SJRRP Flow Bench Evaluation

April 2, 2010

The planned flow increase to 1595 cfs at Friant Dam, scheduled for April 2, 2010, will be delayed and reevaluated on Monday, April 12th. Reclamation will request a new flow schedule from the Restoration Administrator to account for the adjustments. The evaluation of the increase is shown below.

As of April 2, 2010:

1. Flows rates from provisional real-time data are below known conveyance thresholds (8,000 cfs in Reach 2A, 1,300 cfs in Reach 2B, and 1,300 cfs in Reach 3).

2. Mendota Pool operations calls identified a potential need to change gate operations at Chowchilla Bifurcation Structure to pass a sand dune through the structure.

3. The seepage hotline received four calls: on March 4th regarding R2B-1, on March 11th regarding an airstrip and pomegranate orchard near river mile 238.5, on March 15th regarding Fort Washington Beach campground, and on March 26th regarding CCID well 144. All evaluations determined the planned releases could proceed.

4. Real-time provisional groundwater data does not show groundwater depths crossing identified thresholds. Water table elevations in all three wells are continuing to increase.

5. Manually monitored groundwater wells do not show unaddressed groundwater depths crossing identified thresholds.

6. Measured losses in Reach 2A from operations estimates show approximately 190 cfs, and are fluctuating.

7. Projected groundwater levels from the upcoming increase in flow are below thresholds except for wells R2B-1, MW-49B, MW-55B, MW-47, and R3-7. MW-55B is predicted to increase above the top of the buffer zone. Hydraulic rating curves are updated based on new modeling information and site evaluations.

8. The LSJLD was notified of potential increases in flows and identified concerns with approaching channel capacity in some reaches. The LSJLD provided information on Monday, March 29th that flows are adjacent to or inundating 12 flapgates and informed Reclamation that the LSJLD would need to increase monitoring activities in these locations.

9. The CCID was notified of potential increases in flows and identified high groundwater levels in CCID monitoring well 144, concerns regarding site evaluation measurements, and concerns about high water surface levels in the river and potential obstructions.

10. The SLCC was notified of potential increases in flows and did not identify any potential issues.

The seepage management plan uses existing groundwater elevations and extrapolates stage changes to estimate future groundwater depths. Prediction accuracy has generally been conservative at about 0.5 feet error. Telemetered data in Reach 2B shows that existing groundwater elevations have not

stabilized and may continue to rise by several tenths of a foot. Several wells are within the buffer zone and one is predicted to come within the range of potential damages. The inaccuracy from potential transient effects and prediction error exceeds the margin of safety on the potential damages. Based on past experience, water table elevations in MW-54 will require several additional days to stabilize. By April 12th, the monitoring network should have registered any transient effects and uncertainty will include only prediction error. This will extend this 1100 cfs flow release rate for the same number of days as the previous 800 cfs flowbench.

The recommendation from the Restoration Administrator for the 2010 Interim Flows prioritized evaluating losses. The hydrographs were developed to establish flow benches that allow reaching steady-state equilibrium. The monitoring network shows that additional time would be required to achieve steady-state surface flows as well as groundwater interactions.

At the proposed flow bench, operations at Mendota and Sack Dam will exceed historical experience. Stable flow conditions would allow for more accurate development of operating rules by providing a more certain foundation in preparation for future flow benches. Accurate operating rules will improve the ability to establish future studies in reaches downstream of Mendota and Sack Dams.

The combination of avoiding seepage losses and developing a superior data set requires delaying flow adjustments. The flow bench will be reevaluated on April 12th to determine if the planned increase can proceed.

Data

The weekly groundwater report with manual measurements via electronic well sounder and recent flow data is available at: http://restoresjr.net/activities/if/index.html.

Table 1 shows the anticipated changes in flows used to predict future groundwater depths based on Exhibit B loss assumptions and an estimated 300 cfs delivery to Arroyo Canal.

Table 1: Anticipated Change in Flows

	Current Target (cfs)	Future Target (cfs)	Change (cfs)
Reach 2A	950	1445	495
Reach 2B & 4A	815	1290	475
Reach 3	1115	1590	475

Table 2 shows the current and predicted rise in groundwater based on estimated changes in river stage and the conceptual model shown in Figure 1. Subsequent pages show the rating curves for each of the key wells from the Mussetter Engineering, Inc., 2008. San Joaquin HEC-RAS Model Documentation. Technical Memorandum prepared for California Dept. of Water Resources, Fresno, California, June 2. Rating curves in Reach 2B were updated April 1, 2010.

Table 2: Predicted Increases in Groundwater Levels for Key Wells

Well_ID	Site	Buffer Zone (ft bgs)	Screen Depth (ft bgs)	Current Depth Week of April 4th (ft bgs)[1]	Predicted Stage Increase (ft)	Anticipated Depth (ft)
FA-9	Reach 2A – Transect 12 – Left	4-6	12-32	8.6	0.698	7.9
MW-47	Reach 2A – Transect 12 – Right	**6-8**	**20-40**	**7.97**	**0.698**	**7.3**
MA-4	Reach 2A – Transect 13 – Right	6-8	15-25	11.35	0.8782	10.5
MW-49B	Reach 2A – Transect 13 – Left	**4-6**	**10-20**	**5.15**	**0.8782**	**4.3**
MW-54B	Reach 2B – San Mateo Ave. – Right	TBD	TBD	15.03	1.8412	13.2
MW-55B	Reach 2B – San Mateo Ave. – Left	**6-8**	**10-15**	**6.96**	1.8412	**5.1**
R2B-1	Reach 2B – Right	**4-6**	**8-11**	**5.53**	**0.6195**	**4.9**
R2B-2	Reach 2B – Right	4-6	17-20	12.33	0.0749	12.3
R3-1	Reach 3 – Right	4-6	9-24	7.98	1.8746	6.1
R3-6	Reach 3 – Right	4-6	17-20	8.00	1.4018	6.6
R3-7	Reach 3 – Right	**3-5**	**17-20**	**6.48**	**1.6996**	**4.8**
MW-84	Reach 4A – Highway 152 – Right	4-6	32-52	31.88	1.3982	30.5
MW-87B	Reach 4A – Highway 152 - Left	4-6	TBD	Dry (>14)	1.3982	12.6 to dry

[1] Wells in Reaches 2A and 2B were measured on Tuesday, March 30th, wells in Reaches 3 and 4A were measured on Thursday, April 1st.

