Santa Ana River Wasteload Allocation Model Update

March 20, 2019

SAWPA

GEOSCIENCE

Status of Predictive Scenarios

Proposed Changes in Assumptions from the 3rd Budget Amendment

Lake Elsinore Spill (Table 1)

Status: Complete

- No lake spill assumptions will be included in final runs
- Bookend assumptions for Elsinore Valley Discharges capture possible water quality in Temescal Creek

Agency	Facility / Discharge Point	Current Design Capacity [MGD]	2020 Design Capacity [MGD]	2040 Design Capacity [MGD]	Permit TDS [mg/L]	Permit TIN [mg/L]	Scen A 2020 Max Discharge [MGD]	Scen B 2020 Avg Discharge [MGD]	Scen C 2020 Min Discharge [MGD]	Scen D 2040 Max Discharge [MGD]	Scen E 2040 Avg Discharge [MGD]	Scen F 2040 Min Discharge [MGD]
Elsinore Valley Municipal Water District	Regional WWRF - DP001 (Temescal Wash)	8	12	-	700	10.0	8.0	0.5	0.5	8.0	0.5	0.5

Corona Discharge TDS Concentrations (Table 1)

Status: Complete

Agency	Facility / Discharge Point	Current Design Capacity [MGD]	2020 Design Capacity [MGD]	2040 Design Capacity [MGD]	Permit TDS [mg/L]	Permit TIN [mg/L]	Scen A 2020 Max Discharge [MGD]	Scen B 2020 Avg Discharge [MGD]	Scen C 2020 Min Discharge [MGD]	Scen D 2040 Max Discharge [MGD]	Scen E 2040 Avg Discharge [MGD]	Scen F 2040 Min Discharge [MGD]
City of Corona	Corona WWTP-1	11.5	-	15	700[G]	10.0	11.5	4.6	1.5	15.0	8.5	1.5

G. A TDS concentration of 665 mg/L is applied in wetter months (December through April) while a concentration of 725 mg/L is applied in drier months (May through November). The average TDS concentration is 700 mg/L.

Arlington Desalter Discharge (Table 1)

Status: Complete

Agency	Facility / Discharge Point	Current Design Capacity [MGD]	2020 Design Capacity [MGD]	2040 Design Capacity [MGD]	Permit TDS [mg/L]	Permit TIN [mg/L]	Scen A 2020 Max Discharge [MGD]	Scen B 2020 Avg Discharge [MGD]	Scen C 2020 Min Discharge [MGD]	Scen D 2040 Max Discharge [MGD]	Scen E 2040 Avg Discharge [MGD]	Scen F 2040 Min Discharge [MGD]
Western Municipal Water District	Arlington Desalter[N]	6.9	7.25	-	260[D]	4.4[D]	7.25	6.3[O]	0	7.25	6.3[O]	0

D. No discharge projection form (Appendix B) was provided. Discharge assumptions are based on average of last 5 years (WY 2012-2016)

N. No discharge projection form (Appendix B) was provided. Discharge assumptions were developed through conversations with Western. Currently, there are no planned discharges from the Arlington Desalter to the SAR. Discharge is included here based on permitted discharge and possible future operations.

O. Discharge of 6.3 MGD will only be applied from November through April.

Stormwater Capture in Chino Basin

Status: in Progress

- Projected stormwater capture will be provided by IEUA/Chino Basin Watermaster.

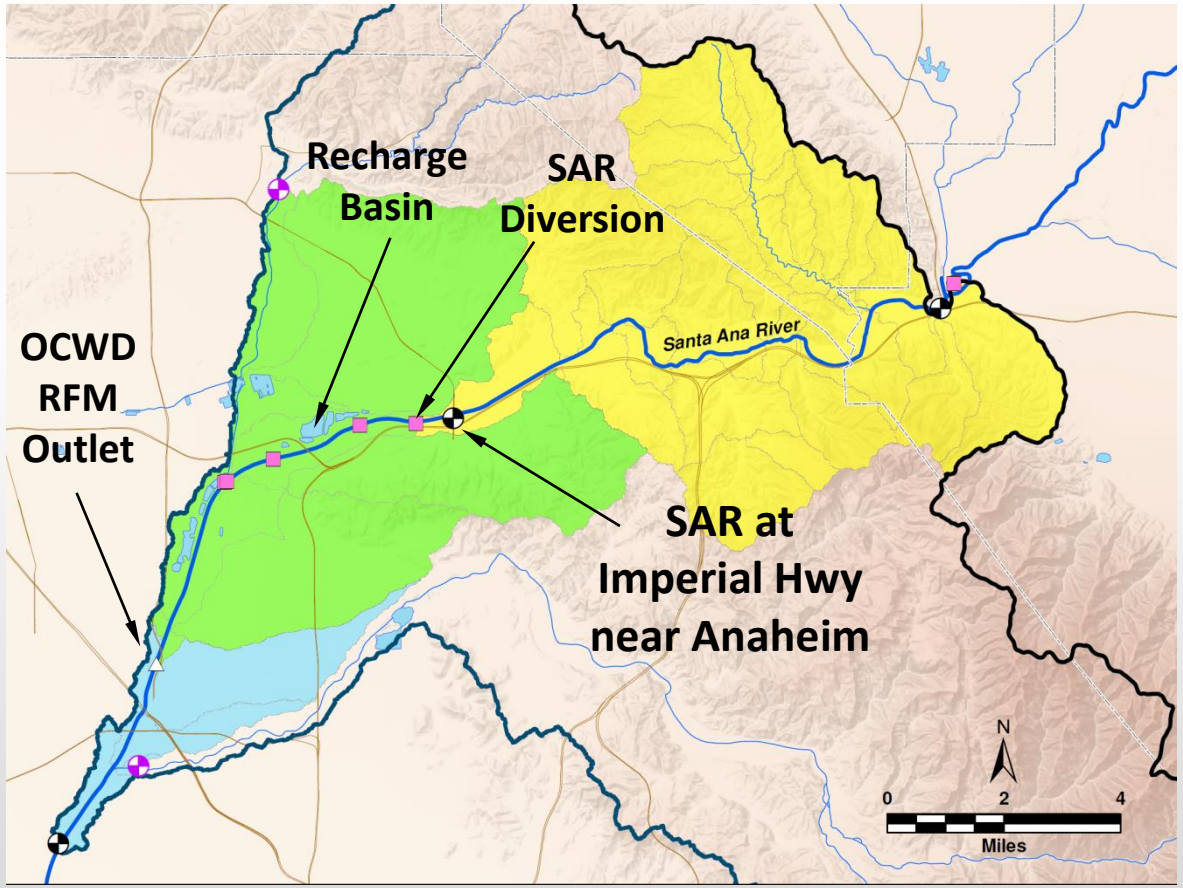
Dry Weather Runoff to Off-Channel Percolation Basins

