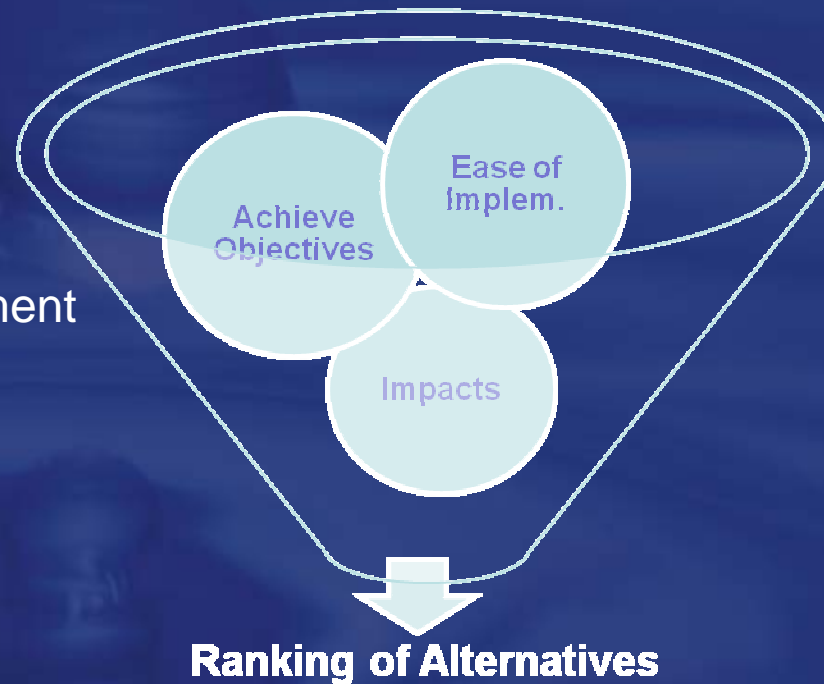


# Suggested Approach for Appraisal Level Economic Analysis of Alternatives

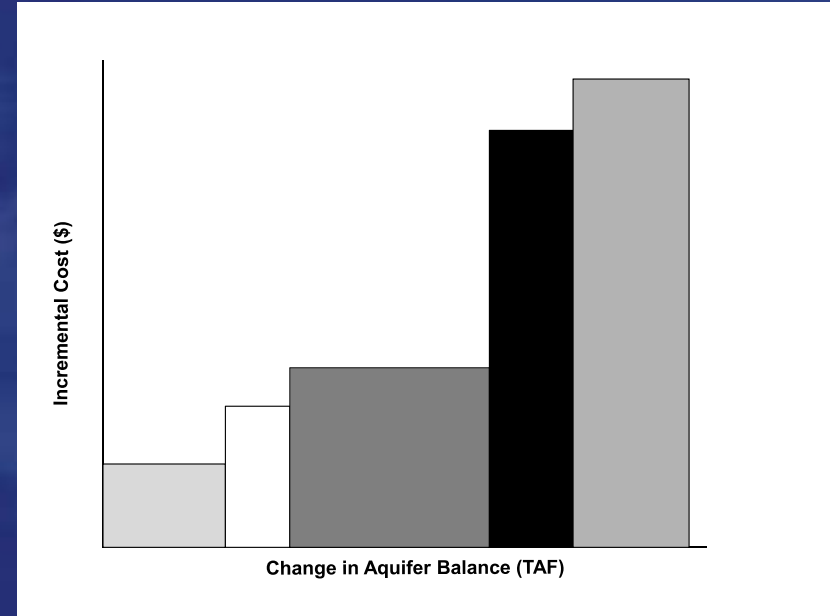
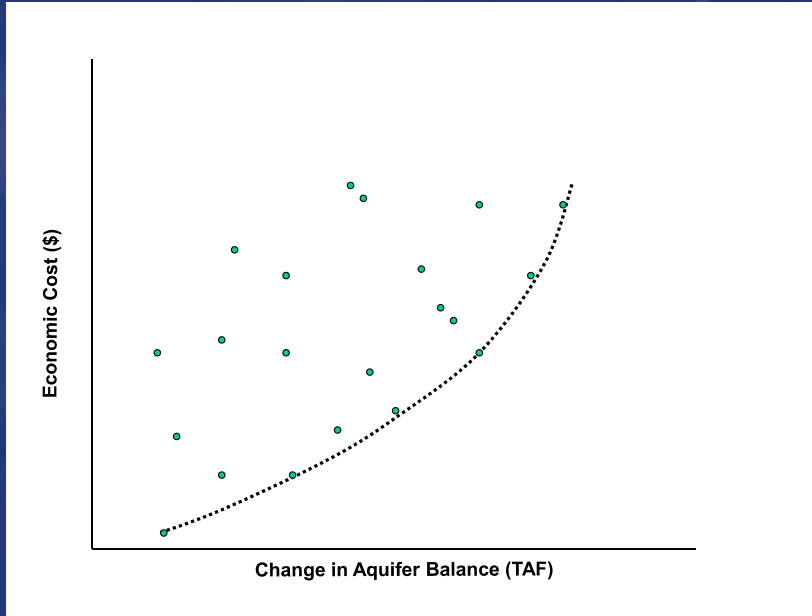
May 8, 2008

