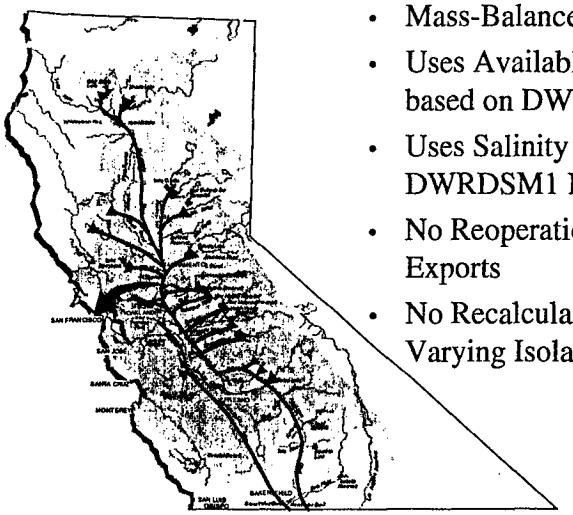
CALFED Bay-Delta Program
CVP/SWP System Water Quality
Initial Evaluation of Alternatives
Using a Post-Processing Spreadsheet Model

Spreadsheet Post-Processing System Water Quality Model

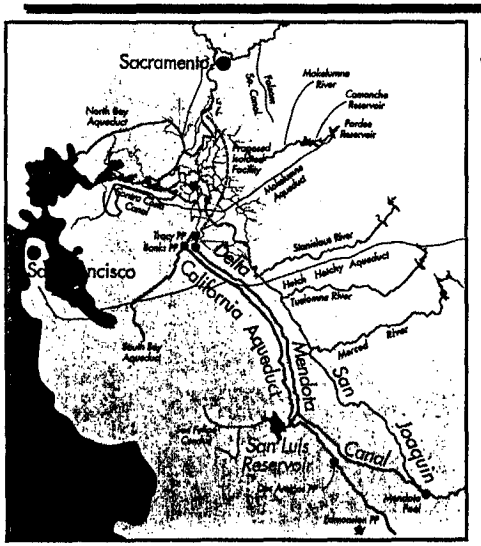


- Mass-Balance Spreadsheet Model
- Uses Available Flows and Capacities based on DWRSIM Modeling
- Uses Salinity (TDS) based on DWRDSM1 Modeling
- No Reoperation of Banks/Tracy Exports
- No Recalculation of Delta Salinity for Varying Isolated Facility (I.F.) Sizes

Spreadsheet Evaluation Process

- Use Available Flows and Capacities based on DWRSIM Study 500 (10.3K Banks + 5k I.F. + 3 MAF NDSS + 2 MAF SDSS)
- Use Salinity (TDS) based on DWRDSM1 Study for Alternative 3B (5000 cfs I.F.) - Hydrology is based on Study 472B (10,300 cfs Banks)

Spreadsheet Evaluation Process



- Assumptions for Water Quality Assessment
  - Isolated Facility (I.F.) Size
  - I.F. Water Quality Blending between SWP and CVP
  - O'Neill Bypass Operation
  - New Water Quality Reservoir at Three Different Locations: Los Vaqueros, LBG, Sunflower
  - Re-operate New Reservoir for Improved Water Quality

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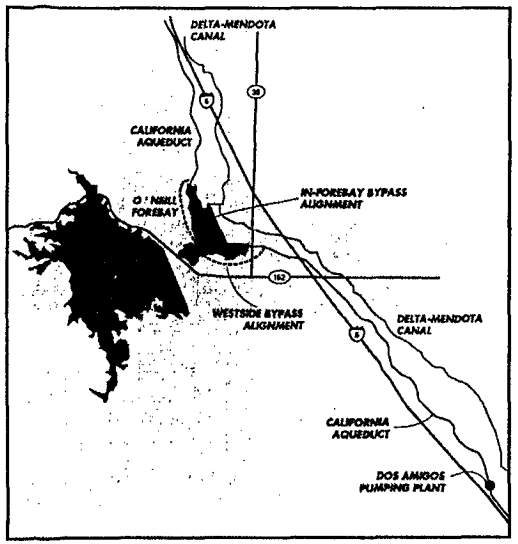
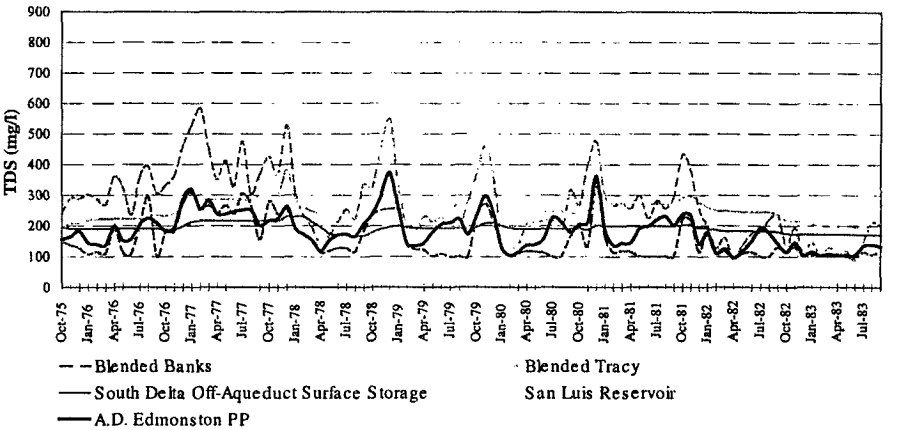
Spreadsheet Evaluation Process