Status: Complete

- No data available from SBCFCD. A note will be made in the draft final report.

Streambed Percolation in Orange County GMZ

Status: Complete



- Recharge in the Orange County Management Zone will be based on model-calculated streambed percolation from the Imperial Gage to the outlet of the RFM.
- Water quality will reflect that calculated at the Imperial Gage, since the model was calibrated to observed data at this location.

Status of Predictive Scenarios

Changes in Assumptions

Since January 8, 2019 Task Force Meeting

IEUA POTW Discharge

Status: in Progress

- Projected discharge (to be varied monthly) will be provided by IEUA/Chino Basin Watermaster

Agency	Facility / Discharge Point	Current Design Capacity [MGD]	2020 Design Capacity [MGD]	2040 Design Capacity [MGD]	Permit TDS [mg/L]	Permit TIN [mg/L]	Scen A 2020 Max Discharge [MGD]	Scen B 2020 Avg Discharge [MGD]	Scen C 2020 Min Discharge [MGD]	Scen D 2040 Max Discharge [MGD]	Scen E 2040 Avg Discharge [MGD]	Scen F 2040 Min Discharge [MGD]
Inland Empire Utilities Agency	RP 1 – DP 001	44	44	44	550	8.0	44.0	1.4	0.0	44.0	1.4	0.0
	RP 1 –DP 002 and RP 4	14	14	21	550	8.0	14.0	8.1	0.2	21.0	8.1	0.2
	RP 5	15	15	30	550	8.0	15.0	2.5	0.0	30.0	2.5	0.0
	CCWRF	12	12	12	550	8.0	12.0	3.2	0.3	12.0	3.2	0.3

