	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			2/18/2015 11:31:10 AM								
5	From File			EPC_015Surf_EU06.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												

	A	B	C	D	E	F	G	H	I	J	K	L
11	Antimony											
12												
13						General Statistics						
14					Total Number of Observations	12				Number of Distinct Observations		12
15										Number of Missing Observations		0
16					Minimum	42.46				Mean		75.6
17					Maximum	112.2				Median		76.3
18					SD	24.81				Std. Error of Mean		7.163
19					Coefficient of Variation	0.328				Skewness		0.168
20												
21						Normal GOF Test						
22					Shapiro Wilk Test Statistic	0.931				Shapiro Wilk GOF Test		
23					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
24					Lilliefors Test Statistic	0.136				Lilliefors GOF Test		
25					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
26						Data appear Normal at 5% Significance Level						
27												
28						Assuming Normal Distribution						
29					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
30					95% Student's-t UCL	88.46				95% Adjusted-CLT UCL (Chen-1995)		87.75
31										95% Modified-t UCL (Johnson-1978)		88.52
32												
33						Gamma GOF Test						
34					A-D Test Statistic	0.314				Anderson-Darling Gamma GOF Test		
35					5% A-D Critical Value	0.73				Detected data appear Gamma Distributed at 5% Significance Level		
36					K-S Test Statistic	0.144				Kolmogrov-Smirnoff Gamma GOF Test		
37					5% K-S Critical Value	0.245				Detected data appear Gamma Distributed at 5% Significance Level		
38						Detected data appear Gamma Distributed at 5% Significance Level						
39												
40						Gamma Statistics						
41					k hat (MLE)	9.754				k star (bias corrected MLE)		7.371
42					Theta hat (MLE)	7.75				Theta star (bias corrected MLE)		10.26
43					nu hat (MLE)	234.1				nu star (bias corrected)		176.9
44					MLE Mean (bias corrected)	75.6				MLE Sd (bias corrected)		27.84
45										Approximate Chi Square Value (0.05)		147.1
46					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		143
47												
48						Assuming Gamma Distribution						
49					95% Approximate Gamma UCL (use when n>=50))	90.89				95% Adjusted Gamma UCL (use when n<50)		93.52
50												
51						Lognormal GOF Test						
52					Shapiro Wilk Test Statistic	0.934				Shapiro Wilk Lognormal GOF Test		
53					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
54					Lilliefors Test Statistic	0.135				Lilliefors Lognormal GOF Test		
55					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
56						Data appear Lognormal at 5% Significance Level						
57												
58						Lognormal Statistics						
59					Minimum of Logged Data	3.749				Mean of logged Data		4.273
60					Maximum of Logged Data	4.721				SD of logged Data		0.342
61												

	A	B	C	D	E	F	G	H	I	J	K	L
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	93.22				90% Chebyshev (MVUE) UCL		98.41
64					95% Chebyshev (MVUE) UCL	108.7				97.5% Chebyshev (MVUE) UCL		123
65					99% Chebyshev (MVUE) UCL	151						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	87.38				95% Jackknife UCL		88.46
72					95% Standard Bootstrap UCL	86.97				95% Bootstrap-t UCL		88.71
73					95% Hall's Bootstrap UCL	86.57				95% Percentile Bootstrap UCL		86.43
74					95% BCA Bootstrap UCL	86.51						
75					90% Chebyshev(Mean, Sd) UCL	97.09				95% Chebyshev(Mean, Sd) UCL		106.8
76					97.5% Chebyshev(Mean, Sd) UCL	120.3				99% Chebyshev(Mean, Sd) UCL		146.9
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	88.46						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86												