- O'Neill Bypass
  - Bypass O'Neill Forebay to fill urban water storage and use demands downstream of Dos Amigos
  - Use remainder to fill the SWP share of San Luis

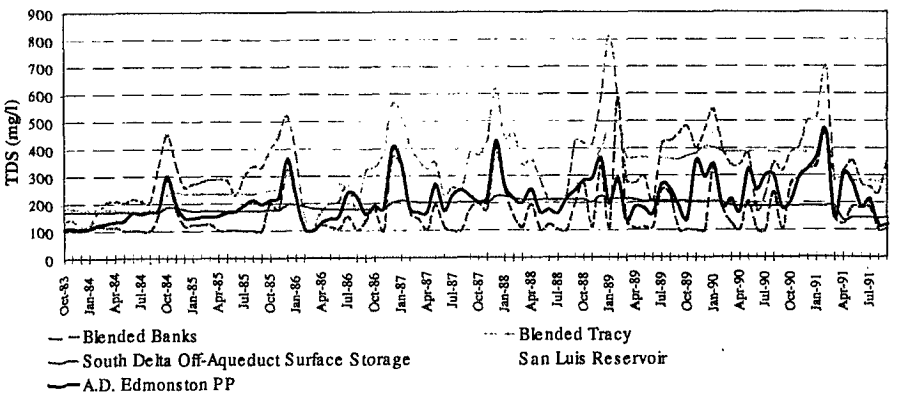
Spreadsheet Evaluation Process

Isolated Facility = 5,000 cfs / Maximize SWP Water Quality / Bypass = Yes
Reservoir Location = Los Vaqueros / Water Quality Operation = No



Spreadsheet Evaluation Process

Isolated Facility = 5,000 cfs / Maximize SWP Water Quality / Bypass = Yes
Reservoir Location = Los Vaqueros / Water Quality Operation = No



Water Quality Spreadsheet Evaluation of Isolated Facility Physical Capacity

- Assessment for **0 - 5,000** cfs Isolated Facility
  - Post-Processing DWRSIM Study 500 for new I.F. Physical Capacity under the existing 3000 cfs Thru-Delta Criteria - (No Changes in CVP/SWP Exports Patterns)
  - With and Without O'Neill Bypass
- Assessment for **6,000 - 10,000** cfs Isolated Facility
  - Post-Processing DWRSIM Study 500 for new I.F. Physical Capacity under a new 0 cfs Thru-Delta Criteria - (No Changes in CVP/SWP Export Patterns)
  - With and Without O'Neill Bypass