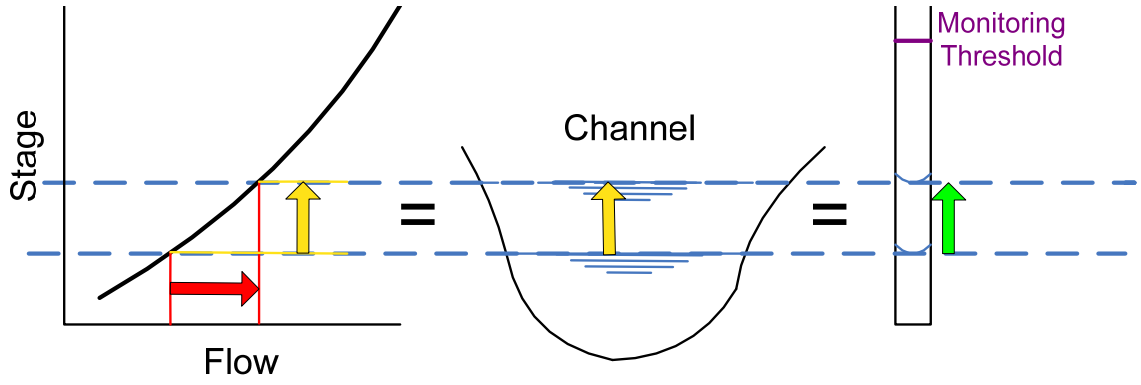
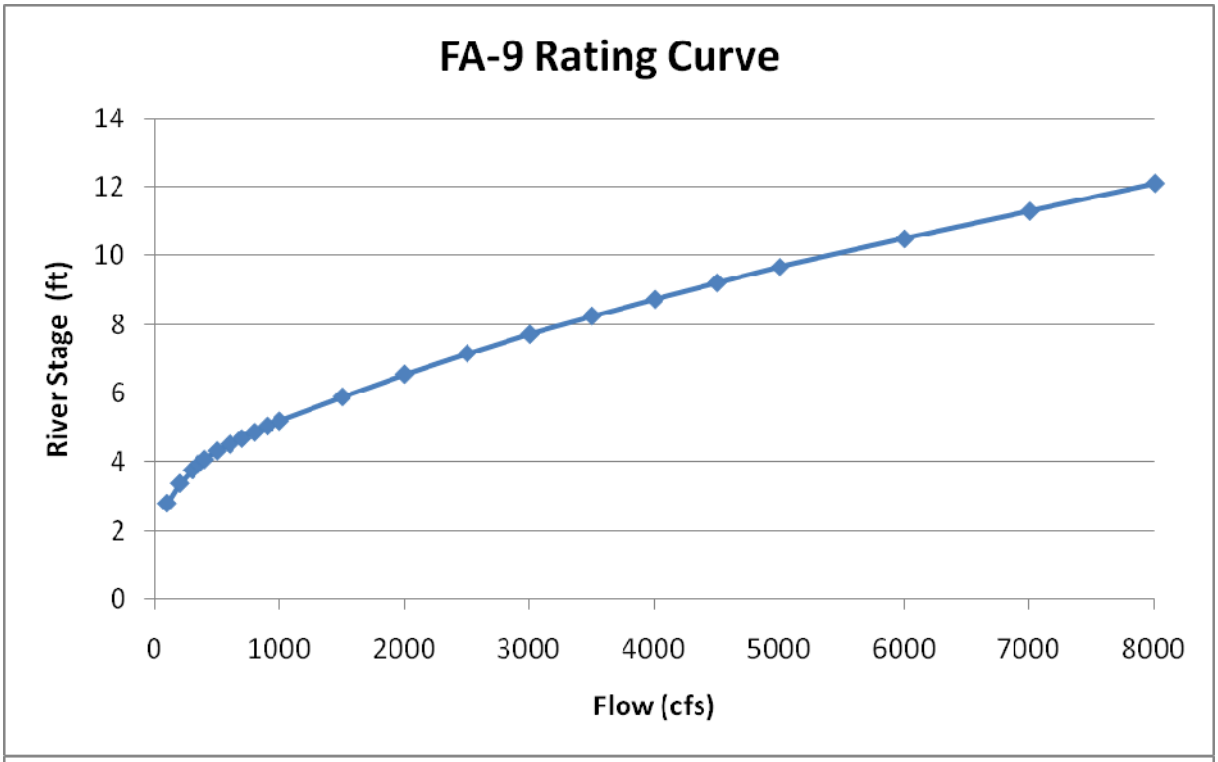
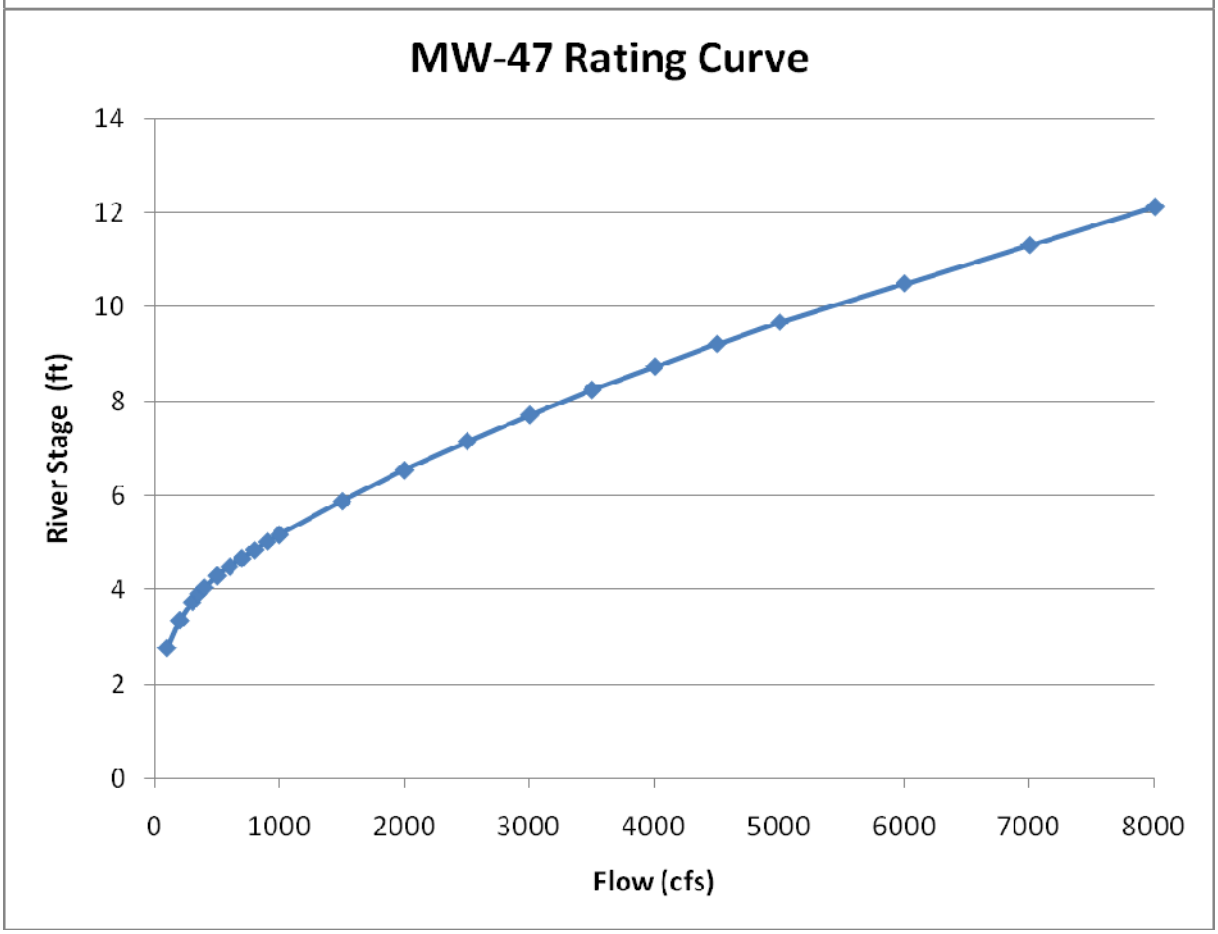
