	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 7:31:46 AM								
5	From File			EPC_015SurfEU3.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					8
15							Number of Missing Observations					0
16	Minimum					30	Mean					56.04
17	Maximum					112.2	Median					46.72
18	SD					28.82	Std. Error of Mean					8.318
19	Coefficient of Variation					0.514	Skewness					0.719
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic					0.846	Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.234	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					70.98	95% Adjusted-CLT UCL (Chen-1995)					71.57
31							95% Modified-t UCL (Johnson-1978)					71.26
32												
33	Gamma GOF Test											
34	A-D Test Statistic					0.837	Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value					0.734	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.261	Kolmogrov-Smirnoff Gamma GOF Test					
37	5% K-S Critical Value					0.246	Data Not Gamma Distributed at 5% Significance Level					
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)					4.355	k star (bias corrected MLE)					3.322
42	Theta hat (MLE)					12.87	Theta star (bias corrected MLE)					16.87
43	nu hat (MLE)					104.5	nu star (bias corrected)					79.73
44	MLE Mean (bias corrected)					56.04	MLE Sd (bias corrected)					30.75
45							Approximate Chi Square Value (0.05)					60.16
46	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					57.57
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))					74.27	95% Adjusted Gamma UCL (use when n<50)					77.61
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic					0.842	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 Not Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.257	**Lilliefors Lognormal GOF Test**					
55					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	3.401	Mean of logged Data					3.907
60					Maximum of Logged Data	4.72	SD of logged Data					0.508
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	78.64	90% Chebyshev (MVUE) UCL					81.1
64					95% Chebyshev (MVUE) UCL	92.51	97.5% Chebyshev (MVUE) UCL					108.3
65					99% Chebyshev (MVUE) UCL	139.4						
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	69.72	95% Jackknife UCL					70.98
72					95% Standard Bootstrap UCL	69.02	95% Bootstrap-t UCL					73.67
73					95% Hall's Bootstrap UCL	70.49	95% Percentile Bootstrap UCL					69.09
74					95% BCA Bootstrap UCL	71						
75					90% Chebyshev(Mean, Sd) UCL	80.99	95% Chebyshev(Mean, Sd) UCL					92.3
76					97.5% Chebyshev(Mean, Sd) UCL	108	99% Chebyshev(Mean, Sd) UCL					138.8
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	70.98						
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					10
91							Number of Missing Observations					0
92					Minimum	8.47	Mean					18.62
93					Maximum	62.55	Median					14.45
94					SD	14.57	Std. Error of Mean					4.207
95					Coefficient of Variation	0.783	Skewness					2.877
96												
97	**Normal GOF Test**											
98					Shapiro Wilk Test Statistic	0.617	**Shapiro Wilk GOF Test**					
99					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
100					Lilliefors Test Statistic	0.33	**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	26.18				95% Adjusted-CLT UCL (Chen-1995)		29.28
107										95% Modified-t UCL (Johnson-1978)		26.76
108												
109	Gamma GOF Test											
110					A-D Test Statistic	0.931	Anderson-Darling Gamma GOF Test					
111					5% A-D Critical Value	0.738	Data Not Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.234	Kolmogrov-Smirnoff Gamma GOF Test					
113					5% K-S Critical Value	0.247	Detected data appear 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)	3.175				k star (bias corrected MLE)		2.437
118					Theta hat (MLE)	5.865				Theta star (bias corrected MLE)		7.641
119					nu hat (MLE)	76.21				nu star (bias corrected)		58.49
120					MLE Mean (bias corrected)	18.62				MLE Sd (bias corrected)		11.93
121										Approximate Chi Square Value (0.05)		41.91
122					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		39.77
123												
124	Assuming Gamma Distribution											
125					95% Approximate Gamma UCL (use when n>=50)	25.99				95% Adjusted Gamma UCL (use when n<50)		27.39
126												
127	Lognormal GOF Test											
128					Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Lognormal GOF Test					
129					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.19	Lilliefors Lognormal GOF Test					
131					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
132	Data appear Approximate Lognormal at 5% Significance Level											
133												
134	Lognormal Statistics											
135					Minimum of Logged Data	2.137				Mean of logged Data		2.759
136					Maximum of Logged Data	4.136				SD of logged Data		0.536
137												
138	Assuming Lognormal Distribution											
139					95% H-UCL	25.95				90% Chebyshev (MVUE) UCL		26.55
140					95% Chebyshev (MVUE) UCL	30.44				97.5% Chebyshev (MVUE) UCL		35.83
141					99% Chebyshev (MVUE) UCL	46.41						
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	25.54				95% Jackknife UCL		26.18
148					95% Standard Bootstrap UCL	25.09				95% Bootstrap-t UCL		37.21
149					95% Hall's Bootstrap UCL	51.62				95% Percentile Bootstrap UCL		26.57
150					95% BCA Bootstrap UCL	30.99						
151					90% Chebyshev(Mean, Sd) UCL	31.25				95% Chebyshev(Mean, Sd) UCL		36.96
152					97.5% Chebyshev(Mean, Sd) UCL	44.9				99% Chebyshev(Mean, Sd) UCL		60.49
153												
154	Suggested UCL to Use											
155					95% Adjusted Gamma UCL	27.39						
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					12	Number of Distinct Observations				3	
167							Number of Missing Observations				0	
168	Minimum					11.9	Mean				12.18	
169	Maximum					14.2	Median				12	
170	SD					0.638	Std. Error of Mean				0.184	
171	Coefficient of Variation					0.0524	Skewness				3.451	
172												
173	**Normal GOF Test**											
174	Shapiro Wilk Test Statistic					0.354	**Shapiro Wilk GOF Test**					
175	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
176	Lilliefors Test Statistic					0.525	**Lilliefors GOF Test**					
177	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
178	**Data Not Normal at 5% Significance Level**											
179												
180	**Assuming Normal Distribution**											
181	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
182	95% Student's-t UCL					12.51	95% Adjusted-CLT UCL (Chen-1995)				12.67	
183							95% Modified-t UCL (Johnson-1978)				12.54	
184												
185	**Gamma GOF Test**											
186	A-D Test Statistic					3.864	**Anderson-Darling Gamma GOF Test**					
187	5% A-D Critical Value					0.731	Data Not Gamma Distributed at 5% Significance Level					
188	K-S Test Statistic					0.529	**Kolmogrov-Smirnoff Gamma GOF Test**					
189	5% K-S Critical Value					0.245	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)					435.9	k star (bias corrected MLE)				327	
194	Theta hat (MLE)					0.0279	Theta star (bias corrected MLE)				0.0372	
195	nu hat (MLE)					10462	nu star (bias corrected)				7848	
196	MLE Mean (bias corrected)					12.18	MLE Sd (bias corrected)				0.673	
197							Approximate Chi Square Value (0.05)				7643	
198	Adjusted Level of Significance					0.029	Adjusted Chi Square Value				7612	
199												
200	**Assuming Gamma Distribution**											
201	95% Approximate Gamma UCL (use when n>=50))					12.5	95% Adjusted Gamma UCL (use when n<50)				12.55	
202												
203	**Lognormal GOF Test**											
204	Shapiro Wilk Test Statistic					0.356	**Shapiro Wilk Lognormal GOF Test**					
205	5% Shapiro Wilk Critical Value					0.859	Data Not Lognormal at 5% Significance Level					
206	Lilliefors Test Statistic					0.524	**Lilliefors Lognormal GOF Test**					
207	5% Lilliefors Critical Value					0.256	Data Not Lognormal at 5% Significance Level					
208	**Data Not Lognormal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
209												
210						Lognormal Statistics						
211					Minimum of Logged Data	2.477				Mean of logged Data		2.498
212					Maximum of Logged Data	2.653				SD of logged Data		0.0489
213												
214						Assuming Lognormal Distribution						
215					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		12.69
216					95% Chebyshev (MVUE) UCL	12.92				97.5% Chebyshev (MVUE) UCL		13.25
217					99% Chebyshev (MVUE) UCL	13.88						
218												
219						Nonparametric Distribution Free UCL Statistics						
220						Data do not follow a Discernible Distribution (0.05)						
221												
222						Nonparametric Distribution Free UCLs						
223					95% CLT UCL	12.48				95% Jackknife UCL		12.51
224					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
225					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
226					95% BCA Bootstrap UCL	N/A						
227					90% Chebyshev(Mean, Sd) UCL	12.73				95% Chebyshev(Mean, Sd) UCL		12.98
228					97.5% Chebyshev(Mean, Sd) UCL	13.33				99% Chebyshev(Mean, Sd) UCL		14.01
229												
230						Suggested UCL to Use						
231					95% Student's-t UCL	12.51				or 95% Modified-t UCL		12.54
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												
239	Chromium											
240												
241						General Statistics						
242					Total Number of Observations	12				Number of Distinct Observations		10
243										Number of Missing Observations		0
244					Minimum	35.36				Mean		62.81
245					Maximum	112				Median		57.59
246					SD	24.18				Std. Error of Mean		6.98
247					Coefficient of Variation	0.385				Skewness		0.705
248												
249						Normal GOF Test						
250					Shapiro Wilk Test Statistic	0.91				Shapiro Wilk GOF Test		
251					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
252					Lilliefors Test Statistic	0.163				Lilliefors GOF Test		
253					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
254						Data appear Normal at 5% Significance Level						
255												
256						Assuming Normal Distribution						
257					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
258					95% Student's-t UCL	75.34				95% Adjusted-CLT UCL (Chen-1995)		75.8
259										95% Modified-t UCL (Johnson-1978)		75.58
260												