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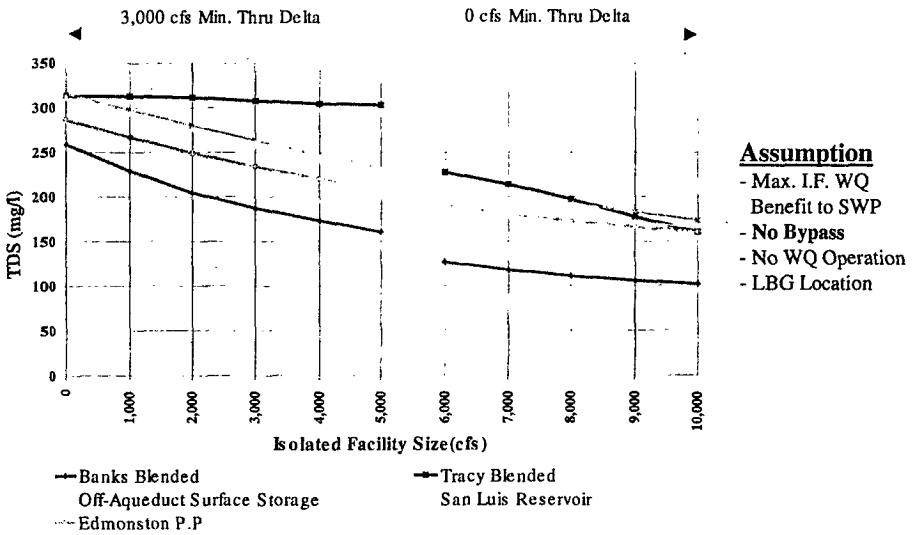
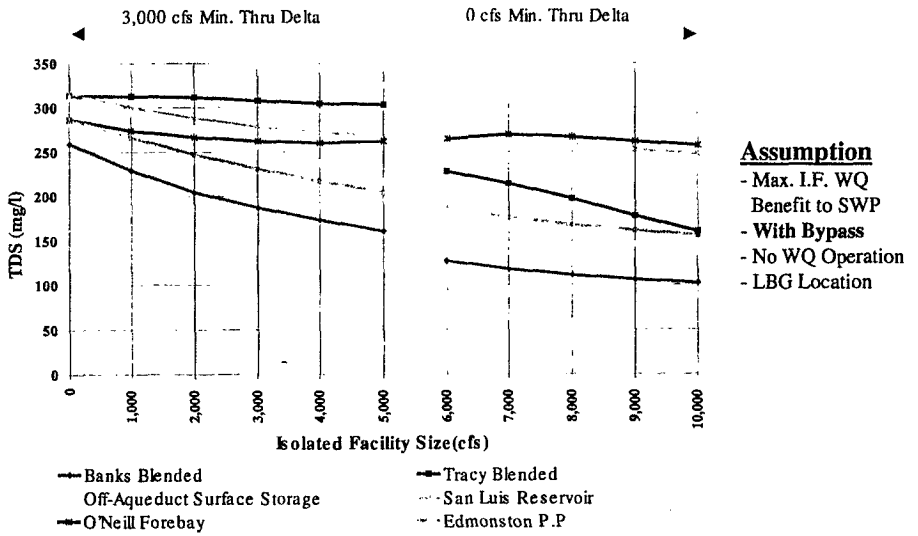
Water Quality Benefit of Varying Isolated Facility Sizes



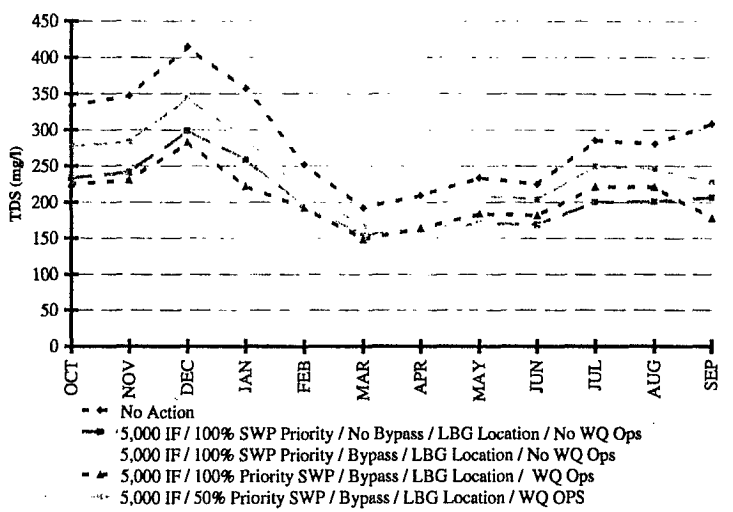
Water Quality Benefits of Varying Isolated Facility Sizes



Water Quality Spreadsheet Evaluation of O'Neill Bypass & SWP I.F. Priority

- **Group 1** - Assessment for **5,000** cfs Isolated Facility
  - 50% & 100% SWP Priority to I.F. Water Quality Benefits
  - With and Without an O'Neill Bypass
  - With and Without New Reservoir Re-operated for Improved Water Quality
  - Using a LBG Location

Edmonston Pumping Plant 1975-91 Monthly Average TDS (Group 1)



