
San Joaquin River Salinity Management Model (SANMAN)

November 2005

Presentation Content

- **Model Description**
- **Salinity & Flow Management Actions**
- **Sensitivity Analysis**

Model Description

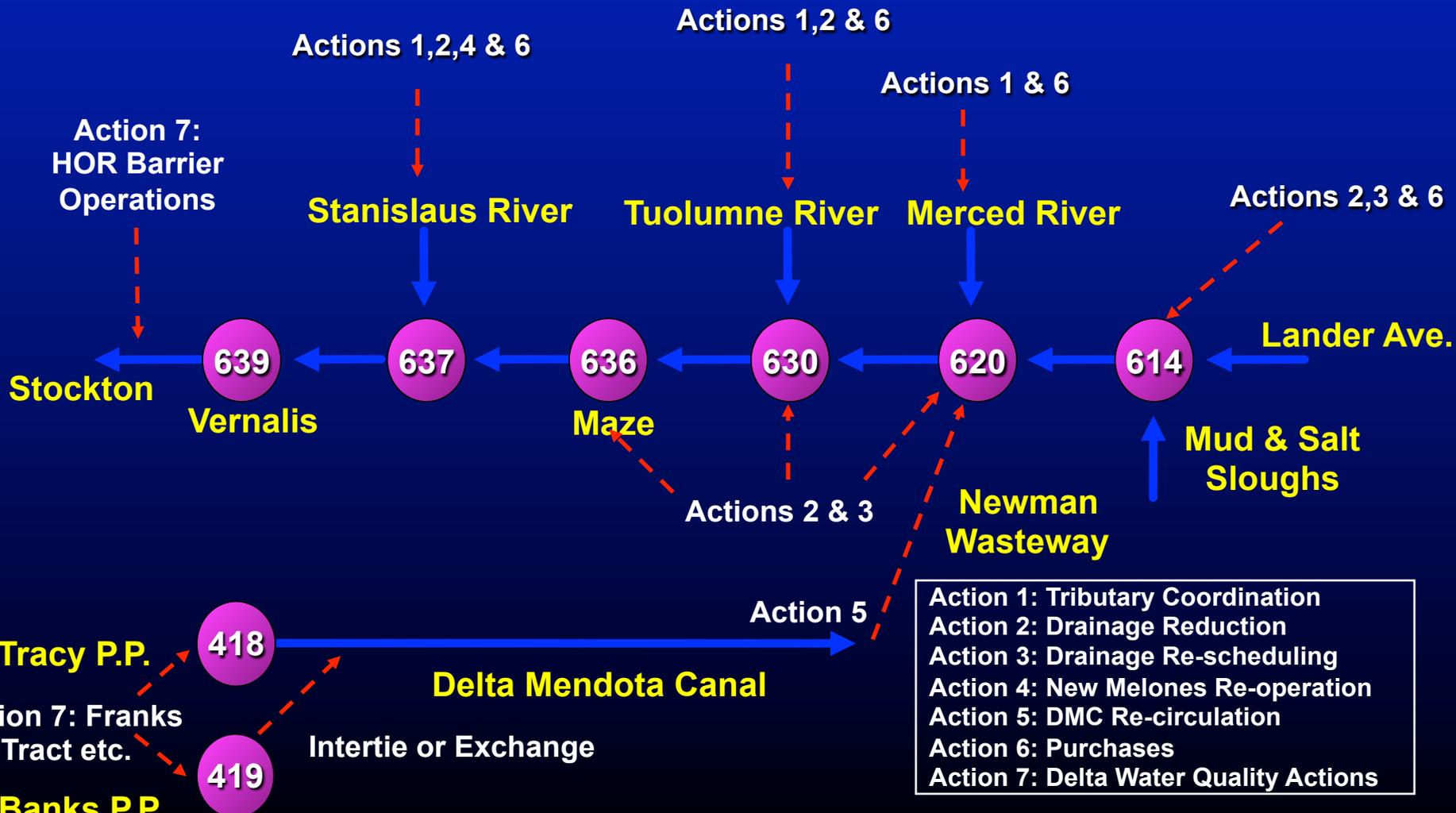
The purpose of the San Joaquin River Salinity Management Model (SANMAN) is to provide reconnaissance-level decision support in the development of a San Joaquin River Salinity Management Plan by:

- Identifying coordinated management strategies that meet San Joaquin River salinity objectives and flow targets
- Estimating water costs of strategies

Model Description (cont' d)

- Microsoft EXCEL
- Post-analysis of CALSIM Sequential Hydrology and CVP-SWP Operations
 - March 1922 thru September 1994
 - April - May: Half month time step
- Prescribes Action Levels (e.g. re-circulation volume) Necessary to Meet Salinity Objectives and Flow Targets Given Pre-defined Action Priorities

SANMAN Version 2.0 Schematic



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Salinity Management Actions

- Coordinated Tributary Operations
- Drainage Reduction
- Drainage Re-scheduling
- New Melones Releases
- DMC Re-circulation & Delta Actions
- Purchases



