

APPENDIX C

MONTE CARLO METHOD DEVELOPMENT

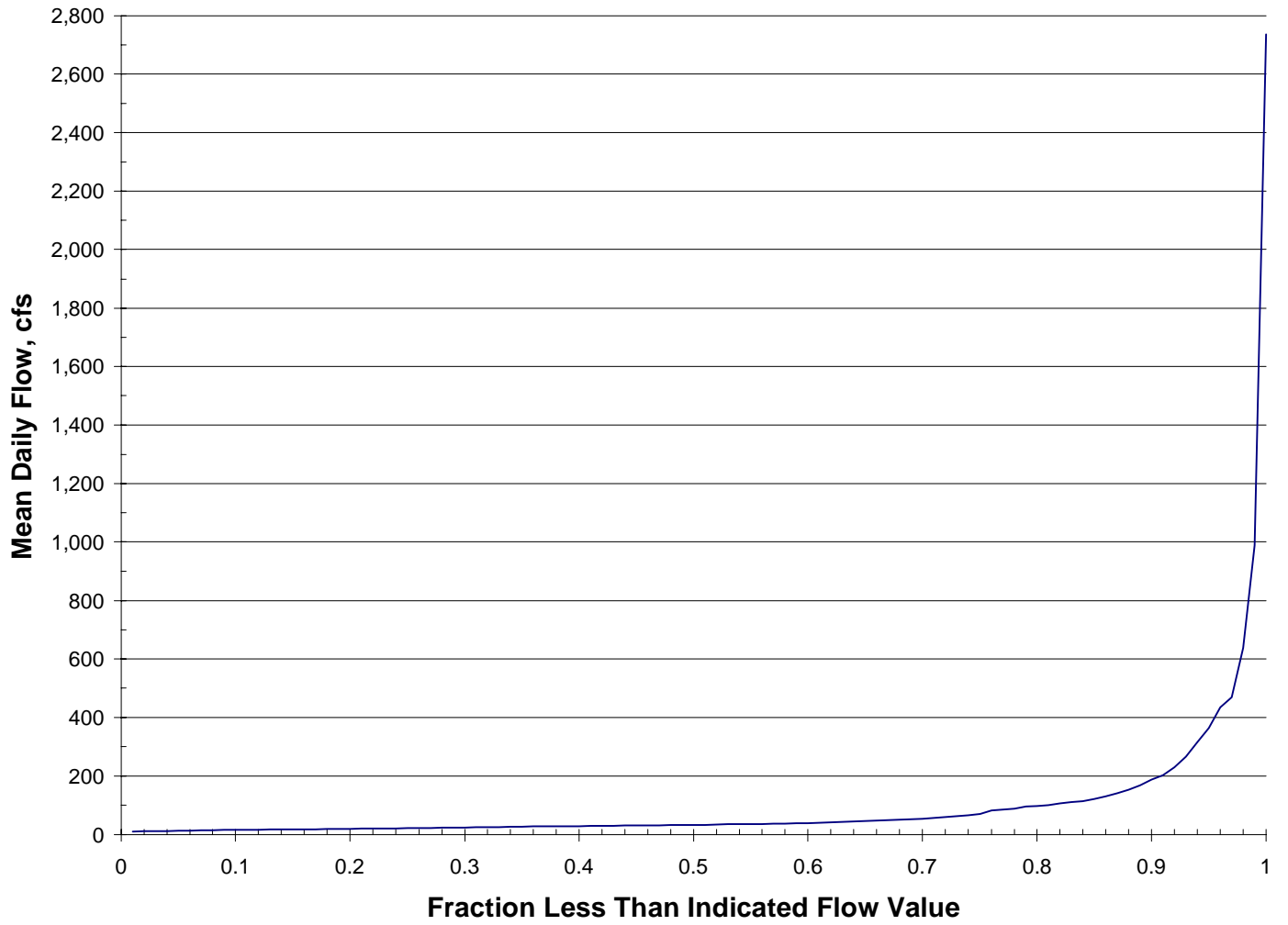


Figure C-1. Cumulative Probability Distribution of Cub Run's 1996 Mean Daily Flows.

