametric Statistics					
907	5% A-D Critical Value				0.765		Kaplan-Meier (KM) Method					
908	K-S Test Statistic				0.765		Mean				125	
909	5% K-S Critical Value				0.19		SD				176.9	
910	Data follow Appr. Gamma Distribution at 5% Significance Level						SE of Mean				32.01	
911							95% KM (t) UCL				179.3	
912	Assuming Gamma Distribution						95% KM (z) UCL				177.7	
913	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL				178.2	
914	Minimum				1E-09		95% KM (bootstrap t) UCL				220.1	
915	Maximum				881		95% KM (BCA) UCL				183.5	
916	Mean				129.6		95% KM (Percentile Bootstrap) UCL				180.5	
917	Median				70.47		95% KM (Chebyshev) UCL				264.5	
918	SD				178.3		97.5% KM (Chebyshev) UCL				324.9	
919	k star				0.258		99% KM (Chebyshev) UCL				443.5	
920	Theta star				502.7							
921	Nu star				16.5		Potential UCLs to Use					
922	AppChi2				8.313		95% KM (Percentile Bootstrap) UCL				180.5	
923	95% Gamma Approximate UCL				257.1							
924	95% Adjusted Gamma UCL				267.1							
925	Note: DL/2 is not a recommended method.											
926												
927												
928	Benzaldehyde											
929												
930	General Statistics											
931	Number of Valid Data				32		Number of Detected Data				18	
932	Number of Distinct Detected Data				15		Number of Non-Detect Data				14	
933							Percent Non-Detects				43.75%	
934												
935	Raw Statistics						Log-transformed Statistics					
936	Minimum Detected				0.021		Minimum Detected				-3.863	

	A	B	C	D	E	F	G	H	I	J	K	L
937	Maximum Detected					0.33	Maximum Detected					-1.109
938	Mean of Detected					0.156	Mean of Detected					-2.004
939	SD of Detected					0.0721	SD of Detected					0.644
940	Minimum Non-Detect					0.18	Minimum Non-Detect					-1.715
941	Maximum Non-Detect					0.47	Maximum Non-Detect					-0.755
942												
943	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					32
944	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
945	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
946												
947	UCL Statistics											
948	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
949	Shapiro Wilk Test Statistic					0.949	Shapiro Wilk Test Statistic					0.838
950	5% Shapiro Wilk Critical Value					0.897	5% Shapiro Wilk Critical Value					0.897
951	Data appear Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
952												
953	Assuming Normal Distribution						Assuming Lognormal Distribution					
954	DL/2 Substitution Method						DL/2 Substitution Method					
955	Mean					0.17	Mean					-1.869
956	SD					0.0598	SD					0.523
957	95% DL/2 (t) UCL					0.188	95% H-Stat (DL/2) UCL					0.321
958												
959	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
960	MLE method failed to converge properly						Mean in Log Scale					-2.026
961							SD in Log Scale					0.503
962							Mean in Original Scale					0.146
963							SD in Original Scale					0.0587
964							95% Percentile Bootstrap UCL					0.162
965							95% BCA Bootstrap UCL					0.163
966												
967	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
968	k star (bias corrected)					2.984	Data appear Normal at 5% Significance Level					
969	Theta Star					0.0524						
970	nu star					107.4						
971												
972	A-D Test Statistic					0.876	Nonparametric Statistics					
973	5% A-D Critical Value					0.744	Kaplan-Meier (KM) Method					
974	K-S Test Statistic					0.744	Mean					0.154
975	5% K-S Critical Value					0.205	SD					0.0699
976	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0167
977							95% KM (t) UCL					0.182
978	Assuming Gamma Distribution						95% KM (z) UCL					0.181
979	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.183
980	Minimum					0.021	95% KM (bootstrap t) UCL					0.183
981	Maximum					0.33	95% KM (BCA) UCL					0.182
982	Mean					0.161	95% KM (Percentile Bootstrap) UCL					0.183
983	Median					0.173	95% KM (Chebyshev) UCL					0.227
984	SD					0.0575	97.5% KM (Chebyshev) UCL					0.258
985	k star					5.108	99% KM (Chebyshev) UCL					0.32
986	Theta star					0.0315						
987	Nu star					326.9	Potential UCLs to Use					
988	AppChi2					286	95% KM (t) UCL					0.182

	A	B	C	D	E	F	G	H	I	J	K	L
989	95% Gamma Approximate UCL					0.184	95% KM (Percentile Bootstrap) UCL					0.183
990	95% Adjusted Gamma UCL					0.185						
991	Note: DL/2 is not a recommended method.											
992												
993												
994	Benzo(a)pyrene											
995												
996	General Statistics											
997	Number of Valid Observations					32	Number of Distinct Observations					31
998												
999	Raw Statistics						Log-transformed Statistics					
1000	Minimum					0.085	Minimum of Log Data					-2.465
1001	Maximum					4	Maximum of Log Data					1.386
1002	Mean					1.027	Mean of log Data					-0.356
1003	Median					0.655	SD of log Data					0.942
1004	SD					0.904						
1005	Coefficient of Variation					0.88						
1006	Skewness					1.552						
1007												
1008	Relevant UCL Statistics											
1009	Normal Distribution Test						Lognormal Distribution Test					
1010	Shapiro Wilk Test Statistic					0.849	Shapiro Wilk Test Statistic					0.979
1011	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
1012	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1013												
1014	Assuming Normal Distribution						Assuming Lognormal Distribution					
1015	95% Student's-t UCL					1.298	95% H-UCL					1.629
1016	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					1.957
1017	95% Adjusted-CLT UCL					1.337	97.5% Chebyshev (MVUE) UCL					2.34
1018	95% Modified-t UCL					1.305	99% Chebyshev (MVUE) UCL					3.093
1019												
1020	Gamma Distribution Test						Data Distribution					
1021	k star (bias corrected)					1.335	Data appear Gamma Distributed at 5% Significance Level					
1022	Theta Star					0.77						
1023	MLE of Mean					1.027						
1024	MLE of Standard Deviation					0.889						
1025	nu star					85.43						
1026	Approximate Chi Square Value (.05)					65.13	Nonparametric Statistics					
1027	Adjusted Level of Significance					0.0416	95% CLT UCL					1.29
1028	Adjusted Chi Square Value					64.18	95% Jackknife UCL					1.298
1029							95% Standard Bootstrap UCL					1.285
1030	Anderson-Darling Test Statistic					0.229	95% Bootstrap-t UCL					1.359
1031	Anderson-Darling 5% Critical Value					0.766	95% Hall's Bootstrap UCL					1.383
1032	Kolmogorov-Smirnov Test Statistic					0.108	95% Percentile Bootstrap UCL					1.307
1033	Kolmogorov-Smirnov 5% Critical Value					0.158	95% BCA Bootstrap UCL					1.313
1034	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					1.724
1035							97.5% Chebyshev(Mean, Sd) UCL					2.025
1036	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					2.617
1037	95% Approximate Gamma UCL					1.348						
1038	95% Adjusted Gamma UCL					1.367						
1039												
1040	Potential UCL to Use						Use 95% Approximate Gamma UCL					1.348

	A	B	C	D	E	F	G	H	I	J	K	L				
1041																
1042																
1043	Benzo(b)fluoranthene															
1044																
1045	General Statistics															
1046	Number of Valid Observations					29		Number of Distinct Observations					27			
1047																
1048	Raw Statistics						Log-transformed Statistics									
1049						Minimum		0.12		Minimum of Log Data					-2.12	
1050						Maximum		6.4		Maximum of Log Data					1.856	
1051						Mean		1.481		Mean of log Data					-0.0784	
1052						Median		1.1		SD of log Data					1.071	
1053						SD		1.397								
1054						Coefficient of Variation		0.943								
1055						Skewness		1.718								
1056																
1057	Relevant UCL Statistics															
1058	Normal Distribution Test						Lognormal Distribution Test									
1059	Shapiro Wilk Test Statistic					0.836		Shapiro Wilk Test Statistic					0.956			
1060	Shapiro Wilk Critical Value					0.926		Shapiro Wilk Critical Value					0.926			
1061	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level									
1062																
1063	Assuming Normal Distribution						Assuming Lognormal Distribution									
1064	95% Student's-t UCL					1.923		95% H-UCL					2.751			
1065	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					3.197				
1066	95% Adjusted-CLT UCL					1.997		97.5% Chebyshev (MVUE) UCL					3.892			
1067	95% Modified-t UCL					1.937		99% Chebyshev (MVUE) UCL					5.256			
1068																
1069	Gamma Distribution Test						Data Distribution									
1070	k star (bias corrected)					1.099		Data appear Gamma Distributed at 5% Significance Level								
1071	Theta Star					1.348										
1072	MLE of Mean					1.481										
1073	MLE of Standard Deviation					1.413										
1074	nu star					63.73										
1075	Approximate Chi Square Value (.05)						Nonparametric Statistics									
1076	Adjusted Level of Significance					0.0407		95% CLT UCL					1.908			
1077	Adjusted Chi Square Value					45.48		95% Jackknife UCL					1.923			
1078								95% Standard Bootstrap UCL					1.891			
1079	Anderson-Darling Test Statistic					0.318		95% Bootstrap-t UCL					2.019			
1080	Anderson-Darling 5% Critical Value					0.77		95% Hall's Bootstrap UCL					2.168			
1081	Kolmogorov-Smirnov Test Statistic					0.101		95% Percentile Bootstrap UCL					1.921			
1082	Kolmogorov-Smirnov 5% Critical Value					0.167		95% BCA Bootstrap UCL					1.963			
1083	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					2.612				
1084								97.5% Chebyshev(Mean, Sd) UCL					3.101			
1085	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL						4.062			
1086	95% Approximate Gamma UCL					2.036										
1087	95% Adjusted Gamma UCL					2.076										
1088																
1089	Potential UCL to Use						Use 95% Approximate Gamma UCL					2.036				
1090																
1091																
1092	Benzo(g,h,i)perylene															

	A	B	C	D	E	F	G	H	I	J	K	L
1093												
1094	General Statistics											
1095	Number of Valid Observations					32	Number of Distinct Observations					32
1096												
1097	Raw Statistics						Log-transformed Statistics					
1098	Minimum					0.043	Minimum of Log Data					-3.147
1099	Maximum					2.7	Maximum of Log Data					0.993
1100	Mean					0.728	Mean of log Data					-0.719
1101	Median					0.507	SD of log Data					0.982
1102	SD					0.639						
1103	Coefficient of Variation					0.878						
1104	Skewness					1.366						
1105												
1106	Relevant UCL Statistics											
1107	Normal Distribution Test						Lognormal Distribution Test					
1108	Shapiro Wilk Test Statistic					0.856	Shapiro Wilk Test Statistic					0.976
1109	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
1110	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1111												
1112	Assuming Normal Distribution						Assuming Lognormal Distribution					
1113	95% Student's-t UCL					0.92	95% H-UCL					1.206
1114	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					1.442
1115	95% Adjusted-CLT UCL					0.943	97.5% Chebyshev (MVUE) UCL					1.732
1116	95% Modified-t UCL					0.924	99% Chebyshev (MVUE) UCL					2.302
1117												
1118	Gamma Distribution Test						Data Distribution					
1119	k star (bias corrected)					1.278	Data appear Gamma Distributed at 5% Significance Level					
1120	Theta Star					0.57						
1121	MLE of Mean					0.728						
1122	MLE of Standard Deviation					0.644						
1123	nu star					81.77						
1124	Approximate Chi Square Value (.05)					61.93	Nonparametric Statistics					
1125	Adjusted Level of Significance					0.0416	95% CLT UCL					0.914
1126	Adjusted Chi Square Value					61	95% Jackknife UCL					0.92
1127							95% Standard Bootstrap UCL					0.908
1128	Anderson-Darling Test Statistic					0.25	95% Bootstrap-t UCL					0.981
1129	Anderson-Darling 5% Critical Value					0.767	95% Hall's Bootstrap UCL					0.949
1130	Kolmogorov-Smirnov Test Statistic					0.0954	95% Percentile Bootstrap UCL					0.925
1131	Kolmogorov-Smirnov 5% Critical Value					0.159	95% BCA Bootstrap UCL					0.947
1132	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					1.221
1133							97.5% Chebyshev(Mean, Sd) UCL					1.434
1134	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1.852
1135	95% Approximate Gamma UCL					0.961						
1136	95% Adjusted Gamma UCL					0.976						
1137												
1138	Potential UCL to Use						Use 95% Approximate Gamma UCL					0.961
1139												
1140												
1141	Benzo(k)fluoranthene											
1142												
1143	General Statistics											
1144	Number of Valid Observations					32	Number of Distinct Observations					27

	A	B	C	D	E	F	G	H	I	J	K	L
1145												
1146	Raw Statistics						Log-transformed Statistics					
1147					Minimum	0.036					Minimum of Log Data	-3.324
1148					Maximum	2.41					Maximum of Log Data	0.88
1149					Mean	0.637					Mean of log Data	-0.958
1150					Median	0.413					SD of log Data	1.08
1151					SD	0.646						
1152					Coefficient of Variation	1.015						
1153					Skewness	1.543						
1154												
1155	Relevant UCL Statistics											
1156	Normal Distribution Test						Lognormal Distribution Test					
1157					Shapiro Wilk Test Statistic	0.798					Shapiro Wilk Test Statistic	0.975
1158					Shapiro Wilk Critical Value	0.93					Shapiro Wilk Critical Value	0.93
1159	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1160												
1161	Assuming Normal Distribution						Assuming Lognormal Distribution					
1162					95% Student's-t UCL	0.831					95% H-UCL	1.122
1163	95% UCLs (Adjusted for Skewness)										95% Chebyshev (MVUE) UCL	1.321
1164					95% Adjusted-CLT UCL	0.858					97.5% Chebyshev (MVUE) UCL	1.603
1165					95% Modified-t UCL	0.836					99% Chebyshev (MVUE) UCL	2.158
1166												
1167	Gamma Distribution Test						Data Distribution					
1168					k star (bias corrected)	1.04	Data appear Gamma Distributed at 5% Significance Level					
1169					Theta Star	0.613						
1170					MLE of Mean	0.637						
1171					MLE of Standard Deviation	0.625						
1172					nu star	66.54						
1173					Approximate Chi Square Value (.05)	48.76	Nonparametric Statistics					
1174					Adjusted Level of Significance	0.0416					95% CLT UCL	0.825
1175					Adjusted Chi Square Value	47.95					95% Jackknife UCL	0.831
1176											95% Standard Bootstrap UCL	0.82
1177					Anderson-Darling Test Statistic	0.432					95% Bootstrap-t UCL	0.89
1178					Anderson-Darling 5% Critical Value	0.773					95% Hall's Bootstrap UCL	0.855
1179					Kolmogorov-Smirnov Test Statistic	0.126					95% Percentile Bootstrap UCL	0.838
1180					Kolmogorov-Smirnov 5% Critical Value	0.16					95% BCA Bootstrap UCL	0.843
1181	Data appear Gamma Distributed at 5% Significance Level										95% Chebyshev(Mean, Sd) UCL	1.135
1182											97.5% Chebyshev(Mean, Sd) UCL	1.35
1183	Assuming Gamma Distribution										99% Chebyshev(Mean, Sd) UCL	1.774
1184					95% Approximate Gamma UCL	0.869						
1185					95% Adjusted Gamma UCL	0.884						
1186												
1187	Potential UCL to Use						Use 95% Approximate Gamma UCL				0.869	
1188												
1189												
1190	Benzo_a_anthracene											
1191												
1192	General Statistics											
1193					Number of Valid Observations	32					Number of Distinct Observations	28
1194												
1195	Raw Statistics						Log-transformed Statistics					
1196					Minimum	0.08					Minimum of Log Data	-2.526

