	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			3/3/2015 7:40:25 AM								
5	From File			EPC_015SubEU03R1.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
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					63.94	Mean					96.05
17	Maximum					168.7	Median					78.22
18	SD					36.46	Std. Error of Mean					10.53
19	Coefficient of Variation					0.38	Skewness					1.189
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.819	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.25	**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					115	95% Adjusted-CLT UCL (Chen-1995)					117.2
31							95% Modified-t UCL (Johnson-1978)					115.6
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					0.74	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.731	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.239	**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)					8.85	k star (bias corrected MLE)					6.693
42	Theta hat (MLE)					10.85	Theta star (bias corrected MLE)					14.35
43	nu hat (MLE)					212.4	nu star (bias corrected)					160.6
44	MLE Mean (bias corrected)					96.05	MLE Sd (bias corrected)					37.13
45							Approximate Chi Square Value (0.05)					132.3
46	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					128.4
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					116.6	95% Adjusted Gamma UCL (use when n<50)					120.1
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.871	**Shapiro Wilk Lognormal GOF Test**					

	A	B	C	D	E	F	G	H	I	J	K	L
53					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.221	**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	4.158	Mean of logged Data					4.507
60					Maximum of Logged Data	5.128	SD of logged Data					0.343
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	117.8	90% Chebyshev (MVUE) UCL					124.4
64					95% Chebyshev (MVUE) UCL	137.4	97.5% Chebyshev (MVUE) UCL					155.4
65					99% Chebyshev (MVUE) UCL	190.9						
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	113.4	95% Jackknife UCL					115
72					95% Standard Bootstrap UCL	112.4	95% Bootstrap-t UCL					124.7
73					95% Hall's Bootstrap UCL	121.2	95% Percentile Bootstrap UCL					114
74					95% BCA Bootstrap UCL	115.7						
75					90% Chebyshev(Mean, Sd) UCL	127.6	95% Chebyshev(Mean, Sd) UCL					141.9
76					97.5% Chebyshev(Mean, Sd) UCL	161.8	99% Chebyshev(Mean, Sd) UCL					200.8
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	115						
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												
87	**Arsenic**											
88												
89	**General Statistics**											
90					Total Number of Observations	12	Number of Distinct Observations					12
91							Number of Missing Observations					0
92					Minimum	5.98	Mean					21.67
93					Maximum	111.4	Median					14.45
94					SD	28.82	Std. Error of Mean					8.318
95					Coefficient of Variation	1.33	Skewness					3.223
96												
97	**Normal GOF Test**											
98					Shapiro Wilk Test Statistic	0.511	**Shapiro Wilk GOF Test**					
99					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
100					Lilliefors Test Statistic	0.415	**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**											

	A	B	C	D	E	F	G	H	I	J	K	L
105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106					95% Student's-t UCL	36.61				95% Adjusted-CLT UCL (Chen-1995)		43.62
107										95% Modified-t UCL (Johnson-1978)		37.9
108												
109	**Gamma GOF Test**											
110					A-D Test Statistic	1.146	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.303	**Kolmogrov-Smirnoff Gamma GOF Test**					
113					5% K-S Critical Value	0.25	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)	1.435				k star (bias corrected MLE)		1.132
118					Theta hat (MLE)	15.09				Theta star (bias corrected MLE)		19.14
119					nu hat (MLE)	34.45				nu star (bias corrected)		27.17
120					MLE Mean (bias corrected)	21.67				MLE Sd (bias corrected)		20.36
121										Approximate Chi Square Value (0.05)		16.28
122					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		15.01
123												
124	**Assuming Gamma Distribution**											
125					95% Approximate Gamma UCL (use when n>=50))	36.15				95% Adjusted Gamma UCL (use when n<50)		39.22
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.225	**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	1.788				Mean of logged Data		2.689
136					Maximum of Logged Data	4.713				SD of logged Data		0.784
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	36.51				90% Chebyshev (MVUE) UCL		33.21
140					95% Chebyshev (MVUE) UCL	39.47				97.5% Chebyshev (MVUE) UCL		48.17
141					99% Chebyshev (MVUE) UCL	65.24						
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	35.35				95% Jackknife UCL		36.61
148					95% Standard Bootstrap UCL	34.61				95% Bootstrap-t UCL		75.2
149					95% Hall's Bootstrap UCL	90.69				95% Percentile Bootstrap UCL		37.96
150					95% BCA Bootstrap UCL	45.94						
151					90% Chebyshev(Mean, Sd) UCL	46.62				95% Chebyshev(Mean, Sd) UCL		57.93
152					97.5% Chebyshev(Mean, Sd) UCL	73.62				99% Chebyshev(Mean, Sd) UCL		104.4
153												
154	**Suggested UCL to Use**											
155					95% H-UCL	36.51						
156												

	A	B	C	D	E	F	G	H	I	J	K	L
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	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
163	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
164	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
165	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
166												
167												
168	**Cadmium**											
169												
170	**General Statistics**											
171	Total Number of Observations					12	Number of Distinct Observations					8
172							Number of Missing Observations					0
173	Minimum					1.62	Mean					10.93
174	Maximum					22.12	Median					12
175	SD					6.367	Std. Error of Mean					1.838
176	Coefficient of Variation					0.583	Skewness					-0.248
177												
178	**Normal GOF Test**											
179	Shapiro Wilk Test Statistic					0.855	**Shapiro Wilk GOF Test**					
180	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
181	Lilliefors Test Statistic					0.311	**Lilliefors GOF Test**					
182	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
183	**Data Not Normal at 5% Significance Level**											
184												
185	**Assuming Normal Distribution**											
186	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
187	95% Student's-t UCL					14.23	95% Adjusted-CLT UCL (Chen-1995)					13.81
188							95% Modified-t UCL (Johnson-1978)					14.21
189												
190	**Gamma GOF Test**											
191	A-D Test Statistic					1.538	**Anderson-Darling Gamma GOF Test**					
192	5% A-D Critical Value					0.743	Data Not Gamma Distributed at 5% Significance Level					
193	K-S Test Statistic					0.392	**Kolmogrov-Smirnoff Gamma GOF Test**					
194	5% K-S Critical Value					0.249	Data Not Gamma Distributed at 5% Significance Level					
195	**Data Not Gamma Distributed at 5% Significance Level**											
196												
197	**Gamma Statistics**											
198	k hat (MLE)					1.826	k star (bias corrected MLE)					1.425
199	Theta hat (MLE)					5.985	Theta star (bias corrected MLE)					7.669
200	nu hat (MLE)					43.83	nu star (bias corrected)					34.21
201	MLE Mean (bias corrected)					10.93	MLE Sd (bias corrected)					9.155
202							Approximate Chi Square Value (0.05)					21.83
203	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					20.33
204												
205	**Assuming Gamma Distribution**											
206	95% Approximate Gamma UCL (use when n>=50))					17.13	95% Adjusted Gamma UCL (use when n<50)					18.39
207												
208	**Lognormal GOF Test**											

	A	B	C	D	E	F	G	H	I	J	K	L
209					Shapiro Wilk Test Statistic	0.717	Shapiro Wilk Lognormal GOF Test					
210					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
211					Lilliefors Test Statistic	0.405	Lilliefors Lognormal GOF Test					
212					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
213					Data Not Lognormal at 5% Significance Level							
214												
215					Lognormal Statistics							
216					Minimum of Logged Data	0.482				Mean of logged Data		2.093
217					Maximum of Logged Data	3.096				SD of logged Data		0.963
218												
219					Assuming Lognormal Distribution							
220					95% H-UCL	29.48				90% Chebyshev (MVUE) UCL		23.14
221					95% Chebyshev (MVUE) UCL	28.07				97.5% Chebyshev (MVUE) UCL		34.92
222					99% Chebyshev (MVUE) UCL	48.36						
223												
224					Nonparametric Distribution Free UCL Statistics							
225					Data do not follow a Discernible Distribution (0.05)							
226												
227					Nonparametric Distribution Free UCLs							
228					95% CLT UCL	13.95				95% Jackknife UCL		14.23
229					95% Standard Bootstrap UCL	13.83				95% Bootstrap-t UCL		14.15
230					95% Hall's Bootstrap UCL	13.83				95% Percentile Bootstrap UCL		13.81
231					95% BCA Bootstrap UCL	13.68						
232					90% Chebyshev(Mean, Sd) UCL	16.44				95% Chebyshev(Mean, Sd) UCL		18.94
233					97.5% Chebyshev(Mean, Sd) UCL	22.41				99% Chebyshev(Mean, Sd) UCL		29.22
234												
235					Suggested UCL to Use							
236					95% Chebyshev (Mean, Sd) UCL	18.94						
237												
238	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
239	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
240	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
241	For additional insight the user may want to consult a statistician.											
242												
243	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
244	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
245												
246												
247	Chromium											
248												
249					General Statistics							
250					Total Number of Observations	12				Number of Distinct Observations		11
251										Number of Missing Observations		0
252					Minimum	29.5				Mean		66.79
253					Maximum	119.1				Median		58.45
254					SD	28				Std. Error of Mean		8.082
255					Coefficient of Variation	0.419				Skewness		0.796
256												
257					Normal GOF Test							
258					Shapiro Wilk Test Statistic	0.913	Shapiro Wilk GOF Test					
259					5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level					
260					Lilliefors Test Statistic	0.19	Lilliefors GOF Test					

