Environmental Water Account

Planning a Longer-Term EWA: Technical Tools and Information For Evaluating Water Supply, Transfers, and Operational Issues

EWA Technical Review Panel

November 9, 2004

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What is a "Longer-Term" EWA?

- An EWA beginning by late 2007, perhaps sooner, and extending beyond 2007
- An EWA with a 10-year planning horizon
- An EWA that addresses OCAP, 8,500 cfs Banks, and South Delta Improvements Program
- An EWA incorporating expanded tools

EWA Purpose and Need

- Flexible, reliable, and sustainable strategy to protect at-risk native fish species
- Contribute to the recovery of these species
- Allow timely water management
- Improve water supply reliability
- Replace project water lost due to pump curtailments

How EWA Works

- EWA Agencies decide to reduce pumping at Banks PP and Tracy PP in Delta to protect fish (Dec-June)
- EWA Agencies purchase replacement water and return it to the CVP and SWP (Jul-Sep, mostly)
- EWA Agencies try to provide multiple benefits as water is delivered

Technical Tools

- Gaming used to estimate fish needs with 8,500 cfs Banks
- CALSIM II applied to estimate EWA needs; time-consuming, logic limiting in modeling EWA water management
- EWA Operations Model developed to assist in developing long-term EWA

EWA Operations Model

Model Objectives:

- To develop a fully operational Environmental Water Account for the next 10 years
- To determine the effectiveness of the proposed tools (EWA assets) to meet fishery needs

EWA Operations Model

Model Development:

- Excel spreadsheet model
- Annual time step over 73 years
- Provision to test multiple EWA tools
- Multiple user-selected options
- Based on CALSIM II output
- Builds on current EWA operations

EWA Operations Model

Model Assumptions:

- Assumes 73-year hydrology record is representative
- Fish actions (pumping cuts) from gaming
- Existing water sellers will continue to sell to EWA and new sellers will emerge
- Sufficient water will be available to EWA

EWA Operations Model

Model Assumptions:

- Banks Pumping Plant will be permitted at 8,500 cfs
- EWA has dedicated Banks capacity and can use available excess capacity
- EWA will transfer its upstream of Delta purchases July-September

EWA Operations Model

Model Assumptions:

- Tools and water sources proposed by agencies and contractors are included
- Purchase strategy and costs will vary by year type, SWP/CVP allocation, and Banks capacity

EWA Operations Model

CALSIM-Based Model Input:

- Available capacity at Banks PP
- Ability to pump (b)(2) and ERP upstream releases
- Use of Joint Point to erase EWA debt
- Ability to back up water during pump curtailments and transfer the water
- Reservoir levels and related data

EWA Operations Model

Water Cost Assumptions:

- 2003 unit prices adjusted for year type
- Fixed annual costs for staff, energy, environmental, and other costs
- Advance-payment discounts apply to long-term purchase contracts
- Cash flow credit/debit accumulation is allowed

EWA Operations Model

Model Features

- Allows alternative fish needs estimates
- Allows alternative purchase targets
- Estimates operational assets:
  - Export/Inflow ratio relaxation
  - Pumping backed-up EWA water
  - Pumping upstream (b)(2) releases
  - Use of Joint Point to erase EWA debt

EWA Operations Model

Model Features (Continued)

- Activates Source Shift when needed
- Allows uneven exchanges to protect EWA assets from spill when San Luis fills
- Allows Dry/Wet exchanges with contractors to reduce costs, protect assets, and manage debt
- Allows banking in Semitropic groundwater bank to protect assets and manage debt

EWA Operations Model

Model Features (Continued)

- Allows addition of new sources upstream of the Delta and in the export service area
- Allows dedicated water to be accepted by EWA
- Allows purchases to be reduced when EWA has excess water, increased when excess debt

EWA Operations Model

Model Features (Continued)

- Provides 50% credit for EWA cuts between 6,680 and 8,500 cfs March-May
- Allows joint purchases in export service area to obtain wet year water for EWA (could include land retirement)
- Allows EWA to receive Phase 8 (SVWMA) water in above normal years

EWA Operations Model

Model Features (Continued)

- Allows 100 TAF debt to projects over year-end
- Allows debt-intensive or normal operation
- Provides visual displays of results
- Provides cumulative water balance data