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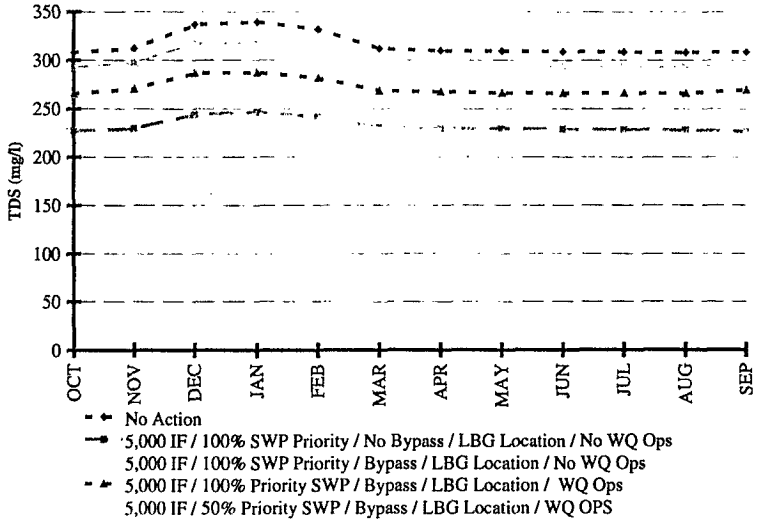
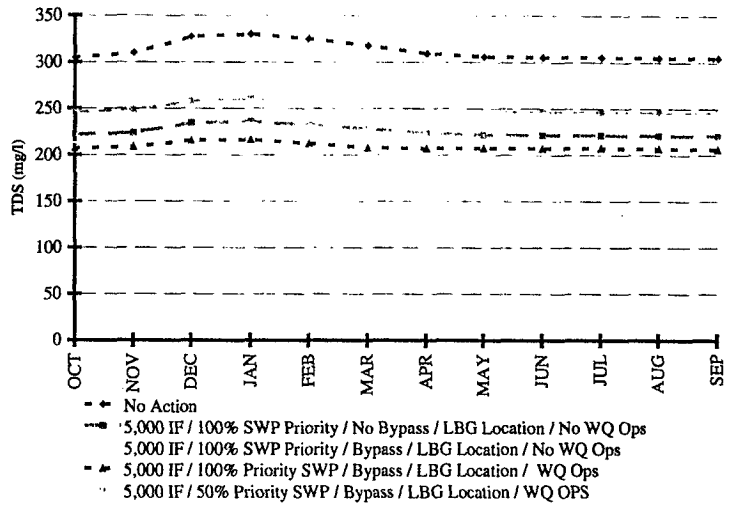
San Luis Reservoir
1975-91 Monthly Average TDS (Group 1)



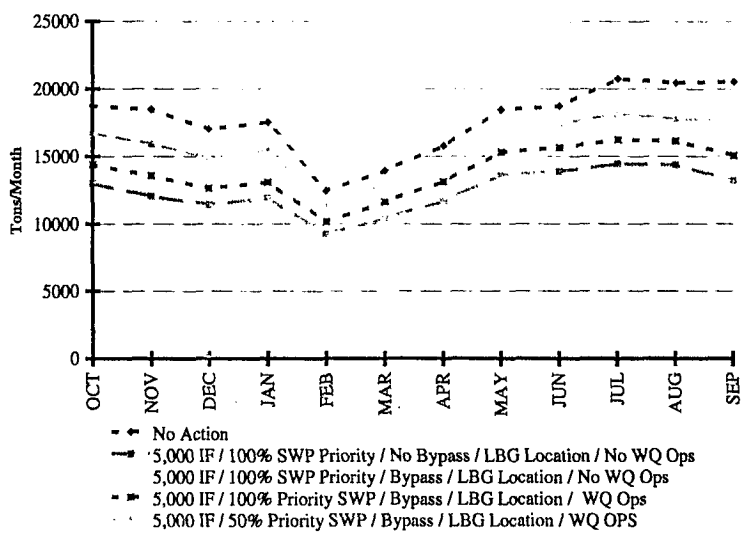
South Off-Aqueduct Reservoir
1975-91 Monthly Average TDS (Group 1)



Water Quality Spreadsheet Evaluation of O'Neill Bypass & SWP I.F. Priority

- **Service Area TDS Loading** - *(Group 1)*
  - South Bay
  - Southern California
  - Coastal Aqueduct
  - CVP San Luis
  - SWP Kern/Tulare
  - CVP DMC/Exchange

South Bay Service Area
1975-91 Monthly Average Tons (Group 1)



