	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			3/1/2015 12:31:59 PM								
5	From File			EPC_015SurfEU4.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					15	Number of Distinct Observations					11
15							Number of Missing Observations					0
16	Minimum					0.8	Mean					61.09
17	Maximum					118.5	Median					61.09
18	SD					33.46	Std. Error of Mean					8.64
19	Coefficient of Variation					0.548	Skewness					0.0163
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.955	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.881	Data appear Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.157	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.229	Data appear Normal at 5% Significance Level					
26	**Data appear Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL					76.31	95% Adjusted-CLT UCL (Chen-1995)					75.34
31							95% Modified-t UCL (Johnson-1978)					76.32
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					0.9	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.751	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.225	**Kolmogrov-Smirnoff Gamma GOF Test**					
37	5% K-S Critical Value					0.225	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)					1.669	k star (bias corrected MLE)					1.38
42	Theta hat (MLE)					36.6	Theta star (bias corrected MLE)					44.27
43	nu hat (MLE)					50.08	nu star (bias corrected)					41.4
44	MLE Mean (bias corrected)					61.09	MLE Sd (bias corrected)					52.01
45							Approximate Chi Square Value (0.05)					27.65
46	Adjusted Level of Significance					0.0324	Adjusted Chi Square Value					26.27
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					91.46	95% Adjusted Gamma UCL (use when n<50)					96.26
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.654	**Shapiro Wilk Lognormal GOF Test**					

	A	B	C	D	E	F	G	H	I	J	K	L
53					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.309	**Lilliefors Lognormal GOF Test**					
55					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	-0.223			Mean of logged Data			3.784
60					Maximum of Logged Data	4.775			SD of logged Data			1.21
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	248.7			90% Chebyshev (MVUE) UCL			173.6
64					95% Chebyshev (MVUE) UCL	213.9			97.5% Chebyshev (MVUE) UCL			269.7
65					99% Chebyshev (MVUE) UCL	379.4						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	75.3			95% Jackknife UCL			76.31
72					95% Standard Bootstrap UCL	75.18			95% Bootstrap-t UCL			76.68
73					95% Hall's Bootstrap UCL	75			95% Percentile Bootstrap UCL			75.28
74					95% BCA Bootstrap UCL	74.15						
75					90% Chebyshev(Mean, Sd) UCL	87.01			95% Chebyshev(Mean, Sd) UCL			98.75
76					97.5% Chebyshev(Mean, Sd) UCL	115			99% Chebyshev(Mean, Sd) UCL			147.1
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	76.31						
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	15			Number of Distinct Observations			12
91									Number of Missing Observations			0
92					Minimum	6			Mean			22.9
93					Maximum	51.31			Median			15.33
94					SD	15.93			Std. Error of Mean			4.113
95					Coefficient of Variation	0.696			Skewness			0.713
96												
97	**Normal GOF Test**											
98					Shapiro Wilk Test Statistic	0.853	**Shapiro Wilk GOF Test**					
99					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
100					Lilliefors Test Statistic	0.239	**Lilliefors GOF Test**					
101					5% Lilliefors Critical Value	0.229	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	30.14				95% Adjusted-CLT UCL (Chen-1995)		30.47
107										95% Modified-t UCL (Johnson-1978)		30.27
108												
109	**Gamma GOF Test**											
110					A-D Test Statistic	0.707	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.24	**Kolmogrov-Smirnoff Gamma GOF Test**					
113					5% K-S Critical Value	0.224	Data Not Gamma Distributed at 5% Significance Level					
114	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117					k hat (MLE)	2.263	k star (bias corrected MLE)					1.855
118					Theta hat (MLE)	10.12	Theta star (bias corrected MLE)					12.34
119					nu hat (MLE)	67.9	nu star (bias corrected)					55.65
120					MLE Mean (bias corrected)	22.9	MLE Sd (bias corrected)					16.81
121							Approximate Chi Square Value (0.05)					39.51
122					Adjusted Level of Significance	0.0324	Adjusted Chi Square Value					37.84
123												
124	**Assuming Gamma Distribution**											
125					95% Approximate Gamma UCL (use when n>=50)	32.25	95% Adjusted Gamma UCL (use when n<50)					33.68
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.221	**Lilliefors Lognormal GOF Test**					
131					5% Lilliefors Critical Value	0.229	Data appear Lognormal at 5% Significance Level					
132	**Data appear Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135					Minimum of Logged Data	1.792	Mean of logged Data					2.894
136					Maximum of Logged Data	3.938	SD of logged Data					0.721
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	36.73	90% Chebyshev (MVUE) UCL					36.48
140					95% Chebyshev (MVUE) UCL	42.61	97.5% Chebyshev (MVUE) UCL					51.12
141					99% Chebyshev (MVUE) UCL	67.84						
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	29.66	95% Jackknife UCL					30.14
148					95% Standard Bootstrap UCL	29.54	95% Bootstrap-t UCL					31.66
149					95% Hall's Bootstrap UCL	29.27	95% Percentile Bootstrap UCL					29.86
150					95% BCA Bootstrap UCL	30.06						
151					90% Chebyshev(Mean, Sd) UCL	35.23	95% Chebyshev(Mean, Sd) UCL					40.82
152					97.5% Chebyshev(Mean, Sd) UCL	48.58	99% Chebyshev(Mean, Sd) UCL					63.82
153												
154	**Suggested UCL to Use**											
155					95% Adjusted Gamma UCL	33.68						
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												
163	**Cadmium**											
164												
165	**General Statistics**											
166	Total Number of Observations					15	Number of Distinct Observations				6	
167							Number of Missing Observations				0	
168	Minimum					0.42	Mean				12.97	
169	Maximum					24.15	Median				12	
170	SD					4.984	Std. Error of Mean				1.287	
171	Coefficient of Variation					0.384	Skewness				-0.16	
172												
173	**Normal GOF Test**											
174	Shapiro Wilk Test Statistic					0.751	**Shapiro Wilk GOF Test**					
175	5% Shapiro Wilk Critical Value					0.881	Data Not Normal at 5% Significance Level					
176	Lilliefors Test Statistic					0.356	**Lilliefors GOF Test**					
177	5% Lilliefors Critical Value					0.229	Data Not Normal at 5% Significance Level					
178	**Data Not Normal at 5% Significance Level**											
179												
180	**Assuming Normal Distribution**											
181	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
182	95% Student's-t UCL					15.24	95% Adjusted-CLT UCL (Chen-1995)				15.03	
183							95% Modified-t UCL (Johnson-1978)				15.23	
184												
185	**Gamma GOF Test**											
186	A-D Test Statistic					2.873	**Anderson-Darling Gamma GOF Test**					
187	5% A-D Critical Value					0.745	Data Not Gamma Distributed at 5% Significance Level					
188	K-S Test Statistic					0.463	**Kolmogrov-Smirnoff Gamma GOF Test**					
189	5% K-S Critical Value					0.224	Data Not Gamma Distributed at 5% Significance Level					
190	**Data Not Gamma Distributed at 5% Significance Level**											
191												
192	**Gamma Statistics**											
193	k hat (MLE)					2.778	k star (bias corrected MLE)				2.267	
194	Theta hat (MLE)					4.668	Theta star (bias corrected MLE)				5.72	
195	nu hat (MLE)					83.35	nu star (bias corrected)				68.02	
196	MLE Mean (bias corrected)					12.97	MLE Sd (bias corrected)				8.613	
197							Approximate Chi Square Value (0.05)				50.03	
198	Adjusted Level of Significance					0.0324	Adjusted Chi Square Value				48.14	
199												
200	**Assuming Gamma Distribution**											
201	95% Approximate Gamma UCL (use when n>=50))					17.63	95% Adjusted Gamma UCL (use when n<50)				18.32	
202												
203	**Lognormal GOF Test**											
204	Shapiro Wilk Test Statistic					0.465	**Shapiro Wilk Lognormal GOF Test**					
205	5% Shapiro Wilk Critical Value					0.881	Data Not Lognormal at 5% Significance Level					
206	Lilliefors Test Statistic					0.482	**Lilliefors Lognormal GOF Test**					
207	5% Lilliefors Critical Value					0.229	Data Not Lognormal at 5% Significance Level					
208	**Data Not Lognormal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
209												
210						**Lognormal Statistics**						
211					Minimum of Logged Data	-0.868				Mean of logged Data		2.372
212					Maximum of Logged Data	3.184				SD of logged Data		0.922
213												
214						**Assuming Lognormal Distribution**						
215					95% H-UCL	31.26				90% Chebyshev (MVUE) UCL		27.98
216					95% Chebyshev (MVUE) UCL	33.51				97.5% Chebyshev (MVUE) UCL		41.18
217					99% Chebyshev (MVUE) UCL	56.24						
218												
219						**Nonparametric Distribution Free UCL Statistics**						
220						**Data do not follow a Discernible Distribution (0.05)**						
221												
222						**Nonparametric Distribution Free UCLs**						
223					95% CLT UCL	15.09				95% Jackknife UCL		15.24
224					95% Standard Bootstrap UCL	14.98				95% Bootstrap-t UCL		15.44
225					95% Hall's Bootstrap UCL	16.35				95% Percentile Bootstrap UCL		15
226					95% BCA Bootstrap UCL	14.88						
227					90% Chebyshev(Mean, Sd) UCL	16.83				95% Chebyshev(Mean, Sd) UCL		18.58
228					97.5% Chebyshev(Mean, Sd) UCL	21.01				99% Chebyshev(Mean, Sd) UCL		25.77
229												
230						**Suggested UCL to Use**						
231					95% Chebyshev (Mean, Sd) UCL	18.58						
232												
233					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
234					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
235					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
236					For additional insight the user may want to consult a statistician.							
237												
238					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
239					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
240												
241												
242	**Chromium**											
243												
244						**General Statistics**						
245					Total Number of Observations	15				Number of Distinct Observations		13
246										Number of Missing Observations		0
247					Minimum	12				Mean		71.84
248					Maximum	150.7				Median		77.11
249					SD	40.43				Std. Error of Mean		10.44
250					Coefficient of Variation	0.563				Skewness		0.258
251												
252						**Normal GOF Test**						
253					Shapiro Wilk Test Statistic	0.953				**Shapiro Wilk GOF Test**		
254					5% Shapiro Wilk Critical Value	0.881				Data appear Normal at 5% Significance Level		
255					Lilliefors Test Statistic	0.129				**Lilliefors GOF Test**		
256					5% Lilliefors Critical Value	0.229				Data appear Normal at 5% Significance Level		
257						**Data appear Normal at 5% Significance Level**						
258												
259						**Assuming Normal Distribution**						
260					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		