	A	B	C	D	E	F	G	H	I	J	K	L
1197	Maximum					4.5	Maximum of Log Data					1.504
1198	Mean					1.132	Mean of log Data					-0.318
1199	Median					0.71	SD of log Data					1.026
1200	SD					1.043						
1201	Coefficient of Variation					0.921						
1202	Skewness					1.554						
1203												
1204	Relevant UCL Statistics											
1205	Normal Distribution Test						Lognormal Distribution Test					
1206	Shapiro Wilk Test Statistic					0.839	Shapiro Wilk Test Statistic					0.965
1207	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
1208	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1209												
1210	Assuming Normal Distribution						Assuming Lognormal Distribution					
1211	95% Student's-t UCL					1.445	95% H-UCL					1.937
1212	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					2.303
1213	95% Adjusted-CLT UCL					1.49	97.5% Chebyshev (MVUE) UCL					2.779
1214	95% Modified-t UCL					1.453	99% Chebyshev (MVUE) UCL					3.715
1215												
1216	Gamma Distribution Test						Data Distribution					
1217	k star (bias corrected)					1.173	Data appear Gamma Distributed at 5% Significance Level					
1218	Theta Star					0.965						
1219	MLE of Mean					1.132						
1220	MLE of Standard Deviation					1.046						
1221	nu star					75.06						
1222	Approximate Chi Square Value (.05)					56.11	Nonparametric Statistics					
1223	Adjusted Level of Significance					0.0416	95% CLT UCL					1.436
1224	Adjusted Chi Square Value					55.23	95% Jackknife UCL					1.445
1225							95% Standard Bootstrap UCL					1.435
1226	Anderson-Darling Test Statistic					0.398	95% Bootstrap-t UCL					1.532
1227	Anderson-Darling 5% Critical Value					0.77	95% Hall's Bootstrap UCL					1.524
1228	Kolmogorov-Smirnov Test Statistic					0.113	95% Percentile Bootstrap UCL					1.441
1229	Kolmogorov-Smirnov 5% Critical Value					0.159	95% BCA Bootstrap UCL					1.505
1230	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					1.936
1231							97.5% Chebyshev(Mean, Sd) UCL					2.283
1232	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					2.966
1233	95% Approximate Gamma UCL					1.515						
1234	95% Adjusted Gamma UCL					1.539						
1235												
1236	Potential UCL to Use						Use 95% Approximate Gamma UCL					1.515
1237												
1238												
1239	bis(2-Ethylhexyl)phthalate											
1240												
1241	General Statistics											
1242	Number of Valid Data					32	Number of Detected Data					19
1243	Number of Distinct Detected Data					19	Number of Non-Detect Data					13
1244							Percent Non-Detects					40.63%
1245												
1246	Raw Statistics						Log-transformed Statistics					
1247	Minimum Detected					0.13	Minimum Detected					-2.04
1248	Maximum Detected					260	Maximum Detected					5.561

	A	B	C	D	E	F	G	H	I	J	K	L
1249	Mean of Detected					29.23	Mean of Detected					1.284
1250	SD of Detected					64.03	SD of Detected					2.272
1251	Minimum Non-Detect					0.34	Minimum Non-Detect					-1.079
1252	Maximum Non-Detect					0.64	Maximum Non-Detect					-0.446
1253												
1254	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					19
1255	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					13
1256	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					59.38%
1257												
1258	UCL Statistics											
1259	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1260	Shapiro Wilk Test Statistic					0.52	Shapiro Wilk Test Statistic					0.95
1261	5% Shapiro Wilk Critical Value					0.901	5% Shapiro Wilk Critical Value					0.901
1262	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1263												
1264	Assuming Normal Distribution						Assuming Lognormal Distribution					
1265	DL/2 Substitution Method						DL/2 Substitution Method					
1266	Mean					17.44	Mean					0.119
1267	SD					50.9	SD					2.25
1268	95% DL/2 (t) UCL					32.7	95% H-Stat (DL/2) UCL					65.15
1269												
1270	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1271	MLE yields a negative mean						Mean in Log Scale					-0.229
1272							SD in Log Scale					2.577
1273							Mean in Original Scale					17.4
1274							SD in Original Scale					50.91
1275							95% Percentile Bootstrap UCL					33.35
1276							95% BCA Bootstrap UCL					40.03
1277												
1278	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1279	k star (bias corrected)					0.309	Data Follow Appr. Gamma Distribution at 5% Significance Level					
1280	Theta Star					94.57						
1281	nu star					11.75						
1282												
1283	A-D Test Statistic					0.976	Nonparametric Statistics					
1284	5% A-D Critical Value					0.838	Kaplan-Meier (KM) Method					
1285	K-S Test Statistic					0.838	Mean					17.44
1286	5% K-S Critical Value					0.214	SD					50.1
1287	Data follow Appr. Gamma Distribution at 5% Significance Level						SE of Mean					9.098
1288							95% KM (t) UCL					32.87
1289	Assuming Gamma Distribution						95% KM (z) UCL					32.4
1290	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					32.69
1291	Minimum					0.13	95% KM (bootstrap t) UCL					74.95
1292	Maximum					260	95% KM (BCA) UCL					35.82
1293	Mean					26.28	95% KM (Percentile Bootstrap) UCL					33.49
1294	Median					18.5	95% KM (Chebyshev) UCL					57.1
1295	SD					48.97	97.5% KM (Chebyshev) UCL					74.26
1296	k star					0.479	99% KM (Chebyshev) UCL					108
1297	Theta star					54.92						
1298	Nu star					30.63	Potential UCLs to Use					
1299	AppChi2					18.99	95% KM (BCA) UCL					35.82
1300	95% Gamma Approximate UCL					42.4						

	A	B	C	D	E	F	G	H	I	J	K	L	
1301	95% Adjusted Gamma UCL					43.52							
1302	Note: DL/2 is not a recommended method.												
1303													
1304													
1305	Butyl benzyl phthalate												
1306													
1307	General Statistics												
1308	Number of Valid Data				32	Number of Detected Data					6		
1309	Number of Distinct Detected Data				5	Number of Non-Detect Data					26		
1310						Percent Non-Detects					81.25%		
1311													
1312	Raw Statistics					Log-transformed Statistics							
1313	Minimum Detected				0.038	Minimum Detected					-3.27		
1314	Maximum Detected				0.29	Maximum Detected					-1.238		
1315	Mean of Detected				0.103	Mean of Detected					-2.608		
1316	SD of Detected				0.102	SD of Detected					0.849		
1317	Minimum Non-Detect				0.148	Minimum Non-Detect					-1.911		
1318	Maximum Non-Detect				3.4	Maximum Non-Detect					1.224		
1319													
1320	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					32		
1321	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					0		
1322	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					100.00%		
1323													
1324	Warning: There are only 6 Detected Values in this data												
1325	Note: It should be noted that even though bootstrap may be performed on this data set												
1326	the resulting calculations may not be reliable enough to draw conclusions												
1327													
1328	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.												
1329													
1330													
1331	UCL Statistics												
1332	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only							
1333	Shapiro Wilk Test Statistic				0.731	Shapiro Wilk Test Statistic					0.796		
1334	5% Shapiro Wilk Critical Value				0.788	5% Shapiro Wilk Critical Value					0.788		
1335	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level							
1336													
1337	Assuming Normal Distribution					Assuming Lognormal Distribution							
1338	DL/2 Substitution Method					DL/2 Substitution Method							
1339	Mean				0.2	Mean					-1.933		
1340	SD				0.281	SD					0.708		
1341	95% DL/2 (t) UCL				0.284	95% H-Stat (DL/2) UCL					0.305		
1342													
1343	Maximum Likelihood Estimate(MLE) Method				N/A	Log ROS Method							
1344	MLE method failed to converge properly					Mean in Log Scale					-2.786		
1345						SD in Log Scale					0.46		
1346						Mean in Original Scale					0.0701		
1347						SD in Original Scale					0.0482		
1348						95% Percentile Bootstrap UCL					0.0857		
1349						95% BCA Bootstrap UCL					0.0903		
1350													
1351	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only							
1352	k star (bias corrected)				0.923	Data appear Lognormal at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L	
1353	Theta Star					0.112							
1354	nu star					11.08							
1355													
1356	A-D Test Statistic					0.766	Nonparametric Statistics						
1357	5% A-D Critical Value					0.707	Kaplan-Meier (KM) Method						
1358	K-S Test Statistic					0.707	Mean					0.0798	
1359	5% K-S Critical Value					0.337	SD					0.0727	
1360	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0253	
1361							95% KM (t) UCL					0.123	
1362	Assuming Gamma Distribution						95% KM (z) UCL					0.121	
1363	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.124	
1364	Minimum					0.0247	95% KM (bootstrap t) UCL					0.439	
1365	Maximum					0.29	95% KM (BCA) UCL					0.129	
1366	Mean					0.109	95% KM (Percentile Bootstrap) UCL					0.123	
1367	Median					0.108	95% KM (Chebyshev) UCL					0.19	
1368	SD					0.0589	97.5% KM (Chebyshev) UCL					0.238	
1369	k star					3.122	99% KM (Chebyshev) UCL					0.331	
1370	Theta star					0.0349							
1371	Nu star					199.8	Potential UCLs to Use						
1372	AppChi2					168.1	95% KM (t) UCL					0.123	
1373	95% Gamma Approximate UCL					0.129	95% KM (% Bootstrap) UCL					0.123	
1374	95% Adjusted Gamma UCL					0.131							
1375	Note: DL/2 is not a recommended method.												
1376													
1377													
1378	Cadmium												
1379													
1380	General Statistics												
1381	Number of Valid Data					32	Number of Detected Data					29	
1382	Number of Distinct Detected Data					27	Number of Non-Detect Data					3	
1383							Percent Non-Detects					9.38%	
1384													
1385	Raw Statistics						Log-transformed Statistics						
1386	Minimum Detected					0.31	Minimum Detected					-1.171	
1387	Maximum Detected					21.8	Maximum Detected					3.082	
1388	Mean of Detected					3.961	Mean of Detected					0.987	
1389	SD of Detected					4.348	SD of Detected					0.894	
1390	Minimum Non-Detect					0.87	Minimum Non-Detect					-0.139	
1391	Maximum Non-Detect					1.1	Maximum Non-Detect					0.0953	
1392													
1393	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					7	
1394	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					25	
1395	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					21.88%	
1396													
1397	UCL Statistics												
1398	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only						
1399	Shapiro Wilk Test Statistic					0.666	Shapiro Wilk Test Statistic					0.966	
1400	5% Shapiro Wilk Critical Value					0.926	5% Shapiro Wilk Critical Value					0.926	
1401	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level						
1402													
1403	Assuming Normal Distribution						Assuming Lognormal Distribution						
1404	DL/2 Substitution Method						DL/2 Substitution Method						

	A	B	C	D	E	F	G	H	I	J	K	L
1405	Mean					3.635	Mean					0.827
1406	SD					4.258	SD					0.989
1407	95% DL/2 (t) UCL					4.912	95% H-Stat (DL/2) UCL					5.141
1408												
1409	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
1410	Mean					3.026	Mean in Log Scale					0.844
1411	SD					4.909	SD in Log Scale					0.964
1412	95% MLE (t) UCL					4.497	Mean in Original Scale					3.644
1413	95% MLE (Tiku) UCL					4.494	SD in Original Scale					4.252
1414							95% Percentile Bootstrap UCL					4.912
1415							95% BCA Bootstrap UCL					5.363
1416												
1417	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1418	k star (bias corrected)					1.304	Data Follow Appr. Gamma Distribution at 5% Significance Level					
1419	Theta Star					3.037						
1420	nu star					75.63						
1421												
1422	A-D Test Statistic					0.892	Nonparametric Statistics					
1423	5% A-D Critical Value					0.764	Kaplan-Meier (KM) Method					
1424	K-S Test Statistic					0.764	Mean					3.635
1425	5% K-S Critical Value					0.166	SD					4.192
1426	Data follow Appr. Gamma Distribution at 5% Significance Level						SE of Mean					0.754
1427							95% KM (t) UCL					4.914
1428	Assuming Gamma Distribution						95% KM (z) UCL					4.876
1429	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					4.912
1430	Minimum					1E-09	95% KM (bootstrap t) UCL					6.122
1431	Maximum					21.8	95% KM (BCA) UCL					4.974
1432	Mean					3.589	95% KM (Percentile Bootstrap) UCL					4.951
1433	Median					2.42	95% KM (Chebyshev) UCL					6.923
1434	SD					4.296	97.5% KM (Chebyshev) UCL					8.346
1435	k star					0.29	99% KM (Chebyshev) UCL					11.14
1436	Theta star					12.38						
1437	Nu star					18.56	Potential UCLs to Use					
1438	AppChi2					9.794	95% KM (Chebyshev) UCL					6.923
1439	95% Gamma Approximate UCL					6.8						
1440	95% Adjusted Gamma UCL					7.046						
1441	Note: DL/2 is not a recommended method.											
1442												
1443												
1444	Carbazole											
1445												
1446	General Statistics											
1447	Number of Valid Data					32	Number of Detected Data					18
1448	Number of Distinct Detected Data					17	Number of Non-Detect Data					14
1449							Percent Non-Detects					43.75%
1450												
1451	Raw Statistics						Log-transformed Statistics					
1452	Minimum Detected					0.024	Minimum Detected					-3.73
1453	Maximum Detected					0.99	Maximum Detected					-0.0101
1454	Mean of Detected					0.218	Mean of Detected					-1.896
1455	SD of Detected					0.221	SD of Detected					0.904
1456	Minimum Non-Detect					0.148	Minimum Non-Detect					-1.911

	A	B	C	D	E	F	G	H	I	J	K	L
1457	Maximum Non-Detect					0.4	Maximum Non-Detect					-0.916
1458												
1459	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					31	
1460	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					1	
1461	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					96.88%	
1462												
1463	UCL Statistics											
1464	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
1465	Shapiro Wilk Test Statistic				0.708	Shapiro Wilk Test Statistic					0.983	
1466	5% Shapiro Wilk Critical Value				0.897	5% Shapiro Wilk Critical Value					0.897	
1467	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
1468												
1469	Assuming Normal Distribution					Assuming Lognormal Distribution						
1470	DL/2 Substitution Method					DL/2 Substitution Method						
1471	Mean				0.193	Mean					-1.888	
1472	SD				0.168	SD					0.708	
1473	95% DL/2 (t) UCL				0.243	95% H-Stat (DL/2) UCL					0.298	
1474												
1475	Maximum Likelihood Estimate(MLE) Method				N/A	Log ROS Method						
1476	MLE method failed to converge properly					Mean in Log Scale					-2.047	
1477						SD in Log Scale					0.736	
1478						Mean in Original Scale					0.173	
1479						SD in Original Scale					0.174	
1480						95% Percentile Bootstrap UCL					0.226	
1481						95% BCA Bootstrap UCL					0.251	
1482												
1483	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
1484	k star (bias corrected)				1.276	Data appear Gamma Distributed at 5% Significance Level						
1485	Theta Star				0.171							
1486	nu star				45.95							
1487												
1488	A-D Test Statistic				0.276	Nonparametric Statistics						
1489	5% A-D Critical Value				0.757	Kaplan-Meier (KM) Method						
1490	K-S Test Statistic				0.757	Mean					0.182	
1491	5% K-S Critical Value				0.207	SD					0.177	
1492	Data appear Gamma Distributed at 5% Significance Level					SE of Mean					0.0348	
1493						95% KM (t) UCL					0.241	
1494	Assuming Gamma Distribution					95% KM (z) UCL					0.239	
1495	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL					0.24	
1496	Minimum				0.024	95% KM (bootstrap t) UCL					0.265	
1497	Maximum				0.99	95% KM (BCA) UCL					0.249	
1498	Mean				0.221	95% KM (Percentile Bootstrap) UCL					0.242	
1499	Median				0.18	95% KM (Chebyshev) UCL					0.333	
1500	SD				0.169	97.5% KM (Chebyshev) UCL					0.399	
1501	k star				2.143	99% KM (Chebyshev) UCL					0.528	
1502	Theta star				0.103							
1503	Nu star				137.2	Potential UCLs to Use						
1504	AppChi2				111.1	95% KM (t) UCL					0.241	
1505	95% Gamma Approximate UCL				0.273							
1506	95% Adjusted Gamma UCL				0.276							
1507	Note: DL/2 is not a recommended method.											
1508												

	A	B	C	D	E	F	G	H	I	J	K	L
1509												
1510	Chromium											
1511												
1512	General Statistics											
1513	Number of Valid Observations					32	Number of Distinct Observations					32
1514												
1515	Raw Statistics						Log-transformed Statistics					
1516	Minimum					21.4	Minimum of Log Data					3.063
1517	Maximum					471	Maximum of Log Data					6.155
1518	Mean					107.9	Mean of log Data					4.349
1519	Median					69.3	SD of log Data					0.785
1520	SD					107.1						
1521	Coefficient of Variation					0.992						
1522	Skewness					2.193						
1523												
1524	Relevant UCL Statistics											
1525	Normal Distribution Test						Lognormal Distribution Test					
1526	Shapiro Wilk Test Statistic					0.706	Shapiro Wilk Test Statistic					0.954
1527	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
1528	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1529												
1530	Assuming Normal Distribution						Assuming Lognormal Distribution					
1531	95% Student's-t UCL					140	95% H-UCL					143.3
1532	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					173.2
1533	95% Adjusted-CLT UCL					146.9	97.5% Chebyshev (MVUE) UCL					203.2
1534	95% Modified-t UCL					141.3	99% Chebyshev (MVUE) UCL					262.1
1535												
1536	Gamma Distribution Test						Data Distribution					
1537	k star (bias corrected)					1.515	Data appear Lognormal at 5% Significance Level					
1538	Theta Star					71.25						
1539	MLE of Mean					107.9						
1540	MLE of Standard Deviation					87.7						
1541	nu star					96.96						
1542	Approximate Chi Square Value (.05)					75.24	Nonparametric Statistics					
1543	Adjusted Level of Significance					0.0416	95% CLT UCL					139.1
1544	Adjusted Chi Square Value					74.22	95% Jackknife UCL					140
1545							95% Standard Bootstrap UCL					138.8
1546	Anderson-Darling Test Statistic					1.205	95% Bootstrap-t UCL					158.4
1547	Anderson-Darling 5% Critical Value					0.763	95% Hall's Bootstrap UCL					147.5
1548	Kolmogorov-Smirnov Test Statistic					0.179	95% Percentile Bootstrap UCL					140.2
1549	Kolmogorov-Smirnov 5% Critical Value					0.158	95% BCA Bootstrap UCL					147.3
1550	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					190.5
1551							97.5% Chebyshev(Mean, Sd) UCL					226.2
1552	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					296.3
1553	95% Approximate Gamma UCL					139.1						
1554	95% Adjusted Gamma UCL					141						
1555												
1556	Potential UCL to Use						Use 95% H-UCL					143.3
1557												
1558												
1559	Chrysene											
1560												

