	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 11:22:05 AM								
5	From File			EPC_015Surf_EU01.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		9
15										Number of Missing Observations		0
16					Minimum	30				Mean		59.35
17					Maximum	106				Median		47.07
18					SD	29.97				Std. Error of Mean		8.652
19					Coefficient of Variation	0.505				Skewness		0.463
20												
21						Normal GOF Test						
22					Shapiro Wilk Test Statistic	0.847				Shapiro Wilk GOF Test		
23					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
24					Lilliefors Test Statistic	0.205				Lilliefors GOF Test		
25					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
26						Data appear Approximate 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	74.89				95% Adjusted-CLT UCL (Chen-1995)		74.82
31										95% Modified-t UCL (Johnson-1978)		75.08
32												
33						Gamma GOF Test						
34					A-D Test Statistic	0.744				Anderson-Darling Gamma GOF Test		
35					5% A-D Critical Value	0.735				Data Not Gamma Distributed at 5% Significance Level		
36					K-S Test Statistic	0.198				Kolmogrov-Smirnoff Gamma GOF Test		
37					5% K-S Critical Value	0.246				Detected data appear Gamma Distributed at 5% Significance Level		
38						Detected data follow Appr. Gamma Distribution at 5% Significance Level						
39												
40						Gamma Statistics						
41					k hat (MLE)	4.308				k star (bias corrected MLE)		3.287
42					Theta hat (MLE)	13.78				Theta star (bias corrected MLE)		18.06
43					nu hat (MLE)	103.4				nu star (bias corrected)		78.88
44					MLE Mean (bias corrected)	59.35				MLE Sd (bias corrected)		32.74
45										Approximate Chi Square Value (0.05)		59.42
46					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		56.84
47												
48						Assuming Gamma Distribution						
49					95% Approximate Gamma UCL (use when n>=50))	78.79				95% Adjusted Gamma UCL (use when n<50)		82.36
50												
51						Lognormal GOF Test						
52					Shapiro Wilk Test Statistic	0.853				Shapiro Wilk Lognormal GOF Test		
53					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
54					Lilliefors Test Statistic	0.195				Lilliefors Lognormal GOF Test		
55					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
56						Data appear Approximate Lognormal at 5% Significance Level						
57												
58						Lognormal Statistics						
59					Minimum of Logged Data	3.401				Mean of logged Data		3.963
60					Maximum of Logged Data	4.663				SD of logged Data		0.515
61												

	A	B	C	D	E	F	G	H	I	J	K	L
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	84.05				90% Chebyshev (MVUE) UCL		86.51
64					95% Chebyshev (MVUE) UCL	98.81				97.5% Chebyshev (MVUE) UCL		115.9
65					99% Chebyshev (MVUE) UCL	149.4						
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	73.58				95% Jackknife UCL		74.89
72					95% Standard Bootstrap UCL	72.81				95% Bootstrap-t UCL		77.52
73					95% Hall's Bootstrap UCL	71.79				95% Percentile Bootstrap UCL		72.71
74					95% BCA Bootstrap UCL	74.11						
75					90% Chebyshev(Mean, Sd) UCL	85.31				95% Chebyshev(Mean, Sd) UCL		97.06
76					97.5% Chebyshev(Mean, Sd) UCL	113.4				99% Chebyshev(Mean, Sd) UCL		145.4
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	74.89						
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		11
91										Number of Missing Observations		0
92					Minimum	7.35				Mean		10.66
93					Maximum	20.04				Median		10.37
94					SD	3.293				Std. Error of Mean		0.951
95					Coefficient of Variation	0.309				Skewness		2.282
96												
97						Normal GOF Test						
98					Shapiro Wilk Test Statistic	0.752				Shapiro Wilk GOF Test		
99					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
100					Lilliefors Test Statistic	0.292				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	12.37				95% Adjusted-CLT UCL (Chen-1995)		12.89
107										95% Modified-t UCL (Johnson-1978)		12.47