	A	B	C	D	E	F	G	H	I	J	K	L
261					95% Student's-t UCL	90.23				95% Adjusted-CLT UCL (Chen-1995)		89.75
262										95% Modified-t UCL (Johnson-1978)		90.34
263												
264						**Gamma GOF Test**						
265					A-D Test Statistic	0.594			**Anderson-Darling Gamma GOF Test**			
266					5% A-D Critical Value	0.746			Detected data appear Gamma Distributed at 5% Significance Level			
267					K-S Test Statistic	0.169			**Kolmogrov-Smirnoff Gamma GOF Test**			
268					5% K-S Critical Value	0.224			Detected data appear Gamma Distributed at 5% Significance Level			
269						**Detected data appear Gamma Distributed at 5% Significance Level**						
270												
271						**Gamma Statistics**						
272					k hat (MLE)	2.423				k star (bias corrected MLE)		1.983
273					Theta hat (MLE)	29.65				Theta star (bias corrected MLE)		36.23
274					nu hat (MLE)	72.7				nu star (bias corrected)		59.49
275					MLE Mean (bias corrected)	71.84				MLE Sd (bias corrected)		51.02
276										Approximate Chi Square Value (0.05)		42.76
277					Adjusted Level of Significance	0.0324				Adjusted Chi Square Value		41.01
278												
279						**Assuming Gamma Distribution**						
280					95% Approximate Gamma UCL (use when n>=50))	99.96				95% Adjusted Gamma UCL (use when n<50)		104.2
281												
282						**Lognormal GOF Test**						
283					Shapiro Wilk Test Statistic	0.856			**Shapiro Wilk Lognormal GOF Test**			
284					5% Shapiro Wilk Critical Value	0.881			Data Not Lognormal at 5% Significance Level			
285					Lilliefors Test Statistic	0.197			**Lilliefors Lognormal GOF Test**			
286					5% Lilliefors Critical Value	0.229			Data appear Lognormal at 5% Significance Level			
287						**Data appear Approximate Lognormal at 5% Significance Level**						
288												
289						**Lognormal Statistics**						
290					Minimum of Logged Data	2.485				Mean of logged Data		4.054
291					Maximum of Logged Data	5.015				SD of logged Data		0.785
292												
293						**Assuming Lognormal Distribution**						
294					95% H-UCL	130.4				90% Chebyshev (MVUE) UCL		126
295					95% Chebyshev (MVUE) UCL	148.4				97.5% Chebyshev (MVUE) UCL		179.6
296					99% Chebyshev (MVUE) UCL	240.8						
297												
298						**Nonparametric Distribution Free UCL Statistics**						
299						**Data appear to follow a Discernible Distribution at 5% Significance Level**						
300												
301						**Nonparametric Distribution Free UCLs**						
302					95% CLT UCL	89.01				95% Jackknife UCL		90.23
303					95% Standard Bootstrap UCL	88.3				95% Bootstrap-t UCL		91.46
304					95% Hall's Bootstrap UCL	91.62				95% Percentile Bootstrap UCL		89.41
305					95% BCA Bootstrap UCL	89.28						
306					90% Chebyshev(Mean, Sd) UCL	103.2				95% Chebyshev(Mean, Sd) UCL		117.3
307					97.5% Chebyshev(Mean, Sd) UCL	137				99% Chebyshev(Mean, Sd) UCL		175.7
308												
309						**Suggested UCL to Use**						
310					95% Student's-t UCL	90.23						
311												
312	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

	A	B	C	D	E	F	G	H	I	J	K	L
313	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
314	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
315	For additional insight the user may want to consult a statistician.											
316												
317												
318	**Copper**											
319												
320	**General Statistics**											
321					Total Number of Observations	15			Number of Distinct Observations		15	
322									Number of Missing Observations		0	
323					Minimum	38			Mean		431.5	
324					Maximum	1274			Median		372.9	
325					SD	368.6			Std. Error of Mean		95.18	
326					Coefficient of Variation	0.854			Skewness		1.265	
327												
328	**Normal GOF Test**											
329					Shapiro Wilk Test Statistic	0.867			**Shapiro Wilk GOF Test**			
330					5% Shapiro Wilk Critical Value	0.881			Data Not Normal at 5% Significance Level			
331					Lilliefors Test Statistic	0.164			**Lilliefors GOF Test**			
332					5% Lilliefors Critical Value	0.229			Data appear Normal at 5% Significance Level			
333	**Data appear Approximate Normal at 5% Significance Level**											
334												
335	**Assuming Normal Distribution**											
336				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
337					95% Student's-t UCL	599.1			95% Adjusted-CLT UCL (Chen-1995)		621.2	
338									95% Modified-t UCL (Johnson-1978)		604.3	
339												
340	**Gamma GOF Test**											
341					A-D Test Statistic	0.194			**Anderson-Darling Gamma GOF Test**			
342					5% A-D Critical Value	0.756			Detected data appear Gamma Distributed at 5% Significance Level			
343					K-S Test Statistic	0.0945			**Kolmogrov-Smirnoff Gamma GOF Test**			
344					5% K-S Critical Value	0.226			Detected data appear Gamma Distributed at 5% Significance Level			
345	**Detected data appear Gamma Distributed at 5% Significance Level**											
346												
347	**Gamma Statistics**											
348					k hat (MLE)	1.377			k star (bias corrected MLE)		1.146	
349					Theta hat (MLE)	313.4			Theta star (bias corrected MLE)		376.5	
350					nu hat (MLE)	41.31			nu star (bias corrected)		34.38	
351					MLE Mean (bias corrected)	431.5			MLE Sd (bias corrected)		403.1	
352									Approximate Chi Square Value (0.05)		21.97	
353					Adjusted Level of Significance	0.0324			Adjusted Chi Square Value		20.75	
354												
355	**Assuming Gamma Distribution**											
356					95% Approximate Gamma UCL (use when n>=50))	675.2			95% Adjusted Gamma UCL (use when n<50)		714.8	
357												
358	**Lognormal GOF Test**											
359					Shapiro Wilk Test Statistic	0.943			**Shapiro Wilk Lognormal GOF Test**			
360					5% Shapiro Wilk Critical Value	0.881			Data appear Lognormal at 5% Significance Level			
361					Lilliefors Test Statistic	0.146			**Lilliefors Lognormal GOF Test**			
362					5% Lilliefors Critical Value	0.229			Data appear Lognormal at 5% Significance Level			
363	**Data appear Lognormal at 5% Significance Level**											
364												