	A	B	C	D	E	F	G	H	I	J	K	L
87	Arsenic											
88												
89						General Statistics						
90					Total Number of Observations	12				Number of Distinct Observations		5
91										Number of Missing Observations		0
92					Minimum	6.61				Mean		11.12
93					Maximum	18.04				Median		11
94					SD	2.512				Std. Error of Mean		0.725
95					Coefficient of Variation	0.226				Skewness		1.637
96												
97						Normal GOF Test						
98					Shapiro Wilk Test Statistic	0.629				Shapiro Wilk GOF Test		
99					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
100					Lilliefors Test Statistic	0.436				Lilliefors GOF Test		
101					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
102						Data Not Normal at 5% Significance Level						
103												
104						Assuming Normal Distribution						
105					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
106					95% Student's-t UCL	12.43				95% Adjusted-CLT UCL (Chen-1995)		12.68
107										95% Modified-t UCL (Johnson-1978)		12.48
108												
109						Gamma GOF Test						
110					A-D Test Statistic	2.221				Anderson-Darling Gamma GOF Test		
111					5% A-D Critical Value	0.732				Data Not Gamma Distributed at 5% Significance Level		
112					K-S Test Statistic	0.411				Kolmogrov-Smirnoff Gamma GOF Test		
113					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
114						Data Not Gamma Distributed at 5% Significance Level						
115												
116						Gamma Statistics						
117					k hat (MLE)	23.41				k star (bias corrected MLE)		17.62
118					Theta hat (MLE)	0.475				Theta star (bias corrected MLE)		0.632
119					nu hat (MLE)	561.9				nu star (bias corrected)		422.8
120					MLE Mean (bias corrected)	11.12				MLE Sd (bias corrected)		2.65
121										Approximate Chi Square Value (0.05)		376.1
122					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		369.4
123												
124						Assuming Gamma Distribution						
125					95% Approximate Gamma UCL (use when n>=50))	12.5				95% Adjusted Gamma UCL (use when n<50)		12.73
126												
127						Lognormal GOF Test						
128					Shapiro Wilk Test Statistic	0.666				Shapiro Wilk Lognormal GOF Test		
129					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
130					Lilliefors Test Statistic	0.398				Lilliefors Lognormal GOF Test		
131					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
132						Data Not Lognormal at 5% Significance Level						
133												
134						Lognormal Statistics						
135					Minimum of Logged Data	1.889				Mean of logged Data		2.388
136					Maximum of Logged Data	2.893				SD of logged Data		0.215
137												

	A	B	C	D	E	F	G	H	I	J	K	L
138	Assuming Lognormal Distribution											
139					95% H-UCL	12.57				90% Chebyshev (MVUE) UCL		13.2
140					95% Chebyshev (MVUE) UCL	14.15				97.5% Chebyshev (MVUE) UCL		15.46
141					99% Chebyshev (MVUE) UCL	18.03						
142												
143	Nonparametric Distribution Free UCL Statistics											
144	Data do not follow a Discernible Distribution (0.05)											
145												
146	Nonparametric Distribution Free UCLs											
147					95% CLT UCL	12.32				95% Jackknife UCL		12.43
148					95% Standard Bootstrap UCL	12.26				95% Bootstrap-t UCL		13.61
149					95% Hall's Bootstrap UCL	21.61				95% Percentile Bootstrap UCL		12.23
150					95% BCA Bootstrap UCL	12.69						
151					90% Chebyshev(Mean, Sd) UCL	13.3				95% Chebyshev(Mean, Sd) UCL		14.29
152					97.5% Chebyshev(Mean, Sd) UCL	15.65				99% Chebyshev(Mean, Sd) UCL		18.34
153												
154	Suggested UCL to Use											
155					95% Student's-t UCL	12.43				or 95% Modified-t UCL		12.48
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
159	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
160	For additional insight the user may want to consult a statistician.											
161												
162												

	A	B	C	D	E	F	G	H	I	J	K	L
163	Cadmium											
164												
165						General Statistics						
166					Total Number of Observations	12				Number of Distinct Observations		5
167										Number of Missing Observations		0
168					Minimum	1.5				Mean		11.89
169					Maximum	15.36				Median		12
170					SD	3.546				Std. Error of Mean		1.024
171					Coefficient of Variation	0.298				Skewness		-2.504
172												
173						Normal GOF Test						
174					Shapiro Wilk Test Statistic	0.62				Shapiro Wilk GOF Test		
175					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
176					Lilliefors Test Statistic	0.429				Lilliefors GOF Test		
177					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
178						Data Not Normal at 5% Significance Level						
179												
180						Assuming Normal Distribution						
181					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
182					95% Student's-t UCL	13.73				95% Adjusted-CLT UCL (Chen-1995)		12.78
183										95% Modified-t UCL (Johnson-1978)		13.6
184												
185						Gamma GOF Test						
186					A-D Test Statistic	2.732				Anderson-Darling Gamma GOF Test		
187					5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level		
188					K-S Test Statistic	0.485				Kolmogrov-Smirnoff Gamma GOF Test		
189					5% K-S Critical Value	0.246				Data Not Gamma Distributed at 5% Significance Level		
190						Data Not Gamma Distributed at 5% Significance Level						
191												
192						Gamma Statistics						
193					k hat (MLE)	4.82				k star (bias corrected MLE)		3.671
194					Theta hat (MLE)	2.466				Theta star (bias corrected MLE)		3.239
195					nu hat (MLE)	115.7				nu star (bias corrected)		88.09
196					MLE Mean (bias corrected)	11.89				MLE Sd (bias corrected)		6.205
197										Approximate Chi Square Value (0.05)		67.46
198					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		64.71
199												
200						Assuming Gamma Distribution						
201					95% Approximate Gamma UCL (use when n>=50))	15.52				95% Adjusted Gamma UCL (use when n<50)		16.18
202												
203						Lognormal GOF Test						
204					Shapiro Wilk Test Statistic	0.453				Shapiro Wilk Lognormal GOF Test		
205					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
206					Lilliefors Test Statistic	0.491				Lilliefors Lognormal GOF Test		
207					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
208						Data Not Lognormal at 5% Significance Level						
209												
210						Lognormal Statistics						
211					Minimum of Logged Data	0.405				Mean of logged Data		2.368
212					Maximum of Logged Data	2.732				SD of logged Data		0.626
213												

