SJRRP Flow Bench Evaluation

March 25, 2010

The planned flow increase to 1100 cfs at Friant Dam, scheduled for March 25, 2010, will be delayed and reevaluated on Monday, March 29th. 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 March 24, 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 did not identify problems with increasing to the next bench.

3. The seepage hotline received three calls. All evaluations determined the planned releases could proceed.

4. Real-time provisional groundwater data does not show that groundwater depths have crossed identified thresholds. Water table elevations in R3-1 are fluctuating. Water table elevations in MW-54 are continuing to increase.

5. Manually monitored groundwater wells do not show unaddressed groundwater depths crossing identified thresholds. R2B-1 and MW-49B are within the buffer zones and have undergone site evaluations. MW-55B will undergo site evaluation as part of the bench increase.

6. Measured losses in Reach 2A from operations estimates show approximately 150 to 160 cfs, and appear to be stabilizing. Changes in flows below sack dam appear to be slowing, but have not yet stabilized.

7. Projected groundwater levels from the upcoming increase in flow are below thresholds except for wells R2B-1, MW-49B, MW-55B, and MW-47. 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 requested flow adjustments to occur during the work week when staffing is available.

9. The CCID was notified of potential increases in flows and identified concerns with developing operating experience at Mendota Dam since Sack Dam flows have not peaked and stabilized from the previous flow bench; concerns with changes in CCID monitoring well elevations that have not peaked or stabilized and may well be within the flow trigger reduction range the elevations peak from the previous bench; and concerns with the proximity to thresholds in Reach 2B wells.

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 predicted to come within about 0.1 foot 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 at least an additional 3 days to stabilize. At that time, the monitoring network should have registered any transient effects and uncertainty will include only prediction error.

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 Monday 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	675	975	300
Reach 2B	555	855	300
Reach 3 and 4A	855	1155	300

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 TetraTech hydraulic model of existing conditions (MEI 2002).

Table 2 Predicted Increases in Groundwater Levels for Key Wells

Well_ID	Site	Buffer Zone (ft bgs)	Screen Depth (ft bgs)	Current Depth March 14th (ft bgs)	Predicted Stage Increase (ft)	Anticipated Depth (ft)
FA-9	Reach 2A – Transect 12 – Left	4-6	12-32	8.76	0.515	8.2
MW-47	Reach 2A – Transect 12 – Right	**6-8**	**20-40**	**8.15**	**0.515**	**7.6**
MA-4	Reach 2A – Transect 13 – Right	6-8	15-25	11.47	0.72	10.75
MW-49B	Reach 2A – Transect 13 – Left	**4-6**	**10-20**	**5.30**	**0.72**	**4.6**
MW-54B	Reach 2B – San Mateo Ave. – Right	TBD	TBD	15.64	1.035	14.6
MW-55B	Reach 2B – San Mateo Ave. – Left	**6-8**	**10-15**	**7.1**	**1.035**	**6.1**
R2B-1	Reach 2B – Right	**4-6**	**8-11**	**5.40**	**0.4635**	**4.9**
R2B-2	Reach 2B – Right	4-6	17-20	12.36	0.4635	11.9
R3-1	Reach 3 – Right	4-6	9-24	9.35	0.9641	8.4
R3-6	Reach 3 – Right	4-6	17-20	8.82	0.9012	7.9
R3-7	Reach 3 – Right	3-5	17-20	7.33	0.9798	6.4
MW-84	Reach 4A – Highway 152 – Right	4-6	32-52	34.82	0.8949	33.9
MW-87B	Reach 4A – Highway 152 - Left	4-6	TBD	>14 (dry)	0.8949	13.1 to dry