Decreasing
Action
Priority

Flow Management Actions

- DMC Re-circulation (Vernalis Flow)
- Purchases (Vernalis Flow)
- DMC Re-circulation with HORB
Operations (Stockton Flow)



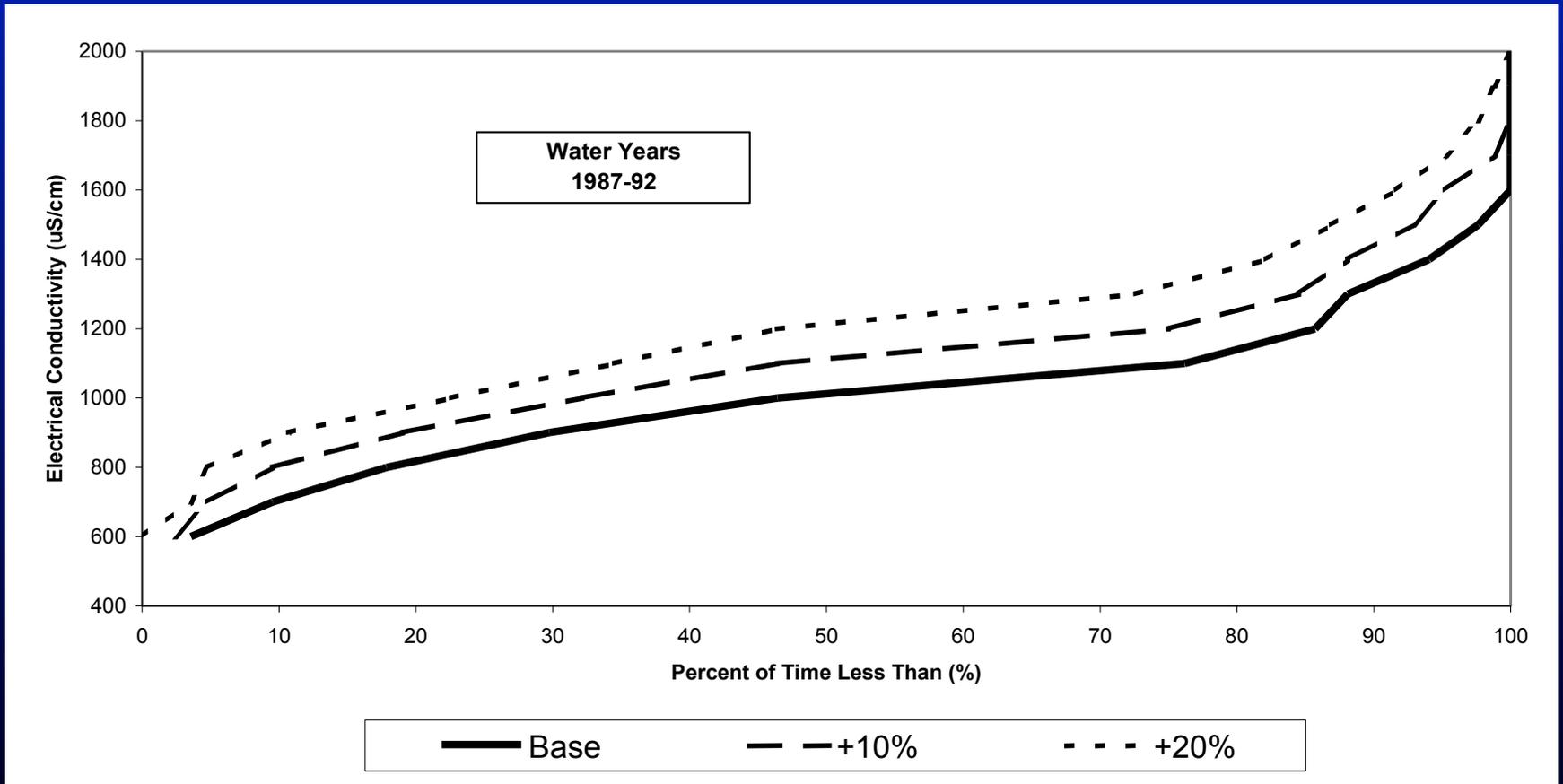
Decreasing
Action
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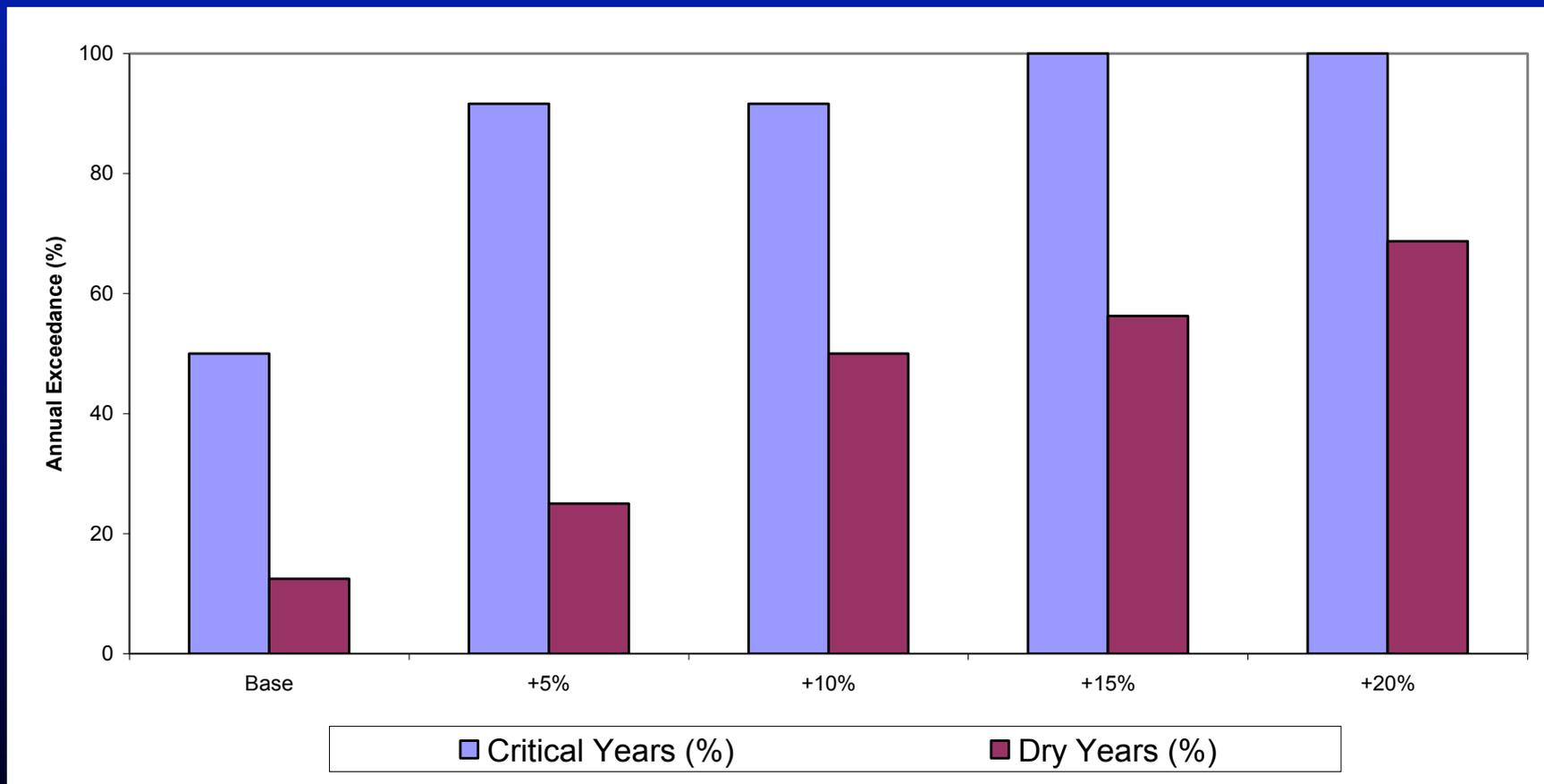
Salinity Frequency at Maze Rd