	A	B	C	D	E	F	G	H	I	J	K	L
214					Assuming Lognormal Distribution							
215					95% H-UCL	20.09				90% Chebyshev (MVUE) UCL		19.91
216				95% Chebyshev (MVUE) UCL		23.15				97.5% Chebyshev (MVUE) UCL		27.65
217				99% Chebyshev (MVUE) UCL		36.49						
218												
219					Nonparametric Distribution Free UCL Statistics							
220					Data do not follow a Discernible Distribution (0.05)							
221												
222					Nonparametric Distribution Free UCLs							
223					95% CLT UCL	13.57				95% Jackknife UCL		13.73
224				95% Standard Bootstrap UCL		13.49				95% Bootstrap-t UCL		13.22
225				95% Hall's Bootstrap UCL		12.99				95% Percentile Bootstrap UCL		13.28
226				95% BCA Bootstrap UCL		13.03						
227				90% Chebyshev(Mean, Sd) UCL		14.96				95% Chebyshev(Mean, Sd) UCL		16.35
228				97.5% Chebyshev(Mean, Sd) UCL		18.28				99% Chebyshev(Mean, Sd) UCL		22.07
229												
230					Suggested UCL to Use							
231				95% Chebyshev (Mean, Sd) UCL		16.35						
232												
233					Recommended UCL exceeds the maximum observation							
234												
235					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
236					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
237					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
238					For additional insight the user may want to consult a statistician.							
239												
240					Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
241					reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.							
242												
243												

	A	B	C	D	E	F	G	H	I	J	K	L
244	Chromium											
245												
246						General Statistics						
247					Total Number of Observations	12				Number of Distinct Observations		5
248										Number of Missing Observations		0
249					Minimum	36.58				Mean		72.71
250					Maximum	85				Median		85
251					SD	18.89				Std. Error of Mean		5.453
252					Coefficient of Variation	0.26				Skewness		-1.084
253												
254						Normal GOF Test						
255					Shapiro Wilk Test Statistic	0.684				Shapiro Wilk GOF Test		
256					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
257					Lilliefors Test Statistic	0.409				Lilliefors GOF Test		
258					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
259						Data Not Normal at 5% Significance Level						
260												
261						Assuming Normal Distribution						
262					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
263					95% Student's-t UCL	82.5				95% Adjusted-CLT UCL (Chen-1995)		79.85
264										95% Modified-t UCL (Johnson-1978)		82.22
265												
266						Gamma GOF Test						
267					A-D Test Statistic	1.902				Anderson-Darling Gamma GOF Test		
268					5% A-D Critical Value	0.731				Data Not Gamma Distributed at 5% Significance Level		
269					K-S Test Statistic	0.415				Kolmogrov-Smirnoff Gamma GOF Test		
270					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
271						Data Not Gamma Distributed at 5% Significance Level						
272												
273						Gamma Statistics						
274					k hat (MLE)	12.98				k star (bias corrected MLE)		9.789
275					Theta hat (MLE)	5.602				Theta star (bias corrected MLE)		7.428
276					nu hat (MLE)	311.5				nu star (bias corrected)		234.9
277					MLE Mean (bias corrected)	72.71				MLE Sd (bias corrected)		23.24
278										Approximate Chi Square Value (0.05)		200.5
279					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		195.6
280												
281						Assuming Gamma Distribution						
282					95% Approximate Gamma UCL (use when n>=50))	85.21				95% Adjusted Gamma UCL (use when n<50)		87.33
283												
284						Lognormal GOF Test						
285					Shapiro Wilk Test Statistic	0.688				Shapiro Wilk Lognormal GOF Test		
286					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
287					Lilliefors Test Statistic	0.403				Lilliefors Lognormal GOF Test		
288					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
289						Data Not Lognormal at 5% Significance Level						
290												
291						Lognormal Statistics						
292					Minimum of Logged Data	3.6				Mean of logged Data		4.247
293					Maximum of Logged Data	4.443				SD of logged Data		0.309
294												