261					5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level					
262	**Data appear Normal at 5% Significance Level**											
263												
264	**Assuming Normal Distribution**											
265	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
266					95% Student's-t UCL	81.3	95% Adjusted-CLT UCL (Chen-1995)					82.07
267							95% Modified-t UCL (Johnson-1978)					81.61
268												
269	**Gamma GOF Test**											
270					A-D Test Statistic	0.303	**Anderson-Darling Gamma GOF Test**					
271					5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level					
272					K-S Test Statistic	0.155	**Kolmogrov-Smirnoff Gamma GOF Test**					
273					5% K-S Critical Value	0.246	Detected data appear Gamma Distributed at 5% Significance Level					
274	**Detected data appear Gamma Distributed at 5% Significance Level**											
275												
276	**Gamma Statistics**											
277					k hat (MLE)	6.546	k star (bias corrected MLE)					4.965
278					Theta hat (MLE)	10.2	Theta star (bias corrected MLE)					13.45
279					nu hat (MLE)	157.1	nu star (bias corrected)					119.2
280					MLE Mean (bias corrected)	66.79	MLE Sd (bias corrected)					29.97
281							Approximate Chi Square Value (0.05)					94.95
282					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					91.65
283												
284	**Assuming Gamma Distribution**											
285					95% Approximate Gamma UCL (use when n>=50))	83.81	95% Adjusted Gamma UCL (use when n<50)					86.82
286												
287	**Lognormal GOF Test**											
288					Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk Lognormal GOF Test**					
289					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
290					Lilliefors Test Statistic	0.129	**Lilliefors Lognormal GOF Test**					
291					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
292	**Data appear Lognormal at 5% Significance Level**											
293												
294	**Lognormal Statistics**											
295					Minimum of Logged Data	3.384	Mean of logged Data					4.123
296					Maximum of Logged Data	4.78	SD of logged Data					0.414
297												
298	**Assuming Lognormal Distribution**											
299					95% H-UCL	86.77	90% Chebyshev (MVUE) UCL					91.08
300					95% Chebyshev (MVUE) UCL	102.1	97.5% Chebyshev (MVUE) UCL					117.4
301					99% Chebyshev (MVUE) UCL	147.4						
302												
303	**Nonparametric Distribution Free UCL Statistics**											
304	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
305												
306	**Nonparametric Distribution Free UCLs**											
307					95% CLT UCL	80.08	95% Jackknife UCL					81.3
308					95% Standard Bootstrap UCL	79.41	95% Bootstrap-t UCL					85.2
309					95% Hall's Bootstrap UCL	83.73	95% Percentile Bootstrap UCL					80.48
310					95% BCA Bootstrap UCL	80.89						
311					90% Chebyshev(Mean, Sd) UCL	91.03	95% Chebyshev(Mean, Sd) UCL					102
312					97.5% Chebyshev(Mean, Sd) UCL	117.3	99% Chebyshev(Mean, Sd) UCL					147.2

	A	B	C	D	E	F	G	H	I	J	K	L
313												
314						**Suggested UCL to Use**						
315					95% Student's-t UCL	81.3						
316												
317					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
318					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
319					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
320					For additional insight the user may want to consult a statistician.							
321												
322												
323	**Cobalt**											
324												
325						**General Statistics**						
326					Total Number of Observations	12			Number of Distinct Observations			3
327									Number of Missing Observations			0
328					Minimum	7.4			Mean			20.75
329					Maximum	34.1			Median			20.75
330					SD	5.692			Std. Error of Mean			1.643
331					Coefficient of Variation	0.274			Skewness			8.068E-16
332												
333						**Normal GOF Test**						
334					Shapiro Wilk Test Statistic	0.6			**Shapiro Wilk GOF Test**			
335					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
336					Lilliefors Test Statistic	0.417			**Lilliefors GOF Test**			
337					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
338						**Data Not 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	23.7			95% Adjusted-CLT UCL (Chen-1995)			23.45
343									95% Modified-t UCL (Johnson-1978)			23.7
344												
345						**Gamma GOF Test**						
346					A-D Test Statistic	2.797			**Anderson-Darling Gamma GOF Test**			
347					5% A-D Critical Value	0.731			Data Not Gamma Distributed at 5% Significance Level			
348					K-S Test Statistic	0.456			**Kolmogrov-Smirnoff Gamma GOF Test**			
349					5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level			
350						**Data Not Gamma Distributed at 5% Significance Level**						
351												
352						**Gamma Statistics**						
353					k hat (MLE)	11.39			k star (bias corrected MLE)			8.601
354					Theta hat (MLE)	1.821			Theta star (bias corrected MLE)			2.413
355					nu hat (MLE)	273.4			nu star (bias corrected)			206.4
356					MLE Mean (bias corrected)	20.75			MLE Sd (bias corrected)			7.075
357									Approximate Chi Square Value (0.05)			174.2
358					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			169.7
359												
360						**Assuming Gamma Distribution**						
361					95% Approximate Gamma UCL (use when n>=50))	24.59			95% Adjusted Gamma UCL (use when n<50)			25.25
362												
363						**Lognormal GOF Test**						
364					Shapiro Wilk Test Statistic	0.544			**Shapiro Wilk Lognormal GOF Test**			

	A	B	C	D	E	F	G	H	I	J	K	L
365					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
366					Lilliefors Test Statistic	0.468	**Lilliefors Lognormal GOF Test**					
367					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
368	**Data Not Lognormal at 5% Significance Level**											
369												
370	**Lognormal Statistics**											
371					Minimum of Logged Data	2.001	Mean of logged Data					2.988
372					Maximum of Logged Data	3.529	SD of logged Data					0.342
373												
374	**Assuming Lognormal Distribution**											
375					95% H-UCL	25.77	90% Chebyshev (MVUE) UCL					27.21
376					95% Chebyshev (MVUE) UCL	30.05	97.5% Chebyshev (MVUE) UCL					33.99
377					99% Chebyshev (MVUE) UCL	41.74						
378												
379	**Nonparametric Distribution Free UCL Statistics**											
380	**Data do not follow a Discernible Distribution (0.05)**											
381												
382	**Nonparametric Distribution Free UCLs**											
383					95% CLT UCL	23.45	95% Jackknife UCL					23.7
384					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
385					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
386					95% BCA Bootstrap UCL	N/A						
387					90% Chebyshev(Mean, Sd) UCL	25.68	95% Chebyshev(Mean, Sd) UCL					27.91
388					97.5% Chebyshev(Mean, Sd) UCL	31.01	99% Chebyshev(Mean, Sd) UCL					37.1
389												
390	**Suggested UCL to Use**											
391					95% Student's-t UCL	23.7	or 95% Modified-t UCL					23.7
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												
399	**Copper**											
400												
401	**General Statistics**											
402					Total Number of Observations	12	Number of Distinct Observations					12
403							Number of Missing Observations					0
404					Minimum	22.56	Mean					604.1
405					Maximum	4360	Median					288.2
406					SD	1199	Std. Error of Mean					346.2
407					Coefficient of Variation	1.985	Skewness					3.298
408												
409	**Normal GOF Test**											
410					Shapiro Wilk Test Statistic	0.477	**Shapiro Wilk GOF Test**					
411					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
412					Lilliefors Test Statistic	0.438	**Lilliefors GOF Test**					
413					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
414	**Data Not Normal at 5% Significance Level**											
415												
416	**Assuming Normal Distribution**											

	A	B	C	D	E	F	G	H	I	J	K	L
417	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
418					95% Student's-t UCL	1226				95% Adjusted-CLT UCL (Chen-1995)		1526
419										95% Modified-t UCL (Johnson-1978)		1281
420												
421	**Gamma GOF Test**											
422					A-D Test Statistic	0.733	**Anderson-Darling Gamma GOF Test**					
423					5% A-D Critical Value	0.778	Detected data appear Gamma Distributed at 5% Significance Level					
424					K-S Test Statistic	0.276	**Kolmogrov-Smirnoff Gamma GOF Test**					
425					5% K-S Critical Value	0.257	Data Not 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)	0.586				k star (bias corrected MLE)		0.495
430					Theta hat (MLE)	1031				Theta star (bias corrected MLE)		1221
431					nu hat (MLE)	14.06				nu star (bias corrected)		11.88
432					MLE Mean (bias corrected)	604.1				MLE Sd (bias corrected)		858.8
433										Approximate Chi Square Value (0.05)		5.145
434					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		4.487
435												
436	**Assuming Gamma Distribution**											
437				95% Approximate Gamma UCL (use when n>=50)		1394				95% Adjusted Gamma UCL (use when n<50)		1599
438												
439	**Lognormal GOF Test**											
440					Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**					
441					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
442					Lilliefors Test Statistic	0.183	**Lilliefors Lognormal GOF Test**					
443					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
444	**Data appear Lognormal at 5% Significance Level**											
445												
446	**Lognormal Statistics**											
447					Minimum of Logged Data	3.116				Mean of logged Data		5.345
448					Maximum of Logged Data	8.38				SD of logged Data		1.515
449												
450	**Assuming Lognormal Distribution**											
451					95% H-UCL	3975				90% Chebyshev (MVUE) UCL		1361
452					95% Chebyshev (MVUE) UCL	1725				97.5% Chebyshev (MVUE) UCL		2230
453					99% Chebyshev (MVUE) UCL	3221						
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	1173				95% Jackknife UCL		1226
460					95% Standard Bootstrap UCL	1156				95% Bootstrap-t UCL		3277
461					95% Hall's Bootstrap UCL	3563				95% Percentile Bootstrap UCL		1284
462					95% BCA Bootstrap UCL	1632						
463					90% Chebyshev(Mean, Sd) UCL	1643				95% Chebyshev(Mean, Sd) UCL		2113
464					97.5% Chebyshev(Mean, Sd) UCL	2766				99% Chebyshev(Mean, Sd) UCL		4048
465												
466	**Suggested UCL to Use**											
467					95% Adjusted Gamma UCL	1599						
468												

	A	B	C	D	E	F	G	H	I	J	K	L
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	Iron											
476												
477	General Statistics											
478	Total Number of Observations					12	Number of Distinct Observations					12
479							Number of Missing Observations					0
480	Minimum					13418	Mean					40236
481	Maximum					171000	Median					25719
482	SD					43668	Std. Error of Mean					12606
483	Coefficient of Variation					1.085	Skewness					2.873
484												
485	Normal GOF Test											
486	Shapiro Wilk Test Statistic					0.58	Shapiro Wilk GOF Test					
487	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
488	Lilliefors Test Statistic					0.361	Lilliefors GOF Test					
489	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
490	Data Not Normal at 5% Significance Level											
491												
492	Assuming Normal Distribution											
493	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
494	95% Student's-t UCL					62875	95% Adjusted-CLT UCL (Chen-1995)					72143
495							95% Modified-t UCL (Johnson-1978)					64618
496												
497	Gamma GOF Test											
498	A-D Test Statistic					1.265	Anderson-Darling Gamma GOF Test					
499	5% A-D Critical Value					0.743	Data Not Gamma Distributed at 5% Significance Level					
500	K-S Test Statistic					0.336	Kolmogrov-Smirnoff Gamma GOF Test					
501	5% K-S Critical Value					0.249	Data Not Gamma Distributed at 5% Significance Level					
502	Data Not Gamma Distributed at 5% Significance Level											
503												
504	Gamma Statistics											
505	k hat (MLE)					1.858	k star (bias corrected MLE)					1.449
506	Theta hat (MLE)					21658	Theta star (bias corrected MLE)					27770
507	nu hat (MLE)					44.59	nu star (bias corrected)					34.77
508	MLE Mean (bias corrected)					40236	MLE Sd (bias corrected)					33427
509							Approximate Chi Square Value (0.05)					22.28
510	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					20.77
511												
512	Assuming Gamma Distribution											
513	95% Approximate Gamma UCL (use when n>=50))					62789	95% Adjusted Gamma UCL (use when n<50)					67370
514												
515	Lognormal GOF Test											
516	Shapiro Wilk Test Statistic					0.842	Shapiro Wilk Lognormal GOF Test					
517	5% Shapiro Wilk Critical Value					0.859	Data Not Lognormal at 5% Significance Level					
518	Lilliefors Test Statistic					0.292	Lilliefors Lognormal GOF Test					
519	5% Lilliefors Critical Value					0.256	Data Not Lognormal at 5% Significance Level					
520	Data Not Lognormal at 5% Significance Level											