	A	B	C	D	E	F	G	H	I	J	K	L
365	**Lognormal Statistics**											
366					Minimum of Logged Data	3.638					Mean of logged Data	5.662
367					Maximum of Logged Data	7.15					SD of logged Data	1.036
368												
369	**Assuming Lognormal Distribution**											
370					95% H-UCL	1069					90% Chebyshev (MVUE) UCL	880
371					95% Chebyshev (MVUE) UCL	1067					97.5% Chebyshev (MVUE) UCL	1326
372					99% Chebyshev (MVUE) UCL	1835						
373												
374	**Nonparametric Distribution Free UCL Statistics**											
375	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
376												
377	**Nonparametric Distribution Free UCLs**											
378					95% CLT UCL	588					95% Jackknife UCL	599.1
379					95% Standard Bootstrap UCL	582					95% Bootstrap-t UCL	658.4
380					95% Hall's Bootstrap UCL	805.4					95% Percentile Bootstrap UCL	584.6
381					95% BCA Bootstrap UCL	609						
382					90% Chebyshev(Mean, Sd) UCL	717					95% Chebyshev(Mean, Sd) UCL	846.4
383					97.5% Chebyshev(Mean, Sd) UCL	1026					99% Chebyshev(Mean, Sd) UCL	1379
384												
385	**Suggested UCL to Use**											
386					95% Student's-t UCL	599.1						
387												
388	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
389	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
390	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
391	For additional insight the user may want to consult a statistician.											
392												
393												
394	**Iron**											
395												
396	**General Statistics**											
397					Total Number of Observations	15					Number of Distinct Observations	15
398											Number of Missing Observations	0
399					Minimum	16098					Mean	53013
400					Maximum	142401					Median	38012
401					SD	35059					Std. Error of Mean	9052
402					Coefficient of Variation	0.661					Skewness	1.338
403												
404	**Normal GOF Test**											
405					Shapiro Wilk Test Statistic	0.868			**Shapiro Wilk GOF Test**			
406					5% Shapiro Wilk Critical Value	0.881			Data Not Normal at 5% Significance Level			
407					Lilliefors Test Statistic	0.199			**Lilliefors GOF Test**			
408					5% Lilliefors Critical Value	0.229			Data appear Normal at 5% Significance Level			
409	**Data appear Approximate Normal at 5% Significance Level**											
410												
411	**Assuming Normal Distribution**											
412	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
413					95% Student's-t UCL	68956					95% Adjusted-CLT UCL (Chen-1995)	71242
414											95% Modified-t UCL (Johnson-1978)	69477
415												
416	**Gamma GOF Test**											

417					A-D Test Statistic	0.337	Anderson-Darling Gamma GOF Test					
418					5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level					
419					K-S Test Statistic	0.162	Kolmogrov-Smirnoff Gamma GOF Test					
420					5% K-S Critical Value	0.223	Detected data appear Gamma Distributed at 5% Significance Level					
421	Detected data appear Gamma Distributed at 5% Significance Level											
422												
423	Gamma Statistics											
424					k hat (MLE)	2.854	k star (bias corrected MLE)					2.328
425					Theta hat (MLE)	18575	Theta star (bias corrected MLE)					22776
426					nu hat (MLE)	85.62	nu star (bias corrected)					69.83
427					MLE Mean (bias corrected)	53013	MLE Sd (bias corrected)					34748
428							Approximate Chi Square Value (0.05)					51.59
429					Adjusted Level of Significance	0.0324	Adjusted Chi Square Value					49.66
430												
431	Assuming Gamma Distribution											
432					95% Approximate Gamma UCL (use when n>=50))	71752	95% Adjusted Gamma UCL (use when n<50)					74536
433												
434	Lognormal GOF Test											
435					Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Lognormal GOF Test					
436					5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level					
437					Lilliefors Test Statistic	0.129	Lilliefors Lognormal GOF Test					
438					5% Lilliefors Critical Value	0.229	Data appear Lognormal at 5% Significance Level					
439	Data appear Lognormal at 5% Significance Level											
440												
441	Lognormal Statistics											
442					Minimum of Logged Data	9.686	Mean of logged Data					10.69
443					Maximum of Logged Data	11.87	SD of logged Data					0.624
444												
445	Assuming Lognormal Distribution											
446					95% H-UCL	77396	90% Chebyshev (MVUE) UCL					79358
447					95% Chebyshev (MVUE) UCL	91421	97.5% Chebyshev (MVUE) UCL					108164
448					99% Chebyshev (MVUE) UCL	141053						
449												
450	Nonparametric Distribution Free UCL Statistics											
451	Data appear to follow a Discernible Distribution at 5% Significance Level											
452												
453	Nonparametric Distribution Free UCLs											
454					95% CLT UCL	67902	95% Jackknife UCL					68956
455					95% Standard Bootstrap UCL	67072	95% Bootstrap-t UCL					73641
456					95% Hall's Bootstrap UCL	74703	95% Percentile Bootstrap UCL					67567
457					95% BCA Bootstrap UCL	72994						
458					90% Chebyshev(Mean, Sd) UCL	80169	95% Chebyshev(Mean, Sd) UCL					92470
459					97.5% Chebyshev(Mean, Sd) UCL	109543	99% Chebyshev(Mean, Sd) UCL					143080
460												
461	Suggested UCL to Use											
462					95% Student's-t UCL	68956						
463												
464	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
465	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
466	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
467	For additional insight the user may want to consult a statistician.											
468												

	A	B	C	D	E	F	G	H	I	J	K	L
469												
470	**Manganese**											
471												
472						**General Statistics**						
473					Total Number of Observations	15				Number of Distinct Observations		15
474										Number of Missing Observations		0
475					Minimum	151				Mean		981.3
476					Maximum	2488				Median		891.8
477					SD	672.4				Std. Error of Mean		173.6
478					Coefficient of Variation	0.685				Skewness		1.115
479												
480						**Normal GOF Test**						
481					Shapiro Wilk Test Statistic	0.892				**Shapiro Wilk GOF Test**		
482					5% Shapiro Wilk Critical Value	0.881				Data appear Normal at 5% Significance Level		
483					Lilliefors Test Statistic	0.176				**Lilliefors GOF Test**		
484					5% Lilliefors Critical Value	0.229				Data appear Normal at 5% Significance Level		
485						**Data appear Normal at 5% Significance Level**						
486												
487						**Assuming Normal Distribution**						
488					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
489					95% Student's-t UCL	1287				95% Adjusted-CLT UCL (Chen-1995)		1320
490										95% Modified-t UCL (Johnson-1978)		1295
491												
492						**Gamma GOF Test**						
493					A-D Test Statistic	0.296				**Anderson-Darling Gamma GOF Test**		
494					5% A-D Critical Value	0.747				Detected data appear Gamma Distributed at 5% Significance Level		
495					K-S Test Statistic	0.119				**Kolmogrov-Smirnoff Gamma GOF Test**		
496					5% K-S Critical Value	0.224				Detected data appear Gamma Distributed at 5% Significance Level		
497						**Detected data appear Gamma Distributed at 5% Significance Level**						
498												
499						**Gamma Statistics**						
500					k hat (MLE)	2.125				k star (bias corrected MLE)		1.744
501					Theta hat (MLE)	461.8				Theta star (bias corrected MLE)		562.5
502					nu hat (MLE)	63.75				nu star (bias corrected)		52.33
503					MLE Mean (bias corrected)	981.3				MLE Sd (bias corrected)		743
504										Approximate Chi Square Value (0.05)		36.72
505					Adjusted Level of Significance	0.0324				Adjusted Chi Square Value		35.11
506												
507						**Assuming Gamma Distribution**						
508					95% Approximate Gamma UCL (use when n>=50))	1399				95% Adjusted Gamma UCL (use when n<50)		1463
509												
510						**Lognormal GOF Test**						
511					Shapiro Wilk Test Statistic	0.919				**Shapiro Wilk Lognormal GOF Test**		
512					5% Shapiro Wilk Critical Value	0.881				Data appear Lognormal at 5% Significance Level		
513					Lilliefors Test Statistic	0.166				**Lilliefors Lognormal GOF Test**		
514					5% Lilliefors Critical Value	0.229				Data appear Lognormal at 5% Significance Level		
515						**Data appear Lognormal at 5% Significance Level**						
516												
517						**Lognormal Statistics**						
518					Minimum of Logged Data	5.017				Mean of logged Data		6.635
519					Maximum of Logged Data	7.819				SD of logged Data		0.807
520												