Base Sensitivity Analysis



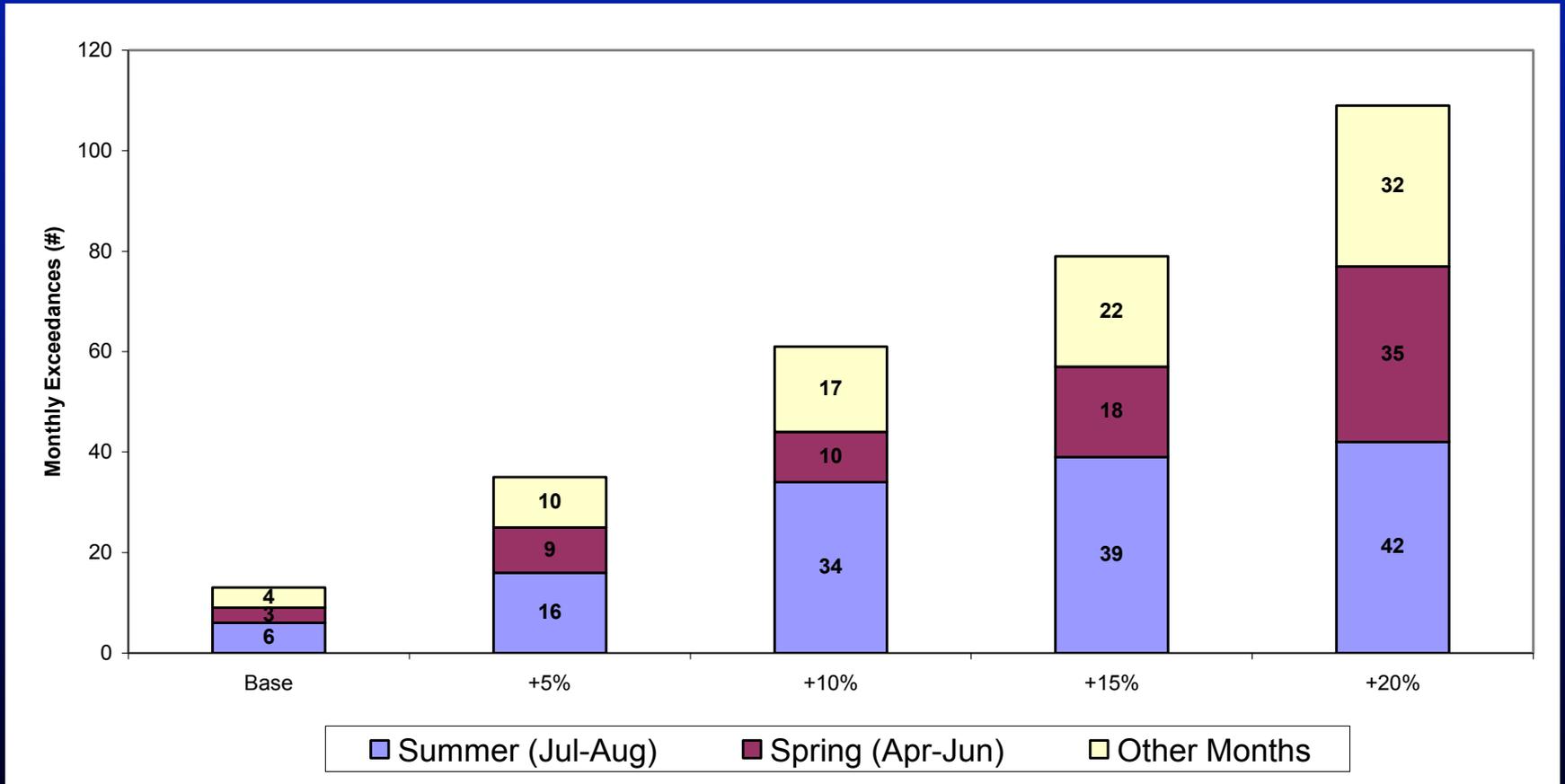
Annual Exceedance of Vernalis Salinity

Base Sensitivity to Maze Dry & Critical Year Salinity



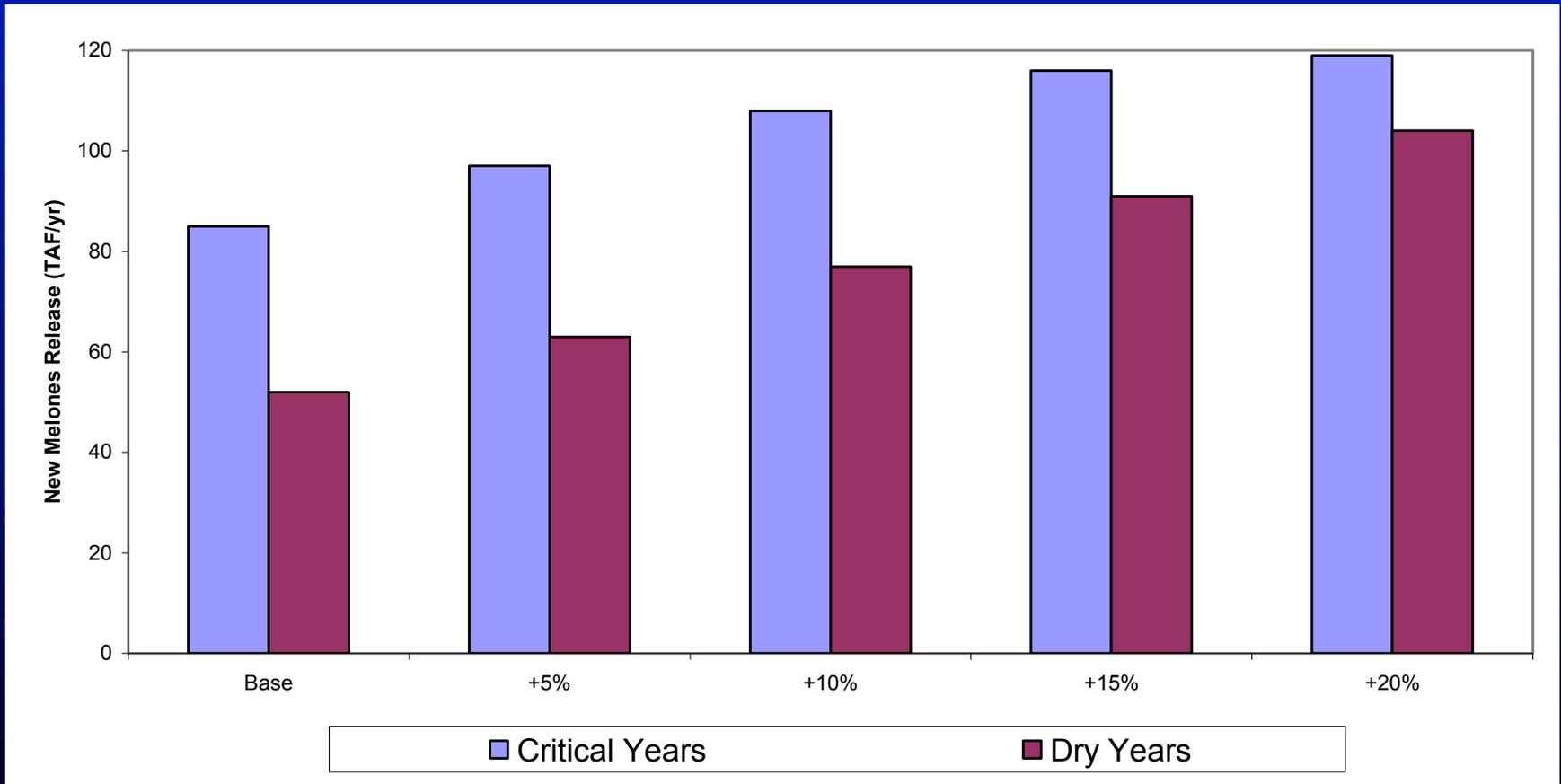
Monthly Exceedance of Vernalis Salinity

Base Sensitivity to Maze Dry & Critical Year Salinity



New Melones Release for Salinity & DO

Base Sensitivity to Maze Dry & Critical Year Salinity