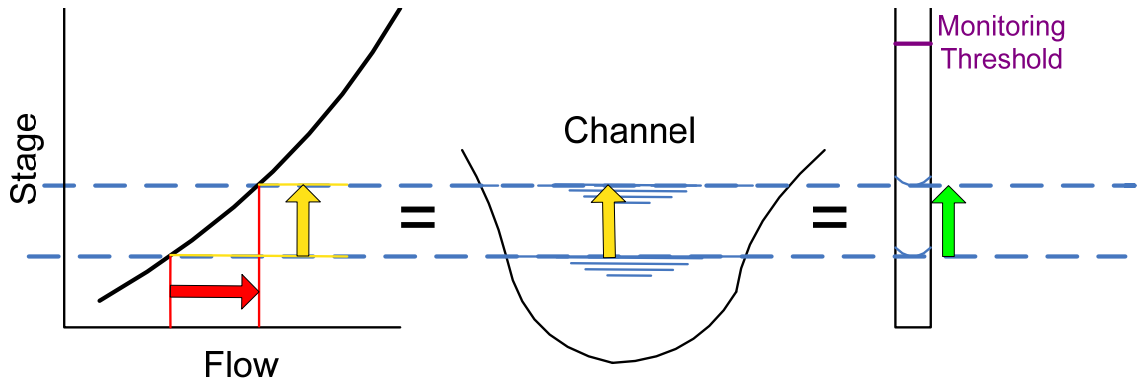
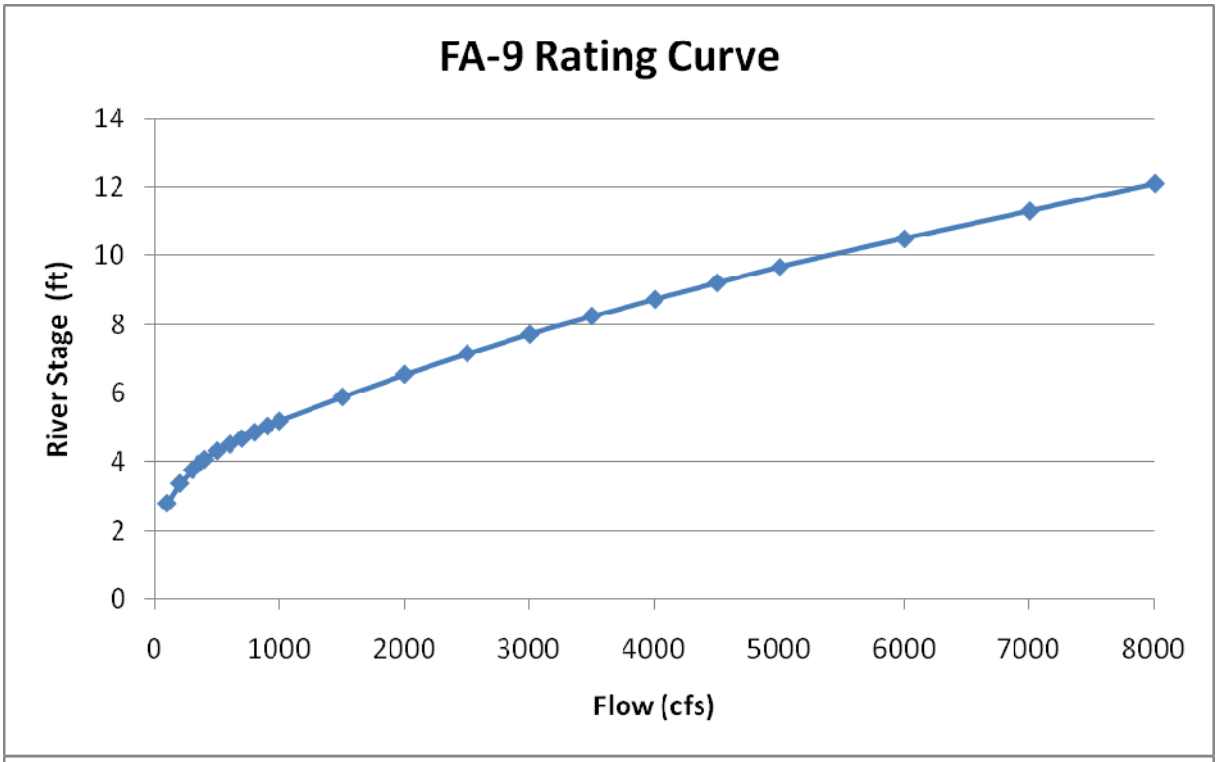
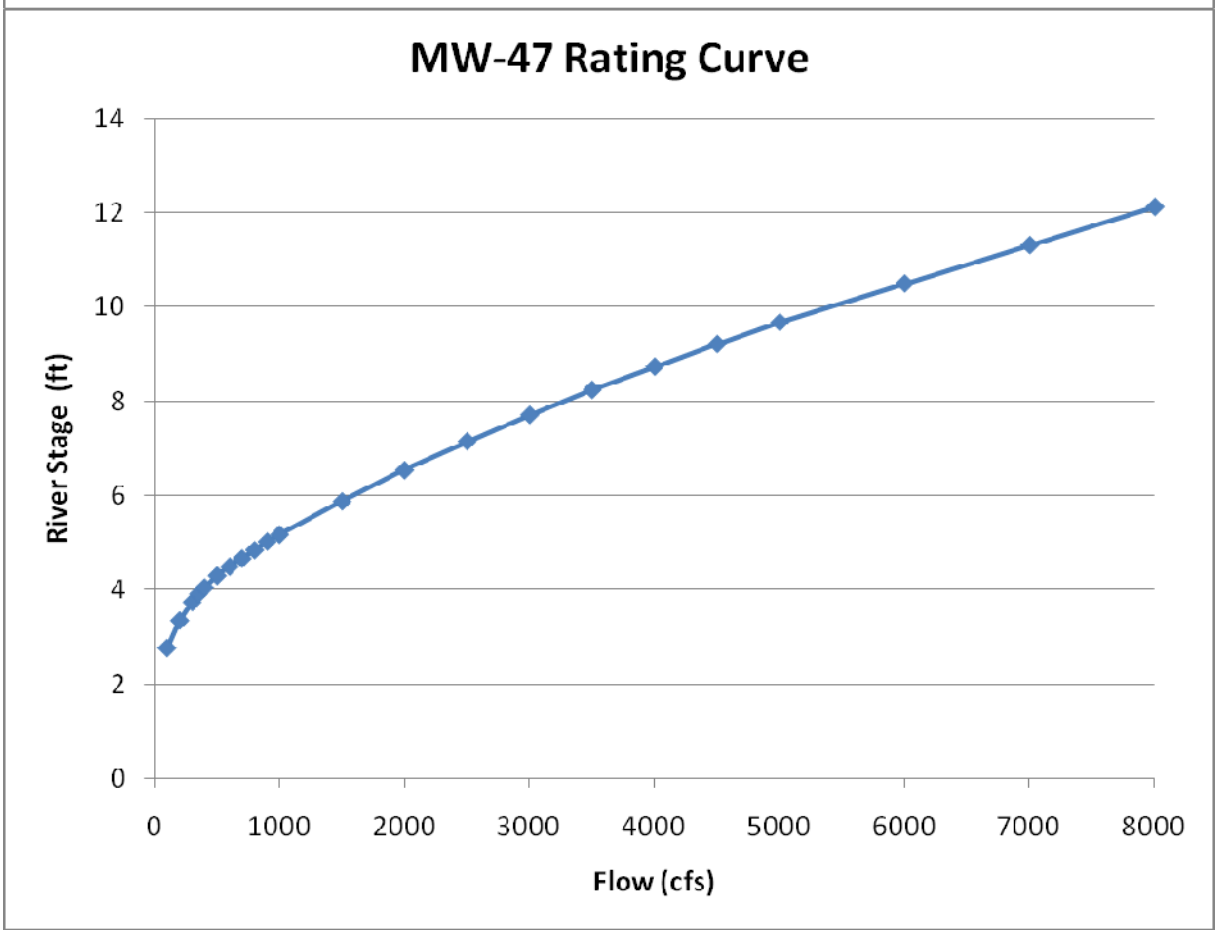
