Figure 1. Summary of Objectives and Approach (DRAFT)

Objectives:

- Describe the potential level of market-based reallocation without the Integrated Plan
- Estimate the extent to which the Integrated Plan might stimulate market-based reallocation of water to offset the economic losses of severe drought on irrigators.

Analytical Approach:

- Spreadsheet model of irrigation that simulates crop-to-crop trades to move water from crops with lower net farm earnings per acre-foot to crops with higher net farm earnings.
- Key assumptions include: water availability during severe drought equals 40 percent of entitlement for proratable irrigators; farmers with a shortage concentrate water on some land and fallow the rest, but do not take other steps, (change crop mix, use groundwater, etc.) to mitigate the effect of the shortage; and average value of net farm earnings for a given crop applies to all acres growing the crop.
- Applies current data on crops, crop-irrigation requirements, crop prices, and variable crop-production costs.
- Applies consistent data, assumptions, and calculations across different scenarios to estimate the upper bound of the potential for market-based reallocation to offset the economic losses of severe drought on irrigators.

Figure 2. Summary of Findings: Potential Water Trading and Impact on Net Farm Earnings in a Severe Drought Year (DRAFT)

Without the Integrated Plan

- By 2040, irrigators will sell water rights sufficient to transfer:
  - Less than 50,000 acre-feet of water per year for post-1905 residential development, both past and future, in the basin.
  - About 5,000 acre-feet of additional water for environmental purposes.
  - About 2,000 acre-feet to other irrigators growing higher-value crops
- Irrigators will lease about 40,000 acre-feet of water to other irrigators during a severe drought year (proratable irrigators receive 40 percent of full entitlement).

With the Integrated Plan

By 2040, during a severe drought year, market reallocation can have these effects on net farm earnings (annual crop revenue minus variable costs), relative to net farm earnings of $280 million with non-drought conditions:

Trading Scenario[a]	Water Traded (ac-ft)	Net Farm Earnings ($mil)
No Drought, No Trading	Zero	$280
Severe Drought		
No Trading	Zero	$190
Trading without the Integrated Plan[b]	40,000	$210
Trading with the Integrated Plan[c]		
Buyers Do Not Acquire More than 70 Percent of Crop-Irrigation Requirements		
Price = $150/ac-ft[d]	80,000	$220
Price = Zero[e]	190,000	$230
Maximum Market Trading		
Price = $150/ac-ft[d]	190,000	$260
Price = Zero[e]	330,000	$270

[a] These estimates reflect a consistent set of data and assumptions across scenarios.

[b] Assumes only intra-district trading for Wapato, Tieton, and Kennewick Districts; intra- and inter-district trading for Roza, Kittitas, and Sunnyside Districts. Also assumes buyers do not acquire water in excess of 70 percent of crop-irrigation requirement.

[c] Assumes only intra-district trading for Wapato, Tieton, and Kennewick Districts; intra- and inter-district trading for Roza, Kittitas, and Sunnyside Districts.

[d] Price = $150 per acre-foot represents the upper bound of expected water-lease prices.

[e] Price = zero represents the potential impact of water trading in the presence of subsidies or other actions aimed at encouraging water trading.