	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			7/30/2013 11:13:51 AM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	mber of Bootstrap Operations			2000								
9												
10	BEHP											
11												
12	General Statistics											
13	Total Number of Observations					66	Number of Distinct Observations					51
14	Number of Detects					51	Number of Non-Detects					15
15	Number of Distinct Detects					44	Number of Distinct Non-Detects					10
16	Minimum Detect					4.2	Minimum Non-Detect					3.2
17	Maximum Detect					240	Maximum Non-Detect					31
18	Variance Detects					2434	Percent Non-Detects					22.73%
19	Mean Detects					49.62	SD Detects					49.33
20	Median Detects					34	CV Detects					0.994
21	Skewness Detects					2.163	Kurtosis Detects					5.208
22	Mean of Logged Detects					3.485	SD of Logged Detects					0.967
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic					0.767	Normal GOF Test on Detected Observations Only					
26	5% Shapiro Wilk P Value					2.898E-10	Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic					0.192	Lilliefors GOF Test					
28	5% Lilliefors Critical Value					0.124	Detected Data Not Normal at 5% Significance Level					
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	Mean					40.76	Standard Error of Mean					5.743
33	SD					46.06	95% KM (BCA) UCL					50.83
34	95% KM (t) UCL					50.34	95% KM (Percentile Bootstrap) UCL					50.61
35	95% KM (z) UCL					50.2	95% KM Bootstrap t UCL					52.73
36	90% KM Chebyshev UCL					57.99	95% KM Chebyshev UCL					65.79
37	97.5% KM Chebyshev UCL					76.62	99% KM Chebyshev UCL					97.9
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic					0.463	Anderson-Darling GOF Test					
41	5% A-D Critical Value					0.772	etected data appear Gamma Distributed at 5% Significance Lev					
42	K-S Test Statistic					0.0856	Kolmogrov-Smirnoff GOF					
43	5% K-S Critical Value					0.127	etected data appear Gamma Distributed at 5% Significance Lev					
44	Detected data appear Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)					1.335	k star (bias corrected MLE)					1.27
48	Theta hat (MLE)					37.16	Theta star (bias corrected MLE)					39.08
49	nu hat (MLE)					136.2	nu star (bias corrected)					129.5
50	MLE Mean (bias corrected)					49.62	MLE Sd (bias corrected)					44.03
51												
52	Gamma Kaplan-Meier (KM) Statistics											
53	k hat (KM)					0.783	nu hat (KM)					103.4
54	Approximate Chi Square Value (103.36, α)					80.9	Adjusted Chi Square Value (103.36, β)					80.46
55	5% Gamma Approximate KM-UCL (use when n>=50)					52.07	95% Gamma Adjusted KM-UCL (use when n<50)					52.36
56												
57	Gamma ROS Statistics using Imputed Non-Detects											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62	Minimum					0.01	Mean					39.09

	A	B	C	D	E	F	G	H	I	J	K	L
63					Maximum	240					Median	23.5
64					SD	47.52					CV	1.216
65					k hat (MLE)	0.48					k star (bias corrected MLE)	0.468
66					Theta hat (MLE)	81.5					Theta star (bias corrected MLE)	83.53
67					nu hat (MLE)	63.31					nu star (bias corrected)	61.77
68					MLE Mean (bias corrected)	39.09					MLE Sd (bias corrected)	57.14
69											Adjusted Level of Significance (β)	0.0464
70					Approximate Chi Square Value (61.77, α)	44.69					Adjusted Chi Square Value (61.77, β)	44.37
71					95% Gamma Approximate UCL (use when n>=50)	54.03					95% Gamma Adjusted UCL (use when n<50)	54.42
72												
73					**Lognormal GOF Test on Detected Observations Only**							
74					Lilliefors Test Statistic	0.0737			**Lilliefors GOF Test**			
75					5% Lilliefors Critical Value	0.124			Detected Data appear Lognormal at 5% Significance Level			
76					**Detected Data appear Lognormal at 5% Significance Level**							
77												
78					**Lognormal ROS Statistics Using Imputed Non-Detects**							
79					Mean in Original Scale	40.59					Mean in Log Scale	3.19
80					SD in Original Scale	46.44					SD in Log Scale	1.039
81					95% t UCL (assumes normality of ROS data)	50.13					95% Percentile Bootstrap UCL	50.45
82					95% BCA Bootstrap UCL	52.39					95% Bootstrap t UCL	54
83					95% H-UCL (Log ROS)	55.76						
84												
85					**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**							
86					KM Mean (logged)	3.176					95% H-UCL (KM -Log)	57.41
87					KM SD (logged)	1.071					95% Critical H Value (KM-Log)	2.263
88					KM Standard Error of Mean (logged)	0.141						
89												
90					**DL/2 Statistics**							
91					**DL/2 Normal**				**DL/2 Log-Transformed**			
92					Mean in Original Scale	40.77					Mean in Log Scale	3.207
93					SD in Original Scale	46.32					SD in Log Scale	1.028
94					95% t UCL (Assumes normality)	50.28					95% H-Stat UCL	55.91
95					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
96												
97					**Nonparametric Distribution Free UCL Statistics**							
98					**Detected Data appear Gamma Distributed at 5% Significance Level**							
99												
100					**Suggested UCL to Use**							
101					95% KM (BCA) UCL	50.83			95% GROS Approximate Gamma UCL			54.03
102					95% Approximate Gamma KM-UCL	52.07						
103												
104	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
105	Recommendations are based upon data size, data distribution, and skewness.											
106	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
107	owever, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticia											
108												