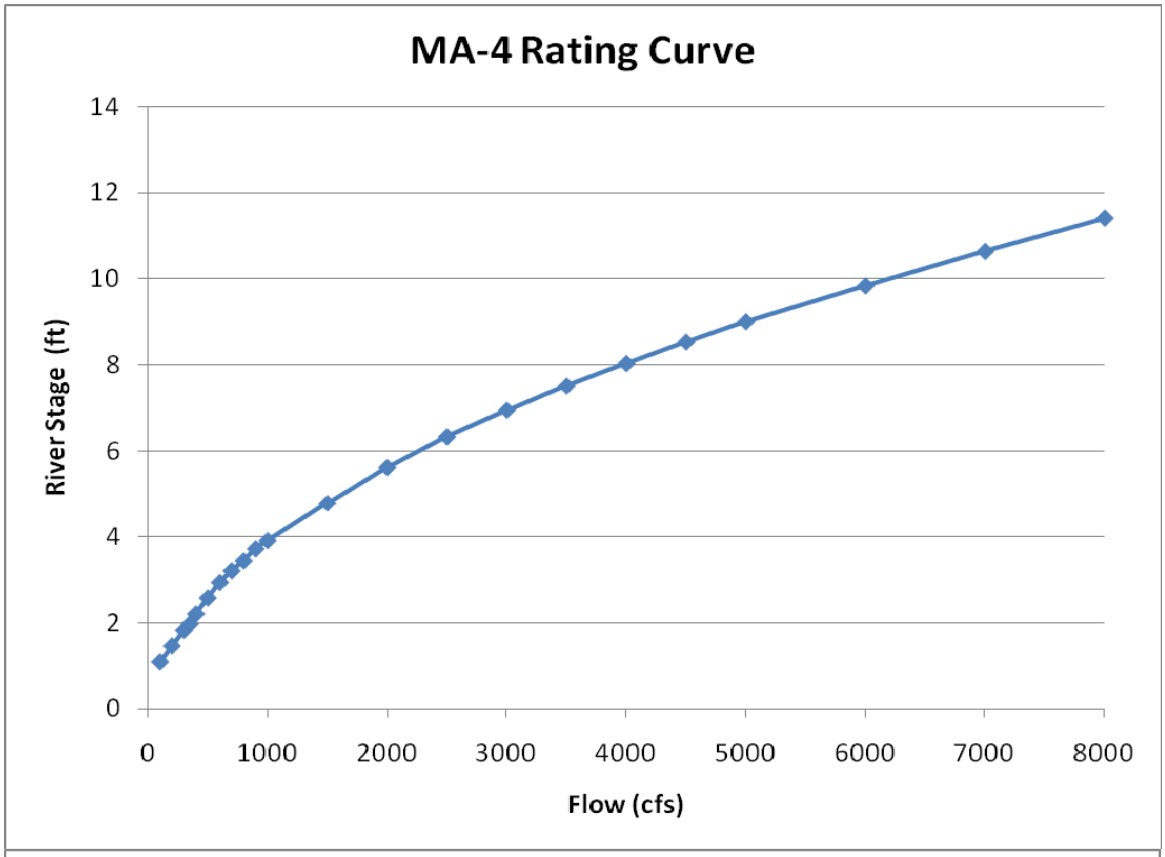
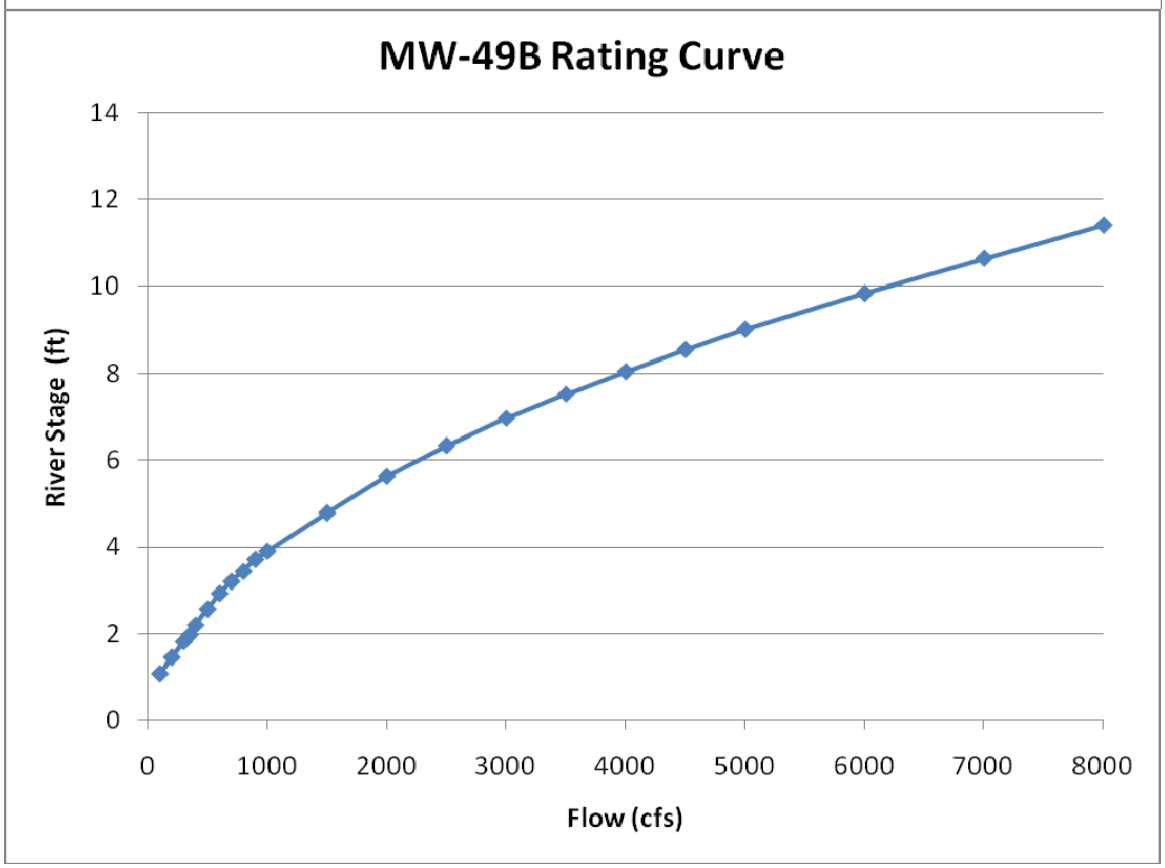