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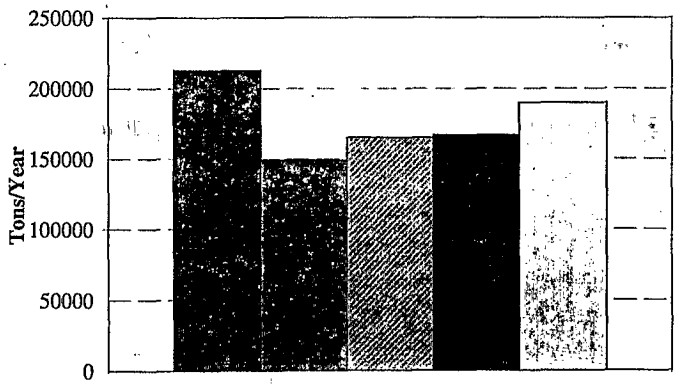
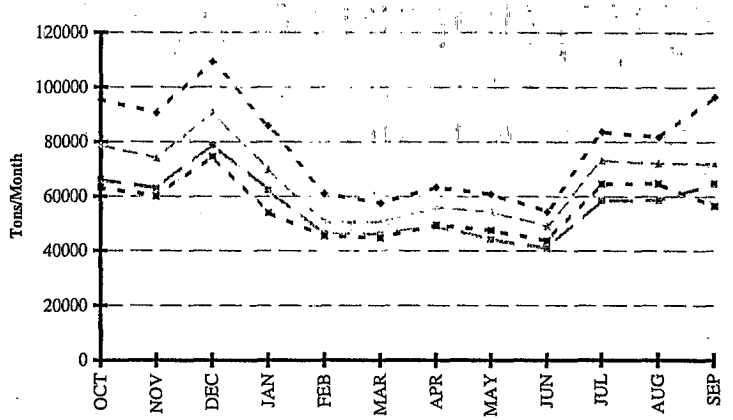
South Bay Service Area
1975-91 Annual Average Tons (Group 1)



- No Action
- 5,000 IF / 100% SWP Priority / No Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% SWP Priority / Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

Southern California Service Area
1975-91 Monthly Average Tons (Group 1)



- No Action
- 5,000 IF / 100% SWP Priority / No Bypass / LBG Location / No WQ Ops
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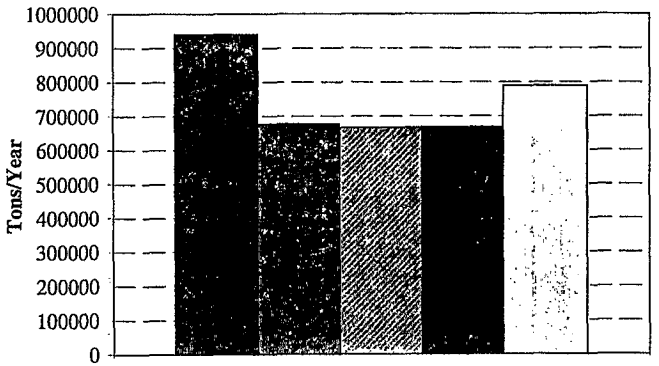
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

Southern California Service Area
1975-91 Annual Average Tons (Group 1)



- No Action
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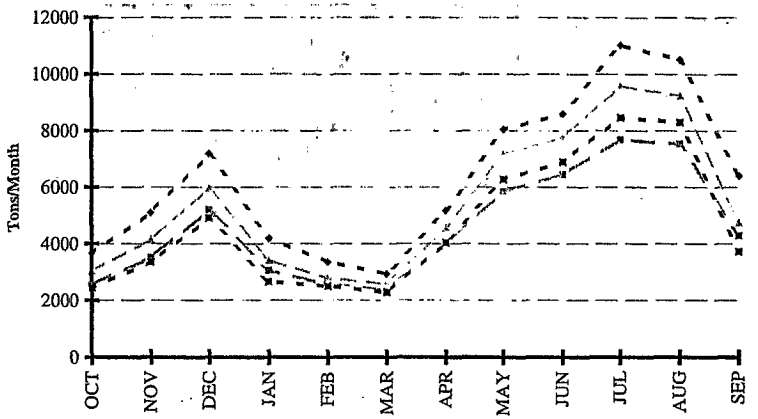
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

Coastal Aqueduct Service Area
1975-91 Monthly Average Tons (Group 1)



- No Action
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- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