EWA Operations Model

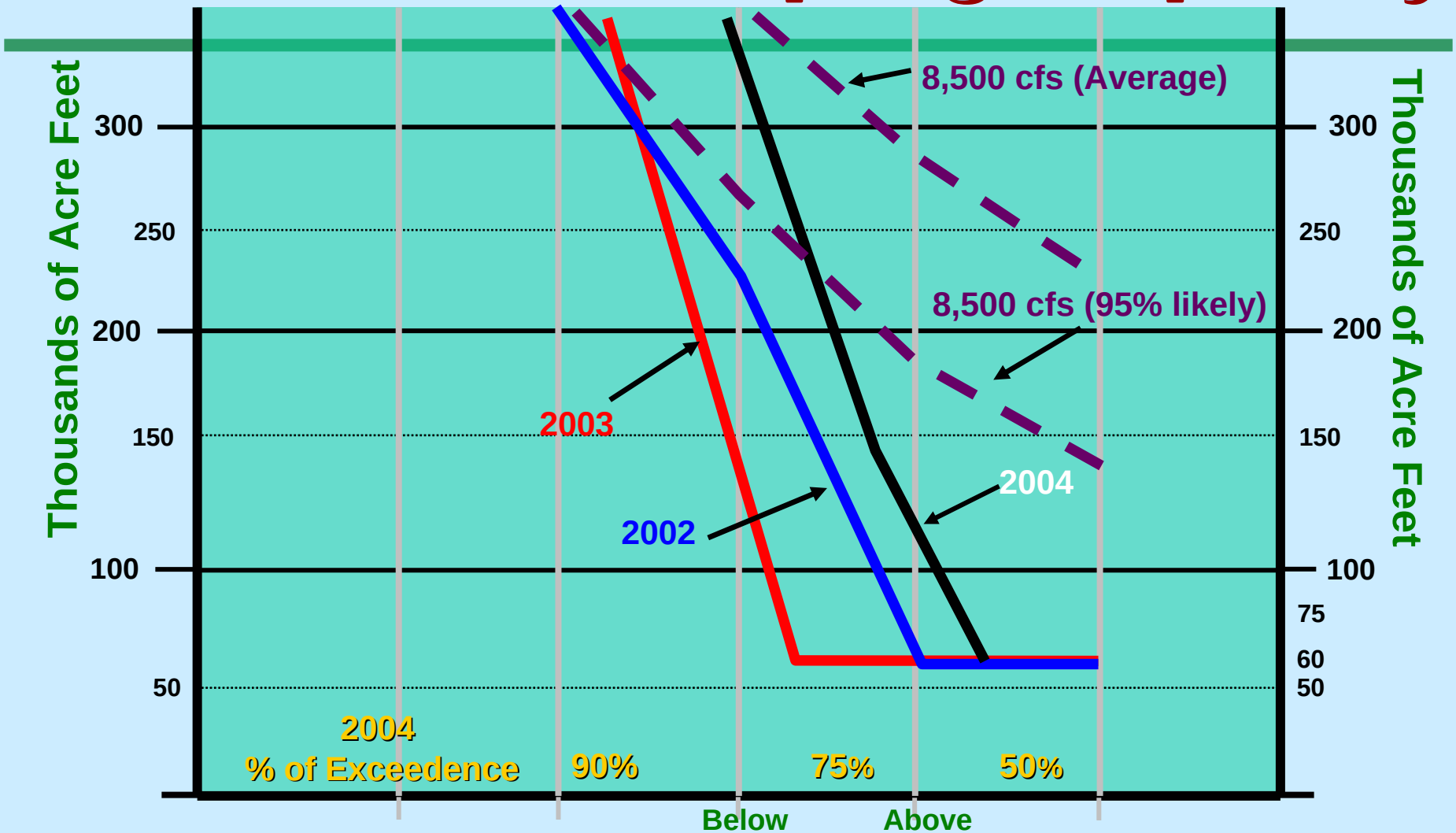
Model Features - Cost Estimating

- Allows bond purchases and advance payment discounts for multi-year deals
- Water cost can vary by source, year type
- Input for staff costs, energy, mitigation, environmental documentation, science
- Allows initial bankroll to bridge high-cost years, and tracks cumulative cash flow

EWA Operations Model Logic

- Primarily a 73-year accounting model
- Takes fish actions (cuts in Delta pumping) according to input assumptions
- Buys water according to input assumptions
- Seeks low cost purchase program
- Pushes purchases upstream as much as available Banks capacity will allow

EWA Delta Pumping Capacity



D 1641 Year Type	Critical	Dry	Below Normal	Above Normal	Wet
Approx. SWP Delivery	<25%	35%	60%	85%	100%

EWA Operations Model Logic

- Assumes there is enough water for sale to meet all EWA needs
- Computes operational assets, carryover
- Purchases water next, then activates exchanges, then uses debt, finally exercises groundwater banking
- Allows fish actions to be reduced when excess debt builds

EWA Operations Model Logic

Upstream of Delta Purchase Estimates – Purchase Flexibility:

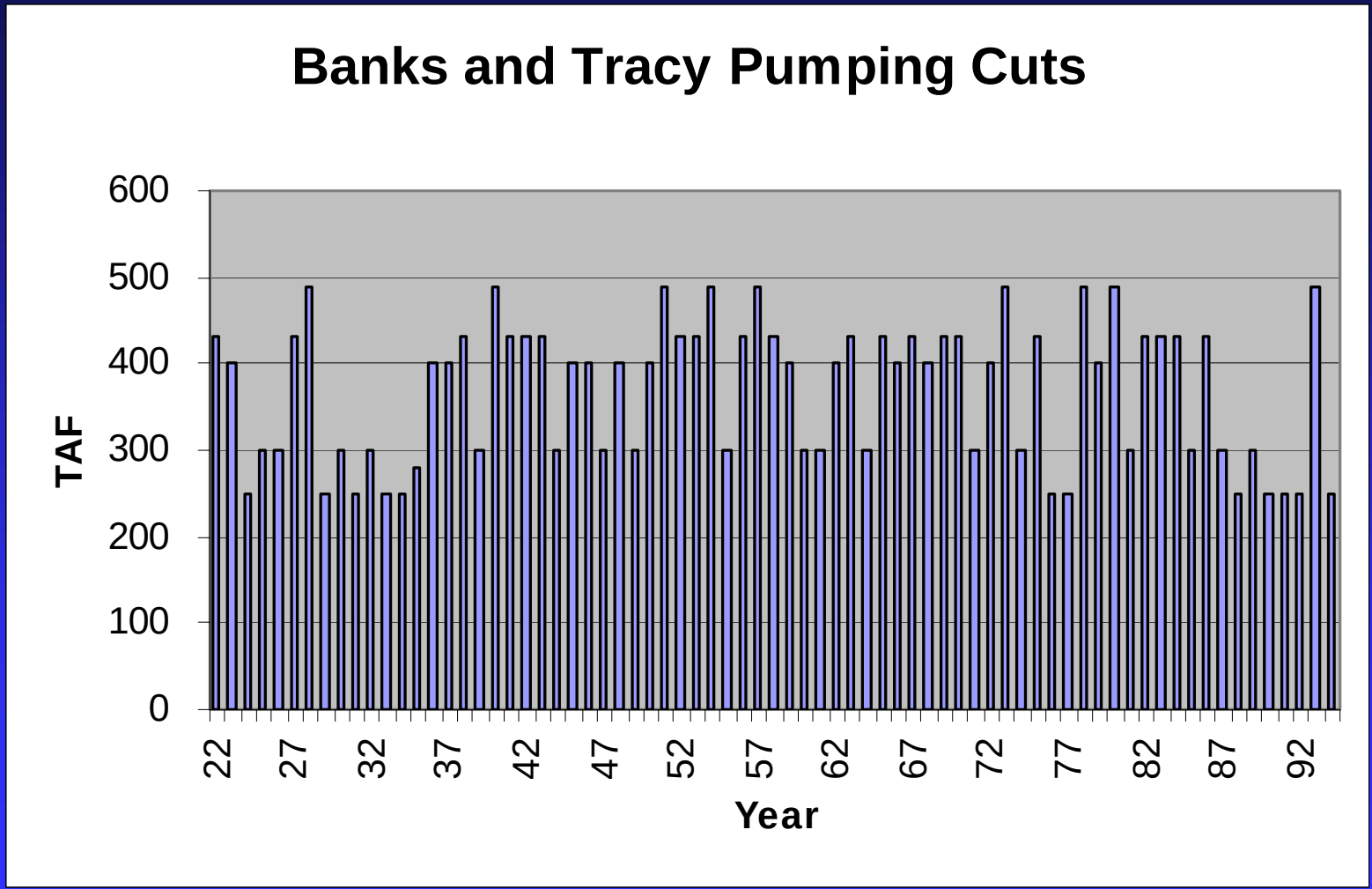
- Allows purchases to be decreased if excess assets accrue
- Running account of water balance is kept
- Additional purchases are made when excess debt accrues, up to available water balance

EWA Operations Model Logic

Water Purchase Priorities:

- Reservoir purchases
- Groundwater substitution
- Banked groundwater from managed groundwater banks
- Crop idling

EWA Operations Model Output



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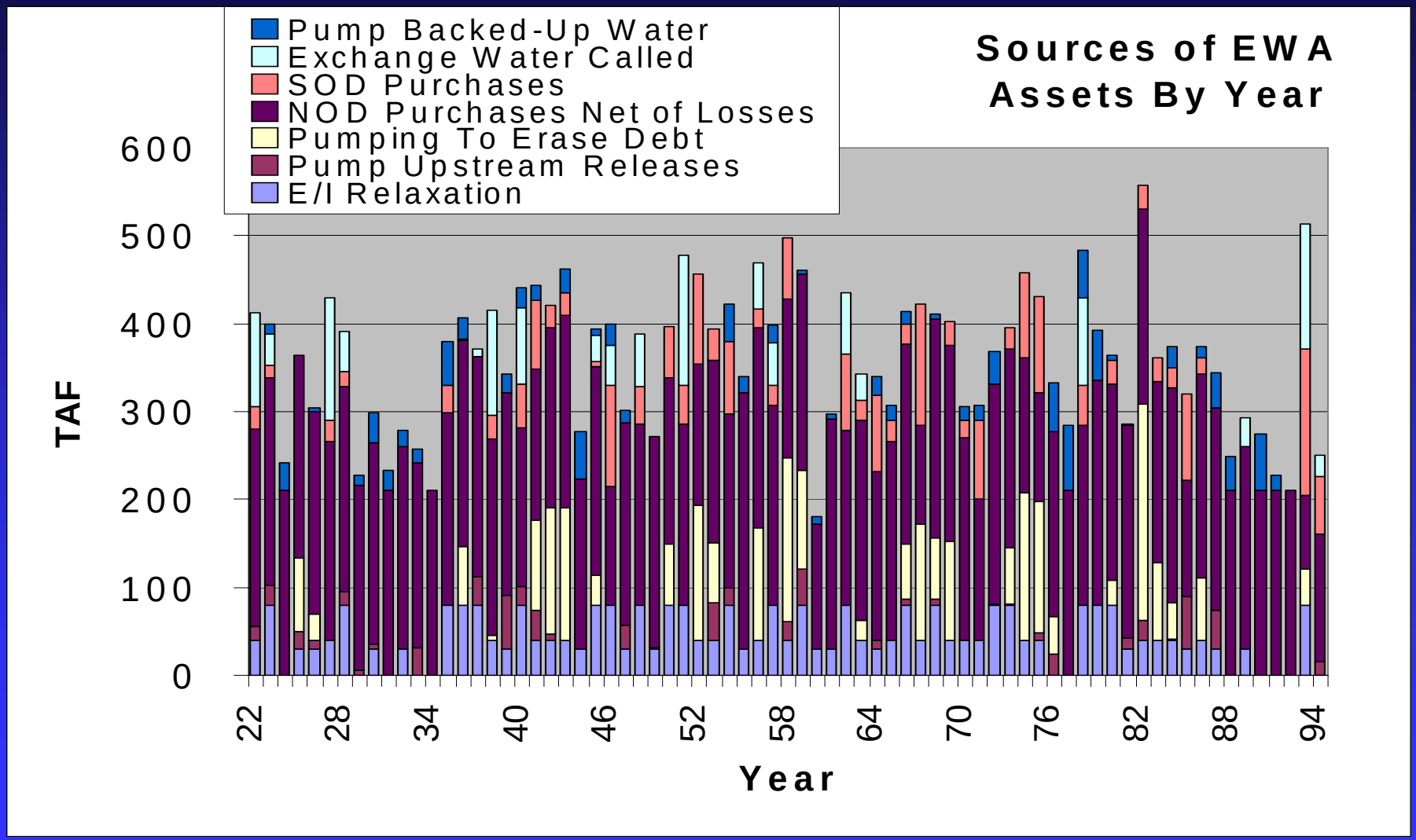

