

# Assessment of San Joaquin River Fall Temperatures from Friant Dam to Gravelly Ford

Water Management Support

**SAN JOAQUIN RIVER**  
RESTORATION PROGRAM



## Restoration Goals Technical Feedback Group Meeting

# Introduction

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SJR water released from Friant Dam to SR 41 may be above optimal temperature for the SJRRP in late fall (October – November) as the Millerton Lake cold water pool is depleted.

The report documents an analysis of 14 alternative operation scenarios for their effectiveness in preserving the cold water pool in Millerton Lake for release during the critical October – November period.

# Scenario 1, 2 and 3

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- Reduce October releases by 50, 100 and 200 cfs respectively and store in Millerton Lake. Release stored water during November.
- Assumes will protect the cold water pool resulting in cooler release temperatures in November.

# Scenario 4, 5 and 6

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- Reduce October releases by 50, 100 and 200 cfs respectively. Increase Friant-Kern Canal diversion by same amount and return to the San Joaquin River via Dry Creek.
- Assumes diverting warmer water through Friant-Kern Canal will protect the cold water pool and result in cooler temperatures in November

# Scenario 7 and 8

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- Scenario 7 - Assume 10% buffer flows during in October through December.
  - Assumes increased release reduces downstream in-river heating
- Scenario 8 - Reduce May through September releases by the smaller of 5 TAF or SJRRP buffer volume and store in Millerton Lake. Release stored water from October through December.
  - Assumes will protect the cold water pool resulting in cooler release temperatures in October - December.

# Scenarios 9, 10 and 11

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- Reduce June through September releases by 50, 100 and 200 cfs respectively. Increase Friant-Kern Canal diversion by same amount and return to the San Joaquin River via Dry Creek.
- Assumes diverting warmer water through Friant-Kern Canal will protect the cold water pool and result in cooler temperatures in October-November
- Similar to Scenario 4, 5, and 6

# Scenarios 12, 13 and 14

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- Reduce May through September releases by 50, 100 and 200 cfs respectively and store in Millerton Lake. Release stored water to San Joaquin River October through January.
- Assumes will protect the cold water pool May to September resulting in cooler release temperatures in October through January

# Methodology

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- Modify the SJRRP minimum required release as specified in the Scenario
- Use the Daily Operations model to simulate resulting Millerton Lake operations
- Use the CE-QUAL-W2 Millerton Lake temperature model to simulate Millerton Lake release temperatures
- Use the HEC-5Q San Joaquin River temperature model to simulate San Joaquin River temperatures.