	A	B	C	D	E	F	G	H	I	J	K	L
261	**Gamma GOF Test**											
262					A-D Test Statistic	0.372	**Anderson-Darling Gamma GOF Test**					
263					5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level					
264					K-S Test Statistic	0.175	**Kolmogrov-Smirnoff Gamma GOF Test**					
265					5% K-S Critical Value	0.246	Detected data appear Gamma Distributed at 5% Significance Level					
266	**Detected data appear Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269					k hat (MLE)	7.701			k star (bias corrected MLE)			5.831
270					Theta hat (MLE)	8.156			Theta star (bias corrected MLE)			10.77
271					nu hat (MLE)	184.8			nu star (bias corrected)			139.9
272					MLE Mean (bias corrected)	62.81			MLE Sd (bias corrected)			26.01
273									Approximate Chi Square Value (0.05)			113.6
274					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			110
275												
276	**Assuming Gamma Distribution**											
277					95% Approximate Gamma UCL (use when n>=50))	77.36			95% Adjusted Gamma UCL (use when n<50)			79.91
278												
279	**Lognormal GOF Test**											
280					Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk Lognormal GOF Test**					
281					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
282					Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**					
283					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
284	**Data appear Lognormal at 5% Significance Level**											
285												
286	**Lognormal Statistics**											
287					Minimum of Logged Data	3.566			Mean of logged Data			4.074
288					Maximum of Logged Data	4.718			SD of logged Data			0.38
289												
290	**Assuming Lognormal Distribution**											
291					95% H-UCL	79.45			90% Chebyshev (MVUE) UCL			83.69
292					95% Chebyshev (MVUE) UCL	93.17			97.5% Chebyshev (MVUE) UCL			106.3
293					99% Chebyshev (MVUE) UCL	132.2						
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
297												
298	**Nonparametric Distribution Free UCLs**											
299					95% CLT UCL	74.29			95% Jackknife UCL			75.34
300					95% Standard Bootstrap UCL	73.65			95% Bootstrap-t UCL			77.56
301					95% Hall's Bootstrap UCL	75.61			95% Percentile Bootstrap UCL			74.39
302					95% BCA Bootstrap UCL	75.48						
303					90% Chebyshev(Mean, Sd) UCL	83.74			95% Chebyshev(Mean, Sd) UCL			93.23
304					97.5% Chebyshev(Mean, Sd) UCL	106.4			99% Chebyshev(Mean, Sd) UCL			132.3
305												
306	**Suggested UCL to Use**											
307					95% Student's-t UCL	75.34						
308												
309	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
310	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
311	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
312	For additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
313												
314												
315	**Cobalt**											
316												
317						**General Statistics**						
318					Total Number of Observations	12				Number of Distinct Observations		1
319										Number of Missing Observations		0
320					Minimum	34.1				Mean		34.1
321					Maximum	34.1				Median		34.1
322												
323						**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**						
324						**ProUCL (or any other software) should not be used on such a data set!**						
325						**The data set for variable Cobalt was not processed!**						
326												
327						**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**						
328						**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**						
329												
330												
331												
332	**Copper**											
333												
334						**General Statistics**						
335					Total Number of Observations	12				Number of Distinct Observations		12
336										Number of Missing Observations		0
337					Minimum	22.56				Mean		600.5
338					Maximum	4360				Median		288.2
339					SD	1201				Std. Error of Mean		346.6
340					Coefficient of Variation	1.999				Skewness		3.294
341												
342						**Normal GOF Test**						
343					Shapiro Wilk Test Statistic	0.477				**Shapiro Wilk GOF Test**		
344					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
345					Lilliefors Test Statistic	0.437				**Lilliefors GOF Test**		
346					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
347						**Data Not Normal at 5% Significance Level**						
348												
349						**Assuming Normal Distribution**						
350					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
351					95% Student's-t UCL	1223				95% Adjusted-CLT UCL (Chen-1995)		1523
352										95% Modified-t UCL (Johnson-1978)		1278
353												
354						**Gamma GOF Test**						
355					A-D Test Statistic	0.738				**Anderson-Darling Gamma GOF Test**		
356					5% A-D Critical Value	0.779				Detected data appear Gamma Distributed at 5% Significance Level		
357					K-S Test Statistic	0.273				**Kolmogrov-Smirnoff Gamma GOF Test**		
358					5% K-S Critical Value	0.257				Data Not Gamma Distributed at 5% Significance Level		
359						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**						
360												
361						**Gamma Statistics**						
362					k hat (MLE)	0.576				k star (bias corrected MLE)		0.488
363					Theta hat (MLE)	1042				Theta star (bias corrected MLE)		1231
364					nu hat (MLE)	13.83				nu star (bias corrected)		11.71

365					MLE Mean (bias corrected)	600.5					MLE Sd (bias corrected)	859.8
366											Approximate Chi Square Value (0.05)	5.035
367					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	4.386
368												
369					**Assuming Gamma Distribution**							
370				95% Approximate Gamma UCL (use when n>=50)		1396					95% Adjusted Gamma UCL (use when n<50)	1603
371												
372					**Lognormal GOF Test**							
373					Shapiro Wilk Test Statistic	0.933			**Shapiro Wilk Lognormal GOF Test**			
374					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
375					Lilliefors Test Statistic	0.178			**Lilliefors Lognormal GOF Test**			
376					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
377					**Data appear Lognormal at 5% Significance Level**							
378												
379					**Lognormal Statistics**							
380					Minimum of Logged Data	3.116					Mean of logged Data	5.319
381					Maximum of Logged Data	8.38					SD of logged Data	1.523
382												
383					**Assuming Lognormal Distribution**							
384					95% H-UCL	3981					90% Chebyshev (MVUE) UCL	1343
385					95% Chebyshev (MVUE) UCL	1702					97.5% Chebyshev (MVUE) UCL	2201
386					99% Chebyshev (MVUE) UCL	3181						
387												
388					**Nonparametric Distribution Free UCL Statistics**							
389					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
390												
391					**Nonparametric Distribution Free UCLs**							
392					95% CLT UCL	1171					95% Jackknife UCL	1223
393					95% Standard Bootstrap UCL	1131					95% Bootstrap-t UCL	3190
394					95% Hall's Bootstrap UCL	3549					95% Percentile Bootstrap UCL	1251
395					95% BCA Bootstrap UCL	1354						
396					90% Chebyshev(Mean, Sd) UCL	1640					95% Chebyshev(Mean, Sd) UCL	2111
397					97.5% Chebyshev(Mean, Sd) UCL	2765					99% Chebyshev(Mean, Sd) UCL	4049
398												
399					**Suggested UCL to Use**							
400					95% Adjusted Gamma UCL	1603						
401												
402					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
403					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
404					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
405					For additional insight the user may want to consult a statistician.							
406												
407												
408	**Iron**											
409												
410					**General Statistics**							
411					Total Number of Observations	12					Number of Distinct Observations	12
412											Number of Missing Observations	0
413					Minimum	12087					Mean	37616
414					Maximum	171000					Median	23378
415					SD	43226					Std. Error of Mean	12478
416					Coefficient of Variation	1.149					Skewness	3.138

