



Santa Clara Valley
Water District



Bay Area Regional Water Quality and Water Supply Reliability Program

Program Summary
Presentation

July 18, 2005

Presentation Overview

- 1. Program Overview**
- 2. Concept and Portfolio Development**
- 3. Concept and Portfolio Analysis**
- 4. Findings and Conclusions**

1. Program Overview

Program Overview

- ◆ **Program Established to Identify Regional Opportunities for Enhancing Water Supply and/or Water Quality for Bay Area Agencies**
- ◆ **Program Identified in CALFED Record of Decision (ROD) for the Final Programmatic Environmental Impact Statement and Environmental Impact Report**
- ◆ **Complementary Action to CALFED Bay-Delta Program**

Bay Area Needs and Interests

- ◆ Drinking water quality and water supply reliability vary significantly around the region depending on water supply sources
- ◆ SFPUC and EBMUD customers have very high source water quality but have water supply reliability needs
- ◆ Some agencies, such as ACWD and some agencies within SCVWD, get both Delta and SFPUC water
- ◆ CCWD, Zone 7, and the portions of SCVWD that don't have access to SFPUC water generally have poorer source water quality
- ◆ Some groundwater sources also have water quality issues such as salinity
- ◆ All Bay Area agencies share dry year water supply challenges

Program Participants

Participating Agencies

- ◆ Alameda County Water District
- ◆ Bay Area Water Supply and Conservation District
- ◆ Contra Costa Water District
- ◆ East Bay Municipal Utility District
- ◆ San Francisco Public Utilities Commission
- ◆ Santa Clara Valley Water District
- ◆ Zone 7 Water Agency

Program Manager

- ◆ California Bay-Delta Authority (Program Manager)

State and Federal Reviewing Agencies

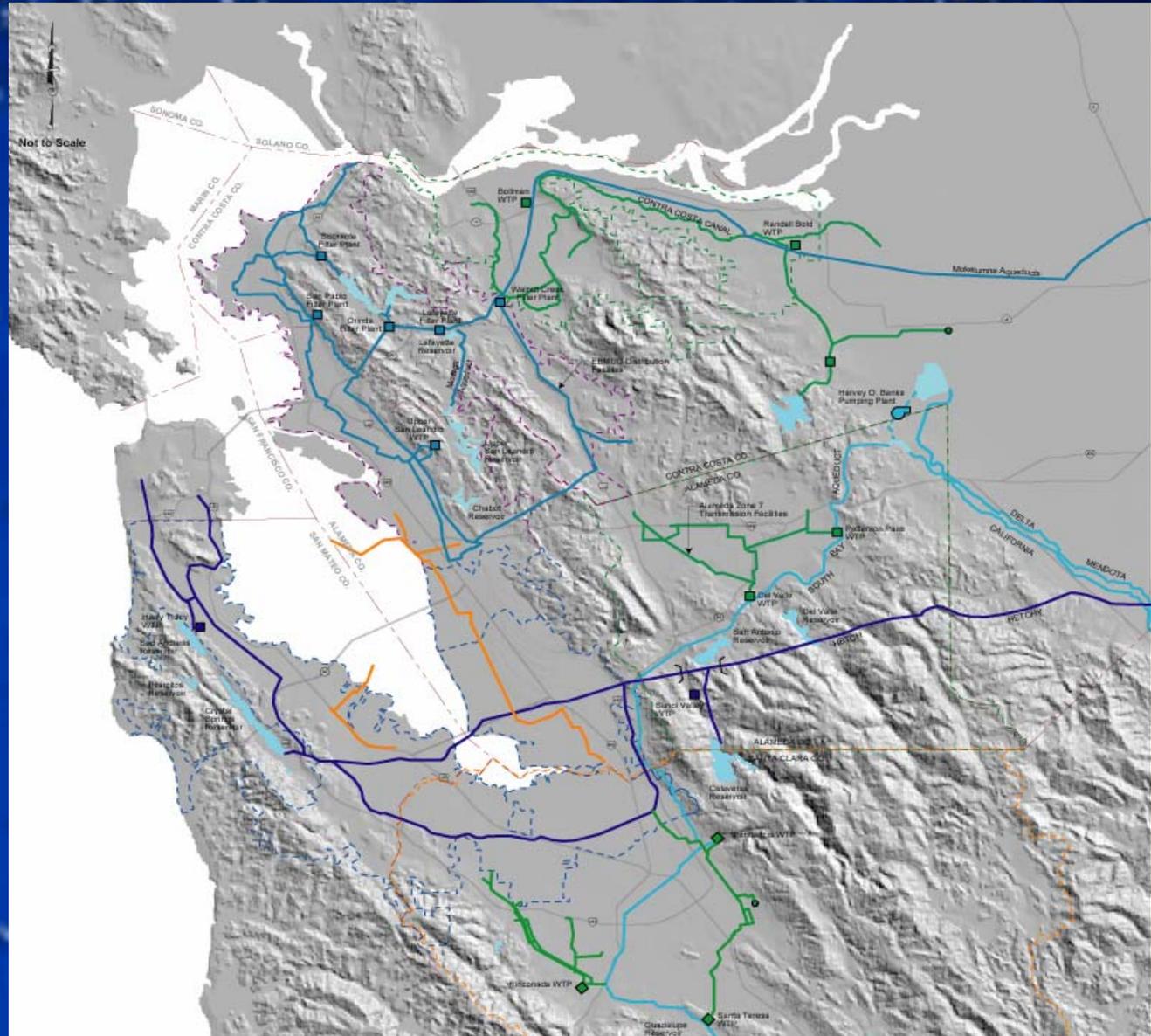
- ◆ California Department of Water Resources
- ◆ United States Bureau of Reclamation

Project Team

- ◆ CDM w/ EDAW and RMC

A Challenge and an Opportunity

- ◆ Different water sources and water quality
- ◆ Similar risks: seismic and drought
- ◆ How can reliability for both quality and supply be improved?