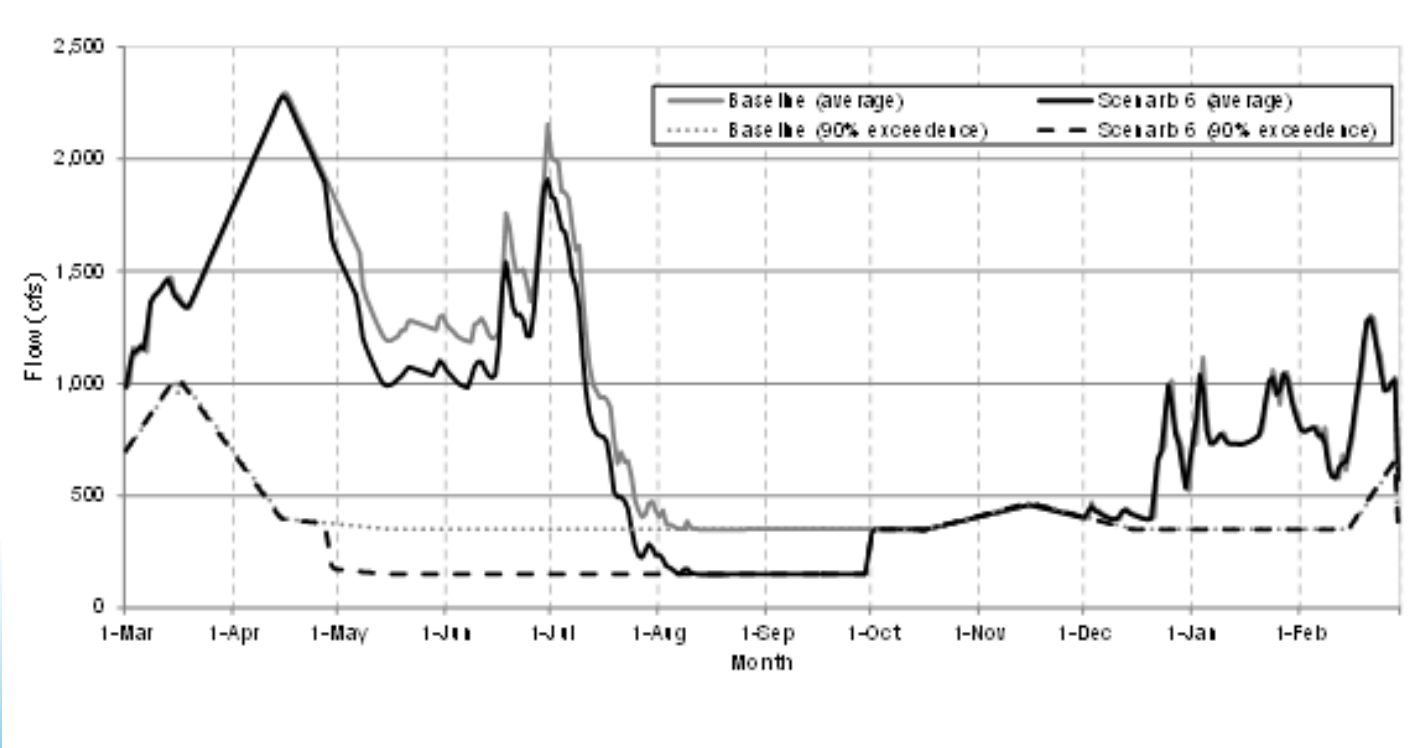


# Scenarios Analysed

- Divided Scenarios into groups based on operational assumptions. Selected representative Scenario expected to have the largest temperature impact.
- Scenario 6 – from 4, 5, 6, 9, 10 and 11
  - Reduce SJR release, increase FKC during summer
- Scenario 7 and 8 – unique
- Scenario 14 – from 1, 2, 3, 12, 13, 14
  - Reduce SJR release during summer, increase during fall

# Scenario 6 Results

## Millerton Lake Release to San Joaquin River

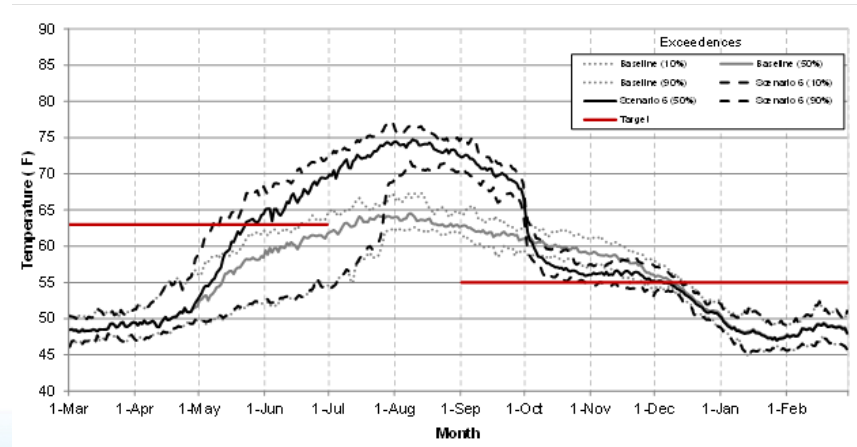
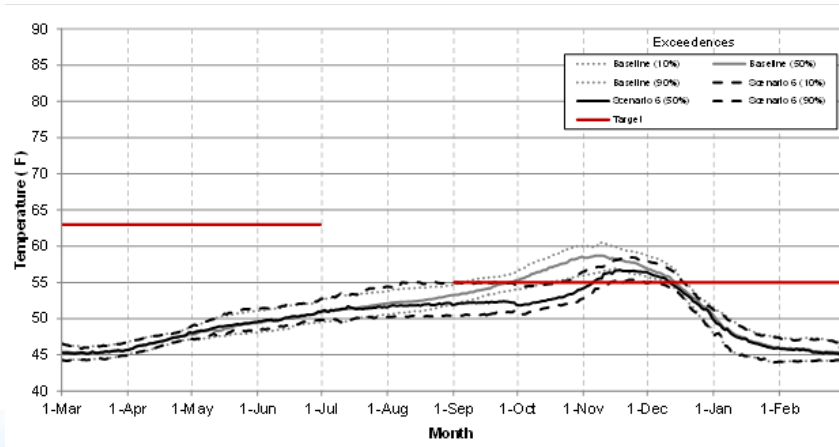