	A	B	C	D	E	F	G	H	I	J	K	L
521					Assuming Lognormal Distribution							
522					95% H-UCL	1789			90% Chebyshev (MVUE) UCL			1711
523					95% Chebyshev (MVUE) UCL	2021			97.5% Chebyshev (MVUE) UCL			2451
524					99% Chebyshev (MVUE) UCL	3297						
525												
526					Nonparametric Distribution Free UCL Statistics							
527					Data appear to follow a Discernible Distribution at 5% Significance Level							
528												
529					Nonparametric Distribution Free UCLs							
530					95% CLT UCL	1267			95% Jackknife UCL			1287
531					95% Standard Bootstrap UCL	1258			95% Bootstrap-t UCL			1390
532					95% Hall's Bootstrap UCL	1587			95% Percentile Bootstrap UCL			1271
533					95% BCA Bootstrap UCL	1308						
534					90% Chebyshev(Mean, Sd) UCL	1502			95% Chebyshev(Mean, Sd) UCL			1738
535					97.5% Chebyshev(Mean, Sd) UCL	2065			99% Chebyshev(Mean, Sd) UCL			2709
536												
537					Suggested UCL to Use							
538					95% Student's-t UCL	1287						
539												
540					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
541					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
542					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
543					For additional insight the user may want to consult a statistician.							
544												
545												
546	Mercury											
547												
548					General Statistics							
549					Total Number of Observations	15			Number of Distinct Observations			5
550									Number of Missing Observations			0
551					Minimum	1.24			Mean			16
552					Maximum	40			Median			10
553					SD	12.75			Std. Error of Mean			3.293
554					Coefficient of Variation	0.797			Skewness			1.443
555												
556					Normal GOF Test							
557					Shapiro Wilk Test Statistic	0.662			Shapiro Wilk GOF Test			
558					5% Shapiro Wilk Critical Value	0.881			Data Not Normal at 5% Significance Level			
559					Lilliefors Test Statistic	0.348			Lilliefors GOF Test			
560					5% Lilliefors Critical Value	0.229			Data Not Normal at 5% Significance Level			
561					Data Not Normal at 5% Significance Level							
562												
563					Assuming Normal Distribution							
564					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
565					95% Student's-t UCL	21.8			95% Adjusted-CLT UCL (Chen-1995)			22.72
566									95% Modified-t UCL (Johnson-1978)			22
567												
568					Gamma GOF Test							
569					A-D Test Statistic	1.902			Anderson-Darling Gamma GOF Test			
570					5% A-D Critical Value	0.748			Data Not Gamma Distributed at 5% Significance Level			
571					K-S Test Statistic	0.304			Kolmogrov-Smirnoff Gamma GOF Test			
572					5% K-S Critical Value	0.225			Data Not Gamma Distributed at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
573	Data Not Gamma Distributed at 5% Significance Level											
574												
575	Gamma Statistics											
576					k hat (MLE)	1.912				k star (bias corrected MLE)		1.574
577					Theta hat (MLE)	8.368				Theta star (bias corrected MLE)		10.16
578					nu hat (MLE)	57.36				nu star (bias corrected)		47.22
579					MLE Mean (bias corrected)	16				MLE Sd (bias corrected)		12.75
580										Approximate Chi Square Value (0.05)		32.45
581					Adjusted Level of Significance	0.0324				Adjusted Chi Square Value		30.94
582												
583	Assuming Gamma Distribution											
584				95% Approximate Gamma UCL (use when n>=50))		23.28				95% Adjusted Gamma UCL (use when n<50)		24.41
585												
586	Lognormal GOF Test											
587					Shapiro Wilk Test Statistic	0.746				Shapiro Wilk Lognormal GOF Test		
588					5% Shapiro Wilk Critical Value	0.881				Data Not Lognormal at 5% Significance Level		
589					Lilliefors Test Statistic	0.346				Lilliefors Lognormal GOF Test		
590					5% Lilliefors Critical Value	0.229				Data Not Lognormal at 5% Significance Level		
591	Data Not Lognormal at 5% Significance Level											
592												
593	Lognormal Statistics											
594					Minimum of Logged Data	0.215				Mean of logged Data		2.489
595					Maximum of Logged Data	3.689				SD of logged Data		0.84
596												
597	Assuming Lognormal Distribution											
598					95% H-UCL	30.03				90% Chebyshev (MVUE) UCL		28.23
599					95% Chebyshev (MVUE) UCL	33.48				97.5% Chebyshev (MVUE) UCL		40.77
600					99% Chebyshev (MVUE) UCL	55.09						
601												
602	Nonparametric Distribution Free UCL Statistics											
603	Data do not follow a Discernible Distribution (0.05)											
604												
605	Nonparametric Distribution Free UCLs											
606					95% CLT UCL	21.41				95% Jackknife UCL		21.8
607					95% Standard Bootstrap UCL	21.49				95% Bootstrap-t UCL		23.27
608					95% Hall's Bootstrap UCL	21.22				95% Percentile Bootstrap UCL		21.42
609					95% BCA Bootstrap UCL	22.35						
610					90% Chebyshev(Mean, Sd) UCL	25.88				95% Chebyshev(Mean, Sd) UCL		30.35
611					97.5% Chebyshev(Mean, Sd) UCL	36.56				99% Chebyshev(Mean, Sd) UCL		48.76
612												
613	Suggested UCL to Use											
614					95% Chebyshev (Mean, Sd) UCL	30.35						
615												
616	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
617	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
618	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
619	For additional insight the user may want to consult a statistician.											
620												
621												
622	Neptunium-237											
623												
624	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
625					Total Number of Observations	15					Number of Distinct Observations	3
626											Number of Missing Observations	0
627					Minimum	0.461					Mean	0.631
628					Maximum	0.8					Median	0.631
629					SD	0.0641					Std. Error of Mean	0.0165
630					Coefficient of Variation	0.102					Skewness	4.350E-15
631												
632					**Normal GOF Test**							
633					Shapiro Wilk Test Statistic	0.53	**Shapiro Wilk GOF Test**					
634					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
635					Lilliefors Test Statistic	0.433	**Lilliefors GOF Test**					
636					5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level					
637					**Data Not Normal at 5% Significance Level**							
638												
639					**Assuming Normal Distribution**							
640			**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**					
641					95% Student's-t UCL	0.66					95% Adjusted-CLT UCL (Chen-1995)	0.658
642											95% Modified-t UCL (Johnson-1978)	0.66
643												
644					**Gamma GOF Test**							
645					A-D Test Statistic	3.815	**Anderson-Darling Gamma GOF Test**					
646					5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level					
647					K-S Test Statistic	0.447	**Kolmogrov-Smirnoff Gamma GOF Test**					
648					5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level					
649					**Data Not Gamma Distributed at 5% Significance Level**							
650												
651					**Gamma Statistics**							
652					k hat (MLE)	100.1					k star (bias corrected MLE)	80.16
653					Theta hat (MLE)	0.0063					Theta star (bias corrected MLE)	0.00787
654					nu hat (MLE)	3004					nu star (bias corrected)	2405
655					MLE Mean (bias corrected)	0.631					MLE Sd (bias corrected)	0.0704
656											Approximate Chi Square Value (0.05)	2292
657					Adjusted Level of Significance	0.0324					Adjusted Chi Square Value	2278
658												
659					**Assuming Gamma Distribution**							
660					95% Approximate Gamma UCL (use when n>=50))	0.662					95% Adjusted Gamma UCL (use when n<50)	0.666
661												
662					**Lognormal GOF Test**							
663					Shapiro Wilk Test Statistic	0.522	**Shapiro Wilk Lognormal GOF Test**					
664					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
665					Lilliefors Test Statistic	0.452	**Lilliefors Lognormal GOF Test**					
666					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
667					**Data Not Lognormal at 5% Significance Level**							
668												
669					**Lognormal Statistics**							
670					Minimum of Logged Data	-0.774					Mean of logged Data	-0.466
671					Maximum of Logged Data	-0.223					SD of logged Data	0.105
672												
673					**Assuming Lognormal Distribution**							
674					95% H-UCL	0.663					90% Chebyshev (MVUE) UCL	0.682
675					95% Chebyshev (MVUE) UCL	0.705					97.5% Chebyshev (MVUE) UCL	0.738
676					99% Chebyshev (MVUE) UCL	0.801						

	A	B	C	D	E	F	G	H	I	J	K	L
677												
678						Nonparametric Distribution Free UCL Statistics						
679						Data do not follow a Discernible Distribution (0.05)						
680												
681						Nonparametric Distribution Free UCLs						
682					95% CLT UCL	0.658				95% Jackknife UCL		0.66
683					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
684					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
685					95% BCA Bootstrap UCL	N/A						
686					90% Chebyshev(Mean, Sd) UCL	0.68				95% Chebyshev(Mean, Sd) UCL		0.703
687					97.5% Chebyshev(Mean, Sd) UCL	0.734				99% Chebyshev(Mean, Sd) UCL		0.795
688												
689						Suggested UCL to Use						
690					95% Student's-t UCL	0.66				or 95% Modified-t UCL		0.66
691												
692						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
693						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
694						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
695						For additional insight the user may want to consult a statistician.						
696												
697												
698	Nickel											
699												
700						General Statistics						
701					Total Number of Observations	15				Number of Distinct Observations		14
702										Number of Missing Observations		0
703					Minimum	21				Mean		594.9
704					Maximum	3787				Median		275.6
705					SD	965.1				Std. Error of Mean		249.2
706					Coefficient of Variation	1.622				Skewness		2.97
707												
708						Normal GOF Test						
709					Shapiro Wilk Test Statistic	0.593				Shapiro Wilk GOF Test		
710					5% Shapiro Wilk Critical Value	0.881				Data Not Normal at 5% Significance Level		
711					Lilliefors Test Statistic	0.31				Lilliefors GOF Test		
712					5% Lilliefors Critical Value	0.229				Data Not Normal at 5% Significance Level		
713						Data Not Normal at 5% Significance Level						
714												
715						Assuming Normal Distribution						
716					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
717					95% Student's-t UCL	1034				95% Adjusted-CLT UCL (Chen-1995)		1209
718										95% Modified-t UCL (Johnson-1978)		1066
719												
720						Gamma GOF Test						
721					A-D Test Statistic	0.466				Anderson-Darling Gamma GOF Test		
722					5% A-D Critical Value	0.779				Detected data appear Gamma Distributed at 5% Significance Level		
723					K-S Test Statistic	0.155				Kolmogrov-Smirnoff Gamma GOF Test		
724					5% K-S Critical Value	0.231				Detected data appear Gamma Distributed at 5% Significance Level		
725						Detected data appear Gamma Distributed at 5% Significance Level						
726												
727						Gamma Statistics						
728					k hat (MLE)	0.693				k star (bias corrected MLE)		0.599