521												
522	**Lognormal Statistics**											
523					Minimum of Logged Data	9.504				Mean of logged Data		10.31
524					Maximum of Logged Data	12.05				SD of logged Data		0.694
525												
526	**Assuming Lognormal Distribution**											
527					95% H-UCL	63159				90% Chebyshev (MVUE) UCL		60638
528					95% Chebyshev (MVUE) UCL	71209				97.5% Chebyshev (MVUE) UCL		85880
529					99% Chebyshev (MVUE) UCL	114699						
530												
531	**Nonparametric Distribution Free UCL Statistics**											
532	**Data do not follow a Discernible Distribution (0.05)**											
533												
534	**Nonparametric Distribution Free UCLs**											
535					95% CLT UCL	60971				95% Jackknife UCL		62875
536					95% Standard Bootstrap UCL	60409				95% Bootstrap-t UCL		131384
537					95% Hall's Bootstrap UCL	140758				95% Percentile Bootstrap UCL		63868
538					95% BCA Bootstrap UCL	75017						
539					90% Chebyshev(Mean, Sd) UCL	78054				95% Chebyshev(Mean, Sd) UCL		95184
540					97.5% Chebyshev(Mean, Sd) UCL	118960				99% Chebyshev(Mean, Sd) UCL		165664
541												
542	**Suggested UCL to Use**											
543					95% Chebyshev (Mean, Sd) UCL	95184						
544												
545	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
546	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
547	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
548	For additional insight the user may want to consult a statistician.											
549												
550												
551	**Lead**											
552												
553	**General Statistics**											
554					Total Number of Observations	12				Number of Distinct Observations		12
555										Number of Missing Observations		0
556					Minimum	18.83				Mean		329.4
557					Maximum	1799				Median		140.6
558					SD	511.7				Std. Error of Mean		147.7
559					Coefficient of Variation	1.553				Skewness		2.583
560												
561	**Normal GOF Test**											
562					Shapiro Wilk Test Statistic	0.623				**Shapiro Wilk GOF Test**		
563					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
564					Lilliefors Test Statistic	0.353				**Lilliefors GOF Test**		
565					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
566	**Data Not Normal at 5% Significance Level**											
567												
568	**Assuming Normal Distribution**											
569					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
570					95% Student's-t UCL	594.7				95% Adjusted-CLT UCL (Chen-1995)		690.1
571										95% Modified-t UCL (Johnson-1978)		613
572												

	A	B	C	D	E	F	G	H	I	J	K	L
573	**Gamma GOF Test**											
574					A-D Test Statistic	0.523	**Anderson-Darling Gamma GOF Test**					
575					5% A-D Critical Value	0.767	Detected data appear Gamma Distributed at 5% Significance Level					
576					K-S Test Statistic	0.204	**Kolmogrov-Smirnoff Gamma GOF Test**					
577					5% K-S Critical Value	0.255	Detected data appear Gamma Distributed at 5% Significance Level					
578	**Detected data appear Gamma Distributed at 5% Significance Level**											
579												
580	**Gamma Statistics**											
581					k hat (MLE)	0.726			k star (bias corrected MLE)			0.6
582					Theta hat (MLE)	453.5			Theta star (bias corrected MLE)			548.7
583					nu hat (MLE)	17.43			nu star (bias corrected)			14.41
584					MLE Mean (bias corrected)	329.4			MLE Sd (bias corrected)			425.2
585									Approximate Chi Square Value (0.05)			6.851
586					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			6.073
587												
588	**Assuming Gamma Distribution**											
589					95% Approximate Gamma UCL (use when n>=50)	692.7			95% Adjusted Gamma UCL (use when n<50)			781.5
590												
591	**Lognormal GOF Test**											
592					Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk Lognormal GOF Test**					
593					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
594					Lilliefors Test Statistic	0.123	**Lilliefors Lognormal GOF Test**					
595					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
596	**Data appear Lognormal at 5% Significance Level**											
597												
598	**Lognormal Statistics**											
599					Minimum of Logged Data	2.935			Mean of logged Data			4.97
600					Maximum of Logged Data	7.495			SD of logged Data			1.349
601												
602	**Assuming Lognormal Distribution**											
603					95% H-UCL	1536			90% Chebyshev (MVUE) UCL			719.3
604					95% Chebyshev (MVUE) UCL	901.8			97.5% Chebyshev (MVUE) UCL			1155
605					99% Chebyshev (MVUE) UCL	1653						
606												
607	**Nonparametric Distribution Free UCL Statistics**											
608	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
609												
610	**Nonparametric Distribution Free UCLs**											
611					95% CLT UCL	572.4			95% Jackknife UCL			594.7
612					95% Standard Bootstrap UCL	566			95% Bootstrap-t UCL			1455
613					95% Hall's Bootstrap UCL	1758			95% Percentile Bootstrap UCL			585.5
614					95% BCA Bootstrap UCL	716.6						
615					90% Chebyshev(Mean, Sd) UCL	772.5			95% Chebyshev(Mean, Sd) UCL			973.3
616					97.5% Chebyshev(Mean, Sd) UCL	1252			99% Chebyshev(Mean, Sd) UCL			1799
617												
618	**Suggested UCL to Use**											
619					95% Adjusted Gamma UCL	781.5						
620												
621	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
622	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
623	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
624	For additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
625												
626												
627	**Manganese**											
628												
629	**General Statistics**											
630					Total Number of Observations	12			Number of Distinct Observations			12
631									Number of Missing Observations			0
632					Minimum	366.6			Mean			765
633					Maximum	2850			Median			504.4
634					SD	677.2			Std. Error of Mean			195.5
635					Coefficient of Variation	0.885			Skewness			3.116
636												
637	**Normal GOF Test**											
638					Shapiro Wilk Test Statistic	0.537			**Shapiro Wilk GOF Test**			
639					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
640					Lilliefors Test Statistic	0.358			**Lilliefors GOF Test**			
641					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
642	**Data Not Normal at 5% Significance Level**											
643												
644	**Assuming Normal Distribution**											
645				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
646					95% Student's-t UCL	1116			95% Adjusted-CLT UCL (Chen-1995)			1275
647									95% Modified-t UCL (Johnson-1978)			1145
648												
649	**Gamma GOF Test**											
650					A-D Test Statistic	1.517			**Anderson-Darling Gamma GOF Test**			
651					5% A-D Critical Value	0.739			Data Not Gamma Distributed at 5% Significance Level			
652					K-S Test Statistic	0.291			**Kolmogrov-Smirnoff Gamma GOF Test**			
653					5% K-S Critical Value	0.248			Data Not Gamma Distributed at 5% Significance Level			
654	**Data Not Gamma Distributed at 5% Significance Level**											
655												
656	**Gamma Statistics**											
657					k hat (MLE)	2.855			k star (bias corrected MLE)			2.197
658					Theta hat (MLE)	268			Theta star (bias corrected MLE)			348.3
659					nu hat (MLE)	68.51			nu star (bias corrected)			52.72
660					MLE Mean (bias corrected)	765			MLE Sd (bias corrected)			516.2
661									Approximate Chi Square Value (0.05)			37.04
662					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			35.04
663												
664	**Assuming Gamma Distribution**											
665					95% Approximate Gamma UCL (use when n>=50))	1089			95% Adjusted Gamma UCL (use when n<50)			1151
666												
667	**Lognormal GOF Test**											
668					Shapiro Wilk Test Statistic	0.764			**Shapiro Wilk Lognormal GOF Test**			
669					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
670					Lilliefors Test Statistic	0.245			**Lilliefors Lognormal GOF Test**			
671					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
672	**Data appear Approximate Lognormal at 5% Significance Level**											
673												
674	**Lognormal Statistics**											
675					Minimum of Logged Data	5.904			Mean of logged Data			6.455
676					Maximum of Logged Data	7.955			SD of logged Data			0.542

	A	B	C	D	E	F	G	H	I	J	K	L
677												
678					Assuming Lognormal Distribution							
679					95% H-UCL	1053			90% Chebyshev (MVUE) UCL			1076
680				95% Chebyshev (MVUE) UCL		1235			97.5% Chebyshev (MVUE) UCL			1455
681				99% Chebyshev (MVUE) UCL		1887						
682												
683					Nonparametric Distribution Free UCL Statistics							
684					Data appear to follow a Discernible Distribution at 5% Significance Level							
685												
686					Nonparametric Distribution Free UCLs							
687					95% CLT UCL	1087			95% Jackknife UCL			1116
688				95% Standard Bootstrap UCL		1069			95% Bootstrap-t UCL			2185
689				95% Hall's Bootstrap UCL		2394			95% Percentile Bootstrap UCL			1115
690				95% BCA Bootstrap UCL		1305						
691				90% Chebyshev(Mean, Sd) UCL		1352			95% Chebyshev(Mean, Sd) UCL			1617
692				97.5% Chebyshev(Mean, Sd) UCL		1986			99% Chebyshev(Mean, Sd) UCL			2710
693												
694					Suggested UCL to Use							
695				95% Chebyshev (Mean, Sd) UCL		1617						
696												
697					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
698					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
699					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
700					For additional insight the user may want to consult a statistician.							
701												
702												
703	Mercury											
704												
705					General Statistics							
706				Total Number of Observations		12			Number of Distinct Observations			5
707									Number of Missing Observations			0
708				Minimum		0.0238			Mean			6.299
709				Maximum		12.23			Median			10
710				SD		5.054			Std. Error of Mean			1.459
711				Coefficient of Variation		0.802			Skewness			-0.389
712												
713					Normal GOF Test							
714				Shapiro Wilk Test Statistic		0.745			Shapiro Wilk GOF Test			
715				5% Shapiro Wilk Critical Value		0.859			Data Not Normal at 5% Significance Level			
716				Lilliefors Test Statistic		0.351			Lilliefors GOF Test			
717				5% Lilliefors Critical Value		0.256			Data Not Normal at 5% Significance Level			
718					Data Not Normal at 5% Significance Level							
719												
720					Assuming Normal Distribution							
721				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
722				95% Student's-t UCL		8.92			95% Adjusted-CLT UCL (Chen-1995)			8.524
723									95% Modified-t UCL (Johnson-1978)			8.892
724												
725					Gamma GOF Test							
726				A-D Test Statistic		1.61			Anderson-Darling Gamma GOF Test			
727				5% A-D Critical Value		0.78			Data Not Gamma Distributed at 5% Significance Level			
728				K-S Test Statistic		0.374			Kolmogrov-Smirnoff Gamma GOF Test			