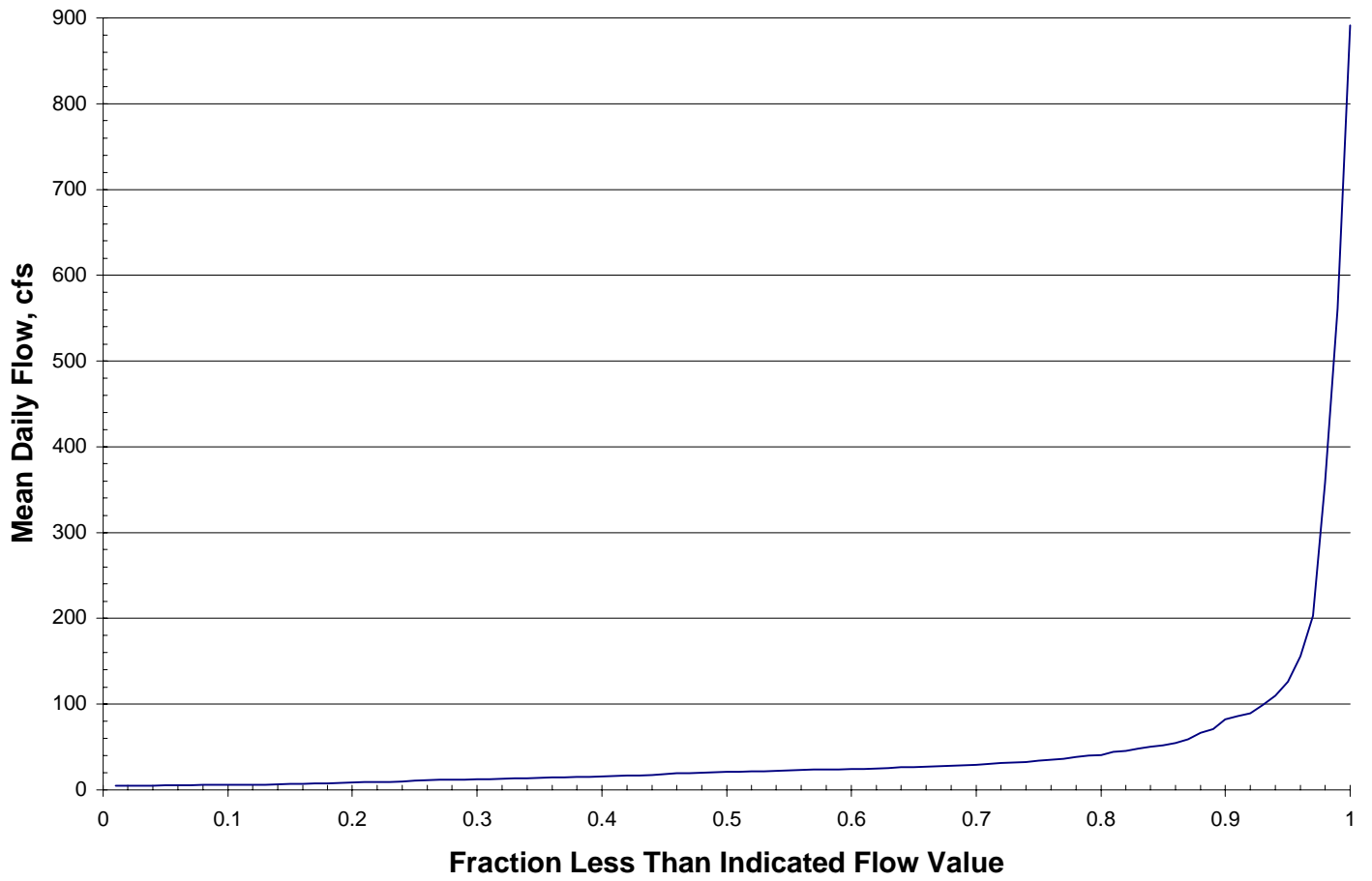


Figure C-2. Cumulative Probability Distribution of Cub Run's 1997 Mean Daily Flows.

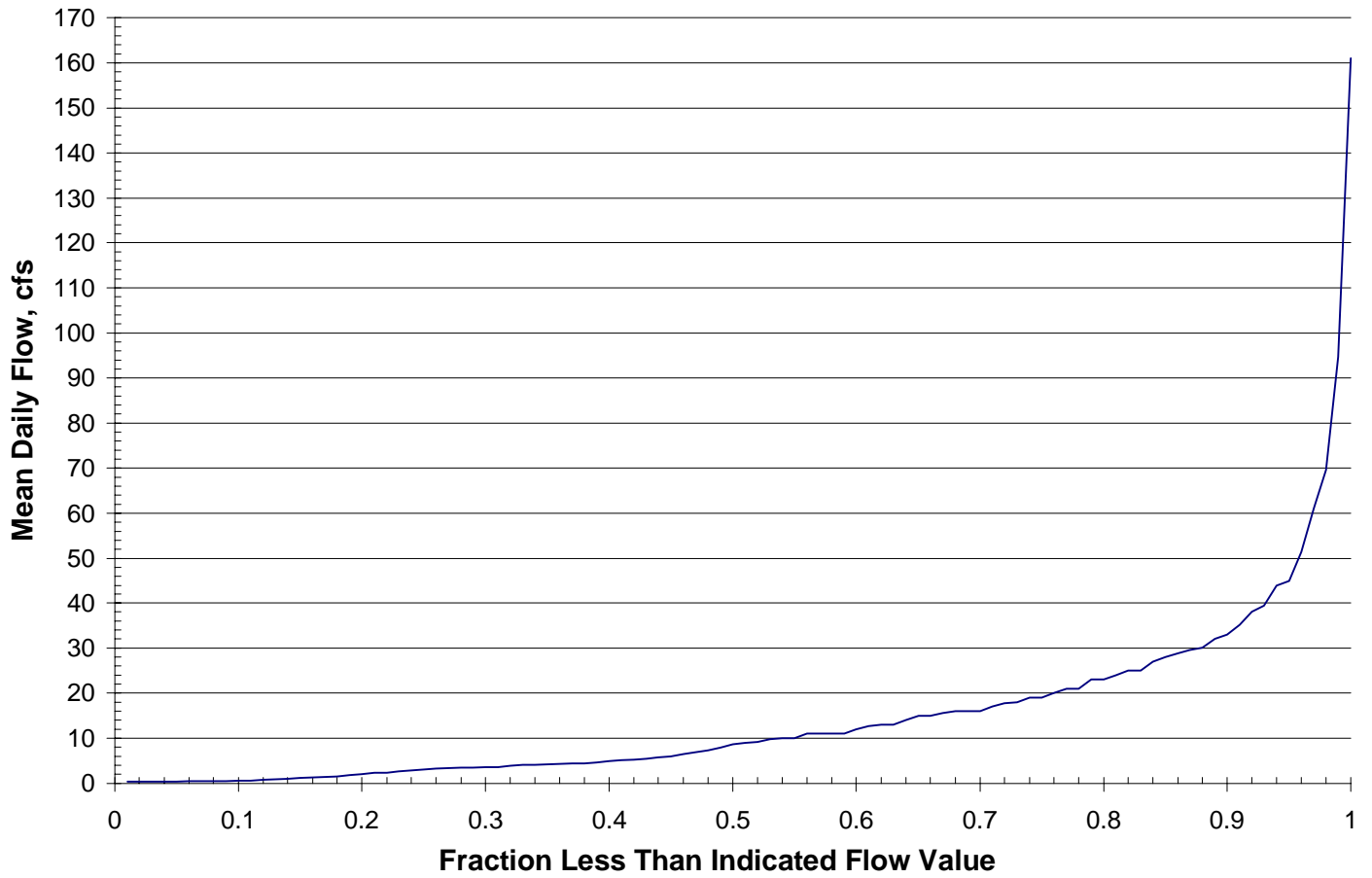


Figure C-3. Example of Cumulative Probability Distribution for One of Swift Creek Reservoir's Tributary's 1996 Mean Daily Flows (CT05, Swift Creek).