	A	B	C	D	E	F	G	H	I	J	K	L
729					Theta hat (MLE)	857.9				Theta star (bias corrected MLE)		992.9
730					nu hat (MLE)	20.8				nu star (bias corrected)		17.98
731					MLE Mean (bias corrected)	594.9				MLE Sd (bias corrected)		768.6
732										Approximate Chi Square Value (0.05)		9.374
733					Adjusted Level of Significance	0.0324				Adjusted Chi Square Value		8.617
734												
735					**Assuming Gamma Distribution**							
736					95% Approximate Gamma UCL (use when n>=50)	1141				95% Adjusted Gamma UCL (use when n<50)		1241
737												
738					**Lognormal GOF Test**							
739					Shapiro Wilk Test Statistic	0.97				**Shapiro Wilk Lognormal GOF Test**		
740					5% Shapiro Wilk Critical Value	0.881				Data appear Lognormal at 5% Significance Level		
741					Lilliefors Test Statistic	0.113				**Lilliefors Lognormal GOF Test**		
742					5% Lilliefors Critical Value	0.229				Data appear Lognormal at 5% Significance Level		
743					**Data appear Lognormal at 5% Significance Level**							
744												
745					**Lognormal Statistics**							
746					Minimum of Logged Data	3.045				Mean of logged Data		5.516
747					Maximum of Logged Data	8.239				SD of logged Data		1.418
748												
749					**Assuming Lognormal Distribution**							
750					95% H-UCL	2520				90% Chebyshev (MVUE) UCL		1359
751					95% Chebyshev (MVUE) UCL	1701				97.5% Chebyshev (MVUE) UCL		2175
752					99% Chebyshev (MVUE) UCL	3107						
753												
754					**Nonparametric Distribution Free UCL Statistics**							
755					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
756												
757					**Nonparametric Distribution Free UCLs**							
758					95% CLT UCL	1005				95% Jackknife UCL		1034
759					95% Standard Bootstrap UCL	991.5				95% Bootstrap-t UCL		1991
760					95% Hall's Bootstrap UCL	2648				95% Percentile Bootstrap UCL		1043
761					95% BCA Bootstrap UCL	1327						
762					90% Chebyshev(Mean, Sd) UCL	1342				95% Chebyshev(Mean, Sd) UCL		1681
763					97.5% Chebyshev(Mean, Sd) UCL	2151				99% Chebyshev(Mean, Sd) UCL		3074
764												
765					**Suggested UCL to Use**							
766					95% Adjusted Gamma UCL	1241						
767												
768					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
769					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
770					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
771					For additional insight the user may want to consult a statistician.							
772												
773												
774	**PAH, Total**											
775												
776					**General Statistics**							
777					Total Number of Observations	15				Number of Distinct Observations		3
778										Number of Missing Observations		0
779					Minimum	0.0233				Mean		1.234
780					Maximum	2.445				Median		1.234

	A	B	C	D	E	F	G	H	I	J	K	L
781					SD	0.458					Std. Error of Mean	0.118
782					Coefficient of Variation	0.371					Skewness	-7.64E-16
783												
784					Normal GOF Test							
785					Shapiro Wilk Test Statistic	0.53	Shapiro Wilk GOF Test					
786					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
787					Lilliefors Test Statistic	0.433	Lilliefors GOF Test					
788					5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level					
789					Data Not Normal at 5% Significance Level							
790												
791					Assuming Normal Distribution							
792				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
793					95% Student's-t UCL	1.442					95% Adjusted-CLT UCL (Chen-1995)	1.428
794											95% Modified-t UCL (Johnson-1978)	1.442
795												
796					Gamma GOF Test							
797					A-D Test Statistic	4.312	Anderson-Darling Gamma GOF Test					
798					5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level					
799					K-S Test Statistic	0.519	Kolmogrov-Smirnoff Gamma GOF Test					
800					5% K-S Critical Value	0.224	Data Not Gamma Distributed at 5% Significance Level					
801					Data Not Gamma Distributed at 5% Significance Level							
802												
803					Gamma Statistics							
804					k hat (MLE)	2.436					k star (bias corrected MLE)	1.993
805					Theta hat (MLE)	0.507					Theta star (bias corrected MLE)	0.619
806					nu hat (MLE)	73.08					nu star (bias corrected)	59.8
807					MLE Mean (bias corrected)	1.234					MLE Sd (bias corrected)	0.874
808											Approximate Chi Square Value (0.05)	43.02
809					Adjusted Level of Significance	0.0324					Adjusted Chi Square Value	41.27
810												
811					Assuming Gamma Distribution							
812					95% Approximate Gamma UCL (use when n>=50))	1.716					95% Adjusted Gamma UCL (use when n<50)	1.788
813												
814					Lognormal GOF Test							
815					Shapiro Wilk Test Statistic	0.37	Shapiro Wilk Lognormal GOF Test					
816					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
817					Lilliefors Test Statistic	0.516	Lilliefors Lognormal GOF Test					
818					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
819					Data Not Lognormal at 5% Significance Level							
820												
821					Lognormal Statistics							
822					Minimum of Logged Data	-3.759					Mean of logged Data	-0.00872
823					Maximum of Logged Data	0.894					SD of logged Data	1.052
824												
825					Assuming Lognormal Distribution							
826					95% H-UCL	3.821					90% Chebyshev (MVUE) UCL	3.103
827					95% Chebyshev (MVUE) UCL	3.767					97.5% Chebyshev (MVUE) UCL	4.689
828					99% Chebyshev (MVUE) UCL	6.5						
829												
830					Nonparametric Distribution Free UCL Statistics							
831					Data do not follow a Discernible Distribution (0.05)							
832												

	A	B	C	D	E	F	G	H	I	J	K	L
833	**Nonparametric Distribution Free UCLs**											
834					95% CLT UCL	1.428				95% Jackknife UCL		1.442
835					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
836					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
837					95% BCA Bootstrap UCL	N/A						
838					90% Chebyshev(Mean, Sd) UCL	1.589				95% Chebyshev(Mean, Sd) UCL		1.749
839					97.5% Chebyshev(Mean, Sd) UCL	1.972				99% Chebyshev(Mean, Sd) UCL		2.41
840												
841	**Suggested UCL to Use**											
842					95% Chebyshev (Mean, Sd) UCL	1.749						
843												
844	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
845	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
846	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
847	For additional insight the user may want to consult a statistician.											
848												
849	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
850	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
851												
852	**PCB, Total**											
853												
854	**General Statistics**											
855					Total Number of Observations	15				Number of Distinct Observations		5
856										Number of Missing Observations		0
857					Minimum	5				Mean		13.09
858					Maximum	55				Median		6.4
859					SD	16.19				Std. Error of Mean		4.18
860					Coefficient of Variation	1.236				Skewness		2.325
861												
862	**Normal GOF Test**											
863					Shapiro Wilk Test Statistic	0.531				**Shapiro Wilk GOF Test**		
864					5% Shapiro Wilk Critical Value	0.881				Data Not Normal at 5% Significance Level		
865					Lilliefors Test Statistic	0.442				**Lilliefors GOF Test**		
866					5% Lilliefors Critical Value	0.229				Data Not Normal at 5% Significance Level		
867	**Data Not Normal at 5% Significance Level**											
868												
869	**Assuming Normal Distribution**											
870	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
871					95% Student's-t UCL	20.46				95% Adjusted-CLT UCL (Chen-1995)		22.65
872										95% Modified-t UCL (Johnson-1978)		20.87
873												
874	**Gamma GOF Test**											
875					A-D Test Statistic	2.364				**Anderson-Darling Gamma GOF Test**		
876					5% A-D Critical Value	0.756				Data Not Gamma Distributed at 5% Significance Level		
877					K-S Test Statistic	0.372				**Kolmogrov-Smirnoff Gamma GOF Test**		
878					5% K-S Critical Value	0.226				Data Not Gamma Distributed at 5% Significance Level		
879	**Data Not Gamma Distributed at 5% Significance Level**											
880												
881	**Gamma Statistics**											
882					k hat (MLE)	1.387				k star (bias corrected MLE)		1.154
883					Theta hat (MLE)	9.437				Theta star (bias corrected MLE)		11.34
884					nu hat (MLE)	41.62				nu star (bias corrected)		34.63