	A	B	C	D	E	F	G	H	I	J	K	L
729					5% K-S Critical Value	0.258	Data Not Gamma Distributed at 5% Significance Level					
730	**Data Not Gamma Distributed at 5% Significance Level**											
731												
732	**Gamma Statistics**											
733					k hat (MLE)	0.562				k star (bias corrected MLE)		0.477
734					Theta hat (MLE)	11.21				Theta star (bias corrected MLE)		13.21
735					nu hat (MLE)	13.49				nu star (bias corrected)		11.45
736					MLE Mean (bias corrected)	6.299				MLE Sd (bias corrected)		9.121
737										Approximate Chi Square Value (0.05)		4.866
738					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		4.23
739												
740	**Assuming Gamma Distribution**											
741				95% Approximate Gamma UCL (use when n>=50))		14.82				95% Adjusted Gamma UCL (use when n<50)		17.05
742												
743	**Lognormal GOF Test**											
744					Shapiro Wilk Test Statistic	0.747	**Shapiro Wilk Lognormal GOF Test**					
745					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
746					Lilliefors Test Statistic	0.343	**Lilliefors Lognormal GOF Test**					
747					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
748	**Data Not Lognormal at 5% Significance Level**											
749												
750	**Lognormal Statistics**											
751					Minimum of Logged Data	-3.738				Mean of logged Data		0.73
752					Maximum of Logged Data	2.504				SD of logged Data		2.225
753												
754	**Assuming Lognormal Distribution**											
755					95% H-UCL	956.9				90% Chebyshev (MVUE) UCL		45.87
756					95% Chebyshev (MVUE) UCL	59.84				97.5% Chebyshev (MVUE) UCL		79.23
757					99% Chebyshev (MVUE) UCL	117.3						
758												
759	**Nonparametric Distribution Free UCL Statistics**											
760	**Data do not follow a Discernible Distribution (0.05)**											
761												
762	**Nonparametric Distribution Free UCLs**											
763					95% CLT UCL	8.699				95% Jackknife UCL		8.92
764					95% Standard Bootstrap UCL	8.557				95% Bootstrap-t UCL		8.95
765					95% Hall's Bootstrap UCL	8.36				95% Percentile Bootstrap UCL		8.578
766					95% BCA Bootstrap UCL	8.304						
767					90% Chebyshev(Mean, Sd) UCL	10.68				95% Chebyshev(Mean, Sd) UCL		12.66
768					97.5% Chebyshev(Mean, Sd) UCL	15.41				99% Chebyshev(Mean, Sd) UCL		20.82
769												
770	**Suggested UCL to Use**											
771					99% Chebyshev (Mean, Sd) UCL	20.82						
772												
773	**Recommended UCL exceeds the maximum observation**											
774												
775	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
776	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
777	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
778	For additional insight the user may want to consult a statistician.											
779												
780	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											

	A	B	C	D	E	F	G	H	I	J	K	L
781	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
782												
783												
784	Neptunium-237											
785												
786	General Statistics											
787					Total Number of Observations	12				Number of Distinct Observations		6
788										Number of Missing Observations		0
789					Minimum	0.0127				Mean		0.996
790					Maximum	4.1				Median		0.996
791					SD	1.067				Std. Error of Mean		0.308
792					Coefficient of Variation	1.072				Skewness		2.434
793												
794	Normal GOF Test											
795					Shapiro Wilk Test Statistic	0.634				Shapiro Wilk GOF Test		
796					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
797					Lilliefors Test Statistic	0.417				Lilliefors GOF Test		
798					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
799	Data Not Normal at 5% Significance Level											
800												
801	Assuming Normal Distribution											
802					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
803					95% Student's-t UCL	1.549				95% Adjusted-CLT UCL (Chen-1995)		1.734
804										95% Modified-t UCL (Johnson-1978)		1.585
805												
806	Gamma GOF Test											
807					A-D Test Statistic	1.624				Anderson-Darling Gamma GOF Test		
808					5% A-D Critical Value	0.772				Data Not Gamma Distributed at 5% Significance Level		
809					K-S Test Statistic	0.354				Kolmogrov-Smirnoff Gamma GOF Test		
810					5% K-S Critical Value	0.256				Data Not Gamma Distributed at 5% Significance Level		
811	Data Not Gamma Distributed at 5% Significance Level											
812												
813	Gamma Statistics											
814					k hat (MLE)	0.668				k star (bias corrected MLE)		0.557
815					Theta hat (MLE)	1.489				Theta star (bias corrected MLE)		1.788
816					nu hat (MLE)	16.04				nu star (bias corrected)		13.37
817					MLE Mean (bias corrected)	0.996				MLE Sd (bias corrected)		1.334
818										Approximate Chi Square Value (0.05)		6.14
819					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		5.41
820												
821	Assuming Gamma Distribution											
822					95% Approximate Gamma UCL (use when n>=50))	2.167				95% Adjusted Gamma UCL (use when n<50)		2.46
823												
824	Lognormal GOF Test											
825					Shapiro Wilk Test Statistic	0.709				Shapiro Wilk Lognormal GOF Test		
826					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
827					Lilliefors Test Statistic	0.393				Lilliefors Lognormal GOF Test		
828					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
829	Data Not Lognormal at 5% Significance Level											
830												
831	Lognormal Statistics											
832					Minimum of Logged Data	-4.366				Mean of logged Data		-0.914

	A	B	C	D	E	F	G	H	I	J	K	L
833					Maximum of Logged Data	1.411					SD of logged Data	1.949
834												
835					Assuming Lognormal Distribution							
836					95% H-UCL	46.33					90% Chebyshev (MVUE) UCL	5.404
837					95% Chebyshev (MVUE) UCL	6.988					97.5% Chebyshev (MVUE) UCL	9.186
838					99% Chebyshev (MVUE) UCL	13.5						
839												
840					Nonparametric Distribution Free UCL Statistics							
841					Data do not follow a Discernible Distribution (0.05)							
842												
843					Nonparametric Distribution Free UCLs							
844					95% CLT UCL	1.502					95% Jackknife UCL	1.549
845					95% Standard Bootstrap UCL	1.466					95% Bootstrap-t UCL	1.909
846					95% Hall's Bootstrap UCL	3.782					95% Percentile Bootstrap UCL	1.526
847					95% BCA Bootstrap UCL	1.691						
848					90% Chebyshev(Mean, Sd) UCL	1.92					95% Chebyshev(Mean, Sd) UCL	2.338
849					97.5% Chebyshev(Mean, Sd) UCL	2.919					99% Chebyshev(Mean, Sd) UCL	4.061
850												
851					Suggested UCL to Use							
852					99% Chebyshev (Mean, Sd) UCL	4.061						
853												
854					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
855					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
856					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
857					For additional insight the user may want to consult a statistician.							
858												
859												
860	Nickel											
861												
862					General Statistics							
863					Total Number of Observations	12					Number of Distinct Observations	11
864											Number of Missing Observations	0
865					Minimum	63.2					Mean	401.5
866					Maximum	2410					Median	225.8
867					SD	644.8					Std. Error of Mean	186.1
868					Coefficient of Variation	1.606					Skewness	3.235
869												
870					Normal GOF Test							
871					Shapiro Wilk Test Statistic	0.508					Shapiro Wilk GOF Test	
872					5% Shapiro Wilk Critical Value	0.859					Data Not Normal at 5% Significance Level	
873					Lilliefors Test Statistic	0.386					Lilliefors GOF Test	
874					5% Lilliefors Critical Value	0.256					Data Not Normal at 5% Significance Level	
875					Data Not Normal at 5% Significance Level							
876												
877					Assuming Normal Distribution							
878					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
879					95% Student's-t UCL	735.7					95% Adjusted-CLT UCL (Chen-1995)	893.4
880											95% Modified-t UCL (Johnson-1978)	764.7
881												
882					Gamma GOF Test							
883					A-D Test Statistic	0.934					Anderson-Darling Gamma GOF Test	
884					5% A-D Critical Value	0.758					Data Not Gamma Distributed at 5% Significance Level	

	A	B	C	D	E	F	G	H	I	J	K	L
885					K-S Test Statistic	0.24	**Kolmogrov-Smirnoff Gamma GOF Test**					
886					5% K-S Critical Value	0.253	Detected data appear Gamma Distributed at 5% Significance Level					
887	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
888												
889	**Gamma Statistics**											
890					k hat (MLE)	0.972				k star (bias corrected MLE)		0.785
891					Theta hat (MLE)	413				Theta star (bias corrected MLE)		511.7
892					nu hat (MLE)	23.33				nu star (bias corrected)		18.83
893					MLE Mean (bias corrected)	401.5				MLE Sd (bias corrected)		453.3
894										Approximate Chi Square Value (0.05)		9.993
895					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		9.026
896												
897	**Assuming Gamma Distribution**											
898					95% Approximate Gamma UCL (use when n>=50)	756.5				95% Adjusted Gamma UCL (use when n<50)		837.6
899												
900	**Lognormal GOF Test**											
901					Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk Lognormal GOF Test**					
902					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
903					Lilliefors Test Statistic	0.159	**Lilliefors Lognormal GOF Test**					
904					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
905	**Data appear Lognormal at 5% Significance Level**											
906												
907	**Lognormal Statistics**											
908					Minimum of Logged Data	4.146				Mean of logged Data		5.399
909					Maximum of Logged Data	7.787				SD of logged Data		1.02
910												
911	**Assuming Lognormal Distribution**											
912					95% H-UCL	923				90% Chebyshev (MVUE) UCL		682.7
913					95% Chebyshev (MVUE) UCL	833.1				97.5% Chebyshev (MVUE) UCL		1042
914					99% Chebyshev (MVUE) UCL	1452						
915												
916	**Nonparametric Distribution Free UCL Statistics**											
917	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
918												
919	**Nonparametric Distribution Free UCLs**											
920					95% CLT UCL	707.6				95% Jackknife UCL		735.7
921					95% Standard Bootstrap UCL	695.4				95% Bootstrap-t UCL		1656
922					95% Hall's Bootstrap UCL	2011				95% Percentile Bootstrap UCL		747.5
923					95% BCA Bootstrap UCL	946.1						
924					90% Chebyshev(Mean, Sd) UCL	959.8				95% Chebyshev(Mean, Sd) UCL		1213
925					97.5% Chebyshev(Mean, Sd) UCL	1564				99% Chebyshev(Mean, Sd) UCL		2253
926												
927	**Suggested UCL to Use**											
928					95% Adjusted Gamma UCL	837.6						
929												
930	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
931	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
932	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
933	For additional insight the user may want to consult a statistician.											
934												
935												
936	**PAH, Total**											