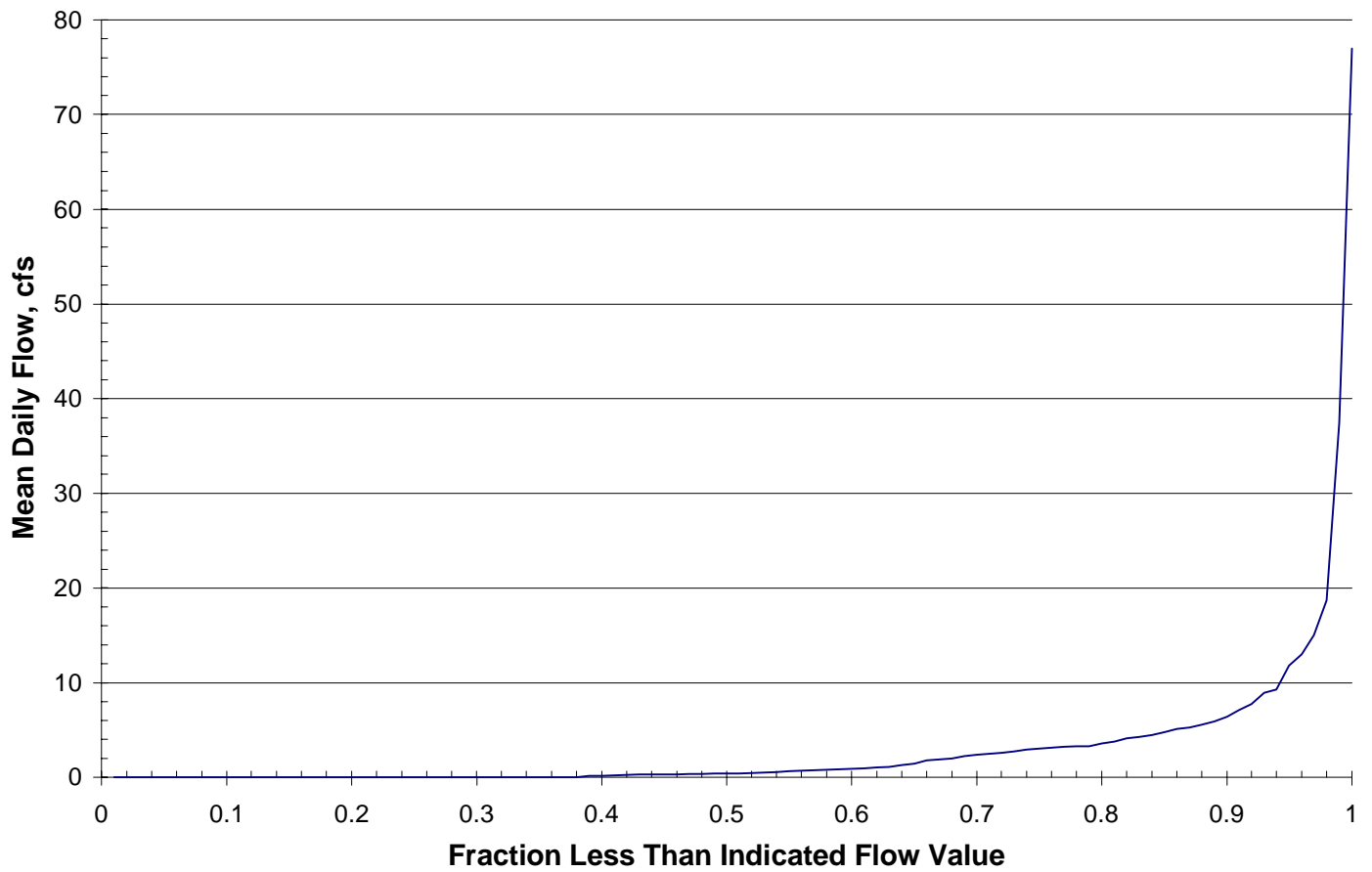


Figure C-4. Example of Cumulative Probability Distribution for One of Swift Creek Reservoirs's Tributary's 1997 Mean Daily Flows (CT31, Horsepen Creek).