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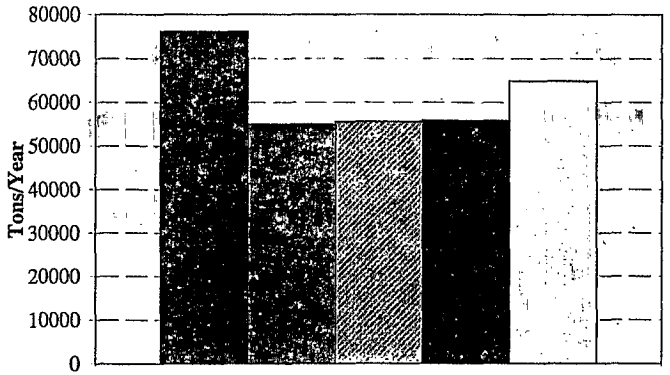
Coastal Aqueduct Service Area
1975-91 Annual Average Tons (Group 1)



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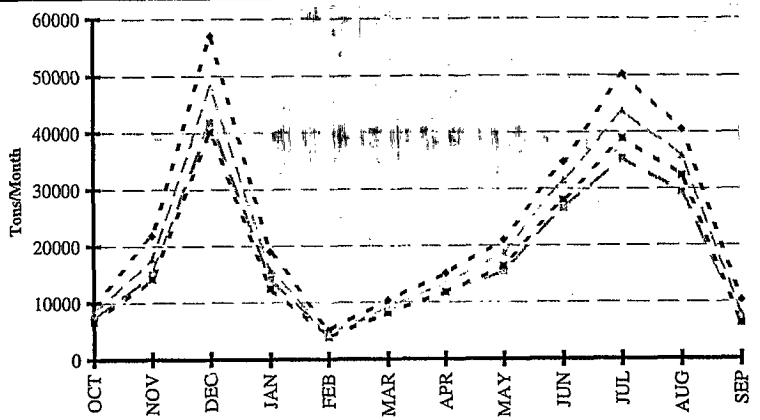
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

CVP San Luis Service Area
1975-91 Monthly Average Tons (Group 1)



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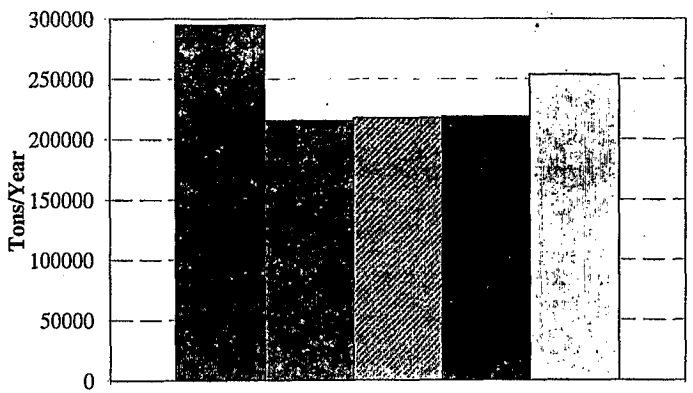
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

CVP San Luis Service Area
1975-91 Annual Average Tons (Group 1)



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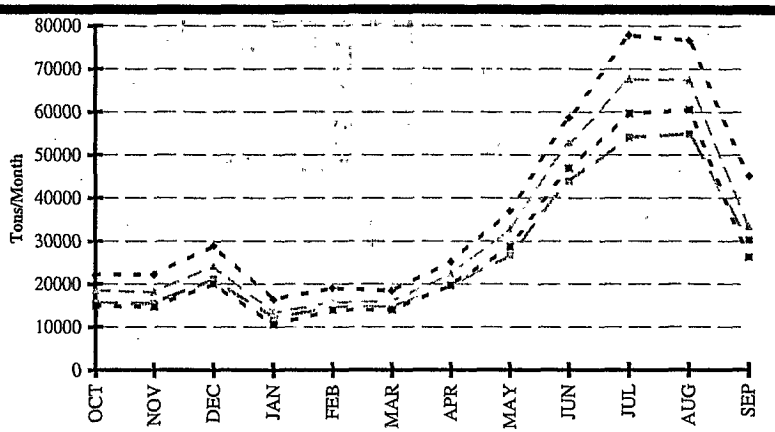
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

SWP Kern/Tulare Service Area
1975-91 Monthly Average Tons (Group 1)



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- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