	A	B	C	D	E	F	G	H	I	J	K	L
295					Assuming Lognormal Distribution							
296					95% H-UCL	87.85				90% Chebyshev (MVUE) UCL		92.8
297					95% Chebyshev (MVUE) UCL	101.7				97.5% Chebyshev (MVUE) UCL		114.2
298					99% Chebyshev (MVUE) UCL	138.6						
299												
300					Nonparametric Distribution Free UCL Statistics							
301					Data do not follow a Discernible Distribution (0.05)							
302												
303					Nonparametric Distribution Free UCLs							
304					95% CLT UCL	81.68				95% Jackknife UCL		82.5
305					95% Standard Bootstrap UCL	81.26				95% Bootstrap-t UCL		80.89
306					95% Hall's Bootstrap UCL	79.97				95% Percentile Bootstrap UCL		80.97
307					95% BCA Bootstrap UCL	79.96						
308					90% Chebyshev(Mean, Sd) UCL	89.07				95% Chebyshev(Mean, Sd) UCL		96.48
309					97.5% Chebyshev(Mean, Sd) UCL	106.8				99% Chebyshev(Mean, Sd) UCL		127
310												
311					Suggested UCL to Use							
312					95% Student's-t UCL	82.5				or 95% Modified-t UCL		82.22
313												
314					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
315					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
316					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
317					For additional insight the user may want to consult a statistician.							
318												
319					Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
320					reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.							
321												
322												
323	Cobalt											
324												
325					General Statistics							
326					Total Number of Observations	12				Number of Distinct Observations		1
327										Number of Missing Observations		0
328					Minimum	16.2				Mean		16.2
329					Maximum	16.2				Median		16.2
330												
331					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
332					ProUCL (or any other software) should not be used on such a data set!							
333					The data set for variable Cobalt was not processed!							
334												
335					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
336					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
337												
338												
339												

	A	B	C	D	E	F	G	H	I	J	K	L
340	Copper											
341												
342						General Statistics						
343					Total Number of Observations	12				Number of Distinct Observations		11
344										Number of Missing Observations		0
345					Minimum	22.41				Mean		289.3
346					Maximum	793.2				Median		285.8
347					SD	257.6				Std. Error of Mean		74.37
348					Coefficient of Variation	0.89				Skewness		0.939
349												
350						Normal GOF Test						
351					Shapiro Wilk Test Statistic	0.862				Shapiro Wilk GOF Test		
352					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
353					Lilliefors Test Statistic	0.216				Lilliefors GOF Test		
354					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
355						Data appear Normal at 5% Significance Level						
356												
357						Assuming Normal Distribution						
358					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
359					95% Student's-t UCL	422.9				95% Adjusted-CLT UCL (Chen-1995)		433.2
360										95% Modified-t UCL (Johnson-1978)		426.3
361												
362						Gamma GOF Test						
363					A-D Test Statistic	0.6				Anderson-Darling Gamma GOF Test		
364					5% A-D Critical Value	0.756				Detected data appear Gamma Distributed at 5% Significance Level		
365					K-S Test Statistic	0.202				Kolmogrov-Smirnoff Gamma GOF Test		
366					5% K-S Critical Value	0.252				Detected data appear Gamma Distributed at 5% Significance Level		
367						Detected data appear Gamma Distributed at 5% Significance Level						
368												
369						Gamma Statistics						
370					k hat (MLE)	1.05				k star (bias corrected MLE)		0.843
371					Theta hat (MLE)	275.5				Theta star (bias corrected MLE)		343.2
372					nu hat (MLE)	25.2				nu star (bias corrected)		20.24
373					MLE Mean (bias corrected)	289.3				MLE Sd (bias corrected)		315.1
374										Approximate Chi Square Value (0.05)		11.03
375					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		10
376												
377						Assuming Gamma Distribution						
378					95% Approximate Gamma UCL (use when n>=50))	531.1				95% Adjusted Gamma UCL (use when n<50)		585.4
379												
380						Lognormal GOF Test						
381					Shapiro Wilk Test Statistic	0.866				Shapiro Wilk Lognormal GOF Test		
382					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
383					Lilliefors Test Statistic	0.244				Lilliefors Lognormal GOF Test		
384					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
385						Data appear Lognormal at 5% Significance Level						
386												
387						Lognormal Statistics						
388					Minimum of Logged Data	3.11				Mean of logged Data		5.121
389					Maximum of Logged Data	6.676				SD of logged Data		1.258
390												