	A	B	C	D	E	F	G	H	I	J	K	L
937												
938						General Statistics						
939					Total Number of Observations	12				Number of Distinct Observations		5
940										Number of Missing Observations		0
941					Minimum	0.026				Mean		0.588
942					Maximum	1.454				Median		0.588
943					SD	0.316				Std. Error of Mean		0.0912
944					Coefficient of Variation	0.537				Skewness		1.625
945												
946						Normal GOF Test						
947					Shapiro Wilk Test Statistic	0.669				Shapiro Wilk GOF Test		
948					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
949					Lilliefors Test Statistic	0.417				Lilliefors GOF Test		
950					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
951						Data Not Normal at 5% Significance Level						
952												
953						Assuming Normal Distribution						
954					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
955					95% Student's-t UCL	0.752				95% Adjusted-CLT UCL (Chen-1995)		0.784
956										95% Modified-t UCL (Johnson-1978)		0.759
957												
958						Gamma GOF Test						
959					A-D Test Statistic	2.187				Anderson-Darling Gamma GOF Test		
960					5% A-D Critical Value	0.741				Data Not Gamma Distributed at 5% Significance Level		
961					K-S Test Statistic	0.387				Kolmogrov-Smirnoff Gamma GOF Test		
962					5% K-S Critical Value	0.248				Data Not Gamma Distributed at 5% Significance Level		
963						Data Not Gamma Distributed at 5% Significance Level						
964												
965						Gamma Statistics						
966					k hat (MLE)	2.31				k star (bias corrected MLE)		1.788
967					Theta hat (MLE)	0.255				Theta star (bias corrected MLE)		0.329
968					nu hat (MLE)	55.45				nu star (bias corrected)		42.92
969					MLE Mean (bias corrected)	0.588				MLE Sd (bias corrected)		0.44
970										Approximate Chi Square Value (0.05)		28.9
971					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		27.15
972												
973						Assuming Gamma Distribution						
974					95% Approximate Gamma UCL (use when n>=50))	0.873				95% Adjusted Gamma UCL (use when n<50)		0.929
975												
976						Lognormal GOF Test						
977					Shapiro Wilk Test Statistic	0.548				Shapiro Wilk Lognormal GOF Test		
978					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
979					Lilliefors Test Statistic	0.429				Lilliefors Lognormal GOF Test		
980					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
981						Data Not Lognormal at 5% Significance Level						
982												
983						Lognormal Statistics						
984					Minimum of Logged Data	-3.65				Mean of logged Data		-0.763
985					Maximum of Logged Data	0.374				SD of logged Data		0.954
986												
987						Assuming Lognormal Distribution						
988					95% H-UCL	1.66				90% Chebyshev (MVUE) UCL		1.314

	A	B	C	D	E	F	G	H	I	J	K	L
989					95% Chebyshev (MVUE) UCL	1.593				97.5% Chebyshev (MVUE) UCL		1.98
990					99% Chebyshev (MVUE) UCL	2.739						
991												
992					Nonparametric Distribution Free UCL Statistics							
993					Data do not follow a Discernible Distribution (0.05)							
994												
995					Nonparametric Distribution Free UCLs							
996					95% CLT UCL	0.738				95% Jackknife UCL		0.752
997					95% Standard Bootstrap UCL	0.736				95% Bootstrap-t UCL		0.815
998					95% Hall's Bootstrap UCL	1.662				95% Percentile Bootstrap UCL		0.741
999					95% BCA Bootstrap UCL	0.787						
1000					90% Chebyshev(Mean, Sd) UCL	0.861				95% Chebyshev(Mean, Sd) UCL		0.985
1001					97.5% Chebyshev(Mean, Sd) UCL	1.157				99% Chebyshev(Mean, Sd) UCL		1.495
1002												
1003					Suggested UCL to Use							
1004					95% Chebyshev (Mean, Sd) UCL	0.985						
1005												
1006					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1007					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1008					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1009					For additional insight the user may want to consult a statistician.							
1010												
1011												
1012	PCB, Total											
1013												
1014					General Statistics							
1015					Total Number of Observations	12				Number of Distinct Observations		5
1016										Number of Missing Observations		0
1017					Minimum	0.13				Mean		4.631
1018					Maximum	10				Median		5
1019					SD	3.246				Std. Error of Mean		0.937
1020					Coefficient of Variation	0.701				Skewness		0.14
1021												
1022					Normal GOF Test							
1023					Shapiro Wilk Test Statistic	0.817				Shapiro Wilk GOF Test		
1024					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
1025					Lilliefors Test Statistic	0.295				Lilliefors GOF Test		
1026					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
1027					Data Not Normal at 5% Significance Level							
1028												
1029					Assuming Normal Distribution							
1030					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1031					95% Student's-t UCL	6.313				95% Adjusted-CLT UCL (Chen-1995)		6.212
1032										95% Modified-t UCL (Johnson-1978)		6.32
1033												
1034					Gamma GOF Test							
1035					A-D Test Statistic	1.664				Anderson-Darling Gamma GOF Test		
1036					5% A-D Critical Value	0.759				Data Not Gamma Distributed at 5% Significance Level		
1037					K-S Test Statistic	0.414				Kolmogrov-Smirnoff Gamma GOF Test		
1038					5% K-S Critical Value	0.253				Data Not Gamma Distributed at 5% Significance Level		
1039					Data Not Gamma Distributed at 5% Significance Level							
1040												

	A	B	C	D	E	F	G	H	I	J	K	L
1041	Gamma Statistics											
1042					k hat (MLE)	0.931	k star (bias corrected MLE)					0.754
1043					Theta hat (MLE)	4.974	Theta star (bias corrected MLE)					6.143
1044					nu hat (MLE)	22.34	nu star (bias corrected)					18.09
1045					MLE Mean (bias corrected)	4.631	MLE Sd (bias corrected)					5.334
1046							Approximate Chi Square Value (0.05)					9.457
1047					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					8.52
1048												
1049	Assuming Gamma Distribution											
1050			95% Approximate Gamma UCL (use when n>=50))			8.859	95% Adjusted Gamma UCL (use when n<50)					9.834
1051												
1052	Lognormal GOF Test											
1053					Shapiro Wilk Test Statistic	0.695	Shapiro Wilk Lognormal GOF Test					
1054					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
1055					Lilliefors Test Statistic	0.42	Lilliefors Lognormal GOF Test					
1056					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
1057	Data Not Lognormal at 5% Significance Level											
1058												
1059	Lognormal Statistics											
1060					Minimum of Logged Data	-2.04	Mean of logged Data					0.907
1061					Maximum of Logged Data	2.303	SD of logged Data					1.593
1062												
1063	Assuming Lognormal Distribution											
1064					95% H-UCL	62.93	90% Chebyshev (MVUE) UCL					18.27
1065					95% Chebyshev (MVUE) UCL	23.25	97.5% Chebyshev (MVUE) UCL					30.17
1066					99% Chebyshev (MVUE) UCL	43.75						
1067												
1068	Nonparametric Distribution Free UCL Statistics											
1069	Data do not follow a Discernible Distribution (0.05)											
1070												
1071	Nonparametric Distribution Free UCLs											
1072					95% CLT UCL	6.172	95% Jackknife UCL					6.313
1073					95% Standard Bootstrap UCL	6.077	95% Bootstrap-t UCL					6.313
1074					95% Hall's Bootstrap UCL	6.673	95% Percentile Bootstrap UCL					6.244
1075					95% BCA Bootstrap UCL	6.236						
1076					90% Chebyshev(Mean, Sd) UCL	7.442	95% Chebyshev(Mean, Sd) UCL					8.715
1077					97.5% Chebyshev(Mean, Sd) UCL	10.48	99% Chebyshev(Mean, Sd) UCL					13.95
1078												
1079	Suggested UCL to Use											
1080					99% Chebyshev (Mean, Sd) UCL	13.95						
1081												
1082	Recommended UCL exceeds the maximum observation											
1083												
1084	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1085	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1086	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1087	For additional insight the user may want to consult a statistician.											
1088												
1089												
1090	Technetium-99											
1091												
1092	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
1093					Total Number of Observations	12					Number of Distinct Observations	6
1094											Number of Missing Observations	0
1095					Minimum	2.1					Mean	90.6
1096					Maximum	367					Median	90.6
1097					SD	93.62					Std. Error of Mean	27.03
1098					Coefficient of Variation	1.033					Skewness	2.607
1099												
1100					Normal GOF Test							
1101					Shapiro Wilk Test Statistic	0.635			Shapiro Wilk GOF Test			
1102					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
1103					Lilliefors Test Statistic	0.417			Lilliefors GOF Test			
1104					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
1105					Data Not Normal at 5% Significance Level							
1106												
1107					Assuming Normal Distribution							
1108					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
1109					95% Student's-t UCL	139.1			95% Adjusted-CLT UCL (Chen-1995)			156.8
1110									95% Modified-t UCL (Johnson-1978)			142.5
1111												
1112					Gamma GOF Test							
1113					A-D Test Statistic	1.052			Anderson-Darling Gamma GOF Test			
1114					5% A-D Critical Value	0.754			Data Not Gamma Distributed at 5% Significance Level			
1115					K-S Test Statistic	0.292			Kolmogrov-Smirnoff Gamma GOF Test			
1116					5% K-S Critical Value	0.252			Data Not Gamma Distributed at 5% Significance Level			
1117					Data Not Gamma Distributed at 5% Significance Level							
1118												
1119					Gamma Statistics							
1120					k hat (MLE)	1.115			k star (bias corrected MLE)			0.892
1121					Theta hat (MLE)	81.24			Theta star (bias corrected MLE)			101.6
1122					nu hat (MLE)	26.76			nu star (bias corrected)			21.41
1123					MLE Mean (bias corrected)	90.6			MLE Sd (bias corrected)			95.93
1124									Approximate Chi Square Value (0.05)			11.89
1125					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			10.83
1126												
1127					Assuming Gamma Distribution							
1128					95% Approximate Gamma UCL (use when n>=50))	163.1			95% Adjusted Gamma UCL (use when n<50)			179.1
1129												
1130					Lognormal GOF Test							
1131					Shapiro Wilk Test Statistic	0.798			Shapiro Wilk Lognormal GOF Test			
1132					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
1133					Lilliefors Test Statistic	0.321			Lilliefors Lognormal GOF Test			
1134					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
1135					Data Not Lognormal at 5% Significance Level							
1136												
1137					Lognormal Statistics							
1138					Minimum of Logged Data	0.742			Mean of logged Data			3.995
1139					Maximum of Logged Data	5.905			SD of logged Data			1.286
1140												
1141					Assuming Lognormal Distribution							
1142					95% H-UCL	474.7			90% Chebyshev (MVUE) UCL			246.6
1143					95% Chebyshev (MVUE) UCL	307.8			97.5% Chebyshev (MVUE) UCL			392.7
1144					99% Chebyshev (MVUE) UCL	559.5						