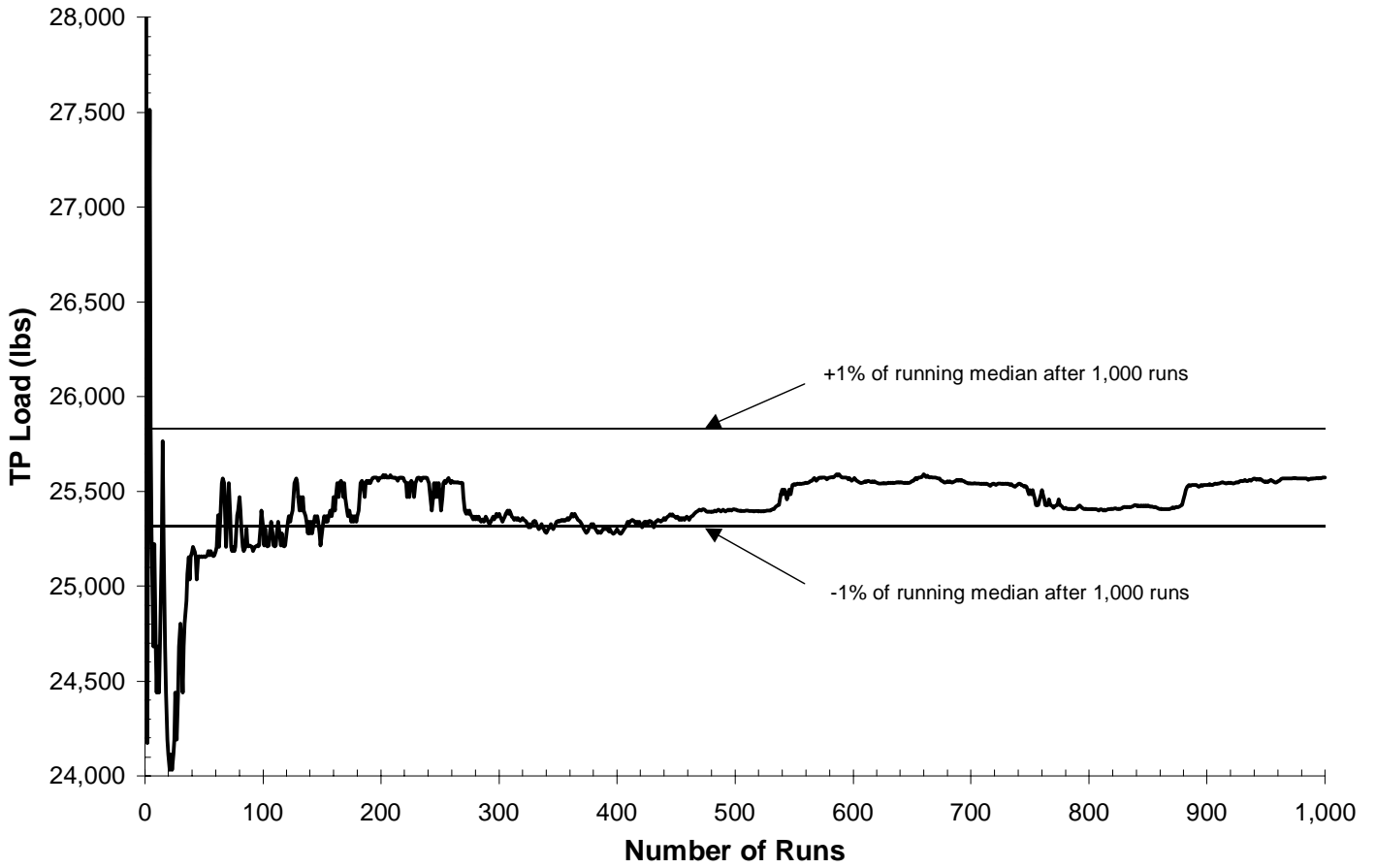


Figure C-5. Running Median of Cub Run's Monte Carlo Gaged Load for 1996 Using the 85th Percentile Flow Separation Point.

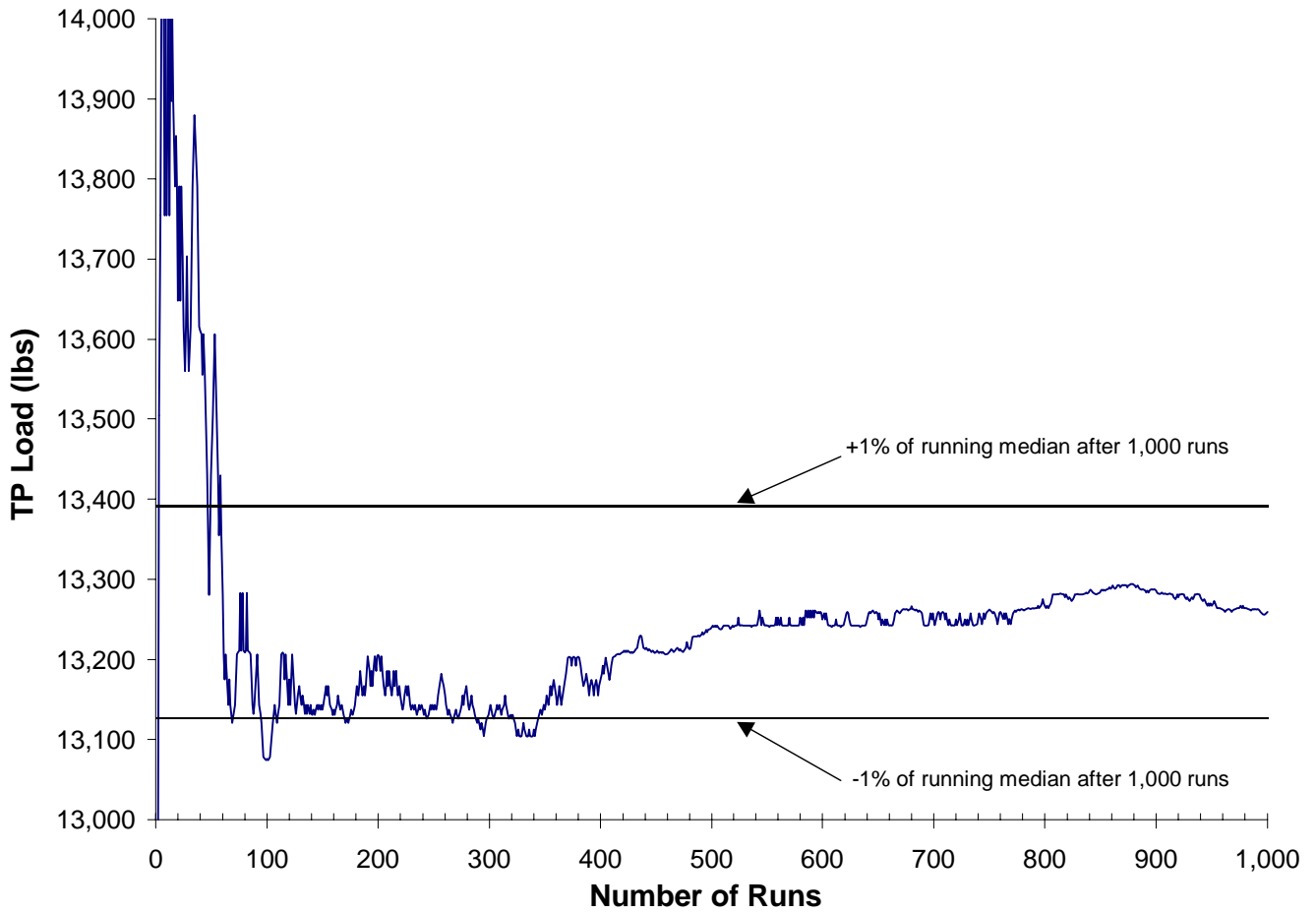


Figure C-6. Running Median of Cub Run's Gaged Monte Carlo Load for 1997 Using the 85th Percentile Flow Separation Point.