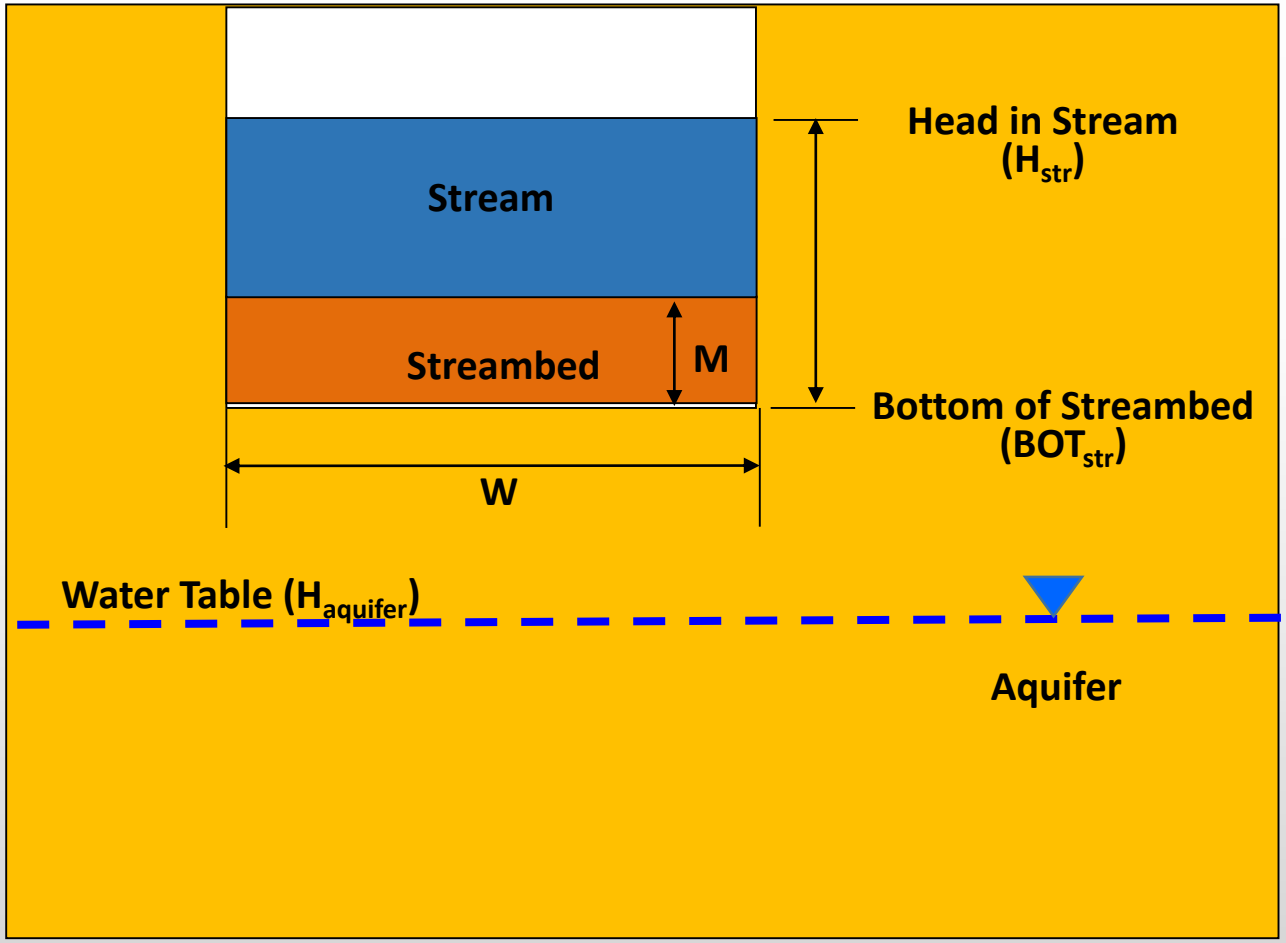
Updated Scenario Assumptions – SNRC

Status: Complete

- Discharge location moved from Reach 7 back to original discharge location Reach 4.

5th Budget Amendment Request

Surface Water and Groundwater Interaction



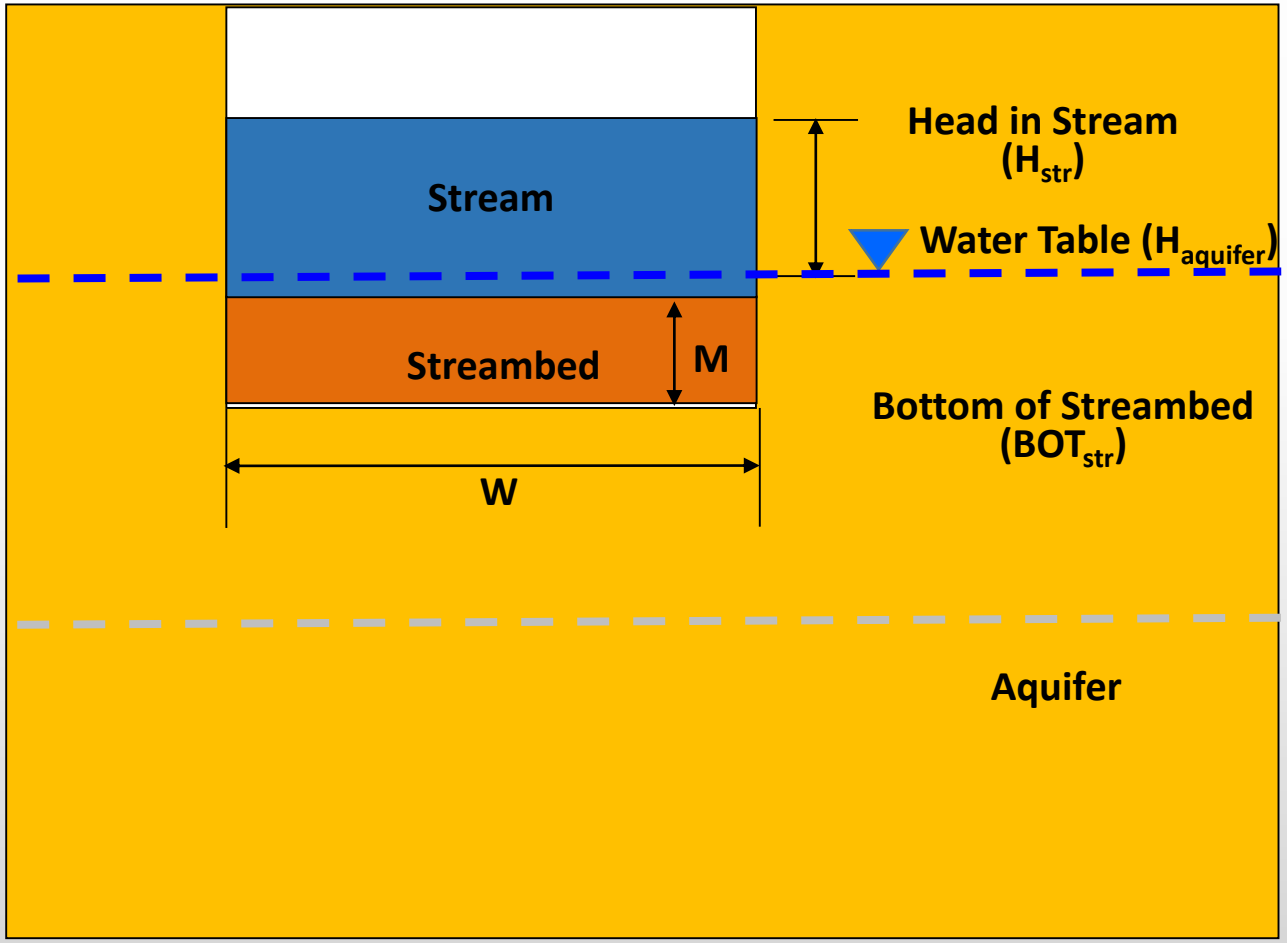
(1)<u>Water Table Below Bottom of Streambed</u>

$BOT_{str} > H_{aquifer}$

Streambed Percolation = Cstr (H_{str} – BOT_{str})

Note: Cstr = Kstr x W x L / M

Surface Water and Groundwater Interaction (cont.)