	A	B	C	D	E	F	G	H	I	J	K	L
1145												
1146					**Nonparametric Distribution Free UCL Statistics**							
1147					**Data do not follow a Discernible Distribution (0.05)**							
1148												
1149					**Nonparametric Distribution Free UCLs**							
1150					95% CLT UCL	135.1				95% Jackknife UCL		139.1
1151					95% Standard Bootstrap UCL	133.8				95% Bootstrap-t UCL		179.2
1152					95% Hall's Bootstrap UCL	326.6				95% Percentile Bootstrap UCL		136.8
1153					95% BCA Bootstrap UCL	153.8						
1154					90% Chebyshev(Mean, Sd) UCL	171.7				95% Chebyshev(Mean, Sd) UCL		208.4
1155					97.5% Chebyshev(Mean, Sd) UCL	259.4				99% Chebyshev(Mean, Sd) UCL		359.5
1156												
1157					**Suggested UCL to Use**							
1158					95% Chebyshev (Mean, Sd) UCL	208.4						
1159												
1160					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1161					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1162					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1163					For additional insight the user may want to consult a statistician.							
1164												
1165												
1166	**Thallium**											
1167												
1168					**General Statistics**							
1169					Total Number of Observations	12				Number of Distinct Observations		6
1170										Number of Missing Observations		0
1171					Minimum	0.26				Mean		9.804
1172					Maximum	16.3				Median		9.804
1173					SD	5.227				Std. Error of Mean		1.509
1174					Coefficient of Variation	0.533				Skewness		-0.725
1175												
1176					**Normal GOF Test**							
1177					Shapiro Wilk Test Statistic	0.797				**Shapiro Wilk GOF Test**		
1178					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
1179					Lilliefors Test Statistic	0.333				**Lilliefors GOF Test**		
1180					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
1181					**Data Not Normal at 5% Significance Level**							
1182												
1183					**Assuming Normal Distribution**							
1184					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1185					95% Student's-t UCL	12.51				95% Adjusted-CLT UCL (Chen-1995)		11.95
1186										95% Modified-t UCL (Johnson-1978)		12.46
1187												
1188					**Gamma GOF Test**							
1189					A-D Test Statistic	2.143				**Anderson-Darling Gamma GOF Test**		
1190					5% A-D Critical Value	0.751				Data Not Gamma Distributed at 5% Significance Level		
1191					K-S Test Statistic	0.452				**Kolmogrov-Smirnoff Gamma GOF Test**		
1192					5% K-S Critical Value	0.251				Data Not Gamma Distributed at 5% Significance Level		
1193					**Data Not Gamma Distributed at 5% Significance Level**							
1194												
1195					**Gamma Statistics**							
1196					k hat (MLE)	1.243				k star (bias corrected MLE)		0.988

	A	B	C	D	E	F	G	H	I	J	K	L
1197					Theta hat (MLE)	7.887				Theta star (bias corrected MLE)		9.924
1198					nu hat (MLE)	29.83				nu star (bias corrected)		23.71
1199					MLE Mean (bias corrected)	9.804				MLE Sd (bias corrected)		9.864
1200										Approximate Chi Square Value (0.05)		13.63
1201					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		12.47
1202												
1203					**Assuming Gamma Distribution**							
1204					95% Approximate Gamma UCL (use when n>=50))	17.06				95% Adjusted Gamma UCL (use when n<50)		18.63
1205												
1206					**Lognormal GOF Test**							
1207					Shapiro Wilk Test Statistic	0.594				**Shapiro Wilk Lognormal GOF Test**		
1208					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
1209					Lilliefors Test Statistic	0.458				**Lilliefors Lognormal GOF Test**		
1210					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
1211					**Data Not Lognormal at 5% Significance Level**							
1212												
1213					**Lognormal Statistics**							
1214					Minimum of Logged Data	-1.347				Mean of logged Data		1.829
1215					Maximum of Logged Data	2.791				SD of logged Data		1.426
1216												
1217					**Assuming Lognormal Distribution**							
1218					95% H-UCL	86.13				90% Chebyshev (MVUE) UCL		35.12
1219					95% Chebyshev (MVUE) UCL	44.26				97.5% Chebyshev (MVUE) UCL		56.95
1220					99% Chebyshev (MVUE) UCL	81.87						
1221												
1222					**Nonparametric Distribution Free UCL Statistics**							
1223					**Data do not follow a Discernible Distribution (0.05)**							
1224												
1225					**Nonparametric Distribution Free UCLs**							
1226					95% CLT UCL	12.29				95% Jackknife UCL		12.51
1227					95% Standard Bootstrap UCL	12.21				95% Bootstrap-t UCL		12.2
1228					95% Hall's Bootstrap UCL	12.17				95% Percentile Bootstrap UCL		11.95
1229					95% BCA Bootstrap UCL	11.89						
1230					90% Chebyshev(Mean, Sd) UCL	14.33				95% Chebyshev(Mean, Sd) UCL		16.38
1231					97.5% Chebyshev(Mean, Sd) UCL	19.23				99% Chebyshev(Mean, Sd) UCL		24.82
1232												
1233					**Suggested UCL to Use**							
1234					95% Chebyshev (Mean, Sd) UCL	16.38						
1235												
1236					**Recommended UCL exceeds the maximum observation**							
1237												
1238					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1239					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1240					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1241					For additional insight the user may want to consult a statistician.							
1242												
1243					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
1244					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
1245												
1246												
1247	**Thorium-230**											
1248												

	A	B	C	D	E	F	G	H	I	J	K	L
1249	General Statistics											
1250	Total Number of Observations					12	Number of Distinct Observations					6
1251							Number of Missing Observations					0
1252	Minimum					0.483	Mean					2.402
1253	Maximum					7.23	Median					2.402
1254	SD					1.756	Std. Error of Mean					0.507
1255	Coefficient of Variation					0.731	Skewness					1.896
1256												
1257	Normal GOF Test											
1258	Shapiro Wilk Test Statistic					0.722	**Shapiro Wilk GOF Test**					
1259	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
1260	Lilliefors Test Statistic					0.333	**Lilliefors GOF Test**					
1261	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
1262	**Data Not Normal at 5% Significance Level**											
1263												
1264	Assuming Normal Distribution											
1265	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1266	95% Student's-t UCL					3.312	95% Adjusted-CLT UCL (Chen-1995)					3.532
1267							95% Modified-t UCL (Johnson-1978)					3.358
1268												
1269	Gamma GOF Test											
1270	A-D Test Statistic					1.256	**Anderson-Darling Gamma GOF Test**					
1271	5% A-D Critical Value					0.741	Data Not Gamma Distributed at 5% Significance Level					
1272	K-S Test Statistic					0.341	**Kolmogrov-Smirnoff Gamma GOF Test**					
1273	5% K-S Critical Value					0.248	Data Not Gamma Distributed at 5% Significance Level					
1274	**Data Not Gamma Distributed at 5% Significance Level**											
1275												
1276	Gamma Statistics											
1277	k hat (MLE)					2.124	k star (bias corrected MLE)					1.648
1278	Theta hat (MLE)					1.131	Theta star (bias corrected MLE)					1.457
1279	nu hat (MLE)					50.97	nu star (bias corrected)					39.56
1280	MLE Mean (bias corrected)					2.402	MLE Sd (bias corrected)					1.871
1281							Approximate Chi Square Value (0.05)					26.15
1282	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					24.5
1283												
1284	Assuming Gamma Distribution											
1285	95% Approximate Gamma UCL (use when n>=50))					3.633	95% Adjusted Gamma UCL (use when n<50)					3.878
1286												
1287	Lognormal GOF Test											
1288	Shapiro Wilk Test Statistic					0.8	**Shapiro Wilk Lognormal GOF Test**					
1289	5% Shapiro Wilk Critical Value					0.859	Data Not Lognormal at 5% Significance Level					
1290	Lilliefors Test Statistic					0.374	**Lilliefors Lognormal GOF Test**					
1291	5% Lilliefors Critical Value					0.256	Data Not Lognormal at 5% Significance Level					
1292	**Data Not Lognormal at 5% Significance Level**											
1293												
1294	Lognormal Statistics											
1295	Minimum of Logged Data					-0.728	Mean of logged Data					0.623
1296	Maximum of Logged Data					1.978	SD of logged Data					0.8
1297												
1298	Assuming Lognormal Distribution											
1299	95% H-UCL					4.775	90% Chebyshev (MVUE) UCL					4.295
1300	95% Chebyshev (MVUE) UCL					5.115	97.5% Chebyshev (MVUE) UCL					6.254