# Scenario 6 Results (cont.)

Millerton Lake Release Temp

SJR Temp at SR 41

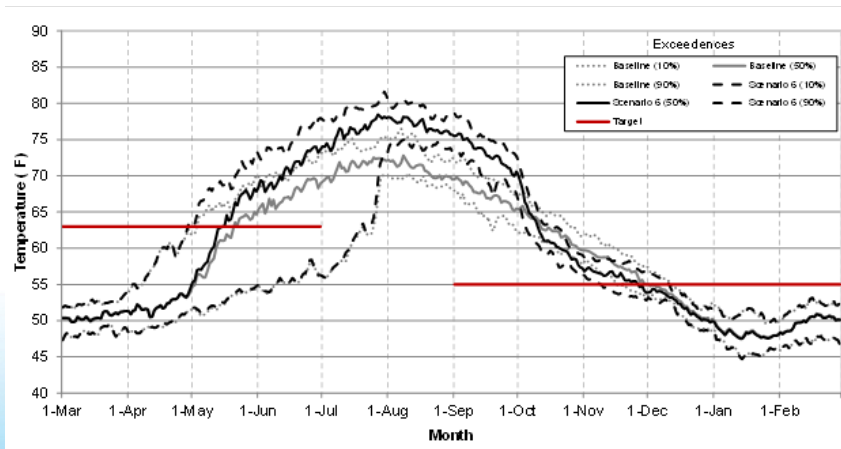


Note: required addition of new San Joaquin inflow at Dry Creek. Inflow temperature assumed to be temperature of FKC diversion plus same heating as in San Joaquin River