	A	B	C	D	E	F	G	H	I	J	K	L
391	**Assuming Lognormal Distribution**											
392					95% H-UCL	1343				90% Chebyshev (MVUE) UCL		728.5
393					95% Chebyshev (MVUE) UCL	907.4				97.5% Chebyshev (MVUE) UCL		1156
394					99% Chebyshev (MVUE) UCL	1643						
395												
396	**Nonparametric Distribution Free UCL Statistics**											
397	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
398												
399	**Nonparametric Distribution Free UCLs**											
400					95% CLT UCL	411.7				95% Jackknife UCL		422.9
401					95% Standard Bootstrap UCL	404				95% Bootstrap-t UCL		463
402					95% Hall's Bootstrap UCL	550.6				95% Percentile Bootstrap UCL		405.8
403					95% BCA Bootstrap UCL	423.8						
404					90% Chebyshev(Mean, Sd) UCL	512.4				95% Chebyshev(Mean, Sd) UCL		613.5
405					97.5% Chebyshev(Mean, Sd) UCL	753.8				99% Chebyshev(Mean, Sd) UCL		1029
406												
407	**Suggested UCL to Use**											
408					95% Student's-t UCL	422.9						
409												
410	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
411	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
412	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
413	For additional insight the user may want to consult a statistician.											
414												
415												

	A	B	C	D	E	F	G	H	I	J	K	L
416	Iron											
417												
418					General Statistics							
419					Total Number of Observations	12				Number of Distinct Observations		12
420										Number of Missing Observations		0
421					Minimum	12350				Mean		23969
422					Maximum	54500				Median		18474
423					SD	13140				Std. Error of Mean		3793
424					Coefficient of Variation	0.548				Skewness		1.477
425												
426					Normal GOF Test							
427					Shapiro Wilk Test Statistic	0.791				Shapiro Wilk GOF Test		
428					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
429					Lilliefors Test Statistic	0.278				Lilliefors GOF Test		
430					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
431					Data Not Normal at 5% Significance Level							
432												
433					Assuming Normal Distribution							
434					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
435					95% Student's-t UCL	30781				95% Adjusted-CLT UCL (Chen-1995)		31937
436										95% Modified-t UCL (Johnson-1978)		31051
437												
438					Gamma GOF Test							
439					A-D Test Statistic	0.815				Anderson-Darling Gamma GOF Test		
440					5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level		
441					K-S Test Statistic	0.234				Kolmogrov-Smirnoff Gamma GOF Test		
442					5% K-S Critical Value	0.246				Detected data appear Gamma Distributed at 5% Significance Level		
443					Detected data follow Appr. Gamma Distribution at 5% Significance Level							
444												
445					Gamma Statistics							
446					k hat (MLE)	4.613				k star (bias corrected MLE)		3.515
447					Theta hat (MLE)	5196				Theta star (bias corrected MLE)		6819
448					nu hat (MLE)	110.7				nu star (bias corrected)		84.36
449					MLE Mean (bias corrected)	23969				MLE Sd (bias corrected)		12785
450										Approximate Chi Square Value (0.05)		64.19
451					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		61.51
452												
453					Assuming Gamma Distribution							
454					95% Approximate Gamma UCL (use when n>=50)	31500				95% Adjusted Gamma UCL (use when n<50)		32872
455												
456					Lognormal GOF Test							
457					Shapiro Wilk Test Statistic	0.887				Shapiro Wilk Lognormal GOF Test		
458					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
459					Lilliefors Test Statistic	0.204				Lilliefors Lognormal GOF Test		
460					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
461					Data appear Lognormal at 5% Significance Level							
462												
463					Lognormal Statistics							
464					Minimum of Logged Data	9.421				Mean of logged Data		9.972
465					Maximum of Logged Data	10.91				SD of logged Data		0.471
466												

	A	B	C	D	E	F	G	H	I	J	K	L
467	Assuming Lognormal Distribution											
468					95% H-UCL	32296				90% Chebyshev (MVUE) UCL		33583
469					95% Chebyshev (MVUE) UCL	38059				97.5% Chebyshev (MVUE) UCL		44271
470					99% Chebyshev (MVUE) UCL	56475						
471												
472	Nonparametric Distribution Free UCL Statistics											
473	Data appear to follow a Discernible Distribution at 5% Significance Level											
474												
475	Nonparametric Distribution Free UCLs											
476					95% CLT UCL	30209				95% Jackknife UCL		30781
477					95% Standard Bootstrap UCL	29802				95% Bootstrap-t UCL		34286
478					95% Hall's Bootstrap UCL	30622				95% Percentile Bootstrap UCL		30656
479					95% BCA Bootstrap UCL	32197						
480					90% Chebyshev(Mean, Sd) UCL	35349				95% Chebyshev(Mean, Sd) UCL		40504
481					97.5% Chebyshev(Mean, Sd) UCL	47658				99% Chebyshev(Mean, Sd) UCL		61712
482												
483	Suggested UCL to Use											
484					95% Adjusted Gamma UCL	32872						
485												
486	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
487	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
488	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
489	For additional insight the user may want to consult a statistician.											
490												
491												
492	Neptunium-237											
493												
494	General Statistics											
495					Total Number of Observations	12				Number of Distinct Observations		1
496										Number of Missing Observations		0
497					Minimum	0.64				Mean		0.64
498					Maximum	0.64				Median		0.64
499												
500	Warning: There is only one distinct observation value in this data set - resulting in '0' variance!											
501	ProUCL (or any other software) should not be used on such a data set!											
502	The data set for variable Neptunium-237 was not processed!											
503												
504	If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.											
505	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
506												
507												
508												