108												
109						Gamma GOF Test						
110					A-D Test Statistic	0.705				Anderson-Darling Gamma GOF Test		
111					5% A-D Critical Value	0.731				Detected data appear Gamma Distributed at 5% Significance Level		
112					K-S Test Statistic	0.251				Kolmogrov-Smirnoff Gamma GOF Test		
113					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
114						Detected data follow Appr. Gamma Distribution at 5% Significance Level						
115												
116						Gamma Statistics						
117					k hat (MLE)	14.66				k star (bias corrected MLE)		11.05
118					Theta hat (MLE)	0.727				Theta star (bias corrected MLE)		0.965
119					nu hat (MLE)	351.8				nu star (bias corrected)		265.2
120					MLE Mean (bias corrected)	10.66				MLE Sd (bias corrected)		3.207
121										Approximate Chi Square Value (0.05)		228.5
122					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		223.3
123												
124						Assuming Gamma Distribution						
125					95% Approximate Gamma UCL (use when n>=50)	12.37				95% Adjusted Gamma UCL (use when n<50)		12.66
126												
127						Lognormal GOF Test						
128					Shapiro Wilk Test Statistic	0.874				Shapiro Wilk Lognormal GOF Test		
129					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
130					Lilliefors Test Statistic	0.234				Lilliefors Lognormal GOF Test		
131					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
132						Data appear Lognormal at 5% Significance Level						
133												
134						Lognormal Statistics						
135					Minimum of Logged Data	1.995				Mean of logged Data		2.332
136					Maximum of Logged Data	2.998				SD of logged Data		0.261
137												

	A	B	C	D	E	F	G	H	I	J	K	L
138	Assuming Lognormal Distribution											
139					95% H-UCL	12.36				90% Chebyshev (MVUE) UCL		13.04
140					95% Chebyshev (MVUE) UCL	14.13				97.5% Chebyshev (MVUE) UCL		15.65
141					99% Chebyshev (MVUE) UCL	18.64						
142												
143	Nonparametric Distribution Free UCL Statistics											
144	Data appear to follow a Discernible Distribution at 5% Significance Level											
145												
146	Nonparametric Distribution Free UCLs											
147					95% CLT UCL	12.23				95% Jackknife UCL		12.37
148					95% Standard Bootstrap UCL	12.2				95% Bootstrap-t UCL		13.63
149					95% Hall's Bootstrap UCL	19.58				95% Percentile Bootstrap UCL		12.24
150					95% BCA Bootstrap UCL	13.01						
151					90% Chebyshev(Mean, Sd) UCL	13.51				95% Chebyshev(Mean, Sd) UCL		14.81
152					97.5% Chebyshev(Mean, Sd) UCL	16.6				99% Chebyshev(Mean, Sd) UCL		20.12
153												
154	Suggested UCL to Use											
155					95% Adjusted Gamma UCL	12.66						
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		3
167										Number of Missing Observations		0
168					Minimum	0.16				Mean		11.18
169					Maximum	14.01				Median		12
170					SD	3.518				Std. Error of Mean		1.016
171					Coefficient of Variation	0.315				Skewness		-3.282
172												
173						Normal GOF Test						
174					Shapiro Wilk Test Statistic	0.422				Shapiro Wilk GOF Test		
175					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
176					Lilliefors Test Statistic	0.509				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				95% Adjusted-CLT UCL (Chen-1995)		11.82
183										95% Modified-t UCL (Johnson-1978)		12.84
184												
185						Gamma GOF Test						
186					A-D Test Statistic	3.986				Anderson-Darling Gamma GOF Test		
187					5% A-D Critical Value	0.742				Data Not Gamma Distributed at 5% Significance Level		
188					K-S Test Statistic	0.549				Kolmogrov-Smirnoff Gamma GOF Test		
189					5% K-S Critical Value	0.249				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)	1.961				k star (bias corrected MLE)		1.526
194					Theta hat (MLE)	5.702				Theta star (bias corrected MLE)		7.326
195					nu hat (MLE)	47.06				nu star (bias corrected)		36.63