# Analysis Components

- Implementation
  - Cost
  - Time to Construct/Implement
  - Risk/Uncertainty
- Benefits/Objectives Achievement
- Potential Impacts
  - Socioeconomic
  - Cultural?
  - Biological/Physical
- Decision Support Analysis



# Economic Analysis



# Implementation Analysis

General: Costs will be compared in total as well as normalized by the volume of water provided by the alternative. Costs *and* water quantities will be “discounted” to allow comparison of alternatives with different implementation periods and timing of outcomes.

- Costs of Alternative
  - Capital Costs
  - Annual Costs
  - Net Present Value
    - Discount Rate (Federal Water Resources Planning Rate – 4.875%)
    - Period of Analysis – 100 years
- Risk/Uncertainty
  - Variability in Costs
  - Variability in Water Yield
- Implementation Period

# Benefits/Objectives

General: How are the primary and secondary benefits of the alternatives defined? These will largely be measured in physical units (e.g. AF, years, stream miles) or ranked according to other alternatives (e.g. 0=worst, 10=best)

- Primary Benefits
  - Restore Aquifer Balance
  - Water Supply (meet the needs of existing water rights)
  - Improve Spring Flows
  - Maintain Economic Opportunities
- Secondary Benefits
  - Scalability (Adaptive Management)
  - Timing of Benefits
  - Equitable Distribution of Benefits (upper/lower basin)

# Impacts of Alternatives

General: These will largely be measured in physical units (e.g. AF, years, stream miles) or ranked according to other alternatives (e.g. 0=worst, 10=best)

- Socioeconomic
  - Land Use (e.g. change in irrigated acres)
  - Secondary Impacts (indirect costs)
  - Industry Economic/Financial Viability
  - Recreation?
- Biological/Physical
  - Endangered Species
  - Water Quality

# Comparison of Alternatives

General: In order to compare the alternatives, it may be useful to develop a scoring system. However, values will be reported with and without scoring.

- Level 1
  - Report values in dollars or physical measurements
  - Normalize costs according to water yield of the alternatives
- Level 2
  - “Score” the alternatives by developing a common scale
  - All costs, benefits, and impacts are converted to the common scale
- Level 3
  - Compare alternatives with all criteria provided equal weight. For example, costs are not weighed more heavily than water quality.
- Level 4
  - Rank each criteria/factor according to relative importance to develop a weighted score.
  - This is a subjective analysis that will not be conducted by WestWater but can be pursued by the Committee.

# Decision Support Analysis

		<i>Units of Analysis</i>	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>Implementation</b>						
Cost	<i>NPV</i>	\$				
	<i>NPV/yield</i>	\$/AF				
Time	<i>Years to Develop</i>	yrs				
Risk	<i>Potential Field Reduction</i>	Rank (0 to 10)				
	<i>Yield Variability</i>	CV, Std. Dev.				
<b>Objectives Achievement</b>						
Primary Benefits	<i>Meet Water Needs</i>	AF/yr				
Secondary Benefits	<i>Aquifer Balance</i>	AF/yr				
	<i>Scalability</i>	Rank (0 to 10)				
	<i>Timing</i>	yrs				
	<i>Equity</i>	Units by Region?				
<b>Impacts</b>						
Socioeconomic	<i>Land Use</i>	Acres				
	<i>Secondary Impacts</i>	Rank (0 to 10)				
	<i>Economic Viability</i>	Rank (0 to 10)				
Cultural	<i>????</i>					
BioPhysical	<i>Endangered Species</i>	Stream Miles, Acres				
	<i>Water Quality</i>	Rank (0 to 10)				