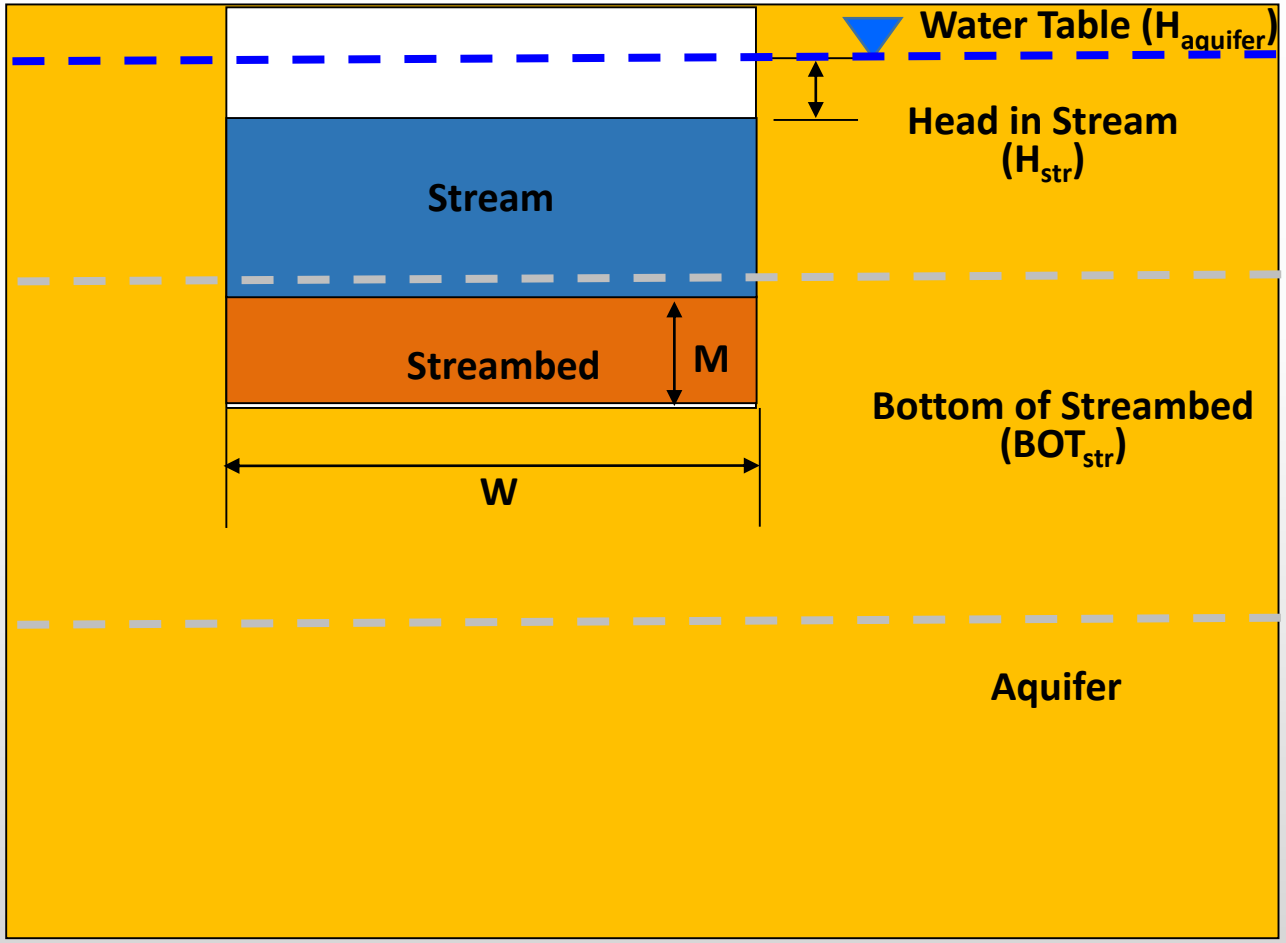
(2) Water Table Above Bottom of Streambed but Below Head in Stream

$H_{str} > H_{aquifer} > BOT_{str}$

Streambed Percolation = Cstr ($H_{str} - H_{aquifer}$)

Note: Cstr = Kstr x W x L / M

Surface Water and Groundwater Interaction (cont.)