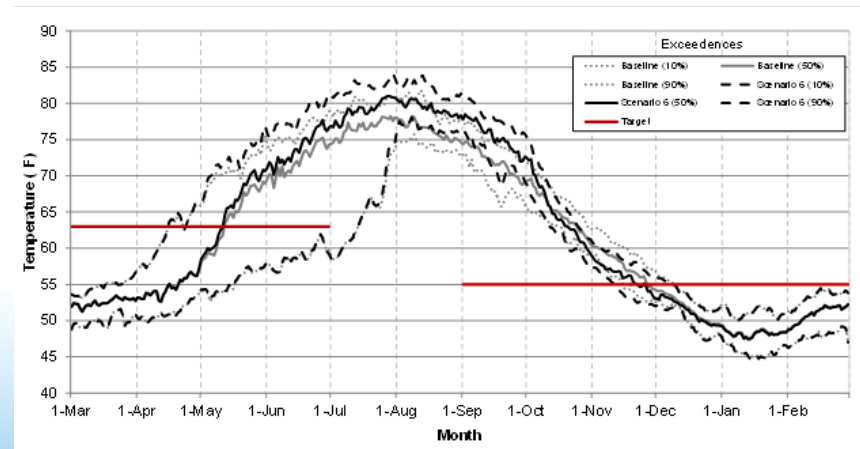


# Scenario 6 Results (cont.)

## SJR Temp at SR 99

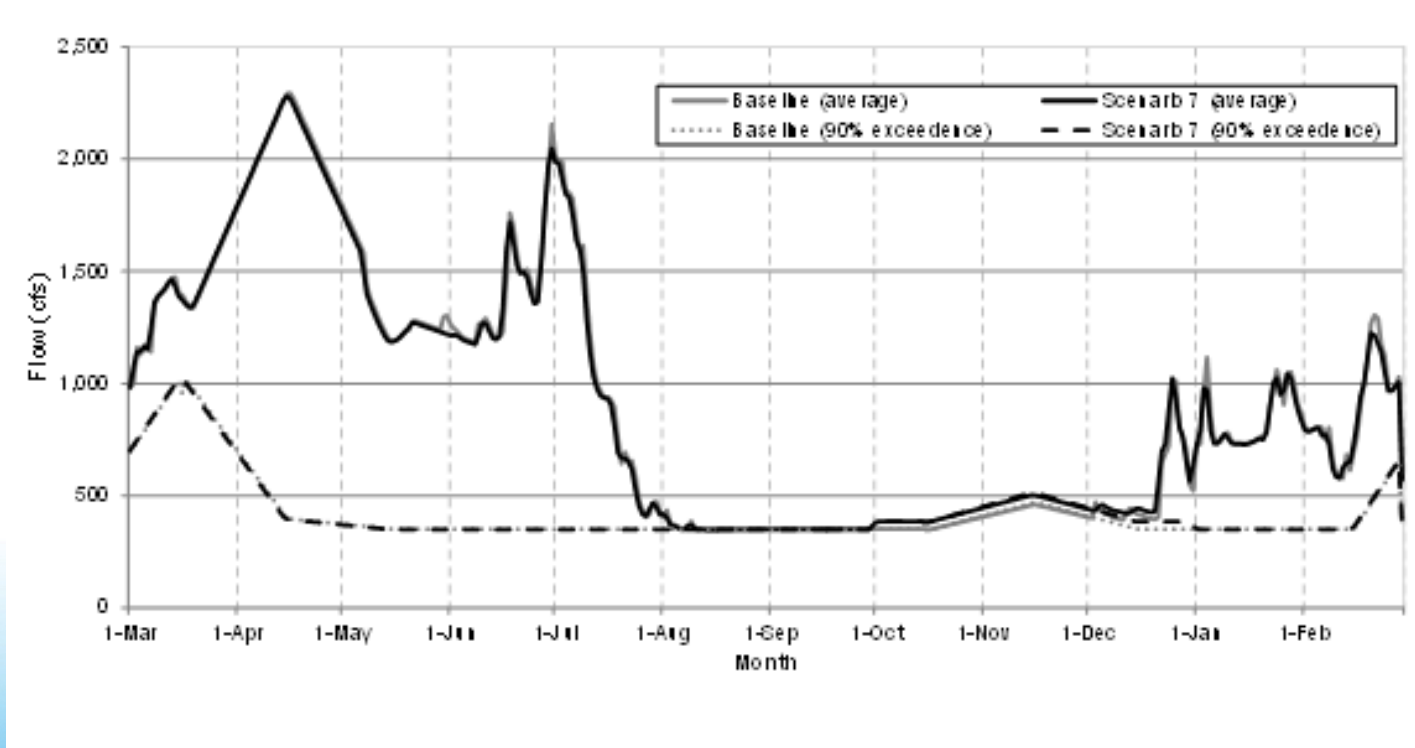


## SJR Temp at Gravelly Ford



# Scenario 7 Results

## Millerton Lake Release to San Joaquin River

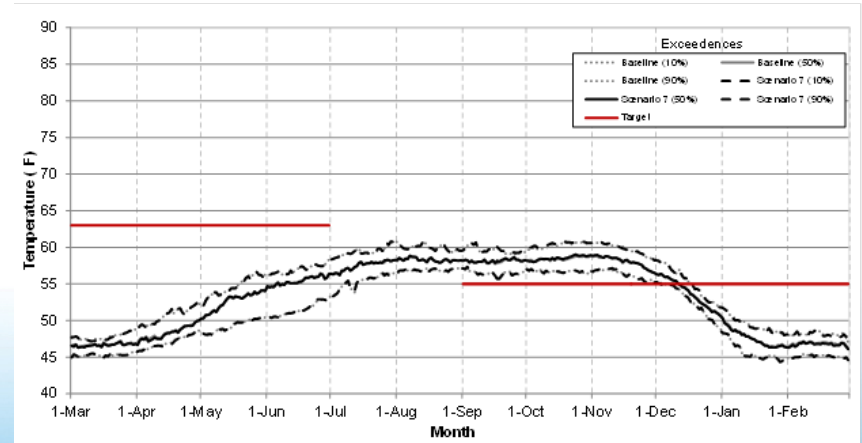
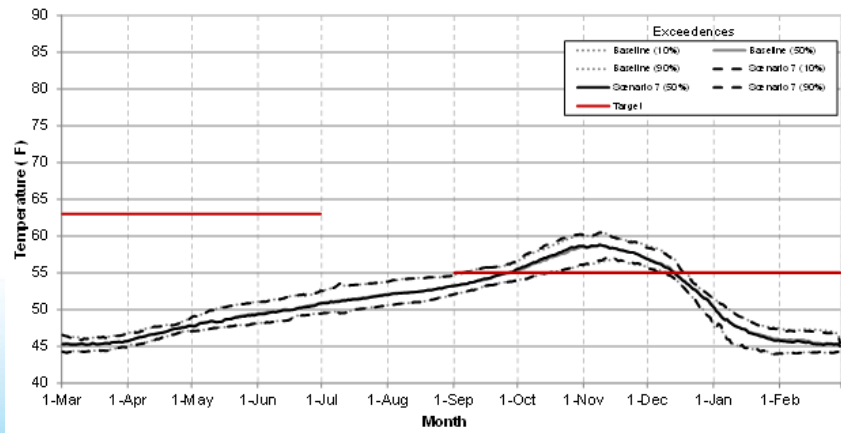