196					MLE Mean (bias corrected)	11.18				MLE Sd (bias corrected)		9.051
197										Approximate Chi Square Value (0.05)		23.77
198					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		22.2
199												
200						Assuming Gamma Distribution						
201					95% Approximate Gamma UCL (use when n>=50))	17.23				95% Adjusted Gamma UCL (use when n<50)		18.44
202												
203						Lognormal GOF Test						
204					Shapiro Wilk Test Statistic	0.348				Shapiro Wilk Lognormal GOF Test		
205					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
206					Lilliefors Test Statistic	0.526				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	-1.833				Mean of logged Data		2.138
212					Maximum of Logged Data	2.64				SD of logged Data		1.251
213												

	A	B	C	D	E	F	G	H	I	J	K	L
214					Assuming Lognormal Distribution							
215					95% H-UCL	66.7				90% Chebyshev (MVUE) UCL		36.54
216					95% Chebyshev (MVUE) UCL	45.49				97.5% Chebyshev (MVUE) UCL		57.92
217					99% Chebyshev (MVUE) UCL	82.32						
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	12.85				95% Jackknife UCL		13
224					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
225					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
226					95% BCA Bootstrap UCL	N/A						
227					90% Chebyshev(Mean, Sd) UCL	14.23				95% Chebyshev(Mean, Sd) UCL		15.61
228					97.5% Chebyshev(Mean, Sd) UCL	17.52				99% Chebyshev(Mean, Sd) UCL		21.29
229												
230					Suggested UCL to Use							
231					95% Chebyshev (Mean, Sd) UCL	15.61						
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	36.75				Mean		71.47
250					Maximum	85				Median		85
251					SD	20.49				Std. Error of Mean		5.916
252					Coefficient of Variation	0.287				Skewness		-0.973
253												
254					Normal GOF Test							
255					Shapiro Wilk Test Statistic	0.667				Shapiro Wilk GOF Test		
256					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
257					Lilliefors Test Statistic	0.412				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	82.09				95% Adjusted-CLT UCL (Chen-1995)		79.42
264										95% Modified-t UCL (Johnson-1978)		81.82
265												
266					Gamma GOF Test							
267					A-D Test Statistic	2.014				Anderson-Darling Gamma GOF Test		
268					5% A-D Critical Value	0.73				Data Not Gamma Distributed at 5% Significance Level		
269					K-S Test Statistic	0.42				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)	10.67				k star (bias corrected MLE)		8.056
275					Theta hat (MLE)	6.7				Theta star (bias corrected MLE)		8.871
276					nu hat (MLE)	256				nu star (bias corrected)		193.4
277					MLE Mean (bias corrected)	71.47				MLE Sd (bias corrected)		25.18
278										Approximate Chi Square Value (0.05)		162.2
279					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		157.8
280												
281					Assuming Gamma Distribution							
282					95% Approximate Gamma UCL (use when n>=50))	85.2				95% Adjusted Gamma UCL (use when n<50)		87.55
283												
284					Lognormal GOF Test							
285					Shapiro Wilk Test Statistic	0.675				Shapiro Wilk Lognormal GOF Test		
286					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
287					Lilliefors Test Statistic	0.408				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	3.604				Mean of logged Data		4.222
293					Maximum of Logged Data	4.443				SD of logged Data		0.341
294												

	A	B	C	D	E	F	G	H	I	J	K	L
295					Assuming Lognormal Distribution							
296					95% H-UCL	88.41				90% Chebyshev (MVUE) UCL		93.33
297					95% Chebyshev (MVUE) UCL	103.1				97.5% Chebyshev (MVUE) UCL		116.6
298					99% Chebyshev (MVUE) UCL	143.1						
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	81.2				95% Jackknife UCL		82.09
305					95% Standard Bootstrap UCL	80.45				95% Bootstrap-t UCL		80.46
306					95% Hall's Bootstrap UCL	79.18				95% Percentile Bootstrap UCL		80.18
307					95% BCA Bootstrap UCL	79.32						