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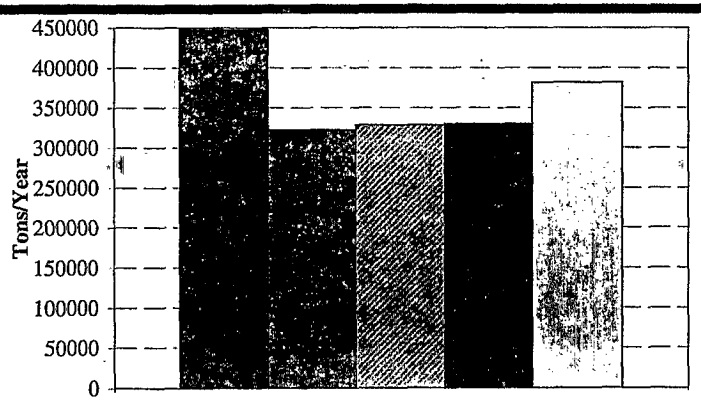
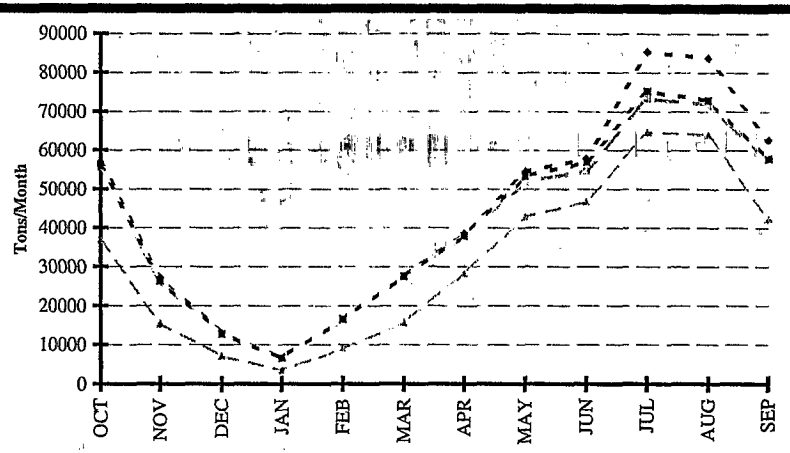
SWP Kern/Tulare Service Area 1975-91 Annual Average Tons (Group 1)



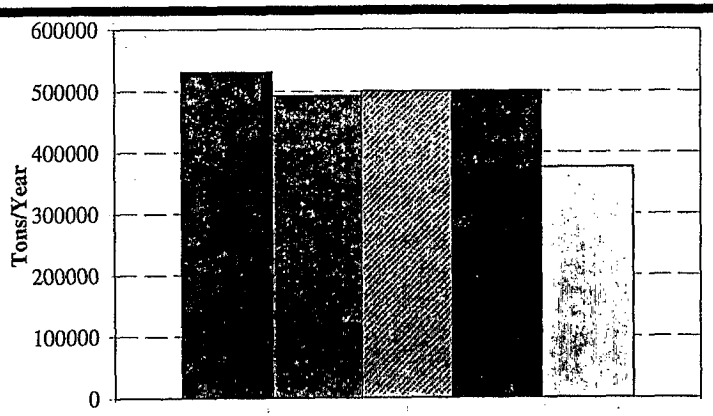
- No Action
- 5,000 IF / 100% SWP Priority / No Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% SWP Priority / Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

CVP DMC/Exchange Service Area 1975-91 Monthly Average Tons (Group 1)



- No Action
- 5,000 IF / 100% SWP Priority / No Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% SWP Priority / Bypass / LBG Location / No WQ Ops
- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

CVP DMC/Exchange Service Area 1975-91 Annual Average Tons (Group 1)



- No Action
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- 5,000 IF / 100% Priority SWP / Bypass / LBG Location / WQ Ops
- 5,000 IF / 50% Priority SWP / Bypass / LBG Location / WQ OPS

Water Quality Spreadsheet Evaluation of O'Neill Bypass & New Reservoir Location

- **Group 2** - Assessment for **5,000** cfs Isolated Facility
  - 100% SWP Priority to I.F. Water Quality Benefits
  - With and Without an O'Neill Bypass
  - With New South of Delta Off-Aqueduct Reservoir Re-operated for Improved Water Quality
  - Using a **LBG, Sunflower** & **Los Vaqueros** Locations