	A	B	C	D	E	F	G	H	I	J	K	L
417												
418						Normal GOF Test						
419					Shapiro Wilk Test Statistic	0.532	Shapiro Wilk GOF Test					
420					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
421					Lilliefors Test Statistic	0.339	Lilliefors GOF Test					
422					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
423						Data Not Normal at 5% Significance Level						
424												
425						Assuming Normal Distribution						
426					95% Normal UCL		95% UCLs (Adjusted for Skewness)					
427					95% Student's-t UCL	60026	95% Adjusted-CLT UCL (Chen-1995)					70219
428							95% Modified-t UCL (Johnson-1978)					61910
429												
430						Gamma GOF Test						
431					A-D Test Statistic	1.338	Anderson-Darling Gamma GOF Test					
432					5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level					
433					K-S Test Statistic	0.302	Kolmogrov-Smirnoff Gamma GOF Test					
434					5% K-S Critical Value	0.249	Data Not Gamma Distributed at 5% Significance Level					
435						Data Not Gamma Distributed at 5% Significance Level						
436												
437						Gamma Statistics						
438					k hat (MLE)	1.829	k star (bias corrected MLE)					1.428
439					Theta hat (MLE)	20563	Theta star (bias corrected MLE)					26351
440					nu hat (MLE)	43.9	nu star (bias corrected)					34.26
441					MLE Mean (bias corrected)	37616	MLE Sd (bias corrected)					31483
442							Approximate Chi Square Value (0.05)					21.87
443					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					20.37
444												
445						Assuming Gamma Distribution						
446					95% Approximate Gamma UCL (use when n>=50))	58920	95% Adjusted Gamma UCL (use when n<50)					63258
447												
448						Lognormal GOF Test						
449					Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Lognormal GOF Test					
450					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
451					Lilliefors Test Statistic	0.25	Lilliefors Lognormal GOF Test					
452					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
453						Data appear Approximate Lognormal at 5% Significance Level						
454												
455						Lognormal Statistics						
456					Minimum of Logged Data	9.4	Mean of logged Data					10.24
457					Maximum of Logged Data	12.05	SD of logged Data					0.684
458												
459						Assuming Lognormal Distribution						
460					95% H-UCL	57798	90% Chebyshev (MVUE) UCL					55767
461					95% Chebyshev (MVUE) UCL	65400	97.5% Chebyshev (MVUE) UCL					78770
462					99% Chebyshev (MVUE) UCL	105033						
463												
464						Nonparametric Distribution Free UCL Statistics						
465						Data appear to follow a Discernible Distribution at 5% Significance Level						
466												
467						Nonparametric Distribution Free UCLs						
468					95% CLT UCL	58141	95% Jackknife UCL					60026

469					95% Standard Bootstrap UCL	57129					95% Bootstrap-t UCL	119117
470					95% Hall's Bootstrap UCL	127754					95% Percentile Bootstrap UCL	62129
471					95% BCA Bootstrap UCL	73542						
472					90% Chebyshev(Mean, Sd) UCL	75051					95% Chebyshev(Mean, Sd) UCL	92008
473					97.5% Chebyshev(Mean, Sd) UCL	115543					99% Chebyshev(Mean, Sd) UCL	161773
474												
475					**Suggested UCL to Use**							
476					95% Chebyshev (Mean, Sd) UCL	92008						
477												
478	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
479	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
480	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
481	For additional insight the user may want to consult a statistician.											
482												
483												
484	**Manganese**											
485												
486					**General Statistics**							
487					Total Number of Observations	12					Number of Distinct Observations	12
488											Number of Missing Observations	0
489					Minimum	304.1					Mean	728
490					Maximum	2850					Median	455.7
491					SD	695.9					Std. Error of Mean	200.9
492					Coefficient of Variation	0.956					Skewness	3.014
493												
494					**Normal GOF Test**							
495					Shapiro Wilk Test Statistic	0.57					**Shapiro Wilk GOF Test**	
496					5% Shapiro Wilk Critical Value	0.859					Data Not Normal at 5% Significance Level	
497					Lilliefors Test Statistic	0.336					**Lilliefors GOF Test**	
498					5% Lilliefors Critical Value	0.256					Data Not Normal at 5% Significance Level	
499					**Data Not Normal at 5% Significance Level**							
500												
501					**Assuming Normal Distribution**							
502					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
503					95% Student's-t UCL	1089					95% Adjusted-CLT UCL (Chen-1995)	1245
504											95% Modified-t UCL (Johnson-1978)	1118
505												
506					**Gamma GOF Test**							
507					A-D Test Statistic	1.191					**Anderson-Darling Gamma GOF Test**	
508					5% A-D Critical Value	0.741					Data Not Gamma Distributed at 5% Significance Level	
509					K-S Test Statistic	0.252					**Kolmogrov-Smirnoff Gamma GOF Test**	
510					5% K-S Critical Value	0.248					Data Not Gamma Distributed at 5% Significance Level	
511					**Data Not Gamma Distributed at 5% Significance Level**							
512												
513					**Gamma Statistics**							
514					k hat (MLE)	2.394					k star (bias corrected MLE)	1.851
515					Theta hat (MLE)	304.1					Theta star (bias corrected MLE)	393.3
516					nu hat (MLE)	57.45					nu star (bias corrected)	44.42
517					MLE Mean (bias corrected)	728					MLE Sd (bias corrected)	535.1
518											Approximate Chi Square Value (0.05)	30.13
519					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	28.35
520												

	A	B	C	D	E	F	G	H	I	J	K	L
521	**Assuming Gamma Distribution**											
522	95% Approximate Gamma UCL (use when n>=50))					1073	95% Adjusted Gamma UCL (use when n<50)					1141
523												
524	**Lognormal GOF Test**											
525	Shapiro Wilk Test Statistic					0.827	**Shapiro Wilk Lognormal GOF Test**					
526	5% Shapiro Wilk Critical Value					0.859	Data Not Lognormal at 5% Significance Level					
527	Lilliefors Test Statistic					0.236	**Lilliefors Lognormal GOF Test**					
528	5% Lilliefors Critical Value					0.256	Data appear Lognormal at 5% Significance Level					
529	**Data appear Approximate Lognormal at 5% Significance Level**											
530												
531	**Lognormal Statistics**											
532	Minimum of Logged Data					5.717	Mean of logged Data					6.367
533	Maximum of Logged Data					7.955	SD of logged Data					0.604
534												
535	**Assuming Lognormal Distribution**											
536	95% H-UCL					1057	90% Chebyshev (MVUE) UCL					1058
537	95% Chebyshev (MVUE) UCL					1226	97.5% Chebyshev (MVUE) UCL					1459
538	99% Chebyshev (MVUE) UCL					1917						
539												
540	**Nonparametric Distribution Free UCL Statistics**											
541	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
542												
543	**Nonparametric Distribution Free UCLs**											
544	95% CLT UCL					1058	95% Jackknife UCL					1089
545	95% Standard Bootstrap UCL					1049	95% Bootstrap-t UCL					1911
546	95% Hall's Bootstrap UCL					2350	95% Percentile Bootstrap UCL					1085
547	95% BCA Bootstrap UCL					1290						
548	90% Chebyshev(Mean, Sd) UCL					1331	95% Chebyshev(Mean, Sd) UCL					1604
549	97.5% Chebyshev(Mean, Sd) UCL					1983	99% Chebyshev(Mean, Sd) UCL					2727
550												
551	**Suggested UCL to Use**											
552	95% Chebyshev (Mean, Sd) UCL					1604						
553												
554	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
555	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
556	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
557	For additional insight the user may want to consult a statistician.											
558												
559												
560	**Mercury**											
561												
562	**General Statistics**											
563	Total Number of Observations					12	Number of Distinct Observations					2
564							Number of Missing Observations					0
565	Minimum					2.74	Mean					9.395
566	Maximum					10	Median					10
567	SD					2.096	Std. Error of Mean					0.605
568	Coefficient of Variation					0.223	Skewness					-3.464
569												
570	**Normal GOF Test**											
571	Shapiro Wilk Test Statistic					0.327	**Shapiro Wilk GOF Test**					
572	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
573					Lilliefors Test Statistic	0.53	**Lilliefors GOF Test**					
574					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
575	**Data Not Normal at 5% Significance Level**											
576												
577	**Assuming Normal Distribution**											
578	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
579					95% Student's-t UCL	10.48	95% Adjusted-CLT UCL (Chen-1995)					9.744
580							95% Modified-t UCL (Johnson-1978)					10.38
581												
582	**Gamma GOF Test**											
583					A-D Test Statistic	4.107	**Anderson-Darling Gamma GOF Test**					
584					5% A-D Critical Value	0.73	Data Not Gamma Distributed at 5% Significance Level					
585					K-S Test Statistic	0.538	**Kolmogrov-Smirnoff Gamma GOF Test**					
586					5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level					
587	**Data Not Gamma Distributed at 5% Significance Level**											
588												
589	**Gamma Statistics**											
590					k hat (MLE)	11.16	k star (bias corrected MLE)					8.424
591					Theta hat (MLE)	0.842	Theta star (bias corrected MLE)					1.115
592					nu hat (MLE)	267.8	nu star (bias corrected)					202.2
593					MLE Mean (bias corrected)	9.395	MLE Sd (bias corrected)					3.237
594							Approximate Chi Square Value (0.05)					170.3
595					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					165.8
596												
597	**Assuming Gamma Distribution**											
598					95% Approximate Gamma UCL (use when n>=50))	11.16	95% Adjusted Gamma UCL (use when n<50)					11.46
599												
600	**Lognormal GOF Test**											
601					Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk Lognormal GOF Test**					
602					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
603					Lilliefors Test Statistic	0.53	**Lilliefors Lognormal GOF Test**					
604					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
605	**Data Not Lognormal at 5% Significance Level**											
606												
607	**Lognormal Statistics**											
608					Minimum of Logged Data	1.008	Mean of logged Data					2.195
609					Maximum of Logged Data	2.303	SD of logged Data					0.374
610												
611	**Assuming Lognormal Distribution**											
612					95% H-UCL	12.06	90% Chebyshev (MVUE) UCL					12.71
613					95% Chebyshev (MVUE) UCL	14.13	97.5% Chebyshev (MVUE) UCL					16.1
614					99% Chebyshev (MVUE) UCL	19.98						
615												
616	**Nonparametric Distribution Free UCL Statistics**											
617	**Data do not follow a Discernible Distribution (0.05)**											
618												
619	**Nonparametric Distribution Free UCLs**											
620					95% CLT UCL	10.39	95% Jackknife UCL					N/A
621					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
622					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
623					95% BCA Bootstrap UCL	N/A						
624					90% Chebyshev(Mean, Sd) UCL	11.21	95% Chebyshev(Mean, Sd) UCL					12.03