	A	B	C	D	E	F	G	H	I	J	K	L
1301					99% Chebyshev (MVUE) UCL	8.49						
1302												
1303					Nonparametric Distribution Free UCL Statistics							
1304					Data do not follow a Discernible Distribution (0.05)							
1305												
1306					Nonparametric Distribution Free UCLs							
1307					95% CLT UCL	3.235				95% Jackknife UCL		3.312
1308					95% Standard Bootstrap UCL	3.199				95% Bootstrap-t UCL		3.63
1309					95% Hall's Bootstrap UCL	7.532				95% Percentile Bootstrap UCL		3.263
1310					95% BCA Bootstrap UCL	3.505						
1311					90% Chebyshev(Mean, Sd) UCL	3.922				95% Chebyshev(Mean, Sd) UCL		4.611
1312					97.5% Chebyshev(Mean, Sd) UCL	5.567				99% Chebyshev(Mean, Sd) UCL		7.446
1313												
1314					Suggested UCL to Use							
1315					95% Chebyshev (Mean, Sd) UCL	4.611						
1316												
1317					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1318					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1319					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1320					For additional insight the user may want to consult a statistician.							
1321												
1322												
1323	Uranium											
1324												
1325					General Statistics							
1326					Total Number of Observations	12				Number of Distinct Observations		12
1327										Number of Missing Observations		0
1328					Minimum	9.9				Mean		148.6
1329					Maximum	459				Median		127.8
1330					SD	129.9				Std. Error of Mean		37.51
1331					Coefficient of Variation	0.874				Skewness		1.194
1332												
1333					Normal GOF Test							
1334					Shapiro Wilk Test Statistic	0.894				Shapiro Wilk GOF Test		
1335					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
1336					Lilliefors Test Statistic	0.143				Lilliefors GOF Test		
1337					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
1338					Data appear Normal at 5% Significance Level							
1339												
1340					Assuming Normal Distribution							
1341					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1342					95% Student's-t UCL	216				95% Adjusted-CLT UCL (Chen-1995)		224.1
1343										95% Modified-t UCL (Johnson-1978)		218.1
1344												
1345					Gamma GOF Test							
1346					A-D Test Statistic	0.262				Anderson-Darling Gamma GOF Test		
1347					5% A-D Critical Value	0.753				Detected data appear Gamma Distributed at 5% Significance Level		
1348					K-S Test Statistic	0.134				Kolmogrov-Smirnoff Gamma GOF Test		
1349					5% K-S Critical Value	0.251				Detected data appear Gamma Distributed at 5% Significance Level		
1350					Detected data appear Gamma Distributed at 5% Significance Level							
1351												
1352					Gamma Statistics							

	A	B	C	D	E	F	G	H	I	J	K	L
1353					k hat (MLE)	1.166					k star (bias corrected MLE)	0.93
1354					Theta hat (MLE)	127.5					Theta star (bias corrected MLE)	159.9
1355					nu hat (MLE)	27.97					nu star (bias corrected)	22.31
1356					MLE Mean (bias corrected)	148.6					MLE Sd (bias corrected)	154.1
1357											Approximate Chi Square Value (0.05)	12.57
1358					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	11.47
1359												
1360					**Assuming Gamma Distribution**							
1361					95% Approximate Gamma UCL (use when n>=50))	263.8					95% Adjusted Gamma UCL (use when n<50)	289.1
1362												
1363					**Lognormal GOF Test**							
1364					Shapiro Wilk Test Statistic	0.929			**Shapiro Wilk Lognormal GOF Test**			
1365					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
1366					Lilliefors Test Statistic	0.177			**Lilliefors Lognormal GOF Test**			
1367					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
1368					**Data appear Lognormal at 5% Significance Level**							
1369												
1370					**Lognormal Statistics**							
1371					Minimum of Logged Data	2.293					Mean of logged Data	4.515
1372					Maximum of Logged Data	6.129					SD of logged Data	1.183
1373												
1374					**Assuming Lognormal Distribution**							
1375					95% H-UCL	588.4					90% Chebyshev (MVUE) UCL	355.8
1376					95% Chebyshev (MVUE) UCL	440.6					97.5% Chebyshev (MVUE) UCL	558.3
1377					99% Chebyshev (MVUE) UCL	789.4						
1378												
1379					**Nonparametric Distribution Free UCL Statistics**							
1380					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
1381												
1382					**Nonparametric Distribution Free UCLs**							
1383					95% CLT UCL	210.3					95% Jackknife UCL	216
1384					95% Standard Bootstrap UCL	207.7					95% Bootstrap-t UCL	240.7
1385					95% Hall's Bootstrap UCL	248.3					95% Percentile Bootstrap UCL	211.4
1386					95% BCA Bootstrap UCL	226.7						
1387					90% Chebyshev(Mean, Sd) UCL	261.2					95% Chebyshev(Mean, Sd) UCL	312.1
1388					97.5% Chebyshev(Mean, Sd) UCL	382.9					99% Chebyshev(Mean, Sd) UCL	521.8
1389												
1390					**Suggested UCL to Use**							
1391					95% Student's-t UCL	216						
1392												
1393					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1394					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1395					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1396					For additional insight the user may want to consult a statistician.							
1397												
1398												
1399	**Uranium-234**											
1400												
1401					**General Statistics**							
1402					Total Number of Observations	12					Number of Distinct Observations	6
1403											Number of Missing Observations	0
1404					Minimum	0.3					Mean	51.36

	A	B	C	D	E	F	G	H	I	J	K	L
1405					Maximum	185					Median	51.36
1406					SD	48.51					Std. Error of Mean	14
1407					Coefficient of Variation	0.944					Skewness	1.915
1408												
1409					Normal GOF Test							
1410					Shapiro Wilk Test Statistic	0.712	Shapiro Wilk GOF Test					
1411					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
1412					Lilliefors Test Statistic	0.333	Lilliefors GOF Test					
1413					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
1414					Data Not Normal at 5% Significance Level							
1415												
1416					Assuming Normal Distribution							
1417				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
1418					95% Student's-t UCL	76.51					95% Adjusted-CLT UCL (Chen-1995)	82.66
1419											95% Modified-t UCL (Johnson-1978)	77.8
1420												
1421					Gamma GOF Test							
1422					A-D Test Statistic	1.68	Anderson-Darling Gamma GOF Test					
1423					5% A-D Critical Value	0.774	Data Not Gamma Distributed at 5% Significance Level					
1424					K-S Test Statistic	0.414	Kolmogrov-Smirnoff Gamma GOF Test					
1425					5% K-S Critical Value	0.257	Data Not Gamma Distributed at 5% Significance Level					
1426					Data Not Gamma Distributed at 5% Significance Level							
1427												
1428					Gamma Statistics							
1429					k hat (MLE)	0.636					k star (bias corrected MLE)	0.532
1430					Theta hat (MLE)	80.79					Theta star (bias corrected MLE)	96.47
1431					nu hat (MLE)	15.26					nu star (bias corrected)	12.78
1432					MLE Mean (bias corrected)	51.36					MLE Sd (bias corrected)	70.39
1433											Approximate Chi Square Value (0.05)	5.743
1434					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	5.041
1435												
1436					Assuming Gamma Distribution							
1437					95% Approximate Gamma UCL (use when n>=50))	114.3					95% Adjusted Gamma UCL (use when n<50)	130.2
1438												
1439					Lognormal GOF Test							
1440					Shapiro Wilk Test Statistic	0.709	Shapiro Wilk Lognormal GOF Test					
1441					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
1442					Lilliefors Test Statistic	0.426	Lilliefors Lognormal GOF Test					
1443					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
1444					Data Not Lognormal at 5% Significance Level							
1445												
1446					Lognormal Statistics							
1447					Minimum of Logged Data	-1.204					Mean of logged Data	2.975
1448					Maximum of Logged Data	5.22					SD of logged Data	2.114
1449												
1450					Assuming Lognormal Distribution							
1451					95% H-UCL	5060					90% Chebyshev (MVUE) UCL	353.9
1452					95% Chebyshev (MVUE) UCL	460.2					97.5% Chebyshev (MVUE) UCL	607.8
1453					99% Chebyshev (MVUE) UCL	897.6						
1454												
1455					Nonparametric Distribution Free UCL Statistics							
1456					Data do not follow a Discernible Distribution (0.05)							

	A	B	C	D	E	F	G	H	I	J	K	L
1457												
1458	**Nonparametric Distribution Free UCLs**											
1459					95% CLT UCL	74.39				95% Jackknife UCL		76.51
1460					95% Standard Bootstrap UCL	73.62				95% Bootstrap-t UCL		85.41
1461					95% Hall's Bootstrap UCL	192.2				95% Percentile Bootstrap UCL		75.15
1462					95% BCA Bootstrap UCL	82.05						
1463					90% Chebyshev(Mean, Sd) UCL	93.37				95% Chebyshev(Mean, Sd) UCL		112.4
1464					97.5% Chebyshev(Mean, Sd) UCL	138.8				99% Chebyshev(Mean, Sd) UCL		190.7
1465												
1466	**Suggested UCL to Use**											
1467					99% Chebyshev (Mean, Sd) UCL	190.7						
1468												
1469	**Recommended UCL exceeds the maximum observation**											
1470												
1471	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1472	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1473	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1474	For additional insight the user may want to consult a statistician.											
1475												
1476												
1477	**Uranium-235**											
1478												
1479	**General Statistics**											
1480					Total Number of Observations	12				Number of Distinct Observations		6
1481										Number of Missing Observations		0
1482					Minimum	0.00472				Mean		5.203
1483					Maximum	21.7				Median		5.203
1484					SD	5.667				Std. Error of Mean		1.636
1485					Coefficient of Variation	1.089				Skewness		2.442
1486												
1487	**Normal GOF Test**											
1488					Shapiro Wilk Test Statistic	0.634				**Shapiro Wilk GOF Test**		
1489					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
1490					Lilliefors Test Statistic	0.417				**Lilliefors GOF Test**		
1491					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
1492	**Data Not Normal at 5% Significance Level**											
1493												
1494	**Assuming Normal Distribution**											
1495					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1496					95% Student's-t UCL	8.141				95% Adjusted-CLT UCL (Chen-1995)		9.126
1497										95% Modified-t UCL (Johnson-1978)		8.333
1498												
1499	**Gamma GOF Test**											
1500					A-D Test Statistic	1.717				**Anderson-Darling Gamma GOF Test**		
1501					5% A-D Critical Value	0.786				Data Not Gamma Distributed at 5% Significance Level		
1502					K-S Test Statistic	0.383				**Kolmogrov-Smirnoff Gamma GOF Test**		
1503					5% K-S Critical Value	0.259				Data Not Gamma Distributed at 5% Significance Level		
1504	**Data Not Gamma Distributed at 5% Significance Level**											
1505												
1506	**Gamma Statistics**											
1507					k hat (MLE)	0.492				k star (bias corrected MLE)		0.425
1508					Theta hat (MLE)	10.57				Theta star (bias corrected MLE)		12.24