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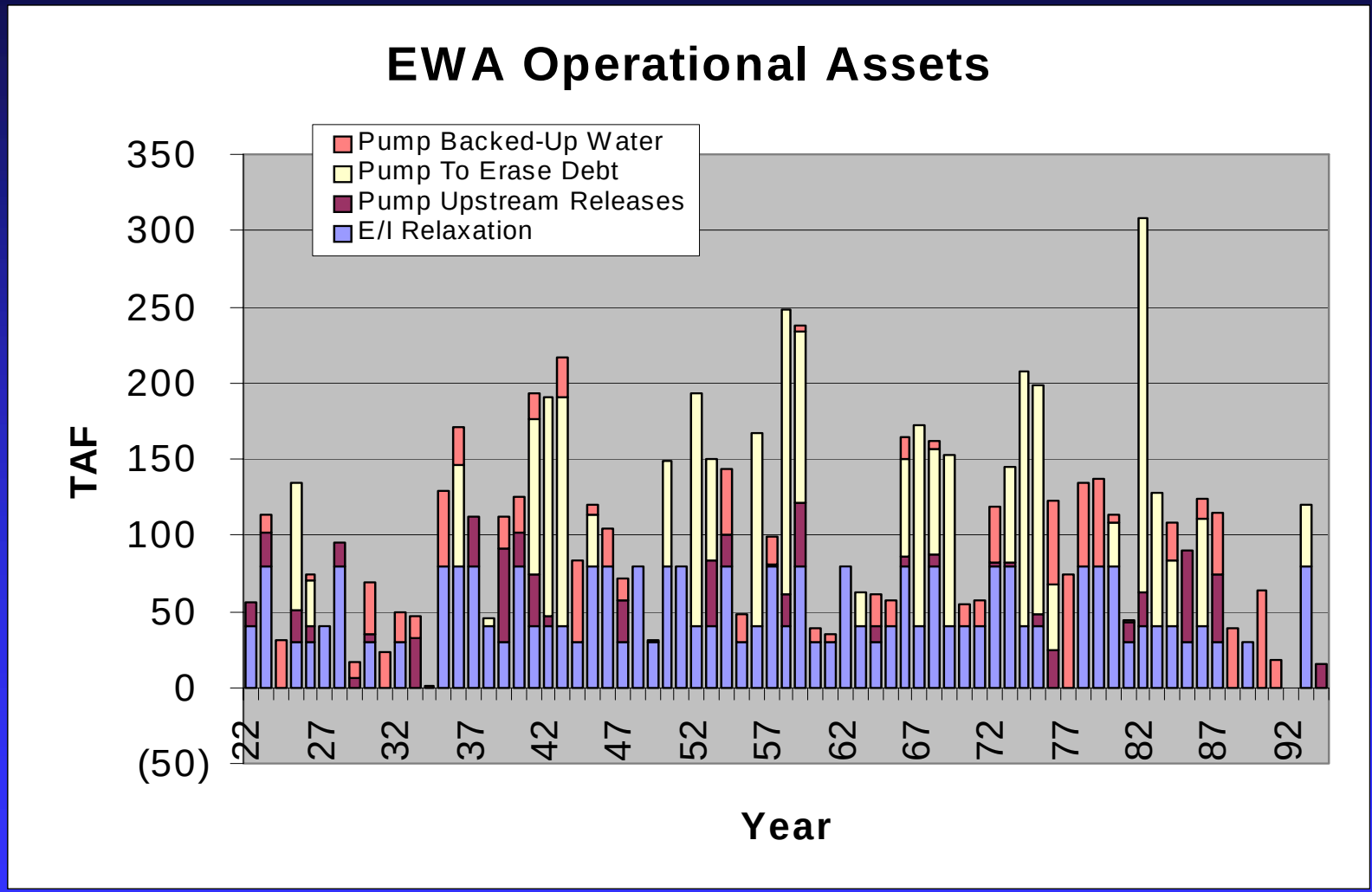