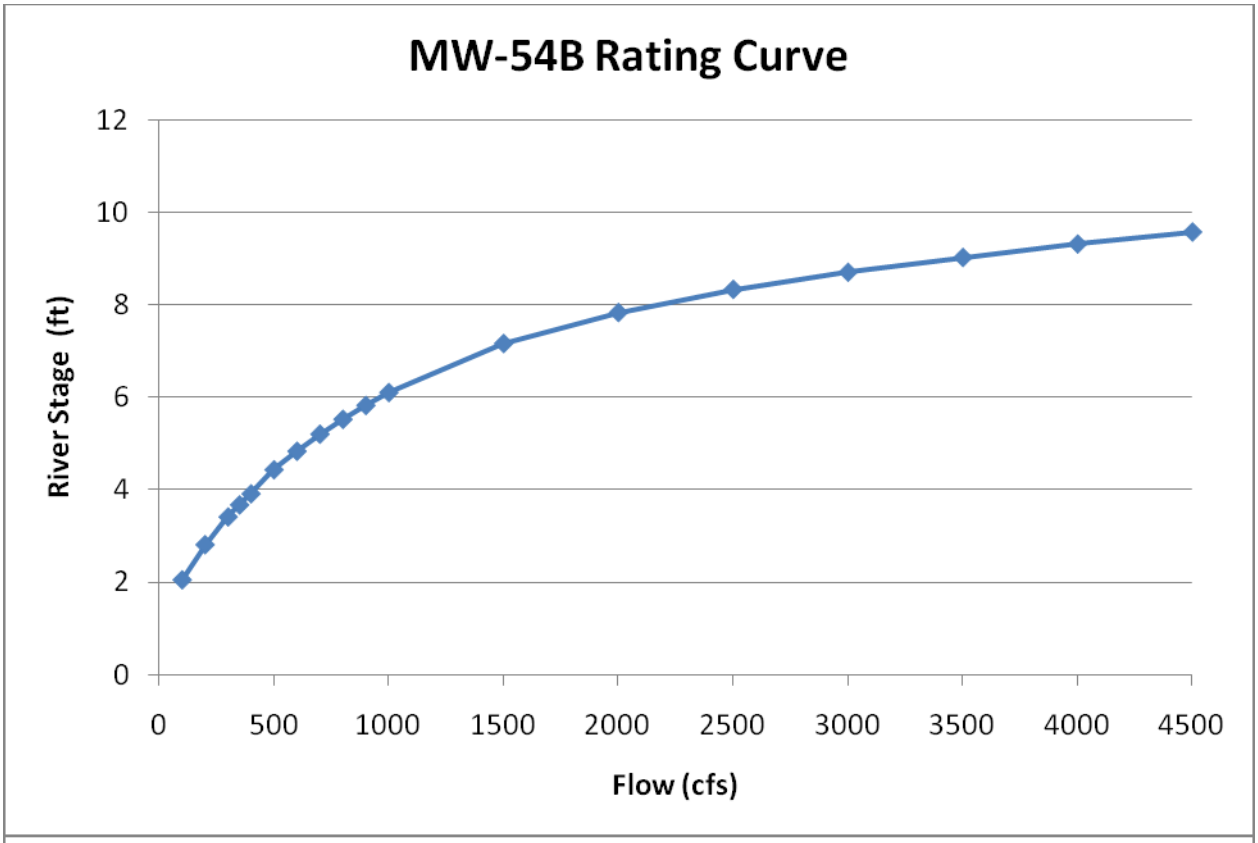
Figure 1 Conceptual Model for Flow Bench Evaluations Estimated Groundwater Depths