308					90% Chebyshev(Mean, Sd) UCL	89.22				95% Chebyshev(Mean, Sd) UCL		97.26
309					97.5% Chebyshev(Mean, Sd) UCL	108.4				99% Chebyshev(Mean, Sd) UCL		130.3
310												
311					Suggested UCL to Use							
312					95% Student's-t UCL	82.09				or 95% Modified-t UCL		81.82
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												

	A	B	C	D	E	F	G	H	I	J	K	L
323	Iron											
324												
325					General Statistics							
326					Total Number of Observations	12				Number of Distinct Observations		12
327										Number of Missing Observations		0
328					Minimum	17604				Mean		26223
329					Maximum	37400				Median		26235
330					SD	6365				Std. Error of Mean		1837
331					Coefficient of Variation	0.243				Skewness		0.609
332												
333					Normal GOF Test							
334					Shapiro Wilk Test Statistic	0.93				Shapiro Wilk GOF Test		
335					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
336					Lilliefors Test Statistic	0.122				Lilliefors GOF Test		
337					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
338					Data appear Normal at 5% Significance Level							
339												
340					Assuming Normal Distribution							
341					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
342					95% Student's-t UCL	29523				95% Adjusted-CLT UCL (Chen-1995)		29590
343										95% Modified-t UCL (Johnson-1978)		29577
344												
345					Gamma GOF Test							
346					A-D Test Statistic	0.267				Anderson-Darling Gamma GOF Test		
347					5% A-D Critical Value	0.732				Detected data appear Gamma Distributed at 5% Significance Level		
348					K-S Test Statistic	0.127				Kolmogrov-Smirnoff Gamma GOF Test		
349					5% K-S Critical Value	0.245				Detected data appear Gamma Distributed at 5% Significance Level		
350					Detected data appear Gamma Distributed at 5% Significance Level							
351												
352					Gamma Statistics							
353					k hat (MLE)	19.18				k star (bias corrected MLE)		14.44
354					Theta hat (MLE)	1367				Theta star (bias corrected MLE)		1816
355					nu hat (MLE)	460.4				nu star (bias corrected)		346.7
356					MLE Mean (bias corrected)	26223				MLE Sd (bias corrected)		6900
357										Approximate Chi Square Value (0.05)		304.5
358					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		298.5
359												
360					Assuming Gamma Distribution							
361					95% Approximate Gamma UCL (use when n>=50))	29852				95% Adjusted Gamma UCL (use when n<50)		30455
362												
363					Lognormal GOF Test							
364					Shapiro Wilk Test Statistic	0.958				Shapiro Wilk Lognormal GOF Test		
365					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
366					Lilliefors Test Statistic	0.115				Lilliefors Lognormal GOF Test		
367					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
368					Data appear Lognormal at 5% Significance Level							
369												
370					Lognormal Statistics							
371					Minimum of Logged Data	9.776				Mean of logged Data		10.15
372					Maximum of Logged Data	10.53				SD of logged Data		0.238
373												

	A	B	C	D	E	F	G	H	I	J	K	L
374	**Assuming Lognormal Distribution**											
375					95% H-UCL	30068			90% Chebyshev (MVUE) UCL			31661
376					95% Chebyshev (MVUE) UCL	34128			97.5% Chebyshev (MVUE) UCL			37551
377					99% Chebyshev (MVUE) UCL	44277						
378												
379	**Nonparametric Distribution Free UCL Statistics**											
380	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
381												
382	**Nonparametric Distribution Free UCLs**											
383					95% CLT UCL	29245			95% Jackknife UCL			29523
384					95% Standard Bootstrap UCL	29062			95% Bootstrap-t UCL			30305
385					95% Hall's Bootstrap UCL	30512			95% Percentile Bootstrap UCL			29096
386					95% BCA Bootstrap UCL	29208						
387					90% Chebyshev(Mean, Sd) UCL	31735			95% Chebyshev(Mean, Sd) UCL			34232
388					97.5% Chebyshev(Mean, Sd) UCL	37698			99% Chebyshev(Mean, Sd) UCL			44506