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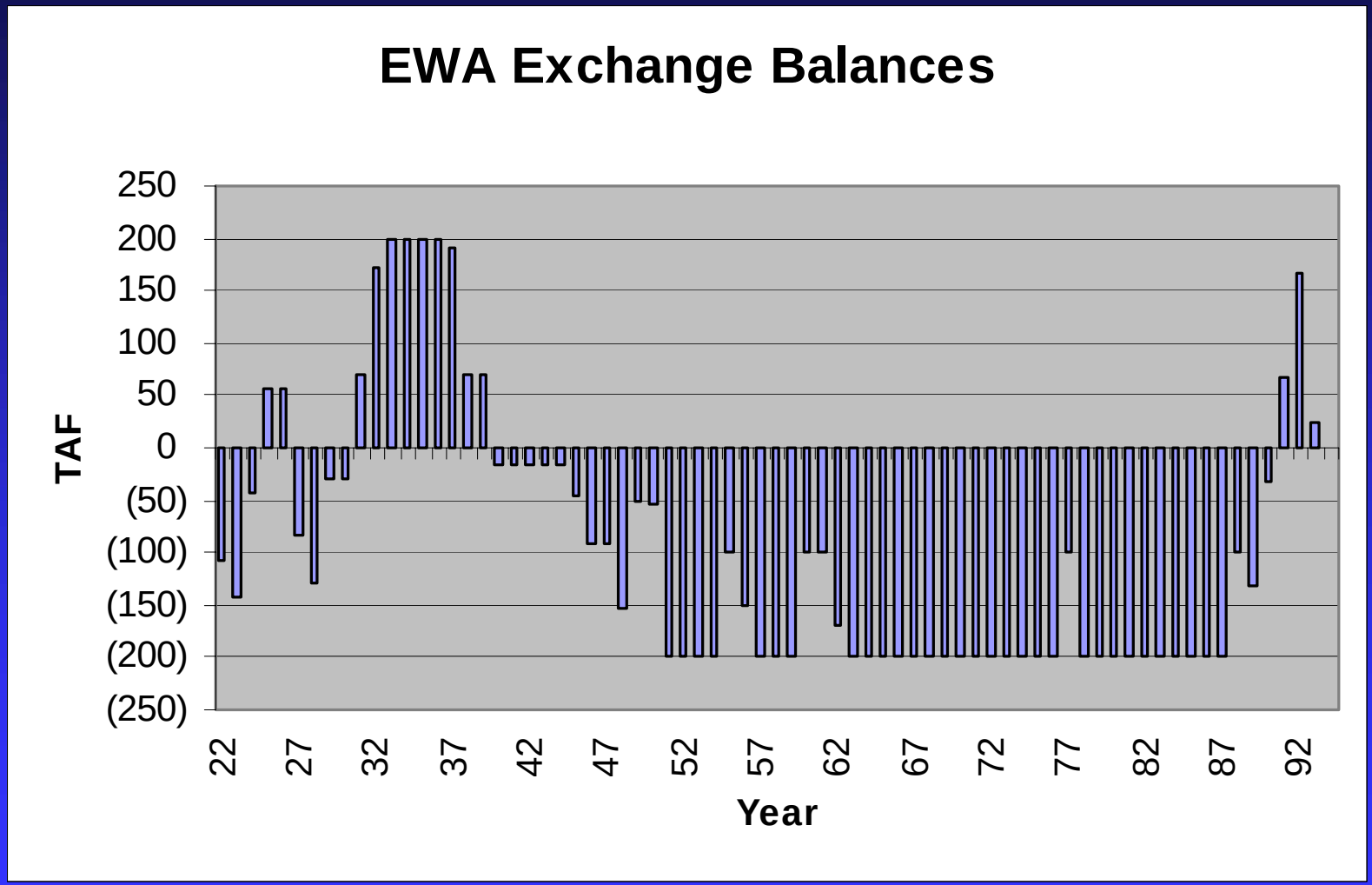