Program Phasing

- ◆ **Phase 1 – Initial Assessment:**
 - ◆ Compile information on agency water quality and demands, and estimate blending needs.
- ◆ **Phase 2 – Pre-Feasibility Studies:**
 - ◆ Develop alternatives, evaluate and identify a variety of concepts or concept portfolios.
- ◆ **Phase 3 & 4 – Detailed Evaluation (Currently Unfunded):**
 - ◆ Project selection & development, EIR, design, financing, implementation and ops plans

Phase I Overview

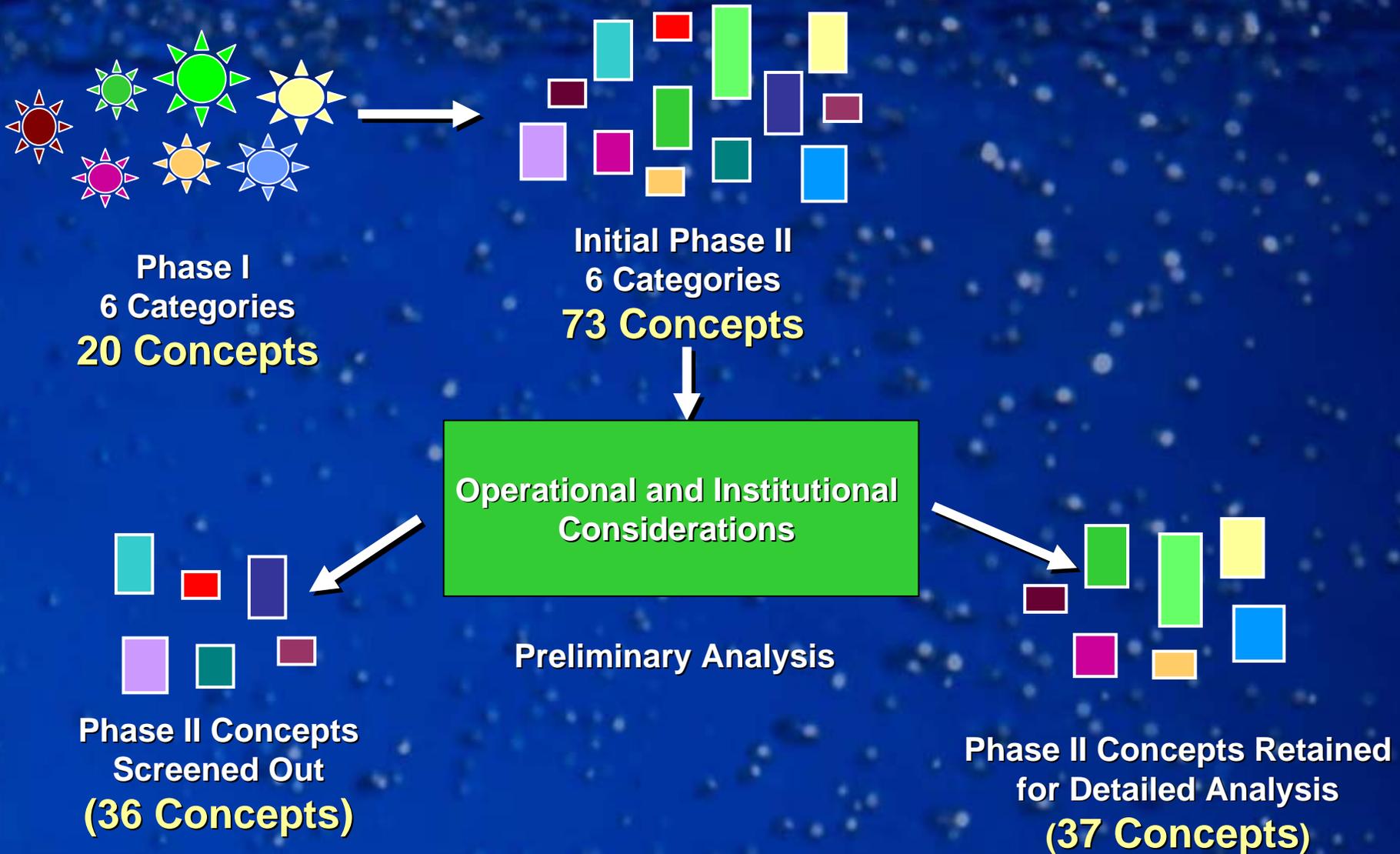
- ◆ **Question: Can CALFED ROD Drinking Water Numeric Objectives be met by Blending High Quality Sierra Water with Delta Water?**
 - ◆ **Bromide < 50 micrograms/liter**
 - ◆ **Total Organic Carbon < 3 milligrams/liter**
- ◆ **Conclusion:**
 - ◆ **Takes More Sierra Water to Blend with Delta Water Than is Available**
 - ◆ **There are Potential Projects that Could Provide Incremental Benefits**
 - ◆ **Need to look at both water quality and supply reliability**

Phase 2 Overview

- ◆ **Further Developed Regional Concepts and Portfolios using Phase 1 Information as a Starting Point**
 - ◆ **Conceptual engineering evaluations**
 - ◆ **Preliminary screening based on MOU principles and other factors**
- ◆ **Phase 2 Provides Information for Participating Agencies To Use in Decision Making on Water Supply and Water Quality Options**

2. Concept and Portfolio Development

The Concept Development Process



Concept and Portfolio Development Guided by Principles from Memorandum of Understanding and Other Factors

- 1. Must benefit more than one agency**
- 2. Participation is voluntary**
- 3. Alternatives must be mutually beneficial or at least neutral**
- 4. Need to make engineering/operational sense**
- 5. Decisions will be informed by the analysis but made by individual agencies**

Evaluation Objectives Developed by At the Outset of Phase 2

Objectives	Sub-Objectives
Maximize Supply Reliability	Meet Demands
	Minimize Vulnerability
	Maximize Control within the Region
Maximize Public Health Protection	Minimize Disinfection By-Products
	Minimize Total Dissolved Solids
	Minimize Variability for Treatment
	Minimize Taste and Odor Problems
Minimize Cost Impacts	Minimize Total Cost
	Allocation of Costs
Minimize Environmental Impacts	Net Impacts to Environment
	Net Benefits to Environment
Maximize Implementation Potential	Maximize External Support
	Ability to Get Outside Funding
	Maximize Internal Consistency with Agency Plans and Baseline