Summary Description of the West Side Regional Drainage Plan

The West Side Regional Drainage Plan is an integrated plan to eliminate irrigated agricultural drainage water from and enhance water supply reliability for, about 100,000 acres in the Grasslands Drainage area as shown in Figure A-1. The Program began as a successful effort to reduce selenium discharges to the San Joaquin River. It is now been proposed for expansion to go beyond regulatory requirements and eliminate selenium and salt discharges to the River, while maintaining productivity of production agriculture in the region and enhancing water supplies to lands remaining in production. It also is key to solving disputes among neighboring water and drainage districts regarding localized impacts of agricultural drainage.

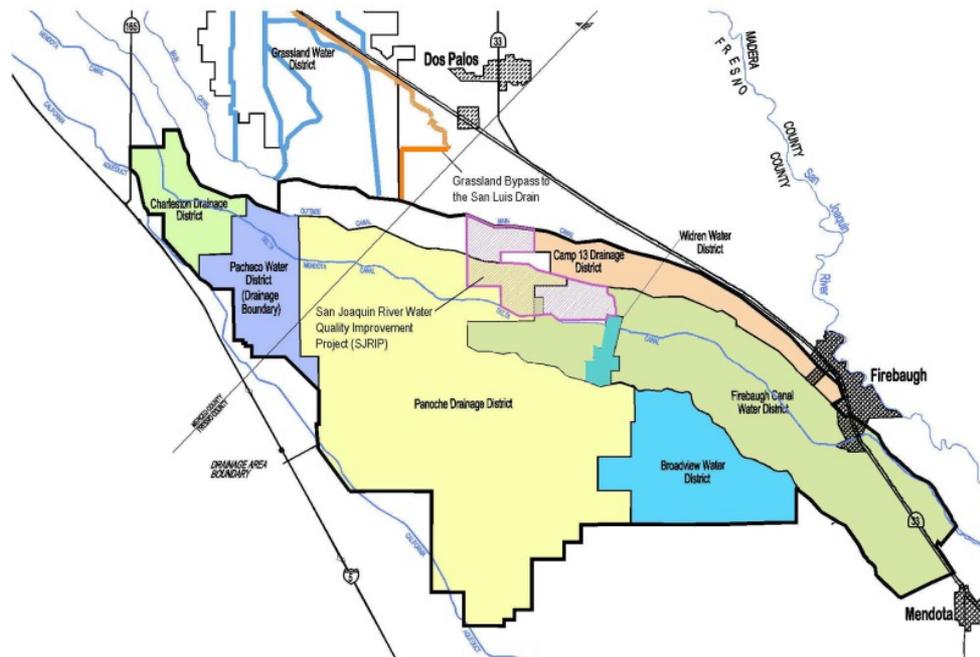
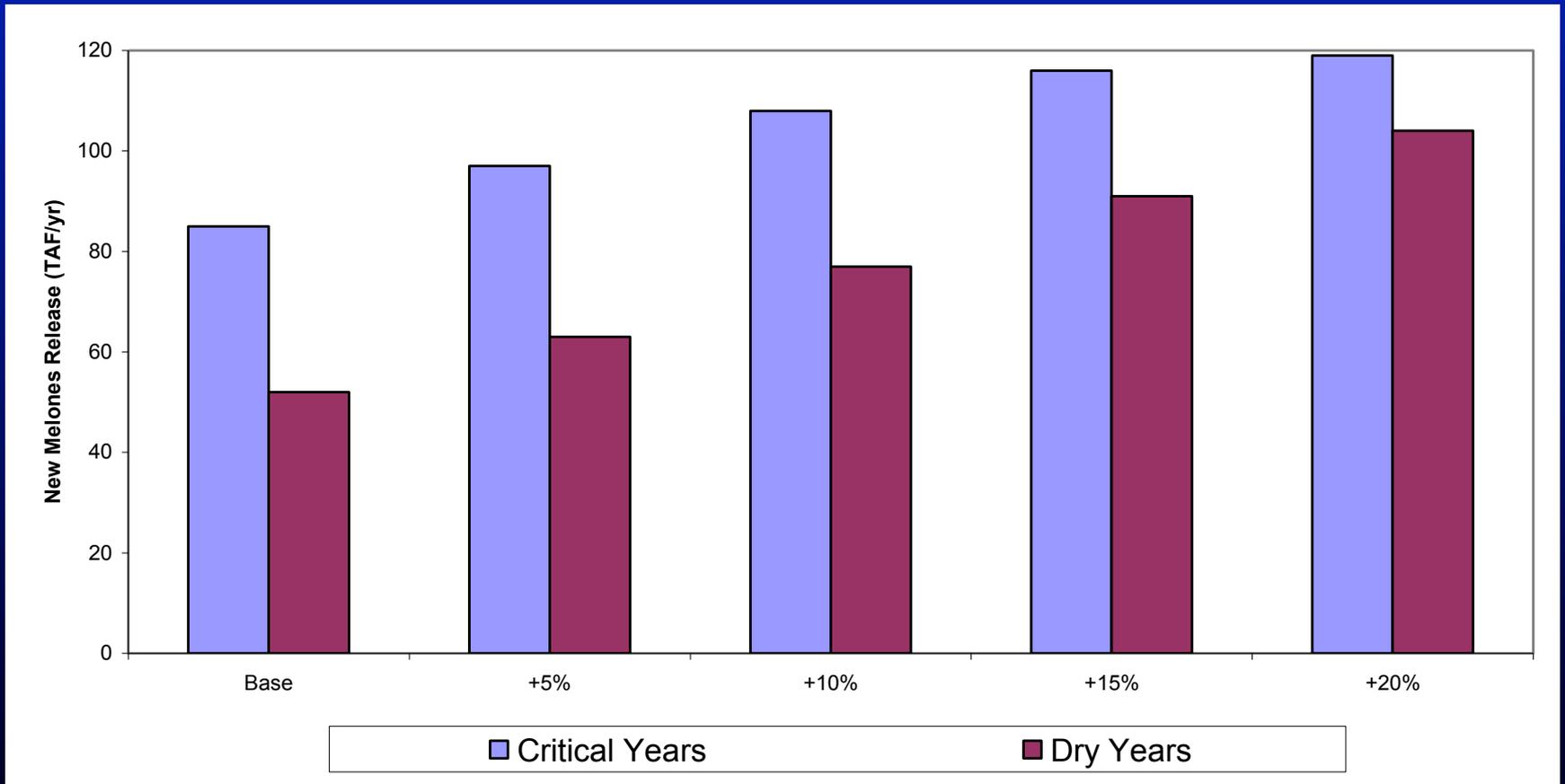