(3) Water Table Above Stream

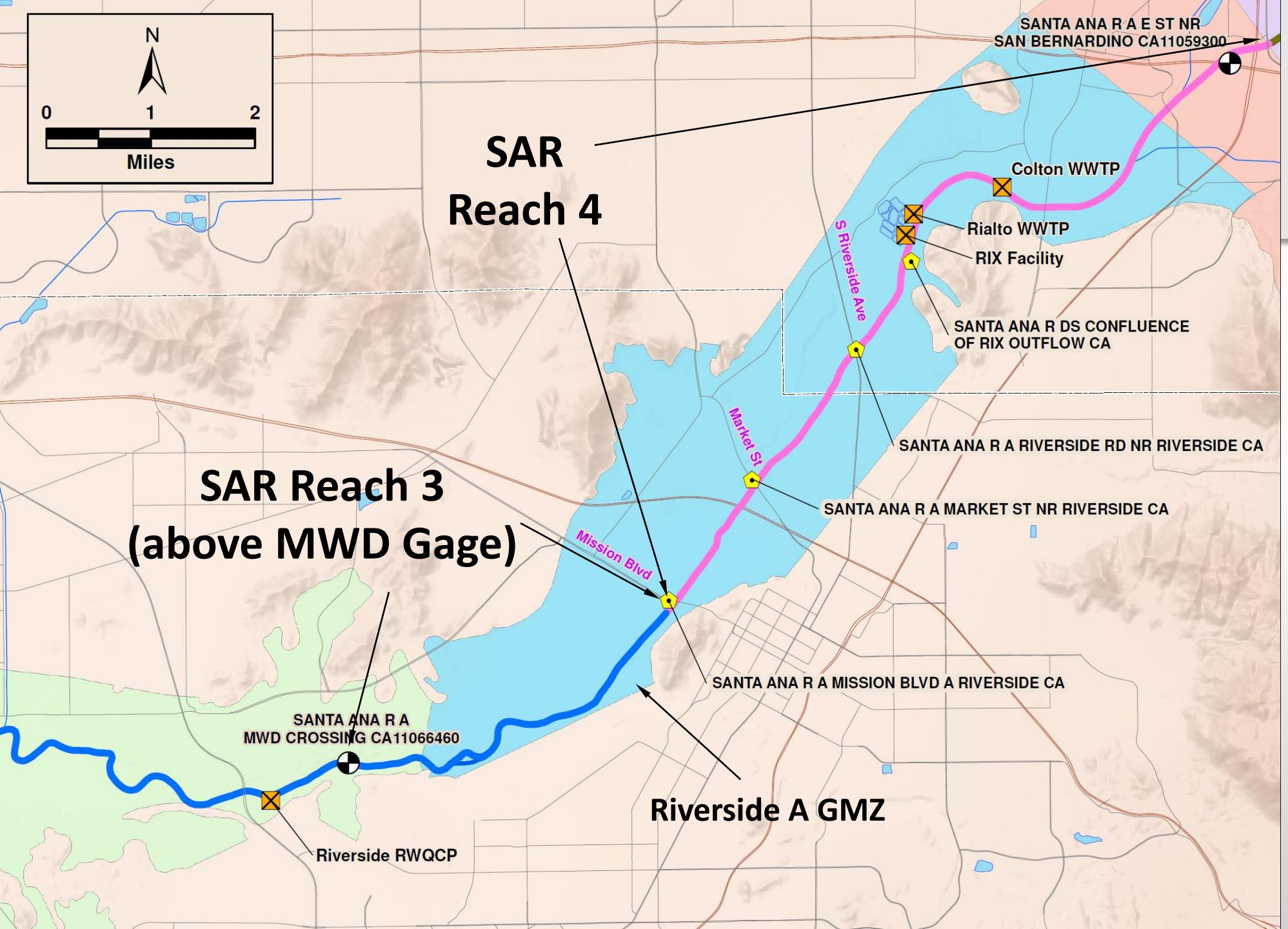
Head

$H_{aquifer} > H_{str}$

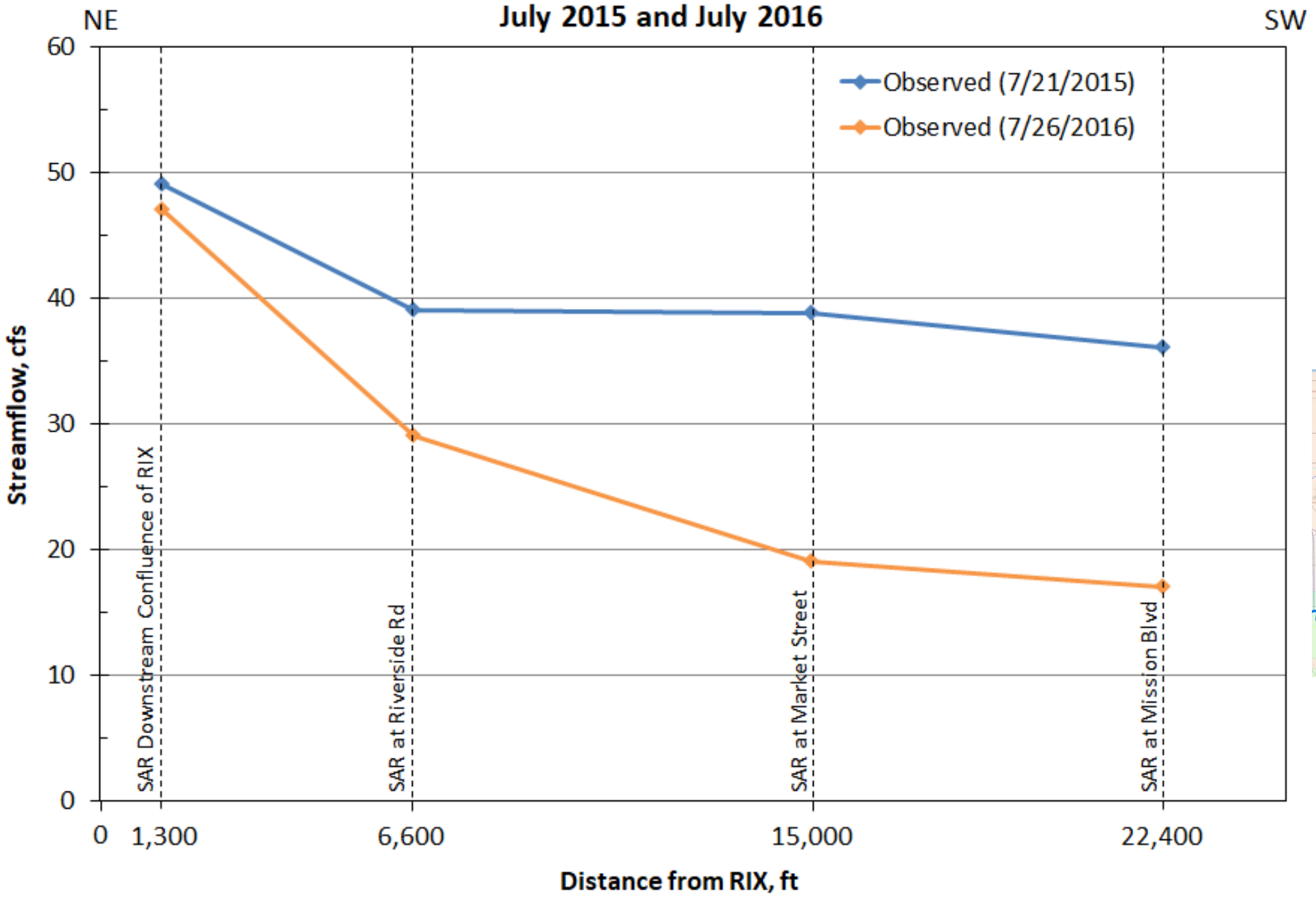
Groundwater from Aquifer Systems to Stream = Cstr ($H_{aquifer}$ - H_{str})