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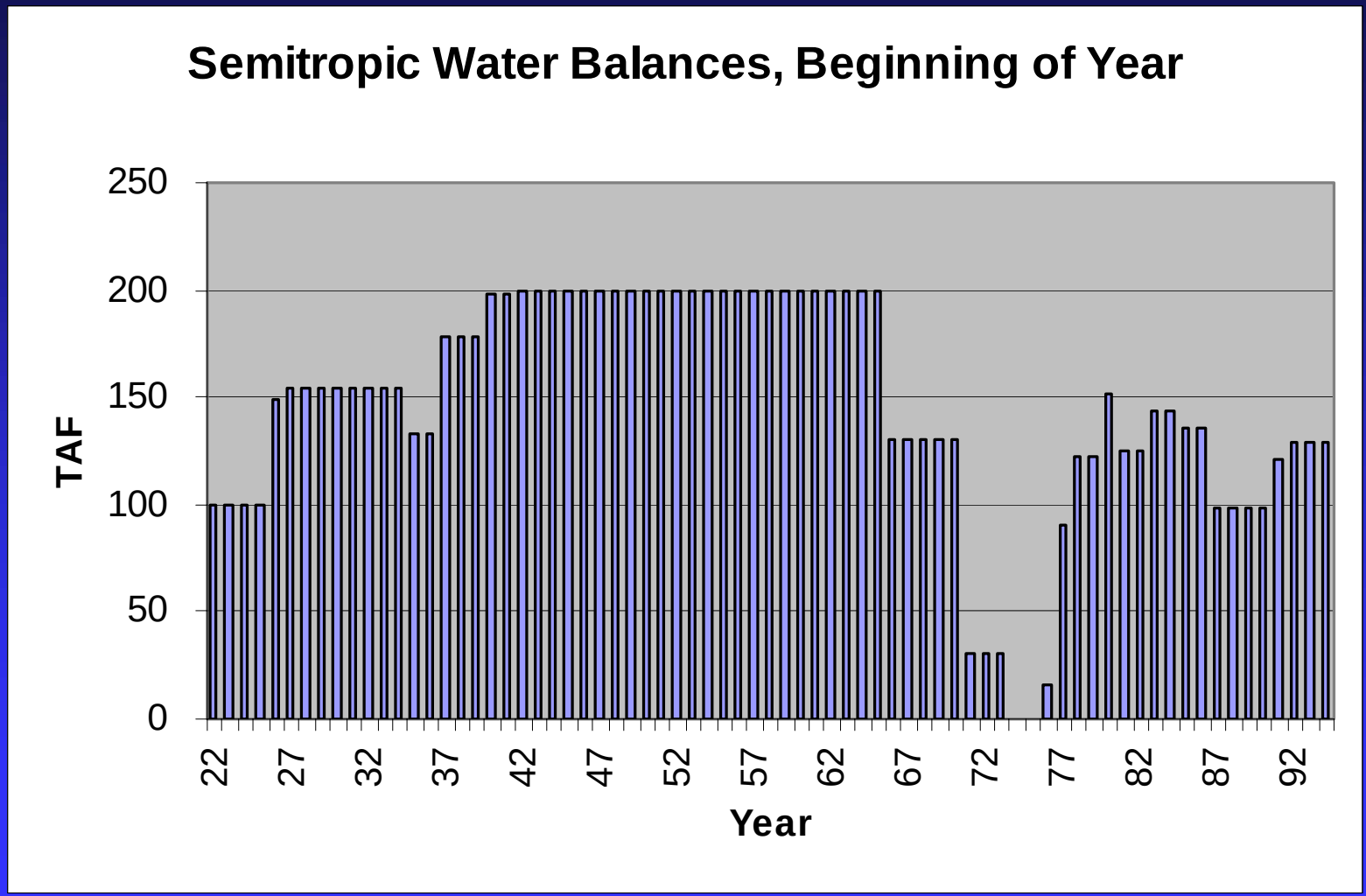

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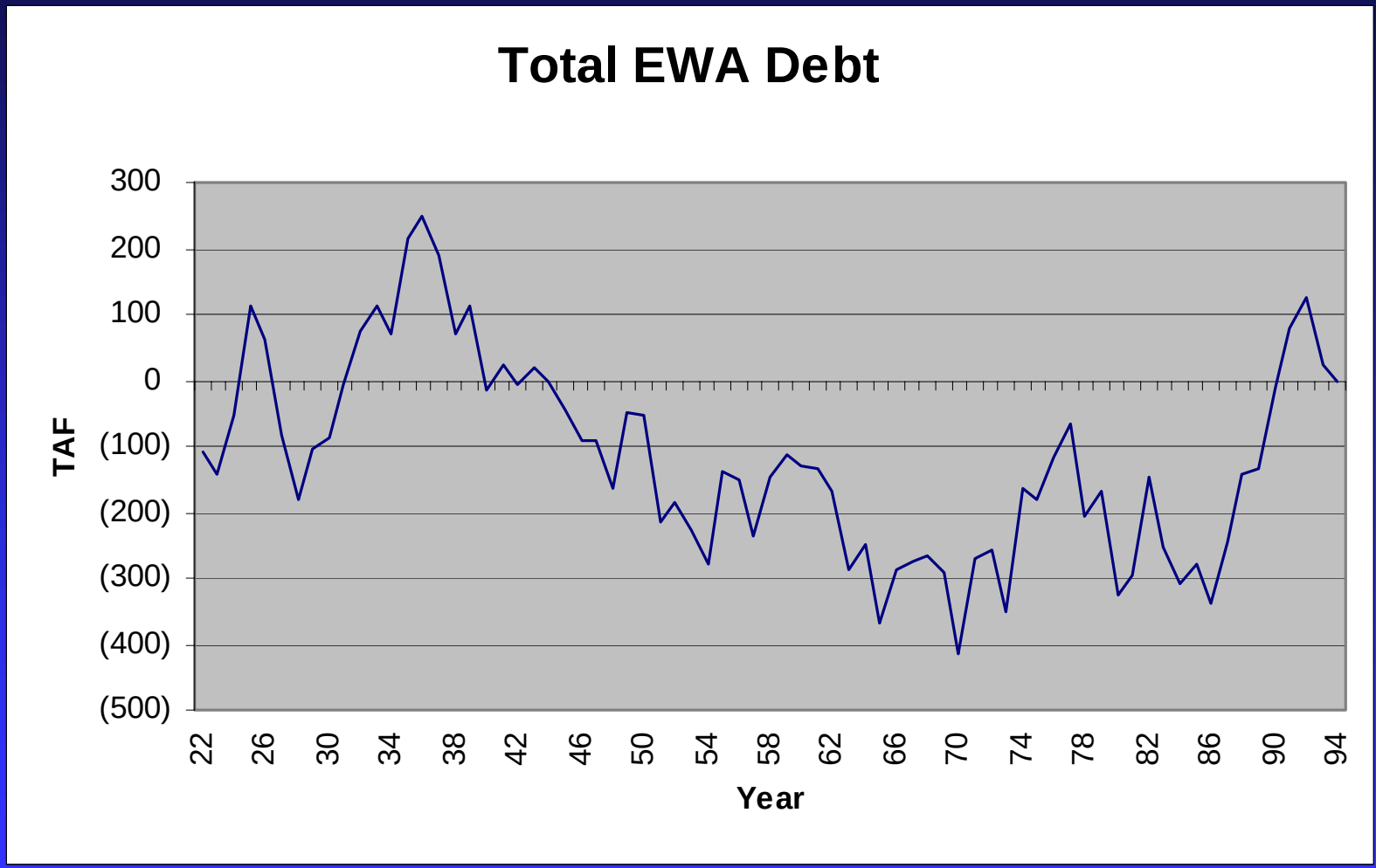