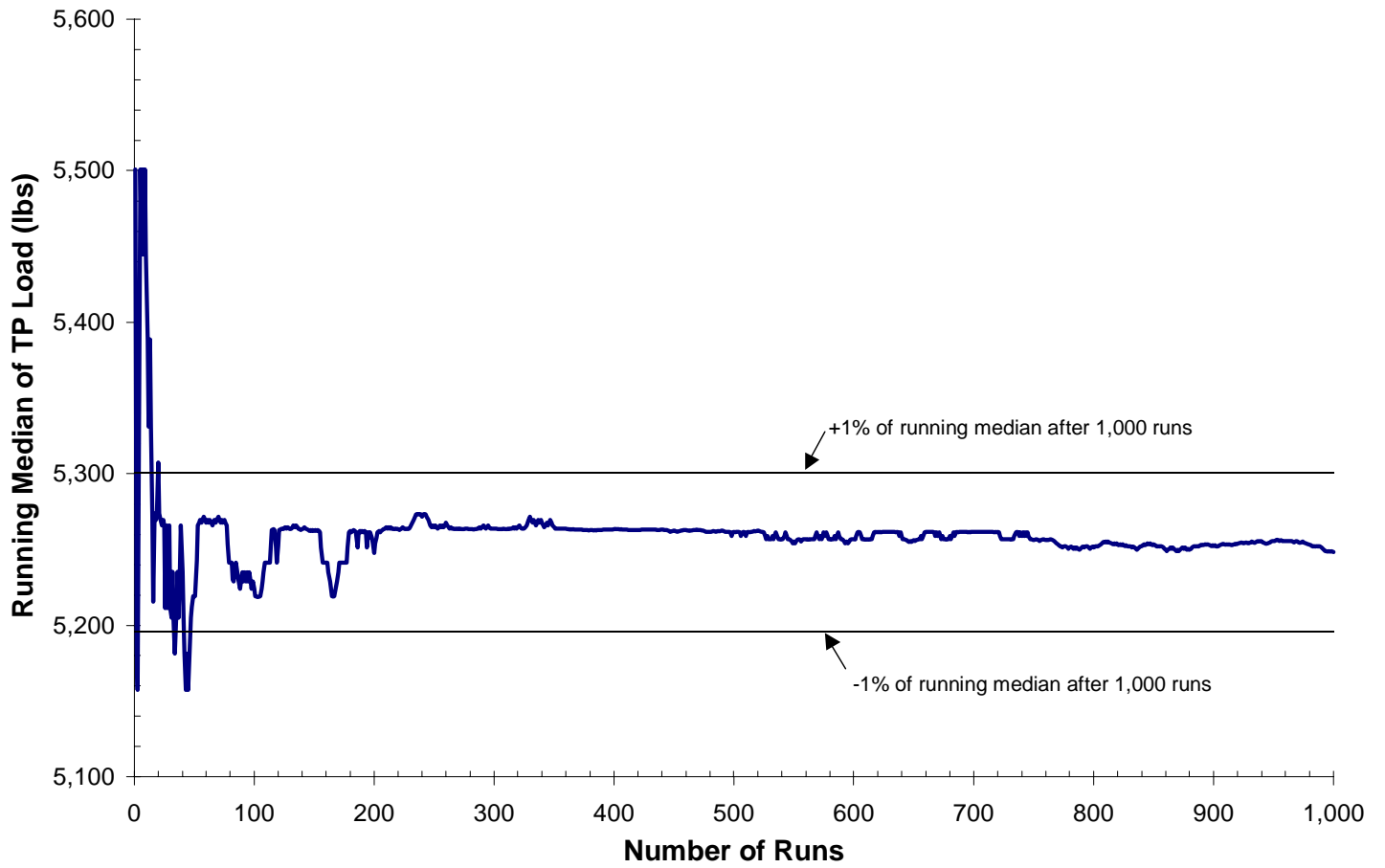


Figure C-7. Running Median of Swift Creek Reservoir's Gaged Load for 1996 using the 85th Percentile Flow Separation Point.