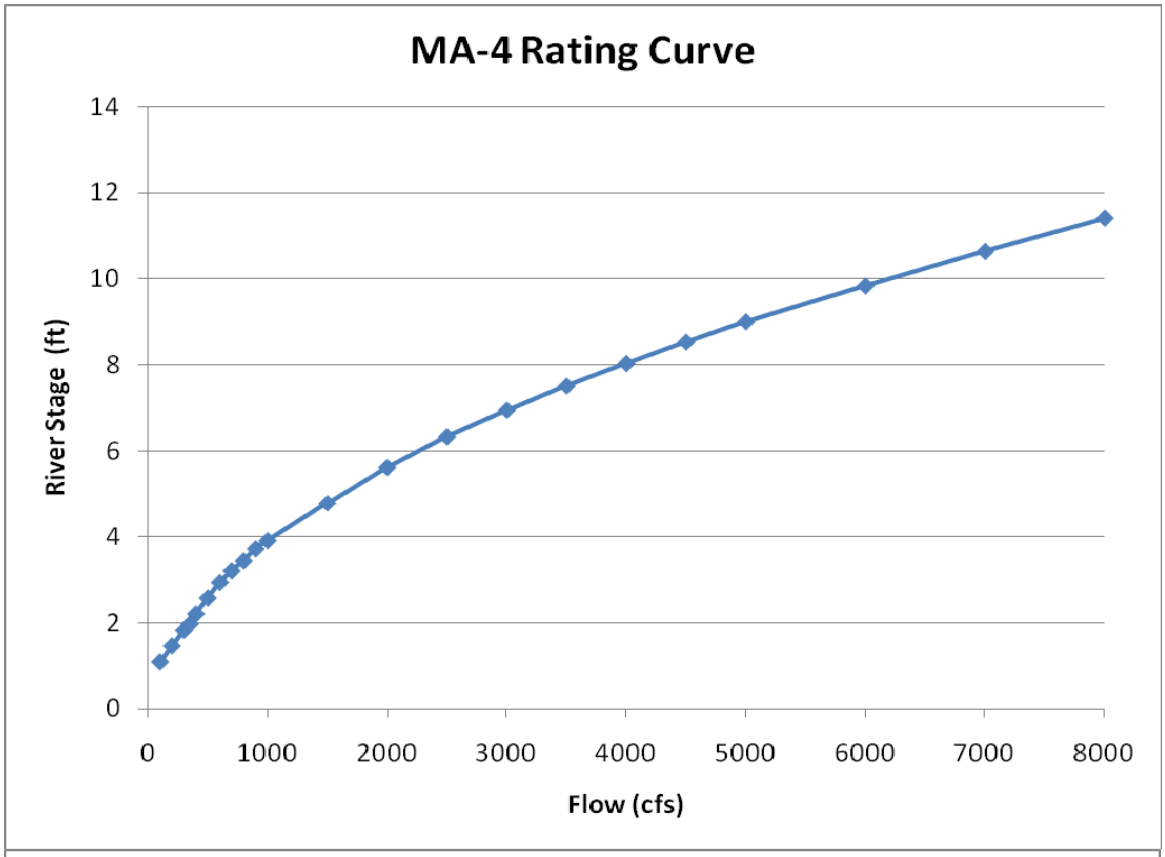
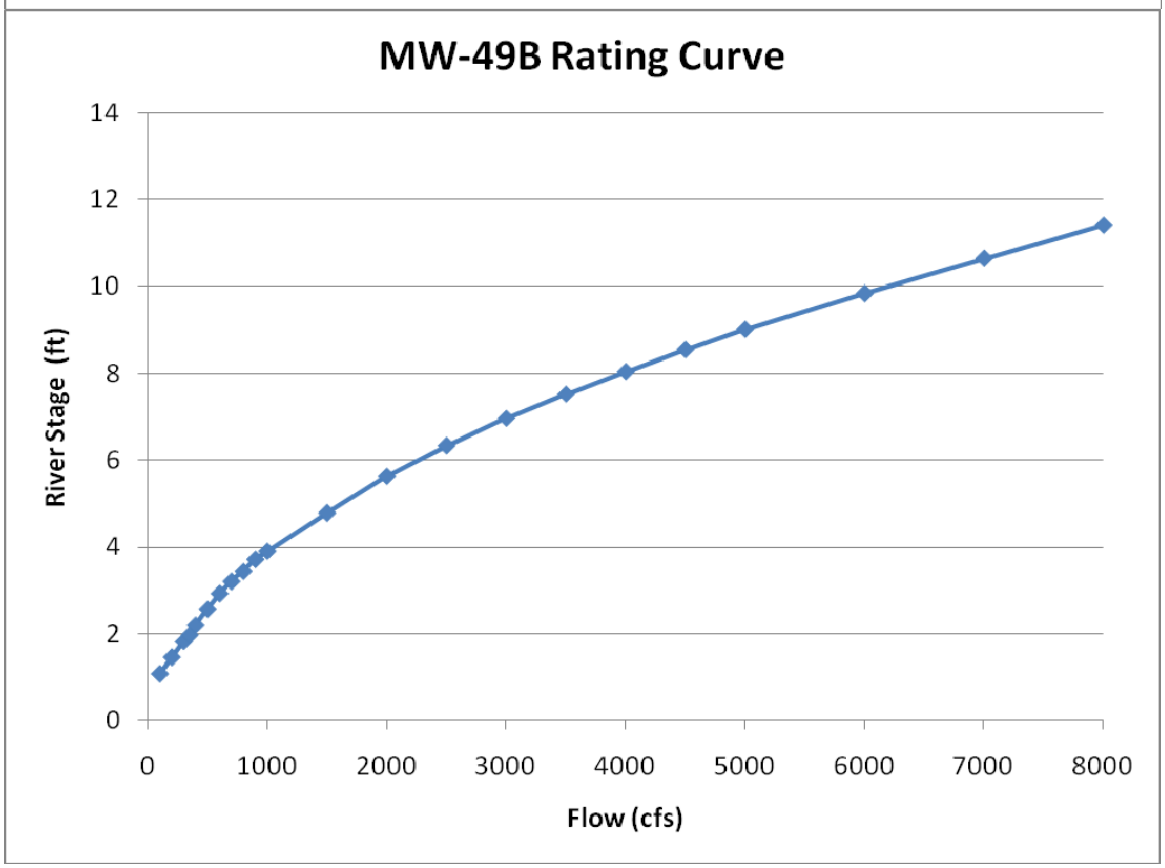