# Scenario 7 Results (cont.)

Millerton Lake Release Temp

SJR Temp at SR 41

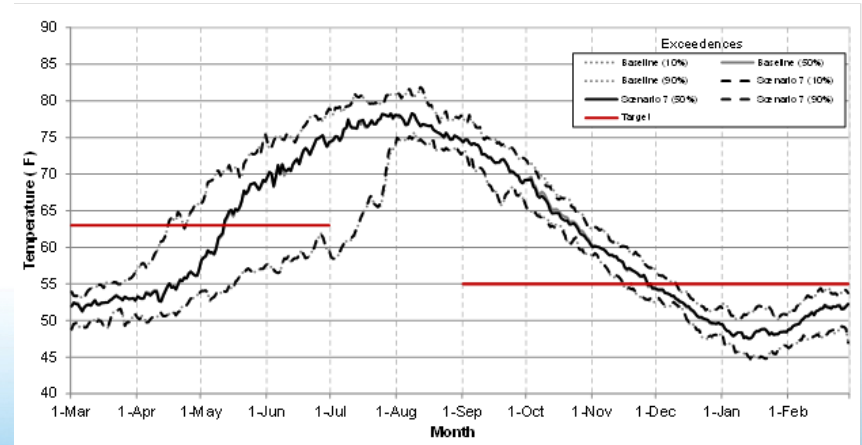
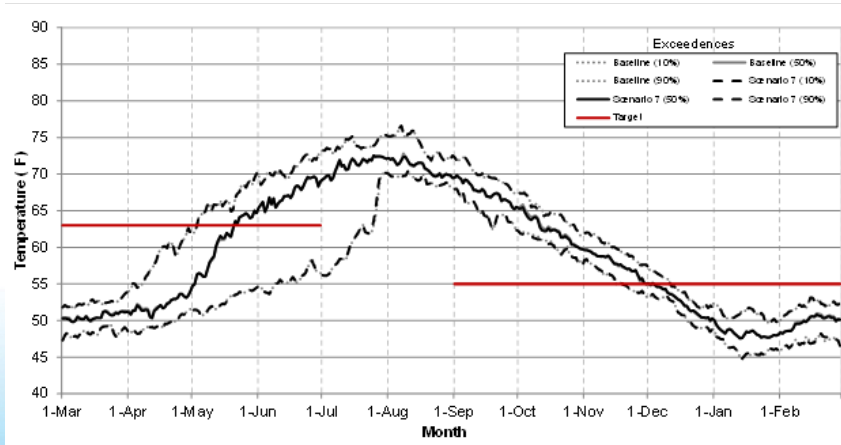