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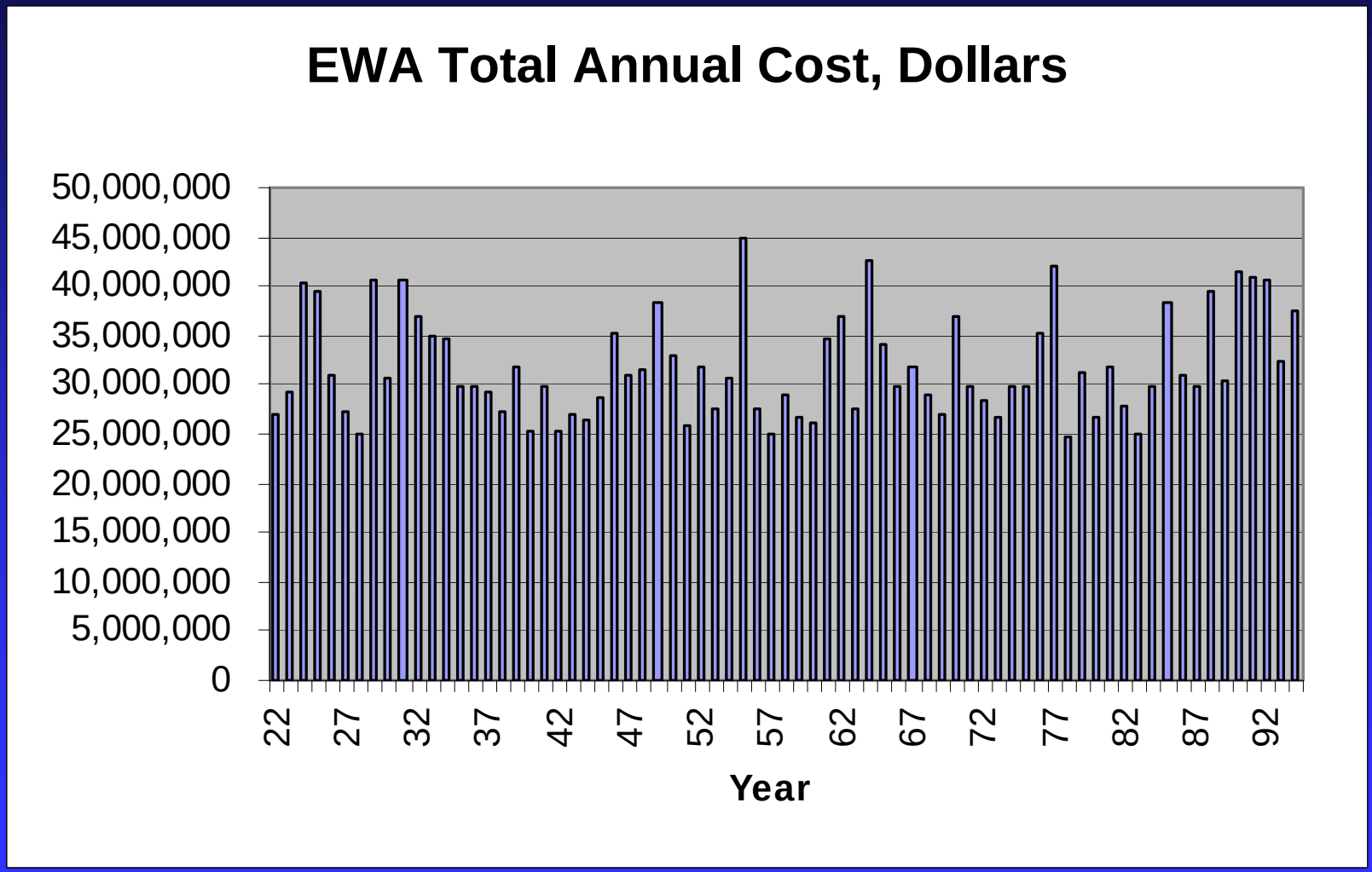