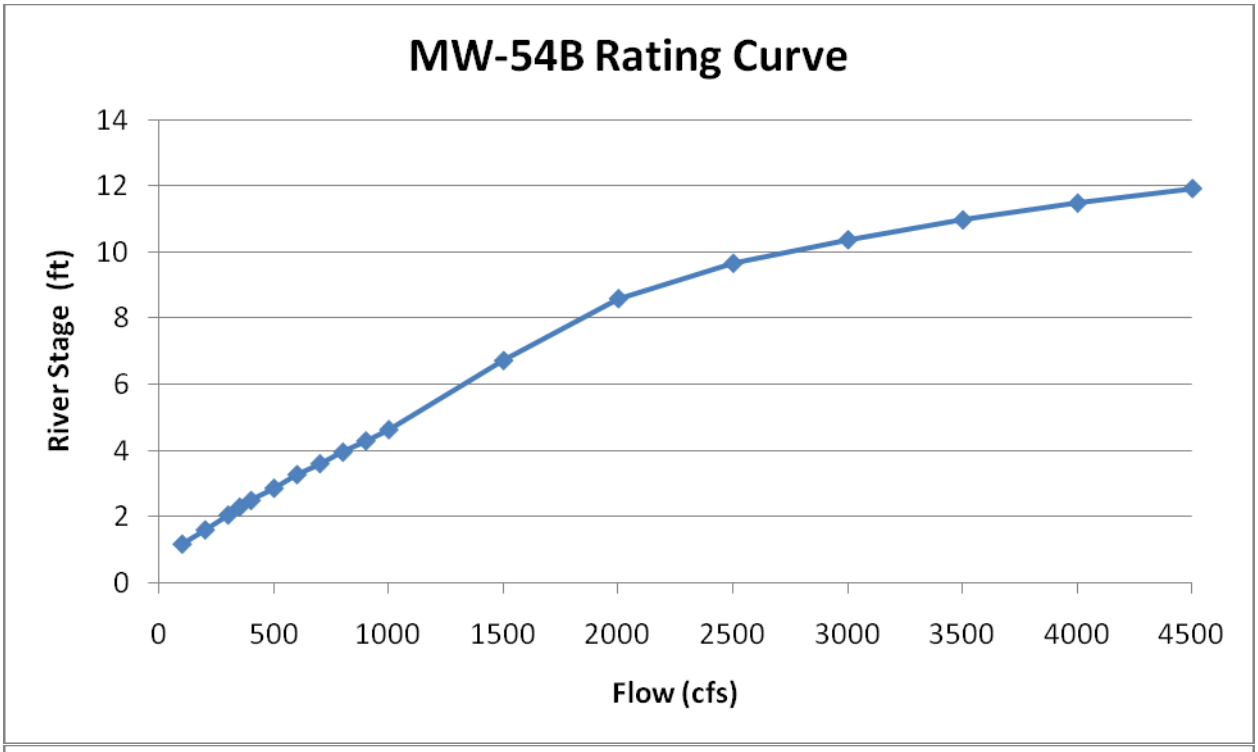
Figure 1: Conceptual Model for Flow Bench Evaluations Estimated Groundwater Depths