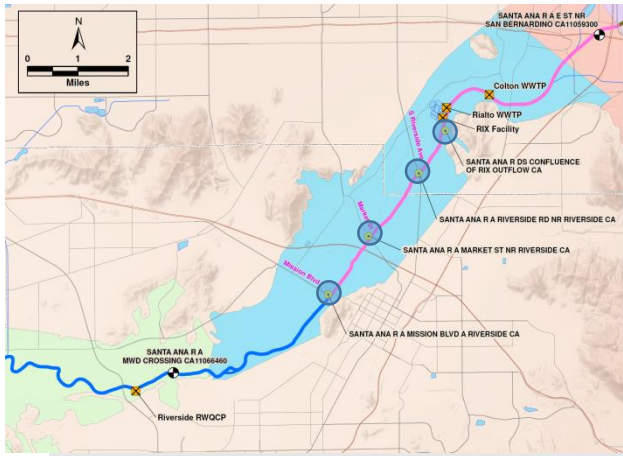
Note: Cstr = Kstr x W x L / M

Locations of USGS Streamflow Measurements

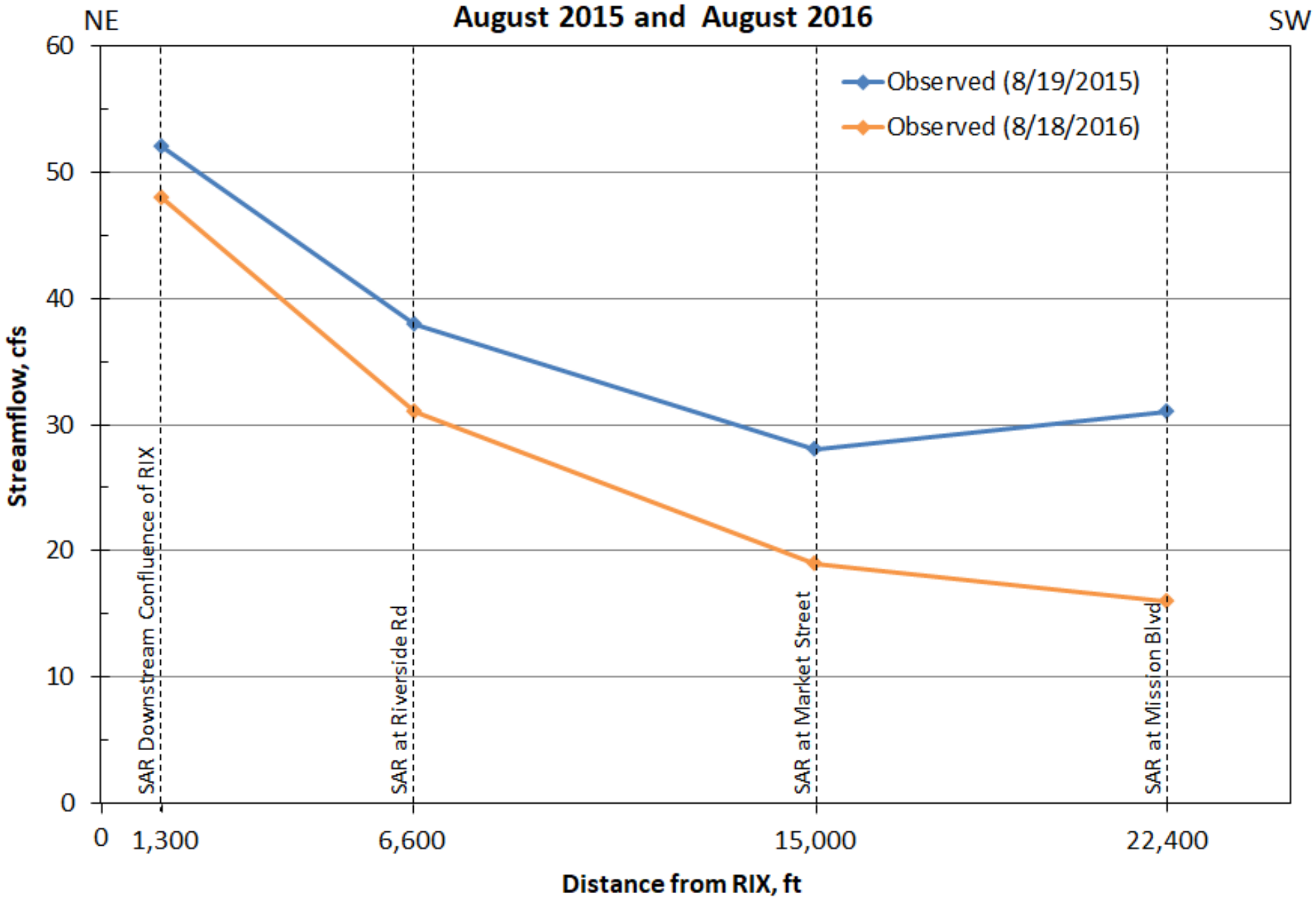


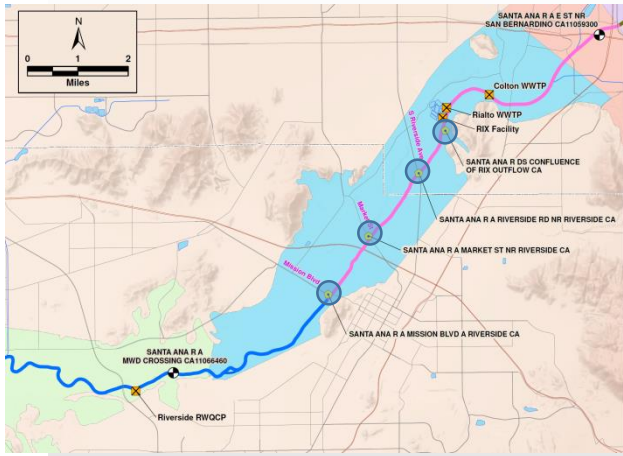
SAR Streamflow in Riverside A GMZ
July 2015 and July 2016