Phase 1: 20 Concepts Grouped by Supply Source

- ◆ EBMUD Facilities/Mokelumne Aqueduct (2 concepts)
- ◆ Hetch Hetchy Aqueduct (4 concepts)
- ◆ Capture of Additional High-Quality Delta Water (5 concepts)
- ◆ Enhanced Local Surface Supplies and Other Local Options (4 concepts)
- ◆ Alternative Sources (3 concepts)
- ◆ Concepts outside of Study that Should be Addressed by CALFED (2 concepts)

Initial Phase 2: 73 Concepts

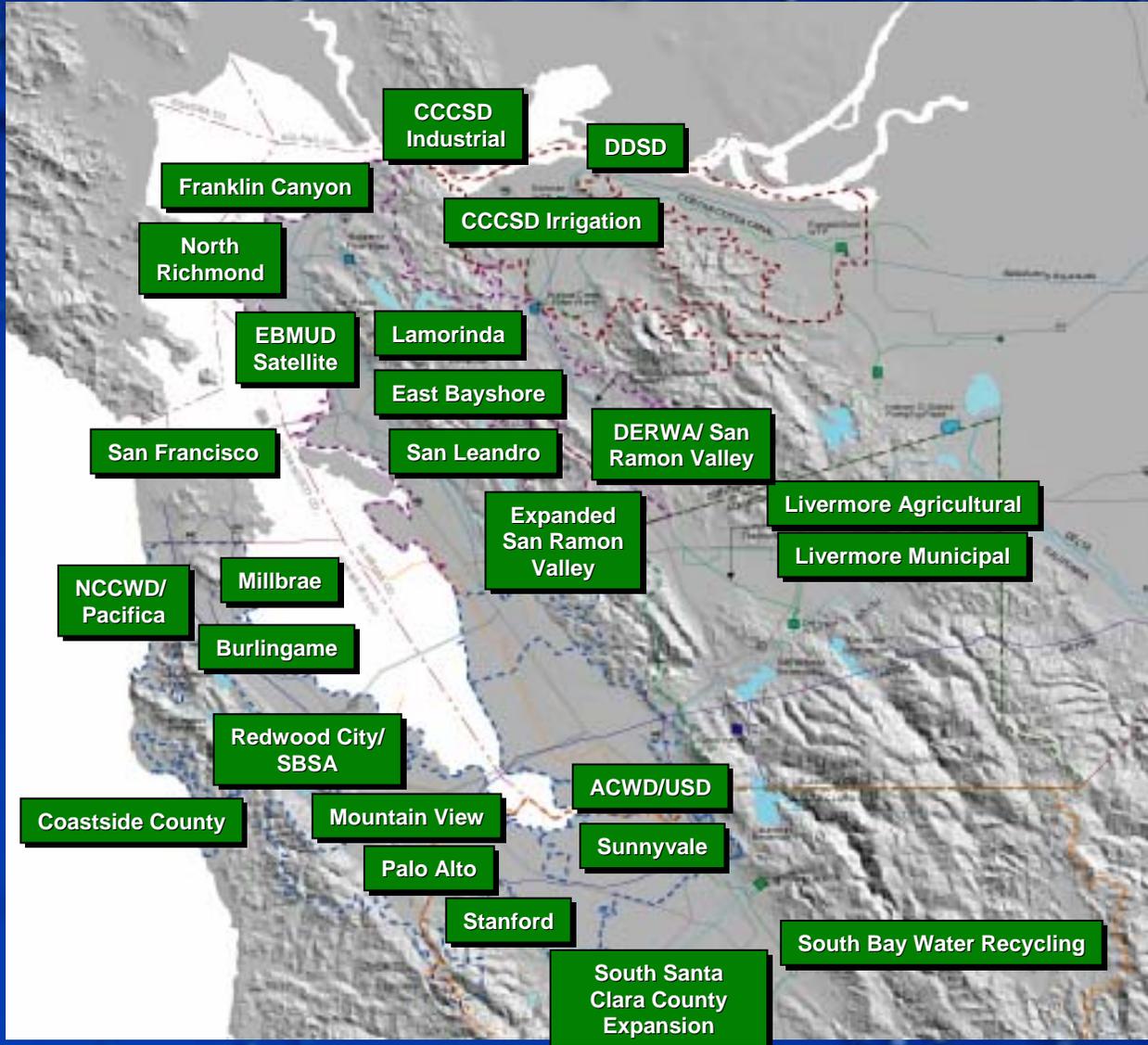
(Evaluation Added, Dropped and Re-Grouped by Project Type)

- 1. Groundwater Storage/Conjunctive Use (6 concepts)**
- 2. Water Recycling (26 concepts)**
- 3. Enhanced Conservation (2 concepts)**
- 4. Desalination (18 concepts)**
- 5. Surface Water Storage (10 concepts)**
- 6. Conveyance (4 concepts)**
- 7. Other (7 concepts)**

Preliminary Screening Identified 37 Concepts for Detailed Evaluation

- ◆ Groundwater Storage/Conjunctive Use (0 concepts)
- ◆ Water Recycling (26 concepts)
- ◆ Enhanced Conservation (1 concept)
- ◆ Desalination (7 concepts)
- ◆ Surface Water Storage (2 concepts)
- ◆ Conveyance (1 concepts)
- ◆ Other (0 concepts)