	A	B	C	D	E	F	G	H	I	J	K	L
625					97.5% Chebyshev(Mean, Sd) UCL	13.17					99% Chebyshev(Mean, Sd) UCL	15.41
626												
627						**Suggested UCL to Use**						
628					95% Student's-t UCL	10.48					or 95% Modified-t UCL	10.38
629												
630						**Recommended UCL exceeds the maximum observation**						
631												
632					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
633					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
634					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
635					For additional insight the user may want to consult a statistician.							
636												
637					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
638					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
639												
640												
641	**Neptunium-237**											
642												
643						**General Statistics**						
644					Total Number of Observations	12					Number of Distinct Observations	3
645											Number of Missing Observations	0
646					Minimum	0.368					Mean	2.234
647					Maximum	4.1					Median	2.234
648					SD	0.796					Std. Error of Mean	0.23
649					Coefficient of Variation	0.356					Skewness	-2.89E-15
650												
651						**Normal GOF Test**						
652					Shapiro Wilk Test Statistic	0.6					**Shapiro Wilk GOF Test**	
653					5% Shapiro Wilk Critical Value	0.859					Data Not Normal at 5% Significance Level	
654					Lilliefors Test Statistic	0.417					**Lilliefors GOF Test**	
655					5% Lilliefors Critical Value	0.256					Data Not Normal at 5% Significance Level	
656						**Data Not Normal at 5% Significance Level**						
657												
658						**Assuming Normal Distribution**						
659					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
660					95% Student's-t UCL	2.646					95% Adjusted-CLT UCL (Chen-1995)	2.612
661											95% Modified-t UCL (Johnson-1978)	2.646
662												
663						**Gamma GOF Test**						
664					A-D Test Statistic	2.902					**Anderson-Darling Gamma GOF Test**	
665					5% A-D Critical Value	0.732					Data Not Gamma Distributed at 5% Significance Level	
666					K-S Test Statistic	0.475					**Kolmogrov-Smirnoff Gamma GOF Test**	
667					5% K-S Critical Value	0.246					Data Not Gamma Distributed at 5% Significance Level	
668						**Data Not Gamma Distributed at 5% Significance Level**						
669												
670						**Gamma Statistics**						
671					k hat (MLE)	5.176					k star (bias corrected MLE)	3.938
672					Theta hat (MLE)	0.432					Theta star (bias corrected MLE)	0.567
673					nu hat (MLE)	124.2					nu star (bias corrected)	94.51
674					MLE Mean (bias corrected)	2.234					MLE Sd (bias corrected)	1.126
675											Approximate Chi Square Value (0.05)	73.09
676					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	70.22

	A	B	C	D	E	F	G	H	I	J	K	L
677												
678						Assuming Gamma Distribution						
679					95% Approximate Gamma UCL (use when n>=50))	2.889				95% Adjusted Gamma UCL (use when n<50)		3.007
680												
681						Lognormal GOF Test						
682					Shapiro Wilk Test Statistic	0.497			Shapiro Wilk Lognormal GOF Test			
683					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
684					Lilliefors Test Statistic	0.487			Lilliefors Lognormal GOF Test			
685					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
686						Data Not Lognormal at 5% Significance Level						
687												
688						Lognormal Statistics						
689					Minimum of Logged Data	-1			Mean of logged Data			0.704
690					Maximum of Logged Data	1.411			SD of logged Data			0.564
691												
692						Assuming Lognormal Distribution						
693					95% H-UCL	3.461			90% Chebyshev (MVUE) UCL			3.511
694					95% Chebyshev (MVUE) UCL	4.043			97.5% Chebyshev (MVUE) UCL			4.782
695					99% Chebyshev (MVUE) UCL	6.233						
696												
697						Nonparametric Distribution Free UCL Statistics						
698						Data do not follow a Discernible Distribution (0.05)						
699												
700						Nonparametric Distribution Free UCLs						
701					95% CLT UCL	2.612			95% Jackknife UCL			2.646
702					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL			N/A
703					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL			N/A
704					95% BCA Bootstrap UCL	N/A						
705					90% Chebyshev(Mean, Sd) UCL	2.923			95% Chebyshev(Mean, Sd) UCL			3.235
706					97.5% Chebyshev(Mean, Sd) UCL	3.668			99% Chebyshev(Mean, Sd) UCL			4.519
707												
708						Suggested UCL to Use						
709					95% Chebyshev (Mean, Sd) UCL	3.235						
710												
711						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
712						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
713						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
714						For additional insight the user may want to consult a statistician.						
715												
716						Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be						
717						reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.						
718												
719												
720	Nickel											
721												
722						General Statistics						
723					Total Number of Observations	12			Number of Distinct Observations			11
724									Number of Missing Observations			0
725					Minimum	63.2			Mean			401.5
726					Maximum	2410			Median			225.8
727					SD	644.8			Std. Error of Mean			186.1
728					Coefficient of Variation	1.606			Skewness			3.235

	A	B	C	D	E	F	G	H	I	J	K	L
729												
730						Normal GOF Test						
731					Shapiro Wilk Test Statistic	0.508	Shapiro Wilk GOF Test					
732					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
733					Lilliefors Test Statistic	0.386	Lilliefors GOF Test					
734					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
735						Data Not Normal at 5% Significance Level						
736												
737						Assuming Normal Distribution						
738					95% Normal UCL		95% UCLs (Adjusted for Skewness)					
739					95% Student's-t UCL	735.7	95% Adjusted-CLT UCL (Chen-1995)					893.4
740							95% Modified-t UCL (Johnson-1978)					764.7
741												
742						Gamma GOF Test						
743					A-D Test Statistic	0.934	Anderson-Darling Gamma GOF Test					
744					5% A-D Critical Value	0.758	Data Not Gamma Distributed at 5% Significance Level					
745					K-S Test Statistic	0.24	Kolmogrov-Smirnoff Gamma GOF Test					
746					5% K-S Critical Value	0.253	Detected data appear Gamma Distributed at 5% Significance Level					
747						Detected data follow Appr. Gamma Distribution at 5% Significance Level						
748												
749						Gamma Statistics						
750					k hat (MLE)	0.972	k star (bias corrected MLE)					0.785
751					Theta hat (MLE)	413	Theta star (bias corrected MLE)					511.7
752					nu hat (MLE)	23.33	nu star (bias corrected)					18.83
753					MLE Mean (bias corrected)	401.5	MLE Sd (bias corrected)					453.3
754							Approximate Chi Square Value (0.05)					9.993
755					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					9.026
756												
757						Assuming Gamma Distribution						
758					95% Approximate Gamma UCL (use when n>=50)	756.5	95% Adjusted Gamma UCL (use when n<50)					837.6
759												
760						Lognormal GOF Test						
761					Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Lognormal GOF Test					
762					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
763					Lilliefors Test Statistic	0.159	Lilliefors Lognormal GOF Test					
764					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
765						Data appear Lognormal at 5% Significance Level						
766												
767						Lognormal Statistics						
768					Minimum of Logged Data	4.146	Mean of logged Data					5.399
769					Maximum of Logged Data	7.787	SD of logged Data					1.02
770												
771						Assuming Lognormal Distribution						
772					95% H-UCL	923	90% Chebyshev (MVUE) UCL					682.7
773					95% Chebyshev (MVUE) UCL	833.1	97.5% Chebyshev (MVUE) UCL					1042
774					99% Chebyshev (MVUE) UCL	1452						
775												
776						Nonparametric Distribution Free UCL Statistics						
777						Data appear to follow a Discernible Distribution at 5% Significance Level						
778												
779						Nonparametric Distribution Free UCLs						
780					95% CLT UCL	707.6	95% Jackknife UCL					735.7