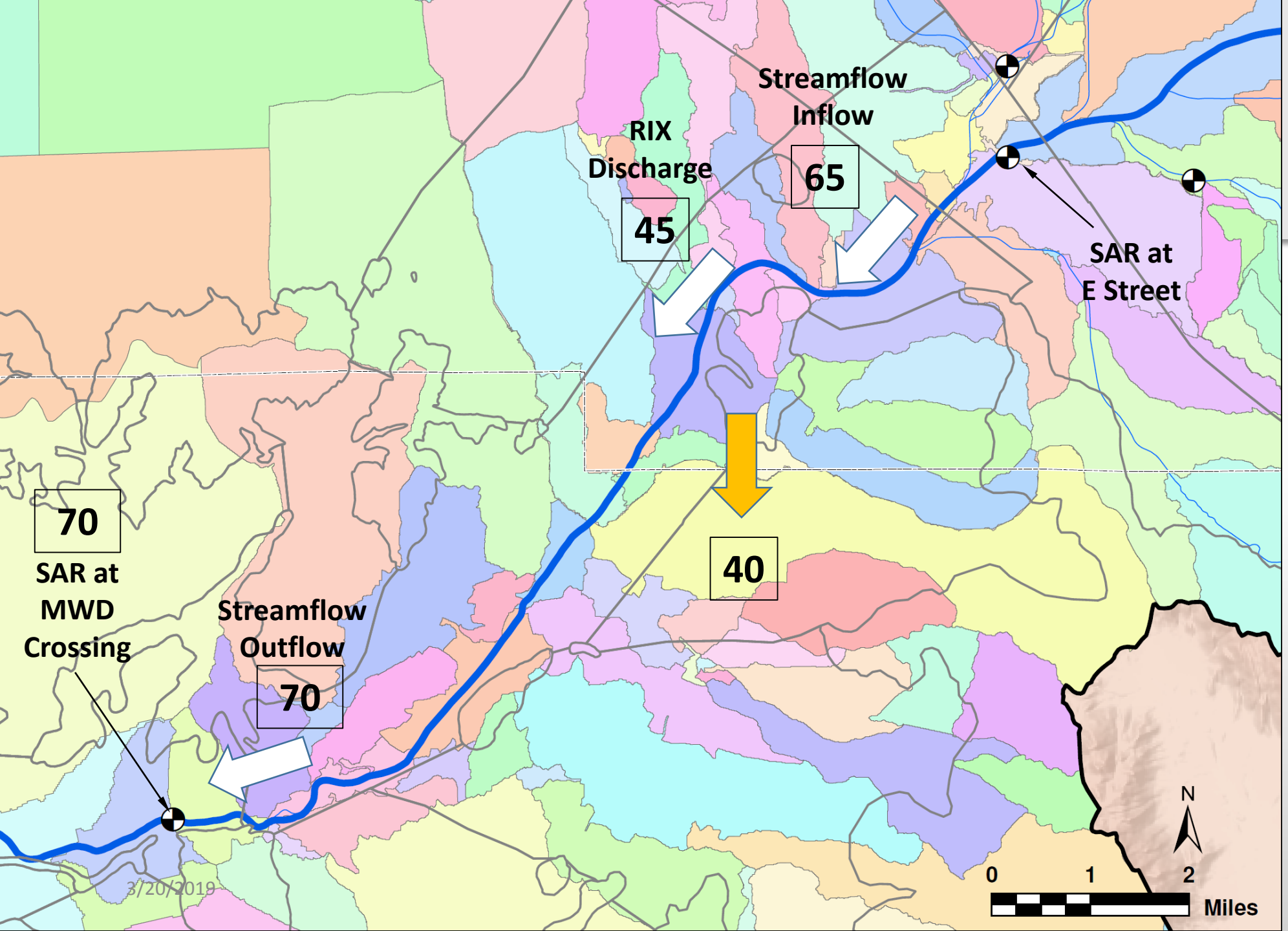


SAR Streamflow in Riverside A GMZ
August 2015 and August 2016





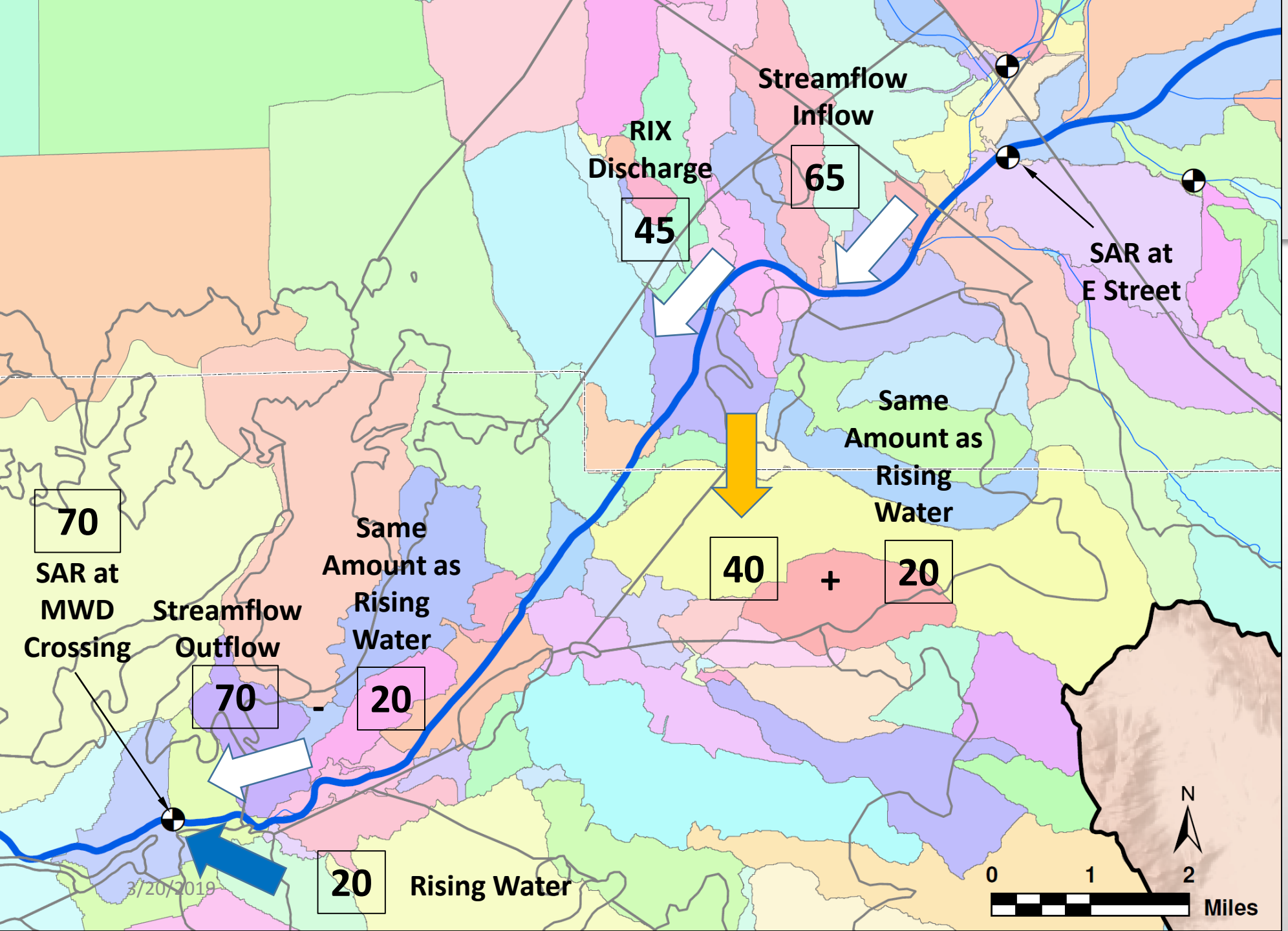
Rising Water Approach 2017 WLAM HSPF



HSPF Model Run:

- Streambed percolation is calculated by the model for Reach 4.
- No Percolation is assumed to occur in Reach 3 due to rising water.
- Model was calibrated so model-calculated flow at MWD Crossing matched observed flow from the MWD gage.

Rising Water Approach 2017 WLAM HSPF (Cont.)



HSPF Post-Processing:

- The amount of rising water was determined from the existing groundwater flow model.
- Since this rising water is contributing to the model-calculated flow at MWD Crossing, additional percolation of the same amount must be added upstream to equilibrate the water balance.

Option 1 Scope

- Summarize streambed percolation in SAR Reach 4 and Reach 3 overlying Riverside A GMZ and associated TDS/TIN concentrations in tables (original Tasks 2 and 3).
- Attend one additional Task Force meeting (May) and Attend 6-Mar-19 Technical Review Subcommittee meeting (out of scope of work for Task 10)

Option 1 Cost

TASK		Total Additional Hours	Total Additional Cost
10.0	Option 1 (no Tasks 2o, 2p, or 3g): Prepare for and Participate in up-to-1 Half-Day Monthly Meeting and 6-Mar-19 Technical Subcommittee Meeting	36	$5,820
	TOTAL (Option 1: no Tasks 2o, 2p, or 3g)	**36**	**$5,820**

Option 1 Project Schedule

- **Submit Draft Study Report in Mid- to Late-April 2019**