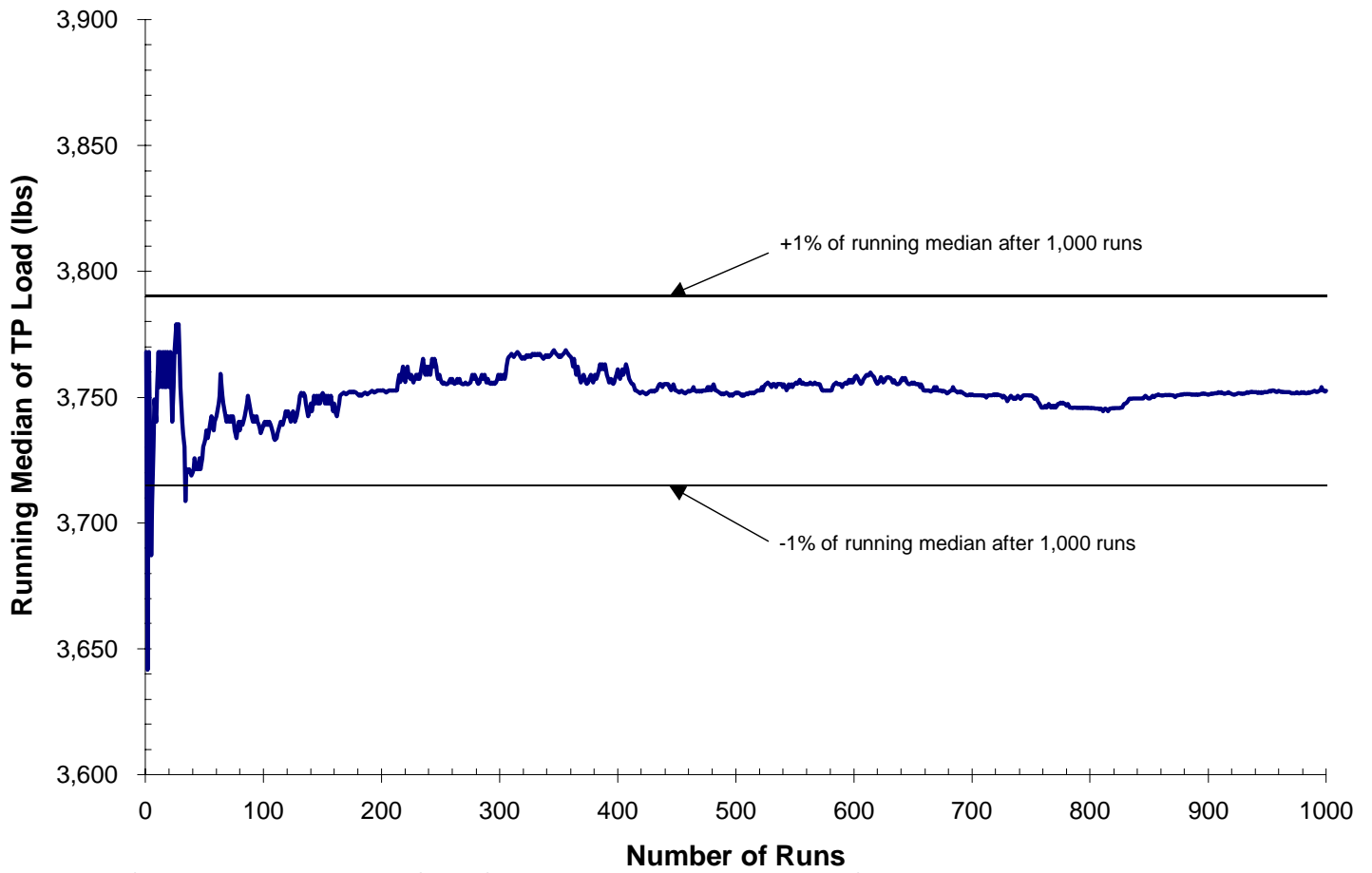


Figure C-8. Running Median of Swift Creek Reservoirs Gaged Monte Carlo Load for 1997 Using the 85th Percentile Flow Separation Point.

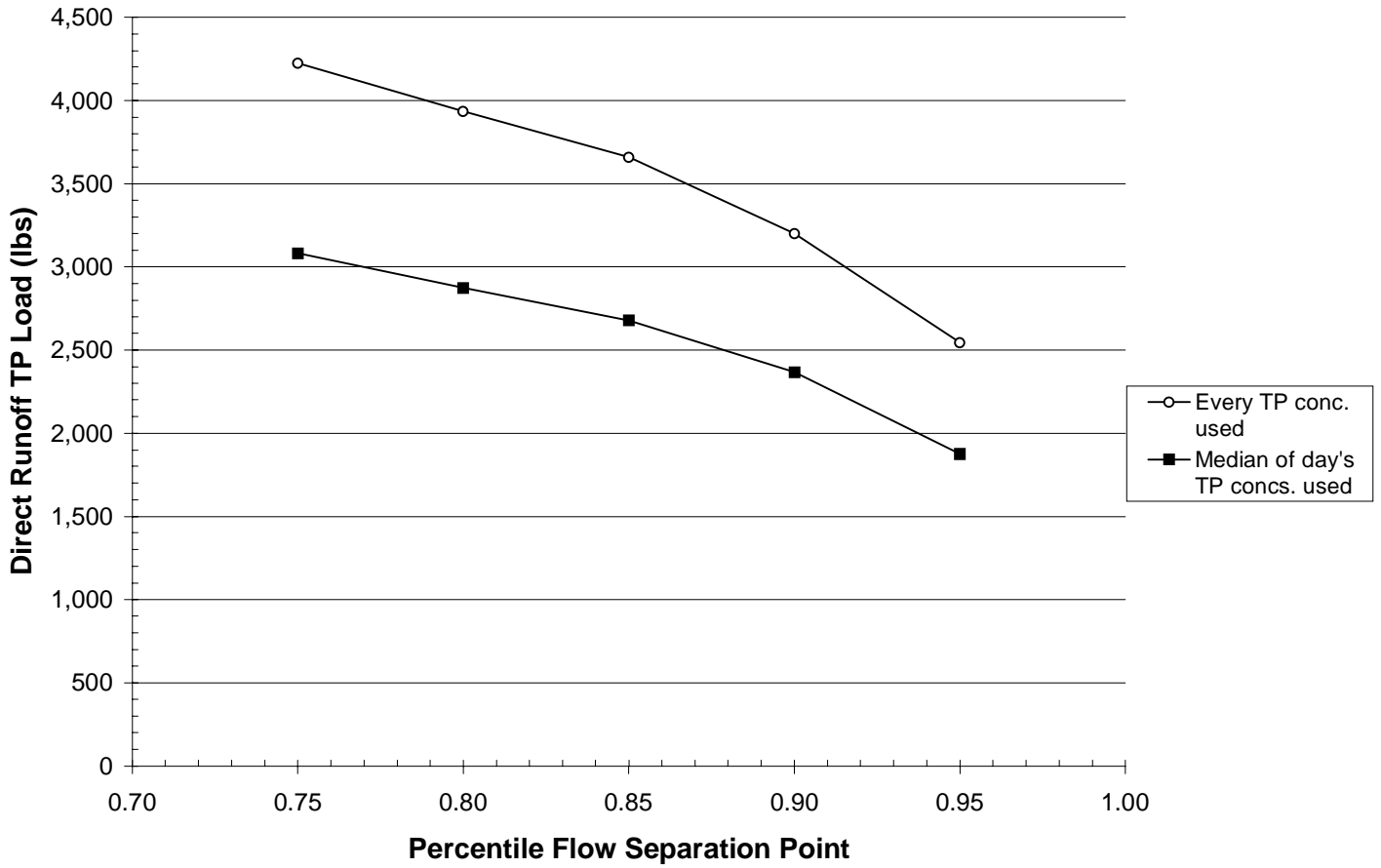


Figure C-9. Swift Creek Reservoir's 1996 Direct Runoff TP Load from Monte Carlo Analysis with Varying Percentile Flow Separation Points.