	A	B	C	D	E	F	G	H	I	J	K	L
509	Nickel											
510												
511						General Statistics						
512					Total Number of Observations	12				Number of Distinct Observations		11
513										Number of Missing Observations		0
514					Minimum	65				Mean		215.5
515					Maximum	616.5				Median		168.4
516					SD	163.4				Std. Error of Mean		47.18
517					Coefficient of Variation	0.758				Skewness		1.464
518												
519						Normal GOF Test						
520					Shapiro Wilk Test Statistic	0.855				Shapiro Wilk GOF Test		
521					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
522					Lilliefors Test Statistic	0.18				Lilliefors GOF Test		
523					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
524						Data appear Approximate Normal at 5% Significance Level						
525												
526						Assuming Normal Distribution						
527					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
528					95% Student's-t UCL	300.3				95% Adjusted-CLT UCL (Chen-1995)		314.5
529										95% Modified-t UCL (Johnson-1978)		303.6
530												
531						Gamma GOF Test						
532					A-D Test Statistic	0.281				Anderson-Darling Gamma GOF Test		
533					5% A-D Critical Value	0.741				Detected data appear Gamma Distributed at 5% Significance Level		
534					K-S Test Statistic	0.141				Kolmogrov-Smirnoff Gamma GOF Test		
535					5% K-S Critical Value	0.248				Detected data appear Gamma Distributed at 5% Significance Level		
536						Detected data appear Gamma Distributed at 5% Significance Level						
537												
538						Gamma Statistics						
539					k hat (MLE)	2.184				k star (bias corrected MLE)		1.693
540					Theta hat (MLE)	98.7				Theta star (bias corrected MLE)		127.3
541					nu hat (MLE)	52.41				nu star (bias corrected)		40.64
542					MLE Mean (bias corrected)	215.5				MLE Sd (bias corrected)		165.6
543										Approximate Chi Square Value (0.05)		27.03
544					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		25.35
545												
546						Assuming Gamma Distribution						
547					95% Approximate Gamma UCL (use when n>=50))	324				95% Adjusted Gamma UCL (use when n<50)		345.6
548												
549						Lognormal GOF Test						
550					Shapiro Wilk Test Statistic	0.949				Shapiro Wilk Lognormal GOF Test		
551					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
552					Lilliefors Test Statistic	0.13				Lilliefors Lognormal GOF Test		
553					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
554						Data appear Lognormal at 5% Significance Level						
555												
556						Lognormal Statistics						
557					Minimum of Logged Data	4.174				Mean of logged Data		5.127
558					Maximum of Logged Data	6.424				SD of logged Data		0.736
559												

	A	B	C	D	E	F	G	H	I	J	K	L
560	Assuming Lognormal Distribution											
561					95% H-UCL	381.8				90% Chebyshev (MVUE) UCL		358.1
562					95% Chebyshev (MVUE) UCL	422.9				97.5% Chebyshev (MVUE) UCL		512.9
563					99% Chebyshev (MVUE) UCL	689.7						
564												
565	Nonparametric Distribution Free UCL Statistics											
566	Data appear to follow a Discernible Distribution at 5% Significance Level											
567												
568	Nonparametric Distribution Free UCLs											
569					95% CLT UCL	293.1				95% Jackknife UCL		300.3
570					95% Standard Bootstrap UCL	291.3				95% Bootstrap-t UCL		342.8
571					95% Hall's Bootstrap UCL	368.2				95% Percentile Bootstrap UCL		294.8
572					95% BCA Bootstrap UCL	312.9						
573					90% Chebyshev(Mean, Sd) UCL	357.1				95% Chebyshev(Mean, Sd) UCL		421.2
574					97.5% Chebyshev(Mean, Sd) UCL	510.2				99% Chebyshev(Mean, Sd) UCL		685
575												
576	Suggested UCL to Use											
577					95% Student's-t UCL	300.3						
578												
579	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
580	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
581	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
582	For additional insight the user may want to consult a statistician.											
583												
584												
585	PAH, Total											
586												
587	General Statistics											
588					Total Number of Observations	12				Number of Distinct Observations		1
589										Number of Missing Observations		0
590					Minimum	1.386				Mean		1.386
591					Maximum	1.386				Median		1.386
592												
593	Warning: There is only one distinct observation value in this data set - resulting in '0' variance!											
594	ProUCL (or any other software) should not be used on such a data set!											
595	The data set for variable PAH, Total was not processed!											
596												
597	If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.											
598	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
599												
600												
601												