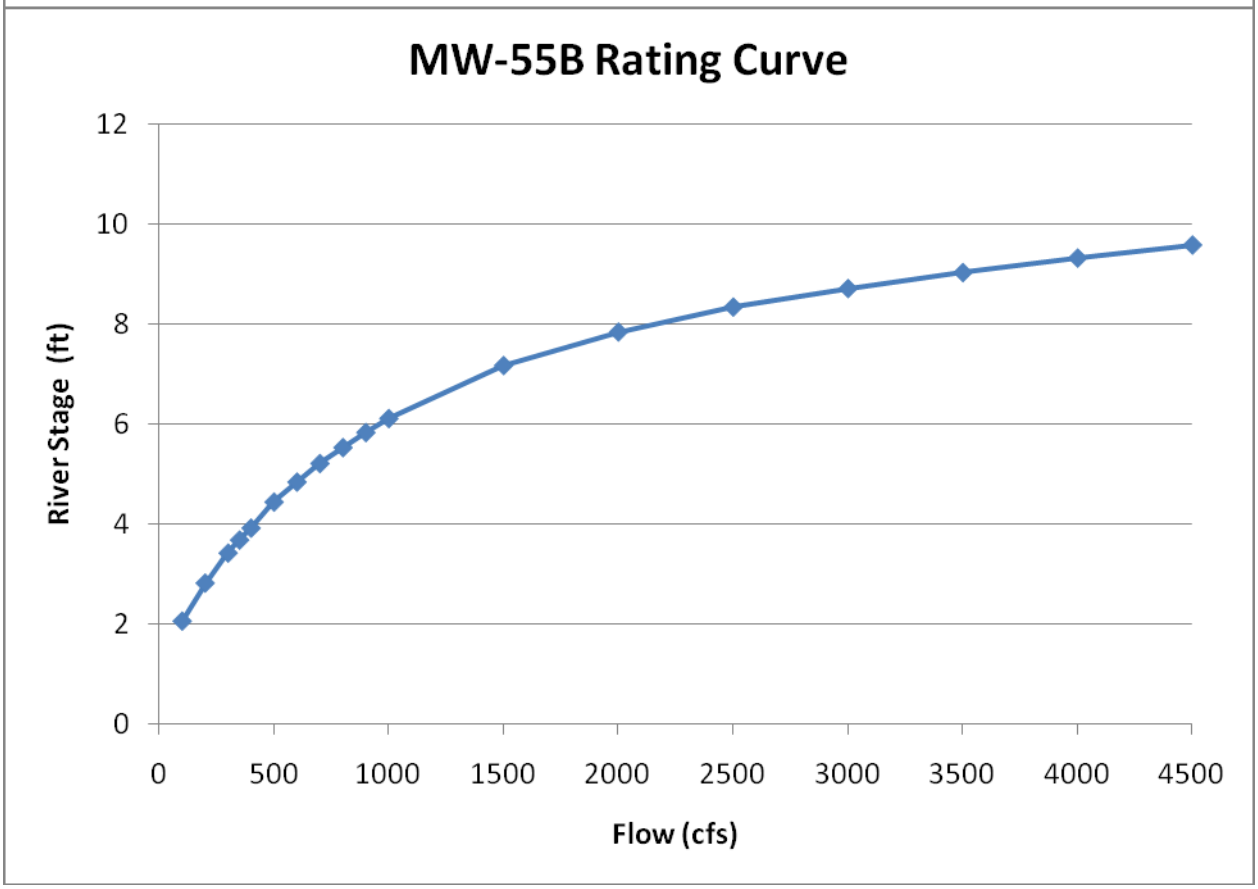

FA-9 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

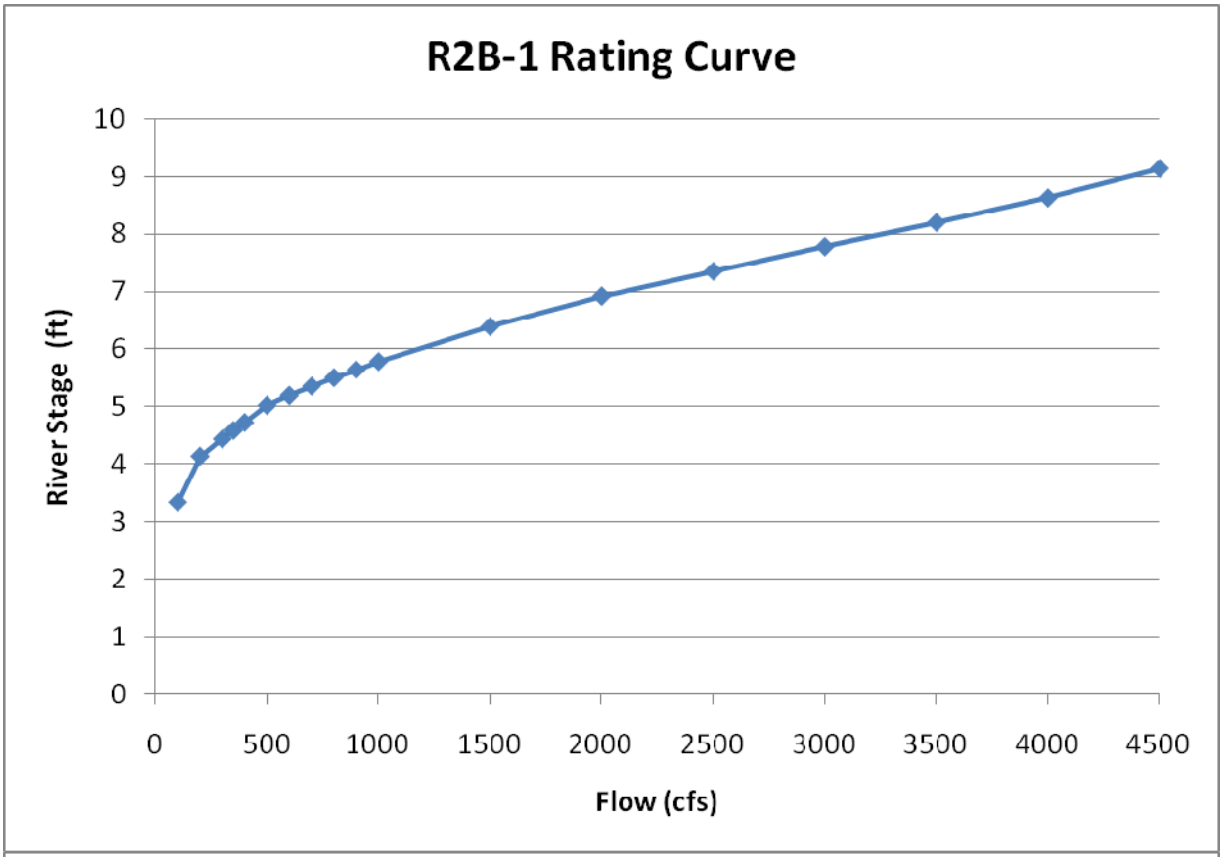

MW-47 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

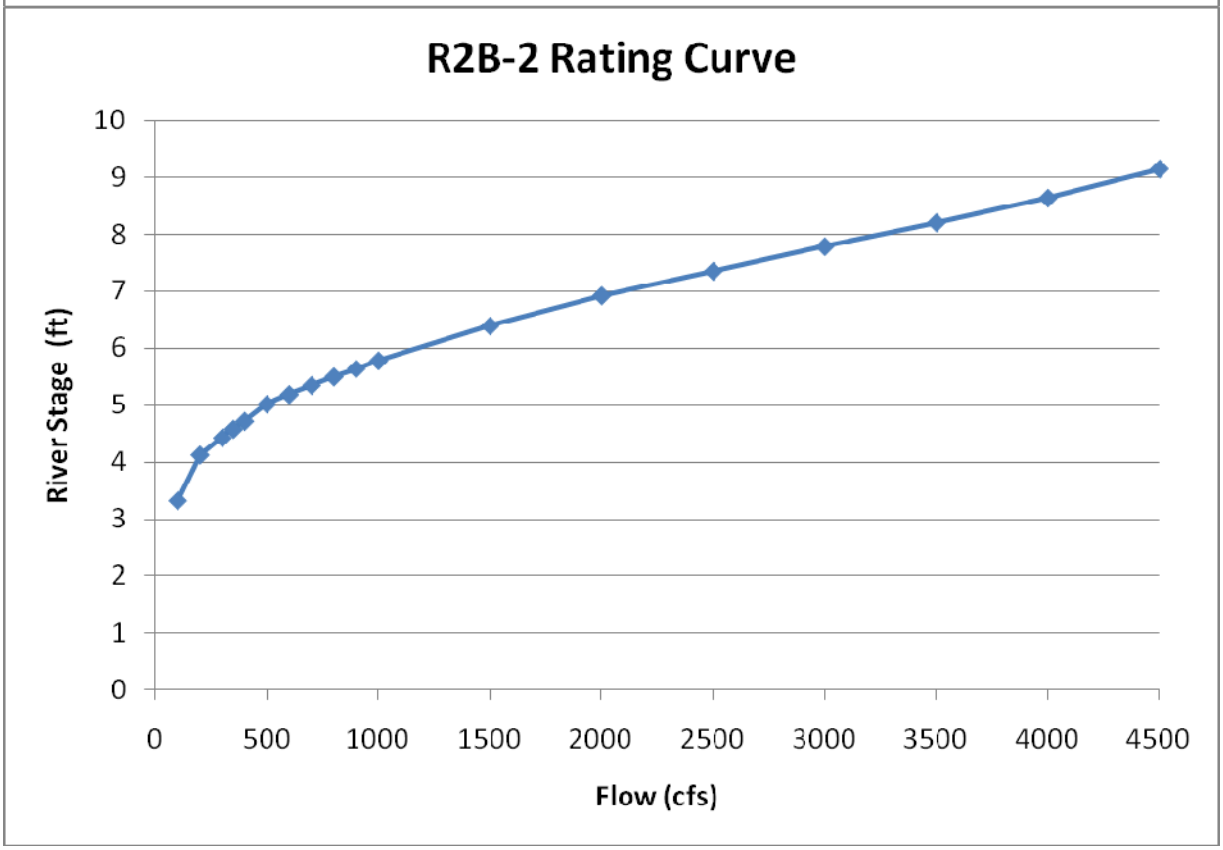