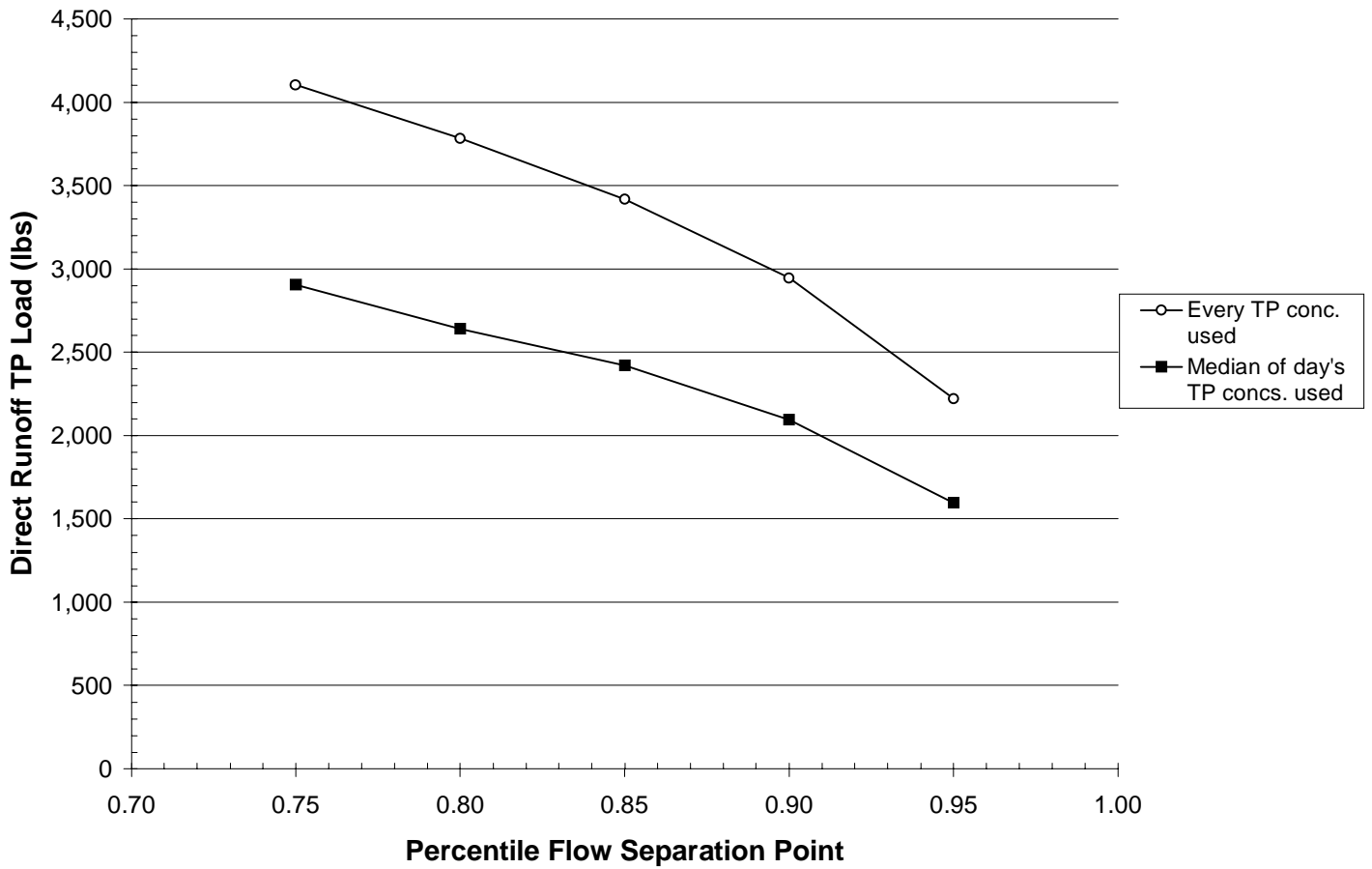


Figure C-10. Swift Creek Reservoir's 1997 Direct Runoff TP Load from Monte Carlo Analysis with Varying Percentile Flow Separation Points

Table C-1. One-way ANOVA Results for Significance of Seasonal Stratification of TP Concentrations for Swift Creek Reservoir's 1996 Monte Carlo Method.

Station	Kruskal-Wallis One-Way ANOVA not corrected for ties	Kruskal-Wallis One-Way ANOVA corrected for ties
CT01 Dry Creek	Reject Ho	Reject Ho
CT02 West Branch	Accept Ho	Accept Ho
CT04 Otterdale	Reject Ho	Reject Ho
CT05 Swift Creek	Reject Ho	Reject Ho
CT06 Tomahawk Creek	Reject Ho	Reject Ho
CT07 Little Tomahawk	Accept Ho	Accept Ho
CT08 Ashbrook	Accept Ho	Accept Ho
CT31 Horsepen	Accept Ho	Accept Ho
CT32 Blackman	Accept Ho	Accept Ho

Note: Winter (Dec., Jan.,Feb.), Spring (Mar.,Apr.,May), Summer (June, July, Aug.)
 Fall (Sept., Oct., Nov.)

Seasonal Stratification was not used because 5 of the 9 tributaries showed no significant difference between the TP concentrations separated by season.

Table C-2. One-Tail T-Test Probability Results to Test if a High Storm Flow TP Database Should be Used in the Monte Carlo Method for 1996.

