Optional Exercise #1 —Rating Curve Development, Multiple Offsets with Transition Zone—Tchoutacabouffa River

- Use methods similar to those you used in Exercises 7 and 8 to develop a rating that passes within reasonable limits of all measurements and transitions smoothly between rating segments.
- You can use a combination of BARC and the graph paper that follows, or just use the graph paper, to complete the exercise. If you use BARC you will still need to plot the transition zone using the graph paper so you can assess the smoothness of the transition zone.
- Use the following measurement data:

Number	Gage Height	Discharge	Rated
48	2.35	31.4	g
49	2.75	89.9	g
50	3.73	407	g
51	2.98	149	g
52	3.02	171	g
52	5.08	890	g
54	9.03	2840	g
55	7.24	1830	f
56	3.67	373	g
57	2.68	78	g
58	2.52	49.9	g
59	2.1	13	g

Hints:

1. Average measurements 51 and 52 and use this point as the upper point on the lower rating segment.
2. Use measurement 59 as the lower point on the lower rating segment.
3. Use an average of measurements 50 and 56 for the lower point on the upper rating segment.
4. Use measurement 54 as the upper point on the upper rating segment.
5. If using BARC use Rating B for the lower rating segment and Rating C for the upper rating segment.
6. Use Johnson's method or BARC (trail and error) to determine the best scale offset for the lower and upper rating segments. You should be able to develop rating segments that pass within acceptable limits of all measurements.
7. Draw a transition curve by hand between a gage height of 3.0 and 3.7 feet. Remember, when you develop ratings you will always want one rating segment to transition smoothly to another. This will require entering multiple input points so that

that ADAPS knows what the discharge is for a given gage height through transition zones. You cannot adequately represent breaks in ratings using single input points. Using a french, or ship curve, will help you draw a smooth transition curve between rating segments.

8. Fill out the table below showing the difference in discharge per 0.1 foot increase in stage through the transition zone between the upper and lower rating segments. Differences should increase smoothly. If they don't, re-plot your transition curve.

9. Develop a complete rating. If you are using BARC you can do this as Rating D. You should have enough information to determine:

- **a.** The offset to use for the log rating
- **b.** The offset for the bottom of the log rating
- **c.** The second offset you want to use.
- **d.** The low endpoint gage height
- **e.** The low endpoint discharge
- **f.** The first breakpoint discharge
- **g.** The first breakpoint gage height
- **h.** The second breakpoint discharge
- i. The second breakpoint gage height
- j. The high endpoint gage height
- k. The high endpoint discharge

10. Your final rating should pass within acceptable limits of all measurements!

Transition Curve Table:

Tchoutacabouff River			
G.H.	**Q**	**Difference per 0.1 foot increase in gage height**	**Comment**
2.8		----------	Discharge value from lower rating segment
2.9			Discharge value from lower rating segment
3.0			End point of lower rating segment
3.1			Discharge handpicked from curve
3.2			Discharge handpicked from curve
3.3			Discharge handpicked from curve
3.4			Discharge handpicked from curve
3.5			Discharge handpicked from curve
3.6			Discharge handpicked from curve
3.7			End point of upper rating segment
3.8			Discharge value from upper rating segment
3.9			Discharge value from upper rating segment