Figure A-1
West Side Drainage Plan
Project Area and Districts

SUMMERS ENGINEERING, INC.
Consulting Engineers
HANFORD CALIFORNIA
SEPTEMBER 2003

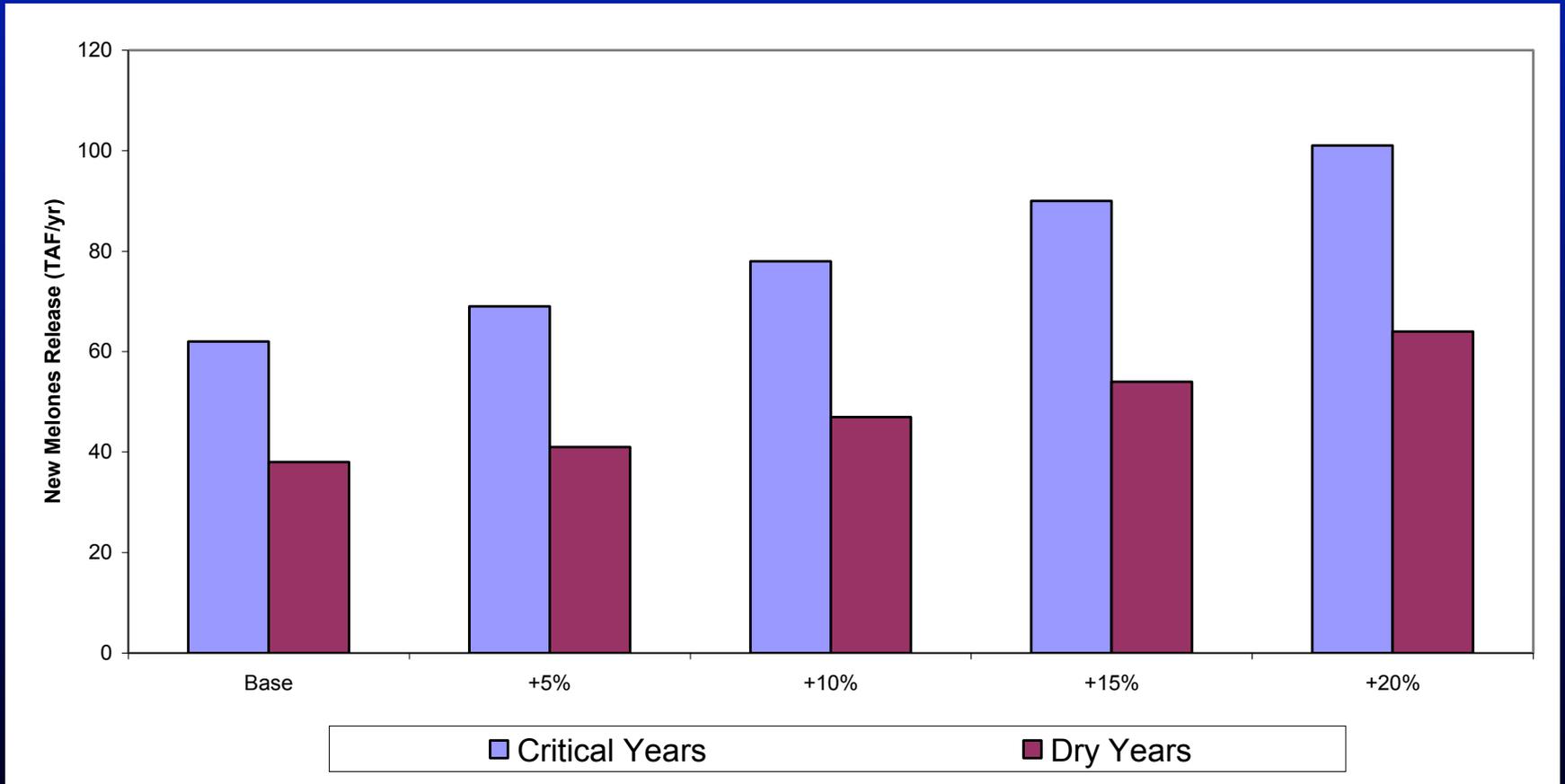
New Melones Releases for Salinity & DO

Base Sensitivity to Maze Dry & Critical Year Salinity



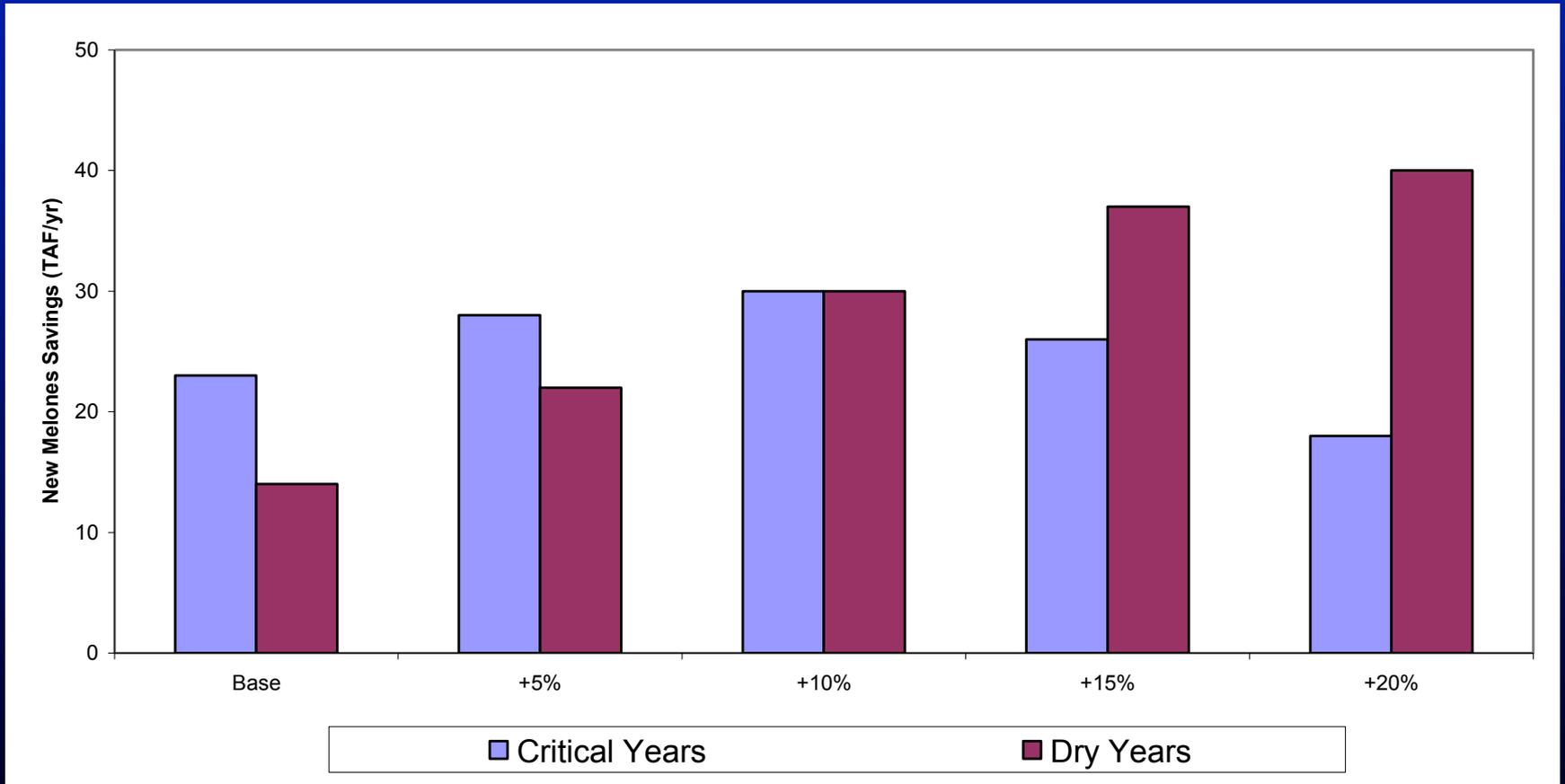
New Melones Releases for Salinity & DO

SJRWQMP Sensitivity to Maze Dry & Critical Year Salinity



New Melones Storage Savings

Sensitivity to Maze Dry & Critical Year Salinity



Need for Additional Salinity Mgt Actions

SJRWQMP Sensitivity to Maze Dry & Critical Year Salinity

Maze Salinity Scenario	Additional Management Actions Required
Base	None
Base + 5%	None
Base + 10%	None
Base + 15%	Purchases in 2 years (10 TAF max)
Base + 20%	3 TAF recirculation in 1 year; purchases in 7 years (28 TAF max)

Acknowledgements

Dan Steiner, Consultant

Armin Munevar, CH2M-Hill

Toshio Kyosai, CH2M-Hill

SJRWQMG (Byron Buck, Chair)

Water Users Technical Group (Dennis Majors, Chair)

Extra Slides

Coordinated Tributary Operations

- **Actions Applied to East Side Tributaries**
- **Action Levels Defined by Time Series Input**

Drainage Reduction

- **Actions Applied to 9 Regions:**
 - East Side (3 regions)
 - Upper DMC (3 regions)
 - Mud & Salt Sloughs (3 regions)
- **Action Levels Defined by Time Series Input**

Drainage Re-scheduling

- **Actions Applied to 6 Regions:**
 - Upper DMC (3 regions)
 - Mud & Salt Sloughs (3 regions)
- **Model-Prescribed Action Level**
- **User Specifications**
 - Storage diversion period
 - Maximum storage volume
 - Maximum residence time

New Melones Releases

- **Model-Prescribed Action Level**
 - **Baseline Water Quality Operation Removed**
- **User Specifications**
 - **Period of operation**
 - **Maximum annual release**
 - **Water quality**

DMC Re-circulation

- **Model-Prescribed Action Level**
- **Accomplished With Available Delta Pumping Capacity**
 - **Tracy first, Banks second**
 - **Available summer capacity “lumped”**