	A	B	C	D	E	F	G	H	I	J	K	L	
1561	General Statistics												
1562	Number of Valid Data					32	Number of Detected Data					31	
1563	Number of Distinct Detected Data					28	Number of Non-Detect Data					1	
1564							Percent Non-Detects					3.13%	
1565													
1566	Raw Statistics					Log-transformed Statistics							
1567	Minimum Detected					0.092	Minimum Detected					-2.386	
1568	Maximum Detected					5	Maximum Detected					1.609	
1569	Mean of Detected					1.151	Mean of Detected					-0.249	
1570	SD of Detected					1.05	SD of Detected					0.946	
1571	Minimum Non-Detect					0.37	Minimum Non-Detect					-0.994	
1572	Maximum Non-Detect					0.37	Maximum Non-Detect					-0.994	
1573													
1574													
1575	UCL Statistics												
1576	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only							
1577	Shapiro Wilk Test Statistic					0.824	Shapiro Wilk Test Statistic					0.982	
1578	5% Shapiro Wilk Critical Value					0.929	5% Shapiro Wilk Critical Value					0.929	
1579	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level							
1580													
1581	Assuming Normal Distribution					Assuming Lognormal Distribution							
1582	DL/2 Substitution Method						DL/2 Substitution Method						
1583	Mean					1.121	Mean					-0.293	
1584	SD					1.047	SD					0.964	
1585	95% DL/2 (t) UCL					1.435	95% H-Stat (DL/2) UCL					1.725	
1586													
1587	Maximum Likelihood Estimate(MLE) Method						Log ROS Method						
1588	Mean					0.991	Mean in Log Scale					-0.289	
1589	SD					1.202	SD in Log Scale					0.958	
1590	95% MLE (t) UCL					1.352	Mean in Original Scale					1.122	
1591	95% MLE (Tiku) UCL					1.355	SD in Original Scale					1.046	
1592							95% Percentile Bootstrap UCL					1.436	
1593							95% BCA Bootstrap UCL					1.502	
1594													
1595	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only							
1596	k star (bias corrected)					1.312	Data appear Gamma Distributed at 5% Significance Level						
1597	Theta Star					0.877							
1598	nu star					81.34							
1599													
1600	A-D Test Statistic					0.21	Nonparametric Statistics						
1601	5% A-D Critical Value					0.765	Kaplan-Meier (KM) Method						
1602	K-S Test Statistic					0.765	Mean					1.121	
1603	5% K-S Critical Value					0.161	SD					1.03	
1604	Data appear Gamma Distributed at 5% Significance Level					SE of Mean							0.185
1605							95% KM (t) UCL					1.435	
1606	Assuming Gamma Distribution					95% KM (z) UCL					1.426		
1607	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					1.435	
1608	Minimum					1E-09	95% KM (bootstrap t) UCL					1.535	
1609	Maximum					5	95% KM (BCA) UCL					1.479	
1610	Mean					1.115	95% KM (Percentile Bootstrap) UCL					1.43	
1611	Median					0.73	95% KM (Chebyshev) UCL					1.928	
1612	SD					1.053	97.5% KM (Chebyshev) UCL					2.277	

	A	B	C	D	E	F	G	H	I	J	K	L	
1613	k star					0.58	99% KM (Chebyshev) UCL					2.963	
1614	Theta star					1.922							
1615	Nu star					37.12	Potential UCLs to Use						
1616	AppChi2					24.17	95% KM (Chebyshev) UCL					1.928	
1617	95% Gamma Approximate UCL					1.712							
1618	95% Adjusted Gamma UCL					1.753							
1619	Note: DL/2 is not a recommended method.												
1620													
1621													
1622	Copper												
1623													
1624	General Statistics												
1625	Number of Valid Observations					32	Number of Distinct Observations					32	
1626													
1627	Raw Statistics					Log-transformed Statistics							
1628	Minimum					15.7	Minimum of Log Data					2.754	
1629	Maximum					1310	Maximum of Log Data					7.178	
1630	Mean					203.6	Mean of log Data					4.643	
1631	Median					80.1	SD of log Data					1.119	
1632	SD					291.7							
1633	Coefficient of Variation					1.433							
1634	Skewness					2.567							
1635													
1636	Relevant UCL Statistics												
1637	Normal Distribution Test					Lognormal Distribution Test							
1638	Shapiro Wilk Test Statistic					0.637	Shapiro Wilk Test Statistic					0.957	
1639	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93	
1640	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level							
1641													
1642	Assuming Normal Distribution					Assuming Lognormal Distribution							
1643	95% Student's-t UCL					291.1	95% H-UCL					325.8	
1644	95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL					380.4		
1645	95% Adjusted-CLT UCL					313.5	97.5% Chebyshev (MVUE) UCL					463.5	
1646	95% Modified-t UCL					295	99% Chebyshev (MVUE) UCL					626.6	
1647													
1648	Gamma Distribution Test					Data Distribution							
1649	k star (bias corrected)					0.811	Data appear Lognormal at 5% Significance Level						
1650	Theta Star					251.1							
1651	MLE of Mean					203.6							
1652	MLE of Standard Deviation					226.1							
1653	nu star					51.91							
1654	Approximate Chi Square Value (.05)					36.36	Nonparametric Statistics						
1655	Adjusted Level of Significance					0.0416	95% CLT UCL					288.5	
1656	Adjusted Chi Square Value					35.66	95% Jackknife UCL					291.1	
1657							95% Standard Bootstrap UCL					285.9	
1658	Anderson-Darling Test Statistic					1.505	95% Bootstrap-t UCL					339	
1659	Anderson-Darling 5% Critical Value					0.782	95% Hall's Bootstrap UCL					342.3	
1660	Kolmogorov-Smirnov Test Statistic					0.203	95% Percentile Bootstrap UCL					292.7	
1661	Kolmogorov-Smirnov 5% Critical Value					0.161	95% BCA Bootstrap UCL					326.6	
1662	Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL					428.4		
1663							97.5% Chebyshev(Mean, Sd) UCL					525.7	
1664	Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL					716.8		

	A	B	C	D	E	F	G	H	I	J	K	L
1665	95% Approximate Gamma UCL					290.7						
1666	95% Adjusted Gamma UCL					296.4						
1667												
1668	Potential UCL to Use						Use 95% H-UCL					325.8
1669												
1670												
1671	Cyanide											
1672												
1673	General Statistics											
1674	Number of Valid Data				32	Number of Detected Data				16		
1675	Number of Distinct Detected Data				15	Number of Non-Detect Data				16		
1676						Percent Non-Detects				50.00%		
1677												
1678	Raw Statistics					Log-transformed Statistics						
1679	Minimum Detected				0.09	Minimum Detected				-2.408		
1680	Maximum Detected				3.8	Maximum Detected				1.335		
1681	Mean of Detected				0.911	Mean of Detected				-0.451		
1682	SD of Detected				0.911	SD of Detected				0.883		
1683	Minimum Non-Detect				0.066	Minimum Non-Detect				-2.718		
1684	Maximum Non-Detect				0.55	Maximum Non-Detect				-0.598		
1685												
1686	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				23	
1687	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected				9	
1688	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage				71.88%	
1689												
1690	UCL Statistics											
1691	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1692	Shapiro Wilk Test Statistic				0.72	Shapiro Wilk Test Statistic				0.976		
1693	5% Shapiro Wilk Critical Value				0.887	5% Shapiro Wilk Critical Value				0.887		
1694	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1695												
1696	Assuming Normal Distribution						Assuming Lognormal Distribution					
1697	DL/2 Substitution Method					DL/2 Substitution Method						
1698	Mean				0.532	Mean				-1.297		
1699	SD				0.744	SD				1.203		
1700	95% DL/2 (t) UCL				0.756	95% H-Stat (DL/2) UCL				0.68		
1701												
1702	Maximum Likelihood Estimate(MLE) Method				N/A	Log ROS Method						
1703	MLE yields a negative mean						Mean in Log Scale				-1.387	
1704						SD in Log Scale				1.166		
1705						Mean in Original Scale				0.509		
1706						SD in Original Scale				0.755		
1707						95% Percentile Bootstrap UCL				0.735		
1708						95% BCA Bootstrap UCL				0.814		
1709												
1710	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1711	k star (bias corrected)				1.294	Data appear Gamma Distributed at 5% Significance Level						
1712	Theta Star				0.704							
1713	nu star				41.42							
1714												
1715	A-D Test Statistic				0.405	Nonparametric Statistics						
1716	5% A-D Critical Value				0.754	Kaplan-Meier (KM) Method						

	A	B	C	D	E	F	G	H	I	J	K	L
1717	K-S Test Statistic					0.754	Mean					0.524
1718	5% K-S Critical Value					0.219	SD					0.737
1719	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.135
1720							95% KM (t) UCL					0.754
1721	Assuming Gamma Distribution						95% KM (z) UCL					0.747
1722	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.724
1723	Minimum					0.09	95% KM (bootstrap t) UCL					0.902
1724	Maximum					3.8	95% KM (BCA) UCL					0.863
1725	Mean					0.829	95% KM (Percentile Bootstrap) UCL					0.771
1726	Median					0.67	95% KM (Chebyshev) UCL					1.115
1727	SD					0.661	97.5% KM (Chebyshev) UCL					1.37
1728	k star					2.344	99% KM (Chebyshev) UCL					1.872
1729	Theta star					0.354						
1730	Nu star					150	Potential UCLs to Use					
1731	AppChi2					122.7	95% KM (t) UCL					0.754
1732	95% Gamma Approximate UCL					1.013						
1733	95% Adjusted Gamma UCL					1.025						
1734	Note: DL/2 is not a recommended method.											
1735												
1736												
1737	Dibenz_a,h_anthracene											
1738												
1739	General Statistics											
1740	Number of Valid Data					32	Number of Detected Data					27
1741	Number of Distinct Detected Data					26	Number of Non-Detect Data					5
1742							Percent Non-Detects					15.63%
1743												
1744	Raw Statistics						Log-transformed Statistics					
1745	Minimum Detected					0.041	Minimum Detected					-3.194
1746	Maximum Detected					0.75	Maximum Detected					-0.288
1747	Mean of Detected					0.217	Mean of Detected					-1.841
1748	SD of Detected					0.182	SD of Detected					0.808
1749	Minimum Non-Detect					0.35	Minimum Non-Detect					-1.05
1750	Maximum Non-Detect					3.4	Maximum Non-Detect					1.224
1751												
1752	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					32
1753	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
1754	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
1755												
1756	UCL Statistics											
1757	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1758	Shapiro Wilk Test Statistic					0.826	Shapiro Wilk Test Statistic					0.961
1759	5% Shapiro Wilk Critical Value					0.923	5% Shapiro Wilk Critical Value					0.923
1760	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1761												
1762	Assuming Normal Distribution						Assuming Lognormal Distribution					
1763	DL/2 Substitution Method						DL/2 Substitution Method					
1764	Mean					0.258	Mean					-1.752
1765	SD					0.311	SD					0.85
1766	95% DL/2 (t) UCL					0.352	95% H-Stat (DL/2) UCL					0.449
1767												
1768	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					

	A	B	C	D	E	F	G	H	I	J	K	L
1769	MLE method failed to converge properly						Mean in Log Scale					-1.875
1770							SD in Log Scale					0.749
1771							Mean in Original Scale					0.203
1772							SD in Original Scale					0.17
1773							95% Percentile Bootstrap UCL					0.252
1774							95% BCA Bootstrap UCL					0.261
1775												
1776	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1777	k star (bias corrected)					1.579	Data appear Gamma Distributed at 5% Significance Level					
1778	Theta Star					0.137						
1779	nu star					85.26						
1780												
1781	A-D Test Statistic					0.66	Nonparametric Statistics					
1782	5% A-D Critical Value					0.76	Kaplan-Meier (KM) Method					
1783	K-S Test Statistic					0.76	Mean					0.206
1784	5% K-S Critical Value					0.171	SD					0.171
1785	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0317
1786							95% KM (t) UCL					0.26
1787	Assuming Gamma Distribution						95% KM (z) UCL					0.258
1788	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.26
1789	Minimum					0.041	95% KM (bootstrap t) UCL					0.279
1790	Maximum					0.75	95% KM (BCA) UCL					0.257
1791	Mean					0.217	95% KM (Percentile Bootstrap) UCL					0.26
1792	Median					0.183	95% KM (Chebyshev) UCL					0.344
1793	SD					0.167	97.5% KM (Chebyshev) UCL					0.404
1794	k star					1.855	99% KM (Chebyshev) UCL					0.521
1795	Theta star					0.117						
1796	Nu star					118.7	Potential UCLs to Use					
1797	AppChi2					94.55	95% KM (BCA) UCL					0.257
1798	95% Gamma Approximate UCL					0.273						
1799	95% Adjusted Gamma UCL					0.276						
1800	Note: DL/2 is not a recommended method.											
1801												
1802												
1803	Dibenzofuran											
1804												
1805	General Statistics											
1806	Number of Valid Data					32	Number of Detected Data					14
1807	Number of Distinct Detected Data					13	Number of Non-Detect Data					18
1808							Percent Non-Detects					56.25%
1809												
1810	Raw Statistics						Log-transformed Statistics					
1811	Minimum Detected					0.061	Minimum Detected					-2.797
1812	Maximum Detected					1.1	Maximum Detected					0.0953
1813	Mean of Detected					0.202	Mean of Detected					-1.942
1814	SD of Detected					0.264	SD of Detected					0.716
1815	Minimum Non-Detect					0.148	Minimum Non-Detect					-1.911
1816	Maximum Non-Detect					0.4	Maximum Non-Detect					-0.916
1817												
1818	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					31
1819	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					1
1820	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					96.88%

	A	B	C	D	E	F	G	H	I	J	K	L
1821												
1822	UCL Statistics											
1823	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1824	Shapiro Wilk Test Statistic					0.485	Shapiro Wilk Test Statistic					0.836
1825	5% Shapiro Wilk Critical Value					0.874	5% Shapiro Wilk Critical Value					0.874
1826	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
1827												
1828	Assuming Normal Distribution						Assuming Lognormal Distribution					
1829	DL/2 Substitution Method						DL/2 Substitution Method					
1830	Mean					0.182	Mean					-1.88
1831	SD					0.175	SD					0.524
1832	95% DL/2 (t) UCL					0.235	95% H-Stat (DL/2) UCL					0.277
1833												
1834	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1835	MLE method failed to converge properly						Mean in Log Scale					-2.044
1836							SD in Log Scale					0.523
1837							Mean in Original Scale					0.159
1838							SD in Original Scale					0.178
1839							95% Percentile Bootstrap UCL					0.22
1840							95% BCA Bootstrap UCL					0.256
1841												
1842	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1843	k star (bias corrected)					1.301	Data do not follow a Discernable Distribution (0.05)					
1844	Theta Star					0.156						
1845	nu star					36.44						
1846												
1847	A-D Test Statistic					1.481	Nonparametric Statistics					
1848	5% A-D Critical Value					0.75	Kaplan-Meier (KM) Method					
1849	K-S Test Statistic					0.75	Mean					0.158
1850	5% K-S Critical Value					0.233	SD					0.177
1851	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0339
1852							95% KM (t) UCL					0.215
1853	Assuming Gamma Distribution						95% KM (z) UCL					0.214
1854	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.215
1855	Minimum					0.0347	95% KM (bootstrap t) UCL					0.289
1856	Maximum					1.1	95% KM (BCA) UCL					0.223
1857	Mean					0.221	95% KM (Percentile Bootstrap) UCL					0.216
1858	Median					0.174	95% KM (Chebyshev) UCL					0.306
1859	SD					0.194	97.5% KM (Chebyshev) UCL					0.37
1860	k star					1.968	99% KM (Chebyshev) UCL					0.495
1861	Theta star					0.112						
1862	Nu star					125.9	Potential UCLs to Use					
1863	AppChi2					101	95% KM (t) UCL					0.215
1864	95% Gamma Approximate UCL					0.275	95% KM (% Bootstrap) UCL					0.216
1865	95% Adjusted Gamma UCL					0.279						
1866	Note: DL/2 is not a recommended method.											
1867												
1868												
1869	Dieldrin											
1870												
1871	General Statistics											
1872	Number of Valid Data					32	Number of Detected Data					29