# Scenario 7 Results (cont.)

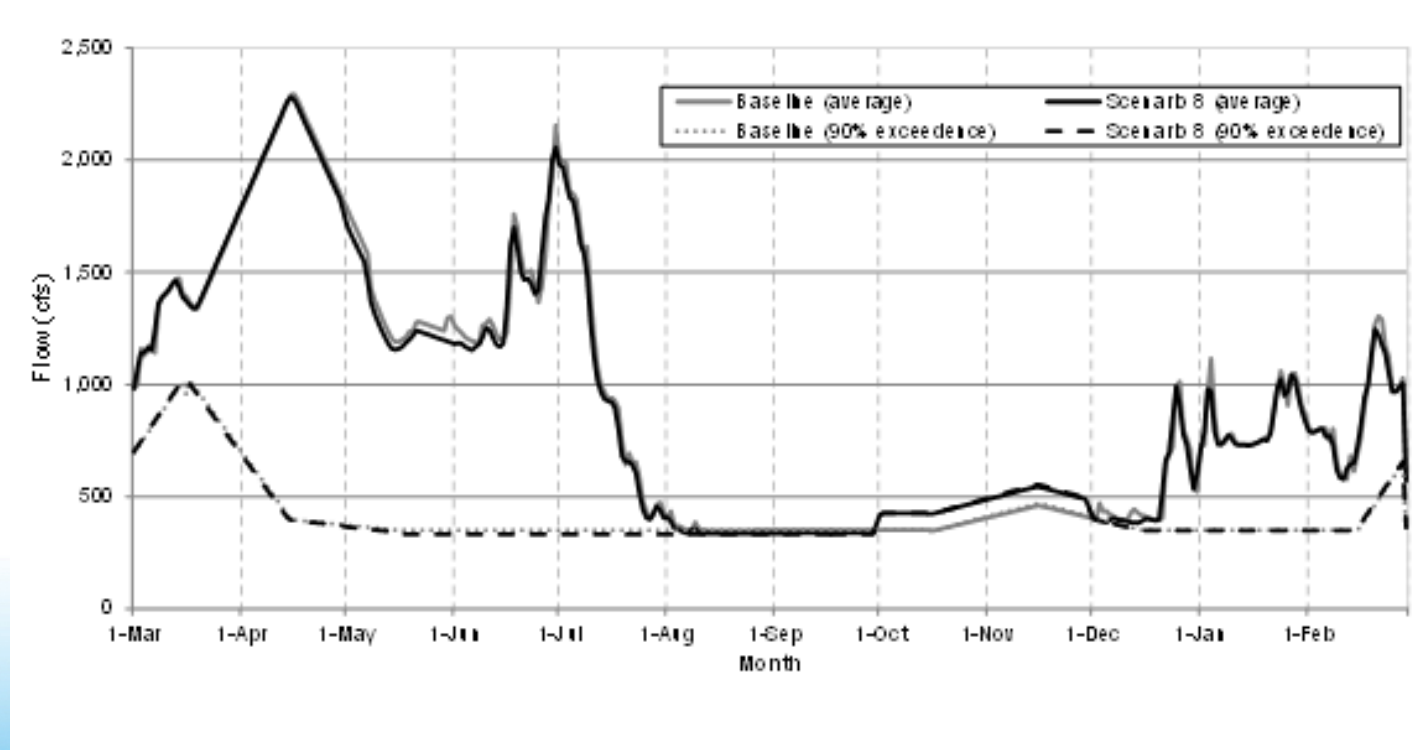
SJR Temp at SR 99

SJR Temp at Gravelly Ford



# Scenario 8 Results

Millerton Lake Release to San Joaquin River



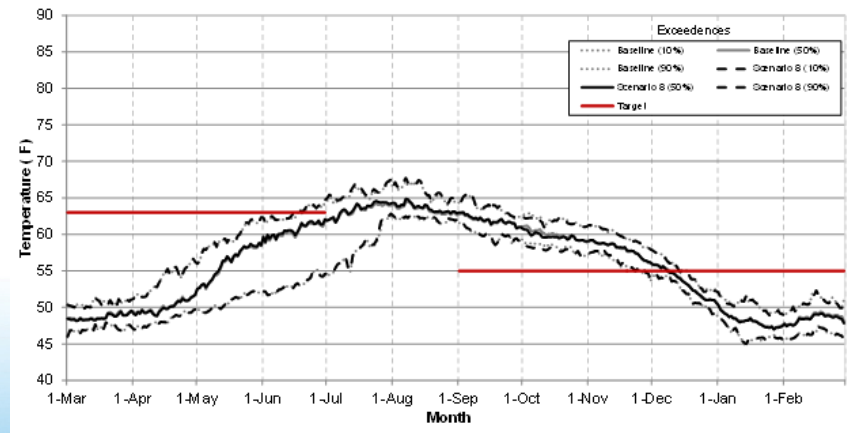
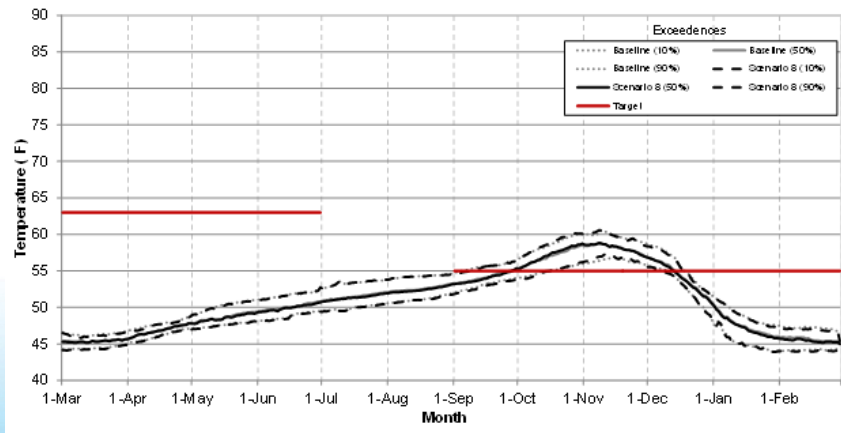