	A	B	C	D	E	F	G	H	I	J	K	L
1509					nu hat (MLE)	11.82				nu star (bias corrected)		10.2
1510					MLE Mean (bias corrected)	5.203				MLE Sd (bias corrected)		7.982
1511										Approximate Chi Square Value (0.05)		4.066
1512					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		3.495
1513												
1514					**Assuming Gamma Distribution**							
1515				95% Approximate Gamma UCL (use when n>=50))		13.05				95% Adjusted Gamma UCL (use when n<50)		15.18
1516												
1517					**Lognormal GOF Test**							
1518					Shapiro Wilk Test Statistic	0.705			**Shapiro Wilk Lognormal GOF Test**			
1519					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
1520					Lilliefors Test Statistic	0.406			**Lilliefors Lognormal GOF Test**			
1521					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
1522					**Data Not Lognormal at 5% Significance Level**							
1523												
1524					**Lognormal Statistics**							
1525					Minimum of Logged Data	-5.356				Mean of logged Data		0.356
1526					Maximum of Logged Data	3.077				SD of logged Data		2.686
1527												
1528					**Assuming Lognormal Distribution**							
1529					95% H-UCL	10010				90% Chebyshev (MVUE) UCL		75.31
1530					95% Chebyshev (MVUE) UCL	99.26				97.5% Chebyshev (MVUE) UCL		132.5
1531					99% Chebyshev (MVUE) UCL	197.8						
1532												
1533					**Nonparametric Distribution Free UCL Statistics**							
1534					**Data do not follow a Discernible Distribution (0.05)**							
1535												
1536					**Nonparametric Distribution Free UCLs**							
1537					95% CLT UCL	7.894				95% Jackknife UCL		8.141
1538					95% Standard Bootstrap UCL	7.784				95% Bootstrap-t UCL		10.07
1539					95% Hall's Bootstrap UCL	19.97				95% Percentile Bootstrap UCL		7.964
1540					95% BCA Bootstrap UCL	8.972						
1541					90% Chebyshev(Mean, Sd) UCL	10.11				95% Chebyshev(Mean, Sd) UCL		12.33
1542					97.5% Chebyshev(Mean, Sd) UCL	15.42				99% Chebyshev(Mean, Sd) UCL		21.48
1543												
1544					**Suggested UCL to Use**							
1545					99% Chebyshev (Mean, Sd) UCL	21.48						
1546												
1547	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1548	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1549	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1550	For additional insight the user may want to consult a statistician.											
1551												
1552												
1553	**Uranium-238**											
1554												
1555					**General Statistics**							
1556					Total Number of Observations	12				Number of Distinct Observations		6
1557										Number of Missing Observations		0
1558					Minimum	0.357				Mean		240
1559					Maximum	1100				Median		240
1560					SD	291				Std. Error of Mean		84

	A	B	C	D	E	F	G	H	I	J	K	L
1561					Coefficient of Variation	1.212					Skewness	2.622
1562												
1563					Normal GOF Test							
1564					Shapiro Wilk Test Statistic	0.62	Shapiro Wilk GOF Test					
1565					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
1566					Lilliefors Test Statistic	0.417	Lilliefors GOF Test					
1567					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
1568					Data Not Normal at 5% Significance Level							
1569												
1570					Assuming Normal Distribution							
1571				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
1572					95% Student's-t UCL	390.9					95% Adjusted-CLT UCL (Chen-1995)	446.1
1573											95% Modified-t UCL (Johnson-1978)	401.5
1574												
1575					Gamma GOF Test							
1576					A-D Test Statistic	1.429	Anderson-Darling Gamma GOF Test					
1577					5% A-D Critical Value	0.789	Data Not Gamma Distributed at 5% Significance Level					
1578					K-S Test Statistic	0.353	Kolmogrov-Smirnoff Gamma GOF Test					
1579					5% K-S Critical Value	0.259	Data Not Gamma Distributed at 5% Significance Level					
1580					Data Not Gamma Distributed at 5% Significance Level							
1581												
1582					Gamma Statistics							
1583					k hat (MLE)	0.477					k star (bias corrected MLE)	0.413
1584					Theta hat (MLE)	503.6					Theta star (bias corrected MLE)	581.2
1585					nu hat (MLE)	11.44					nu star (bias corrected)	9.913
1586					MLE Mean (bias corrected)	240					MLE Sd (bias corrected)	373.5
1587											Approximate Chi Square Value (0.05)	3.887
1588					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	3.332
1589												
1590					Assuming Gamma Distribution							
1591					95% Approximate Gamma UCL (use when n>=50))	612.1					95% Adjusted Gamma UCL (use when n<50)	714.1
1592												
1593					Lognormal GOF Test							
1594					Shapiro Wilk Test Statistic	0.732	Shapiro Wilk Lognormal GOF Test					
1595					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
1596					Lilliefors Test Statistic	0.362	Lilliefors Lognormal GOF Test					
1597					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
1598					Data Not Lognormal at 5% Significance Level							
1599												
1600					Lognormal Statistics							
1601					Minimum of Logged Data	-1.03					Mean of logged Data	4.138
1602					Maximum of Logged Data	7.003					SD of logged Data	2.634
1603												
1604					Assuming Lognormal Distribution							
1605					95% H-UCL	315863					90% Chebyshev (MVUE) UCL	2991
1606					95% Chebyshev (MVUE) UCL	3939					97.5% Chebyshev (MVUE) UCL	5254
1607					99% Chebyshev (MVUE) UCL	7838						
1608												
1609					Nonparametric Distribution Free UCL Statistics							
1610					Data do not follow a Discernible Distribution (0.05)							
1611												
1612					Nonparametric Distribution Free UCLs							

	A	B	C	D	E	F	G	H	I	J	K	L
1613					95% CLT UCL	378.2					95% Jackknife UCL	390.9
1614					95% Standard Bootstrap UCL	368.8					95% Bootstrap-t UCL	511.8
1615					95% Hall's Bootstrap UCL	966.4					95% Percentile Bootstrap UCL	383.4
1616					95% BCA Bootstrap UCL	462.9						
1617					90% Chebyshev(Mean, Sd) UCL	492					95% Chebyshev(Mean, Sd) UCL	606.2
1618					97.5% Chebyshev(Mean, Sd) UCL	764.6					99% Chebyshev(Mean, Sd) UCL	1076
1619												
1620					**Suggested UCL to Use**							
1621					99% Chebyshev (Mean, Sd) UCL	1076						
1622												
1623					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1624					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1625					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1626					For additional insight the user may want to consult a statistician.							
1627												
1628												
1629	**Vanadium**											
1630												
1631					**General Statistics**							
1632					Total Number of Observations	12					Number of Distinct Observations	8
1633											Number of Missing Observations	0
1634					Minimum	11.3					Mean	60.63
1635					Maximum	131.9					Median	70
1636					SD	31.98					Std. Error of Mean	9.232
1637					Coefficient of Variation	0.527					Skewness	0.497
1638												
1639					**Normal GOF Test**							
1640					Shapiro Wilk Test Statistic	0.86			**Shapiro Wilk GOF Test**			
1641					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
1642					Lilliefors Test Statistic	0.282			**Lilliefors GOF Test**			
1643					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
1644					**Data appear Approximate Normal at 5% Significance Level**							
1645												
1646					**Assuming Normal Distribution**							
1647					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
1648					95% Student's-t UCL	77.21			95% Adjusted-CLT UCL (Chen-1995)			77.23
1649									95% Modified-t UCL (Johnson-1978)			77.43
1650												
1651					**Gamma GOF Test**							
1652					A-D Test Statistic	0.984			**Anderson-Darling Gamma GOF Test**			
1653					5% A-D Critical Value	0.739			Data Not Gamma Distributed at 5% Significance Level			
1654					K-S Test Statistic	0.339			**Kolmogrov-Smirnoff Gamma GOF Test**			
1655					5% K-S Critical Value	0.247			Data Not Gamma Distributed at 5% Significance Level			
1656					**Data Not Gamma Distributed at 5% Significance Level**							
1657												
1658					**Gamma Statistics**							
1659					k hat (MLE)	3.095			k star (bias corrected MLE)			2.377
1660					Theta hat (MLE)	19.59			Theta star (bias corrected MLE)			25.51
1661					nu hat (MLE)	74.29			nu star (bias corrected)			57.05
1662					MLE Mean (bias corrected)	60.63			MLE Sd (bias corrected)			39.33
1663									Approximate Chi Square Value (0.05)			40.69
1664					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			38.59

	A	B	C	D	E	F	G	H	I	J	K	L
1665												
1666						Assuming Gamma Distribution						
1667					95% Approximate Gamma UCL (use when n>=50))	85.01				95% Adjusted Gamma UCL (use when n<50)		89.64
1668												
1669						Lognormal GOF Test						
1670					Shapiro Wilk Test Statistic	0.838			Shapiro Wilk Lognormal GOF Test			
1671					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
1672					Lilliefors Test Statistic	0.345			Lilliefors Lognormal GOF Test			
1673					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
1674						Data Not Lognormal at 5% Significance Level						
1675												
1676						Lognormal Statistics						
1677					Minimum of Logged Data	2.425			Mean of logged Data			3.935
1678					Maximum of Logged Data	4.882			SD of logged Data			0.677
1679												
1680						Assuming Lognormal Distribution						
1681					95% H-UCL	104.6			90% Chebyshev (MVUE) UCL			101.3
1682					95% Chebyshev (MVUE) UCL	118.7			97.5% Chebyshev (MVUE) UCL			142.8
1683					99% Chebyshev (MVUE) UCL	190.2						
1684												
1685						Nonparametric Distribution Free UCL Statistics						
1686						Data appear to follow a Discernible Distribution at 5% Significance Level						
1687												
1688						Nonparametric Distribution Free UCLs						
1689					95% CLT UCL	75.82			95% Jackknife UCL			77.21
1690					95% Standard Bootstrap UCL	75.01			95% Bootstrap-t UCL			78.06
1691					95% Hall's Bootstrap UCL	80.32			95% Percentile Bootstrap UCL			75.32
1692					95% BCA Bootstrap UCL	77.1						
1693					90% Chebyshev(Mean, Sd) UCL	88.33			95% Chebyshev(Mean, Sd) UCL			100.9
1694					97.5% Chebyshev(Mean, Sd) UCL	118.3			99% Chebyshev(Mean, Sd) UCL			152.5
1695												
1696						Suggested UCL to Use						
1697					95% Student's-t UCL	77.21						
1698												
1699						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
1700						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
1701						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
1702						For additional insight the user may want to consult a statistician.						
1703												