	A	B	C	D	E	F	G	H	I	J	K	L
1873	Number of Distinct Detected Data					28	Number of Non-Detect Data					3
1874							Percent Non-Detects					9.38%
1875												
1876	Raw Statistics						Log-transformed Statistics					
1877	Minimum Detected					0.0031	Minimum Detected					-5.776
1878	Maximum Detected					0.81	Maximum Detected					-0.211
1879	Mean of Detected					0.0973	Mean of Detected					-3.171
1880	SD of Detected					0.161	SD of Detected					1.311
1881	Minimum Non-Detect					0.0035	Minimum Non-Detect					-5.655
1882	Maximum Non-Detect					0.0038	Maximum Non-Detect					-5.573
1883												
1884	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					4
1885	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					28
1886	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					12.50%
1887												
1888	UCL Statistics											
1889	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1890	Shapiro Wilk Test Statistic					0.572	Shapiro Wilk Test Statistic					0.979
1891	5% Shapiro Wilk Critical Value					0.926	5% Shapiro Wilk Critical Value					0.926
1892	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1893												
1894	Assuming Normal Distribution						Assuming Lognormal Distribution					
1895	DL/2 Substitution Method						DL/2 Substitution Method					
1896	Mean					0.0883	Mean					-3.463
1897	SD					0.155	SD					1.552
1898	95% DL/2 (t) UCL					0.135	95% H-Stat (DL/2) UCL					0.198
1899												
1900	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
1901	Mean					0.0747	Mean in Log Scale					-3.424
1902	SD					0.167	SD in Log Scale					1.483
1903	95% MLE (t) UCL					0.125	Mean in Original Scale					0.0884
1904	95% MLE (Tiku) UCL					0.122	SD in Original Scale					0.155
1905							95% Percentile Bootstrap UCL					0.137
1906							95% BCA Bootstrap UCL					0.159
1907												
1908	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1909	k star (bias corrected)					0.665	Data appear Lognormal at 5% Significance Level					
1910	Theta Star					0.146						
1911	nu star					38.6						
1912												
1913	A-D Test Statistic					1.094	Nonparametric Statistics					
1914	5% A-D Critical Value					0.787	Kaplan-Meier (KM) Method					
1915	K-S Test Statistic					0.787	Mean					0.0885
1916	5% K-S Critical Value					0.169	SD					0.153
1917	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0275
1918							95% KM (t) UCL					0.135
1919	Assuming Gamma Distribution						95% KM (z) UCL					0.134
1920	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.135
1921	Minimum					1E-09	95% KM (bootstrap t) UCL					0.177
1922	Maximum					0.81	95% KM (BCA) UCL					0.135
1923	Mean					0.0882	95% KM (Percentile Bootstrap) UCL					0.141
1924	Median					0.033	95% KM (Chebyshev) UCL					0.208

	A	B	C	D	E	F	G	H	I	J	K	L
1925	SD					0.155	97.5% KM (Chebyshev) UCL					0.26
1926	k star					0.284	99% KM (Chebyshev) UCL					0.362
1927	Theta star					0.311						
1928	Nu star					18.17	Potential UCLs to Use					
1929	AppChi2					9.516	97.5% KM (Chebyshev) UCL					0.26
1930	95% Gamma Approximate UCL					0.168						
1931	95% Adjusted Gamma UCL					0.175						
1932	Note: DL/2 is not a recommended method.											
1933												
1934												
1935	Di-N-Octyl phthalate											
1936												
1937	General Statistics											
1938	Number of Valid Data					32	Number of Detected Data					8
1939	Number of Distinct Detected Data					8	Number of Non-Detect Data					24
1940							Percent Non-Detects					75.00%
1941												
1942	Raw Statistics						Log-transformed Statistics					
1943	Minimum Detected					0.145	Minimum Detected					-1.931
1944	Maximum Detected					14.7	Maximum Detected					2.688
1945	Mean of Detected					4.428	Mean of Detected					0.435
1946	SD of Detected					6.192	SD of Detected					1.645
1947	Minimum Non-Detect					0.148	Minimum Non-Detect					-1.911
1948	Maximum Non-Detect					3.4	Maximum Non-Detect					1.224
1949												
1950	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					30
1951	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
1952	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					93.75%
1953												
1954	Warning: There are only 8 Detected Values in this data											
1955	Note: It should be noted that even though bootstrap may be performed on this data set											
1956	the resulting calculations may not be reliable enough to draw conclusions											
1957												
1958	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1959												
1960												
1961	UCL Statistics											
1962	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1963	Shapiro Wilk Test Statistic					0.685	Shapiro Wilk Test Statistic					0.932
1964	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
1965	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1966												
1967	Assuming Normal Distribution						Assuming Lognormal Distribution					
1968	DL/2 Substitution Method						DL/2 Substitution Method					
1969	Mean					1.281	Mean					-1.188
1970	SD					3.484	SD					1.329
1971	95% DL/2 (t) UCL					2.326	95% H-Stat (DL/2) UCL					1.35
1972												
1973	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1974	MLE method failed to converge properly						Mean in Log Scale					-1.894
1975							SD in Log Scale					1.709
1976							Mean in Original Scale					1.174

	A	B	C	D	E	F	G	H	I	J	K	L
1977							SD in Original Scale					3.508
1978							95% Percentile Bootstrap UCL					2.16
1979							95% BCA Bootstrap UCL					2.892
1980												
1981	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1982	k star (bias corrected)					0.451	Data appear Gamma Distributed at 5% Significance Level					
1983	Theta Star					9.819						
1984	nu star					7.216						
1985												
1986	A-D Test Statistic					0.55	Nonparametric Statistics					
1987	5% A-D Critical Value					0.756	Kaplan-Meier (KM) Method					
1988	K-S Test Statistic					0.756	Mean					1.223
1989	5% K-S Critical Value					0.307	SD					3.439
1990	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.65
1991							95% KM (t) UCL					2.325
1992	Assuming Gamma Distribution						95% KM (z) UCL					2.292
1993	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					2.127
1994	Minimum					1E-09	95% KM (bootstrap t) UCL					6.446
1995	Maximum					16.61	95% KM (BCA) UCL					2.943
1996	Mean					4.441	95% KM (Percentile Bootstrap) UCL					2.547
1997	Median					2.961	95% KM (Chebyshev) UCL					4.057
1998	SD					5.357	97.5% KM (Chebyshev) UCL					5.283
1999	k star					0.175	99% KM (Chebyshev) UCL					7.692
2000	Theta star					25.39						
2001	Nu star					11.19	Potential UCLs to Use					
2002	AppChi2					4.7	95% KM (t) UCL					2.325
2003	95% Gamma Approximate UCL					10.57						
2004	95% Adjusted Gamma UCL					11.1						
2005	Note: DL/2 is not a recommended method.											
2006												
2007												
2008	Endosulfan II											
2009												
2010	General Statistics											
2011	Number of Valid Data					32	Number of Detected Data					2
2012	Number of Distinct Detected Data					2	Number of Non-Detect Data					30
2013							Percent Non-Detects					93.75%
2014												
2015	Raw Statistics						Log-transformed Statistics					
2016	Minimum Detected					0.0061	Minimum Detected					-5.099
2017	Maximum Detected					0.00754	Maximum Detected					-4.888
2018	Mean of Detected					0.00682	Mean of Detected					-4.993
2019	SD of Detected					0.00102	SD of Detected					0.15
2020	Minimum Non-Detect					0.00029	Minimum Non-Detect					-8.146
2021	Maximum Non-Detect					0.0052	Maximum Non-Detect					-5.259
2022												
2023	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					30
2024	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
2025	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					93.75%
2026												
2027	Warning: Data set has only 2 Distinct Detected Values.											
2028	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											

	A	B	C	D	E	F	G	H	I	J	K	L
2029	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2030												
2031	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
2032												
2033	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
2034	Those methods will return a 'N/A' value on your output display!											
2035												
2036	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
2037	However, results obtained using 4 to 9 distinct values may not be reliable.											
2038	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
2039												
2040												
2041	UCL Statistics											
2042	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2043	Shapiro Wilk Test Statistic					N/A	Shapiro Wilk Test Statistic					N/A
2044	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
2045	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2046												
2047	Assuming Normal Distribution						Assuming Lognormal Distribution					
2048	DL/2 Substitution Method						DL/2 Substitution Method					
2049	Mean					0.00192	Mean					-6.611
2050	SD					0.00148	SD					1.026
2051	95% DL/2 (t) UCL					0.00236	95% H-Stat (DL/2) UCL					0.00344
2052												
2053	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2054	MLE method failed to converge properly						Mean in Log Scale					N/A
2055							SD in Log Scale					N/A
2056							Mean in Original Scale					N/A
2057							SD in Original Scale					N/A
2058							95% Percentile Bootstrap UCL					N/A
2059							95% BCA Bootstrap UCL					N/A
2060												
2061	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2062	k star (bias corrected)					N/A	Data do not follow a Discernable Distribution (0.05)					
2063	Theta Star					N/A						
2064	nu star					N/A						
2065												
2066	A-D Test Statistic					N/A	Nonparametric Statistics					
2067	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
2068	K-S Test Statistic					N/A	Mean					0.00615
2069	5% K-S Critical Value					N/A	SD					0.0002506
2070	Data not Gamma Distributed at 5% Significance Level						SE of Mean					6.264E-05
2071							95% KM (t) UCL					0.00625
2072	Assuming Gamma Distribution						95% KM (z) UCL					0.00625
2073	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00709
2074	Minimum					N/A	95% KM (bootstrap t) UCL					0.00615
2075	Maximum					N/A	95% KM (BCA) UCL					0.00754
2076	Mean					N/A	95% KM (Percentile Bootstrap) UCL					N/A
2077	Median					N/A	95% KM (Chebyshev) UCL					0.00642
2078	SD					N/A	97.5% KM (Chebyshev) UCL					0.00654
2079	k star					N/A	99% KM (Chebyshev) UCL					0.00677
2080	Theta star					N/A						

	A	B	C	D	E	F	G	H	I	J	K	L	
2081	Nu star					N/A	Potential UCLs to Use						
2082	AppChi2					N/A	95% KM (t) UCL					0.00625	
2083	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					N/A	
2084	95% Adjusted Gamma UCL					N/A							
2085	Note: DL/2 is not a recommended method.												
2086													
2087													
2088	Endosulfan Sulfate												
2089													
2090	General Statistics												
2091	Number of Valid Data					28	Number of Detected Data					6	
2092	Number of Distinct Detected Data					6	Number of Non-Detect Data					22	
2093							Percent Non-Detects					78.57%	
2094													
2095	Raw Statistics						Log-transformed Statistics						
2096	Minimum Detected					0.003	Minimum Detected					-5.809	
2097	Maximum Detected					0.01	Maximum Detected					-4.605	
2098	Mean of Detected					0.006	Mean of Detected					-5.195	
2099	SD of Detected					0.00253	SD of Detected					0.446	
2100	Minimum Non-Detect					0.00029	Minimum Non-Detect					-8.146	
2101	Maximum Non-Detect					0.052	Maximum Non-Detect					-2.957	
2102													
2103	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					28	
2104	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0	
2105	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%	
2106													
2107	Warning: There are only 6 Detected Values in this data												
2108	Note: It should be noted that even though bootstrap may be performed on this data set												
2109	the resulting calculations may not be reliable enough to draw conclusions												
2110													
2111	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.												
2112													
2113													
2114	UCL Statistics												
2115	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only						
2116	Shapiro Wilk Test Statistic					0.947	Shapiro Wilk Test Statistic					0.944	
2117	5% Shapiro Wilk Critical Value					0.788	5% Shapiro Wilk Critical Value					0.788	
2118	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level						
2119													
2120	Assuming Normal Distribution						Assuming Lognormal Distribution						
2121	DL/2 Substitution Method						DL/2 Substitution Method						
2122	Mean					0.00397	Mean					-6.395	
2123	SD					0.00603	SD					1.449	
2124	95% DL/2 (t) UCL					0.00591	95% H-Stat (DL/2) UCL					0.00886	
2125													
2126	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method						
2127	MLE method failed to converge properly						Mean in Log Scale					-6.208	
2128							SD in Log Scale					0.622	
2129							Mean in Original Scale					0.00253	
2130							SD in Original Scale					0.00218	
2131							95% Percentile Bootstrap UCL					0.00325	
2132							95% BCA Bootstrap UCL					0.00342	

	A	B	C	D	E	F	G	H	I	J	K	L	
2133													
2134	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only						
2135	k star (bias corrected)					3.343	Data appear Normal at 5% Significance Level						
2136	Theta Star					0.00179							
2137	nu star					40.12							
2138													
2139	A-D Test Statistic					0.28	Nonparametric Statistics						
2140	5% A-D Critical Value					0.698	Kaplan-Meier (KM) Method						
2141	K-S Test Statistic					0.698	Mean					0.00372	
2142	5% K-S Critical Value					0.333	SD					0.00169	
2143	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0003671	
2144							95% KM (t) UCL					0.00435	
2145	Assuming Gamma Distribution						95% KM (z) UCL					0.00433	
2146	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00427	
2147	Minimum					0.003	95% KM (bootstrap t) UCL					0.00434	
2148	Maximum					0.01	95% KM (BCA) UCL					0.00662	
2149	Mean					0.006	95% KM (Percentile Bootstrap) UCL					0.00636	
2150	Median					0.006	95% KM (Chebyshev) UCL					0.00532	
2151	SD					0.00109	97.5% KM (Chebyshev) UCL					0.00601	
2152	k star					26.43	99% KM (Chebyshev) UCL					0.00737	
2153	Theta star					0.000227							
2154	Nu star					1480	Potential UCLs to Use						
2155	AppChi2					1392	95% KM (t) UCL					0.00435	
2156	95% Gamma Approximate UCL					0.00638	95% KM (Percentile Bootstrap) UCL					0.00636	
2157	95% Adjusted Gamma UCL					0.00641							
2158	Note: DL/2 is not a recommended method.												
2159													
2160													
2161	Endrin Aldehyde												
2162													
2163	General Statistics												
2164	Number of Valid Data					28	Number of Detected Data					5	
2165	Number of Distinct Detected Data					5	Number of Non-Detect Data					23	
2166							Percent Non-Detects					82.14%	
2167													
2168	Raw Statistics						Log-transformed Statistics						
2169	Minimum Detected					0.0044	Minimum Detected					-5.426	
2170	Maximum Detected					0.022	Maximum Detected					-3.817	
2171	Mean of Detected					0.0101	Mean of Detected					-4.8	
2172	SD of Detected					0.00751	SD of Detected					0.692	
2173	Minimum Non-Detect					0.00029	Minimum Non-Detect					-8.146	
2174	Maximum Non-Detect					0.0047	Maximum Non-Detect					-5.36	
2175													
2176	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					24	
2177	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					4	
2178	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					85.71%	
2179													
2180	Warning: There are only 5 Detected Values in this data												
2181	Note: It should be noted that even though bootstrap may be performed on this data set												
2182	the resulting calculations may not be reliable enough to draw conclusions												
2183													
2184	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.												