# Scenario 8 Results (cont.)

Millerton Lake Release Temp

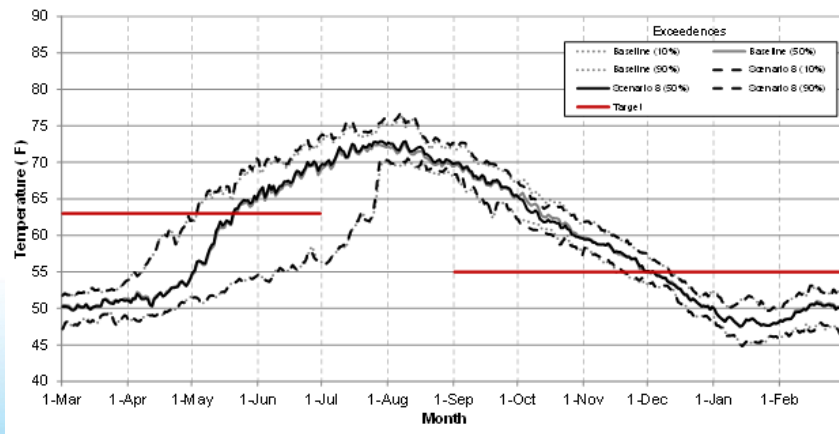
SJR Temp at SR 41



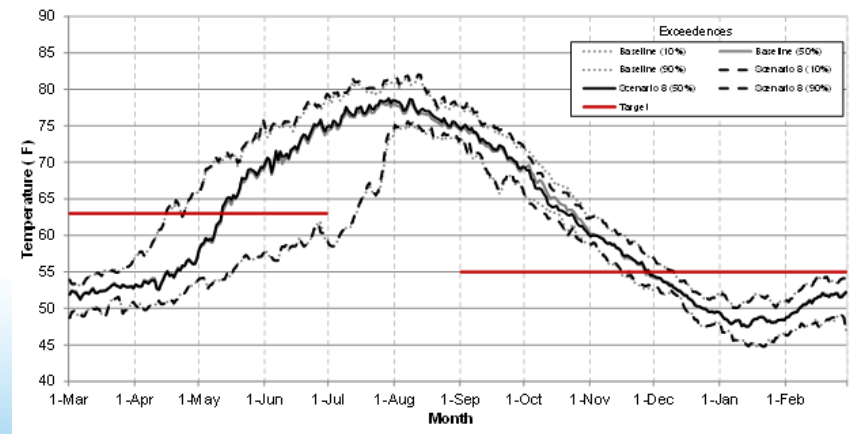


# Scenario 8 Results (cont.)

SJR Temp at SR 99

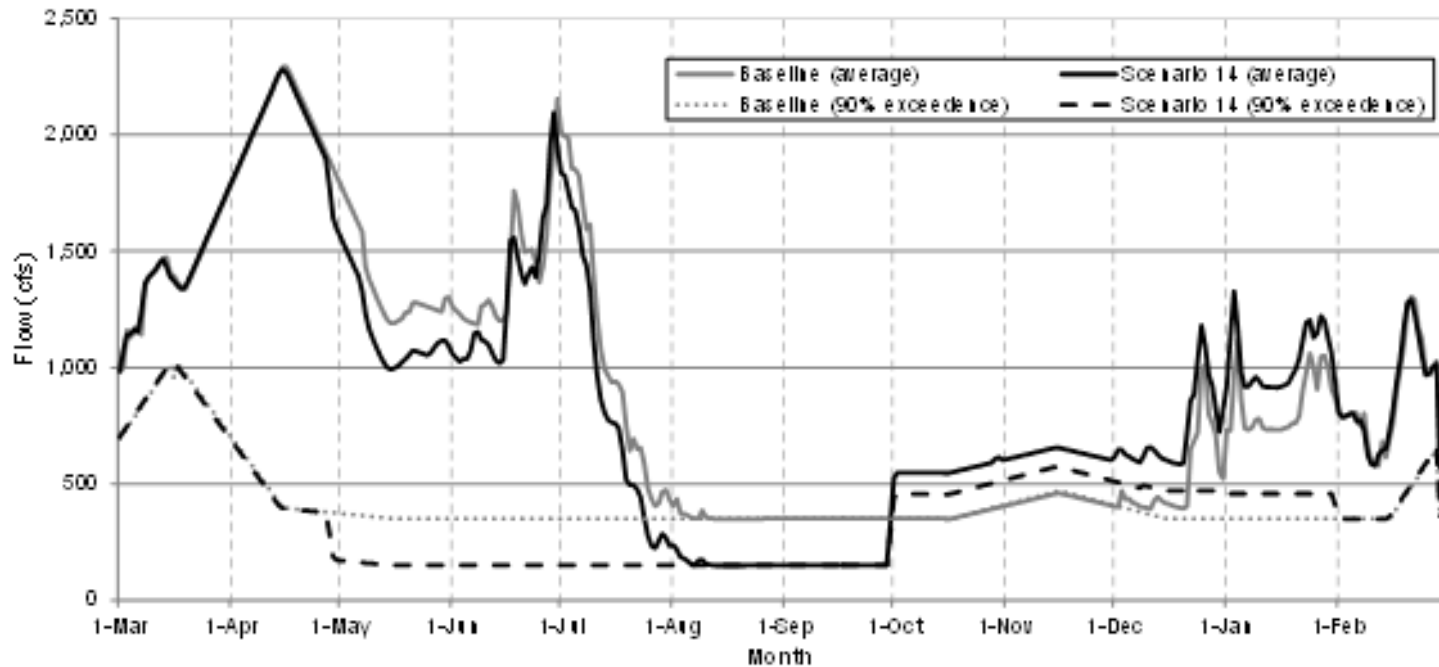


SJR Temp at Gravelly Ford



# Scenario 14 Results

## Millerton Lake Release to San Joaquin River

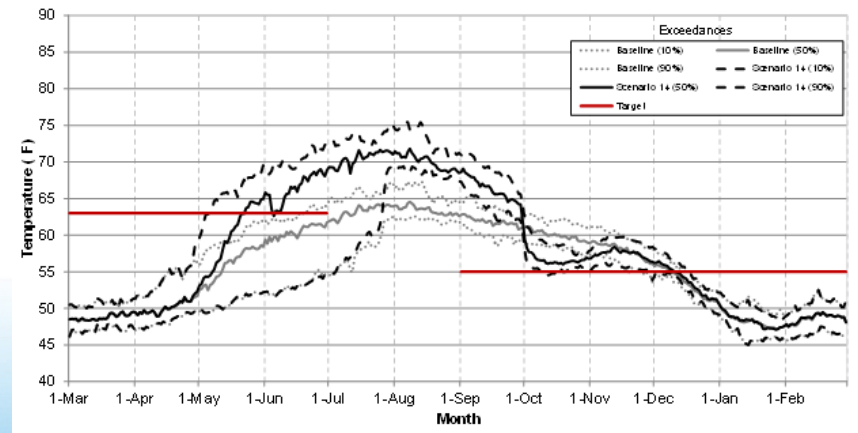
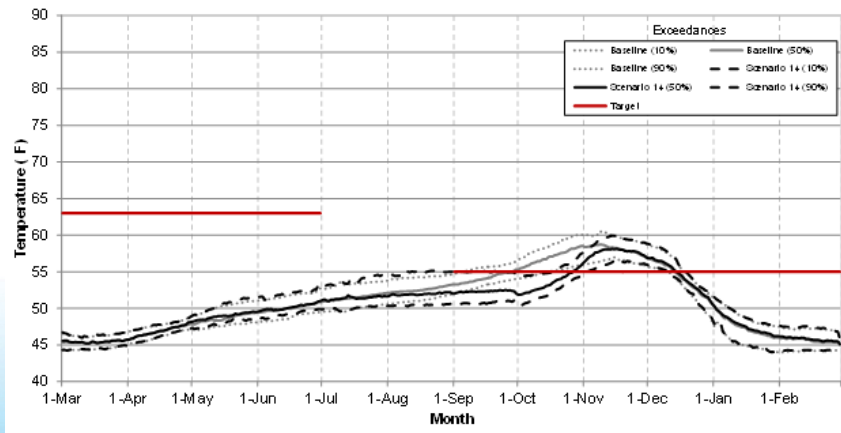