	A	B	C	D	E	F	G	H	I	J	K	L
885					MLE Mean (bias corrected)	13.09					MLE Sd (bias corrected)	12.19
886											Approximate Chi Square Value (0.05)	22.17
887					Adjusted Level of Significance	0.0324					Adjusted Chi Square Value	20.95
888												
889					**Assuming Gamma Distribution**							
890					95% Approximate Gamma UCL (use when n>=50))	20.45					95% Adjusted Gamma UCL (use when n<50)	21.65
891												
892					**Lognormal GOF Test**							
893					Shapiro Wilk Test Statistic	0.701			**Shapiro Wilk Lognormal GOF Test**			
894					5% Shapiro Wilk Critical Value	0.881			Data Not Lognormal at 5% Significance Level			
895					Lilliefors Test Statistic	0.3			**Lilliefors Lognormal GOF Test**			
896					5% Lilliefors Critical Value	0.229			Data Not Lognormal at 5% Significance Level			
897					**Data Not Lognormal at 5% Significance Level**							
898												
899					**Lognormal Statistics**							
900					Minimum of Logged Data	1.609			Mean of logged Data			2.17
901					Maximum of Logged Data	4.007			SD of logged Data			0.793
902												
903					**Assuming Lognormal Distribution**							
904					95% H-UCL	20.08			90% Chebyshev (MVUE) UCL			19.33
905					95% Chebyshev (MVUE) UCL	22.8			97.5% Chebyshev (MVUE) UCL			27.61
906					99% Chebyshev (MVUE) UCL	37.05						
907												
908					**Nonparametric Distribution Free UCL Statistics**							
909					**Data do not follow a Discernible Distribution (0.05)**							
910												
911					**Nonparametric Distribution Free UCLs**							
912					95% CLT UCL	19.97			95% Jackknife UCL			20.46
913					95% Standard Bootstrap UCL	19.51			95% Bootstrap-t UCL			52.56
914					95% Hall's Bootstrap UCL	65.02			95% Percentile Bootstrap UCL			19.85
915					95% BCA Bootstrap UCL	23.43						
916					90% Chebyshev(Mean, Sd) UCL	25.63			95% Chebyshev(Mean, Sd) UCL			31.31
917					97.5% Chebyshev(Mean, Sd) UCL	39.2			99% Chebyshev(Mean, Sd) UCL			54.69
918												
919					**Suggested UCL to Use**							
920					95% Chebyshev (Mean, Sd) UCL	31.31						
921												
922					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
923					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
924					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
925					For additional insight the user may want to consult a statistician.							
926												
927												
928	**Thallium**											
929												
930					**General Statistics**							
931					Total Number of Observations	15			Number of Distinct Observations			3
932									Number of Missing Observations			0
933					Minimum	0.15			Mean			0.18
934					Maximum	0.21			Median			0.18
935					SD	0.0113			Std. Error of Mean			0.00293
936					Coefficient of Variation	0.063			Skewness			0

	A	B	C	D	E	F	G	H	I	J	K	L
937												
938						Normal GOF Test						
939					Shapiro Wilk Test Statistic	0.53	Shapiro Wilk GOF Test					
940					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
941					Lilliefors Test Statistic	0.433	Lilliefors GOF Test					
942					5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level					
943						Data Not Normal at 5% Significance Level						
944												
945						Assuming Normal Distribution						
946				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
947					95% Student's-t UCL	0.185	95% Adjusted-CLT UCL (Chen-1995)					0.185
948							95% Modified-t UCL (Johnson-1978)					0.185
949												
950						Gamma GOF Test						
951					A-D Test Statistic	3.809	Anderson-Darling Gamma GOF Test					
952					5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level					
953					K-S Test Statistic	0.441	Kolmogrov-Smirnoff Gamma GOF Test					
954					5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level					
955						Data Not Gamma Distributed at 5% Significance Level						
956												
957						Gamma Statistics						
958					k hat (MLE)	266.4	k star (bias corrected MLE)					213.2
959					Theta hat (MLE)	6.7568E-4	Theta star (bias corrected MLE)					8.4442E-4
960					nu hat (MLE)	7992	nu star (bias corrected)					6395
961					MLE Mean (bias corrected)	0.18	MLE Sd (bias corrected)					0.0123
962							Approximate Chi Square Value (0.05)					6210
963					Adjusted Level of Significance	0.0324	Adjusted Chi Square Value					6188
964												
965						Assuming Gamma Distribution						
966					95% Approximate Gamma UCL (use when n>=50))	0.185	95% Adjusted Gamma UCL (use when n<50)					0.186
967												
968						Lognormal GOF Test						
969					Shapiro Wilk Test Statistic	0.527	Shapiro Wilk Lognormal GOF Test					
970					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
971					Lilliefors Test Statistic	0.445	Lilliefors Lognormal GOF Test					
972					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
973						Data Not Lognormal at 5% Significance Level						
974												
975						Lognormal Statistics						
976					Minimum of Logged Data	-1.897	Mean of logged Data					-1.717
977					Maximum of Logged Data	-1.561	SD of logged Data					0.0638
978												
979						Assuming Lognormal Distribution						
980					95% H-UCL	N/A	90% Chebyshev (MVUE) UCL					0.189
981					95% Chebyshev (MVUE) UCL	0.193	97.5% Chebyshev (MVUE) UCL					0.199
982					99% Chebyshev (MVUE) UCL	0.21						
983												
984						Nonparametric Distribution Free UCL Statistics						
985						Data do not follow a Discernible Distribution (0.05)						
986												
987						Nonparametric Distribution Free UCLs						
988					95% CLT UCL	0.185	95% Jackknife UCL					0.185

	A	B	C	D	E	F	G	H	I	J	K	L
989					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
990					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
991					95% BCA Bootstrap UCL	N/A						
992					90% Chebyshev(Mean, Sd) UCL	0.189				95% Chebyshev(Mean, Sd) UCL		0.193
993					97.5% Chebyshev(Mean, Sd) UCL	0.198				99% Chebyshev(Mean, Sd) UCL		0.209
994												
995					**Suggested UCL to Use**							
996					95% Student's-t UCL	0.185				or 95% Modified-t UCL		0.185
997												
998					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
999					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1000					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1001					For additional insight the user may want to consult a statistician.							
1002												
1003												
1004	**Uranium**											
1005												
1006					**General Statistics**							
1007					Total Number of Observations	15				Number of Distinct Observations		14
1008										Number of Missing Observations		0
1009					Minimum	10				Mean		95.13
1010					Maximum	259.3				Median		62.87
1011					SD	74.58				Std. Error of Mean		19.26
1012					Coefficient of Variation	0.784				Skewness		1.143
1013												
1014					**Normal GOF Test**							
1015					Shapiro Wilk Test Statistic	0.878				**Shapiro Wilk GOF Test**		
1016					5% Shapiro Wilk Critical Value	0.881				Data Not Normal at 5% Significance Level		
1017					Lilliefors Test Statistic	0.201				**Lilliefors GOF Test**		
1018					5% Lilliefors Critical Value	0.229				Data appear Normal at 5% Significance Level		
1019					**Data appear Approximate Normal at 5% Significance Level**							
1020												
1021					**Assuming Normal Distribution**							
1022					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1023					95% Student's-t UCL	129				95% Adjusted-CLT UCL (Chen-1995)		132.9
1024										95% Modified-t UCL (Johnson-1978)		130
1025												
1026					**Gamma GOF Test**							
1027					A-D Test Statistic	0.307				**Anderson-Darling Gamma GOF Test**		
1028					5% A-D Critical Value	0.753				Detected data appear Gamma Distributed at 5% Significance Level		
1029					K-S Test Statistic	0.125				**Kolmogrov-Smirnoff Gamma GOF Test**		
1030					5% K-S Critical Value	0.225				Detected data appear Gamma Distributed at 5% Significance Level		
1031					**Detected data appear Gamma Distributed at 5% Significance Level**							
1032												
1033					**Gamma Statistics**							
1034					k hat (MLE)	1.572				k star (bias corrected MLE)		1.302
1035					Theta hat (MLE)	60.53				Theta star (bias corrected MLE)		73.08
1036					nu hat (MLE)	47.15				nu star (bias corrected)		39.05
1037					MLE Mean (bias corrected)	95.13				MLE Sd (bias corrected)		83.38
1038										Approximate Chi Square Value (0.05)		25.74
1039					Adjusted Level of Significance	0.0324				Adjusted Chi Square Value		24.41
1040												