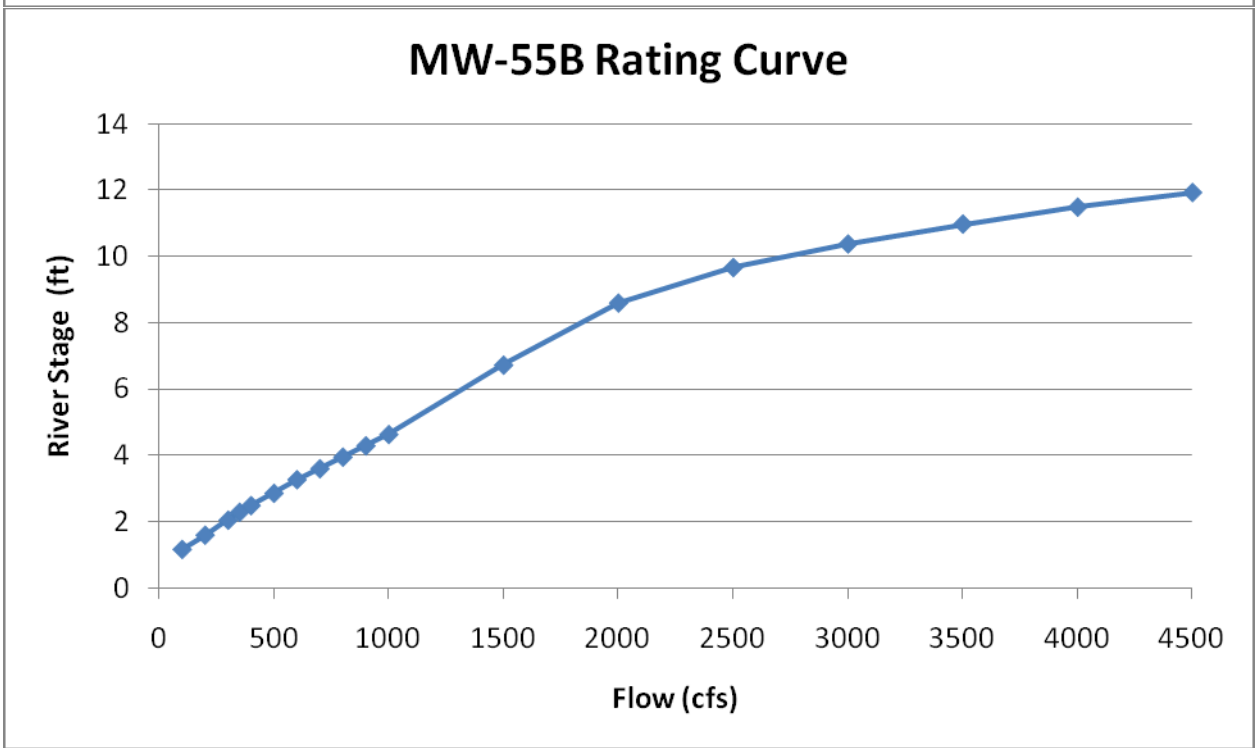

FA-9 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

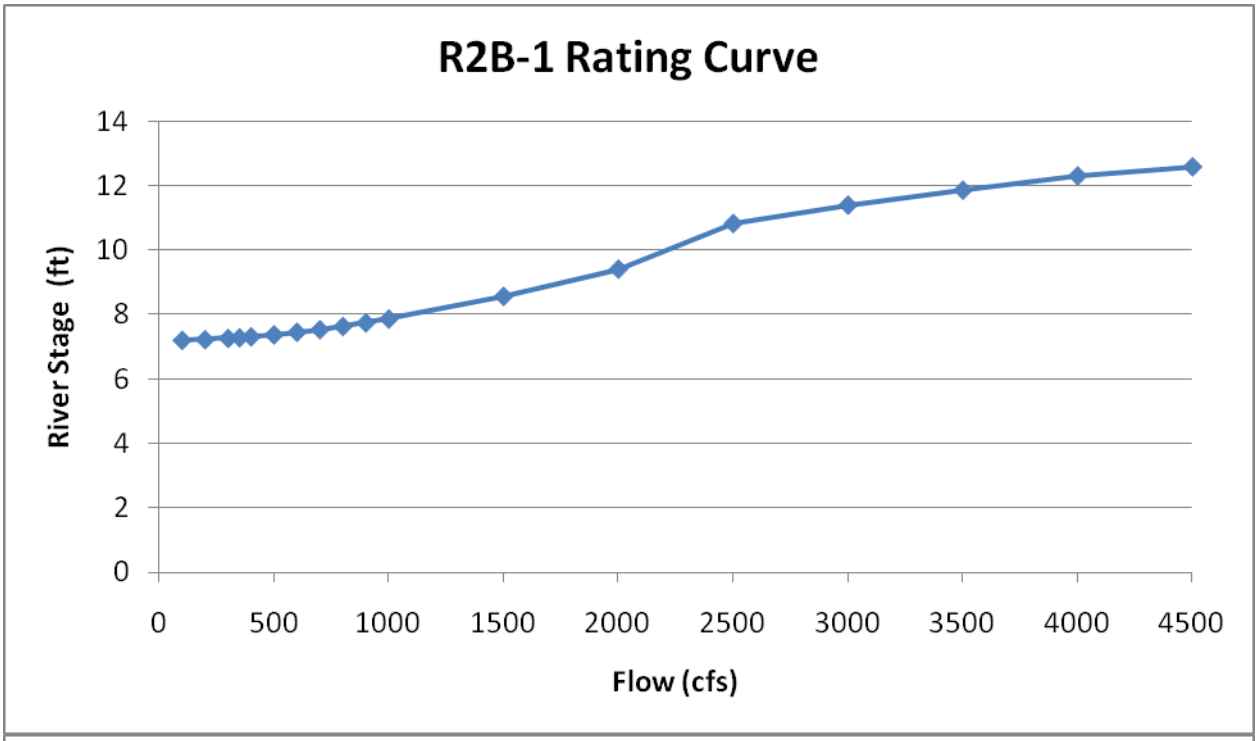

MW-47 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

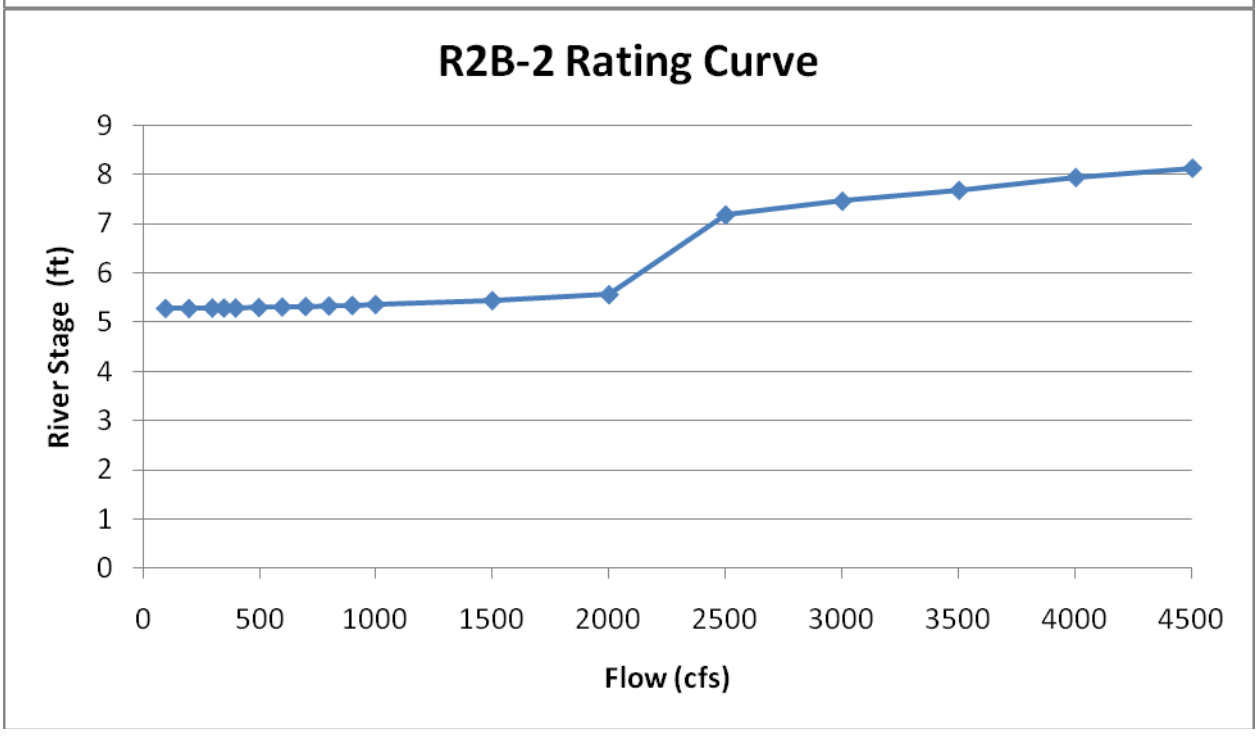

MA-4 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

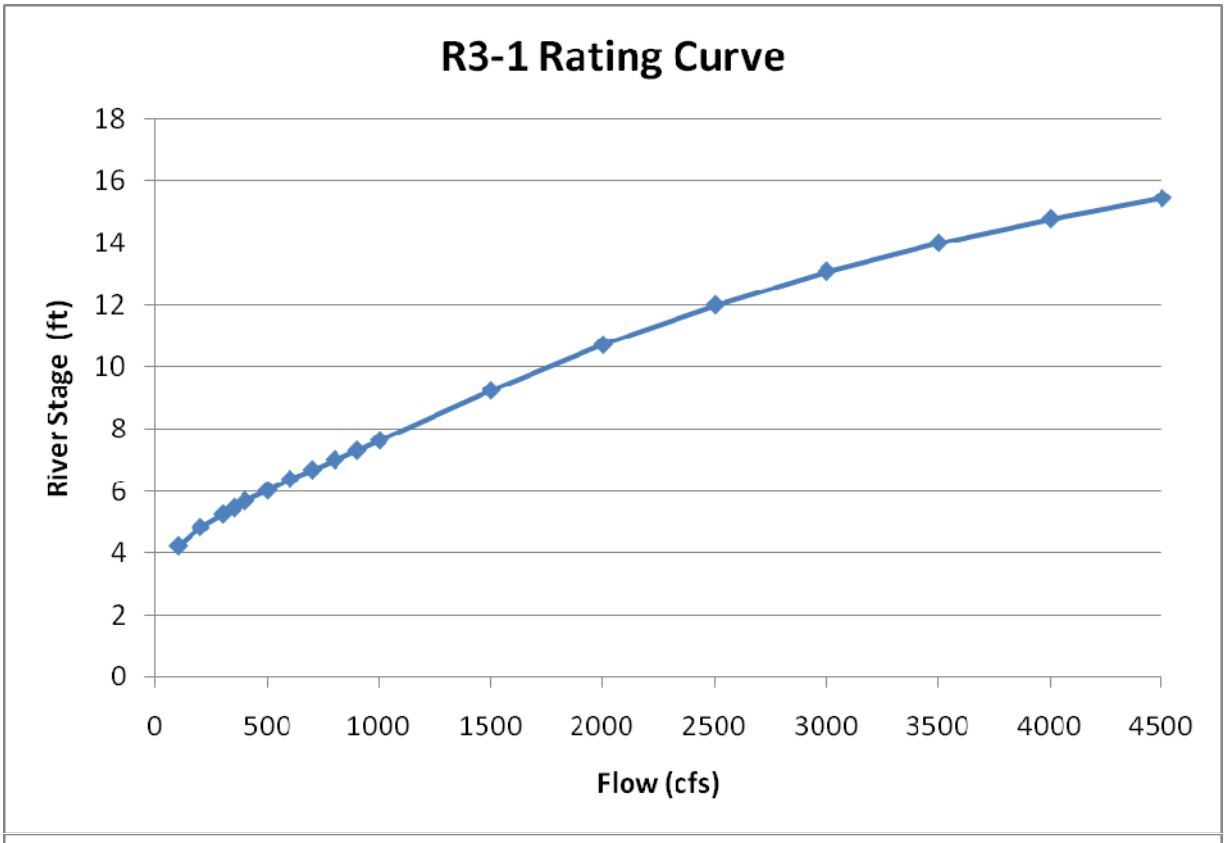