NOTE: Release period extended from through November to through January to avoid potential dewatering impacts

# Scenario 14 Results (cont.)

Millerton Lake Release Temp

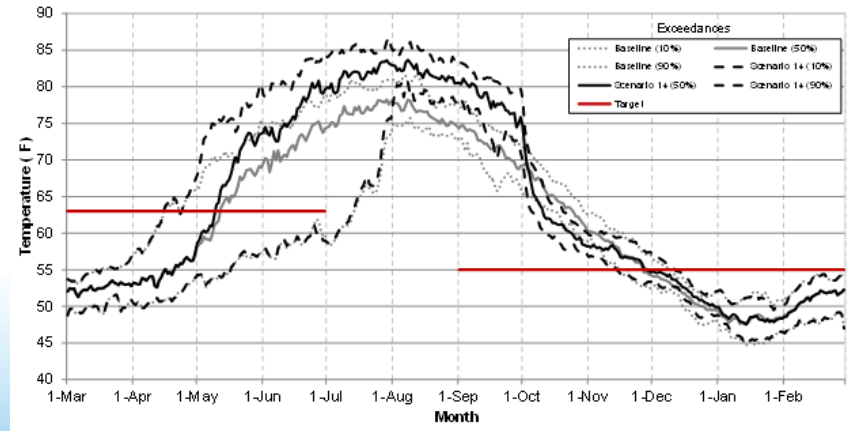
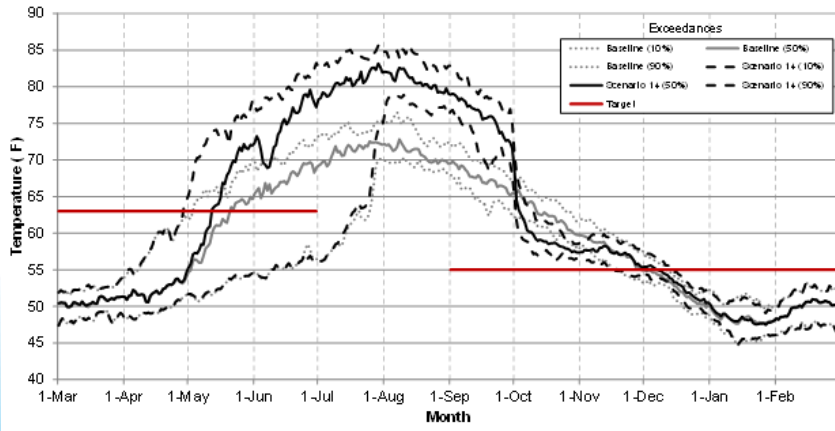
SJR Temp at SR 41



# Scenario 14 Results (cont.)

SJR Temp at SR 99

SJR Temp at Gravelly Ford





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# Questions?