	A	B	C	D	E	F	G	H	I	J	K	L
2185												
2186												
2187	UCL Statistics											
2188	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2189	Shapiro Wilk Test Statistic					0.824	Shapiro Wilk Test Statistic					0.882
2190	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
2191	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2192												
2193	Assuming Normal Distribution						Assuming Lognormal Distribution					
2194	DL/2 Substitution Method						DL/2 Substitution Method					
2195	Mean					0.00296	Mean					-6.576
2196	SD					0.00451	SD					1.345
2197	95% DL/2 (t) UCL					0.00442	95% H-Stat (DL/2) UCL					0.00452
2198												
2199	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2200	MLE yields a negative mean						Mean in Log Scale					-7.38
2201							SD in Log Scale					1.354
2202							Mean in Original Scale					0.00214
2203							SD in Original Scale					0.00476
2204							95% Percentile Bootstrap UCL					0.00373
2205							95% BCA Bootstrap UCL					0.00439
2206												
2207	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2208	k star (bias corrected)					1.181	Data appear Normal at 5% Significance Level					
2209	Theta Star					0.00853						
2210	nu star					11.81						
2211												
2212	A-D Test Statistic					0.456	Nonparametric Statistics					
2213	5% A-D Critical Value					0.683	Kaplan-Meier (KM) Method					
2214	K-S Test Statistic					0.683	Mean					0.00541
2215	5% K-S Critical Value					0.36	SD					0.00357
2216	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0007553
2217							95% KM (t) UCL					0.0067
2218	Assuming Gamma Distribution						95% KM (z) UCL					0.00666
2219	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0064
2220	Minimum					0.0044	95% KM (bootstrap t) UCL					0.0125
2221	Maximum					0.022	95% KM (BCA) UCL					0.022
2222	Mean					0.0101	95% KM (Percentile Bootstrap) UCL					0.00807
2223	Median					0.0101	95% KM (Chebyshev) UCL					0.00871
2224	SD					0.00336	97.5% KM (Chebyshev) UCL					0.0101
2225	k star					8.792	99% KM (Chebyshev) UCL					0.0129
2226	Theta star					0.00114						
2227	Nu star					492.4	Potential UCLs to Use					
2228	AppChi2					441.9	95% KM (t) UCL					0.0067
2229	95% Gamma Approximate UCL					0.0112	95% KM (Percentile Bootstrap) UCL					0.00807
2230	95% Adjusted Gamma UCL					0.0113						
2231	Note: DL/2 is not a recommended method.											
2232												
2233												
2234	Endrin Ketone											
2235												
2236	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L	
2237	Number of Valid Data					31	Number of Detected Data					1	
2238	Number of Distinct Detected Data					1	Number of Non-Detect Data					30	
2239							Percent Non-Detects					96.77%	
2240													
2241	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!												
2242	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).												
2243													
2244	The data set for variable Endrin Ketone was not processed!												
2245													
2246													
2247													
2248	Fluoranthene												
2249													
2250	General Statistics												
2251	Number of Valid Observations					32	Number of Distinct Observations					31	
2252													
2253	Raw Statistics					Log-transformed Statistics							
2254	Minimum					0.14	Minimum of Log Data					-1.966	
2255	Maximum					9	Maximum of Log Data					2.197	
2256	Mean					2.034	Mean of log Data					0.155	
2257	Median					1.24	SD of log Data					1.11	
2258	SD					2.226							
2259	Coefficient of Variation					1.095							
2260	Skewness					1.754							
2261													
2262	Relevant UCL Statistics												
2263	Normal Distribution Test					Lognormal Distribution Test							
2264	Shapiro Wilk Test Statistic					0.777	Shapiro Wilk Test Statistic					0.974	
2265	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93	
2266	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level							
2267													
2268	Assuming Normal Distribution					Assuming Lognormal Distribution							
2269	95% Student's-t UCL					2.701	95% H-UCL					3.601	
2270	95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL					4.213		
2271	95% Adjusted-CLT UCL					2.811	97.5% Chebyshev (MVUE) UCL					5.128	
2272	95% Modified-t UCL					2.721	99% Chebyshev (MVUE) UCL					6.926	
2273													
2274	Gamma Distribution Test					Data Distribution							
2275	k star (bias corrected)					0.959	Data appear Gamma Distributed at 5% Significance Level						
2276	Theta Star					2.12							
2277	MLE of Mean					2.034							
2278	MLE of Standard Deviation					2.077							
2279	nu star					61.38							
2280	Approximate Chi Square Value (.05)					44.36	Nonparametric Statistics						
2281	Adjusted Level of Significance					0.0416	95% CLT UCL					2.681	
2282	Adjusted Chi Square Value					43.59	95% Jackknife UCL					2.701	
2283							95% Standard Bootstrap UCL					2.674	
2284	Anderson-Darling Test Statistic					0.55	95% Bootstrap-t UCL					2.867	
2285	Anderson-Darling 5% Critical Value					0.775	95% Hall's Bootstrap UCL					2.907	
2286	Kolmogorov-Smirnov Test Statistic					0.132	95% Percentile Bootstrap UCL					2.696	
2287	Kolmogorov-Smirnov 5% Critical Value					0.16	95% BCA Bootstrap UCL					2.766	
2288	Data appear Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL					3.749		

	A	B	C	D	E	F	G	H	I	J	K	L
2289							97.5% Chebyshev(Mean, Sd) UCL					4.491
2290	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					5.949
2291	95% Approximate Gamma UCL					2.814						
2292	95% Adjusted Gamma UCL					2.864						
2293												
2294	Potential UCL to Use						Use 95% Approximate Gamma UCL					2.814
2295												
2296												
2297	Gamma-Chlordane											
2298												
2299	General Statistics											
2300	Number of Valid Data					22	Number of Detected Data					8
2301	Number of Distinct Detected Data					8	Number of Non-Detect Data					14
2302							Percent Non-Detects					63.64%
2303												
2304	Raw Statistics						Log-transformed Statistics					
2305	Minimum Detected					0.00135	Minimum Detected					-6.608
2306	Maximum Detected					0.018	Maximum Detected					-4.017
2307	Mean of Detected					0.00674	Mean of Detected					-5.365
2308	SD of Detected					0.00603	SD of Detected					0.928
2309	Minimum Non-Detect					0.00167	Minimum Non-Detect					-6.395
2310	Maximum Non-Detect					0.022	Maximum Non-Detect					-3.817
2311												
2312	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					22
2313	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
2314	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
2315												
2316	Warning: There are only 8 Detected Values in this data											
2317	Note: It should be noted that even though bootstrap may be performed on this data set											
2318	the resulting calculations may not be reliable enough to draw conclusions											
2319												
2320	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
2321												
2322												
2323	UCL Statistics											
2324	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2325	Shapiro Wilk Test Statistic					0.845	Shapiro Wilk Test Statistic					0.936
2326	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
2327	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2328												
2329	Assuming Normal Distribution						Assuming Lognormal Distribution					
2330	DL/2 Substitution Method						DL/2 Substitution Method					
2331	Mean					0.00353	Mean					-6.251
2332	SD					0.00477	SD					1.011
2333	95% DL/2 (t) UCL					0.00528	95% H-Stat (DL/2) UCL					0.00506
2334												
2335	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2336	MLE method failed to converge properly						Mean in Log Scale					-6.416
2337							SD in Log Scale					1.039
2338							Mean in Original Scale					0.00307
2339							SD in Original Scale					0.0045
2340							95% Percentile Bootstrap UCL					0.00474

	A	B	C	D	E	F	G	H	I	J	K	L	
2341							95% BCA Bootstrap UCL					0.00543	
2342													
2343	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only						
2344	k star (bias corrected)					1.029	Data appear Normal at 5% Significance Level						
2345	Theta Star					0.00655							
2346	nu star					16.47							
2347													
2348	A-D Test Statistic					0.381	Nonparametric Statistics						
2349	5% A-D Critical Value					0.728	Kaplan-Meier (KM) Method						
2350	K-S Test Statistic					0.728	Mean					0.00341	
2351	5% K-S Critical Value					0.299	SD					0.00435	
2352	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.00102	
2353							95% KM (t) UCL					0.00516	
2354	Assuming Gamma Distribution						95% KM (z) UCL					0.00508	
2355	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00487	
2356	Minimum					0.00135	95% KM (bootstrap t) UCL					0.00619	
2357	Maximum					0.018	95% KM (BCA) UCL					0.0063	
2358	Mean					0.00692	95% KM (Percentile Bootstrap) UCL					0.0055	
2359	Median					0.00674	95% KM (Chebyshev) UCL					0.00784	
2360	SD					0.00381	97.5% KM (Chebyshev) UCL					0.00975	
2361	k star					2.877	99% KM (Chebyshev) UCL					0.0135	
2362	Theta star					0.00241							
2363	Nu star					126.6	Potential UCLs to Use						
2364	AppChi2					101.6	95% KM (t) UCL					0.00516	
2365	95% Gamma Approximate UCL					0.00862	95% KM (Percentile Bootstrap) UCL					0.0055	
2366	95% Adjusted Gamma UCL					0.00877							
2367	Note: DL/2 is not a recommended method.												
2368													
2369													
2370	Heptachlor Epoxide												
2371													
2372	General Statistics												
2373	Number of Valid Data					31	Number of Detected Data					1	
2374	Number of Distinct Detected Data					1	Number of Non-Detect Data					30	
2375							Percent Non-Detects					96.77%	
2376													
2377	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!												
2378	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).												
2379													
2380	The data set for variable Heptachlor Epoxide was not processed!												
2381													
2382													
2383													
2384	Indeno(1,2,3-cd)pyrene												
2385													
2386	General Statistics												
2387	Number of Valid Observations					32	Number of Distinct Observations					30	
2388													
2389	Raw Statistics						Log-transformed Statistics						
2390	Minimum					0.052	Minimum of Log Data					-2.957	
2391	Maximum					2.4	Maximum of Log Data					0.875	
2392	Mean					0.611	Mean of log Data					-0.916	

	A	B	C	D	E	F	G	H	I	J	K	L
2393	Median					0.395	SD of log Data					1.002
2394	SD					0.552						
2395	Coefficient of Variation					0.904						
2396	Skewness					1.451						
2397												
2398	Relevant UCL Statistics											
2399	Normal Distribution Test						Lognormal Distribution Test					
2400	Shapiro Wilk Test Statistic					0.846	Shapiro Wilk Test Statistic					0.968
2401	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2402	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2403												
2404	Assuming Normal Distribution						Assuming Lognormal Distribution					
2405	95% Student's-t UCL					0.776	95% H-UCL					1.023
2406	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					1.221
2407	95% Adjusted-CLT UCL					0.798	97.5% Chebyshev (MVUE) UCL					1.469
2408	95% Modified-t UCL					0.78	99% Chebyshev (MVUE) UCL					1.958
2409												
2410	Gamma Distribution Test						Data Distribution					
2411	k star (bias corrected)					1.221	Data appear Gamma Distributed at 5% Significance Level					
2412	Theta Star					0.5						
2413	MLE of Mean					0.611						
2414	MLE of Standard Deviation					0.553						
2415	nu star					78.11						
2416	Approximate Chi Square Value (.05)					58.75	Nonparametric Statistics					
2417	Adjusted Level of Significance					0.0416	95% CLT UCL					0.771
2418	Adjusted Chi Square Value					57.85	95% Jackknife UCL					0.776
2419							95% Standard Bootstrap UCL					0.77
2420	Anderson-Darling Test Statistic					0.283	95% Bootstrap-t UCL					0.806
2421	Anderson-Darling 5% Critical Value					0.768	95% Hall's Bootstrap UCL					0.82
2422	Kolmogorov-Smirnov Test Statistic					0.0933	95% Percentile Bootstrap UCL					0.773
2423	Kolmogorov-Smirnov 5% Critical Value					0.159	95% BCA Bootstrap UCL					0.798
2424	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					1.036
2425							97.5% Chebyshev(Mean, Sd) UCL					1.22
2426	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1.582
2427	95% Approximate Gamma UCL					0.812						
2428	95% Adjusted Gamma UCL					0.825						
2429												
2430	Potential UCL to Use						Use 95% Approximate Gamma UCL					0.812
2431												
2432												
2433	Iron											
2434												
2435	General Statistics											
2436	Number of Valid Observations					32	Number of Distinct Observations					29
2437												
2438	Raw Statistics						Log-transformed Statistics					
2439	Minimum					6130	Minimum of Log Data					8.721
2440	Maximum					55750	Maximum of Log Data					10.93
2441	Mean					15723	Mean of log Data					9.489
2442	Median					11250	SD of log Data					0.556
2443	SD					11121						
2444	Coefficient of Variation					0.707						

	A	B	C	D	E	F	G	H	I	J	K	L
2445	Skewness					2.031						
2446												
2447	Relevant UCL Statistics											
2448	Normal Distribution Test						Lognormal Distribution Test					
2449	Shapiro Wilk Test Statistic					0.741	Shapiro Wilk Test Statistic					0.883
2450	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2451	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2452												
2453	Assuming Normal Distribution						Assuming Lognormal Distribution					
2454	95% Student's-t UCL					19056	95% H-UCL					18805
2455	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					22290
2456	95% Adjusted-CLT UCL					19711	97.5% Chebyshev (MVUE) UCL					25294
2457	95% Modified-t UCL					19174	99% Chebyshev (MVUE) UCL					31195
2458												
2459	Gamma Distribution Test						Data Distribution					
2460	k star (bias corrected)					2.776	Data do not follow a Discernable Distribution (0.05)					
2461	Theta Star					5664						
2462	MLE of Mean					15723						
2463	MLE of Standard Deviation					9437						
2464	nu star					177.7						
2465	Approximate Chi Square Value (.05)					147.8	Nonparametric Statistics					
2466	Adjusted Level of Significance					0.0416	95% CLT UCL					18957
2467	Adjusted Chi Square Value					146.4	95% Jackknife UCL					19056
2468							95% Standard Bootstrap UCL					18922
2469	Anderson-Darling Test Statistic					2.017	95% Bootstrap-t UCL					20502
2470	Anderson-Darling 5% Critical Value					0.753	95% Hall's Bootstrap UCL					20423
2471	Kolmogorov-Smirnov Test Statistic					0.262	95% Percentile Bootstrap UCL					19106
2472	Kolmogorov-Smirnov 5% Critical Value					0.157	95% BCA Bootstrap UCL					19885
2473	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					24292
2474							97.5% Chebyshev(Mean, Sd) UCL					28000
2475	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					35284
2476	95% Approximate Gamma UCL					18895						
2477	95% Adjusted Gamma UCL					19083						
2478												
2479	Potential UCL to Use						Use 95% Chebyshev (Mean, Sd) UCL					24292
2480												
2481												
2482	Lead											
2483												
2484	General Statistics											
2485	Number of Valid Observations					32	Number of Distinct Observations					32
2486												
2487	Raw Statistics						Log-transformed Statistics					
2488	Minimum					19.1	Minimum of Log Data					2.95
2489	Maximum					2230	Maximum of Log Data					7.71
2490	Mean					357.9	Mean of log Data					4.991
2491	Median					107	SD of log Data					1.265
2492	SD					573.3						
2493	Coefficient of Variation					1.602						
2494	Skewness					2.234						
2495												
2496	Relevant UCL Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
2497	Normal Distribution Test						Lognormal Distribution Test					
2498	Shapiro Wilk Test Statistic					0.605	Shapiro Wilk Test Statistic					0.92
2499	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2500	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2501												
2502	Assuming Normal Distribution						Assuming Lognormal Distribution					
2503	95% Student's-t UCL					529.7	95% H-UCL					613.6
2504	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					685.9
2505	95% Adjusted-CLT UCL					567.3	97.5% Chebyshev (MVUE) UCL					846.9
2506	95% Modified-t UCL					536.4	99% Chebyshev (MVUE) UCL					1163
2507												
2508	Gamma Distribution Test						Data Distribution					
2509	k star (bias corrected)					0.639	Data do not follow a Discernable Distribution (0.05)					
2510	Theta Star					560.2						
2511	MLE of Mean					357.9						
2512	MLE of Standard Deviation					447.7						
2513	nu star					40.89						
2514	Approximate Chi Square Value (.05)					27.23	Nonparametric Statistics					
2515	Adjusted Level of Significance					0.0416	95% CLT UCL					524.6
2516	Adjusted Chi Square Value					26.64	95% Jackknife UCL					529.7
2517							95% Standard Bootstrap UCL					525.3
2518	Anderson-Darling Test Statistic					2.336	95% Bootstrap-t UCL					597.4
2519	Anderson-Darling 5% Critical Value					0.794	95% Hall's Bootstrap UCL					548.6
2520	Kolmogorov-Smirnov Test Statistic					0.238	95% Percentile Bootstrap UCL					525.1
2521	Kolmogorov-Smirnov 5% Critical Value					0.162	95% BCA Bootstrap UCL					562
2522	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					799.6
2523							97.5% Chebyshev(Mean, Sd) UCL					990.8
2524	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1366
2525	95% Approximate Gamma UCL					537.3						
2526	95% Adjusted Gamma UCL					549.4						
2527												
2528	Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL					1366
2529												
2530												
2531	Manganese											
2532												
2533	General Statistics											
2534	Number of Valid Observations					32	Number of Distinct Observations					30
2535												
2536	Raw Statistics						Log-transformed Statistics					
2537	Minimum					86.1	Minimum of Log Data					4.456
2538	Maximum					1680	Maximum of Log Data					7.427
2539	Mean					272.4	Mean of log Data					5.337
2540	Median					191	SD of log Data					0.67
2541	SD					288						
2542	Coefficient of Variation					1.057						
2543	Skewness					3.999						
2544												
2545	Relevant UCL Statistics											
2546	Normal Distribution Test						Lognormal Distribution Test					
2547	Shapiro Wilk Test Statistic					0.566	Shapiro Wilk Test Statistic					0.913
2548	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93

	A	B	C	D	E	F	G	H	I	J	K	L
2549	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2550												
2551	Assuming Normal Distribution						Assuming Lognormal Distribution					
2552	95% Student's-t UCL					358.7	95% H-UCL					334.1
2553	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					401.4
2554	95% Adjusted-CLT UCL					394.6	97.5% Chebyshev (MVUE) UCL					463.5
2555	95% Modified-t UCL					364.7	99% Chebyshev (MVUE) UCL					585.3
2556												
2557	Gamma Distribution Test						Data Distribution					
2558	k star (bias corrected)					1.836	Data Follow Appr. Gamma Distribution at 5% Significance Level					
2559	Theta Star					148.3						
2560	MLE of Mean					272.4						
2561	MLE of Standard Deviation					201						
2562	nu star					117.5						
2563	Approximate Chi Square Value (.05)					93.5	Nonparametric Statistics					
2564	Adjusted Level of Significance					0.0416	95% CLT UCL					356.1
2565	Adjusted Chi Square Value					92.35	95% Jackknife UCL					358.7
2566							95% Standard Bootstrap UCL					357.5
2567	Anderson-Darling Test Statistic					1.322	95% Bootstrap-t UCL					442.2
2568	Anderson-Darling 5% Critical Value					0.759	95% Hall's Bootstrap UCL					695.7
2569	Kolmogorov-Smirnov Test Statistic					0.149	95% Percentile Bootstrap UCL					360.1
2570	Kolmogorov-Smirnov 5% Critical Value					0.158	95% BCA Bootstrap UCL					411.4
2571	Data follow Appr. Gamma Distribution at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					494.3
2572							97.5% Chebyshev(Mean, Sd) UCL					590.3
2573	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					778.9
2574	95% Approximate Gamma UCL					342.4						
2575	95% Adjusted Gamma UCL					346.6						
2576												
2577	Potential UCL to Use						Use 95% Approximate Gamma UCL					342.4
2578												
2579												
2580	Mercury											
2581												
2582	General Statistics											
2583	Number of Valid Observations					32	Number of Distinct Observations					29
2584												
2585	Raw Statistics						Log-transformed Statistics					
2586	Minimum					0.037	Minimum of Log Data					-3.297
2587	Maximum					1.8	Maximum of Log Data					0.588
2588	Mean					0.421	Mean of log Data					-1.225
2589	Median					0.285	SD of log Data					0.879
2590	SD					0.397						
2591	Coefficient of Variation					0.943						
2592	Skewness					2.037						
2593												
2594	Relevant UCL Statistics											
2595	Normal Distribution Test						Lognormal Distribution Test					
2596	Shapiro Wilk Test Statistic					0.775	Shapiro Wilk Test Statistic					0.986
2597	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2598	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2599												
2600	Assuming Normal Distribution						Assuming Lognormal Distribution					