MA-4 Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

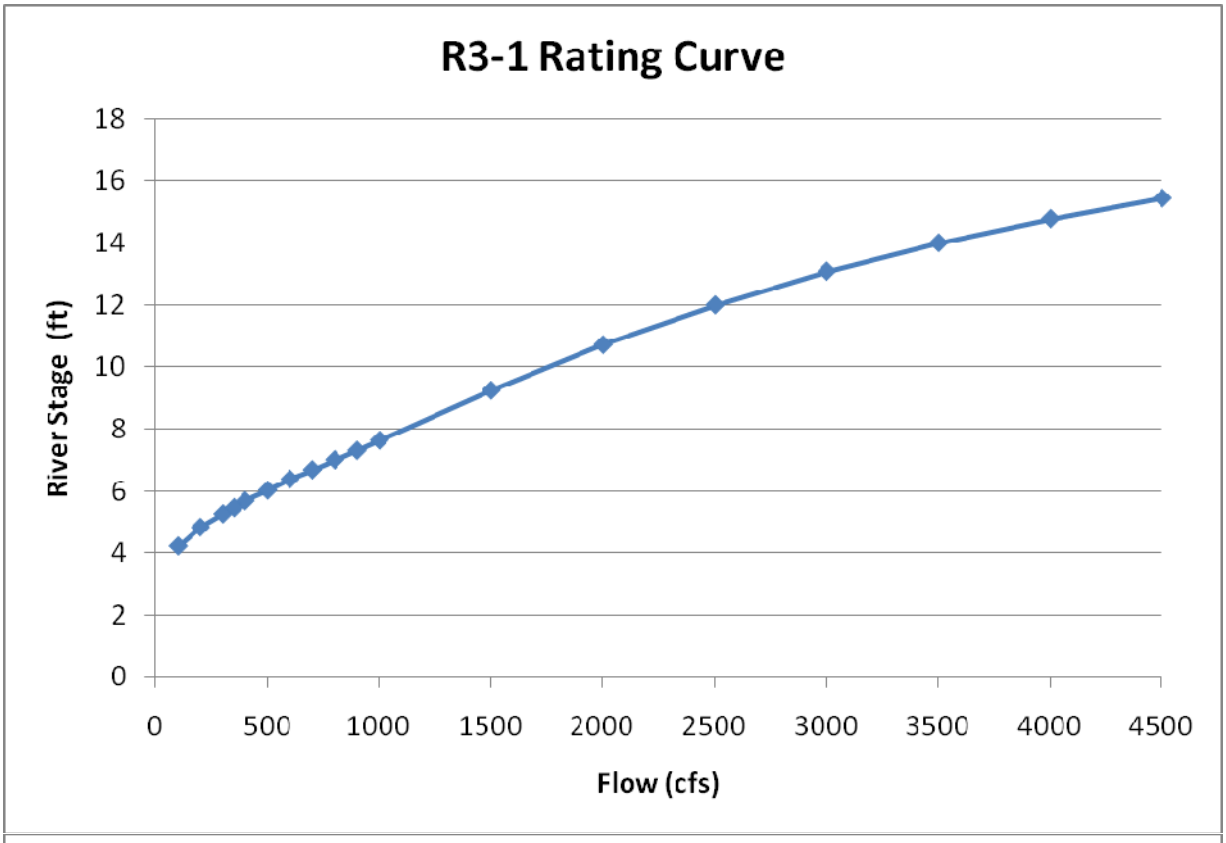

MW-49B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
14
0
1000
2000
3000
4000
5000
6000
7000
8000
Flow (cfs)