389												
390	**Suggested UCL to Use**											
391					95% Student's-t UCL	29523						
392												
393	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
394	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
395	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
396	For additional insight the user may want to consult a statistician.											
397												
398												

	A	B	C	D	E	F	G	H	I	J	K	L
399	Nickel											
400												
401					General Statistics							
402					Total Number of Observations	12				Number of Distinct Observations		9
403										Number of Missing Observations		0
404					Minimum	61.44				Mean		102.1
405					Maximum	260.5				Median		83.77
406					SD	57.29				Std. Error of Mean		16.54
407					Coefficient of Variation	0.561				Skewness		2.217
408												
409					Normal GOF Test							
410					Shapiro Wilk Test Statistic	0.719				Shapiro Wilk GOF Test		
411					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
412					Lilliefors Test Statistic	0.254				Lilliefors GOF Test		
413					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
414					Data appear Approximate Normal at 5% Significance Level							
415												
416					Assuming Normal Distribution							
417					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
418					95% Student's-t UCL	131.8				95% Adjusted-CLT UCL (Chen-1995)		140.6
419										95% Modified-t UCL (Johnson-1978)		133.6
420												
421					Gamma GOF Test							
422					A-D Test Statistic	0.882				Anderson-Darling Gamma GOF Test		
423					5% A-D Critical Value	0.732				Data Not Gamma Distributed at 5% Significance Level		
424					K-S Test Statistic	0.222				Kolmogrov-Smirnoff Gamma GOF Test		
425					5% K-S Critical Value	0.246				Detected data appear Gamma Distributed at 5% Significance Level		
426					Detected data follow Appr. Gamma Distribution at 5% Significance Level							
427												
428					Gamma Statistics							
429					k hat (MLE)	5.017				k star (bias corrected MLE)		3.819
430					Theta hat (MLE)	20.36				Theta star (bias corrected MLE)		26.75
431					nu hat (MLE)	120.4				nu star (bias corrected)		91.64
432					MLE Mean (bias corrected)	102.1				MLE Sd (bias corrected)		52.27
433										Approximate Chi Square Value (0.05)		70.57
434					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		67.75
435												
436					Assuming Gamma Distribution							
437					95% Approximate Gamma UCL (use when n>=50))	132.6				95% Adjusted Gamma UCL (use when n<50)		138.2
438												
439					Lognormal GOF Test							
440					Shapiro Wilk Test Statistic	0.844				Shapiro Wilk Lognormal GOF Test		
441					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
442					Lilliefors Test Statistic	0.203				Lilliefors Lognormal GOF Test		
443					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
444					Data appear Approximate Lognormal at 5% Significance Level							
445												
446					Lognormal Statistics							
447					Minimum of Logged Data	4.118				Mean of logged Data		4.523
448					Maximum of Logged Data	5.563				SD of logged Data		0.439
449												

	A	B	C	D	E	F	G	H	I	J	K	L
450					Assuming Lognormal Distribution							
451					95% H-UCL	133.4				90% Chebyshev (MVUE) UCL		139.6
452					95% Chebyshev (MVUE) UCL	157.2				97.5% Chebyshev (MVUE) UCL		181.7
453					99% Chebyshev (MVUE) UCL	229.8						
454												
455					Nonparametric Distribution Free UCL Statistics							
456					Data appear to follow a Discernible Distribution at 5% Significance Level							
457												
458					Nonparametric Distribution Free UCLs							
459					95% CLT UCL	129.3				95% Jackknife UCL		131.8
460					95% Standard Bootstrap UCL	126.8				95% Bootstrap-t UCL		163.7
461					95% Hall's Bootstrap UCL	243.8				95% Percentile Bootstrap UCL		131.3
462					95% BCA Bootstrap UCL	142.2						
463					90% Chebyshev(Mean, Sd) UCL	151.7				95% Chebyshev(Mean, Sd) UCL		174.2
464					97.5% Chebyshev(Mean, Sd) UCL	205.4				99% Chebyshev(Mean, Sd) UCL		266.7