MW-49B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

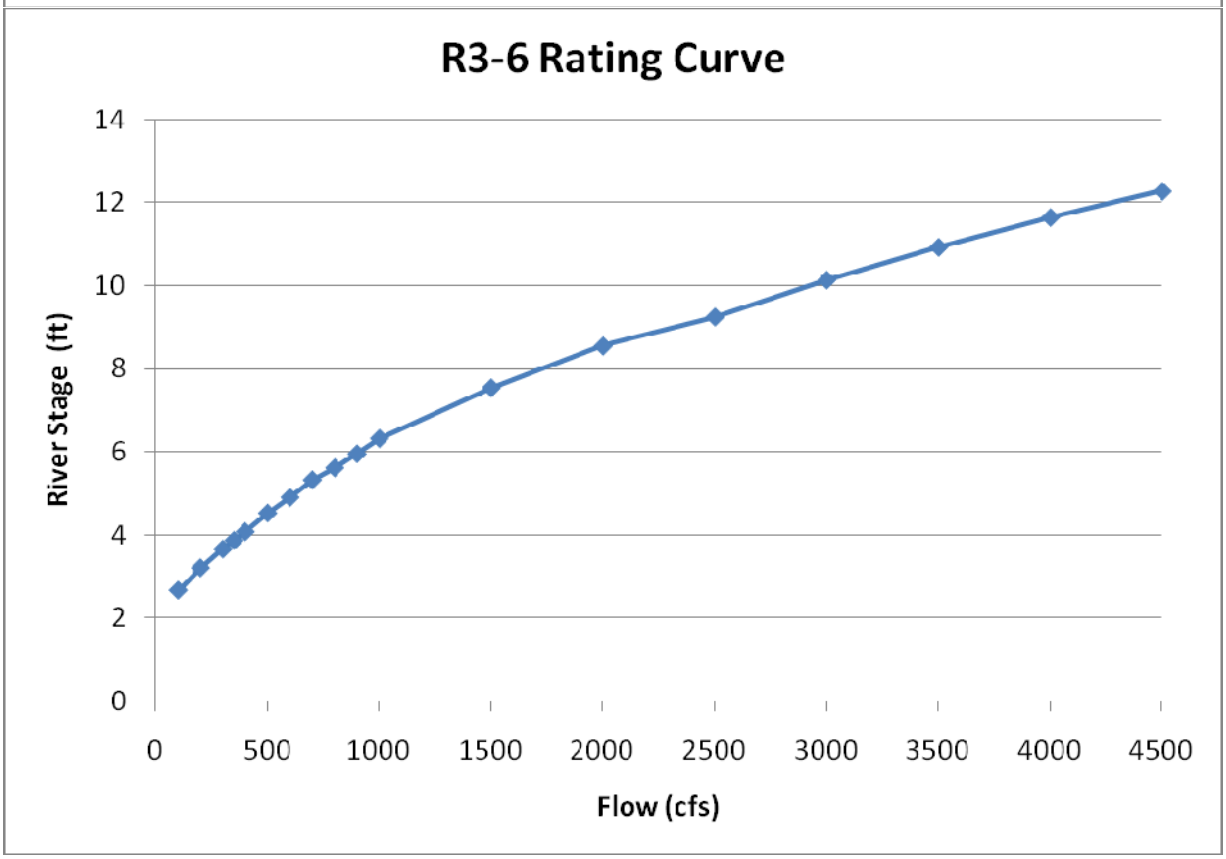

MW-54B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

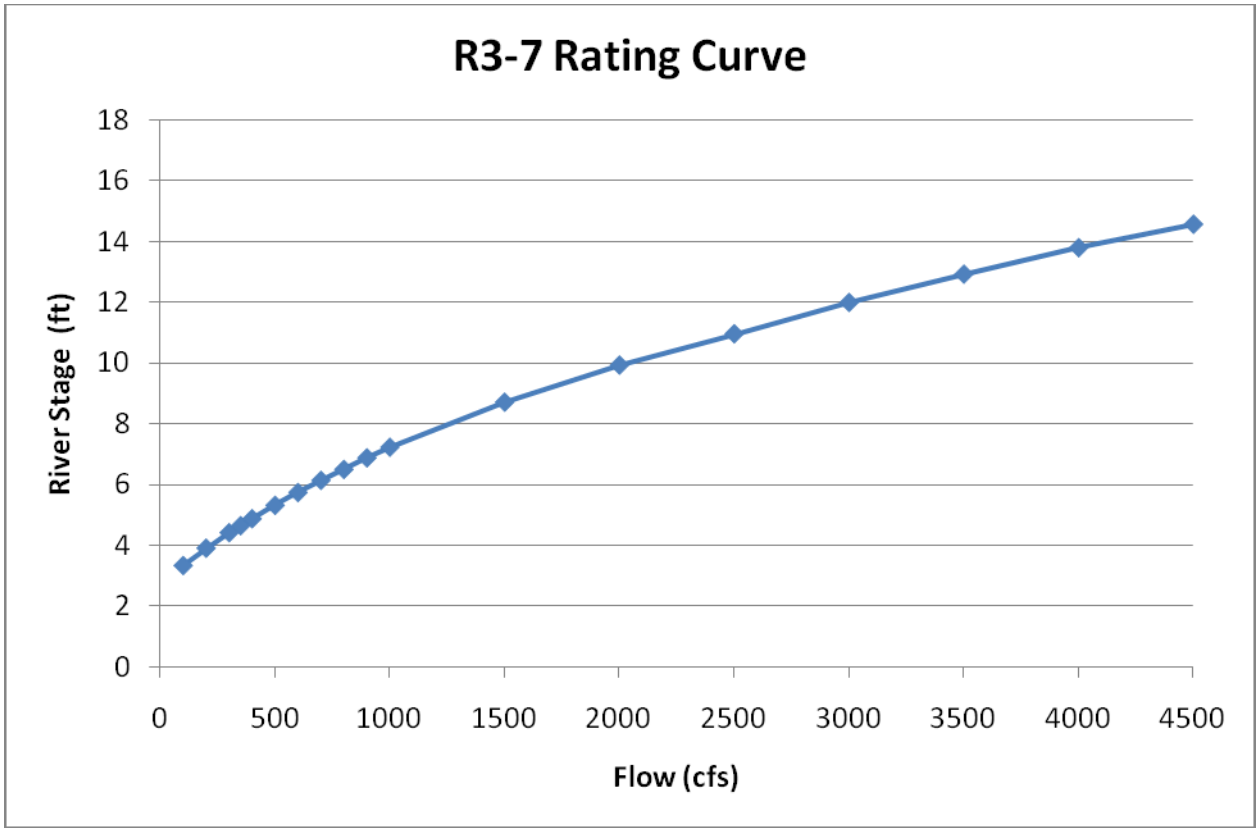

MW-55B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

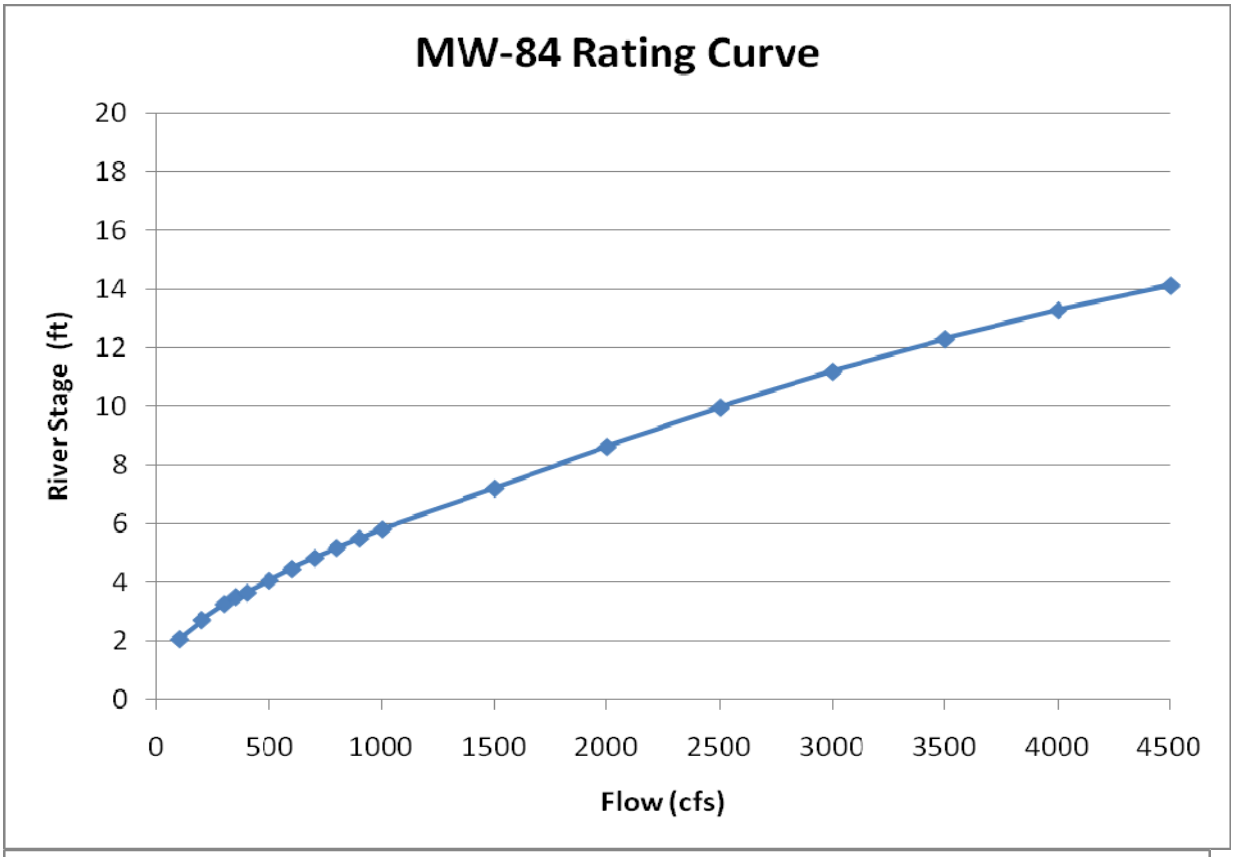