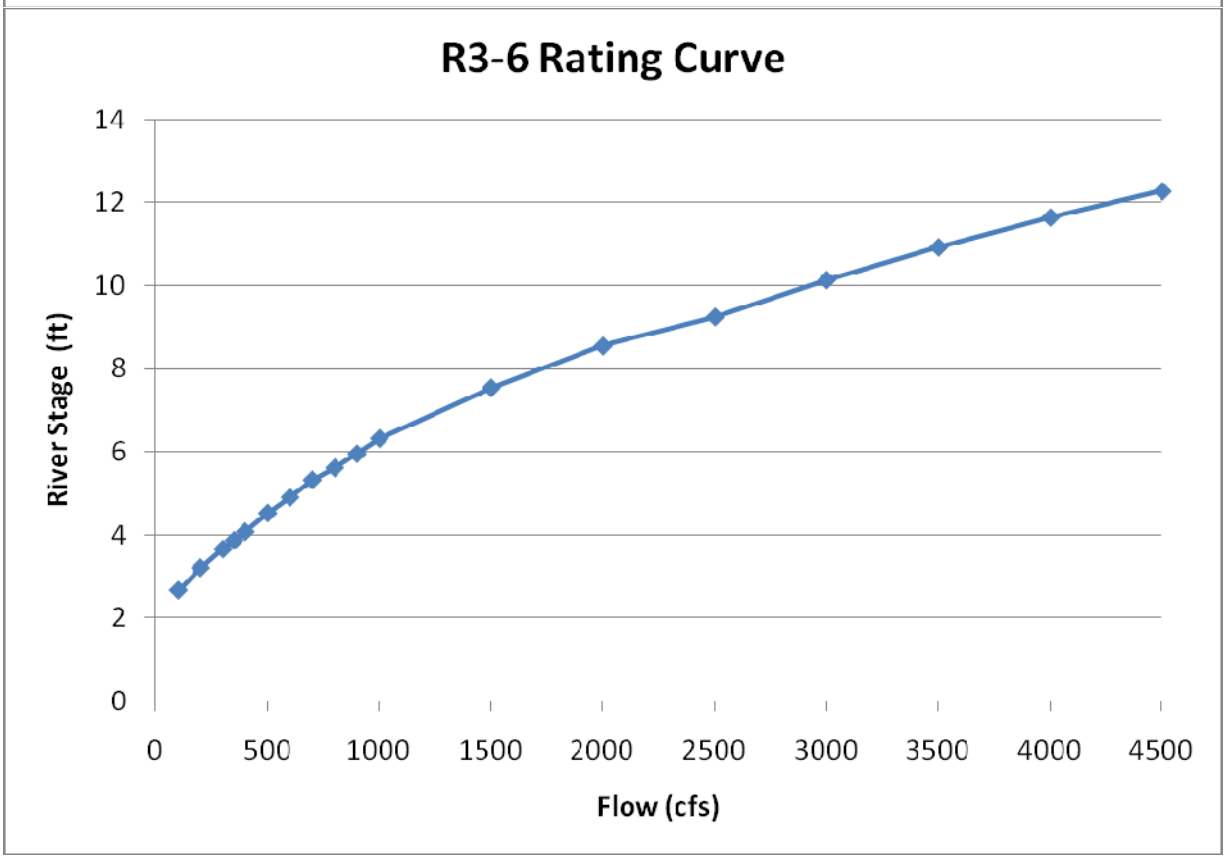

MW-54B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

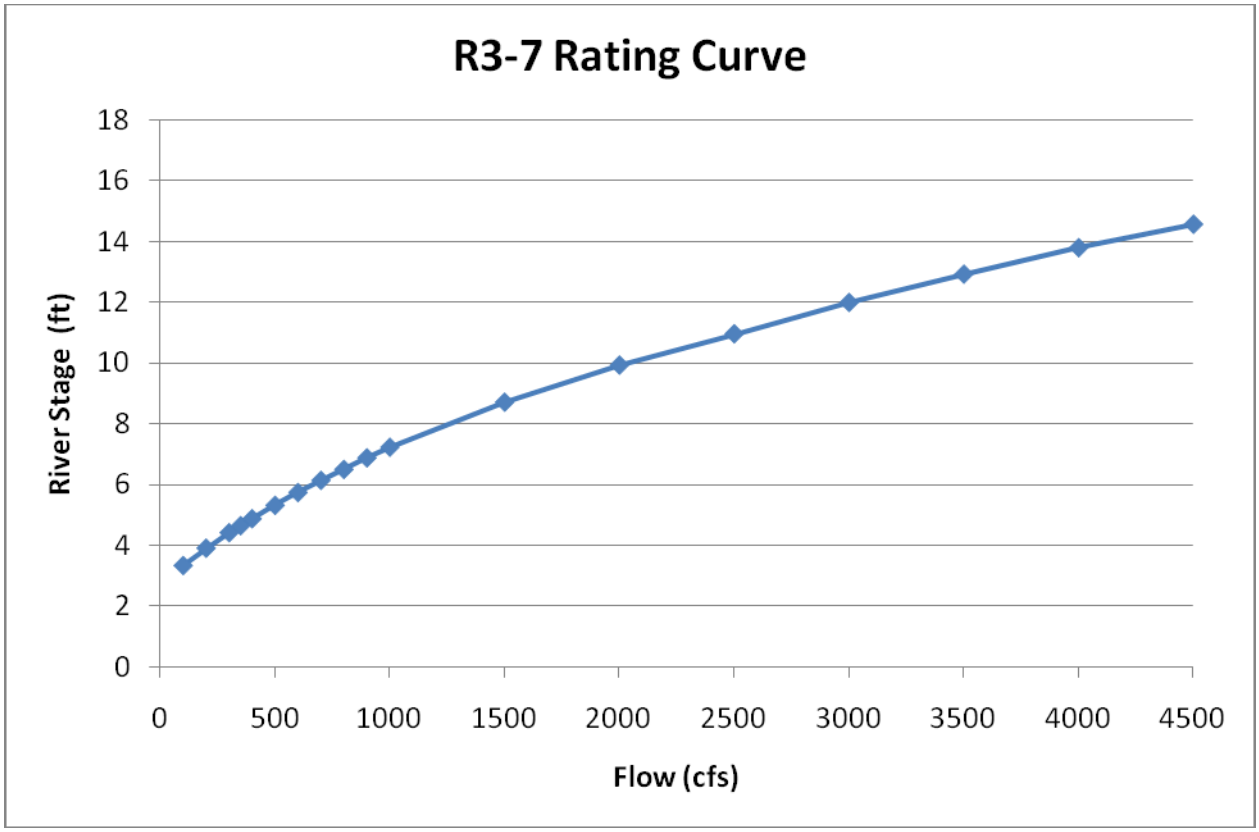

MW-55B Rating Curve
River Stage (ft)
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