	A	B	C	D	E	F	G	H	I	J	K	L
781					95% Standard Bootstrap UCL	691.4					95% Bootstrap-t UCL	1742
782					95% Hall's Bootstrap UCL	2010					95% Percentile Bootstrap UCL	758.9
783					95% BCA Bootstrap UCL	933.4						
784					90% Chebyshev(Mean, Sd) UCL	959.8					95% Chebyshev(Mean, Sd) UCL	1213
785					97.5% Chebyshev(Mean, Sd) UCL	1564					99% Chebyshev(Mean, Sd) UCL	2253
786												
787						Suggested UCL to Use						
788					95% Adjusted Gamma UCL	837.6						
789												
790					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
791					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
792					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
793					For additional insight the user may want to consult a statistician.							
794												
795												
796	PAH, Total											
797												
798						General Statistics						
799					Total Number of Observations	12					Number of Distinct Observations	1
800											Number of Missing Observations	0
801					Minimum	1.166					Mean	1.166
802					Maximum	1.166					Median	1.166
803												
804						Warning: There is only one distinct observation value in this data set - resulting in '0' variance!						
805						ProUCL (or any other software) should not be used on such a data set!						
806						The data set for variable PAH, Total was not processed!						
807												
808						If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.						
809						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
810												
811												
812												
813	PCB, Total											
814												
815						General Statistics						
816					Total Number of Observations	12					Number of Distinct Observations	3
817											Number of Missing Observations	0
818					Minimum	5					Mean	5.825
819					Maximum	10					Median	5
820					SD	1.927					Std. Error of Mean	0.556
821					Coefficient of Variation	0.331					Skewness	2.056
822												
823						Normal GOF Test						
824					Shapiro Wilk Test Statistic	0.467					Shapiro Wilk GOF Test	
825					5% Shapiro Wilk Critical Value	0.859					Data Not Normal at 5% Significance Level	
826					Lilliefors Test Statistic	0.499					Lilliefors GOF Test	
827					5% Lilliefors Critical Value	0.256					Data Not Normal at 5% Significance Level	
828						Data Not Normal at 5% Significance Level						
829												
830						Assuming Normal Distribution						
831					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
832					95% Student's-t UCL	6.824					95% Adjusted-CLT UCL (Chen-1995)	7.093

	A	B	C	D	E	F	G	H	I	J	K	L
833										95% Modified-t UCL (Johnson-1978)		6.879
834												
835					Gamma GOF Test							
836					A-D Test Statistic	3.432	Anderson-Darling Gamma GOF Test					
837					5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level					
838					K-S Test Statistic	0.507	Kolmogrov-Smirnoff Gamma GOF Test					
839					5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level					
840					Data Not Gamma Distributed at 5% Significance Level							
841												
842					Gamma Statistics							
843					k hat (MLE)	13.31	k star (bias corrected MLE)					10.04
844					Theta hat (MLE)	0.438	Theta star (bias corrected MLE)					0.58
845					nu hat (MLE)	319.5	nu star (bias corrected)					240.9
846					MLE Mean (bias corrected)	5.825	MLE Sd (bias corrected)					1.838
847							Approximate Chi Square Value (0.05)					206
848					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					201.1
849												
850					Assuming Gamma Distribution							
851					95% Approximate Gamma UCL (use when n>=50))	6.813	95% Adjusted Gamma UCL (use when n<50)					6.98
852												
853					Lognormal GOF Test							
854					Shapiro Wilk Test Statistic	0.466	Shapiro Wilk Lognormal GOF Test					
855					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
856					Lilliefors Test Statistic	0.499	Lilliefors Lognormal GOF Test					
857					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
858					Data Not Lognormal at 5% Significance Level							
859												
860					Lognormal Statistics							
861					Minimum of Logged Data	1.609	Mean of logged Data					1.724
862					Maximum of Logged Data	2.303	SD of logged Data					0.268
863												
864					Assuming Lognormal Distribution							
865					95% H-UCL	6.775	90% Chebyshev (MVUE) UCL					7.149
866					95% Chebyshev (MVUE) UCL	7.762	97.5% Chebyshev (MVUE) UCL					8.613
867					99% Chebyshev (MVUE) UCL	10.29						
868												
869					Nonparametric Distribution Free UCL Statistics							
870					Data do not follow a Discernible Distribution (0.05)							
871												
872					Nonparametric Distribution Free UCLs							
873					95% CLT UCL	6.74	95% Jackknife UCL					6.824
874					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
875					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
876					95% BCA Bootstrap UCL	N/A						
877					90% Chebyshev(Mean, Sd) UCL	7.494	95% Chebyshev(Mean, Sd) UCL					8.25
878					97.5% Chebyshev(Mean, Sd) UCL	9.299	99% Chebyshev(Mean, Sd) UCL					11.36
879												
880					Suggested UCL to Use							
881					95% Student's-t UCL	6.824					or 95% Modified-t UCL	6.879
882												
883	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
884	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											

	A	B	C	D	E	F	G	H	I	J	K	L
885	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
886	For additional insight the user may want to consult a statistician.											
887												
888												
889	Technetium-99											
890												
891	**General Statistics**											
892					Total Number of Observations	12			Number of Distinct Observations			3
893									Number of Missing Observations			0
894					Minimum	34.6			Mean			200.8
895					Maximum	367			Median			200.8
896					SD	70.87			Std. Error of Mean			20.46
897					Coefficient of Variation	0.353			Skewness			-2.00E-15
898												
899	**Normal GOF Test**											
900					Shapiro Wilk Test Statistic	0.6			**Shapiro Wilk GOF Test**			
901					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
902					Lilliefors Test Statistic	0.417			**Lilliefors GOF Test**			
903					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
904	**Data Not Normal at 5% Significance Level**											
905												
906	**Assuming Normal Distribution**											
907	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
908					95% Student's-t UCL	237.5			95% Adjusted-CLT UCL (Chen-1995)			234.5
909									95% Modified-t UCL (Johnson-1978)			237.5
910												
911	**Gamma GOF Test**											
912					A-D Test Statistic	2.896			**Anderson-Darling Gamma GOF Test**			
913					5% A-D Critical Value	0.732			Data Not Gamma Distributed at 5% Significance Level			
914					K-S Test Statistic	0.474			**Kolmogrov-Smirnoff Gamma GOF Test**			
915					5% K-S Critical Value	0.246			Data Not Gamma Distributed at 5% Significance Level			
916	**Data Not Gamma Distributed at 5% Significance Level**											
917												
918	**Gamma Statistics**											
919					k hat (MLE)	5.354			k star (bias corrected MLE)			4.071
920					Theta hat (MLE)	37.5			Theta star (bias corrected MLE)			49.32
921					nu hat (MLE)	128.5			nu star (bias corrected)			97.71
922					MLE Mean (bias corrected)	200.8			MLE Sd (bias corrected)			99.52
923									Approximate Chi Square Value (0.05)			75.91
924					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			72.98
925												
926	**Assuming Gamma Distribution**											
927					95% Approximate Gamma UCL (use when n>=50))	258.5			95% Adjusted Gamma UCL (use when n<50)			268.8
928												
929	**Lognormal GOF Test**											
930					Shapiro Wilk Test Statistic	0.5			**Shapiro Wilk Lognormal GOF Test**			
931					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
932					Lilliefors Test Statistic	0.486			**Lilliefors Lognormal GOF Test**			
933					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
934	**Data Not Lognormal at 5% Significance Level**											
935												
936	**Lognormal Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
937					Minimum of Logged Data	3.544					Mean of logged Data	5.206
938					Maximum of Logged Data	5.905					SD of logged Data	0.551
939												
940					Assuming Lognormal Distribution							
941					95% H-UCL	306.4					90% Chebyshev (MVUE) UCL	312.1
942					95% Chebyshev (MVUE) UCL	358.7					97.5% Chebyshev (MVUE) UCL	423.3
943					99% Chebyshev (MVUE) UCL	550.2						
944												
945					Nonparametric Distribution Free UCL Statistics							
946					Data do not follow a Discernible Distribution (0.05)							
947												
948					Nonparametric Distribution Free UCLs							
949					95% CLT UCL	234.5					95% Jackknife UCL	237.5
950					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
951					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
952					95% BCA Bootstrap UCL	N/A						
953					90% Chebyshev(Mean, Sd) UCL	262.2					95% Chebyshev(Mean, Sd) UCL	290
954					97.5% Chebyshev(Mean, Sd) UCL	328.6					99% Chebyshev(Mean, Sd) UCL	404.4
955												
956					Suggested UCL to Use							
957					95% Chebyshev (Mean, Sd) UCL	290						
958												
959					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
960					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
961					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
962					For additional insight the user may want to consult a statistician.							
963												
964					Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
965					reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.							
966												
967												
968	Thallium											
969												
970					General Statistics							
971					Total Number of Observations	12					Number of Distinct Observations	1
972											Number of Missing Observations	0
973					Minimum	0.26					Mean	0.26
974					Maximum	0.26					Median	0.26
975												
976					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
977					ProUCL (or any other software) should not be used on such a data set!							
978					The data set for variable Thallium was not processed!							
979												
980					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
981					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
982												
983												
984												
985	Thorium-230											
986												
987					General Statistics							
988					Total Number of Observations	12					Number of Distinct Observations	3