	A	B	C	D	E	F	G	H	I	J	K	L
602	PCB, Total											
603												
604						General Statistics						
605					Total Number of Observations	12				Number of Distinct Observations		2
606										Number of Missing Observations		0
607					Minimum	5				Mean		5.417
608					Maximum	10				Median		5
609					SD	1.443				Std. Error of Mean		0.417
610					Coefficient of Variation	0.266				Skewness		3.464
611												
612						Normal GOF Test						
613					Shapiro Wilk Test Statistic	0.327				Shapiro Wilk GOF Test		
614					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
615					Lilliefors Test Statistic	0.53				Lilliefors GOF Test		
616					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
617						Data Not Normal at 5% Significance Level						
618												
619						Assuming Normal Distribution						
620					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
621					95% Student's-t UCL	6.165				95% Adjusted-CLT UCL (Chen-1995)		6.547
622										95% Modified-t UCL (Johnson-1978)		6.234
623												
624						Gamma GOF Test						
625					A-D Test Statistic	4.092				Anderson-Darling Gamma GOF Test		
626					5% A-D Critical Value	0.732				Data Not Gamma Distributed at 5% Significance Level		
627					K-S Test Statistic	0.536				Kolmogrov-Smirnoff Gamma GOF Test		
628					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
629						Data Not Gamma Distributed at 5% Significance Level						
630												
631						Gamma Statistics						
632					k hat (MLE)	22.61				k star (bias corrected MLE)		17.01
633					Theta hat (MLE)	0.24				Theta star (bias corrected MLE)		0.318
634					nu hat (MLE)	542.6				nu star (bias corrected)		408.3
635					MLE Mean (bias corrected)	5.417				MLE Sd (bias corrected)		1.313
636										Approximate Chi Square Value (0.05)		362.4
637					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		355.8
638												
639						Assuming Gamma Distribution						
640					95% Approximate Gamma UCL (use when n>=50))	6.102				95% Adjusted Gamma UCL (use when n<50)		6.215
641												
642						Lognormal GOF Test						
643					Shapiro Wilk Test Statistic	0.327				Shapiro Wilk Lognormal GOF Test		
644					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
645					Lilliefors Test Statistic	0.53				Lilliefors Lognormal GOF Test		
646					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
647						Data Not Lognormal at 5% Significance Level						
648												
649						Lognormal Statistics						
650					Minimum of Logged Data	1.609				Mean of logged Data		1.667
651					Maximum of Logged Data	2.303				SD of logged Data		0.2
652												

	A	B	C	D	E	F	G	H	I	J	K	L
653					Assuming Lognormal Distribution							
654					95% H-UCL	6.04				90% Chebyshev (MVUE) UCL		6.334
655				95% Chebyshev (MVUE) UCL		6.759				97.5% Chebyshev (MVUE) UCL		7.35
656				99% Chebyshev (MVUE) UCL		8.509						
657												
658					Nonparametric Distribution Free UCL Statistics							
659					Data do not follow a Discernible Distribution (0.05)							
660												
661					Nonparametric Distribution Free UCLs							
662					95% CLT UCL	6.102				95% Jackknife UCL		N/A
663				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
664				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
665				95% BCA Bootstrap UCL		N/A						
666				90% Chebyshev(Mean, Sd) UCL		6.667				95% Chebyshev(Mean, Sd) UCL		7.233
667				97.5% Chebyshev(Mean, Sd) UCL		8.019				99% Chebyshev(Mean, Sd) UCL		9.562
668												
669					Suggested UCL to Use							
670					95% Student's-t UCL	6.165				or 95% Modified-t UCL		6.234
671												
672	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
673	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
674	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
675	For additional insight the user may want to consult a statistician.											
676												
677												