 - **Available capacity limited by E/I ratio, B2-EWA restrictions and higher pumping priorities**

DMC Re-circulation (cont' d)

- **Tracy Pumping Priorities**
 - **CVP contract deliveries**
 - **Export of additional CVP stored water**
 - **CVP water transfers**
 - **SWP exports through JPOD**
 - **DMC re-circulation**

DMC Re-circulation (cont' d)

■ Banks Pumping Priorities

- SWP contract deliveries (including 500 cfs Jul-Sep EWA reservation)
- SWP water transfers
- Additional EWA reservation
- CVP exports through JPOD
- DMC re-circulation

DMC Re-circulation (cont' d)

■ User Specifications

- Period of operation
- Conveyance losses by month and water year type
- Water quality changes by month and water year type resulting from Delta actions (e.g. Frank's Tract)

■ 3 Priorities for Salinity Management

- “High” Priority – before New Melones
- “Mid” Priority – after New Melones
- “Low” Priority – “pay” E/I cost

DMC Re-circulation (cont' d)

- **2 Priorities for Flow Management**
 - **Vernalis flow targets**
 - **Stockton flow targets**
- **User Specifications for HORB Operations**
 - **Maximum flow split by month**
 - **Minimum Old River flow by month**
 - **Consumptive use on San Joaquin River**

Purchases

- **Actions Applied to East Side Tributaries and Region Upstream of Merced River**
- **User Specifications**
 - **Period of operation**
 - **Maximum annual purchase**
 - **Water quality**
- **Identical logic for salinity and flow management**

Water Costs

- **Defined Relative to CVP-SWP Delta Operations**
 - **Reduced Delta inflow = cost**
 - **Increased Delta inflow = benefit**

Baseline Assumptions

- **Delta & Sacramento River Watershed Based on CALSIM OCAP Study**
 - **2020 Level of Development**
 - **Banks 8,500 cfs permitted capacity**
 - **CVP-SWP intertie**
 - **CVP & SWP water transfers introduced**
 - **EWA & JPOD actions removed & re-introduced**

Baseline Assumptions (cont' d)

- **San Joaquin River Watershed Based on Preliminary CALSIM Study with Current Level of Development**
- **Fully integrated CALSIM Study Not Available**