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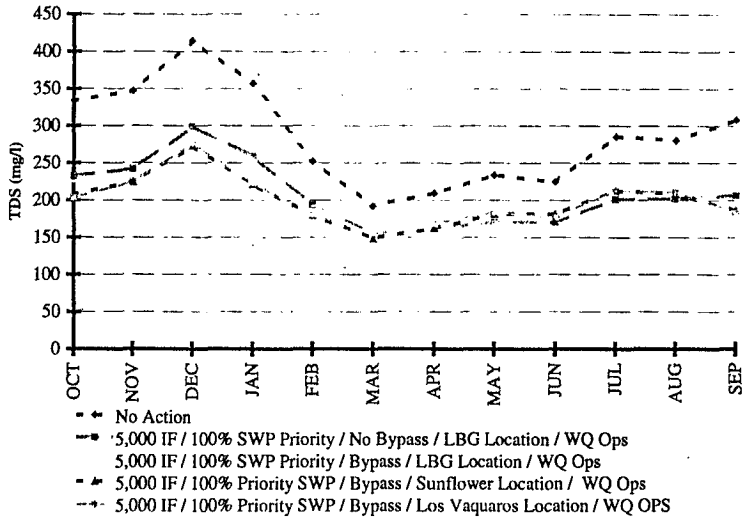
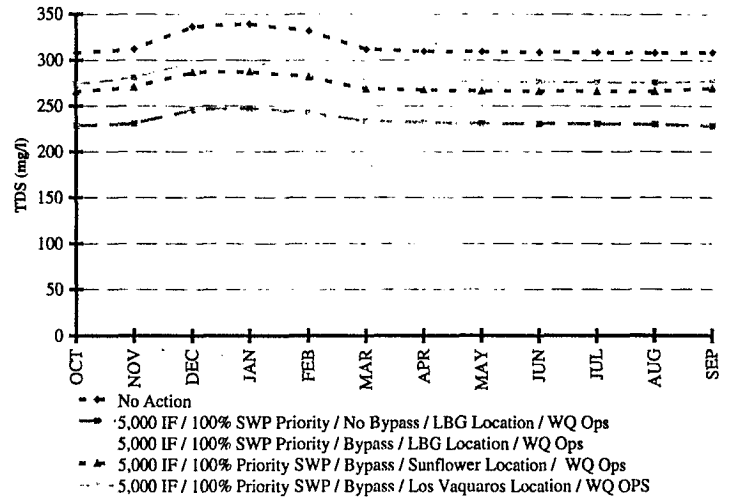
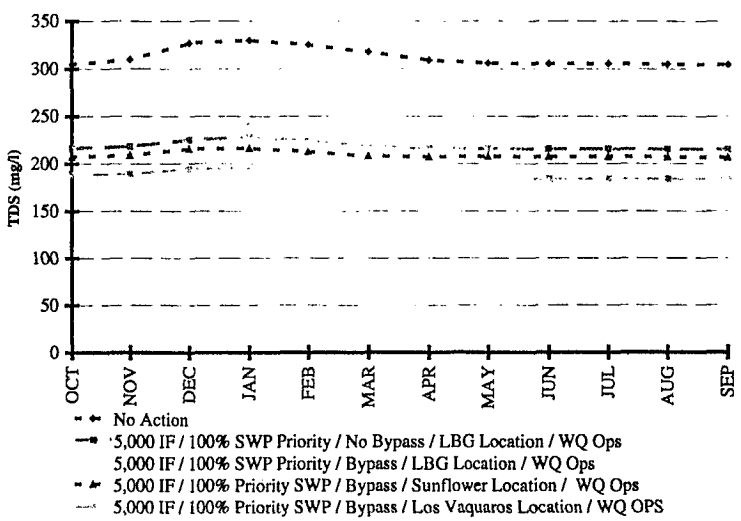
Edmonston Pumping Plant 1975-91 Monthly Average TDS (Group 2)



San Luis Reservoir 1975-91 Monthly Average TDS (Group 2)



South Off-Aqueduct Reservoir 1975-91 Monthly Average TDS (Group 2)



Findings

- Isolated Facility physical capacity provides significant export water quality benefits, but incremental water quality benefits decrease with larger physical capacities
- Isolated Facility Water Quality Blending between the CVP and SWP Export Facilities has significant impact on urban water quality
- O'Neill Bypass provides no or little water quality benefits to urban water users.

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Findings

- Location of new south of Delta off-stream reservoir has no or little impacts on system water quality under existing conveyance configurations.
- Re-operation of new south of Delta off-stream reservoir for water quality purposes has no or little benefits on system water quality
- CVP operations of San Luis unit has significant impacts urban water quality (Southern California water quality increasing on average by 50 TDS over Banks PP)

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