R2B-1 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

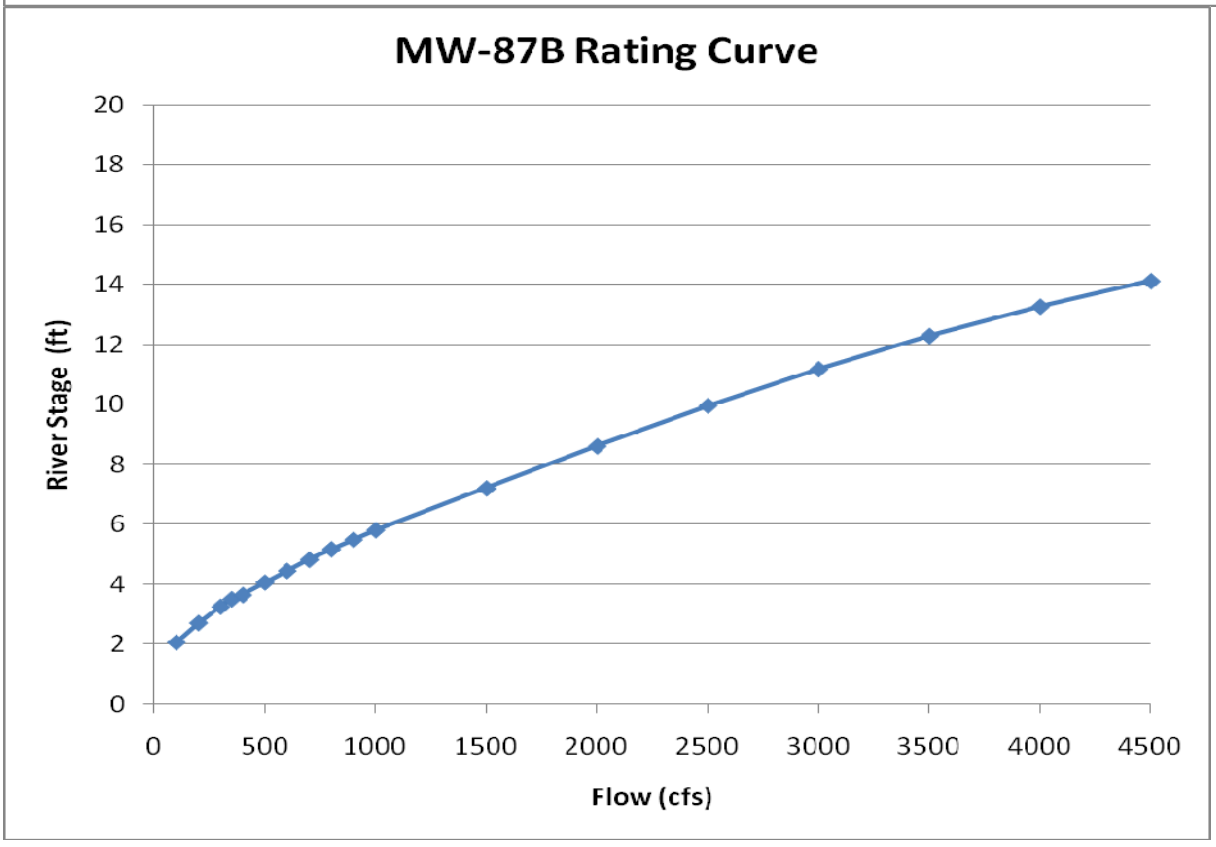

R2B-2 Rating Curve
River Stage (ft)
0
1
2
3
4
5
6
7
8
9
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-1 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-6 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


R3-7 Rating Curve
River Stage (ft)
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


MW-84 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
20
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


MW-87B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
16
18
20
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)