	A	B	C	D	E	F	G	H	I	J	K	L
989											Number of Missing Observations	0
990					Minimum	1.86					Mean	4.545
991					Maximum	7.23					Median	4.545
992					SD	1.145					Std. Error of Mean	0.331
993					Coefficient of Variation	0.252					Skewness	-1.29E-15
994												
995					Normal GOF Test							
996					Shapiro Wilk Test Statistic	0.6	Shapiro Wilk GOF Test					
997					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
998					Lilliefors Test Statistic	0.417	Lilliefors GOF Test					
999					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
1000					Data Not Normal at 5% Significance Level							
1001												
1002					Assuming Normal Distribution							
1003			95% Normal UCL				95% UCLs (Adjusted for Skewness)					
1004					95% Student's-t UCL	5.139					95% Adjusted-CLT UCL (Chen-1995)	5.089
1005											95% Modified-t UCL (Johnson-1978)	5.139
1006												
1007					Gamma GOF Test							
1008					A-D Test Statistic	2.781	Anderson-Darling Gamma GOF Test					
1009					5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level					
1010					K-S Test Statistic	0.452	Kolmogrov-Smirnoff Gamma GOF Test					
1011					5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level					
1012					Data Not Gamma Distributed at 5% Significance Level							
1013												
1014					Gamma Statistics							
1015					k hat (MLE)	14.14					k star (bias corrected MLE)	10.66
1016					Theta hat (MLE)	0.321					Theta star (bias corrected MLE)	0.426
1017					nu hat (MLE)	339.4					nu star (bias corrected)	255.9
1018					MLE Mean (bias corrected)	4.545					MLE Sd (bias corrected)	1.392
1019											Approximate Chi Square Value (0.05)	219.9
1020					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	214.8
1021												
1022					Assuming Gamma Distribution							
1023					95% Approximate Gamma UCL (use when n>=50))	5.29					95% Adjusted Gamma UCL (use when n<50)	5.416
1024												
1025					Lognormal GOF Test							
1026					Shapiro Wilk Test Statistic	0.553	Shapiro Wilk Lognormal GOF Test					
1027					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
1028					Lilliefors Test Statistic	0.464	Lilliefors Lognormal GOF Test					
1029					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
1030					Data Not Lognormal at 5% Significance Level							
1031												
1032					Lognormal Statistics							
1033					Minimum of Logged Data	0.621					Mean of logged Data	1.478
1034					Maximum of Logged Data	1.978					SD of logged Data	0.301
1035												
1036					Assuming Lognormal Distribution							
1037					95% H-UCL	5.467					90% Chebyshev (MVUE) UCL	5.775
1038					95% Chebyshev (MVUE) UCL	6.32					97.5% Chebyshev (MVUE) UCL	7.076
1039					99% Chebyshev (MVUE) UCL	8.563						
1040												

	A	B	C	D	E	F	G	H	I	J	K	L
1041	**Nonparametric Distribution Free UCL Statistics**											
1042	**Data do not follow a Discernible Distribution (0.05)**											
1043												
1044	**Nonparametric Distribution Free UCLs**											
1045					95% CLT UCL	5.089				95% Jackknife UCL		5.139
1046					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
1047					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
1048					95% BCA Bootstrap UCL	N/A						
1049					90% Chebyshev(Mean, Sd) UCL	5.537				95% Chebyshev(Mean, Sd) UCL		5.986
1050					97.5% Chebyshev(Mean, Sd) UCL	6.609				99% Chebyshev(Mean, Sd) UCL		7.833
1051												
1052	**Suggested UCL to Use**											
1053					95% Student's-t UCL	5.139				or 95% Modified-t UCL		5.139
1054												
1055	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1056	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1057	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1058	For additional insight the user may want to consult a statistician.											
1059												
1060	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
1061	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
1062												
1063												
1064	**Uranium**											
1065												
1066	**General Statistics**											
1067					Total Number of Observations	12				Number of Distinct Observations		12
1068										Number of Missing Observations		0
1069					Minimum	9.9				Mean		148.6
1070					Maximum	459				Median		127.8
1071					SD	129.9				Std. Error of Mean		37.51
1072					Coefficient of Variation	0.874				Skewness		1.194
1073												
1074	**Normal GOF Test**											
1075					Shapiro Wilk Test Statistic	0.894				**Shapiro Wilk GOF Test**		
1076					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
1077					Lilliefors Test Statistic	0.143				**Lilliefors GOF Test**		
1078					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
1079	**Data appear Normal at 5% Significance Level**											
1080												
1081	**Assuming Normal Distribution**											
1082	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1083					95% Student's-t UCL	216				95% Adjusted-CLT UCL (Chen-1995)		224.1
1084										95% Modified-t UCL (Johnson-1978)		218.1
1085												
1086	**Gamma GOF Test**											
1087					A-D Test Statistic	0.262				**Anderson-Darling Gamma GOF Test**		
1088					5% A-D Critical Value	0.753				Detected data appear Gamma Distributed at 5% Significance Level		
1089					K-S Test Statistic	0.134				**Kolmogrov-Smirnoff Gamma GOF Test**		
1090					5% K-S Critical Value	0.251				Detected data appear Gamma Distributed at 5% Significance Level		
1091	**Detected data appear Gamma Distributed at 5% Significance Level**											
1092												