Recycled Water Concepts



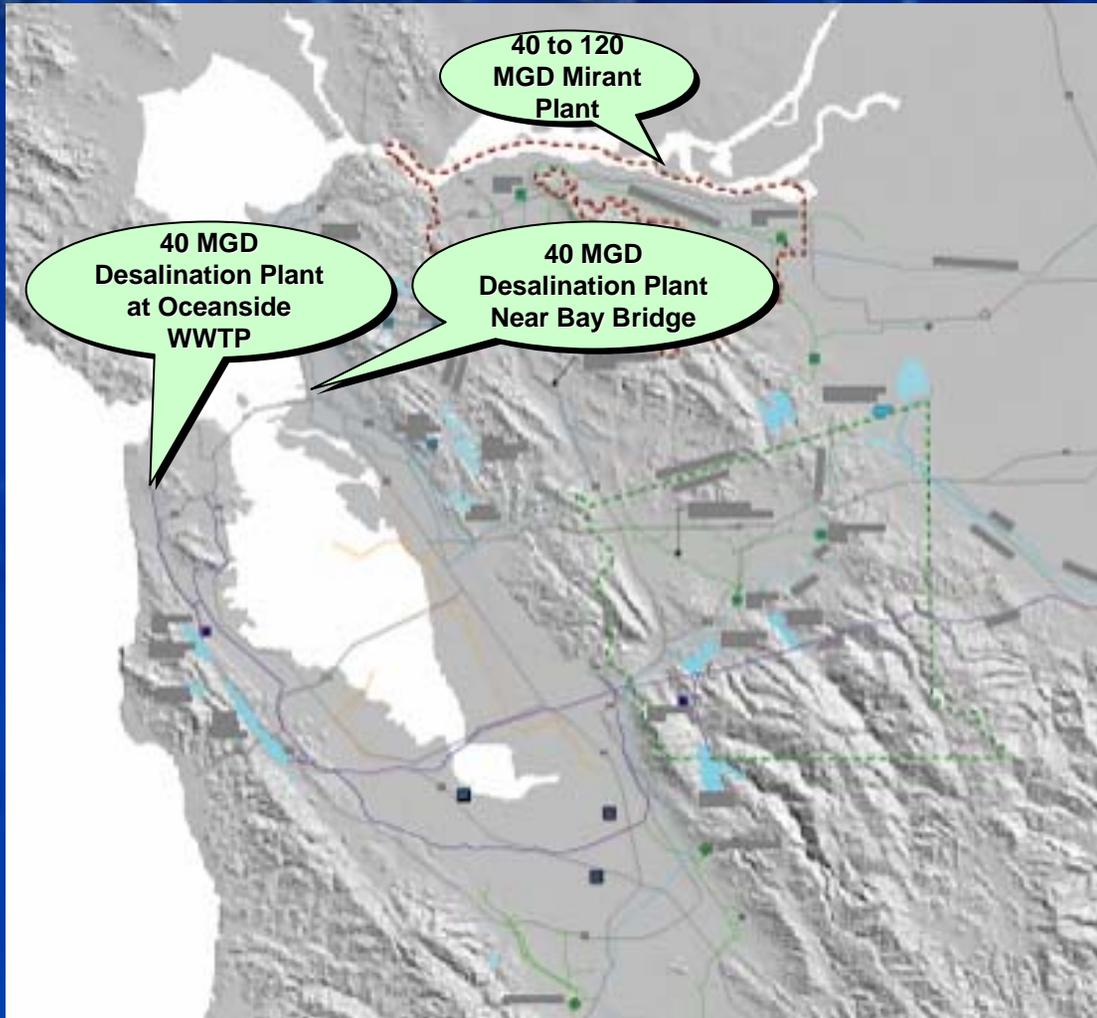
Enhanced Conservation

- ◆ Goes beyond the 180,000 acre-foot/year of Bay Area conservation projects currently planned by 2020
- ◆ Examined:
 - ◆ Activities not currently projected to be locally cost-effective
 - ◆ Regional opportunities for public outreach and research collaboration.

Desalination Concepts

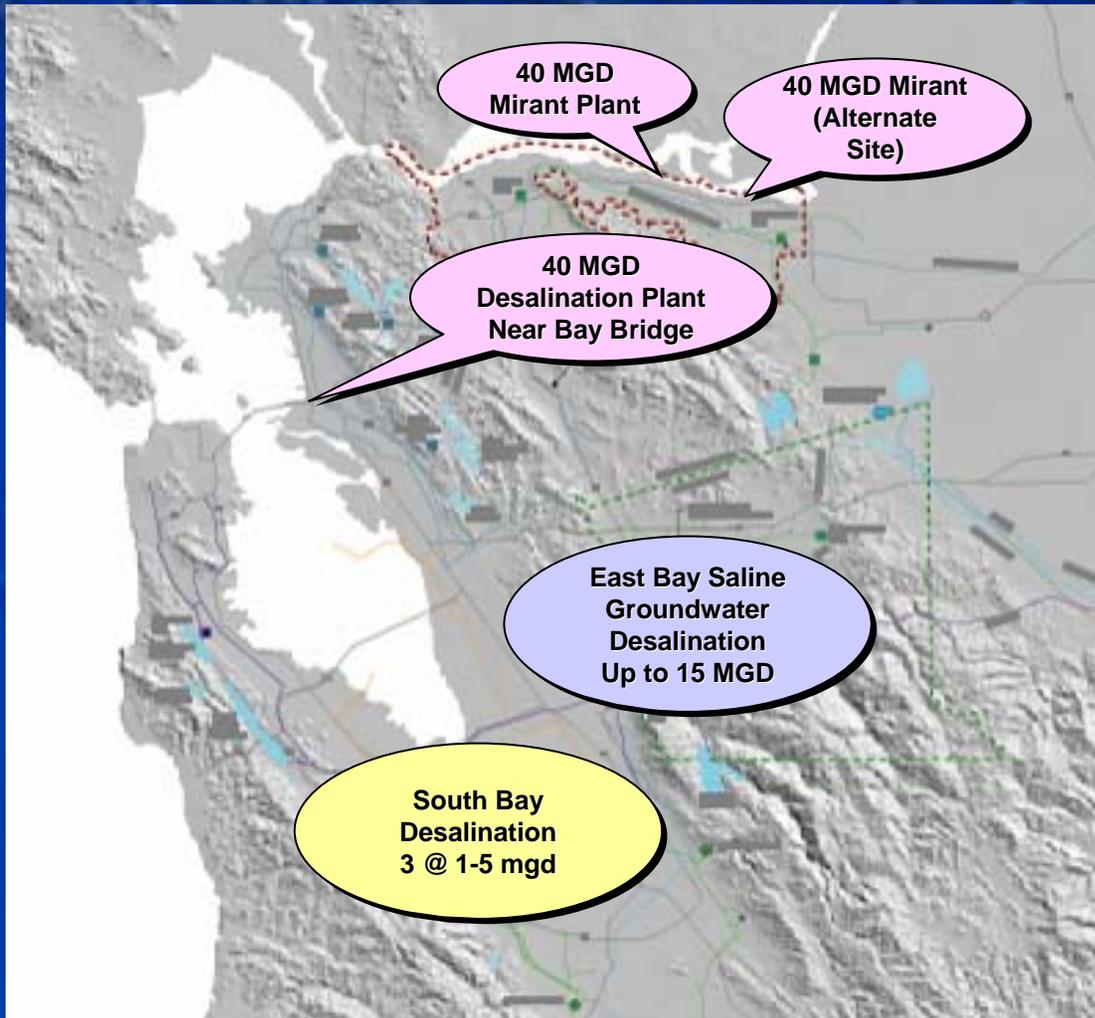
- ◆ **Regional Desalination Project**
- ◆ **Mirant Desal with Water Quality Element**
- ◆ **East Bay Saline Groundwater Desal**
- ◆ **South Bay (3 sites)**