	A	B	C	D	E	F	G	H	I	J	K	L
2601	95% Student's-t UCL					0.54	95% H-UCL					0.621
2602	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					0.749
2603	95% Adjusted-CLT UCL					0.564	97.5% Chebyshev (MVUE) UCL					0.889
2604	95% Modified-t UCL					0.544	99% Chebyshev (MVUE) UCL					1.164
2605												
2606	Gamma Distribution Test						Data Distribution					
2607	k star (bias corrected)					1.409	Data appear Gamma Distributed at 5% Significance Level					
2608	Theta Star					0.299						
2609	MLE of Mean					0.421						
2610	MLE of Standard Deviation					0.355						
2611	nu star					90.2						
2612	Approximate Chi Square Value (.05)					69.3	Nonparametric Statistics					
2613	Adjusted Level of Significance					0.0416	95% CLT UCL					0.537
2614	Adjusted Chi Square Value					68.32	95% Jackknife UCL					0.54
2615							95% Standard Bootstrap UCL					0.534
2616	Anderson-Darling Test Statistic					0.473	95% Bootstrap-t UCL					0.581
2617	Anderson-Darling 5% Critical Value					0.764	95% Hall's Bootstrap UCL					0.608
2618	Kolmogorov-Smirnov Test Statistic					0.127	95% Percentile Bootstrap UCL					0.544
2619	Kolmogorov-Smirnov 5% Critical Value					0.158	95% BCA Bootstrap UCL					0.566
2620	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					0.727
2621							97.5% Chebyshev(Mean, Sd) UCL					0.86
2622	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1.12
2623	95% Approximate Gamma UCL					0.548						
2624	95% Adjusted Gamma UCL					0.556						
2625												
2626	Potential UCL to Use						Use 95% Approximate Gamma UCL					0.548
2627												
2628												
2629	Methoxychlor											
2630												
2631	General Statistics											
2632	Number of Valid Data					31	Number of Detected Data					2
2633	Number of Distinct Detected Data					1	Number of Non-Detect Data					29
2634							Percent Non-Detects					93.55%
2635												
2636	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
2637	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
2638												
2639	The data set for variable Methoxychlor was not processed!											
2640												
2641												
2642												
2643	Methyl acetate											
2644												
2645	General Statistics											
2646	Number of Valid Data					32	Number of Detected Data					2
2647	Number of Distinct Detected Data					2	Number of Non-Detect Data					30
2648							Percent Non-Detects					93.75%
2649												
2650	Raw Statistics						Log-transformed Statistics					
2651	Minimum Detected					0.00158	Minimum Detected					-6.454
2652	Maximum Detected					0.00825	Maximum Detected					-4.798

	A	B	C	D	E	F	G	H	I	J	K	L
2653	Mean of Detected					0.00491	Mean of Detected					-5.626
2654	SD of Detected					0.00472	SD of Detected					1.171
2655	Minimum Non-Detect					0.00217	Minimum Non-Detect					-6.133
2656	Maximum Non-Detect					0.014	Maximum Non-Detect					-4.269
2657												
2658	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					32
2659	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
2660	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
2661												
2662	Warning: Data set has only 2 Distinct Detected Values.											
2663	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
2664	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2665												
2666	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
2667												
2668	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
2669	Those methods will return a 'N/A' value on your output display!											
2670												
2671	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
2672	However, results obtained using 4 to 9 distinct values may not be reliable.											
2673	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
2674												
2675												
2676	UCL Statistics											
2677	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
2678	Shapiro Wilk Test Statistic					N/A	Shapiro Wilk Test Statistic					N/A
2679	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
2680	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
2681												
2682	Assuming Normal Distribution					Assuming Lognormal Distribution						
2683	DL/2 Substitution Method						DL/2 Substitution Method					
2684	Mean					0.00445	Mean					-5.547
2685	SD					0.00191	SD					0.581
2686	95% DL/2 (t) UCL					0.00502	95% H-Stat (DL/2) UCL					0.00627
2687												
2688	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2689	MLE method failed to converge properly						Mean in Log Scale					N/A
2690							SD in Log Scale					N/A
2691							Mean in Original Scale					N/A
2692							SD in Original Scale					N/A
2693							95% Percentile Bootstrap UCL					N/A
2694							95% BCA Bootstrap UCL					N/A
2695												
2696	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
2697	k star (bias corrected)					N/A	Data do not follow a Discernable Distribution (0.05)					
2698	Theta Star					N/A						
2699	nu star					N/A						
2700												
2701	A-D Test Statistic					N/A	Nonparametric Statistics					
2702	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
2703	K-S Test Statistic					N/A	Mean					0.00209
2704	5% K-S Critical Value					N/A	SD					0.00178

	A	B	C	D	E	F	G	H	I	J	K	L
2705	Data not Gamma Distributed at 5% Significance Level						SE of Mean				0.0006977	
2706							95% KM (t) UCL				0.00327	
2707	Assuming Gamma Distribution						95% KM (z) UCL				0.00324	
2708	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL				0.00632	
2709	Minimum				N/A		95% KM (bootstrap t) UCL				N/A	
2710	Maximum				N/A		95% KM (BCA) UCL				N/A	
2711	Mean				N/A		95% KM (Percentile Bootstrap) UCL				0.00825	
2712	Median				N/A		95% KM (Chebyshev) UCL				0.00513	
2713	SD				N/A		97.5% KM (Chebyshev) UCL				0.00645	
2714	k star				N/A		99% KM (Chebyshev) UCL				0.00903	
2715	Theta star				N/A							
2716	Nu star				N/A		Potential UCLs to Use					
2717	AppChi2				N/A		95% KM (BCA) UCL				N/A	
2718	95% Gamma Approximate UCL				N/A							
2719	95% Adjusted Gamma UCL				N/A							
2720	Note: DL/2 is not a recommended method.											
2721												
2722												
2723	Naphthalene											
2724												
2725	General Statistics											
2726	Number of Valid Data				32		Number of Detected Data				22	
2727	Number of Distinct Detected Data				21		Number of Non-Detect Data				10	
2728							Percent Non-Detects				31.25%	
2729												
2730	Raw Statistics					Log-transformed Statistics						
2731	Minimum Detected				0.04		Minimum Detected				-3.219	
2732	Maximum Detected				0.87		Maximum Detected				-0.139	
2733	Mean of Detected				0.205		Mean of Detected				-1.915	
2734	SD of Detected				0.201		SD of Detected				0.807	
2735	Minimum Non-Detect				0.34		Minimum Non-Detect				-1.079	
2736	Maximum Non-Detect				0.4		Maximum Non-Detect				-0.916	
2737												
2738	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				30	
2739	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected				2	
2740	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage				93.75%	
2741												
2742	UCL Statistics											
2743	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
2744	Shapiro Wilk Test Statistic				0.705		Shapiro Wilk Test Statistic				0.96	
2745	5% Shapiro Wilk Critical Value				0.911		5% Shapiro Wilk Critical Value				0.911	
2746	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2747												
2748	Assuming Normal Distribution						Assuming Lognormal Distribution					
2749	DL/2 Substitution Method						DL/2 Substitution Method					
2750	Mean				0.198		Mean				-1.847	
2751	SD				0.166		SD				0.673	
2752	95% DL/2 (t) UCL				0.248		95% H-Stat (DL/2) UCL				0.369	
2753												
2754	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
2755	MLE method failed to converge properly						Mean in Log Scale				-1.961	
2756							SD in Log Scale				0.69	

	A	B	C	D	E	F	G	H	I	J	K	L	
2757							Mean in Original Scale					0.183	
2758							SD in Original Scale					0.17	
2759							95% Percentile Bootstrap UCL					0.236	
2760							95% BCA Bootstrap UCL					0.254	
2761													
2762	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only							
2763	k star (bias corrected)					1.464	Data appear Gamma Distributed at 5% Significance Level						
2764	Theta Star					0.14							
2765	nu star					64.43							
2766													
2767	A-D Test Statistic					0.625	Nonparametric Statistics						
2768	5% A-D Critical Value					0.758	Kaplan-Meier (KM) Method						
2769	K-S Test Statistic					0.758	Mean					0.186	
2770	5% K-S Critical Value					0.188	SD					0.171	
2771	Data appear Gamma Distributed at 5% Significance Level					SE of Mean					0.0323		
2772							95% KM (t) UCL					0.241	
2773	Assuming Gamma Distribution					95% KM (z) UCL					0.239		
2774	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.241	
2775	Minimum					0.04	95% KM (bootstrap t) UCL					0.277	
2776	Maximum					0.87	95% KM (BCA) UCL					0.238	
2777	Mean					0.208	95% KM (Percentile Bootstrap) UCL					0.242	
2778	Median					0.185	95% KM (Chebyshev) UCL					0.327	
2779	SD					0.167	97.5% KM (Chebyshev) UCL					0.388	
2780	k star					2.098	99% KM (Chebyshev) UCL					0.507	
2781	Theta star					0.099							
2782	Nu star					134.3	Potential UCLs to Use						
2783	AppChi2					108.5	95% KM (Percentile Bootstrap) UCL					0.242	
2784	95% Gamma Approximate UCL					0.257							
2785	95% Adjusted Gamma UCL					0.26							
2786	Note: DL/2 is not a recommended method.												
2787													
2788													
2789	Nickel												
2790													
2791	General Statistics												
2792	Number of Valid Data					32	Number of Detected Data					30	
2793	Number of Distinct Detected Data					28	Number of Non-Detect Data					2	
2794							Percent Non-Detects					6.25%	
2795													
2796	Raw Statistics					Log-transformed Statistics							
2797	Minimum Detected					4.6	Minimum Detected					1.526	
2798	Maximum Detected					158	Maximum Detected					5.063	
2799	Mean of Detected					21.49	Mean of Detected					2.693	
2800	SD of Detected					28.68	SD of Detected					0.758	
2801	Minimum Non-Detect					7	Minimum Non-Detect					1.946	
2802	Maximum Non-Detect					9	Maximum Non-Detect					2.197	
2803													
2804	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					9		
2805	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					23		
2806	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					28.13%		
2807													
2808	UCL Statistics												

	A	B	C	D	E	F	G	H	I	J	K	L
2809	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2810	Shapiro Wilk Test Statistic					0.516	Shapiro Wilk Test Statistic					0.904
2811	5% Shapiro Wilk Critical Value					0.927	5% Shapiro Wilk Critical Value					0.927
2812	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
2813												
2814	Assuming Normal Distribution						Assuming Lognormal Distribution					
2815	DL/2 Substitution Method						DL/2 Substitution Method					
2816	Mean					20.4	Mean					2.61
2817	SD					28.07	SD					0.802
2818	95% DL/2 (t) UCL					28.81	95% H-Stat (DL/2) UCL					25.21
2819												
2820	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2821	Mean					13.97	Mean in Log Scale					2.621
2822	SD					33.99	SD in Log Scale					0.787
2823	95% MLE (t) UCL					24.16	Mean in Original Scale					20.45
2824	95% MLE (Tiku) UCL					24.43	SD in Original Scale					28.04
2825							95% Percentile Bootstrap UCL					28.98
2826							95% BCA Bootstrap UCL					33.48
2827												
2828	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2829	k star (bias corrected)					1.352	Data do not follow a Discernable Distribution (0.05)					
2830	Theta Star					15.89						
2831	nu star					81.14						
2832												
2833	A-D Test Statistic					2.03	Nonparametric Statistics					
2834	5% A-D Critical Value					0.764	Kaplan-Meier (KM) Method					
2835	K-S Test Statistic					0.764	Mean					20.54
2836	5% K-S Critical Value					0.163	SD					27.56
2837	Data not Gamma Distributed at 5% Significance Level						SE of Mean					4.955
2838							95% KM (t) UCL					28.94
2839	Assuming Gamma Distribution						95% KM (z) UCL					28.69
2840	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					28.93
2841	Minimum					1E-09	95% KM (bootstrap t) UCL					41.47
2842	Maximum					158	95% KM (BCA) UCL					30.52
2843	Mean					20.17	95% KM (Percentile Bootstrap) UCL					29.74
2844	Median					11.4	95% KM (Chebyshev) UCL					42.13
2845	SD					28.23	97.5% KM (Chebyshev) UCL					51.48
2846	k star					0.518	99% KM (Chebyshev) UCL					69.84
2847	Theta star					38.91						
2848	Nu star					33.17	Potential UCLs to Use					
2849	AppChi2					21	95% KM (Chebyshev) UCL					42.13
2850	95% Gamma Approximate UCL					31.85						
2851	95% Adjusted Gamma UCL					32.66						
2852	Note: DL/2 is not a recommended method.											
2853												
2854												
2855	Phenanthrene											
2856												
2857	General Statistics											
2858	Number of Valid Observations					32	Number of Distinct Observations					28
2859												
2860	Raw Statistics						Log-transformed Statistics					

	A	B	C	D	E	F	G	H	I	J	K	L
2861	Minimum					0.061	Minimum of Log Data					-2.797
2862	Maximum					13	Maximum of Log Data					2.565
2863	Mean					1.519	Mean of log Data					-0.345
2864	Median					0.643	SD of log Data					1.277
2865	SD					2.387						
2866	Coefficient of Variation					1.572						
2867	Skewness					3.858						
2868												
2869	Relevant UCL Statistics											
2870	Normal Distribution Test						Lognormal Distribution Test					
2871	Shapiro Wilk Test Statistic					0.57	Shapiro Wilk Test Statistic					0.977
2872	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2873	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2874												
2875	Assuming Normal Distribution						Assuming Lognormal Distribution					
2876	95% Student's-t UCL					2.234	95% H-UCL					3.03
2877	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					3.373
2878	95% Adjusted-CLT UCL					2.52	97.5% Chebyshev (MVUE) UCL					4.169
2879	95% Modified-t UCL					2.282	99% Chebyshev (MVUE) UCL					5.733
2880												
2881	Gamma Distribution Test						Data Distribution					
2882	k star (bias corrected)					0.728	Data appear Gamma Distributed at 5% Significance Level					
2883	Theta Star					2.085						
2884	MLE of Mean					1.519						
2885	MLE of Standard Deviation					1.78						
2886	nu star					46.62						
2887	Approximate Chi Square Value (.05)					31.95	Nonparametric Statistics					
2888	Adjusted Level of Significance					0.0416	95% CLT UCL					2.213
2889	Adjusted Chi Square Value					31.3	95% Jackknife UCL					2.234
2890							95% Standard Bootstrap UCL					2.203
2891	Anderson-Darling Test Statistic					0.689	95% Bootstrap-t UCL					2.981
2892	Anderson-Darling 5% Critical Value					0.786	95% Hall's Bootstrap UCL					5.086
2893	Kolmogorov-Smirnov Test Statistic					0.135	95% Percentile Bootstrap UCL					2.243
2894	Kolmogorov-Smirnov 5% Critical Value					0.161	95% BCA Bootstrap UCL					2.689
2895	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					3.358
2896							97.5% Chebyshev(Mean, Sd) UCL					4.154
2897	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					5.717
2898	95% Approximate Gamma UCL					2.216						
2899	95% Adjusted Gamma UCL					2.262						
2900												
2901	Potential UCL to Use						Use 95% Approximate Gamma UCL					2.216
2902												
2903												
2904	Pyrene											
2905												
2906	General Statistics											
2907	Number of Valid Observations					32	Number of Distinct Observations					30
2908												
2909	Raw Statistics						Log-transformed Statistics					
2910	Minimum					0.17	Minimum of Log Data					-1.772
2911	Maximum					18	Maximum of Log Data					2.89
2912	Mean					2.463	Mean of log Data					0.348