	A	B	C	D	E	F	G	H	I	J	K	L
1041	**Assuming Gamma Distribution**											
1042	95% Approximate Gamma UCL (use when n>=50))					144.3	95% Adjusted Gamma UCL (use when n<50)					152.2
1043												
1044	**Lognormal GOF Test**											
1045	Shapiro Wilk Test Statistic					0.914	**Shapiro Wilk Lognormal GOF Test**					
1046	5% Shapiro Wilk Critical Value					0.881	Data appear Lognormal at 5% Significance Level					
1047	Lilliefors Test Statistic					0.179	**Lilliefors Lognormal GOF Test**					
1048	5% Lilliefors Critical Value					0.229	Data appear Lognormal at 5% Significance Level					
1049	**Data appear Lognormal at 5% Significance Level**											
1050												
1051	**Lognormal Statistics**											
1052	Minimum of Logged Data					2.303	Mean of logged Data					4.205
1053	Maximum of Logged Data					5.558	SD of logged Data					0.971
1054												
1055	**Assuming Lognormal Distribution**											
1056	95% H-UCL					216.3	90% Chebyshev (MVUE) UCL					187.1
1057	95% Chebyshev (MVUE) UCL					225.3	97.5% Chebyshev (MVUE) UCL					278.3
1058	99% Chebyshev (MVUE) UCL					382.4						
1059												
1060	**Nonparametric Distribution Free UCL Statistics**											
1061	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1062												
1063	**Nonparametric Distribution Free UCLs**											
1064	95% CLT UCL					126.8	95% Jackknife UCL					129
1065	95% Standard Bootstrap UCL					126	95% Bootstrap-t UCL					135.7
1066	95% Hall's Bootstrap UCL					152.8	95% Percentile Bootstrap UCL					127
1067	95% BCA Bootstrap UCL					128.7						
1068	90% Chebyshev(Mean, Sd) UCL					152.9	95% Chebyshev(Mean, Sd) UCL					179.1
1069	97.5% Chebyshev(Mean, Sd) UCL					215.4	99% Chebyshev(Mean, Sd) UCL					286.7
1070												
1071	**Suggested UCL to Use**											
1072	95% Student's-t UCL					129						
1073												
1074	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1075	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1076	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1077	For additional insight the user may want to consult a statistician.											
1078												
1079												
1080	**Uranium-234**											
1081												
1082	**General Statistics**											
1083	Total Number of Observations					15	Number of Distinct Observations					3
1084							Number of Missing Observations					0
1085	Minimum					4	Mean					7.35
1086	Maximum					10.7	Median					7.35
1087	SD					1.266	Std. Error of Mean					0.327
1088	Coefficient of Variation					0.172	Skewness					2.308E-15
1089												
1090	**Normal GOF Test**											
1091	Shapiro Wilk Test Statistic					0.53	**Shapiro Wilk GOF Test**					
1092	5% Shapiro Wilk Critical Value					0.881	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1093					Lilliefors Test Statistic	0.433	**Lilliefors GOF Test**					
1094					5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level					
1095	**Data Not Normal at 5% Significance Level**											
1096												
1097	**Assuming Normal Distribution**											
1098	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1099					95% Student's-t UCL	7.926	95% Adjusted-CLT UCL (Chen-1995)					7.888
1100							95% Modified-t UCL (Johnson-1978)					7.926
1101												
1102	**Gamma GOF Test**											
1103					A-D Test Statistic	3.839	**Anderson-Darling Gamma GOF Test**					
1104					5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level					
1105					K-S Test Statistic	0.457	**Kolmogrov-Smirnoff Gamma GOF Test**					
1106					5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level					
1107	**Data Not Gamma Distributed at 5% Significance Level**											
1108												
1109	**Gamma Statistics**											
1110					k hat (MLE)	32.37	k star (bias corrected MLE)					25.94
1111					Theta hat (MLE)	0.227	Theta star (bias corrected MLE)					0.283
1112					nu hat (MLE)	971.2	nu star (bias corrected)					778.3
1113					MLE Mean (bias corrected)	7.35	MLE Sd (bias corrected)					1.443
1114							Approximate Chi Square Value (0.05)					714.6
1115					Adjusted Level of Significance	0.0324	Adjusted Chi Square Value					707
1116												
1117	**Assuming Gamma Distribution**											
1118					95% Approximate Gamma UCL (use when n>=50))	8.006	95% Adjusted Gamma UCL (use when n<50)					8.091
1119												
1120	**Lognormal GOF Test**											
1121					Shapiro Wilk Test Statistic	0.506	**Shapiro Wilk Lognormal GOF Test**					
1122					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
1123					Lilliefors Test Statistic	0.466	**Lilliefors Lognormal GOF Test**					
1124					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
1125	**Data Not Lognormal at 5% Significance Level**											
1126												
1127	**Lognormal Statistics**											
1128					Minimum of Logged Data	1.386	Mean of logged Data					1.979
1129					Maximum of Logged Data	2.37	SD of logged Data					0.19
1130												
1131	**Assuming Lognormal Distribution**											
1132					95% H-UCL	8.077	90% Chebyshev (MVUE) UCL					8.451
1133					95% Chebyshev (MVUE) UCL	8.945	97.5% Chebyshev (MVUE) UCL					9.63
1134					99% Chebyshev (MVUE) UCL	10.98						
1135												
1136	**Nonparametric Distribution Free UCL Statistics**											
1137	**Data do not follow a Discernible Distribution (0.05)**											
1138												
1139	**Nonparametric Distribution Free UCLs**											
1140					95% CLT UCL	7.888	95% Jackknife UCL					7.926
1141					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
1142					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
1143					95% BCA Bootstrap UCL	N/A						
1144					90% Chebyshev(Mean, Sd) UCL	8.331	95% Chebyshev(Mean, Sd) UCL					8.775

	A	B	C	D	E	F	G	H	I	J	K	L
1145					97.5% Chebyshev(Mean, Sd) UCL	9.392					99% Chebyshev(Mean, Sd) UCL	10.6
1146												
1147						Suggested UCL to Use						
1148					95% Student's-t UCL	7.926					or 95% Modified-t UCL	7.926
1149												
1150						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
1151						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
1152						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
1153						For additional insight the user may want to consult a statistician.						
1154												
1155												
1156	Uranium-235											
1157												
1158						General Statistics						
1159					Total Number of Observations	15					Number of Distinct Observations	3
1160											Number of Missing Observations	0
1161					Minimum	0.271					Mean	0.351
1162					Maximum	0.43					Median	0.351
1163					SD	0.03					Std. Error of Mean	0.00776
1164					Coefficient of Variation	0.0857					Skewness	-9.55E-15
1165												
1166						Normal GOF Test						
1167					Shapiro Wilk Test Statistic	0.53					Shapiro Wilk GOF Test	
1168					5% Shapiro Wilk Critical Value	0.881					Data Not Normal at 5% Significance Level	
1169					Lilliefors Test Statistic	0.433					Lilliefors GOF Test	
1170					5% Lilliefors Critical Value	0.229					Data Not Normal at 5% Significance Level	
1171						Data Not Normal at 5% Significance Level						
1172												
1173						Assuming Normal Distribution						
1174					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
1175					95% Student's-t UCL	0.364					95% Adjusted-CLT UCL (Chen-1995)	0.363
1176											95% Modified-t UCL (Johnson-1978)	0.364
1177												
1178						Gamma GOF Test						
1179					A-D Test Statistic	3.812					Anderson-Darling Gamma GOF Test	
1180					5% A-D Critical Value	0.734					Data Not Gamma Distributed at 5% Significance Level	
1181					K-S Test Statistic	0.444					Kolmogrov-Smirnoff Gamma GOF Test	
1182					5% K-S Critical Value	0.221					Data Not Gamma Distributed at 5% Significance Level	
1183						Data Not Gamma Distributed at 5% Significance Level						
1184												
1185						Gamma Statistics						
1186					k hat (MLE)	142.2					k star (bias corrected MLE)	113.8
1187					Theta hat (MLE)	0.00247					Theta star (bias corrected MLE)	0.00308
1188					nu hat (MLE)	4265					nu star (bias corrected)	3413
1189					MLE Mean (bias corrected)	0.351					MLE Sd (bias corrected)	0.0329
1190											Approximate Chi Square Value (0.05)	3279
1191					Adjusted Level of Significance	0.0324					Adjusted Chi Square Value	3262
1192												
1193						Assuming Gamma Distribution						
1194					95% Approximate Gamma UCL (use when n>=50))	0.365					95% Adjusted Gamma UCL (use when n<50)	0.367
1195												
1196						Lognormal GOF Test						

	A	B	C	D	E	F	G	H	I	J	K	L
1197					Shapiro Wilk Test Statistic	0.525	**Shapiro Wilk Lognormal GOF Test**					
1198					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
1199					Lilliefors Test Statistic	0.449	**Lilliefors Lognormal GOF Test**					
1200					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
1201					**Data Not Lognormal at 5% Significance Level**							
1202												
1203					**Lognormal Statistics**							
1204					Minimum of Logged Data	-1.306				Mean of logged Data		-1.052
1205					Maximum of Logged Data	-0.844				SD of logged Data		0.0877
1206												
1207					**Assuming Lognormal Distribution**							
1208					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		0.374
1209					95% Chebyshev (MVUE) UCL	0.385				97.5% Chebyshev (MVUE) UCL		0.4
1210					99% Chebyshev (MVUE) UCL	0.43						
1211												
1212					**Nonparametric Distribution Free UCL Statistics**							
1213					**Data do not follow a Discernible Distribution (0.05)**							
1214												
1215					**Nonparametric Distribution Free UCLs**							
1216					95% CLT UCL	0.363				95% Jackknife UCL		0.364
1217					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
1218					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
1219					95% BCA Bootstrap UCL	N/A						
1220					90% Chebyshev(Mean, Sd) UCL	0.374				95% Chebyshev(Mean, Sd) UCL		0.384
1221					97.5% Chebyshev(Mean, Sd) UCL	0.399				99% Chebyshev(Mean, Sd) UCL		0.428
1222												
1223					**Suggested UCL to Use**							
1224					95% Student's-t UCL	0.364				or 95% Modified-t UCL		0.364
1225												
1226					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1227					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1228					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1229					For additional insight the user may want to consult a statistician.							
1230												
1231					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
1232					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
1233												
1234												
1235	**Uranium-238**											
1236												
1237					**General Statistics**							
1238					Total Number of Observations	15				Number of Distinct Observations		3
1239										Number of Missing Observations		0
1240					Minimum	6.19				Mean		12.45
1241					Maximum	18.7				Median		12.45
1242					SD	2.364				Std. Error of Mean		0.61
1243					Coefficient of Variation	0.19				Skewness		4.609E-15
1244												
1245					**Normal GOF Test**							
1246					Shapiro Wilk Test Statistic	0.53	**Shapiro Wilk GOF Test**					
1247					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
1248					Lilliefors Test Statistic	0.433	**Lilliefors GOF Test**					