Desalination Concepts - RDP



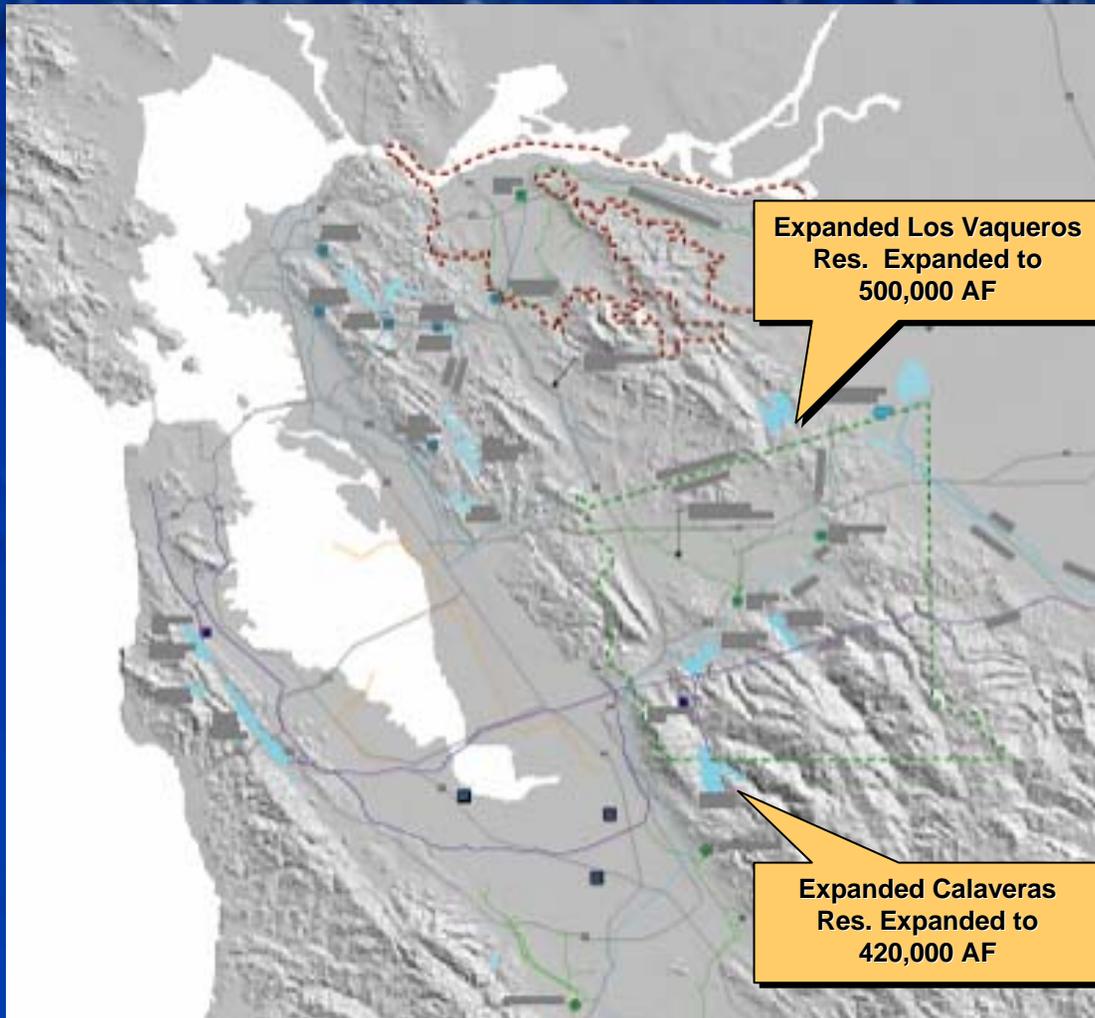
- ◆ Sponsored by CCWD, EBMUD, SFPUC and SCVWD