	A	B	C	D	E	F	G	H	I	J	K	L
2913	Median					1.325	SD of log Data					1.069
2914	SD					3.321						
2915	Coefficient of Variation					1.348						
2916	Skewness					3.596						
2917												
2918	Relevant UCL Statistics											
2919	Normal Distribution Test						Lognormal Distribution Test					
2920	Shapiro Wilk Test Statistic					0.611	Shapiro Wilk Test Statistic					0.987
2921	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
2922	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2923												
2924	Assuming Normal Distribution						Assuming Lognormal Distribution					
2925	95% Student's-t UCL					3.459	95% H-UCL					4.066
2926	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					4.797
2927	95% Adjusted-CLT UCL					3.828	97.5% Chebyshev (MVUE) UCL					5.816
2928	95% Modified-t UCL					3.521	99% Chebyshev (MVUE) UCL					7.817
2929												
2930	Gamma Distribution Test						Data Distribution					
2931	k star (bias corrected)					0.962	Data appear Gamma Distributed at 5% Significance Level					
2932	Theta Star					2.561						
2933	MLE of Mean					2.463						
2934	MLE of Standard Deviation					2.511						
2935	nu star					61.56						
2936	Approximate Chi Square Value (.05)					44.51	Nonparametric Statistics					
2937	Adjusted Level of Significance					0.0416	95% CLT UCL					3.429
2938	Adjusted Chi Square Value					43.74	95% Jackknife UCL					3.459
2939							95% Standard Bootstrap UCL					3.425
2940	Anderson-Darling Test Statistic					0.512	95% Bootstrap-t UCL					4.315
2941	Anderson-Darling 5% Critical Value					0.775	95% Hall's Bootstrap UCL					7.376
2942	Kolmogorov-Smirnov Test Statistic					0.116	95% Percentile Bootstrap UCL					3.486
2943	Kolmogorov-Smirnov 5% Critical Value					0.16	95% BCA Bootstrap UCL					4.024
2944	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					5.022
2945							97.5% Chebyshev(Mean, Sd) UCL					6.13
2946	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					8.305
2947	95% Approximate Gamma UCL					3.406						
2948	95% Adjusted Gamma UCL					3.467						
2949												
2950	Potential UCL to Use						Use 95% Approximate Gamma UCL					3.406
2951												
2952												
2953	Selenium											
2954												
2955	General Statistics											
2956	Number of Valid Data					28	Number of Detected Data					10
2957	Number of Distinct Detected Data					10	Number of Non-Detect Data					18
2958							Percent Non-Detects					64.29%
2959												
2960	Raw Statistics						Log-transformed Statistics					
2961	Minimum Detected					0.372	Minimum Detected					-0.989
2962	Maximum Detected					1.73	Maximum Detected					0.548
2963	Mean of Detected					1.06	Mean of Detected					-0.0707
2964	SD of Detected					0.522	SD of Detected					0.558

	A	B	C	D	E	F	G	H	I	J	K	L
2965	Minimum Non-Detect					0.29	Minimum Non-Detect					-1.238
2966	Maximum Non-Detect					0.77	Maximum Non-Detect					-0.261
2967												
2968	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					22
2969	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					6
2970	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					78.57%
2971												
2972	UCL Statistics											
2973	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2974	Shapiro Wilk Test Statistic					0.89	Shapiro Wilk Test Statistic					0.893
2975	5% Shapiro Wilk Critical Value					0.842	5% Shapiro Wilk Critical Value					0.842
2976	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2977												
2978	Assuming Normal Distribution						Assuming Lognormal Distribution					
2979	DL/2 Substitution Method						DL/2 Substitution Method					
2980	Mean					0.548	Mean					-0.912
2981	SD					0.496	SD					0.759
2982	95% DL/2 (t) UCL					0.707	95% H-Stat (DL/2) UCL					0.758
2983												
2984	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2985	Mean					1.436	Mean in Log Scale					-0.922
2986	SD					0.285	SD in Log Scale					0.746
2987	95% MLE (t) UCL					1.528	Mean in Original Scale					0.542
2988	95% MLE (Tiku) UCL					1.633	SD in Original Scale					0.498
2989							95% Percentile Bootstrap UCL					0.707
2990							95% BCA Bootstrap UCL					0.722
2991												
2992	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2993	k star (bias corrected)					2.892	Data appear Normal at 5% Significance Level					
2994	Theta Star					0.366						
2995	nu star					57.85						
2996												
2997	A-D Test Statistic					0.515	Nonparametric Statistics					
2998	5% A-D Critical Value					0.729	Kaplan-Meier (KM) Method					
2999	K-S Test Statistic					0.729	Mean					0.634
3000	5% K-S Critical Value					0.268	SD					0.437
3001	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0881
3002							95% KM (t) UCL					0.785
3003	Assuming Gamma Distribution						95% KM (z) UCL					0.779
3004	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.772
3005	Minimum					0.372	95% KM (bootstrap t) UCL					0.8
3006	Maximum					1.73	95% KM (BCA) UCL					0.943
3007	Mean					1.075	95% KM (Percentile Bootstrap) UCL					0.843
3008	Median					1.172	95% KM (Chebyshev) UCL					1.019
3009	SD					0.329	97.5% KM (Chebyshev) UCL					1.185
3010	k star					8.525	99% KM (Chebyshev) UCL					1.511
3011	Theta star					0.126						
3012	Nu star					477.4	Potential UCLs to Use					
3013	AppChi2					427.7	95% KM (t) UCL					0.785
3014	95% Gamma Approximate UCL					1.2	95% KM (Percentile Bootstrap) UCL					0.843
3015	95% Adjusted Gamma UCL					1.208						
3016	Note: DL/2 is not a recommended method.											

	A	B	C	D	E	F	G	H	I	J	K	L
3017												
3018												
3019	Silver											
3020												
3021	General Statistics											
3022	Number of Valid Data					32	Number of Detected Data					21
3023	Number of Distinct Detected Data					19	Number of Non-Detect Data					11
3024							Percent Non-Detects					34.38%
3025												
3026	Raw Statistics					Log-transformed Statistics						
3027	Minimum Detected					0.605	Minimum Detected					-0.503
3028	Maximum Detected					8.1	Maximum Detected					2.092
3029	Mean of Detected					4.366	Mean of Detected					1.255
3030	SD of Detected					2.443	SD of Detected					0.761
3031	Minimum Non-Detect					0.35	Minimum Non-Detect					-1.05
3032	Maximum Non-Detect					2.5	Maximum Non-Detect					0.916
3033												
3034	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect				17	
3035	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected				15	
3036	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage				53.13%	
3037												
3038	UCL Statistics											
3039	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
3040	Shapiro Wilk Test Statistic					0.941	Shapiro Wilk Test Statistic					0.888
3041	5% Shapiro Wilk Critical Value					0.908	5% Shapiro Wilk Critical Value					0.908
3042	Data appear Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
3043												
3044	Assuming Normal Distribution					Assuming Lognormal Distribution						
3045	DL/2 Substitution Method						DL/2 Substitution Method					
3046	Mean					3.146	Mean					0.681
3047	SD					2.615	SD					1.108
3048	95% DL/2 (t) UCL					3.93	95% H-Stat (DL/2) UCL					6.217
3049												
3050	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
3051	Mean					2.432	Mean in Log Scale					0.782
3052	SD					3.519	SD in Log Scale					0.928
3053	95% MLE (t) UCL					3.487	Mean in Original Scale					3.189
3054	95% MLE (Tiku) UCL					3.775	SD in Original Scale					2.572
3055							95% Percentile Bootstrap UCL					3.94
3056							95% BCA Bootstrap UCL					3.959
3057												
3058	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
3059	k star (bias corrected)					2.123	Data appear Normal at 5% Significance Level					
3060	Theta Star					2.056						
3061	nu star					89.18						
3062												
3063	A-D Test Statistic					0.624	Nonparametric Statistics					
3064	5% A-D Critical Value					0.752	Kaplan-Meier (KM) Method					
3065	K-S Test Statistic					0.752	Mean					3.16
3066	5% K-S Critical Value					0.191	SD					2.56
3067	Data appear Gamma Distributed at 5% Significance Level					SE of Mean					0.466	
3068							95% KM (t) UCL					3.951

	A	B	C	D	E	F	G	H	I	J	K	L
3069	Assuming Gamma Distribution						95% KM (z) UCL					3.927
3070	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					3.897
3071	Minimum					0.605	95% KM (bootstrap t) UCL					4.03
3072	Maximum					8.1	95% KM (BCA) UCL					4.086
3073	Mean					3.95	95% KM (Percentile Bootstrap) UCL					4.018
3074	Median					3.85	95% KM (Chebyshev) UCL					5.193
3075	SD					2.163	97.5% KM (Chebyshev) UCL					6.072
3076	k star					2.652	99% KM (Chebyshev) UCL					7.8
3077	Theta star					1.49						
3078	Nu star					169.7	Potential UCLs to Use					
3079	AppChi2					140.6	95% KM (t) UCL					3.951
3080	95% Gamma Approximate UCL					4.768	95% KM (Percentile Bootstrap) UCL					4.018
3081	95% Adjusted Gamma UCL					4.817						
3082	Note: DL/2 is not a recommended method.											
3083												
3084												
3085	TEQ - Total											
3086												
3087	General Statistics											
3088	Number of Valid Observations					6	Number of Distinct Observations					6
3089												
3090	Raw Statistics						Log-transformed Statistics					
3091	Minimum					0.0000088	Minimum of Log Data					-11.64
3092	Maximum					0.0000671	Maximum of Log Data					-9.609
3093	Mean					3.502E-05	Mean of log Data					-10.43
3094	Median					3.315E-05	SD of log Data					0.691
3095	SD					1.975E-05						
3096	Coefficient of Variation					N/A						
3097	Skewness					0.555						
3098												
3099												
3100	Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
3101												
3102	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
3103	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3104												
3105												
3106	Warning: There are only 6 Values in this data											
3107	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
3108	the resulting calculations may not be reliable enough to draw conclusions											
3109												
3110	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
3111												
3112	Relevant UCL Statistics											
3113	Normal Distribution Test						Lognormal Distribution Test					
3114	Shapiro Wilk Test Statistic					0.978	Shapiro Wilk Test Statistic					0.935
3115	Shapiro Wilk Critical Value					0.788	Shapiro Wilk Critical Value					0.788
3116	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3117												
3118	Assuming Normal Distribution						Assuming Lognormal Distribution					
3119	95% Student's-t UCL					5.127E-05	95% H-UCL					9.952E-05
3120	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					7.998E-05

	A	B	C	D	E	F	G	H	I	J	K	L
3121	95% Adjusted-CLT UCL					5.023E-05	97.5% Chebyshev (MVUE) UCL					9.904E-05
3122	95% Modified-t UCL					5.157E-05	99% Chebyshev (MVUE) UCL					0.0001365
3123												
3124	Gamma Distribution Test						Data Distribution					
3125	k star (bias corrected)					1.682	Data appear Normal at 5% Significance Level					
3126	Theta Star					2.081E-05						
3127	MLE of Mean					3.502E-05						
3128	MLE of Standard Deviation					2.7E-05						
3129	nu star					20.19						
3130	Approximate Chi Square Value (.05)					10.99	Nonparametric Statistics					
3131	Adjusted Level of Significance					0.0122	95% CLT UCL					4.828E-05
3132	Adjusted Chi Square Value					8.648	95% Jackknife UCL					5.127E-05
3133							95% Standard Bootstrap UCL					4.709E-05
3134	Anderson-Darling Test Statistic					0.213	95% Bootstrap-t UCL					5.51E-05
3135	Anderson-Darling 5% Critical Value					0.701	95% Hall's Bootstrap UCL					6.609E-05
3136	Kolmogorov-Smirnov Test Statistic					0.165	95% Percentile Bootstrap UCL					4.763E-05
3137	Kolmogorov-Smirnov 5% Critical Value					0.334	95% BCA Bootstrap UCL					4.822E-05
3138	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					7.017E-05
3139							97.5% Chebyshev(Mean, Sd) UCL					8.538E-05
3140	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					0.0001153
3141	95% Approximate Gamma UCL					6.432E-05						
3142	95% Adjusted Gamma UCL					8.175E-05						
3143												
3144	Potential UCL to Use						Use 95% Student's-t UCL					5.127E-05
3145												
3146												
3147	Tetrachloroethene											
3148												
3149	General Statistics											
3150	Number of Valid Data					32	Number of Detected Data					3
3151	Number of Distinct Detected Data					3	Number of Non-Detect Data					29
3152							Percent Non-Detects					90.63%
3153												
3154	Raw Statistics						Log-transformed Statistics					
3155	Minimum Detected					0.00212	Minimum Detected					-6.156
3156	Maximum Detected					0.025	Maximum Detected					-3.689
3157	Mean of Detected					0.01	Mean of Detected					-5.218
3158	SD of Detected					0.013	SD of Detected					1.336
3159	Minimum Non-Detect					0.00157	Minimum Non-Detect					-6.457
3160	Maximum Non-Detect					0.014	Maximum Non-Detect					-4.269
3161												
3162	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					31
3163	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					1
3164	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					96.88%
3165												
3166	Warning: There are only 3 Distinct Detected Values in this data set											
3167	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
3168	Those methods will return a 'N/A' value on your output display!											
3169												
3170	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
3171	However, results obtained using 4 to 9 distinct values may not be reliable.											
3172	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											

	A	B	C	D	E	F	G	H	I	J	K	L
3173												
3174												
3175	UCL Statistics											
3176	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3177	Shapiro Wilk Test Statistic					0.779	Shapiro Wilk Test Statistic					0.853
3178	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
3179	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3180												
3181	Assuming Normal Distribution						Assuming Lognormal Distribution					
3182	DL/2 Substitution Method						DL/2 Substitution Method					
3183	Mean					0.0047	Mean					-5.594
3184	SD					0.00411	SD					0.697
3185	95% DL/2 (t) UCL					0.00593	95% H-Stat (DL/2) UCL					0.00677
3186												
3187	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
3188	MLE method failed to converge properly						Mean in Log Scale					-7.154
3189							SD in Log Scale					1.016
3190							Mean in Original Scale					0.00171
3191							SD in Original Scale					0.00432
3192							95% Percentile Bootstrap UCL					0.00316
3193							95% BCA Bootstrap UCL					0.00435
3194												
3195	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3196	k star (bias corrected)					N/A	Data appear Normal at 5% Significance Level					
3197	Theta Star					N/A						
3198	nu star					N/A						
3199												
3200	A-D Test Statistic					N/A	Nonparametric Statistics					
3201	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
3202	K-S Test Statistic					N/A	Mean					0.00296
3203	5% K-S Critical Value					N/A	SD					0.00397
3204	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0008682
3205							95% KM (t) UCL					0.00443
3206	Assuming Gamma Distribution						95% KM (z) UCL					0.00438
3207	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00401
3208	Minimum					N/A	95% KM (bootstrap t) UCL					0.00742
3209	Maximum					N/A	95% KM (BCA) UCL					0.025
3210	Mean					N/A	95% KM (Percentile Bootstrap) UCL					N/A
3211	Median					N/A	95% KM (Chebyshev) UCL					0.00674
3212	SD					N/A	97.5% KM (Chebyshev) UCL					0.00838
3213	k star					N/A	99% KM (Chebyshev) UCL					0.0116
3214	Theta star					N/A						
3215	Nu star					N/A	Potential UCLs to Use					
3216	AppChi2					N/A	95% KM (t) UCL					0.00443
3217	95% Gamma Approximate UCL					N/A	95% KM (Percentile Bootstrap) UCL					N/A
3218	95% Adjusted Gamma UCL					N/A						
3219	Note: DL/2 is not a recommended method.											
3220												
3221												
3222	Thallium											
3223												
3224	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
3225	Number of Valid Data					32	Number of Detected Data					10
3226	Number of Distinct Detected Data					10	Number of Non-Detect Data					22
3227							Percent Non-Detects					68.75%
3228												
3229	Raw Statistics						Log-transformed Statistics					
3230	Minimum Detected					0.0665	Minimum Detected					-2.711
3231	Maximum Detected					1.2	Maximum Detected					0.182
3232	Mean of Detected					0.374	Mean of Detected					-1.604
3233	SD of Detected					0.439	SD of Detected					1.134
3234	Minimum Non-Detect					0.29	Minimum Non-Detect					-1.238
3235	Maximum Non-Detect					1.1	Maximum Non-Detect					0.0953
3236												
3237	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					31
3238	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					1
3239	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					96.88%
3240												
3241	UCL Statistics											
3242	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3243	Shapiro Wilk Test Statistic					0.702	Shapiro Wilk Test Statistic					0.804
3244	5% Shapiro Wilk Critical Value					0.842	5% Shapiro Wilk Critical Value					0.842
3245	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
3246												
3247	Assuming Normal Distribution						Assuming Lognormal Distribution					
3248	DL/2 Substitution Method						DL/2 Substitution Method					
3249	Mean					0.356	Mean					-1.288
3250	SD					0.262	SD					0.748
3251	95% DL/2 (t) UCL					0.434	95% H-Stat (DL/2) UCL					0.841
3252												
3253	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
3254	MLE method failed to converge properly						Mean in Log Scale					-1.946
3255							SD in Log Scale					0.678
3256							Mean in Original Scale					0.203
3257							SD in Original Scale					0.265
3258							95% Percentile Bootstrap UCL					0.286
3259							95% BCA Bootstrap UCL					0.311
3260												
3261	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3262	k star (bias corrected)					0.724	Data do not follow a Discernable Distribution (0.05)					
3263	Theta Star					0.517						
3264	nu star					14.47						
3265												
3266	A-D Test Statistic					1.194	Nonparametric Statistics					
3267	5% A-D Critical Value					0.75	Kaplan-Meier (KM) Method					
3268	K-S Test Statistic					0.75	Mean					0.202
3269	5% K-S Critical Value					0.274	SD					0.278
3270	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0563
3271							95% KM (t) UCL					0.297
3272	Assuming Gamma Distribution						95% KM (z) UCL					0.295
3273	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.295
3274	Minimum					0.0665	95% KM (bootstrap t) UCL					0.344
3275	Maximum					1.2	95% KM (BCA) UCL					0.302
3276	Mean					0.374	95% KM (Percentile Bootstrap) UCL					0.302