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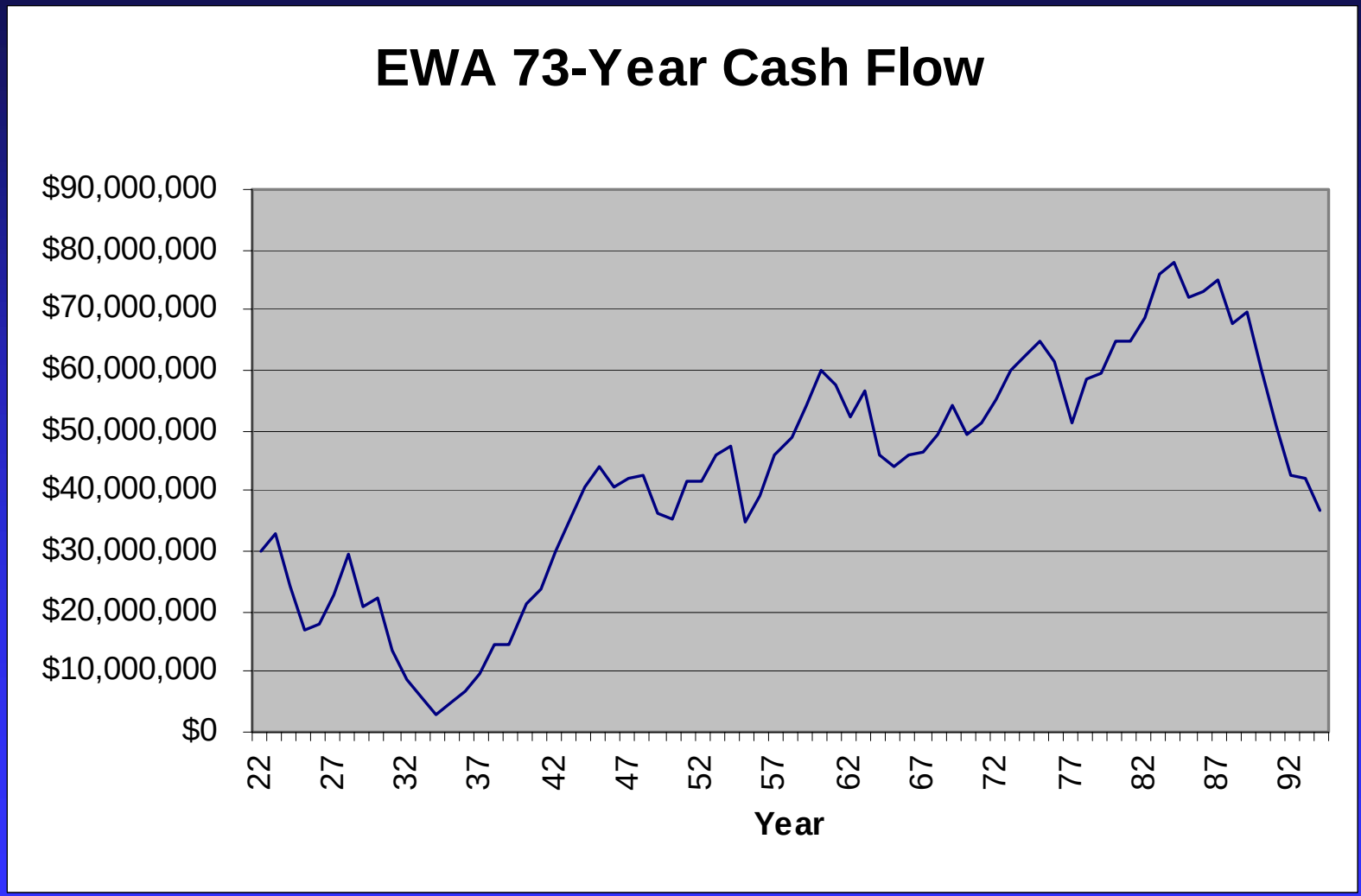

EWA Operations Model Uses

- Developing a size for the EWA
- Testing the adequacy of existing and proposed assets to meet fish action estimated needs
- Developing a long-term EWA budget and financing plan
- Estimating benefits from CALFED water storage programs

EWA Operations Model Uses

- Testing the value of long-term transfers to the EWA (e.g., YCWA)
- Testing the impact of changed reservoir purchases on costs and crop idling
- Providing an independent check on other model output
- (Note: USBR staff is updating CALSIM II to incorporate selected features of the EWA Operations Model)

Environmental Water Account

Question:

- Are the agencies using technical tools (e.g., models, analytical and assessment techniques) that are appropriate and adequate for developing detailed and informed proposals for a longer-term EWA program?

Environmental Water Account

Proposed Answer:

- The EWA Operations Model is one important tool for developing detailed and informed proposals for the water management and asset acquisition aspects of a longer-term EWA program.
- Its adequacy is dependent on input assumptions, especially fish needs and water availability and cost.

Environmental Water Account

Question:

- Are there additional considerations or uncertainties that should be addressed to ensure the agencies obtain and use the information necessary to making informed decisions about a longer-term EWA program?

Environmental Water Account

Proposed Answer:

- From a water management perspective, the major uncertainties are:
  - Availability of sufficient water at acceptable prices in future markets
  - Practical limitations on cross-Delta EWA transfers during the July-September transfer season with Banks at 8,500 cfs.

EWA Operations Model

Summary

- The EWA Operations Model provides a useful tool to develop a longer-term EWA, determine its size, and evaluate potential water sources and management tools

EWA Strategies and Practices

- Questions?