	A	B	C	D	E	F	G	H	I	J	K	L
1249					5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level					
1250					Data Not Normal at 5% Significance Level							
1251												
1252					Assuming Normal Distribution							
1253					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
1254					95% Student's-t UCL	13.52			95% Adjusted-CLT UCL (Chen-1995)			13.45
1255									95% Modified-t UCL (Johnson-1978)			13.52
1256												
1257					Gamma GOF Test							
1258					A-D Test Statistic	3.847			Anderson-Darling Gamma GOF Test			
1259					5% A-D Critical Value	0.735			Data Not Gamma Distributed at 5% Significance Level			
1260					K-S Test Statistic	0.459			Kolmogrov-Smirnoff Gamma GOF Test			
1261					5% K-S Critical Value	0.221			Data Not Gamma Distributed at 5% Significance Level			
1262					Data Not Gamma Distributed at 5% Significance Level							
1263												
1264					Gamma Statistics							
1265					k hat (MLE)	25.92			k star (bias corrected MLE)			20.78
1266					Theta hat (MLE)	0.48			Theta star (bias corrected MLE)			0.599
1267					nu hat (MLE)	777.7			nu star (bias corrected)			623.5
1268					MLE Mean (bias corrected)	12.45			MLE Sd (bias corrected)			2.73
1269									Approximate Chi Square Value (0.05)			566.6
1270					Adjusted Level of Significance	0.0324			Adjusted Chi Square Value			559.9
1271												
1272					Assuming Gamma Distribution							
1273					95% Approximate Gamma UCL (use when n>=50))	13.7			95% Adjusted Gamma UCL (use when n<50)			13.86
1274												
1275					Lognormal GOF Test							
1276					Shapiro Wilk Test Statistic	0.5			Shapiro Wilk Lognormal GOF Test			
1277					5% Shapiro Wilk Critical Value	0.881			Data Not Lognormal at 5% Significance Level			
1278					Lilliefors Test Statistic	0.469			Lilliefors Lognormal GOF Test			
1279					5% Lilliefors Critical Value	0.229			Data Not Lognormal at 5% Significance Level			
1280					Data Not Lognormal at 5% Significance Level							
1281												
1282					Lognormal Statistics							
1283					Minimum of Logged Data	1.823			Mean of logged Data			2.502
1284					Maximum of Logged Data	2.929			SD of logged Data			0.215
1285												
1286					Assuming Lognormal Distribution							
1287					95% H-UCL	13.87			90% Chebyshev (MVUE) UCL			14.56
1288					95% Chebyshev (MVUE) UCL	15.51			97.5% Chebyshev (MVUE) UCL			16.82
1289					99% Chebyshev (MVUE) UCL	19.41						
1290												
1291					Nonparametric Distribution Free UCL Statistics							
1292					Data do not follow a Discernible Distribution (0.05)							
1293												
1294					Nonparametric Distribution Free UCLs							
1295					95% CLT UCL	13.45			95% Jackknife UCL			13.52
1296					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL			N/A
1297					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL			N/A
1298					95% BCA Bootstrap UCL	N/A						
1299					90% Chebyshev(Mean, Sd) UCL	14.28			95% Chebyshev(Mean, Sd) UCL			15.11
1300					97.5% Chebyshev(Mean, Sd) UCL	16.26			99% Chebyshev(Mean, Sd) UCL			18.52

	A	B	C	D	E	F	G	H	I	J	K	L
1301												
1302						**Suggested UCL to Use**						
1303					95% Student's-t UCL	13.52					or 95% Modified-t UCL	13.52
1304												
1305					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1306					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1307					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1308					For additional insight the user may want to consult a statistician.							
1309												
1310												
1311	**Vanadium**											
1312												
1313						**General Statistics**						
1314					Total Number of Observations	15					Number of Distinct Observations	5
1315											Number of Missing Observations	0
1316					Minimum	25.6					Mean	74.64
1317					Maximum	122					Median	70
1318					SD	21.25					Std. Error of Mean	5.488
1319					Coefficient of Variation	0.285					Skewness	0.238
1320												
1321						**Normal GOF Test**						
1322					Shapiro Wilk Test Statistic	0.732					**Shapiro Wilk GOF Test**	
1323					5% Shapiro Wilk Critical Value	0.881					Data Not Normal at 5% Significance Level	
1324					Lilliefors Test Statistic	0.386					**Lilliefors GOF Test**	
1325					5% Lilliefors Critical Value	0.229					Data Not Normal at 5% Significance Level	
1326						**Data Not Normal at 5% Significance Level**						
1327												
1328						**Assuming Normal Distribution**						
1329					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
1330					95% Student's-t UCL	84.31					95% Adjusted-CLT UCL (Chen-1995)	84.03
1331											95% Modified-t UCL (Johnson-1978)	84.36
1332												
1333						**Gamma GOF Test**						
1334					A-D Test Statistic	2.349					**Anderson-Darling Gamma GOF Test**	
1335					5% A-D Critical Value	0.737					Data Not Gamma Distributed at 5% Significance Level	
1336					K-S Test Statistic	0.389					**Kolmogrov-Smirnoff Gamma GOF Test**	
1337					5% K-S Critical Value	0.221					Data Not Gamma Distributed at 5% Significance Level	
1338						**Data Not Gamma Distributed at 5% Significance Level**						
1339												
1340						**Gamma Statistics**						
1341					k hat (MLE)	11.16					k star (bias corrected MLE)	8.969
1342					Theta hat (MLE)	6.69					Theta star (bias corrected MLE)	8.322
1343					nu hat (MLE)	334.7					nu star (bias corrected)	269.1
1344					MLE Mean (bias corrected)	74.64					MLE Sd (bias corrected)	24.92
1345											Approximate Chi Square Value (0.05)	232.1
1346					Adjusted Level of Significance	0.0324					Adjusted Chi Square Value	227.9
1347												
1348						**Assuming Gamma Distribution**						
1349					95% Approximate Gamma UCL (use when n>=50))	86.53					95% Adjusted Gamma UCL (use when n<50)	88.14
1350												
1351						**Lognormal GOF Test**						
1352					Shapiro Wilk Test Statistic	0.656					**Shapiro Wilk Lognormal GOF Test**	

	A	B	C	D	E	F	G	H	I	J	K	L
1353					5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level					
1354					Lilliefors Test Statistic	0.411	**Lilliefors Lognormal GOF Test**					
1355					5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level					
1356	**Data Not Lognormal at 5% Significance Level**											
1357												
1358	**Lognormal Statistics**											
1359					Minimum of Logged Data	3.243				Mean of logged Data		4.267
1360					Maximum of Logged Data	4.804				SD of logged Data		0.337
1361												
1362	**Assuming Lognormal Distribution**											
1363					95% H-UCL	89.65				90% Chebyshev (MVUE) UCL		95.07
1364					95% Chebyshev (MVUE) UCL	104.1				97.5% Chebyshev (MVUE) UCL		116.6
1365					99% Chebyshev (MVUE) UCL	141.1						
1366												
1367	**Nonparametric Distribution Free UCL Statistics**											
1368	**Data do not follow a Discernible Distribution (0.05)**											
1369												
1370	**Nonparametric Distribution Free UCLs**											
1371					95% CLT UCL	83.67				95% Jackknife UCL		84.31
1372					95% Standard Bootstrap UCL	83.4				95% Bootstrap-t UCL		83.84
1373					95% Hall's Bootstrap UCL	87.63				95% Percentile Bootstrap UCL		83.47
1374					95% BCA Bootstrap UCL	82.8						
1375					90% Chebyshev(Mean, Sd) UCL	91.1				95% Chebyshev(Mean, Sd) UCL		98.56
1376					97.5% Chebyshev(Mean, Sd) UCL	108.9				99% Chebyshev(Mean, Sd) UCL		129.2
1377												
1378	**Suggested UCL to Use**											
1379					95% Student's-t UCL	84.31				or 95% Modified-t UCL		84.36
1380												
1381	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1382	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1383	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1384	For additional insight the user may want to consult a statistician.											
1385												