	A	B	C	D	E	F	G	H	I	J	K	L
1093	Gamma Statistics											
1094					k hat (MLE)	1.166				k star (bias corrected MLE)		0.93
1095					Theta hat (MLE)	127.5				Theta star (bias corrected MLE)		159.9
1096					nu hat (MLE)	27.97				nu star (bias corrected)		22.31
1097					MLE Mean (bias corrected)	148.6				MLE Sd (bias corrected)		154.1
1098										Approximate Chi Square Value (0.05)		12.57
1099					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		11.47
1100												
1101	Assuming Gamma Distribution											
1102				95% Approximate Gamma UCL (use when n>=50))		263.8				95% Adjusted Gamma UCL (use when n<50)		289.1
1103												
1104	Lognormal GOF Test											
1105					Shapiro Wilk Test Statistic	0.929				Shapiro Wilk Lognormal GOF Test		
1106					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
1107					Lilliefors Test Statistic	0.177				Lilliefors Lognormal GOF Test		
1108					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
1109	Data appear Lognormal at 5% Significance Level											
1110												
1111	Lognormal Statistics											
1112					Minimum of Logged Data	2.293				Mean of logged Data		4.515
1113					Maximum of Logged Data	6.129				SD of logged Data		1.183
1114												
1115	Assuming Lognormal Distribution											
1116					95% H-UCL	588.4				90% Chebyshev (MVUE) UCL		355.8
1117					95% Chebyshev (MVUE) UCL	440.6				97.5% Chebyshev (MVUE) UCL		558.3
1118					99% Chebyshev (MVUE) UCL	789.4						
1119												
1120	Nonparametric Distribution Free UCL Statistics											
1121	Data appear to follow a Discernible Distribution at 5% Significance Level											
1122												
1123	Nonparametric Distribution Free UCLs											
1124					95% CLT UCL	210.3				95% Jackknife UCL		216
1125					95% Standard Bootstrap UCL	207.5				95% Bootstrap-t UCL		235.1
1126					95% Hall's Bootstrap UCL	249.8				95% Percentile Bootstrap UCL		211.9
1127					95% BCA Bootstrap UCL	225.1						
1128					90% Chebyshev(Mean, Sd) UCL	261.2				95% Chebyshev(Mean, Sd) UCL		312.1
1129					97.5% Chebyshev(Mean, Sd) UCL	382.9				99% Chebyshev(Mean, Sd) UCL		521.8
1130												
1131	Suggested UCL to Use											
1132					95% Student's-t UCL	216						
1133												
1134	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1135	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1136	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1137	For additional insight the user may want to consult a statistician.											
1138												
1139												
1140	Uranium-234											
1141												
1142	General Statistics											
1143					Total Number of Observations	12				Number of Distinct Observations		3
1144										Number of Missing Observations		0

	A	B	C	D	E	F	G	H	I	J	K	L
1145					Minimum	69.6					Mean	127.3
1146					Maximum	185					Median	127.3
1147					SD	24.6					Std. Error of Mean	7.102
1148					Coefficient of Variation	0.193					Skewness	4.264E-15
1149												
1150					Normal GOF Test							
1151					Shapiro Wilk Test Statistic	0.6	Shapiro Wilk GOF Test					
1152					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
1153					Lilliefors Test Statistic	0.417	Lilliefors GOF Test					
1154					5% Lilliefors Critical Value	0.256	Data Not Normal at 5% Significance Level					
1155					Data Not Normal at 5% Significance Level							
1156												
1157					Assuming Normal Distribution							
1158			95% Normal UCL				95% UCLs (Adjusted for Skewness)					
1159					95% Student's-t UCL	140.1					95% Adjusted-CLT UCL (Chen-1995)	139
1160											95% Modified-t UCL (Johnson-1978)	140.1
1161												
1162					Gamma GOF Test							
1163					A-D Test Statistic	2.749	Anderson-Darling Gamma GOF Test					
1164					5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level					
1165					K-S Test Statistic	0.443	Kolmogrov-Smirnoff Gamma GOF Test					
1166					5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level					
1167					Data Not Gamma Distributed at 5% Significance Level							
1168												
1169					Gamma Statistics							
1170					k hat (MLE)	26.26					k star (bias corrected MLE)	19.75
1171					Theta hat (MLE)	4.848					Theta star (bias corrected MLE)	6.446
1172					nu hat (MLE)	630.1					nu star (bias corrected)	473.9
1173					MLE Mean (bias corrected)	127.3					MLE Sd (bias corrected)	28.65
1174											Approximate Chi Square Value (0.05)	424.5
1175					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	417.3
1176												
1177					Assuming Gamma Distribution							
1178					95% Approximate Gamma UCL (use when n>=50))	142.1					95% Adjusted Gamma UCL (use when n<50)	144.6
1179												
1180					Lognormal GOF Test							
1181					Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Lognormal GOF Test					
1182					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
1183					Lilliefors Test Statistic	0.452	Lilliefors Lognormal GOF Test					
1184					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
1185					Data Not Lognormal at 5% Significance Level							
1186												
1187					Lognormal Statistics							
1188					Minimum of Logged Data	4.243					Mean of logged Data	4.827
1189					Maximum of Logged Data	5.22					SD of logged Data	0.213
1190												
1191					Assuming Lognormal Distribution							
1192					95% H-UCL	143.9					90% Chebyshev (MVUE) UCL	151.2
1193					95% Chebyshev (MVUE) UCL	161.9					97.5% Chebyshev (MVUE) UCL	176.7
1194					99% Chebyshev (MVUE) UCL	205.9						
1195												
1196					Nonparametric Distribution Free UCL Statistics							

	A	B	C	D	E	F	G	H	I	J	K	L
1197	Data do not follow a Discernible Distribution (0.05)											
1198												
1199	Nonparametric Distribution Free UCLs											
1200					95% CLT UCL	139				95% Jackknife UCL		140.1
1201					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
1202					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
1203					95% BCA Bootstrap UCL	N/A						
1204					90% Chebyshev(Mean, Sd) UCL	148.6				95% Chebyshev(Mean, Sd) UCL		158.3
1205					97.5% Chebyshev(Mean, Sd) UCL	171.7				99% Chebyshev(Mean, Sd) UCL		198
1206												
1207	Suggested UCL to Use											
1208					95% Student's-t UCL	140.1				or 95% Modified-t UCL		140.1
1209												
1210	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1211	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1212	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1213	For additional insight the user may want to consult a statistician.											
1214												
1215												
1216	Uranium-235											
1217												
1218	General Statistics											
1219					Total Number of Observations	12				Number of Distinct Observations		3
1220										Number of Missing Observations		0
1221					Minimum	4.21				Mean		12.96
1222					Maximum	21.7				Median		12.96
1223					SD	3.729				Std. Error of Mean		1.076
1224					Coefficient of Variation	0.288				Skewness		-7.18E-16
1225												
1226	Normal GOF Test											
1227					Shapiro Wilk Test Statistic	0.6				Shapiro Wilk GOF Test		
1228					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
1229					Lilliefors Test Statistic	0.417				Lilliefors GOF Test		
1230					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
1231	Data Not Normal at 5% Significance Level											
1232												
1233	Assuming Normal Distribution											
1234					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1235					95% Student's-t UCL	14.89				95% Adjusted-CLT UCL (Chen-1995)		14.73
1236										95% Modified-t UCL (Johnson-1978)		14.89
1237												
1238	Gamma GOF Test											
1239					A-D Test Statistic	2.809				Anderson-Darling Gamma GOF Test		
1240					5% A-D Critical Value	0.73				Data Not Gamma Distributed at 5% Significance Level		
1241					K-S Test Statistic	0.459				Kolmogrov-Smirnoff Gamma GOF Test		
1242					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
1243	Data Not Gamma Distributed at 5% Significance Level											
1244												
1245	Gamma Statistics											
1246					k hat (MLE)	10.03				k star (bias corrected MLE)		7.577
1247					Theta hat (MLE)	1.292				Theta star (bias corrected MLE)		1.71
1248					nu hat (MLE)	240.7				nu star (bias corrected)		181.9

	A	B	C	D	E	F	G	H	I	J	K	L
1249					MLE Mean (bias corrected)	12.96					MLE Sd (bias corrected)	4.706
1250											Approximate Chi Square Value (0.05)	151.7
1251					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	147.5
1252												
1253					Assuming Gamma Distribution							
1254				95% Approximate Gamma UCL (use when n>=50))		15.53					95% Adjusted Gamma UCL (use when n<50)	15.98
1255												
1256					Lognormal GOF Test							
1257					Shapiro Wilk Test Statistic	0.538			Shapiro Wilk Lognormal GOF Test			
1258					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
1259					Lilliefors Test Statistic	0.471			Lilliefors Lognormal GOF Test			
1260					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
1261					Data Not Lognormal at 5% Significance Level							
1262												
1263					Lognormal Statistics							
1264					Minimum of Logged Data	1.437					Mean of logged Data	2.511
1265					Maximum of Logged Data	3.077					SD of logged Data	0.369
1266												
1267					Assuming Lognormal Distribution							
1268					95% H-UCL	16.46					90% Chebyshev (MVUE) UCL	17.35
1269					95% Chebyshev (MVUE) UCL	19.27					97.5% Chebyshev (MVUE) UCL	21.94
1270					99% Chebyshev (MVUE) UCL	27.19						
1271												
1272					Nonparametric Distribution Free UCL Statistics							
1273					Data do not follow a Discernible Distribution (0.05)							
1274												
1275					Nonparametric Distribution Free UCLs							
1276					95% CLT UCL	14.73					95% Jackknife UCL	14.89
1277					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
1278					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
1279					95% BCA Bootstrap UCL	N/A						
1280					90% Chebyshev(Mean, Sd) UCL	16.18					95% Chebyshev(Mean, Sd) UCL	17.65
1281					97.5% Chebyshev(Mean, Sd) UCL	19.68					99% Chebyshev(Mean, Sd) UCL	23.67
1282												
1283					Suggested UCL to Use							
1284					95% Student's-t UCL	14.89					or 95% Modified-t UCL	14.89
1285												
1286					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1287					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1288					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1289					For additional insight the user may want to consult a statistician.							
1290												
1291					Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
1292					reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.							
1293												
1294												
1295	Uranium-238											
1296												
1297					General Statistics							
1298					Total Number of Observations	12					Number of Distinct Observations	3
1299											Number of Missing Observations	0
1300					Minimum	96.7					Mean	598.4