Desalination Concepts – BAWQ&WSRP



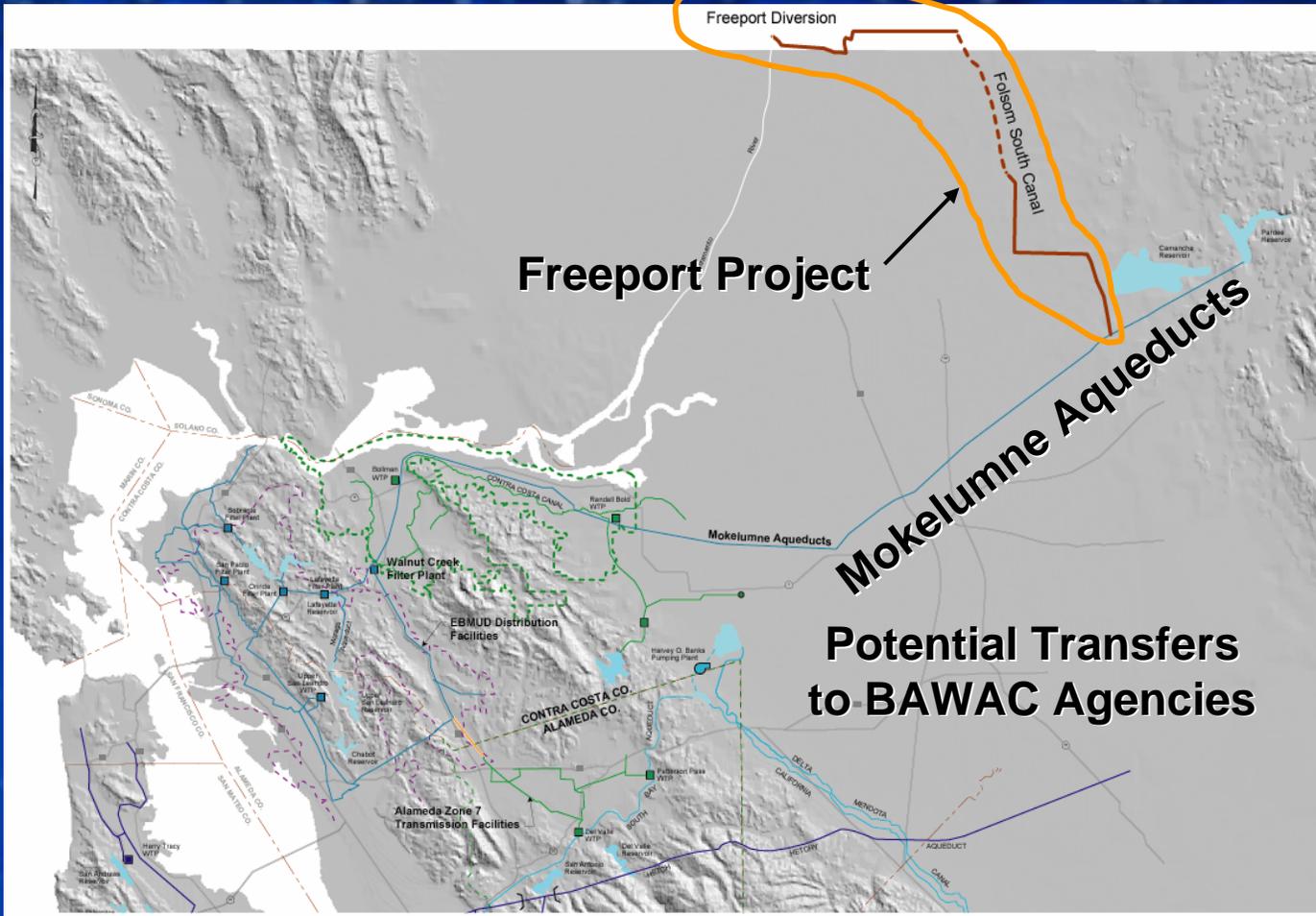
- ◆ **Desal with WQ Element**
 - ◆ Uses RDP sites
 - ◆ Includes average year WQ
- ◆ **East Bay Saline GW Desalination**
- ◆ **South Bay Desal**
 - ◆ 3 sites
 - ◆ Potable or non-potable