- **Submit Final Study Report in Mid- to Late-May 2019**

Option 2 Scope

- Recalibrate WLAM with rising water as model input and compare results (out of scope of work for Task 2o).
- Sensitivity run on model calibration with reduced rising water (out of scope of work for Task 2p).
- Use the refined calibration version from Task 2o to recalculate streambed recharge under future scenario conditions (per model run) (out of scope of work for Task 3g).

Option 2 Scope (Cont.)

- Attend two additional Task Force meetings (May and June) and attend 6-Mar-19 Technical Review Subcommittee meeting (out of scope of work for Task 10)

Option 2 Cost

TASK		Total Additional Hours	Total Additional Cost
2o	Recalibrate WLAM with Rising Water as Model Input and Compare Results	27	$3,530
2p	Sensitivity Run on Model Calibration with Reduced Rising Water	19	$2,530
3g	Use the Refined Calibration Version from Task 2o to Recalculate Streambed Recharge under Future Scenario Conditions (per model run)	19	$2,530
10.0	Option 2 (with Tasks 2o, 2p, and 3g): Prepare for and Participate in up-to-2 Half-Day Monthly Meetings and 6-Mar-19 Technical Subcommittee Meeting	48	$8,010
	TOTAL (Option 2: with Tasks 2o, 2p, and 3g)	**113**	**$16,600**

Option 2 Project Schedule

- Present Results from Tasks 2o and 2p in Mid- to Late-April 2019
- Submit Draft Study Report in Mid- to Late-May 2019
- Submit Final Study Report in Mid- to Late-June 2019