Percentile of Mean Daily Flows						
Year	Station		85th	90th	95th	97.5th
1996	CT01	Dry	0.00995	0.01083	0.01083	0.00131
1996	CT02	West Branch	0.22201	0.22201	0.13082	0.00265
1996	CT04	Otterdale	0.24398	0.34672	0.41192	0.34478
1996	CT05	Swift Creek	0.35818	0.35818	0.15322	0.00136
1996	CT06	Tomahawk	0.04939	0.01289	0.00001	0.00001
1996	CT07	Little Tomahawk	0.18294	0.09879	0.00584	0.01393
1996	CT08	Ashbrook	0.40644	0.23064	0.02228	0.05944
1996	CT31	Horsepen	0.23089	0.11121	0.10893	0.28000
1996	CT32	Blackman	0.46051	0.25771	0.06095	0.00745
1995		Cub Run	0.00493	0.19398	0.25946	0.45633
1996		Cub Run	0.33079	0.02586	0.22488	0.20856

Note: Bold means reject null hypothesis with an alpha of 0.05

Results of t-tests between EMC TP concentrations for storms with storm flows above the given percentile and below the given percentile of the year's mean daily flows. The results above are the probabilities for a one-tail test with the null hypothesis that the higher flows' TP Concentrations are < or = to the lower flows' TP Concentrations. The alternative hypothesis is that the higher flows' TP Concentrations are > than the TP Concentrations for the lower flows.

Since 6 out of 9 of Swift Creek Reservoir's tributaries had a significant difference for flows over 97.5th percentile, the 1997 data was tested.

Table C-3. One-Tail T-Test Probability Results to Test if a High Storm Flow TP Database Should be Used in the Monte Carlo Method for 1997.

Year	Station	97.5th Percentile	
1997	CT01	Dry	0.1992
1997	CT02	West Branch	0.4221
1997	CT04	Otterdale	0.4091
1997	CT05	Swift Creek	0.3947
1997	CT06	Tomahawk	0.2721
1997	CT07	Little Tomahawk	0.0796
1997	CT08	Ashbrook	0.5000
1997	CT31	Horsepen	0.0513
1997	CT32	Blackman	0.2124

None of the 1997 data showed a significant difference between high storm flow concentrations and low storm flow concentrations. Therefore, a high flow storm database was not used.

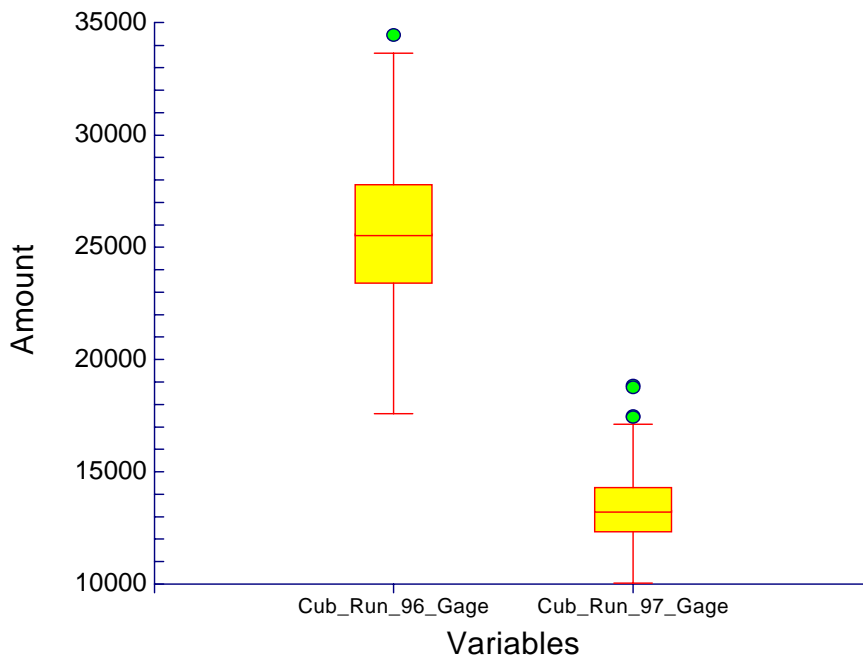


Figure C-11. Box Plot of Cub Run's 1996 and 1997 Monte Carlo Results of 1,000 Iterations Using the 85th Percentile Flow Separation (Shown in Pounds of TP).

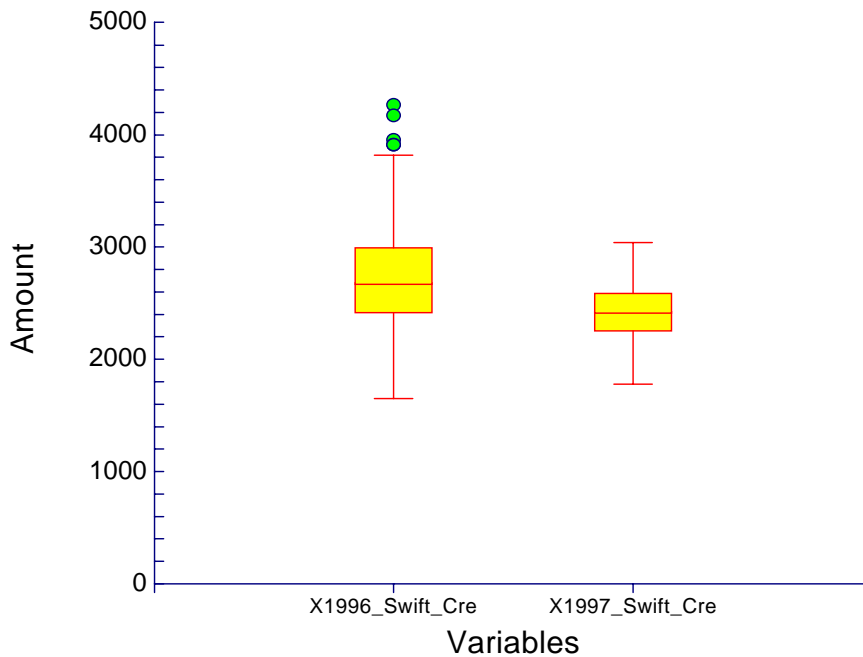


Figure C-12. Box Plots of Swift Creek Reservoir's 1996 and 1997 Gaged Monte Carlo Results of 1,000 Iterations Using the 85th Percentile Flow Separation Point (Shown in lbs of TP).