465												
466					Suggested UCL to Use							
467					95% Student's-t UCL	131.8						
468												
469					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
470					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
471					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
472					For additional insight the user may want to consult a statistician.							
473												
474												
475	PAH, Total											
476												
477					General Statistics							
478					Total Number of Observations	12				Number of Distinct Observations		1
479										Number of Missing Observations		0
480					Minimum	1.488				Mean		1.488
481					Maximum	1.488				Median		1.488
482												
483					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
484					ProUCL (or any other software) should not be used on such a data set!							
485					The data set for variable PAH, Total was not processed!							
486												
487					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
488					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
489												
490												
491												

	A	B	C	D	E	F	G	H	I	J	K	L
492	Thallium											
493												
494					General Statistics							
495					Total Number of Observations	12			Number of Distinct Observations			1
496									Number of Missing Observations			0
497					Minimum	0.24			Mean			0.24
498					Maximum	0.24			Median			0.24
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 Thallium 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	Uranium											
510												
511					General Statistics							
512					Total Number of Observations	12				Number of Distinct Observations		9
513										Number of Missing Observations		0
514					Minimum	6.9				Mean		22.33
515					Maximum	45.33				Median		20
516					SD	12.97				Std. Error of Mean		3.743
517					Coefficient of Variation	0.581				Skewness		0.846
518												
519					Normal GOF Test							
520					Shapiro Wilk Test Statistic	0.852				Shapiro Wilk GOF Test		
521					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
522					Lilliefors Test Statistic	0.321				Lilliefors GOF Test		
523					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
524					Data Not 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	29.05				95% Adjusted-CLT UCL (Chen-1995)		29.47
529										95% Modified-t UCL (Johnson-1978)		29.21
530												
531					Gamma GOF Test							
532					A-D Test Statistic	0.551				Anderson-Darling Gamma GOF Test		
533					5% A-D Critical Value	0.738				Detected data appear Gamma Distributed at 5% Significance Level		
534					K-S Test Statistic	0.255				Kolmogrov-Smirnoff Gamma GOF Test		
535					5% K-S Critical Value	0.247				Data Not Gamma Distributed at 5% Significance Level		
536					Detected data follow Appr. Gamma Distribution at 5% Significance Level							
537												
538					Gamma Statistics							
539					k hat (MLE)	3.315				k star (bias corrected MLE)		2.542
540					Theta hat (MLE)	6.736				Theta star (bias corrected MLE)		8.785
541					nu hat (MLE)	79.57				nu star (bias corrected)		61.01
542					MLE Mean (bias corrected)	22.33				MLE Sd (bias corrected)		14.01
543										Approximate Chi Square Value (0.05)		44.05
544					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		41.86
545												
546					Assuming Gamma Distribution							
547					95% Approximate Gamma UCL (use when n>=50)	30.93				95% Adjusted Gamma UCL (use when n<50)		32.55
548												
549					Lognormal GOF Test							
550					Shapiro Wilk Test Statistic	0.918				Shapiro Wilk Lognormal GOF Test		
551					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
552					Lilliefors Test Statistic	0.218				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	1.932				Mean of logged Data		2.948
558					Maximum of Logged Data	3.814				SD of logged Data		0.601
559												

	A	B	C	D	E	F	G	H	I	J	K	L
560					Assuming Lognormal Distribution							
561					95% H-UCL	34.48				90% Chebyshev (MVUE) UCL		34.52
562					95% Chebyshev (MVUE) UCL	39.98				97.5% Chebyshev (MVUE) UCL		47.57
563					99% Chebyshev (MVUE) UCL	62.48						
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	28.49				95% Jackknife UCL		29.05
570					95% Standard Bootstrap UCL	28.34				95% Bootstrap-t UCL		30.84
571					95% Hall's Bootstrap UCL	28.6				95% Percentile Bootstrap UCL		28.12
572					95% BCA Bootstrap UCL	29.29						
573					90% Chebyshev(Mean, Sd) UCL	33.56				95% Chebyshev(Mean, Sd) UCL		38.65
574					97.5% Chebyshev(Mean, Sd) UCL	45.71				99% Chebyshev(Mean, Sd) UCL		59.57
575												
576					Suggested UCL to Use							
577					95% Adjusted Gamma UCL	32.55						
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	Uranium-238											
586												
587					General Statistics							
588					Total Number of Observations	12				Number of Distinct Observations		1
589										Number of Missing Observations		0
590					Minimum	1.85				Mean		1.85
591					Maximum	1.85				Median		1.85
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 Uranium-238 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												