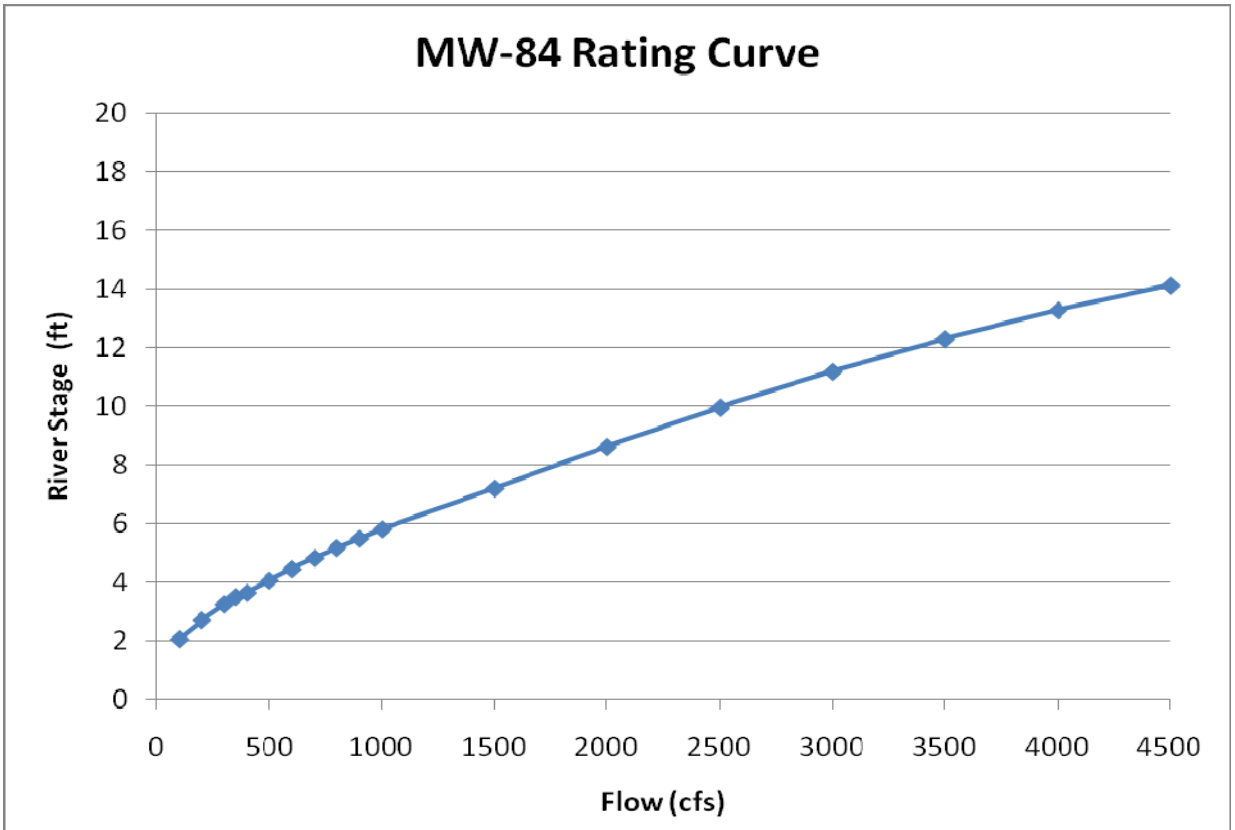

R2B-1 Rating Curve
River Stage (ft)
0
1
2
3
4
5
6
7
8
9
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)

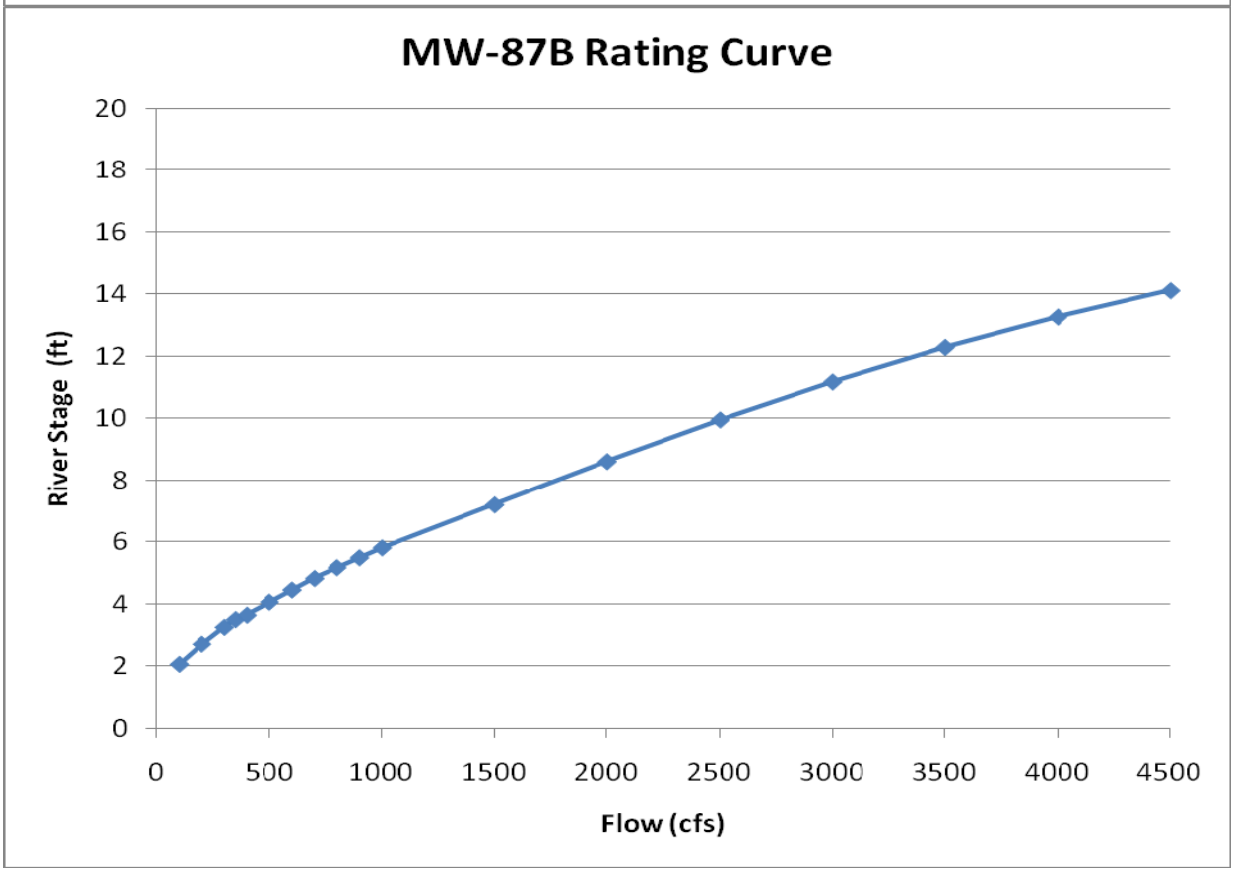

R2B-2 Rating Curve
River Stage (ft)
0
1
2
3
4
5
6
7
8
9
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Flow (cfs)


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)