	A	B	C	D	E	F	G	H	I	J	K	L
678	Uranium											
679												
680						General Statistics						
681					Total Number of Observations	12				Number of Distinct Observations		9
682										Number of Missing Observations		0
683					Minimum	20				Mean		46.8
684					Maximum	112				Median		32.72
685					SD	31.18				Std. Error of Mean		9
686					Coefficient of Variation	0.666				Skewness		1.001
687												
688						Normal GOF Test						
689					Shapiro Wilk Test Statistic	0.829				Shapiro Wilk GOF Test		
690					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
691					Lilliefors Test Statistic	0.255				Lilliefors GOF Test		
692					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
693						Data appear Approximate Normal at 5% Significance Level						
694												
695						Assuming Normal Distribution						
696					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
697					95% Student's-t UCL	62.96				95% Adjusted-CLT UCL (Chen-1995)		64.38
698										95% Modified-t UCL (Johnson-1978)		63.4
699												
700						Gamma GOF Test						
701					A-D Test Statistic	0.731				Anderson-Darling Gamma GOF Test		
702					5% A-D Critical Value	0.74				Detected data appear Gamma Distributed at 5% Significance Level		
703					K-S Test Statistic	0.217				Kolmogrov-Smirnoff Gamma GOF Test		
704					5% K-S Critical Value	0.248				Detected data appear Gamma Distributed at 5% Significance Level		
705						Detected data appear Gamma Distributed at 5% Significance Level						
706												
707						Gamma Statistics						
708					k hat (MLE)	2.761				k star (bias corrected MLE)		2.126
709					Theta hat (MLE)	16.95				Theta star (bias corrected MLE)		22.01
710					nu hat (MLE)	66.27				nu star (bias corrected)		51.04
711					MLE Mean (bias corrected)	46.8				MLE Sd (bias corrected)		32.09
712										Approximate Chi Square Value (0.05)		35.63
713					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		33.67
714												
715						Assuming Gamma Distribution						
716					95% Approximate Gamma UCL (use when n>=50))	67.04				95% Adjusted Gamma UCL (use when n<50)		70.93
717												
718						Lognormal GOF Test						
719					Shapiro Wilk Test Statistic	0.871				Shapiro Wilk Lognormal GOF Test		
720					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
721					Lilliefors Test Statistic	0.182				Lilliefors Lognormal GOF Test		
722					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
723						Data appear Lognormal at 5% Significance Level						
724												
725						Lognormal Statistics						
726					Minimum of Logged Data	2.996				Mean of logged Data		3.654
727					Maximum of Logged Data	4.718				SD of logged Data		0.637
728												

	A	B	C	D	E	F	G	H	I	J	K	L
729					Assuming Lognormal Distribution							
730					95% H-UCL	73.98			90% Chebyshev (MVUE) UCL			72.97
731				95% Chebyshev (MVUE) UCL		84.99			97.5% Chebyshev (MVUE) UCL			101.7
732				99% Chebyshev (MVUE) UCL		134.5						
733												
734					Nonparametric Distribution Free UCL Statistics							
735					Data appear to follow a Discernible Distribution at 5% Significance Level							
736												
737					Nonparametric Distribution Free UCLs							
738					95% CLT UCL	61.6			95% Jackknife UCL			62.96
739				95% Standard Bootstrap UCL		61.14			95% Bootstrap-t UCL			67.8
740				95% Hall's Bootstrap UCL		62.04			95% Percentile Bootstrap UCL			61.98
741				95% BCA Bootstrap UCL		63.16						
742				90% Chebyshev(Mean, Sd) UCL		73.8			95% Chebyshev(Mean, Sd) UCL			86.03
743				97.5% Chebyshev(Mean, Sd) UCL		103			99% Chebyshev(Mean, Sd) UCL			136.3
744												
745					Suggested UCL to Use							
746					95% Student's-t UCL	62.96						
747												
748					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
749					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
750					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
751					For additional insight the user may want to consult a statistician.							
752												
753												
754	Uranium-234											
755												
756					General Statistics							
757					Total Number of Observations	12			Number of Distinct Observations			1
758									Number of Missing Observations			0
759					Minimum	8.74			Mean			8.74
760					Maximum	8.74			Median			8.74
761												
762					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
763					ProUCL (or any other software) should not be used on such a data set!							
764					The data set for variable Uranium-234 was not processed!							
765												
766					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
767					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
768												
769												
770												

	A	B	C	D	E	F	G	H	I	J	K	L
771	Uranium-235											
772												
773						General Statistics						
774					Total Number of Observations	12				Number of Distinct Observations		1
775										Number of Missing Observations		0
776					Minimum	0.57				Mean		0.57
777					Maximum	0.57				Median		0.57
778												
779						Warning: There is only one distinct observation value in this data set - resulting in '0' variance!						
780						ProUCL (or any other software) should not be used on such a data set!						
781						The data set for variable Uranium-235 was not processed!						
782												
783						If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.						
784						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
785												
786												
787												
788	Uranium-238											
789												
790						General Statistics						
791					Total Number of Observations	12				Number of Distinct Observations		1
792										Number of Missing Observations		0
793					Minimum	15.4				Mean		15.4
794					Maximum	15.4				Median		15.4
795												
796						Warning: There is only one distinct observation value in this data set - resulting in '0' variance!						
797						ProUCL (or any other software) should not be used on such a data set!						
798						The data set for variable Uranium-238 was not processed!						
799												
800						If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.						
801						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
802												
803												