	A	B	C	D	E	F	G	H	I	J	K	L
3277	Median					0.373	95% KM (Chebyshev) UCL					0.447
3278	SD					0.236	97.5% KM (Chebyshev) UCL					0.553
3279	k star					2.501	99% KM (Chebyshev) UCL					0.762
3280	Theta star					0.149						
3281	Nu star					160.1	Potential UCLs to Use					
3282	AppChi2					131.8	95% KM (BCA) UCL					0.302
3283	95% Gamma Approximate UCL					0.454						
3284	95% Adjusted Gamma UCL					0.459						
3285	Note: DL/2 is not a recommended method.											
3286												
3287												
3288	Vanadium											
3289												
3290	General Statistics											
3291	Number of Valid Data					32	Number of Detected Data					31
3292	Number of Distinct Detected Data					28	Number of Non-Detect Data					1
3293							Percent Non-Detects					3.13%
3294												
3295	Raw Statistics						Log-transformed Statistics					
3296	Minimum Detected					8	Minimum Detected					2.079
3297	Maximum Detected					33.3	Maximum Detected					3.506
3298	Mean of Detected					15.8	Mean of Detected					2.702
3299	SD of Detected					5.74	SD of Detected					0.343
3300	Minimum Non-Detect					12	Minimum Non-Detect					2.485
3301	Maximum Non-Detect					12	Maximum Non-Detect					2.485
3302												
3303												
3304	UCL Statistics											
3305	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3306	Shapiro Wilk Test Statistic					0.913	Shapiro Wilk Test Statistic					0.972
3307	5% Shapiro Wilk Critical Value					0.929	5% Shapiro Wilk Critical Value					0.929
3308	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3309												
3310	Assuming Normal Distribution						Assuming Lognormal Distribution					
3311	DL/2 Substitution Method						DL/2 Substitution Method					
3312	Mean					15.49	Mean					2.673
3313	SD					5.906	SD					0.373
3314	95% DL/2 (t) UCL					17.26	95% H-Stat (DL/2) UCL					16.93
3315												
3316	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
3317	Mean					14.52	Mean in Log Scale					2.69
3318	SD					7.1	SD in Log Scale					0.343
3319	95% MLE (t) UCL					16.65	Mean in Original Scale					15.63
3320	95% MLE (Tiku) UCL					16.83	SD in Original Scale					5.725
3321							95% Percentile Bootstrap UCL					17.38
3322							95% BCA Bootstrap UCL					17.38
3323												
3324	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3325	k star (bias corrected)					7.905	Data appear Gamma Distributed at 5% Significance Level					
3326	Theta Star					1.998						
3327	nu star					490.1						
3328												

	A	B	C	D	E	F	G	H	I	J	K	L	
3329	A-D Test Statistic					0.457	Nonparametric Statistics						
3330	5% A-D Critical Value					0.746	Kaplan-Meier (KM) Method						
3331	K-S Test Statistic					0.746	Mean						15.63
3332	5% K-S Critical Value					0.158	SD						5.64
3333	Data appear Gamma Distributed at 5% Significance Level						SE of Mean						1.014
3334							95% KM (t) UCL						17.35
3335	Assuming Gamma Distribution						95% KM (z) UCL						17.3
3336	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL						17.35
3337	Minimum					8	95% KM (bootstrap t) UCL						17.64
3338	Maximum					33.3	95% KM (BCA) UCL						17.35
3339	Mean					15.64	95% KM (Percentile Bootstrap) UCL						17.4
3340	Median					14.35	95% KM (Chebyshev) UCL						20.05
3341	SD					5.713	97.5% KM (Chebyshev) UCL						21.96
3342	k star					7.922	99% KM (Chebyshev) UCL						25.72
3343	Theta star					1.975							
3344	Nu star					507	Potential UCLs to Use						
3345	AppChi2					455.8	95% KM (BCA) UCL						17.35
3346	95% Gamma Approximate UCL					17.4							
3347	95% Adjusted Gamma UCL					17.5							
3348	Note: DL/2 is not a recommended method.												
3349													
3350													
3351	Zinc												
3352													
3353	General Statistics												
3354	Number of Valid Observations					32	Number of Distinct Observations					32	
3355													
3356	Raw Statistics					Log-transformed Statistics							
3357	Minimum					25.9	Minimum of Log Data					3.254	
3358	Maximum					1570	Maximum of Log Data					7.359	
3359	Mean					294.6	Mean of log Data					4.861	
3360	Median					81.95	SD of log Data					1.22	
3361	SD					427.5							
3362	Coefficient of Variation					1.451							
3363	Skewness					1.841							
3364													
3365	Relevant UCL Statistics												
3366	Normal Distribution Test					Lognormal Distribution Test							
3367	Shapiro Wilk Test Statistic					0.649	Shapiro Wilk Test Statistic					0.862	
3368	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93	
3369	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level							
3370													
3371	Assuming Normal Distribution					Assuming Lognormal Distribution							
3372	95% Student's-t UCL					422.7	95% H-UCL					491.6	
3373	95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL					558.1		
3374	95% Adjusted-CLT UCL					445.2	97.5% Chebyshev (MVUE) UCL					686.4	
3375	95% Modified-t UCL					426.8	99% Chebyshev (MVUE) UCL					938.5	
3376													
3377	Gamma Distribution Test					Data Distribution							
3378	k star (bias corrected)					0.681	Data do not follow a Discernable Distribution (0.05)						
3379	Theta Star					432.5							
3380	MLE of Mean					294.6							

	A	B	C	D	E	F	G	H	I	J	K	L
3381	MLE of Standard Deviation					357						
3382	nu star					43.59						
3383	Approximate Chi Square Value (.05)					29.45	Nonparametric Statistics					
3384	Adjusted Level of Significance					0.0416	95% CLT UCL					418.9
3385	Adjusted Chi Square Value					28.83	95% Jackknife UCL					422.7
3386							95% Standard Bootstrap UCL					414.8
3387	Anderson-Darling Test Statistic					2.91	95% Bootstrap-t UCL					464.9
3388	Anderson-Darling 5% Critical Value					0.79	95% Hall's Bootstrap UCL					427.6
3389	Kolmogorov-Smirnov Test Statistic					0.286	95% Percentile Bootstrap UCL					423.5
3390	Kolmogorov-Smirnov 5% Critical Value					0.162	95% BCA Bootstrap UCL					450.6
3391	Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					624
3392							97.5% Chebyshev(Mean, Sd) UCL					766.6
3393	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					1047
3394	95% Approximate Gamma UCL					436						
3395	95% Adjusted Gamma UCL					445.5						
3396												
3397	Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL					1047
3398												

						RME Conc - 95% UCL unless greater than the Max Det. Otherwise use Max. Det.
	CTE Conc Geommean	Max Det	95% UCL	Method	Distribution	
2-Butanone	0.004794	0.044	0.0154	95% KM (t) UCL	(NP)	0.0154
Acetone	0.009137	0.13	0.0221	95% KM (t) UCL	(NP)	0.0221
Methyl acetate	0.003901	0.00825	NC	NA	2 detects, but not adequate	0.00825
Tetrachloroethene	0.00372	0.025	0.00443	95% KM (t) UCL	(NP)	0.00443
2-Methylnaphthalene	0.138969	0.37	0.154	95% KM (t) UCL	(NP)	0.154
Acenaphthylene	0.11531	0.43	0.15	95% KM (BCA) UCL	(NP)	0.15
Acetophenone	0.159396	0.86	0.178	95% KM (BCA) UCL	(NP)	0.178
Anthracene	0.210675	1.1	0.372	95% KM (BCA) UCL	(NP)	0.372
Benzaldehyde	0.154342	0.33	0.182	95% KM (t) UCL	(NP)	0.182
Benzo(a)pyrene	0.700465	4	1.348	95% Approximate Gamma UCL	(G)	1.348
Benzo(b)fluoranthene	0.924628	6.4	2.036	95% Approximate Gamma UCL	(G)	2.036
Benzo(g,h,i)perylene	0.487061	2.7	0.961	95% Approximate Gamma UCL	(G)	0.961
Benzo(k)fluoranthene	0.383684	2.41	0.869	95% Approximate Gamma UCL	(G)	0.869
Benzo[a]anthracene	0.72756	4.5	1.515	95% Approximate Gamma UCL	(G)	1.515
bis(2-Ethylhexyl)phthalate	1.125916	260	35.82	95% KM (BCA) UCL	(NP)	35.82
Butyl benzyl phthalate	0.144696	0.29	0.123	95% KM (t) UCL	(NP)	0.123
Carbazole	0.151366	0.99	0.241	95% KM (t) UCL	(NP)	0.241
Chrysene	0.745666	5	1.928	95% KM (Chebyshev) UCL	(NP)	1.928
Dibenz[a,h]anthracene	0.173465	0.75	0.257	95% KM (BCA) UCL	(NP)	0.257
Dibenzofuran	0.152524	1.1	0.215	95% KM (t) UCL	(NP)	0.215
Di-N-Octyl phthalate	0.304923	14.7	2.325	95% KM (t) UCL	(NP)	2.325
Fluoranthene	1.167196	9	2.814	95% Approximate Gamma UCL	(G)	2.814
Indeno(1,2,3-cd)pyrene	0.400072	2.4	0.812	95% Approximate Gamma UCL	(G)	0.812
Naphthalene	0.157731	0.87	0.242	95% KM (Percentile Bootstrap) UCL	(NP)	0.242
Phenanthrene	0.708462	13	2.216	95% Approximate Gamma UCL	(G)	2.216
Pyrene	1.416186	18	3.406	95% Approximate Gamma UCL	(G)	3.406
4,4'-DDD	0.00353	0.0537	0.0113	95% KM (t) UCL	(NP)	0.0113
4,4'-DDE	0.004624	0.07	0.0158	95% KM (BCA) UCL	(NP)	0.0158
4,4'-DDT	0.003448	0.025	0.00726	95% KM (t) UCL	(NP)	0.00726
alpha-Chlordane	0.002016	0.0195	0.00443	95% KM (t) UCL	(NP)	0.00443
Dieldrin	0.031323	0.81	0.26	97.5% KM (Chebyshev) UCL	(NP)	0.26
Endosulfan II	0.001346	0.00754	0.00625	95% KM (t) UCL	(NP)	0.00625
Endosulfan Sulfate	0.00167	0.01	0.00435	95% KM (t) UCL	(NP)	0.00435
Endrin Aldehyde	0.001393	0.022	0.0067	95% KM (t) UCL	(NP)	0.0067
Endrin Ketone	0.001214	0.014	NC	NA	1 detect	0.014
Gamma-Chlordane	0.001929	0.018	0.00516	95% KM (t) UCL	(NP)	0.00516
Heptachlor Epoxide	0.000738	0.013	NC	NA	1 detect	0.013
Methoxychlor	0.004293	0.028	NC	NA	1 detect	0.028
Dioxin TEQ	2.96E-05	0.0000671	0.00005127	95% Student's-t UCL	(N)	5.13E-05
Aluminum	5635.617	11400	6581	95% Modified-t UCL	(N)	6581
Antimony	2.530314	63.6	9.485	95% KM (t) UCL	(NP)	9.485
Arsenic	7.266055	26.1	11.57	95% Approximate Gamma UCL	(G)	11.57
Barium	62.65798	881	180.5	95% KM (Percentile Bootstrap) UCL	(NP)	180.5
Cadmium	2.287458	21.8	6.923	95% KM (Chebyshev) UCL	(NP)	6.923
Chromium	77.37268	471	143.3	95% H-UCL	(LN)	143.3
Copper	103.8825	1310	325.8	95% H-UCL	(LN)	325.8
Cyanide	0.273382	3.8	0.754	95% KM (t) UCL	(NP)	0.754
Iron	13219.78	55750	24292	95% Chebyshev (Mean, Sd) UCL	(NP)	24292
Lead	147.0529	2230	1366	99% Chebyshev (Mean, Sd) UCL	(NP)	1366
Manganese	207.95	1680	342.4	95% Approximate Gamma UCL	(G)	342.4
Mercury	0.293665	1.8	0.548	95% Approximate Gamma UCL	(G)	0.548
Nickel	13.60505	158	42.13	95% KM (Chebyshev) UCL	(NP)	42.13
Selenium	0.401525	1.73	0.785	95% KM (t) UCL	(NP)	0.785
Silver	1.975413	8.1	3.951	95% KM (t) UCL	(NP)	3.951
Thallium	0.27572	1.2	0.302	95% KM (BCA) UCL	(NP)	0.302
Vanadium	14.48483	33.3	17.35	95% KM (BCA) UCL	(NP)	17.35
Zinc	129.1197	1570	1047	99% Chebyshev (Mean, Sd) UCL	(NP)	1047

APPENDIX C

SAMPLE GROUPINGS USED TO DEVELOP EXPOSURE POINT CONCENTRATIONS

Peterson Puritan Superfund Site - Operable Unit 2
Summary of Surface Soil Samples

Scenario Timeframe:	Current/Future
Exposure Area:	Unnamed Island
Exposure Medium:	Surface Soil

Location ID Sample ID	Sample Depth	Date Collected
LUI-005		
LUI-005	NA	12/08/05
LUI-006		
LUI-006	NA	12/08/05
SO-006-UI		
SO-006-UI	0 - 1	08/19/03
SO-007-UI		
SO-007-UI	0 - 1	08/19/03
SO-010-UI		
SO-010-UI	0 - 1	08/20/03
SO-011-UI		
SO-011-UI	0 - 1	08/20/03
SO-012-UI		
SO-012-UI	0 - 1	08/20/03
SO-013-UI		
SO-013-UI	0 - 1	08/20/03
SO-014-UI		
SO-014-UI	0 - 1	08/20/03
SO-015-UI		
SO-015-UI	0 - 1	08/20/03
SO-016-UI		
SO-016-UI	0 - 1	08/20/03
SO-077-UI		
SO-077-UI	0 - 1	09/10/04
SO-078-UI		
SO-078-UI	0 - 1	09/10/04
SO-079-UI		
SO-079-UI	0 - 1	09/10/04
SO-080-UI		
SO-080-UI	0 - 1	09/10/04
SO-081-UI		
SO-081-UI	0 - 1	09/10/04
SO-082-UI		
SO-082-UI	0 - 1	09/10/04
SO-083-UI		
SO-083-UI	0 - 1	09/10/04
SO-084-UI		
SO-084-UI	0 - 1	09/09/04
SO-084-UI		
SO-089-UI	0 - 1	11/27/04
SO-085-UI		
SO-085-UI	0 - 1	09/09/04
SO-085-UI		
SO-090-UI	0 - 1	11/27/04
SO-085-UI		
SO-FD-20	0 - 1	11/27/04
SO-086-UI		
SO-086-UI	0 - 1	09/09/04
SO-087-UI		
SO-087-UI	0 - 1	09/09/04
SO-088-UI		
SO-088-UI	0 - 1	09/10/04
UI-TT-01,02		
SO-W03-UI	NA	08/20/03
UI-TT-03		
SO-W04-UI	NA	08/20/03
UI-TT-03		
SO-FD02	NA	08/20/03
UI-TT-06		
SO-W01-UI	NA	08/19/03
UI-TT-10		
SO-W02-UI	NA	08/19/03
SO-200-UI		
SO-200-UI (0-1')	0-1	11/18/09
SO-203-UI		
SO-203-UI 0-1'	0-1	11/18/09

Peterson Puritan Superfund Site - Operable Unit 2
Summary of Surface Soil Samples

Scenario Timeframe:	Current/Future
Exposure Area:	Unnamed Island
Exposure Medium:	Surface Soil

Location ID Sample ID	Sample Depth	Date Collected
SO-208B-UI SO-208B-UI (0-1')	0-1	11/19/09
SO-209-UI SO-209-UI (0-1')	0-1	11/20/09
SO-211-UI SO-211-UI (0-1')	0-1	11/20/09
SO-213-UI SO-213-UI-0-1'	0-1	11/20/09
SO-214-UI SO-214-UI-0-1'	0-1	11/20/09
SO-215-UI SO-215-UI-0-1'	0-1	11/20/09
SO-216-UI SO-216-UI-0-1'	0-1	11/20/09
SO-217-UI SO-217-UI (0-1')	0-1	11/20/09
SO-223F-UI SO-223F-UI-0-1'	0-1	11/24/09
SO-225A-UI SO-225A-UI-0-1'	0-1	11/24/09
SO-225A-UI DUP-2	0-1	11/24/09

Notes:

Shaded samples collected at Pratt Dam/Southern Bank for use as reference