Surface Water Storage Concepts



- ◆ **Regional Benefit - water quality & supply**

Regional Conveyance



Bay Area Use of Freeport Regional Project

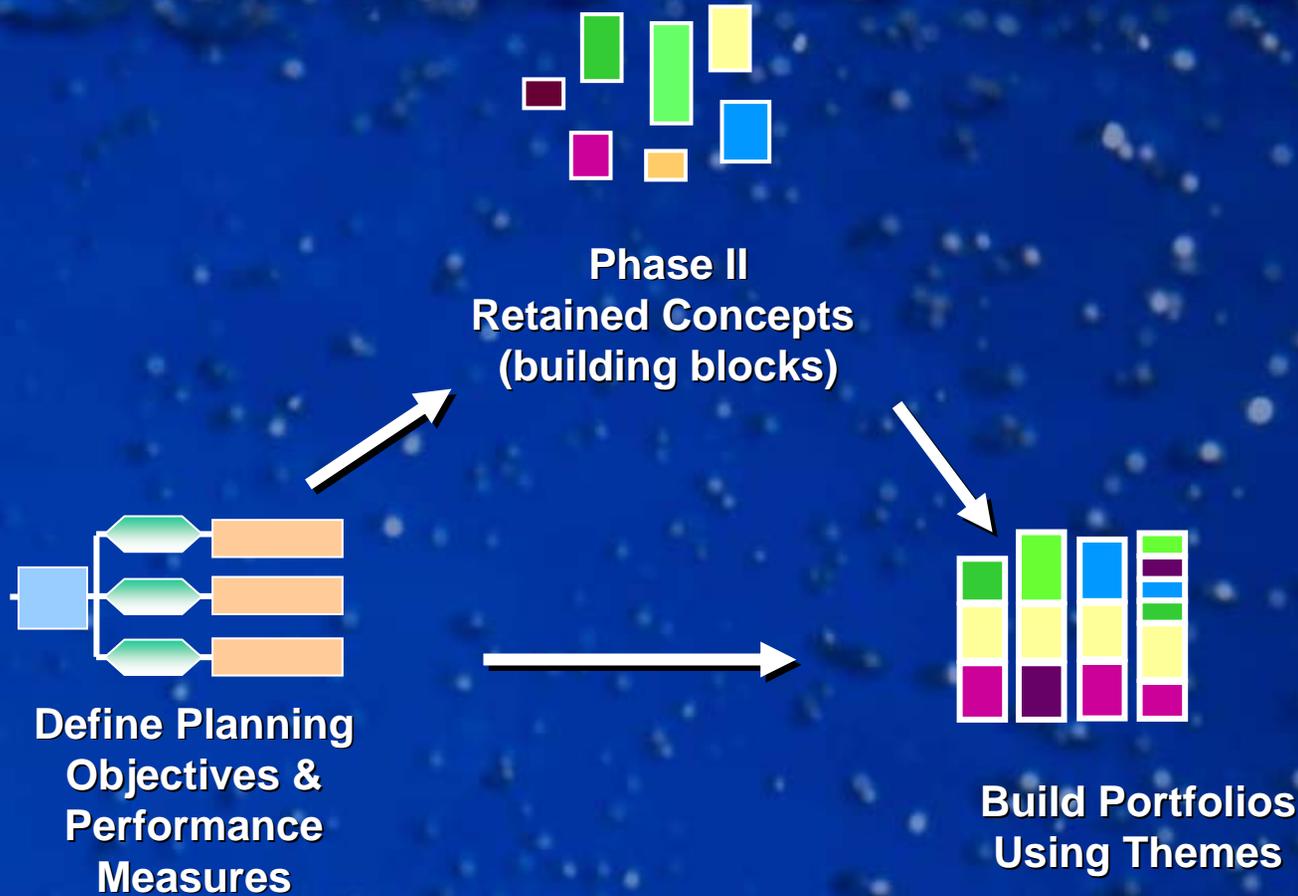
- ◆ Average year WQ Deliveries

Summary of Concepts and Yields

Concepts	Dry-Year Supply (afy)	Avg. Year WQ (afy)	Potential Partners
Surface Water Storage			
Calaveras Reservoir Expansion	Up to 53,000	---	SFPUC ¹ , SCVWD, ACWD
Calaveras Reservoir. Exp. with Water Quality	Up to 41,000	Up to 50,000	SFPUC ¹ , SCVWD, ACWD
Los Vaqueros Reservoir Expansion	Up to 42,000	121,000 ²	CCWD, Zone 7, SCVWD, ACWD
Enhanced Conservation	not defined	0	All
Recycled Water Concepts	Up to 97,000	0	All
Desalination			
South Bay Desal Concepts (Up to 3)	Up to 4,300 each	Up to 2,300 each	SCVWD, SFPUC, BAWSCA
Regional Desal Project (RDP)	not defined	0	CCWD, EBMUD, SFPUC, SCVWD
Mirant Desal with Water Quality Element	not defined	Up to 15,000	RDP Partners + Zone 7
Near Bay Bridge with Water Quality Element	not defined	Up to 10,000	RDP Partners + Zone 7
East Bay Saline Groundwater Desal	Up to 16,000	Up to 16,000	SFPUC ¹ , ACWD
Conveyance			
Bay Area Use of Freeport Reg. Water Project	0	Up to 15,000	EBMUD, Zone 7

1. SFPUC Wholesale customers (BAWSCA members)
2. 121,000 AFY based on average of deliveries for WY 1922 through WY 1994. Los Vaqueros Expansion studies estimate average year water quality benefits of up to 143,000 AFY.

Developing Example Portfolios



Example Portfolios Developed Using Program Principal Themes

Themes for Portfolios:

I – Maximize Water Quality

II – Maximize Water Supply Reliability with Storage

III – Maximize Water Supply Reliability with ELV

IV – Maximize Water Supply Reliability with Calaveras

V – Maximize Water Supply Reliability without Storage

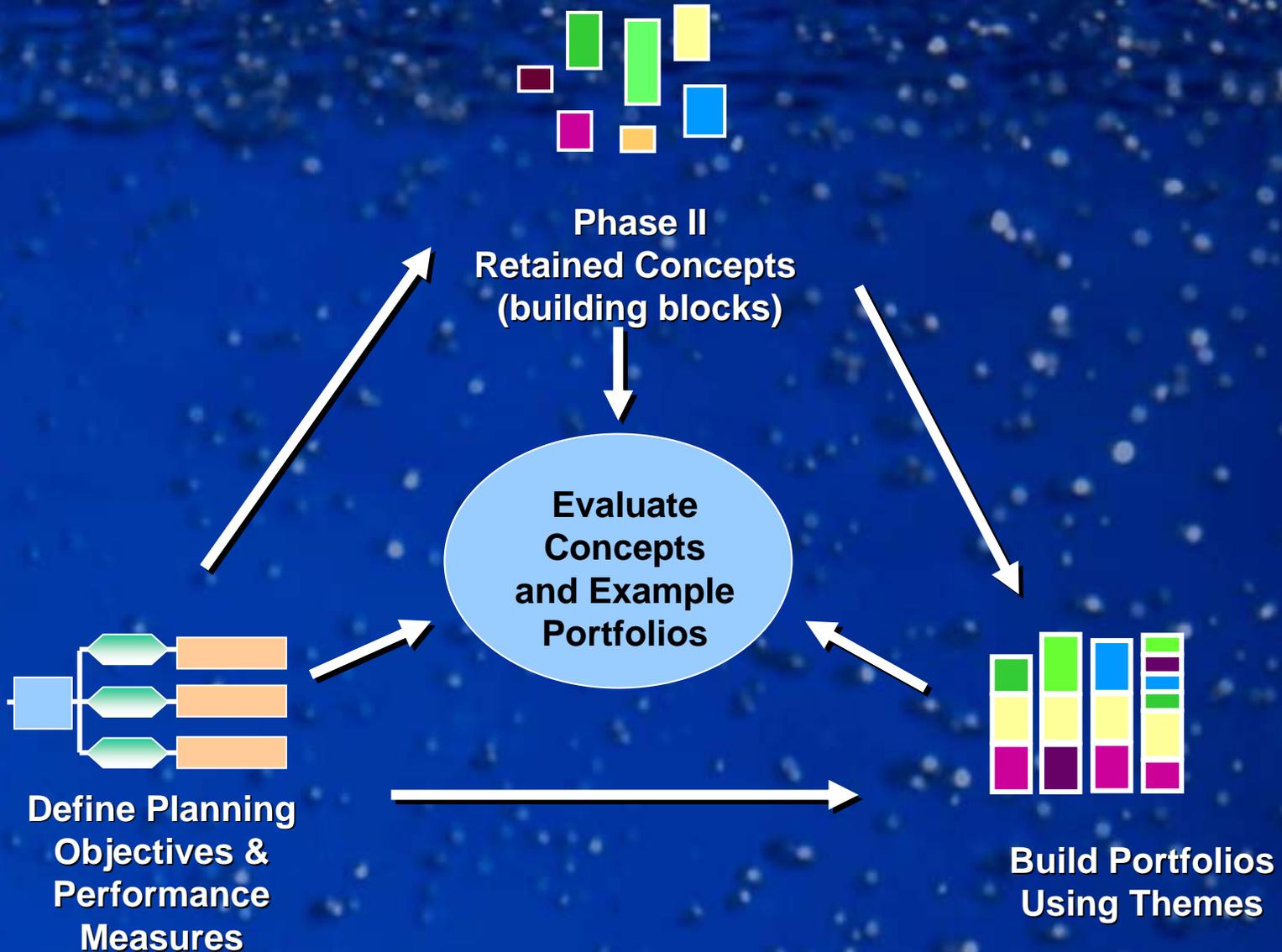
Example Portfolios and Benefits

Concepts Included	Yield		Portfolio I: Max. Quality	Portfolio II: Max. Supply w/ Storage	Portfolio III: Max. Supply w/ ELV	Portfolio IV: Max. Supply w/ Calaveras	Portfolio V: Max. Supply w/o Storage
	Dry Yr. Supply (AFY)	Avg. Yr. Blending (AFY)					
Los Vaqueros Reservoir Expansion	Up to 42,000	121,000 ¹	✓	✓	✓		
Calaveras Res. Exp. (max yield)	53,000	0		✓		✓	
Calaveras Res. Exp. (max quality)	41,000	50,000	✓				
Regional Desalination Project (2)	TBD	TBD		✓	✓	✓	✓
Mirant Desal w/ WQ Element	0	15,000	✓				
South Bay Desal (Up to 3 facilities)	Up to 4,300 ea	Up to 2,300 ea		✓	✓	✓	✓
East Bay Saline GW Desal	16,000	16,000		✓	✓	✓	✓
Bay Area Use of the Freeport Regional Water Project	0	15,000	✓				
Current and Planned Conserv. (1)	(180,000)	0	✓	✓	✓	✓	✓
Enhanced Conservation	NA	NA		✓	✓	✓	✓
RW Concepts (3)	up to 97,000	0		✓	✓	✓	✓
PORTFOLIO YIELD (Dry Year Supply) (4)	-	-	Up to 83,000	Up to 221,000	168,000	179,000	126,000
PORTFOLIO YIELD (Supply for Water Quality Blending) (4)	-	-	Up to 186,000	145,000	145,000	24,000	24,000

1. 121,000 AFY based on average of deliveries for WY 1922 through WY 1994. Los Vaqueros Expansion studies estimate average year water quality benefits of up to 143,000 AFY.

3. Concept and Portfolio Analysis

Evaluation Framework



Performance Measures Developed For Each Sub-Objective

Objective and Sub-Objective	Local Agency Perspective Performance Measure	Regional Perspective Performance Measure
Maximize Supply Reliability		
Meet Demands	Incremental Supply Compared to Demand	Affected Population Base. Number of Agencies Receiving Benefits
Minimize Vulnerability	Amount of Supply Dependent on Common Hydrology or Infrastructure	Affected Population Base. Number of Agencies Receiving Benefits
Maximize Regional Control	Degree of dependency on state or federal control.	

Scorecards Developed for Each Concept and Portfolio Performance

- ◆ **Supply Quantities and Qualities Projected for Each Agency With and Without Concepts or Portfolios**
- ◆ **Each Concept Evaluated with Respect to Each Objective and Performance Measure**
- ◆ **Example Portfolios Evaluated to Determine Benefits Relative to Individual Concepts Comprising the Portfolio**

4. Findings and Conclusions

Program Findings and Conclusions

- 1. Regional approach to addressing water quality and water supply is complex**
- 2. Viable actions exist but there is no simple solution for water quality and water supply**
- 3. Improvements to water quality in the Delta will be necessary as part of an integrated strategy to meet the long-term objectives of Equivalent Level of Public Health (ELPH) protection**

Regional Approach is Complex

- ◆ Factors that make planning complex on an individual agency level are multiplied
- ◆ Interplay between water quality and water supply apparent
 - ◆ Agencies with high quality water are also supply limited
 - ◆ Quality opportunities are limited, unless supply is also a component
- ◆ Although regional approach presents challenges, it also has many benefits

Though Viable Actions Exist, There is No Simple Solution

- ◆ Concepts and portfolios are not sufficient to achieve the numeric CALFED ROD Delta targets of 50 ug/L bromide and 3.0 mg/L TOC
- ◆ Enhanced conservation and water recycling are important elements of a comprehensive program, but are not sufficient alone to solve the Bay Area's water quality and supply challenges

A Broad Array of Actions Is Needed for Water Quality and Supply Objectives

- ◆ **Optimizing and improving treatment strategies**
- ◆ **Implementing elements of agencies' integrated water resources plans**
- ◆ **Continuing regional programs, such as Bay Area Regional Water Recycling Program and Regional Desalination Project**
- ◆ **Supplementing with more recycling, conservation, water banking, desalination, etc.**
- ◆ **Improvements to water quality in the Delta**

Delta Water Quality Improvements Necessary to Meet Long-Term Objectives

- ◆ **Source water improvements will be necessary**
- ◆ **As “Equivalent Level of Public Health Protection” is further developed and refined by CALFED, the extent of source water quality improvements needed within the Delta will be better defined**

Discussion