	A	B	C	D	E	F	G	H	I	J	K	L
1301					Maximum	1100					Median	598.4
1302					SD	213.9					Std. Error of Mean	61.75
1303					Coefficient of Variation	0.357					Skewness	-2.33E-15
1304												
1305					Normal GOF Test							
1306					Shapiro Wilk Test Statistic	0.6			Shapiro Wilk GOF Test			
1307					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
1308					Lilliefors Test Statistic	0.417			Lilliefors GOF Test			
1309					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
1310					Data Not Normal at 5% Significance Level							
1311												
1312					Assuming Normal Distribution							
1313					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
1314					95% Student's-t UCL	709.2			95% Adjusted-CLT UCL (Chen-1995)			699.9
1315									95% Modified-t UCL (Johnson-1978)			709.2
1316												
1317					Gamma GOF Test							
1318					A-D Test Statistic	2.905			Anderson-Darling Gamma GOF Test			
1319					5% A-D Critical Value	0.732			Data Not Gamma Distributed at 5% Significance Level			
1320					K-S Test Statistic	0.476			Kolmogrov-Smirnoff Gamma GOF Test			
1321					5% K-S Critical Value	0.246			Data Not Gamma Distributed at 5% Significance Level			
1322					Data Not Gamma Distributed at 5% Significance Level							
1323												
1324					Gamma Statistics							
1325					k hat (MLE)	5.104			k star (bias corrected MLE)			3.884
1326					Theta hat (MLE)	117.2			Theta star (bias corrected MLE)			154.1
1327					nu hat (MLE)	122.5			nu star (bias corrected)			93.21
1328					MLE Mean (bias corrected)	598.4			MLE Sd (bias corrected)			303.6
1329									Approximate Chi Square Value (0.05)			71.95
1330					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			69.1
1331												
1332					Assuming Gamma Distribution							
1333					95% Approximate Gamma UCL (use when n>=50))	775.2			95% Adjusted Gamma UCL (use when n<50)			807.1
1334												
1335					Lognormal GOF Test							
1336					Shapiro Wilk Test Statistic	0.496			Shapiro Wilk Lognormal GOF Test			
1337					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
1338					Lilliefors Test Statistic	0.487			Lilliefors Lognormal GOF Test			
1339					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
1340					Data Not Lognormal at 5% Significance Level							
1341												
1342					Lognormal Statistics							
1343					Minimum of Logged Data	4.572			Mean of logged Data			6.293
1344					Maximum of Logged Data	7.003			SD of logged Data			0.57
1345												
1346					Assuming Lognormal Distribution							
1347					95% H-UCL	932.9			90% Chebyshev (MVUE) UCL			944.8
1348					95% Chebyshev (MVUE) UCL	1089			97.5% Chebyshev (MVUE) UCL			1289
1349					99% Chebyshev (MVUE) UCL	1682						
1350												
1351					Nonparametric Distribution Free UCL Statistics							
1352					Data do not follow a Discernible Distribution (0.05)							

	A	B	C	D	E	F	G	H	I	J	K	L
1353												
1354					Nonparametric Distribution Free UCLs							
1355					95% CLT UCL	699.9				95% Jackknife UCL		709.2
1356					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
1357					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
1358					95% BCA Bootstrap UCL	N/A						
1359					90% Chebyshev(Mean, Sd) UCL	783.6				95% Chebyshev(Mean, Sd) UCL		867.5
1360					97.5% Chebyshev(Mean, Sd) UCL	984				99% Chebyshev(Mean, Sd) UCL		1213
1361												
1362					Suggested UCL to Use							
1363					95% Chebyshev (Mean, Sd) UCL	867.5						
1364												
1365					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1366					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1367					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1368					For additional insight the user may want to consult a statistician.							
1369												
1370					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
1371					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
1372												
1373												
1374	**Vanadium**											
1375												
1376					General Statistics							
1377					Total Number of Observations	12				Number of Distinct Observations		4
1378										Number of Missing Observations		0
1379					Minimum	32.8				Mean		67.37
1380					Maximum	74.72				Median		70
1381					SD	10.97				Std. Error of Mean		3.167
1382					Coefficient of Variation	0.163				Skewness		-3.363
1383												
1384					Normal GOF Test							
1385					Shapiro Wilk Test Statistic	0.409				**Shapiro Wilk GOF Test**		
1386					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
1387					Lilliefors Test Statistic	0.511				**Lilliefors GOF Test**		
1388					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
1389					**Data Not Normal at 5% Significance Level**							
1390												
1391					Assuming Normal Distribution							
1392					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1393					95% Student's-t UCL	73.06				95% Adjusted-CLT UCL (Chen-1995)		69.29
1394										95% Modified-t UCL (Johnson-1978)		72.55
1395												
1396					Gamma GOF Test							
1397					A-D Test Statistic	3.601				**Anderson-Darling Gamma GOF Test**		
1398					5% A-D Critical Value	0.731				Data Not Gamma Distributed at 5% Significance Level		
1399					K-S Test Statistic	0.521				**Kolmogrov-Smirnoff Gamma GOF Test**		
1400					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
1401					**Data Not Gamma Distributed at 5% Significance Level**							
1402												
1403					Gamma Statistics							
1404					k hat (MLE)	27.41				k star (bias corrected MLE)		20.61

	A	B	C	D	E	F	G	H	I	J	K	L
1405					Theta hat (MLE)	2.458				Theta star (bias corrected MLE)		3.268
1406					nu hat (MLE)	657.9				nu star (bias corrected)		494.8
1407					MLE Mean (bias corrected)	67.37				MLE Sd (bias corrected)		14.84
1408										Approximate Chi Square Value (0.05)		444.2
1409					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		436.9
1410												
1411					**Assuming Gamma Distribution**							
1412					95% Approximate Gamma UCL (use when n>=50))	75.04				95% Adjusted Gamma UCL (use when n<50)		76.3
1413												
1414					**Lognormal GOF Test**							
1415					Shapiro Wilk Test Statistic	0.383				**Shapiro Wilk Lognormal GOF Test**		
1416					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
1417					Lilliefors Test Statistic	0.518				**Lilliefors Lognormal GOF Test**		
1418					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
1419					**Data Not Lognormal at 5% Significance Level**							
1420												
1421					**Lognormal Statistics**							
1422					Minimum of Logged Data	3.49				Mean of logged Data		4.192
1423					Maximum of Logged Data	4.314				SD of logged Data		0.222
1424												
1425					**Assuming Lognormal Distribution**							
1426					95% H-UCL	76.76				90% Chebyshev (MVUE) UCL		80.7
1427					95% Chebyshev (MVUE) UCL	86.62				97.5% Chebyshev (MVUE) UCL		94.82
1428					99% Chebyshev (MVUE) UCL	110.9						
1429												
1430					**Nonparametric Distribution Free UCL Statistics**							
1431					**Data do not follow a Discernible Distribution (0.05)**							
1432												
1433					**Nonparametric Distribution Free UCLs**							
1434					95% CLT UCL	72.58				95% Jackknife UCL		73.06
1435					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
1436					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
1437					95% BCA Bootstrap UCL	N/A						
1438					90% Chebyshev(Mean, Sd) UCL	76.87				95% Chebyshev(Mean, Sd) UCL		81.17
1439					97.5% Chebyshev(Mean, Sd) UCL	87.15				99% Chebyshev(Mean, Sd) UCL		98.88
1440												
1441					**Suggested UCL to Use**							
1442					95% Student's-t UCL	73.06				or 95% Modified-t UCL		72.55
1443												
1444					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1445					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1446					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1447					For additional insight the user may want to consult a statistician.							
1448												
1449					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
1450					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
1451												